

Petition PE1664 - greater protection for mountain hares: evidence from Scottish Natural Heritage

Scottish Natural Heritage (SNH) is a non-departmental public body funded by the Scottish Government through Grant-in-Aid. We are the Scottish Government's advisers on issues relating to nature and landscape. Our statutory purpose is to:

- secure the conservation and enhancement of nature and landscapes;
- foster understanding and facilitate their enjoyment of them; and,
- advise on their sustainable use and management.

Scotland's nature and landscapes are recognised internationally, and this natural capital plays an important role in supporting economic growth, improving people's health and wellbeing, adapting to climate change and strengthening communities. We work with partners both nationally and locally to maintain and enhance these assets and to improve the public benefits generated from their sustainable use, both now and in the future.

With input from the British Trust for Ornithology (BTO) and the Game & Wildlife Conservation Trust (GWCT), we have reviewed the available population trend data i.e. BTO Breeding Bird Survey (BBS) mammal data and the GWCT National Gamebag Census (NGC) data, along with additional time series data from moorland sites in NE Scotland due to be published in a forthcoming scientific paper. The key findings are:

- The NGC and BBS trend data since the mid 1990's show some similarities and some differences. The BBS data show a statistically significant decline between 1996 and 2010/11 but data from 2012-2015 suggest an upward trend. This could be explained by a population cycle (known to span c.9.5 years in Peak District hares, but variable from 5-15 years), although more data are needed to verify this and any underlying long-term trend. Over the same 20 year period covered by the BBS dataset, a non-significant upward trend is apparent in the NGC data. In light of this, We consider that evidence of a national decline in mountain hares since the mid-1990's is not conclusive.
- The NGC data collected from estates across the mountain hare's range in Scotland show clear cyclicity but provide no evidence for an underlying decline in the hare population from the mid 1950's to 2015. However, gamebag data have their limitations, including the absence of a measure of effort, so caution is needed when drawing conclusions from this source alone.
- In contrast to the above, the NE Scotland data show a dramatic decline after 2003 at a range of monitored moorland sites. It is not known whether this downward trend is continuing. As this is not reflected in either of the other two datasets, it is difficult to draw conclusions, or extrapolate this, beyond the North East.

From the evidence available we do not believe the picture is of widespread decline, however we recognise that the evidence from NE Scotland indicates that significant local declines may have taken place since the early 2000's on some grouse moors

and this is at odds with the overall national trend. Given this mixed picture, we do not consider that a moratorium on culling is justified at present but we expect to have further discussions with SG over whether any additional measures are necessary to safeguard this species on a precautionary basis and to ensure no significant local declines occur.

Where there are concerns over the status of hares on NE grouse moors, we will be looking to ensure that these are initially addressed through the new *Principles of Moorland Management* (PoMM) guidance on sustainable hare management currently being drafted by the Moorland Forum. The PoMM guidance encourages collaborative working between estates to develop sustainable hare management plans. These would be informed by count data obtained according to a standard method, based on the findings of the joint hare counting study involving the James Hutton Institute, GWCT and SNH, due to be published in ~~December~~ January 2018. It is intended that the PoMM guidance require estates to make all cull data available to SNH for monitoring and reporting purposes, to ensure there is a surveillance system in place with alerts for any changes of conservation concern.

Scottish Natural Heritage
October 2017

Agenda

Mountain Hare Management Meeting

10:00-12.00 Wednesday 3rd May 2017

VC (Silvan House Meeting Room 1 & GGH Caerlaverock Room)

1. Introduction and purpose of the meeting
2. SNH response to the data from [REDACTED]. How might this influence our assessment (under Article 17) of conservation status?
3. Voluntary restraint – is it a viable option for the future? If not, we need to review the joint [SNH/GWCT/SLE position on hare culling to reduce Louping Ill](#), press statement, both issued in December 2014, see <https://www.snhpresscentre.com/news/call-for-voluntary-restraint-on-large-scale-hare-culls>
4. SNH's recommended option for future management of hares – see paper for Hugh Dignon for background - [Regulation of mountain hare management in Scotland](#)
5. PoMM guidance – SNH position
6. Publication of the joint JHI/GWCT/SNH study - next steps (e.g autumn workshop/seminar, development of monitoring programme)
7. Roles & responsibilities

From: [REDACTED]
To: [Robert Raynor](#)
Subject: Changes with GAM 4 df
Date: 04 August 2017 13:24:01
Attachments: SNH_MountainHare_GAMgraphs.docx

Hi Rob,

Please find attached a file with the GAM graphs with the corrected y-axis labels, and on the following page, a table with the calculated changes using a GAM with 4 df. For none of the periods considered does the 95% confidence interval of change exclude zero, meaning that none of the changes in the long-term trend (after removal of cyclicity) is significant at $P < 0.05$. By implication, there is no evidence within the bag data to suggest that a long-term population change has taken place.

Best wishes,

[REDACTED]

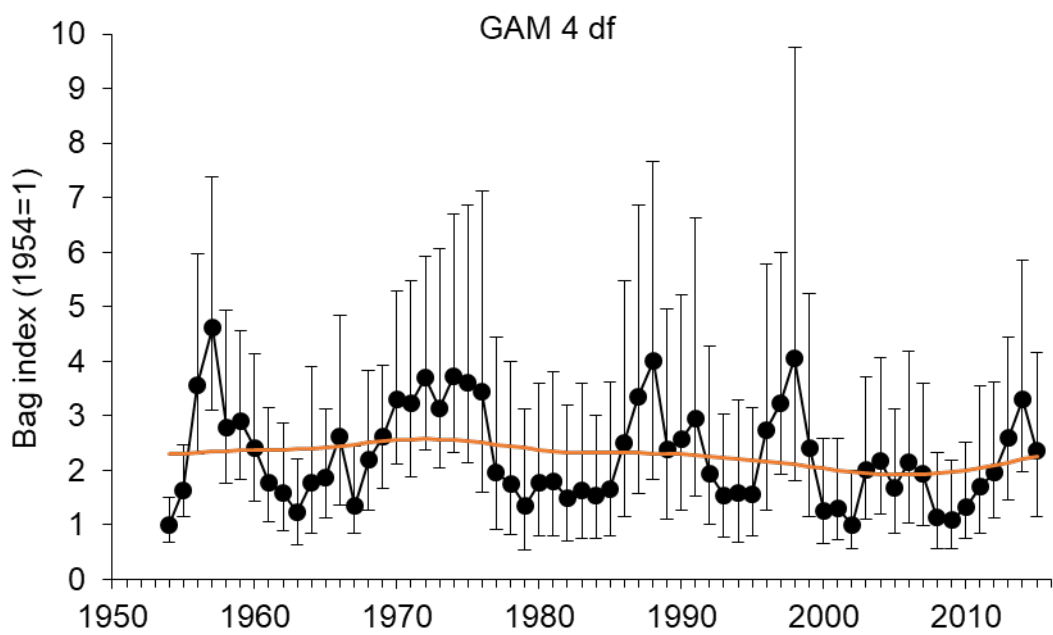
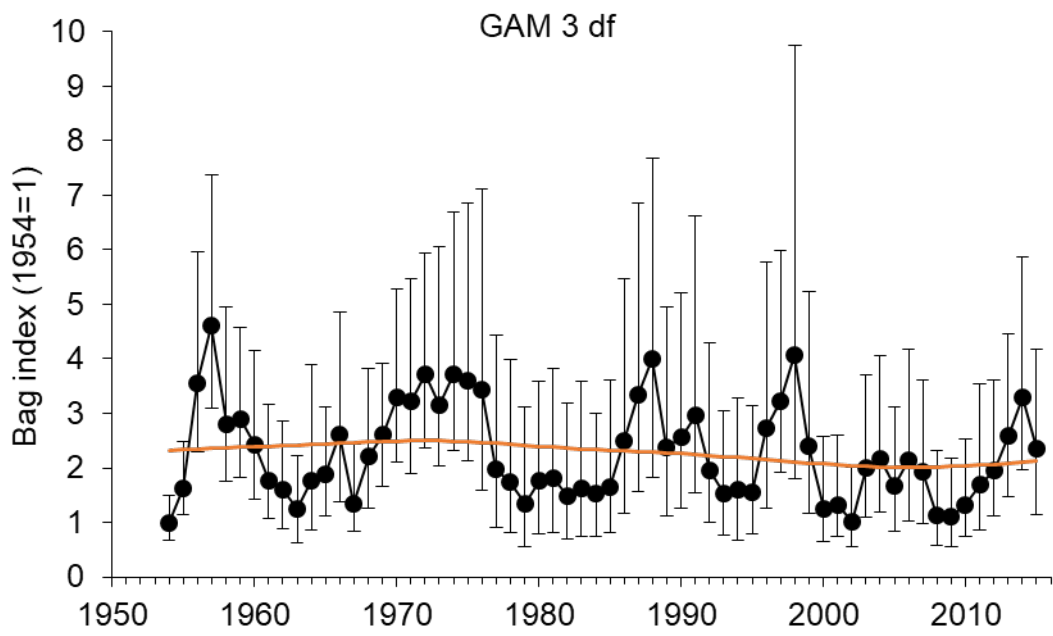
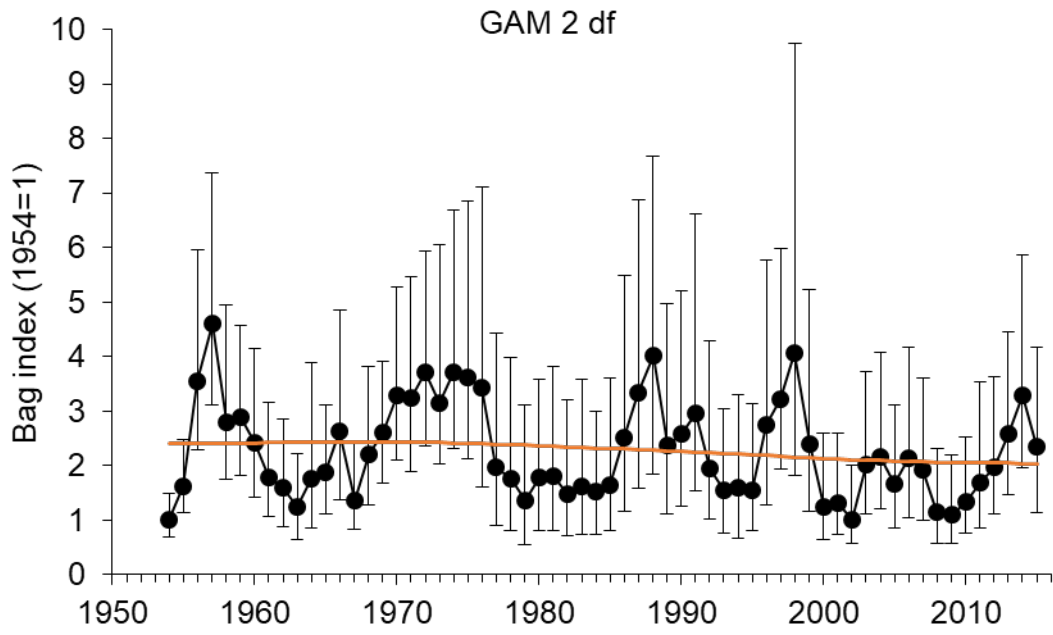


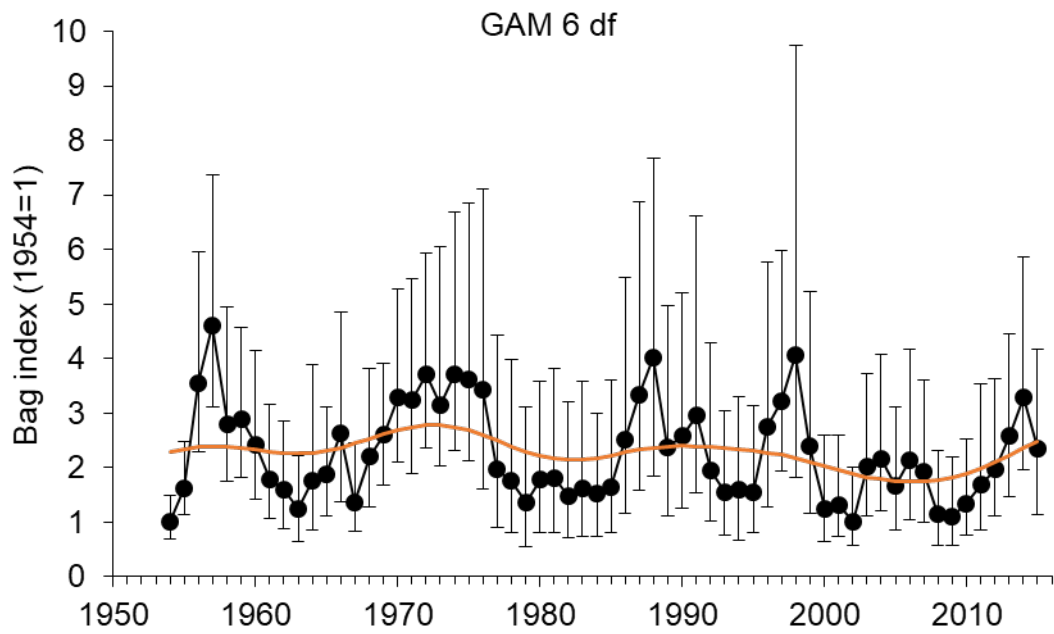
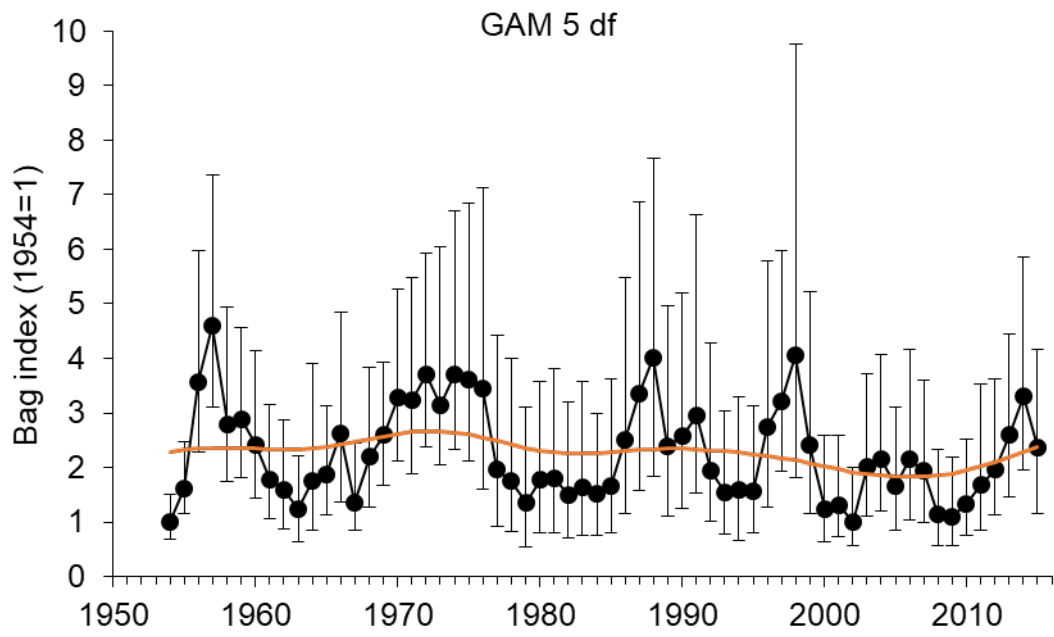
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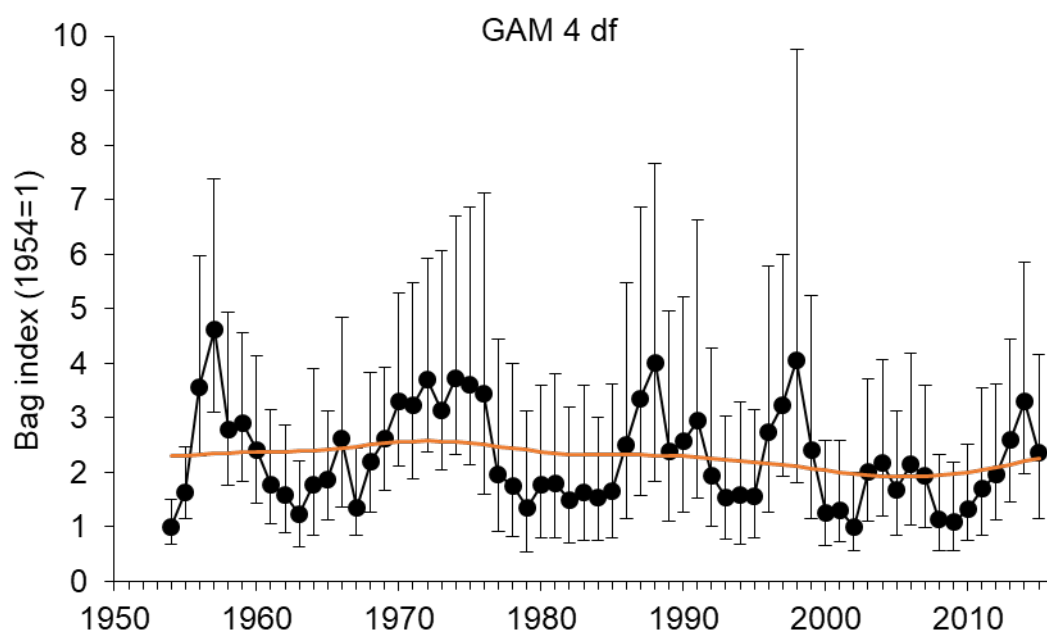
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Using a GAM with 4 df to remove cyclicity and reveal the long-term trend:



Estimated % change and 95% confidence limits for specified periods

Start	End	Change (%)	95%LCL	95%UCL
1954	2003	-15.0	-47.1	49.3
1954	2009	-14.1	-47.6	48.6
1954	2015	-1.4	-45.2	62.2
1990	2015	-1.4	-45.3	71.7
1995	2003	-11.0	-25.0	12.5
1995	2010	-8.6	-40.2	36.5
1995	2015	3.2	-41.8	64.7
2000	2015	11.2	-33.1	60.7
2003	2015	16.0	-25.5	55.5
2005	2015	17.5	-20.8	50.2
2010	2015	12.9	-7.4	27.1
2011	2015	10.6	-5.3	21.3

None of the changes differs significantly from zero at $P < 0.05$

From: [Eileen Stuart](#)
To: [Mairi Cole](#); [Robert Raynor](#); [Alastair MacGugan](#); [Andrew Coupar](#); [Katherine Leys](#)
Subject: FW: Mountain Hare Petition
Date: 12 October 2017 17:42:05
Attachments: PE1664 - response from GWCT Scotland.docx

For info, Eileen

*Eileen Stuart
Head of Policy & Advice
Scottish Natural Heritage
Great Glen House
Inverness
IV3 8NW*

DD. 01463 725227

Mob. [REDACTED]

From: [REDACTED] [mailto:[REDACTED]@gwct.org.uk]
Sent: 12 October 2017 15:53
To: Will Boyd Wallis; petemayhew@cairngorm.co.uk; Eileen Stuart; Robbie Kernahan
Subject: Mountain Hare Petition

Folk

You might be interested in our response to the call for evidence from the Petition Committee on PE1664.

[REDACTED]

~~~~~

[REDACTED]

[REDACTED], Game & Wildlife Conservation Trust (OSCR - SC038868)

[www.gwct.org.uk/scotland](http://www.gwct.org.uk/scotland)

[REDACTED] Game & Wildlife Scottish Demonstration Farm, Auchnerran (OSCR - SC045900)

[www.gwct.org.uk/auchnerran](http://www.gwct.org.uk/auchnerran)

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Hare Management in Scotland - a Game & Wildlife Conservation Trust (Scotland) briefing for the Petitions Committee on issues raised by PE1664.

Executive summary

- Mountain hares are an important part of Scotland's moorlands and the species should be maintained in a favourable conservation status.
- Compared to the rest of Europe, mountain hares are often at high densities in Scotland, largely because of grouse moor management.
- Game & Wildlife Conservation Trust, working for SNH, found that mountain hare distribution was stable between 1997 and 2007.
- Game bag data from 1954-2015 suggests cyclical fluctuations in numbers of hares are natural.
- These data do not show any detectable long-term decline or increase in the numbers of hares in the bag over the last 60 years. Local declines reported for the late 1990s and early 2000s appear in line with the national cycle for that period.
- There is no evidence for sporting management being associated with these periodic declines in mountain hare range or numbers in Scotland. It seems highly likely that intensive forestry and farming practice does locally and regionally restrict Scottish mountain hare distribution.
- GWCT endorse voluntary restraint on taking hares where their numbers are low. We actively promote more monitoring of mountain hares by managers as very important practice. More research is justifiable as this would allow the refinement of management prescriptions.
- A review in 2015 by SNH rehearsed these views, and they are being incorporated into 'Principles of Moorland Management' best practice guidance for mountain hare management

Introduction

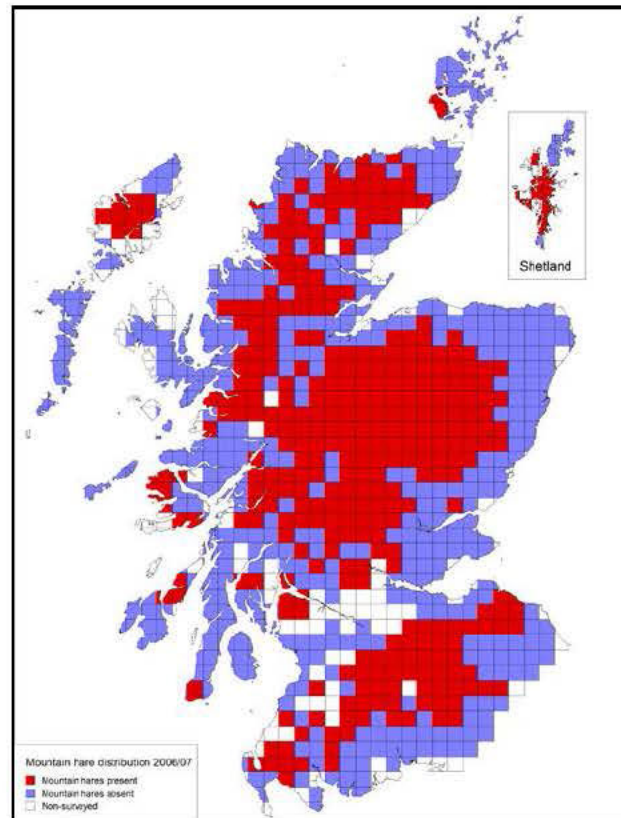
PE1664 calls for a moratorium on the taking of mountain hares (*Lepus timidus*) in Scotland to preserve their conservation status. The Game & Wildlife Conservation Trust (GWCT) are a research body with an active interest in upland land management; our work on this species extends back to the 1980s. GWCT are working with SNH (Scottish Natural Heritage), Scotland's Moorland Forum, the James Hutton Institute (JHI) and others to meet Scotland's need for sustainable management of mountain hares. GWCT has prepared this briefing on mountain hare status and management which brings together the relevant evidence.

Mountain Hares in Scotland

Mountain hares are an important part of Scotland's moorland heritage. They are a valued quarry species and a locally important grazer/browser. They can be an important prey species for predators such as golden eagles, and are enjoyed as a wildlife spectacle.

When GWCT, SNH and JHI surveyed for hares we found that over 80% of the UK's mountain hare population is in Scotland and most of these are on now grouse moors¹ (Figure 1). This research also shows fewer hares in habitats without sporting management. Research has also shown that Scottish mountain hare densities can be up to ten times higher than are typical in other European countries².

Figure 1: The distribution of mountain hares in 2006/07 in Scotland on a 10x10-km square basis. The use of a 10x10-km square scale resulted in some small areas appearing to have mountain hares when in fact they were reported as absent. They are (from north to south) Yell (Shetland), Mainland (Orkney), the Morvern peninsula (adjacent to Mull) and Islay.



This pattern of range and abundance suggests that intensive fox control and habitat management by gamekeepers appears to benefit both red grouse and mountain hares^{3,4}. The Mammal Society, picking up on previous reports²⁴, states on its website:

“Their [mountain hare] numbers have declined locally where favorable habitat such as former grouse moors has been afforested or heather has been removed by excessive grazing by other animals. Young forestry plantations can support high densities of hares which sometimes cause significant damage to trees, but these high densities decline once the forest canopy closes, and the ground vegetation is diminished.”

Consequently, mountain hares seem to do best in areas managed for red grouse (which includes their own management) and these areas seem likely to be future refuges for them in Scotland.

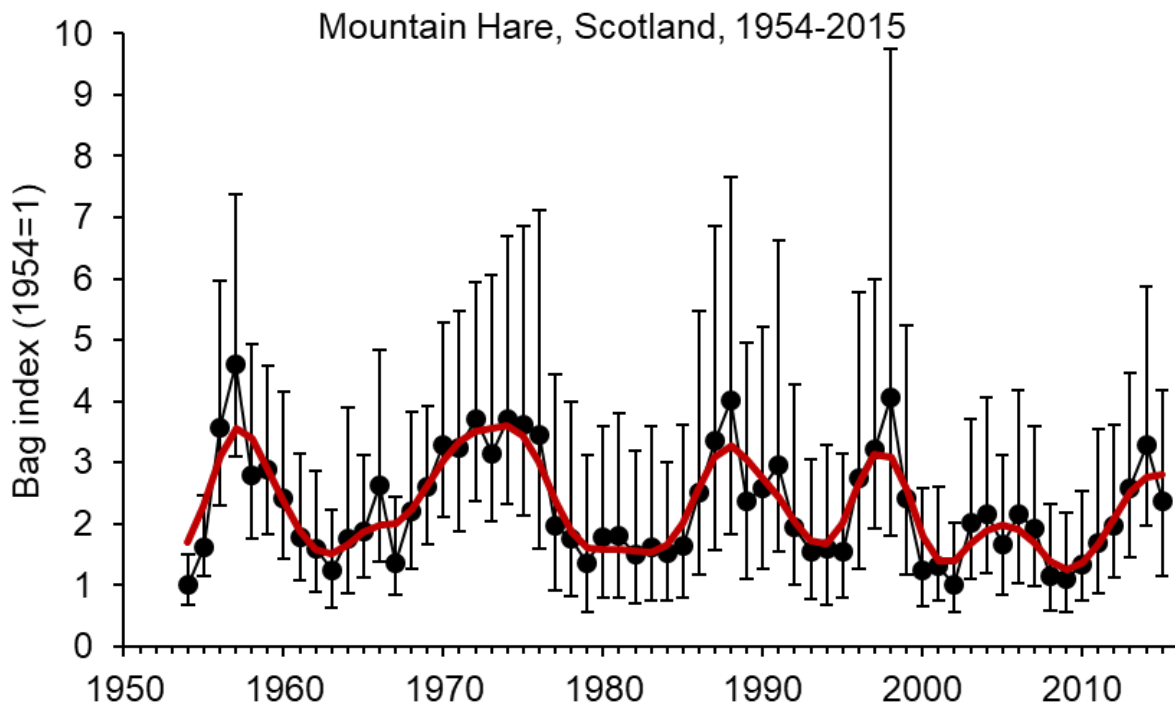
Current trends Mountain Hare population status

Good practice and legislation requires that we monitor mountain hares to track the effects of management.

1. In 2008 SNH, GWCT and JHI established that the Scottish range of mountain hares has not shrunk since the mid-1990s¹. This is important as range contraction is often the first sign of a population in trouble.
2. The National Game Bag Census^{6,27} has collected data on the numbers of hares shot on Scottish moors since 1954; 213 shoots contributed data for at least 2 years during this period. These data represent an index of mountain hare abundance, assuming more hares are taken when

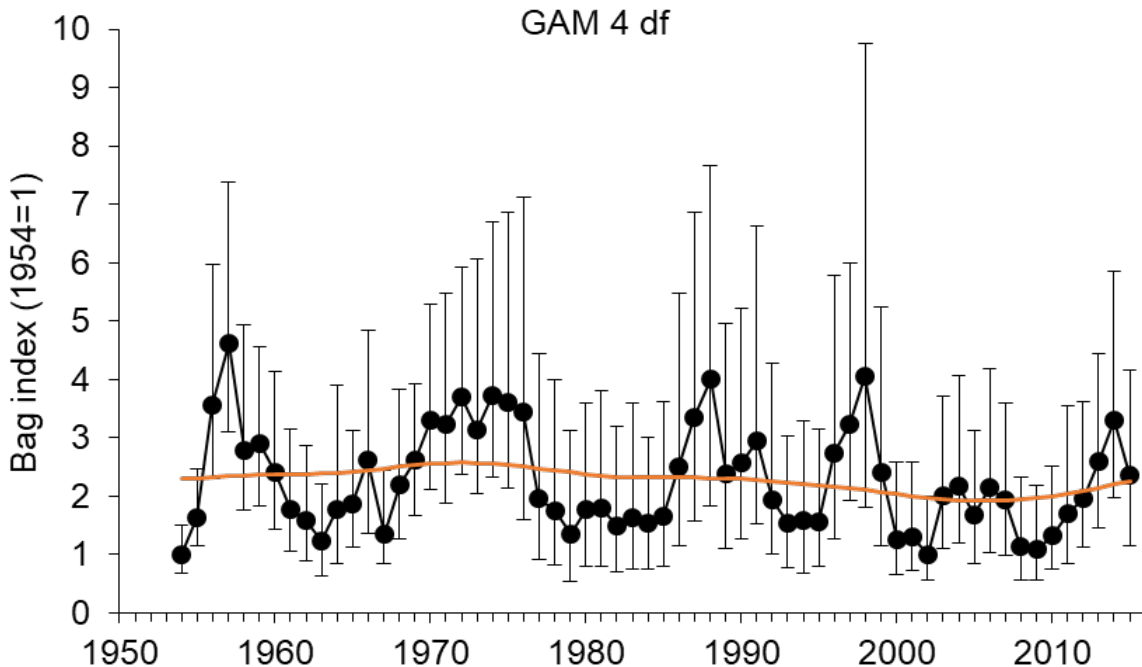
more are available. The data suggest that mountain hare populations are a 'quasi-cyclical'; that is their abundance fluctuates up and down in a reasonably predictable manner over time (Figure 2). Fluctuations by 5-fold appear normal, with peak abundances probably being 10 times higher than the low points. In Scotland the reasons for these fluctuations may include food quality and gut parasites⁹.

Figure 2: National Game Bag Census data from 213 shoots show a cyclical pattern of peaks and troughs (red line) in numbers of hares in the bag between 1954 and 2015. The pattern of change is relative to the starting point in 1954.



3. Removing the cyclical effect using GAM (generalized additive modelling) shows there is no long-term trend, either up or down, in these data (Aebischer pers comm; Figure 3).

Figure 3: National Game Bag Census data of hares taken suggest that despite large short- and medium-term changes, there is no discernable *long-term* trend (orange line) in numbers of hares in the bag between 1954 and 2015.



There have been recent reports of a declines in hares seen during the BTO Breeding Bird Surveys of 1995 and 2013 ⁷. We note the reported decline was 33% (not 43% as has been mis-quoted) and was not statistically significant. The decline may therefore have been due to chance, or because non-specific counts such as these are affected by weather, observer variation and design¹⁰.

Nevertheless, evidence from gamekeepers and other land managers can be a valuable source of 'Practitioner Knowledge'. The value of such 'co-produced' information is something we need to capture more effectively; this is happening already in some SNH supported projects²⁸. Practitioner commentary is that the hare's population dynamics may be more robust than is commonly thought, with harvesting allowing greater breeding success²². Typically there are notable numbers of hares even on areas after harvesting of hares is taking place. Anecdotal evidence of this from March 2015, after the end of the hare shooting season, when populations might be expected to be at their lowest has been seen by SNH during field visits. This is the repeated experience of land managers who undertake the predator control and habitat management on Scottish moors.

GWCT are working to improve the accuracy of mountain hare abundance assessments with SNH and JHI; we hope a report will be published this year. We are also working on 'Principle of Moorland Management' guidance document for Scotland's Moorland Forum. These reports will provide a formal framework for the informed and updatable assessments of current and future mountain hare management.

Management of Mountain Hares

Management for hares can both increase and decrease numbers. The predator control and habitat management typical of that used for red grouse may increase mountain hare numbers.

A managed decline in numbers within a local area will occur when they are shot on moorland for three reasons; for food, for habitat protection in woodland expansion areas and statutorily designated sites such as SSSIs, and for disease control ¹. Habitat protection can be a significant issue, especially during winter when many hill sheep flocks are removed to protect important moorland habitats; seven

mountain hares have the same dry matter food requirement as one blackface ewe²⁹. Young woodland areas can support high numbers of hares which graze on and amongst trees. To protect woodlands hares may be controlled to prevent both economic and ecological damage to trees²¹. Declines in abundance will eventually be part of woodland expansion as hares typically do not use dense conifer woods following canopy closure.

Tick & Disease Control

Disease control is an important driver for taking hares. Hares are shot to reduce the overall number of tick (*Ixodes ricinus*) hosts on a moor. The reason for this activity is research GWCT undertook between the late 1970s and 1990s in Morayshire which demonstrated a link between hare abundance and tick biting rates on grouse¹¹. Mountain hares, along with other mammals, provide a blood meal for ticks thus supporting ticks in completing their life cycle. Ticks are becoming more common in Scotland¹⁸ and disease transmission may also be increasing. Ticks can carry a viral disease called *Louping-ill* which can cause high levels of mortality in sheep and red grouse, with 79% of infected grouse chicks dying from the virus in laboratory and field conditions¹⁴. Upland wader chicks (lapwing, golden plover and curlew) have been observed with high numbers of ticks which may reduce their overall fitness, though there is no incidence of viral infection being detected in these chicks from the relatively small sample tested¹⁵.

GWCT see a case for more experimental work to inform the modelled connection between tick, LIV transmission and mountain hare²³. In the meantime stabilising grouse numbers through disease management helps underpin the continued private investment in conservation, providing wider biodiversity and public benefits which include; an increase in upland farm economics through improved sheep productivity¹⁶ and possible, though untested, benefits for public health, as ticks also transmit Lyme disease¹⁷. Our research and advice is that with the correct application of management techniques (limiting tick host numbers and treating sheep with acaricidal dips and anti-viral vaccination) it is possible to suppress tick and louping-ill to levels where their impact on sheep flock health and red grouse is reduced to a minimum¹⁹.

The Future

GWCT believe there may be more to be lost from constraining mountain hare management than to be gained. Mountain hares benefit greatly from managing moorland for red grouse – their disappearance from Langholm Moor during a period without keeping in the late 1990s-early 2000s was likely no coincidence. Constraint on management would seem a poor decision at a time when hares have retreated to the moors in the face of predation, forestry and farming practice. Potentially dis-incentivising management by restricting an ability to limit high densities of hares appears to fail tests of necessity and reasonableness.

However, GWCT stands by its joint position with SNH and SLE on the need for restraint²⁵, both to ensure compliance with the law and for best practice. These views were also upheld by a 2015 review for SNH²⁶ and are being incorporated into the 'Principles of Moorland Management' guidance on mountain hares being produced by Scotland's Moorland Forum. There are good reasons for taking mountain hares on Scottish moors, but GWCT has always been clear that hare culls cannot be justified for disease control where there are significant numbers of other tick hosting species, particularly deer or where tick and disease levels are low^{12, 20}. In these cases, the priority for disease control should be deer management, hand-in-hand with treating sheep. And we believe that if hares are locally at lower than peak numbers, moor managers should consult their neighbours to make sure natural declines and harvest offtake are not coupled across large landscape areas.

Lastly, we have made it clear moorland managers should act in the context of some demonstrable assessment of mountain hare abundance. This would aid their own decision making, and if properly presented, allay fears about mountain hare conservation. We understand from keepers and others that 2017 has been a good breeding year for mountain hares across their range. Putting this practitioner knowledge into an indexed context is of critical importance.

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AA Smith & H. Appleton
October 2017

**Mountain hare
3 May 2017**

Action Points

Present: Eileen Stuart, Ben Ross, Rob Raynor, Mairi Cole, Alastair McGugan

Purpose of meeting

1. To ensure a common understanding of main strands of work on mountain hares.
2. To clarify roles and responsibilities within SNH.

New data

- AP1 RR/MC to review new data available and carry out an interim A17 assessment by **w/b 22 May**.
- AP2 RR to lead on develop key messages and lines to take based on interim A17 assessment (liaising with others are required). This should:
1. Verify the SNH position re the influence of the new data.
 2. Identify communications messages and lines to take (using template).
 3. Ensure routes for a clear dialogue with SG Greener Comms.
- Draft required by w/b 22 May.**
- AP3 MC to follow-up with Des T to get a link to the Executive Summary of the paper submitted for publication for circulation to key staff, including Hugh D.
- AP4 AMcG to clarify internal sign-off process for the PoMM guidance as it goes to the editorial Steering Group. Decision to be put through the [RAPID](#) process
- AP5 RR to clarify the process for developing guidance arising from the JHI/GWCT research, including the appropriate level of QA and potential inclusion of PoMM Steering Group.
- AP6 RR to lead on a review of position statement on voluntary restraint and refresh as required. This is to include identifying any evidence of uptake or use by estates. To liaise with others in the group and ensure media team are advised.
- AP7 MC to follow-up with Hugh D to provide update on strands of work and clarify the output of his meeting with the Cab Sec.
- AP8 ES to alert Vicki M to the current FoI and ensure SG are aware.
- AP9 MC to speak to George Hogg re whether there is an SRO available for mountain hare work from the Activity.
- AP10 ES to discuss involvement in mountain hare work with Claudia.
- AP11 MC to arrange next meeting for w/b 22/5.

Rhoda Davidson

From: SNHGOVERNMENT_RELATIONS
Sent: 11 August 2017 14:46
To: John.Gray@gov.scot
Cc: SNHGOVERNMENT_RELATIONS
Subject: RE: Mountain Hare PQ

Hi John

Here's our contribution for the PQ. Let me know if anything needs clarifying.

Thanks
Richard

Mountain hare numbers are controlled for several reasons and their removal can help to meet a number of environmental, economic and social land management objectives. They are a quarry species, although under Annex V of the Habitats Directive we are required to ensure any management is sustainable.

SNH has been clear about the position on large-scale culling of mountain hares. A joint position statement with GWCT and SLE issued in December 2014 stated:

"We recognise that some culling is occasionally needed to ensure healthy grouse stocks, but available evidence shows that large-scale culls of mountain hares are only effective when other tick-carrying animals are removed, or there is an absence of them in the area. Where such animals are not removed, we urge that hare culls should not be undertaken.

We do not support large-scale culls and we will work with estates to put in place effective but sustainable management of mountain hares."

This remains our current position. We are, however, also assembling, assessing and providing objective information on the conservation status of mountain hares including the benefits from, and impacts of, their management. This includes working with the Moorland Forum to develop and promote good practice and the means by which this can be assured.

*Richard Kehoe
Government Relations Coordinator
Scottish Natural Heritage
Silvan House
231 Corstorphine Road
Edinburgh
EH12 7AT*

Tel: +44 (0)1896 661 715

From: John.Gray@gov.scot [<mailto:John.Gray@gov.scot>]
Sent: 08 August 2017 10:16
To: SNHGOVERNMENT_RELATIONS
Subject: Mountain Hare PQ

Good morning Richard/Marianne

Please see the following PQ we have received regarding mountain hares.

S5W-10597 MSP: Alison Johnstone

Question Text: To ask the Scottish Government what its position is on non-departmental government bodies endorsing large-scale killings of mountain hares in situations where there is an absence of evidence that this practice is sustainable and an absence of animal welfare standards.

Grateful for any advice SNH can provide please by next Monday 14 August if possible.

Best wishes

John

John Gray
Wildlife Management Team
Natural Resources Division
Directorate for Environment and Forestry
The Scottish Government
3-G South
Victoria Quay
Leith
EH6 6QQ
Tel. 0131-244-0728

john.gray@scotland.gsi.gov.uk

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Rhoda Davidson

From: John.Gray@gov.scot
Sent: 21 August 2017 14:11
To: SNHGOVERNMENT_RELATIONS
Subject: RE: Mountain Hare PQ

Thanks Richard

I googled it and it appears that OneKind did an article recently that mentioned that it was Balavil Estate so just looking for confirmation that this is the actual estate.

Thanks

John

John Gray
Wildlife Management Team
Natural Resources Division
Directorate for Environment and Forestry
The Scottish Government
3-G South
Victoria Quay
Leith
EH6 6QQ

Tel. 0131-244-0728

john.gray@scotland.gsi.gov.uk

From: SNHGOVERNMENT_RELATIONS [mailto:SNHGOVERNMENT_RELATIONS@snh.gov.uk]
Sent: 21 August 2017 14:09
To: Gray J (John)
Subject: RE: Mountain Hare PQ

Hi John

Ok, I'll see what I can do.

Richard

*Richard Kehoe
Government Relations Coordinator
Scottish Natural Heritage
Silvan House
231 Corstorphine Road
Edinburgh
EH12 7AT*

Tel: +44 (0)1896 661 715

From: John.Gray@gov.scot [<mailto:John.Gray@gov.scot>]
Sent: 21 August 2017 14:07
To: SNHGOVERNMENT_RELATIONS
Subject: RE: Mountain Hare PQ

Hi Richard

Would tomorrow lunchtime be okay?

Thanks

John

John Gray
Wildlife Management Team
Natural Resources Division
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The Scottish Government
3-G South
Victoria Quay
Leith
EH6 6QQ

Tel. 0131-244-0728

john.gray@scotland.gsi.gov.uk

From: SNHGOVERNMENT_RELATIONS [mailto:SNHGOVERNMENT_RELATIONS@snh.gov.uk]
Sent: 21 August 2017 14:04
To: Gray J (John)
Subject: RE: Mountain Hare PQ

Hi John

I'll follow it up. When do you need this by?

Thanks
Richard

*Richard Kehoe
Government Relations Coordinator
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Silvan House
231 Corstorphine Road
Edinburgh
EH12 7AT*

Tel: +44 (0)1896 661 715

From: John.Gray@gov.scot [<mailto:John.Gray@gov.scot>]

Sent: 21 August 2017 10:41

To: SNHGOVERNMENT_RELATIONS

Subject: RE: Mountain Hare PQ

Good morning Richard

In the following mountain hare PQ that we have also received, it refers to reports of one estate claiming to have shot up to 2,000 hares in the course of a season. Does SNH have any further information on these claims? Do we know what estate it is and is there any proof that they have killed 2,000 hares?

S5W-10600 MSP: Alison Johnstone

Question Text: To ask the Scottish Government what its policy is on large-scale recreational killing of mountain hares, in light of reports of one estate claiming to have shot up to 2,000 in the course of a season.

Answer - The Scottish Government recognises that mountain hare numbers need to be controlled in some circumstances but does not support large-scale culls.

Many thanks

John

John Gray
Wildlife Management Team
Natural Resources Division
Directorate for Environment and Forestry
The Scottish Government
3-G South
Victoria Quay
Leith
EH6 6QQ

Tel. 0131-244-0728

john.gray@scotland.gsi.gov.uk

From: SNHGOVERNMENT_RELATIONS [mailto:SNHGOVERNMENT_RELATIONS@snh.gov.uk]

Sent: 11 August 2017 14:46

To: Gray J (John)

Cc: SNHGOVERNMENT_RELATIONS

Subject: RE: Mountain Hare PQ

Hi John

Here's our contribution for the PQ. Let me know if anything needs clarifying.

Thanks
Richard

Mountain hare numbers are controlled for several reasons and their removal can help to meet a number of environmental, economic and social land management objectives. They are a quarry species, although under Annex V of the Habitats Directive we are required to ensure any management is sustainable.

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*Richard Kehoe
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Tel: +44 (0)1896 661 715

From: John.Gray@gov.scot [<mailto:John.Gray@gov.scot>]
Sent: 08 August 2017 10:16
To: SNHGOVERNMENT_RELATIONS
Subject: Mountain Hare PQ

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Question Text: To ask the Scottish Government what its position is on non-departmental government bodies endorsing large-scale killings of mountain hares in situations where there is an absence of evidence that this practice is sustainable and an absence of animal welfare standards.

Grateful for any advice SNH can provide please by next Monday 14 August if possible.

Best wishes

John

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Wildlife Management Team
Natural Resources Division
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The Scottish Government
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Dh'fhaodadh gum bi teachdaireachd sam bith bho Riaghaltas na h-Alba air a chlàradh neo air a sgrùdadh airson dearbhadh gu bheil an siostam ag obair gu h-èifeachdach neo airson adhbhar laghail eile. Dh'fhaodadh nach eil beachdan anns a' phost-d seo co-ionann ri beachdan Riaghaltas na h-Alba.

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Rhoda Davidson

From: SNHGOVERNMENT_RELATIONS
Sent: 22 August 2017 13:32
To: John.Gray@gov.scot
Cc: SNHGOVERNMENT_RELATIONS
Subject: RE: Mountain Hare PQ

Hi John

See response to your queries below in green.

Regards
Richard

*Richard Kehoe
Government Relations Coordinator
Scottish Natural Heritage
Silvan House
231 Corstorphine Road
Edinburgh
EH12 7AT*

Tel: +44 (0)1896 661 715

From: John.Gray@gov.scot [mailto:John.Gray@gov.scot]
Sent: 21 August 2017 10:41
To: SNHGOVERNMENT_RELATIONS
Subject: RE: Mountain Hare PQ

Good morning Richard

In the following mountain hare PQ that we have also received, it refers to reports of one estate claiming to have shot up to 2,000 hares in the course of a season. Does SNH have any further information on these claims? Do we know what estate it is and is there any proof that they have killed 2,000 hares? **The OneKind report mentions Balavil Estate and cites the estate's own website (currently being re-designed) as the source of this figure. We currently have no means of verifying the figure independently.**

S5W-10600 MSP: Alison Johnstone

Question Text: To ask the Scottish Government what its policy is on large-scale recreational killing of mountain hares, in light of reports of one estate claiming to have shot up to 2,000 in the course of a season.

Answer - The Scottish Government recognises that mountain hares numbers need to be controlled in some circumstances but does not support large-scale culls.

Many thanks

John

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Tel. 0131-244-0728

john.gray@scotland.gsi.gov.uk

From: SNHGOVERNMENT_RELATIONS [mailto:SNHGOVERNMENT_RELATIONS@snh.gov.uk]
Sent: 11 August 2017 14:46
To: Gray J (John)
Cc: SNHGOVERNMENT_RELATIONS
Subject: RE: Mountain Hare PQ

Hi John

Here's our contribution for the PQ. Let me know if anything needs clarifying.

Thanks
Richard

Mountain hare numbers are controlled for several reasons and their removal can help to meet a number of environmental, economic and social land management objectives. They are a quarry species, although under Annex V of the Habitats Directive we are required to ensure any management is sustainable.

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This remains our current position. We are, however, also assembling, assessing and providing objective information on the conservation status of mountain hares including the benefits from, and impacts of, their management. This includes working with the Moorland Forum to develop and promote good practice and the means by which this can be assured.

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Sent: 08 August 2017 10:16
To: SNHGOVERNMENT_RELATIONS
Subject: Mountain Hare PQ

Good morning Richard/Marianne

Please see the following PQ we have received regarding mountain hares.

S5W-10597 MSP: Alison Johnstone

Question Text: To ask the Scottish Government what its position is on non-departmental government bodies endorsing large-scale killings of mountain hares in situations where there is an absence of evidence that this practice is sustainable and an absence of animal welfare standards.

Grateful for any advice SNH can provide please by next Monday 14 August if possible.

Best wishes

John

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Rhoda Davidson

From: Danielle Casey
Sent: 24 October 2017 15:58
To: 'John.Gray@gov.scot'
Cc: Jonathan.Young@gov.scot; Robert Raynor; Sally Thomas;
SNHGOVERNMENT_RELATIONS
Subject: RE: PQ S5W-12001 - Mountain Hare PQ

Hi John,

Thank you for the extension to the deadline for this. Please see our response to PQ S5W-12001 below.

Background:

The assessment of conservation status for the purposes of Article 17 reporting under the EC Habitats Directive is undertaken at a UK level by JNCC, using information supplied by the country agencies. In the case of mountain hare the process by which the final outcome is derived, hinges on a technicality in the assessment process – namely that, although the long term trend in habitat quality and extent is negative (based mainly on evidence of the long-term decline in the extent and quality of heather moorland), the short term trend was considered stable at the time. With the other 3 parameters in the overall assessment process assessed as favourable, this results in the overall Favourable result. However, if the long term trend had been considered rather than the short term trend, our view is that a different result would be the outcome, i.e. “Unfavourable-inadequate” - the same as the 2007 Article 17 assessment. Essentially, therefore, the final result is an artefact of the process involved.

Response:

Four parameters are used when assessing the conservation status of species of community interest: range, population, habitat for the species (extent and condition) and future prospects. Each of these parameters is assessed as being in one of the following conditions: Favourable, Unfavourable-inadequate, Unfavourable-bad or Unknown. Assessments are undertaken at a UK level.

In the 2007 Article 17 report, the overall UK assessment of mountain hares was Unfavourable-inadequate, based on habitat information, with the other parameters being assessed as Favourable. In the 2013 Article 17 report, all four parameters were assessed as Favourable.

In the 2007 report, the Joint Nature Conservation Committee (JNCC) led on the compilation of each individual species report with input from each of the country agencies. With respect to habitat, the 2007 report indicates a decrease in suitable habitat, but acknowledged that the quality of the data was poor. The result was an Unfavourable-inadequate assessment.

In 2013, the country agencies compiled the relevant species reports for their respective countries, but the assessment against each of the four parameters was undertaken at the UK level by JNCC. More detail is provided in the 2013 (Scotland) assessment compiled by SNH where it states “The latest Countryside Survey for Scotland reports a loss of 113,000ha (11%) of dwarf shrub heath between 1990 and 2007, though the change (-1.9%) between 1998 and 2007 was not significant. This is the broad habitat most likely to support *L. timidus* populations at intermediate or high densities. There were losses to other broad habitats, bracken and acid grassland. Over the same period (1990-2007), there was a significant 12% decrease in species richness of the dwarf shrub broad habitat, which may affect densities of *L. timidus*. These data, particularly those on species richness, suggest that habitat quality should be described as Moderate”.

In both the equivalent 2013 reports from Northern Ireland and England, the quality of habitat is described as “Unknown”. JNCC undertook the assessment of habitat quality and habitat trend at the UK level, based on country level assessments, weighted by the proportion of the UK population of mountain hare found in each country. On this basis JNCC assessed the UK habitat quality as “Moderate”, and the short term trend as “Stable”. JNCC undertook

the overall assessment of the parameter “habitat for the species”, taking on board the recorded quality and short term trend, concluding that this parameter was “Favourable”.

Regards,
Dani

Danielle Casey

Operations and Government Relations Officer | Scottish Natural Heritage | Caspian House | Mariner Court | 8
South Avenue | Clydebank Business Park | Clydebank | G81 2NR
SB: 0131 314 6750 / DD: 0131 314 6760
www.snh.scot

From: John.Gray@gov.scot [mailto:John.Gray@gov.scot]
Sent: 16 October 2017 11:43
To: SNHGOVERNMENT_RELATIONS
Cc: Jonathan.Young@gov.scot
Subject: Mountain Hare PQ

Hi Marianne

We have had a follow-up PQ to a previous one on mountain hares.

S5W-12001 MSP: Alison Johnstone

Question Text: To ask the Scottish Government, in light of the 2007 assessment recording an “unfavourable/inadequate” status, for what reason its 2013 article 17 habitats regulations report to the EU Commission assessed the mountain hare population as “favourable”, and whether it will provide a breakdown of the (a) criteria it used and (b) evidence it received.

This is in response to a previous PQ which you provided a response on.

To ask the Scottish Government what reports it has made to the EU Commission in the last 10 years regarding the population status of mountain hares, and what summary conclusions these included regarding the species' health.

The Scottish Government is required to report to the European Commission (via the UK Government) under Article 17 of the Habitats Directive on a 6-year basis. The first assessment of the conservation status of mountain hares covered the period 2001–2006 and was submitted in 2007. The second such assessment covered the period 2007–2012 and was submitted in 2013.

Each assessment considered four parameters: range, population, habitat and future prospects. Each parameter was assessed as being in one of the following conditions: favourable; unfavourable-inadequate; unfavourable-bad; or unknown. An overall species assessment of ‘favourable’ requires all four parameters to be assessed as favourable.

In the 2007 Article 17 report, the overall assessment of mountain hares was ‘unfavourable-inadequate’, based on habitat information, with the other parameters being assessed as favourable. In the 2013 Article 17 report, all four parameters were assessed as ‘favourable’.

Grateful if SNH could provide advice so we can draft an answer to the PQ by this Friday 20 October if possible.

Happy to discuss.

Thanks

John

John Gray
Wildlife Management Team
Natural Resources Division
Directorate for Environment and Forestry
The Scottish Government
3-G South
Victoria Quay
Leith
EH6 6QQ
Tel. 0131-244-0728

john.gray@scotland.gsi.gov.uk

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Rhoda Davidson

From: John.Gray@gov.scot
Sent: 16 October 2017 11:43
To: SNHGOVERNMENT_RELATIONS
Cc: Jonathan.Young@gov.scot
Subject: Mountain Hare PQ

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S5W-12001 MSP: Alison Johnstone

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Happy to discuss.

Thanks

John

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Rhoda Davidson

From: Steven.Dora@gov.scot
Sent: 15 September 2017 10:43
To: SNHGOVERNMENT_RELATIONS
Cc: Hugh.Dignon@gov.scot; John.Gray@gov.scot
Subject: Mountain Hare PQs

Hi Marianne

Please see 3 PQs below as discussed which I'm forwarding on John's behalf. If you could get something back to us by Tuesday that would be great.

Regards,

Steven

Steven Dora

Natural Resources Division | Directorate for Environment and Forestry

The Scottish Government | 3G South, Victoria Quay | Edinburgh EH6 6QQ | T: 0131 244 6518

BlackBerry: [REDACTED]

To ask the Scottish Government what reports it has made to the EU Commission in the last 10 years regarding the population status of mountain hares, and what summary conclusions these included regarding the species' health. [S5W-11180](#)

*Asking MSP: Alison Johnstone
PO Deadline: 19/09/2017*

To ask the Scottish Government, when it will publish its standardised counting method for mountain hare populations. [S5W-11181](#)

*Asking MSP: Alison Johnstone
PODeadline: 19/09/2017*

To ask the Scottish Government when Scotland's Moorland Forum will publish its best practice guidance on the sustainable management of mountain hares, as part of the Principles of Moorland Management project. [S5W-11182](#)

*Asking MSP: Alison Johnstone
PODeadline: 19/09/2017*

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Rhoda Davidson

From: SNHGOVERNMENT_RELATIONS
Sent: 15 September 2017 15:55
To: Steven.Dora@gov.scot
Subject: Mountain Hare PQs S5W-11180/1

Hi Steven

Please find our response to PQs S5W-11180 and 1 below. We'll get the response to the other PQ to you on Monday, or early Tuesday.

Hope that's ok.
Marianne

To ask the Scottish Government what reports it has made to the EU Commission in the last 10 years regarding the population status of mountain hares, and what summary conclusions these included regarding the species' health. [S5W-11180](#)

The Scottish Government is required to report to the European Commission under Article 17 of the Habitats Directive (via the UK Government) on a 6 year basis. The first assessment of the conservation status of mountain hares covered the period 2001–2006, and was submitted in 2007. The second such assessment covered the period 2007–2012, and was submitted in 2013.

Each assessment considered four parameters: Range, Population, Habitat and Future Prospects, with each parameter assessed as being in one of the following conditions: Favourable; Unfavourable-inadequate; Unfavourable-Bad; or Unknown. All four parameters must be assessed as Favourable for the overall species assessment to be Favourable.

In the 2007 Article 17 report the overall assessment of mountain hares was Unfavourable-Inadequate, based on habitat information; the other 3 parameters being assessed as Favourable. In the 2013 Article 17 report, all four parameters were assessed as Favourable.

To ask the Scottish Government, when it will publish its standardised counting method for mountain hare populations. [S5W-11181](#)

We aim to publish the final report on this study before the end of the calendar year. The study compared various methods and it is anticipated that the report will make recommendations on the most appropriate of these, which we will then discuss with key stake-holders, with a view to establishing a consistent method of assessing mountain hare population health and the impact of any future management activity.

Marianne Sandison
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EH12 7AT
Tel: +44 (0)131 316 2672

Rhoda Davidson

From: SNHGOVERNMENT_RELATIONS
Sent: 19 September 2017 12:02
To: Steven.Dora@gov.scot
Cc: SNHGOVERNMENT_RELATIONS
Subject: Mountain hare PQ - S5W-11182

Hi Steven

Please find our response to PQ S5W-11182 below.

Regards
Richard

To ask the Scottish Government when Scotland's Moorland Forum will publish its best practice guidance on the sustainable management of mountain hares, as part of the Principles of Moorland Management project. [S5W-11182](#)

The timescale is unclear. The draft has been created by the Guidance Group (which is a practitioner-led sub group) and submitted to the POMM Steering Group for consideration. The procedure is that the POMM steering group will determine when it is to be put forward for endorsement by the Moorland Forum.

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EH12 7AT*

Tel: +44 (0)1896 661 715

Rhoda Davidson

From: Hugh.Dignon@gov.scot
Sent: 22 March 2017 17:08
To: Mairi Cole
Cc: Andrew Bachell; Eileen Stuart; Robert Raynor; Ben Ross; Claudia Rowse; Des Thompson; Keith.Connal@gov.scot
Subject: RE: Mountain hares
Categories: For information

Mairi

Thanks. This is helpful.

It would be comparable in terms of legal and Parliamentary effort to introduce a new regulation to the Habs Regs as it would be to bring forward an SI to amend a schedule of the WCA. But not much focus on Habs Dir options in the paper. I do accept though that given previous Art 17 reporting, this route might be difficult for other reasons.

As regards licensable purposes to allow control of MH if they were listed on sch5 WCA, I would be keen to have your view on what are the real reasons why estates want to control them.

If it is disease control, but you are clear that culling has no impact on this, then no problem in not granting a licence.

If it is economic - income from shooting them, or from maintaining grouse populations - then have you considered WCA 16(3)(i) as a licensable purpose (any other social, economic or environmental purpose)?


If it is for the maintenance of heather moorland, what about WCA 16(3)(ca) purpose of conserving any area of natural habitat?

Generally I think the Cab Sec would be keen for those wanting to cull mountain hares to have to make the case for doing so, including providing info on numbers, and for you to consider against a precautionary approach.

An approach limited to the National Parks might be a good way of trialling regulation.

Meeting with the Cab Sec is tomorrow 2pm, so grateful for any comments before then.

Hugh

Hugh Dignon | Wildlife and Protected Areas | Natural Resources | Environment and Forestry Directorate | Scottish Government | Victoria Quay | EH6 6QQ | 0131 244 7574 | 

From: Mairi Cole [mailto:Mairi.Cole@snh.gov.uk]
Sent: 22 March 2017 15:42
To: Dignon HJ (Hugh)

Cc: Andrew Bachell; Eileen Stuart; Robert Raynor; Ben Ross; Claudia Rowse; Des Thompson
Subject: Mountain hares

Hugh,

Please find attached a paper summarising our advice on the current situation and options for future management of mountain hares.

There are a few key points to support this paper:

1. The options are; voluntary restraint, mandatory reporting (amending Section 10A of the WCA), full protection (either by extending closed season or adding species to Sched 5) or NCO's in certain areas.
2. Licensing would need to be put in place if full-protection was afforded. There are, however, significant issues to address, particularly that the current provisions for licensing under the Act may not cover the reasons for which most hares are shot. This would make it difficult to justify granting of licences for many/most forms of control. If a licensable purpose is identified, there are a range of ways in which we can licence, from General Licences to Individual licences, but there would need to be a legal mechanism to support this change.
3. There is no obvious provision under the Habitat Regulations for formal regulation/restriction/control or taking of Annex V species. Current provisions focus on surveillance to ensure the species' are managed at favourable conservation status (see para 2 of the attached). Article 14 of the Directive, however, provides insight into additional measures that could be taken to restore/maintain the species at FCS should this surveillance indicate that the management is falling short of expectations. Legal consideration would need to be given to how these measures could be translated into domestic law.
4. Key to all of this is the evidence-base for introducing new regulation. Information from previous Art 17 reporting suggests the species has been at FCS. The only information that has come to light since the last A17 report is [REDACTED] data which suggests a decline in some hare populations. This decline has not, however, been verified so any additional regulation would be put in place on the basis of the precautionary principle.

I hope this includes the information you are seeking but please let me know if you need more.

Mairi

Dr Mairi Cole | Species Group Manager | Scottish Natural Heritage | Silvan House | 231 Corstorphine Road | EDINBURGH EH12 7AT
Tel: 0131 316 2615 (Direct) [REDACTED] (M)

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Rhoda Davidson

From: Eileen Stuart
Sent: 06 October 2017 10:57
To: Hugh.Dignon@gov.scot
Cc: Sally Thomas; Stuart MacQuarrie; Mairi Cole; SNHGOVERNMENT_RELATIONS
Subject: RE: Mountain Hare Petition background and SNH submission

Hi Hugh,

Just to confirm, we have to send our submission to the Committee by midday today, so will proceed on this basis unless we hear anything from you before then.

Best wishes

Eileen

*Eileen Stuart
Head of Policy & Advice
Scottish Natural Heritage
Great Glen House
Inverness
IV3 8NW*

*DD. 01463 725227
Mob. [REDACTED]*

From: Eileen Stuart
Sent: 04 October 2017 16:43
To: 'Hugh.Dignon@gov.scot'
Cc: Sally Thomas; Stuart MacQuarrie; Mairi Cole
Subject: RE: Mountain Hare Petition background and SNH submission

Hugh,

I have copied the content of the request below. It is a generic letter but the substance of the petition is clearly focused on additional controls, hence our outline comments on this issue.

Eileen

Dear Ms Sandison,

CONSIDERATION OF PETITION [PE1664](#)

Calling upon the Scottish Parliament to urge the Scottish Government to introduce greater protection for mountain hares on both animal welfare and conservation grounds, which may include: introducing a three-year moratorium on all mountain hare killing, permitting culls and driven hunts only under licence, and ending all culling and driven hunting of mountain hares within Scotland's national parks using a nature conservation order.

The Public Petitions Committee considered the above petition at its meeting on 14 September 2017 and agreed to seek the views of Scottish Natural Heritage.

The [Official Report](#) of the meeting is due for publication by 6pm on 19 September 2017. In the meantime, a video of the meeting is available online via the [Parliament's TV Service](#).

The Committee's clerks would be grateful to receive your response electronically and in Word format by no later than **12 October 2017**. Your response will be processed in accordance with the Parliament's [policy on the treatment of written evidence](#).

The Committee asks that this deadline is met to allow sufficient time for the petitioner to comment on your written response and for consideration of the petition to continue as timetabled. Should you be unable to meet the above deadline, I would be grateful if you could advise the Committee's clerks that this is the case as soon as possible.

On behalf of the Committee, thank you for your assistance.

Yours sincerely,
Lynn Russell
Assistant Clerk
Public Petitions Committee

*Eileen Stuart
Head of Policy & Advice
Scottish Natural Heritage
Great Glen House
Inverness
IV3 8NW*

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From: Hugh.Dignon@gov.scot [<mailto:Hugh.Dignon@gov.scot>]
Sent: 04 October 2017 16:32
To: Eileen Stuart
Cc: Sally Thomas; Stuart MacQuarrie; Mairi Cole
Subject: RE: Mountain Hare Petition background and SNH submission

Eileen

Can't see from your email whether Petitions Committee specifically asked for your views on the petition and/or whether a moratorium is justified.

Hugh

From: Eileen Stuart [<mailto:Eileen.Stuart@snh.gov.uk>]
Sent: 04 October 2017 13:25
To: Dignon HJ (Hugh)
Cc: Sally Thomas; Stuart MacQuarrie; Mairi Cole
Subject: RE: Mountain Hare Petition background and SNH submission

Hugh,

I thought it might be helpful for you to see this initial notification of the petition, which includes the timeline and the official report of the Petitions Committee discussion, which notes the links to the related topics of grouse and lyme disease.

Eileen

From: SNHGOVERNMENT_RELATIONS

Sent: 15 September 2017 15:07

To: Robert Raynor; George Hogg; Eileen Stuart

Cc: Mairi Cole; Sally Thomas; Stuart MacQuarrie; Roger Burton; Alastair MacGugan; Ian Bray

Subject: Petition PE1664 - greater protection for mountain hares - Letter inviting SNH to submit written evidence - 15 September 2017 (A2404361)

Hi Rob, George
cc others for info

Petition PE1664 - greater protection for mountain hares was discussed in the Public Petitions Committee yesterday. The Clerk has written to us on behalf of the Convenor asking us to submit evidence on the petition – please see attached. This has a deadline of 12 October 2017. I've attached a document for you to put your response into. The submission can be up to six pages, though four is probably a better limit.

The [Official Report](#) of the meeting is due for publication by 18:00 on 19 September 2017. In the meantime, a video of the meeting is available online via the [Parliament's TV Service](#). The relevant part starts at 11:05 approx.

It's worth noting that the Convenor made a connection between this Petition and two others; one was also discussed at the meeting, [PE 01662 Improve Treatment for Patients with Lyme Disease and Associated Tick-Bourne Diseases](#); the other, [PE 01663 Driven Grouse Shooting](#) is before Committee but has not yet been discussed. While the links may be a bit tenuous, they are on the radar of the Convenor (Johann Lamont) and we may be drawn in. Will keep you posted if anything develops.

Happy to discuss.
Marianne

Marianne Sandison has sent you a link to "Petition PE1664 - greater protection for mountain hares - Letter inviting SNH to submit written evidence - 15 September 2017" (A2404361) from Objective.

*Eileen Stuart
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From: Hugh.Dignon@gov.scot [<mailto:Hugh.Dignon@gov.scot>]

Sent: 04 October 2017 11:33

To: Eileen Stuart

Cc: Sally Thomas; Stuart MacQuarrie; Mairi Cole

Subject: RE: Mountain Hare Petition background and SNH submission

Eileen

Thanks. I will get back to you on this. In the meantime, can you remind me please of the chain of events that led to this analysis being requested by the committee and short deadline for comments. As you know, this is a sensitive subject and Cab Sec/SpAds likely to ask about implications for policy.

Hugh

From: Eileen Stuart [<mailto:Eileen.Stuart@snh.gov.uk>]
Sent: 04 October 2017 11:02
To: Dignon HJ (Hugh)
Cc: Sally Thomas; Stuart MacQuarrie; Mairi Cole
Subject: Mountain Hare Petition background and SNH submission

Hi Hgh,

Please find attached the submission we have prepared for the Petitions Committee. This focuses on our re-evaluation of the evidence base on mountain hare numbers and ongoing work to encourage good management practice.

We have also provided a more detailed background briefing which explains in more detail what the analysis of the evidence shows and what conclusions we are drawing from this.

I know you have discussed the contents of the submission with Mairi, but if you can confirm you have no concerns with the content of our petition ahead of the Friday submission deadline, that would be helpful.

I'd be happy to discuss this if you want to follow up on any points.

Thanks

Eileen

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Rhoda Davidson

From: Eileen Stuart
Sent: 22 November 2017 15:39
To: Robert Raynor; Vicki Mowat; Daniel Gotts
Cc: Mairi Cole
Subject: Re: Mountain hares - forthcoming research report - keeping people informed

Rob

I agree. Best to unlink the Report from Countryfile for reasons of timing and expectations.

Vicki, I think we got approval for this previously and so all that is changed is the date so I am happy for you to confirm to CF and I'll update Sally next week.

Eileen

Sent from my BlackBerry 10 smartphone.

From: Robert Raynor
Sent: Wednesday, 22 November 2017 15:30
To: Vicki Mowat; Eileen Stuart; Daniel Gotts
Cc: Mairi Cole
Subject: RE: Mountain hares - forthcoming research report - keeping people informed

Vicki/All

I'd be wary about launching the report on this programme. We are also going to have to manage expectations here because the report isn't a "silver bullet" by any means, it's a technical assessment that compares counting methods. The more challenging (and probably more interesting) bit is what we plan to do next, and this is what I hope will come out of the seminar on 24 January.

Rob

From: Vicki Mowat
Sent: 22 November 2017 15:19
To: Eileen Stuart; Daniel Gotts; Robert Raynor
Cc: Mairi Cole
Subject: RE: Mountain hares - forthcoming research report - keeping people informed

Hi Eileen,

Thanks for that. A couple questions:

- I assume I should run this by Sally when she's back in next week and then the SG, before replying to Countryfile?
- If Sally and SG agree, could I say to Countryfile that we could speak about the report, but we can't confirm the launch day yet – or something along those lines? Or should we be saying that we have to confirm when the report will be ready for publication, so we may or may not be available for interview, depending on that date?

On the idea of launching the report on the programme, I would hope Countryfile could work with something along the lines of 'The report has been published this month.' Then if the publication date doesn't work with the programme

airing, we could possibly hold off on the news release if necessary to make them happy – embargo it until after the programme airs, for example.

That's great that you're up for the interview if it takes place on January 11 or 12.

Cheers,
Vicki

From: Eileen Stuart
Sent: 22 November 2017 13:54
To: Vicki Mowat; Daniel Gotts; Robert Raynor
Cc: Mairi Cole
Subject: RE: Mountain hares - forthcoming research report - keeping people informed

Vicki,

Thanks for the heads up. I'm happy with us contributing to the story – and agree the later timing is best.

Launching of the Report is likely to be problematic. Our Chair has asked for a temporary moratorium on publishing any new commissioned reports while we review the commissioning process. We are currently doing an exercise to see what is in the pipeline and whether there are critical deadlines for publishing. I don't think we can give any publication date until we have been through that process. I think we should work to the planned publication timeline and do the preliminary ground work as outlined by Daniel. In the meantime I will ensure Sally is aware of the planned publication date and stakeholder meeting and recommend that this Report is not held up given the expectations of it emerging and wider work and public interest.

Vicki, is this enough of a steer for you to follow up with Countryfile? I am happy to put myself up to be interviewed but I'm on leave the 4-5 Jan so this would be problematic for me.

Eileen

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From: Vicki Mowat
Sent: 22 November 2017 12:13
To: Daniel Gotts; Robert Raynor
Cc: Mairi Cole; Eileen Stuart
Subject: RE: Mountain hares - forthcoming research report - keeping people informed

Hi all,

I've copied Eileen into this email as well, as I've had a request from BBC Countryfile on this topic which gives us another option for PR on mountain hares.

Countryfile are filming a story on mountain hare culling in January. They are going along on a cull on an estate in Strathdon, and will be speaking to those who say they need to cull hares for management reasons. They will also be speaking to people on the other side who want a moratorium on culling.

As both sides agree more evidence is required, Countryfile would like SNH to fill the third element in the story, speaking about the report (actually, they'd like us to launch the report in conjunction with the programme if possible). So our role would just be to discuss the research, and what we've learned about how to best count hares, etc.

Daniel and I think this sounds like a good, fairly low-risk chance to get our messages out in an impartial way -- so we do think it's worth considering internally and then discussing with the Scottish Government if we decide it's a good choice.

Countryfile would either like to film on Jan 4-5 for broadcast on July 21, or film on Jan 11-12 for broadcast on Jan 28. Rob, Daniel thought the latter option might work best with the stakeholder meeting.

We need to let them know by December 4 if possible.

Cheers,
Vicki

From: Daniel Gotts
Sent: 21 November 2017 16:31
To: Robert Raynor
Cc: Vicki Mowat; Mairi Cole
Subject: RE: Mountain hares - forthcoming research report - keeping people informed

Rob

Thanks for your email on this.

I think it is important not to see this report in isolation from our overall approach on mountain hares – i.e. it is part of a bigger picture. So, the discussion about comms needs to be in this wider context – and you need to have that discussion with Mairi and Kath first, then with Eileen and then with Hugh Dignon. Given that the overall messages from the report are unlikely to change much between now and the final version, that discussion can start now (certainly, the internal discussion).

The publication of this report provides us with an opportunity to be proactive on where things have got to and are going with the work on mountain hares – we can say things on our terms, whereas if we wait to react to inquiries we are more restricted in what we might say.

The text in the draft briefing (accepting that this may change a little as the report is finalised) is a starting-point for the section of the news release related directly to this report. Much of the rest of the news release needs to be what we say about the wider context, in particular the next steps. This will need SG input from Hugh and others.

Given a planned publication date of 15 January, you need to think about the steps involved in getting from here to there – i.e. getting our approach agreed, text drafted and then agreed by Sally, Eileen and SG colleagues.

I'm away from the end of this week until 4 December – but happy to discuss where things have got to when I get back.

Daniel.

Daniel Gotts
SNH
0131 316 2674

daniel.gotts@snh.gov.uk

From: Robert Raynor
Sent: 20 November 2017 17:34
To: Daniel Gotts
Cc: Vicki Mowat
Subject: RE: Mountain hares - forthcoming research report - keeping people informed
Importance: High

Daniel

For info and update really. Attached is the draft hare counting report with my comments and those of the external QA reviewer shown. This has now gone back to the contractor to make the necessary changes and provide a final

version by 4 December. I have also drafted the attached SLT briefing based on what the report is saying. This is subject to change as I haven't discussed it more widely yet, but it just gives you a flavour of what this is about and the possible issues. Based on this, are you still of the view that a press release is required and if so, is it too early to start drafting one do you think? (given that the report is not finalised yet).

Publication is planned for 15 Jan.

Happy to discuss if you prefer.

Thanks,

Rob

From: Daniel Gotts
Sent: 10 November 2017 10:03
To: Robert Raynor
Cc: Vicki Mowat; Mairi Cole
Subject: RE: Mountain hares - forthcoming research report - keeping people informed

Rob

Thanks for getting back to me on this – apologies for not responding sooner, but I was on leave last week.

As Mairi emphasises in her email of 30 October (attached), while the report might not appear contentious in isolation, the whole issue certainly is. So every step in the process needs to be handled carefully. It is about counting methods which are part of the information to inform policy; as you say, it will generate interest.

On timescale for publication, I understand that Mairi and you are in discussion over this – in particular, that the report probably needs to be published a couple of weeks ahead of the workshop.

Whether or not we issue a news release (but I agree with Mairi that we probably should), we can expect that we will get questions about what happens next. We need to be ready for that. Almost every day, there are tweets about it reported in the daily social media monitoring email.

Internally, the process for clearing and publishing commissioned reports has changed since our email exchange (see the staff notice on 27 October on the intranet):

- Given that we know what is in the report, I think that the briefings for SLT and Board need to be updated as soon as possible – you will need to prepare the shorter one now needed for the Board

For external comms, we need to agree with SG colleagues (Policy – Hugh Dignon; Sponsor – Keith Connal; Comms – Gillian Provan and Scott Rogerson) how we approach this:

- That discussion probably needs to start with you (and possibly Mairi and Eileen) discussing with Hugh how we approach this over the next three months (run-up to publication of the report, workshop, and post-workshop); Vicki and I can help and advise as necessary
- The main things are being ready to respond reactively (line-to-take and any FAQs kept up-to-date); and what we might need to do proactively over the next three months (whether a news release or any social media)
- We might need to engage directly with some of the key stakeholders – but you may already be doing this and I expect that the workshop is going to be helping with this as well

Given the sensitivity/risk around this area of work, I think we should have the steps which we plan to take set out in a simple checklist/plan in a Word document rather than relying on what is buried in emails. We need to have this by the end of this month, if possible.

Vicki and Mairi may want to comment on my suggested approach above.

Daniel.

Daniel Gotts
SNH
0131 316 2674


daniel.gotts@snh.gov.uk

From: Robert Raynor
Sent: 25 October 2017 16:35
To: Daniel Gotts
Cc: Vicki Mowat; Mairi Cole
Subject: RE: Mountain hares - forthcoming research report - keeping people informed

Daniel

Thanks for this. The report itself is not contentious - it is a technical report on testing/comparing counting methods and does not include a hare management/policy angle to it *per se*. That said, it will generate interest, as it is long-awaited and will lead to further work on improving our knowledge of hare status through better monitoring (hopefully). Given this, I would have thought some "brigading" of these separate actions could take place - e.g. notifying some of the contacts (DSU, SG policy *et al* at around the same time, rather than each separately). As regards publication date, so much will depend on how many changes are required during the QA process. We'd be aiming for mid-January though, just ahead of the proposed seminar (see below) which is scheduled for 24 Jan.

I'm not sure that a Press Release is the best option here, as I'm not convinced there is much of a story in an analysis of hare counting methods (and the study might not even recommend one single method as being the best). It will lead to further questions about what we are going to do next and the answer is that we're holding a seminar of invited experts/stakeholders in January to review the findings and help develop a way forward in terms of better monitoring and surveillance. Maybe the press release should be after the seminar when we will hopefully have identified a set of actions to take us forward?

As regards your last 3 points, the essential background and associated sensitivities are all covered in the recently issued SLT and SG briefings (attached), to which I will refer the relevant individuals, drawing their attention to the sections that refer to this piece of work and what we plan to do next. Does that sound reasonable?

Rob

-----Original Message-----

From: Daniel Gotts
Sent: 13 October 2017 15:12
To: Robert Raynor
Cc: Vicki Mowat; Mairi Cole
Subject: Mountain hares - forthcoming research report - keeping people informed

Rob

Cc. Vicki, Mairi

I understand that a commissioned research report on mountain hares is due to be published in the next few months.

Before the news release is put out and material published on the website, we (in Comms) need to be certain that all the people who need to know about it do know about it - and, if necessary, their views have been taken into account.

In particular, relevant colleagues in other parts of SNH should be made aware of what is to be published - and policy colleagues in the Scottish Government should be aware. Responsibility for this should rest with the project officer for the work in SNH. Letting SG Sponsor Team and SG Greener Comms know will be done by SNH Government Relations and Media Team respectively.

With input from others in PAD, I've developed the attached checklist showing the steps which need to be considered on comms about research work. However, I'm aware that you are quite a bit down the line with this one so the main things we need to be reassured on are:

- Sally Thomas and others in SNH Senior Leadership Team are aware of this, especially any sensitivities
- Others in SNH who might have an interest (e.g. colleagues in the Areas where this is relevant; colleagues in PAD Units dealing with the land management issues - there may be others)
- SG colleagues are aware of what is coming out of this work and that we plan to publish the commissioned report (and possibly a news release)

Please can you let Vicki and I know where you are on these three points - and the timescale for ensuring that they are completed.

Thanks,

Daniel.

Daniel Gotts

SNH

0131 316 2674


daniel.gotts@snh.gov.uk

Rhoda Davidson

From: Eileen Stuart
Sent: 23 November 2017 08:28
To: Mairi Cole; Robert Raynor; Alastair MacGugan; Ben Ross
Subject: RE: Mountain hares - legal analysis from [REDACTED] - 17 November 2017 (A2469301)

Mairi,

This is a good summary. Alastair and I had a chat last week about the POMM guidance and talked through possible ways to amend the section on disease management to address the concerns raised.

Eileen

*Eileen Stuart
Head of Policy & Advice
Scottish Natural Heritage
Great Glen House
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IV3 8NW*

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From: Mairi Cole
Sent: 21 November 2017 12:37
To: Robert Raynor; Alastair MacGugan; Ben Ross
Cc: Eileen Stuart
Subject: Mountain hares - legal analysis from [REDACTED] - 17 November 2017 (A2469301)

Folks,

Eileen and I had a meeting with [REDACTED] (RSPB), [REDACTED] (RSPB) and [REDACTED] (SWT) last week to hear the SE Link position on mountain hares. Key points from discussion were:

- SE Link are concerned about increased culling at a landscape-scale;
- They feel they have given the voluntary restraint sufficient time to work;
- They have met with SG and expressed their concerns;
- They feel the issue of mountain hare is being 'parked' with the Moorland Forum to avoid difficult decisions.

The PoMM guidance figured heavily in discussion and they signalled that NTS, SWT and RSPB will not be endorsing it as they feel it:

- needs much clearer guidance about the legal context in order to provide a clear steer;
- is a bottom-up approach rather than setting a top-down standard;
- are increasingly concerned that it will be portrayed as best practice;
- do not feel it supports 'sustainable management' according to the principles of the Habitats Regulations;
- does not address issues around culling in Protected Areas.

SE Link haven't seen the comments on the PoMM guidance returned by other partners in the MF sub-group and felt this was a failing of the approach. They felt that publication of the guidance should be delayed until after the Independent Review and, until then, the precautionary principle should apply and a moratorium put in place on control measures.

[REDACTED] asked whether SNH would prepare guidance to interpret the Hab Reg definition of population control (sustainable management) versus culling but we highlighted that we do not provide legal interpretation. We agreed we could look for information – in particular case studies – that may help to clarify this though. The attached email was subsequently received from [REDACTED] in relation to this.

Mention was made several times during the meeting of 'increased landscape-scale culling'. Whilst not disputing pictures circulating in social (and into mainstream) media of large number of hares being killed at some locations, we said the said number of images we've received was limited and queried the evidence of this being an 'increasing' trend. After short discussion we requested that, if such evidence exists, we would be very happy to receive it as part of the evidence of increasing and widespread non-compliance with the voluntary restraint.

They felt the voluntary restraint needs to be revised. They felt landowners were exploiting a loophole in the inclusion of wording to suggest that control was acceptable where there were no other mammal reservoirs was. They cited an estate which is subject to extensive control of a wide range of potential reservoir species, effectively clearing the path to control mountain hare as the only remaining vector. We agreed that we could look at revising this if there was new evidence.

We discussed briefly the suggestion of the precautionary principle as the basis of managing control measures. We shared the information coming from the analysis of NGC and BBS data, acknowledging that we recognised this has limitation. [REDACTED]'s data was offered as a counter to this but we highlighted that the data we have did not present evidence of a national decline that would trigger the need to change legislation. We agreed, however, that [REDACTED]'s data was suggestive of more local issues and that we felt this was where we needed to invest further work. This tied back to the Independent Review.

The meeting was amicable but tended to mix issues around the PoMM guidance with wider MH issues. We didn't leave them with a copy of the NGC/BBS analysis but agreed that we would look for a way to make this more public. The Independent Review panel may provide this route.

Eileen – I hope this covers it but let me know if I've missed anything.

Mairi

Rhoda Davidson

From: John.Gray@gov.scot
Sent: 27 September 2017 11:50
To: SNHGOVERNMENT_RELATIONS
Subject: Petition PE1664 - Mountain Hares

Good morning Marianne

The Public Petitions Committee considered OneKind's Petition PE1664 on mountain hares at its meeting on 14 September 2017 and agreed it would write to the Scottish Government to seek its views on the petition.

The following is the wording of the petition

CONSIDERATION OF PETITION [PE1664](#)

Calling upon the Scottish Parliament to urge the Scottish Government to introduce greater protection for mountain hares on both animal welfare and conservation grounds, which may include: introducing a three-year moratorium on all mountain hare killing, permitting culls and driven hunts only under licence, and ending all culling and driven hunting of mountain hares within Scotland's national parks using a nature conservation order.

Robbie Kernahan sent me a paper recently produced by SNH back in March earlier this year which set out some of the options for greater regulation and control of Mountain Hare management which covers some of the points raised in the petition.

I would be grateful for SNH thoughts on the proposed three-year moratorium. I know that mountain hares will be considered more as part of the proposed working group looking at grouse moor management, as announced by the Cabinet Secretary.

I have to provide a response to the PPC by 12 October so a response by Friday 5th October would be appreciated.

Happy to discuss further.

Best wishes

John

John Gray
Wildlife Management Team
Natural Resources Division
Directorate for Environment and Forestry
The Scottish Government
3-G South
Victoria Quay
Leith
EH6 6QQ
Tel. 0131-244-0728

john.gray@scotland.gsi.gov.uk

From: Jonathan.Young@gov.scot
To: [SNHGOVERNMENT_RELATIONS](#)
Cc: John.Gray@gov.scot
Subject: Mountain hare - PQ Reference: S5W-10597 - Alison Johnstone MSP - Cab Sec ECCLR - 080817
Date: 08 August 2017 10:41:32
Attachments: image001.png

Good morning Richard

I would be grateful if you could provide John Gray with a short contribution for this PQ and background note by cop, Friday, 11 August (if possible please).

PQ, reference S5W-10597

- MSP: Alison Johnstone
- Question Text: To ask the Scottish Government what its position is on non-departmental government bodies endorsing large-scale killings of mountain hares in situations where there is an absence of evidence that this practice is sustainable and an absence of animal welfare standards.

Best regards

Jonathan

Charles Jonathan Young MSc HRM / CIPD | Policy Officer | Wildlife & Protected Areas | Natural Resources Division | Environment & Forestry Directorate | Area 3G South | The Scottish Government | Victoria Quay | Edinburgh | EH6 6QQ | +44 (0)131 244 2671 | email: Jonathan.Young@gov.scot



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Tha am post-d seo (agus faidhle neo ceanglan còmhla ris) dhan neach neo luchd-ainmichte a-mhàin. Chan eil e ceadaichte a chleachdadh ann an dòigh sam bith, a' toirt a-steach còraichean, foillseachadh neo sgaoileadh, gun chead. Ma 's e is gun d'fhuair sibh seo le gun fhiosd', bu choir cur às dhan phost-d agus lethbhreac sam bith air an t-siostam agaibh, leig fios chun neach a sgaoil am post-d gun dàil.

Dh'fhaodadh gum bi teachdaireachd sam bith bho Riaghaltas na h-Alba air a chlàradh neo air a sgrùdadh airson dearbhadh gu bheil an siostam ag obair gu h-èifeachdach neo airson adhbhar laghail eile. Dh'fhaodadh nach eil

Mountain hare population trends and management Briefing for Scottish Government

October 2017

In February 2017, Scottish Government asked SNH for advice on possible options to increase regulation of mountain hare control. We provided an initial response to this and also to questions posed on the licensing of snaring. Since then we have, with input from the British Trust for Ornithology (BTO) and the Game & Wildlife Conservation Trust (GWCT), reviewed the hare population trend data used for the 2013 Article 17 report, i.e. BTO Breeding Bird Survey (BBS) mammal data and the GWCT National Gamebag Census (NGC) data, along with new data from [REDACTED] for NE Scotland. The purpose of this re-analysis was to identify any ongoing population trend that would influence the next Article 17 assessment.

The annexed paper summarises the result of this. The following outlines our position and planned course of action in light of this assessment.

Key points are:

1. The BBS data show a statistically significant decline between 1996 and 2010/11 but data from 2012-2015 suggest an upward trend. This could be explained by a population cycle (known to span c.9.5 years in Peak District hares, but variable from 5-15 years), although more data are needed to verify this and confirm any underlying long-term trend. Over the same 20 year period covered by the BBS dataset, a non-significant upward trend is apparent in the NGC data. In light of this, we consider that evidence of a national decline in mountain hares since the mid-1990's is not conclusive.
2. The NGC data collected from estates across the mountain hare's range in Scotland show clear cyclicity but provide no evidence for an underlying decline in the hare population from the mid 1950's to 2015. However, gamebag data have their limitations, including the absence of a measure of effort, so caution is needed when drawing conclusions from this source alone.
3. In contrast to the above, the [REDACTED] data show a dramatic decline after 2003 at a range of monitored moorland sites in the North East. It is not known whether this downward trend is continuing. As this is not reflected in either of the other two datasets, it is difficult to draw conclusions, or extrapolate this, beyond the North East.

Further data are required to clarify the conclusions to be drawn from this data. In recognition of this, we propose to:

- Publish the findings of the separate JHI/GWCT/SNH hare counting study before the end of January 2018;
- Manage a workshop in January involving key experts and stakeholders to determine how to apply the finding of this study in a structured surveillance programme that can alert us to any conservation concerns;
- Integrate the recommendations from this workshop into the *Principles of Moorland Management* (PoMM) guidance on sustainable hare management currently being drafted by the Moorland Forum. This will include estate-level management planning and any associated reporting requirements necessary to support surveillance.

We recognise that the data from NE Scotland suggests that significant declines may have taken place since the early 2000's, which is at odds with the national trend. Some of these are managed grouse moors. Where there are concerns over the status of hares on NE grouse moors, we are initially working to address through the new PoMM guidance which encourages collaboration between estates through sustainable hare management plans informed by count data obtained by a standard method. This will be addressed in the forthcoming report and subsequent workshop. We envisage that the PoMM guidance will also require estates to make all data on the number of hares culled available to us for monitoring and reporting purposes.

Rob Raynor
Ecosystems & Biodiversity Unit
Inverness

3 October 2017

ANNEX

Evidence for population trends in mountain hares (*Lepus timidus*)

Mountain hares are listed in Annex V of the EC Habitats Directive (1992), as a species 'of community interest whose taking in the wild and exploitation may be subject to management measures'. Member States are therefore required to ensure that the exploitation of Annex V species 'is compatible with their being maintained at a favourable conservation status'.

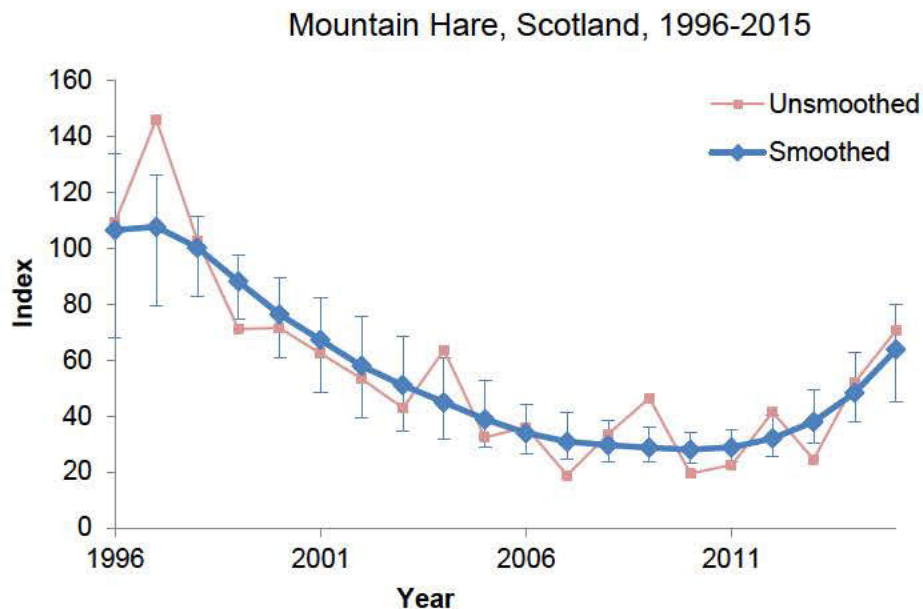
In order to provide an evidence-based approach to the development of policy in relation to the management and conservation of this species, time series data collected from three independent sources are reviewed here.

- BTO Breeding Bird Survey (BBS) data
- GWCT National Gamebag Census (NGC) data
- Unpublished data from a forthcoming scientific paper ()

Breeding Bird Survey (BBS) mountain hare data

These data represent the number of hares incidentally observed by fieldworkers during surveys of breeding birds according to a standard, repeatable methodology. The sample size for Scotland is 19 squares (averaged over all BBS years). In view of the small sample size, the Scottish trend (Fig. 1 below) needs to be interpreted with caution. However, the confidence limits are not excessively wide, so the trend is considered to be a reasonably reliable indicator. Furthermore the data are not restricted to a particular region of the country so are considered to be representative of the overall mountain hare range in Scotland.

Fig.1



The long-term trend 1996–2014, calculated on the smoothed index, is -55% and its 95%-confidence interval is (-76%, -10%), which makes the negative trend statistically significant at the 0.05 level. However, the trend from 2009/10 to 2015 is upward suggesting that the observed pattern may represent part of a natural population cycle. If so, the overall

downward trend could become non-significant or disappear entirely. This can only be confirmed with more data.

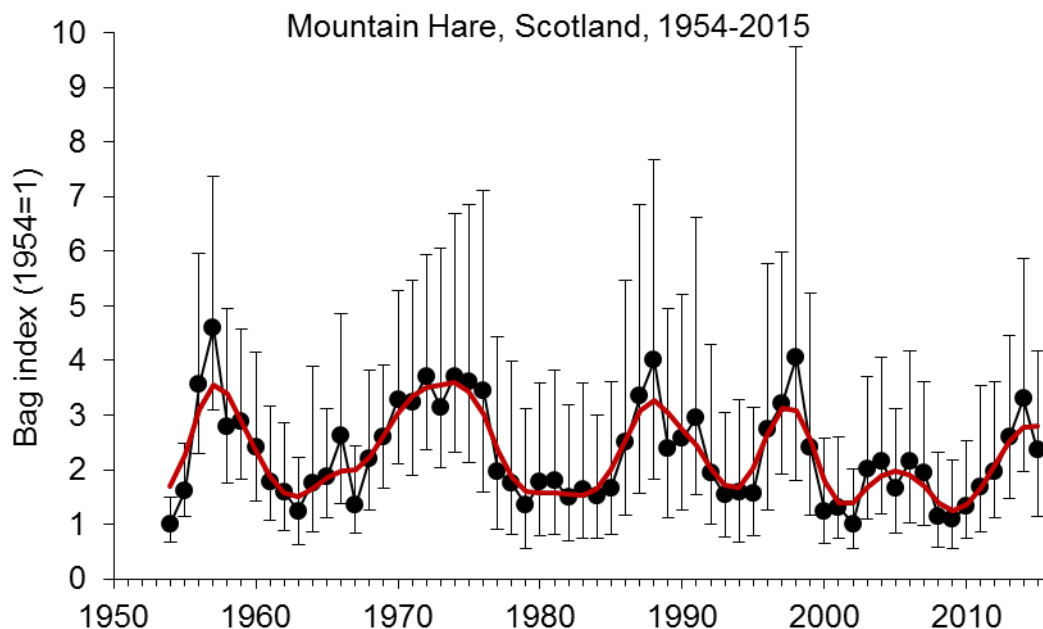
National Gamebag Census (NGC) data

This dataset is compiled from game-bag returns from estates. As it is a measure of the number of hares shot/controlled and has no associated measure of effort, caution is required when drawing conclusions about actual changes in the hare population. There are potential biases associated with bag data that do not occur with count data, such that underlying trends can be obscured or apparent changes in abundance created where none has occurred. Crucially, the number of animals killed depends on the number of animals present and on the effort invested in harvesting them. There are annual changes in the number of shooting days per site and number of shooters per day that cause effort to vary over time. Furthermore, culling can itself be the cause of changes in species abundance, which poses a problem because the method of data collection then has a direct impact on the quantity it intends to measure. There are other potential sources of bias in these data, notably in the case of hares, representativeness. The sites contributing records to the NGC do so on a voluntary basis and cannot be assumed to represent a random sample of shoots across Scotland.

Despite these potential biases, game bag data have been shown generally to provide a good index of population change where it has been possible to match up bag data with count data (e.g. red grouse).

In Fig.2 the game bag data are plotted from 1954 to 2015 and show very clearly the cyclical nature of the returns, reflecting the cyclical nature of changes in hare abundance.

Fig.2

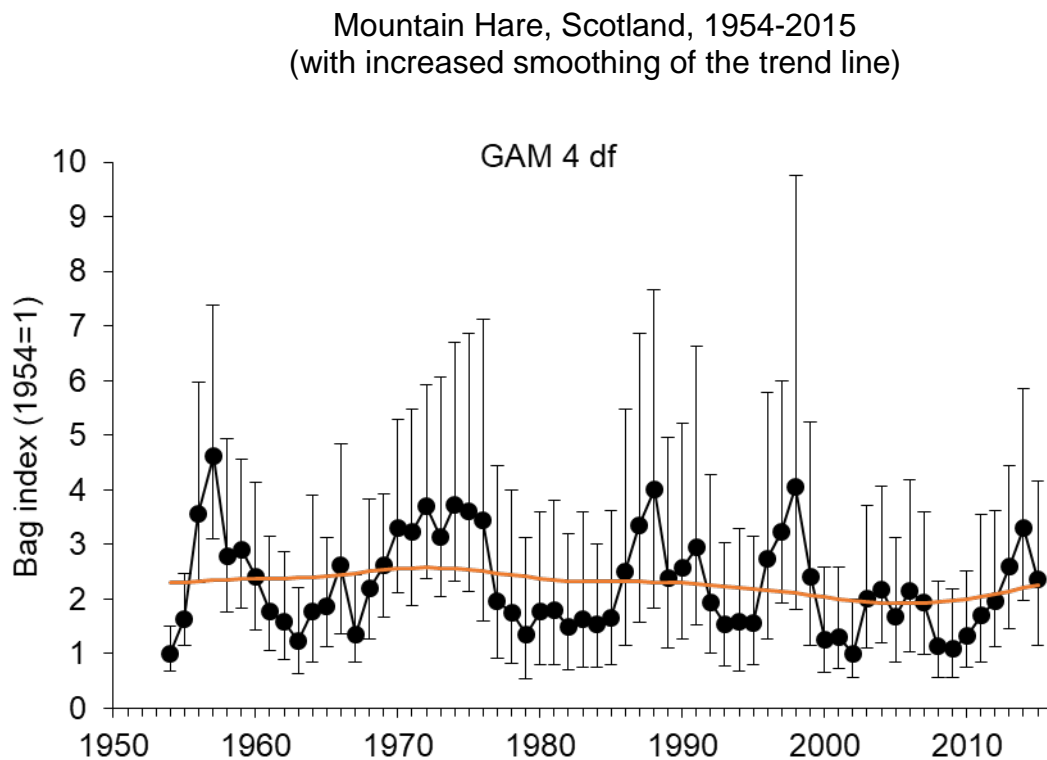


The long term trend from 1954 to 2015 is a non-significant 65.6% increase (95% confidence interval : -1.4, 149.7). However, comparing the start and end points of the data in isolation is not ideal, as the combination of the wide confidence interval in 2015 and the difference

between the smoothed and unsmoothed values can introduce errors. Furthermore, for a species showing such cyclicity any underlying trend can be masked.

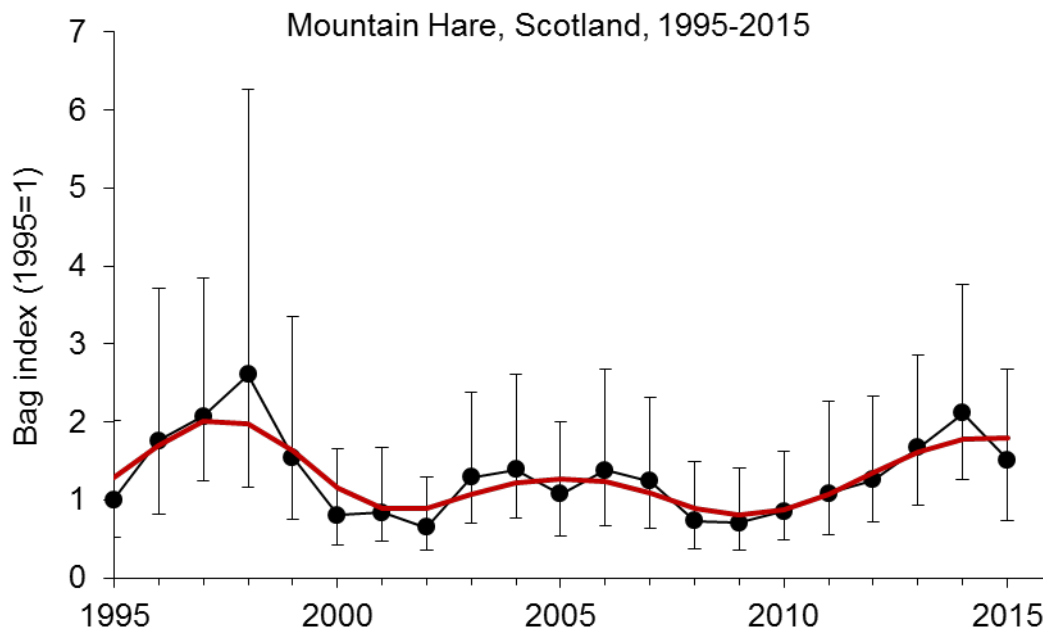
Fig. 3 presents the same NGC data but with fewer degrees of freedom (4df). This shows the underlying trend more clearly whilst maintaining an indication of the population fluctuations in the smoothed trend line. The change between 1954 and 2015 calculated from the smoothed trend line in Fig.3 is a non-significant -1.4% decrease (95% confidence interval: -45.2, 62.2). Thus, there is no evidence within the bag data to suggest that a long-term population change has taken place.

Fig.3



The NGC data presented in Fig. 4 focus on the time period covered by the BBS data, in order to facilitate direct comparison with the latter. The difference between the 1995 to 2015 values is a non-significant 38.8% increase (95% confidence interval: -27.1, 147.8). No clear trend is apparent from the game bag data for this period although an upturn after 2009/10 is apparent in both the BBS and NGC data and there is a peak in the late 1990's in both datasets.

Fig.4



Hare count data collected by [REDACTED] (to be published)

A paper submitted to the scientific journal *Conservation Letters* in December 2016 by [REDACTED] and available as a privileged communication presents an analysis of spring counts of mountain hares on moorland sites across NE Scotland between the 1950's and early 2000's. It shows that the index of hare population density fell gradually (2.8% per annum) to approximately a quarter of initial values by 2003. It then fell dramatically (37.2% per annum) to less than 1% of initial values by 2009, and a minimum of 0.1% of initial values in 2014. On higher, alpine sites where hares are not generally controlled, hare abundance increased slightly (2.4% per annum) until 2008, then declined severely (47.5% per annum), but remained within the previous range of variation.

In 2003, research was published (Laurenson *et al.* 2003) suggesting that culling of hares (carriers of the sheep tick *Ixodes ricinus*) might assist grouse managers by reducing grouse tick burdens and louping ill seroprevalence. Subsequent advice issued the Game Conservancy Trust (now GWCT) recommended reductions in hare density (down to <3 /km²) in certain circumstances to reduce tick density. This advice has since been withdrawn.

A comparison between the BBS and NGC trends and that presented by [REDACTED] for moorland sites show little or no similarity. The latter shows a gradual decline from the mid 1950's to 2003/4 after which there is a steep decline, although the last data point in the series (2015) appears to contradict the trend. Furthermore the confidence intervals for the data become considerably broader in the last 7 years compared with all the preceding years, thereby reducing the confidence in the trend line at this point.

Conclusions

1. The NGC and BBS trend data since the mid 1990's show some similarities and some differences, notably that the BBS negative trend is statistically significant, whereas a

non-significant upward trend is apparent in the NGC dataset. More data are needed to clarify whether the apparent upward trend in the BBS in recent years is continuing.

2. Based on the NGC data and despite clear cyclicity, there is no evidence for an underlying decline in the hare population from the mid 1950's to 2015.
3. The dramatic decline presented by [REDACTED] is associated with moorland sites in NE Scotland, many of which are managed grouse moors. As it is not reflected in the other 2 datasets, it is difficult to draw conclusions more widely than for the North East.

Recommendation

Based on the NGC and BBS datasets, the evidence of an overall decline in mountain hares since the mid 1990's is inconclusive and no clear trend exists in the game bag data since the 1950's. However, this is not reflected in the data presented by [REDACTED] for NE Scotland, whereby substantial local declines have been recorded on grouse moors in the region. It is unclear whether this reported downward trend is continuing, so further data will be needed from a representative sample of the previously monitored sites (and perhaps elsewhere, e.g. Perthshire and the Southern Uplands) to clarify the situation.

Acknowledgements

Megan Towers (SNH), [REDACTED] (GWCT) and [REDACTED] (BTO) contributed essential data, analysis and statistical expertise to this review of the evidence base.

Rob Raynor
Policy & Advice Officer (mammals)
4 August 2017

REGULATION OF MOUNTAIN HARE MANAGEMENT IN SCOTLAND

Purpose

1. This paper sets out the legal framework controlling exploitation of the mountain hare, *Lepus timidus*, the state of current knowledge and options for future action.

Existing legal framework

2. The Mountain hare is listed in Annex V of the EC Habitats Directive (1992), as a species '*of community interest whose taking in the wild and exploitation may be subject to management measures*'. Member States are therefore required to ensure that the exploitation of Annex V species '*is compatible with their being maintained at a favourable conservation status*'.
3. Paragraph 1 of Regulation 37A of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland) requires the surveillance of the conservation status of species of Community interest. Paragraph 2 allow the Scottish Ministers to make arrangements for ensuring that the taking in the wild of specimens of such species, and their exploitation, is compatible with their being maintained at favourable conservation status.
4. Mountain hares are a quarry species that have long been shot for sport. The Wildlife and Natural Environment (Scotland) Act 2011 introduced closed seasons for killing or taking of hares, following repeal of the 1892 Game Act and its restrictions on their sale. As a result of this and amendments made to the Wildlife & Countryside Act 1981, it is now an offence to intentionally or recklessly kill, injure or take a mountain hare in the closed season. This extends from 1 March to 31 July, and provides full protection to mountain hares during the main part of their breeding season. Licences may be granted to permit the control of mountain hares during the closed season for specific purposes such as for preventing serious damage to forestry.
5. Certain methods of capture and killing, for example non-selective trapping, are prohibited and may only take place under licence. Licences can be issued to control mountain hares by prohibited means for various purposes.

Current knowledge

6. The combination of rotational burning and predator control under heather moorland management benefits both mountain hares and red grouse, such that hare densities can reach 30-70 km⁻², and exceptionally 200 km⁻² or more. These figures are well in excess of mountain hare densities recorded in other habitats.
7. Information on hare populations comes from three sources: the National Gamebag Census (NGC), operated by the Game & Wildlife Conservation Trust (GWCT); the British Trust for Ornithology monitoring scheme and more recently a long times series of hare counts collected over seven decades by ██████████ and due to be published in 2017. In the NGC bag data on the numbers of hares controlled by

estates participating in the scheme are supplied in confidence to the GWCT allowing trends over time to be derived. It is an index and therefore does not provide a measure of the number of hares present or their population density. Data submission to this source is voluntary and does not include a consistent measure of control effort, so some caution is advised in its interpretation. The BTO scheme is based on incidental sightings of hares recorded by observers whilst undertaking systematic bird surveys. Likewise it produces an index which can be compared with the NGC trend.

8. The [REDACTED] time series data are based on hares counted at 113 moorland and alpine sites in the north-east of Scotland. These sites range in size from 8 to 1130 ha, and from 130 to 1170 m in elevation. All sites were on heathland managed for grouse shooting or stalking of red deer ('moorland' sites), or were on alpine land above the former treeline with no burning and little predator control ('alpine sites'). Hares were counted annually in spring, during parallel transect surveys with pointing dogs. These surveys were designed primarily to estimate the abundance of red grouse as part of long-term ecological studies of that species, but were used to count mountain hares too.
9. There has been considerable speculation recently about mountain hare numbers but evidence of changes in mountain hare populations is equivocal. Data from the NGC found no significant overall trend between 1961 and 2009. In contrast, data from the same statistic (NGC) between 1995 and 2009 suggested a decline of 36% in the mountain hare index during this time. Concurrent data from the BTO Breeding Birds Survey (BBS) suggested a decline of 26%. Combining these indices gives a statistically significant decline of 28% (see <http://jncc.defra.gov.uk/pdf/468%20and%20Appendix%20web.pdf>).
10. A questionnaire survey commissioned by SNH in 2006/7 concluded that there was no evidence of an overall change in the distribution of mountain hares when compared to a similar study in the mid 1990's. However, the report also concluded that the analysis may have failed to detect localised declines and possibly local extinctions, below the 10km² scale at which the data were collected and analysed. The report also noted that a minimum of 24,529 mountain hares were controlled across 90 sporting estates (almost half of these were taken by just 26 estates). These data from the participating estates were supplied in confidence to the GWCT and are not available to SNH. The report referred to in the previous hyperlink also includes maps showing broad changes in game bag density and the BBS index (measures of relative abundance) across the mountain hare's range in Scotland.
11. The [REDACTED] data have recently been analysed and reviewed in a draft scientific paper prepared for publication in a peer reviewed journal. This suggests that there has been a long-term decline in the density index¹ on the monitored moorland sites of 2.8% per annum, although an increase of 2.4% per annum was observed on the alpine sites until 2008, followed by a decline to values comparable to the 1954 baseline. The observed gradual decline at moorland sites accelerated in 2003 to a decline of 37.2% per annum thereafter, reducing

¹ The density index is not an absolute measure of actual hare density (expressed as hares per km²), but a comparative measure against a 1954 baseline with the value set at 1.0.

densities to less than 0.1% of the 1954 baseline. The acceleration coincides with publication in 2003 of a study suggesting that hare culling could lead to enhanced grouse productivity. These data do not conclusively demonstrate cause and effect, but they do raise questions about potential declines associated with moorland management practices.

The challenge

12. The primary objective in relation to the management of mountain hares is for the population to be managed sustainably such that the population continues to be assessed as being in favourable conservation status for the purposes of Article 17 reporting under the EC Habitats Directive. Previous Article 17 reports (2006 and 2013) assessed the species as being in favourable condition, but this was in the absence of robust evidence to the contrary. There was debate amongst the country agencies and JNCC at the time concerning this assessment.
13. The robustness of the evidence as a basis for new action has, to date, limited the options that could practically be implemented. The evidence for a long term decline in mountain hare numbers is unclear, partly because of inadequate data on hare populations but also because of complexities associated with identifying long term population trends from the natural cycles that around half of hare populations exhibit. The [REDACTED] data do appear to provide a more convincing case for a decline, although there is no evidence to unequivocally demonstrate a causal relationship with management. As the paper based on these data is still to be published, we cannot refer to it publicly at this stage though.
14. In addition to the above, there are other significant considerations associated with management decisions concerning this species. One is the level of concern expressed by both the general public and a range of environmental NGOs. Emotive images in the media of piles of dead hares present a powerful case for action when the status of the hare population is incompletely understood and the rationale behind the management is not always clearly articulated by those involved.
15. Successful action for mountain hares also depends on effective cooperation with estates and land managers. SNH, Scottish Land & Estates and GWCT have a joint statement promoting voluntary restraint and the success of this needs to be evaluated in terms of sustainable management of hares.
16. SNH has been contributing to guidance on mountain hare management through the Moorland Forum's Principles of Moorland Management (PoMM) project (see <http://www.moorlandforum.org.uk/project-work/principles-of-moorland-management-2-pomm-2>). This initiative has been led by GWCT and SL&E and aims to introduce a greater degree of transparency amongst estates on the issue of hare management, combined with increased cooperation amongst neighbouring estates, with the intention of demonstrating coordinated sustainable hare management over adjoining areas of grouse moor. The draft guidance has not yet been finalised and may need further revision. There is no compulsion for SNH to endorse the final product.

17. One future management option is increased regulation of hare management (see below). Associated with this are significant licensing implications for SNH. The challenge here concerns the quality and availability of robust data on hare numbers in order to make informed and defensible decisions on bag limits. A current 3 year joint SNH, GWCT and James Hutton Institute research project comparing counting methods is due to report later in the year and is intended to help develop a better monitoring scheme. Nevertheless, even if progress towards this is rapid and unhindered, there will be a time delay of several years before any useful data and a robust harvesting model² are likely to be available for use in making licensing decisions. In the intervening period, SNH would have to rely largely on information supplied by each applicant and this could be open to challenge.

Legislative options for regulating or monitoring of hare management

18. There are several mechanisms available to Scottish Ministers to regulate or monitor mountain hare control. These range from the current voluntary approach to mandatory reporting of numbers controlled (and including associated hare count data), to full protection with control only possible under licence.
19. Although the previous Article 17 reports assessed the status of mountain hares as favourable, access to the [REDACTED] time series data makes future assessment of this species (e.g. Article 17 reporting (2019)) less clear. Taking this data into account, it is possible this will result in an unfavourable assessment. If this is the conclusion, only the latter 3 options below (paragraphs 23-25) are likely to be worthy of further consideration. Furthermore, it will not be possible within the reporting timescale for us to specify what magnitude of population change would be needed to restore the species to favourable status.
20. The 2013 Article 17 report for Scotland is available at: http://jncc.defra.gov.uk/pdf/Article17Consult_20131010/S1334_SCOTLAND.pdf It gives a favourable reference value of 350,000 hares derived using 1994 as the baseline and making a judgement on whether the population in 1994 was viable in the long-term. However, in common with most other mammal species, the data that were used for this assessment have significant limitations attached and are based on population estimates published in 1995 (and with broad error margins). The distribution and range information is more reliable, but the overall population trend information is less so due to the limitations of game bag data (i.e. control effort is not recorded) and the cyclic pattern of hare populations. Although an updated population estimate will soon be published, these limitations all still apply; the only major difference since 2013 is the availability of the [REDACTED] data. This is the reason for uncertainty in respect of the next Article 17 conservation status assessment.
21. *Voluntary restraint*: the success of this has been challenged by opponents of hare culling but it is difficult to objectively assess how successful the initiative has been in the absence of estate cull data before and after its introduction in December 2014. We believe that some estates have continued to cull substantial

² A PhD study by A. Harrison (2011) - *Dispersal and compensatory population dynamics in a harvested mammal* - did consider harvesting models and provides some information, but further work is needed.

numbers of hares. For example, 4,000 are known to have been taken from one 6,000 ha estate in the central Highlands in the winter of 2014/15, although despite this, hares remained abundant on at least one part of the estate and the density of hares observed in that area suggests that the estate supports a strong population. Furthermore, the numbers culled in previous winters were reported to be between 2,000 and 3,000, which *may* suggest that this level of offtake is sustainable, but it is not possible to confirm this at present. One of the aims of the PoMM guidance (paragraph 15) is to make the voluntary approach more effective.

22. *Unregulated control with mandatory reporting*: at present there is no requirement for estates to report to SNH on the numbers of hares controlled outside the closed season, or to provide any information on the numbers of hares present on their ground. This option would maintain the current voluntary approach but would introduce a requirement to report on the above. Such data could then be analysed in relation to assessing the sustainability of the harvest. The onus would be on SNH to analyse all data retrospectively in order to determine if the level of offtake in relation to the available population data is sustainable, although as it would not be possible to verify the data, the reliability of such an analysis would be open to challenge. This option would require an amendment to the Wildlife & Countryside Act (1981), possibly by an amendment to Section 10A.
23. *General Licence with mandatory reporting*: this option is similar to the previous one, except that the mechanism for achieving it involves limited regulation such that the existing closed season for mountain hares would be extended to cover the whole of the year. The Wildlife & Natural Environment (Scotland) Act 2011 amended the Wildlife & Countryside Act 1981 such that "*the Scottish Ministers may by order vary the close season for any wild animal included in Schedule 5A which is specified in the order*". (Section 5A includes the mountain hare). This would be accompanied by the issue of a General Licence by SNH, enabling estates to continue to control hares, but subject to there being a suitable licensing purpose in the legislation (see paragraph 29). The licence would include certain requirements, including the provision of all relevant data (as above) to SNH on an annual basis. Failure to provide the necessary data would exclude the relevant estate(s) from operating under the terms of the licence in future. If monitoring indicated that over-harvesting was taking place, further restrictions may need to be introduced, which could include a move to more regulated control (below). Again, the onus would be on SNH to analyse all data retrospectively and determine if the level of offtake in relation to the available population data is sustainable. This information would be used to review and refine the conditions in the general licence relating to permitted offtake, i.e the proportion of the estimated hare population in a given area that can be controlled under the terms of the licence. This option (and the two below) would require the development of an appropriate harvesting model to inform licensing decisions.
24. *Regulated control with mandatory reporting*: this option would introduce a fully regulated system for managing mountain hares. The closed season would be extended, as above, but without the associated General Licence. Therefore, each estate wishing to control hares would need to apply individually (or perhaps

collectively, if a group of neighbouring estates decide to collaborate) for a licensed quota. The above mandatory reporting requirements would apply to every licence issued. The onus would be on both the licence applicant and SNH to agree a level of offtake in relation to the available population data that would be sustainable. Unlike the previous options, this assessment is made in advance of any licence issued and would be used to specify individual bag limits for each licence.

25. *Regulated control (with mandatory reporting) in the two national parks only:* this legislative mechanism has been suggested by *Onekind*. It relies on the issue of a Nature Conservation Order (NCO) under Section 23 of the Nature Conservation (Scotland) Act 2004, but is less comprehensive than the previous option (paragraph 20) in that it would be restricted only to the two national parks, thereby excluding some important parts of the hare's range that are outside these areas (e.g. parts of highland Perthshire, the east Grampians and southern Scotland). Furthermore, it assumes that the national parks would be regarded as being of "special interest" within the provisions of the 2004 Act, by reason of their natural features. While this is likely to be the case, the Act does not specifically state it. In addition, the 2004 Act requires consultation with the relevant parties (Schedule 2) before an NCO can be implemented. This is likely to introduce delays, given the sensitivities associated with this species and the various interests that are involved with it. The onus would be on both the licence applicant and SNH in consultation with the relevant national park authority to determine if the level of offtake in relation to the available population data is sustainable.
26. An alternative legislative mechanisms for providing enhanced legal protection for mountain hares, would be to add the species to Schedule 5 of the Wildlife & Countryside Act 1981 (as amended in Scotland). This could be implemented at the same time as the current proposal to increase the level of protection afforded to water voles as part of the fifth quinquennial review of this schedule. The existing provisions of Section 16 would apply in relation to any licence application to control hares, as in paragraph 20 above.

Implications and constraints

27. The introduction of full protection for mountain hares by whatever legal mechanism will be welcomed by conservationists and wildlife groups, but is expected to lead to significant public opposition from sport-shooting interests. The evidence is likely to be challenged and the production of the PoMM guidance utilised to support the argument that land managers already manage hares responsibly, with no intention of eradicating the species.
28. Because grouse moor management can lead to artificially enhanced mountain hare populations, hares can cause damage to young trees and there is the potential for damage to sensitive vegetation, especially on designated Special Areas of Conservation and/or Sites of Special Scientific Interest. Browsing by hares has been noted at 13 sites including Caenlochan, Carn nan Tri-tighearnan,

Ben Griams, Glen Callater, Garbh Choire and the Drummochter Hills. It has also been argued that culling is necessary to maintain a healthy hare population.

29. The past two UK Article 17 reports to the European Commission assessed mountain hares as being in favourable conservation status, so the justification for any proposal to increase the level of protection and degree of regulation is likely to receive considerable scrutiny. Since the last report, additional information (the [REDACTED] data) has become available to us.
30. The introduction of full protection (or a year-round closed season) to mountain hares would require that any control could only be carried out under licence issued under Section 16(3) of the Wildlife and Countryside Act 1981. This would likely have a significant impact on the number of hares controlled each year, primarily because the terms of Section 16 mean that licences can only be granted for specific purposes.
31. Currently there are no restrictions on control of hares outside of the closed season. This means that control during this period, be it for sporting purposes or otherwise is permitted regardless of the reason for which control is taking place. If the law changed to require that a licence was needed for any control of mountain hares, then control for certain purposes (e.g. sporting interests) may no longer be possible because of a lack of licensable purpose. Similarly, if people wanted to control hares to reduce tick populations and/or incidence of Louping ill, we would have to be satisfied that control was indeed necessary for *preventing the spread of disease* in this respect.
32. To put this in to some context, of the small number of mountain hare licences that we consider currently, they have all been necessary for the purpose of preventing serious damage to growing timber or regeneration of native woodlands. One or two licences have been sought for the purpose of preventing the spread of disease, but they have been rejected because of a lack of robust evidence to support this.
33. In short, the lack of ability to licence sport shooting, and the difficulty in providing sufficient evidence to support applications for the purpose of preventing the spread of disease is likely to be controversial to those who currently shoot mountain hares outside of the closed season.

Future options

Management of mountain hares can have a number of impacts that may influence decision-making. The most notable impacts are:

1. A decline in distribution and density of hare populations.
2. Local extinctions.
3. Risk to livelihoods/economic impacts imposed by control options.
4. Public perceptions.

The table below presents the likely impact of each of the five options outlined in the paper.

Options	Concerns			
	Hare distribution and abundance	Local extinctions	Economic impacts	Perception
Voluntary restraint	Gross changes in the overall hare distribution are unlikely, but local abundance and distribution could be compromised, as the control measures are voluntary.	Local extinctions are a possibility, as the control measures are voluntary.	Little or no economic impact.	Perceived by conservation NGOs, raptor study groups and the general public as ineffective.
Unregulated control with mandatory reporting	As above, if the quality of mandatory reporting is inadequate, and/or appropriate action is not taken promptly where there is evidence of over-exploitation.	As above, if the quality of mandatory reporting is inadequate, and/or appropriate action is not taken promptly where there is evidence of local extinction.	Little or no economic impact.	Unlikely to be perceived as an effective measure, unless it is clear that appropriate (i.e. regulatory) action would be taken in response to an unimproved situation.
General Licence with mandatory reporting	Provided adequate information is made available to SNH, and the necessary population data and harvesting model are in place, this option should ensure sustainable management. However, it could result in the same situation as Option 2 if not adequately enforced.	If effectively enforced, this option should prevent local extinctions. But, as any enforcement measures are retrospective, it cannot guarantee to prevent some short term local impacts.	Little or no economic impact.	Might be perceived as better than options 1 and 2, but questions may remain over compliance and enforceability.
Regulated control with mandatory reporting	Provided adequate information is made available to SNH, and the necessary population data and harvesting model are in place, this option should ensure	This option should prevent local extinctions as the licence applicant must provide hare counts for all areas included.	Slight loss of revenue possible in some cases, but overall little or no economic impact.	This may be perceived as a significant improvement, but may not go far enough for some, i.e. it would not introduce a complete

Regulated control (with mandatory reporting) in the two national parks only

sustainable management. It is the most resource-intensive option though.

This option only protects hare populations in the national parks. These restrictions could lead to an unregulated increase in exploitation elsewhere. Increased pressure around the margins could cause local declines and a contraction in the range.

This option can only prevent local extinctions in the national parks. Local extinctions are a possibility elsewhere.

Slight loss of revenue possible in some cases within the national parks, but overall little or no economic impact.

ban on all hare control unless population data indicated a sustained downward trend.

Might be perceived as better than options 1 and 2, but doesn't address the situation outside the 2 national parks.

**SNH
March 2017**

Mountain hares

9 February 2017

Present: Andrew Bachell, Des Thompson, Robbie Kernahan, Rob Raynor, Mairi Cole

Context

The commissioned research on assessing a method of counting mountain hares is due for completion in March. There is therefore a need to consider the implications of this work, whether it influences future action and the implications of various policy options for the species.

The research will help us to better understand the levels of confidence that can be attached to a number of methods of counting mountain hares *in situ*. It recognises that there will be more than one method to do this. The intention is to complete this work (March) and follow up with a workshop in the autumn to review the methods available with potential practitioners.

Alongside this, a paper is in prep. to publish a long-term data set collated by [REDACTED]. Although this remains to be peer-reviewed, the suggestion from the paper is that there has been a decline in mountain hare populations in north-east Scotland. It does not, *per se*, underpin more general statements about declines elsewhere in Scotland.

Action point: RK, RR and DT to produce clear lines to take following publication of the [REDACTED] data.

Current knowledge

The research will give us methods to count mountain hares but it is generally recognised that we need to develop a better understanding of the distribution and abundance of the species if we are to monitor impacts of management activities. In particular we need to better understand:

- What is (are) the current objective(s) of mountain hare management activities?
- What is the conservation status of the species in Scotland?
- How does land use change interplay with control activities?

Action point: RR and MC to provide a species assessment based on current knowledge in Scotland.

Future options

Management of mountain hares can have a number of impacts that may influence decision-making. RR had prepared a draft [paper](#) outlining options to regulate mountain hare control as the basis for advice to the Cab. Sec. This needs to be revised to ensure it includes any information on past distributions and changes - with particular reference to any known cause-and-effects - and identification of concerns. Most notable impacts are:

1. A decline in distribution and density of hare populations.
2. Local extinctions.
3. Risk to livelihoods/economic impacts imposed by control options.
4. Public perceptions.

It was suggested that the paper need not make definite recommendations as long as it presented the options in terms of the likely impacts. This should be in the form of a table, e.g.

Options	Concerns			
	Hare distribution and abundance	Local extinctions	Economic impacts	Perception
1				
2				
3				
4				
5				

Action point: RR to revise paper to include the above.

The paper will present options but we need to be mindful also of the likely reception to any recommended change.

Future action

We still need to investigate the status of the mountain hare population in Scotland. This may be done through:

- Independent survey
- Using estate feedback
- Regulatory intervention to collate data from areas of concern.

We also need to define sustainable management, both where they are controlled and in an environment without control. The former may be more difficult to define given the influence intervention will have on natural fluctuations in species density and abundance. One option may be to source data by linking licensing to the provision of data and feedback in target areas.

Roles and responsibilities

RK has to date been the SRO on the mountain hare project. Given changes in the organisation, there is a case to move this to the Activity Team.

Action point: AB/MC to check whether the activity team has an SRO to offer for mountain hare work.

From: [Des Thompson](#)
To: [Ron Macdonald](#); [Fergus MacNeill](#); [Robert Raynor](#)
Cc: [Vicki Mowat](#); [Nancy Fraser](#); [Mairi Cole](#)
Subject: Mountain hare position statement: ready for issue
Date: 22 December 2014 14:06:20
Attachments: Mountain hare position statement - 22 December 2014 FINAL.docx

Fergus

Here is the final agreed position statement on mountain hares. Can we please issue this tomorrow with a press release. It should have a quote from Ron and from [REDACTED].

The last email I saw on the PR aspect was from Vicki, at the bottom of this email.

Unless plans have been progressed, we should have a press release announcing the new study (under Rob's direction) and this joint statement. I'm in Silvan for rest of today if we need to chat.

Des

Thanks, Rob. Looks good! I've made two or three minor suggestions.

As far as the quotes from partners, I've spoken to [REDACTED] at GWCT who was going to pass along to [REDACTED] that we'd like a quote from him. I suspect his quote will focus on the moratorium possibly though, more than the study, but that's up to them. No one had mentioned the possibility of the JHI having a quote, but if you have a contact, we could ask. But I'm more concerned about getting this release out quickly - is it important they have a quote, Rob? If so, do you have a contact you could quickly ask for a quote, or pass along to me and I'll check?

Ron, once you've had a look at the release, can you let me know and I'll pass it along to [REDACTED] [REDACTED] for a quote.

We also have to figure out where the statement should go on the website and arrange that with the web team - any thoughts? If they can't do it in time, we could perhaps put it in with the news releases, but that's not ideal.

Cheers,
Vicki

SNH-GWCT-SL&E POSITION ON LARGE-SCALE CULLS OF MOUNTAIN HARES TO REDUCE LOUPING ILL

The mountain hare is the only native species of hare or rabbit in Britain. In Scotland, heather moorland actively managed for red grouse, provides very good habitat for this species.

The mountain hare is listed under Annex V of the EC Habitats Directive (1992) as a species '*of community interest whose taking in the wild and exploitation may be subject to management measures*'. Under Article 14, Scotland is required to ensure that the exploitation of such a species '*is compatible with their being maintained at a favourable conservation status*' (FCS). This requires active monitoring of the population, and as a first step towards maintaining FCS, Scotland introduced closed seasons under the Wildlife & Natural Environment (Scotland) Act 2011.

Favourable Conservation Status (FCS)

FCS uses trends in population numbers, range and habitat availability to draw conclusions about the conservation status of a species and its future prospects. For mountain hares we believe that management of the species at FCS means maintaining the population across its range, and maintaining a range which is comparable to the one which was assessed when the Directive came into force in the 1990s. Habitats associated with the high densities of hares in Scotland also need to be maintained.

The Issue

The mountain hare is a quarry species in Scotland and has been for hundreds of years. The impact of harvesting or culling on its population is, however, poorly understood. We do know that population sizes can fluctuate widely (up to ten fold) but that habitat fragmentation can affect their dispersal ability, and the likelihood of losing populations increases where they cannot re-colonize from elsewhere. SNH has received reports of heavy culls leading to local declines, and there is evidence that populations have been lost where former grouse moors have reduced management, been afforested, or heather has declined due to heavy grazing by other animals. Heather moorland habitats actively managed for red grouse can have unusually high densities of mountain hares when compared with where they occur in Scandinavia, the Boreal/Arctic zone and the Alps in continental Europe.

Given these concerns, a sub-group of experts from SNH's Scientific Advisory Committee (chaired by Professor Alan Werritty) is reviewing the management of mountain hares as one of a number of issues connected with sustainable moorland management practices. This review is due to be completed by March 2015.

SNH, GWCT and SL&E interim-position

We recognise there are genuine concerns being expressed about the status of mountain hares in Scotland, and we need to ensure that current hare management

measures are not damaging their long-term prospects. As well as sustainable game shooting, we recognize that controlling mountain hares is a legitimate practice in certain circumstances: for example, to protect young trees or as a quarry species. Large-scale culls of mountain hares to reduce tick loads, in order to benefit grouse and other bird survival, will only be effective when other hosts are absent, or their ability to host ticks are similarly reduced. This will not be the case for many estates in Scotland.

On the basis of the available evidence, there is no compelling field evidence for undertaking large-scale mountain hare culls to control LIV in areas of Scotland where there are high densities of other tick-bearing mammals. Culls should therefore not be undertaken for this purpose in these circumstances.

We recognise that there are concerns about the potential negative impacts of culling on the resilience of mountain hare populations and other protected species. To this end we:

- Will work with estates to put in place effective and sustainable management of mountain hares;
- Recommend that this management should aim to maintain mountain hares as part of the moorland wildlife assemblage, and not eliminate them;
- Ask estates to adhere to a voluntary restraint on large culls which could jeopardise the conservation status of mountain hares (SNH and GWCT can advise on this);
- Recommend that if the objective of hare culling is to support grouse shooting or to allow woodland regeneration, there needs to be evidence of sufficient management of deer and sheep to sustain these objectives; and
- Urge that any hare culling undertaken should be localized, rather than at a landscape scale.

This position may change as a result of new research and the outcome of the SNH SAC review of sustainable moorland management.

New research

SNH is working with scientists from the James Hutton Institute and the Game & Wildlife Conservation Trust to trial methods of measuring mountain hare numbers to underpin better monitoring and to improve the quality of the information used to assess population status and the sustainability of hare management measures. The work will be carried out across three years to ensure a robust evidence-base, and is due to be completed in 2017.

ANNEX

The mountain hare is listed under Annex V of the EC Habitats Directive (1992) as a species '*of community interest whose taking in the wild and exploitation may be subject to management measures*'. Moreover, Article 14 of the Directive requires

Member States to ensure that the exploitation of such species 'is compatible with their being maintained at a favourable conservation status'.¹

Evidence on culling mountain hares

Laurenson *et al.*, 2003 presented evidence indicating that culling hares to low densities (thereby reducing host tick burdens) could reduce the prevalence of Louping Ill Virus (LIV) in young, shot red grouse on managed grouse moors. Importantly, the study took place on an estate where, there were naturally very few deer (and the sheep present were treated with an acaricide and vaccinated against LIV). Red deer provide an alternative host for ticks, but they do not display symptoms of LIV. Therefore, reducing mountain hare density in areas with high densities of red deer will not reduce LIV, because the virus is maintained in the grouse population with the tick population maintained by deer (Gilbert *et al.*, 2001).

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¹ Further restrictions on the control of both hare species exist in the form of Closed Seasons, introduced by the 2011 Wildlife & Natural Environment (Scotland) Act.

MT briefing
Mountain hare





Summary	<p>Over winter 2016/17, several images were published in mainstream and social media of multiple dead mountain hares. This raised public concern, particularly the charity OneKind. Concurrent with this, new data emerged from an independent researcher (██████████) of significant declines in hare populations in the North East of Scotland between c. 1950 and early 2000s. This data was analysed by the RSPB and paper submitted to a scientific journal for publication. The paper has since been delayed but is likely to be published. The existence of this data became widespread knowledge and OneKind have been pursuing a campaign – including social media – for a moratorium on hare control until such times as the hare population has recovered.</p> <p>As a consequence of the media traffic, Scottish Government contacted us in February indicating the Cabinet Secretary’s interest in increasing regulation around mountain hare control. We provided an initial response for this. However, in preparing this response it was apparent that further analysis of data was required to support a robust scientific position. We commissioned a reanalysis of the data used for the previous Article 17 report and received this in July. This does not provide clear evidence of a national decline in mountain hares.</p> <p>In pursuing this, we have provided a number of responses to PQs and, latterly, have been asked for evidence for the Petitions Committee to consider a petition submitted by OneKind. The deadline for this is 6 October. The information below summarises the evidence being offered to this Committee. Scottish Government are being kept advised.</p>
Key points	<ol style="list-style-type: none"> 1. Reanalysis of the BTO breeding bird survey (BBS) data and GWCT Gamebag census data (NGC) do not support a national decline as implied by the data to be published by ██████████ and RSPB. 2. The BBS data shows evidence of a decline in the national population between 1996 and 2010/11 but this has been followed (since 2012) by a consistent rise in numbers. The NGC data over the same period shows a (statistically non-significant) upward trend. These data are suggestive of a population cycle (known in mountain hares to vary between 5 and 15 years) however further data is required to monitor the ongoing trends. 3. The ██████████ data relates to the NE of Scotland. Evidence from this cannot be extrapolated to a national decline but may be suggestive of population issues on local moorland sites.
Lines being taken	<ul style="list-style-type: none"> • Further data are required to clarify whether the evidence is showing a long-term population cycle and whether (or not) the species remains in Favourable Conservation status (the conclusion from the 2013 Article 17 report). • We recognised the disparity between the national and NE data and that the latter may reflect local management issues. • We will be publishing a report in January on survey methods for mountain hare and will subsequently be looking to develop these into a surveillance programme to alert us early to any significant population changes. • We support development of guidance being drafted by the Moorland Forum on Principles of Moorland Management for mountain hare, which will include estate-level management planned and reporting of control efforts that may support the surveillance programme.
Key documents	<ul style="list-style-type: none"> • Advice to Scottish Government (October 2017) • Response to the Petitions Committee (October 2017)
Contact	<ul style="list-style-type: none"> • Mairi Cole

- | | |
|--|--|
| | <ul style="list-style-type: none">• Rob Raynor |
|--|--|

Draft Guidance Mountain Hare Management

This guidance is to help land managers sustainably manage mountain hare populations in the short and long term, and over large areas. It is complementary to, and underpins the Joint Statement (December, 2014), which calls for voluntary restraint on large hare culls and urges that any hare culling undertaken should be localized, rather than at a landscape scale. This guidance is an evolving document and will be reviewed and updated when necessary.

It has been prepared by representatives of the Game & Wildlife Conservation Trust (GWCT), The Scottish Gamekeepers' Association (SGA), Scottish Land & Estates (SLE), Scottish Natural Heritage (SNH), and The James Hutton Institute (JHI) and reviewed by the PoMM Steering Group.



1 Mountain Hares in Scotland	<p>1.1 The mountain hare is the only native hare species in the British Isles. In Scotland, it is a widespread and sometimes locally numerous species.</p> <p>1.2 Mountain hares are a valued quarry species and a locally important grazer/browser. They can be an important prey species for predators such as golden eagles and are enjoyed as a wildlife spectacle.</p>
2 The Law and Mountain Hare management    	<p>2.1 Mountain hares are a European species 'of community interest' the hunting of which may be controlled by Governments to ensure the species is doing sufficiently well in terms of quality and quantity, and has good prospects of doing so in the future.</p> <p>2.2 In support of this, Scottish Government has introduced closed seasons and restrictions on the species sale as game. SNH maintains an overview of changes in the status of the population.</p> <p>2.3 Between 1st March and 31st July (the close season), it is an offence to intentionally or recklessly kill, injure or take a mountain hare.</p> <p>2.4 Outside this close season, (1 August - 28/29 February),</p>






Comment [RR1]: Wasn't this removed with repeal of the Game Acts and replaced with close seasons?

Comment [AMac2]: Yip will delete 2.2

Comment [MC3]: Not sure what this means. It implies active management but I don't think this is what we do. Even if we received bag records, it still wouldn't give us an overview of population changes as expressed

Comment [AMac4]: Relates to our reporting requirements ie we try to understand what the population is doing... We do not want to go into the intricacies of section 17 reporting : will delete here and put in under 2.1

 	<p>mountain hares may be legally killed by shooting.</p> <p>2.5 A licence MUST be held:</p> <p>2.5.1 To take hares in the close season</p> <p>2.5.2 To take mountain hare in ways which are not permitted by law. These include the use of: snares, spotlight thermal imaging, semi-automatic weapons, non-selective traps.</p> <p>2.6 Licences may only be issued by SNH for specific purposes including the prevention of the spread of disease, preventing serious damage or for social, economic or environmental purposes.</p> <p>2.7 See Section 9.1 Further detail and information - Licensing</p>
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<p>3 Sustainable Management</p>     	<p>3.1 Need to Manage. Managers choosing to actively manage mountain hare numbers SHOULD follow a four-stage process in management planning:</p> <p>3.1.1 Identify land use objectives for the area</p> <p>3.1.2 Identify targets for the hare population commensurate with those land management objectives.</p> <p>3.1.3 Identify hare management actions</p> <p>3.1.4 Share the plan with neighbours to account for objectives on adjacent land-holdings.</p> <p>3.2 Management Plan. Management Plans SHOULD include <i>Objectives Targets and Actions</i> and how these will be undertaken, reviewed and adapted. A management plan brings these elements together. An example plan can be found on the Moorland Forum Website. Please see Section 9 for the link.</p> <p>3.3 Management Objectives. A statement of the management area's main land uses will help identify whether management of the hare population is necessary and inform any other management required. Mountain hare management objectives may include:</p> <p>3.3.1 Conservation of hares (Section 5)</p> <p>3.3.2 Sporting (Section 6)</p> <p>3.3.3 Disease management (Section 7)</p> <p>3.3.4 Habitat protection (Section 8)</p> <p>3.4 Management Targets. Managers SHOULD identify whether they seek to maintain, increase or reduce the hare population, on identified areas, over given times depending on the objectives. In setting targets:</p> <p>3.4.1 Managers SHOULD describe the current size</p>
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- Comment [MC5]: 'Should' or 'Must'? Why is this capitalised?
- Comment [AMac6]: Part of the wider style which will be defined for all the guide as an introduction to the PoMM suite. Is in line with the WDBP, Deer Code and the Land Commission developing codes
- Comment [MC7]: ...commensurate with land management objectives...
- Comment [AMac8]: Yip will add
- Comment [MC9]: As above
- Comment [RR10]: Why not just have an embedded link in the text here?
- Comment [AMac11]: There will be live links 'produced' for publication
- Comment [MC12]: This section is misleading
- Comment [AMac13]: See comments later
- Comment [MC14]: As above

of their population and where known, levels in the previous five years when setting objectives. This is a baseline against which to assess management effects and describe whether the population is stable, growing or declining.

- 3.4.2 Hare populations cycle from high to low abundance, with the frequency and timing of the cycle varying between different areas. Understanding where your population sits on the cycle is important as it will determine to what extent or whether a cull can be taken.
See Section 4.0 for more detail.

Comment [RR15]: But needs to link clearly to the next section

- 3.5 **Management Actions.** SHOULD identify what and how actions are to be carried out to meet identified targets.

- 3.5.1 This may include mitigation measures such as predator control or cull methods.
3.5.2 Management actions may also identify what additional information will be collected to inform management such as parasite burdens or grazing pressures.

- 3.6 **Management Review:**

- 3.6.1 An element of caution SHOULD be built into plans with the results of management being regularly reviewed.
3.6.2 Hare populations are influenced by a range of environmental and ecological factors and prone to unpredictable changes in abundance.
3.6.3 Managing hare populations SHOULD be reactive and adaptive to these many factors.

Comment [MC16]: Not sure why the reference to "caution"? Regular review is simply good practice





Comment [AMac17]: The regular review is not to be cautious by the caution should be bu

Comment [MC18]: These two paras seem to undermine the rigour that 3 4 1 tried to bring into the system

- 3.7 **Sharing Management plans** at landscape scales:

- 3.7.1 Managers SHOULD be able to demonstrate that their sustainable management planning is well reasoned and based on best current understanding
3.7.2 Managers SHOULD co-ordinate management, including counting efforts, conservation (predator control and habitat) and culls across wider areas and share information.
3.7.3 To promote sustainable management, groups of land managers SHOULD make their amalgamated count and cull data available through the National Game Bag Census (GWCT), Wildlife Estates Scotland (SLE), Green Shoots (BASC) or their own dedicated web pages. All such data should be freely available to SNH on request.

Comment [AMac19]: Perhaps but we can't really say they are wrong \we take exactly this approach for deer management planning... What we are asking for is the management plan has the key needs of count, objectives, assessment, plan cull, implement, and then review... 3 6 2 and 3 6 3 all will be built into that process

<p>4 Counting Mountain Hares</p>   	<p>4.1 SNH, GWCT and JHI are working to validate different count methods by the end of January 2018⁷, and this document will be updated with that information as soon as possible.</p> <p>4.2 No one single, simple, standard and widely applicable method has yet been validated. A repeatable estimate of mountain hare abundance SHOULD be carried out, and can be achieved by:</p> <p>4.2.1 Direct counts, such as counting with dogs, spotting using lamps or thermal imaging equipment, and vantage point surveys. These methods are affected by day-to-day changes in their behaviour and distribution.</p> <p>4.2.2 Indirect counts, particularly by clearing accumulated dung from plots has been shown to provide an index where enough time is allowed for dung to accumulate on sufficient plots.</p> <p>4.2.3 Sharing the count method used and being consistent in area, time of day, time of year and survey effort will help to demonstrate that count data are a reliable reflection of population trend.</p> <p>4.3 For efficiency, mountain hares COULD be recorded when undertaking other duties.</p> <p>4.4 The method used SHOULD be agreed in advance with neighbouring land-holdings, and the collated results shared.</p>
<p>5 Objective: Conservation and recovery</p> 	<p>5.1 Mountain hares are part of Scotland's natural heritage. Conservation and re-establishment of the species allows them to act as browsers, to be prey for predators and be enjoyed as a wildlife spectacle.</p> <p>5.2 Mountain hares appear to benefit from management activity typically associated with moorland management for red grouse.</p> <p>5.3 Legal control of known hare predators may reduce mortality of mountain hares locally, but population level effects are unknown.</p> <p>5.4 Supplementary food supply and gut parasite control of mountain hare have both delivered measurable effects in</p>

Comment [RR20]: Should say that undertaking repeat counts using the same method, route, time of day/night, weather conditions and in the same season will improve the reliability of any estimates generated

MC - Doesn't 4.2.3 say this?

Comment [AMac21]: I do think that 4 2 3 does cover this

Comment [RR22]: This is a slightly odd way of expressing this What you mean is "allows them to fulfil their natural role in the upland ecosystem" (or food web, if you prefer)

Comment [MC23]: Agree with Rob They are part of the ecosystem I'm not sure why it needs to be justified beyond this?

Comment [AMac24]: Is not allows them to fulfil their natural role in the upland ecosystem a rather over used and misunderstood series of vague terms ... Would suggest that the statement is not wrong

Comment [MC25]: Reduce what mortality? Legal control, by definition, would tend to increase mortality, unless it's alluding to something else?

Comment [AMac26]: This is about the impact of legal control of predators on hare Have added the

Comment [MC27]: For mountain hares??

Comment [AMac28]: added

experimental research, but neither appear to be cost effective management tools.

6 Objective: Sporting



- 6.1 Numbers shot SHOULD not reduce the future population size to a level that risks a sharp decline (crash) in that population.
- 6.2 Numbers shot annually greater than the annual growth rate will usually decrease hare population size. Numbers shot should take account of natural fluctuations in mountain hare numbers due to natural changes in mortality and reproduction.
- 6.3 Harvest plans SHOULD include an adaptive element and be reviewed annually in light of counts of mountain hare numbers and management targets.
- 6.4 Harvest plans SHOULD be co-ordinated between neighbouring properties.
- 6.5 As with all shot game, mountain hares SHOULD be treated with respect. Handling, transport and storage should be done sensitively, noting the potential value of shot game, food hygiene requirements and the diversity of views on hunting.

Comment [MC29]: Sharp decline or unsustainably low population?

Comment [AMac30]: Again is about style Crash is a term that practitioners understand Have suggested that we need to be a bit more ruthless with editing so can pick up language when next version comes around

7 Objective: Disease Control



- 7.1 SNH, SLE and GWCT agree that mountain hare culls cannot be justified for tick and Louping Ill Virus (LIV) control to benefit red grouse where other tick hosting species, particularly red deer, are supporting ticks and disease transmission, or where tick and disease levels are low.
- 7.2 The health of sheep and red grouse can be improved by reducing the abundance of tick (*Ixodes ricinus*) and a disease, Louping-ill, they can transmit.
- 7.3 Culling mountain hares SHOULD NOT be the first step in tick and tick-borne disease management.
- 7.4 With the correct application of management techniques (limiting deer numbers and treating sheep with acaricide dips and anti-viral vaccination) it is possible to suppress tick and LIV to levels where the impact on sheep flock health and red grouse is reduced to a minimum.
- 7.5 In rare situations, LIV prevalence may not decline


Comment [MC31]: This section is very confused and doesn't present our position well Mountain hare management is low on the priorities for any disease control but this isn't coming across

Comment [AMac32]: This section is not surprisingly the contentious one and have asked that we look at this as a Steering Group ... And see if by further editing we can be more directive We do need to be sure that this does link back to the statement but that it also reflect the statement being about restraint not a moratorium

Comment [MC33]: This and the previous para are confusing Yes *Ixodes* can transmit disease but the issue is that culls of mountain hares to control this are not justified where there are other reservoirs This section seems unnecessarily repetitive given this simple message

Comment [MC34]: The 'first step' or 'at all'? This doesn't seem consistent with the message of the voluntary restraint



Comment [AMac35]: The statement is not a moratorium though?

	<p>sufficiently to allow red grouse numbers to increase to levels that support economically viable driven shooting and thus sustain moorland management inputs. If mountain hares are present, reducing their numbers over small areas and for short time periods may be considered for disease control.</p> <p>7.6 In such cases, moorland managers SHOULD take professional advice before undertaking culls carried out as part of tick and LIV management (e.g. SNH area officer, GWCT Ltd, SLE, or BASC).</p> <p>7.7 Advisors should consider evidence of disease, what management <u>is</u> in place, whether a reduction in hare numbers is needed and likely to be effective, and whether a license is required.</p>
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Comment [RR36]: Why? If there are other tick hosts present, this won't work. It can only be considered if there are no other tick hosts present

Comment [RR37]: Re-phrase or delete this

Comment [MC38]: Agree with Rob, this isn't consistent with our position or the voluntary restraint text

<p>8 Objective: Habitat and Land Use Change</p>  	<p>8.1 Habitat change through forestry or woodland planting/clearance, wind farms, or significant changes in stocking can affect mountain hares.</p> <p>8.2 The effects may be positive or negative over different time and geographic scales.</p> <p>8.3 The likely impact of changes in land use on mountain hares SHOULD be documented in mountain hare management plans.</p> <p>8.4 These SHOULD record the spatial extent and time scale of any planned reduction and an assessment of the likely impact on the local and wider mountain hare population.</p> <p>8.5 The plan should also give details of proposed monitoring, management/mitigation and review.</p> <p>8.6 Young forestry plantations can support high numbers of mountain hares, which graze on and amongst trees until the canopy closes. Management culls (see above) may be undertaken for habitat protection including woodland, scrub and bog habitats, on and off protected sites.</p>
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Comment [RR39]: But evidence of hare damage should be provided for the record. E.g. images of browsed shoots etc. This is to ensure that any hare mgmt for this purpose can be justified

Comment [AMac40]: Which will be covered in the management planning process

<p>9 Further Information</p>	<p>9.1 Licensing: http://www.snh.gov.uk/protecting-scotlands-nature/species-licensing/mammal-licensing/hares-and-licensing/</p> <p>9.2 Hare populations: http://www.gwct.org.uk/research/species/m</p>
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[ammals/mountain-hare/](#)

- 9.3 BTO mammal population monitoring: <https://www.bto.org/volunteer-surveys/bbs/latest-results/mammal-monitoring>
- 9.4 James Hutton Institute Mountain Hares: <http://www.hutton.ac.uk/research/groups/ecological-sciences/landscape-and-spatial-ecology/mountain-hares>
- 9.5 The latest information we have on the distribution of mountain hares can be found in a report to SNH in 2008 'The distribution of Mountain Hare (*Lepus timidus*) in Scotland (2006/07)' (Commissioned Report No. 278 <http://www.snh.org.uk/pdfs/publications/commissioned-reports/Report%20No278.pdf>)
- 9.6 Mountain Hare Management: <http://www.gwct.org.uk/policy/position-statements/mountain-hare-management/>
- 9.7 Mountain Hare Trends: <https://www.gwct.org.uk/research/long-term-monitoring/national-gamebag-census/mammal-bags-comprehensive-overviews/mountain-hare/>
- 9.8 Mountain Hare – reviewing our knowledge of landscape scale conservation.: <http://www.moorlandforum.org.uk/?>
- 9.9 Mountain Hare - Example Management Plan [http://www.moorlandforum.org.uk /?](http://www.moorlandforum.org.uk/?)
- 9.10 Tick and Louping-ill information can be found at:
- <http://www.moredun.org.uk/research/practical-animal-health-information/disease-summaries/ticks-and-diseases-they-cause>
- <http://www.moredun.org.uk/research/practical-animal-health-information/disease-summaries/louping-ill-sheep>
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Draft Guidance Mountain Hare Management







This guidance is to help land managers sustainably manage mountain hare populations in the short and long term, and over large areas. It is complementary to, and underpins the Joint Statement (December, 2014), which calls for voluntary restraint on large hare culls and urges that any hare culling undertaken should be localized, rather than at a landscape scale. This guidance is an evolving document and will be reviewed and updated when necessary.





It has been prepared by representatives of the Game & Wildlife Conservation Trust (GWCT), The Scottish Gamekeepers' Association (SGA), Scottish Land & Estates (SLE), Scottish Natural Heritage (SNH), and The James Hutton Institute (JHI) and reviewed by the PoMM Steering Group.

1 Mountain Hares in Scotland	<p>1.1 The mountain hare is the only native hare species in the British Isles. In Scotland, it is a widespread and sometimes locally numerous species.</p> <p>1.2 Mountain hares are a valued quarry species and a locally important grazer/browser. They can be an important prey species for predators such as golden eagles and are enjoyed as a wildlife spectacle.</p>
2 The Law and Mountain Hare management 	<p>2.1 Mountain hares are a European species 'of community interest' the hunting of which may be controlled by Governments to ensure the species is doing sufficiently well in terms of quality and quantity, and has good prospects of doing so in the future. <u>SNH is required to take an overview of population distribution and abundance and report this periodically to the European Commission.</u></p> <p>2.2 <u>In support of this, Scottish Government has introduced closed seasons and restrictions on the species_sale as game. SNH maintains an overview of changes in the status of the population.</u></p> <p>2.3 Between 1st March and 31st July (the close season), it is an offence to intentionally or recklessly kill, injure or</p>






Comment [AMac1]: Delete




	<p>take a mountain hare.</p> <p>2.4 Outside this close season, (1 August - 28/29 February), mountain hares may be legally killed by shooting.</p> <p>2.5 A licence MUST be held:</p> <p>2.5.1 To take hares in the close season</p> <p>2.5.2 To take mountain hare in ways which are not permitted by law. These include the use of: snares, spotlight thermal imaging, semi-automatic weapons, non-selective traps.</p> <p>2.6 Licences may only be issued by SNH for specific purposes including the prevention of the spread of disease, preventing serious damage or for social, economic or environmental purposes.</p> <p>2.7 See Section 9.1 Further detail and information - Licensing</p>
<p>3 Sustainable Management</p> 	<p>3.1 Need to Manage. Managers choosing to actively manage mountain hare numbers SHOULD follow a four-stage process in management planning:</p> <p>3.1.1 Identify land use objectives for the area</p> <p>3.1.2 Identify targets for the hare population <u>commensurate with those land management objectives.</u></p> <p>3.1.3 Identify hare management actions</p> <p>3.1.4 Share the plan with neighbours to account for objectives on adjacent land-holdings.</p> <p>3.2 Management Plan. Management Plans SHOULD include <i>Objectives Targets and Actions</i> and how these will be undertaken, reviewed and adapted. A management plan brings these elements together. An example plan can be found on the Moorland Forum Website. Please see Section 9 for the link.</p> <p>3.3 Management Objectives. A statement of the management area's main land uses will help identify whether management of the hare population is necessary and inform any other management required. Mountain hare management objectives may include:</p> <p>3.3.1 Conservation of hares (Section 5)</p> <p>3.3.2 Sporting (Section 6)</p> <p>3.3.3 Disease management (Section 7)</p> <p>3.3.4 Habitat protection (Section 8)</p> <p>3.4 Management Targets. Managers SHOULD identify whether they seek to maintain, increase or reduce the</p>

	<p>hare population, on identified areas, over given times depending on the objectives. In setting targets:</p>
	<p>3.4.1 Managers SHOULD describe the current size of their population and where known, levels in the previous five years when setting objectives. This is a baseline against which to assess management effects and describe whether the population is stable, growing or declining.</p> <p>3.4.2 Hare populations cycle from high to low abundance, with the frequency and timing of the cycle varying between different areas. Understanding where your population sits on the cycle is important as it will determine to what extent or whether a cull can be taken. See Section 4.0 for more detail.</p>
	<p>3.5 Management Actions. SHOULD identify what and how actions are to be carried out to meet identified targets.</p> <p>3.5.1 This may include mitigation measures such as predator control or cull methods.</p> <p>3.5.2 Management actions may also identify what additional information will be collected to inform management such as parasite burdens or grazing pressures.</p>
	<p>3.6 Management Review:</p> <p>3.6.1 An element of caution SHOULD be built into <u>any actions arising from</u> plans with the results of management being regularly reviewed.</p> <p>3.6.2 Hare populations are influenced by a range of environmental and ecological factors and prone to unpredictable changes in abundance.</p> <p>3.6.3 Managing hare populations SHOULD be reactive and adaptive to these many factors.</p>
	<p>3.7 Sharing Management plans at landscape scales:</p> <p>3.7.1 Managers SHOULD be able to demonstrate that their sustainable management planning is well reasoned and based on best current understanding</p> <p>3.7.2 Managers SHOULD co-ordinate management, including counting efforts, conservation (predator control and habitat) and culls across wider areas and share information.</p>
	<p>3.7.3 To promote sustainable management, groups of land managers SHOULD make their amalgamated count and cull data available through the National Game Bag Census (GWCT), Wildlife Estates Scotland (SLE), Green Shoots (BASC) or their own dedicated web pages. <u>This data should be made available</u></p>




	<u>to SNH if requested.</u>
<p>4 Counting Mountain Hares</p>   	<p>4.1 SNH, GWCT and JHI are working to validate different count methods by <u>January 2018</u>, and this document will be updated with that information as soon as possible.</p> <p>4.2 No one single, simple, standard and widely applicable method has yet been validated. A repeatable estimate of mountain hare abundance SHOULD be carried out, and can be achieved by:</p> <p>4.2.1 Direct counts, such as counting with dogs, spotting using lamps or thermal imaging equipment, and vantage point surveys. These methods are affected by day-to-day changes in their behaviour and distribution.</p> <p>4.2.2 Indirect counts, particularly by clearing accumulated dung from plots has been shown to provide an index where enough time is allowed for dung to accumulate on sufficient plots.</p> <p>4.2.3 Sharing the count method used and being consistent in area, time of day, time of year and survey effort will help to demonstrate that count data are a reliable reflection of population trend.</p> <p>4.3 For efficiency, mountain hares COULD be recorded when undertaking other duties.</p> <p>4.4 The method used SHOULD be agreed in advance with neighbouring land-holdings, and the collated results shared.</p>
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	<u>mountain hare</u> have both delivered measurable effects in experimental research, but neither appear to be cost effective management tools.
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<p>6 Objective: Sporting</p>     	<p>6.1 Numbers shot SHOULD not reduce the future population size to a level that risks a sharp decline (crash) in that population.</p> <p>6.2 Numbers shot annually greater than the annual growth rate will usually decrease hare population size. Numbers shot should take account of natural fluctuations in mountain hare numbers due to natural changes in mortality and reproduction.</p> <p>6.3 Harvest plans SHOULD include an adaptive element and be reviewed annually in light of counts of mountain hare numbers and management targets.</p> <p>6.4 Harvest plans SHOULD be co-ordinated between neighbouring properties.</p> <p>6.5 As with all shot game, mountain hares SHOULD be treated with respect. Handling, transport and storage should be done sensitively, noting the potential value of shot game, food hygiene requirements and the diversity of views on hunting.</p>
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<p>7 Objective: Disease Control</p>   	<p>7.1 SNH, SLE and GWCT agree that mountain hare culls cannot be justified for tick and Louping Ill Virus (LIV) control to benefit red grouse where other tick hosting species, particularly red deer, are supporting ticks and disease transmission, or where tick and disease levels are low.</p> <p>7.2 The health of sheep and red grouse can be improved by reducing the abundance of tick (<i>Ixodes ricinus</i>) and a disease, Louping-ill, they can transmit.</p> <p>7.3 Culling mountain hares SHOULD NOT be the first step in tick and tick-borne disease management.</p> <p>7.4 With the correct application of management techniques (limiting deer numbers and treating sheep with acaricide dips and anti-viral vaccination) it is possible to suppress tick and LIV to levels where the impact on sheep flock health and red grouse is reduced to a minimum.</p>
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Comment [AMac2]: This section is not surprisingly the contentious one and suggest that Steering Group convene and see if by further editing we can be more directive We do need to be sure that this does link back to the statement but that it also reflect the statement being about restraint not a moratorium

	<p>7.5 In rare situations, LIV prevalence may not decline sufficiently to allow red grouse numbers to increase to levels that support economically viable driven shooting and thus sustain moorland management inputs. If mountain hares are present, reducing their numbers over small areas and for short time periods may be considered for disease control.</p> <p>7.6 In such cases, moorland managers SHOULD take professional advice before undertaking culls carried out as part of tick and LIV management (e.g. SNH area officer, GWCT Ltd, SLE, or BASC).</p> <p>7.7 Advisors should consider evidence of disease, what management <u>is</u> in place, whether a reduction in hare numbers is needed and likely to be effective, and whether a license is required.</p>
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<p>9 Further Information</p>	<p>9.1 Licensing: http://www.snh.gov.uk/protecting-scotlands-nature/species-licensing/mammal-licensing/hares-and-licensing/</p>

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- 9.2 Hare populations: <http://www.gwct.org.uk/research/species/mammals/mountain-hare/>
- 9.3 BTO mammal population monitoring: <https://www.bto.org/volunteer-surveys/bbs/latest-results/mammal-monitoring>
- 9.4 James Hutton Institute Mountain Hares: <http://www.hutton.ac.uk/research/groups/ecological-sciences/landscape-and-spatial-ecology/mountain-hares>
- 9.5 The latest information we have on the distribution of mountain hares can be found in a report to SNH in 2008 'The distribution of Mountain Hare (*Lepus timidus*) in Scotland (2006/07)' (Commissioned Report No. 278 http://www.snh.org.uk/pdfs/publications/commissioned_reports/Report%20No278.pdf)
- 9.6 Mountain Hare Management: <http://www.gwct.org.uk/policy/position-statements/mountain-hare-management/>
- 9.7 Mountain Hare Trends: <https://www.gwct.org.uk/research/long-term-monitoring/national-gamebag-census/mammal-bags-comprehensive-overviews/mountain-hare/>
- 9.8 Mountain Hare – reviewing our knowledge of landscape scale conservation.: <http://www.moorlandforum.org.uk/?>
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<http://www.moredun.org.uk/research/practical-animal-health-information/disease-summaries/ticks-and-diseases-they-cause>
<http://www.moredun.org.uk/research/practical-animal-health-information/disease-summaries/louping-ill-sheep>
-

Example Management Plan for Mountain Hares at XXXXX
20XX to 20XX season

1. Management Objectives

- 1.1. **Primary Use:** The moorland area of Xha is primarily used for sport shooting, stalking, and farming. There is an intention to protect semi-native woodland, about X% of this area.
- 1.2. **Background:** Mountain hares have always been resident on this moor and appear in variable numbers as part of the game bag over the current and previous ownership.
- 1.3. **Management:** The moor sees active predator control and habitat management for heather dominated moorland.
- 1.4. **Objectives:** Given these uses our objectives for the mountain hare population:
 - 1.4.1. Sporting – maintain and increase
 - 1.4.2. Habitat protection – locally decrease

Comment [RR1]: I think there needs to be something in here to support this How has the estate come to the conclusion that the woodland is suffering hare damage – evidence? Without this evidence, there is no way of independently assessing whether protecting trees is the primary/sole motivation for control

2. Management Targets

- 2.1. **Counts:** Mountain hares are counted using:
 - 2.1.1. the same recording method (during spring and summer grouse counts)
 - 2.1.2. regularly (every year).
 - 2.1.3. over the same X areas of Xha.
 - 2.1.4. This method is also used by X neighbours.
- 2.2. **Numbers:** We are seeing around X hares in spring and X hares in summer
 - 2.2.1. Compared against our bag records and having consulted with GWCT and neighbours we believe these data indicate the current population is at a medium-high level for this area
- 2.3. **Targets 1:** We seek to cull hares across the moor at a level likely to maintain these numbers, subject to unpredicted weather and parasite effects. We expect to cull around X hares
- 2.4. **Targets 2:** We will reduce and suppress at low levels hare numbers near the woodland regeneration until at least 20XX.

Comment [RR2]: All data should also be available to SNH on request for independent verification This needs to be stated unambiguously in the text.

Comment [RR3]: This is a rather vague target Wording needs tightened

Comment [RR4]: Or the trees are sufficiently well established to be resistant to further browsing Whichever comes first

3. Management Action

- 3.1. **Shooting:** Culls will be undertaken by shooting in daylight in the first instance.
- 3.2. **Monitoring review:** We will track the population of hares by continuing our counts and recording the numbers of hares culled. We will record browsing damage on the woodland regeneration area.
 - 3.2.1. We will review this management plan in 20XX.
- 3.3. **Adaptation:** Large declines in number on the main moor will mean we will review the numbers of days shot in the next year.

4. Management at Landscape Scales.

- 4.1. **Neighbours:** We have discussed our management targets with our neighbours. They use similar counting methods and have similar targets. We believe the risk of damage to the mountain hare population from this management is very low.
- 4.2. **Sharing:** We will contribute our cull data to the National Game Bag Census (GWCT) and have shared this position in confidence with GWCT who will store it on a mountain hare management register

Comment [RR5]: Wording needs tightened "Believe" is not going to cut the mustard with critics of hare mgmt

Comment [RR6]: Comment RR2 also applies here

Management Team
Month 20xx

Mountain Hare – reviewing our knowledge of landscape scale conservation.

- 1.1 Though the mountain hares' range appears relatively stable in Scotland, and hares remain a common, slightly seen in the core of that range, some aspects of contemporary mountain hare culling, and land use change on moorland and hill-edge habitats, are raising concerns about whether the mountain hare's conservation status will remain favourable.
- 1.2 Assessments of mountain hare numbers would help address concerns over maintaining their favourable conservation status. However accurate counts are hampered by natural population cycles or fluctuations, and the lack of a monitoring technique that can assess numbers to individual levels with confidence levels. The hare's cryptic coloration and behaviour makes them hard to easily challenging to count and to assess distribution and abundance, especially when conducting spot counts, rather than constant effort monitoring (for example: the difference between occasional visits by surveyors versus local knowledge of resident land managers built up though regular, frequent exposure).
- 1.3 Despite these difficulties there is evidence that hares have declined in some areas, while in other areas their populations appear 'stable' or are increasing. The reasons for these changes are variable but three factors appear relevant:
 - 1.3.1 Changes in abundance possibly caused by disease outbreaks;
 - 1.3.2 Culling of mountain hares which can reduce mountain hare populations to low levels, particularly when culling is carried out over large areas, prolonged time periods and without reference to wider trends in mountain hare numbers, (though evidence for extirpation because of culling is lacking);
 - 1.3.3 Commercial afforestation and grassland improvement, which is likely to reduce mountain hare numbers in the longer term, (though Native woodland expansion may increase hare numbers in the short term, while but subsequent declines would lead to hares occurring at very low densities in mature native woodland in the long-term).
- 1.4 Many of the concerns around sustainability would be addressed with better estimates of hare numbers, and using these count data to better understand the effects of land management, and hare management, at large scales. Such analyses need gaps in our knowledge of mountain hare population ecology to be addressed:
 - 1.4.1 How can we count hares better? The development of reliable methods for estimating mountain hare numbers is a high priority for a wide range of stakeholders.
 - 1.4.2 What has driven loss of mountain hares outside the moorland core? Have populations been lost where moorland management for red grouse has declined, land has been commercially afforested, or where the heather has declined due to heavy grazing by other animals.
 - 1.4.3 How do mountain hares move and disperse, particularly in response to culling and land use change? Currently there is contradictory evidence which suggests mountain hares exhibit both a low dispersal rate and dispersal distance, and yet can recolonise areas from neighbouring populations.
 - 1.4.4 What is the effect of different levels of culling on population density and growth rate at different stages of the population cycle and how do these interact?

Comment [RR1]: It is being re-assessed in 2018, so probably best not to assume anything at this stage.

Comment [RR2]: Re-phrase? Need to express it in terms of hare density, i.e. the number of hares/km².

Comment [RR3]: I'm not sure this is the correct term – just say "observation over time by site-based staff". I think this whole sentence could be re-phrased to make it clearer and more accurate.

Comment [RR4]: Use "unclear" instead!

Comment [RR5]: Refer to forthcoming study – due to be published in January 2018

1.4.5 What are the impacts of climate change on mountain hares?

From: [REDACTED]
To: [Robert Raynor](mailto:Robert.Raynor@snh.gov.uk)
Subject: RE: Habitats Directive Reporting (Article 17) - Mountain Hare - Hunting bag numbers
Date: 03 August 2017 16:26:26
Attachments: image001.jpg
SNH_MountainHare_GAMgraphs.docx

Hi Rob,

Here are some graphs showing how GAMs with different numbers of degrees of freedom (df) remove the cyclicity from the Mountain Hare bag indices to reveal the underlying trend. In my opinion, the trends in the last two graphs, with 5 and 6 df, are already being influenced by the cyclicity, particularly towards the ends of the time series where the trough (left end) and peak (right end) is pulling the trend line downwards and upwards respectively. Conversely, there is still very little flexibility in the GAM with 2 df, so the generally higher values in 1965-75 and generally lower values in 1976-1986 and 2000-2010 make no perceptible difference. This leaves the GAMs with 3 and 4 df: either one eliminates the cyclicity while retaining some flexibility in background trend. Personally I find the one with 3 df still rather rigid relative to the periods mentioned above, so would choose the GAM with 4 df as a the optimal smoother for calculations of change.

If you would like me to proceed with the calculations of change based on a new GAM, please let me know which GAM you would like me to use, and I shall go ahead.

Best wishes,

[REDACTED]

From: Robert Raynor [mailto:Robert.Raynor@snh.gov.uk]
Sent: 03 August 2017 10:13
To: [REDACTED]@gwct.org.uk>
Subject: RE: Habitats Directive Reporting (Article 17) - Mountain Hare - Hunting bag numbers

[REDACTED]

I tried phoning but with no success. Anyway, many thanks for this and for the previous analysis last month which is very useful. What I wanted to discuss with you is the question of any underlying trends, which of course is central to the mountain hare debate. I asked you to calculate the % change for a range of time periods which you have done, but I wonder if you would be able to look again at the data and how best to identify an underlying trend if one exists. One idea we had is to focus on the peaks in the cycles only (e.g 1957, 1972/74, 1988, 1998, (2004/6?) and 2014) but there might be a better method. Is this something that you could investigate and if so, is it a substantial task?

Happy to discuss, if you prefer.

Thanks,

Rob

Rob Raynor
Policy & Advice Officer (Mammals)
Scottish Natural Heritage
Great Glen House
Leachkin Road
Inverness
IV3 8NW

Tel: 01463 725244 (Direct)
01463 725000 (Switchboard)
Fax: 01463 723119
email: robert.raynor@snh.gov.uk

From: [REDACTED] [\[REDACTED\]@gwct.org.uk](mailto:[REDACTED]@gwct.org.uk)
Sent: 02 August 2017 10:10
To: Claire McSorley; [REDACTED]
Cc: Robert Raynor
Subject: RE: Habitats Directive Reporting (Article 17) - Mountain Hare - Hunting bag numbers

Dear Claire and [REDACTED],

In the attached file, which I sent to Rob Raynor last month, you will find the updated harvest indices for Mountain Hare. These show very clearly the cyclical nature of the returns, in line with the cyclical changes in abundance of the species (see for instance Reynolds et al., 2006, Implications of 'cyclical' population dynamics for the conservation of Irish hares (*Lepus timidus hibernicus*), J. Zool. 270: 408-413).

In terms of estimating the total Scottish harvest, the size of the pool of shoots from which the NGC draws its sample is unknown, so it is not possible to extrapolate upwards from total NGC harvest to total Scottish harvest. However, it is possible to calibrate the NGC index against the known value of 24529, being the harvest estimated for 2006/07 from Patton et al. (2010, Distribution of mountain hares *Lepus timidus* in Scotland: results from a questionnaire, Mammal Review 40: 313-326). Accordingly, in the attached file, I have added a column showing the annual harvest estimates obtained by calibration against the 2006/07 estimate. This not only gives you the harvest sizes for the last five years, but also back to 1954, so that you have the complete historical picture. Because of the uncertainties associated with the estimates, I suggest that they be rounded to the nearest thousand before reporting, so as not to give an impression of spurious accuracy.

I trust that this answers your question.

Best wishes,

[REDACTED]

[REDACTED]

[REDACTED]
Game & Wildlife Conservation Trust
Fordingbridge
Hampshire
SP6 1EF

Tel: 01425 652381
Fax: 01425 655848
Email: [REDACTED]@gwct.org.uk

From: [REDACTED]
Sent: 01 August 2017 19:21
To: Claire McSorley <Claire.McSorley@snh.gov.uk>
Cc: [REDACTED]@gwct.org.uk
Subject: Re: Habitats Directive Reporting (Article 17) - Mountain Hare - Hunting bag numbers

Claire

I'm just returning from leave so have a little catching up to do.

I'll discuss this matter with [REDACTED] who manages the NGC and we'll revert.

Best

[REDACTED]

Sent from my iPhone

On 1 Aug 2017, at 13:42, Claire McSorley <Claire.McSorley@snh.gov.uk> wrote:

Dear [REDACTED],

I am writing to you to enquire about mountain hare hunting bag numbers.

As you probably know, EU member states are required to report every 6 years on the implementation of the Habitats Directive, with mountain hare being listed on Annex V of the Habitats Directive (Annex V are those species that are taken in the wild). SNH contributes to the UK's report to Europe on the conservation status of Habitats and Species that occur in our territory. This will be the fourth UK Article 17 report since 1994, with JNCC coordinating the UK response and publishing the results on their website <http://jncc.defra.gov.uk/page-6397>.

For the current reporting period (2012-2018) the European Commission requires us to include as part of the assessment the "Hunting bag or quantity taken in the wild" for Annex V mammals and *Acipenseridae*. This would be in the form of number of individuals taken each year in Scotland for the last six years. I think the last estimate for mountain hare was in 2006/7 at 25,000 individuals.

I understand from my colleague Rob Raynor that GWCT produce hunt bag trends (which I think you are currently updating), but I wondered if you would also consider discussing with us the actual hunt bag numbers for Scotland please, with the ultimate hope that these data could be included in the UK's Art17 report?

Many thanks in advance for your time,

All the best
Claire

Dr Claire A McSorley – Species Surveillance

Knowledge and Information Management Unit | Scottish Natural Heritage | Cameron House | Oban | Argyll | PA34 4AE
t: 0300 244 9360 | mob: [REDACTED] | email: claire.mcsorley@snh.gov.uk

work pattern: Mon – Thurs 9-14:45. I do not work on Fridays.
planned leave: 3-7 August & 10-15 August inclusive

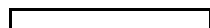
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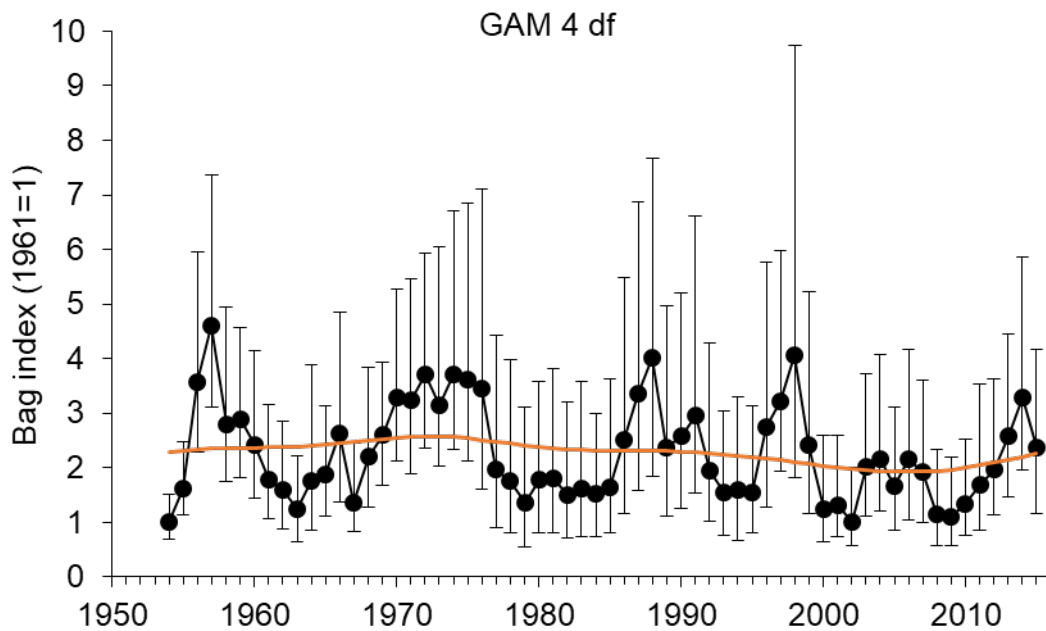
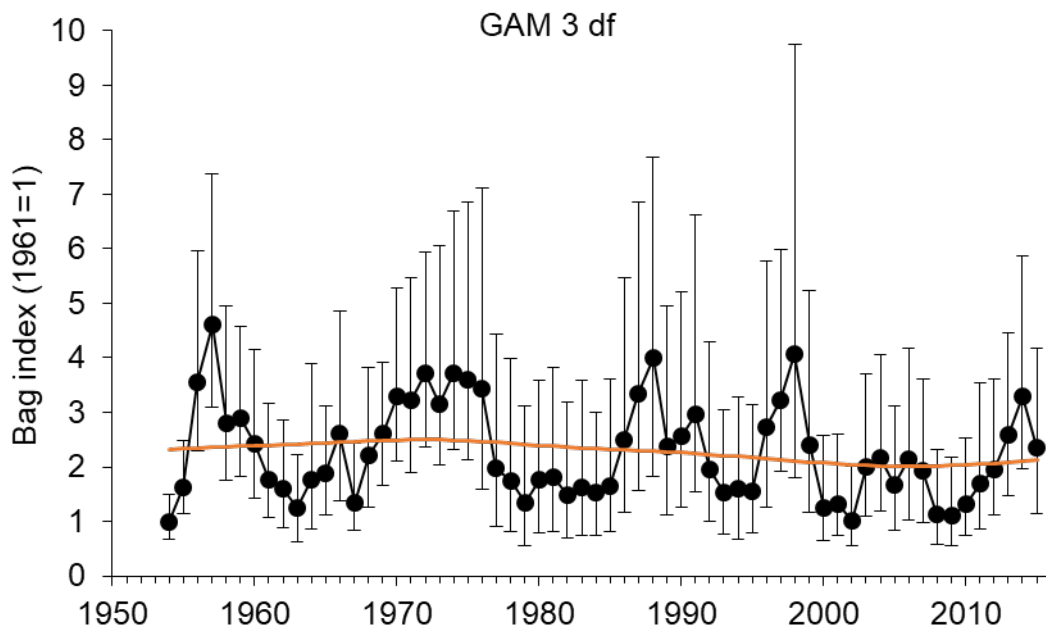
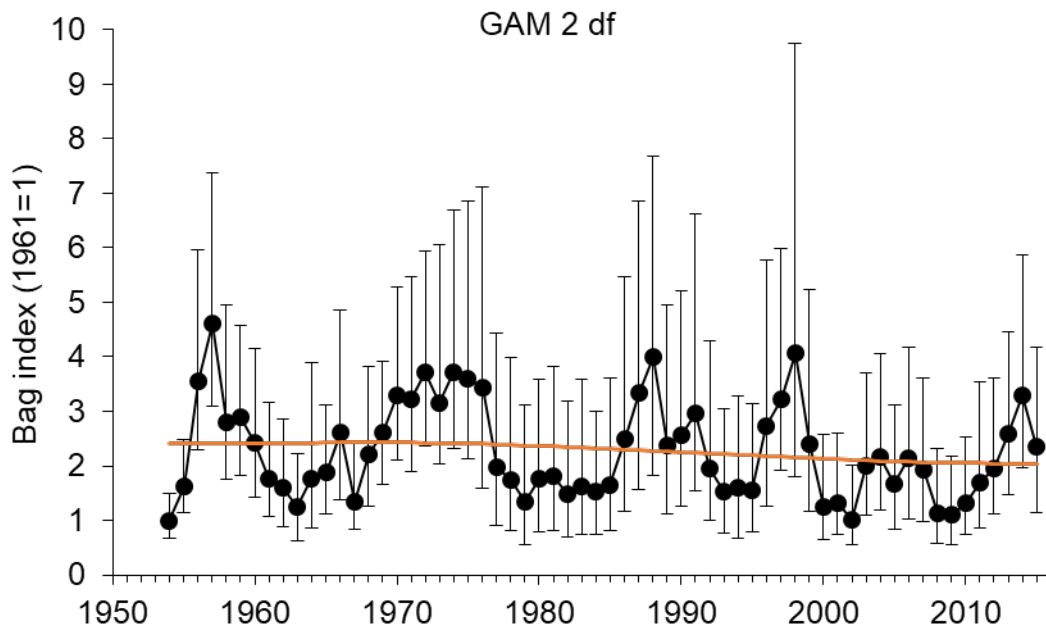
Tha am post-dealain seo agus fiosrachadh sam bith na chois dìomhair agus airson an neach no buidheann ainmichte a-mhàin. Mas e gun d' fhuair sibh am post-dealain seo le mearachd, cuiribh fios dhan manaidsear-siostaim no neach-sgrìobhaidh.

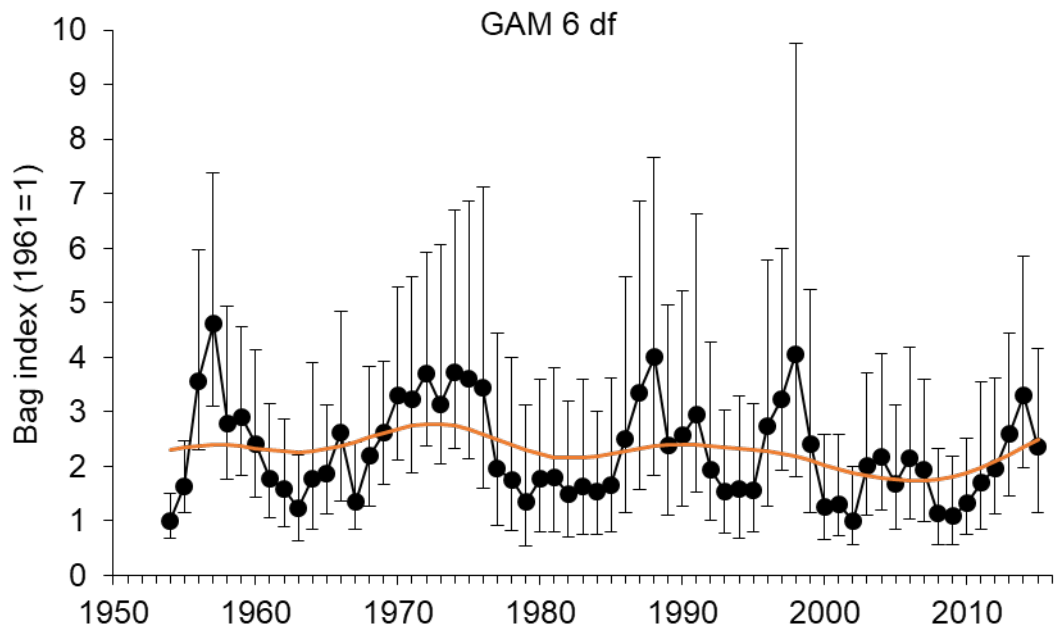
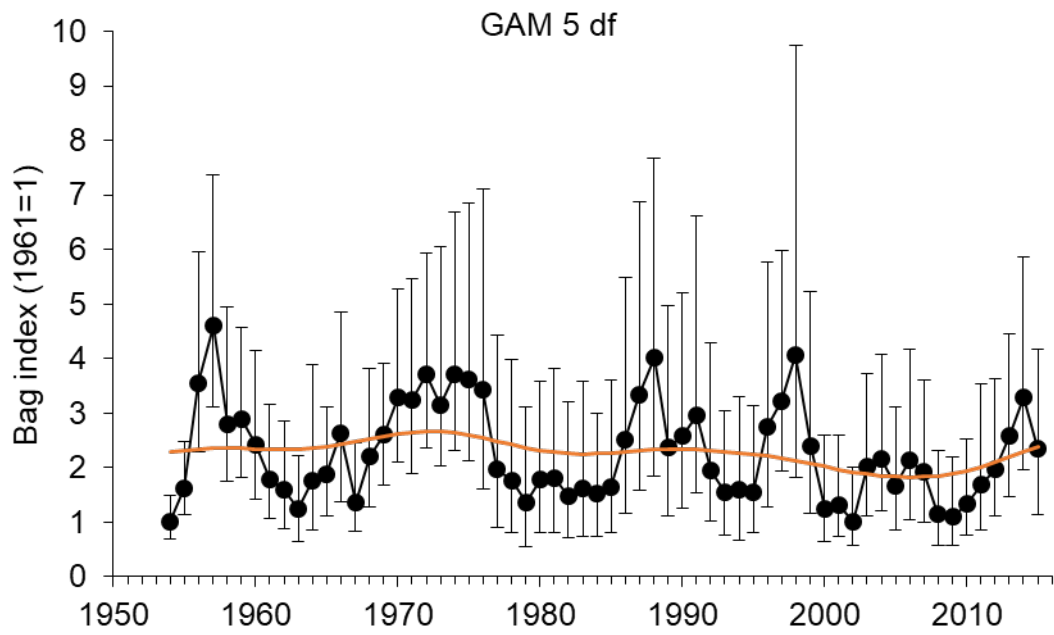
Thoiribh an aire airson adhbharan gnothaich, 's dòcha gun tèid sùil a chumail air puist-dealain a' tighinn a-steach agus a' dol a-mach bho SNH.



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From: [REDACTED]
To: [Claire McSorley](#); [REDACTED]
Cc: [Robert Raynor](#)
Subject: RE: Habitats Directive Reporting (Article 17) - Mountain Hare - Hunting bag numbers
Date: 02 August 2017 10:24:04
Attachments: SNH_MountainHare_Indices.xlsx

Dear Claire and [REDACTED],

In the attached file, which I sent to Rob Raynor last month, you will find the updated harvest indices for Mountain Hare. These show very clearly the cyclical nature of the returns, in line with the cyclical changes in abundance of the species (see for instance Reynolds et al., 2006, Implications of 'cyclical' population dynamics for the conservation of Irish hares (*Lepus timidus hibernicus*), J. Zool. 270: 408-413).

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I trust that this answers your question.

Best wishes,

[REDACTED]

[REDACTED]

[REDACTED]

Game & Wildlife Conservation Trust
Fordingbridge
Hampshire
SP6 1EF

Tel: 01425 652381

Fax: 01425 655848

Email [REDACTED]@gwct.org.uk

From: [REDACTED]
Sent: 01 August 2017 19:21
To: Claire McSorley <Claire.McSorley@snh.gov.uk>
Cc: [REDACTED]@gwct.org.uk

Subject: Re: Habitats Directive Reporting (Article 17) - Mountain Hare - Hunting bag numbers

Claire

I'm just returning from leave so have a little catching up to do.

I'll discuss this matter with [REDACTED] who manages the NGC and we'll revert.

Best

[REDACTED]

Sent from my iPhone

On 1 Aug 2017, at 13:42, Claire McSorley <Claire.McSorley@snh.gov.uk> wrote:

Dear [REDACTED],

I am writing to you to enquire about mountain hare hunting bag numbers.

As you probably know, EU member states are required to report every 6 years on the implementation of the Habitats Directive, with mountain hare being listed on Annex V of the Habitats Directive (Annex V are those species that are taken in the wild). SNH contributes to the UK's report to Europe on the conservation status of Habitats and Species that occur in our territory. This will be the fourth UK Article 17 report since 1994, with JNCC coordinating the UK response and publishing the results on their website <http://jncc.defra.gov.uk/page-6397>.

For the current reporting period (2012-2018) the European Commission requires us to include as part of the assessment the "Hunting bag or quantity taken in the wild" for Annex V mammals and *Acipenseridae*. This would be in the form of number of individuals taken each year in Scotland for the last six years. I think the last estimate for mountain hare was in 2006/7 at 25,000 individuals.

I understand from my colleague Rob Raynor that GWCT produce hunt bag trends (which I think you are currently updating), but I wondered if you would also consider discussing with us the actual hunt bag numbers for Scotland please, with the ultimate hope that these data could be included in the UK's Art17 report?

Many thanks in advance for your time,

All the best
Claire

Dr Claire A McSorley – Species Surveillance

Knowledge and Information Management Unit | Scottish Natural Heritage | Cameron House | Oban | Argyll | PA34 4AE
t: 0300 244 9360 | mob: [REDACTED] | email: claire.mcsorley@snh.gov.uk

work pattern: Mon – Thurs 9-14:45. I do not work on Fridays.
planned leave: 3-7 August & 10-15 August inclusive

From: [Eileen Stuart](#)
To: John.Gray@gov.scot
Cc: [Robbie Kernahan](#)
Subject: RE: Mountain hare legislation and management paper - March 2017 (A2158942)
Date: 31 July 2017 13:46:00
Attachments: RE Mountain hares.msg

Hi John,

For info, this paper was shared with Hugh earlier this year. There was a wee bit of follow up discussion (see attached email) but as Robbie says, we anticipate further work being led by the Short Term Working Group. We have been advising Hugh on the possible make up and terms of reference for the Group and can share that with you if that would be helpful.

Eileen

Eileen Stuart
Head of Policy & Advice
Scottish Natural Heritage

01463 725227

From: Robbie Kernahan
Sent: 31 July 2017 13:19
To: John.Gray@gov.scot
Cc: Eileen Stuart
Subject: Mountain hare legislation and management paper - March 2017 (A2158942)

Hi John,

Thanks for your call. SNH produced this paper earlier in the year, which outlines some of the options for greater regulation and control of Mountain Hare management . I don't think that this has been considered much further, as the expectation that Mountain Hare Culling may well be one of the topics for further exploration by the Short Term Working Group, announced by the Cabinet sec in relation to grouse moor management.

Give me a bell if you would like to discuss further though, or if there is anything else we can do to assist in the meantime.

Regards,

Robbie

From: [Ben Ross](#)
To: Hugh.Dignon@gov.scot
Cc: [Mairi Cole](#); [Alastair MacGugan](#); [Claudia Rowse](#); [Andrew Bachell](#); Keith.Connal@gov.scot
Subject: Re: New Board Briefing Upload - Snaring of Mountain Hares
Date: 23 March 2017 13:35:35
Attachments: image001.gif
image002.gif
image003.gif
image004.gif

Hugh

This is a possible licensing route but a very shaky one. It would likely be challenged and I think with a good chance of success

Ben

Sent from my BlackBerry 10 smartphone.

From: Hugh.Dignon@gov.scot
Sent: Thursday, 23 March 2017 13:12
To: Ben Ross
Cc: Mairi Cole; Alastair MacGugan; Claudia Rowse; Andrew Bachell; Keith.Connal@gov.scot
Subject: RE: New Board Briefing Upload - Snaring of Mountain Hares

Ben/Mairi

Discussion of options for further regulation of control of Mountain Hares with the Cabinet Secretary will be rather difficult without knowing whether there would be any possibility of licensed control. This is a key aspect. The main thing I need to know is whether or not, when you say there may be no licensable purposes, whether you have considered WCA 16(3)(i) as a licensable purpose (any other social, economic or environmental purpose)? The meeting is at 2.15 pm.

Hugh

Hugh Dignon | Wildlife and Protected Areas | Natural Resources | Environment and Forestry Directorate | Scottish Government | Victoria Quay | EH6 6QQ | 0131 244 7574 | 

From: Ben Ross [mailto:Ben.Ross@snh.gov.uk]
Sent: 23 March 2017 13:00
To: Dignon HJ (Hugh)
Cc: Mairi Cole; Alastair MacGugan
Subject: Fw: New Board Briefing Upload - Snaring of Mountain Hares

Hugh

Overview of snaring and welfare issue provided below. I'm afraid I don't think i will be able to provide answers to the other questions at the moment as am in a meeting

Ben

Sent from my BlackBerry 10 smartphone.

From: Stuart MacQuarrie <Stuart.MacQuarrie@snh.gov.uk>

Sent: Thursday, 23 March 2017 12:54
To: Ben Ross
Subject: RE: New Board Briefing Upload - Snaring of Mountain Hares

Ben,
I've edited it somewhat and it has been cleared by Ian Jardine.

Stuart

There has been a considerable amount of recent press coverage and social media comment over SNH's position on snaring of mountain hares.

Snaring of mountain hares is illegal under the legislation which covers the requirements for protected European (Natura) sites, and also those for European Protected Species, often referred to as the Habitats Regulations. However, it is possible to licence activities such as snaring which are otherwise illegal. In the past (up to around 2014) we have received a very small number of applications each year to snare mountain hares to protect woodlands. The last time we issued a licence following an application to snare mountain hares was in 2013.

In 2015 SNH licensing team sought advice from Game and Wildlife Conservation Trust and British Association for Shooting and Conservation over potential welfare issues specific to snaring hares after concerns had been raised about this. The advice received indicated that they were not aware of any means by which a snare could be designed or used in such a way so as to either humanely kill hares as target species or to humanely restrain them. As such we took the decision at that point not to licence snaring of hares in future.

There was no press release at the time related to this decision because the demand for licences to snare hares was very small (one or two per year). The issue has recently been picked up by the press following the publication of the snaring review in which reference was made to the advice and decision referred to above. The snaring review, published March 2017 is available for download here: <http://www.gov.scot/Resource/0051/00515272.pdf>

ENDS

From: Ben Ross
Sent: 23 March 2017 12:53
To: Stuart MacQuarrie
Subject: Re: New Board Briefing Upload - Snaring of Mountain Hares

Stuart
Could you possibly send me the text that I sent to you for the briefing - I need it quite urgently and don't have access to Objective
Ben

Sent from my BlackBerry 10 smartphone.

From: Stuart MacQuarrie
Sent: Thursday, 23 March 2017 09:41
To: PO_BOARD_MEMBERS

Cc: PO_MANAGEMENT_TEAM; Robbie Kernahan; Ben Ross; Shelley Rennie
Subject: New Board Briefing Upload - Snaring of Mountain Hares

Dear All,

A Board briefing on current news coverage on snaring mountain hares has been added to the Board Briefing Connect Share file. (Attached as an eRDMS reference for those on the CC list).

Stuart

Stuart MacQuarrie,

Head of Senior Management Unit

Scottish Natural Heritage

☎ +44 (0)1463 725274

✉ Stuart.MacQuarrie@snh.gov.uk

🌐 www.snh.gov.uk

🌐 <https://scotlandsnature.wordpress.com/>



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From: [REDACTED]
To: [Robert Raynor](mailto:Robert.Raynor@snh.gov.uk)
Subject: RE: NGC data - mountain hares
Date: 03 July 2017 18:25:23
Attachments: ~WRD000.jpg
image001.jpg
SNH_MountainHare_Indices.xlsx
SNH_MountainHare_Methods.docx

Hi Rob,

I'm very sorry, I got bogged down in Langholm stuff because [REDACTED] called a SCG meeting for which I needed to provide the demographic analysis just before I went on leave for a week.

I have attached the NGC analysis of Mountain Hare bags in Scotland, with the periods that you specified across the various emails, as well as the standard spans of 5, 10, 15, 20 and 25 years. The Excel file contains tables of the annual index values, their 95% confidence limits and the smoothed values, for 1954-2015 and 1995-2015, with the start years standardised to 1. The graphs are adjacent to the tables. A third sheet gives you the table of changes with their 95% confidence limits and I have marked those that differ significantly from zero with an asterisk.

I have also attached a Word document summarising the details of the analysis.

Best wishes,

[REDACTED]

From: Robert Raynor [mailto:Robert.Raynor@snh.gov.uk]
Sent: 30 June 2017 14:40
To: [REDACTED]@gwct.org.uk>
Subject: RE: NGC data - mountain hares

[REDACTED]

I'll now be on leave until 17 July but it would be good to have your NGC analysis for when I return then.

Many thanks

Rob

From: [REDACTED]@gwct.org.uk]
Sent: 19 June 2017 14:37
To: Robert Raynor
Subject: RE: NGC data - mountain hares

Hi Rob,

Thank you for this. I shall try to get it done by Friday, but it's a bit close now so may not achieve it. At the latest I can promise to get everything to you by the end of Monday 26 June, which I

hope works for you.

Best wishes,

██████████

From: Robert Raynor [<mailto:Robert.Raynor@snh.gov.uk>]

Sent: 19 June 2017 12:24

To: ██████████@gwct.org.uk>

Cc: ██████████@gwct.org.uk>

Subject: FW: NGC data - mountain hares

██████████

Further to my email below, please could GWCT quote PO66632 on the invoice for this work

Thank you,

Rob

From: Robert Raynor

Sent: 16 June 2017 15:58

To: ██████████

Cc: ██████████

██████████: NGC data - mountain hares

██████████

Thank you for this. Having given further consideration to this, I agree that individual graphs for each of the shorter time periods are not essential as these changes will also be evident in the two graphs showing the medium and longer term changes in the hare index indicated below with an asterisk.

We are still interested in calculations of change (and CIs) over the following periods:

1995-2015 (with graph)*

1954-2015 (with graph)*

1995-2003

1995-2010

2011-2015

2003-2015

Please could you present the data in a table (or series of tables) laid out such that for each year there are corresponding columns containing: the smoothed index, the unsmoothed index, and the upper and lower 95% confidence limits for each of these indices.

Please could you calculate, for each specified time period above, the trend as calculated on the smoothed index, and with 95% confidence intervals and an indication of whether the trend is statistically significant at the 0.05 level.

I can confirm that the SNH contribution to cost of this work is £[REDACTED] + VAT.

To confirm then, please can you progress this. Will this still be possible by 23 June?

Many thanks,

Rob

Rob Raynor
Policy & Advice Officer (Mammals)
Scottish Natural Heritage
Great Glen House
Leachkin Road
Inverness
IV3 8NW

Tel: 01463 725244 (Direct)
01463 725000 (Switchboard)
Fax: 01463 723119
email: robert.raynor@snh.gov.uk

From: [REDACTED]@gwct.org.uk]
Sent: 12 June 2017 10:51
To: Robert Raynor; [REDACTED]
Subject: RE: NGC data - mountain hares

Hi Rob,

I can get results back to you by 23 June, if that works at your end.

Thank you for specifying the periods that you are interested in. I am pretty certain that going back to 1954 will not be a problem – the annual surveys started in 1961, but we have extended many of our series backwards in time using historical game books, so I believe that we have adequate sample sizes to do that. In addition to the annual bag indices for the full span of years, for each of the periods that you have specified I shall provide an estimated percentage change between the start and end years, together with the associated 95% confidence limits.

As well as these estimates of change, are you really wanting seven graphs (one per period specified), or would you rather have a short-term graph (1995-2015) and a long-term one (1954-2015)?

Best wishes,

[REDACTED]

From: Robert Raynor [<mailto:Robert.Raynor@snh.gov.uk>]
Sent: 12 June 2017 09:54
To: [REDACTED]<[\[REDACTED\]@gwct.org.uk](mailto:[REDACTED]@gwct.org.uk)>

Cc: [REDACTED]@gwct.org.uk>

Subject: RE: NGC data - mountain hares

[REDACTED]

Further to this, these are the time periods that we are most interested in, so please could [REDACTED] produce graphs of change in the NGC mountain hare (Scotland) index, with confidence intervals, for the following periods:

1995-2015

1995-2003

1995-2010

2011-2015

2003-2015

In addition would it be possible to produce equivalent longer term graphs for the periods 1954-2003 and 1954-2009?

Please could you indicate when this analysis could be completed by.
Happy to discuss if that's easier.

Many thanks,

Rob

From: Robert Raynor
Sent: 08 June 2017 17:28
To: [REDACTED]
Cc: [REDACTED]
Subject: RE: NGC data - mountain hares

[REDACTED]

Thanks, yes we'd like to progress this work. I'll be in touch again v. soon with further details.

Rob

From: [REDACTED] [mailto:[REDACTED]@gwct.org.uk]
Sent: 06 June 2017 10:52
To: Robert Raynor
Cc: [REDACTED]
Subject: RE: NGC data - mountain hares

Rob

Apologies for the tardy reply.

[REDACTED] has indicated he can produce a graph for 1995-2015 change and its confidence limits. He would include calculations of change (and CIs) over the most recent 5, 10, 15, 20 and 25 years (and any other intervals that you are interested in if specified).

Because it's a bit more than simply updating our running baseline NGC index this is a morning's work - [REDACTED]+VAT. We will happily 50% match fund this in the spirit of partnership and knowledge; could you cover [REDACTED]+VAT?

Regards,

[REDACTED]

From: Robert Raynor [<mailto:Robert.Raynor@snh.gov.uk>]

Sent: 24 May 2017 13:51

To: [REDACTED]@gwct.org.uk>

Subject: NGC data - mountain hares

[REDACTED]

We're currently looking at population trend data for mountain hares in relation to the next Article 17 reporting round and I note from the GWCT website that the NGC trend for this species does not extend beyond 2009. As far I am aware, there has been no published update on the trend since the publication in 2012 of JNCC report 468 which analysed both the NGC and the BTO data for a range of mammals including mountain hare. It would be interesting to analyse the game bag data since 2009 (ideally in parallel with the BTO data). We are particularly interested in the time period 1995 - 2015 for which there is an equivalent BTO dataset and a (UK) trend published on their website. However, it is unclear what proportion of the sample used to derive this trend comes from Scotland, so I suspect further analysis would be required with that dataset to draw out the Scotland (only) trend.

In order to further our partnership working on this species, would GWCT be in a position to undertake an analysis of the NGC hare data for the same time period? Perhaps, some analysis of the data already exists within GWCT? Maybe we could have a discussion about this?

I look forward to hearing from you,

Best wishes,

Rob

Rob Raynor
Policy & Advice Officer (Mammals)
Scottish Natural Heritage
Great Glen House
Leachkin Road
Inverness
IV3 8NW

Tel: 01463 725244 (Direct)

01463 725000 (Switchboard)
Fax: 01463 723119
email: robert.raynor@snh.gov.uk

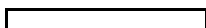
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Tha am post-dealain seo agus fiosrachadh sam bith na chois dìomhair agus airson an neach no buidheann ainmichte a-mhàin. Mas e gun d' fhuair sibh am post-dealain seo le mearachd, cuiribh fios dhan manaidsèar-siostaim no neach-sgrìobhaidh.

Thoiribh an aire airson adhbharan gnothaich, 's dòcha gun tèid sùil a chumail air puist-dealain a' tighinn a-steach agus a' dol a-mach bho SNH.



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Analysis of NGC data for Mountain Hare *Lepus timidus*

Statistical procedure

The statistical analysis followed the approach in Aebischer et al. (2011). Bag data were analysed using a generalised linear model (McCulloch & Nelder 1996) with a Poisson error distribution and logarithmic link function, with site and year as factors and the logarithm of moorland area as an offset variable. As the longest period of interest was 1954-2015, the start and end years for calculations were 1953-2016. Analysis was based on all annual shoot returns greater than zero and sites contributing only one year's data were omitted. The year coefficients from the analysis were exponentiated to give an index of bag size on the arithmetic scale, and scaled to give an index value of 1 for the start years (1954 for the long series, 1995 for the short series). The 95% confidence intervals around the index values were obtained by bootstrapping at the site level: for each of 199 bootstrap runs. In each run, sites equal in number to the original sample (213 sites) were selected at random with replacement and a new set of indices obtained as described above (Efron & Tibshirani 1986). For each year, the 95% confidence limits were taken as the lower and upper 95th percentiles of the distribution of all 200 index values.

To measure the percentage change between the first and last years of each time period, a generalized additive model (GAM, Hastie & Tibshirani 1990) was fitted to the bag indices with the degrees of freedom equal to a third of the number of years. The percentage change was calculated from the GAM fitted values for the first and last years of each period of interest. The 95% confidence limits were obtained by fitting GAMs to each bootstrap sample, calculating the percentage change, and selecting the lower and upper 95th percentiles of the 200 values that resulted. If the 95% confidence interval did not include zero, then the percentage change was declared significant at $P < 0.05$.

Analysis was carried out using the GenStat 18th edition statistical computer package (Lawes Agricultural Trust, Rothamsted).

References

- Aebischer, N.J., Davey, P.D. & Kingdon, N.G. (2011). National Gamebag Census: Mammal Trends to 2009. Game & Wildlife Conservation Trust, Fordingbridge (<http://www.gwct.org.uk/ngcmammals>).
- Efron, B. & Tibshirani, R.J. (1986). Bootstrap methods for standard errors, confidence intervals, and other measures of statistical accuracy. *Statistical Science* 1: 54-77.
- Hastie, T.J. & Tibshirani, R.J. (1990). *Generalized Additive Models*. Chapman & Hall, London.
- McCullagh, P. & Nelder, J.A. (1996). *Generalized Linear Models*, 3rd edn. Chapman & Hall, London.

From: [Megan Towers](#)
To: [Robert Raynor](#)
Subject: RE: NGC data - mountain hares
Date: 18 July 2017 11:59:10
Attachments: image002.jpg
image003.jpg

Hi Rob,

I have no problem with the analysis done as it seems like a sensible approach, although I am curious as to why 'shoot' was a fixed effect rather than a random effect. It would increase the power of these analysis, but there may well be some valid reasons that just aren't springing to my mind at the moment. (The Word document that you had attached was a copy and paste job from the website.) Also, there are no glaring 'this is odd' things on the spreadsheet that you attached. However, I would be very cautious about looking at differences that use the start or end values as these are notoriously 'flappy' as they are only anchored on one side. For example, look at 2015. The smoothed value (red lines) for 2015 is higher than the unsmoothed (black dots with error bars). The unsmoothed 2015 point is lower than 2014 and the cycles earlier in the time series suggest that this is the start of another trough. If it is, the later points will pull down the 2015 smoothed value further than it currently is which means that the estimates of change and their significance will change with it. You will need to bear this in mind with your interpretations. It is also dangerous to compare two time points that are at different points in the cycle as this isn't a true reflection of a change in population, but rather a change in population AND point in cycle. It would be better to either 1) stick to comparisons between points at the same part of the cycle (e.g. peak or trough); or 2) do some analysis that takes out the cyclical nature to reveal the underlying trend (e.g. harmonic regression) although I'm not sure that'd be straight forward as the cycles appear to be of different lengths.

I do have concerns with the data itself. The link on their website to 'interpretational considerations' discusses these potential sources of bias very well and I suggest that these are incorporated into any interpretation of this trend that you wish to make.

It would be useful if the BBS data was also incorporated into this analysis for two reasons. Firstly, the confidence intervals are narrower and so we can have more confidence in the trends observed. Secondly, there's not quite such a long list of potential biases and other things that need to be considered when interpreting this trend.

Regards,
Megan

*Megan Towers
Statistician
Scottish Natural Heritage
Great Glen House
Leachkin Road
Inverness
IV3 8NW
Direct dial: 01463 725072*

From: Robert Raynor
Sent: 17 July 2017 17:50

To: Megan Towers
Subject: FW: NGC data - mountain hares

Megan

Please see email below and the attachments. I'd be interested in any comments you may have on this analysis. For more background see <https://www.gwct.org.uk/research/long-term-monitoring/national-gamebag-census/mammal-bags-comprehensive-overviews/mountain-hare/> This analysis updates that presented on the website.

Happy to discuss if that's easier.

Thanks,
Rob

From: [REDACTED] [@gwct.org.uk](mailto:[REDACTED]@gwct.org.uk)
Sent: 03 July 2017 18:25
To: Robert Raynor
Subject: RE: NGC data - mountain hares

Hi Rob,

I'm very sorry, I got bogged down in Langholm stuff because [REDACTED] called a SCG meeting for which I needed to provide the demographic analysis just before I went on leave for a week.

I have attached the NGC analysis of Mountain Hare bags in Scotland, with the periods that you specified across the various emails, as well as the standard spans of 5, 10, 15, 20 and 25 years. The Excel file contains tables of the annual index values, their 95% confidence limits and the smoothed values, for 1954-2015 and 1995-2015, with the start years standardised to 1. The graphs are adjacent to the tables. A third sheet gives you the table of changes with their 95% confidence limits and I have marked those that differ significantly from zero with an asterisk.

I have also attached a Word document summarising the details of the analysis.

Best wishes,

[REDACTED]

From: Robert Raynor [\[mailto:Robert.Raynor@snh.gov.uk\]](mailto:Robert.Raynor@snh.gov.uk)
Sent: 30 June 2017 14:40
To: [REDACTED] [@gwct.org.uk](mailto:[REDACTED]@gwct.org.uk)>
Subject: RE: NGC data - mountain hares

[REDACTED]

I'll now be on leave until 17 July but it would be good to have your NGC analysis for when I return then.

Many thanks

Rob

From: [REDACTED]@gwct.org.uk]
Sent: 19 June 2017 14:37
To: Robert Raynor
Subject: RE: NGC data - mountain hares

Hi Rob,

Thank you for this. I shall try to get it done by Friday, but it's a bit close now so may not achieve it. At the latest I can promise to get everything to you by the end of Monday 26 June, which I hope works for you.

Best wishes,

[REDACTED]

From: Robert Raynor [<mailto:Robert.Raynor@snh.gov.uk>]
Sent: 19 June 2017 12:24
To: [REDACTED]@gwct.org.uk>
Cc: [REDACTED]@gwct.org.uk>
Subject: FW: NGC data - mountain hares

[REDACTED]

Further to my email below, please could GWCT quote PO66632 on the invoice for this work

Thank you,

Rob

From: Robert Raynor
Sent: 16 June 2017 15:58
To: [REDACTED]
Cc: [REDACTED]
Subject: RE: NGC data - mountain hares

[REDACTED]

Thank you for this. Having given further consideration to this, I agree that individual graphs for each of the shorter time periods are not essential as these changes will also be evident in the two graphs showing the medium and longer term changes in the hare index indicated below with an asterisk.

We are still interested in calculations of change (and CIs) over the following periods:

1995-2015 (with graph)*

1954-2015 (with graph)*

1995-2003
1995-2010
2011-2015
2003-2015

Please could you present the data in a table (or series of tables) laid out such that for each year there are corresponding columns containing: the smoothed index, the unsmoothed index, and the upper and lower 95% confidence limits for each of these indices.

Please could you calculate, for each specified time period above, the trend as calculated on the smoothed index, and with 95% confidence intervals and an indication of whether the trend is statistically significant at the 0.05 level.

I can confirm that the SNH contribution to cost of this work is [REDACTED] + VAT.

To confirm then, please can you progress this. Will this still be possible by 23 June?

Many thanks,

Rob

Rob Raynor
Policy & Advice Officer (Mammals)
Scottish Natural Heritage
Great Glen House
Leachkin Road
Inverness
IV3 8NW

Tel: 01463 725244 (Direct)
01463 725000 (Switchboard)
Fax: 01463 723119
email: robert.raynor@snh.gov.uk

From: [REDACTED] [@gwct.org.uk](mailto:[REDACTED]@gwct.org.uk)
Sent: 12 June 2017 10:51
To: Robert Raynor; [REDACTED]
Subject: RE: NGC data - mountain hares

Hi Rob,

I can get results back to you by 23 June, if that works at your end.

Thank you for specifying the periods that you are interested in. I am pretty certain that going back to 1954 will not be a problem – the annual surveys stated in 1961, but we have extended many of our series backwards in time using historical game books, so I believe that we have adequate sample sizes to do that. In addition to the annual bag indices for the full span of years, for each of the periods that you have specified I shall provide an estimated percentage change between the start and end years, together with the associated 95% confidence limits.

As well as these estimates of change, are you really wanting seven graphs (one per period specified), or would you rather have a short-term graph (1995-2015) and a long-term one (1954-2015)?

Best wishes,

██████████

From: Robert Raynor [<mailto:Robert.Raynor@snh.gov.uk>]
Sent: 12 June 2017 09:54
To: ██████████@gwct.org.uk>
Cc: ██████████@gwct.org.uk>
Subject: RE: NGC data - mountain hares

██████████

Further to this, these are the time periods that we are most interested in, so please could ██████████ produce graphs of change in the NGC mountain hare (Scotland) index, with confidence intervals, for the following periods:

1995-2015
1995-2003
1995-2010
2011-2015
2003-2015

In addition would it be possible to produce equivalent longer term graphs for the periods 1954-2003 and 1954-2009?

Please could you indicate when this analysis could be completed by.
Happy to discuss if that's easier.

Many thanks,

Rob

From: Robert Raynor
Sent: 08 June 2017 17:28
To: ██████████
Cc: ██████████
Subject: RE: NGC data - mountain hares

██████████

Thanks, yes we'd like to progress this work. I'll be in touch again v. soon with further details.

Rob

From: [REDACTED] [[mailto:\[REDACTED\]@gwct.org.uk](mailto:[REDACTED]@gwct.org.uk)]
Sent: 06 June 2017 10:52
To: Robert Raynor
Cc: [REDACTED]
Subject: RE: NGC data - mountain hares

Rob

Apologies for the tardy reply.

[REDACTED] has indicated he can produce a graph for 1995-2015 change and its confidence limits. He would include calculations of change (and CIs) over the most recent 5, 10, 15, 20 and 25 years (and any other intervals that you are interested in if specified).

Because it's a bit more than simply updating our running baseline NGC index this is a morning's work - £[REDACTED]+VAT. We will happily 50% match fund this in the spirit of partnership and knowledge; could you cover £[REDACTED]+VAT?

Regards,

[REDACTED]

From: Robert Raynor [<mailto:Robert.Raynor@snh.gov.uk>]
Sent: 24 May 2017 13:51
To: [REDACTED] [[mailto:\[REDACTED\]@gwct.org.uk](mailto:[REDACTED]@gwct.org.uk)]
Subject: NGC data - mountain hares

[REDACTED]

We're currently looking at population trend data for mountain hares in relation to the next Article 17 reporting round and I note from the GWCT website that the NGC trend for this species does not extend beyond 2009. As far I am aware, there has been no published update on the trend since the publication in 2012 of JNCC report 468 which analysed both the NGC and the BTO data for a range of mammals including mountain hare. It would be interesting to analyse the game bag data since 2009 (ideally in parallel with the BTO data). We are particularly interested in the time period 1995 - 2015 for which there is an equivalent BTO dataset and a (UK) trend published on their website. However, it is unclear what proportion of the sample used to derive this trend comes from Scotland, so I suspect further analysis would be required with that dataset to draw out the Scotland (only) trend.

In order to further our partnership working on this species, would GWCT be in a position to undertake an analysis of the NGC hare data for the same time period? Perhaps, some analysis of the data already exists within GWCT? Maybe we could have a discussion about this?

I look forward to hearing from you,

Best wishes,

Rob

Rob Raynor
Policy & Advice Officer (Mammals)
Scottish Natural Heritage
Great Glen House
Leachkin Road
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IV3 8NW

Tel: 01463 725244 (Direct)
01463 725000 (Switchboard)
Fax: 01463 723119
email: robert.raynor@snh.gov.uk

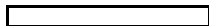
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Thoiribh an aire airson adhbharan gnothaich, 's dòcha gun tèid sùil a chumail air puist-dealain a' tighinn a-steach agus a' dol a-mach bho SNH.



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From: [Robert Raynor](#)
To: [REDACTED]
Cc: [REDACTED]
Bcc: [Mairi Cole](#)
Subject: RE: NGC data - mountain hares
Date: 16 June 2017 15:58:00
Attachments: image001.jpg
image004.jpg

[REDACTED]

Thank you for this. Having given further consideration to this, I agree that individual graphs for each of the shorter time periods are not essential as these changes will also be evident in the two graphs showing the medium and longer term changes in the hare index indicated below with an asterisk.

We are still interested in calculations of change (and CIs) over the following periods:

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I can confirm that the SNH contribution to cost of this work is £[REDACTED] + VAT.

To confirm then, please can you progress this. Will this still be possible by 23 June?

Many thanks,

Rob

Rob Raynor
Policy & Advice Officer (Mammals)
Scottish Natural Heritage
Great Glen House
Leachkin Road
Inverness
IV3 8NW

Tel: 01463 725244 (Direct)

01463 725000 (Switchboard)
Fax: 01463 723119
email: robert.raynor@snh.gov.uk

From: [REDACTED]@gwct.org.uk]
Sent: 12 June 2017 10:51
To: Robert Raynor; [REDACTED]
Subject: RE: NGC data - mountain hares

Hi Rob,

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Thank you for specifying the periods that you are interested in. I am pretty certain that going back to 1954 will not be a problem – the annual surveys started in 1961, but we have extended many of our series backwards in time using historical game books, so I believe that we have adequate sample sizes to do that. In addition to the annual bag indices for the full span of years, for each of the periods that you have specified I shall provide an estimated percentage change between the start and end years, together with the associated 95% confidence limits.

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Best wishes,

[REDACTED]

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Sent: 12 June 2017 09:54
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Cc: [REDACTED]@gwct.org.uk>
Subject: RE: NGC data - mountain hares

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Many thanks,

Rob

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Sent: 08 June 2017 17:28
To: [REDACTED]
Cc: [REDACTED]
Subject: RE: NGC data - mountain hares

[REDACTED]

Thanks, yes we'd like to progress this work. I'll be in touch again v. soon with further details.

Rob

From: [REDACTED] [[mailto:\[REDACTED\]@gwct.org.uk](mailto:[REDACTED]@gwct.org.uk)]
Sent: 06 June 2017 10:52
To: Robert Raynor
Cc: [REDACTED]
Subject: RE: NGC data - mountain hares

Rob

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Regards,

[REDACTED]

From: Robert Raynor [<mailto:Robert.Raynor@snh.gov.uk>]
Sent: 24 May 2017 13:51
To: [REDACTED]@gwct.org.uk>
Subject: NGC data - mountain hares

[REDACTED]

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Rob

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email: robert.raynor@snh.gov.uk

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Thoiribh an aire airson adhbharan gnothaich, 's dòcha gun tèid sùil a chumail air puist-dealain a' tighinn a-steach agus a' dol a-mach bho SNH.