



## Appendix V

# Deer Management Plan (DMP) – Clunes & Loch Arkaig LMP

## Background

This deer management plan identifies the deer management issues and priorities for Scotland's National Forest Estate in Clunes and Loch Arkaig which is managed by Forestry and Land Scotland (FLS). The DMP is used to support the Land Management Plan (LMP) and is based on the best available information for this area. Wider issues for deer management across the West Region remain to be addressed. The DMP relates to, and should be used in conjunction with FLS Deer Management Strategy.

In line with the Scottish Government's consultation on Scotland's Strategic Framework for Biodiversity "Tackling the Nature Emergency" we recognise that reducing herbivore impacts is one of the most effective ways to reduce biodiversity loss and enable regeneration at scale. This is particularly relevant to this LMP area where pinewood and native broadleaf restoration is being carried out at a landscape scale in collaboration between FLS and neighbouring landowners.

## National & Local objectives

National strategies and objectives:

Contributing to [Scottish Forestry - Forestry Strategy](#) (also includes Climate Change)

One of the strategic drivers to deliver the objectives of "Scotland's Forestry Strategy 2019 – 2029" is adaptation and resilience. Deer and other herbivores have been identified as a threat to woodland establishment and management and as such, identifies in the priorities for action the need to improve the mitigation of the risks posed by deer and other herbivores.

Deer Management Strategy [Deer management strategy - Forestry and Land Scotland](#)

Deer management policy aims to: "manage deer density safely, cost-effectively and humanely at a level which is consistent with acceptable impacts on forests, other habitats and land uses". This includes some of the following best practice:

- Carry out deer culling in a safe, exemplary and humane way.
- Work with relevant organisations, Naturescot and neighbours to recognise objectives for all parties.
- Optimise income from venison sales.
- Preventative management regarding the spread of non-native deer into new areas.
- Compliance with legislation, certification and quality assurance schemes to add value to both the forest estate and venison products that come from it.

It is generally accepted that a sustainable population of deer in FLS managed land ranges between 2-7 deer/km<sup>2</sup>. In the case of this LMP, the lower range of this population density is appropriate for native woodland, montane scrub and peatland habitats.

Scottish Biodiversity Strategy [Biodiversity strategy: consultation - gov.scot \(www.gov.scot\)](https://www.gov.scot/biodiversity-strategy-consultation)

The proposed outcome for Scotland's Rural Environment – Farmland, Woodlands and Forestry, Soils and Uplands by 2045 is to have:

A range of nature recovery activity that enables: a sustainable natural regeneration of woodlands; greater diversity of woodland species and age structure, increased woodland cover and woodland connectivity; soils as a nature-based solution for issues contributing to restoration of degraded ecosystems; deer range management contribute to high standards of sustainable land use in upland areas that supports regenerating habitat and wildlife interests.

For this to be achieved, in relation to the Clunes & Loch Arkaig LMP area, it means that by 2030 we need to have native woodland cover and woodland ecosystem health sustaining rich biodiversity, large scale regeneration is steadily increasing mainly through reductions in deer browsing and grazing impacts, and removal of INNS.

FLS Corporate Plan 2022 – 2025: consultation [Forestry and Land Scotland draft corporate plan 2022 - 2025: consultation - gov.scot \(www.gov.scot\)](https://www.gov.scot/forestry-land-scotland-draft-corporate-plan-2022-2025-consultation)

Outcome 2 of the FLS Corporate Plan is most relevant to this Deer Management Plan and the Clunes and Loch Arkaig area. The following outlines the actions required to deliver this outcome with details that are relevant to this specific location:

- Tackling the twin crises of climate change and biodiversity loss.
  - Helping the Scottish Government to meet forest and woodland creation targets.
  - Increasing our contribution to the Peatland Action programme.
  - Managing the national forests and land to further the conservation and enhancement of biodiversity.
  - Working beyond designated sites at the landscape scale with partners where we can – for example in Scotland's rainforests.
  - Increasing ancient woodland restoration.
- Protecting our forests and land from other threats.

- Implementing a programme to improve the resilience of the national forests and land to the impacts of climate change and tree health threats.
- Continuing to implement the FLS Deer Management strategy while working in partnership with others to support the Scottish Government's response to the Independent Panel's recommendations on deer management in Scotland.
- Working at the landscape scale and in partnership, to make a bigger difference.
- Collaborating with partners on integrated landscape scale approaches to habitat management and restoration, using our capabilities to complement and support the work of others.

Local strategies and objectives:

At the local level the main objective of deer management is to manage deer populations at a level which secures environmental and other forest management objectives. This aims to:

- Establish commercial tree crops with minimal damage.
- Secure natural regeneration and planted native crops.
- Improve the condition of other habitats such as bog, tall herbs and montane scrub.
- Enable biodiversity connectivity.
- Soil health and soil stability.

## What are we going to protect?

- Woodland habitat throughout Clunes and Loch Arkaig Forests (1,184ha):
  - The ancient semi-natural woodland remnants, natural regeneration, woodland flora and the associated Scottish rainforest features.
  - The regenerating native trees in PAWS.
  - Riparian woodland – both existing and new areas which will be created in the restocking in the new LMP.
  - Montane scrub remnants.
  - New native woodland creation in Gleann Cia-Aig east.
  - Establishing non-native crops.
- Open priority habitat, notably Clunes hill ground (1,818ha):
  - Blanket bog areas, in particular those open hagged areas which will undergo peatland restoration.
  - Upland heathland, montane heath, upland flushes/fens, inland rock and scree, tall herbs

## Deer Species (and other herbivores/feral pigs)

The large herbivore population is dominated by a high population of red deer. Roe deer are the next most populous species followed by Sika. Feral pigs are also present, however, the population estimates are unknown. It should be noted that at this point in time, feral pigs have had a positive impact on native regeneration.

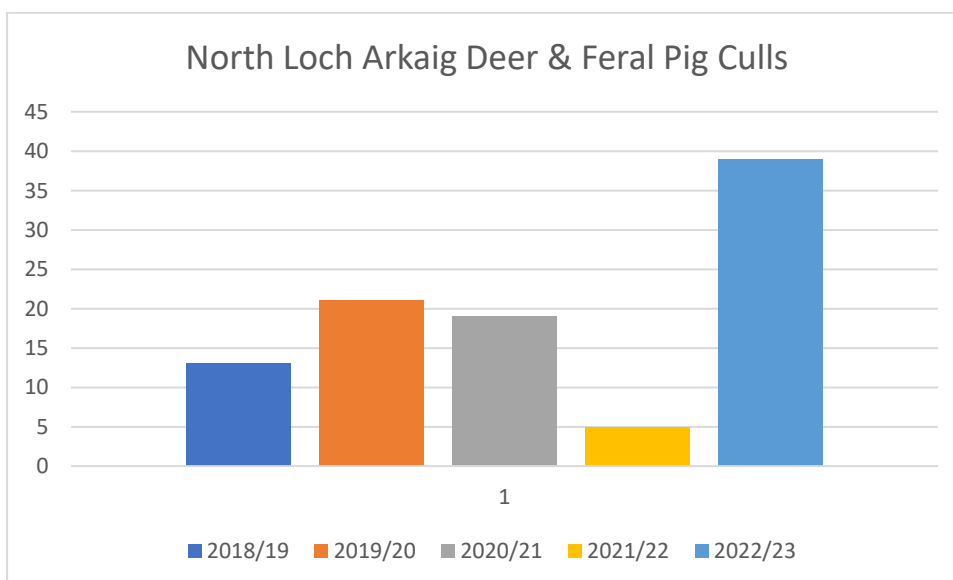
The neighbouring Achnacarry Estate is a sporting estate.

## What have we done to date?

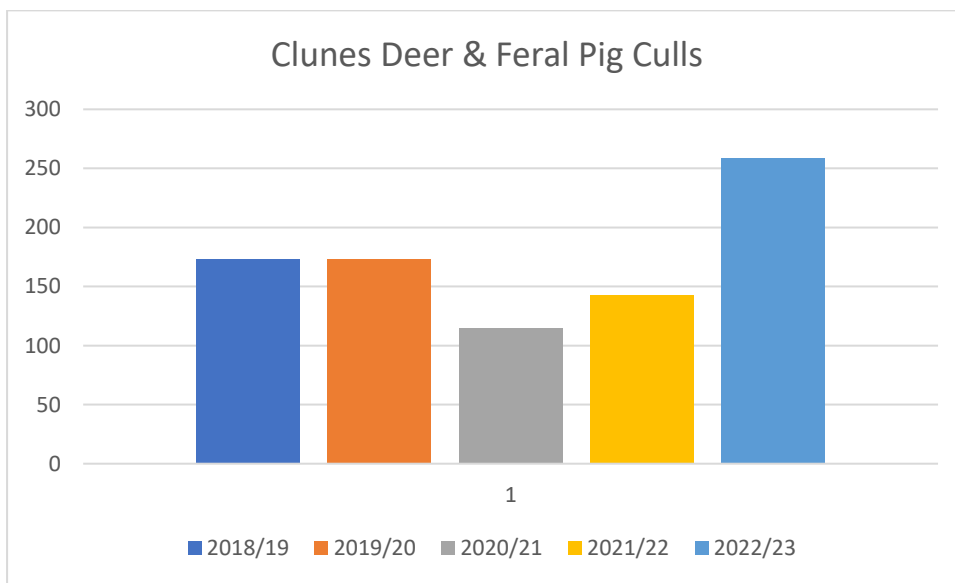
Deer management is an ongoing operation. This LMP area is covered by two wildlife management units (WMU): North Loch Arkaig (Culcharn and Allt Mhuic woods), and Clunes which covers the remainder of the LMP area and part of the FLS managed Glengarry Forest, specifically the open hill around Ben Tee and Sron a Choire Gharbh. The Covid outbreak did impact on culling operations during 2020/21, especially in Clunes.

Recent culling figures:

North Loch Arkaig (482ha) (4.82km2)	2018/19	2019/20	2020/21	2021/22	2022/23
Red	4	11	8	4	13
Roe	8	5	9	1	20
Sika	1	5	2	0	4
Feral pig	0	0	0	0	2
Total	13	21	19	5	39



Clunes (5364ha) (53.64km <sup>2</sup> )	2018/19	2019/20	2020/21	2021/22	2022/23
Red	161	166	101	132	233
Roe	8	4	6	7	16
Sika	4	3	8	4	8
Feral pig	0	0	0	0	2
Total	173	173	115	143	259



The Clunes WMU last underwent a formal deer population assessment in 2009 with a density of 12.4 deer/km<sup>2</sup>. It is accepted that the deer numbers here are much higher than this figure. Impact is high especially in north Gleann Cia-Aig and the montane scrub areas of Clunes hill. The North Loch Arkaig WMU has not undergone any deer population assessment, however, deer impact is low to medium.

Deer are a woodland species so naturally seek the safety and shelter that forests can provide, especially during tough winter months. Out with the LMP area this location to the north and west of Loch Arkaig is open high elevation land and much of it is managed as sporting estate. This puts high pressure on the LMP protective fences especially in winter months as deer from elsewhere try to gain access to the forest.

Protective fences surround the North Loch Arkaig WMU woods aided by cattle grids on the public roads aligned with deer fencing.

The Clunes area shares a strategic fence with FLS managed Glengarry Forest stretching from Achnasaul over the hills to Pouлары. This fence has high pressure on it. It is requiring a major

overhaul in order to protect PAWS and peatland restoration in Clunes, Loch Arkaig as well as Glengarry Forests. Nonetheless, the population of deer within FLS property is also high, as demonstrated by the need to erect internal deer fencing to protect the 2021 native afforestation in Clunes and to restore open peatland which has been hagged by deer overgrazing vegetation and poaching the ground.

## Geography

The Clunes and Loch Arkaig LMP lies in a mountainous area on the SW side of the Great Glen. The North Loch Arkaig WMU lies on Low elevation, gentle to moderate south facing slopes along the northern shores of Loch Arkaig. A forest road dissects these woods in an east to west line and further access is gained by existing ATV tracks through younger plantation.

The Clunes WMU is characterised by steep ground both within and out with the forested areas. The land rises from 30m at the shore of Loch Lochy to 917m at the summit of Meall na Teanga. The slope throughout is steep with gentler slopes on the open ground occupied with deep peat, thus making access for deer management very challenging. The forested areas are well served by a roading infrastructure but very few ATV tracks exist as access off forest roads is impeded by the height of the roadline batter, the intensity of side slope off road, loose boulders, bedrock, outcrops and the density of watercourses especially along the side of the LMP which faces Loch Lochy. This area is highly visible from the A82 which is very busy with tourists as well as locals further impeding ATV access. There is more scope in the Gleann Cia-Aig area to improve ATV access, however, this area lies within the Kinlochhourn-Knoydart-Morar Wild Land Area (WLA), which is notable for its wild natural character wildness and remoteness.

The extraction of deer carcasses is currently difficult due to the constraints mentioned above. An existing hill access and ScotWays track leading from Clunes Forest does however allow ATV access through the Cam Bealach to the low ground along part of the northern section of Clunes.

## Have an evidence based approach

Population assessments were normally based on the dung count method.

Evidence gathering on the large herbivore population is long overdue in the Clunes WMU and the North Loch Arkaig WMU. The last count in the Clunes WMU was in 2009 and identified a population density of 12.4 deer/km<sup>2</sup>. No formal population assessment has taken place in North Loch Arkaig WMU.

However, it is evident on the ground that the deer population is too high as native regeneration is not achieved in some of the ASNW and CPI (Caledonian pinewood inventory) areas, in particular within the upper elevations of the forested ground. Young native planted sites have also been impacted by severe browsing damage especially in the central and upper reaches of the Abhainn Cia-Aig.

NatureScot carried out a helicopter deer count on the open areas occupied by the Knoydart Deer Management Group (DMG), in March 2021. It did not include the North Loch Arkaig WMU woods, however, it did highlight where deer were grouping in high numbers on the Clunes hill.

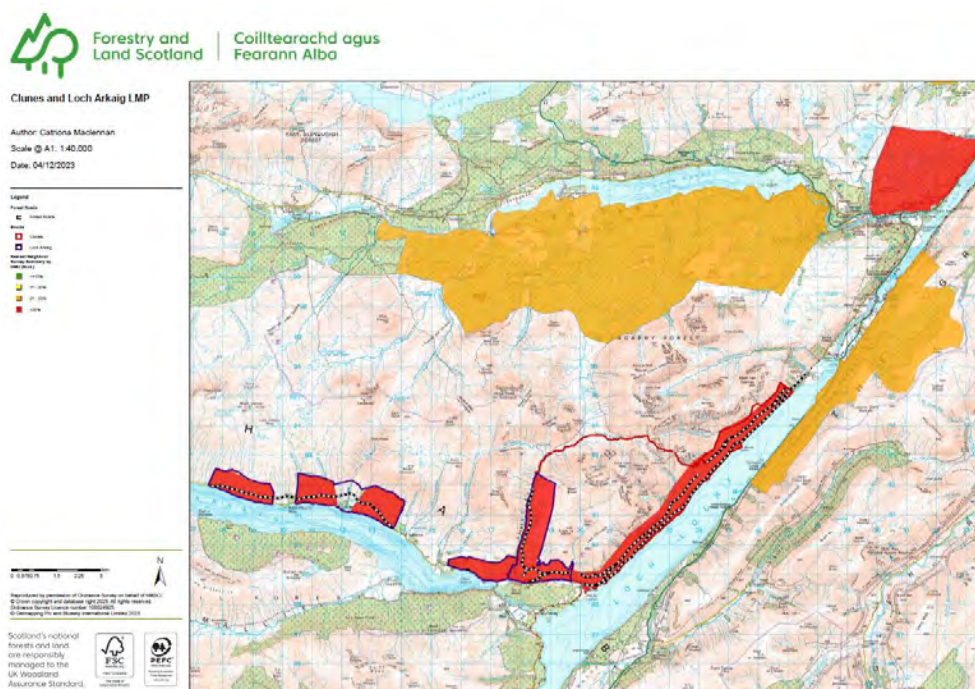
Very high numbers, 27 – 43 deer/km<sup>2</sup>, were observed in north Gleann Cia-Aig on open ground and young broadleaf plantation. This coincides with failed areas of young native trees on the strip of ground between the forest road and the Abhainn Cia-Aig. It also relates to the westerly montane scrub areas which are confined to areas inaccessible to deer.

The other area of very high deer numbers, 20 – 46 deer/km<sup>2</sup>, was identified on the east facing slopes on the Clunes open hill above the forest along Loch Lochy between Allt Molaich and Cam Bealach mountain pass. This coincides with high deer impact affecting natural regeneration in some of the higher elevation ASNW remnants and the eastern montane scrub remnants.

Impact of deer is measured in varying surveys: nearest neighbour (NN); herbivore impact assessments (HIA); natural regeneration surveys, stocking density assessments (SDA), ASNW and PAWS surveys.

Nearest neighbour survey:

The map below shows the forested sections of Clunes and Loch Arkaig Forests as red areas in the southern half of the picture. This represents more than 30% of crops being negatively impacted by deer and is summarised at a forest block level. Nearest neighbour surveys are systematically set out to ensure there is accuracy and consistency in areas that represent the crop.



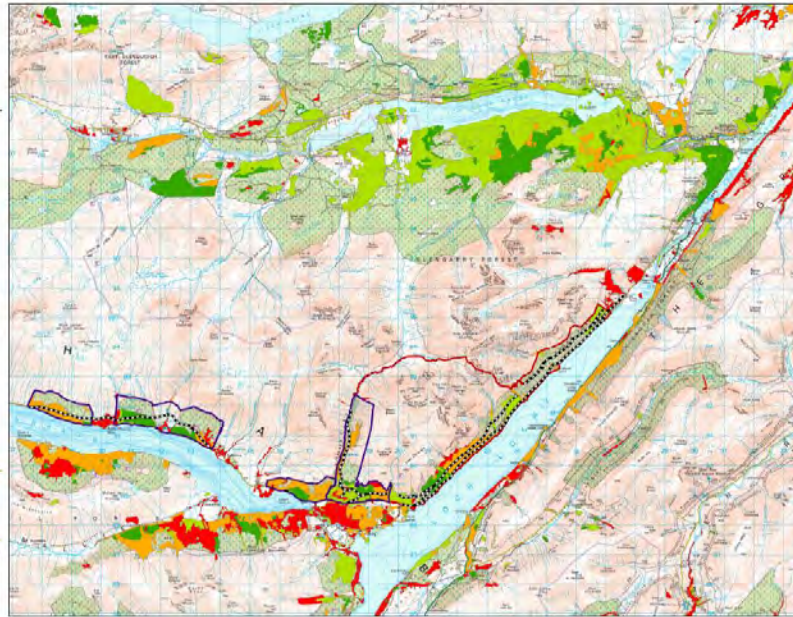
Native Woodland Survey for Scotland (NWSS) HIA:

The map below shows the locations of different herbivore damage in native woodland sites. This will include damage to trees and woodland flora. The highest impact areas in the LMP area affect the richest native woodland habitat – the ASNW.

Clunes and Loch Arkaig LMP

Author: Catriona MacLennan  
 Scale @ A1: 1:40,000  
 Date: 04/12/2023

- Legend
- Roads
  - Water
  - Clunes
  - ASNW
  - Herbivore impact
  - Low
  - Medium
  - High



The ASNW surveys also capture herbivore impact. The ASNW remnants are scattered throughout the forested sections of the LMP and tend to be confined to the loch sides, the gullies of the main streams or lie on the upper boundary of the forest. The map below shows the location of the remnants most impacted by herbivore. It should be noted that the ASNW in the middle of Allt Mhuic is affected by woodland pasture management through controlled grazing by cattle.

Clunes and Loch Arkaig LMP

Author: Catriona MacLennan  
 Scale @ A1: 1:26,000  
 Date: 04/12/2023

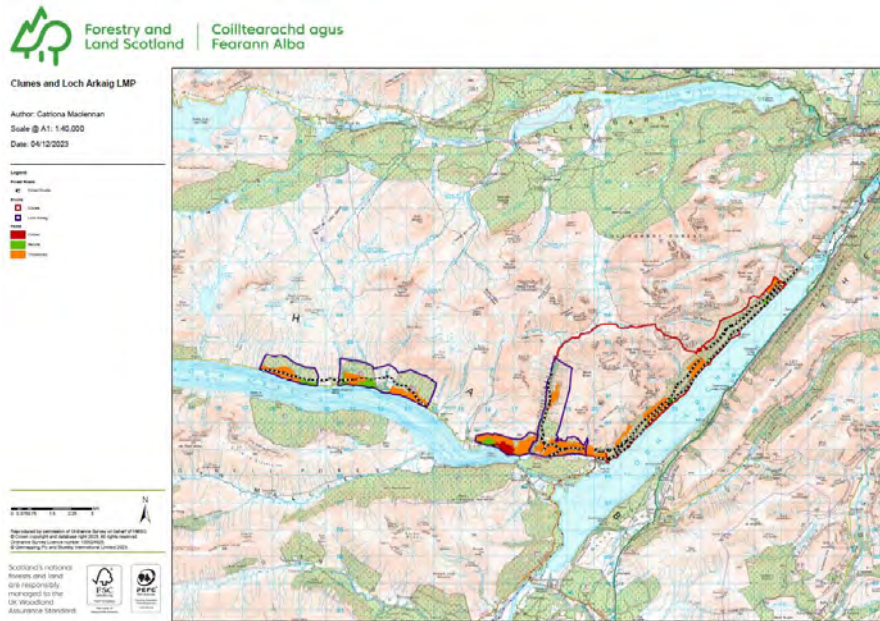
- Legend
- Roads
  - Water
  - Clunes
  - PAWS
  - Low
  - Medium
  - High



The PAWS surveys capture the herbivore threat to ancient woodland features in sites that are restored and establishing native woodland as well as areas that are yet to undergo restoration from non-native to native species. The map below shows PAWS areas colour coded according to



herbivore threat. There are large areas of forest where deer impact is too high for successful native woodland development.



Stocking density assessments are routinely carried out at year 1 and year 5 of a planted woodland’s stage of establishment. These determine if the crop is growing successfully at the stocking density appropriate to site objectives. These now incorporate HIA and so can quickly identify where appropriate deer management operations are required.

The FLS wildlife team have invested in drones. Although it is at the early stage of use it has produced good real time information on the population and distribution of deer throughout FLS properties. It is capable of identifying deer through much of the tree canopy. It will be adopted as the most reliant method of population assessment and will likely be carried out around four times annually to gauge the overall density.

### Link to Deer Dashboard

Most of data is used to create this DMP can be found in the Deer Dashboard

### Population Modeling and Future Culls

Financial Year (FY)	Population at 1st April (Start FY)	Population at 1st April (Start FY)	Total Population	No per 100ha 1st April
2021	353	431	784	15.0
2022	362	401	763	14.6
2023	308	351	659	12.6
2024	321	319	640	12.3
2025	292	289	581	11.1
2026	258	256	514	9.8
2027	220	218	438	8.4
2028	178	175	353	6.8
2029	130	128	258	4.9
2030	76	74	150	2.9

Kid % of pop at 1st April	Recruitment Female	Recruitment Male	Total Recruitment
25	44	44	88
25	45	45	90
25	38	38	77
25	40	40	80
25	36	36	73
25	32	32	65
25	28	28	55
25	22	22	44
25	16	16	33
25	10	10	19

Female pop 31st Aug	Male pop 31st Aug	Population 31st Aug	No per 100ha 31st Aug
397	475	872	16.7
407	446	853	16.3
346	390	736	14.1
362	359	721	13.8
328	326	654	12.5
290	288	578	11.1
248	245	493	9.4
200	198	398	7.6
145	144	290	5.6
86	83	169	3.2

Set % Cull	Female Cull	Male Cull	Total Cull
30.0	35	74	109
30.0	99	95	194
30.0	25	71	96
30.0	70	70	140
30.0	70	70	140
30.0	70	70	140
30.0	70	70	140
30.0	70	70	140
30.0	70	70	140
30.0	70	70	140

% Cull Achieved	Female Pop at 31st March (End FY)	Male Pop at 31st March (End FY)	Total Pop 31st March
12.5	362	401	763
22.7	308	351	659
13.0	321	319	640
19.4	292	289	581
21.4	258	256	514
24.2	220	218	438
28.4	178	175	353
35.2	130	128	258
48.2	76	74	150
82.6	16	13	29

## Protection Options

Deer culling that takes place within this LMP area is carried out by contractors. There are two main challenges that impact deer management – steep inaccessible land and migration from the neighbouring sporting estate. The mountainous terrain in which the strategic fence crosses is vulnerable to drifting snow in which deer can easily cross from neighbouring land into the LMP area. Also, the combination of poor weather and lack of available food can force deer to push on fences in an attempt to seek shelter and other food sources.

It is important to increase deer culling to sustainable levels which will promote habitat recovery as well as creating a healthier deer population. It will be necessary to upgrade the existing strategic deer fence, and it will be necessary to protect native woodland afforestation in Glenn Cia-Aig by replacing the existing internal fencing.

## How will objectives be met?

FLS are obliged to manage deer to sustainable levels under the Scottish Forestry Strategy and Biodiversity Strategy, as well as compliance with the UK Forestry Standard and UK Woodland Assurance Standard.

FLS aims to manage the deer population to between 2 – 7 deer/km<sup>2</sup> in national forests. Clunes and Loch Arkaig Forests are undergoing a large transition from non-native conifer plantation to native woodland. FLS now place much emphasis on managing open habitats, in particular blanket bogs. These types of habitat will require a much lower deer density to secure healthy habitats meaning that the deer density in this LMP area will need to be reduced to around 2-3 deer/km<sup>2</sup>. The LMP objectives will be met through the following:

- Use of qualified contractor resource to lower deer numbers. Qualifications and associated certificates will be checked as part of the contract award process.
- If necessary FLS will consider the increase in contractor resource to achieve goals.
- The use of drone counts around four times annually will provide accurate and real time information on deer numbers and deer behaviour enabling flexibility in management.

- Upgrade of the strategic deer fence that stretches from- Achnasaul in Loch Arkaig Forest, along part of Clunes Forest and through the SW section of Glengarry Forest. This offers the greatest protection from deer migration.
- Repair porous fences of North Loch Arkaig woods.
- Upgrade the internal fence in east Gleann Cia-Aig to protect native restocking and native woodland afforestation areas.
- Upgrade and maintain existing ATV tracks throughout the LMP area.
- Create a new ATV track through the native woodland planted in 2021 along the upper reaches of Abhainn Cia-Aig as requested by the wildlife team. Prior notification will be sought from Highland Council.
- Install gates in deer fencing to enable ATV access and consider using double gate systems to ensure a closed system at all times.
- Install self-closing pedestrian gates where paths and popular hill access routes straddle the deer fences. This will reduce the risk of gates being left open or fencing cut to allow dogs to access the land with their owners.
- An annual review held each August between the FLS Wildlife, FM and Planning teams to monitor achievement of targets, analyse the outcomes of beat-up surveys against nearest neighbour and SDA surveys.

## Infrastructure:

The FLS deer larder at Torlundy serves the Clunes and Loch Arkaig area.

The LMP area is well served by a network of forest roads enabling access in much of the lower elevations. Existing ATV tracks allow further access in Loch Arkaig Forest, however, opportunities for ATV access in Clunes is limited.

Upgrades of existing tracks in Cam Bealach and Gleann Cia-Aig east will enable access to parts of the open hill. During the next plan period it is proposed to create an ATV track through the young native woodland along the upper reaches of Abhainn Cia-Aig. This will further improve access for deer management and will prevent erosion to the soil by excessive ATV use on peaty soils.

Post harvesting operations tracks will be constructed, where topography allows, to secure establishment operations including deer management.

## Collaborative working opportunities

Cooperating with our neighbours, in particular Achnacarry Estate, to manage deer, access, fencing and timing of operations for mutual benefit will be necessary during this plan period to achieve the wider landscape scale native woodland restoration. This will be the case for the Loch Arkaig Forest section of the LMP. FLS is open to future partnership working.

As part of the Deer Working Group Recommendations, we should seek out opportunities where FLS can take a collaborative approach to achieving Deer Management Objectives.

## DMG present

FLS carries out deer management over much of the landscape between Lochs Arkaig, Lochy and Garry. These areas lie on the eastern extent of the Knoydart DMG in which FLS is an active participant.

## Venison

FLS subscribe to the Scottish Quality Wild Venison (SQWV) scheme. All venison is quality assured and sold to Highland Game via the Torlundy larder.