# Scientific Advisory Group - Capercaillie Emergency Plan Meeting note

Friday 5 December, 09.00 - 11.00 | Park Authority Office, Grantown-on-Spey and Teams

## Attendees

- Alice Broome - Forest Research, Senior Scientist - Priority species / habitats
- Carolyn Robertson - Park Authority, Cairngorms Nature Manager
- Chris Sutherland - University of St Andrews, Reader of Statistics
- Dave Parish - NatureScot, Terrestrial Ornithologist
- Helen Senn - RZSS, Head of Conservation and Science Programmes
- Jason Matthiopoulos - University of Glasgow, Head of Ecology and Environmental Change
- Kathy Fletcher - GWCT, Senior Scientist Scottish Upland Research
- Steven Ewing - RSPB, Senior Conservation Scientist
- Stuart MacQuarrie - NatureScot, Deputy Director Nature and Climate Change (Chair)
- Xavier Lambin - University of Aberdeen, Professor of Ecology

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## 1. Actions from previous meeting

Alice provided an update on a DEFRA-funded project led by Forest Research exploring how LiDAR data can be used to better understand and monitor forest structure and its links to biodiversity. The project focuses on three main areas: improving or replacing field-based habitat measurements using LiDAR and scaling this nationally; tracking structural change in forests over time under different management approaches; and testing aerial imagery as a tool for estimating canopy structure.

Chris confirmed that the Cairngorms Connect LiDAR dataset is now available to input to CaperMap, enabling analysis of vegetation structural change over a two-year period. He also shared that key findings are now available from a survey (n=900) examining messaging to encourage pro-environmental behaviours that benefit capercaillie. (See actions)

The first draft of the Research and Monitoring Plan has been updated in response to feedback shared in the previous meeting and circulated for review ahead of this meeting.

## 2. Review of the second draft of the Research and Monitoring Plan

*Lifetime of the Research and Monitoring Plan*

Points were raised regarding the lag in capercaillie responses to interventions delivered through the Emergency Plan; this time lag needs to be communicated clearly. Significant ecological impacts are unlikely to be evident by 2030, although some early indicators may show change. There is potential to revisit the Emergency Plan in 2045, in line with the Scottish Biodiversity Strategy, to assess long-term impacts.

Inherent stochastic variation was also noted as a challenge in monitoring ecological change, as natural fluctuations in populations and environmental conditions can make it difficult to distinguish real trends from random noise. This highlights the need for longer-term datasets and careful interpretation when assessing the effectiveness of management actions.

It was agreed that efforts should be made to identify intermediary indicators capable of demonstrating measurable change within five years. It was also noted that the Capercaillie Integrated Population Model should be able to predict when population trends are likely to stabilise, indicating no overall increase or decline despite short-term fluctuations.

It was agreed that productivity data should be used as the primary indicator of success for the Emergency Plan as increased productivity is expected to drive population-level change. Key indicators, monitored through an annual dashboard, could include female capercaillie presence and population size, brood counts and brood size, chick survival, and lek counts of males where relevant, alongside wider population data from the National Survey. Together, these metrics would provide a practical picture of annual breeding success, short-term population performance, and longer-term population trends.

The National Survey remains the primary mechanism for detecting longer-term trends. It was noted that the timing of the National Survey could be reviewed to better align with the Emergency Plan. The next National Survey is currently scheduled for 2026/27, which falls midway through the Emergency Plan rather than at its conclusion in 2030, when it would provide a more useful measure of overall impact.

*Link between the Emergency Plan and the Research and Monitoring Plan*

It was noted that clear terminology should be used to distinguish between the Capercaillie Emergency Plan and the Research and Monitoring Plan. The Emergency Plan is recognised as the overarching adaptive management plan, with the Research and Monitoring Plan providing the evidence base to inform, guide, and evaluate that adaptive approach. It is considered important to clearly set out the governance relationship between the two plans, and it was suggested that a simple diagram could be helpful in illustrating how the two plans support decision-making and delivery.

*Theory of change*

It was agreed that the Research and Monitoring Plan should include a simple “theory of change” diagram for capercaillie setting out how management actions are expected to lead to desired outcomes. This would involve mapping the relationships between pressures, interventions, and ecological responses. It was felt this would help illustrate the complexity of the capercaillie system, highlighting the multiple interacting factors that influence the species, and what is being monitored, how and why. Including such a diagram would also support clearer communication of the evidence base and assumptions underpinning the Research and Monitoring Plan.

The species recovery curve should remain in the Research and Monitoring Plan as a useful way of illustrating the different stages of population decline and recovery. However, it was noted that the position of capercaillie on the curve depends on our understanding of the key drivers of decline and how effectively these are being addressed. As evidence improves and management actions are refined, our interpretation of where the population sits on the curve may change over time. It was noted that it is important this uncertainty, and the potential for the position to shift, is clearly communicated.

*Spatial information*

It was agreed that the Research and Monitoring Plan would benefit from including more spatial information to provide a clearer picture of where capercaillie, particularly breeding hens, are currently present, how this relates to National Survey results, and how populations are distributed across the wider range. This would help improve understanding of current population patterns and ensure that monitoring and management are better targeted geographically. It was also noted that the focus should not be solely on reacting to current declines, but should place greater emphasis on predicting future change and identifying areas where conditions may improve or deteriorate. Habitat suitability was recognised as a key part of this approach, and it was suggested that the plan could include aspirational mapping to show where suitable habitat could be maintained, improved, or expanded over time to support long-term recovery, with population expansion throughout Scotland being an aspiration.

*Capercaillie core areas*

Monitoring effort could be structured proportionately across the updated core capercaillie areas and buffer zones. This would involve stratifying areas according to factors such as geography, management, or level of risk to ensure monitoring coverage is appropriately distributed. Greater effort could then be focused on the most important or vulnerable areas while still maintaining representative coverage across the wider range and avoiding disproportionate focus on already well-studied sites.

Given that the revised core areas now include Special Protection Areas where capercaillie are a qualifying feature, woodlands with recent capercaillie records (2019 - 2024), and surrounding buffer zones with suitable habitat and capercaillie records from 2014 - 2024, it was recognised that overarching monitoring datasets may need to be reviewed to ensure

they remain representative of this geographic and ecological scope. However, caution was noted given the scale of the updated core areas and buffer zones, and a pragmatic approach may be for these updated areas to help inform and guide monitoring priorities, rather than rigidly determine them.

*Monitoring methodologies*

It was agreed that it would be helpful to develop standard operating procedures for capercaillie monitoring, which the group could help to shape. It was recognised that substantial work has already been undertaken by RSPB and NatureScot to ensure consistency in established approaches, such as cold-searching and lek count methodologies. However, with new methods emerging, including camera traps, and new datasets becoming available, there is scope for review.

The aim would be to develop standard operating procedures that provide clear, consistent guidance on survey methods, data collection, quality assurance, and reporting standards, helping to ensure that data used within the Research and Monitoring Plan is robust and comparable across sites and years. There may also be scope to refine methodologies over time, improve efficiency, and guide how monitoring effort should best be prioritised to address key evidence gaps.

*Dedicated modelling support*

It was recognised that dedicated funding is needed to support the ongoing development and use of the Capercaillie Integrated Population Model as a key tool within the Research and Monitoring Plan. This includes updating the model with new data to guide recommendations and support strategic decision-making by the Programme Board.

Funding would also help link the model with CaperMap, allowing outputs to be presented more clearly in spatial form, improving accessibility and helping to target actions more effectively. While the model itself is open source, dedicated support is needed to ensure it can continue to be maintained and operated reliably over the long-term, with the University of Glasgow responsible for maintaining this commitment. Longer-term funding arrangements were considered preferable to annual grants, which carry greater risk. (See actions)

*Pine marten data*

There was discussion around which pine marten datasets should be prioritised within the Research and Monitoring Plan, including spatially explicit density estimates from 2012, 2019, and ongoing subject to funding, and longer-term activity data within core woodlands from 1995, 2009, 2025 (and ongoing subject to funding). It was agreed that both datasets are valuable, alongside the results of a winter predator survey within Kinveachy Forest Special Protection Area in 2014 and 2020. Combining multiple data sources will increase the likelihood of identifying potential relationships and correlations with capercaillie outcomes, while also strengthening the overall evidence base for interpretation.

Predator images collected through camera monitoring at dustbaths could also provide useful supplementary information. However, it was noted that the Cairngorms Connect Predator Project primarily aggregates these data into broader maps of predator presence and absence across the landscape, which is valuable for understanding distribution patterns.

*Intervention-specific evidence: woodland grazing and robocutting*

The RSPB Abernethy Large-scale Field-layer Disturbance (LFD) project is a landscape-scale restoration initiative testing how reintroducing natural disturbance processes, including targeted cattle grazing and robocutting, can improve habitat structure within Caledonian pinewood. By reducing dense heather cover and promoting a more diverse field layer, the project aims to improve conditions for capercaillie while supporting wider woodland regeneration and biodiversity outcomes. The final year of data collection will take place during 2026 - 27, with the majority of field data being gathered during the 2026 field season. Nature Restoration Fund support would enable more rapid analysis of the LFD project, ensuring findings can be used in a timely way to help inform the Emergency Plan. (See actions)

*Volunteer and student involvement*

It was noted that the Research and Monitoring Plan should include clear opportunities for volunteer and student involvement where appropriate. Ensuring it is inclusive and accessible to those who are willing and able to contribute was recognised as important both for expanding delivery capacity and for achieving wider social outcomes.

## Actions

1. **Chris** to liaise with Amber on sharing behavioural messaging survey results with the Park Authority Access Team.
2. **Carolyn and Steven** to discuss potential NRF support to fast-track LFD project data analysis following the 2026 field season.
3. **Carolyn and Jason** to discuss funding options for the Capercaillie Integrated Population Model.