MONADHLIATH DEER MANAGEMENT GROUP: STRATEGIC DEER MANAGEMENT PLAN FOR 2015-2024

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Strath Caulaidh

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- The owners of land within the Monadhliath DMG.
- The agents, managers and keepers of estates within the Monadhliath DMG.
- Drew McFarlane Slack, chair of the Monadhliath DMG
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- The project team:
    - The staff of Strath Caulaidh Ltd.
    - Carron Tobin of Rural Dimensions Ltd.
    - Dr. Rob McMorran of the Scottish Agricultural College.

REPORT PREPARATION

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- MDMG Task Group and MDMG Members

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Standard caveats

- SCL have exercised reasonable skill, care and diligence in the preparation of this document, in accordance with the standards of a qualified and competent person experienced in carrying out work of a similar scope and complexity to the agreed services and current at the time when the services were performed.
- SCL have performed the agreed services generally in accordance with our proposal document or otherwise according to the clients specification, but have in places added to and varied the scope where it appeared to us necessary and reasonable to do so.
- SCL have taken all reasonable precautions to avoid damage to property belonging to the client and any third party.
- SCL worked with sub-contractors to perform part of the services and we exercised all reasonable care to ensure that they were appropriately skilled and experienced in relation to the work that they were instructed to carry out.
- The services and the service products delivered to date cannot necessarily reveal all adverse or other material conditions at the site that could otherwise be identified either through a different formulation of the services or through more detailed work being carried out by SCL.

Specific caveats

- The report in places uses data sets created by other organisations and we cannot be held responsible for their accuracy.

PREFACE

Members of the Monadhliath Deer Management Group (MDMG), after considerable internal debate, decided in 2013 to commission a Strategic Deer Management Plan (SDMP) covering the period 2014-2024. This decision was made with the support of the Association of Deer Management Groups and Scottish Natural Heritage.

The decision to prepare a new plan acknowledged the Scottish Government's desire for more 'effective and environmentally responsible' deer management plans. These new plans need to take account of and deliver a wide range of public benefits including: protection of designated sites, expansion of native woodlands and restoration of habitats at the landscape scale to secure a wide range of ecosystem services for the benefit of future generations.

This new SDMP for the Monadhliath has been prepared in a structured, professional and inclusive manner with the support of a small Task Group and a project team led by Strath Caulaidh Ltd (SCL).

The scale of the task has been daunting and included: face to face interviews with members and staff, reviewing and analysing statistical data and policy documents, discussions with SNH on the management of designated sites, and modelling the subtleties of local deer population dynamics and their relationships with complex, sometimes competing, land management objectives.

The process of analysis exposed areas of historic conflict, which helped to open a constructive dialogue amongst the project Task Group and, in turn, the DMG membership about ways to resolve the problems apparent. The Task Group worked extremely hard over a 12 month period, responding with common sense and determination to achieve the compromises that were required.

In preparing the new SDMP, it is clear that MDMG members have acknowledged and embraced the many challenges identified by the Scottish Government through the RACCE (Rural Affairs, Climate Change and Environment Committee). Nevertheless, this SDMP only marks the starting point of a much longer-term planning process which we trust will ultimately help provide the wide range of outcomes sought by MDMG members, the communities around their estates, our partners in and outside Government and the general public who during their visits see land management in action.

It has been a privilege to work with the Task Group members and their Chairman, Jamie Williamson, with Douglas Campbell and his team at SCL, and with SNH's Chris Donald and Iain Hope to help bring this SDMP to you for your consideration and adoption.

Drew McFarlane-Slack MBE

EXECUTIVE SUMMARY

This document presents a Strategic Deer Management Plan (SDMP) for the Monadhliath Deer Management Group (MDMG) covering the period 2015-2024. Chapters 1-4 of this document provide a brief background to the MDMG area and the strategic planning process undertaken in 2014. The SDMP is described in detail within Chapters 5-19, with the key points summarised below for convenience:

Chapter 5 Geographic Extent & Layout (see Overview Map on Page 9)

- ✓ Secure the active involvement of all MDMG estates in the plan (Chapter 5).
- ✓ Consider dividing the DMG into two DMG's (Eastern and Western Monadhliath), depending on how well the group operates at its current size in the first 5 years of the plan (Chapter 5).
- ✓ Ensure 'low ground' deer populations are considered at meetings and in strategic deer management planning from Year 5 onwards (Chapter 5).

Chapter 6 Organisational Structure & Responsibilities

- ✓ Formalise the structure and operation of the DMG via a new constitution which members will be asked to sign up to and adhere to (Chapter 6).
- ✓ Share future responsibility for running the DMG by creating a number of new executive roles, to reduce the current reliance on the Chairman (Chapter 6).

Chapter 7 Annual Activities & Key Events

- ✓ Hold two formal meetings annually (April & August) to promote regular communication between owners and maintain good relations (Chapter 7).
- ✓ Hold a meeting annually with estate keepers (June) to promote good communication on the ground (Chapter 7).
- ✓ Ensure stakeholders views are sought and represented annually, in advance of the April meeting at which any changes in culls will be agreed (Chapter 7).
- ✓ Keep the SDMP up-to-date annually by treating the MDMG Annual Report (see Chapter 16) and meeting minutes as formal annexes (Chapter 7).
- ✓ Formally update the SDMP after 5 years ('Interim Review') and 10 years ('Full Review') to ensure it remains fit-for-purpose over the plan's cycle (Chapter 7).

Chapter 8 Budgets & Financial Management

- ✓ Revise the current method of allocating subscriptions - base on a combination of estate land area and size of deer cull taken in the future (Chapter 8).

Chapter 9 Raising of Subscriptions

- ✓ Increase subscription levels to ensure that all key components of the new SDMP can be successfully delivered over a 10-year period (Chapter 9).

Chapter 10 Membership Information

- ✓ Ensure consistent, up-to-date member information is held (Chapter 10).

Chapter 11 External Communications

- ✓ Ensure external communications are properly managed (Chapter 11).

Chapter 12 Strategic Monitoring Program

- ✓ Undertake regular monitoring to underpin the strategic direction of the DMG (key elements: aerial deer counts & sheep/goat counts) (Chapter 12).

Chapter 13 Strategic Research Program (see Overview Map on Page 10)

- ✓ Deliver a program of DMG research to support key strategic decisions (key elements: undercounting deer in woodland, deer density-dependent effects on sporting stag quality, current & future blanket bog condition on Monadhliath SAC and effect of sheep stock reductions on bog condition) (Chapter 13).

Chapter 14 Strategic Habitat Management (Overview Maps on Page 10/11/12)

- ✓ Undertake strategic habitat enhancement work to improve the condition of the deer herd and enhance the environment supporting it, in particular the MDMG's 'designated sites' (key elements: expand woodland cover – focus on natural regeneration using native species, open up mature conifer woodland for winter shelter, increase heather cover for winter forage at middle altitudes & open up low ground fields for shelter and winter forage) (Chapter 14).

Chapter 15 Strategic Fencing Program (see Overview Map on Page 9)

- ✓ Erect / maintain strategic fences to underpin SDMP delivery (Chapter 15).

Chapter 16 Deer Management Information

- ✓ Encourage prompt supply of standardised annual cull returns (Chapter 16).
- ✓ Encourage group-wide gathering of mortality / recruitment data (Chapter 16).
- ✓ Encourage regular reporting of changes in estate status (Chapter 16).
- ✓ Analyse group cull data annually in spring and re-run the new MDMG population models; include outputs in an Annual Report sent to members and used to aid strategic decision-making (Chapter 16).

Chapter 17 Cull Planning & Execution (see Overview Map on Page 12)

- ✓ Reduce local densities of hinds, to improve herd condition and deliver environmental gains, in the first 5 years of the plan (**principal strategic target**: deliver a marked reduction in hind densities in the Eastern Monadhliath to produce a 1:1 adult sex ratio, and a minor reduction in W. Monadhliath to produce a 1:1 ratio (Chapter 17). **Appendix 5-7 confirms the changes in cull planned** and their predicted effects.
- ✓ Other than in 'hind reduction' areas – see above – the MDMG owners should aim to maintain winter hind densities at no higher than the level counted in winter 2013 for 5 years (Chapter 17). Review decision in 2018 and consider further local reductions in hind densities if required (e.g. if designated sites have problems).
- ✓ Consult with neighbours on Out of Season licences, and other proposed changes to culling practices, and seek compromise solutions where possible in order to help foster and maintain good neighbourly relations (Chapter 17).
- ✓ Ensure plans for new windfarm take account of the SDMP's aims, in particular plans for culling and management of designated sites (Chapter 17).

Chapter 18 Stag Management (see Overview Map on Page 12)

- ✓ Aim to produce and shoot up to 1,015 sporting stags (0.68 per km^2) per annum across the Red Deer Management Area (RDMA) as a whole (Chapter 18).
- ✓ Try where possible to avoid culling stags other than for sport, unless where judged necessary by estates to meet habitat or crop management objectives and only when alternative approaches cannot be agreed with neighbours wishing to protect stags for sport. Promote 'stags for hinds' swaps[1] as the primary means of helping to reduce the size of the stag 'protection cull' (Chapter 18) and, ideally, maintain stag protection culls at the 2013-14 level where no alternative agreement can be reached.

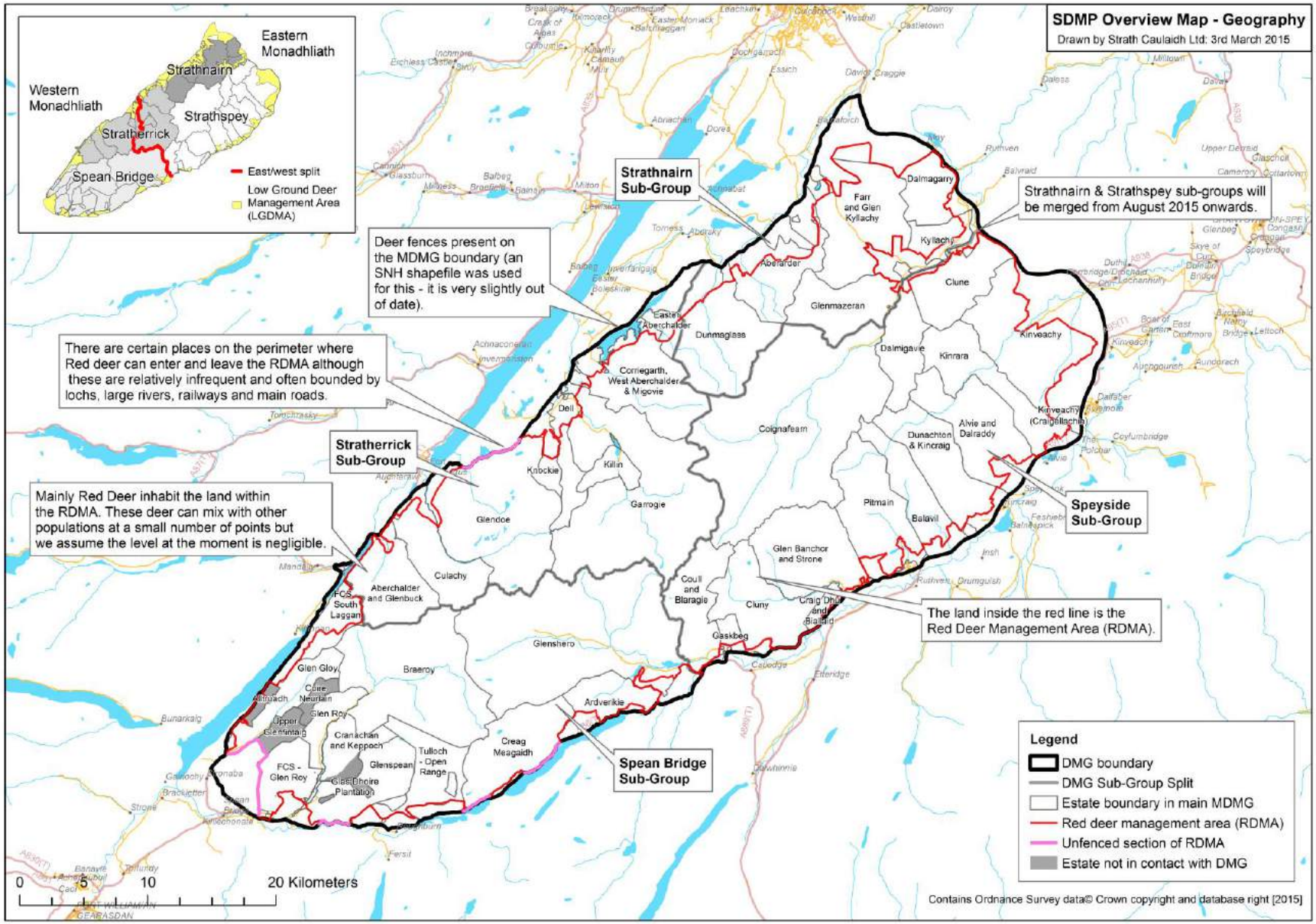
Chapter 19 Legislation & National Policies

- ✓ Aim for estates to deliver deer management to Best Practice standards wherever possible (Chapter 19).
- ✓ Update the SDMP when significant changes in legislation or government policy changes (Chapter 19).

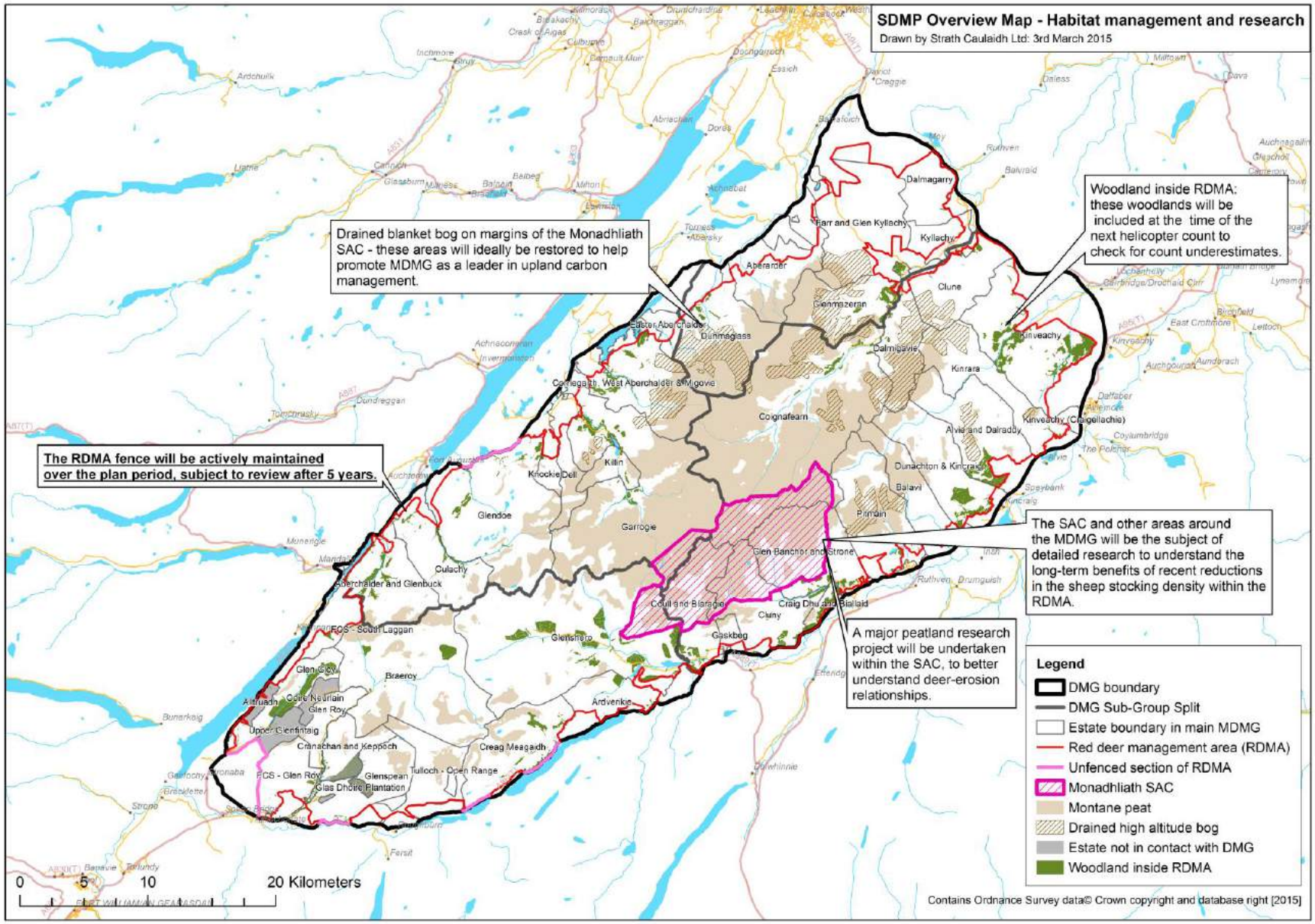
Note: Several maps were prepared as part of this Executive Summary, to illustrate the key points of the outline SDMP presented above. They are presented overleaf for interested readers but can also be provided to members as separate PDF's if required.

[1] Minimise stags shot as part of protection culls, to make them available for sport. Concurrently, reduce hind densities to the minimum required to support the sporting stag cull, in order to help maintain habitat impacts at an acceptable level and promote ecological recovery on target sites.

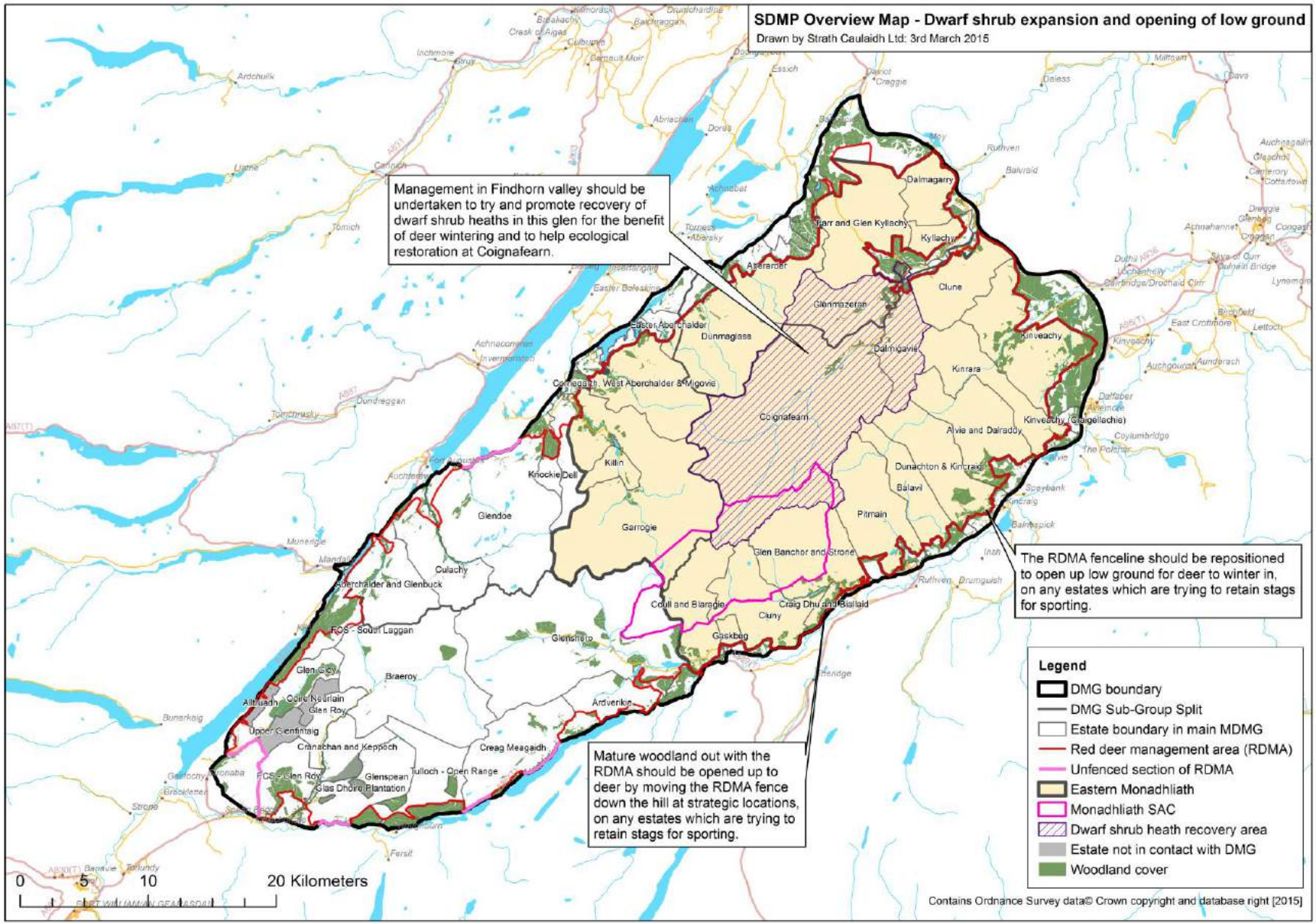
SDMP Executive Summary Overview Map: Geographic Extent, Layout & Strategic Fencing



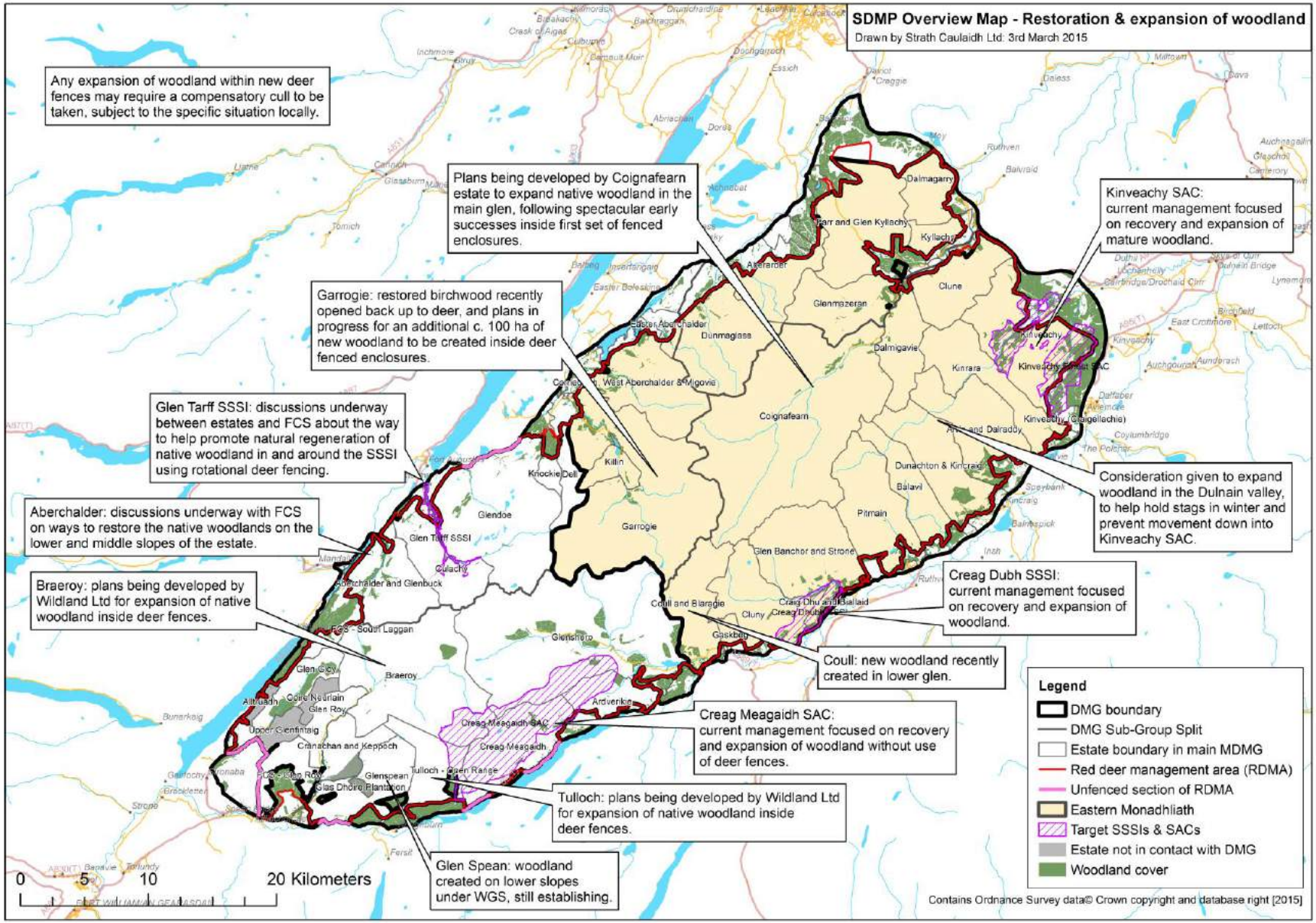
SDMP Executive Summary Overview Map: Strategic Habitat Management & Research (Blanket Bogs)



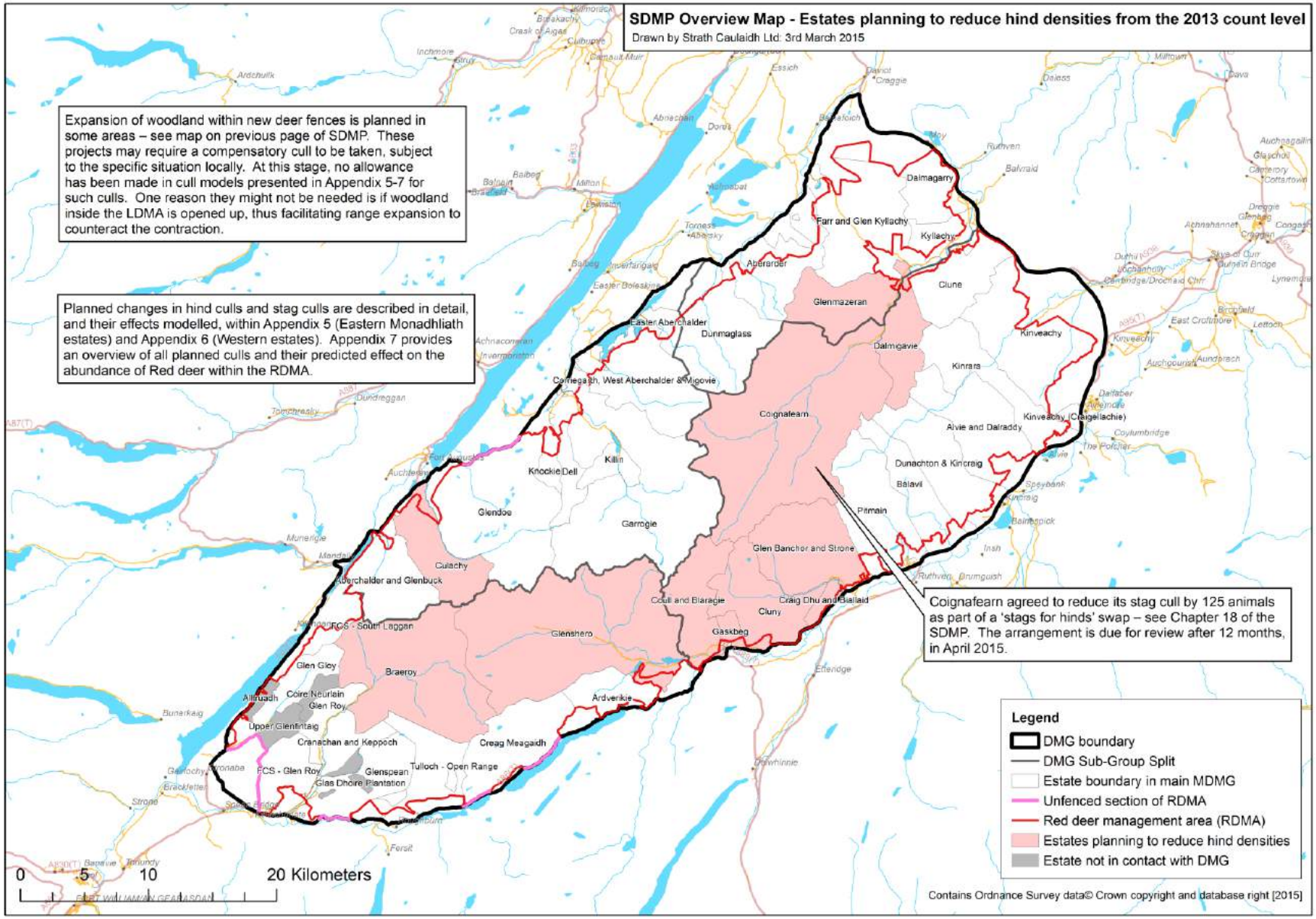
SDMP Executive Summary Overview Map: Strategic Habitat Management (Dwarf Shrub Expansion / Low Ground Accessibility)



SDMP Executive Summary Overview Map: Strategic Habitat Management (Native Woodland Restoration & Expansion)



SDMP Executive Summary Overview Map: Locations of Planned Hind Reductions (see Appendix 5-7 for details).



1. INTRODUCTION

NOTE: A set of supporting PDF maps were sent to DMG members (and to other stakeholder organisations) at the time the 'Review of Deer Management' report was issued in summer 2014 (see Para. 5 below). These maps are referred to within this report, for the benefit of MDMG members who hold copies.

The Monadhliath Deer Management Group (MDMG) is one of the largest Deer Management Groups in the UK. Situated south of Inverness and north-east of Spean Bridge in the Scottish Highlands, the area of Red deer range actively managed by the group comprises approximately 150,200ha (see Map 1.1).

The group meets regularly to consider deer management issues. Over the last decade and more, there have been numerous disagreements between different landowner groups within the MDMG, and also with Scottish Natural Heritage, about the most appropriate way to manage deer in the group area.

In April 2013 the DMG agreed to prepare a new Strategic Deer Management Plan (SDMP) because the previous plan, updated over the period 2003-2005, was due for an update in the view of many members. The planning project also included for the possibility of developing DMP's for each of the four DMG 4 sub-groups if required (see Map 1.2). Strath Caulaidh Ltd (SCL) along with their project partners won the tender for the project and began the work in July 2013.

In the period July 2013 – September 2014, the project team met with estate owners (see Map 1.2), and discussed with them their management objectives and future plans. The team also analysed a wide variety of data available for the group area (e.g. live deer counts, deer culls, vegetation & soils mapping). In addition the project team reviewed all the key information for the main designated sites present (see Map 1.3; the four biological SAC's) and met with SNH to discuss SAC site condition, and SNH's wider role in the MDMG area.

A detailed report was prepared for the membership in April 2014 describing the findings of the strategic review undertaken ("Wild Deer in the Monadhliath: A Review of Current Management Practices & Future Options"). The purpose of the report (termed hereon in 'the Review') was to feed back to the MDMG landowners with the findings of the project to date, what these findings showed about the Red deer population using the MDMG area and the way deer were currently managed therein. The report also contained recommendations to group members on the range of actions they might consider taking to resolve current differences and, at the same time, promote sustainable deer management[2] in the group area.

A summary of the Review is included in Chapter 2 as background to the MDMG.

Various meetings were held following release of the Review, to discuss its contents and possible ways forward. These discussions led to the formulation of a plan for how the SDMP would be drafted, consulted on and adopted. Chapter 3 of this document describes the process. The remaining chapters of this document (Chapter 4 – Chapter 19) comprise the Strategic Deer Management Plan (SDMP) itself.

[2] Sustainable deer management is defined by SNH in their Code of Practice as "managing deer to achieve the best combination of benefits for the economy, environment, people and communities for now and for future generations".

2. SUMMARY OF THE 2014 REVIEW

This section contains a Non-Technical Summary of the original, detailed Review of Deer Management produced on behalf of the group as the first stage in the process of consulting on a Strategic Deer Management Plan.

SITE CHARACTERISTICS

The Red Deer Management Area (RDMA)[3], which is 150,200 hectares, has many inherent physical and biological characteristics that will tend to drive strong patterns of Red deer behaviour.

The fact that the site includes a large high altitude plateau and several deep valleys means that a considerable proportion of the Red deer population will always be expected to migrate seasonally from low to high ground (see Map 2.1).

The relatively limited, accessible areas of low-lying fertile ground will tend to focus deer very much in the valleys in winter and otherwise to the valley sides where habitats supporting Heather, a vital winter food, are commonplace (see Maps 2.3 & 2.4). The presence of open woodland only on the low ground, and in certain parts of the RDMA, is likely to reinforce a localised distribution in winter (see Map 2.4).

It is also clear that the Eastern and Western zones of the RDMA are quite different in character. The Eastern zone contains a large proportion of the higher altitude habitats, with quality winter habitat for deer generally present only round the margins. Conversely, the Western zone has a markedly higher proportion of good quality deer habitat at low to middle altitudes and this is more evenly distributed through the zone. This would suggest that longer distance seasonal migrations of deer are more likely to occur in the Eastern zone than in the Western zone, where a high percentage of the deer population has higher ground for summering in close proximity to their winter range. As well as topographic differences, the Eastern zone has a drier climate than the Western zone and this drives some of the underlying differences in soils and vegetation that are apparent.

PATTERNS OF LAND USE

The RDMA is predominantly an upland area and the pattern of land use generally reflects this, comprising a mixture of sporting, extensive livestock production and renewable energy generation, along with dedicated conservation management on some estates (see Maps 3.1 - 3.3).

Marked changes in land management practices have occurred in the RDMA in recent decades. Most notably a significant reduction in the number of sheep has occurred as the economics of hill farming and crofting have become progressively less favourable. The reduction appears to have been less marked in the Eastern zone compared with the Western zone, because many estates in the East still stock sheep to aid their grouse management. The overall reduction in sheep numbers in the

[3] The area inside the strategic perimeter deer fence which is present around much of the land within which Red deer were, in the 1960's, contained and managed actively for sporting purposes. The RDMA continues to this day to be the main focus on management decision-making.

RDMA is reported to have been well over 20,000 since the 1960's[4] and the current number of ewes/hoggs reportedly stocked peaks at 17,900 per annum, suggesting a decline of c. 50%. This reduction in livestock might have been expected to result in a significant increase in deer numbers in the longer term. However, ground counts of the RDMA only showed an increase from c. 12,000 in the late 1960's to c. 21,000 in the late 1970's[5], which was planned. Thereafter, subsequent counts suggested deer numbers remained relatively stable in comparison. On the basis of count data, and even allowing for large errors in them (see main Review), it would seem sensible to conclude that the overall density of large herbivores using the RDMA (sheep and deer combined) has declined markedly since the 1960's, given that the reported declines in sheep numbers are far larger than any measured increase in deer numbers.

Another widespread switch in land management practice within the RDMA relates to management for grouse[6]. This change has occurred mainly in the Eastern zone where the majority of the grouse bag within the RDMA is generally taken. Some estates in the Western zone, however, are now planning to increase their efforts on grouse in coming years albeit within the constraints of climate. Where estates focus more on their grouse management activities a reduction in deer density normally has to occur alongside.
Despite the differences that may have arisen because of recent land use changes, there remains some common ground between owners because of their sporting ambitions. Almost all ownerswant some deer present to fulfil sporting aims (stags in summer and autumn); the remaining estates want deer present to help meet conservation aims through their ability to drive ecological processes (e.g. Creag Meagaidh and Kinveachy) or for a mixture of reasons (Coignafearn wish to promote the ecological restoration of native woodland and scrub, vegetation and riparian areas, but with some sporting also). In addition, most estates want also to manage their land for grouse where practical.

In contrast with the Eastern zone, the majority of estates in the Western zone are trying to manage their land on a similar basis – almost all are focused on deer stalking with an element of grouse and seem, for now, very unlikely to move in a wholesale direction towards large-scale renewable energy or back to intensive sheep farming. Based on landowner feedback it would appear that the Eastern zone is where the majority of the tensions between owners exist because of changes pertaining to grouse management or for delivery of conservation management objectives. The Eastern zone is also where tensions will, for the foreseeable future, remain or escalate depending on how successful this present strategic deer management planning process is.

[4] When interviewed, owners reported large declines in sheep stocking across the RDMA particularly in the Spean Bridge-Laggan area (at least 10,000 since the late 1990's), on Coignafearn (10,000 since the 1960's) and in the Newtonmore area (at least 4,000 since the 1960's). Scottish Government statistics show a reduction of approx. 50,000 sheep in the last decade alone (1993-2013) in the parishes linked to the MDMG area, albeit this is a much larger area than the RDMA.
[5] This was a deliberate management decision by the MDMG owners at the time, to increase the number of stags for sport.

DEER POPULATION DYNAMICS & GENERAL DEER IMPACTS

The MDMG has a long running set of deer population estimates based on ground counts going back to 1968. Whilst ground counts provide an interesting historic record, in our view the aerial count data for the RDMA are likely to be the most accurate when quantifying deer abundance[7] and, in turn, modelling historic and future trends. Unfortunately, the aerial count data set is much more restricted being available for 2004 and 2013 only. Even though we believe the aerial counts are more accurate we suspect they are still underestimates of the number of deer in the RDMA given the extent of concealing woodland present (6,688ha within c. 150,200ha of land cover overall). Despite there being scope for error, we used the aerial winter counts of 2004 and 2013 to quantify the likely dynamics of the Red deer herd using the RDMA over recent decades as it was felt they provided the most robust platform for the review.

The aerial count data provide very strong evidence for the way in which Red deer use the RDMA seasonally, suggesting the majority of deer (> 95%) are likely to be found utilising habitats below 600m for long periods of the winter (see Map 4.2). In the summer, a considerable proportion of the Red deer herd are likely to be found utilising the montane habitats above 600m based on available summer count data (see Map 4.2). Of the 150,200ha land present in the RDMA, 44.4% (83,038ha) is above 600m in altitude and 55.6% (66,245ha) is below 600m. This suggests the entire deer herd is likely to be forced into using only c. 50-60% of the RDMA for a lengthy period of the winter.

The aerial count data also provide confirmation of the distinct areas in which stags tend to winter (see Map 4.4). This helps to better understand the likely dynamics of the stag population and, as a consequence, the possible effects on deer stalking estates of any large protection or reduction culls taken. In turn this might help develop ways to manage the herd to mitigate these effects for mutual benefit.

The winter aerial count data also provide fairly strong evidence that an overall decline in Red deer abundance across the RDMA took place between 2004 and 2013 (see Maps 4.6 - 4.9). At the time of the last winter deer count in early 2013, the Red deer population in the RDMA was estimated by aerial count at 18,984 (15.0 per km^2 in 149,217ha[8]). The previous aerial count in winter 2004 showed 21,484 Red deer (17.0 per km^2) to be present in the RDMA, implying a possible reduction over the period 2004-13 of c. 12%. That said the true size of the decline may have been smaller or larger depending on the exact way the count errors interact from each survey, and in particular will depend on the % of the population present in woodlands during each count.

When analysed in more detail the aerial count data, if assumed to be accurate, show that most of the decline in deer numbers from 2004 to 2013 (2,500 deer overall; broken down as 691 stags, 1,616 hinds and 193 calves) probably occurred in the Eastern zone of the RDMA – numbers appeared to remain stable in the Western zone over the period (see Maps 4.6 - 4.9). The reductions appeared to be greatest

[7] Reports of some estates not taking part in some ground counts, and during some estates estimating deer numbers on the day rather than counting them directly, lead to concerns over data quality. The aerial counts are undertaken in a more independent manner, with multiple observers, albeit they are still potentially error prone. Also, the larger deer herds are photographed and counted digitally during aerial counts - we believe this is likely to promote greater accuracy.

[8] The RDMA is 150,200ha including water bodies but 149,200 without water bodies.

on the estates in the Eastern zone where large culls were taken over the period 2000-2013 when land management practices changed, but smaller reductions are apparent in many other parts also (see Maps 5.1 – 5.3).

Population models for the RDMA were built using the aerial count data and parameterised with estate owner audit data (e.g. estimates of natural mortality) and MDMG cull records. The models were used to produce retrospective estimates of population size in the RDMA from 1988[9] to 2014. The model outputs were then used to ascertain whether the decline shown by the aerial count data from 2004 and 2013 was likely to have occurred, given the size of the 2004 count, the scale of reported culls taken and the extent of other deaths likely to have occurred over the period.

The model predicted rising deer densities from the late 1980's through the 1990's but declining densities from the early 2000's to the present day. Interestingly, many owners when interviewed felt that deer numbers had risen during the 1990's which matched the modelled prediction. Ground count data for 1998 also suggested a rise in deer density occurred between 1998 and the previous count in 1994 although the count was disputed by some owners[10]. Irrespective, deer culls in the period 1988 – 1998 from the RDMA were markedly lower (typically 2,500-3,000 per annum) than the culls taken in the subsequent 10 years (3,500 – 4,500 per annum). It would perhaps be surprising if the population, which is more or less self-contained inside the RDMA, remained stable over the 25 year period from 1988-20013 given such differences in culling intensity.

The same population model was used to predict trends in abundance over the 25 year period moving forwards from 2013. Assuming the count data from 2004/2013 are accurate and the recruitment rate used (35 calves per 100 hinds) is appropriate, the model predicts that the RDMA population will experience a slow decline in numbers if the level of the 2012-13 cull is sustained. However if the recruitment rate is in fact higher (e.g. 37-40%) as was suggested by the results of the 2013 count, then the population in the RDMA overall might begin to rise based on the present level of cull taken.

Interestingly, many estates when interviewed reported to the project team that they are generally happy with the condition of the deer they are shooting and the condition of their land hence are not planning to adjust densities markedly in the next 10 years (i.e. their 2013 count levels were broadly satisfactory at an estate or sub-group scale). However, some estates confirmed when interviewed that they will shoot more hinds in the next few years to induce a local adjustment in deer density – across the RDMA these adjustments will amount to c. 400 additional hinds being culled in total over a period of 1-2 years[11]). These additional hind culls should lead to a further reduction in overall hind numbers within the RDMA (an extra 400 hinds culled equates with c. 4% of the 2013 count population of 9,241 inside the RDMA) depending on the rate of recruitment over the period. Of course, in reality, the proposed adjustments to hind numbers will only reduce hind densities locally, rather

[9] Detailed cull data broken down into estates and sex/age-classes was only provided by the MDMG from 1988 onwards – the lack of detailed records prior to 1988 meant that modelling was only undertaken from this point forward.

[10] According to the Chair of the DMG various criticisms of the 1998 count were made including the possibility of double counting by the then DCS count teams.

[11] The extra 400 hinds will be culled from the combined area of Culachy, Braeroy, Dalmigavie, Glenshero, Glenmazeran, Braeroy. Coignafearn would like to reduce their summering hind densities but feel they will not be able to without the help of neighbouring estates because most of the summering hinds winter in these other areas – this reduction is not included in the 400 total planned.

than overall, irrespective of the prevailing population recruitment rate[12]. Indeed, it is the dynamics of the deer population at a local scale within the RDMA that is of greatest relevance for the strategic deer management planning process because deer interact with the habitat, and with each other, at the local scale.

Of particular relevance is that the 12% decline in deer numbers between the winter counts of 2004 and 2013 masks the fact that deer densities were highly variable between geographic areas at the time of each count (see Maps 4.6 - 4.9). In essence, densities in some areas remained stable over the period whereas densities were high in some areas in 2004 but markedly lower in 2013. That said some of the areas where declines in count were apparent showed only small % reductions that were well within the margins of likely count error.

More importantly, it was clear from the aerial count data that deer densities in the winter range[13] appeared to rise between 2004 and 2013 in certain geographic areas[14], notably so with hind densities, despite the overall declining trend evident (see Maps 4.6 - 4.9). These findings are supported by the fact that, when compared with local culls taken, groups of hinds in these areas have been culled below the level of recruitment at times between 2004 and 2013 (see Map 5.7). It is also evident from the 2013 count data that hind densities in the winter range of the RDMA remain locally very high from an 'ecological' perspective[15] irrespective of any reductions that have occurred overall (see Map 4.7).

Average deer densities in the peak of summer on the montane habitats are also likely to be fairly high from an ecological perspective[16]. This was confirmed by an analysis which allocated the overall winter deer counts of 2004 and 2013, plus recruitment, into the area of the predicted summer range[17]. This analysis predicted a density in the RDMA of c. over 30 deer per km^2 in this 'peak summer' range. Of

[12] Reducing deer densities at the local scale will tend, with all else equal, to increase the average rate of recruitment. The differences are not necessarily always large (e.g. 35% rising to 38-40%) but can have significant longer-term effects on population dynamics if subsequent cull levels are not then adjusted to take account of it.

[13] In this report, and in the maps prepared, deer densities from the winter counts of 2004 and 2013 are calculated as the total deer counted in each area divided by the size of the 'winter range' (i.e. all land below 600m) and **NOT** using the traditional method of using the entire range. The logic behind this is that the deer spend much or all of the winter on the land below 600m hence managers should be considering the density of deer on the winter range itself; many of the impacts deer have on habitats (e.g. Heather, native woodland) occur at this time of year. It is also the time of year when resources are most limited hence nutritional and environmental stresses on deer are most prevalent.

[14] The geographic areas used for the analysis (see Map 1.4) and presented in Maps 4.6-4.9 are termed the 'Combined Estates' scale. This scale relates to areas of land on which deer are more likely to remain resident for long periods of the winter – in essence, some estates are very small and topographically different hence movements between them are frequent hence this can influence the number of deer present on the day of a count and make it difficult to use the count statistics for analysis purposes.

[15] Winter range densities in 2013 were as high as c. 40-60 per km^2 in some parts of the RDMA and at this level of occupancy over the winter / spring it is highly likely that there will be adverse effects on natural habitats where woody plants are a major component – for example, Heather cover will contract and native woodlands will fail to regenerate where conditions are otherwise suitable. Major differences in habitat structure inside and outside fenced enclosures demonstrate this point well. From an ecological or conservation management perspective, the most common aim of management is to maximise biodiversity that in most manager's views means optimising habitat structure to maximise habitat niches.

[16] The impacts of high densities of deer on montane habitats in Scotland are less well documented and understood by scientists than lower-altitude moorland and grassland habitats. However, the presence of several SAC's in the MDMG area means that SNH, and hence owners, ideally need to adopt a conservative stance until such times as more research can be undertaken to ascertain the implications of high summering densities (see Recommendations).

[17] Group-wide summer deer counts are not undertaken.

course, the distribution of deer in the summer is likely to be somewhat uneven hence we would expect densities locally to range from being low to being very high depending on the location. We cannot be sure of the distribution of deer in the RDMA in summer at present because a group-wide count at this time of year has not been undertaken.

That said the most recent local summer count, organised by SNH in 2013, provides strong evidence that the density of deer using the Monadhliath SAC and surrounding area during summer is relatively high. Also, the summer count data from 2003-2013 suggest that the number of deer using the SAC might have risen markedly in the past 10 years (2003 count was 1,772 and 2013 count was 3,252), whereas hind/follower numbers in the Eastern zone generally have declined by c. 1,950 over the same time according to the 2004 and 2013 counts.

This local rise in deer use of the SAC, *if real*, could conceivably be related in part to rising hind densities on select estates in the wider region, given that a high percentage (85-90%) of the deer using the SAC in summer appear to be hinds and their followers. However, the local rise in hind/follower numbers over the period 2004-2013 on estates adjacent to the SAC was only 400 extra hinds/followers; see Map 4.7) and in many of the other surrounding estates the number of hinds actually went down over this period. The rise of 400 between the two winter counts is far smaller than the rise of 1,500 deer apparent in the SAC counts between 2003 and 2013. The evidence implies that any rise in numbers on the SAC must also be related in part to changes in the way deer are using the SAC. This might conceivably be due to increased levels of disturbance of deer in the Eastern zone due to changing land management practices and patterns of land use (see Map 4.10). That said, the difference might also be explained by count methodology; in essence, the SAC count area is relatively small and deer on the boundaries are free to move in and out at will – the potential for 'SAC-only' summer count statistics to be misleading is evidenced by the fact that over 1,000 deer were recorded just outside the boundaries of the SAC when it was counted in summer 2013.

Despite the potential weaknesses of the local summer count data, the winter count are considered to be robust for planning purposes. They show that there is a strong bias towards hinds in the population using the Eastern zone (approx. 1.8 hinds: 1 stag) whereas in the Western zone the ratio is approx. 1: 1. In addition, there are many parts of the Eastern zone, and some in the Western zone, where the density of wintering hinds/followers present is relatively high (up to 35 hinds/followers per km^2 – see Map 4.7; with stags present over and above this – see Map 4.8).

A corollary is that density-dependent effects might be operating on the populations within these areas, with pressures on the available resource base at key times caused by high densities of hinds leading to adverse effects on the performance of the stag population. Density-dependent effects would manifest themselves in many important ways for sporting estates, including reduced %'s of male calves being born, reduced male calf size at birth, decreased male survivorship, reduced adult body size, increased emigration rates and reduced antler size/crowning (see Appendix 4 of the main Review for more details on how these effects arise and what the implications are[18] - much of the evidence for these adverse effects comes from the long-term deer research project on Rum).

[18] Appendix 4 of the main report explains in some detail how density dependent effects operate in a Red deer population and how these effects manifest themselves. In essence, Red deer that inhabit poor quality open range habitats on higher altitude sites such as the RDMA tend on average to be smaller in body size than their companions that inhabit low lying woodlands all year round. Females tend to

Interestingly, population modelling for the period 1988-2013 suggests that there should be markedly more stags born in the Eastern zone than are culled, based on the standard parameters employed – it is possible that elevated mortality rates for young stags and emigration to other areas could be responsible, alongside illegal culls, unrecorded culls and RTA's, for this discrepancy.

On a related point, the RDMA is somewhat lacking in woodland for deer to shelter in during winter (see Map 1.2). Deer, in particular stags, benefit greatly from access to woodland cover during winter months when their condition, after the rut, constantly declines due to a lack of food and increased energy expenditure with the cold/wet weather. An expansion of woodland cover would likely benefit stags. The lack of woodland cover is primarily as a result of historic deforestation in past millennia. Crucially though, many estates find the expansion of woodland cover now to be an unattractive proposition. This is because financial incentives are relatively poor and timber production is a long-term investment. Also, expansion of woodland would result in a loss of grouse habitat and new woods might harbour higher densities of foxes. Certainly, almost all recent expansions in woodland cover have been inside deer fences on the lower reaches of the site. This reduces the effective area of the RDMA and also means deer are excluded, at least temporarily, from a significant proportion of the already limited woodland cover.

The fact that deer are generally kept off the low ground, irrespective of the presence of woodland, is another important point to consider particularly in relation to stag condition. The exclusion of low ground arises because of the extensive perimeter fencing around the RDMA (see Map 2.1 shows the limited low ground inside the fence). This was installed to keep Red deer, and particularly stags, from moving down into agricultural or forestry land. In the absence of the fence, deer would have used the lower ground for over-winter feeding and shelter but whilst there would often have been culled as marauders to protect agricultural and forest crops. The restricted access to low ground locally, coupled to the lack of shelter locally, means that the RDMA is in many places a sub-optimal area for Red deer stags to winter in.

Interestingly, in the Eastern zone many owners reported experiencing significant adverse effects due to their neighbours' deer management activities (see Map 6.1). Estates are concerned they will not be able to meet their desired sporting stag targets in future years because of the consistently larger culls of stags taken on estates such as Coignafearn and Kinveachy since the changes in management approach they adopted in the late 1990's[19] and early 2000's respectively. Deer are presumably attracted into these estates in winter, at least in part, because of the local quality of shelter and forage present as well as because of the reduced competition for resources.

That said the predicted number of stags being born each year in the RDMA (c. 1,700) is sufficient, in theory, to more than satisfy the total sporting stag requirement

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reproduce less often and have smaller calves, and those calves born are more likely to die young and be slower to mature. Males tend to mature more slowly and have their secondary sexual characteristics repressed – this includes reduced antler length, reduced antler weight and a reduced degree of antler crowning at a given age. One of the key factors that can help counteract the effects of the environment is the availability of shelter in woodlands, and the related improvements in grazing that this environment can provide at key times. The key time is in the winter and spring months when open hill Red deer are most exposed to the elements and when stags in particular are in the poorest condition to cope with them. At this time Heather forms a key component of the diet hence if cover of Heather is suppressed by high grazing levels then deer are less able to sustain themselves.

[19] Objectives changed upon transfer of ownership at Coignafearn.

stated in estate interviews which was c. 1,015 (*total* stag cull was 1,350 in 2012-13). However, the distribution of the stag population in the shooting season appears to be a problem, with some estates reporting they are short of the animals they expect to see. It is also likely that the age structure of the stag population is becoming modified by the large protection culls being taken, as these types of culls are typically much less selective. As a result, they are likely to be markedly heavier on the younger age classes compared to a traditional sporting cull that focuses on older animals.

Moreover, there is also strong evidence from population modelling that the intensive culls taken in estates 'changing their objectives' since the late 1990's[20] have caused a general draw of deer into them over time (a 'vacuum'; see main Review). This close interconnection means that the owners of surrounding estates will always feel vulnerable unless close communication is maintained and effective compromises found on deer culling plans wherever possible. A result of the 'vacuum' effect has been that many estates adjacent to areas reducing their densities now feed more deer, or otherwise have started feeding, to try and retain them to fulfil their sporting ambitions. Interviews with owners confirm that over 2,100 deer are currently being fed in the RDMA[21], some of which are fed every winter / all winter whereas in some places this happens only in severe weather. Many owners stated they would prefer not to do this but feel they have no option.

DEER IMPACTS ON DESIGNATED SITES

It is evident from the many reports produced by SNH and FC that they consider deer impacts on designated sites to be a key issue needing resolved, both in the RDMA and out with on the low ground. Whilst a few owners are entirely in agreement with this view, the majority of owners are not keen to undertake reductions in deer numbers without a solid evidence base (where it is disputed in the Monadhliath SAC) and a sympathetic, balanced approach being adopted.

In the case of the Creag Meagaidh SAC there appears to be no real conflict at present between the owners and SNH based on the audit responses provided. That said, it has been pointed out that this attitude might change on some estates if major culls were planned again by SNH (or had not taken place until now on SNH's land). Irrespective, in the case of the other SAC's within the RDMA there are varying degrees of unease within the landowning community most notably amongst many of the Monadhliath SAC owners.

In the case of the Monadhliath SAC, it seems that there is much contradictory evidence on site condition. For example, SNH studies on herbivore impacts report that the area of bare peat may be expanding whereas studies of aerial photos over a 70-year period suggest bare peat is decreasing in overall extent (e.g. see Maps 7.1-7.5). There is also a belief on the part of many owners that the assessment methods being used by SNH to determine herbivore impact levels and site condition are not fit-for-purpose. The project team reviewed the available information for the site as part of the review process. Taking account of our intimate knowledge of the site and its processes, it certainly seems SNH does not at present have all the necessary information to prove unequivocally that a marked reduction in deer numbers is likely to improve site condition.

[20] The main estates are Clune, Coignafearn, Corriegarth, Creag Meagaidh, Farr and Kinveachy.
[21] There were also hundreds of deer fed on Coignafearn and Kinveachy up until the early 2000's – now only a small number of deer are fed at Coignafearn and only in extreme weather events such as in 2010.

Crucially, it also appears that rates of change in vegetation composition and hence site condition are relatively slow on the bog in the SAC primarily because of its altitude. For this reason there is sufficient time available, in principal, to ensure that a new set of more robust information, agreed upon by all parties at the outset, is obtained from the site so that the right decisions can be jointly made about appropriate deer densities for the future.

That said there is some evidence from SNH summer and winter deer counts that the number of deer using the area has risen in recent years. There is also evidence that from an ecological perspective the current deer densities in summer are already generally high given the potentially fragile nature of the SAC. It would therefore seem that some form of compromise on deer management in this area for a 5 year-period would be appropriate, to give comfort to SNH that the population is not still rising locally.

In the case of the Kinveachy SAC, it is apparent from the data being gathered by SNH that recovery to favourable condition[22] will take many decades and, even then, will not produce the extensive areas of new pinewood perhaps envisaged at the outset. The fact that Kinveachy is such a draw for deer in the winter, and yet a 'limited tolerance' policy to deer will remain in place for years to come to try and secure pinewood regeneration, means that neighbouring owners can expect little change in the approach taken to culling in the near future. Given it is such a problem perhaps some compromise could be found in how the site is currently managed, so that neighbouring estates to the west are more motivated to work together with Kinveachy Estate and SNH to help achieve the aims of the SAC and the neighbouring Monadhliath SAC.

Within the Glen Tarff SSSI section of the Ness Woods SAC, owners understand that it would be desirable to move the woodland to favourable condition by reducing browsing pressure. However the remnant woods therein provide excellent shelter for their deer so fencing it all out without counter measures is not ideal. Landscape-scale culling to obtain regeneration is not considered desirable at all because so many deer would need to be culled to reduce occupancy to the necessary low level within the small strip of woodland present. On this basis it would appear that a more measured and strategic long-term approach to achieving favourable condition of woodland across a wider area, perhaps facilitated by woodland expansion using rotational fences, might provide the best option for all parties concerned. A large part of the Ness Woods SAC lies out with the RDMA boundary (see Map 1.3) and these parts are also considered to be in unfavourable condition. Solutions to this issue will also need to be found.

The Creag Dhu SSSI, an upland birchwood, lies within the RDMA boundary. SNH and FC consider its condition to be affected adversely by the impacts of wild deer. Management agreements are in place which aim to move the site into favourable condition but the site is prone to external influences which appear to make it difficult to gain the level of control over deer numbers desired. Consideration should be given to ways of resolving this issue.

In general terms, our discussions with landowners lead us to believe that most, if not actually all, are willing to engage with SNH/FC and consider ways to tackle the issue

[22] The aim of management at Kinveachy is to facilitate regeneration of the pinewoods, and the primary management action is to reduce the level of deer occupancy then maintain it at a level compatible with allowing young trees to establish.

of designated site condition. However, it is also fair to say that most owners also wish to be convinced of the logic for undertaking culls, rather than using other measures (e.g. fences). They would also like to see a balanced approach to be adopted based on a multi-faceted view of the situation, working on 'win-win' solutions wherever possible and otherwise working to compromise solutions.

Crucially, as well as causing profound disagreements and upset between organisations, an overly strong focus on the condition of designated sites draws some attention and resources away from the wider, and possibly more useful, long-term aim of promoting biodiversity in the wider countryside for public benefit (discussed later in this summary). The central point here is that designated sites tend to be the remnants of a formerly more extensive tract of habitat (e.g. most areas of native woodland within the MDMG area are now much smaller than they were in historic times; the best, least disturbed areas of blanket bog are now very much smaller than they were in the past due to drainage impacts and erosion). Otherwise, they often tend to be sites where the feature of interest is now much less abundant than it was previously within the local landscape in historic times (e.g. montane scrub on rocky ledges and steep corrie headwalls). Many remnant woodland and scrub features are highly attractive to deer for browse or shelter, even more so now that they are so much smaller in extent and deer are concentrated in them. It is unlikely that the current 'condition' of such features can be improved easily without a drastic reduction in deer numbers or the installation of deer fences to ensure complete exclusion. Heavy culling will always cause difficulty with owners trying to deliver multiple objectives. Fencing will, many would argue, lead to an unnatural habitat developing and also may require compensatory culls to be taken. That said, in the long-term fencing should always be as a temporary measure ideally - deer should ideally be allowed back into a fenced area once recovered, so that a more natural balance can develop across the feature as a whole. Even more importantly, a sufficient extent of habitat should be created to reduce the risks of deer concentrating their impacts on recovered areas once they are opened back up.

The project team proposes that the MDMG owners seek to develop innovative, long-term solutions that help to protect designated sites but at the same time help to protect owners' interests. For example, this could involve expanding remnant habitat into the wider landscape over a 20-30 year period so that in the long-term the designated site boundaries actually expand (e.g. sequentially expanding native woodland around the edges of each remnant in the Ness Woods SAC using fences, and later opening the entire restored area back up to deer. It might equally involve restoring habitat of equivalent interest (or potential) located around designated sites over a 10-20 year period to expand the extent of feature in good condition (e.g. improve the condition of all the high-altitude blanket bog around the Monadhliath SAC by damming drains and repairing eroding areas linked to drainage). This general approach, whilst arguably more challenging to organise and deliver, would help reduce the pressure on SNH/FC and in turn the MDMG to protect the SAC's 'at all costs'. After all, many of these areas only need protected because they have become much less extensive than in historic times. A related thought is that it might also be useful for SNH to undertake reviews of why some of the SAC's are designated in the first place and, if better areas are found, consider options for changing the boundaries to make achieving favourable condition more achievable for all parties. The Monadhliath SAC, and the land to its north, are a good example.

The project team believes that the forms of compromise proposed above would result in owners delivering the wider public benefits desired by government at the same time as using SNH's resources and expertise in a more constructive and efficient way (solve a problem rather than 'fight it'). The result would hopefully be

that SNH attains more of its goals, and in more places, but the trade-off is that delivery takes longer. In turn, owners are able to deliver public benefits without being unnecessarily penalised for owning part of an SAC.

DEER IMPACTS ON NON-DESIGNATED SITES

Outside of the SAC's a wide range of impacts are evident across the RDMA as a result of locally high densities of wintering deer. These include local contraction of heather cover, suppression of regeneration processes in native woodland remnants and impacts on agricultural landholdings/forestry plantations. The differences in habitat in and outside of the many fenced enclosures across the RDMA are testament to the long-term impact that deer have had (see images in main Review). The presence of wide ranging impacts is also indicated by the regular requests from landowners to SNH for authorisations to protect native woodland, crops on agricultural land and forestry re-stocks.

That said it does not follow that all landowners consider these forms of impact to comprise serious damage to the environment – it depends on their perspective. Owners focused on agricultural production or solely on commercial stalking might take the view that they are simply using the available vegetation to support their deer herd for sporting or their sheep flock for production of lambs. To others focused strongly on conservation management for biodiversity, the very same piece of land might be viewed as an ecological desert requiring dramatic action to facilitate recovery. These strong views are represented within the MDMG but, in reality, the vast majority of owners have a view somewhere in between.

ADMG's recent response to the Rural Affairs committee encourages owners to undertake reductions in deer impacts where needed, as supported by habitat monitoring. The extent to which owners in the RDMA would wish to address such impacts will probably in part be dependent on whether they see net benefits in doing so and whether the approach to achieving the changes can be delivered with limited impact on their other objectives of ownership. From the feedback and review work undertaken it also seems unlikely that widespread changes to the management of non-designated land will happen unless SNH can find ways to moderate their stance somewhat in relation to these designated sites. The main reason for this is that many MDMG landowners feel that the increasing burden of regulation and policy from government acts to limit their ability to manage the land sustainably for economic gain, personal enjoyment / interest or both. Willingness to engage tends to decrease with increasing pressure (i.e. increasing pressure creates a negative feedback which damages relations and makes genuine, successful partnership working harder to deliver). A related point is that many owners are already undertaking habitat management work themselves, in their own chosen way to suit their circumstances. For example using localized electric fencing to help establish new heather for grouse and deer fenced exclosures to allow native woodland to regenerate.

SOCIO-ECONOMICS

The interviews undertaken with owners confirmed that over 70 'Full-Time Equivalent' people are employed as gamekeepers in the RDMA. This is a considerable number given the nature of the land within the RDMA (high altitude and low productivity; accessible for only part of the year and severely constrained by planning regulations) and the limited alternative options for employment that exist therein.

The constraints on generating alternative employment arise for many reasons. The economics of breeding sheep for production of lambs are becoming increasingly marginal. Windfarms are proving difficult to develop because of the strength of opposition to developing on 'wild land' and concerns over environmental damage. Timber production will always be limited by the climate, altitude and soils of the RDMA. Tourism activity is high outside the RDMA to the east and also to a lesser extent on the southern and western perimeters, but opportunities to generate economic activity from it seem to be relatively limited inside the RDMA. Moreover, the tourism market is presumably finite hence the presence of so much activity already on the margins of the RDMA might constrain large-scale opportunities. Pure conservation management is being undertaken by some private landowners but is unlikely to occur across large parts of the RDMA unless partly or wholly funded by the state because the net costs are high (loss of many other income streams) and because most owners wish to use their estates for sporting.

At the time of writing, sporting management appears to be the primary land use capable of generating significant income on private estates in the RDMA that need or want it. That said, it is clear that only some estates rely on commercial sporting fees to justify their continued existence whereas there are many others where the owners fund sporting activity using their own personal finances. It follows that if policy pushes deer stalking estates too hard in a direction that doesn't suit them it's possible that they will cut back on what they do, particularly in relation to hind culling as this generates little or no real income compared to stags and is more demanding of time and resources because of the time of year and weather it is undertaken in.

If forced to reduce their emphasis on deer stalking some estates have a potential fall-back position in the form of grouse management (e.g. Kinrara) but switching emphasis to grouse is not a viable option for all estates as some areas are not well suited to grouse production for climatic reasons. Also, some owners might not be willing or able to fund such an operation because grouse production is much more labour-intensive than deer and estates focused on it tend to run at a substantial financial deficit in some or all years.

Crucially, many of the estates in the MDMG want to deliberately adopt a balanced, 'mixed approach' to sporting management whereby they have some deer stalking, some grouse shooting and, if available, some fishing. The thinking behind this is that it provides them with a resilient business model that reduces the risks of relying on one land use or income source too heavily. It is also good for the sporting client as it offers them the chance to enjoy various sporting interests on the estate by helping to ensure a good service is supplied to the client irrespective of weather. With all else equal this mixed approach helps ensure that habitats on estates will tend to be more diverse and resilient.

MANAGEMENT STRUCTURES & PROCESSES

The MDMG is a voluntary organisation that in many ways is remarkable, particularly given that all the owners involved are extremely busy people with a wide range of other commitments in their lives including major business interests and extra-curricular responsibilities. It is clear that most if not all owners are very passionate about deer, and sporting more generally, and that it is not difficult in principal to engage them in discussions on deer-related matters. That said we believe it needs to be done on their terms to ensure positive and constructive engagement.

On the other hand, owning land brings with it a set of wide ranging responsibilities. These need to include recognition that European laws on Special Areas of Conservation need to be adhered to by the Scottish Government and therefore, in turn, the owners of the designated sites. In addition, the Deer Scotland Act and other related acts are present to ensure that deer are not managed in a way that is unduly damaging to other interests[23]. In essence, we must expect that owners will engage willingly and constructively in processes designed to ensure that key legal obligations are met.

Our interviews with owners showed it is difficult for some of them to find ways of engaging positively with the MDMG during meetings. Some who attend say they find the meetings frustrating and ineffective – for them this calls into question whether it is worth attending. There are related concerns about estates 'saying one thing and doing another', and about a general lack of consultation in advance of marked changes being made and about estates sending people without executive authority to meetings knowing they cannot make decisions. It is clear that on some estates keepers and owners do not agree entirely on the best way to manage estates which is somewhat problematic. Finally, some stakeholders feel that they would like to attend meetings but are not invited and otherwise are not entirely welcome when they do attend. However, it should be noted that some owners worry that some of the stakeholders are, in reality, pressure groups that fundamentally disagree with the way land is presently owned and managed – they fear they might unnecessarily disrupt meetings. In general it would appear that marked but relatively simple changes to the way the MDMG conducts its business might go a long way to restoring the confidence of most members in their organisation and most stakeholders too. In turn, this is likely to improve the effectiveness of the group.

In relation to SNH, there is a general acknowledgement amongst most landowners that they have a very hard job to do. The majority of landowners (65%) felt when asked that they have good relationships with SNH staff. During interviews, there was also a wider general recognition and appreciation for the funding that SNH makes available for technical studies and deer counts. However these positive feelings are not shared universally within the group.

[23] A fuller list of responsibilities includes (a) extrinsic European legislation such as (for instance) the Habitats Directive 1992 (92/43/EEC), The Birds Directive 1979 (79/409/EEC) and The EIA Directive 1997 (97/11/EC); (b) Primary internal legislation such as The Wildlife and Countryside Act (1981 as amended), The Natural Heritage (Scotland) Act 1991, The Environment Act 1995, The Deer Scotland Act 1996, Environmental Assessment (Scotland) Act 2005, The Nature Conservation (Scotland) Act 2004, The Wildlife and Natural Environment (Scotland) Act 2011 and (c) internal Secondary Legislation including – for instance (and there are hundreds of these) The Conservation (Natural Habitats &c) Regulations 1994 (as amended)and The Environmental Liability (Scotland) Regulations 2009.

A significant proportion of owners (20%[24]) feel variously that SNH are too heavy-handed, are out of touch with the reality of running an estate and cannot be trusted to act in an objective and balanced way. Some feel that the senior management of SNH is typically unhelpful and have in the past seemed unwilling to find compromise solutions to problems. There is also a strong feeling that SNH does not have the internal systems in place or the culture needed to accept criticism and learn from it. Some owners do not feel SNH abides by its own Code of Practice, which asks for consultation before action takes place. In addition, some owners are concerned that SNH is working on too short a timeframe, with insufficient data, when it comes to making complex and important decisions about designated sites.

Owners would ideally like to see SNH change the way it interacts with the DMG, to become a partner that facilitates rather than a regulator that dictates. SNH's provision of 75% funding for the new Deer Management Plan, currently under development, is a sign that such a change is achievable. Moreover, in a very welcome move, SNH has recently indicated to the project team and Task Group that it is willing to make further changes going forwards in the form of a partnership working agreement[25]. This would involve allocating some SNH staff time for the benefit of the group as well as helping to identify funds that could be used to help deliver key research and monitoring projects identified in our recommendations.

CONCLUSIONS OF THE REVIEW

There appear to be many reasons for optimism that plans agreeable to most estates, and all the main user groups, can be developed and signed up to. This optimism is justified in part because the MDMG is still an active group with many willing participants. It is also justified because of the way in which the current owners and relevant stakeholders have engaged to date with the project team. Moreover, wide-ranging and robust information has now been supplied, collated and analysed in detail by the project team. The analyses presented in the Review, and summarised herein, help shed light on the dynamics of the Red deer population using the RDMA as well as the factors that govern its current behaviour and will determine its future size and trajectory. The analyses can be considered to form a 'toolbox' for the MDMG to help them make decisions, and also to point them to where essential information is still lacking and key uncertainties remain.

A key finding is that significant local gradients in deer density exist right across the RDMA – their widespread and continued presence for almost a decade implies that, to a degree at least, different owners should be able, without fences, to maintain different deer densities to meet objectives assuming they are not causing undue adverse impacts on neighbours or designated sites. In doing so, though, certain parts of the deer population are more prone than others to being attracted into low-density areas from high-density areas and then culled, notably younger stags. This is especially the case when hind densities are very high in the potential source areas, as this is likely to be a cause of emigration pressure in young stags.

On the basis of the findings to date, our developing belief is that strategic deer management has to be built from the local scale upwards and that detail is important to each owner; local effects are the most important ones as they are the cause of

[24] The owners of land around the Monadhliath SAC formed the majority of this figure – this is significant as it reflects a strong concentration of owners that were unhappy within that geographic area.
[25] SNH has already prepared a letter that was sent to the DMG Chair in May 2014 outlining its intentions going forwards.

competition between deer for resources and are also what causes 'impacts' to arise on land and between land users. Therefore, a key issue requiring resolution is concerns from neighbours over the continued availability of their current and future sporting stags.
Another issue needing a resolution is deer impacts and their potential to affect the condition of the designated sites in the RDMA. This is a very serious consideration and all owners are urged to recognise the need to act, within reason, to protect these sites where evidence is available to back up this need. It is fair to say from the interviews undertaken that all owners are indeed concerned with the state of the natural environment and wish within reason to manage it for the public interest. That said owners worry that the current ways in which SNH is assessing habitat condition, on the Monadhliath SAC especially, are not appropriate. Given the way many of the technical assessments to date have been designed, there is indeed evidence to suggest that SNH does not entirely understand key aspects of the natural environment it is charged with protecting and in particular the high altitude blanket bog on the Monadhliath SAC. On a related point, landowners feel that SNH sometimes appears unable to recognise the practical and economic constraints owners are working under , would feel the need to consequently work more closely together to help deliver public benefits on designated sites and in the wider environment.

The views and aspirations of landowners are crucial. They have now been captured, summarised and interpreted formally alongside other key constraints such as the socio-economics of the MDMG estates. It is evident that landownership patterns and motivations for ownership and management are highly complex and personal. Nevertheless, a web of strong interdependency clearly exists between owners, employees, the natural environment and SNH (if they are to achieve the country's nature conservation aims in the uplands). The interdependency that clearly exists implies that working together through compromise is far more likely to be successful in the long-term than working in parallel, trying to achieve individual aims whilst arguing that one person is right and one is wrong.

The success of any new strategic DMP for the MDMG area will be measured by the extent to which it is actually adopted and executed. This will require landowners to agree a direction of travel beforehand. To do this, they will need to consider the wide-ranging recommendations made in the Review, debate their merits and then decide which of them to adopt. The willingness of owners and agents to be completely honest, up front, and speak up for their estate, will be an essential requirement when debates are held. Also central to the eventual success of the planning process will be an objective and considered judgment by landowners on whether their views have been adequately captured and distilled down by the project team. On a related point, landowners will need to be convinced that the government departments involved in the MDMG area are willing to concede there are better, more positive ways to work together than has been the case in recent years. However, owners should also be careful not to forget the substantial level of financial support made available to them by SNH, without which it would have been difficult to prepare this review for we would have had very little survey information. Owners should also consider that SNH is more than willing to provide ongoing funding to help resolve the issues faced by all parties. Finally, owners should be aware that in undertaking this review the project team has asked SNH to push well into the 'middle ground' between the previous, somewhat extreme viewpoints – assuming they are willing, we propose that owners should also consider the benefits in the long term of moderating their views somewhat to see whether genuine partnership working with SNH can develop.

3. THE STEPS TO PLAN ADOPTION

REVIEW RECOMMENDATIONS

The Strategic Review of 2014 included a wide range of recommendations that all members were asked to comment on (see Page 146 of the main report**).** Owners then met on 4th August at Alvie House, during the group's AGM, to discuss the contents of the Review and agree a way forward.

AGM OF 4TH AUGUST 2014

A Vote of Confidence in the findings of the Review was passed (unanimous support, with one abstention) by the membership during the AGM on the 4th August. It was agreed that the next stage was for estates to review the recommendations in detail and agree (i) which recommendations should be adopted as part of the Strategic Deer Management Plan and (ii) how the Plan should be funded and delivered.

CONSULTATION ON DETAILED RECOMMENDATIONS

SCL produced a spreadsheet summarising all of the recommendations and sent this to the owners for comment in early August 2014. The proposed approach was to gauge the likelihood of individual elements of the plan being adopted by assessing the % of owners who were supportive in each relevant geographic area.

It was made clear in the e-mail accompanying the detailed spreadsheet that owners had several weeks to respond, but that if no response was forthcoming we would assume they were fully supportive of the recommendations made. By mid-September only 35% of owners had sent their views back on the detailed recommendations (in stark contrast to the 100% uptake for the consultation and widespread support for the Review in general[26]). This lack of response meant we were unable to gauge support for the plan quantitatively, as we had hoped.

A decision was made by the project team to proceed with preparation of the Strategic Deer Management Plan, based on the recommendations of the Review, with the justification being that owners would still have a chance to comment in detail on the plan itself once it had been drafted.

[26] It is fair to say that by this stage the project team had asked a lot of the owners' time, and this was probably a signal that people were keen to use their time to review the draft plan itself.

ADOPTION OF THIS PLAN

This document comprises the Strategic Deer Management Plan (SDMP) for the Monadhliath Deer Management Group covering the period 1st October 2014 – 30th September 2024 inclusive. It is based on the wide-ranging suite of recommendations made in the 2014 Review of Deer Management.

This document passed through the following stages in the lead up to its adoption:

1. The project Task Group reviewed the draft plan in late September 2014.
2. The TG met at Inverness on 2nd October 2014 to discuss the draft plan, and any issues relating to its adoption.
3. The TG provided formal written comments on the SDMP in early October 2014.
4. The draft plan was sent out to the membership, and to key stakeholders, in mid-October 2014. Final comments were asked for by mid-November 2014.
5. Stakeholders were asked to comment on the plan in January 2015[27].
6. Task Group members attended a meeting to discuss the draft, post stakeholder meeting, and agree any final changes needing to be made.
7. DMG members were asked to attend a presentation in early March 2015, if they had any remaining questions on the final draft of the SDMP.
8. The TG met finally on the 13th April 2015 to finalise the SDMP in advance of it being sent to members in final form.
9. The DMG plans to hold a vote to adopt the final version of the SDMP on 1st May 2015. Any owners not able to attend will be asked to sign off the plan formally by post.

[27] This final draft takes into account the comments of the various stakeholders - they read a previous version of the SDMP (Version 2.1) and met at Alvie House on 16thJanuary 2015 to discuss the SDMP and pass comment on it. The minute of this meeting was sent to TG members and the DMG membership as part of the final consultation process in early February 2015. TG members confirmed Version 2.5 as being the final one at a meeting on 13th April 2015.

STRUCTURE OF THIS PLAN

The remainder of this document, which is laid out according to the chapter list below, contains the main body of the SDMP. These chapters include all the action points which together form the SDMP. For interested readers, the chapter list below is cross referenced to the list of 48 principal recommendations which were proposed in the Review of Deer Management by SCL.

SDMP CHAPTER NUMBER	SDMP CHAPTER TITLE	LINK TO RECOMMENDATIONS IN THE SCL REVIEW
4	KEY AIMS	*N/A*
5	GEOGRAPHIC EXTENT & LAYOUT	*1,2,3,4,5,*
6	ORGANISATIONAL STRUCTURE & RESPONSIBILITIES	*10, 11, 16, 17, 18, 22, 23, 24*
7	OVERVIEW OF ACTIVITIES & EVENTS	*6,7,8,9,12,13,14,15*
8	BUDGETS & FINANCIAL MANAGEMENT	*25,26*
9	RAISING OF SUBSCRIPTIONS	*19,20*
10	MEMBERSHIP INFORMATION	*N/A*
11	EXTERNAL COMMUNICATIONS	*21*
12	STRATEGIC MONITORING PROGRAM	*27,28,30,36,37*
13	STRATEGIC RESEARCH PROGRAM	*29,31,32,33,34,35*
14	STRATEGIC HABITAT MANAGEMENT PROGRAM	*38,39,40,41*
15	STRATEGIC FENCING PROGRAM	*42,43*
16	DEER MANAGEMENT: CORE INFORMATION HELD	*45,46,47,48*
17	DEER MANAGEMENT: CULL PLANNING & EXECUTION	
18	LEGISLATION & NATIONAL POLICIES	*N/A*
N/A	APPENDICES	*N/A*

NB The 2014 Review contains a wealth of detailed background and analysis on the MDMG area. Owners are aware of this and hence it was considered inappropriate to include this level of detail in the SDMP document. Readers are urged to read the Review before reading this SDMP in order to gain a full appreciation of the background.

4. STRATEGIC DEER MANAGEMENT PLAN: KEY AIMS

The Monadhliath Strategic Deer Management Plan represents a commitment from its members to adopt a new, integrated approach to jointly managing the deer herd. However, **the plan is considered to be flexible** and can be modified, by following due process, through discussion and consensus within the group at any point.

The key aims of the Monadhliath SDMP are as follows:

- ✓ **Manage for appropriate local deer densities**: The MDMG's members will through their management of the herd help to provide quality Red deer stags for those that wish them, but without impairing the ability of the members to achieve their other management objectives to the extent that the group finds itself in an intractable situation and unable to resolve any conflict between members;

- ✓ **Deliver significant public benefits**: The MDMG will work in partnership with the Scottish government to deliver public benefits on designated sites, and more widely where practical and mutually agreeable. Concurrently, the MDMG will encourage the Scottish Government to reciprocate by helping to secure the funds necessary to (i) deliver core scientific research in the uplands in partnership, where knowledge is presently lacking, and (ii) support the group to operate independently;

- ✓ **Create rural employment**: The MDMG members will wherever possible promote rural employment inside the RDMA, and take pride as a DMG in creating and sustaining jobs in this fragile rural area given that the alternatives are so few;

- ✓ **Promote the voluntary approach**: The MDMG's landowners should be willing to, and demonstrably engaged in, responsible deer management but as a consequence should feel they are then free to remain in general control of wider issues of land management decision-making;

- ✓ **Encourage pre-emptive action**: The MDMG will develop expertise in identifying potential land management problems before they actually occur through planning and information management, and then act quickly to resolve disputes, before they affect the basic functioning of the group, using a pre-agreed system of electronic communication, meetings and mediation;

- ✓ **Focus on landscape-scale delivery**: The MDMG owner will embrace the need to think strategically about deer management and will strive, though excellence in herd management and habitat management, to be a leader in the delivery of landscape-scale conservation management and carbon management in the uplands, thus demonstrating that major public benefits can be delivered on large tracts of privately-owned land;

- ✓ **Promote best practice in DMG's**: MDMG will aim to become one of the foremost and most admired DMG's in the UK, through a robust empirically-derived understanding of how their deer herd behaves and how it interacts with the environment.

5. GEOGRAPHIC EXTENT & LAYOUT

5.1. MEMBER ESTATES

The range of estates located within the MDMG area are shown on Map 1.2.

At the time of writing in March 2015, a small number of estates are not in proper contact with the DMG and efforts to contact them during the planning process failed:

- Alltruadh
- Coire Neurlain
- Ghlas Dhoire Plantation
- Upper Glenfintaig

The membership of the DMG is therefore assumed, at present in March 2015, to comprise all estates on Map 1.2 with the exception of those listed above and also FCS South Laggan (almost no land within the RDMA because of the line of their present deer fence).

In advance of the AGM in August 2015, renewed attempts will be made to contact the 'missing estates' as follows:

- ✓ ACTION: Check whether **'missing estates'** are willing to provide historic and future **cull data** to the DMG, in line with current members, as a minimum.

- ✓ ACTION: Check whether **'missing estates'** would be willing to **take part in DMG** activities, for the benefit of all including attending meetings and paying a subscription.

Postscript: In late March 2015 Drew McFarlane-Slack made attempts to contact the missing estates. At the time of writing on 31st March 2015, Allt Ruadh Estate had been contacted and agreed to: (i) provide cull data to Drew in due course and (ii) to review and comment on the SDMP in due course. Also, the agent responsible for the recent sale of Ghlas Dhoire confirmed to Drew that the new owner would be in touch in due course to provide information. In the interim he confirmed that there did not appear to have been a deer cull undertaken in recent years but this would begin soon as felling (and re-stocking) plans are currently being developed for the site.

5.2. SUB-GROUPS

The DMG area is presently divided into 4 Sub-Groups (see Map 1.4). It is proposed that these Sub-Groups are retained for a period of 2 years, from 1st October 2014, as most members seemed keen on this at the AGM on 4th August 2014.

However, at the AGM's in August 2016 and August 2019 these boundaries will be re-considered in line with recommendations made in the 2014 Review:

- ✓ ACTION: The first proposal, to be considered in August 2016, is to split the MDMG area into **two zones** (**Eastern and Western**; see Map 1.4) for the purposes of streamlining decision-making and management given the distinct differences between the two areas.

- ✓ ACTION: The second proposal, to be considered in August 2019 assuming the first proposal is adopted and is judged effective, is to make a permanent

split thus forming **two new DMG's** which are then linked only by a Strategic DMP and a new Liaison Group (some Executives Members of each new group) in line with other large areas of the Highlands.

Postscript: at a project Task Group meeting on 2nd October 2014 it was proposed that the existing Strathnairn Sub-Group could be merged in with the Speyside Sub-Group. Members should consider this as part of their review of the draft SDMP. Unless there are strong objections at the proposed adoption meeting for the SDMP in May 2015, it will considered an agreed part of this plan that the merger will go ahead.

5.3. LOW GROUND & HIGH GROUND

The land within the MDMG area is presently split into two distinct sections for the purposes of management, namely the RDMA (Red Deer Management Area; see Map 1.2) and the low ground located out with the RDMA (termed herein the Low Ground Deer Management Area or LGDMA[28]) which contains widely varying mixtures of Roe, Sika and Red deer.

The DMG presently discusses the RDMA in detail at meetings but refers rarely if ever to the LGDMA. It is evident that many of the core conflicts between deer and people are likely to be arising in the LGDMA rather than the RDMA, in particular Road Traffic Collisions, illegal taking of deer, damage to agricultural crops and damage to forest crops. In order to address this important disparity:

- ✓ ACTION: The DMG should aim to **compile all available information** relating to the LGDMA in the 5th year of the SDMP (1st January 2019 – 30th June 2019), including land uses, land use policies, deer culls taken, deer abundance estimates available and supporting information (employment levels, reported impacts, identify key stakeholders etc). A key focus at this stage will be to determine the best way to deal with designated sites inside the LGDMA that are in unfavourable condition, in particular native woodlands given that a high % of the overall cover of native woodland in the MDMG area lies within the LGDMA as opposed to the RDMA (see Map 1.2). [29]

- ✓ ACTION: At the AGM in August 2019 the DMG should aim to discuss and **agree a new policy** for how land in the LGDMA will be reported on and managed at the strategic level.

- ✓ ACTION: As of 1st October 2019, the MDMG (or the two new DMG's) should aim to initiate **formal reporting of the LGDMA** at meetings and actively work to resolve key conflicts apparent, with a particular focus on designated native woodlands within this area. Reporting will include: (i) culls of each deer species by area, including Roe and Sika and (ii) regular recording of the reported extent and nature of impacts arising from interactions between deer and people. Data on the condition of designated sites should be provided by SNH/FC and also taken into account as part of the reporting process.

[28] The area comprises all the land out with the red RDMA boundary, but which still lies within the outer boundary of the overall MDMG area.
[29] This task has been de-prioritised relative to others for now, because it is felt by all members that they are otherwise trying to change too much at once.

6. ORGANISATIONAL STRUCTURE & RESPONSIBILITIES

The MDMG will adopt a revised organisational structure as of 1st September 2015. The table and diagram overleaf summarise the new structure. The key points are as follows:

Office Holders

- ✓ ACTION: A new **Chairperson** was selected during the 4th August 2014 AGM (Drew McFarlane Slack). The Chair should ideally rotate every 5 years at the latest, which means August 2019 in Drew's case[30].

- ✓ ACTION: A new **Vice-Chair** should be selected from the membership during the AGM of August 2015, their role being to support the Chair and undertake some of their duties in their absence. They should rotate every 5 years at the latest. Interim support is currently being provided by Jamie Williamson (ex-Chair) in the period until the AGM.

- ✓ ACTION: An **Executive Committee** should be formed and will act as a steering group for the DMG, to help promote more rapid decision-making. They should rotate every 5 years at the latest. It is proposed that this committee is formed from the current Chairs of the Sub-Groups for the first year of the SDMP, in the absence of any better proposals, the logic being they are up to speed with all planning-related matters. Future membership of this committee should be voted upon during the AGM of August 2015, with existing members able to put themselves forward along with anyone else who is interested.

- ✓ ACTION: A **Technical Liaison Committee** should be formed, comprising Chair (or Vice) plus three members (assumed to be the same as the Executive Committee members). Their role will be to scrutinise government-funded proposals for research & monitoring within the MDMG area to make sure the DMG has a chance to input. They should rotate every 5 years at the latest. For now, it is proposed that this committee is formed from members of the Executive Committe for the first year of the SDMP, in the absence of any better proposals, the logic being they are up to speed with all planning-related matters and technical matters. Future membership of this committee should be voted upon during the AGM of August 2015, with existing members able to put themselves forward along with anyone else who is interested.

  ACTION: The group should consider creating a **Treasurer** role, because of the likely increase in complexity of finances in the future (and in particular if the Scottish Government award the DMG any research funding). They should rotate every 5 years at the latest. This idea should be put to a vote at the AGM in 2015, and the position filled with a subsequent vote the same day if the majority of members agree. They should rotate every 5 years at the latest.

[30] Given that there was no formal constitution in place during the August AGM (proposals are now in place to develop one), it might be preferable for members to confirm again during the AGM in 2015 meeting (1 member = 1 vote) that they are happy to retain Drew as the new Chairperson.

- ✓ ACTION: The role of **Secretary** is currently filled by James MacPherson-Fletcher of Strutt & Parker, who continued on when Rod Andean left in summer 2014. Many members have mentioned the idea of using independent secretarial services for this role rather than a land agent, in order to save money (or make the same funds go further). This idea should be put to a vote at the AGM in 2015, and the position filled within 3 months of the meeting date (Executive Committee role) if the majority of members agree. They should rotate every 5 years at the latest.

NB For reasons of efficiency and integration members might hold multiple roles, as described above, as long as there is no obvious conflict of interest between them.

Ordinary members

- ✓ ACTION: The DMG should arrange meeting venues, beginning at the AGM in 2015, so that **Voting Members** sit to the front of the room and other members (and other participants) sit behind, the aim being to allow the Chair to identify who is eligible to vote and who is not (1 estate = 1 vote).

- ✓ ACTION: **Non-Voting Members** should be entitled to take part in all debates and discussions as previously, but should not be eligible to vote on DMG matters from the meeting from the AGM in 2015 onwards.

- ✓ ACTION: The Chair should develop a **Constitution for the DMG** in consultation with the Executive Committee and SCL, and have it in final draft form by May 2015 ready for review and adoption at the proposed AGM in August 2015. The Constitution will then be reviewed every 5 years in line with the SDMP review cycle (see Chapter 7). This document should include rules on how votes are taken and decision made as a group, including definitions of a 'quorum' and a 'majority' etc (as suits the group set up).

- ✓ ACTION: The MDMG Executive Committee should have an 'on the ground' sounding board available to them when helping to steer DMG policy and decisions. A '**Keepers Group**' should be formed and should comprise a Head Keeper from each of the existing Sub-Groups (ideally from different estates to those of the Exec Committee members). They should be consulted by e-mail on relevant matters, copied into minutes of all meetings, and will also meet in June each year to discuss topical issues within and out with the DMG area (see later section on Events). Members for this group should be sought and appointed at the AGM in 2015. They should rotate every 5 years at the latest.

Advisors & Stakeholders

- ✓ ACTION: **SNH** should be asked in August 2015 to provide a single, named point of contact for the DMG to communicate with (even if more than one staff member within SNH is involved in the DMG area and meetings etc). SNH will inform the Chair if this person changes, who will take over and when the change will take place.

- ✓ ACTION: A representative of **ADMG** should be asked formally to attend each of the DMG main meetings (2 per year), beginning with the May 2015 DMG meeting because of its importance. The person(s) should be identified in advance and placed on the circulation list for these meetings.

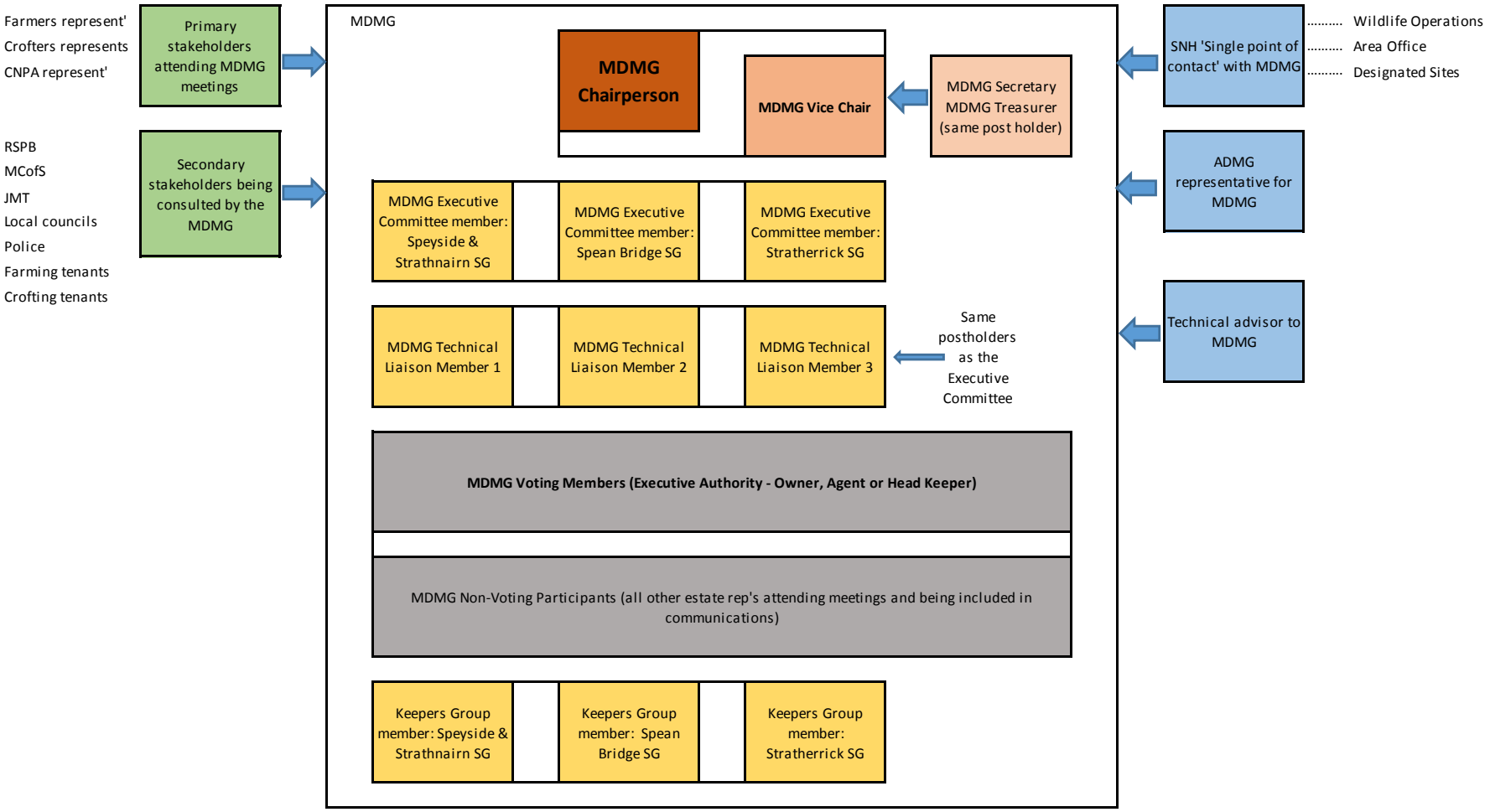
- ✓ ACTION: The DMG should invite **Primary Stakeholders** to represent their views at the DMG meetings in April/May and August each year (see Chapter 7 – Sub-Chapter 7.1). The primary stakeholders are considered to be: (i) a farmers and a crofter's representative and (ii) a CNPA representative.

- ✓ ACTION: The DMG should invite **Secondary Stakeholders** to put forward their views for each main DMG meeting by e-mail in advance of meetings, using the 'Cause for Concern' mechanism (see later section in this report). The secondary stakeholders are considered provisionally to include: (i) community council representatives, (ii) Police, (iii) MCofS, (iv) RSPB and (v) JMT. Members should vote in August 2015 on a final list and then the Chair (and Exec Committee) should be tasked with contacting these organisations and explaining to them the mechanism for communication.

- ✓ ACTION: MDMG should appoint a **Technical Advisor** to help support the activities of the group, notably in relation to the analysis and presentation of annual statistics but also to help steer technical decision-making. An organisation or individual should be chosen in advance of the August AGM in 2015.

Postscript: The TG decided to appoint Strath Caulaidh as the Technical Advisor for the first year of the plan (March 2015-February 2016). At the AGM in 2015 a decision will be made about who to appoint going forwards after 2015-16.

MDMG STRUCTURE



7. OVERVIEW OF ACTIVITIES & EVENTS

A repeating annual cycle of activities and events will form the backbone of the SDMP. This will be set within a 10-year planning cycle which also has several key stages.

7.1. ANNUAL PLANNING CYCLE

The following activities will underpin the MDMG's annual planning cycle:

Preparatory Work

- ✓ ACTION: SCL should produce a short form which allows estates to **update the Planning Records** of the group (i) update their membership details (contacts, addresses etc), (ii) confirm any proposed changes in management objective that affect the group, (iii) raise any 'Causes for Concern' (e.g. neighbour activities, adverse impacts occurring etc). This will be e-mailed to members in January each year by the Secretary.

- ✓ ACTION: SCL should produce a **standardised larder record** (see Appendix 1) which estates will be encouraged to adopt in part (core data) or in full, to facilitate easy analysis of cull records from across the MDMG area to help with population modelling. This will be e-mailed to members in March each year by the Secretary if any updates have been made in the intervening period (these would be made by the Technical Advisor). The new form should be used from July 2015 onwards of the group is willing to adopt it.

Scheduled Activities & Events

- ✓ ACTION: **Estates** should be asked to provide their **final cull records** by the end of March each year. The records should be sent to the Secretary and the Technical Advisor for compilation and analysis respectively.

- ✓ ACTION: **Estates** should be asked to provide an **update** to the **MDMG Planning Records** at the same time as their cull records (records will be compiled by the Secretary and sent on for analysis).

- ✓ ACTION: The Technical Advisor should analyse all the groups new cull data, and updated status data, and produce a short **MDMG Annual Report** which will be sent to all members by mid-April each year. This should include a **Risk Register**, which covers any Causes for Concern raised by members and proposals for resolving them.

- ✓ ACTION: The Chair and Executive Committee, in consultation with the membership, should **identify one or more meeting venues** suitable for holding DMG functions for each phase of the annual cycle (April/May DMG meeting, June keepers meeting and August AGM – see actions below). Arrangements should be made (i) to compensate venue owners accordingly (even if in kind, or with a small gift) and (ii) to arrange for a sandwich lunch (including tea/coffee/water) to be provided.

- ✓ ACTION: The DMG should **meet in late-April** / **early May** each year to undertake the following activities: (i) Executive Committee meeting 9am-

10.30am, (ii) Sub-Groups meetings from 10.45am-12.30pm, (iii) DMG lunch from 12.30-1.30pm and (iv) **General Meeting** of whole group from 1.30pm – 4.30pm. The focus of the meeting should be on the size of the most recent deer cull, plans for the next season and likely effects. Related discussions should be held on impacts arising from culls (on neighbours, on habitats and on the deer themselves).

- ✓ ACTION: The **keepers of the MDMG should meet in mid-June** each year as follows: (i) meeting in the morning to discuss the practical fallout of the mid-April meeting and discuss on-the-ground issues, (ii) hold a lunch and (iii) undertake a site visit in the afternoon to which all MDMG owners should also be invited. The aim of the afternoon visit should be to foster understanding between different land user groups as well as to promote educational aspects (new management techniques, results of applied deer research etc). An optional extra is to invite a guest speaker (or expert from within the MDMG ranks) to discuss a topic relevant to the site being visited.

- ✓ ACTION: The DMG should **meet in early August** each year to undertake the following activities: (i) Executive Committee meeting 9am-10.30am, (ii) Sub-Groups meetings from 10.45am-12.30pm, (iii) DMG lunch from 12.30-1.30pm and (iv) **Annual General Meeting** of whole group from 1.30pm – 4.30pm. The focus of the meeting should be on group structure, finances, reviewing the SDMP and on research & monitoring progress/needs going forwards. The assumed date for the AGM is just in advance of 12th August when most owners are in Scotland for the start of the grouse season.

<u>One-Off Activities & Events</u>

- ✓ ACTION: Estates should during the year **update** the DMG membership on any significant **changes in status** (ownership, objectives, staff etc).

- ✓ ACTION: **Estates** should at any time during the year issue a **'Cause for Concern'** to the group (or a group of neighbours) if they feel something is concerning them unduly. The Risk Register will be updated and the Executive Committee tasked with finding a resolution, in discussion with others as required (e.g. SNH, Technical Advisor).

- ✓ ACTION: **Primary stakeholders** can at any time during the year choose to issue a **'Cause for Concern'** to the group (or a group of neighbours) if they feel something is concerning them unduly. The Risk Register should be updated and the Executive Committee tasked with finding a resolution, in discussion with others as required (e.g. SNH, Technical Advisor).

- ✓ ACTION: Estates or tenants should at any time during the year notify all neighbours and the Chair of the DMG if an **Out of Season (OOS) licence** is going to be sought, and otherwise also if a major change in culling policy is being considered (see Chapter 17). A consultation should be held over no more than a 2-week period (wherever possible), the aim being to identify ways of neutralising any potential conflicts that might arise because of the application. This might include agreeing to different ways of working to help achieve a similar outcome, compromising on the level of extra cull, switching the composition or timing of the cull etc. The Chair and the Executive Committee should be tasked with finding a resolution if required, in discussion with others as needed (e.g. SNH, Technical Advisor).

ACTIVITY	05 January 2015	12 January 2015	19 January 2015	26 January 2015	02 February 2015	09 February 2015	16 February 2015	23 February 2015	02 March 2015	09 March 2015	16 March 2015	23 March 2015	30 March 2015	06 April 2015	13 April 2015	20 April 2015	27 April 2015	04 May 2015	11 May 2015	18 May 2015	25 May 2015	01 June 2015	08 June 2015	15 June 2015	22 June 2015	29 June 2015	06 July 2015	13 July 2015	20 July 2015	27 July 2015	03 August 2015	10 August 2015	17 August 2015	24 August 2015	31 August 2015	07 September 2015	14 September 2015	21 September 2015	28 September 2015	05 October 2015	12 October 2015	19 October 2015	26 October 2015	02 November 2015	09 November 2015	16 November 2015	23 November 2015	30 November 2015	07 December 2015	14 December 2015	21 December 2015	28 December 2015	COMMENTS
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	
Estates update member details																																																						Annual update
Estates: update management obj's																																																					Annual update
Estates: list 'Cause for Concern'																																																				Annual update
Estates prepare cull records																																																					Annual update
Analyst updates records & models																																																					Update models
Analyst updates Risk Register																																																					Update models
Analyst prepares DMP Update																																																					Update models
April/May GM: Exec Committee																																																						
April/May GM: Sub-Groups																																																					Sequence of meetings to ensure effective group operation - focus on cull analysis and population predictions
April/May GM: Group lunch																																																					
April/May GM: Group meeting																																																					
Keepers day June: meeting																																																					
Keepers day June: lunch																																																					Keepers have a chance to meet and discuss matters
Keepers day June: site visit																																																					
Keepers day June: owners to site (opt)																																																				Owners invited to site
August AGM: Exec Committee																																																					
August AGM: Sub-Groups																																																					Sequence of meetings to ensure effective group operation - focus on membership, group structure, finances etc
August AGM: Group lunch																																																					
August AGM: Group meeting																																																					
Update: major changes in manage'																																																					As required
Update: major change proposed cull																																																					As required
Update: new 'Cause for Concern'																																																					As required
Update: OOS licence consultation																																																					As required
Technical Liaison Committee																																																						As required
Technical Advisor																																																						As required

7.2. 10-YEAR PLANNING CYCLE

- ✓ ACTION: The **SDMP should be adopted** by MDMG members at special DMG meeting in May 2015 (date TBC by Chair).

- ✓ ACTION: The Chair, along with the Executive Committee, should undertake an **Annual Review of progress** with the SDMP in advance of the AGM each year. They should report back on progress, problems and plans ahead at the AGM. The Annual Report will be the core document used to help review progress, and each Annual Report and its contents, along with the minutes of each DMG meeting held, will be considered a formal Annex to the plan.

- ✓ ACTION: A **5-year review of progress** with the SDMP should be undertaken over the period January - August 2019, the aim being to confirm the onwards direction of travel, based on progress to date and problems encountered along the way. A report should be issued at the AGM confirming the outcome of the review and any actions that need to be taken to bring the group back in line with the SDMP's aims and objectives.

- ✓ ACTION: The **SDMP should be reviewed in its 10th year**. Tasks should be as follows: (i) Prepare tender for SDMP review & update by 1st September 2023, (ii) Award tender for SDMP review & update by 1st December 2023 and (iii) Update of SDMP at end of 10 year-period (time window should be: January - December 2024).

Plan Year	Start Date	End date	Annual Review	5-Year Review	10-Year Review	Comments
1	Jan-15	Dec-15	✓			At AGM
2	Jan-16	Dec-16	✓			At AGM
3	Jan-17	Dec-17	✓			At AGM
4	Jan-18	Dec-18	✓			At AGM
5	Jan-19	Dec-19	✓	✓		Jan - Aug 2019
6	Jan-20	Dec-20	✓			At AGM
7	Jan-21	Dec-21	✓			At AGM
8	Jan-22	Dec-22	✓			At AGM
9	Jan-23	Dec-23	✓			At AGM
10	Jan-24	Dec-24	✓		✓	January - December 2024

8. BUDGETS & FINANCIAL MANAGEMENT

In order to operate effectively, and achieve the objectives of the SDMP, the MDMG needs to take account of the financial budgets required.

- ✓ ACTION: MDMG needs to produce and then agree a **budget for the general costs of running the group**, including (i) subscriptions to ADMG, (ii) the costs of the secretariat and (iii) the costs associated with the new structures & annual activities proposed. Accurate provisional sums need to have been ascertained by the time of the May 2015 meeting, so that members can vote whether or not to put in place the general level of funding needed (variances can be agreed if needed at a later date, subject to a majority vote) at the AGM in August 2015.

- ✓ ACTION: MDMG needs to produce and then agree a **budget estimate for the costs of running a basic program of research and monitoring**. Accurate provisional sums need to have been ascertained by the time of the May 2015 meeting, so that members can vote at the AGM whether or not to put in place the general level of funding needed (variances can be agreed if needed at a later date, subject to a majority vote).

- ✓ ACTION: The MDMG and SNH need to produce and then agree a **budget estimate for the costs of running the proposed major blanket bog research project** (and related projects) as proposed in the Review of Deer Management. This should be done over the period 1st October 2014 – 31st March 2015. [The project scope also needs finalised in advance of this, along with confirmation of the arrangements that need to be in place for SNH to release funds on behalf of the Scottish Government; see later section on Research]

- ✓ ACTION: The MDMG may need to consider changes to the way it is structured, in order to be able to receive in funds e.g. from Scottish Government. A suitably-qualified CA is needed to provide advice on this matter. They should also need to consider (i) the benefits of opening an extra bank account, so that one of for sub's and the other is for research funds received in, and (ii) the pros and cons of VAT registration. The MDMG might also be advised to consider appointing the same CA (or another) to check over its accounts each year, in order to verify them on behalf of the membership who will be paying in subscriptions.

- ✓ ACTION: The MDMG should consider the issue of payment to the Chair (and perhaps Vice-Chair) for their time or at least to cover their expenses given the demands on time of these positions.

  FINANCIAL AND BUDGETARY INFORMATION HAS BEEN OMITTED FROM THIS VERSION OF THE SDMP FOR REASONS OF OWNER PRIVACY.

9. RAISING OF SUBSCRIPTIONS

The MDMG needs to agree a method for raising the extra subscriptions required to deliver the SDMP. It is thought wise to consider a different means of allocating sub's than the method currently employed by the group.

- ✓ ACTION: SCL to develop a proposed **method for raising subscriptions** for the group, based on a combination of (i) land area (ha) within the RDMA and (ii) culls taken, with a 2:1 weighting in favour of stags culled (by May 2015).

- ✓ ACTION: MDMG owners to review the proposed method and **agree at the August AGM in 2015 meeting** whether or not they wish to adopt it, or an alternative method. Discuss the possibility of varying subscriptions for estates who do not pay on time (e.g. £100 extra onto subscriptions for late payers; £50 discount for early payers).

- ✓ ACTION: **Start the process of raising new subscriptions** in August 2015 after the AGM, following creation of the necessary bank accounts and DD mandates or Standing Orders (request that estates do not issue cheques due to the time required to handle them, given the more onerous bookkeeping and banking demands involved); consider whether the 1st year of subscriptions can be reduced by an amount equal to any surplus in the existing DMG account albeit it might best be held in reserve as contingency.

SCL has produced (separately) a model for allocating a given level of subscriptions based on the following approach

- ✓ 50% weighting given to land area and 50% to culls taken.
- ✓ The estate with the largest land area has the largest 'area weighting' and the smallest estate has the smallest weight.
- ✓ A similar weighting approach is used for culls. However, in the 'culls taken' element a weighting of 2: 1 in favour of stags is employed (no weight is given to calf culls at all) reflecting the value and emphasis placed on stags being shot for sport.
- ✓ A minimum payment of £100 is applied to all estates who are members, irrespective of size or culls taken.

MODEL HAS BEEN OMITTED FROM THIS VERSION OF THE SDMP FOR REASONS OF OWNER PRIVACY.

10. MEMBERSHIP INFORMATION

The MDMG needs to manage its information sources carefully, both to help in day-to-day running of the groups' affairs as well as to help facilitate a smooth update of the SDMP in 10 years' time.

A range of 'core documents' and related files need to be produced early in the plan period (see table overleaf):

- ✓ ACTION: SCL should produce **final report copies/map copies** and hand over to MDMG members (by May 2015).
- ✓ ACTION: SCL should produce a **data handover** of planning project files (key GIS shapefiles and key Excel sheets) (by May 2015).
- ✓ ACTION: A definitive file of **MDMG contacts** and addresses needs to be produced by the group secretary, with help from SCL who currently hold the most up to date records (by May 2015).
- ✓ ACTION: Final files of **deer count (live & aerial) data** and **deer cull data** as created by SCL for the Review (by May 2015).
- ✓ ACTION: Create a **standard Excel file to take in annual cull data** and process it, along with other companion data sets (cattle/sheep/goat numbers; deer mortality & deer recruitment data) (by May 2015).
- ✓ ACTION: Create a spreadsheet containing '**forms' for Members Details, Change in Status & Cause for Concern** along with a Risk register (by March 2015).
- ✓ ACTION: Create a **standard larder record** form for use by MDMG estates if they are willing, to make data analysis for research projects much easier to undertake (by March 2015; see Appendix 1 for an example).
- ✓ ACTION: Create a **pro forma Annual DMP Update** for members and a **pro forma 'Briefing Paper'** for one-off discussions in the MDMG (by April 2015).
- ✓ ACTION: Create **pro forma Agenda and Minutes** for MDMG meetings (by April 2015).

Item	Software Package	Publisher	Description
MDMG Review of Deer Management	Word	SCL	Review published by SCL in spring 2014 on behalf of the MDMG
MDMG Review Data Handover	Various	SCL	Key elements of data produced during the SCL Review
MDMG Strategic DMP	Word	SCL	Strategic Deer Management Plan produced by SCL following the Review
MDMG Members Database	Excel	MDMG (Strutt & Parker)	Excel spreadsheet of members contact details
MDMG Deer Count Data - Ground	Excel	SCL	Spreadsheet summarising all MDMG ground count data
MDMG Deer Count Data - Aerial	Excel	SCL	Spreadsheet summarising all MDMG aerial count data
MDMG Deer Cull Data	Excel	SCL	Spreadsheet summarising all cull records held for the MDMG estates for deer culled within the RDMA (begins 1988)
MDMG Deer Population Models	Excel	Not published	Spreadsheet-based model of how the MDMG populations are likely to behave under different management scenarios
MDMG Standard Cull Record	Excel	SCL	Record the numbers of deer shot (and key biometrics) within the RDMA and out with the RDMA on an estate-by-estate basis
MDMG Deer Recruitment & Mortality Record	Excel	SCL	Estimate the % recruitment for the past season (% calves at foot) and the estimated numbers of deer dying of other causes (natural, roadkill, poaching)
MDMG Large Grazing Mammals Record	Excel	SCL	Record the numbers of sheep, goats and cattle within the RDMA on an estate-by-estate basis, and patterns of stocking
MDMG Change in Status form	Word	SCL	Confirm that estate contact details and management structure remains similar and document any changes
MDMG Causes for Concern form	Word	SCL	Raise any issues of concern relating to deer management that need to be considered by parts or all of the MDMG
MDMG Planning Risk Register	Excel	SCL	Spreadsheet registering each Cause for Concern raised and recording its status (active, resolved)
MDMG Annual Report	Word	SCL	Briefing paper which will include: annual culls taken for previous season, historic analysis of culls & counts, predicted changes in population at different spatial scales within MDMG area & causes for concern raised
MDMG General Meeting Agenda	Word	MDMG (Strutt & Parker)	
MDMG General Meeting Minutes	Word	MDMG (Strutt & Parker)	
MDMG Annual General Meeting Agenda	Word	MDMG (Strutt & Parker)	
MDMG Annual General Meeting Minutes	Word	MDMG (Strutt & Parker)	

NB Final information to be provided once plan is adopted in 2015.

11. EXTERNAL COMMUNICATIONS

The MDMG needs to decide exactly how it wants to present itself to the outside world, and also how it wishes to formally communicate with them.

- ✓ ACTION: Discuss with MDMG owners at the proposed April 2015 meeting whether they want to still build the **MDMG website** and run it, as proposed by SCL in their original Scope[31]. Put arrangements in place by August 2015 for building the site and going live with it.

- ✓ ACTION: Consider if any **other pro-active measures** should be put in place to help with **external communication**, including: (i) media training, (ii) leaflet, (iii) publishing the SDMP etc. Put arrangements in place by August 2015.

- ✓ ACTION: Consider who in the group is to act as their **main spokesperson**, and agree the level of autonomy they have on this matter in advance of any enforced situations presenting themselves (e.g. external criticism being levelled from pressure groups etc). Agree a brief for them and also a protocol for how to deal with enquiries. Put arrangements in place by August 2015.

[31] This was originally part of the Scope proposed by SCL but the level of fees remaining in the project budget for this work is now negligible, due to the extent of extra work that has had to be done by SCL to get the planning process to this stage.

12. STRATEGIC MONITORING PROGRAM

The SDMP proposed that the MDMG commissions a range of monitoring work, over and above that carried out by SNH as a matter of course on designated sites (Site Condition Monitoring; Herbivore Impact Assessments). The actions points arising are listed below, and some background to each project is provided in the table overleaf.

- ✓ ACTION: SNH should organise over the plan period, with the help of MDMG owners, **two winter helicopter counts** of the entire RDMA (February 2018 and February 2023).

- ✓ ACTION: SNH should organise a **summer helicopter count** of the entire RDMA at some point in the period July-August 2016.

- ✓ ACTION: The MDMG owners should on an annual basis in late March submit a form which **confirms the numbers of sheep, cattle and goats** grazing in the RDMA so that records from the planning process can be updated by the Technical Advisor and chart-based outputs incorporated into the annual briefing to members to show trends in overall levels of grazing.

- ✓ ACTION: The MDMG owners should on an annual basis in late March submit a form which confirms the **numbers of deer** they believe to have **died naturally in the RDMA** (and also from poaching and RTC's) so that population models from the planning process can be updated by the Technical Advisor and chart-based outputs incorporated into the annual briefing to members to show trends in these parameters (they are crucial in promoting model accuracy).

- ✓ ACTION: The MDMG owners should on an annual basis in late March submit a form which confirms the **numbers of juvenile deer** they believe to have been **born in the previous season**, based on direct observations in spring, in the RDMA so that population models from the planning process can be updated by the Technical Advisor and chart-based outputs incorporated into the annual briefing to members to show trends in these parameters (they are crucial in promoting model accuracy).

  NB1 The MDMG owners should, at their own discretion, organise a DMG-wide ground count of deer every 2 or 3 years. This was not recommended in the 2014 Review so is not listed as an action point of the SDMP. The work has no direct costs therefore it has not been included in the chapter on funding.

  NB2 The owners of estates in Area 7, who are undertaking additional hind culls, are planning to undertake some ground counts locally. Again, this does not form part of the formal SDMP but it is nevertheless noteworthy.

ACTIVITY	NOTE	OVERVIEW & PURPOSE
WINTER HELICOPTER COUNT (RDMA) *	1	Two counts previously done of entire RDMA in 2004 and 2013. The aim is to repeat this in Feb 2018 and again in Feb 2023, to help quantify changes in herd size and structure over time. Results will be related to those presented in the DM Review by SCL of 2014. The counts are timed to be every 5 years, but will also be available for the Interim Review and Review & Update of the SDMP planned for 2019 and 2023. It would be viewed very positively if the DMG were willing to fund between 25 and 50% of the costs of this survey, given it the core survey needed to manage the population.
SUMMER HELICOPTER COUNT (RDMA)	2	Summer counts have only been undertaken in relatively small parts of the RDMA previously (2003, 2007, 2010, 2013). This would be a 'whole RDMA' count funded by SNH to help the MDMG (and SNH) understand the large scale population migrations reported to occur each year in spring (cotton grass flowering) and again in autumn (first snows). It will be more expensive than a winter count as the popultion will not be constrained by snow, as in winter.
MONITORING OF GOAT, CATTLE & SHEEP NUMBERS	4	The Review of DM involved an audit of the numbers of goats, sheep and hill cattle present within the RDMA. Given that these animals can also, if stocked at inappopriate densities, cause impacts similar to deer it is considered important to understand how their numbers vary in time and space across the RDMA. Owners will supply stocking information annually as part of their February update, hence all this project will involve is compiling the records for each year, adding them into a summary spreadsheet and producing summary statistics to include in the annual briefing paper which goes to the membership.
NATURAL MORTALITY LEVELS	10	Natural mortality is a potentially signficant control on deer population size in the RDMA depending on its extent and intensity. This work would involve compiling records from each estate annually, and then analysing the data to ascertain the likely degree of mortality occuring each year. The data would be fed into the MDMG population models used to predict future population size based on count and cull data.
ANNUAL VARIATION IN CALVING LEVELS	11	As above, but for annual calving rates - these are crucially important to measure annually if we are to predict accurately population trends over time and hence calculate appropriate culls.

N.B. Colour coding and 'Note' references relate to the budget tables presented elsewhere in this document.

13. STRATEGIC RESEARCH PROGRAM

The 2014 Review proposed that the MDMG owners should commission a range of research. The aims of this research program, which would be undertaken over the period 2015-2014, are to: (i) expand the knowledge base on deer population dynamics & deer impacts in the Monadhliath area specifically and (ii) where possible to help expand the knowledge base on deer population dynamics, deer impacts and best practice deer management in the Scottish uplands generally.

- ✓ ACTION: SNH should consider commissioning a **repeat of the detailed SCL study of deer occupancy levels** and blanket bog condition, which was first undertaken in 2011, in summer 2017. Details of the baseline study and its results are available on the SNH website using the link below: http://www.snh.org.uk/pdfs/publications/commissioned_reports/527.pdf

- ✓ ACTION: The MDMG owners and SNH should work together in 2015 to develop a **multi-disciplinary program of research** aimed at understanding the range of processes that govern the condition of **high altitude peatlands in the Monadhliath**. Appendix 2 includes the provisional Scope of Work, which was originally put together as Green Stimulus application (now Peatland Action). The proposal has yet to be finalised and fully costed - at the time of writing the MDMG is still waiting on SNH confirming how the work would be funded and what the application process involves. The aim is to start the project by December 2015.

- ✓ ACTION: The MDMG owners and SNH should work together to ascertain how the major peatland research project can incorporate studies into the **long-term effects of sheep removal** on bog condition. Start date of December 2015, as above.

- ✓ ACTION: The MDMG owners and SNH should work together to develop an experimental protocol that can be applied during the next winter and summer helicopter count of the MDMG area, with the core aim of quantifying the extent of **underestimates in deer numbers caused by presence of woodland**[32]. The work should be undertaken in 2017 (summer count) and 2018 (winter count).

- ✓ ACTION: The MDMG owners and SNH should work together in late 2014 to develop a protocol which all estates can adopt for **ageing culled stags** from 2015 onwards, and then providing this data in a format which can be used to build up a better knowledge of the age structure of the cull and the population more widely.

- ✓ ACTION: The MDMG owners and SNH should work together to develop a project scope aimed at studying the **long term effects on stag performance** of **holding hinds at varying densities** within the RDMA. The project should ideally start in 2015 with a major baseline analysis of historic records, and then should be updated after 5 and 10 years of the plan period.

[32] This could be usefully extended to include the possible effects of forestry fences having holes in them (or at least could include a check on the extent of holes present).

ACTIVITY	NOTE	OVERVIEW & PURPOSE
REPEAT OF SCL OCCUPANCY & IMPACTS STUDY	3	SCL undertook a very detailed assessment of blanket bog condition and deer occupancy in summer 2011 at over 200 fixed locations, which superceded previous SNH surveys (http://www.snh.org.uk/pdfs/publications/commissioned_reports/527.pdf). A repeat of this survey would be very valuable, as it would allow rates of change to be accurately assessed on the Monadhliath SAC which would compliment the aerial photo analysis undertaken by SCL for the Review of DM. There may be value in doing the work again 5 years after the repeat, but this would need to be decided nearer the time based on the 1st monitoring results.
RESTORING HIGH ALTITUDE BLANKET BOG	5	The Review of DM proposed that the knowledge base on high-altitude blanket bog in the Monadhliath (and elsewhere) is seriously lacking. SCL proposed to the DMG and SNH that a major piece of multi-displinary research is commissioned to fill the knowledge gaps for the public benefit. An initial proposal to Peatland Action was rejected, but SCL was advised that central government funding is likely to be available for this project. However, a key stumbling block at present is that the DMG would need to apply for the money, and it would have to be constituted in order to receive the funds. Because SNH will not be funding this directly, the costs are not detailed here. The overall approach that would be used is detailed in the briefing sent to estates by SCL in June 2014.
THE LONG-TERM EFFECTS OF SHEEP REMOVAL	6	The Review of DM showed that 10's of thousands of sheep have been removed from the RDMA in the past 40 years, but that deer numbers have not risen a similar amount (i.e. grazing pressure has declined). A project to examine the long-term effects of sheep removal is proposed, with the focus being on benefits for blanket bog condition. Due to synergies with the above project, this work would be incorporated into the main bog research project.
AERIAL CENSUS ERROR RATES IN WOODLAND	7	The accuracy of population models, used to predict future population dynamics within the RDMA, is highly sensitive to 'starting population' size. The Review of DM concludesd that helicopter counts were likely to be markedly more accurate than ground counts, but that there is over 6,000ha of woodland in the RDMA open to deer hence deer are likely to be present in woods when helicopter census work is underway. If a serious undercount occurs, this has major implications for models hence it is proposed that some woods are overflown before being driven out then afterwards, to ascertain the likely scale of errors.
STAG AGE STRUCTURE	8	A key aim of the SDMP is to try and manage a herd of deer that is sufficient in size to produce c. 1,000 sporting stags per annum for group members. A key issue is the age structure of the stag population and specifically the age at which stags 'mature' for sport and hence what the optimal age structure of the cull should be. The aim of this work would be to compile all the records kept by estates on stag ages, weights and antler form and establish (i) what estates consider to be a sporting stag and (ii) how many such stags are likely to be present, for a given population of hinds, according to a variety of hind and stag management approaches that could concievably be employed.
DENSITY-DEPENDENT EFFECTS ON STAG QUALITY *	9	It is widely reported in the scientific literature that stags perform best when hinds are at low density and not under severe nutritional stress during the period when calves are growing inside them and later dependent on their milk. It is proposed to undertake a detailed examination of the deer count and cull data, along with stag condition data (e.g. weights, ages, antler form) to establish the extent to which there is evidence in the RDMA for variable levels of stag performance relative to hind density. This would be a desk-based exercise with no need for fieldwork.

N.B. Colour coding and 'Note' references relate to the budget tables presented elsewhere in this document.

14. STRATEGIC HABITAT MANAGEMENT PROGRAM

The 2014 Review identified that there were several potential problems with the way that habitat is currently managed for Red deer sporting at the strategic scale in the RDMA. This included a general lack of woodland shelter in many parts of the RDMA, a lack of access to low ground in some places and a lack of vigorous Heather cover at middle altitudes in some places.

Several strategic habitat management projects were proposed to help make these habitats more available for Red deer, the aim being to improve conditions for production of sporting stags in the RDMA. Of course, planning and undertaking such management in a thoughtful manner will also deliver a wide range of public benefits. A particular opportunity exists where land on designated sites might be managed differently for the long-term benefit of deer **and** the environment.

The 2014 review identified that a willingness on the part of the MDMG owners to help deliver the wider public benefits desired by government would mean that SNH's resources and expertise can be used in a more constructive and efficient way (i.e. to help solve a problem rather than 'fight it'). The result would hopefully be that SNH attains more of its goals than at present, and in more places, but the trade-off is that delivery may take longer and might not involve the ideal approach in their eyes (e.g. use of temporary deer fencing and less culling). In turn, owners would be able to deliver public benefits without being unnecessarily penalised for owning part of an SAC / SSSI, and otherwise for owning land generally.

Of course, if habitat management works are planned strategically and targeted sympathetically then they might also deliver marked gains for ecosystem services generally (e.g. carbon storage, water quality management and woodland / riparian restoration) as well as for nature conservation reasons.

Each project proposed under the SDMP is outlined below, and actions points for the plan are identified.

14.1. EXPANSION OF WOODLAND COVER

Background

Deer in the RDMA, and particularly over-wintering stags, would benefit from an expansion in woodland cover[33]. There are many potential gains for the MDMG owners as well as for government agencies:

- It would provide a markedly better environment in which to harbour the sporting herd in winter, as it would help guard deer against major losses in condition during severe spells of weather.

[33] Expansion is defined in this document as any of the following: (i) direct creation of new woodlands by planting, (ii) natural regeneration of native woodland in areas where tree cover is highly degraded or virtually absent (e.g. the sparse, highly degenerate birch stands at Coignafearn, (iii) recovery of existing well established native woodland by expansion from the edges of present stands of trees (e.g. Kinveachy) or (iv) opening up of existing woodland, currently located within the LGDMA, by removing or lowering deer fences (e.g. on the current RDMA perimeter).

- It might act to reduce the current trend of stags moving long distances into high quality wintering areas which have woodland, whereupon they are being culled heavily (i.e. it would produce a more balanced distribution of stags with better potential to hold stags in the areas they are wanted for sport).
- It could markedly reduce pressure on existing woodland habitats in (including SAC's) in the longer-term if the new/expanded woodlands were created adjacent to existing sites.
- It would be beneficial for carbon management and biodiversity in the longer-term, and might also provide natural flood management benefits.

If woodland expansion plans were pursued in tandem with the other proposed habitat management measures (re-alignment of fences to open up low ground, Heather moorland restoration or bog restoration; see other sections in this Chapter) then the DMG could rightfully claim to be a leader in delivery of planned strategic upland carbon management, landscape scale conservation management and ecosystem services for public benefit. These benefits would accrue in addition to the marked improvements in the quality of stags that owners would enjoy.

Overall Potential

The 2014 Review identified from soils maps that there is plenty of land suitable for tree planting available on the lower and middle reaches of the RDMA (Map 2.3; all soil types where an organic horizon is absent and is otherwise shallow - < 50cm but ideally < 20cm). There is also plenty of land on which good natural regeneration of native woodland could be secured based on the distribution of existing remnants and old diffuse stands of seed-bearing trees. Moreover, there are also grants available to expand woodland cover from FC, by natural regeneration or planting. Funding is also potentially available from windfarm projects seeking sites for compensatory planting.

Another approach to expanding woodland cover in the RDMA which was identified in the Review is to change the boundaries of the RDMA itself, by moving deer fences 'down the hill' and allowing deer access to woodlands currently excluded on the periphery. This can be achieved anywhere that woodlands are currently fenced in the RDMA and otherwise where they comprise a fenced external boundary to the RDMA (see Map 1.2).

Establishment Approaches

The benefit of re-aligning fences is that it provides 'instant' woodland cover, as opposed to creation of new woodland cover which will take time. In terms of the speed of establishment of new woodland by planting, several factors are important. Circumstances where faster establishment by direct planting could be expected include:

- Use of low-altitude sites where exposure levels are lower.
- Use of sites with the more fertile soil types (surface water gleys, brown earths).
- Careful selection of tree species for the site in question, to ensure fast growth.
- Ground preparation, planting and aftercare are crucial stages: intensive cultivation, choice of suitable growing stock and good maintenance programs (e.g. regular fertilizing / weeding) will promote faster establishment.
- Use of deer fencing (and otherwise 'twin' electric fencing) to reduce large mammal impacts on growing trees.

- Use of vole guards and control of other mammals (e.g. hare) will on some sites also help against early losses of trees.

Of course, natural regeneration can also be used. This can involve fencing off areas adjacent to existing seed trees and allowing natural processes to take hold, whether or not with some early intervention (e.g. burning or scarification). It can also involve landscape-scale culling of deer, but only a few owners in the MDMG area advocate this as the optimal approach given the impact it can have on neighbours, and the consequent difficulties that can arise in working jointly to manage the herd for the common good. The 2014 Review proposed that the primary focus should be on finding ways to use fencing to rotationally establish or regenerate woodland, whether with electric stock or deer fences, to allow the other objectives of the estates (and their neighbours) to be pursued in parallel.

A key related point is when owners choose to allow deer to enter the fenced area, if fencing is used. If the woodland is established by planting and only needed for shelter, then deer might be allowed in relatively early (e.g. after 10 years). This could either be on a wholesale basis (fence removal) or selectively (make strategic holes in the fence only). If the owner wants to plant and produce a quality timber crop then allowing deer entry before 25 or 30 years is risky because of the potential for timber degrade to occur due to bark stripping (albeit this tends to be relatively localised in most forests, and typically worse where Sika deer are present). On naturally-regenerated sites the same problem is faced in deciding when to open up the woodland to deer again.

Locations, Extent and Types of Woodland

The location for any new woodlands is a key question, along with extent and type.

The 2014 Review proposed that the focus should ideally be on expanding existing native woodland remnants, rather than on planted woodlands, to maximise biodiversity gains. This would be undertaken using natural regeneration where possible. That said, there are relatively few places where natural regeneration would be *strategically* advantageous.

The key places where woodland cover should ideally be expanded, and ultimately made available to deer, are listed below (see Map 1.2). There is a wide range of other locations in the RDMA where local benefits would accrue to individual owners if they expanded woodland remnants or planted additional woodland, but the strategic advantages to the group are less obvious.

+++ High priority ++ Medium priority + Low priority

- ✓ ACTION +++: The **Dulnain valley**, to the west of the Kinveachy march. The aim is to help hold stags in the land out with the Kinveachy SAC, as this would be helpful to all parties given the ongoing protection cull of stags being taken. Owners should be asked to express an interest formally by the end of August 2015, and plans should be drawn up and implemented by December 2016. An appropriate aim might be to increase woodland cover by 100ha over 10 years, with a key focus being to design the site(s) specifically for deer sheltering.

- ✓ ACTION +++: The **'hill face' running east from Laggan** towards Kinrara[34]. The aim is to help hold stags on the other side of the mountains from Coignafearn, as this would be helpful to all parties given the ongoing protection cull of stags being taken. Owners should be asked to express an interest formally by the end of August 2015, and plans should be drawn up and implemented by December 2016. An appropriate aim might be to increase woodland cover inside the RDMA (by expansion or opening up of existing woodlands) by 500ha over 10 years, with any planted woodland (if this is the approach used) designed specifically to be suitable for deer sheltering. Any additional woodland cover should ideally be well distributed through the estates in question.

- ✓ ACTION +++: The **environs of the Glen Tarf SSSI** / Ness Woods SAC[35]. The site is currently in unfavourable condition, in part due to deer browsing impacts, and discussions are currently ongoing with FC and SNH about how the land within the SSSI might best be managed in future. It is suggested that consultation with native woodland experts on behalf of SNH and FC will be carried out to consider the practicalities and worthiness of creating native woodland in some areas both within and beyond the current boundaries of the SSSI. This will help to achieve the strategic aims of (i) expanding woodland in the RDMA (ii) expanding wintering grounds for stags and (iii) delivering wider public benefits. Once the consultation has been carried out and FC, as the professional woodland organisation, accepts it is worthwhile pursuing, then owners will be asked to express an interest. Owners will then negotiate with SNH & FC regarding size and funding available for each planted area. The woodlands, might best be created using a program of rotational fencing (mix of deer fence and electric), based on only a proportion of the SSSI being fenced out at any one point in time. It is also suggested that local reductions in hind densities in this area might be beneficial, to help reduce pressure generally on the site if fencing is erected and excludes some current deer range, although that is up to the owners to discuss with SCL.

- ✓ ACTION ++: In the **estates east of Coignafearn**, in particular around Glenmazeran[36] and Dalmigavie, where there is the potential for supplies of sporting stags to be depleted in the longer-term due to ongoing local reduction culls (this would be helpful to all parties). Owners should be asked to express an interest formally by the end of August 2015, and plans should be drawn up and implemented by December 2016. An appropriate aim might be to create (and otherwise open up) a total of 100ha of new woodland over 10 years, designed specifically to be suitable for deer sheltering. In this area the opening up of fences is likely to be the best approach, albeit plans for the creation of additional woodlands to help expand future cover would also be welcomed[37].

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[34] Include estates from Coull east to Kinrara; can include woodlands already established or recently planted but which will be available to open up within 10 years.
[35] SAC and SSSI boundary overlaps here; the other parts of the Ness Woods SAC are out with the RDMA and are not due to be discussed under the SDMP until the 5 year review.
[36] It should be noted that Glenmazeran has had a long-term policy of natural regeneration in place since 1977, when they began to rotationally fence their 'Sanctuary' to regenerate the birch woods therein. Some of the earliest sections of fence have recently been taken down, providing some excellent new shelter for deer in the winter. Glenmazeran has also been pro-active in restoring riparian woodland on the margins of its estate.
[37] This is particularly important given that some woodlands, notably those open to deer at present on Glenmazeran, are moving towards the point where windblow will become an increasing problem.

- ✓ ACTION ++: The **Garrogie-Killin glen**. Owners of these estates wish to retain stags for sporting. There are extensive remnant woodlands in the area generally, and whilst some work has been done to improve their condition for deer there is much more that could be done. Any additional regenerated cover of woodland would help to retain deer in this glen and prevent them from being drawn into the neighbouring Corriegarth Estate or into Coignafearn where heavier culls are taken. Owners should be asked to express an interest formally by the end of August 2015, and plans should be drawn up and implemented by December 2016. An appropriate aim might be to increase cover by a total of 200ha of native woodland over 30 years, based ideally on natural regeneration. The woodlands could be created using a program of rotational fencing (mix of deer fence and electric), based on only a proportion of the woodland being fenced out at any one point in time. It is also suggested that local reductions in hind densities in this area might be beneficial, to help reduce pressure generally on the site if fencing is erected and excludes some current deer range, although that is up to the owners to discuss with SCL[38].

- ✓ ACTION +: In the immediate **environs of Creag Meagaidh**, where there is the potential for supplies of sporting stags to be depleted in the longer-term due to ongoing local reduction culls (this would be helpful to all parties). This has been marked as a low priority because most of the owners in this area expressed relatively little concern during the audits in 2014 over the pattern of culling at Creag Meagaidh. If owners are interested, it is proposed that an appropriate aim might be to increase woodland cover by 100ha over 10 years, designed specifically to be suitable for deer sheltering, on the margins of the SSSI.

- ✓ ACTION +++: **Creag Dhu SSSI**: FC and Creag Dhu Estate have been working hard over a number of years to reduce deer densities locally to facilitate recovery of the native birch woodlands present. The MDMG will try, where possible, to identify ways to help the partner organisations deliver this aim. At the time of writing the MDMG is awaiting delivery of information on the site to review – any proposals will therefore be drawn up in conjunction with the partners within the first 12 months of this plan being adopted (i.e. by the end of 2015). In the meantime, it is relevant to point out that there are proposals for a major reduction in local hind densities in the vicinity of Creag Dhu SSSI (see Chapter 17) and this is likely to help markedly in delivering the aims of management on the SSSI.

- ✓ ACTION +++: **MDMG area as a whole**: SNH and FC have identified national targets to help improve the status of native woodland within each DMG, based on the results of the Native Woodland Survey of Scotland. The MDMG has 9,954ha of native woodland mapped by FC of which 2,612ha (26.2%) is considered to be impacted by herbivores. It has been suggested by the agencies that 750ha of woodland should be restored/regenerated across the MDMG area. Some of the proposals for the RDMA, as outlined above, will go a considerable way to helping achieve this target, but they will not meet it in isolation. The LGDMA contains the majority of the native woodland in the MDMG area (see Map 1.3). The SDMP proposes that the LGDMA is actively

[38] The owner of Garrogie-Stronelairg confirmed to SCL in October 2014 that plans are already being drawn up to erect a series of additional fenced enclosures to expand native woodland (c. 200 acres). These enclosures will be in addition to the areas previously fenced by the estate and recently opened back up to deer, in which excellent natural regeneration of birch has been secured.

considered from half-way through the new plan period, and that strategic management proposals are drawn up as required at that point in time - a key focus at this stage should be to ensure that any shortfall in the proposed target for native woodland in the DMG area is made up where a group of willing landowners can be found, assuming other owners have not already organised their own schemes in the intervening period.

Footnote 1: It is important to note that this SDMP also includes major proposals to reduce hind densities locally (see Chapter 17). These local reductions in hind density, which will take place predominantly in the Eastern Monadhliath, are likely to produce conditions in which general improvements in open range and native woodland habitat condition will occur over the next 10 years. These changes will be in addition to the specific strategic proposals mentioned in this sub-chapter.

14.2. INCREASE ACCESS TO LOW GROUND

A similar argument can be applied to the 'opening up' of low ground as for creating additional deer sheltering, in that owners allowing Red deer access to more lower ground would see benefits for their herd and notably for stags. Options include opening up currently fenced woodlands early (as suggested above) and otherwise allowing access to lower fields whether permanently and otherwise in periods of severe winter weather.

Old deer fences may need removed and new deer fencing erected to allow such improvements, but there is good evidence to support the fact that long-term changes in the herd would arise. Many benefits could accrue including (i) an increased chance of deer remaining on estates that want them, rather than moving to areas that don't want deer and (ii) improved foraging opportunities at key times, notably when hinds need to feed heavily in spring, and reduced exposure to the elements during severe spells of weather.

The areas where this potential problem is perhaps most evident are (see Map 2.1):

- ✓ ACTION: The 'hill face' running east from Laggan towards Kinrara[39]. The aim of pulling fencelines down the hill is to help hold deer on the other side of the mountains from Coignafearn, as this would be helpful to all parties given the ongoing protection culls being taken therein. The most obvious locations where fence lines are relatively 'high' on the hillside are **Alvie** and **Pitmain**, but any estates in this area that are concerned about an inability to hold deer might consider bringing fences down the hill especially if to open up woodland. Owners should be asked to express an interest formally by the end of August 2015, and plans should be drawn up and implemented by December 2016.

- ✓ ACTION: As above, but for estates on the northern side of the Monadhliath who wish to manage deer for sporting: **Dell, Knockie & Aberarder**. Owners should be asked to express an interest formally by the end of August 2015, and plans should be drawn up and implemented by December 2016.

[39] Include estates from Coull east to Kinrara; can include woodlands already established or recently planted but which will be available to open up within 10 years.

Footnote: SCL understands that some estates may have recently undertaken some re-alignment of fences, or removal of fences, to open up woodland. These estates are encouraged to confirm that this has taken place, as it contributes to owners achieving the objectives of the new SDMP.

14.3. EXPAND HEATHER AT MIDDLE ALTITUDES

In a similar vein to the opening up of low ground, there are good arguments for improving the cover level and condition of Heather, where grazing pressure is locally very high, to provide a reliable source of winter food for deer. Heather is a vital foodstuff for Red deer over winter. Expansion of its cover locally will help hinds to retain condition over the winter, and might help to better retain deer in certain areas. Restored heather moorland also represents a significant extra store of carbon and would potentially add to the extent of good grouse habitat on estates.

There are a variety of approaches that could be used to expand Heather cover locally, including electric / deer fencing and local reductions in the pressure from large grazing mammals (sheep and Red deer hinds). Of course, the issue of increased fuel loads, and potential changes in the locations where high fire risks are present, should be considered as part of any changes implemented.

The general areas where a lack of Heather cover is perhaps most important include:

- ✓ Where fencelines are relatively high on the hillslope, and thus deer are forced to overwinter at relatively high altitudes where access to better quality grazing is minimal.
- ✓ Other locations where deer historically congregate in the winter, and over periods of many years act to gradually reduce the stock of Heather available.

The areas where this potential problem is perhaps most evident, and important in respect of estate management objectives, are:

- ✓ ACTION: On the lower slopes of **Glenmazeran**, and to a lesser extent, **Dalmigavie,** where a key aim of management is to retain stags for sport and yet Coignafearn operates a different management regime next door [40], Owners should be asked to express an interest formally by the end of August 2015, and plans should be drawn up and implemented by December 2016.

- ✓ ACTION: **Coignafearn**, where a key aim of management is ecological restoration of native woodland and scrub, vegetation and riparian areas [41]. It is evident from the enclosures created in the early 2000's and since that the cover of dwarf shrubs is extremely degraded in this area.

There are many other estates where impacts on Heather locally, at low and middle altitudes, are very evident. All estates are encouraged to think about managing browsing intensity locally to allow Heather to recover given its status as a key food source.

The adoption of proposals to manage for improved Heather cover at middle altitudes are likely, in the same way as proposals to reduce local hind densities (Chapter 17,

[40] The habitat is reported to have improved in these areas, as a result of a program of reduced hind densities on Dalmigavie and a program of electric fencing on Glenmazeran over the past 10 years; that said, the habitat still appears somewhat degraded at lower altitudes.
[41] As above.

referred to in the previous section of the plan), to create conditions in which native woodland cover might expand.

14.4. IMPROVE BLANKET BOG CONDITION

The condition of high-altitude blanket bogs in parts of the MDMG area is clearly poor. This includes (i) areas where drainage is installed and (ii) areas which have erosion present as a result of cascading effects from drainage being installed (slumping; headwards erosion). These effects are particularly evident around the peripheries of the Monadhliath SAC which is, of course, recognised for the character of its high altitude peatlands.

Some owners expressed an interest during audit interviews in having these habitats restored, even if it does not have direct benefits for the condition of the deer herd. It would undoubtedly provide public benefits (e.g. possible improvements in water quality for salmon fisheries, improved flood water attenuation downstream etc).

There are funds available to do this work via SNH and the Scottish Government (Peatland Action; SRDP).

The proposed approach would be to undertake restoration work in the first instance where owners want it already (e.g. Glenmazeran and Coignafearn - although the latter does not wish to be grant aided) have expressed an interest in damming moorland drains at higher altitudes) and, in the second instance, where owners decide based on the planning process, and otherwise based on the findings of the proposed new blanket bog research project, that it is worthwhile. The work would ideally be delivered as part of the wider high altitude peatlands research project proposed earlier in this document (Appendix 2 describes a possible integrated project outline and contains a map showing the range of estates where drainage of high-altitude peatlands is present in aerial photos of the RDMA).

The following areas are prime candidates for restoration of high-altitude peat using drain blocking techniques (see map overleaf, also presented in Appendix 2):

- ✓ ACTION: Area of high-altitude peatland owned jointly by **Dalmigavie, Kinrara & Clune**. Owners should be asked to express an interest formally in restoration work being undertaken by the end of August 2015, and plans should be drawn up and implemented by December 2016.

- ✓ ACTION: Area of high-altitude peatland owned jointly by **Coignafearn**, **Glenmazeran & Farr**. Owners should be asked to express an interest by the end of August 2015, and plans should be drawn up and implemented by December 2016.

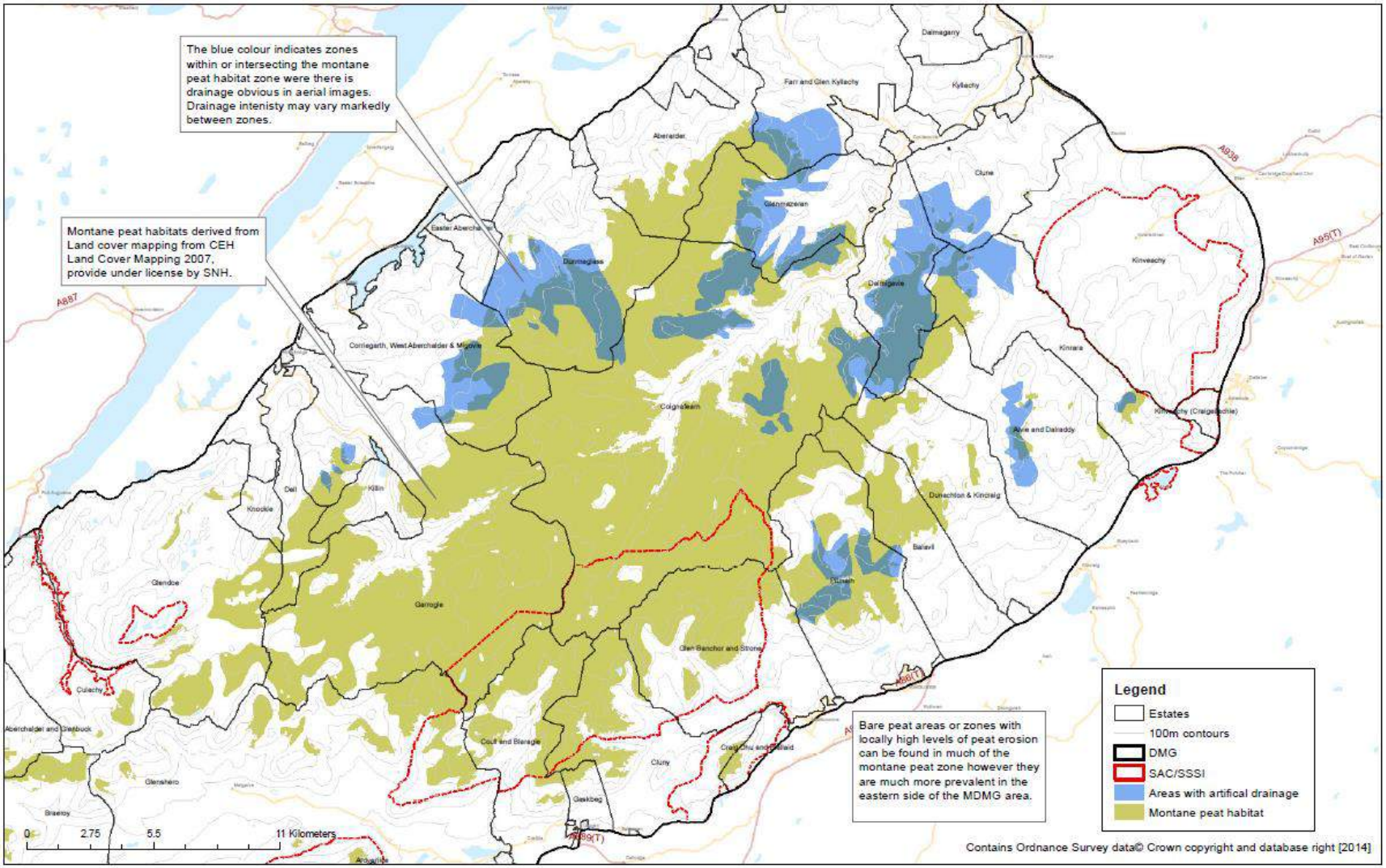
- ✓ ACTION: Area of high-altitude peatland owned jointly by **Corriegarth & Dunmaglass**[42]. Owners should be asked to express an interest formally in restoration work being undertaken by the end August 2015, and plans should be drawn up and implemented by December 2016.

- ✓ ACTION: Individual areas of high-altitude peatland owned by: **Alvie / Pitmain / Coignafearn**. Owners should be asked to express an interest formally in

[42] These areas may already be targeted under Habitat Management Plans for proposed windfarms.

restoration work being undertaken by the end of August 2015, and plans should be drawn up and implemented by December 2016.

Depending on the outcome of the proposed major research project on high-altitude peatlands in the Monadhliath, currently being organised, it might be that other areas of eroded or heavily-grazed peatland are identified as candidates for restoration. If this is the cased then proposals would be drawn up at the time and estates contacted to discuss options.


The blue colour indicates zones within or intersecting the montane peat habitat zone were there is drainage obvious in aerial images. Drainage intenisty may vary markedly between zones.
Montane peat habitats derived from Land cover mapping from CEH Land Cover Mapping 2007, provide under license by SNH.
Bare peat areas or zones with locally high levels of peat erosion can be found in much of the montane peat zone however they are much more prevalent in the eastern side of the MDMG area.
Legend
Estates
100m contours
DMG
SAC/SSSI
Areas with artifical drainage
Montane peat habitat
0
2.75
5.5
11 Kilometers
Contains Ordnance Survey data© Crown copyright and database right [2014]

15. STRATEGIC FENCING PROGRAM

There are many existing sections of deer fence on the periphery of the RDMA which presently separate out the 'low ground' and 'upland' populations of deer. No owners expressed an interested during the 2014 audits in removing this fence at the present time hence some type of surveillance and maintenance program is needed.

The 2014 Review also identified the possible benefits of constructing a new strategic fence round Kinveachy and Clune, because of the major differences in management objectives with their neighbours.

Strategic fences need to be dealt with under this SDMP as follows:

- ✓ ACTION: Estates should be asked as part of this SDMP to be responsible for monitoring and **maintaining their own section of the RDMA fence**. At any time in the future, if they are considering stopping maintenance they should inform the DMG using the 'Change in Status' form described previously in this report.

- ✓ ACTION: Any new **proposals for deer fences by estates** should be put forward to the group for **discussion**, so that neighbours can be consulted on local effects and the MDMG can retain a 'strategic overview' for planning purposes. Estates considering erection of new fence should, with maximum notice, inform the DMG using the 'Change in Status' form described previously in this report.

- ✓ ACTION: The issue of **strategic fencing at Kinveachy and Clune** was discussed at a meeting on 4th August 2014 and the idea was broadly rejected. However, SCL explained at the time that the options for use of fencing in this area were broader than simply a barrier fence. They could include deflective fences, or fencing of certain woodland areas within the SAC. The options also included other management measures to deliver a sustainable solution for all estates, including habitat management in the Dulnain (see Woodland Creation) and a change in the way deer are culled (e.g. different management of hinds, different management of OOS licences). As part of the process of finalising the SDMP, SCL should put forward further proposals to the estates in question. This is most likely to take place once Kinveachy applies formally for an OOS licence to shoot stags in winter (autumn 2015), which is where the majority of the conflict arises from, and otherwise in advance of this (pre-emptive discussions have been instigated with a view to dealing with the issue before the SDMP is adopted – see comments on stag management at Kinveachy in Chapter 18).

16. DEER MANAGEMENT: CORE INFORMATION

The MDMG should have a strong focus on the provision and management of appropriate information on estates and their deer herds, the aim being to promote objective and informed decisions.

- ✓ ACTION: The MDMG should maintain detailed and **accurate historic records** of the patterns of **deer culling** in the group area. To help this, estates should submit accurate annual cull returns to the MDMG Secretary and Technical Advisor in good time. The Technical Advisor should insert these records into a database and produce a range of standardised chart-based outputs for all owners to review annually. Every 5 years, these data should be used to update maps which illustrate the pattern of deer culling geographically and over time[43].

- ✓ ACTION: To facilitate prompt, complete and accurate analysis of the MDMG's cull records it is proposed that estates where possible **adopt a standard format of larder record** - Appendix 1 contains an example of the proposed larder record form.

- ✓ ACTION: To help ensure **accuracy** in the gathering of good larder records, it is proposed that a short **training session** is held on the date of the first Keepers Day in June 2015, with a particular focus being on **ageing of jaws** so that stag ageing is consistent across the area for research purposes.

- ✓ ACTION: The MDMG should maintain detailed and **accurate historic records** of the **deer counts** in the group area (ground count data & aerial count data). To help this, SNH and the MDMG owners should submit accurate survey records to the MDMG Secretary and Technical Advisor in good time each year (if a survey has been undertaken). The Technical Advisor should insert these records into a database and produce a range of standardised chart-based outputs for all owners to review annually. Every 5 years, these data should be used to update maps which illustrate the pattern of deer counted geographically and over time[44].

- ✓ ACTION: The MDMG should maintain detailed and **accurate records of deer population dynamics** in the group area (non-cull **mortality**; **recruitment** by visual estimates) to use in a suite of large-scale deer population models. To help this, the MDMG owners should submit records each year of mortality and recruitment to the MDMG Secretary and Technical Advisor in good time. The Technical Advisor should insert these records into existing models, update the results and produce a range of standardised chart-based outputs for all owners to review annually.

- ✓ ACTION: The MDMG should maintain detailed and **accurate records** providing an **overview of the management policies** and general approach of each estate. To help this, MDMG owners should submit a return each year

[43] These maps were first produced for the 2014 Review of Deer Management (see Maps 5.1 – 5.3 & 5.6 - 5.7).
[44] These maps were first produced for the 2014 Review of Deer Management (see Maps 4.2 – 4.9 inclusive).

confirming changes in status to the MDMG Secretary and Technical Advisor in good time each year. The Technical Advisor should summarise these records and provide a digest of the changes for all owners to review annually. Every 10 years, these data should be used to update a database and maps which illustrate the pattern of ownership, management objectives and estate management approach[45].

[45] These maps were first produced for the 2014 Review of Deer Management (see Maps 3.1 – 3.3 & 5.4 – 5.5 & 6.1 – 6.6 inclusive).

17. DEER MANAGEMENT: CULL PLANNING & EXECUTION

The MDMG has cull records for Red deer in the RDMA stretching back as far as 1968, although the best and most consistent records begin in 1988. The group also has a long-running set of ground count data, as well as two DMG-wide winter helicopter count surveys and a run of summer counts from the Monadhliath SAC.

These data, along with estimates of recruitment and mortality obtained from discussions with owners, and the count / cull records themselves, were used in 2014 to undertake a detailed analysis of deer population dynamics for the period 1988-2013. The analysis involved inputting information into Excel and ArcMap (a GIS package) and producing a suite of standardized chart-based outputs and digital mapping files. The work also involved parameterisation of a suite of population models (at multiple spatial scales) which were used to (i) ascertain the likely trend in deer population size in the period 1988-2013 and (ii) to predict the likely size of the population from 2013 onwards based on a variety of scenarios.

The detailed analysis was used to undertake a strategic planning exercise, at the end of which advice was issued to the estates on the best way to manage the herd in future to deliver the optimal mixture of private and public benefit. The detailed results of all the analysis, mapping and modelling work are described and presented in the 2014 Review and are not all reproduced here for sake of brevity.

A useful overview of the findings is presented in the Summary of the 2014 Review which forms Chapter 2 of this SDMP document. In summary, the findings were as follows (see sequence of maps in following pages[46]):

- 1st map: Red deer spend a large proportion of the winter at lower altitudes within the RDMA, typically being found below c. 600m when the weather is severe or snowy.
- 2nd map: There are several areas where stags traditionally winter and several areas where mainly hinds and followers winter.
- 3rd map: Deer densities based on winter counts in 2013 were very variable, ranging from 3 per km^2 to 23 per km^2 in the 'Combined Estates' management units[47] in which data were analysed for the 2014 Review. Appendix 3 contains the actual count data for 2004 and 2013 by Sub-Group and overall for the RDMA.
- 4th map: when compared to the helicopter count of 2004, it was evident that densities had declined in some areas (by up to 18 per km^2), remained stable in some and had risen in others (by up to 8 per km^2).
- 5th map: if densities are actually calculated using the 'winter range' (i.e. land below 600m) where deer spend most of their time from November – April, then they are much higher in some places (limited winter range) whereas less affected in others (large % of estate comprises winter range).
- 6th map: if winter range densities of breeding hinds (& followers) are plotted, it is evident that the majority of the MDMG's deer inhabit a relatively small part of the RDMA for much of the year.

[46] These are pasted from the original PDF maps created for the 2014 Review, which are the maps also associated with this SDMP – they are supplied separately, but select maps are pasted herein to aid readers.

[47] These are aggregations of estates which are geographically proximate and which otherwise have similar management objectives. See the 2014 Review for details.

The findings of the helicopter count analysis confirmed that there are several parts of the MDMG area where the densities of breeding hinds are very high, and thus are likely to be causing adverse effects on the performance of stags (an Appendix in the 2014 Review explains how these adverse effects arise). In essence, when hinds are under environmental stress caused by a lack of appropriate nutrition they will tend to produce fewer stag calves, give birth to smaller stag calves and be less able to feed the calf adequately after birth. In addition, as young stags these animals will be more likely to die in their first year as well as being more likely to disperse to other areas. Older stags, because some of these early-life effects are pervasive, might also be unable to achieve optimal body size or achieve optimal antler size, and will be more prone to dying of natural causes in severe spells of weather, where hinds take most of the good grazing. The effects are likely to be more pronounced in the Eastern Monadhliath where the ratio of hinds: stags is approx. 1.7: 1 and local densities of hinds/followers in the winter range are ~ 30 per km^2. [48]

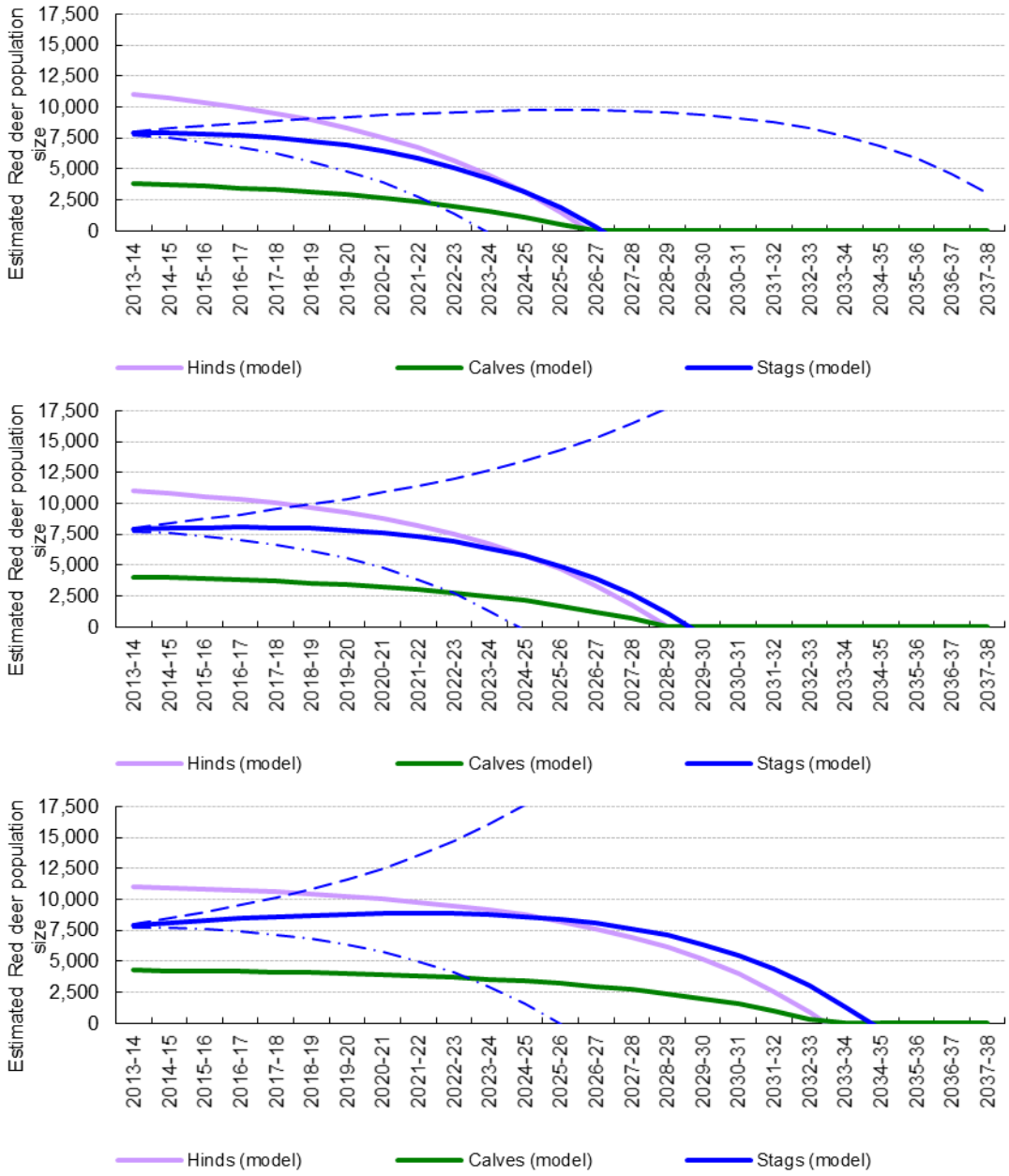
A key objective of the SDMP in the period 2015-2014 should be to ensure that local winter hind densities do not rise above the levels recorded in the winter count of 2013. The rationale for adopting this approach, as the backbone of the SDMP, is that almost all estates in the MDMG confirmed they wished to hold their deer densities steady and otherwise most wished to induce a local decline.

NB A very small number of estates suggested that they wanted ideally to increase their deer density because of concerns that they were losing sporting stags. These concerns are being tackled by a range of other measures, so that increasing overall densities is not seen as the 'go to' approach for estates under pressure from their neighbours; this approach leads to a negative feedback occurring which helps neither party in the long-run. Chapter 18 describes the measures that will be put in place to tackle this concern.

In order to help prevent local winter hind densities from rising, the MDMG should try to maintain overall hind culls in the RDMA at the level taken in the 2013-14 season **as a minimum**.

Of course, the recruitment rate of the population will need to be monitored closely to ensure that the overall level of hind cull taken in 2013-14 cull level remains appropriate (i.e. does not fall below increment). That is because population modelling of the MDMG population shows that the model is particularly sensitive to the recruitment rate applied - depending on the rate applied, and according to the level of underestimate in the winter count, the population might in future rise, stay stable or fall (see charts overleaf) based on the overall 2013-14 hind cull level being sustained.

[48] In the Western Monadhliath the ratio is 1.1: 1 and densities of breeding hinds tend in most places to be at a lower level.



The predicted future trend in summer deer population size in the entire RDMA based on a continuation of the 2013-14 cull level and a 39% recruitment rate (upper), a 37% recruitment rate (middle) and a 35% recruitment rate (lower). Solid lines show predicted trends (with recruitment added each year). Dotted lines show the results of running the start population for stags with a +/- 2% error and confirm the model is very sensitive both to the size of the starting population and the recruitment rate employed.

Whilst an overall cull of hinds similar to 2013-14 might help maintain a stable overall population level in the RDMA as a whole, it will not necessarily address the local problems apparent where hinds are currently held at very high density in their winter range. By holding high densities of hinds the adult sex ratio in the RDMA is strongly skewed towards hinds locally and regionally. A key aim should be to ensure that MDMG estate owners are aware of the disadvantages of maintaining high wintering hind densities, and act wherever possible to reduce them to the minimum level

required to sustain the target level of sporting cull. This level is considered, pending further research[49], to be a ratio of 1: 1 (e.g. 100 stags: 100 hinds).

By focusing their management efforts on reducing the local density of breeding hinds, especially in the Eastern Monadhliath because of its strong skew in the sex ratio to hinds, the MDMG will help to ensure that conditions for production of sporting stags are optimised. In doing so, they will also help to reduce overall deer densities in many of the areas where they are presently high – this will help to reduce the conflicts with neighbouring estates who wish to hold lower densities of deer to achieve their own management objectives (e.g. woodland expansion & improvements in heather condition linked to grouse production). In turn, it is anticipated that reductions in hind densities may 'open the door' for negotiations to reduce the level of stag protection culls being taken on estates focused on conservation and grouse production.

A number of estates confirmed that they were planning to undertaken local reductions in hind densities when they were interviewed as part of the planning process; other estates agreed to deliver local reductions in hind numbers as part of negotiations undertaken during the final stages of planning process. The aim of these reductions should be to manipulate the adult sex ratio to 1: 1 in both the Eastern and the Western Monadhliath, rather than being hind biased as they both are presently.

Once the proposed level of reduction in local hind densities has been undertaken in the first 5 years of the SDMP, a review will be undertaken into stag performance and stag culls achieved. The aim will be to ascertain whether further reductions in hind densities might be beneficial to improve stag performance and/or for nature conservation reasons[50], or the new 'balanced' population is judged to be optimal.

Due to the complexity of the statistics and model calculations involved, the information pertaining to cull plans is presented in a range of appendices. Appendix 4 confirms recent culls levels, including those taken in 2013-14. Appendix 5 contains details of the proposed changes in culling patterns in the Eastern Monadhliath, along with model outputs which show the predicted changes the modified culls will produce. Appendix 6 does the same for the Western Monadhliath, whilst Appendix 7 summarises the situation for the MDMG area as a whole.

In summary, the following approach to deer culling will be adopted over the 10-year period of the SDMP:

- ✓ ACTION: **Prevent local hind densities in their winter range from rising** above the level of the 2013 winter count, by maintaining local hind culls at 2013-14 levels OTHER THAN in those areas where local reductions in hind density are proposed by estates or have otherwise been agreed (see action points below). The mechanism for judging whether a change has occurred will be through a repeat helicopter count in winter 2018 and associated detailed mapping of local hind densities.

[49] Research undertaken by the JNCC on Rum over the past 30 years supports the optimal approach as being to hold a ratio of 1: 1 stags: hinds or, ideally, to hold more stags. Obviously, deer should also be held well within the carrying capacity of the land on which they range. Further research into this aspect of Red deer management is planned for the RDMA – see Chapter 13 for details.

[50] The 2014 Review stated that the results of the proposed High-Altitude Peatland Research Project would by then have interim results, and they might show that designated sites would benefit from further density reductions. If this is the case then owners and SNH would need to come to a satisfactory mutual agreement.

- ✓ ACTION: **Reduce local densities of hinds and followers**[51] in their winter range, in key areas of the Eastern Monadhliath where densities are highest, to a target level of 25 per km^2 over the period 2014-2019. Review the effect of the culls at this point and consider next steps. The areas requiring a reduction are listed below. The proposed changes in the size of culls on these estates are presented in detail in Appendix 5, along with the predicted effects.
    - **Area 7** (Glenbanchor, Cluny, Coull/Blaragie, Craig Dhu & Gaskbeg – with Pitmain involved also for logistical reasons). This represents by far the largest change in culling patterns.

POSTSCRIPT: This arrangement is now in place for Area 7, as of 14th September 2014, until 30th March 2014 at which point it will be reviewed by all parties with the possibility of it being continued for up to 4 more years.

    - **Area 6** (Garrogie-Stronelairg along with its smaller neighbours: Killin, Dell & Knockie). This represents a relatively small change in the current level of cull.

POSTSCRIPT: Corriegarth Estate were contacted in the final weeks of the planning process to establish whether they might agree to limit their stag cull on the land marching with Garrogie-Stronelairg, in return for complimentary management on the Garrogie side to reduce the present level of deer movement into Corriegarth. At the time of writing these discussions are still underway.

- ✓ ACTION: Estates which came forward during the 2014 Review with their own local hind reduction plans were as follows: **Braeroy, Coignafearn, Culachy, Dalmigavie, Glenmazeran & Glenshero** (see comments in table below; Appendix 5 confirms the effect of extra culls on the Eastern Monadhliath population[52], Appendix 6 confirms the effects for the Western Monadhliath and Appendix 7 confirms the overall effect).

ESTATE	ZONE	VOLUNTARY HIND REDUCTIONS PROPOSED
BRAEROY	WESTERN MONADH'	SHOOT C. 50 EXTRA HINDS PER YEAR UNTIL OVERALL DEER DENSITY AT 10 PER KM^2
COIGNAFEARN	EASTERN MONADH'	REDUCE SUMMER DEER POPULATION DENSITY (WISH FOR SUMMER HINDS NUMBERS TO BE LOWER, BUT HARD TO ACHIEVE WITHOUT OTHER ESTATES HELPING BECAUSE THEY ARE NOT PRESENT DURING THE HIND SEASON)
CULACHY	WESTERN MONADH'	REDUCE DEER NUMBERS BY MAINTAINING HIND CULL AT HIGHER 2013-14 LEVEL FOR 3 YEARS – 160 - THEN DROP BACK TO 80 ONGOING
DALMIGAVIE	EASTERN MONADH'	REDUCE TYPICAL HEAD OF C. 200 HINDS BY 20-25% IN NEXT FEW YEARS

[51] Wherever a hind cull is described, it is assumed the estate will shoot calves in proportion to those seen at foot (i.e. matching the recruitment rate from the previous year). For example, if there were 40 calves at foot per 100 hinds, then it is assumed 40 calves will be shot for every 100 hinds culled.
[52] The overall effect of proposed changes in culls in the Eastern Zone will be significant and important for these estates understand - this the reason for building additional models and presenting them in Appendix 5 for members. The scale of proposed change in the Western zone as a result of relatively small increases in hind culls is much less significant and does not, at this stage, warrant additional models being built to illustrate the impacts.

GLENMAZERAN	EASTERN MONADH'	SHOOT C. 100 EXTRA HINDS IN NEXT FEW YEARS TO STABILISE AT 500 HEAD THEN DROP BACK TO STANDARD 2013-14 CULL
GLENSHERO	WESTERN MONADH'	SLIGHT FURTHER REDUCTION PLANNED IN THE 800 HINDS TYPICALLY PRESENT (NO MORE THAN 100 OF A REDUCTION)

- ✓ ACTION: There is a range of other estates which have not been formally asked to undertake hind density reductions, at this stage, but which would nevertheless benefit from local reductions and, moreover, would likely be asked to do so at the time of the 5 year Review. If they wished to undertake reductions now then it would be welcomed because of the positive message it puts out. Those estates are: **Aberchalder, Glendoe & Glenmazeran** (over and above the extra 100 hind reduction already suggested on Glenmazeran[53]).

- ✓ ACTION: If estates wish to significantly change the level of their cull, or its composition, from what is stated or agreed in this document they should (i) notify their neighbours and (ii) the Chair of the MDMG, then in partnership undertake a consultation on their proposals so that strategic planning considerations can be taken into account.

- ✓ ACTION: Where an **Out of Season licence** is sought by an estate in the MDMG area, and the number of deer to be shot is likely to be over 5, the estates should undertake a **consultation with neighbours** before making the application to SNH. At least **2 weeks** should be allowed ideally for the consultation. Until August 2015, requests for a consultation should be sent to SCL who should undertake it on the DMG's behalf. In August 2015, a vote should be held at the AGM to determine the organisation best placed to do the work thereafter. The aim of the consultation should be (i) to ascertain if there is another way to resolve the problem identified and (ii) otherwise to find ways to mitigate the impacts of the OOS cull on neighbours as far as possible[54]. This system should remain in place for the 10-year duration of the SDMP.

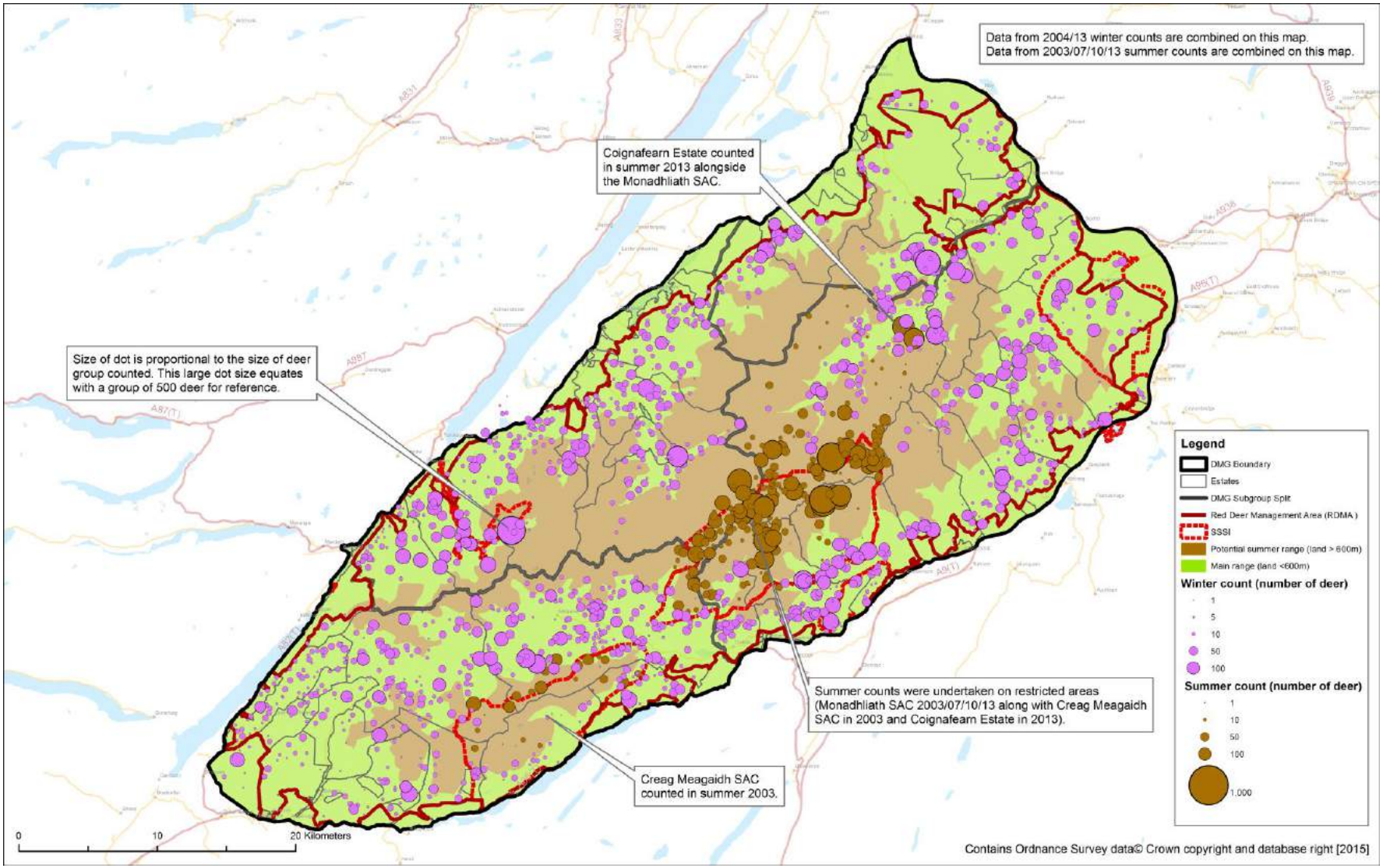
- ✓ ACTION: Windfarm applications are becoming increasingly frequent in the MDMG area and a condition of most is that a Deer Management Plan needs to be prepared, to help guide decision-making generally but also, where needed, to mitigate any adverse effects which might arise from construction and operation. Estates who need to prepare such a plan as part of their planning application are asked to: (i) ensure that the person(s) preparing the new DMp are familiar with the contents of the SDMP and its background (i.e. the Review) and (ii) consult with its neighbours and with the MDMG in respect of any associated changes to cull plans proposed OR significant changes to deer distribution predicted. It should be remembered that the Review identified disturbance around the periphery of the Eastern Monadhliath

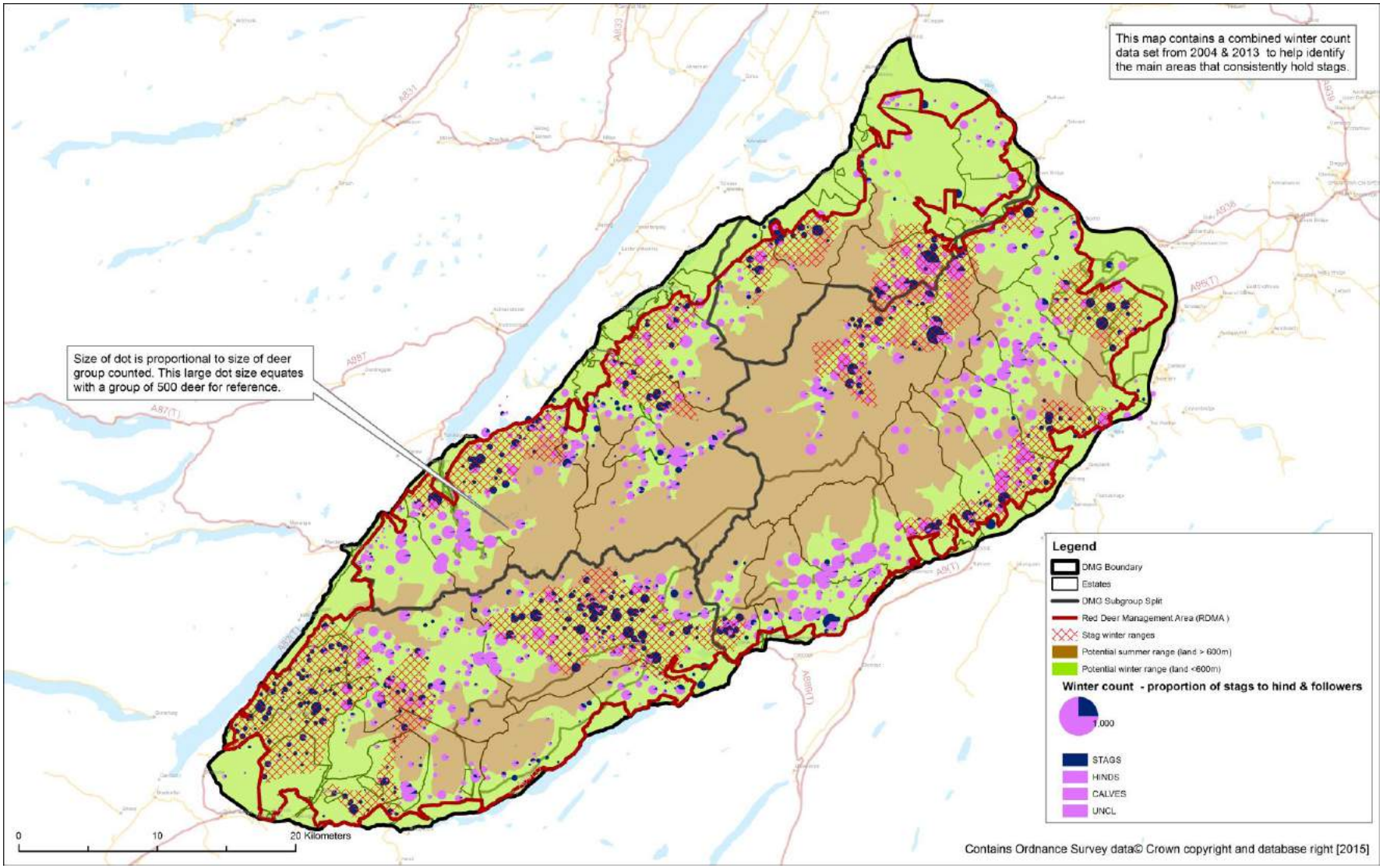
[53] Glenmazeran Estate notes that during the 2013 count it believes it had deer present on its ground which were not normally resident, and these had been moved off neighbours land due to counting activity. It is also the case that Glenmazeran produces a strong draw for deer and that this is another reason why counts can be high (concentration of local deer from the wider area).

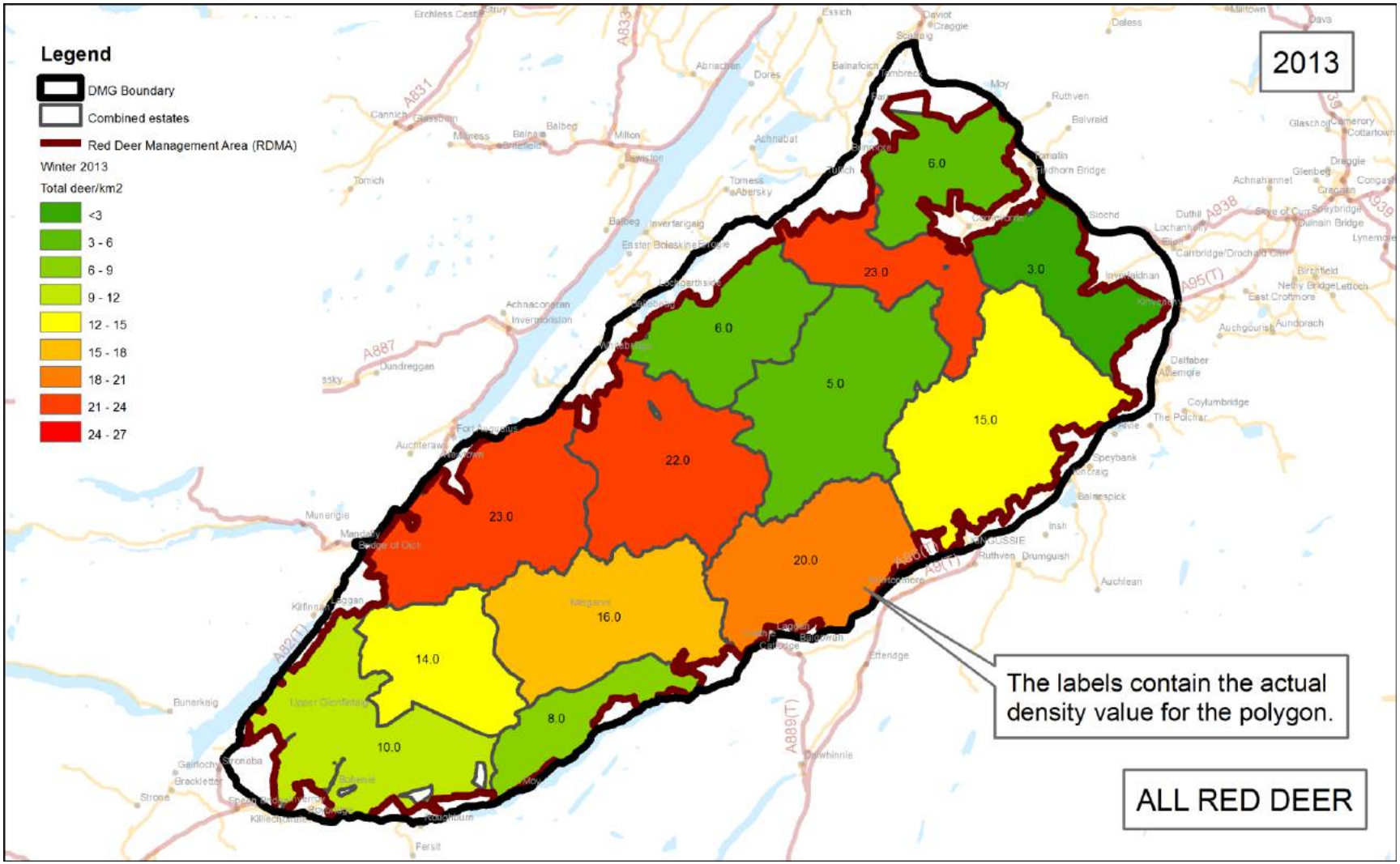
[54] An excellent example of this is the negotiation between Coignafearn and neighbours in August-September 2014, during which Coignafearn agreed to reduce their stag cull from 250 to 125 for the 2014-15 season in return for increasing their hind cull from 200 to 325. Neighbours were consulted on the need for an OOS licence to help Coignafearn achieve the increased hind cull, and the application was supported by the neighbours because of the benefits accruing to them as a result of the reduced stag cull.

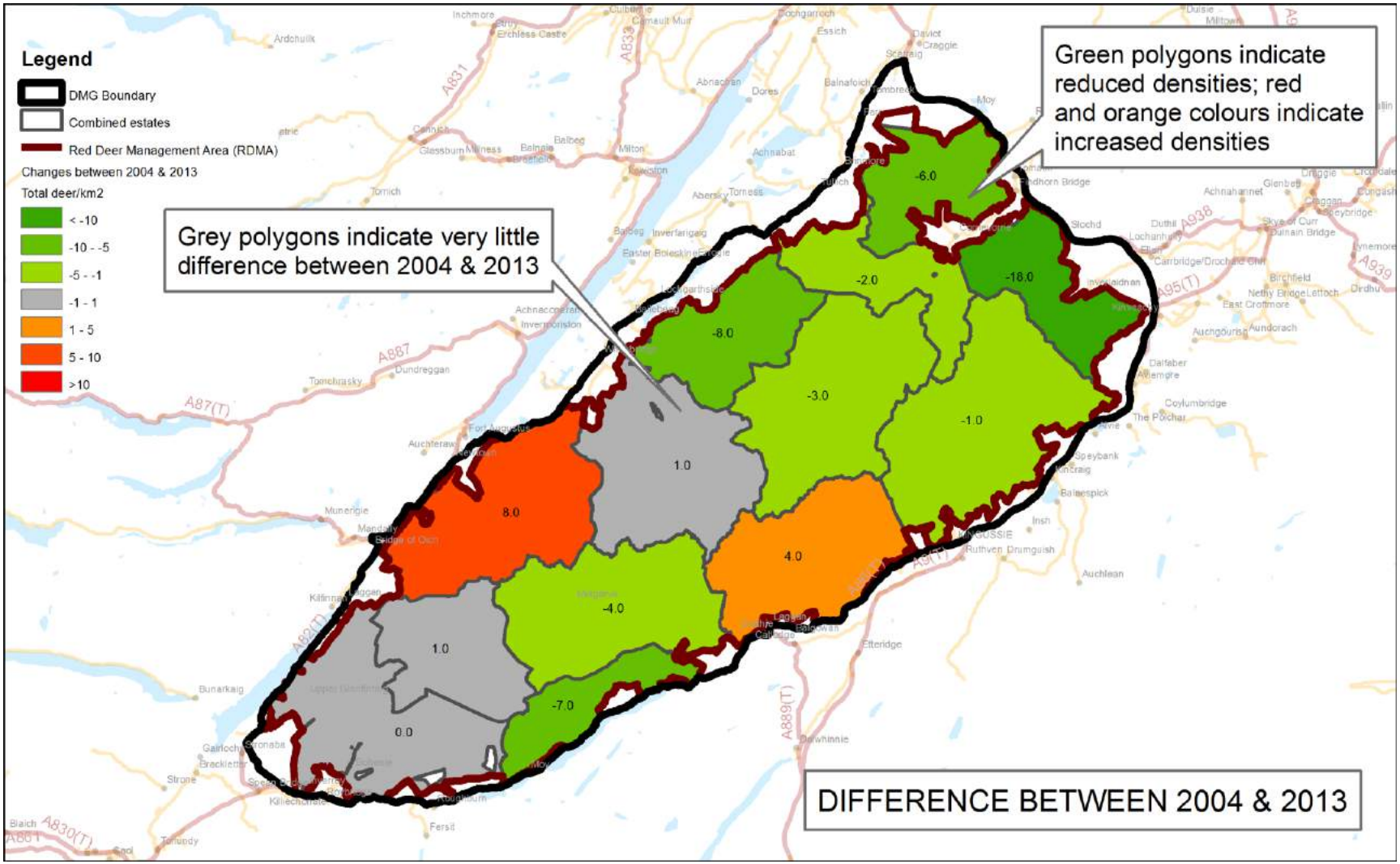
estates as a possible cause of the increased numbers recorded by SNH on the Monadhliath SAC.

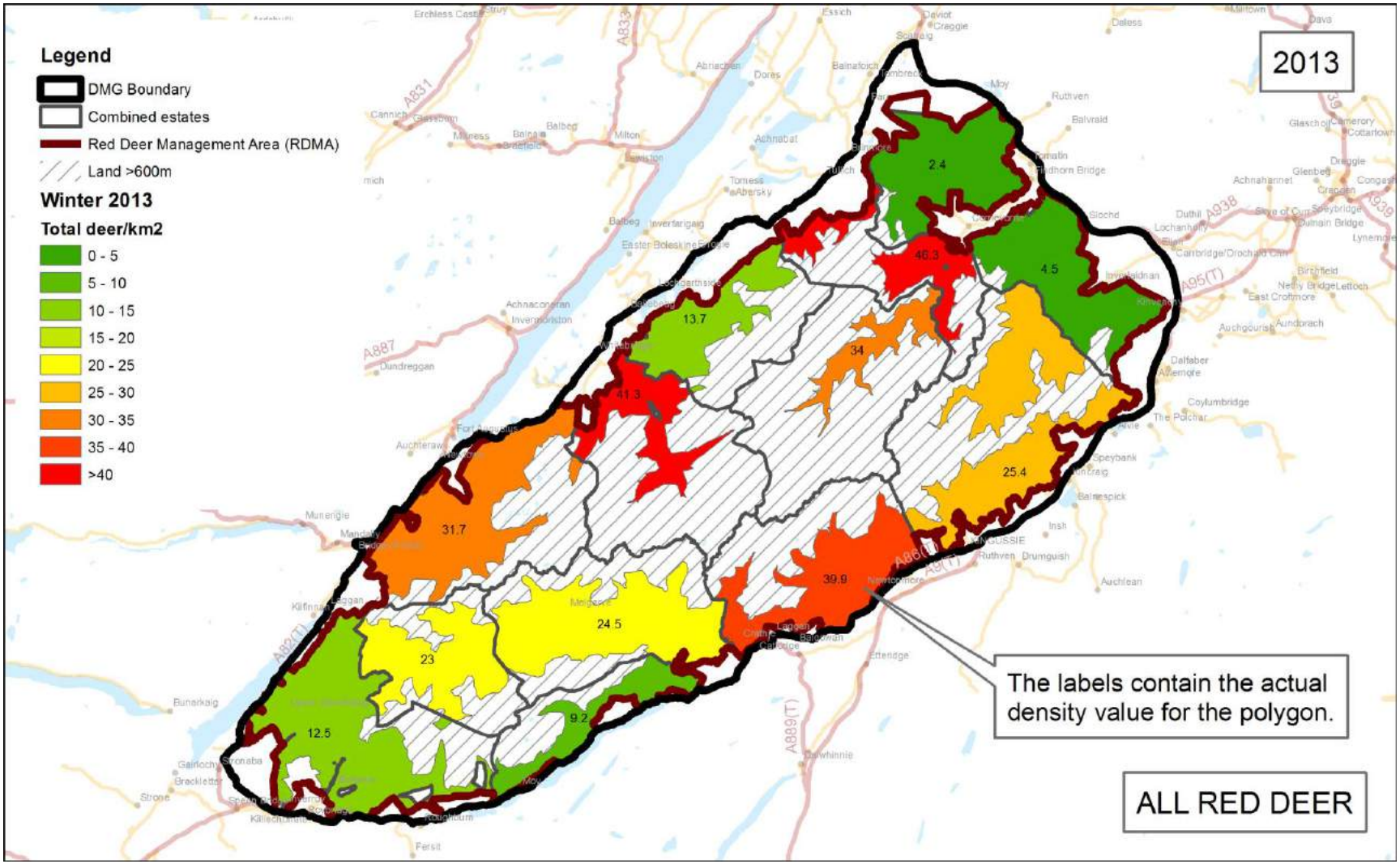
NB Actions on future stag culls are dealt with separately in Chapter 18.

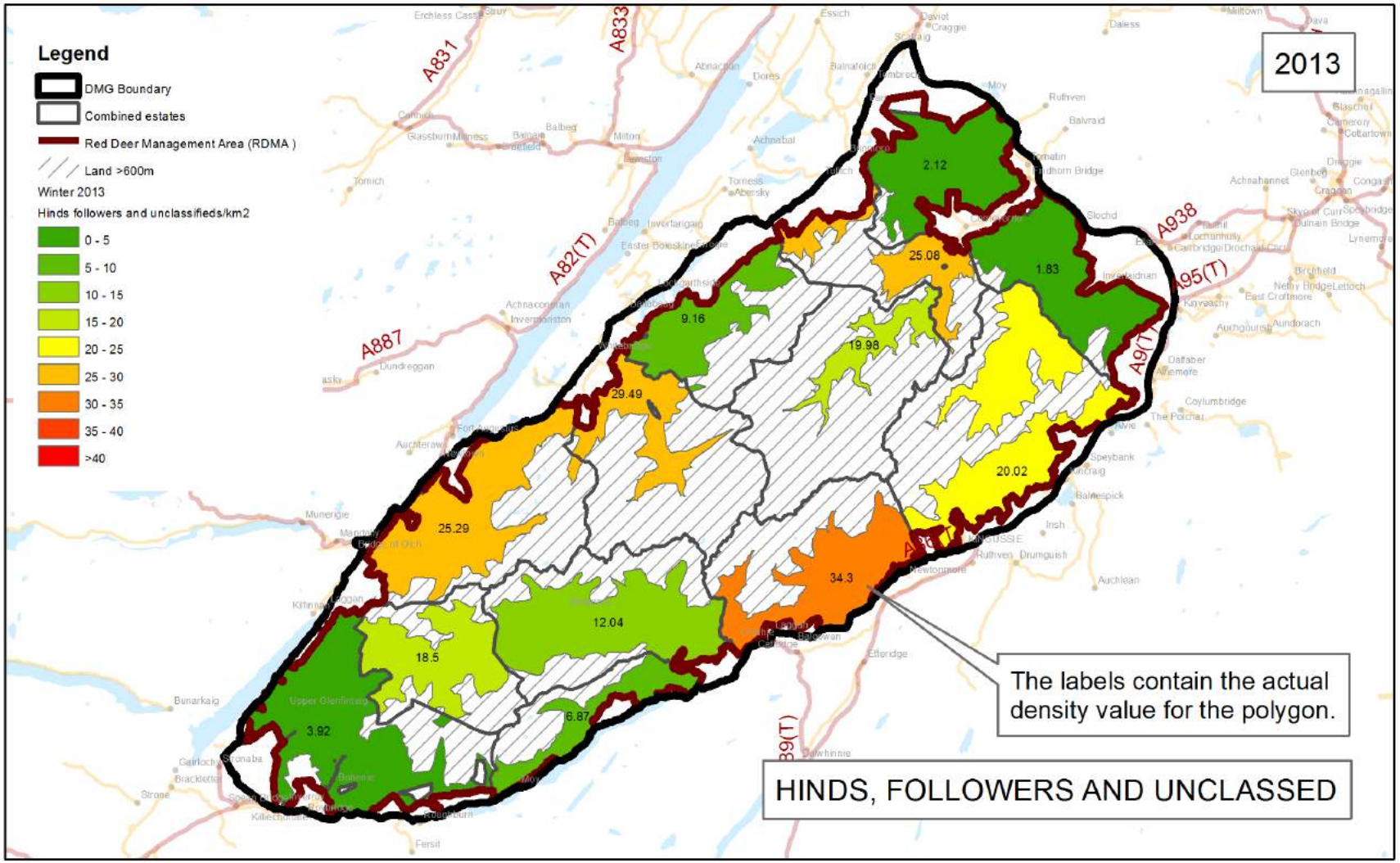

Data from 2004/13 winter counts are combined on this map.
Data from 2003/07/10/13 summer counts are combined on this map.
Coignafearn Estate counted in summer 2013 alongside the Monadhliath SAC.
Size of dot is proportional to the size of deer group counted. This large dot size equates with a group of 500 deer for reference.
Summer counts were undertaken on restricted areas (Monadhliath SAC 2003/07/10/13 along with Creag Meagaidh SAC in 2003 and Coignafearn Estate in 2013).
Creag Meagaidh SAC counted in summer 2003.
Legend
DMG Boundary
Estates
DMG Subgroup Split
Red Deer Management Area (RDMA)
SSSI
Potential summer range (land > 600m)
Main range (land <600m)
Winter count (number of deer)
1
5
10
50
100
Summer count (number of deer)
1
10
50
100
1,000
0
10
20 Kilometers
Contains Ordnance Survey data© Crown copyright and database right [2015]


This map contains a combined winter count data set from 2004 & 2013 to help identify the main areas that consistently hold stags.
Size of dot is proportional to size of deer group counted. This large dot size equates with a group of 500 deer for reference.
Legend
DMG Boundary
Estates
DMG Subgroup Split
Red Deer Management Area (RDMA)
Stag winter ranges
Potential summer range (land > 600m)
Potential winter range (land <600m)
Winter count - proportion of stags to hind & followers
1,000
STAGS
HINDS
CALVES
UNCL
0
10
20 Kilometers
Contains Ordnance Survey data© Crown copyright and database right [2015]


Legend
DMG Boundary
Combined estates
Red Deer Management Area (RDMA)
Winter 2013
Total deer/km2
<3
3 - 6
6 - 9
9 - 12
12 - 15
15 - 18
18 - 21
21 - 24
24 - 27
2013
6.0
23.0
3.0
6.0
5.0
15.0
22.0
23.0
20.0
16.0
14.0
8.0
10.0
The labels contain the actual density value for the polygon.
ALL RED DEER


Legend
DMG Boundary
Combined estates
Red Deer Management Area (RDMA)
Changes between 2004 & 2013
Total deer/km2
< -10
-10 - -5
-5 - -1
-1 - 1
1 - 5
5 - 10
>10
Green polygons indicate reduced densities; red and orange colours indicate increased densities
Grey polygons indicate very little difference between 2004 & 2013
-6.0
-2.0
-18.0
-8.0
-3.0
-1.0
1.0
8.0
4.0
-4.0
1.0
-7.0
0.0
DIFFERENCE BETWEEN 2004 & 2013


Legend
DMG Boundary
Combined estates
Red Deer Management Area (RDMA)
Land >600m
Winter 2013
Total deer/km2
0 - 5
5 - 10
10 - 15
15 - 20
20 - 25
25 - 30
30 - 35
35 - 40
>40
2013
2.4
4.5
46.3
13.7
34
41.3
25.4
31.7
39.9
24.5
23
9.2
12.5
The labels contain the actual density value for the polygon.
ALL RED DEER


Legend
DMG Boundary
Combined estates
Red Deer Management Area (RDMA)
Land >600m
Winter 2013
Hinds followers and unclassifieds/km2
0 - 5
5 - 10
10 - 15
15 - 20
20 - 25
25 - 30
30 - 35
35 - 40
>40
2013
2.12
1.83
25.08
9.16
19.98
29.49
20.02
25.29
34.3
12.04
18.5
6.87
3.92
The labels contain the actual density value for the polygon.
HINDS, FOLLOWERS AND UNCLASSED

18. DEER MANAGEMENT: SPORTING STAGS

A further initiative that was proposed in the 2014 Review relates to the pro-active management of Red deer stags in the Monadhliath. The estates within the MDMG area confirmed at the time of the audit that they would ideally like, in combination, to take a total of 1,015 stags for sport.

A central theme of the SDMP is to try and make the ambition of 1,015 sporting stags per annum achievable, whilst at the same time ensuring that this does not impinge significantly on the ability of the MDMG estates to achieve their other management objectives.

The management of stags is, in part, covered off by the various habitat management initiatives outlined earlier in this document and also by the local reductions in hind density which have been proposed earlier. However, there is also a further range of pro-active measures that can be implemented a part of the process of determining stag culls.

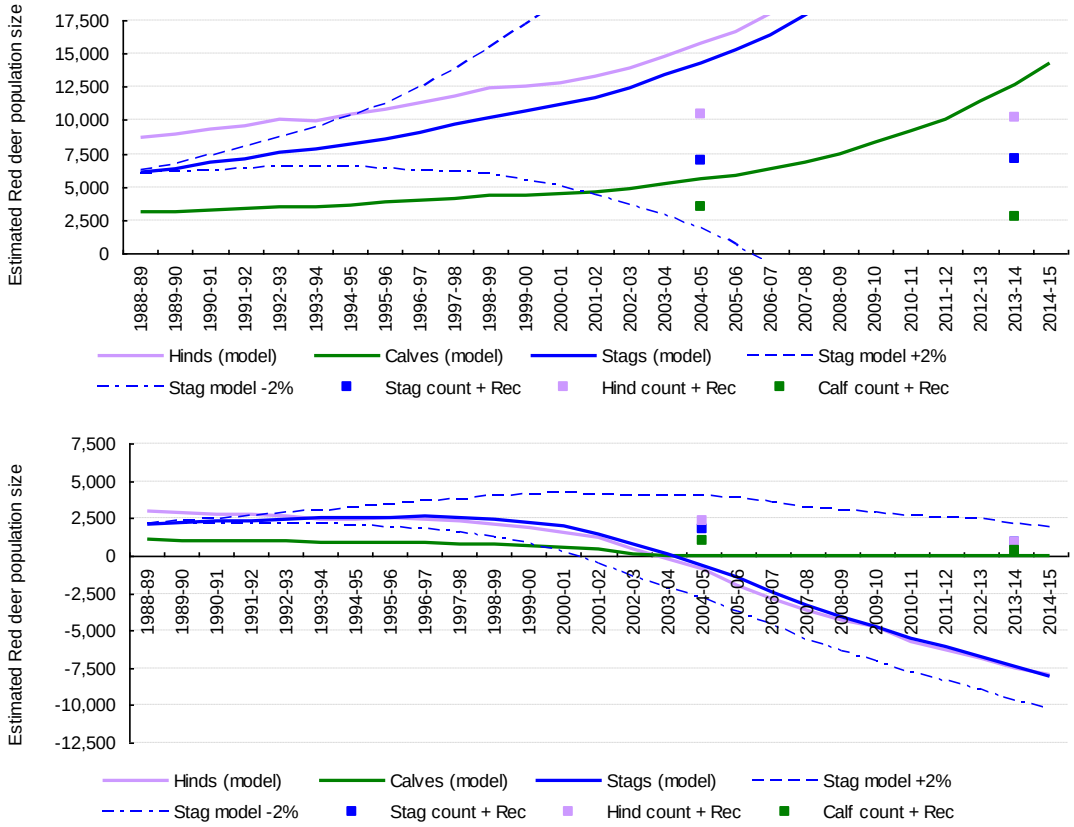
At present, there are between 1,300 and 1,400 stags officially culled per annum within the RDMA. It is thought, in fact, that there are more than this culled, but they are not recorded. There are also some that die of natural causes. The 2014 Review describes all of this in detail.

On the basis of the winter 2013 count, it was estimated that c. 1,700 stag calves would have been born in the early summer of 2013. This implies that the supply of stags for sport (mainly aged from 5 years upwards) could be sustained, assuming that the distribution of older stags is suitable during the late summer and into the rut.

Analysis of the cull records from recent years shows that a small number of estates has been culling a large proportion of the stags in the MDMG area, and yet these are the estates which need few or no sporting stags. In essence, the stags are culled for reasons of habitat protection or in the process of converting to a full grouse moor. The difference between the c. 1000 stags needed for sport and the 1,300-1,400 total cull (c. 300-400 stags per annum) is accounted for mainly by these protection culls. Of course, protection culls are relatively indiscriminate and will, with all else equal, result in large number of immature stags being culled. It follows that this will 'squeeze' the base of the stag population pyramid.

Detailed population modelling (see below) confirms that, over the past decade and more, the estates which 'Changed Objectives' have in combination shot far more deer than their original populations present could have produced[55]. At the same time, the estates around them have in combination produced far more deer than they have shot. A corollary is that the deer populations using many of the MDMG's main estates are highly mobile and interconnected, with the result that culling policies on one estate can markedly influence the other and vice versa.

[55] These are the key estates where major reductions in deer density have been undertaken in the past 10-15 years: Clune, Coignafearn, Corriegarth, Creag Meagaidh, Farr and Kinveachy.



The predicted trend in summer deer population size and density for the Status Quo and Change in Objectives estates since 1988. Lines show predicted trends (with recruitment added each year) and dots show aerial count data (also with recruitment added). Dotted lines show the results of running the start population for stags with a +/- 2% error and confirm the model is very sensitive to the size of the starting population input.

The obvious question to ask is why so many stags are shot in these few 'Change' estates. A major reason is that high densities of hinds on many neighbouring estates, occurring in tandem with high levels of culling on adjoining ground, create an 'immigration gradient' down which young stags flow due to the environmental pressures apparent in the areas where they were born. Moreover, we can see from the models that, in essence, when major pressure is applied in one place the neighbours will tend to reduce general pressure on deer at their side to compensate. As they wish to retain a good stag cull, even in difficult circumstances, it is mainly hinds that gain from this reduced culling pressure. In addition, at Coignafearn it is reportedly difficult to shoot hinds in season on the higher ground especially around the Monadhliath SAC so they focus their cull on hinds in season in the lower glen and on stags generally. At Kinveachy, the quality of the wintering habitat is reportedly what draws stags in. At Creag Meagaidh, the south facing slopes and excellent shelter, combined with now expanding woodland cover, are thought to be responsible.

The potential to find other ways for these Change estates to reduce their deer densities is present, but it requires some careful thought. The following actions are proposed to try and help better manage stags for the benefit of the group:

- ✓ ACTION: MDMG estates should, wherever possible, shoot a number of stags equal to (or less than) their 'desired sporting stag' cull – see confirmed numbers in Appendix 4. The main exceptions to this are as follows[56]:
  - Where estates are taking a 'protection cull' of stags to help promote / secure forest crop establishment, native woodland regeneration or other forms of habitat recovery (e.g. heather expansion for grouse) BUT subject to firstly making all reasonable attempts to find alternative ways to reduce deer impacts on the sites in question (e.g. seeking neighbour support to shoot more hinds, in return for less stags).
  - Where stags are marauding onto agricultural crops and no alternative solution (e.g. fencing animals out or driving them out) is possible.
  - Where public safety or animal welfare is a concern.

  NB The SDMP assumes that these estates will not otherwise shoot any more stags than were shot in 2013-14, without consulting with the MDMG first.

- ✓ ACTION: Investigate the potential to undertake a **'stags for hinds' swap** at Coignafearn, whereby the estate are aided by their neighbours to reduce hind densities in return for an easing in the pressure applied to mature stags. This approach would ideally be put in place for up to 5 years to establish its potential, but in the first instance it is recognised that a trial of a year is attempted. The benefits for **Coignafearn** are that it reduces its own breeding population first, which is present all year and causes impacts, whilst at the same time hinds usually resident for the summer only are also culled (Out of Season) on the high ground and are also culled by neighbouring estates in season if cull targets are not met each year. This should benefit Coignafearn through an increased likelihood that ecological restoration objectives relating to native woodland and scrub, vegetation and riparian areas should be achieved. The benefits for neighbours include a reduction in stags culled, thus leaving more to mature and be available for sport, and also reduced tension between the neighbours which tends to act as a barrier to working together on other matters also. Discussions should be held in the period mid-August to mid-October 2014, with SCL facilitating, the aim being to have an agreement in place before major out of season stags culls are taken in the coming winter (assuming a licence is granted).

  POSTSCRIPT: This arrangement is now in place, as of 14th September 2014, until 30th March 2015 at which point it should be reviewed by all parties with the presumption in favour of it being continued for up to 4 more years. The overall effect of the 'stags for hinds' swap AND the requested and voluntary changes to hind culls in the Eastern Monadhliath have been modelled in **Appendix 5** to enable members to understand the likely dynamics and trajectory of the population.

- ✓ ACTION: It is proposed that a similar arrangement to Coignafearn and neighbours is put in place between **Creag Meagaidh** and its neighbours (if they want it), based on the premise that Creag Meagaidh focuses its cull on Red hinds / hind calves and Roe/Sika deer wherever possible, and otherwise on older Red stags, to reduce deer occupancy levels on the site (this should help SNH to achieve its objectives). In return, neighbours should reduce their hind densities to try and reduce the inflow of young stags and should also

[56] On some estates, stalkers sometimes shoot younger stags with poor antler form etc.

investigate longer term measures to improve their habitats for stag wintering so that more stags are retained within their own marches. Creag Meagaidh should also be asked to share with the DMG any data on deer impacts and habitat changes which supports the need for ongoing heavy culling of Red deer stags in or out of season, as it must form part of any licence application.

POSTSCRIPT: The management of Creag Meagaidh NNR was asked about the possibility of putting in place such measures. They felt it was unnecessary because they believed all their neighbours to be satisfied with the way deer are currently managed on Creag Meagaidh. It was agreed at a Task Group meeting in early February that this would be followed up and confirmed at the next Sub-Group meeting by Thomas Macdonell.

- ✓ ACTION: **Kinveachy** – the DMG should seek to put in place a similar arrangement as is proposed for Creag Meagaidh. The key neighbours are considered to be: Kinrara, Alvie/Dalraddy & Dunachton. Discussions on proposals for Kinveachy have been initiated are were ongoing at the time of writing.

POSTSCRIPT: Kinveachy Estate provided the following text for inclusion in the SDMP on 13th February 2015:

"Kinveachy Estate is committed to working with its neighbours to gather sufficient data to enable an adaptive approach to deer management on all properties based on a mutual understanding of objectives and constraints, including those imposed on deer management in the eastern Monadhliath by UK and European designations."

- ✓ ACTION: **Corriegarth** – the DMG should seek to put in place a similar arrangement as is proposed for Creag Meagaidh. The key neighbours are: Garrogie and Dunmaglass (Dunmaglass not generally concerned though).

- ✓ ACTION: Estates across the Eastern Monadhliath should be asked, where practical, to try and **focus their calf cull on hind calves**. Whilst this is a somewhat unusual request, it is believed that it might help to push the sex ratio back towards parity (1: 1 stags: hinds) and would also help in key areas to reduce the hind population more quickly. We acknowledge that in many cases this is not possible to achieve, but given most of the hind culling in the RDMA is selective it is an ambition worth striving for. A review after 5 years would help us to ascertain what the effects have been.

19. LEGISLATION & NATIONAL POLICIES

There is a range of legislation which landowners are expected as individuals to comply with – these are extracted from SNH's Code of Practice on Deer Management:

- Deer (Scotland) Act 1996 (as amended) – includes offences to shoot out of season, the need to seek 'Authorisations' to shoot out of season, driving deer and poaching.
- Nature Conservation (Scotland) Act 2004 (as amended) – includes legislation on designated sites which SNH oversees and reports to the DMG on as required.
- The Conservation of Natural Habitats &c. Regulations 1994
- Firearms Legislation
- Food Hygiene Legislation
- Land Reform (Scotland) Act 2003 – includes legislation on public
- access to land and water.
- Wildlife and Natural Environment (Scotland) Act 2011 – includes legislation on Invasive Non-Native species.

This Strategic Deer Management Plan cannot realistically hope to cover off all the compliance issues for over 40 estates given they involve multiple owners, agents and stalkers. Rather, it is assumed that these individuals are aware of their legal responsibilities and take them seriously in as far as they are aware of them.

- ✓ ACTION: The MDMG should organise, fund and run a **seminar** in autumn 2015 to ensure that all owners or managers are aware of their **legal responsibilities** in relation to deer management.

- ✓ ACTION: Actions arising from the **seminar**, if they relate to strategic planning matters, should be incorporated into an updated version of the SDMP.

There is also a range of policies created by the Scottish Government, SNH and ADMG which these organisations hope that landowners will adopt – the main ones are:

- The Code of Practice on deer management produced by SNH.
- Wild Deer Best Practice Guidance produced by SNH.
- The DMG Benchmark produced by ADMG (see Appendix 6).
- SNH Public Interest tests (see Appendix 7).

- ✓ ACTION: The MDMG should undertake the **ADMG Benchmark Assessment** in October 2014 with the help of a SNH Wildlife Operations Officer, using this SDMP as the basis. This assessment includes provision for assessment against the **SNH Public Interest** tests also. Failures to meet the required standards should be assessed against 3 relevant 'timescales':
    - 1. Prior to the SDMP being commissioned.
    - 2. With the SDMP signed up to in February 2015, but not yet delivered.
    - 3. With the SDMP delivery fully underway in 5 years' time.

- ✓ ACTION: MDMG owners should be encouraged to adopt **SNH's Code of Practice** for deer management, whether fully or in stages as is practical, from 2015 onwards. However, we already know that the 2014 Review confirmed that only 50% of managers have read it thoroughly and that a fair proportion of them, and the others who have not, are not convinced that some of the proposals within it, whilst laudable, are deliverable on a practical basis. Therefore MDMG should, off the back of the strategic planning process, prepare a statement to SNH confirming where they fail to conform with the Code, why they fail to conform and what their proposed solutions are.

- ✓ ACTION: MDMG owners should be encouraged to **adopt Wild Deer Best Practice guidance wherever possible and practical**. MDMG should ask Iain Hope of SNH to provide a seminar in 2015 on the topic, to try and raise awareness of the guidance. The MDMG should then, off the back of the strategic planning process and the seminar, prepare a statement to SNH confirming where owners fail to conform with the BPG requirements, why they fail to conform and what their proposed solutions are.

- ✓ ACTION: MDMG owners should encourage their stalkers to attain **Deer Stalking Certificates where possible**. At the time of the 2014 Review, c. 80% of stalkers operating in the RDMA had DSC1 and c. 50% had DSC2. The MDMG should hold a seminar in 2015 for the estates who currently do not have stalkers operating with DSC1, to establish the reasons why not and to find a solution if possible.

APPENDIX 1: STANDARD LARDER RECORD

ESTATE	GRID REF	STALKER INITIALS	TAG NUMBER	DATE SHOT	INSIDE RDMA?	SPECIES	SEX	AGE	BODY WEIGHT	NO. of ANTLER POINTS	NO. OF CORPUS LUTEUM	NO. OF EMBRYOS - MALE	NO. OF EMBRYOS - FEMALE	HIND IN MILK?	KIDNEY WEIGHT	KIDNEY FAT WEIGHT	SHOT AT NIGHT?
e.g. Braeroy	e.g. NY 134 435	e.g. DF	Estate's larder tag or reference	12/09/14	Yes / No	Roe, Sika, Red	M, F	0, 1, 2 etc	kg (no head or legs)	e.g. 11	0, 1, 2 etc	0, 1, 2 etc	0, 1, 2 etc	Y, N	grams	grams	Y, N
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Note 1: Red cells are essential - the rest are optional; **Note 2**: write comments at base of sheet, and mark relevant record with an asterisk *																	

This is the type of information that estates in the MDMG should ideally gather, to enable formal analysis of cull records each year. The columns coloured red are the 'core data' and the others are data which is important to gather but which could be foregone if estates are not willing to spend the time gathering it.

Information on kidney fat (and KFI) will only be needed at certain junctures, to help monitor the condition of the deer herd. It is anticipated that such data will only be gathered every 3rd year in the planning cycle and only for an agreed period of the hind season (e.g. 1 month). These proposals need to be discussed with owners at the proposed May 2015 DMG meeting before being finalised.

APPENDIX 2: HIGH-ALTITUDE PEATLAND RESEARCH PROPOSAL

"HIGH ALTITUDE ERODING BLANKET BOG IN THE MONADHLIATH MOUNTAINS: A COLLABORATIVE INVESTIGATION INTO THE POTENTIAL FOR LANDSCAPE-SCALE RESTORATION USING AN ECOSYSTEM APPROACH"

1. The Scottish Government wishes to restore degraded peatlands to help deliver a wide range of ecosystem services. The Monadhliath DMG area has extensive areas of montane peatland, termed herein 'high-altitude peatlands'.

2. High-altitude peatlands[57] are a significant store of carbon in Scotland but it is known that many areas are currently experiencing net losses of carbon due to drainage effects and wind / water-based erosion of the peat masses present. Restoration of high-altitude peatlands may help increase their ability to store carbon, but only where the restoration work undertaken is shown to be ecologically-appropriate, cost-effective to deliver to the standard required and deliverable without causing consequent environmental damage (e.g. catalysing bog bursts due to changes in pore water pressure during storms). To date, little formal research or large-scale practical restoration work has been undertaken on high-altitude sites in Scotland despite the fact that they are very extensive.

3. Artificial surface drainage is present on high-altitude peatlands in some parts of the MDMG area, most notably in the north-east (see Map 1 at the end of this appendix). Blocking these drains could lead to a marked improvement in bog condition, but only if the blocking is executed appropriately. Blocking of moorland drains has been done extensively at low altitudes but the success of the measures has not been intensively studied in Scottish conditions; at higher altitudes little practical work has been done and almost no research undertaken. Therefore, a degree of uncertainty is apparent in (i) how best to block drains at high altitudes to ensure minimum environmental damage arises and (ii) how successful the outcome would be in conservation terms (how damaging are the drains in the first place to these high altitude peatlands?).

4. There are also considerable areas of eroding high-altitude peatland in the eastern section of the MDMG area - Map 1 at the end of this appendix shows the extent of high-altitude peatlands, and it is clear that erosion has acted, and continues to act, to remove considerable volumes of peat from these areas. Over time it is assumed that significant amounts of stored carbon are being released into the atmosphere. It is unclear why the erosion started and also if it would be right to intervene to prevent it at this stage. There are many factors that might contribute to erosion being initiated and being sustained; many of these factors are also likely to play a part in determining the timescale over which eroding land might recover – these factors include weathering effects, land management practices and the effects of wild grazing mammals. On a related point, there has also been a long-running debate between landowners and SNH regarding the role of wild deer in determining the dynamics of the eroding peatlands in the Monadhliath SAC

[57] Defined as blanket bog above c. 600m in altitude for the purposes of this study (i.e. in the montane zone).

and the surrounding land where most of the high-altitude peatland in the MDMG area can be found (see Map 1).

5. A review of deer management in the MDMG area, undertaken by Strath Caulaidh Ltd IN 2014 on behalf of the MDMG owners, made several recommendations to help the DMG identify ways to deliver sustainable deer management for public benefit. They included the following:

    a. The DMG should consider, where landowners are willing, restoring high-altitude bog where it is obviously damaged by surface drainage. Restoration of drained bog in the region around the Monadhliath SAC would help to increase the amount of high-quality bog in the vicinity of the SAC hence increase the conservation value of the whole area.

    b. SNH and the DMG should in parnership undertake new research into the role of wild deer in determining the dynamics of eroding peatlands. This will help the owners and SNH identify whether there is a genuine justification for management intervention in the form of increased culls or other measures (e.g. re-seeding). If research shows it is justified and worthwhile, high-altitude eroded peatland in the north-east of the DMG area (see map at end of this section) might also be considered for restoration to help expand the area of good quality high-altitude bog present regionally.

6. A major peatlands restoration and research project is proposed for the Monadhliath Deer Management Group (MDMG) area, the main aims of which are to:

    a. Test the scientific case for pursuing landscape scale restoration of (i) drained and (ii) eroded high-altitude blanket bogs in Scotland, using empirical evidence gathered from the Monadhliath Deer Management Group (MDMG area) as the basis for the investigation.
    b. Quantify the potential future benefits of restoring (i) drained and (ii) eroded high-altitude blanket bogs across the MDMG area, using the current status and dynamics of the ecosystem as the starting point.
    c. Set up integrated experimental trials to establish the most appropriate method(s) to deliver restoration of (i) drained and (ii) eroded high-altitude bogs in the MDMG area - the trial plot set up by SNH in summer 2013 will be one of the proposed trial sites for this project[58].
    d. Based on the experimental results, design and implement a trial restoration program for (i) drained and (i) eroded high-altitude bog on pilot areas within the MDMG area, as a prelude to larger scale restoration of the area in the future if follow-up funding can be secured.
    e. Develop and deliver a program of educational outputs, including (i) training for estate staff (ii) information exchange for SNH staff, (iii) guidance on practical work for practitioners and (iv) technical guidance on site condition monitoring of high-altitude bogs for scientists.

[58] SNH set up a trial in a 1 hectare fenced enclosure on Coignafearn in summer 2013. The aim is to assess options for restoring vegetation on bare peat, and what factors control the process naturally. A comparable unfenced plot was also created which will help see what impacts deer have on these processes.

7. The Scottish Government's Peatland Action fund was open for funding bids. Funds were available from it to help undertake standard restoration work, to promote innovation in restoration methods and to support research & educational activities relating to peatland restoration. Unfortunately, the scale and scope of this proposed project was somewhat beyond the Peatland Action fund – it was advised that an application to it would not be worthwhile. However, SNH has subsequently advised us that it is possible the Scottish Government would be able to help find ways to locate the additional funds needed from central government resources.

8. The project would need to involve a wide range of partners including:

    a. Member estates of the MDMG – see Map 1 for the set of estates that have high-altitude bog present and could be involved in the project[59].
    b. SNH/Scottish Government.
    c. Strath Caulaidh Ltd.

9. The partners would have the following proposed roles:

    a. SCL would (i) act as the technical lead for the project, (ii) lead on delivery of practical scientific services and (iii) act as project coordinator / manager.
    b. MDMG estates would (i) provide the permission to work on sites for the trial work and restoration work, (ii) provide help in kind to transport materials to project experimental sites and help establish experimental plots (see later in this document) and (iii) have a role in monitoring sites to suit their schedules.
    c. SNH/Scottish Government would provide (i) project funding through their Peatland Action scheme and (ii) high level operational / technical support through the project period.

10. The project would be managed by a steering group comprising several members with a variety of experience and viewpoints, with a possible grouping being:

    a. Douglas Campbell - Strath Caulaidh Ltd.
    b. Jamie Williamson - MDMG chairman.
    c. Landowner representatives from MDMG (those owners who put land forward for the project).
    d. Keeper representatives x 2 (MDMG).
    e. Iain Hope – SNH (wildlife operations unit).
    f. Anne Elliot – SNH (area staff).

11. The project would ideally run for a period of 5 years from 2014 – 2019[60].

[59] All estates that have high-altitude bog present would need to be involved in some way with the project, as part of the audit process (see later in this document). However, only some estates would need to provide permission for land to undertake restoration work or formal experiments.
[60] The project may then need to seek funding for an extension period of 3-5 years depending on the early outcomes of research undertaken on drainage, erosion and deer-related impacts.

12. The proposed approach for erosion-related trial and restoration work would, in outline, be as follows:

    a. Testing the evidence base to justify landscape-scale restoration

        i. Site-wide analysis of historic imagery and contemporary imagery to establish the nature and extent of any environmental change in the high-altitude blanket bogs since the 1940's (e.g. expansion or contraction of bare peat cover, migration of gully systems, cessation of muirburn, introduction of surface drains)[61].
        ii. Analysing the current spatial distribution of bare peat against a range of relevant covariates (e.g. peat depth, slope, aspect, altitude, topographic position, peat pipe density) to help establish the degree to which physical factors, including weather, landform and superficial geology, might interact and provide a catalyst for natural breakdown of the main peat mass.
        iii. Sampling and dating of sediments in select lochs around the MDMG area to help establish the timing of major historic erosion events[62].
        iv. Sampling the existing peat mass to establish the extent to which fire may have been an important mechanism in catalysing erosion in the past.
        v. Analysing the extent of current anthropogenic influences on erosion (drainage networks, roads, off road vehicles tracks) and possible influences on local patterns of erosion.
        vi. Analysing livestock records and game book records to identify possible land use changes that coincide with the onset of erosion as detected from aerial images, sediment cores etc.
        vii. Analysing long-term weather records for the MDMG area and/or analogues to help understand how changing weather might influence erosion rates and patterns. Comparing this with climate change predictions.

    b. Quantifying the potential benefits of restoration

        i. Quantifying the current extent and size of the carbon store in intact and eroding mire across the MDMG area (peat and vegetation); comparing this with the predicted original size of the store before the onset of erosion.
        ii. Quantifying the present levels of carbon flux out of the ecosystem (air-based, water-based and wind-based) and into it (new sequestration from plants into the peat mass) at a set of trial plots (see below).
        iii. Investigating the hydrology of the ecosystem, including groundwater fluctuations (bog water table) and surface water flows according to site type and weather conditions, at a set of trial plots (see below).

[61] A smaller study of historic air images was undertaklen previously by Environment Systems for SNH. The results were not conclusive, and we feel this was mainly because of the methods employed. This proposed study would be much more intensive and have a geomorphological basis rather than simply trying to identify changes in bare peat cover *per se*.

[62] There is only a small number of such lochs present – whilst the sample size is small they may well still hold very important evidence which helps us to date the timing of erosion from the plateau areas.

iv. Quantifying weather conditions at a set of trial plots (see below) in order to help (i) understand carbon fluxes and (ii) identify the extent to which weathering will be a constraint to restoration aims being achieved.
v. Defining appropriate local restoration targets for the MDMG area using high-quality intact mire sites within the study area as benchmarks.
vi. Auditing the present status of the blanket bog across the MDMG area with the aim of identifying locations where restoration would be beneficial and ranking those areas based on severity of damage, accessibility for practical work, costs to restore etc (desk-based then site based work).

c. Developing appropriate methods to achieve restoration aims
   i. Establishing a network of experimental trial plots, each located in different conditions, and trialling in each a range of restoration options[63]:
      1. Control of grazing (exclusion; low levels; high levels) to catalyse spontaneous re-colonisation[64].
      2. Drain blocking to raise bog water table levels.
      3. Gully blocking to slow down sediment release and catalyse spontaneous re-colonisation.
      4. Intervention to help eroding surfaces to 'heal' more quickly through the introduction of diaspores (e.g. seed, moss fragments) and using associated treatments to secure successful germination (e.g. fertilising, protection).
      5. Novel methods of treatment as developed, subject to agreements on their ecological appropriateness (e.g. include deliberate collapsing of hag edges to help stimulate peat dead flat formation, machine compaction of hag to reduce wind-erosion effects etc).
   ii. Quantifying the ability of the restoration methods to (i) stem carbon losses/promote carbon sequestration, (ii) provide mitigation against downstream flooding[65] and (iii) improve water quality for human consumption/fisheries [66].
   iii. Quantifying the way in which the treated and untreated sites deliver improvements in the value/condition of these site types from a conservation perspective generally, but with a special focus on deer impacts and related interactions (animal trampling of re-colonising plants, elevated levels of sediment release due to trampling, grazing impacts on true grasses reducing seeding rates etc).
   iv. Quantifying the potential costs of restoration versus the potential benefits; undertaking a cost-benefit analysis to ascertain whether restoration of high-altitude peatlands is a

[63] The trial plot already set up by SNH on Coignafearn in summer 2013 will act as one of the proposed plots, with lessons learned from the first year of this study being fed into the wider design.
[64] The management of grazing levels is considered to be a valid 'restoration method' in the same way as drain damming or re-seeding. This approach could conceivably form part of a package of restoration measures if experimental evidence suggests it is worthwhile.
[65] The MDMG area, and land downstream, may or may not presently experience such problems but the results of the study can be used to predict the potential benefits of restoration in other areas nonetheless.
[66] As above.

cost-effective option given the benefits predicted, or whether resources are best used on more middle altitude or low altitude sites.

d. Rolling out restoration work in pilot areas
    i. Identifying pilot areas within the MDMG area, on sites designated for blanket bog, at which restoration methods if deemed appropriate to do so from experimental trials could be rolled out more widely – up to of 500ha (5km^2) of eroding bog would be targeted for experimental restoration at the pilot stage, depending on the final mix of treatments deemed best suited to the conditions[67].
    ii. Developing a management and operational plan for local delivery of restoration measures on the pilot areas.
    iii. Identifying contractors to deliver a package of restoration measures across the pilot areas.
    iv. Monitoring restoration pilot areas in advance of treatment.
    v. Overseeing delivery of the treatment work on the pilot areas
    vi. Undertaking a 'work study' and using the results to develop a model to predict the time / resources to undertake restoration work at scale across the MDMG area if judged appropriate.
e. Delivering educational benefits
    i. Organise and host site meetings for estate staff / factors / owners to learn about the project before it starts, after 12/24 months to discuss interim results and after 36 months to discuss final outcomes and implications.
    ii. Provide the opportunity for estate staff and owners to attend site monitoring visits and help with the work if interested, in order to understand the methods being used and the rationale underpinning them.
    iii. Organise and host workshops for SNH area and wildlife staff to learn about the project.
    iv. Produce a detailed technical report on the project outcome.
    v. Produce a scientific paper on the key outcomes of the project.
    vi. Produce a set of guidance notes on the most appropriate ways to assess the conservation condition of high-altitude intact and eroding bog ecosystems in Scotland specifically.
    vii. Produce best practice guidance on the practical restoration of high-altitude intact and eroding bog ecosystems in Scotland.
    viii. Work with the estates to produce a management plan for high-altitude blanket bogs in the MDMG area, and more widely, if it is judged that larger scale restoration is desirable.

13. The proposed approach for drainage-related trial and restoration work would, in outline, be as follows:

    a. Testing the evidence base to justify landscape-scale restoration
        i. Published scientific studies into the effects of damming moorland drains would be sourced.
        ii. A review of available literature would be undertaken with the aim of establishing all the possible approaches to use to block drains on the high-altitude bogs and what the potential problems of doing so might be.

[67] The project budget would include a sum allowed for restoration, and work wouldbe undertaken up to the limit of this budget.

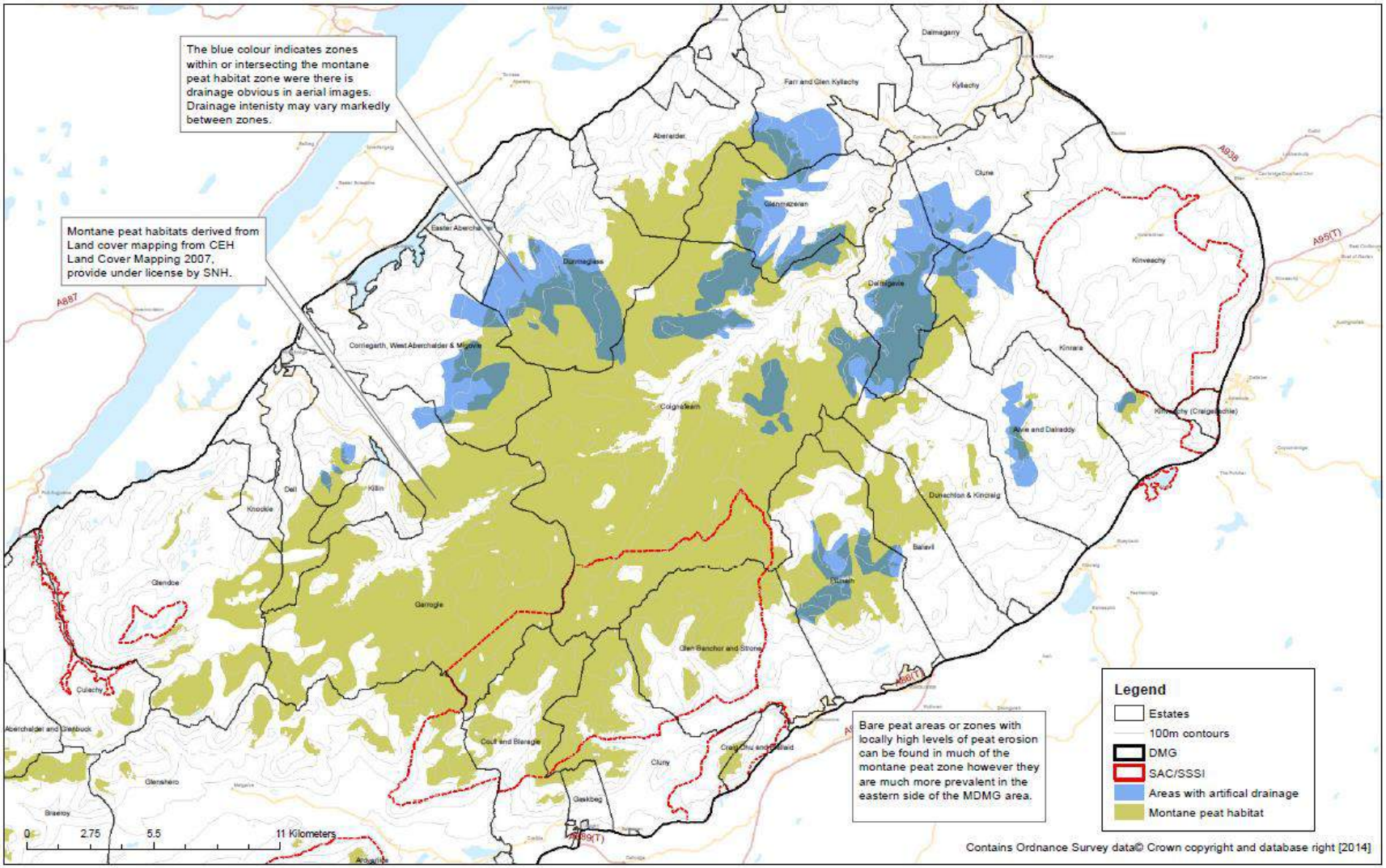
iii. Consider any associated risk that could arise from the work, for example bog burst, peat slides etc

b. Quantifying the potential benefits of restoration
   i. Identify 5 sites within the proposed project area (see Map 1) in which a trial could safely be undertaken, each of approximately 10 ha.
   ii. Set up monitoring on two parts of each site, one to be treated (5ha at least) and one to act as a control (reference) site (with a similar size and situation).
   iii. Undertake damming on the site to be treated. This would result in 25ha of land being dammed as part of the trial. It is anticipated that peat dams will be used where possible but that plastic pile damming will also be used at the edges of the site (and key drain junctions) to help manage flows. Additional measures may also be needed to ensure minimal risk to downstream interests of dam bursts.
   iv. Map the trial areas for future reference once the trial work is completed.
   v. Re-visit the sites after 1 year, 2 years and 3 years to assess the effects of damming against the untreated reference areas.
c. Developing appropriate methods to achieve restoration aims
   i. As part of the proposed trial damming on each site, at the outset of the practical work, a variety of approaches to blocking will be used and their effectiveness measured as part of the repeat monitoring proposed above.
d. Rolling out restoration work in pilot areas
   i. Once the results have been obtained from the trial sites, it is proposed that the remaining parts of the trial areas generally, and any other areas of land put forward by owners in the wider target area (see Map 1), are dammed using the best methods identified.
e. Delivering educational benefits
   i. The program of education proposed for the eroded bog trial sites would cover the damming-trial sites also.

14. Undertaking the proposed project will deliver a wide range of benefits, with perhaps the most notable being that:

    a. It would help to establish in which circumstances a strong scientific argument exists to intervene on eroding high-altitude bogs on the Monadhliath SAC and to what extent the type of mire found in the wider area can have its condition improved by drain blocking. The trials will also add to the wider knowledge base for whether to intervene on drained and eroding high-altitude bogs generally.
    b. It will produce a much more robust understanding of the dynamics of these ecosystems, and the levels of carbon flux occurring in different situations, which will help to (i) quantify the likely benefits of intervening and (ii) understand when / how best to intervene and at what cost.
    c. It will provide the basis for a large future landscape-scale restoration project on eroded and drained bog in the MDMG area, which if successful would secure the future of a very extensive mire complex. This will help deliver the government's aims of undertaking landscape scale restoration of Annex 1 habitats at an ecosystem scale and using an ecosystems approach.

d. It will act as a means to help bring the MDMG estates together and for them to work in partnership with SCL and SNH to help answer key questions about site condition. This should help resolve ongoing debate on this issue between landowners and SNH. In turn, and if successful, the process will provide strong evidence that the voluntary approach to deer management can deliver multiple benefits for society at large. In essence, the project will help participants to deliver some of the key aims of the new Monadhliath Deer Management Plan, currently in the consultation phase.


The blue colour indicates zones within or intersecting the montane peat habitat zone were there is drainage obvious in aerial images. Drainage intenisty may vary markedly between zones.
Montane peat habitats derived from Land cover mapping from CEH Land Cover Mapping 2007, provide under license by SNH.
Bare peat areas or zones with locally high levels of peat erosion can be found in much of the montane peat zone however they are much more prevalent in the eastern side of the MDMG area.
Legend
Estates
100m contours
DMG
SAC/SSSI
Areas with artifical drainage
Montane peat habitat
0
2.75
5.5
11 Kilometers
Contains Ordnance Survey data© Crown copyright and database right [2014]

APPENDIX 3: RECENT AERIAL COUNTS OF THE RMDA

Estate	2004				2013			
	SNH Live count				SNH Live count			
	Stags	Hinds	Calves	Total	Stags	Hinds	Calves	Total
Alltruadh					63	1	1	65
Ardverikie	139	239	83	461	39	118	38	195
Braeroy	305	676	236	1,217	252	731	284	1,267
Coire Neurlain	59	7	3	69	78	0	0	78
Cranachan and Keppoch	59	93	33	185	15	12	7	34
Creag Meagaidh	71	15	5	91	50	77	30	157
FCS - Glen Roy	32	3	1	36	77	59	3	139
FCS - South Laggan					14	3	3	20
Glas Dhoire Plantation								
Glen Gloy	145	34	12	191	347	23	7	377
Glen Roy	62	48	17	127	70	0	0	70
Glenshero	1,279	1,176	412	2,867	1,163	815	286	2,264
Glenspean	119	25	9	153	194	173	85	452
Tulloch - Open Range	65	180	63	308	19	61	34	114
Upper Glenfintaig	90	0	0	90	45	0	0	45
SPEAN BRIDGE SUB -TOTAL	***2,425***	***2,496***	***874***	***5,795***	***2,426***	***2,073***	***778***	***5,277***

Estate	2004				2013			
	SNH Live count				SNH Live count			
	Stags	Hinds	Calves	Total	Stags	Hinds	Calves	Total
Aberchalder & Glenbuck	34	143	50	227	42	496	212	750
Corriegarth, W. Aber. & Mig.	180	400	140	720	103	164	78	345
Culachy	147	292	102	541	178	511	219	908
Dell	67	1	1	69	21	68	31	120
Easter Aberchalder	4	28	10	42	4	4	2	10
Garrogie	247	673	235	1,155	397	563	231	1,191
Glendoe	433	824	288	1,545	337	546	231	1,114
Killin	24	112	39	175	46	48	14	108
Knockie	21	143	50	214	14	169	65	248
STRATHERRICK SUB -TOTAL	***1,157***	***2,616***	***915***	***4,688***	***1,142***	***2,569***	***1,083***	***4,794***

Estate	2004				2013			
	SNH Live count				SNH Live count			
	Stags	Hinds	Calves	Total	Stags	Hinds	Calves	Total
Aberarder and Flichity	434	90	31	555	222	57	16	295
Dalmagarry	36	136	48	220	7	14	7	28
Dunmaglass	80	190	66	336	128	150	48	326
Farr and Glen Kyllachy	97	132	46	275	9	1	1	11
Glenmazeran	371	556	195	1,122	307	348	119	774
Kyllachy	19	94	33	146	6	85	41	132
STRATHNAIRN SUB -TOTAL	***1,037***	***1,198***	***419***	***2,654***	***679***	***655***	***232***	***1,566***

Estate	2004				2013			
	SNH Live count				SNH Live count			
	Stags	Hinds	Calves	Total	Stags	Hinds	Calves	Total
Alvie and Dalraddy	246	508	182	936	111	379	166	656
Balavil	58	99	35	192	128	51	27	206
Clune	333	254	88	675	0	2	2	4
Cluny	125	640	224	989	179	852	286	1,317
Coignafearn	341	745	261	1,347	381	358	134	873
Coull and Blaragie	222	217	74	513	131	212	80	423
Craig Dhu and Biallaid	10	58	23	91	4	73	22	99
Dalmigavie	188	161	56	405	326	302	121	749
Dunachton & Kincraig	101	441	156	698	110	512	231	853
Gaskbeg					24	0	0	24
Glen Banchor and Strone	63	369	129	561	42	598	206	846
Kinrara	73	478	169	720	46	294	139	479
Kinveachy	361	444	156	961	197	98	32	327
Kinveachy (Craigellachie)								
Pitmain	79	133	47	259	202	213	76	491
STRATHSPEY SUB -TOTAL	***2,200***	***4,547***	***1,600***	***8,347***	***1,881***	***3,944***	***1,522***	***7,347***

Sub group	2004				2013			
	SNH Live count				SNH Live count			
	Stags	Hinds	Calves	Total	Stags	Hinds	Calves	Total
SPEAN BRIDGE SUB -TOTAL	2,425	2,496	874	5,795	2,426	2,073	778	5,277
STRATHERRICK SUB -TOTAL	1,157	2,616	915	4,688	1,142	2,569	1,083	4,794
STRATHNAIRN SUB -TOTAL	1,037	1,198	419	2,654	679	655	232	1,566
STRATHSPEY SUB -TOTAL	2,200	4,547	1,600	8,347	1,881	3,944	1,522	7,347
MDMG TOTAL	***6,819***	***10,857***	***3,808***	***21,484***	***6,128***	***9,241***	***3,615***	***18,984***

APPENDIX 4: RECENT CULLING PATTERNS IN THE RMDA

The tables below show (i) the most recent 5-year average culls in the RDMA, (ii) the actual culls taken in 2012-13 and 2013-14 and (iii) the 'ideal' size of sporting stag cull mentioned during estate interviews in 2014.

Changes in the pattern of culling are proposed on a number of estates, particularly in the Eastern Monadhliath but also in the Western Monadhliath. The changes in cull level proposed, and the effects predicted, are presented in three further appendices: Eastern Monadhliath - Appendix 5, Western Monadhliath - Appendix 6 and all Monadhliath - Appendix 7.

Estate	2008-13 5 year average			2012-13 Total culled			2013-14 Total culled			Ideal no. sporting Stags
	Stags	Hinds	Calves	Stags	Hinds	Calves	Stags	Hinds	Calves	
Alltruadh										
Ardverikie	24	41	10	19	20	2	15	19	5	20
Braeroy	43	84	33	28	112	34	60	141	38	65
Coire Neurlain										
Cranachan and Keppoch	13	10	1	17	3	0	18	12	4	18
Creag Meagaidh	107	83	45	109	79	41	104	84	45	0
FCS - Glen Roy	17	7	0	14	5	0	48	20	8	0
FCS - South Laggan *										
Glas Dhoire Plantation										
Glen Gloy	23	13	2	35	26	2	33	25	6	30
SNH Glen Roy	5	5	1	5	10	3	5	4	3	0
Glenshero	143	117	28	131	132	38	116	126	30	100
Glenspean	14	13	6	15	15	7	15	18	17	16
Tulloch - Open Range	25	22	6	17	2	0	25	26	7	30
Upper Glenfintaig										
SPEAN BRIDGE SUB - TOTAL	***413***	***395***	***132***	***390***	***404***	***127***	***439***	***475***	***163***	***279***

Missing data – estates not in contact with DMG; *Almost all land outside the RDMA fence

Estate	2008-13 5 year average			2012-13 Total culled			2013-14 Total culled			Ideal no. sporting Stags
	Stags	Hinds	Calves	Stags	Hinds	Calves	Stags	Hinds	Calves	
Aberchalder & Glenbuck	17	19	4	19	20	8	20	15	5	30
Corriegarth, W. Aber. & Mig.	51	115	51	27	31	16	43	68	34	20
Culachy	46	44	12	45	62	13	51	171	62	50
Dell	16	20	4	14	25	0	15	15	2	15
Easter Aberchalder	4	2	0	0	4	0	0	2	0	3
Garrogie	43	97	32	37	120	22	44	59	10	50
Glendoe	39	51	15	43	62	13	47	81	21	40
Killin	9	17	3	6	19	3	8	11	9	12
Knockie	9	0	0	0	0	0	13	2	1	10
STRATHERRICK SUB - TOTAL	***234***	***367***	***122***	***191***	***343***	***75***	***241***	***424***	***144***	***230***

Estate	2008-13 5 year average			2012-13 Total culled			2013-14 Total culled			Ideal no. sporting Stags
	Stags	Hinds	Calves	Stags	Hinds	Calves	Stags	Hinds	Calves	
Aberarder and Flichity	17	9	5	4	2	0	8	12	2	15
Dalmagarry	9	3	0	11	2	0	7	1	0	10
Dunmaglass	16	27	9	14	16	15	14	34	11	12
Farr and Glen Kyllachy	24	29	6	23	10	1	10	20	4	15
Glenmazeran	26	59	19	25	40	19	26	66	12	30
Kyllachy	6	6	1	4	0	0	5	10	2	12
STRATHNAIRN SUB - TOTAL	***99***	***133***	***41***	***81***	***70***	***35***	***70***	***143***	***31***	***94***

Estate	2008-13 5 year average			2012-13 Total culled			2013-14 Total culled			Ideal no. sporting Stags
	Stags	Hinds	Calves	Stags	Hinds	Calves	Stags	Hinds	Calves	
Alvie and Dalraddy	27	35	11	26	31	12	29	32	10	40
Balavil	28	23	6	27	41	6	30	33	10	30
Clune	32	31	12	4	10	4	5	15	2	0
Cluny	64	84	30	66	109	24	55	100	33	55
Coignafearn	148	170	69	204	250	84	252	200	80	100
Coull and Blaragie	29	29	13	36	48	28	39	27	20	35
Craig Dhu and Biallaid	5	14	2	9	19	6	3	23	5	7
Dalmigavie	17	71	20	29	83	19	8	87	26	15
Dunachton & Kincraig	28	18	3	23	13	0	29	18	6	30
Gaskbeg	12	14	7	8	0	0	7	4	1	0
Glen Banchor and Strone	37	67	23	40	77	23	40	92	26	40
Kinrara	21	17	3	22	10	2	32	32	13	40
Kinveachy	111	76	51	168	76	42	103	32	25	0
Pitmain	19	9	3	13	10	2	32	18	8	20
STRATHSPEY SUB - TOTAL	***578***	***657***	***254***	***675***	***777***	***252***	***664***	***713***	***265***	***412***

Estate	2008-13 5 year average			2012-13 Total culled			2013-14 Total culled			Ideal no. sporting Stags
	Stags	Hinds	Calves	Stags	Hinds	Calves	Stags	Hinds	Calves	
SPEAN BRIDGE SUB - TOTAL	413	395	132	390	404	127	439	475	163	279
STRATHERRICK SUB - TOTAL	234	367	122	191	343	75	241	424	144	230
STRATHNAIRN SUB - TOTAL	99	133	41	81	70	35	70	143	31	94
STRATHSPEY SUB - TOTAL	578	657	254	675	777	252	664	713	265	412
MDMG TOTAL	***1323***	***1551***	***549***	***1337***	***1594***	***489***	***1414***	***1755***	***603***	***1015***

APPENDIX 5: CHANGES TO CULLS - EASTERN MONADHLIATH

This Appendix (i) describes the recent and present levels of cull taken in the Eastern Monadhliath, (ii) confirms the proposed future size of culls over a 10-year period to 2024 and (iii) confirms the likely impact of taking these future culls.

The first table below confirms the 5 year averages for 2004-09 and 2009-2014 for each estate in the Eastern Monadhliath, as well as the 10-year average and the ideal number of sporting stags each estate would like to take annually. The table is divided into two zones: (i) estates taking mainly a sporting cull and (ii) estates taking mainly a reduction cull, to try and keep deer densities low.

Estate	2004-09: 5 year average		2009-14: 5 year average		2004-14: 10 year average		
	Stags	Hinds	Stags	Hinds	Stags	Hinds	**Ideal Sporting stags**
Aberarder and Flichity	31	22	14	8	23	15	15
Alvie and Dalraddy	33	44	27	32	30	38	40
Balavil	30	16	29	26	30	21	30
Cluny	69	74	61	90	65	82	55
Coull and Blaragie	41	34	53	53	47	43	35
Craig Dhu and Biallaid	9	18	5	15	7	17	7
Dalmagarry	13	16	8	3	10	10	10
Dalmigavie	42	41	17	88	29	65	15
Dunachton and Kincraig	34	34	26	17	30	26	30
Dunmaglass	22	33	14	27	18	30	12
Easter Aberchalder	2	7	2	2	2	4	3
Garrogie	47	78	42	83	45	80	50
Gaskbeg	7	17	12	10	9	14	0
Glen Banchor and Strone	33	72	38	72	36	72	40
Glenmazeran	35	105	26	55	30	80	30
Killin	10	11	9	17	9	14	12
Kinrara	37	58	22	15	30	36	40
Kyllachy	11	8	6	6	8	7	12
Pitmain	26	16	20	10	23	13	20
Sub total (Sporting cull)	**531**	**704**	**432**	**618**	**482**	**661**	**456**
Clune	41	39	22	20	31	30	0
Coignafearn	180	250	173	188	177	219	100
C'garth, W A'chalder & Mig	56	30	43	114	50	72	20
Farr and Glen Kyllachy	45	79	23	29	34	54	15
Kinveachy	207	161	108	72	157	116	0
Sub total (Reduction cull)	**529**	**559**	**369**	**423**	**449**	**491**	**135**
TOTAL (East MDMG)	**1060**	**1263**	**801**	**1041**	**930**	**1152**	**591**

The table below confirms the cull taken in 2013-14 for each estate in the Eastern Monadhliath, before any changes were proposed as part of the SDMP. It also shows the proposed culls for 2014-15, with changes highlighted in various colours (associated notes at base of table).

Estate	2013/14				2014-15			
	Stags	Hinds	Calves	**Total**	Stags	Hinds	Calves	**Total**
Aberarder and Flichity	8	12	2	**22**	8	12	2	**22**
Alvie and Dalraddy	29	32	10	**71**	29	32	10	**71**
Balavil	30	33	10	**73**	30	33	10	**73**
Cluny	55	100	33	**188**	55	150	55	**260**
Coull and Blaragie	39	27	20	**86**	39	84	31	**154**
Craig Dhu and Biallaid	3	23	5	**31**	3	26	9	**38**
Dalmagarry	7	1	0	**8**	7	1	0	**8**
Dalmigavie	8	87	26	**121**	8	102	32	**142**
Dunachton and Kincraig	29	18	6	**53**	29	18	6	**53**
Dunmaglass	14	34	11	**59**	14	34	11	**59**
Easter Aberchalder	0	2	0	**2**	0	2	0	**2**
Garrogie***	44	59	10	**113**	44	99	25	**168**
Gaskbeg	7	4	1	**12**	7	13	4	**24**
Glen Banchor and Strone	40	92	26	**158**	40	168	62	**270**
Glenmazeran	26	66	12	**104**	26	106	27	**159**
Killin	8	11	9	**28**	8	11	9	**28**
Kinrara	32	32	13	**77**	32	32	13	**77**
Kyllachy	5	10	2	**17**	5	10	2	**17**
Pitmain	32	18	8	**58**	32	18	8	**58**
Sub total (Sporting cull)	**416**	**661**	**204**	**1241**	**416**	**951**	**316**	**1683**
Clune	5	15	2	**22**	5	15	2	**22**
Coignafearn	252	200	80	**532**	125	325	114	**564**
C'garth, W A'chalder & Mig	43	68	34	**145**	43	68	34	**145**
Farr and Glen Kyllachy	10	20	4	**34**	10	20	4	**34**
Kinveachy	103	32	25	**160**	103	32	25	**160**
Sub total (Reduction cull)	**413**	**335**	**145**	**893**	**286**	**460**	**179**	**925**
TOTAL (East MDMG)	**829**	**996**	**349**	**2,134**	**702**	**1,411**	**495**	**2,608**

Area 7 estates asked to increase their hind culls as part of the SDMP

Dalmigavie (15 for 3 yrs) & Glenmazeran (40 for 3 years) voluntary hind increase

Area 6 estates (Garrogie largest) asked to increase their hind culls (pending)

Coignafearn asked to undertake a 'stags for hinds' swap

Other estates where negotiations will focus on reducing stag culls if possible (pendi

*** Other estates associated with Garrogie: Killin / Dell / Knockie (but only Killin signficant; others have v. limited RDMA land)

There are a number of reasons for the changes in cull proposed in the Eastern Monadhliath:

- Area 7 estates have been asked to reduce markedly their hind (and follower) densities as there is a high likelihood that the high population densities of hinds being held will be having adverse effects on stag population performance - these are: Coull/Blaragie, Gaskbeg, Craig Dhu, Cluny and Glenbanchor[68].

- Area 6 estates have been asked to reduce slightly their hind (and follower) densities for the same reason as Area 7. There are 4 estates in Area 6 (Garrogie-Stronelairg, Killin, Dell and Knockie) but Garrogie-Stronelairg is by far the largest owner in respect of the overall range and the winter range (<600m)[69].

- Dalmigavie and Glenmazeran proposed their own increases in culls when interviewed in 2014 for the Review.

- Coignafearn, in consultation with SCL, has agreed with its neighbours to reduce its stag cull by 125 in return for (i) increasing its hind cull by 125 and (ii) its key neighbours to the south also agreeing to reduce their hind densities (i.e. Area 7). This agreement, strictly speaking, falls under the proposed plans for stag management outlined in Chapter 18 but the proposals are included herein because the fallout of the reduced stag cull is an increased hind cull. The arrangement will ideally last for up to 5 years, but at present has only been agreed for 1 year subject to review in March 2015. The hope is that the arrangement will continue, though, to achieve the maximum benefits (including benefits for sport and the benefit of ecological restoration for those estates that seek to achieve it) for all parties.

- There are two other key estates (Kinveachy and Corriegarth) which SCL hopes might be willing to moderate their stag culls. These negotiations are only in their earliest stages at the time of writing[70] but the aim will be to see if a way can be found to reduce the cull of stags on each estate, in return for increased co-operation from their neighbours where sensible and by deploying changes in management approach as appropriate.

The anticipated outcome of the increased culls is that local densities of hinds will be markedly reduced in the Eastern Monadhliath, and the adult sex ratio manipulated over time to become 1: 1, producing benefits for estates focused on stag stalking. In tandem, the same local reductions of hinds will benefit those estates focused on nature conservation including grouse production, both on their land and on their marches, because overall deer densities will decline and local densities decline markedly.

The amended culls will only remain in place for a period of a few years, beyond which, at present, it is anticipated that a new 'maintenance cull' would be taken

[68] Pitmain has been asked where feasible to help GB achieve its cull because of the interconnected nature of the deer population on their marches.
[69] Knockie and Dell have only a very small area of the winter range for hinds & followers hence cannot be expected to help significantly with any proposed increase in the hind cull. Killin sits entirely within the Garrogie Estate and is small in land area.
[70] SCL has not spoken to Corriegarth because it is still discussing matters with Garrogie-Stronelairg.

because at this point the population in the Eastern Monadhliath will have reduced in size and changed composition so markedly.

To help illustrate to the estates the likely outcome of all the proposed changes to stag and hind culls, a new population model was built for the Eastern Monadhliath. It shows the combined effect of (i) a 'business as usual' cull being taken on most estates in line with the cull taken in 2013-14 and (ii) the proposed temporary changes in cull level layered on top. It also calculates the approximate size of the maintenance cull required after the reductions in hinds have been achieved.

The model outputs are shown in the pages overleaf. The model assumes that the starting population was as per the winter count of 2013 and the reported cull in 2013-14 is accurate. It also assumes that average recruitment rates rise from 37% to 40% over the 10 year period, and the proportion of male calves born rises from 50% to 55% over 10 years. A background level of 'other mortality' is also assumed to arise from road traffic collisions, illegal taking, natural mortality and unrecorded culls by estates and other minor landowners and tenants, albeit that natural mortality in male deer is expected to decline somewhat. The outputs confirm the following:

- The overall cull of hinds will rise from 996 (2013-14 levels) to 1,411[71] for a period of 4 years (it might require a 5th year but the final version of the Eastern Monadhliath model run in late September 2014 suggests this might not be needed[72]).

- The cull of stags will go down from 829 to 702 as a result of Coignafearn's swap of stags for hinds. It is anticipated that this cull will be able to go down again to c. 650 from 2018-19 (or before) as a result of (i) additional changes in stag culls on other estates (e.g. on Kinveachy and Corriegarth) and (ii) changes in local hind density reducing the inflow of young stags into Kinveachy, Coignafearn, Corriegarth etc. The 'ideal' number of sporting stags needed by the estates in the Eastern Monadhliath is 591.

- The overall density of deer in the Eastern Monadhliath will decline from c. 14 per km^2 in June 2013 to c. 9 per km^2 in 2024 (by the end of the planning period), albeit most of this reduction will take place in the next 4-5 years.

- The population of hinds will decline from a peak of 6,400 in June 2013 to c. 3,400 in June 2023. The overall density of hinds will decline to c. 3.5 – 4.0 per km^2, but with very large changes in density occurring locally (and relatively little change in other places).

- The population of stags will be fairly similar in June 2023 (c. 3,500) to June 2013 (c. 4,100) because of the changes in the size and composition of the stag cull proposed plus the predicted changes that will occur in population dynamics (proportionately more stag calves born, higher stag birth weights, reduced stag mortality and reduced stag emigration to heavy culling areas).

[71] This will decline from 1,411 to 1,356 after 3 years because extra culls at Dalmigavie and Glenmazeran will be complete by then.

[72] The final model includes all proposed changes in cull (including Dalmigavie and Glenmazeran), and final cull figures for 2013-14. The exact outcome depends partly on the timing of culls taken and also on the outcome of negotiations with Kinveachy and with Garrogie/Corriegarth. The results from this model suggest that the elevated levels of hind culling might only be needed for a total of 4 years to effect the size of change required to bring the hind and stag populations back into balance. However, this also depends on how accurate the winter 2013 count was – new research is proposed to establish the level of bias likely to arise by deer being concealed in woodland during helicopter counts in snowy weather.

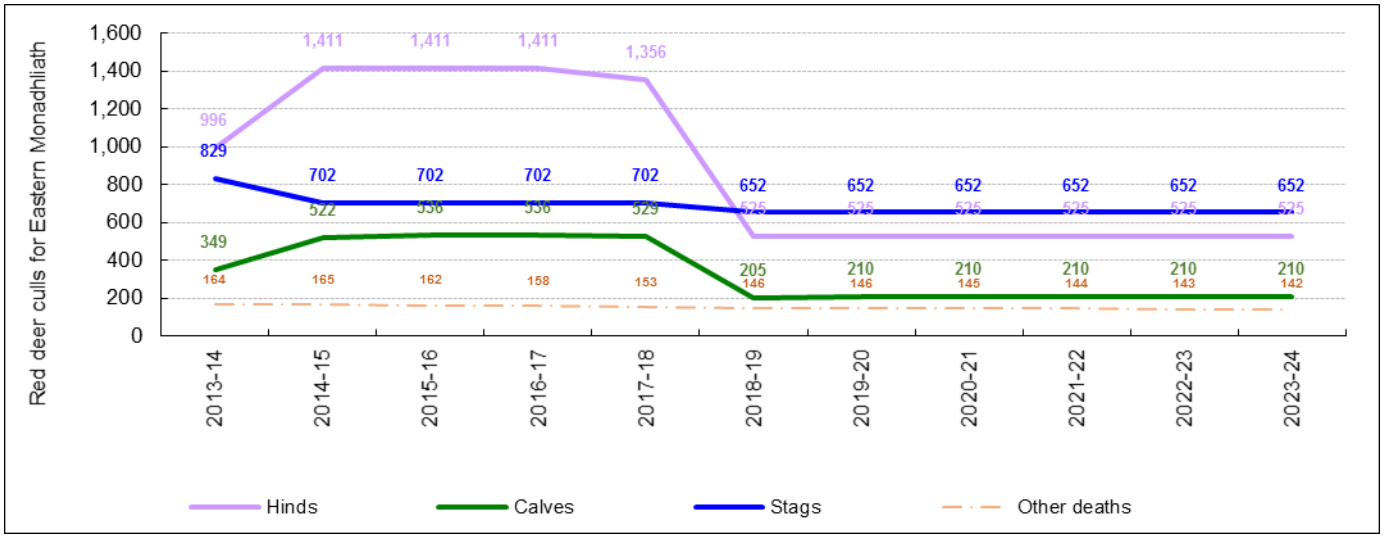
- A maintenance cull of approx. 1,390 would be required each year from 2018-19 onwards (c. 650 stags, 525 hinds and 210 calves) assuming that an additional c. 140-150 deer continue to die each year from 'other causes' as described earlier (the ongoing reductions in hind cull size would arise mainly in Area 6/7 and in Coignafearn as local densities will have declined).

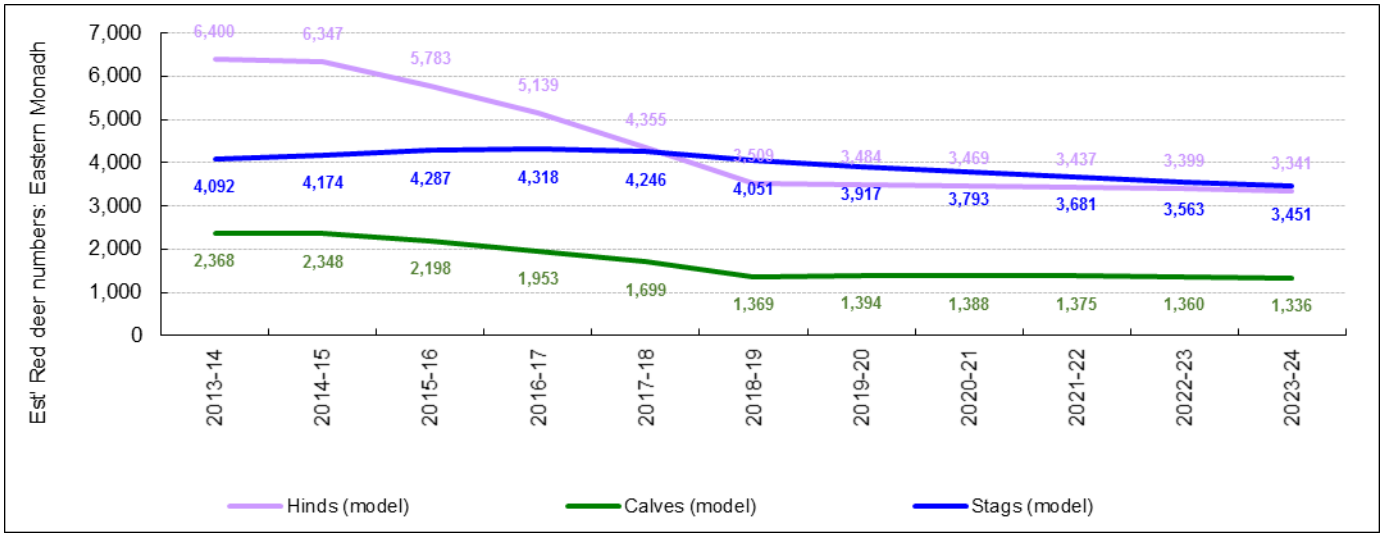
OUTPUTS FROM EASTERN MONADHLIATH POPULATION MODEL: 2013-2024

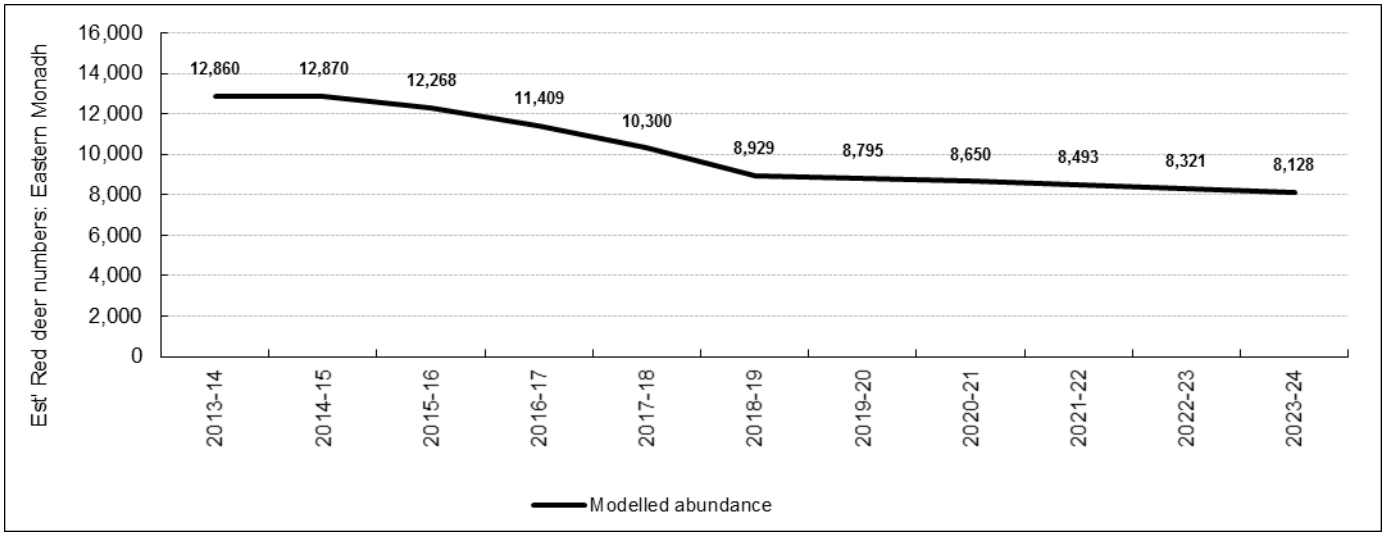
There are 5 charts presented in this section of the appendix.

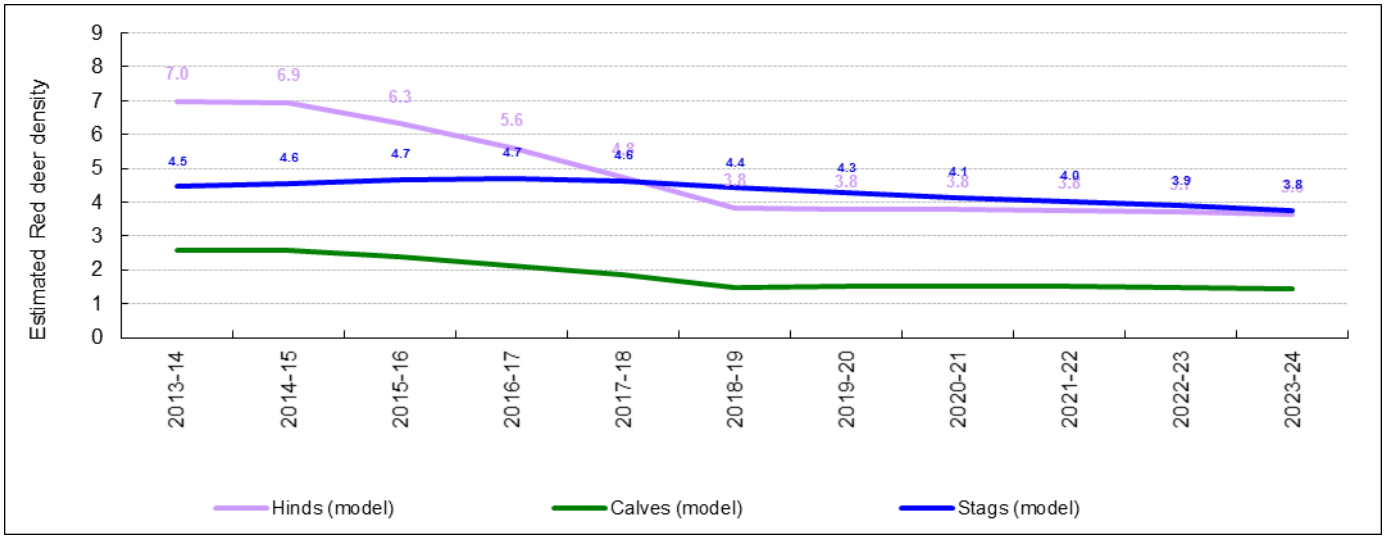
- In the 1st chart, the size of culls to be taken in the 'reduction phase' and the 'maintenance phase' is shown.
- The 2nd and 3rd charts (overleaf) illustrate the predicted changes in deer abundance for (i) stags, hinds & calves and (ii) overall. The primary strategic aim is to produce an adult sex ratio of 1:1 overall, whilst maintaining an appropriate number of stags for sport.
- The 4th and 5th charts (overleaf again) show the predicted changes in deer density for (i) stags, hinds & calves and (ii) overall.

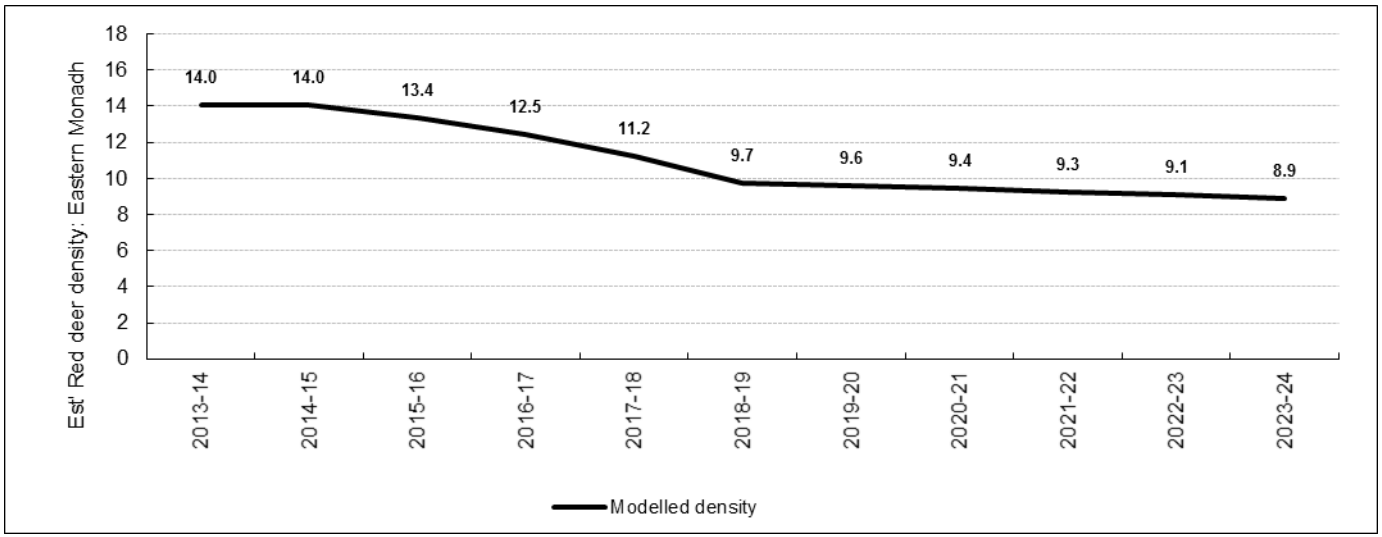
The trend lines all have their data values shown, so that readers can clearly see and examine the exact numbers produced by the models. The figures shown in the abundance/density charts include recruitment each year (i.e. show the maximum population present at the outset of each cull season).




Est' Red deer numbers: Eastern Monadh
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
6,400
6,347
5,783
5,139
4,355
3,509
3,484
3,469
3,437
3,399
3,341
4,092
4,174
4,287
4,318
4,246
4,051
3,917
3,793
3,681
3,563
3,451
2,368
2,348
2,198
1,953
1,699
1,369
1,394
1,388
1,375
1,360
1,336
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
Hinds (model)
Calves (model)
Stags (model)


Est' Red deer numbers: Eastern Monadh
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
12,860
12,870
12,268
11,409
10,300
8,929
8,795
8,650
8,493
8,321
8,128
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
Modelled abundance


Estimated Red deer density
9
8
7
6
5
4
3
2
1
0
7.0
6.9
6.3
5.6
4.8
4.6
3.8
3.8
3.8
3.8
3.7
4.5
4.6
4.7
4.7
4.6
4.4
4.3
4.1
4.0
3.9
3.8
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
Hinds (model)
Calves (model)
Stags (model)


Est' Red deer density: Eastern Monadh
18
16
14
12
10
8
6
4
2
0
14.0
14.0
13.4
12.5
11.2
9.7
9.6
9.4
9.3
9.1
8.9
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
Modelled density

APPENDIX 6: CHANGES TO CULLS - WESTERN MONADHLIATH

This Appendix confirms the proposed future size of culls in the Western Monadhliath over a 10-year period to 2024 and confirms the likely impact of taking these future culls. Only a small number of estates at the time of writing are planning to reduce hind numbers from the level counted in winter 2013. These are as follows:

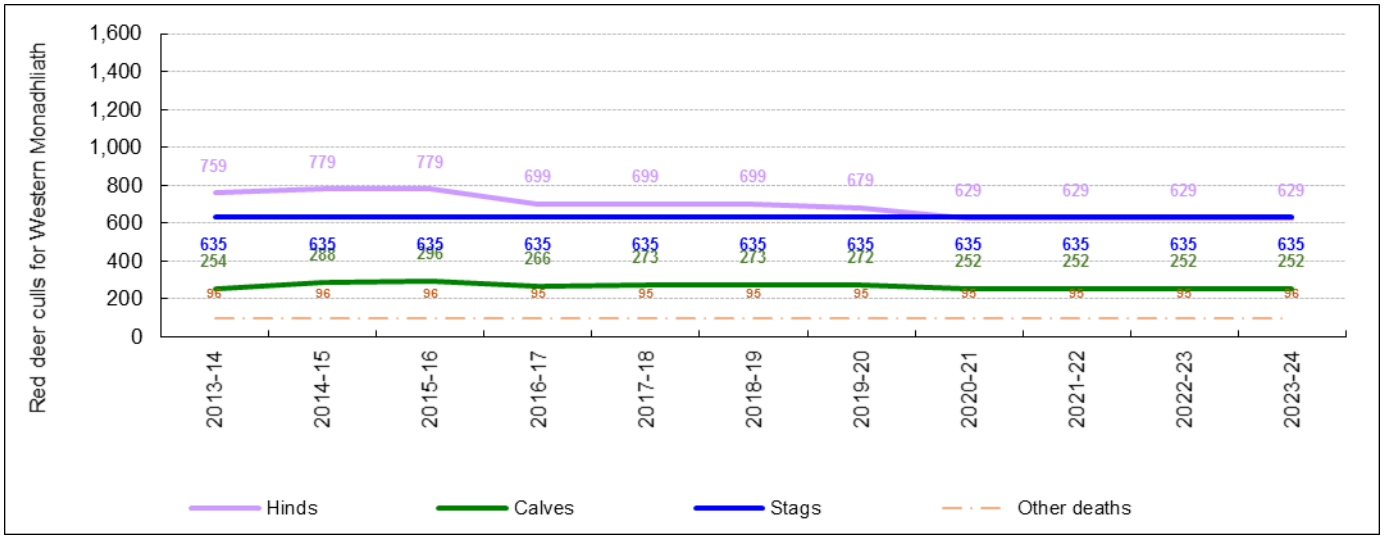
- Braeroy: plan to cull 50 extra hinds per annum, from 2013-14, until such times as the overall density on the estate reaches 10 per km^2 (winter count in 2013 was 14 per km^2). This equates roughly with a reduction in hind numbers of 280 compared to the 2013 count (if taking into account the associated reduction in calves at foot this change would result in).
- Culachy: plan to cull approx. 160 hinds per annum for 3 years (2013-14, 2014-15 and 2015-16) then change back to standard cull of 80.
- Glenshero: plan to reduce their winter 2013 hind count by a further 100 hinds maximum.

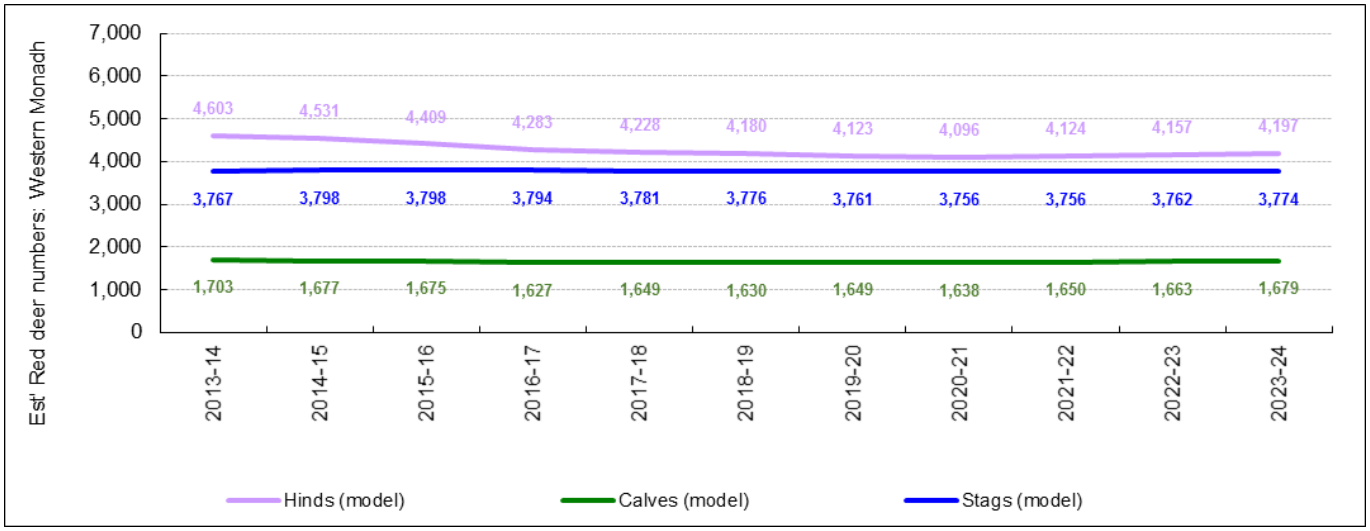
There are 5 charts presented overleaf, which provide an overview of the deer population and its likely composition over the next 10 years:

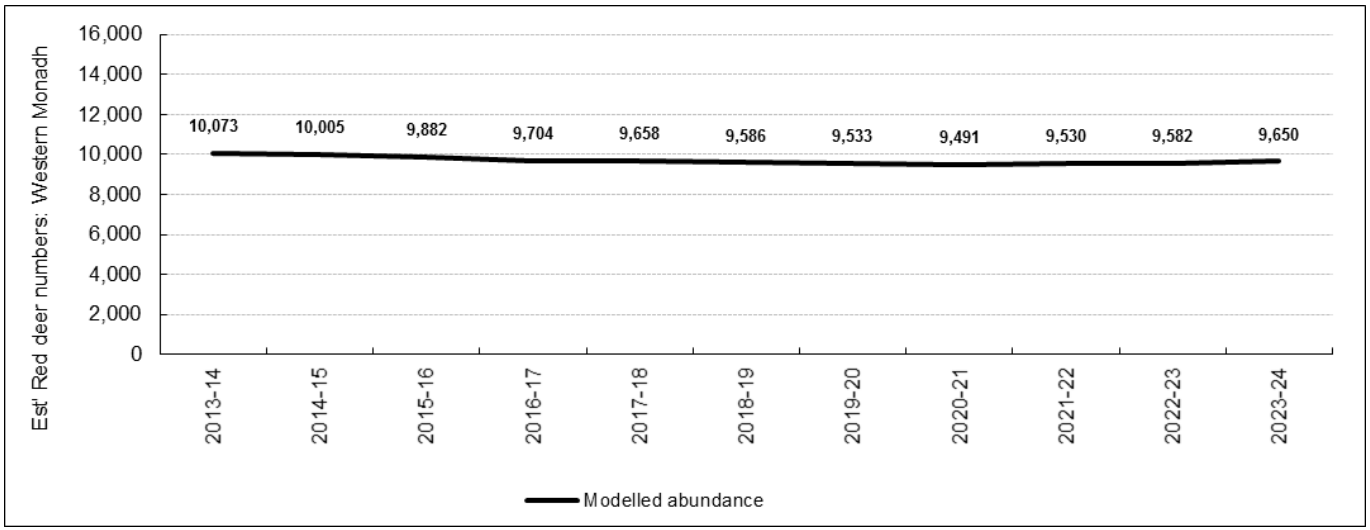
- Chart 1: the size of culls to be taken in the 'reduction phase' and the 'maintenance phase' is shown. We assume the Braeroy cull will remain elevated for 6 years (including 2013-14), the Culachy cull will be elevated for 3 years (including 2013-14) and the Glenshero cull will also be taken over 5 years (from 2013-14).
- Charts 2 & 3: illustrate the predicted changes in deer abundance for (i) stags, hinds & calves and (ii) overall. The primary strategic aim is to produce an adult sex ratio of 1:1 overall, whilst maintaining an appropriate number of stags for sport. The model assumptions are described in Appendix 5[73].
- Charts 4 & 5: show the predicted changes in deer density for (i) stags, hinds & calves and (ii) overall.

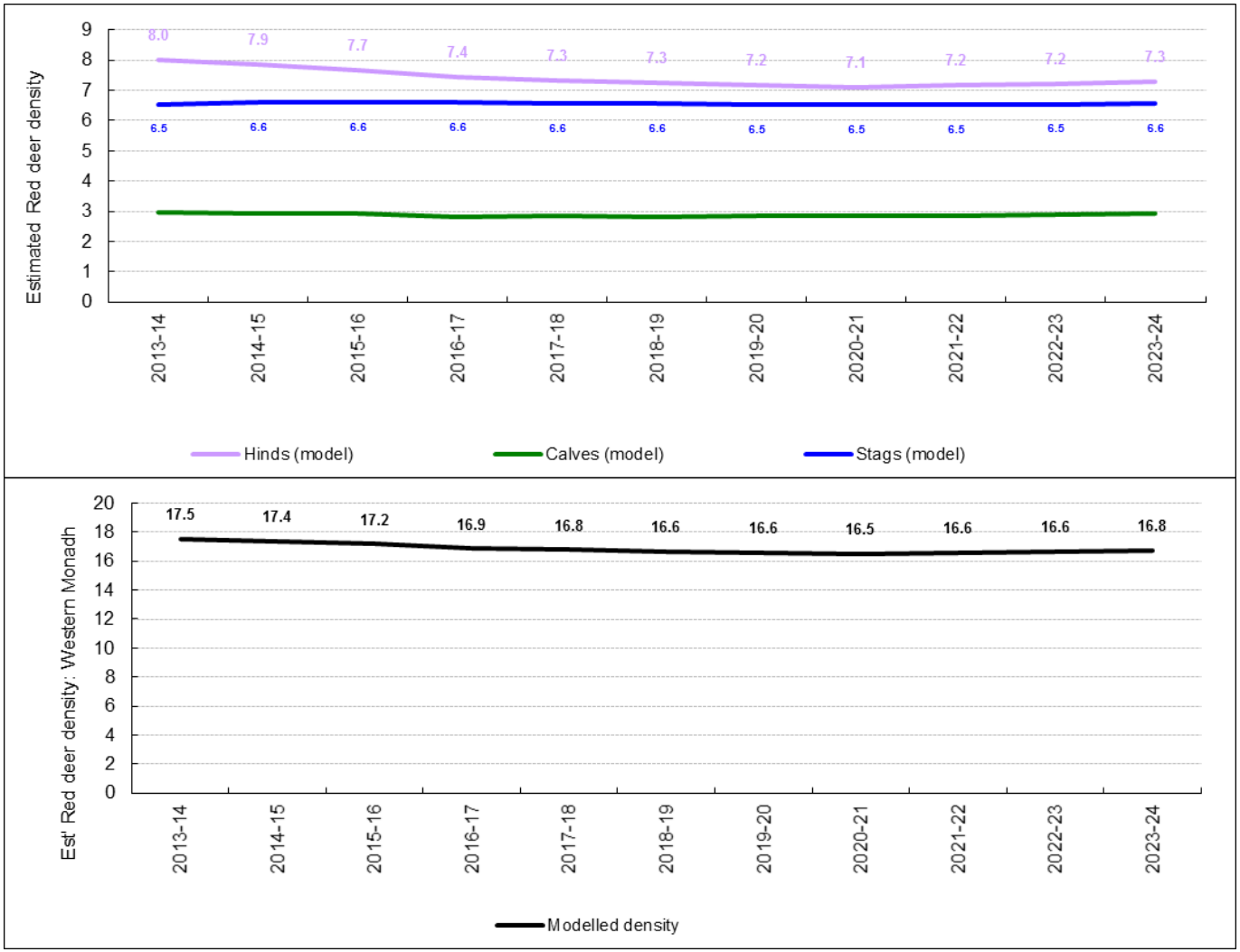
The trend lines all have their data values shown, so that readers can clearly see and examine the exact numbers produced by the models. The figures shown in the abundance/density charts include recruitment each year (i.e. show the maximum population present at the outset of each cull season).

[73] The only difference between the models is that we assume sex ratios of calves at birth will be steady at 1: 1. In the Eastern Monadhliath model we assume they will shift from 1:1, slightly in favour of male calves, because of the marked density reductions planned and the fact that the density of deer present is already lower at the outset of the model compared to the Western Monadhliath.


Red deer culls for Western Monadhliath
1,600
1,400
1,200
1,000
800
600
400
200
0
759
779
779
699
699
699
679
629
629
629
629
635
635
635
635
635
635
635
635
635
635
635
254
268
266
273
273
272
252
252
252
252
96
96
96
95
95
95
95
95
95
95
95
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
Hinds
Calves
Stags
Other deaths


Est Red deer numbers: Western Monadh
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
4,603 4,531 4,409 4,283 4,228 4,180 4,123 4,096 4,124 4,157 4,197
3,767 3,798 3,798 3,794 3,781 3,776 3,761 3,756 3,756 3,762 3,774
1,703 1,677 1,675 1,627 1,649 1,630 1,649 1,638 1,650 1,663 1,679
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
Hinds (model)
Calves (model)
Stags (model)


Est Red deer numbers: Western Monadh
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
10,073 10,005 9,882 9,704 9,658 9,586 9,533 9,491 9,530 9,582 9,650
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
Modelled abundance


Estimated Red deer density
9
8
7
6
5
4
3
2
1
0
8.0
7.9
7.7
7.4
7.3
7.3
7.2
7.1
7.2
7.2
7.3
6.5
6.6
6.6
6.6
6.6
6.6
6.5
6.5
6.5
6.5
6.6
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
Hinds (model)
Calves (model)
Stags (model)
Est' Red deer density: Western Monadh
20
18
16
14
12
10
8
6
4
2
0
17.5
17.4
17.2
16.9
16.8
16.6
16.6
16.5
16.6
16.6
16.8
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
Modelled density

APPENDIX 7: CHANGES TO CULLS – ENTIRE RDMA

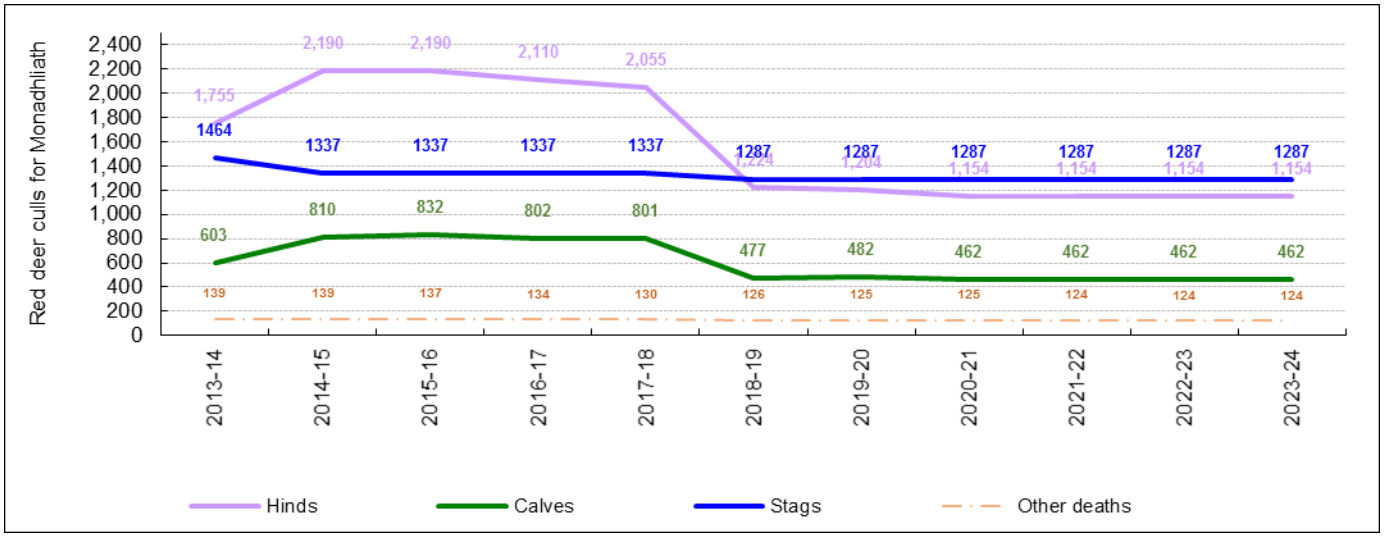
This Appendix confirms the proposed future size of culls in the Monadhliath RDMA over a 10-year period to 2024 and confirms the likely impact of taking these future culls.

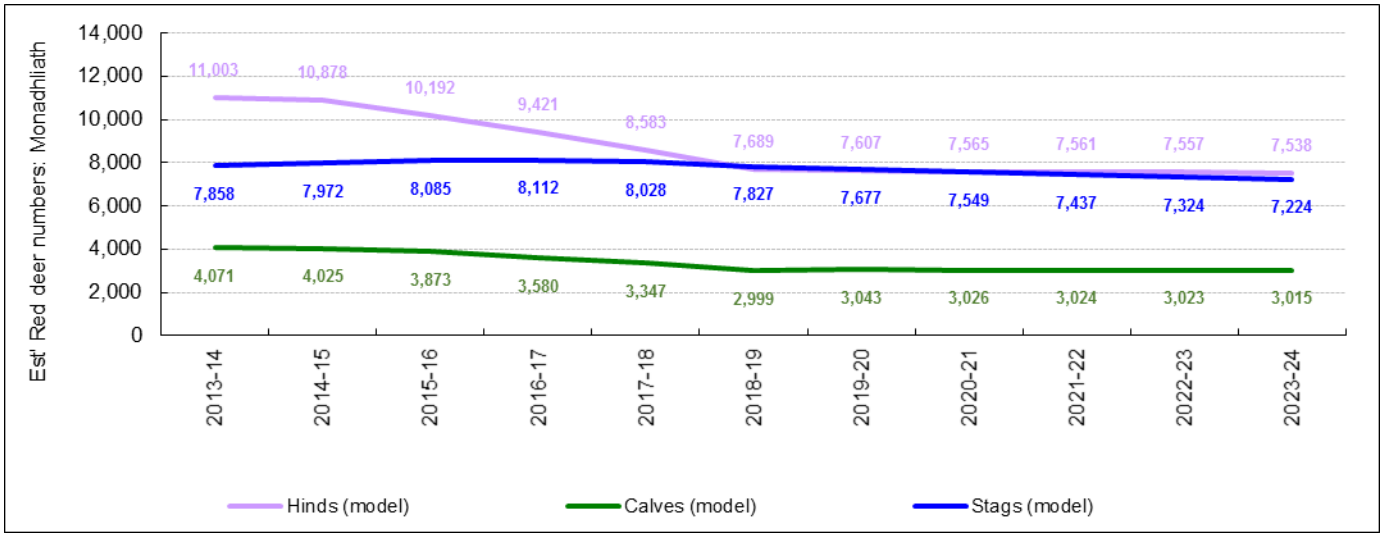
The changes in cull proposed over the plan period are described in Appendix 5 & 6.

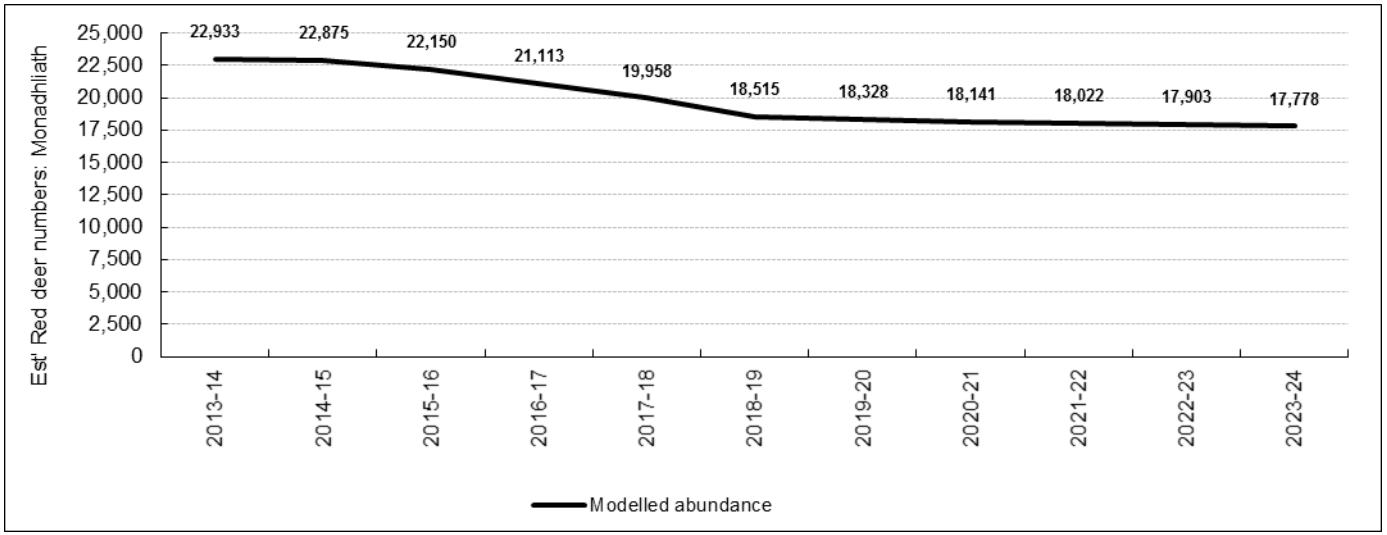
There are 5 charts presented overleaf, which provide an overview of the deer population and its likely composition over the next 10 years:

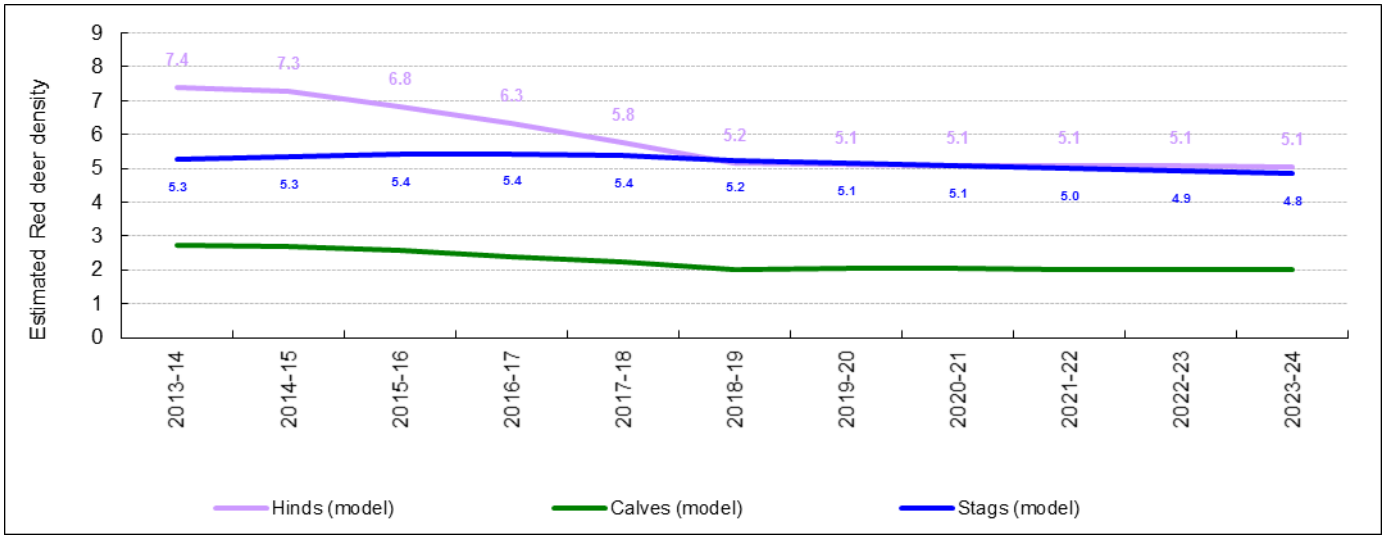
- Chart 1: the size of culls to be taken in the 'reduction phase' and the 'maintenance phase' is shown.
- Charts 2 & 3: illustrate the predicted changes in deer abundance for (i) stags, hinds & calves and (ii) overall. The primary strategic aim is to produce an adult sex ratio of 1:1 overall, whilst maintaining an appropriate number of stags for sport. The model assumptions are described in Appendix 5 and 6.
- Charts 4 & 5: show the predicted changes in deer density for (i) stags, hinds & calves and (ii) overall.

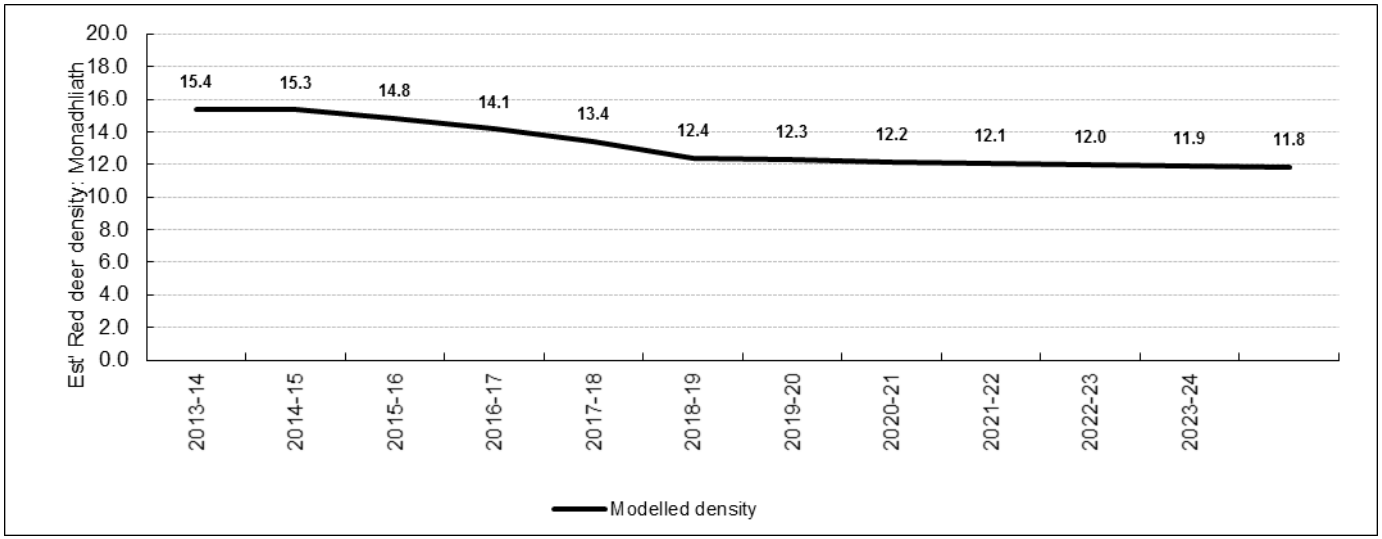
The trend lines all have their data values shown, so that readers can clearly see and examine the exact numbers produced by the models. The figures shown in the abundance/density charts include recruitment each year (i.e. show the maximum population present at the outset of each cull season).


Red deer culls for Monadhliath
2,400
2,200
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
1,755
2,190
2,190
2,110
2,055
1,229
1,204
1,154
1,154
1,154
1,154
1464
1337
1337
1337
1337
1287
1287
1287
1287
1287
1287
603
810
832
802
801
477
482
462
462
462
462
139
139
137
134
130
126
125
125
124
124
124
Hinds
Calves
Stags
Other deaths


Est' Red deer numbers: Monadhliath
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
11,003
10,878
10,192
9,421
8,583
7,689
7,607
7,565
7,561
7,557
7,538
7,858
7,972
8,085
8,112
8,028
7,827
7,677
7,549
7,437
7,324
7,224
4,071
4,025
3,873
3,580
3,347
2,999
3,043
3,026
3,024
3,023
3,015
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
Hinds (model)
Calves (model)
Stags (model)


Est' Red deer numbers: Monadhliath
25,000
22,500
20,000
17,500
15,000
12,500
10,000
7,500
5,000
2,500
0
22,933
22,875
22,150
21,113
19,958
18,515
18,328
18,141
18,022
17,903
17,778
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
Modelled abundance


Estimated Red deer density
9
8
7
6
5
4
3
2
1
0
7.4
7.3
6.8
6.3
5.8
5.2
5.1
5.1
5.1
5.1
5.1
5.3
5.3
5.4
5.4
5.4
5.2
5.1
5.1
5.0
4.9
4.8
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
Hinds (model)
Calves (model)
Stags (model)


Est' Red deer density: Monadhliath
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
15.4
15.3
14.8
14.1
13.4
12.4
12.3
12.2
12.1
12.0
11.9
11.8
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
2020-21
2021-22
2022-23
2023-24
Modelled density

APPENDIX 8: ADMG BENCHMARK ASSESSMENT

This appendix contains the 'script' of the ADMG's Benchmark Assessment for DMG's in Scotland. It is included for interested readers,

ADMG Benchmark Assessment - Monadhliath Deer Management Group
Operation of Group
Area and boundaries
Identify the appropriate boundaries for the group to operate in.
Define appropriate sub populations where applicable
Membership
All property owners within a deer range should be members of a DMG, including private and public land owners; also, where possible, agricultural occupiers, foresters, crofters and others on adjoining land where deer may be present. In some cases this may extend to householders with private gardens.
Meetings
DMGs should meet regularly. Two formal meetings per year is the norm but more frequent interaction between members, between meetings, should be encouraged.
For effective collaborative management to take place it is important that all DMG Members should attend every meeting or be represented by someone authorised to make appropriate decisions on their behalf.
In addition to landholding Members, including public sector owners, public agencies such as SNH and Forestry Commission Scotland should be in attendance and other relevant authorities such as Police Scotland may be invited to attend DMG meetings.
Meetings should operate to an agenda and be accurately minuted. Attendees should be encouraged to participate and agreed actions and decisions should be recorded.
Group can demonstrate a capacity to deal with issues between meetings as they arise, and to provide an ongoing source of communication and advice as required.
Constitution & Finances
All DMGs should have a Constitution which defines the area of the Group, sets out its purpose, its operating principles, membership and procedures, in addition to providing for appointing office bearers, voting, raising subscriptions and maintaining financial records

Good management and budgeting of finances
Deer Management Plans
All DMGs should have an up to date, effective and forward looking Deer Management Plan (DMP).
The DMP should record all the land management objectives within the DMG area.
Where applicable, the plan should include a rolling 5 year population model
Appropriate use of maps to illustrate relevant detail.
The DMP should identify the public interest aspects of deer management
DMP should make appropriate reference to other species of deer within the DMG area, and provide a level of detail proportionate to this interest.
It should include a list of actions that deliver the collective objectives of DMG Members as well as public interest objectives. These actions should be updated annually
It is important that all DMG Members should play a full part in the planning process and in the implementation of agreed actions
The DMP may identify potential conflicts and how they can be prevented or addressed to ensure an equitable approach to the shared deer population.
Relevant local interests should be consulted on new DMPs and advised of any changes as they come forward.
Code of Practice on Deer Management
The Code should be endorsed by all DMGs and referenced in both the Constitution and Deer Management Plan of every Group. The terms of the Code should be delivered through the Group Deer Management Plan.
ADMG Principles of Collaboration
The Principles of Collaboration should be incorporated into all DMG Constitutions and Deer Management Plans.
Best Practice
All deer management should be carried out in accordance with Best Practice.
All Deer Management Plans should reference and follow WDBP which will continue to evolve.
Data and Evidence gathering- Deer counts
Accurate deer counting forms the basis of population modelling. An ethos that reflects this should be in evidence

As publicly funded aerial counts are now exceptional, DMGs should aim to carry out a regular well planned coordinated foot count of the whole open range deer population. The norm is to count annually.
Recruitment and mortality counts are also essential for population modelling.
Other census methods may be required in some circumstances, eg dung counting in woodland or other concealing habitats or on adjoining open ground.
Data and evidence gathering- Culls
All DMGs should agree a target deer population or density which meets the collective requirements of Members without detriment to the public interest.
The cull should be apportioned among Members to deliver the objectives of the DMP and individual management objectives while maintaining the agreed target population and favourable environmental condition.
The Group cull target should be reviewed and, if necessary, adjusted annually.
Data and evidence gathering- Habitat Monitoring
DMGs should carry out habitat monitoring. Habitat Impact Assessments (HIA) measure progress towards agreed habitat condition targets on both designated sites and the wider deer range.
HIAs should be carried out on a systematic and regular basis. A three year cycle is the norm but many find annual monitoring useful.
Data is required on other herbivores present and their impact on the habitat.
DMPs should include a section on habitat monitoring methods and procedures and record annual results so as to measure change and record trends.
Competence
It is recommended that in addition to DSC 1 deer managers should also attain DSC 2 or equivalent.
Deer managers supplying venison for public consumption are required to certify carcasses as fit for human consumption to demonstrate due diligence. "Trained Hunter" status is required for carcass certification.
Training
All DMGs should have a training policy and incorporate it in the DMP
All DMG Members or those acting on their behalf should undergo the necessary training to demonstrate Competence.
The training policy should promote and record continuing professional development through Best Practice Guidance.
Venison Marketing

Membership of the Scottish Quality Wild Venison scheme is recommended by ADMG.
There is evidence of collaborative vension production within the Group
Communications
DMGs should include a Communications Policy in their DMP. External communication should be directed at parties not directly involved but with an interest in deer management including individuals, local bodies such as community councils, local authorities, local media and other specialist interests.
An annual communication programme suitable to local circumstances is advised. This might include a DMG website or a page on www.deer-management.co.uk, an annual Newsletter, annual open meeting, or attending local meetings by invitation.
A Deer Management Plan should be accessible and publicly available, and local consultation during its development is advised.

Delivery of objective is good, in line with benchmark
Delivery of objective is only partial/ variable in quality
Group is not delivering this element

APPENDIX 9: SNH PUBLIC INTEREST ASSESSMENT

This appendix contains the 'script' of the SNH's Public Interest assessment for DMG's in Scotland. It is included for interested readers, and supports the observations made in Chapter 19 in relation to the likely outcome of a formal assessment.

Actions 1 to 14	
1. ACTIONS to develop mechanisms to manage deer	
	Carry out an assessment of effectiveness against the Benchmark
	Develop a series of actions to be implemented and assign roles
	Produce and publish a forward-looking, effective deer management plan which includes public interest elements relevant to local circumstances. Plan should include an agreed action-plan to clarify roles and monitor progress against objectives. Minutes of DMG meetings should be publicly available.
	Summary : Agree a colour for current delivery of the Action (red, amber, green) and detail what is going to happen to deliver future actions
2. ACTIONS for the delivery of designated features into Favourable Condition.	Identify designated features, the reported condition and herbivore pressures affecting designated sites in the DMG area.
	Identify and agree actions to manage herbivore impacts affecting the favourable condition of designated features.
	Monitor progress and review actions to manage herbivore impacts affecting favourable condition.
	Summary : Agree a colour for current delivery of the Action (red, amber, green) and detail what is going to happen to deliver future actions

3. ACTIONS to manage deer to	Establish overall extent of woodland and determine what proportion is existing native woodland.
	Determine current condition of native woodland.

retain existing native woodland cover and improve woodland condition in the medium to long term.	Identify actions to retain and improve native woodland condition and deliver DMG woodland management objectives.
	Monitor progress and review actions to manage herbivore impacts.
	Summary : Agree a colour for current delivery of the Action (red, amber, green) and detail what is going to happen to deliver future actions

4. ACTIONS to demonstrate DMG contribution to the Scottish Government woodland expansion target of 25% woodland cover.	Identify and quantify extent of recent woodland establishment (through SRDP (last 20 years) and through other schemes).
	Identify and quantify opportunities and priorities for woodland expansion over the next 5-10 years.
	Consider at a population level the implication of increased woodland on deer densities and distribution across the DMG.
	Implement actions to deliver the DMG woodland expansion proposals and review progress.
	Summary : Agree a colour for current delivery of the Action (red, amber, green) and detail what is going to happen to deliver future actions

5. ACTIONS to monitor and manage deer impacts in the wider countryside.	Identify habitat resource by broad type.
	Identify required impact targets for habitat types.
	identify a sustainable level of grazing and trampling for each of these habitat types.
	Identify where different levels of grazing may be required and prioritise accordingly.
	Conduct herbivore impact assessments , and assess these against acceptable impact ranges. Identify and implement actions to attain impacts within the range.
	Regularly review information to measure progress and adapt management when necessary.
	Summary : Agree a colour for current delivery of the Action (red, amber, green) and detail what is going to happen to deliver future actions

6. ACTIONS to improve Scotland's ability to store carbon by maintaining or improving ecosystem health.	Quantify the extent of the carbon-sensitive habitats within the DMG range.
	Conduct herbivore impact assessments , and assess these against acceptable impact ranges for these sensitive habitats. Identify and implement actions to attain impacts within the range.
	Identify opportunities for the creation/restoration of peatlands
	Contribute as appropriate to River Basin Management Planning
	Summary : Agree a colour for current delivery of the Action (red, amber, green) and detail what is going to happen to deliver future actions

7. ACTIONS to reduce or mitigate the risk of establishment of invasive non-native species	Manage invasive non-native species (e.g. muntjac) to prevent their establishment and spread e.g. report sightings of muntjac to SNH
	Agree on local management of other non-natives which may be utilised as a resource e.g sika, fallow, goats, to reduce their spread and negative impacts.
	Summary : Agree a colour for current delivery of the Action (red, amber, green) and detail what is going to happen to deliver future actions

8. ACTIONS to protect designated historic and cultural features from being damaged by deer e.g. by trampling.	Identify any historic or cultural features that may be impacted by deer and undertake deer management to retain these features
	Consider the implications of fencing on the landscape with due regard to the Joint Agency Guidance on Fencing.
	Summary : Agree a colour for current delivery of the Action (red, amber, green) and detail what is going to happen to deliver future actions

9. ACTIONS to contribute to	Undertake a skills and training assessment to establish current skill levels applicable to deer management within the DMG

delivering higher standards of competence in deer management.	Identify training and development needs / requirements of DMG members including opportunities for Continuous Professional Development (i.e. in relation to Best Practice)
	Ensure all those who actively manage deer are "competent" according to current standard
	Promote and facilitate the uptake of formal and CPD training opportunities for those participating in deer management.
	Summary : Agree a colour for current delivery of the Action (red, amber, green) and detail what is going to happen to deliver future actions

10. ACTIONS to Identify and promote opportunities contributing to public health and wellbeing.	Identify and quantify public safety issues associated with deer within the DMG area. e.g. DVCs, airports etc
	Identify actions with landowners, Local Authority, DMG to reduce or mitigate public safety risk and monitor effectiveness of actions.
	Identify means of ensuring food safety is maintained in carcass handling and venison processing and compliance with BPG in relation to meat hygiene
	Ensure deer managers are familiar with notifiable diseases, that a system for recording is in place and all deer managers are familiar with course of action to take.
	Ensure that appropriate bio security measures are enacted when visitors from areas where CWD is present are involved with deer management activities
	Identify opportunites to raise awareness of the risks associated with Lyme's Disease.
	Identify main access and recreational activity within the DMG area and assess how this fits with deer management activity.
	Identify actions to mitigate any effects of public access and recreation activities during peak periods of deer culling e.g. use of Hill phones and web sites
	Facilitate public access and promote positive communication between visiting public and wildlife managers.

	Summary : Agree a colour for current delivery of the Action (red, amber, green) and detail what is going to happen to deliver future actions

11. ACTIONS to maximise economic benefits associated with deer	Identify and quantify the main sources of revenue related to deer (sport, tourism etc).
	Identify and quanify deer related employment. Identify opportunities to increase and improve prospects throughout the DMG;
	Identify opportunities to add value to products from deer management (SQWV, venison branding)
	Explore options for larder sharing, infrastructure improvement and carcass collection to ensure maximum benefit from venison production whilst reducing carbon costs.
	Summary : Agree a colour for current delivery of the Action (red, amber, green) and detail what is going to happen to deliver future actions

12. ACTIONS to minimise the economic costs of deer, and ensure deer management is cost-effective	Identify and quantify capital investment in deer management related infrastructure.
	Identify where deer are impacting on other land uses and include all relevant stakeholders to assist the group in understanding costs of deer within the DMG (e.g. woodland, agriculture, DVCs)
	Where there are management changes, assess the likely economic impacts across the DMG
	Formulate a strategy to minimise the negative economic impacts in an equitable way.
	Summary : Agree a colour for current delivery of the Action (red, amber, green) and detail what is going to happen to deliver future actions

13. ACTIONS to ensure effective communication on deer management	Provide regular opportunity for wider community and public agency engagement in planning and communications.
	Identify and implement actions to address community issues on deer or deer management activity.
	Support and promote wider opportunities for further education on deer.

issues.	**Summary : Agree a colour for current delivery of the Action (red, amber, green) and detail what is going to happen to deliver future actions**

14. ACTIONS to ensure deer welfare is taken fully into account at individual animal and population level.	Agree, collate and review data available within the DMG which might be used as a proxy for deer health/welfare i.e recruitment, winter mortality, larder weights etc
	Take reasonable actions to ensure that deer culling operations safeguard welfare; for culled and surviving animals (e.g. for example by following BPG)
	Take reasonable actions to ensure that the welfare of surviving populations is safeguarded (e.g. provision and access to food and shelter)
	Periodically review information on actions to safeguard welfare, identify and implement changes as required.
	Summary : Agree a colour for current delivery of the Action (red, amber, green) and detail what is going to happen to deliver future actions

Delivery of objective is good, in line with actions

Delivery of objective is only partial/ variable in quality

Group is not delivering this element