SCOTLAND'S NATIONAL LYNX DISCUSSION:

Stakeholder views on key topics related to a potential reintroduction of the Eurasian lynx to the Scottish Highlands

May 2025

LYNX TO SCOTLAND

IUCN SSC Species Survival Commission

CONSERVATION PLANNING SPECIALIST GROUP
Changing the Future for Wildlife

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Executive Summary

Between May and November 2024, a cross-sectoral group of 53 institutional representatives in total were involved in Scotland's National Lynx Discussion process, facilitated by the IUCN SSC Conservation Planning Specialist Group (CPSG). The process was designed to address concerns raised during the Vincent Wildlife Trust (VWT)-led multi-stakeholder study (2021-2022) and to further assess the social feasibility of a potential Eurasian lynx (*Lynx lynx)* reintroduction to the Scottish Highlands.

The National Lynx Discussion process focused on stakeholder concerns related to: the availability of sufficient, suitable habitat and prey for lynx; the potential positive and negative impacts of lynx on deer, gamebirds, livestock (with an emphasis on sheep) and other species of concern; and the potential opportunities and associated risks presented by a return of lynx to Scotland (e.g. enhanced wildlife tourism, the repair of predation pyramids). Specific concern over the potential implications of a lynx reintroduction on roe deer hunting and on woodland management were raised by stakeholders as requiring further discussion. Two further meetings were held with relevant stakeholders to consider these topics.

Stakeholders were initially brought together on 9 May 2024, during an in-person, full-day meeting in Perth, Scotland, at which they developed and agreed a process for generating recommendation statements for each topic, with this process informing the structure and output of subsequent online workshops. Between 16 May and 15 August 2024, stakeholders and observers then participated in ten online meetings, ranging in duration from three to six hours each. An additional targeted stakeholder session was held for roe deer managers on 28 August 2024, and for forest managers on 21 November 2024, per the recommendation of the larger stakeholder group.

Each topic of concern discussed within these online sessions was preceded by the distribution of pre-meeting briefing notes. The meetings themselves comprised a summary of the initial concern identified by the VWT study; expert presentations reviewing the state of knowledge based on experience from Europe; open, facilitated discussions that critically reviewed this information and its relevance to the Scottish context; and the drafting of concluding thoughts on each topic. Once concluding statements had been agreed and finalised (either during or after meetings), stakeholders were asked to vote on the statement to assess the level of consensus. If consensus was not reached, statements were edited further until all meeting participants reached a point of agreement.

Stakeholders reached a point of full agreement or agreement with stated reservations for all seven concern topics discussed. In addition, stakeholders: identified social and ecological factors to be prioritised in any monitoring efforts attendant to a possible lynx reintroduction programme; critically reviewed options for mitigating potential negative impacts of reintroduced lynx on livestock; and delineated the key components of any potential compensation scheme and adaptive management framework that would need to be in place should a lynx reintroduction be proposed.

Uncertainty regarding the application of European lynx research and lived experiences to the Scottish context was expressed throughout the process, with many stakeholders feeling that Scotland is significantly different from mainland Europe in several ways. Consequently, a clear recommendation from the process was that any lynx reintroduction proposal would need to be carried out as a phased approach with holistic monitoring, open communication, inclusive decision-making, and adaptive response including an exit strategy built in from the outset.

The need for trust-building, transparency and flexibility were also highlighted as being critical components for the success of any such proposal, along with clarity concerning how long-term, sustainable financial support, including for assisting persons who have sustained loss or damage, would be delivered. The importance of aligning any lynx reintroduction project with the policy landscape was also frequently raised by stakeholders.

Additional work recommended by stakeholders following the National Lynx Discussion process was to collect available data on the scale of gamebird rearing in other countries where the Eurasian lynx occurs, and to investigate the management of any associated conflicts. It was also recommended that population modelling be undertaken to forecast lynx population growth trajectories together with potential implications for predation on other species (especially livestock) under different deer management scenarios.

Stakeholders supported the move next towards a more local level consultation process, involving individual landowners and others who may be directly impacted by a potential reintroduction of lynx to Scotland.

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1. Introduction

1.1. Background

The Eurasian lynx is known to have been present in the UK until the Middle Ages,[1] and may have persisted in Scotland into the mediaeval period or even much later.[2] Extinction is believed to have occurred due to habitat loss and associated declines in prey availability, alongside unsustainable levels of hunting of the species for its fur. Similar extinctions occurred in other parts of its range and by the middle of the 20th century the lynx had disappeared from much of Europe.[3]

Since the 1970s, reintroductions have taken place in numerous European countries. Although a number of early attempts failed due to a variety of reasons, with improved knowledge and increasing public support, success rates improved, and lynx have now been successfully reintroduced to the Swiss Jura, the French Vosges, Slovenia and Croatia's Dinaric Alps, the Czech Republic's Bohemian Forest, and Poland and Germany's Palatinate Forest.[3] The UK remains one of the few parts of its former range from which the species is still missing.

Lynx to Scotland is a project to assess the feasibility of reintroducing the Eurasian lynx to the Scottish Highlands. It comprises both ecological and socioeconomic considerations, alongside all the practicalities that would be required to reintroduce the species. It is a partnership between Trees for Life, SCOTLAND: The Big Picture and The Lifescape Project.

1.2. Vincent Wildlife Trust report and results

In 2021, Lynx to Scotland commissioned the Vincent Wildlife Trust (VWT) to carry out a **study** to explore the social feasibility of a potential lynx reintroduction to Scotland.[4] Between January 2021 and February 2022, 116 semi-structured interviews were held with a wide range of stakeholders in two regions of the Scottish Highlands (the Cairngorms National Park and Argyll), as well as sessions with eight organisations and five community groups. The study found a wide spectrum of sentiments regarding lynx reintroduction, ranging from enthusiastic support to significant opposition, whilst many perspectives were far more nuanced than being simply 'for' or 'against'. Additionally, the study identified a series of knowledge gaps regarding lynx ecology and behaviour and categorised these into six primary themes around which stakeholders' perceived benefits and concerns revolved:

1. Habitat suitability
2. Impacts on deer and deer hunting
3. Impacts on other species
4. Impacts on gamebirds
5. Impacts on livestock
6. Socioeconomic opportunities

Overall, the study found that there was sufficient appetite amongst the stakeholders to develop a more comprehensive understanding of the potential for lynx reintroduction in Scotland to warrant further exploration.[4] Indeed, all perspectives believed that proactivity in addressing

conflicts and building trust would be valuable. The report recommended that this process should begin with the establishment of a cross-sectoral stakeholder group to: appraise the findings of the study; address perceived knowledge gaps and contested information; integrate local and scientific knowledge in an attempt to address areas of concern and, crucially, to begin a process of trust-building between stakeholder groups.[4]

1.3. Aim and objectives of Scotland's National Lynx Discussion

The national discussion process that led to the production of the current report was designed to determine the extent to which the thematic concerns identified in the VWT study could be addressed. The discussions drew upon available information on the Eurasian lynx within its current European range and encouraged reflection on the extent to which this can reasonably be applied to the Scottish context. The discussions were attended by representatives from a cross-sectoral range of national organisations to capture views at the country level.

The objectives of these discussions were to respond to the following specific questions:

1. Is there sufficient, suitable habitat and prey in Scotland to support a viable population of lynx?
2. What is the likely impact of a reintroduced population of lynx on deer populations and related hunting interests?
3. To what extent would a reintroduced population of lynx impact gamebirds and their management?
4. What is the likely impact of a reintroduced population of lynx on other species of conservation concern?
5. To what extent would a reintroduced population of lynx impact livestock farming (primarily sheep) and what steps could be taken to mitigate or manage such impacts?
6. What are the socioeconomic opportunities presented by the reintroduction of lynx to Scotland and what would need to be done to maximise these potential benefits?

1.4. References

1. Hetherington, D. (2006) The lynx in Britain's past, present and future. ECOS 27: 66-74.
2. **https://theconversation.com/the-lynx-may-have-survived-in-scotland-centuries-later-than-previously-thought-new-study-suggests-167250**
3. Hetherington, D. (2019) The Lynx and Us. SCOTLAND: The Big PictureBavin, D. & MacPherson, J. (2022) The Lynx to Scotland Project: assessing the social feasibility of potential Eurasian lynx reintroduction to Scotland. Vincent Wildlife Trust

2. Methods

2.1. Lynx Focus Group

As per the VWT report's recommendation, in 2023, Lynx to Scotland established a cross-sectoral stakeholder group: the Lynx Focus Group (LFG). The remit of this group was to:

1. Review the findings of the VWT study;
2. Design a national stakeholder consultation process to examine the concerns and opportunities identified by the VWT study; and
3. Oversee the consultation process to ensure that the final report is an accurate representation of what took place.

The group comprised six individuals/organisations with knowledge of lynx and/or of the sectors that could be impacted should lynx be reintroduced to Scotland (**Table 1**).

Individual	Organisation and position
Steve Micklewright	Trees for Life (CEO)
Andrew Bauer	Previous professional experience of species reintroduction policy process in Scotland
Dee Ward	Rottal Estate (Owner, Manager)
David Hetherington	Lynx Ecologist
Sarah Henshall	Cairngorms National Park Authority (Head of Conservation)
Rory Kennedy/ Ross Macleod	Game & Wildlife Conservation Trust (Director, Scotland) Game & Wildlife Conservation Trust (Head of Policy, Scotland)

Table 1. Members and affiliations of the Lynx Focus Group.

The LFG met multiple times online between November 2022 and March 2024 to discuss and agree upon:

1. The scope, rationale and required product from the national discussions;
2. The list of stakeholder organisations that should be invited to participate; and
3. The focus and outline of each national discussion.

An early recommendation of the LFG was that the stakeholder discussions should sit within the context of a proposed *trial* release of Eurasian lynx to Scotland. As would become clear within the stakeholder discussions themselves, the group felt that there would remain many questions and uncertainties that would need to be addressed through careful monitoring of a trial population, with clarity around an exit strategy, if required.

The group also strongly recommended that a reintroduction of lynx should not be assumed to be a foregone conclusion to this process. The release of lynx (via a trial process or a longer-term reintroduction programme) would not be recommended if it was proven to be infeasible on the basis of this national discussion process and/or any subsequent stakeholder consultations.

Six representatives of the LFG were stakeholders themselves and took part in the national discussions. As per their remit, the LFG also played an oversight role in the production of this report to ensure that it was a true reflection of the discussions and their outcomes.

2.2. Lynx study tour

In April 2024, Lynx to Scotland ran a study tour to the Jura region of Switzerland. 13 interested stakeholders with backgrounds in farming, hunting and forestry, together with representatives from the Cairngorms National Park took part, with the aim of learning more about how Switzerland has managed its lynx reintroduction and what lessons might be learned for a possible reintroduction of the species to Scotland. Seven of these participants subsequently took part in the National Lynx Discussion process, contributing both their personal expertise and their impressions from the **study tour to Switzerland**.

2.3. Facilitation

The National Lynx Discussion process was designed and facilitated by the **Conservation Planning Specialist Group (CPSG)** of the **International Union for Conservation of Nature Species Survival Commission**. The process met the following planning principles drawn from the **CPSG Species Conservation Planning Principles and Steps**:

1. **Plan to act:** the intent of planning is to promote and guide effective action to improve conservation management. This principle underpins everything the CPSG does.
2. **Promote inclusive participation:** inclusivity refers not only to who is included in the planning process but also to how their voices are valued and incorporated.
3. **Use sound science:** working from the best available science is crucial to good conservation planning. Using science-based approaches to integrate, analyse and evaluate information supports effective decision making.
4. **Ensure good design and neutral facilitation:** collaborative planning is designed to move diverse groups of people through a structured conversation in a way that supports them to coalesce around a common vision and to transform this into an achievable plan. Critically, neutral facilitation eliminates potential or perceived bias in the planning process, helping participants to contribute their ideas and perspectives freely and equally.
5. **Reach decisions through consensus:** effective species conservation planning results in decisions that all participants can support or accept. Recognising shared goals, seeing the perspective of others, and proceeding by consensus helps to galvanise participants behind a single plan of action that is more likely to be implemented.
6. **Generate shared products quickly:** producing and sharing the products of a conservation planning process quickly, freely and widely are key factors in its success.

7. **Adapt to Changing Circumstances:** effective plans are those that evolve in response to new evidence and knowledge, and to the changing biological, political, socio-economic, and cultural circumstances that influence conservation efforts. Plans should be considered living documents that are reviewed, updated and improved over time.

This collaborative approach to conservation planning encourages the development of a shared understanding across a broad spectrum of participants' levels of training and expertise. CPSG's role as a neutral, third-party facilitator is designed to reduce actual and perceived bias.

Consequently, these principles support the creation of functional working agreements that directly address the conservation problems at hand, along with the management decisions and actions required to mitigate those problems. As participants work as a group to appreciate the complexity of the conservation problems at hand, they take ownership of the process and of the ultimate management recommendations that emerge. Specifically, the process was designed and facilitated by Jamie Copsey, CPSG's **Director of Training**. Exercises involving small group facilitation and note-taking were additionally supported as needed by Lauren Waller and Bonnie Gulas-Wroblewski, both CPSG associates and trained facilitators.

2.4. Stakeholder selection

Stakeholder selection for the National Lynx Discussion process was performed by the LFG, using the criteria listed below. Twenty-eight organisations were invited to participate (**Appendix I**), 20 of which responded and agreed to participate in the process (**Table 1**). Andrew Bauer, Dee Ward (Owner, Manager Rottal Estate) and Steve Micklewright (CEO, Trees for Life) also participated as stakeholders in this process, as well as being members of the LFG.

Criteria used by the LFG to determine which stakeholder organisations should be included within the national discussion process were as follows:

1. The ability of the organisation to represent a national group of stakeholders;
2. The likelihood that the stakeholders represented by that organisation may be impacted by or have an impact on the issues raised during the preceding VWT study*;
3. The expertise that stakeholder group could bring to inform the discussion.

* It is not possible to determine what overlap there was between those involved in the VWT study and those selected for the National Lynx Discussion, as only areas of interest were recorded in the VWT study rather than individual or institutional names.

Name	Role
Andrew Bauer	Voting member
Association of Deer Management Groups	Voting member
British Association for Shooting and Conservation	Voting member
Cairngorms National Park Authority	Observer and provision of expertise
Confor	Voting member
Forestry and Land Scotland	Observer and provision of expertise
Game & Wildlife Conservation Trust	Voting member
Highland Environment Forum	Voting member
National Farmers Union Scotland	Voting member
National Sheep Association Scotland	Voting member
Ramblers Scotland	Voting member
Rottal Estate	Voting member
Royal Society for the Protection of Birds	Voting member
Royal Zoological Society of Scotland	Voting member
Scottish Environment Link	Voting member
Scottish Gamekeepers Association	Voting member
Scottish Land & Estates	Voting member
Scottish Wildlife Trust	Voting member
Trees for Life	Voting member
Wild Scotland	Voting member
Woodland Trust Scotland	Voting member

Table 2. Organisations participating in the National Lynx Discussion.

All stakeholders were invited to attend all the workshops, but actual organisational participation in the in-person and online meetings varied, the details of which are described within the meeting summaries below and compiled in **Appendix II**.

During the discussions pertaining to the potential impacts of lynx on deer and deer management in Scotland, the need for a separate, targeted discussion among roe deer stakeholders was recommended. Consequently, an additional online meeting with roe deer-related stakeholders was held on 28 August 2024. Similarly, a recommendation was made during several thematic sessions to host an independent consultation session with stakeholders

representing the forestry sector. This additional online meeting with forestry managers and experts was conducted on 21 November 2024. Stakeholders for these online sessions were identified through input from the national discussions group with final confirmation from the LFG (**Appendix III**).

A combination of eleven further organisations and/or individuals attended one or two meetings, relating to their area of interest or concern. John Macpherson (private landowner/ farmer), Ruaridh Ormiston (Highland Horse Fun; Croila Croft Kingussie) and Colin Murdoch (Reraig Forest Estate) all participated in the discussion during the lynx and livestock meetings, contributing their experience as farmers and their impressions from the study tour to Switzerland. Frank Law (Carrbridge Capercaillie Group and former manager of Seafield and Strathspey Estates) participated in the gamebirds and other species of concern discussions. David Olds (University of the Highlands and Islands), James Scott (British Deer Society) and John Bruce (Lowland Deer Network, Scotland) all participated in the additional discussion on lynx and roe deer. Ben Clinch (Moray Estates) and Will Anderson (Seafield & Strathspey Estates) participated in both supplementary discussions on lynx and roe deer and on lynx and forest management. Four additional stakeholders participated in just the lynx and forest management session: Euan Bowditch (Scottish School of Forestry), Nathan Bryceland (Scottish Land & Estates), Ruth Forrester (RTS Forestry) and Stuart Wilkie (Scottish Woodlands).

Three additional organisations attended the first meeting of the process – an in-person day in Perth – but decided not to participate further. Cairngorms Connect felt that its membership was too diverse to be represented by a single voice and that there were already member organisations included within the existing stakeholder group selected (namely Forestry and Land Scotland and RSPB); NatureScot felt that their participation was not appropriate given their statutory role as the licensing authority in a potential licence application for lynx reintroduction; and the Roy Dennis Wildlife Foundation declined due to lack of capacity.

2.5. National Lynx Discussion process overview

The National Lynx Discussion process comprised the following:

1. An introductory in-person meeting which enabled participants to meet each other, to familiarise themselves with the context of the discussions and the topics to be reviewed, and to contribute to the format and design of the online workshops;
2. A series of online workshops, each tackling a separate topic of concern raised through the VWT study; and
3. A concluding online meeting for all participating stakeholders to review and accept the report from the national discussions prior to it being made publicly accessible.

2.5.1. In-person meeting: purpose and content

The in-person stakeholder meeting was held on 9 May 2024, in the Perth Theatre, Scotland. The meeting was attended by 18 stakeholders (**Appendix II**) and consisted of a series of introductory presentations on the proposed national discussion process, the history of the Lynx to Scotland partnership and the VWT study that laid the groundwork for these discussions. Also included was a presentation on the Eurasian lynx and the rationale for considering its

reintroduction to Scotland (**Appendix III**). Jamie Copsey guided attendees in completing two tasks during the meeting:

1. Identification of any specific needs they felt should be considered in the course of the online topic discussions (**Table 5**).
2. Development of a scale of agreement to be used to assess levels of consensus for the conclusions arising from each online topic discussion (**Figure 1**);

Identification of stakeholder needs

To ensure that the national discussions proceeded in a way that all stakeholders felt comfortable with, time was spent at the in-person meeting identifying needs to be considered (**Table 3**). The need to create a 'safe space' in which stakeholders could talk openly without fear of their words being shared externally was identified. Consequently, it was agreed that no-one would share information on the discussions until the final report was completed and agreed by all stakeholders. These needs were revisited at the start of each of the online meetings that followed to remind the group as to what they thought was important to consider, and to check if any additional needs required consideration.

Needs related to:				
The lynx themselves	**The quality of the data underpinning the discussions**	**Potential negative impacts on public access and tourism**	**Potential negative impacts on the wider land management sector**	**How the process is run**
I need to be sure that the process will follow high standards of animal welfare.	I need the process to be evidence-led, to create informed decisions.	I need to know we will ensure there are no detrimental impacts to our ability to access the landscape and that we make active provision for tourism.	I need to ensure that habitat expansion and restoration do not compromise food production.	I need to be comfortable that we maintain transparency to ensure the credibility of the process.
I need to know the likely dispersal [of the animals] based on available habitat.	I need to be clear about where information is sparse/unclear within the Scottish context, to ensure the process is credible and we make good decisions.	I need to know that both the negative and positive impacts of lynx reintroduction can be accurately represented to the tourism sector.	I need to understand what the management framework might look like and how it will be funded.	I need to be comfortable that all opinions are expressed and represented to ensure inclusivity and fairness.

	I need to be comfortable that we are not presenting Scotland as exceptional unless the data supports it.		I need to know we will consider the impacts on land managers and the mitigation required (long-term) to maintain their livelihoods.	I need to be sure that we will not be reductive about sectors, e.g. don't assume 'farmers think X' or 'conservationists think Y'.
	I need to be sure that the return of lynx is a driver/ complimentary to/for wider ecological restoration and does not harm other threatened species unduly.		I feel lynx should be considered as a conflict species from the start until proven otherwise.	I need to be sure the process of lynx return has the trust of key stakeholders.

Table 3. Summary of needs identified by stakeholders to be reflected within the online discussions to follow.

2.5.2. Online meetings: purpose and content

The aim of the online meetings was to discuss each topic identified in the VWT study – critically reviewing the available literature alongside stakeholder knowledge and expertise to produce an agreed conclusion. Where relevant, this conclusion included recommendations for any further work that should be undertaken and any mitigation or management measures that would need to be implemented should a reintroduction of lynx take place.

The following process was used for each online meeting:

1. A **briefing document** focused on the topic under discussion was sent to all stakeholders prior to the meeting. Compiled by Lynx to Scotland, these briefing documents provided a succinct but comprehensive review of existing knowledge surrounding each topic. Every participant was thus equally prepared with the same baseline information on the topic when attending the online session.
2. Meetings began with personal introductions, followed by an outline of the meeting process (including the scale of agreement to be used to evaluate consensus: **Figure 1**), a review of the Needs Statements defined at the Perth meeting (**Table 3**) and a summary of the specific thematic concern to be addressed on that day, as originally identified by the VWT study.
3. A presentation was given on what is known on the topic from the European context, followed by an opportunity to ask questions and an open discussion to critically review this information in relation to its relevance to Scotland. Where relevant, these presentations introduced models or other evidence-based predictions of probable future scenarios should a reintroduction of lynx occur within the United Kingdom. Dr David Hetherington (UK lynx expert) delivered presentations on topics 1-5 and Peter Cairns (SCOTLAND: The Big Picture) and Pete Creech (Heart of Argyll Tourism Alliance) on topic 6 (see **Table 4** for topic titles). Additional presentations were given

by specialist speakers on some topics, detailed in the results sections.

4. All stakeholders were asked for their thoughts on the topic. A sub-group of stakeholders was then asked to draft a concluding statement reflecting the views of the group, to be shared – along with a summary of the concern raised by the VWT study and a summary of the accepted knowledge on the topic – with all stakeholders.
5. All stakeholders were then asked to comment on and edit the statement until they were comfortable with its content. In some cases this happened during the meeting, but, due to time constraints, in most cases this took place after the workshop.
6. Stakeholders were asked to indicate their views on the concluding statement by voting on a scale of agreement (**Figure 1).** This scale was developed and agreed by stakeholders in the in-person meeting and was modified from the ***Gradients of Agreement*** method.*

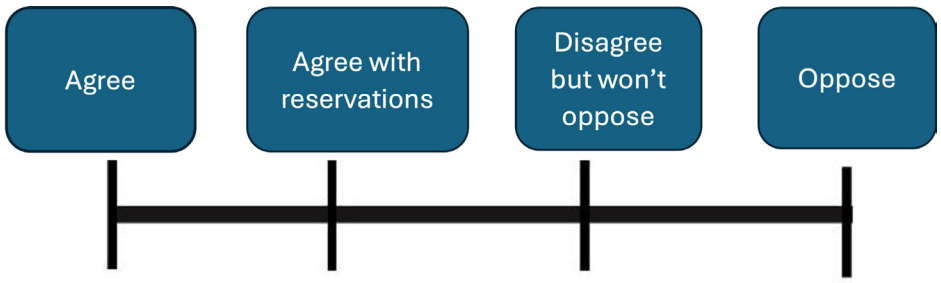

Figure 1. Gradients of Agreement scale developed by stakeholders during the in-person meeting.

Stakeholders had decided in the in-person meeting that the minimum level of agreement that would reflect consensus on a topic should be 'agree with reservations'. If anyone opposed or didn't agree with the statement, it was further edited until all stakeholders reached this point. Any reservations were summarised under each statement.

Twelve online meetings were held between May and October 2024 (**Table 4**). Meetings 11 and 12 were not part of the original schedule but were identified by stakeholders during the process as topics that warranted further analysis from an additional subset of stakeholders with specific interests and experience in these areas.

* Kaner, S., 2014. Facilitator's guide to participatory decision-making. John Wiley & Sons.

Online meeting topics	Times	Date and agenda
Topic 1: Habitat and prey: Could Scotland sustain a population of lynx?	9:30 – 15:00	16 May 2024
Topic 2: Lynx, deer and implications for Scotland (Part 1)	9:30 – 13:00	3 June 2024
Topic 2: Lynx, deer and implications for Scotland (Part 2)	9:30 – 13:00	13 June 2024
Topic 3: Lynx and gamebirds and potential responses*	9:30 – 15:30	18 June 2024
Topic 4: Lynx and other species of concern (Part 1)	9:30 – 13:00	27 June 2024
Topic 5: Lynx and other species of concern (Part 2)	9:30 – 12:30	4 July 2024
Topic 6: Lynx and livestock and potential responses (Part 1)	9:30 – 13:00	18 July 2024
Topic 6: Lynx and livestock and potential responses (Part 2)	9:30 – 14:30	24 July 2024
Topic 6: Lynx and livestock and potential responses (Part 3)	9:30 – 15:00	1 August 2024
Topic 7: Potential opportunities and associated concerns	9:30 – 14:00	15 August 2024
Topic 8: Lynx and roe/forest deer and implications	9:30 – 13:30	28 August 2024
Topic 9: Lynx and forest management	9:00 – 13:00	21 November 2024
Review of report, final words and next steps	9:30 – 13:00	3 February 2025

Table 4. Online meeting schedule for the National Lynx Discussion. All times are in GMT.

* The National Lynx Discussion process addressed gamebirds hunted for sport (pheasants, red-legged and grey partridges, red grouse and woodcock) separately from gamebirds of conservation concern (western capercaillie, black grouse, ptarmigan). The former were discussed during the session on gamebirds, whereas the latter were considered in the sessions focused on "other species of concern" (**Table 4**). This contrasts with the VWT report in which black grouse and capercaillie are considered as gamebirds.

3. Results

For each of the discussions held, a synopsis is provided of the presentations given and topics explored. This is followed by a summary of:

1. The concern(s) identified by the VWT report;
2. The state of the knowledge linked to those concerns; and
3. The concluding statement from discussion participants, agreed upon by all involved stakeholders and including any reservations communicated.

A list of the organisations that participated in, drafted and voted on each concluding statement is provided in **Appendix II**.

The need for comprehensive, transparent and responsive monitoring of both ecological and social variables following any potential release of lynx was emphasised by stakeholders throughout the discussions and a specific session was held as part of the Lynx and other species of concern meeting (part 2) to explore this further. A summary of these recommendations is provided in **Section 3.9**. Additionally, within the lynx and livestock topic sessions, an in-depth discussion was held concerning potential mitigation, compensation and integrative lynx management options that might (or might not) be viable within Scotland. A more detailed synopsis of these assessments is included in **Section 3.7.4**.

3.1. Habitat and prey: could Scotland sustain a population of lynx?

3.1.1. Synopsis of discussion content

The first online session of the National Lynx Discussion process commenced on 15 May 2024, with a 6-hour meeting during which 11 stakeholders and 3 observers considered the availability of adequate wild prey and suitable habitat for any reintroduced population of lynx within Scotland (**Appendix II**).

Jamie Copsey began the session with a general introduction to the process and the specific topic to be explored along with the related concerns noted from the VWT report. Next, David Hetherington presented a summary of his and others' work on the availability of suitable habitat and wild prey that could support a viable population of reintroduced lynx within Scotland, with reference to data on lynx habitat requirements in other areas of Europe.

After these presentations, participants engaged in a facilitated question-and-answer session. The meeting culminated in a review of a previously drafted "strawman" statement provided to stimulate discussion among participants on: 1) what were reasonable conclusions to draw from the best available information on suitable lynx habitat and prey, and 2) what were the most important aspects of this information to capture in a position statement? This review catalysed further discussion and the production of a final statement agreed by all stakeholders.

Data presented by David Hetherington suggested that Scotland contains sufficient wild prey (primarily roe deer) and suitable, sufficiently connected habitat to meet the ecological requirements of a reintroduced lynx population. This was reinforced by reference to the lynx's adaptability to human-dominated landscapes in Switzerland and elsewhere in continental Europe. His presentation noted the lynx's preference for deer (even at densities that are significantly lower than Scotland's relatively abundant deer populations) and the importance of habitat that provides concealment for these ambush predators, such as forested areas, densely-shrubbed habitats, or even rocky outcroppings. In particular, he highlighted models that accounted for European lynx demography, habitat use and dispersal behaviour to predict the strong likelihood that Scotland could currently support two populations of reintroduced lynx: up to 400 individuals in The Highlands separated by the highly developed Central Belt from approximately 50 individuals in the Southern Uplands.

David Hetherington's presentation cultivated a vibrant discussion among participants that converged on the following topics:

1. Adaptability and variations in the dispersal behaviour of lynx in continental Europe;
2. The assumptions included (and omitted) from specific models predicting the viability and habitat occupancy of reintroduced lynx populations in Scotland;
3. The suitability of human-dominated and/or heavily fragmented landscapes for lynx, including lynx welfare concerns (e.g. likelihood of mortality from vehicle collisions and human-wildlife conflict);
4. The paucity of standardised national estimates for deer densities across Scotland, though there was universal agreement that whatever these population numbers may be, they are higher than many areas across Eurasia where lynx thrive; and

5. Questions around the impact of future government policies advocating for increased deer culling and the implementation of these policies in the field, although related declines in deer populations are not expected to reach below the one deer per sq.km threshold at which lynx hunting success is noted to begin declining steeply.[1,2]

It was highlighted that a more comprehensive estimate of population densities for all deer species across public and private lands in Scotland would be desirable as part of the national drive to lower deer densities. A second suggestion was to incorporate genetic health factors (e.g. genetic diversity) and future estimates of forest cover into population and habitat viability assessments (PHVAs) and lynx dispersal models. Participants also voiced an interest in collecting more information relating to any evidenced variation in dispersal behaviours between wild-born and captive-bred lynx as it relates to sourcing of individuals for possible future releases in Scotland.

3.1.2. Concluding statement

After discussion and revision of the draft statement among all meeting participants, the following statement was finalised and accepted without reservations by all stakeholders in attendance:

Summary of concern

The results of the **VWT study** highlighted the view shared that the quality, quantity and distribution of habitat and prey in Scotland differs from that in the rest of the lynx's natural range. It was therefore felt that Scotland may not be able to support a viable population of lynx, or they may behave differently to elsewhere, leading to increased conflict with other land users.

Summary of related knowledge

Lynx do not require vast swathes of continuous, undisturbed habitat to survive.[3] Many countries across Europe support lynx populations in fragmented, human-dominated landscapes and with lower natural prey availability than Scotland.[4] Three separate studies have concluded that Scotland has sufficient habitat and prey to support a healthy, self-sustaining population of lynx.[5,6,7]

Conclusion

Whilst the potential for conflict with other land users remains a concern to be considered in other discussions and recognising that it is difficult to predict with absolute certainty the behaviour and impacts of reintroduced lynx, the evidence suggests that there is sufficient habitat quality and quantity and prey to support a viable population of lynx in Scotland. Policies and initiatives relating to land use and nature restoration may affect suitability over time.

3.1.3. References

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3.2. Lynx and forest management practices

3.2.1. Synopsis of discussion content

Participants in the National Lynx Discussion identified the need for a targeted discussion among stakeholders in the forestry sector, which was realised in an online session on 21 November 2024. Two observers and eight stakeholders, identified for their representative experience within the forestry sector, discussed the potential ramifications of lynx reintroduction for the practice of Scottish forestry across various operational contexts (**Appendix II**).

This was the first time most attendees were participating in the National Lynx Discussion process. Therefore, Jamie Copsey initiated the meeting with a review of the general objectives and process behind the national consultation, a summary of the **VWT report** information and of the Perth needs statements (**Table 3**), and an explanation of the session's agenda within the framework of the wider consultation process. David Hetherington and Hugh Webster then shared presentations on the European experience of lynx as it relates to forestry management. Dave Hetherington focused on the biological, behavioural and ecological characteristics of lynx correlated with their use of forested landscapes and interactions with deer, humans and other relevant species. Hugh Webster shared testimonials from wildlife and forestry professionals in Finland, Germany, Norway, Poland, Slovakia, Slovenia and Switzerland, which addressed the question *"Do lynx protections limit forestry operations in Europe, and, if so, how is this issue managed?"* Following both presentations, attendees were able to ask questions and freely discuss the topics raised by each.

After a brief break, Jamie Copsey led the group through a facilitated discussion on the specific direct and indirect effects that a reintroduction of lynx could potentially have for the forestry sector in Scotland. Participants were then directed to a brainstorm on two main topics to be incorporated into the group's concluding statement:

1. What possible impacts could reintroduced lynx have on the practice of forestry?
2. What prerequisites would need to be incorporated into any proposal for lynx reintroduction to reduce current concerns from forestry stakeholders?

Overall, participants agreed that stakeholder concerns were not related to any direct effects of lynx on forested lands or the practice of forestry but were rather related to fears of an additional layer of onerous European Protected Species (EPS) regulations that could further restrict forestry management because of any protected status afforded to reintroduced lynx. As summarised by one stakeholder, *"This is a people and policy issue, not a wildlife issue."* Within this discussion, some of the key subjects included:

- The desire for a pragmatic, balanced and scientifically founded approach to EPS and other wildlife species regulations by government agencies in Scotland.
- The potential for lynx reintroduction to be: 1) an opportunity to establish a common best practice, such as how to integrate regulatory burdens into project planning and how to genuinely co-develop the project with practitioners and a diversity of other

stakeholders, and 2) a catalyst for re-evaluating the burdensome EPS regulatory framework currently in place for other wildlife species (e.g. Scottish wildcats, red squirrels).

- The need for regulators and the public to recognise the significant contributions that the forestry sector has made to species recovery and protection (e.g. the reintroduction of red kites, pine martens and European dormouse) and biodiversity conservation, which is counterintuitively threatened by protective regulations that restrict the practice of this beneficial forestry management.
- In contrast to the current regulatory penalties, options for incentivising forest managers (e.g. financial support from Nature Capital markets, freedom from other regulations to actively develop land management activities) to promote practices that benefit protected species and to increase overall support for lynx reintroduction and other conservation initiatives.
- The possibility of reducing the regulatory burden on forestry managers by using non-governmental forestry certifications (e.g. Forest Stewardship Council, UK Woodland Assurance Standard) to meet governmental protective requirements for lynx and other EPS species as well.

Another concern that was broached in the discussion was the inequity between compensatory schemes for agricultural operations and for forestry operations in relation to species reintroduction programmes. It was highlighted that, like agricultural producers, forestry operators bear the costs of species protective measures, often within small margins for their operations. However, in contrast to agricultural operations that receive recompense for their losses, forestry managers are not compensated for any losses resulting from EPS protective measures. An additional concern related to the agricultural sector and compensation nested under a discussion of the "Polluter Pays" policy. The question was raised of how this policy would apply to cases where reintroduced lynx living in managed forests predate livestock. Could the situation be construed such that the forest owner is interpreted as "harbouring" the lynx and, therefore, responsible for financially compensating the livestock owner? This prospective scenario added to the apprehension associated with costly regulatory oversight.

3.2.2. Concluding statement

As agreed during the online meeting, three stakeholders worked with Hugh Webster to draft a concluding statement that was then circulated for comments with all participants. Subsequently, an additional meeting was scheduled among a small drafting team to further develop the statement per email feedback. The following statement was agreed by all meeting participants with one reservation:

Summary of concern

During discussions with national stakeholders in the summer of 2024, concerns emerged from within the Scottish forestry sector that a lynx reintroduction might negatively impact their industry. Concerns centred around fears of the legislative protections that are considered likely to follow a lynx reintroduction – assuming they eventually attain European Protected Species

(EPS) status as recognised elsewhere in Europe. Against a background of significant recovery across a wide range of species, this would mean a further layering of burdens on working forests, whereby when and where forest operations can be carried out are increasingly limited by legal protections and out-of-date guidance around protected species and protected habitats.

These concerns have been exacerbated by recent issues with extant and other recently reintroduced protected species, with it widely felt that lynx would add another layer of burdens on the existing matrix, becoming the proverbial straw that breaks the camel's back and potentially putting vital contractors out of business. Examples were cited where the burden was already felt to be unreasonable and the requirements sometimes contradictory, with one statutory agency (SEPA) demanding forestry work be suspended in winter, to avoid the risk of silting up watercourses and damage to salmonid stocks, and another agency (NatureScot) demanding work be carried out in winter to avoid disturbing nesting birds or breeding wildcats in Spring and Summer.

The situation with wildcats was felt to be particularly relevant to a potential lynx reintroduction. In particular, the wildcat surveying responsibilities currently expected of forest contractors – whereby time-consuming and expensive survey work is demanded wherever wildcats are suspected of being present – are dreaded by some forest managers. The phrasing of the current legislation, based on the European Habitats Directive (1992), which makes it an offence to deliberately or recklessly disturb a wildcat "while it is occupying its breeding sites/ resting places; or to obstruct access to its breeding sites/resting places" or to "damage or destroy breeding sites/resting places even accidentally," is felt to be especially problematic for foresters, given the vagueness of what might constitute a resting place and the apparent risk of inadvertently committing an offence, and the fear is that lynx would be protected by similar regulations.[1]

Other examples cited included the golden eagle reintroduction to the south of Scotland, where the establishment of an eagle nest can render large tracts of timber inaccessible to contractors, and similar issues around badger setts, red squirrel dreys, red kites and even common raptors like buzzards. This context all adds up to make foresters wary of further reintroductions and feel unable to welcome the potential benefits of an animal like the lynx – benefits which they freely recognise but which are not felt to be sufficient to offset the concurrently expected regulatory burdens. The suggestion that lynx would manifest no extra surveying burden on top of that already demanded for wildcats was considered cold comfort when that burden was already rated extremely problematic.

Additional concerns were also raised about the framing of lynx as a 'silver bullet' for managing deer populations – something foresters were highly sceptical of – and whether forestry operations might be interrupted if it was suggested that they might critically threaten lynx dispersal corridors, given the still fragmentary nature of much Scottish forestry, or that other industries might pillory the forestry sector for harbouring a threat (i.e. lynx) to livestock or hunting interests, much as foresters are currently resented for harbouring foxes. It was noted that some less scrupulous actors are interested in the development of the polluter pays principle and may look to co-opt such legislation to suggest that owners of forests which harbour problematic species should be held responsible for their depredations.

Finally, frustration was expressed that foresters are not being offered any form of compensation for the costly consequences of these various protections, while other sectors that are felt to enjoy more political sway are being promised payments, other forms of aid and much greater sympathy. The question was raised: if farmers can demand compensation for the direct and indirect costs of lynx depredations on their livestock, why shouldn't foresters be offered similar compensation for any costs incurred to their operations by the presence of lynx?

It was further noted that lynx and many other existing protected species are dependent on woodland habitat and thus on the forestry sector that manage them, but little credit is given for the benefits to biodiversity that sustainable forest management delivers. It was suggested therefore that opportunities to incentivise foresters to welcome lynx should be explored, either in the form of direct financial incentives linked to good management practices, or perhaps by easing some of the existing regulatory burdens or requirements for survey activity wherever lynx are present.

In essence, the wider benefits of establishing and managing working forests (within carefully designed and independently audited and regulated forest plans) should, it was suggested, constitute a licence to continue to operate, albeit it was accepted that there would still be a requirement to remain vigilant during operations for signs of lynx presence, with contractors obliged to stop operations when either fresh feeding activity was discovered or a den site found. Indeed, it was noted that this more reactive approach works successfully in other European countries where lynx populations are thriving.

Summary of related knowledge

Lynx denning ecology: Eurasian lynx have just one breeding season, mating in February or March and usually give birth in late May or early June in a natal den. This is different to the situation with wildcats which have two breeding seasons, with wildcat kittens born between the end of March and May and a second or later litter sometimes born between July and August, meaning wildcat dens may be encountered over a much longer period.[2]

Data collected on reproductive events involving 169 lynx across Europe identified 28 May as the mean Eurasian lynx birth date (range: 23 April to 1 July), with birth dates approximately 10 days later in northern Europe than in central and southern Europe. Severe and cold weather may affect neonatal survival via hypothermia and avoiding inclement weather early in the season may select against earlier births, especially at northern latitudes, where birth dates are more closely synchronised than in the south.[3]

Lynx are strict seasonal breeders but still show a degree of flexibility to adapt to surrounding environmental conditions, with the timing of births seemingly delayed by colder May temperatures.[3] Lynx typically give birth to 2-3 kittens in a natal den which is used for the first weeks of the kittens' lives. These kittens are born with their eyes closed, nearly deaf, immobile, and unable to regulate their own body temperature, making them highly vulnerable in these early days. In captivity, it has been observed that a mother lynx will not come out of the den until a couple of days after birth. Lynx nurse their young for three to five months, with the most

intensive period of care lasting until around August. Kittens begin to eat solid food at one month of age, and at six weeks old, the young lynx begin to follow their mother on short trips.

Mothers normally move their kittens to a new den site after a few weeks, typically using one primary (natal) den and then one or two secondary (maternal) dens for each litter.[4] In one Swiss study of 30 natal and 40 maternal dens belonging to 26 females, the distances moved between dens never exceeded 500 metres.[4] Reasons for these moves can vary; human disturbance is one apparent catalyst for moves, but other hypothesised reasons include den moves serving as a way of reducing the risk that the den will be detected by potential predators, a response to changing environmental conditions (e.g. flooding, changes in temperature, pollution from food remains), a rising burden of ectoparasites or a response to local prey depletion. It may also just be that growing kittens need more space.

In the Swiss Jura and northwestern Alps, den sites were closed, i.e. provided good shelter, had few entrances, and measured 1m^2. These Swiss dens were found in rocky places, caves and wooden surroundings[4] but dens can be almost anywhere, including under root plates, within log piles and under collapsed human structures (pers. comm. John Linnell). Natal and maternal den sites did not differ noticeably in their siting in Switzerland, with dens typically located in steeper terrain than was available on average and often within mixed forests with relatively open vegetation allowing for a visibility of 10-20 metres.

However, maternal den structures may be more diverse and more open, suggesting that females are very selective regarding structural attributes when choosing natal dens, but cannot make such a careful choice when they need to find an alternative den site in a hurry. On the other hand, maternal dens are often surrounded by a larger number of potential hiding places.[4] Den sites aren't typically re-used but may occasionally be re-used from one year to the next. In Switzerland, four females chose the same site in two consecutive years. Notably, both these sites were very hard to access, suggesting that particularly safe sites may be more likely to be used repeatedly for denning.[4]

In the forests of Belarus, there may be fewer rocky crevices of the sort favoured in Switzerland (where 65% of dens are situated among rocks[4]). As a result, lynx mothers must find dens in other places, including thickets and under root plates, but also reportedly in abandoned badger setts, disused wolf burrows and collapsed beaver burrows in sandy subsoils.[5]

Other den sites were reported under compressed logging remains, where kittens were noted to be protected from mosquitos, rain and predators' attacks (wolves and foxes). According to the testimony of those who discovered one such den, it looked like the mother lynx did not go into the logging remains mound and just called the kittens outside when it came to nursing them or bringing them meat.[5]

Twice lynx kittens were discovered in Belarus where one big spruce had fallen against another big spruce. Kittens were located at a height of 5-7 metres above the ground, on a flat platform that was created by the branches entangled between the spruce trunks. Another den was found under many spruce branches compressed on each other in one place, where two big spruces had recently been toppled by wind, with one crown laid on top of another.

And another lynx den was found in the central part of Belarus "in the kind of a couch under a spruce with lowly located dense branches."[5]

Ole Anders, the coordinator of the Harz Lynx Project notes that "any remote place that offers protection from the weather can be chosen by the female to give birth" (Pers. Comm.). John Linnell of the Norwegian Institute for Nature Research makes the same point (Pers. Comm.), stating: "A lynx den can be anywhere – under a few rocks, under a bush, under a collapsed cottage – and they do not normally reuse sites, so there is no way to tell in advance where a lynx will give birth within its home range (usually within a quiet and rugged part of it – but it can be anywhere)." The authors of the Swiss den site study also agree on this matter, concluding that: "Finding the den site and litter of lynx or other large carnivores is, even in long-time field studies, a rare incident."[4]

Resting places

Lynx can coexist with humans outside strictly protected areas by adapting their behaviour to avoid human activity, but for lynx to survive in human-dominated landscapes the availability of high quality diurnal resting sites is considered important.[6] Accordingly, the European Commission Habitats Directive (1992) prohibits not only the deliberate capture and killing of lynx (Annex II), but also the "deterioration or destruction of breeding sites or resting places" (Annex IV).

A study in the Bohemian Forest Ecosystem, at the border between the Czech Republic and Germany, revealed how lynx prefer resting sites in close proximity to rock formations (within a 50 metre radius) and that the probability that a lynx will return to a resting site increases with proximity to rocks.[6] Rock formations offer suitable resting sites by providing cover, shelter from heat or cold, inaccessibility to people, a good overview of the surrounding landscape, and means for territorial marking, as well as often being important for wider biodiversity. The authors of this study therefore suggest that when new infrastructure is planned (e.g. roads, hiking trails, geocaching, climbing routes, wind power plants), rock formations "should be avoided whenever possible, in order to adhere to Annex IV of the Habitats Directive."[6] However, they made no reference to forestry operations.

The influence of recreational activity on lynx resting site selection has also been examined in the Bohemian Forest Ecosystem, where the local intensity and recurrence of recreation was found to be negatively correlated with the probability that lynx would use a given location for daytime resting and with the number of hours that lynx spent at a given killed prey each night.[7] Furthermore, recreational activity levels negatively correlated with the number of nights lynx spent at killed prey in winter (i.e. October-April).[7]

Animals are often most vulnerable while sleeping. Resting sites should therefore ideally provide them with cover to reduce exposure but at the same time offer them a good overview of the surroundings to detect any approaching danger. Lynx may thus face a trade-off between the need to remain concealed and the need to secure a good vantagepoint, often resolved by selecting vegetated microhabitats on top of ridges, hilltops or on steep slopes.[8]

A study in Slovenia examined which environmental features were important for lynx when selecting resting sites, noting that "although resting sites represent an important part of the lynx habitat and can be negatively affected by human activities, it is still poorly known how lynx select these sites."[8] Nonetheless, they noted a tendency for resting sites to avoid human infrastructure such as forest cabins and to select rocky terrain and southern exposures, although this preference was sometimes constrained by kill sites, which remained characterised by low visibility (denser vegetation).[8]

An older study from Norway suggested resting lynx generally avoid areas less than 200 metres from houses or roads, and also prefer steeper terrain, although they showed no particular preference for particular elevations.[9] This study, of a hunted lynx population, also examined the "tolerance distance" towards intruding people (i.e. how close walking people could approach before lynx abandoned resting sites). Noting when the signal from collared lynx indicated the animal was moving, this study calculated a median tolerance distance of just 50 metres, although this figure varied considerably (from 8-250 metres) and was highly correlated with horizontal visibility and forest maturation stage. These researchers thus concluded that even when suffering extensive, man-induced mortality, lynx "may tolerate high human activity within their range as long as sufficient stands of undisturbed, mature forest with dense horizontal cover are present."[9]

Managing forestry with lynx – advice from European lynx researchers

In the wake of the concerns raised by foresters about the impact of potential protective legislation surrounding lynx dens and resting places, the Lynx to Scotland project sought the opinions of lynx researchers around Europe, asking them: do lynx protections limit forestry operations in any European countries and, if so, how is this issue managed?

The unanimous response was that while legal protections were technically in place, in practice there were no coordinated efforts made to identify lynx dens or resting sites before forestry operations. Dr Miha Krofel, from the University of Ljubljana in Slovenia, claimed that "no such restrictions are taking place," and that, "to me, it would be also a bit difficult to imagine what such restrictions would be." Miha noted that finding dens was "very difficult", given the cryptic nature of such sites, while John Linnell, from the Norwegian Institute for Nature Research also noted the fact that a lynx den could be almost "anywhere."

Ole Anders, the Coordinator of the Harz Lynx Project in Germany, observed that, "to completely prevent critical disturbances during the rearing of kittens, forestry measures would have to be largely reduced between May and July." However, to his knowledge, "nothing similar has ever been seriously demanded in any of the federal states touched by the Harz lynx population to ensure its protection." Furthermore, Ole added that, "lynx managers should be very cautious with demands for usage restrictions. It would risk the support of lynx protection of an extremely important interest group."

In Ole's opinion, "normal (sustainable) forestry has little influence on the reproductive success of lynx," but he notes that "normal" forestry in Germany does not involve clearfell operations, and where such clearfell operations have occasionally been necessary in the Harz Mountains

to limit bark beetle damage, he believes it may have led to an increase in the occurrence of lynx orphans.

Fridolin Zimmermann, from KORA (Swiss Carnivore Ecology and Wildlife Management), also recorded some kitten mortality linked to forestry operations: "In the Genetics, Health and Demography Project (2020-2023) we documented a female losing her whole litter because of logging. These kittens were only 4 days old." However, "Another female moved her kittens because of logging. They were older and survived."

In Slovenia, Miha also recorded "two cases that logging took place in the close vicinity of an active den, where collared females gave birth. In both cases females moved kittens to another location away from logging activity (and kittens survived). But it's also true that in our area with very karstic terrain there are plenty of good denning sites for them to relocate. In different (e.g. fluvial or glacial) terrain this could be more limiting." Notably, it is not unusual for a lynx mother to move her kittens, but if she is disturbed before the kittens are old enough to be safely moved, or where there are no alternative den sites that are sufficiently suitable and nearby, then young kittens may be especially at risk from exposure or predators.

Robin Rigg, from the Slovak Wildlife Society and the editor of Carnivore Damage Prevention News, stated (Pers. Comm.): "I am not aware of there being any proactive searching for dens ahead of logging operations (in Slovakia)," although he added that: "If foresters chanced on a lynx den, they might temporarily adapt local operations, but I don't suppose this situation arises very often." Robin also noted that lynx appear relatively tolerant of forestry operations, persisting in areas of active forest management. Indeed, "when tractors and chainsaws are quiet at night, some individuals scent-mark fresh log piles."

Robin concluded: "In Slovakia, lynx protections do not limit forestry operations (and, in general, lynx are not displaced from areas with routine forestry operations)." In his opinion, "what might happen in the UK would likely depend on, amongst other things, the specifics of the legislation and its implementation in practice. If very strict measures were imposed, they could impact forestry. But is such an approach necessary for lynx to thrive within managed forests? Not according to experience in Slovakia."

Similarly, In Poland, Dr Robert Mysłajek, from the University of Warsaw, reported that, "the regulation on the protection of animal species states that temporary protection zones may be created around the breeding sites of lynx and wolves and the winter lairs of bears. However, since identifying such places is extremely difficult without telemetry, this law is not applicable in practice. Consequently, such a zone for lynxes in commercial forests has never been created." There have been several lynx reintroduction projects in Poland, and Robert notes that, "the Polish State Forest Service always supported such projects." Summing up, he says, "neither Polish foresters nor hunters see lynx as a threat to their business."

And in Finland, Dr Sakari Mykrä-Pohja from Metsahallitus, the Finnish state conservation agency, confirms that "it is illegal to disturb any protected species," but "there is no law or guidance whatsoever in that sense – not in practice, anyway." Sakari adds that "if it ever happens that a Finnish forester becomes aware of a lynx den site, they are obviously obliged by the law to avoid ANY disturbance there," but they say that "'Becoming aware' is the key

here. There are certain within-stand habitat characteristics that always need to be considered or left completely untouched while logging at any site, but there isn't any obligation to carry out a pre-logging survey on a plot for sporadic/hard-to-detect/uncommon features such as lynx dens."

The main practical guideline suggested by Dr Miha Krofel, from the University of Ljubljana, was: "that in case loggers come upon fresh lynx kill to leave it there and don't move it (which otherwise often happens, at least in Slovenia and Norway where we collected data on this). If possible, it would make sense to not disturb such a kill site (3-4 days is usually enough I would say)." John Linnell, from the Norwegian Institute for Nature Research, also suggested that in the exceptional cases where a den is discovered, "it would of course be logical to avoid disturbing the general area around its den – maybe on a scale of a kilometre radius or so at least – for 6-8 weeks."

Conclusion

In terms of the direct effect lynx themselves will have on timber producing forest management, this is unlikely to be of any significance. There are no perceived benefits to forestry in terms of improved deer control nor negative outcomes from lynx presence on productive silviculture or indeed expansion of native woodland.

The main concern is the likely effect that inappropriate protection given to the species will have on the ability of timber growing foresters to carry out good quality silviculture and habitat improvement. We already have a regulatory regime which provides protection to a wide range of species which pays little attention to species ecology, abundance, and behaviour in response to disturbance and in effect prioritises the protection of terrestrial animals over ground flora, soils and aquatic environments including fish. Current guidance does not define 'disturbance', 'resting places', when a structure is 'inactive' or 'abandoned' and buffers are mostly based on arbitrary distances made up with no scientific basis. This leads to a great deal of misunderstanding between foresters and other interests as to what is acceptable and very often to significant effort and cost being required on the part of foresters to prove a negative.

The focus on terrestrial animals often leads to a sub-optimal outcome for nature as a whole. The current position can also have negative consequences for the timber growing forestry workforce as the arrival or discovery of a protected species during contracted operations often results in the work being suspended or postponed. There is concern that additional protections for lynx would negatively affect the ability of small contracting outfits to remain viable year-round.

The introduction of lynx into this regulatory regime, given their large range and numerous dens will create a significant additional survey and management burden that would be almost impossible to discharge within guidance or to the satisfaction of vexatious groups or individuals. Foresters would refer to EU guidance which is not currently applied in the UK to other species as a basis for negotiation around any proposed protection and to the experience of European foresters. Indeed, there is an opportunity to use lynx as an exemplar

of how guidance around species protection can be framed in a manner that allows foresters to work positively with the species:

EU guidance: *A proper implementation of Article 12(1)(d) requires a good knowledge of the ecology (biology, habitats, population size, distribution and dynamics) and behaviour of the species (life cycle, organisation, interaction within and between species).*

EU guidance: *Resting places are defined here as the areas essential to sustain an animal or group of animals when they are not active.*

There may also be restrictions imposed on forest planning as lynx use large areas of interconnected forest habitat. Lynx could become a complicating factor in achieving approval for forest plans and felling permission refused on the grounds of habitat fragmentation for lynx. This could be a very significant cost both financially and in lost timber due to windblow. There may also be strong resistance to new woodland creation from the agricultural sector who may well perceive the new woodland as bringing lynx closer to their land and that agriculture will look to forestry for compensation for the loss of stock to lynx, real or imagined.

Forest managers must be seen as the major stakeholders, not as a periphery group, as it is their land management that will guide the success of the reintroduction project. As such they should be rewarded for their efforts and should not have extra costs imposed upon them.

Recommendations for responding to the above concerns:

1. Forest managers should be considered integral to future discussions
2. Further development of a lynx reintroduction proposal would need to be accompanied by discussion on how a more pragmatic, balanced, and scientifically founded approach to EPS and other wildlife species regulations by government agencies in Scotland could be realised.

Reservations

Reservation 1: Experience from Europe shows that the presence of lynx does not result in significant restrictions on forestry operations. This is, in part, due to the pragmatic and proportionate approach adopted by regulators. While the Lynx to Scotland project cannot be expected to determine how Scottish regulators approach potential impacts of forestry operations on lynx, it is reasonable for foresters to expect Lynx to Scotland to have robust discussions with them, highlighting the approach taken in other European countries. If lessons are learned from Europe and a similar pragmatic approach is adopted in Scotland, there will be little impact on forestry operations, except in very exceptional circumstances.

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3.3. Lynx, deer and implications for Scotland

3.3.1. Synopsis of discussion content

Two online sessions of the National Lynx Discussion process were devoted to the consideration of the potential impacts of any lynx reintroduction on Scottish deer populations and the management of these deer: a 3.5-hour meeting on 3 June 2024 and a 3.5-hour meeting on 13 June 2024. Two observers and 20 stakeholders attended at least one of these online sessions (**Appendix II**).

The first session opened with a summary of the progress of the national discussions to date, the process adopted for this consultation, and the objectives of the two-part discussion to continue into the next online meeting. David Hetherington then provided an overview of the current state of knowledge related to lynx and their interactions with deer and deer management in Eurasia, as relevant to the Scottish context. This comprised the most likely impacts lynx will have on red, roe, fallow and sika deer populations and behaviour in Scotland, as well as the possible ecological consequences of carcass deposition in the landscape and the complex interrelationships between deer densities, deer management and the risk of lynx predation on livestock.

This presentation was followed by an opportunity for all participants to ask questions and discuss the topic, with discussion focused on:

1. The complex interrelationships between lynx densities, rates of lynx predation on livestock, deer densities and human-managed deer control, with special consideration of an example that had been presented from Switzerland;
2. The potential beneficial effects (albeit likely small) of reintroduced lynx supplementing human control efforts of non-native sika and (in the future) muntjac deer within Scotland;
3. The likelihood of any "landscape of fear" effects of lynx on deer species or other wildlife, given that this has only been minimally studied in Europe, and the need for studies of any such behavioural changes in Scotland should lynx reintroduction occur;
4. The rare cases of lynx predation on domestic cats and small dogs in Europe;
5. The intriguing suite of positive knock-on effects that lynx-provisioned carcasses could have in the Scottish landscape, although with some apprehension for possible biosafety and public image risks from these decomposing remains; and
6. Concern over disturbance to any reintroduced lynx from deer culling activities necessitated by government policy and/or the management of private landholdings.

It was highlighted that evidence from Europe suggests that lynx have the greatest impact on deer numbers where deer densities are low – and recognised that, given Scotland's relatively high deer densities, lynx would be unlikely to significantly reduce woodland/roe deer densities nationwide. However, they could help to reduce the cull burden and be particularly beneficial in hard-to-cull areas such as dense thickets.

Jamie Copsey concluded the meeting with a facilitated discussion among attendees focused on their general thoughts and concerns related to the available knowledge of lynx's impact

on deer and the potential social-ecological consequences of these effects. Participants were asked to reflect on two points raised in the VWT report: 1) if lynx are likely to be ineffective at significantly reducing overabundant deer populations, what would be the benefit of their introduction (for deer management), and 2) the view that humans are already managing deer populations effectively on their own.

Prior to the second meeting, several stakeholders worked collaboratively to draft an initial concluding statement for the group to critically review and revise. Consequently, the entire 13 June session was devoted to a facilitated analysis of this draft statement with space for discussion of related points, concerns and questions for clarification, all of which are reflected in the concluding statement in **Section 3.3.2**.

The importance of aligning the Government's deer control policies and actions with any plans for a reintroduction of lynx to Scotland was stressed in discussions throughout both meetings. Stakeholders strongly recommended that there be a dynamic, adaptive and integrated deer management framework in place, which fully considers lynx management within its decision-making and incorporates lessons learned from the European context. Similarly, participants highlighted the need to conscientiously balance deer culling and forest regeneration efforts with any release of lynx.

Additional concerns raised by the group revolved around the potential for human-lynx conflict to emerge among hunters, trophy roe deer managers, private landowners that rely on deer, livestock, and/or gamebird income, and pet owners, based on real and perceived threats from lynx predation. In addition, potential friction over lynx protection-related restrictions on activities (including deer management) within the forestry sector were raised. In general, it was felt that most, if not all, of these issues could be avoided (or at least mitigated) by transparent and inclusive communication with all stakeholders, encouragement of responsible media reporting, and full consideration of and alignment with government policies.

3.3.2. Concluding statement

During the 13 June meeting, a draft statement was discussed and revised to near completion. Afterwards, a final draft based on this review was shared via email, and all attendees accepted the following statement without any reservations:

Summary of concern

The **VWT study** reported a range of views on the likely impacts of lynx on deer. Whilst a decrease in numbers was largely considered to be beneficial, it was questioned how likely this was and whether there is any point in reintroducing lynx if it is not certain that they would bring about a significant reduction in deer numbers. Others felt that deer control is adequately provided by humans and that there is no need for a top predator.

There were different perceptions regarding the abundance of roe deer, and it was felt that where numbers were low, lynx could deplete roe populations and move into unfavourable areas, leading to increased conflict with livestock. Finally, there were some concerns

regarding the impact of lynx on roe deer stalking, in particular the loss of trophy bucks but also increased vigilance in the presence of a top predator, making them harder to hunt.

Summary of related knowledge

Wild native predators of deer are now extinct in the UK. Research indicates that Eurasian lynx would have access to sufficient suitable habitat and prey resources if reintroduced to Scotland,[1,2,3] although deer numbers may shift in the future in response to policy changes. Roe deer constitute most of the lynx's diet and comprise around 36% of the deer population in Scotland.[4]

Woodland deer densities are hard to estimate, and there is no up-to-date national dataset on Scottish populations, but studies have estimated average roe deer densities to be 7.4 per sq.km across the Scottish Highlands and 5.5 per sq.km in the Southern Uplands[5] and from 0.6 to 24.8 per sq.km in conifer plantations across Scotland.[6] Recent estimates from National Forest Estate sites in Highland and Moray report a range of roe deer densities from 0-70 per sq.km with an average of 10.3 per sq.km and of total woodland deer from 2.9-70 per sq.km with an average of 21.8 per sq.km.[*13]

Data from Europe suggest that lynx predation can have a localised impact on deer populations, most notably when combined with intense human hunting pressure and climatic stresses but also when deer densities are very clustered or very low.[7,8,9] However, there is no very clear relationship between lynx density, roe deer density, and the amount of roe deer mortality due to predation. Nonetheless, where roe deer numbers are relatively abundant (>5 per sq.km.), the contribution of lynx to overall mortality may be minimal.[10]

Conversely, where roe deer density is very low, i.e. less than 0.5 deer per sq.km, as in parts of Norway, then lynx can be responsible for over 50% of deer mortality.[8] In general, the current, relatively high deer densities in Scotland are calculated to be adequate to sustain a healthy lynx population, with mortality from lynx predation expected to be well below 50%. Anecdotal evidence from places where deer numbers have been reduced through culling also suggests that the body conditions of the remaining deer improve. It is possible that such an effect could be experienced where lynx predation has been able to reduce deer numbers, at least at a local level.

Despite some recent successes in reducing the densities of red deer on the open range and woodland deer in parts of the National Forest Estate, there are anecdotal indications that the national abundance of roe deer has seen a significant increase in recent decades. Deer densities in many parts of Scotland remain above the level thought necessary to allow woodland regeneration, suggesting that any additive effect that lynx predation may have on overall mortality rates could help towards reducing Scotland's woodland deer population.

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[*] National Forest Estate data

- Data is from dung counting methods (EDU) deployed as part of Deer Population Assessments (DPA).
- Density data is only held for areas which have been surveyed as above.
- Data is from surveys within the Highland and Moray local authority areas. This includes the North Region, part West Region and part East Region.

Roe deer are the primary prey for lynx, with all age and sex classes being predated according to their relative availability. Non-native sika deer, being of a similar size to fallow deer, are also likely to be predated within the Scottish context. Sika can be particularly hard to cull, so any level of lynx predation of this species would be beneficial. Where lynx prey on the larger red deer, which they do more often in the absence of roe deer, it is usually calves that are killed, with adult hinds also taken but to a lesser extent. Healthy, mature stags are generally avoided.

The lynx is an ambush predator and, therefore, favours woodland habitats, including both natural woodland and plantation forestry, containing either native or exotic tree species. Lynx tend to avoid open landscapes, although in Europe they have been known to adapt to using other ground cover for movement and hunting, such as gorse, etc. Where woodland habitat can be found close to urban areas, lynx may be present but typically still stay out of sight.

Data from both European reintroduction sites and where lynx have persisted through to the present day indicate that attacks on livestock are relatively rare across most of the lynx's range and are influenced by the abundance of local deer populations. Livestock killing rates reported in parts of Norway that contain both high deer densities and livestock are low, which suggests that deer are by far their preferential prey.[11] Very occasionally, cats or dogs may be killed.

A temporary increase in vigilance has been recorded among roe deer exposed to lynx scent, but the same study found that overall levels of vigilance were similar in areas with and without lynx, suggesting that lynx would not necessarily make individual deer harder to stalk.[12] If lynx predation does combine with human hunting pressure and climatic stresses to reduce population densities of some species, then the availability of trophy animals would be expected to show a corresponding decline. However, where deer densities have been reduced through concentrated control efforts, deer have sometimes exhibited an increase in body mass and other metrics of health,[13] suggesting that trophy quality could be improved in the presence of a wild native predator. Wilder and more challenging hunts can also attract more of a premium among hunting clients.

Conclusion

The reintroduction of Eurasian lynx into Scotland should not be thought of as a silver bullet to provide natural deer control in place of culling by humans or weather impacts. Instead, data from continental Europe suggest that the direct impacts of lynx on deer populations in Scotland could complement other methods of deer control. Current data suggest that human attempts to control woodland deer numbers are insufficient to sustainably manage Scotland's deer populations.

As a potential top predator, lynx could be a valuable keystone species and, as such, could help to secure a more natural balance of species within ecosystems. From what is known about other predator-prey interactions, deer may become more aware of lynx in the landscape over time and so modify their behaviour. Ongoing monitoring and research studying the interaction between reintroduced lynx and Scottish deer, alongside any resulting impacts on woodland habitats, could help inform our understanding of such relationships and enhance woodland management. Plans to reintroduce lynx could also benefit from modelling that

examines how lynx predation over time might interact with the realisation of government policies to increase deer culling and affect population declines.

Based on available information, the introduction of lynx is likely to have minimal impact on deer occupying open terrain, so upland red deer stalking interests should be little affected. However, consideration should be given to the possible effects of lynx presence on practical woodland deer management, especially any local site protections afforded to breeding lynx that might limit normal deer management activity. Further discussion on the potential impact on roe hunting, particularly in lowland areas, should also take place to explore this issue.

Rates of livestock predation across Europe are generally low, but this topic needs further exploration and will be covered in detail in the lynx and livestock meetings.

3.3.3. References

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3.4. Lynx, woodland deer and implications for Scotland

3.4.1. Synopsis of discussion content

This additional meeting, scheduled to specifically focus on the potential positive and negative impacts of reintroduced lynx on forest deer species and their management, especially in the lowlands, was held on 28 August 2024. Two observers and nine stakeholders, selected by participants in the main process for their expertise in this area, attended this supplementary session (**Appendix II**).

Since this was many of the participants' first experience with the National Lynx Discussion process, Jamie Copsey began the meeting by introducing the general objectives and process behind the national consultation followed by the standard review of the VWT report information and of the Perth needs statements (**Table 3**). Next, he detailed the main conclusions from the two sessions that had focused on "lynx, deer, and implications for Scotland" (**Section 3.3**). David Hetherington then shared the same presentation that he discussed with the wider stakeholder group on 3 June (**Section 3.3.1**) after which attendees were able to discuss his presentation and the general topic as interest dictated.

In the final half of the meeting, Jamie Copsey led the group through a facilitated discussion focused on the specific implications that a reintroduction of lynx could potentially have for roe deer and other woodland deer, both for individuals (especially trophy bucks) and populations, as well as the management of these deer species in various habitats. Attendees were also asked to consider any potential positive direct or indirect consequences of lynx predation on woodland deer in Scotland.

The main topics explored by these stakeholders throughout the session included:

1. The possible inter-specific deer relationships (e.g. one deer species moving into an area when another is removed or reduced) that may be affected by lynx prey preference, though human hunting and habitat quality were recognised as being significantly more important drivers of these interactions;
2. How imperative it is to communicate responsibly about the limited degree to which reintroduced lynx will likely be able to contribute to deer population control efforts;
3. The potential effects of lynx predation on deer behaviour and, thus, deer management and deer dispersal among various habitats (even within a single site);
4. Relatedly, the potential for lynx-driven differences in deer behaviours to change perceptions among hunters and/or shift human hunting practices;
5. The need for a well-thought-out and adaptive lynx management programme to be agreed on by all stakeholders prior to any release of lynx in Scotland;
6. The benefit of future PHVA models evaluating dynamic landscapes rather than assessing habitats based on static or status quo scenarios; and
7. The impacts of lynx on roe deer, deer stalking, trophy hunting and forest management (including deer management) operations most likely being localised in extent but nonetheless important to consider in national decision-making for their social and ecological effects at this scale.

Stakeholders recognised that many incidents of human-lynx conflict across Europe were driven by perceived rather than real threats, in addition to the backlash of some stakeholders from being excluded from decision-making processes. Consequently, attendees noted it was imperative to involve all stakeholders (particularly deer stalkers and other hunters) in any reintroduction project from conception through to implementation, so that local community members would feel invested in the initiative and support the project on the ground. The example was given of hunters serving as citizen scientists for lynx monitoring projects in the Harz Mountains of Germany. It was also highlighted that honesty and transparency in messaging and careful choice of language would be crucial in any communication strategy employed by the project.

Another concern that was voiced in relation to deer culling, as well as general forestry management practices, was related to policies intended to protect lynx as a threatened species. The point was raised that exclusion zones and other restrictions to operations resulting from species' protection policies combine with adverse climate change effects to make it untenable to optimally manage woodlands for high levels of biodiversity. This unintended consequence of misaligned policy was felt to not only negatively affect the health and productivity of the forest ecosystem but also to jeopardise the sustainability of forestry operations, and contributes to job loss, which has a wider impact on the local community and economy. It was recommended that: 1) protective policies initiated on behalf of any potential reintroduced lynx should be flexible and holistic in scope, and 2) an additional meeting should take place with forestry stakeholders to reflect more extensively on the regulatory implications of lynx reintroduction.

Finally, stakeholders mirrored the conclusions from the wider stakeholder group's consideration of this topic:

1. Scottish deer management must be dynamic and fully integrated with reintroduced lynx management based on a comprehensive review of the lessons provided by continental Europe; and
2. There needs to be a consistent, accurate accounting system for deer culling and estimating population numbers throughout all of Scotland in order to support efficacious deer management, forestry management and any future management of reintroduced lynx.

3.4.2. Additional conclusion

After developing, revising and finalising a concluding statement online, all participating stakeholders accepted the following statement with four reservations:

Any reintroduction of European Lynx should not be thought of as a silver bullet in terms of roe deer management. The data suggest that lynx could complement human management of roe deer particularly in situations where the aim of management is to reduce, as far as possible, deer presence.

At modelled carrying capacity, lynx are not going to have a significant national impact on the population of roe deer in Scotland, due to the favourable climatic conditions for roe

population density. Even if reported roe deer culls are only a proportion of the actual numbers taken, it remains unlikely any additional, lynx-related roe deer predation will significantly impact roe deer populations nationally.

It is possible that lynx could have locally significant impacts on roe deer populations and the behaviours of the remaining roe deer. These impacts will be most keenly felt where there is significant woodland cover and less open ground. This could have negative impacts on local businesses which rely on roe deer culling for their income.

Although predation by lynx on roe deer may assist in managing populations of roe deer, it is also considered that the presence of lynx, especially if given significant protection, could be detrimental in terms of access to sites to conduct land management activities including deer culling. It would be an unhelpful and somewhat perverse outcome if the reintroduction of a predator reduced the offtake of woodland roe deer.

Monitoring of the impacts of lynx on roe deer populations will be key to the success of any potential reintroduction. This evidence should be gathered from as wide a range of sources as possible. Evidence from elsewhere in Europe has shown that reintroductions are less contentious and more successful where hunters have been involved in the reintroduction and its subsequent monitoring. It is considered unlikely that broad consensus can be reached, but there is a real value in any reintroduction project making great efforts to bring communities of interest into the process.

A pragmatic approach by government to the level of protection and establishing responsive, flexible and light touch management options which many have felt lacking on other reintroductions could go a long way to allaying concerns around a possible lynx reintroduction.

Reservations

Reservation 1: We probably will not get the 'climate of fear' effect seen with wolves for a number of reasons: 1) Lynx are ambush predators so the prey do not know they are there most of the time 2) roe deer are fairly solitary so when one is attacked no other deer will be present to be frightened!

Reservation 2: If a reintroduction proposal was to be developed, it would need to consider the implications on lynx prey selection, should national deer density targets be met.

Reservation 3: We do not have an agreed, accurate baseline of current deer densities from which monitoring of change could be assessed.

Reservation 4: We would strongly encourage a clear, legal management and exit strategy to be generated and approved by the regulatory body (NatureScot) prior to lynx release.

3.5. Lynx and gamebirds and potential responses

3.5.1. Synopsis of discussion content

On 18 June 2024, three observers and 14 stakeholders participated in a 6-hour online session to discuss the potential direct and indirect impacts of lynx reintroduction on gamebird populations in Scotland (**Appendix II**). Attendant to this discussion was an evaluation of options for preventing and mitigating possible adverse effects of lynx on gamebirds and activities related to gamebird sport shooting.

After a review of the Perth meeting's Needs Statements (**Table 3**) and of the gamebird-related concerns identified in the VWT study, David Hetherington and Ross Macleod (Game & Wildlife Conservation Trust) each provided expert perspectives on the complexities involved in lynx and gamebird interactions. Both presentations were followed by open discussions and opportunities for questions. The second half of the session was devoted to the interactive development of a recommendation statement responding to the concerns from the VWT study and summarising the group's understanding of the potential impact of reintroduced lynx on gamebirds and on gamebird hunting.

David Hetherington's presentation provided data on the minimal extent to which gamebirds constitute a part of the lynx diet in European countries and predictions as to how this might be reflected within the Scottish context. He also discussed the potential benefits of lynx to gamebird populations through mesopredator* control, most notably of red foxes. The presentation sparked discussion on a range of related topics, including:

1. The potential for lynx-provisioned carcasses to serve as diversionary food sources for mesopredators, thus releasing predatory pressure on nesting gamebirds;
2. The possibility of lynx acting as significant predators of cryptic, ground-nesting gamebirds (e.g. woodcock), which was deduced to be unlikely, due to the lynx's reliance on sight rather than smell in hunting;
3. The possible adverse effects, both direct and indirect, that reintroduced lynx could have on gamebird sporting businesses; and,
4. The potential for lynx to have an indirect effect on disease transmission among gamebirds if predation on sheep led to any decline in the use of sheep as tick mops in moorland habitats. In response, it was reiterated that the availability of both forested habitat and abundant wild deer prey in Scotland should reduce the likelihood that lynx would venture into open moorlands to predate livestock serving as tick mops.

Building on this theme, Ross Macleod's presentation focused on the possible effects of lynx on gamebird operations in Scotland, along with some management options that could prevent or mitigate risks from these reintroduced predators. Mr. Macleod remarked on the unintentional consequences of fox management for mesopredator "vacuum/sink" dynamics in Aberdeenshire, which may have contributed to elevated predation on wading bird nests by European badgers during a hard freeze.

* A mesopredator is a mid-ranking predator in a food chain, often preying on smaller animals.

The group speculated on the possible interactions between lynx and other mesopredators in Scotland that could have similar negative outcomes or conversely, whether lynx would benefit nesting bird populations because of their impact on foxes and other mesopredators. The question was raised as to whether focusing this level of attention on a hypothetical negative impact of lynx on gamebird populations might create the impression that there is a risk when none of the current best available science supports this conclusion, i.e. "are we making a problem where there isn't one?"

During both open discussions, strong concerns were raised regarding the potential negative effects lynx could have on gamebird rearing and shooting operations. Not only is direct predation on gamebirds both inside and outside of rearing pens a possible cost to shooting operations, but stress and scattering of gamebirds once they have left pens was also raised as a possible risk. Given the high concentrations of birds reared in this manner, it was suggested that these impacts could be significant and have detrimental effects over multiple seasons. It was felt that the cost of prevention and mitigation measures (e.g. lynx-proof fencing) could be prohibitive, especially for smaller scale operations.

Although a compensation scheme was suggested and generally supported by the group, uncertainty was raised as to how valuation could be estimated for intangible, indirect, and/or difficult to measure costs, such as scattering of birds, land being unsuitable for shoots over an extended period, or loss of reputation among clients. However, it was pointed out that gamebird managers already face these threats from extant mesopredators, including those that cannot be lethally controlled (e.g. pine martens, wildcats and badgers).

The paucity of information on the effects of lynx on similar gamebird rearing and release hunting operations across Europe raised questions as to the likely additive costs of lynx on the Scottish gamebird sport sector as well as the efficacy of potential prevention and mitigation measures. All stakeholders agreed that collecting more data on analogous European systems would be informative to fill these sizeable knowledge gaps and to render a more informed assessment of the projected impact of reintroduced lynx on gamebird hunting in Scotland.

3.5.2. Concluding statement

After discussion and revision of a draft statement among all meeting participants, the following statement was finalised and accepted by all stakeholders in attendance, with five reservations:

Summary of concern

The **VWT study** found few concerns regarding potential lynx impacts on red grouse, although it was suggested that ground nesting birds could provide an easy meal for lynx if they foraged in the open. The point was also made that sheep depredation by lynx could impact grouse moor management due to the common use of sheep for grazing and as tick mops.

However, it was suggested that pheasants, raised *en masse* in woodland, would be vulnerable to lynx predation, particularly from young, inexperienced lynx and females with kittens. It was felt that pens could be modified to enhance protection against lynx, but the potential for

disturbance of released birds at roost sites, pushing them off shooting beats, and rendering them unavailable to clients was highlighted. The point was made that foxes and some small mustelids can be lethally controlled around pheasant pens, but lynx would likely be protected and so could not.

The sentiment was expressed that, although lynx may kill individual foxes and feral cats, it was thought unlikely that they would have any appreciable regulatory effect on mesopredator populations, and that ecosystem balance could be better regulated by empowering gamekeepers and land managers to control protected predators.

It was highlighted that there are no comparable examples in Europe of mass-rearing game birds in woodland, so the risks to this industry cannot be inferred with any confidence from elsewhere. Stakeholders explained that raising pheasants is increasingly challenging given the increase in abundance of protected predators and frequency of disease outbreaks, and so, lynx could be perceived as an unwelcome added pressure. Overall, however, the above concerns were not cited as major barriers but as factors to be considered when conducting a thorough risk assessment for lynx reintroduction.

Summary of related knowledge

Eurasian lynx primarily hunt medium-sized ungulates, favouring roe deer where they are available.[1] Ground nesting birds form a minimal part of lynx diet[2,3], but gamebirds – including black grouse and willow grouse – have been recorded as occasional prey items.[4,5]

Woodland is the preferred habitat of lynx, while red grouse are largely restricted to open moorland environments. Data from Europe indicate that sheep depredation rarely occurs more than 250m from woodland edges[6], and so moorland grouse populations should be at low risk of lynx predation. This assumes that lynx do not adapt in the new landscape to hunt in more open areas. This risk could conceivably be exacerbated by the presence of sheep, which are often used for parasite control on moorland managed for grouse shooting.

By contrast, pheasants and red-legged partridges are raised in or around woodlands so would be more likely to become potential prey for lynx in Scotland, likely being most vulnerable in and around rearing pens. There are few directly comparable examples in Europe of mass-rearing game birds in woodland, so the level of risk cannot accurately be inferred. The extent to which lynx may habituate to take advantage of released pheasant and partridge is a known unknown. Where comparisons can be made (e.g. Czech Republic, Hungary), further data should be collected to inform this understanding. However, foxes are a key existing threat to gamebirds, and lynx are known to predate foxes. Multiple studies have found evidence of a net reduction in predation levels of various ground nesting species due to the lynx's suppression of foxes.[7,8,9] Within Scotland, significant effort goes into fox control, so predation by lynx on foxes is likely to have minimal effect.

What remains unknown is the intra-guild relationships and dynamics that may occur in these relationships between lynx, their preferred prey, and other species that could form part of their diet.

Conclusion

Whilst the currently available evidence suggests that gamebirds, at a national scale, are unlikely to play a significant role in lynx diet, where lynx and gamebird interests come into contact at the local level, the impacts could be significant. It is recognised that a better understanding as to the scale and extent of gamebird release in Scotland would help to inform potential lynx conflict and mitigation as far as possible. The relative distinctiveness of gamebird shooting in Scotland makes it difficult to project with certainty how lynx would interact in these systems and so deserves further exploration. The potential positive benefits to hunting interests should lynx be returned to the landscape also deserve investigation.

If a lynx were to be around a release pen, it could impact directly through mortality of birds and indirectly through stress and susceptibility to disease. The presence of a lynx could cause birds to leave the pen, making it difficult to manage them during this phase in their management. In addition, the consequences of disturbance once the birds were at large could cause significant management problems with regathering birds, feeding and health, particularly when birds are still in early stages in their development outside pens. For these reasons, there should be a flexible and pragmatic framework for lynx management and their impacts where they arise, up to and including, where appropriate, lethal control.

Whilst a compensation scheme with farmed stock could be envisaged, it is more challenging with gamebirds due to the issue with quantifying subtle impacts of lynx in and around release pens and on game drives and how you would put a value on the potential financial loss. What would need to be understood is the likely incidence of such impacts. It would be critically important to monitor such incidence to understand the extent to which it is an issue, both at the local and national scales. If any reintroduction was to go ahead, it would be critical for there to be a suite of accessible management options in place and a clear, practical exit strategy in place.

Reservations

Reservation 1: Based on the available information, there was agreement with the statement as is. However, should counter-evidence be provided then there would be a desire to revisit this agreement.

Reservation 2: Although there was agreement that more research is required as to the potential impacts of lynx on concentrations of gamebirds, be that in woodland or on moorland, it was felt that the statement goes rather a long way down the 'known unknowns' road. For example, the hypothesis that lynx could be lured onto the open hill by very low densities of 'tick mop' sheep to then prey upon grouse. Whilst the gamebird industry may be suffering increasing economic impacts due to disease, these are likely to be exacerbated by the close confined conditions in which they are reared. In respect to this, there was a reservation regarding a lethal control policy being considered if gamebird rearing conditions have not been addressed. Experience with the current control policy in respect to beavers does not provide reassurance that a similar policy for lynx would be any better managed. As to the difficulty in establishing compensation within localised areas, maybe area-specific

subsidies would be more likely to succeed than a potentially confrontational claims procedure?

Reservation 3: There remains a question mark over the effectiveness of any attempts to modify release pens to prevent lynx entry. This is something that would need to be monitored and responded to accordingly.

Reservation 4: It was felt to be far too early in the process to include lethal control in the agreed statement. It was felt that we should be doing all possible to avoid such a scenario – and at this point we should be talking about monitoring, research and mitigation, 'mitigation' being a suitably vague statement for discussions at this early stage. It was appreciated that the reality is that, in the case of lynx reintroduction, phrasing around lethal control may need to be included – but we must have far more detailed analysis and discussion before doing so.

Reservation 5: Finally, it was expressed that at a landscape scale the potential impact of lynx on reared birds (mainly pheasants) is likely to be intermittent (not every year) and localised. Many other mortality and disturbance factors (for example weather and roadkill) will create good and bad years. Where problems are reported, and as part of any assessment for compensation, account must be taken at a local level of these other variables to guard against a default position of making payments.

3.5.3. References

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3.6. Lynx and other species of concern

3.6.1. Synopsis of discussion content

On 27 June and 4 July 2024, two observers and sixteen stakeholders met online to discuss the potential impacts of reintroduced lynx on species of concern that were not explicitly addressed in other sessions (**Appendix II**; **Appendix IV**).

Jamie Copsey opened both sessions with a summary of the relevant concerns identified by the VWT report and a description of the National Lynx Discussion process. After the general introduction on 27 June, David Hetherington presented on the lynx's direct and indirect effects on a diversity of wildlife based on information from continental Europe. David's presentation was followed by an opportunity for all attendees to ask questions and to raise any concerns. Participants were asked to reflect on the current state of knowledge related to the potential negative and positive impacts of lynx on species of conservation concern (e.g. capercaillie, black grouse, wildcats, pine martens) and on mesopredators (e.g. foxes, badgers).

The discussion that followed tackled the following subjects:

1. The extent to which red fox densities in upland Scotland (relatively low, partly due to intensive lethal control and partly due to low environmental productivity) may be analogous to those in Nordic countries (relatively low largely because of reduced environmental productivity), where lynx predation (and/or fear of predation) has suppressed red fox numbers, with consequent benefits for ground nesting birds and other species of concern;
2. The implications of Bamber *et al.*'s 2024 study[1] on diversionary feeding with respect to any ecological interactions that might occur between lynx, mesopredators and species of conservation and/or socioeconomic interest, mediated by the lynx's provision of large carcasses in the environment;
3. Uncertainties around lynx's interactions with badgers and pine martens, and the probability that lynx will not be significant predators of European beavers or feral pigs in Scotland;
4. The tendency for young, inexperienced lynx to prey more often on smaller prey (e.g. lagomorphs, chickens) in comparison to adult lynx, which prefer hunting deer;
5. How the current Scottish wildcat reintroduction programme's focus on responsible management of domestic cats reduces the disease transmission risk for any future reintroduction of lynx;
6. The low likelihood that lynx would become significant predators of waterbirds, waders, or other ground nesting birds, due both to the lynx's relatively low density and normal prey preferences; and
7. The value decisions underlying this specific discussion topic: a) Should we introduce another species to the landscape (i.e. lynx) that will need resources to protect while we are struggling to save and grow populations of other threatened species (e.g. capercaillie) that are already present in Scotland?; b) Should we introduce a species that may adversely impact threatened species that we are already experiencing difficulty in successfully managing in the Scottish landscape?

Related to this last point, a specific concern was raised as to the effects of any reintroduced lynx on capercaillie and black grouse. Since these galliformes* currently exist in such low populations, any potential threat to these species, even at the individual level (e.g. lynx predation), could have a disproportional impact on their populations.

However, it was noted that amplifying effects can work both ways, and the lynx's provision of carcasses in the habitats of capercaillie and black grouse could equally have a beneficial effect for these birds by reducing mesopredator predation pressure. This debate underlined the group's prioritisation of collecting detailed data during any trial release that would directly inform a pre-defined, stakeholder-vetted plan for adaptive responses to *any* threats that may arise at *any* time after a lynx reintroduction.

It was reiterated that if there were to be a reintroduction of lynx, any release would initially be of a small number of animals that would be closely monitored. The participants strongly felt that a well-thought-out research and monitoring programme could: 1) provide an opportunity to learn about the actual effects of lynx on other species in Scotland, instead of relying on conjecture; and 2) offer an opportunity to build a wider understanding of lynx's interactions with other species in different ecosystems that could inform other reintroduction programmes across Europe.

To identify areas of focus that should be prioritised by a monitoring programme for any pilot project, stakeholders engaged in a brainstorming exercise. Since this activity identified a wide range of social and ecological factors to monitor, details of this exercise and its resulting conclusions are covered in their own section below (**Section 3.9.**).

As in earlier topic discussions, stakeholders stressed the importance of setting not only the ecological stage but also the social and cultural stages, so as to facilitate positive coexistence with any reintroduced lynx, with recommended efforts including but not limited to:

1. Full incorporation of and genuine consultation with stakeholders throughout the planning, implementation and evaluation processes of any trial reintroduction;
2. Clear, inclusive and honest communication with all stakeholders;
3. Recognition that any project to reintroduce lynx would benefit from prior examination of existing conflicts among interested and affected parties (e.g. those conflicts instigated and/or intensified by the beaver and white-tailed sea eagle reintroduction programmes) and consideration of how to avoid similar situations prior to any lynx reintroduction; and
4. Alignment of all relevant government policies with lynx reintroduction.

Between the 27 June and 4 July meetings, a draft version of a concluding statement was constructed and shared with participants for comments. The second meeting was then dedicated to critically reviewing the draft statement collectively and to individually addressing each comment that had been added. After each point had been discussed, a revised draft of the "Summary of related knowledge" section was completed and agreed on by all stakeholders in attendance. Jamie Copsey concluded the meeting with an open discussion of

* A group of small to large-bodied, largely terrestrial birds with blunt wings that includes species often referred to as gamebirds.

the key information that participants felt should be included in the Conclusion section of the draft statement, which was completed online afterwards.

3.6.2. Concluding statement

The following recommendation statement was finalised and accepted by all participants with two reservations:

Summary of concern

The **VWT study** reported a number of concerns regarding the potential impact of lynx on other species. Some stakeholders felt that populations of threatened species such as wildcats, mountain hares, red squirrels, capercaillie, black grouse and other ground nesting birds are too vulnerable to withstand any predation by lynx and that reintroducing a top predator could compound biodiversity loss.

The lynx's potential role in controlling mesopredators was also questioned, with some stakeholders believing that, whilst individual animals might be taken, lynx would be unlikely to have any significant regulatory effect on populations of smaller predators (e.g. foxes and badgers). The opinion was also expressed that existing management of predators by people is sufficient to negate the need for any large carnivore. It was highlighted that significant amounts of money have been invested in trying to save capercaillie and wildcats, and a frequently voiced sentiment was that conservation efforts should focus on saving existing species rather than reintroducing "new" ones, i.e. building biodiversity from the "bottom up" rather than "top down."

Summary of related knowledge

Eurasian lynx specialise in hunting medium-sized ungulates, with roe deer their preferred prey. They also take a variety of smaller species, including several that are threatened in Scotland, including wildcats, mountain hares, capercaillie, and black grouse. The presence of other ground nesting birds within lynx diet has not been widely reported but may be a risk. However, wherever suitably sized deer are available, these other, smaller species are rarely taken.[2]

Scotland supports a significantly higher density of roe deer in a range of habitat types than Norway.[3] Scottish roe deer occur within a range of densities (varying between habitat type*) common to many European countries which already host surviving or reintroduced lynx populations. Scotland also supports large numbers of other medium-sized ungulates like fallow and sika deer, while British red deer are smaller than European specimens and so may also be targeted by lynx in or around woodlands.[4] Whilst we cannot determine the exact dynamics of what might play out in Scotland, based on evidence from Europe, Scotland's relatively abundant deer population should thus limit the pressure on alternative, less preferred prey species, at least for the foreseeable future.

* See knowledge section of the lynx and deer statement for further detail on the variations in density of roe deer populations in different habitat types. Note that, as stated in this section on lynx and deer, no up-to-date national dataset on Scottish populations exists.

There is considerable evidence for lynx controlling mesopredators in Europe, with data from Finland and Sweden finding that mountain hares,[5] capercaillie[6] and black grouse[6] all enjoyed population *increases* after lynx recolonised parts of their range, with this effect thought to be driven by the lynx's suppression of foxes.[7] In the case of forest grouse in Finland, it has been suggested that an increase in the lynx population actually worked better for controlling fox numbers than human hunting.[6]

The lynx's impact on mesopredators is also not limited to direct predation. Partially eaten deer carcasses left by lynx provide scavenging opportunities for species such as foxes, badgers, and pine martens, which, in turn, can help to reduce predation pressure on the species they might otherwise hunt. Following the return of lynx to southern Sweden, the proportion of venison in fox diets rose to account for half of the food consumed by foxes in winter, even as local roe deer densities fell.[8] At the same time, this carrion subsidy did not lead to any increase in fox density, again thought to be due to the lynx's suppression of fox numbers.[7,8]

The potential for increased carrion availability to reduce predation pressure on ground nesting birds was also suggested by a recent experiment in Scotland, which found that maintaining a supply of by-products from deer culling operations led to a substantial reduction in the depredation rate suffered by artificial capercaillie nests – largely thanks to a reduction in nest predation by pine martens and badgers.[9]

Carcasses created by lynx would also help to boost missing natural processes[10] linked to nutrient cycling and help restore the diversity and healthy functioning of the necrobiome, including small birds, mice, or even hedgehogs, which could all benefit from year-round carrion availability. Carcasses can also help to boost invertebrate biodiversity, with a wide variety of beetles, flies, butterflies and ants attracted to decomposing carcasses.

There is limited evidence regarding lynx impacts on a small and vulnerable wildcat population such as currently exists in Scotland. However, a study specifically investigating the relationship between wildcats and lynx in Anatolia found a high degree of temporal overlap between the two species, with wildcats exhibiting no change in their activity patterns in the presence of lynx.[11] Data from Romania[12] and anecdotal reports from Switzerland also found that wildcats were more common in areas where lynx were present.

The proportion of hares in the lynx's diet increases with latitude and is inversely proportional to the abundance of ungulates; where deer are available, they remain the preferred prey choice.[13] Of the two species of hares found in Scotland, the European brown hare is adapted to open country, so Scotland's large and robust population is unlikely to be much troubled by the woodland-loving lynx. Mountain hares could experience some predation in woodland habitats but where roe deer are common – as they often are in these habitats – hares would be likely to remain an infrequent prey item. Mountain hares would also be less at risk on the open moorlands where they reach their highest densities, with lynx disinclined to hunt far from woodland edges.[14]

Red squirrels are a very rare item in lynx diet across Europe; in a study of prey items spanning two decades in Switzerland, only a single red squirrel was recorded out of more than 1,000

prey items.[15] The Scottish population is currently estimated to number around 120,000 so would appear to be more than large enough to sustain such occasional predation.

Conclusion

The Eurasian lynx specialises in hunting medium-sized ungulates, particularly roe deer. Lynx may also sometimes take a variety of smaller species, including species of conservation concern in Scotland, such as wildcats, mountain hares, red squirrels, capercaillie, and black grouse, amongst others. However, the evidence from mainland Europe suggests that, in places where its preferred ungulate prey species exist at sufficient densities, smaller prey species are rarely taken.

Furthermore, while there are unknowns regarding the impacts of the reintroduction of lynx on the other wild species discussed here, the lynx is known to have been part of a wild Scottish ecosystem that also included all these species, which suggests that these species can exist in the presence of lynx. In addition, in Scotland, the availability of roe deer and other suitably sized deer, such as fallow, sika, and red deer hinds and calves, should be sufficient in most places, at least for the foreseeable future, to negate the need for lynx to resort to regularly hunting smaller prey species.

It will be desirable, prior to any lynx release, to assess deer densities within the lynx's predicted distribution using existing methodologies and to model the potential effect of planned/predicted human deer control on lynx prey availability over time. It will also be necessary to monitor human deer control efforts to understand potential effects on lynx prey requirements and the effect of predation by lynx on deer numbers. Close monitoring of the effect of lynx on priority species during potential initial trial and reintroduction periods will also be necessary.

There is evidence from mainland Europe that lynx reintroduction/recolonisation can lead to increases in species of concern such as capercaillie, black grouse, and mountain hares, due to the suppression of some mesopredators, particularly foxes. There is also evidence for a diversionary feeding effect of deer carcasses left by lynx, reducing predation pressure by foxes and potentially by badgers and pine martens. Wildcats may also benefit from increased scavenging opportunities as well as from reduced competition from foxes if lynx prove able to lower Scottish fox densities.

While mesopredator control by humans may continue to be necessary to protect certain species of concern in some places, having lynx in the landscape could make this job easier (or at least work synergistically with continuing control efforts) at a time when a range of factors are otherwise making it harder. Furthermore, lynx could bring added benefits by restoring some lost ecosystem processes (e.g. nutrient input to woodlands) and by boosting the tourism draw to the areas in which they are present.

Reservations

Reservation 1: If a reintroduction were to occur, there needs to be a suitable monitoring plan, legal framework for management, and exit strategy for lynx removal if negative impacts are ecologically and/or economically damaging.

Reservation 2: With limited habitat availability, other environmental pressures, small population sizes, and in a reintroduction scenario, there is the potential for unforeseen interspecies dynamics to occur between released lynx and species of conservation concern (despite evidence that they coexist (ed) naturally in Europe or Scotland), and, therefore, detailed monitoring of any lynx release for impacts would be vital.

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3.7. Lynx and livestock and potential responses

3.7.1. Synopsis of discussion content

Three online meetings were dedicated to considering the potential effects of a lynx reintroduction on livestock and their management, and to developing recommendations for how these potential impacts should influence any plans related to a trial lynx release project. Two observers, twenty stakeholders and three participants from the Swiss study tour attended at least one of these three online sessions: a 3.5-hour meeting on 18 July, a 5-hour meeting on 24 July, and a 5.5-hour meeting on 1 August 2024 (**Appendix II**).

Discussions from all three meetings are comprehensively captured in the content of the concluding statement on this topic (**Section 3.7.2.**), whilst the results of the interactive exercise from the 24 July session are presented in **Section 3.7.4**. The following content summary only highlights notable points that are absent from these compilations.

Meeting one: The focus of the first meeting was on understanding the current state of knowledge relating to lynx predation of sheep and other livestock.

The session began with a summary of the lessons learned by stakeholders on the Swiss study tour in April-May 2024 (**Section 2.2.**), presented by Grace Reid (National Sheep Association Scotland). She connected these points to the current state of livestock rearing in Scotland, reviewing the key concerns of Scottish farmers and crofters, the challenges of depending on government agencies to manage any reintroduction programme, and the need for transparent communications with stakeholders from a local to national level and across national borders.

A brief discussion followed, which addressed the generational and cultural differences among farmers' perceptions of predators. It was suggested that there is a higher acceptance of high-profile predators by the Swiss public than there is in Scotland. In addition, Swiss livestock herders view wolves as a greater risk to sheep than lynx, whilst younger generations of farmers are overall more tolerant of predators than are older farmers.

David Hetherington followed Grace Reid's talk with a review of:

1. Lynx predatory behaviour;
2. The factors that influence lynx predation on sheep in Eurasia and the variation in predation patterns and scales across time, management systems, habitats and countries, with a special focus on a Swiss case study from 1973-2020;
3. Comparisons between livestock management in Scotland and continental European countries; and
4. The implications of this information for mitigating human-lynx conflict related to the real and perceived risk of lynx predation on sheep and other livestock, should a reintroduction occur.

Dr. Robin Rigg (Slovak Wildlife Society and co-editor of Large Carnivore Prevention Damage magazine) then provided additional insight on lynx and livestock predation issues based on his experience in Slovakia, emphasising the crucial distinction between the impacts of wild

predators and how many sheep are killed and the actual degree of conflict (i.e. losses do not always automatically elicit conflict).

After an open question-and-answer period, the second half of the meeting consisted of a deep-dive into stakeholders' experiences on the Swiss Study Tour. Hugh Webster (SCOTLAND: The Big Picture and Lynx to Scotland) presented an overview of the trip itself, the history of lynx reintroduction in Switzerland, lynx predation on Swiss sheep and lynx management in Switzerland. Hugh also touched on reported public perceptions and acceptance of lynx in Norway, making the point that, even where the highest levels of livestock losses are reported, overall public support for lynx remains very high. A loose panel discussion with attendees who had participated in the study tour then ensued until the end of the meeting time.

Meeting two: The focus of the second meeting was on understanding the array of mitigation and management measures used across Europe to deal with predation of livestock by lynx and discussing what might be appropriate for use in Scotland, should lynx be reintroduced. Jamie Copsey started the session by detailing the five livestock-related concerns identified in the VWT report and asking for the stakeholders' critiques and general responses to these statements. This information was later incorporated into the initial draft of the concluding statement below.

Next, the discussion transitioned into an assessment of the mitigation, compensation and management options available for preventing, reducing, or eliminating human-lynx conflict related to lynx predation on sheep and other livestock. Robin Rigg launched this conversation with a presentation summarising the techniques and management frameworks employed across continental Europe. He specifically reviewed:

1. Relevant research and resources available for lynx and human-lynx conflict management options;
2. The general principles underlying human-wildlife conflict and its mitigation, such as the underlying human-human conflict that often is the root cause of much human-wildlife conflict;
3. Various predator management models that have been employed throughout Europe and their measured outcomes;
4. Specific mitigation and management options for lynx (e.g. non-lethal damage preventatives, lethal control and both ex-post and ex-ante financial schemes) and how critical it is to tailor solutions to each situation and to invest in proactive, low-cost adaptations to livestock management, whilst saving high-cost interventions to reactively address specific incidents in high-risk or hotspot locations and, lastly:
5. The benefits of coexistence with lynx (and other large carnivores), including but not limited to wildlife tourism, predator-friendly product marketing, fostering of cultural and social identities, opportunities for species-specific up to global-level ecological education and research, and proffering of a diversity of ecosystem services.

Some points raised during the facilitated discussion following Robin's talk (and that were not integrated into the concluding statement) were:

1. There are mixed results from taste aversion conditioning studies, but a doctoral project is currently evaluating its effectiveness for lynx in the field;
2. Even if fencing is not lynx-proof, it can still serve as a psychological barrier to lynx and keep sheep out of the woods. The more obstacles you put between lynx and sheep, the more likely lynx will focus on deer or other wild prey instead.

Multiple stakeholders identified the need for a future exchange during which non-farmers could engage with farmers to learn about the logistical, economic, socio-cultural and emotional components of livestock production in Scotland. It was suggested that crofters and herders that have been directly impacted by reintroduced white-tailed eagles should be targeted for inclusion in this dialogue.

To further assess mitigation measures, compensation schemes and management frameworks that were considered appropriate or not for the Scottish context, attendees were divided into three small groups and guided by Jamie Copsey, Lauren Waller (CPSG) and Bonnie Gulas-Wroblewski (CPSG) through an interactive exercise using the virtual whiteboard app, Mural. Conclusions drawn from this participatory activity are relayed in Section 3.7.4. Meeting two ended with a summary report from each of the three thematic sessions to all stakeholders, during which time it was confirmed that everyone's views were accurately reflected in the Mural board spaces.

Meeting three: The final meeting for this topic focused on reviewing acceptance for stakeholders' syntheses to date of concerns, knowledge related to lynx's potential impacts on livestock and livestock management, and mitigation and lynx management options for the Scottish context. Time was also set aside to discuss recommendations for funding requirements, communication strategies and other aspects of any trial lynx reintroduction project that were not previously examined.

Jamie Copsey addressed each main point within a draft summary of the state of the knowledge on this topic based on conclusions from the first two sessions. All stakeholders had the opportunity to suggest revisions to each section prior to voting on its final version, which was subsequently incorporated into the concluding statement. He repeated this exercise with all attendees for both the responses to the concerns from the VWT report and the outputs from the second session's Mural exercise, which were focused on mitigation options, compensation schemes and lynx management deemed feasible and appropriate for Scotland, should there be a trial release of lynx.

Several issues came to light that were not featured in the concluding statement, including:

1. The challenges of collaring (and re-collaring) wild lynx, most notably wild-born individuals, and the practical challenges this raises for future monitoring efforts;
2. The complexities of balancing transparency with privacy concerns in the case of lynx management interventions, particularly those involving lethal control with the risk of aggressive public backlash; and

3. The opportunity to apply tourism-related taxes to mitigation, compensation and other lynx management costs.

Once participants were satisfied with the content and composition of these summary statements, stakeholders were divided into two small groups to complete their critique of four remaining mitigation options that were not analysed during the Mural exercise on 24 July. Jamie Copsey and Bonnie Gulas-Wroblewski facilitated this activity, the results of which are supplied in Section 3.7.4. below and Appendix IV. Feedback from each of the groups was then shared and discussed in a plenary session. During this discussion, Robin Rigg was able to provide further insight on volunteer shepherding projects from examples throughout continental Europe (e.g. Project Pasturs, Italy; Swiss Alps LIFEstockProtect, Switzerland; and Project "Herdenschutz Niedersachsen", Germany).

The third meeting concluded with facilitated conversations on the logistical aspects of any potential trial lynx reintroduction programme. Some of the key suggestions from stakeholders shared during these targeted discussions were:

1. Nature-based financing options (e.g. biodiversity credits) hold potential for assisting with the funding of mitigation support, compensation schemes and/or lynx management activities;
2. A blended model for project funding that relies on a diversity of private and public sources would be more reliable, sustainable and flexible than alternate, limited-source options for financial support;
3. Even if lynx predation on livestock is unlikely to happen in the initial stages of any lynx release programme, lynx-livestock interactions could still provide an opportunity to build closer relationships with those who experience conflicts by stakeholders working together to solve any real or perceived issues. This potential for relationship-building should be considered in any project planning;
4. There is a critical need to talk to stakeholders (especially local community members) through the development of any lynx project and to reassure them that the project is genuinely consulting with them, listening and taking their feedback on board. Future consultations at more local levels than this national discussion process are imperative for the success of any lynx reintroduction programme. However, timing is important and the specific communication needs of each stakeholder group should be thoughtfully strategised well ahead of time. A question posed to the entire group for future reflection was, '*To what extent do you feel that the concerns raised can or cannot be addressed sufficiently to move beyond these national discussions at the present time*?'. Stakeholders did not respond directly to this question and it was suggested that they consider their responses in the development of the remaining recommendation statements.

The group ended the session by devising plans for drafting, editing and then finalising a concluding statement on this topic by all stakeholders that attended at least one of these topic meetings.

3.7.2. Concluding statement

The following statement was drafted by a sub-group of stakeholders from the meetings and subsequently agreed on by all participants in these three sessions, with three reservations:

Summary of concern

Predation of sheep by lynx was the dominant concern reported by the **VWT study**, but there was widespread uncertainty about the likely magnitude of its impact. Whilst some stakeholders felt that sheep losses would be negligible compared to losses from inclement weather, accident, disease and black loss, and insignificant to the Scottish sheep farming economy, others anticipated significant levels of loss, with most farmers consulted having serious concerns about their future if lynx were to be reintroduced to Scotland. Some consultees believed that lynx reintroduction would eradicate sheep farming altogether.

It was felt by many that sheep farming in Scotland is unique and that likely interactions between lynx and sheep cannot be inferred with confidence from Europe. It was highlighted that, in the Scottish uplands, flocks are extensively grazed over large areas without close shepherding, usually year-round, lambing on the hill, and often near to woodland or on land incorporating transitional, scrubby ground with gorse, bracken, juniper, etc., where sheep could be vulnerable to predation. In Argyll, most farmers stated that at least one of their boundaries was with forest, and the point was made that afforestation objectives would increase the amount of woodland on or beside farms in the future. It was felt by many that sheep farming in Scotland is quite like Norway, which experiences the highest levels of sheep loss to lynx.

Concerned stakeholders noted that the loss of even small numbers of sheep can have a significant impact on the livelihoods of individual farmers and landowners. It was highlighted that the loss of just a few individuals from vulnerable flocks could impact the viability of rare breeds and bloodlines, the ability to heft flocks, and to maintain a prescribed number of animals for conservation grazing schemes. The point was also made that, if lynx were to predate young lambs, this could cause mastitis in lactating ewes. A point consistently raised was that it is not only the financial loss of animals that is of concern but also the emotional toll on farmers.

The point was made that upland sheep farming and crofting are already under myriad pressures, and lynx would be an additional threat to an already struggling sector. It was also suggested that, if upland sheep are lost, so too would be the flora and fauna that rely on sheep-grazed pasture and heath.

Although much of the focus was on upland sheep farming, concern was also expressed that the most optimal lynx habitat in terms of woodland and deer densities is in the middle ground and lowlands where there are also high densities of sheep. A common view was that sheep and lambs would represent the easiest prey for lynx, and "why would lynx hunt hard-to-catch deer when they could easily hop over a fence and catch sheep or a lamb?"

Welfare implications were raised and it was felt by some to be unfair that farmers adhere to some of the highest standards of animal welfare in the world, but environmentalists could release a large carnivore that would "rip sheep to pieces."

White-tailed eagles and the perceived mis-management of sheep losses was frequently raised. The eagles are believed to have caused significant damage to sheep farming on the west coast and to have driven some crofters and sheep farmers out of business. It was highlighted that the birds have protected status and that there is no compensation for stock loss, and it was widely felt that the financial incentives for coexistence are insufficient. Practitioners' perceived failure to foresee these impacts on farming was raised multiple times, with the implication that the same would occur if lynx were to be reintroduced.

The VWT study found little concern for poultry, but some farmers expressed concern for calves and small breeds of cattle such as Dexters. It was also suggested that there could be a risk to deer farming and that this industry is predicted to expand in Scotland over the coming years.

There was broad consensus that a fair management scheme should include a sustainable compensation programme. However, there was general concern that the Scottish Government would not endorse such a scheme or be prepared to pay compensation, as per white-tailed eagles. It was also suggested that some crofters would refuse compensation or coexistence payments out of principle, perceiving it as "blood money," and that they would not be prepared to be paid to raise sheep simply to feed lynx. It was felt that any scheme would require a long-term guarantee and not be subject to short-term government funding cycles. Overall, it was frequently expressed that, for many farmers, financial compensation of loss misses the point as the real impact is on their emotional welfare and way of life.

The VWT study found stakeholders had little faith in the two most reportedly effective mitigations against livestock loss to large carnivores: fencing and guardian animals. Fencing was generally not thought economically or logistically practical to protect sheep grazed extensively over rough, scrubby terrain, whilst it was anticipated that electric fencing would be considered aesthetically undesirable for the Cairngorms National Park. It was also suggested that public access rights would be a barrier to additional fencing. It was generally felt that livestock guardian dogs would be problematic given the public's right of access and the extensive areas grazed by sheep. The significant costs of training, upkeep and vet bills were highlighted, as was liability should a member of the public or their pet dog be attacked by a livestock guardian dog.

Some stakeholders felt that guard llamas and donkeys had potential, although most farmers were sceptical about accommodating animals that would require specific extra husbandry considerations and that potentially represented biosecurity challenges from the novel pathogens they might harbour.

Several stakeholders felt that the best mitigation would be to fund additional shepherds and to revitalise the practice of close shepherding that is used in countries where sheep are reared alongside large carnivores. However, farming stakeholders felt that there was not enough

appetite amongst young people to undertake the hard work of shepherding, or to dedicate the requisite time to becoming skilled in the practice whilst there was little economic incentive to becoming a shepherd.

It was widely voiced that lethal control should be part of a suite of management measures, but it was anticipated that there would be public backlash should a lynx need to be killed under licence, and that this could be a barrier to its implementation. The lack of an exit strategy was frequently mentioned with respect to white-tailed eagles and there was a fear that this would also be the case with lynx.

Overall, many stakeholders felt that the length of time between now and when people last had to consider large carnivores is too great, and that re-adaptation is not possible given the unique way in which many sheep are farmed in Scotland.

Summary of related knowledge

The scale of the potential impacts: Lynx can and do kill sheep, but the frequency with which they do so varies a great deal around Europe. Annual sheep losses attributed to lynx range from zero to a few dozen in most countries within the lynx's European range, only exceeding one hundred animals a year in France, Switzerland and Sweden.[1] The significant exception to this is in Norway, where farmers report losing thousands of sheep to lynx every year.[2] However, claimed Norwegian losses are rarely independently verified and abuse of the compensation system is suspected.[2] Nonetheless, whilst reported losses may be exaggerated, there is no doubt that lynx do kill large numbers of sheep in Norway.[3]

On the other hand, despite the scale of losses reported from Norway and despite Norway hosting not just lynx but also bears and wolves, the size of the overall sheep industry in Norway has been growing, with meat production rising by 8.4% between 2012 and 2018.[4] Given this fact, even if we imagine a worst-case scenario (a Norway-like future) in which thousands of sheep were killed annually, lynx would still be profoundly unlikely to cause the end of all sheep farming in Scotland.

However, predation by lynx could still impose significant costs on individual farmers or crofters and this could be particularly impactful for those who maintain smaller flocks, where losses may have a disproportionate impact. Furthermore, the nature of Scotland's stratified sheep farming system means that lynx predation suffered in hill or upland systems could have wider knock-on consequences at a time when sheep farmers are already under a range of pressures.

Notably, predation of sheep appears to be largely opportunistic and areas where sheep are grazed in or adjacent to extensive woodland habitats thus represent high-risk zones, since the risk of a fatal chance encounter with a lynx is greatest in such areas.[5] Accordingly, the risk of attack gets lower the further sheep are kept away from large areas of woodland.[6] Repeat attacks are also often focused within situational hotspots where different environmental risk factors align, but no simple set of rules offers a perfect predictor for habitual sheep-killing behaviour by lynx.[6,7]

Comparisons between Scotland and Norway: The exceptional losses seen in Norway are thought to be driven by the fact that Norwegian sheep wander freely through the forest, are checked only rarely and generally remain unprotected.[8] The vulnerability of Norwegian flocks may also be heightened by the relative scarcity of wild ungulates in Norwegian forests. Indeed, in places within Norway where roe deer numbers exceed 4-7 roe deer per square kilometre – densities that are relatively low by Scottish standards – lynx kill rates are very low,[3] and where sheep are confined within fenced pastures, they are "almost never killed."[2]

This suggests the risk of attack should be lower in Scotland since most Scottish sheep are either kept within fenced fields or graze open, moorland habitats, where they are generally further away from woodlands where the predation risk is highest.[6] Furthermore, Scottish sheep share the landscape with an abundance of not only roe deer but red deer, fallow deer and sika deer too, all of which could be potential lynx prey.

The case could thus be made that Scotland is more similar to the Swiss Jura (where sheep are kept within fenced pastures in a wooded landscape occupied by abundant roe deer and chamois) than it is to Norway. Overall, it is unwise to base predictions for what may happen in Scotland on any single country and examining sheep predation across the range of countries inhabited by lynx is more appropriate.

Preferential selection of wild prey: Whilst we cannot 100% predict how lynx would behave in Scotland, evidence from elsewhere in Europe (including Norway) suggests that lynx preferentially target wild prey over domestic livestock, even where the latter occur in the same landscape.[9] Anecdotal evidence suggests that killing fenced-in sheep is also not so easy for a lynx, partly because the sudden and rapid movements of the whole flock are thought to discourage hunting lynx.[6]

Sheep are targeted with more regularity when roe deer become scarce[3] or where they occur in a small number of hotspots where too many risk factors align.[6] Furthermore, female lynx appear to actively avoid sheep pastures,[9] while male lynx – which are responsible for most sheep predation – appear to kill sheep only opportunistically,[5] except for a small number of male and female individuals which become habitual livestock killers.[6]

Impact on flora/fauna if sheep lost: Localised predation could impact individual farmers and crofters and their ability to manage their land accordingly. However, given the size of the sheep population in Scotland, it is unlikely that predation levels would lead to such significant losses that the use of sheep in conservation grazing would become untenable.

Concern for sheep welfare: The five freedoms of animal welfare include freedom from fear and distress but also the freedom to express natural behaviour. There is no clear-cut response to this concern, as fundamentally this is an ethical concern and can be argued from multiple angles. The only solution to avoiding such concerns entirely is to keep livestock and wild predators in entirely separate spaces, either confining animals indoors (which raises its own welfare questions) or keeping them in entirely separate landscapes, which leaves little room for wildlife unless vast areas are set aside exclusively for natural systems. However, only a handful of national parks globally are large enough to sustain large predator populations in isolation.

Concern for other livestock: Cases of lynx killing cattle are virtually unheard of, with just a handful of recorded claims, although very young calves could at least theoretically be killed by a lynx.[1] Farmed deer can also be targeted by lynx, with farmed fallow deer subject to attacks recorded in Switzerland, but improvements to enclosure design can secure such deer from attack.[10]

Rare breeds and bloodlines: Compensation is commonplace throughout Europe for livestock losses to large carnivores, including lynx, alongside a range of mitigation and management measures. The 'special' nature of certain livestock (e.g. rare breeds or bloodlines and hefted flocks) may demand tailored compensation and special efforts to mitigate or manage potential impacts. However, it is worth noting that other countries where lynx occur also have rare breeds and valued bloodlines, with farmers being equally attached to their livestock as they are in Scotland and so the precedent exists for dealing with this issue.

Mitigation measures: Considerable experience in managing lynx has been acquired over the last half century across Europe, and, whilst local context is always key, this knowledge can inform what might be expected to work in Scotland if supported with sufficient resource.[10,11,12,13] Indeed, a review of the many different approaches employed to protect human assets from large mammalian predators in 23 countries found that those used to prevent damage to livestock by lynx were among the most effective of protective techniques used for any predator anywhere,[14] with non-lethal measures noted to be highly effective.[15]

Analyses from Sweden[16] and the French Jura[6] suggest that farms that have already suffered one lynx attack are more likely to suffer further attacks, with the Swedish study documenting how 30% of repeat attacks occurred within one week of the initial attack and 60% occurred within the first five weeks.[16] The risk of an individual lynx developing into becoming a habitual livestock killer may thus be reduced by responding quickly and effectively to initial attacks.

Accordingly, temporary deterrents, including the deployment of rapid response teams with access to additional shepherding resources or volunteer patrols equipped with scaring/ hazing devices and other protective measures may thus be most efficaciously deployed during these relatively brief high-risk periods. If persistent, localised livestock predation hotspots are identified, it may then be cost effective to invest in long-term protective interventions tailored to local conditions.[17] Indeed, such measures are the only approach that may yield a long-term solution to chronic vulnerability in problem areas.[6]

Overall, while many measures successfully employed to protect livestock from lynx may present challenges in the Scottish context, where the habit of protective husbandry has long lapsed, it is certainly the case that a large toolbox of lynx conflict mitigation options exists, with most of these challenges having been faced – and overcome – elsewhere to a greater or lesser extent. This allows Scottish practitioners to pick and choose what may work best in individual locations and specific circumstances, whilst offering potential protection against predatory attacks from other species as well.

Nor would Scotland be the first country to have had to re-learn the culture of coexistence with large predators, with Switzerland offering a clear example of a return from a Scottish-style 'ground zero'.[10] Experience from Europe also suggests that there is significant appetite among

young people for learning shepherding skills and for volunteering to protect livestock from recovering predator populations, with little reason to believe the Scottish public would be less interested in similar schemes.[18,19]

Protected status and lethal control: The government would decide if lynx had protected status – this would involve them being added to the relevant schedules. Lethal control of genuinely problematic individual large carnivores, kept as an option of last resort, is part of managed coexistence elsewhere in Europe. It may not always be a cure-all as it is possible that lethal control could increase predation through another animal filling the void left by the removed one.[20] However, it should be understood to be a valid option for managing lynx in Scotland from the outset of any potential reintroduction.

Conclusion

If an application for reintroduction of lynx into Scotland is made, those advancing the application must demonstrate that they recognise and will put in place plans to respond to all the concerns raised in the following statement:

Experience from continental Europe strongly suggests that livestock in or near wooded areas are more vulnerable to predation. Whilst sheep in Scotland are typically grazed in open areas, this is already changing as woodland expansion accelerates and is likely to grow ever more so. Scotland's typically stratified sheep-rearing systems also mean that certain guarding or deterrent techniques used elsewhere may be expensive or ineffective in certain circumstances in Scotland, especially open hill situations.

Lynx will predate sheep and lambs and possibly other small livestock. The circumstances under which they will do so cannot be fully predicted and may depend upon factors such as the availability of wild prey, land management practices, weather and the behaviour of individual lynx. So, whilst we can learn from experiences elsewhere, we must not assume the situation would play out in the same way should lynx be reintroduced to Scotland. Indeed, we should prepare for the likelihood of unexpected situations and reactions. Close monitoring of the effect of lynx on livestock during potential initial trial and reintroduction periods will be imperative.

The resources required to establish an effective management system will likely be significant. For it to be a success, the system would need sufficient, long-term secured funding from the outset and be implemented in a manner that demonstrates transparency and fairness and builds trust. It must also adapt to new information as it materialises. The project needs to acknowledge that losses experienced by land managers may be more than purely financial. The emotional, societal and cultural impacts – both one-off and cumulative – also need to be accounted for and mitigated wherever possible.

The management system should operate on the principles that earliest engagement with land managers is best, transparency is key and seeking to find collaborative solutions is vital. Where applicable, it needs to compensate for more than income foregone, as this is insufficient to account for impacts on important bloodlines, hefted flocks and the emotional impacts on land managers and their families of repeated predation.

On the ground, the management system's response to a report of livestock loss or mortality by lynx needs to be quick, proportionate and transparent. It should involve a two-way flow of information to seek learning and opportunities for improvement. It must value both evidence and experience, and treat all parties involved with respect. It must also develop and deploy a credible and useful position on the issues of black loss* and associations with lynx.

In both approaches to mitigation and decisions on unacceptable levels of impact (including any trigger for an exit strategy, lethal control, or a regional approach to lynx management), the management system needs to be able to recognise and mitigate individual, local and national impacts. It must also be careful to ensure that suggested mitigation measures are compatible with Scottish outdoor access legislation.

The scheme may wish to encourage land managers to capitalise on opportunities to benefit from co-existence with lynx (e.g. nature-based tourism) and to support them in changes to land management that will enable better co-existence. However, it must acknowledge that there will always be variations in values and desires and must avoid implying that land managers should significantly change their lives or compromise their businesses to accommodate lynx.

Finally, whilst recognising that lynx populations may grow slowly (more akin to the experience with white-tailed eagles than Eurasian beavers), perceptions of the requirements of the European Protected Species Framework should not pose a barrier to the necessary and proportionate management. It is strongly recommended that should there be any lynx reintroduction proposals put forward, the project and/or management system should actively seek to build public understanding of the concerns of those earning a living from the land alongside reintroduced lynx and the need for management intervention and associated endeavours in certain circumstances.

Reservations

Reservation 1: It is assumed that the statement relates to the current landscape of agricultural payments, which may change in the future. Incentives which reward all landholders that demonstrate presence of lynx/predators should be considered as an alternative to compensation payments for predation losses.

Reservation 2: Lynx predation of sheep does not disrupt sheep production at a national scale in any European country, so it is an assertion that they may have negative impacts on the industry as a whole. However, because of the stratified model of sheep production in Scotland, this should be monitored by the project.

Reservation 3: An incentive/benefit scheme should be considered as a replacement to the current compensation models operating for losses to predation.

* Black loss describes the perennial loss of lambs and sheep to reasons that cannot be accurately ascertained due to the absence of the carcass or the state of the carcass once found. Reasons may include disease, parasite burden, predation, accidental death (especially related to falls and drowning), starvation and weather. The management system needs to be alert and agile to anticipate change and detect early issues, responding through improvements (including learning from other projects) as the lynx population expands and in response to any change in natural prey density or distribution, climate change and land management practices.

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3.7.4. Potential mitigation and management responses

A further output of the lynx and livestock discussions was an initial analysis of:

1. Potential mitigation measures employed elsewhere within the Eurasian lynx's range and their appropriateness within the Scottish context;
2. Compensation as a means of responding to potential losses through lynx predation; and
3. Components of the management framework that would need to be in place should lynx be reintroduced to Scotland.

3.7.4.1. Mitigation measures

A presentation was given by Robin Rigg on the following list of mitigation measures to reduce the likelihood and/or severity of lynx predation on livestock:

1. Fencing
2. Adapting husbandry (e.g. avoiding woodland, lambing indoors, night protection)
3. Livestock guardian dogs
4. Shepherding
5. Acoustic and visual deterrents
6. Livestock collars
7. Electric collars
8. Volunteer patrols
9. Other guardian animals
10. Diversionary feeding

The results of small-group initial analyses of these measures is provided in **Appendix IV**. No single mitigation measure was identified as being the most appropriate or likely to be the most effective in all circumstances, though each was recognised to have merits in certain situations. The need for adaptability and flexibility in which measure might be most appropriate in each circumstance was a theme running through the analyses, as was the need for trialling mitigation measures to determine their efficacy.

3.7.4.2. Compensation to respond to losses

The second discussion topic concerned the factors that would need to be considered within any potential compensation scheme, should the project move forward. Specifically, participants responded to the following questions:

What should the purpose of any compensation scheme be (e.g. to promote co-existence/ minimise financial loss etc.)?

Would such a scheme need to be tailored, and if so, what should be considered? (e.g. level of impact in relation to farm size, bloodlines etc.)?

What would you want to avoid with such a scheme? (Consider the role of verification, unnecessary red tape etc.)

What should the purpose of any compensation scheme be?

Points raised during the discussion included the idea that compensation should promote co-existence and be designed to move towards a place where most land managers were accepting of lynx back in the landscape. Upfront payments might encourage land managers to view the lynx positively, though there may need to be additional compensation available for those who experience losses.

Concern was raised over who would manage such a scheme and whether it should be run nationally or through community councils, local authorities, or park authorities. A strategic approach to the scheme was highlighted, with a likely need for NatureScot to play a role. However, it was voiced that the scheme would need to be bureaucratically-light, flexible and responsive to local conditions and needs. Concern was raised that whilst the scheme would need to have a local grounding, at least some community councils may not have the capacity to manage such a scheme. Conversely, it was also suggested that involving local councils might empower and energise them.

The question was raised as to who would pay for such a scheme. Some form of tourism tax, perhaps levied at the community council level, was proposed as a way of funding such a scheme longer-term. The idea of a 'lynx insurance' scheme was voiced, though it was also noted that land managers would need to pay into such a scheme and so incur costs. A need for a sense of justice to be at the heart of any scheme was pointed out, whatever shape or form the ultimate scheme might take.

To what extent would such a scheme need to be tailored?

Participants acknowledged that the nature of the livestock farming industry in Scotland would need to be considered in the development of any compensation scheme and that it may need to be tailored to different circumstances. Factors such as hefted versus non-hefted flocks; pedigree/heritage breed management versus buying market stock and turning over within a year; the value of different age classes and bloodlines; and the value of breeding females to maintain hefted flocks over time were raised as requiring consideration in any tailoring of such a scheme. It might also be necessary to think specifically about cross-border farms and how/who might be responsible for compensating them. The idea of a hierarchical or tiered system of compensation was raised to recognise these differences.

Additional factors were identified as requiring consideration that went beyond the individual sheep themselves. The opportunity cost of losing potentially valuable grazing land through predation risk was identified (which could also hinder efforts to fulfil requirements for grazing numbers per acreage), as was potential loss of carbon sequestration payments. Such costs might be acknowledged in a scheme designed to promote coexistence. The additional time investment in applying mitigation measures was another concern raised, as were the psychological or intangible costs of operating within this 'new reality'.

Whatever scheme was designed it would need to provide a clear, transparent way in which 'value' was determined. It was also highlighted that there are fixed costs to livestock farming and at a certain point the business drops below a line at which it is no longer viable. Finally,

it was acknowledged that any compensation scheme might need to be reactive at the start, responding to losses as required, giving time for mitigation/preventative measures to be put in place and for the farming community to adapt to having lynx back in the landscape.

What should the scheme avoid?

The final question related to compensation concerned the factors that should be considered from the outset, to avoid foreseeable issues.

A core theme emerging from this discussion concerned the need to avoid distrust and dissatisfaction with any process. In the early stages of any reintroduction most lynx would be fitted with tracking collars, allowing clearer monitoring of any possible predation of livestock. However, over time, as the lynx population grew, this level of 'oversight' would become less comprehensive.

Avoiding a 'monotype' decision-making body was recommended. Instead, there should be a balance of sectoral representation to ensure transparency and to build trust in the process. When assessing claims, it was suggested that the scheme could assess whether lynx were responsible for livestock attacks on the 'balance of probabilities', considering different forms of evidence to make a decision. The need for simple, independent verification was mentioned, as was a clear and fair appeals process for negotiating the scale of any compensation paid. The ideas of valuation tables and some means of determining the worth of an individual (e.g. value of an animal at the likeliest first point of sale) were raised.

It was acknowledged that, whilst it might be possible to assign adult livestock mortality to lynx predation (through observation of a carcass), it might be more challenging with lambs that might be harder to locate. The related issue of black loss was also highlighted in relation to concern over verification. It was suggested that comparing livestock losses over time might aid in determining if livestock predation was likely to have occurred, although it was also recognised that historic record-keeping may be insufficient to make these comparisons and that losses naturally fluctuated. The question was raised as to how to determine if predation had occurred and whether DNA testing could be used to remove the bias that may exist with individuals making best-guess judgements.

The overall view expressed was that any compensation scheme must seek to avoid abuse (as is believed to be the case in Norway) whilst at the same time ensuring that the system avoided unnecessary bureaucracy. The scheme should also be uncomplicated, timely, agreed and reviewed to track how much compensation was being allocated, where and when.

A strong view expressed was the need to avoid the funding of any compensation scheme being vulnerable to changes in political or societal interest, especially if the compensation pot was to transfer at some point from private to public sources. Reassurance was needed that funding would be secured for the long-term support of farmers through what would be a significant period of change.

It was recognised that the balance between compensating for losses versus funding preventative measures might shift over time. In fact, it was suggested that the term

'compensation' should be replaced with 'mitigation' in how the scheme is communicated. Finally, any scheme developed would need to be subject to periodic reviews and ensure that it maintains its flexibility and adaptability so that it remains fit for purpose.

3.7.4.3. Factors to consider in a management framework

The final topic discussed concerned the form that any management framework might take, responding to the following questions:

1. What would 'successful' management of livestock predation look like?
2. What scale of loss might be considered unacceptable and contribute to an exit strategy for the project?
3. Should lethal control be part of a management plan, and if so, what should be considered when deciding when this should occur? What might a trigger/threshold for the decision look like?

What would constitute successful management of livestock predation

Stakeholder perceptions surrounding any management framework, and how these change over time, was suggested as a central 'measuring stick' to assess its success. If compensation paid is felt to be appropriate; if the advice and support systems in place are seen to be even-handed in how they are enacted; and if the systems are perceived to be properly resourced over the long-term (with those most negatively impacted by lynx not bearing all the costs), then it was felt that this would go some way towards demonstrating successful management. If all these measures were in place, then ultimately success would be measured by conflict being minimised and those potentially most impacted by lynx becoming increasingly comfortable with the animals in the landscape.

It was highlighted that such success would require 'boots on the ground' and timely responses to calls for assistance. The project would need to have the capacity to act early and quickly to mitigate problems and the framework would need to clearly outline how such problems would be managed, with scope for further modifications over time. Success would require the framework to be reviewed and be adaptable to evolving needs.

The framework would need to address the question of black loss, management measures should be laid out upfront (rather than always playing catchup), and the framework would need to demonstrate preparedness.

Some stakeholders suggested that reintroduction success would require clarity from the outset as to what the ideal lynx population size would be. It was also suggested that a measure of success for the lynx themselves should not be correlated with a decline in sheep numbers. The view was expressed that, if this project could be executed correctly, then it could serve as a model for other reintroduction projects.

What would be considered unacceptable

During this discussion it was mentioned that levels of acceptability will vary depending on who is being asked and there would not be a single threshold of unacceptability that was applicable to all circumstances. If an individual farmer were to experience losses that were not offset through compensation or mitigation support received, then this would be unacceptable at this level. Broadly though, it was perceived that if the negative impacts of lynx can no longer be managed; if resources were insufficient to offset losses; if all mitigation measures have been tried yet failed; or if lynx behaved unexpectedly, in a manner that made it challenging to manage their impacts, then these factors would each constitute unacceptability.

The idea of adopting a regional perspective on 'acceptability' was raised, recognising that thresholds of acceptability might vary depending on the scale and type of livestock farming undertaken, a lower bar being set for some regions than others. This bar could trigger responses such as more active management or removal of lynx from certain areas through to complete exiting of the project if a certain threshold of lynx removal was demanded.

A question raised was whether you would know whether the impacts were unacceptable before the point at which removal of all lynx from the landscape was still possible. A response given was that this was one reason why close monitoring of the project and a slow, careful process of reintroduction would be required. Finally, it was voiced that a multi-factorial approach would need to be incorporated into any exit strategy, recognising both the range of impacts of lynx on the landscape and whether or not the lynx themselves were showing signs of moving towards the desired population level.

Lethal control within the management plan

The last topic to be discussed concerned the question of lethal control, whether it should be built into the project, and if so under what circumstances. A general view expressed by participants was that lethal control *was* a necessary option to incorporate into the project, even if it were one of last resort. This measure would need to be included in a way that made it both available and *usable,* recognising that there would need to be clear guidelines and support provided to those involved to avoid or respond effectively (and unitedly) to any potential public backlash. Emphasis was placed on the need for transparency, clarity and cross-sectoral unanimity on the place of lethal control within the management hierarchy. Guidelines would need to be equally clear, minimising the likelihood of different interpretations being made.

Whilst the focus of the discussions were around lynx management in relation to livestock owners, the point was made that other land managers could be impacted by lynx being back in the landscape. Any decisions concerning lethal control or other management options would also need to take them into consideration.

Translocation was voiced as a possible alternative to lethal control in certain circumstances. Whilst it was recognised that lynx will disperse, it was also suggested that they should not consciously be put into areas where conflict is likely to occur. Where lynx were causing negative impacts, the question was asked as to whether they could be translocated to low

conflict areas, benefiting both the lynx themselves and the areas from whence they came. The practicalities of translocation (and the challenges of trapping lynx) were questioned, particularly in relation to the difficulty of trapping other species for translocation, such as beavers. If translocation were a viable option, then the procedures would need to have been tested so there was confidence they could work. These procedures would need to be simple and inexpensive, and there would need to be consideration given to the legal framework required to allow it.

3.8. Potential opportunities and associated concerns for a trial lynx reintroduction

3.8.1. Synopsis of discussion content

The final meeting of the National Lynx Discussion process examined opportunities associated with lynx in Scotland and associated concerns. In addition to two observers, thirteen stakeholders attended the 15 August session (**Appendix II**).

Jamie Copsey opened the meeting with a review of the relevant needs identified at the in-person meeting in Perth (**Table 3**), along with the opportunities and concerns reported by the VWT summary. Of primary interest among these and, therefore, of particular focus during this session were opportunities and concerns linked to tourism. However, attendees were also encouraged to reflect on additional benefits of a potential lynx reintroduction that arose from previous topic discussions:

1. Lynx, deer and implications for Scotland (**Section 3.3**):
   a) Supporting forest regeneration through supplementing deer control, particularly where deer densities have been lowered already via intensive deer management.
2. Lynx and gamebirds and potential responses (**Section 3.5**) and Lynx and other species of concern (**Section 3.6**):
   a) Potential benefits to gamebirds and species of conservation interest through mesopredator control (e.g. foxes).
   b) The provision of carcasses may provide diversionary food options for mesopredators, offer additional food sources for smaller species and support natural ecological processes such as nutrient recycling.

Peter Cairns (SCOTLAND: The Big Picture; The Wild Media Foundation and Lynx to Scotland) then gave a presentation on the diversity of nature-focused tourism opportunities for lynx reintroduction in Scotland based on lynx examples throughout continental Europe and large carnivore initiatives in North America. He also stressed the connections between wildlife tourism, local community support and economic benefits, and advancing environmental education.

An open discussion inspired by this presentation converged on the following points:

1. Examples of, and the need for more, research into the economic impact of wildlife-centred tourism initiatives, especially those specifically attributable to lynx;
2. The diversity of financial models that support European and North American visitor centres;
3. The importance of incorporating local communities into wildlife education and outreach initiatives and, relatedly:
4. The risks of over-reliance on volunteers and relatively low-paid workers as the foundation for most conservation programmes in Scotland.

An extensive conversation emanated from the question of whether lynx-friendly branding or certification of products (e.g. those from sheep) could be a feasible option, which could potentially mitigate human-lynx conflict among livestock producers. Although it was acknowledged that these types of programmes have worked in tourist-targeted specialty markets elsewhere (e.g. predator-friendly beef in eco-lodges within Botswana) and premium-priced local markets in Scotland (e.g. the Lynbreck Croft's nature-friendly meat production in the Cairngorms National Park), multiple stakeholders representing agricultural interests doubted the feasibility of this type of system for livestock and lynx in Scotland based on stumbling blocks from:

1. Markets already saturated with premium products for which the public does not have sufficient disposable income to pay;
2. Mismatch with existing supply chains;
3. Veterinarian capacity;
4. Untenably high costs of abattoir and processing operations (e.g. for waste management), especially when these are of small-scale and/or mobile;
5. Difficulties in tracking "lynx-friendly" individuals within the stratified sheep sector; and
6. Policy and welfare issues related to the above points.

However, if it were possible to overcome most or all of these hindrances, stakeholders would consider investigating this opportunity further.

Another possible opportunity from lynx reintroduction was identified for the forestry sector. Although concerns about the potential adverse impact of lynx protection policies on forestry operations had been mentioned during earlier sessions (**Section 3.2.**), offshoots of some of the opportunities discussed above (e.g. ecotourism and lynx-friendly certification of forestry products and culled venison) were posited as benefits that could offset these costs for the sector.

Pete Creech (Heart of Argyll Wildlife Organisation) expanded on the opportunities and challenges for nature tourism within Scotland in his presentation that followed. Finally, Jamie Copsey concluded the meeting by leading attendees through an exercise to outline the main issues and information that stakeholders felt were important to capture in the group's concluding statement.

3.8.2. Concluding statement

Based on the in-depth discussions and initial drafting during the meeting, a version of the concluding statement was written by several attendees and shared via email with all participating stakeholders for feedback. Following revision, the statement below was finalised and accepted by all participants, with seven reservations:

Summary of opportunities and associated concerns

The **VWT study** reported that most stakeholders believed that lynx reintroduction could benefit local economies, primarily via tourism. Some questioned the likelihood and magnitude of this boost, given that lynx are reported to be elusive and rarely seen, and felt that tourism was a

fickle industry and not a sound justification for lynx reintroduction. For many, however, it was not perceived that not actually seeing a lynx would limit the appeal.

The Knapdale beavers and sea eagles on the island of Mull, were cited as examples of species reintroductions that have significantly increased visitor numbers and spend in Scotland, and the Harz mountains in Germany as an area where lynx tourism brings in millions of euros to the local economy. It was suggested that lynx could offer iconic branding opportunities and observed that many farmers and landowners, especially in the Cairngorms National Park, already incorporate tourism as part of their diversified income streams, so lynx presence could potentially be packaged to be attractive rather than burdensome to landowners.

However, it was recognised that there are downsides to tourism as well. A key concern was whether money derived from lynx tourism would trickle down to local people who had to coexist with lynx daily, or whether it would remain in the pockets of ecotourism operators and hospitality businesses. Similarly, while it was recognised that landowners might benefit from some additional income, some felt it unlikely that this income would filter down to tenant farmers and estate workers. Sea eagles on Mull were referenced in this regard, with farmers in Argyll reporting that money from tourism does not reach the crofters who live alongside them.

The possibility of increased visitor numbers to the Highlands was highlighted as a concern. It was felt that tourist pressure is already an issue and that roads, transport provisions and local amenities are struggling to cope in some areas. The North Coast 500 was frequently referenced as a scheme that failed to consider infrastructure constraints.

It was highlighted that tourists can cause disturbance of vulnerable species such as capercaillie, and that visitors do not always adhere to signage indicating sensitive areas. Some gamekeepers expressed concern that people looking for lynx would interfere with their operations, whilst some farmers feared that people would be accessing farms at all hours, trying to find lynx. Conversely, some stakeholders felt that the presence of lynx might leave some parents reluctant to let their children play in the woods unsupervised, or for tourists to picnic in the woods.

Aside from the potential financial benefits of ecotourism, some stakeholders believed that lynx could benefit the public purse by taking up a proportion of the deer cull and by reducing deer damage to commercial forestry. It was also suggested that a reduction in deer numbers could reduce incidences of road traffic collisions. In the long-term, it was perceived by some that the anticipated improvements to woodland health and biodiversity from hosting a carnivore at the top trophic level would create diverse future opportunities for people and communities that were as yet unrecognised.

Supportive stakeholders felt that lynx reintroduction offers an opportunity to reverse biodiversity loss and to help restore Scotland's lost natural heritage, providing hope in the face of anxiety and despair caused by the climate and biodiversity crises. Others suggested that reintroduction could become a source of pride and inspiration for the Scottish people, and

that lynx would engender a sense of wildness to Scottish landscapes which would be attractive and spiritually enriching for people with pro-rewilding values.

Summary of related knowledge

Despite concerns among some stakeholders that the relatively cryptic nature of lynx might limit their touristic appeal, evidence from Europe suggests that lynx tourism can attract tourists, generating significant sums for local economies. For example, in the Harz mountains region alone, lynx have been calculated to generate between £7.5M and £12.5M of tourist spend every year.[1] Furthermore, a diverse suite of touristic activities have been built around the presence of lynx across Europe, encompassing visitor centres, viewing platforms at captive breeding facilities (complementing interest in wild lynx nearby), lynx trails, guided walks and assorted branding and promotional opportunities.[2,3,4,5]

The intrinsic value of the lynx as a charismatic species and top predator means its simple presence in an area provides the basis for enhanced brand reputation alongside economic and educational benefits. As such, there would be plenty of scope for an attraction like the Wildcat Experience in Newtonmore to be replicated for lynx. This 10km orbital path around the village, developed in cooperation with local landowners and crofters, is complemented by a treasure hunt within the village. This features model wildcats, in gardens and other locations, for which "Trackpacks", with a brochure, map and pens, can be purchased from the local visitor centre and elsewhere.

There appears to be ample opportunity for lynx to be incorporated into Scotland's tourism offering. Nature-based tourism is one of Scotland's fastest growing sectors, with 'activity and adventure' tourism worth £759M to the Scottish economy, accounting for nearly 40% of tourism spending in Scotland[6] and supporting nearly 40,000 full time equivalent jobs.[7] Wildlife tourists typically spend more per head than the average tourist and contribute to the overall tourist economy by combining wildlife watching trips with other touristic activities, supporting a wealth of hospitality businesses.[8]

There is also a precedent for reintroduced species to be of particular interest. On Mull, data from 2019 recorded that a quarter of visitors cited sea eagles as one of the reasons motivating their visit, while an additional 3.5% cited it as the main reason, even half a century after sea eagles were first reintroduced, demonstrating the longevity of their appeal.[9] These visitors contribute a conservatively estimated minimum of £4.9M per year to the Mull economy, supporting between 98 and 160 full-time equivalent jobs.[9]

Elsewhere, bottlenose dolphin watching in the Moray Firth generates at least £4M for the local economy each year, with dolphin watching identified as a 'significant reason' for 52,200 overnight visitors a year, and with over 17,000 of these visitors identifying dolphin-watching as the 'main reason' for visiting.[8] Lynx could attract tourists to new areas, while the improved chances of seeing – or at least tracking – lynx in winter may serve to tackle the problematic seasonality of tourism in some locations.

Notably, tourism generates costs as well as benefits, often straining local infrastructure, sometimes introducing anti-social behaviour and, in places, inflating local house prices, but

these are not challenges that are unique to lynx tourism.[10] And whilst concerns about uneven distribution of costs and benefits are valid and should be something the project actively seeks to address, the money and jobs lynx generate for local economies could nevertheless offer indirect benefits for communities living with lynx, helping to keep shops in business and schools open.

Lynx should not discourage anyone from letting their children play in the woods, since lynx present no realistic threat to humans. There are a handful of recorded instances across Europe of lynx – usually mothers with kittens – defending themselves against dogs off the lead.

Aside from the socioeconomic benefits that lynx could generate, lynx could also generate a variety of ecological benefits, some of which could yield their own economic benefits. For example, lynx predation – in combination with human hunting pressure and environmental factors – has been linked to declines in roe deer density in Switzerland.[11] If lynx can manifest localised reductions in Scottish deer densities, affecting not only roe deer but other species such as fallow, sika and even red deer (all of which lynx are capable of hunting), it could potentially help reduce the costs of deer management and the costs linked to deer damage, albeit the extent of this effect is hard to predict.[12]

Lynx could also help resurrect missing and/or incomplete natural processes in Scottish ecosystems, restoring a year-round supply of large carcasses, boosting biodiversity (potentially including benefits for ground nesting species like capercaillie through the suppression of mesopredators)[13], enhancing nutrient cycling,[14] encouraging reafforestation via natural woodland regeneration[11] and helping to mitigate climate threats by increasing the overall functional resilience of natural systems.

Finally, there are more intangible benefits to lynx reintroduction alongside the potential assorted socioeconomic and ecological opportunities.[15] People value wild animals and wildness simply for what they mean to them and how their existence enriches their experience of the world. Indeed, many are happy to recognise that existence value by contributing funding support simply to know that wild animals continue to exist, even when they have little expectation of ever seeing them.[1] Specific existence values for lynx in Scotland have not been calculated but a range of surveys have found considerable support for lynx reintroduction, whilst reports from other countries where lynx persist or have been reintroduced show the large majority of the public support the existence of lynx,[11] often noting the species' high aesthetic and educational values and that lynx represent "a symbol of preserved nature."[16]

Conclusion

The reintroduction of lynx to Scotland has the potential to bring a range of benefits relating to the economic, ecological and spiritual health of the nation through ecotourism opportunities, sustainable wildlife management, restoration of lost ecological processes, and less tangible wellbeing benefits derived from returning a sense of wildness to the Scottish landscape. It has been demonstrated in Europe that, despite the elusive nature of lynx, just the knowledge that a large carnivore exists in the landscape is enough to generate millions of pounds of tourist spend annually in a single region via a diverse range of lynx-themed offerings. There is no reason why Scotland's tourism economy couldn't benefit in a similar way, considering nature-

based tourism is a burgeoning sector in Scotland, and there is a precedent for reintroduced species to be of particular interest.

It is recognised that increased tourism may put a strain on local infrastructure, something that is already felt in parts of the Scottish Highlands where concentrated visitor pressures arise close to the road network. However, given the dispersed nature of lynx colonisation that would result from reintroduction, it is anticipated that impacts on local infrastructure would be minimal and outweighed by the increased income to local businesses and job creation.

Lynx reintroduction would not be expected to have any negative impacts on public access rights in Scotland but, where any difficulties did arise, due to visitors exploring countryside where lynx were known to be present, better promotion of the Scottish Outdoor Access Code (SOAC) should deal with any disturbance of vulnerable species and habitats or land management operations. The Lynx to Scotland Project should help in the promotion of SOAC and actively seek to address any uneven distribution of costs and benefits of lynx tourism that may arise. Equally important, for farmers and crofters, will be a fair and sound system of management payments to mitigate any negative impacts on their livestock rearing activities.

There might be some concern around the public safety aspect of having a large carnivore in the landscape. However, lynx are secretive animals which are rarely encountered by humans in the wild in their current natural range and there are no recorded instances of healthy lynx attacking people.

Lynx primarily prey upon small to medium ungulates, with a preference for roe deer, but in Scotland would also be likely to hunt other suitably sized deer such as fallow, sika and red deer hinds and calves. Reducing Scotland's deer densities to levels which promote widespread regeneration of woodlands and other important plant communities is a Scottish Government priority and is accepted as an essential measure to restore Scotland's ecosystems and fight climate change. Whilst the reintroduction of European lynx into Scotland should not be thought of as a silver bullet regarding deer control in place of culling by humans or weather impacts, data from continental Europe suggests that the direct impacts of lynx on deer populations in Scotland could complement other methods, at least at the local level.

Lynx may also benefit ecosystems through the suppression of mesopredators, such as foxes, to the benefit of vulnerable ground-nesting birds, for example, and by enhancing nutrient cycling in woodlands via abandoned prey carcasses. Abandoned or unattended carcasses can also benefit vulnerable species by providing an alternative food source for mesopredators.

Across Europe there appear to be high levels of public support for lynx reintroduction or spread through natural recolonisation. Furthermore, a range of surveys of the Scottish public have indicated considerable support for lynx reintroduction. Part of this support can be attributed to what having a mammalian apex predator back in the Scottish landscape symbolises for people – the return of wildness, the idea of living in harmony with nature and restoring what has been lost. The return of lynx, therefore, has the potential to have a positive impact on the mental and spiritual wellbeing of the nation, providing hope in the face of anxiety and despair caused by the climate and biodiversity crises.

Reservations

Reservation 1: An incentive/benefit scheme should be considered as a replacement to the current compensation models operating for losses to predation.

Reservation 2: Clear guidance for business operators (across land management and tourism sectors) will be required to support a lynx reintroduction and manage potential conflict and licensing issues in relation to disturbance and business operations. This will need to be developed with the assistance of/be led by statutory agencies. Ideally much of this would be in place in advance of a release using existing lessons from lynx in Europe and other species reintroductions to Scotland.

Reservation 3: ADMG supports the view that there is no one size fits all approach to deer management in Scotland. Recognising that deer reductions are a government priority, target deer densities to deliver on biodiversity and climate change objectives will likely vary considerably geographically and should be informed by, and relevant to, local land management objectives and aspirations.

Reservation 4: It is perhaps better to say that predation from lynx could help efforts to reduce deer populations in combination with deer stalking, rather than inferring lynx should be seen as an answer (silver bullet) to the deer problem.

Reservation 5: There is a risk that too much early investment in 'lynx experiences' could be wasted if the population/reintroduction fails. There is also definitely a genuine concern that disturbance by humans can negatively impact settlement of newly reintroduced animals.

Reservation 6: There are potentially unknown impacts of reintroducing a species into a cultural, economic and environmental landscape that is quite different from when lynx were last present in Scotland. This reintroduction may of course be distinctively positive for tourism, but we should track some agreed 'visit' metrics to help adapt to any emerging challenges. The suggestion that an incentive/benefit scheme might be more relevant than a compensation scheme is an interesting proposal.

Reservation 7: The potential benefits described possess varying degrees of possibility of occurring and each will need considerable efforts to ensure 'success'.

3.8.3. References

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3.9. Monitoring, learning and response

A common theme throughout the discussions concerned uncertainty around the likely impacts of lynx reintroduction and the need for a comprehensive, transparent and responsive monitoring scheme to be in place from the outset of any potential reintroduction. Time was allocated during the *Lynx and Other Species* discussion to undertake an initial brainstorm of the factors that could be monitored (**Table 5.**)

Factors identified ranged from those related to the lynx population themselves and their interactions with other species, through to the socio-economic, cultural and human perceptual changes that might occur. It was highlighted that monitoring may need to be tailored to local circumstances, beginning with how lynx use space and what they kill and eat, potentially being focused initially in a pilot study area. Camera trapping at sensitive sites (including where capercaillie live, potentially as part of existing monitoring work for this species) was also suggested, as was the need to collaborate with established research institutions (e.g. Aberdeen University) to undertake specific studies. It was also noted that funding for this monitoring work would need to come from within the budget of the reintroduction proposal itself rather than costs being borne by others.

Prey population/ecological change
Deer species densities (especially local level impacts on deer populations)
Deer herd movement/habitat use
Population changes in mesopredators and their impacts on other species (e.g. ground-nesting birds)
Habitat use/movement changes by meso-predators
Positive/negative impacts on species of conservation concern (e.g. wildcat)
Vegetation response/herbivore impacts
Use of carcasses by other animals
Breeding success of ground nesting birds
Lynx behaviour
Lynx habitat/territory use/trends-tracked through habitat types
Lynx behaviour changes due to human proximity vs individuals that occupy more remote areas
All areas visited by lynx including how close they venture near humans/human settlements (towns, individual houses, farms etc.)
Potential signs of mal-adaptation from captivity/quarantine (related to welfare post-release)

Lynx population change
Breeding success
Mortality due to disease, such as those spread through domestic cats
Road traffic collisions
Lynx diet
Scat analysis
Dietary trends
Human socio-cultural and economic impacts
Changes in public perception/opinion/interest
Monitor rural economic changes – population, income
Impacts on human behaviour e.g. public use of forests, any interactions with lynx
Tourism attraction
Potential kills of domestic cats/dogs
Human conflicts
Impacts on livestock
Interactions with non-native game birds
Land management changes associated with predator/prey population shifts
Human disturbance of lynx

Table 5. Factors that could be incorporated into a monitoring programme for lynx reintroduction.

4. Discussion

The National Lynx Discussion process was built on the results of the Vincent Wildlife Trust (VWT) study which identified a series of stakeholder concerns relating to the possibility of the Eurasian lynx being reintroduced to Scotland. The national discussions further explored these concerns with a cross-sectoral group of national organisational representatives to begin to understand the extent to which they could be addressed. Stakeholders were able to reach a consensus around all concerns presented, producing agreed concluding statements for each, though this agreement should not be confused with support for any proposal to reintroduce lynx to Scotland. These concluding statements capture the extent to which the concerns raised appear justified, based on currently available information, and what might need to be in place – should a proposal to reintroduce lynx to Scotland be developed – to respond most effectively to circumstances.

Consensus on discussion topics

Stakeholders agreed that, based on available evidence, there is sufficient quantity and quality of habitat in Scotland to support a viable population of lynx. The point was highlighted that this suitability might change over time in response to national policies and initiatives relating to land use and nature restoration. Lynx could help to secure a more natural balance of species within the ecosystem, although they should not be thought of as a 'silver bullet' in relation to deer population control. They are unlikely to replace culling by humans or weather impacts, although they could complement these controls, particularly in locations where deer numbers have already been suppressed.

Due to lynx preference for wooded areas in which to hunt, lynx are likely to have minimal impact on deer occupying open terrain, so upland red deer stalking interests should be little affected. However, consideration should be given to the possible effects of lynx presence on practical woodland/roe deer management, especially concerning any local site protections afforded to breeding lynx that might limit normal deer management or forestry activity. It is possible that lynx could have locally significant impacts on roe deer populations and the behaviours of the remaining roe deer, which may impact local businesses that rely on roe deer stalking for their income.

Stakeholders agreed that, whilst the currently available evidence suggests that gamebirds, at a national scale, are unlikely to play a significant role in lynx diet, where lynx and gamebird interests come into contact at the local level, the impacts could be significant. For these reasons, it was felt by most stakeholders that any management framework designed to respond to the potential negative impacts of lynx should be open to application by other sectors too, including gamebird management.

In relation to potential impacts of lynx on other species of conservation concern (e.g. capercaillie, black grouse, wildcats) stakeholders concluded that, based on evidence from mainland Europe, lynx are unlikely to predate these species to any significant degree due to their preference for medium-sized ungulates, which are relatively abundant in Scotland; deer. Lynx may in fact have a *positive* impact on some of these species of conservation concern through predation on 'mesopredators', particularly foxes, and through the provision

of carcasses as an additional food source for other species. Such carcasses could also boost nutrient cycling within the ecosystem.

Arguably the most significant concern discussed by stakeholders was that of potential impacts of lynx on livestock, in particular sheep. It was agreed that lynx are likely to predate on sheep, lambs and potentially other small livestock, in at least some circumstances, especially when they are located in or near wooded areas. Furthermore, Scotland's typically stratified sheep-rearing systems mean that predation could have impacts for the wider sector in addition to the immediate farm affected.

Significant resources would be required to establish an effective management system, and to ensure it was funded long-term from the outset. Stakeholders felt that any such management framework (including mitigation measures and compensation options) would need to be implemented in a transparent, collaborative, responsive and fair manner in order to build and maintain trust. It would also need to be flexible and to adapt to new information as it arises.

In their further discussions on the management framework, stakeholders felt that the aim might be to move towards a system of payment for co-existence, whilst recognising that there will always be variations in values and desires and that land managers should not have to compromise their livelihoods to accommodate lynx. Relocation or lethal control were agreed as being necessary components of any management framework. In addition, stakeholders highlighted the need for such a measure to be *usable* as well as available, meaning that there would need to be clear and consistent messaging to the public at large as to the situations under which this measure would be applied, so that those implementing it did not face any public or political backlash.

Opportunities presented by the possibility of lynx being back in the landscape were also identified and discussed. Potential economic benefits (especially linked to ecotourism) were highlighted, despite the elusive nature of the lynx. Evidence from Europe suggests that the mere presence of the lynx within the landscape can be enough to encourage visitation and significantly grow tourism income. Additional benefits identified included enhancements to the ecological and spiritual health of the nation and the restoration of lost ecological processes as well as the additive, if limited, positive impacts lynx might have on deer management.

A concern was raised that Scotland's tourism infrastructure was already stretched, though it was agreed that the dispersed nature of lynx meant that lynx-related tourism was unlikely to place it under undue further pressure. Participants agreed that should financial benefits emerge through enhanced tourism revenues, then these should be linked with a fair and sound management payment system for farmers and crofters impacted by lynx.

Uncertainty and the need to monitor

Whilst stakeholders valued the evidence from mainland Europe where the Eurasian lynx is currently found, they also recognised that such information is not perfectly translatable to the Scottish landscape. Though consensus was built on all concerns discussed, each had its own caveats based on what the realities might actually be, should lynx be reintroduced. Careful,

comprehensive and transparent monitoring was deemed necessary from the outset of any potential proposal to reintroduce lynx to Scotland.

It was felt that a better understanding of the scale and extent of gamebird releases in Scotland would help to inform the perspective on potential lynx conflict and mitigation measures needed for this sector and it would be critically important to monitor the realities of any negative lynx impacts on gamebird management at both the local and national scales. There may also be potential *gains* to this sector (e.g. through lynx predation on foxes) which would also need to be tracked.

Close monitoring of any positive or negative effects on other species, in particular priority species of conservation concern, was considered necessary during any reintroduction, to track potential consequences and respond accordingly. Furthermore, monitoring of the wider potential socio-economic, ecological and cultural benefits should lynx be brought back, would help inform understanding of the gains.

Preparing for the unexpected, beginning with close monitoring and rapid response to any effects of lynx on livestock would be critical to the long-term success of any project. Valuing local, experiential knowledge within any monitoring, learning and response process alongside more 'traditional' scientifically derived information will not only better inform decision-making, but would also contribute to trust-building and acceptance of those stakeholders potentially most impacted.

Phased approach and exit strategy

It was recognised that if a reintroduction of lynx to Scotland were to occur, it would need to be undertaken in a stepwise, phased manner, linked to close monitoring of the individuals, so learning can occur from the outset and timely responses be provided should they be required. It was also highlighted that an exit strategy process would need to be built into the project from the start.

Given the complexities in making decisions regarding the possible 'failure' of a reintroduction project and any associated required exit, it was emphasised that a diverse group of stakeholders would need to be involved to fairly consider any evidence provided. It is likely that such a process might need to be regionally tailored, recognising that any negative impacts of lynx might not be felt equally across the landscape.

Alignment with policy and its enactment

The influence of national (and potentially European) policies on any proposed reintroduction of lynx to Scotland was identified as needing careful consideration. If Scotland were, for example, to reach the desired reduction target in deer densities, this could have implications for the potential size of a lynx population and their individual behaviour, including possible prey switching and an increased rate of attacks on livestock. It would therefore be prudent to incorporate prey requirements of lynx into deer reduction targets, to avoid negative consequences both for a lynx population and other potential prey species.

Furthermore, if lynx were to be reintroduced, the interpretation of European Protected Species law in Scotland may restrict land management practices, as is the case with the buffer zones that are currently put in place around breeding sites for protected species. Elsewhere within the Eurasian lynx's range national governments employ a 'lighter touch' approach, permitting ongoing land management unless it is proven that it could compromise particular species covered by the law. Careful consideration and discussion of how existing (and potentially future) policy or legislation may impact any reintroduction of lynx or the practices of different land managers should the reintroduction occur, would need to take place to avoid exacerbated impacts.

Learning lessons from prior reintroductions

There are clear lessons to be learned from previous reintroductions in Scotland, including the white-tailed eagle and Eurasian beaver, in terms of trust-building, transparency, adaptability and responsiveness. Being proactive, collaborative and honest from the outset would be central to the success of any project to reintroduce lynx. Key would be the identification and securing of long-term sustainable funding, free from any constraints imposed by political or social change.

Any move towards a situation in which there was wide acceptance of lynx being back in the landscape would require sufficient resources to pre-empt, and where not possible, to track and respond effectively to any negative impacts, particularly those felt by land managers. If executed properly, a lynx reintroduction process has the opportunity to set a new bar for reintroductions in Scotland and provide a model for how others should be designed in the future.

5. Recommendations

In addition to the recommendations made within conclusion statements, stakeholders advised that three specific pieces of work should be carried out:

1. **Review of gamebird rearing/releasing in Europe**

To further inform understanding of the potential impacts of lynx on gamebird rearing/releasing, it was recommended that data be collected – where available – on the scale of such rearing/releasing* in other countries where the Eurasian lynx occurs. It was felt that a better understanding of the scale of release of gamebirds in Scotland would also help to inform this topic.

2. **Additional lynx population modelling**

Further to discussions on the potential implications of government policy to reduce deer densities, it was recommended that population modelling be undertaken to forecast lynx population growth trajectories (and potential implications for predation on other species, especially livestock) under different scenarios.

3. **Local consultations**

Stakeholders in the National Lynx Discussion process expressed a desire for further consultations to take place, involving individual landowners and others who may be impacted (potentially positively or negatively) by any proposal to bring lynx back to Scotland. This need was also previously identified within the LFG.

In addition to these three pieces of work, it was recommended that there would be a need for careful genetic management of the lynx population, should the species be reintroduced to Scotland. Although not discussed in detail, it was highlighted that careful thought would need to be put into both the genetics of any founding population and how the management of these genetics could be monitored and acted upon in the long term to maintain the genetic integrity of the population. This management would need to consider the potential impacts of habitat fragmentation and the related fragmentation of the lynx population itself.

* Releasing is the stage when pheasants are in open pens that enable them to acclimatise to a woodland environment and therefore are more vulnerable to predation.

6. Appendices

Appendix I: Organisations invited to the National Lynx Discussion

Invitees	Attendance
A Focus on Nature	Declined
Andrew Bauer	Voting member
Association of Deer Management Groups	Voting member
British Association for Shooting and Conservation	Voting member
Cairngorms Connect	Declined
Cairngorms National Park Authority	Observer and provision of expertise
Community Land Scotland	Declined
Confor	Voting member
Forestry and Land Scotland	Observer and provision of expertise
Game & Wildlife Conservation Trust Scotland	Voting member
Highland Environment Forum	Voting member
Scottish Environment Link	Voting member
Mountaineering Scotland	Declined
National Sheep Association	Voting member
National Trust for Scotland	Declined
NatureScot	Declined
National Farmers Union: Scotland	Voting member
Ramblers Scotland	Voting member
Roy Dennis Wildlife Foundation	Declined
Royal Society for the Protection of Birds	Voting member
Royal Zoological Society of Scotland	Voting member
Scottish Association of Young Farmers Clubs	Unable to attend
Scottish Crofting Federation	Unable to attend
Scottish Forestry	Declined
Scottish Gamekeepers Association	Voting member

Scottish Tenant Farmers Association	Declined
Scottish Tourism Alliance	Declined
Scottish Wildlife Trust	Voting member
Scottish Land & Estates	Voting member
Trees for Life	Voting member
Visit Scotland	Declined
Wild Discovery	Declined
Wild Scotland	Voting member
Wilderness Scotland	Declined
Woodland Trust Scotland	Voting member

Appendix II: Record of meeting participation

Name (Stakeholders and Observers)	Affiliation	1	2	3	4	5	6	7	8	9	10	11	12	13
Caroline Vawdrey	Highland Environment Forum		x	x		x	x	x						
Pete Creech	Heart of Argyll Wildlife Organisation	x	x	x	x	x	x	x		x	x	x		
Colin McClean	Cairngorms National Park Authority	x	x	x	x				x	x				
Alan McDonnell	Trees For Life		x											
Colin Edwards	Forestry and Land Scotland		x		x		x	x		x	x	x	x	x
Sarah Henshall	Cairngorms National Park Authority	x	x				x	x	x	x		x		
Andrew Bauer	Food & Footprint, SAC Consulting	x	x			x			x	x	x			
Grace Reid	National Sheep Association	x	x	x	x	x	x	x	x	x	x	x		
Iain Moss	Woodland Trust Scotland	x	x	x	x	x	x	x	x	x		x		
Dave Morris	Ramblers Scotland		x	x					x	x	x	x		
Hazel Forrest	Scottish Wildlife Trust	x	x	x	x		x	x	x	x		x		
Penny Middleton	National Farmers Union Scotland	x	x		x	x	x			x	x	x		
Alistair Green	Game & Wildlife Conservation Trust			x										
Emma Bradbury	National Farmers Union Scotland			x										
Sarah Robinson	Scottish Wildlife Trust	x		x	x	x								
Steve Micklewright	Trees for Life; Lynx Focus Group	x		x	x			x	x	x	x	x	x	x

Helen Senn	The Royal Zoological Society of Scotland	x		x	x		x	x		x		x			
Linzi Seivwright	Caorann Ecological Consultancy; Upper Deeside and Donside Land Management Group			x	x	x	x	x	x		x	x			
James Silvey	The Royal Society for the Protection of Birds Scotland	x		x					x			x			
Tom Turnbull	Association of Deer Management Groups			x					x			x	x		
April Armstrong	Confederation of Forest Industries			x	x										
Rory Kennedy	Game & Wildlife Conservation Trust				x	x									
Duncan Orr-Ewing	The Royal Society for the Protection of Birds Scotland				x										
Dee Ward	Rottal Estate; Wildlife Estates Scotland; Angus Glens Moorland Group; Scottish Land & Estates	x			x										
Andrew Bachell	Ramblers Scotland	x			x	x	x								
Ross Macleod	Game & Wildlife Conservation Trust	x				x	x	x	x	x	x	x			
Glynn Evans	The British Association for Shooting and Conservation					x									
Robert Connelly	Scottish Gamekeepers Association					x							x		
Ross Ewing	Scottish Land & Estates					x									
Frank Law	Carrbridge Capercaillie Group					x	x								
Robyn Stewart	The Royal Society for the Protection of Birds Scotland						x	x							
Darren Wisniewski	Trees for Life						x								
James Sutcliffe	The British Association for Shooting and Conservation						x								
Jay Wilson	Association of Northern Trails Scotland							x							

Martin Edwards	The British Association for Shooting and Conservation							x	x	x	x	x	x	
Colin Murdoch	Reraig Forest Estate								x	x				
John Macpherson	Private farmer, landowner								x					
Alan Anderson	Scottish Wildlife Trust								x					
Ruaridh Ormiston	Highland Horse Fun; Croila Croft Kingussie								x	x				
Chris Bailey	The Royal Society for the Protection of Birds Scotland									x	x			
David Olds	University of the Highlands and Islands												x	
James Scott	British Deer Society												x	
Henry Dobson	The Woodland Trust												x	x
Ben Clinch	Moray Estates												x	x
Will Anderson	Seafield & Strathspey Estates												x	x
Roy Dennis	Roy Dennis Wildlife Foundation	x												
Jeremy Roberts	Cairngorms Connect; The Royal Society for the Protection of Birds Scotland	x												
Chris Donald	NatureScot	x												
Stuart Wilkie	Scottish Woodlands													x
Nathan Bryceland	Scottish Land & Estates													x
Euan Bowditch	Scottish School of Forestry													x
Ruth Forrester	RTS Forestry													x

Meeting Key

Meeting number	Meeting details
1	9 May: In-person meeting
2	16 May: Topic 1 Habitat and prey
3	3 June: Topic 2 (Part 1) Lynx and deer
4	13 June: Topic 2 (Part 2) Lynx and deer
5	18 June: Topic 3 Lynx and gamebirds
6	27 June: Topic 4 (Part 1) Lynx and other species of concern
7	4 July: Topic 4 (Part 2) Lynx and other species of concern
8	18 July: Topic 5 (Part 1) Lynx and livestock
9	24 July: Topic 5 (Part 2) Lynx and livestock
10	1 August: Topic 5 (Part 3) Lynx and livestock
11	15 August: Topic 6 Opportunities and options
12	28 August: Additional topic – Lynx and roe deer
13	21 November: Additional topic – Lynx and forest management

Appendix III: Participating organisations in lynx and roe deer and forest management discussions

Organisations participating in lynx and roe deer discussion
Scottish Gamekeepers Association
Association of Deer Management Groups
The British Association for Shooting and Conservation
Forestry and Land Scotland
Trees for Life
Moray Estates
British Deer Society
Seafield/Strathspey Estates
The Woodland Trust
University of the Highlands and Islands

Organisations participating in lynx and forest management discussion
Forestry and Land Scotland
Moray Estates
RTS Forestry
Scottish Land & Estates
Scottish School of Forestry
Scottish Woodlands
Seafield & Strathspey Estates
Trees For Life
Woodland Trust Scotland

Appendix IV: Small group appraisal of potential livestock predation mitigation measures

OPTION 1: Fencing

Positive points	Negative points	Potential resolutions
Can present a form of barrier.	Public may not want to see more fences.	Farmers may be willing to consider if supported in terms of materials, maintenance and labour.
Relatively easy mitigation measure to implement and/or maintain within the Scottish context.	High cost involved where fencing doesn't already exist.	Opportunity to replicate Swedish situation in which farmers can apply for funding to work with fencing experts to develop/test new measures for keeping lynx away from livestock.
Wider benefits to the farmer.	Challenge in determining which landowners should bear the cost or how it could be shared – *should farmers face the costs of harbouring lynx*?	Investigate circular fencing for sheep that might mimic sheep 'stells' (circular drystone shelters) in southern Scotland.
Keeps livestock out of woodland areas.	Large scale of fencing required.	Explore contractor costs – converting stock fencing to electrical fencing.
Wide acceptance of fencing as a livestock management tool.	Stags with antlers – get tangled with fencing material .	Ensure fencing options are supported and realistically priced.
Once fence is up, maintenance is passive compared to some other measures.	Visible impact on landscapes where the policy has been to remove fencing .	
Where existing stock fencing is present, a single hotwire may be relatively less expensive.	Potential for negative impact on some priority species, e.g. capercaillie.	
There is existing knowledge of fencing erection and maintenance.	Fencing to keep sheep in pens at night unlikely to be practicable in some extensive systems with widely scattered flocks.	
	Logistics of getting fencing material to more remote areas.	
	Impact of moving through electric fencing – responsible access problem. Vandalism risks.	

OPTION 2: Adaptive husbandry

Positive points	Negative points	Potential resolutions
Some changes may be low cost and relatively easy to implement, particularly if farmers can choose for themselves.	Where indoor lambing is not already in place, this could be a costly measure to apply.	Sheep being trained to re-enter holding areas or other modification to stock and farming behaviour to reduce exposure.
Sheep are kept away from woodland to a point, though this is a sensitive issue for farmers given the pressures on farmers with regards to woodland.	Some measures will not be feasible at times of the year, based on the farming calendar.	Find 'low hanging fruit' in terms of what is feasible and cost effective.
Indoor lambing (where appropriate) could be a viable husbandry measure.	The significant culture change and the time needed for this to occur at scale.	Any suggested husbandry changes need to be very carefully described with thought put into the accompanying messaging to ensure it is appropriate.
	Would require more input from sheep experts in terms of viable options that could work from an industry perspective.	Need to keep flexibility to respond effectively.
	Resistance from farmers as some measures need substantial additional work on their part (e.g. bringing sheep in at night may be impossible for some areas).	IUCN guidelines speak to a theory of change, behaviour change – a valuable resource to look at and gives insights into the mechanisms involved.

OPTION 3: Livestock guardian dogs

Positive points	Negative points	Potential resolutions
This option has potential, but there are concerns.	Long timescale to implement such a method.	There would need to be a cultural shift and convince people that this measure will work in the Scottish context.
May be an option in more remote areas where there are fewer people, and fewer people with dogs.	Interactions with domestic dogs and domestic dog ownership may impact on the success of this option.	Needs to be tried out before lynx are reintroduced.
The dogs stay with the sheep full time in Switzerland, so provide round the clock protection.	Scepticism that this option can be effective within a society where there is high domestic dog ownership and high numbers of visitors wanting to access the landscape.	Some farms in Europe have guardian dogs that did not have them previously, so it can work (e.g. Sweden, Finland).
	Additional management and time constraints for farmer.	Peer-to-peer learning could help.
	Potential opportunity for conflict.	Automatic dog feeders could reduce the time investment from farmers.
	The number of guardian dogs that may be needed (scale and numbers involved), particularly for large farms.	
	Potential impact if employing automatic dog feeders on birds.	

OPTION 4: Increased shepherding

Positive points	Negative points	Potential resolutions
Viable option in theory.	Cost (salary, infrastructure required).	In Switzerland and France, the State have supported employing shepherds and providing infrastructure for them.
More shepherding opportunities could help keep rural economies going. However, local economy benefits will only be realised if shepherds stay in the same area.	Few shepherds in Scotland now.	More shepherds could help reduce black loss and improve sheep welfare on the hill.
	Time required to learn the skill and cost associated with that. Farmers need people with experience.	There are shepherd schools in Europe – possible in Scotland too?

OPTION 5: Acoustic and visual deterrents

Positive points	Negative points	Potential resolutions
Simple and low impact.	Habituation and learning will kick in – won't work long-term.	Need rapid and well-communicated response process in place to know when to scale up/change intervention.
Random lights/radio etc. already in use in certain places, so might not be too much of a shift.	Maintenance of the devices can be labour intensive, particularly if there are many involved.	Suggest these methods as appropriate in the right context – not appropriate across large areas – to avoid loss of credibility.
Easy to install.	Credibility challenge – hangover from white-tailed eagles where such measures do not appear to work.	Need to consider communications to wider community when such methods might be employed, so they're suitably prepared.
Fox lights in Switzerland seem to work for ±4 weeks.	Not a long-term solution to problem hotspots.	To avoid habituation, use them for brief periods only and not as a general mitigation measure.
Helpful in situations where sheep already penned in/ lambing sheds.	Wouldn't work if operating over a large area.	Combine these deterrents with husbandry actions, e.g. penning/restricted to smaller fields.
Cheap option.	Difficult to see how you would select locations for maximum effect given the large home range of lynx.	Should have monitoring scheme in place to learn over time what is most effective.
	Potential sound and light pollution – public objections to this?	

OPTION 6: Protective livestock collars (i.e. collars placed on adult livestock themselves)

Positive points	Negative points	Potential resolutions
No change to the landscape.	Need to minimise handling time for lambs, as it can compromise their development.	Depends on design for lynx specifically.
Promising in term of effectiveness at first and works in other contexts with other predators (e.g. caracals), but lynx learned to bite around the collar in Switzerland, so maybe it depends on design.	Potential cost in terms of money, staff time and training so they could be used effectively.	Collate real-life examples to communicate to farmers.
	Flystrike if put on incorrectly, which could contribute to animal welfare concerns.	
	Extensive operations do not handle lambs until 3 months old, so may have already lost many before collars are fitted.	
	Negative perceptions by farmers.	
	Potential negative perceptions by tourists/public.	

OPTION 7: Electric ('no-fence/invisible fence' and/or tracking-type) collars (could be applied to livestock themselves or to lynx as outlined in the table)

Positive points	Negative points	Potential resolutions
Have already been used on cattle, sheep and goats in Scotland.	Cost: relatively expensive considering the cost of the technology in the collars themselves and any maintenance plan for monitoring and/or maintaining perimeter fencing.	Funding from private sources to cover elevated cost.
If tracker collar is placed on lynx, it could alert farmers/ crofters when a lynx is nearby, to enable implementation of prevention/mitigation measures in a timely and targeted way; example from use with brown bears with a history of conflict in European context.	Welfare concerns: stress and possible injury (e.g. flystrike from misfitted collars) if on livestock and/or lynx from collars and handling to place collars.	Real-life examples to communicate to farmers.
Minimal (except installation of sensor posts) changes to landscape.	Cost: if flock is spread out, there would need to be multiple collars on several livestock compared to concentrated flocks where might only be a need for one or two.	Pilot programme. Warnings only useful if effective prevention/mitigation methods can be implemented in effective and timely manner in response.
If tracker collar placed on livestock, could give warning when livestock are in a risky area so farmer/crofter could relocate livestock.	Time and training for staff whether for collars on livestock or lynx.	As time goes by, the collars will become cheaper and more cost-efficient.
If shock/alarm collar is placed on livestock, it could prevent livestock from grazing in risky areas (e.g. woodlands or near woodland edges).	Logistical difficulties of catching and collaring lynx, then maintaining collar function on lynx over time.	

OPTION 8: Volunteer patrols

Positive points	Negative points	Potential resolutions
Could be self-financing, if people pay to be part of the patrols as part of working holidays (of the sort that are already popular in much of the UK).	Health and safety and logistical challenges in managing and maintaining such an initiative, particularly in remote locations.	May work as a targeted approach in certain areas.
The lynx is a charismatic species to work on – likely to attract volunteers for this, potentially making it a longer-term option.	There could be a perception/ reality of volunteers being around to police land manager practices NOT to focus on the lynx.	Could learn from other organisations already doing this sort of thing, e.g. RSPB.
Enhanced shepherding opportunity – has been one of the biggest successes of the white-tailed eagle project. But it only works when the shepherd is there!	Challenge predicting where we need people as 'problem' lynx may move on.	Potentially look to other organisations to manage these groups who already know how to do it.
Those keen to volunteer are likely to be pro-lynx. Their involvement in this way could help them to understand the complexities and challenges farmers may face. Build bridges in both directions.	How to marry the desire to leave lynx to live their lives with the desire to disturb them in certain areas...needs careful communication.	
Building volunteering into the project could unlock further funding opportunities (many grant bodies want local community involvement).	If it requires funding, there may be a challenge in securing this support long-term.	

OPTION 9: Other guardian animals

Positive points	Negative points	Potential resolutions
Llamas could be a viable option.	Comes at a cost, particularly for farmers who have smaller farms.	
Could there be tourism potential linked to this measure?	Time required from farmers to make this work.	

OPTION 10: Diversionary feeding

Positive points	Negative points	Potential resolutions
Relatively inexpensive – shooting deer anyway. Cheaper than electric fence installation and management.	Would lynx scavenge a carcass if they are active hunters? Would this approach be enough to have an effect?	Undertake a proper literature review, pilot studies – may be just not investigated.
Innovative – may be a short-term tool in a suite of options to manage specific situations.	Ethical aspects in terms of dealing with wild animal.	Might be used with other mitigation measures.
Straightforward – doesn't require physical changes to the landscape.	Not used elsewhere in Europe – no examples in other contexts (worth looking at pine marten study out of Edinburgh).	Tolerance to try these methods without jeopardising long-term acceptance of lynx if doesn't work.
	Potential cost depending on what carcasses were used and how many and for how long.	
	Potential negative reactions from wider stakeholders if the approach doesn't work.	