

West Region

Drimnatorran

Land Management Plan 2023/32



Plan Reference No: 030/519/204

Plan Approval Date: \*\*\*\*\*\*

**Plan Expiry Date: \*\*\*\*\*\***



**FORESTRY AND LAND SCOTLAND**

**Application for Land Management Plan Approvals in Scotland**

**Forestry and Land Scotland – Property (see Map 1 – Location Map)**

| Region: | West |
| --- | --- |
| Woodland or property name: | Drimnatorran |
| Nearest town, village or locality: | Strontian |
| OS Grid reference: | NM 83186265 |
| Local Authority district/unitary Authority: | Highland |

| *Areas for Approval* | *Conifer Ha* | *Broadleaf* | *Open Space* | *Other Land* |
| --- | --- | --- | --- | --- |
| *Clear felling* | *235.23* | *11.94* | *0* | *0* |
| *Selective Fell* | *3.35* | *0* | *0* | *0* |
| *Restocking* | *103.52* | *66.34* | *50.65* | *0* |
| *Restocking - Natural Regeneration* | *0* | *30.74* | *7.44* | *0* |
| *Forest-to-bog Peatland Restoration (FTB)* | *0* | *0* | *53.31* | *70.77 (FTB)* |
| *New Plant* | *12.92* | *7.29* | *5.26* | *0* |

*Note: restock includes areas felled under previous Plan*

1. I apply for **Land Management Plan** approval for the property described above and in the enclosed Forest Plan.

2. \* I apply for an opinion under the terms of the **Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999 for road building /quarries /afforestation /deforestation** as detailed in my application.

3. I confirm that the initial scoping of the plan was carried out with FLS and SF staff in 06/09/2019.

4. I confirm that the proposals contained in this plan comply with the UK Forestry Standard.

5. I confirm that the scoping, carried out and documented in the Consultation Record attached, incorporated those stakeholders which the SF agreed must be included.

6. I confirm that agreement has been reached with all of the stakeholders over the content of the forest plan and that there are no outstanding issues to be addressed. Copies of consultee endorsements of the plan are attached.

7. I undertake to obtain any permissions necessary for the implementation of the approved Plan.

Signed …………………………………………… Signed ……………………………………………

Regional Manager Conservator

Region: West Conservancy:

Date : **Date of Approval:** ………………………….

**Date approval ends:** ………………………….

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# 1 Regulatory Requirements

## 1.1 Summary of Proposals:

* To clearfell 363.33ha of commercial conifer crop
* To fell-to-recycle 2.5ha of non-native commercial species within the SSSI/SAC designation
* To carry out up to 3.35ha of CCF felling in Phemies ’Wood as part of Larch management
* To restock/supplementary plant current felled sites – 31.11ha
* To restock after the Phase 1 & 2 felling – 174.85ha (of which 35.04ha is NR)
* To newly plant 5.54ha of commercial conifer plantation in Carnoch
* To newly plant up to 19.93ha Gross of native open crowned woodland habitat in East and West Carnoch
* To construct 6810 metres of new roading, 1960 metres of which has been approved under FPA-9713.
* To carry out 1342 metres of road upgrades.
* To construct 780 metres of Forwarder track
* To replace one pedestrian bridge over the Strontian river.
* To restore 126.78ha of peatland, of which, 70.77ha is forest-to-bog restoration.

### 1.1.1 Objectives - 10 year plan objectives:

* + - To complete the economic and plant health felling of commercial conifer crops in Ariundle plateau and Longrigg
    - To remove non-native species from the Designated woodland in Ariundle in the area annexed from the main block by the NNR and Strontian river.
    - To manage non-native regeneration within the main section of the Designated woodland.
    - To fell the non-native species, including Larch, from the small isolated and difficult to access blocks on West Carnoch
    - To remove the poorly performing Sitka spruce crops from the deep peat soils on Carnoch summit and from the Strontian river floodplain in Eggadale.
    - To restore the afforested peatlands in Carnoch summit, Strontian river floodplain in Eggadale, in localised areas in Ariundle plateau and in the central and northern portion of Longrigg
    - To replant the Carnoch felled areas with commercial conifer crops
    - To expand native woodland habitat in Ariundle plateau through restock planting and natural regeneration.
    - To protect the adjacent designated woodland with a protective buffer of native species and Scots pine.
    - To establish Norway spruce and Scots pine crops in the Southern section of Ariundle plateau.
    - To establish native woodland habitat in Northern Longrigg with riparian woodland protecting the watercourses and native woodland edge habitat protecting neighbouring houses in Southern Longrigg.
    - To establish Sitka spruce on the fertile sloping ground of Longrigg.
    - To secure the sale of Longrigg to the local Community.
    - To maintain the existing formal recreational facilities
    - To plan and commence access to inaccessible Larch crops in Eggadale

### 1.1.2 Long term objectives:

* To plan for the resilience of woodland and open habitats, commercial forestry, soils, water and biodiversity in a changing climate.
* To maintain and expand the features of the Designated woodland into sections of Ariundle plateau and Eggadale.
* To improve biodiversity connectivity by reinstating riparian woodland habitat to connect low-lying woodland and open priority habitat with upland open, peatland edge and open crowned woodland.
* To work with NatureScot to resolve the issues affecting the management of the NNR non-native seeding threat affecting the FLS owned section of the SSSI/SAC woodland.
* To use the opportunity of felling to improve water quality for water supplies, salmonid habitat and habitat through the creation of riparian woodland, expansion of native woodland and peatland restoration.
* To maintain formal recreational facilities to ensure the local community and visitors to the area can continue to enjoy the special habitats and views.

### 1.1.3 Summaries of Management Proposals

The felling proposals in the first twenty years of the plan are summarised below:

(See Map 2 – Management Coupes)

| **Felling** | **Phase 1** | **Phase 2** | **Phase 3** | **Phase 4** | **Area outwith 20 year plan period** |
| --- | --- | --- | --- | --- | --- |
| Coupe Nett Fell area (ha) | 190.78 | 55.27 | 22.79 | 21.35 | 134.11 |
| % of area  (not including other land) | 27.7 | 8.1 | 3.3 | 3.1 | 20 |
| Volume (Km3) | 80.8 | 16.25 | 14.33 | 13.77 | 113.58 |

The species composition over the first twenty years is as follows:

(See Map 3 – Future Forest Current 2022/23

Map 4 – Future Forest 2033

Map 5 – Future Forest 2043

Map 6 – Future Forest 2073)

| **Species Group** | **Current** | **(2023)** | **Year 10** | **(2033)** | **Year 20** | **(2043)** |
| --- | --- | --- | --- | --- | --- | --- |
|  | Area (ha) | % | Area (ha) | % | Area (ha) | % |
| Sitka Spruce | 231.3 | 33.8 | 182.8 | 29.7 | 176.7 | 28.8 |
| Norway Spruce | 0.5 | 0 | 11.2 | 1.8 | 15.1 | 2.4 |
| Larches | 66.1 | 9.7 | 31.5 | 5.1 | 10.2 | 1.7 |
| Mixed Conifers | 142.9 | 20.8 | 90.8 | 14.7 | 115.9 | 18.9 |
| Mixed Broadleaves | 18.5 | 2.7 | 16.8 | 2.7 | 15.2 | 2.5 |
| Native Broadleaves | 102.2 | 14.9 | 165.4 | 26.9 | 221.3 | 36 |
| Internal Open Space | 87 | 12.7 | 47.4 | 7.7 | 38.7 | 6.3 |
| Failed | 5 | 0.7 | 1.6 | 0.3 | 1.6 | 0.3 |
| Felled | 32 | 4.7 | 68.5 | 11.1 | 19.2 | 3.1 |
| **Total** | **685.5** | **100** | **616** | **100** | **613.9** | **100** |
| Open Hill | 385.5 | 100 | 455 | 100 | 457.1 | 100 |
| Agriculture | 0 | 0 | 0 | 0 | 0 | 0 |
| Open Water | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **385.5** | **100** | **455** | **100** | **457.1** | **100** |

The age class composition over the first twenty years is as follows:

| **Age Class** | **Current** | **(2023)** | **Year 20** | **(2043)** |
| --- | --- | --- | --- | --- |
|  | Area (ha) | % | Area (ha) | % |
| Bare/Failed/Felled/Intruded broadleaf | 129.9 | 19 | 64.3 | 10.5 |
| 0 – 20 yrs | 39.4 | 5.7 | 317.5 | 51.7 |
| 21 – 40 yrs | 286 | 41.7 | 28.1 | 4.6 |
| 41 – 100 yrs | 195.8 | 28.6 | 176.7 | 28.8 |
| 100+ yrs | 34.4 | 5 | 27.3 | 4.4 |
| **Total** | **685.5** | **100** | **613.9** | **100** |

| **Forest Structure** | **Age Class** | **Current** | **2023** | **Year 20** | **2043** |
| --- | --- | --- | --- | --- | --- |
|  |  | **Area (ha)** | **%** | **Area (ha)** | **%** |
| Bare/felled/failed/Intruded broadleaf | 0 | 129.9 | 19 | 64.3 | 10.5 |
| Establishment | 0 - 10 | 18 | 2.6 | 137.8 | 22.4 |
| Thicket | 11 - 20 | 21.4 | 3.1 | 179.7 | 29.3 |
| Pole | 21 - 40 | 286 | 41.8 | 28.1 | 4.6 |
| Mature | 41 - 60 | 181.3 | 26.4 | 161.6 | 26.3 |
| Really mature | 60+ years | 48.9 | 7.1 | 42.4 | 6.9 |
| **Total** |  | **685.5** | **100** | **613.9** | **100** |

**UKWAS Summary**

| **Description** | **% of LMP Area1** | **Location of Data** |
| --- | --- | --- |
| Restock main conifer spp – Scots pine | 14.7 | Forester Restock Layer |
| Restock other conifer – Sitka spruce | 14.1 | Forester Restock Layer |
| Open Space2 | 26 | Forester Restock Layer |
| Native broadleaves3 | 36.6 | Forester Restock Layer |
| Management for biodiversity as primary objective (incl NR and MI area) | 15.6 | Forester Management Layer |
| LISS | 2.7 | Forester Management Layer |
| Natural reserves | 0 | Forester Management Layer |

**Notes**

1. The % will total more than 100% as the species and management categories overlap.
2. Only the larger areas of open space area recorded here. There many more small areas of open space within the broadleaf woodland.
3. The native broadleaves will be at variable stocking densities.

### **Planned Roading Operations** (see Map 7 – Civil Engineering)

| **Planned operations** | **2023 – 2032**  **10 plan period** |
| --- | --- |
| DT2 – Drimnatorran far West  (approved 30/08/2022 ref: 030/519/204, FPA 9713)  DT1 – Carnoch Access  DT4 DT-PW – Phemie’s Wood  DT3-LRG2 – Longrigg  Forwarder track – West Carnoch | 1960 metres  3850 metres felling road line  (840 metres road construction 2022/23  1180 metres road construction 2025/26  680 metres road construction 2026/27  1150 metres road construction 2030/31)  370 metres  630 metres  780 metres |

The roads to be constructed, as detailed on the Roading Map will require local authority Prior Notification (PN) approval. This will be submitted following EIA determination approval by Conservancy, as included in this plan.

## 1.2 Activity Summary

### 1.2.1 Table of Clearfelling (Phase 1)

(See Map 8 – Approved 10 year Felling)

| **Coupe No.** | **Total Area (Ha)** | **Spp by Ha (SS)** | **Spp by Ha (SP)** | **Spp by Ha (LP)** | **Spp by Ha (NS)** | **Spp by Ha (Larch)** | **Spp by Ha**  **(X con)** | **Spp by Ha (BLeaf)** | **Open Land by Ha** | **Restock Year** | **Monitoring Comments** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 84006 | 125.76 | 14.64 | 0 | 66.19 | 0 | 15.42 | 0 | 0.21 | 29.3 | 2027/28 plant  2035/36 NR | This area lies adjacent to a SSSI/SAC woodland.  Peatland restoration will occur in localised areas. Harvest the deep peat areas in a manner which will enable effective restoration of peat. |
| 84013 | 17.65 | 2.37 | 0 | 0.13 | 0 | 0 | 0 | 8.19 | 6.96 | 2035/36 NR | SSSI/SAC designated woodland. Remove non-native conifer species only. Retain as much native broadleaf species as possible. Some broadleaf felling may be required to gain access to the conifer crops. Protect Oak species. |
| 84063 | 7.28 | 0.13 | 0.34 | 0.03 | 0.14 | 3.42 | 0.63 | 1.62 | 0.97 | 2027/28 plant | Retain as much of the native and Scots pine element of the crop. Remove non-native conifer and broadleaf species. (0.04ha SYC) |
| 84068 | 86.57 | 23.26 | 0 | 39.54 | 0 | 15.15 | 0.46 | 0 | 8.16 | 2027/28 plant | Longrigg. This separate block is up for sale to the local community. The flat central portion of the site will undergo peatland restoration. Harvest this area in a manner which will enable effective restoration of peat. |
| **Totals** | **237.26** | **40.4** | **0.34** | **105.89** | **0.14** | **33.99** | **1.09** | **10.02** | **45.39** | N/A |  |

### 1.2.2 Table of Clearfelling (Phase 2)

(See Map 8 – Approved 10 year Felling)

| **Coupe No** | **Total Area (ha)** | **Spp by Ha (SS)** | **Spp by Ha (SP)** | **Spp by Ha (LP)** | **Spp by Ha (NS)** | **Spp by Ha (Larch)** | **Spp by Ha**  **(X con)** | **Spp by Ha (BLeaf)** | **Open Land by Ha** | **Restock Year** | **Monitoring Comments** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 84016 | 32.65 | 14.54 | 0 | 0 | 0 | 0 | 0 | 1.4 | 16.71 | 2032/33 plant  2040/41 NR | Poorly performing difficult to access crop. Retain the 1.4ha native broadleaf trees. |
| 84025 | 30.47 | 6.5 | 0 | 0.11 | 0 | 0 | 0 | 0.52 | 23.34 | 0 | Peatland restoration coupe. Harvest the site in a manner which will enable effective restoration of peat. |
| 84034 | 65.45 | 32.23 | 0 | 0 | 0 | 0 | 0 | 0 | 33.22 | 0 | Peatland restoration coupe. Harvest the site in a manner which will enable effective restoration of peat. |
| **Totals** | **128.57** | **53.27** | **0** | **0.11** | **0** | **0** | **0** | **1.92** | **73.27** | N/A |  |

### 1.2.3 Table of CCF Felling (Phase 1)

(See Map 8 – Approved 10 year Felling)

| **Coupe No.** | **Total Area (Ha)** | **Volume (M3)** | **Spp by Ha (SS)** | **Spp by Ha (SP)** | **Spp by Ha (LP)** | **Spp by Ha (NS)** | **Spp by Ha (Larch)** | **Spp by Ha**  **(X con)** | **Spp by Ha (BLeaf)** | **Open Land by Ha** | **Silv.Method** | **Monitoring Comments** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 84001 | 29.29 | 189 | 0 | 0 | 0 | 0 | 1.35 | 0 | 0 | 2.85 | Group shelterwood, Group selection | Eventually remove the Larch component of the crop. Proximity to powerlines. |
|  |  |  |  |  |  |  |  |  |  |  |  | Localised amenity and environmental halo thinning, |
| **Totals** | 29.29 | **189** | **0** | **0** | **0** | **0** | **1.35** | 0 | 0 | 2.85 |  |  |

### 1.2.4 Table of CCF Felling (Phase 2)

(See Map 8 – Approved 10 year Felling)

| **Coupe No.** | **Total Area (Ha)** | **Volume (M3)** | **Spp by Ha (SS)** | **Spp by Ha (SP)** | **Spp by Ha (LP)** | **Spp by Ha (NS)** | **Spp by Ha (Larch)** | **Spp by Ha**  **(X con)** | **Spp by Ha (BLeaf)** | **Open Land by Ha** | **Silv.Method** | **Monitoring Comments** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 84001 | 29.29 | 280 | 0 | 0 | 0 | 0 | 2.0 | 0 | 0 | 2.85 | Group shelterwood, Group selection | Eventually remove the Larch component of the crop. Proximity to powerlines |
|  |  |  |  |  |  |  |  |  |  |  |  | Localised amenity and environmental halo thinning, |
| **Totals** | 29.29 | **280** | **0** | **0** | **0** | **0** | **2.0** | 0 | 0 | 2.85 |  |  |

### 1.2.5 Table of Thinning (Phase 1 & 2)

(See Map 9 – Thinning)

| **Coupe No.** | **Total Area (Ha)** | **Thin**  **Year** | **Species** | **Thin-able Area (Ha)** | **Prescription for Thinning**  **(including subsequent planned intervention)** | **Final Thinned Area (Ha)** | **Final Vol/Ha Removed** | **Monitoring Comments** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 84042/84044/84045/84048 | 16.5 | 2023 | SS/LP | 16.5 | Removal of sparse/scattered non-native regeneration from open priority habitats: Blanket bog, Upland Heathland, Fen/Marsh/Swamp | N/A | N/A | Fell to recycle.  SPA – Golden eagle |

### 1.2.6 Table of Felling for Approved Plan Period

| **Method** | **Total Area (Ha)** | **Total Volume (M3)** | **Spp by Ha (SS)** | **Spp by Ha (SP)** | **Spp by Ha (LP)** | **Spp by Ha (NS)** | **Spp by Ha (Larch)** | **Spp by Ha**  **(X con)** | **Spp by Ha (BLeaf)** | **Open Land by Ha** | **Comments** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Clearfell** | **365.83** | **97,050** | **93.67** | **0.34** | **106** | **0.14** | **33.99** | **1.09** | **11.94** | **118.66** | **Economic, plant health and peatland restoration felling objectives** |
| **Thinning** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **Fell to recycle non-native scattered trees from priority open habitat** |
| **CCF** | **3.35** | **469** | **0** | **0** | **0** | **0** | **3.35** | **0** | **0** | **2.85** | **Primarily the removal of Larch from Phemies’ Wood** |
| **Totals** | **369.18** | **97,519** | **93.67** | **0.34** | **106** | **0.14** | **37.34** | **1.09** | **11.94** | **121.51** |  |

### 1.2.7 Table of Restocking

(See Map 10 – Approved 10 year Restocking and Peatland Restoration, and Appendix VIII – Peatland)

| **Coupe No.** | **Total Area (Ha)** | **SS (Ha)** | **LP (Ha)** | **SP (Ha)** | **NS (Ha)** | **Larch (Ha)** | **Other Con. (Ha)** | **Native Mixed B/Leaf** | **Other B/Leaf** | **Open (Ha)** | **Year** | **Restock Method & Density**  **(Restock/Nat Regen/Alt Area/Coppice/Open)** | **Monitoring Comments**  **(Including any reason not to restock)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 84010 | 31.15 | 0 | 0 | 0 | 0 | 0 | 0 | 0.98 | 0 | 0.25 | 2022 | Birch has already been naturally regenerating on this site.  Supplementary plant with SOK/HAZ/ASP/CAR to ensure 1600/ha | Lies within the Sunart SSSI/SAC designation  This felled area lies within a Minimum Intervention coupe. It lies adjacent to recently restored peatland. The edge Birch and Hazel maybe coppiced to optimise the habitat for Chequered Skipper. |
| 84012 | 11.53 | 0 | 0 | 0 | 0 | 0 | 0 | 2.9 | 0 | 0.73 | 2022 | Birch has already been naturally regenerating on this site.  Supplementary plant with SOK/HAZ/ASP/CAR to ensure 1600/ha | This felled area lies within a Minimum Intervention coupe. It lies adjacent to recently restored peatland. The edge Birch and Hazel maybe coppiced to optimise the habitat for Chequered Skipper. |
| 84054 | 23.32 | 13.77 | 0 | 3.84 | 0 | 0 | 0 | 1.67 | 0 | 4.04 | 2022 | Plant conifer species at 2500/ha  1.2ha native species planted at 1600/ha  0.47ha native regeneration riparian woodland – 600-1200/ha | Current felled site  Allow up to 10 years for Natural Regeneration to establish.  Assess at years 5 & 7 and supplementary plant gaps by year 10. |
| 84055 | 10.92 | 0 | 0 | 0.54 | 0 | 0 | 0 | 2.05 | 0 | 1.32 | 2022 | This current felled area occupies 3.91ha of Coupe 84055  0.14ha is native natural regeneration in a riparian zone – 600-1200/ha  1.91ha native planted at 1600/ha  SP planted at 2500/ha | Allow up to 10 years for Natural Regeneration to establish.  Assess at years 5 & 7 and supplementary plant gaps by year 10. |
| 84006 | 125.76 | 0 | 0 | 39.32 | 10.83 | 0 | 0 | 50.22 | 0 | 25.39 | 2028 2036 | Commercial conifers planted at 2500/ha nett.  Native woodland (with SP) planted at 1600/ha  Riparian woodland 600-1200/ha  Forest-to-bog restoration (1.5ha)  Natural regeneration = 27.66ha  Planted = 72.71ha | Allow up to 10 years for Natural Regeneration to establish.  Assess at years 5 & 7 and supplementary plant gaps by year 10. |
| 84013 | 17.65 | 0 | 0 | 0 | 0 | 0 | 0 | 2.5 | 0 | 0 | 2036 | Natural regeneration.  Unclear if felling operations will include the removal of the produce. Most likely that fell to recycle will be the only option. This will impede natural regeneration until the produce has rotted down. | Lies entirely within the Sunart SSSI/SAC designation.  Allow at least 10 years for Natural Regeneration to establish.  Assess at years 5 & 7 and supplementary plant gaps by year 10.  If produce cannot be removed from the fell area then monitoring of this area will extend over many years |
| 84063 | 7.28 | 0 | 0 | 2.33 | 0 | 0 | 0.29 | 4.66 | 0 | 0 | 2028  2036 | Most SP will be that retained from previous crop with supplementary planting in localised areas.  MC to be planted.  Allow natural regeneration of NMB  5.8ha of NMB &SP at 1600/ha  1.47ha of NMB/SP/MC at 2500/ha | Allow up to 10 years for Natural Regeneration to establish.  Assess at years 5 & 7 and supplementary plant gaps by year 10. |
| 84068 | 86.57 | 27.52 | 0 | 0 | 0 | 0 | 0 | 21.24 | 0 | 37.81 | 2028 | Forest-to-bog – 26.66ha  27.52ha SS planted at 2500/ha  17.63ha NMB planted at 1600/ha  3.61ha NMB Riparian woodland planted at 600-1200/ha |  |
| 84016 | 32.65 | 0 | 0 | 5.08 | 0 | 0 | 0 | 10.86 | 0 | 16.71 | 2033  2041 | 9.62ha transition native woodland planted at 1200/ha  6.1ha planted at 1600/ha  0.22ha natural regeneration within the Coille Dhubh ASNW. | Allow up to 10 years for Natural Regeneration to establish.  Assess at years 5 & 7 and supplementary plant gaps by year 10.  1.4ha is existing native woodland |
| 84025 | 30.47 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30.47 | 2031 | Peatland restoration of which 5.51ha is Forest-to-bog restoration |  |
| 84034 | 65.45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 65.45 | 2031 | Peatland restoration of which 37.1ha is Forest-to-bog restoration |  |

### 1.2.8 Table of New Planting

(See Map 11 – New Plant)

| **Coupe No.** | **Total Area (Ha)** | **SS (Ha)** | **LP (Ha)** | **SP (Ha)** | **NS (Ha)** | **Larch (Ha)** | **Other Con. (Ha)** | **Native Mixed B/Leaf** | **Other B/Leaf** | **Open (Ha)** | **Year** | **Planting Method & Density**  **(Planting/Nat Regen)** | **Monitoring Comments** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 84051 | 15.51 | 2.77 | 2.77 | 5.39 | 0 | 0 | 0 | 1.31 | 0 | 3.27 | 2024 | SS/LP mixture planted at 2500/ha  SP/NMB planted at 1600/ha variable spacing decreasing in density going uphill | Non-commercial component long term objective is to develop a native open crowned woodland which is a transition from adjacent plantation woodland to adjacent open ground. |
| 84064 | 9.96 | 0 | 0 | 1.99 | 0 | 0 | 0 | 5.98 | 0 | 1.99 | 2024 | Planted at 1600/ha variable spacing decreasing in density going uphill. | Long term objective is to develop a native open crowned woodland which is a transition from adjacent mature Community woodland to adjacent open ground on Carnoch hill. |

### 1.2.9 Table of Civil Engineering

(See Map 7 – Civil Engineering)

| **Proposed Activity (Road/Quarry)** | **OS Grid Reference** | **Forest/Coupe** | **Description**  **(Length/Area/Construction)** | **Monitoring Comments** |
| --- | --- | --- | --- | --- |
| New Road | NM 8351 6231 | 84034/84033 | Phase 1- 840 metres | DT1 Carnoch Access PAZ road - construct road 2022/23 |
| (Totals 3850m) | NM 8346 6273 | 84033/84035 | Phase 2 - 1180 metres | DT1 Drimnatorran Link – construct road 2025/26 |
|  | NM 8273 6271 | 84031/84035 | Phase 3 – 680 metres | DT1 Drimnatorran Link – construct road 2026/27 |
|  | NM 8343 6322 | 84024/84026/84027/84029/84035 | Phase 4 - 1150 metres | DT1 Carnoch Access, Drimnatorran link – construct road 2030/31 |
| New road | NM 8114 6162 | 84001 | 370 metres | DT4 DT-PW Phemie’s Wood – construct 21/22 required to remove areas of Larch |
| New road | NM 8042 6226 | 84068 | 630 metres | DT3 DT-LRG 1 Longrigg – fell route 2021/22, construct 2021/22 |
|  | NM 8313 6443 | 84006 | 1960 metres | DT2 Phase 2 – Approval under FPA- 9713 – fell route & construct road 2022/23 |
| Road upgrade | NM 8327 6383 | 84010/84012 | 412 metres | DT21 – Final approach to NNR. Mostly within SSSI/SAC designations. |
| Road upgrade | NM 8382 6420 | NNR | 930 metres | DT21 – entrance of NNR – to boardwalk trail – NatureScot property. Liaise with/ seek permission from NatureScot. Also within SSSI/SAC designations. |
| Forwarder track | NM 8209 6129 | 84063/84064/84062 | 780 metres | Surveyed track. Required to facilitate harvesting operations and gain access to forest road network in Carnoch. Assists with the removal of Larch from an isolated area, |
| Bridge replacement | NM 8322 6358 | 84010, 84025 | Pedestrian Bridge crossing the Strontian river. Forms part of the Ariundle trail. | Bridge 3116 |

## 1.3 EIA Screening Determination

#### 1.3.1.1 – Screening Opinion Request New Roads Form

Please complete this form to find out if you need consent from Scottish Forestry, under the **Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017**, to carry out your proposed forestry project. Please refer to Schedule 2 Selection Criteria for Screening Forestry Projects under [Applying for an opinion](https://forestry.gov.scot/support-regulations/environmental-impact-assessment/applying-for-opinion). If you are not sure about what information to include on this form please contact your [local Conservancy office](https://forestry.gov.scot/about/structures/local-offices).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Proposed Work | | | | | | | |
| Please put a cross in the box to indicate the type of work you are proposing to carry out. Give the area in hectares and where appropriate the percentage of conifers and broadleaves | | | | | | | |
| Proposed Work | select | Area in hectares | % Conifer | % Broad-leaves | Proposed work | select | Area in hectares |
| Afforestation |  |  |  |  | Forest roads |  | 9.04 |
| Deforestation |  |  |  |  | Forest quarry |  |  |
| Location of work | | Drimnatorran Forest, Strontian | | | | | |

|  |
| --- |
| Description of Forestry Project and Location |
| Provide details of the forestry project (size, design, use of natural resources such as soil, and the cumulative effect if relevant).  Please attach map(s) showing the boundary of the proposed work and other known details. |
| The location of the proposed three new roads within Drimnatorran Forest, Strontian, Lochaber are:  DT1 - Carnoch Access - 3850 metres total length constructed in three phases:  Phase 1 - NM 8332 6215 - 840 metres. Construction year 2023/24  Phase 2 - NM 8320 6273 - 1180 metres. Construction year 2025/26  Phase 3 - NM 8278 6260 - 680 metres. Construction year 2026/27  Phase 4 - NM 8343 6322 - 1150 metres. Construction year 2030/31  DT4 - Phemies' Wood - NM 8114 6162 - 370 metres. Construction year 2023/24  DT3 DT-LRG2 - Longrigg - NM 8042 6226 - 630 metres. Construction year 2023/24.  Construction of a forwarder track  West Carnoch - NM 8210 6127 - 780 metres. Construction year 2023/24.  The construction of 4850 metres of Category 1 road will provide roads in Phemies' Wood facilitating thinning operations and in Longrigg facilitating clearfell operations. The Carnoch Access route provides an extension of the DT1 Carnoch roading North into Eggadale Glen in preparedness for the early felling of Larch coupes in the event of an outbreak of P' ramorum. Phase 4 (1150m), of this route is planned for construction in 2030/31, however, it is wished that the felling of the entire length of this route may be carried out in one operation in 2023/24.  The running surface will be 3.5 metres wide with the overall footprint, which includes drains and verges, being approximately 8 metres wide. The stone material will be obtained from the Carnoch quarry with Drimnatorran Forest The clearfelling of up to 14.42Gross ha of conifer forest will be required to facilitate a road construction swathe of 30 metres width. This involves the felling of the following crops:  DT3-LRG2 - Longrigg - Coupe 84068  1.93ha conifer crop: 49 year old JL - 0.58ha; SS - 0.78ha; LP - 0.55ha and WH - 0.02ha (all within Phase 1 fell coupe 84068)  DT4 - Phemies' Wood - Coupe 84001  0.79ha Mixed broadleaf crop (MB): 71 year old MB - 0.1ha; 35 year old MB - 0.69ha. The route also passes through 0.15ha of open ground (powerline and wayleave)  DT1 Carnoch Access - Drimnatorran main block  30/31 year old SS - 6.32ha; 30/31 year old Larch - 0.53ha; 71 year old MB - 1.13ha; 31 year old MB - 1.83ha. The route of the planned road also crosses 2.27ha of open ground.  West Carnoch forwarder track felling contained within Phase 1 fell Coupe 84063. |

|  |
| --- |
| Provide details on the existing land use and the environmental sensitivity of the area that is likely to be affected by the forestry project. |
| DT1 - passes through commercial conifer crops and some semi-natural birch woodland. The initial section cannot avoid crossing areas of deep peat. The initial kilometre of road lies within the Moidart and Ardgour SPA designation (for Golden eagle). The road crosses multiple small - medium watercourses.  DT3-LRG2 - passes through commercial conifer crops and crosses three small watercourses  DT4 - has no environmental constraints  West Carnoch forwarder track - passes through non-priority habitat, some commercial conifer crop and some semi-natural birch woodland. It also crosses three small watercourses. |

|  |
| --- |
| Description of Likely Significant Effects |
| Provide details on any likely significant effects that the project will have on the environment (resulting from the project itself or the use of natural resources) and the extent of the information available to assist you with this assessment. |
| The land is owned and managed by FLS and the existing land use is predominently commercial conifer production with a lesser broadleaf component. The sites lie outwith the Sunart SSSI and SAC. However, 3.5ha of the Carnoch Access DT1 roading wayleave lies within the Moidart and Ardgour SPA, (Golden eagle). Road construction operations could cause visual and noise disturbance to Golden eagles' ability to hunt over the open hill of Carnoch.  All watercourses affected by all three planned road and the forwarder track construction flow into the Loch Sunart to the Sound of Jura MPA, and in the process, pass through the coastal habitats of the Sunart SSSI and SAC.  Most of the Longrigg road and about one third of the Carnoch Access DT1 road lie within Black Grouse lek impact zones. Road construction operations can cause visual and noise disturbance to the grouse lekking and nesting. Likewise, a barn owl box lies 60 metres from the West Carnoch forwarder track. Any nesting owls may be disturbed by track construction works.  Five watercourses and their tributaries, which are affected by the Carnoch Access DT1 road, lie within the public water supply catchment and flow into the Strontian river upstream of the weir. The Strontian River is a former SSSI designation. The forwarder track crosses one stream which is a known private water supply which could be exposed to siltation.The DT1 road has the potential to impact on on the salmonid habitat and the drinking water quality downstream through the siltation of watercourses during road construction operations. It also has the potential to cause significant loss of carbon and drainage of the deep peat areas of Carnoch summit.  The Carnoch Access DT1 route also affects 1.13ha of P'1950 native woodland, (assumed to be semi-natural native woodland which had been attributed a plant year). This broadleaf area does not lie in any ancient woodland designation. |

|  |
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| Include details of any consultees or stakeholders that you have contacted in order to make this assessment. Please include any relevant correspondence you have received from them. |
| None |

|  |
| --- |
| Mitigation of Likely Significant Effects |
| If you believe there are likely significant effects that the project will have on the environment, provide information on the opportunities you have taken to mitigate these effects. |
| Road construction will minimise further disturbance in accordance with the TTF "Design and use of the Structural Pavement of Unsealed Roads 2014"; the FLS "Civil Engineering Handbook", chapters 4, 5, 6 and 7; and SNH/FCS Good practice "Floating Roads on Peat".  FLS " Civil Engineering Handbook" Section 7 provides guidance on road construction on peat soils to minimise the loss of carbon. In the case of the DT1 road, it is impossible to avoid crossing the peat areas.  A "floating road" construction system will be used. Where the road passes through forested areas, the roots and brash of the felled crop will be used to float the road. On the open peat areas, the road will be floated using geogrid. These methods minimise the amount of geogrid used. The water table will be maintained either by avoiding drainage altogether or using the minimal required, such as the shallowest of scoops. Culverts will be used only where absolutely required to cross existing watercourses. (See the Figure 18 Roads across peatland \*Inverted stump or lattice brash method" and "Geotextile membrane protection method" cross-sections in Appendix 1).  The proposed roadlines will be surveyed by the Environment Ranger prior to the commencement of construction and felling operations. The Environment Forester will provide further guidance on these operations where required - for example, guidance on the timing of operations to minimise the effect on Black Grouse and owl nesting and Golden activity. It should be noted that there are no known active Golden eagle nests which impact Drimnatorran Forest.  All road lines and the forwarder track lie outwith areas of Ancient woodland, Long Established woodland and Roy woodland mapping. The roading in Phemies' Wood and Longrigg avoid known raptor nests and badger setts.  Water crossing points will not require bridge construction. All new culverts will comply with the FLS "Culvert Design Guide". Culverts will be planned to cope with a one-in-50 year flood. This will be based on the latest guidance from SEPA and gathering data on a given catchment.  The road/ forwarder track construction works will comply with the UK Forestry Standard 2017, in particular sections: 6.6 - Forests and Soils and 6.7 - Forests and Water. |

|  |  |
| --- | --- |
| Sensitive Areas | |
| Please indicate if any of the proposed forestry project is within a sensitive area. Choose the sensitive area from the drop down below and give the area of the proposal within it. | |
| Sensitive Area | Area |
|  | 3.5ha |
|  | 1.06ha |
|  |  |
|  |  |
|  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Property Details | | | |
| Property Name: | Drimnatorran Forest | | |
| Business Reference Number: | 030/519/204 | Main Location Code: |  |
| Grid Reference: (e.g. NH 234 567) | NM 831 628 | Nearest town or locality: | Strontian |
| Local Authority: | | Highland | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Owner’s Details | | | | | | |
| Title: | Ms | | Forename: | Christina | | |
| Surname: | Tracey | | | | | |
| Organisation: | Forestry and Land Scotland | | | Position: | Planning Manager | |
| Primary Contact Number: | | 07767251380 | | Alternative Contact Number: | | 0131 370 5530 |
| Email: | christina.tracey@forestryandland.gov.scot | | | | | |
| Address: | FLS West Region, Torlundy Office, Fort William, Inverness-shire. | | | | | |
|  | | | | | | |
| Postcode: | PH33 6SW | | | Country: | Scotland | |
| Is this the correspondence address? | | | |  | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Agent’s Details | | | | | | |
| Title: |  | | Forename: |  | | |
| Surname: |  | | | | | |
| Organisation: |  | | | Position: |  | |
| Primary Contact Number: | |  | | Alternative Contact Number: | |  |
| Email: |  | | | | | |
| Address: |  | | | | | |
|  | | | | | | |
| Postcode: |  | | | Country: |  | |
| Is this the correspondence address? | | | |  | | |

|  |  |
| --- | --- |
| Office Use Only | |
| GLS Ref number: |  |

#### 1.3.1.2 – Diagram of roads across peatland Appendix 1



#### 1.3.1.3 – FLS Roads Specification Appendix 2

#### **FORESTRY COMMISSION ROAD SPECIFICATION WITH REFERENCE TO THE DfT HIGHWAYS AGENCY DESIGN MANUAL FOR ROADS AND BRIDGES (DMRB) AND MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS (MCHW)**

This specification is the standard for forest roads built by outside parties on FLS land. Any

reduction in this standard is to have the FC Engineer’s written approval before construction

starts. Road survey and design should also have taken place before felling takes place.

Design speed:

25 km/h.

Design loading:

Full C&U (currently 44 tonnes).

Road Width:

3.4 m running width (+/- 200 mm) - widened on inside of bends to suit radius (see table page 3).

Road alignment:

Roads shall fit into the landscape and be constructed to a uniform horizontal and longitudinal profile. They shall avoid unstable ground and any features that require preserving.

Felled width:

25 m average recommended.

Max gradient:

<8% in general to be preferred, but gradients up to 10% acceptable. Small lengths (<200m) up to 12.5% may be permitted provided that they are contained within an overall gradient of 10%. For restrictions on gradient on bends, see table.

Min gradient:

2% except over short sections on crests and sags. (This is an important requirement.)

Passing places:

20m long and at least 3m wide with 10m splays. Spaced to be inter-visible with a maximum spacing to be agreed.

Bridge approaches:

Minimum approach straight is 20m.

Turning places:

Turning “T’s” to be 26m in overall length (i.e. from far edge of road to end of ‘T’), 4m wide with 11m radii.

Harvesting Facilities:

Ramps and stacking areas supplied as required.

For guidance: ramps provided every 40m; stacking areas 30m by 3m provided every 200m. Surfaced where there is a risk of erosion.

Earthworks:

Earthworks will be undertaken in accordance with Clauses 601 & 602 of the MCHW. Unsuitable materials to be stripped and removed. The formation shall be shaped to keep it free of standing water. Minimise disturbance of peaty soils to retain the stored carbon.

Cuttings:

Cutting slopes must be stable and free of overhangs and loose rock. The maximum slope to be 30% for slopes up to 2m high.

For slopes more than 2 m high, the maximum slope to be 1 in 2 (50%) for fine grained soils, 1 in 1½ (67%) for other soils, and 1 in 1 for rock slopes.

Embankments:

Unless agreed beforehand, the fill material to be free draining and non-cohesive, placed in layers and effectively compacted in accordance with Clause 612 of the MCHW. Slopes as for cuttings.

Roadside drains & ditches:

A roadside ditch shall be provided on the uphill side of a road and on both sides where the road formation is at or below the adjacent ground. Drains shall have a depth of not less than 150 mm below the formation edge and a longitudinal gradient of not less than 2%. Ditches and drains shall not lead directly into watercourses. Filters will be provided in and adjacent to the drains and culverts to avoid pollution and sedimentation of watercourses. Drains can help in temporary storage of flood water.

Culverts:

All pipes shall be to Clause 501 of the MCHW - excavated in accordance with Clause 502; bedded, laid and surrounded in accordance with Clause 503; and backfilled in accordance with

Clause 505. Laid in natural ground or in bed of original watercourse where applicable. Aim for bed continuum, for flora and fauna. Minimum size 300 mm although 450 mm preferred.

Inlets to be provided with erosion protection. Outfalls should be so constructed as to eliminate possible erosion. Ditch relief culverts should be spaced as required with a maximum spacing of 200m. Where appropriate, culverts to be designed for 1 in 50 year storm. Where the diameter is greater than 1.2 m, the culvert to be designed for 1 in 100 year storm. Bridges are preferred, including for flora and fauna riparian zones.

Geosynthetics:

Used as necessary over silty clay and peat formations.

Road construction:

Capping layer of durable rock or road base to Clause 613 of MCHW to improve subgrade CBR to a minimum of 5%. Road metal Granular Sub-base Type 1 to Clause 803 and laid in accordance with Clause 801 of MCHW. Material for the running surface shall have a minimum Magnesium Sulphate Soundness Value of 85. Principal or arterial forest roads shall have a minimum compacted surfacing thickness of 100mm of hard wearing well bound continuously graded aggregate.

Road metal thickness:

Subgrade Min. Road Construction Depth

5% CBR 450 mm

7% CBR 325 mm

10% CBR 250 mm

>10% CBR To be agreed by FC Engineer, but 100mm minimum.

Cross slope (camber or crossfall):

The surface shall be cambered with 5% falls from the crown, or with a 5% crossfall sloping inwards on steep side slopes.

Water Guidelines:

UK Forestry Standard: Section 6.7 - Forests and Water

Account must also be taken of any requirements of SEPA.

Fuel spillage:

A written procedure to be in place prior to work start.

Signs:

The site to be adequately signed.

Blasting:

Excavation of rock by blasting shall only be undertaken by suitably qualified personnel appointed in writing.

Quarrying:

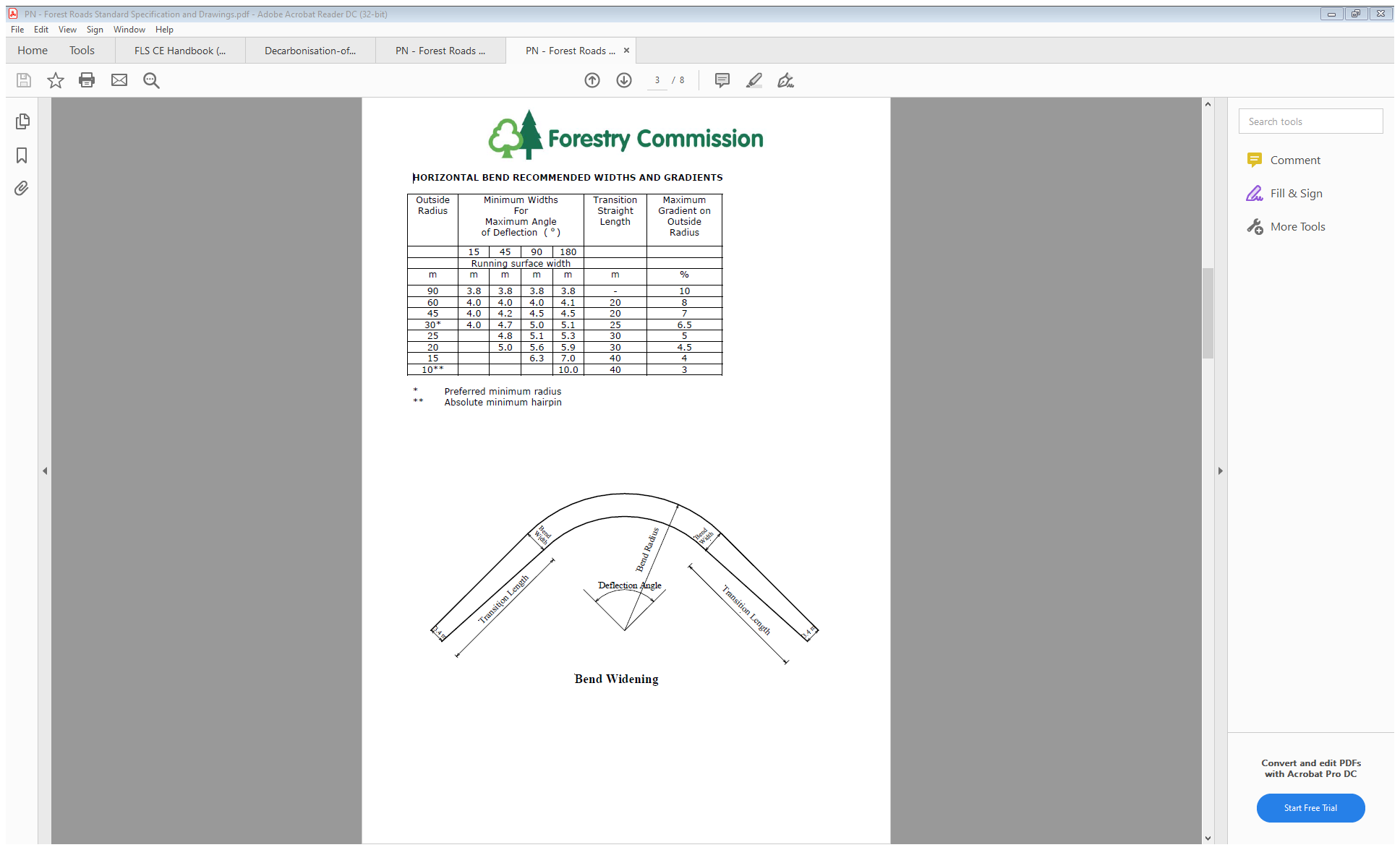
The method of working (and re-instatement where applicable) of borrow pits and quarries must be in accordance with the *Quarries* *Regulations 1999,* and approved by the Forestry and Land Scotland.

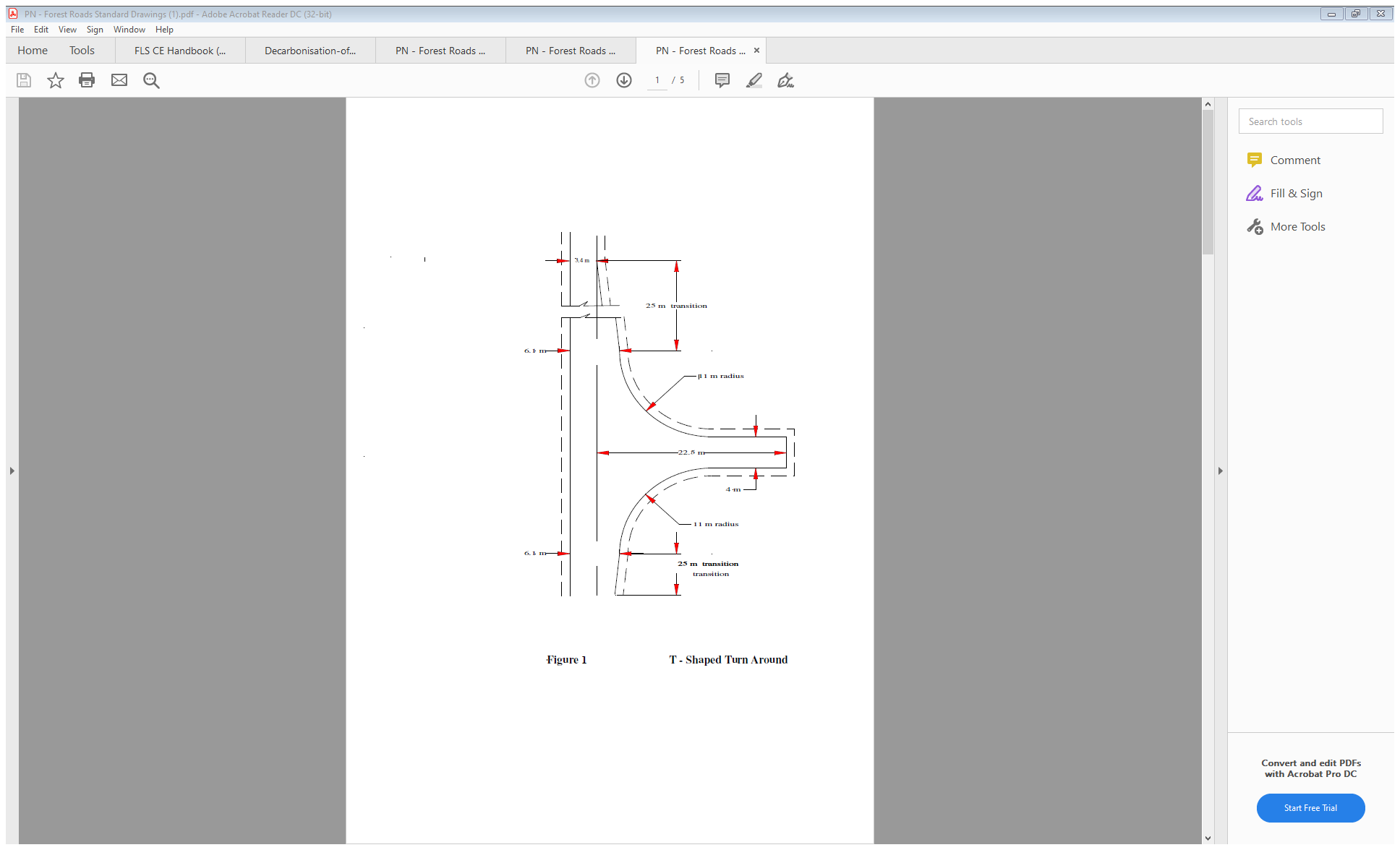
Horizontal bend recommended widths and gradients:

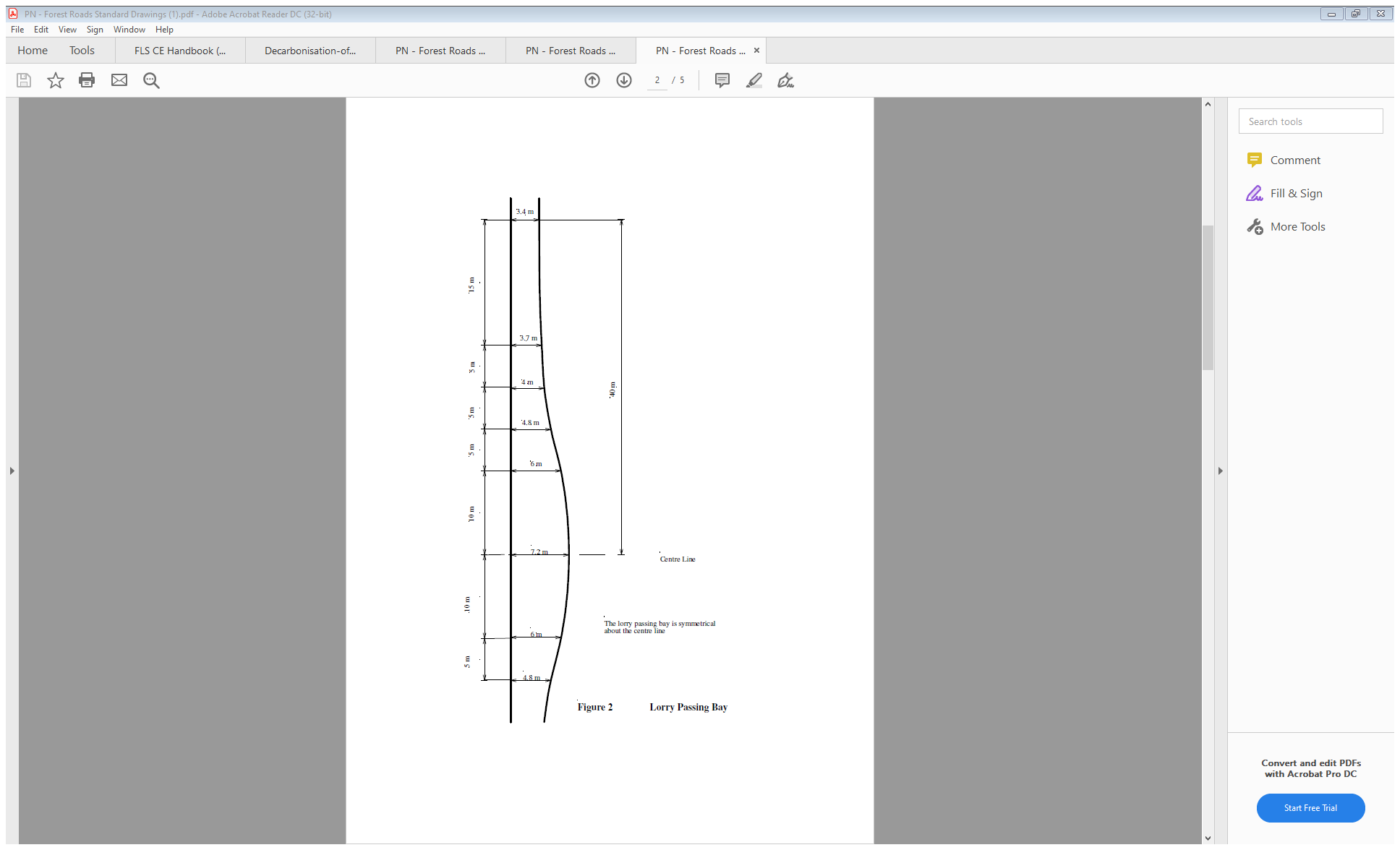
| Outside radius | Minimum widths for maximum angle of deflection (\*). Running surface width detailed in main section of the table. | | | | Transition straight length | Maximum gradient on outside radius |
| --- | --- | --- | --- | --- | --- | --- |
|  | 15° | 45ˋ | 90̀ˋ | 180° |  |  |
| m | m | m | m | m | m | % |
| 90 | 3.8 | 3.8 | 3.8 | 3.8 | - | 10 |
| 60 | 4.0 | 4.0 | 4.0 | 4.1 | 20 | 8 |
| 45 | 4.0 | 4.2 | 4.5 | 4.5 | 20 | 7 |
| 30\* | 4.0 | 4.7 | 5.0 | 5.1 | 25 | 6.5 |
| 25 |  | 4.8 | 5.1 | 5.3 | 30 | 5 |
| 20 |  | 5.0 | 5.6 | 5.9 | 30 | 4.5 |
| 15 |  |  | 6.3 | 7.0 | 40 | 4 |
| 10\*\* |  |  |  | 10.0 | 40 | 3 |

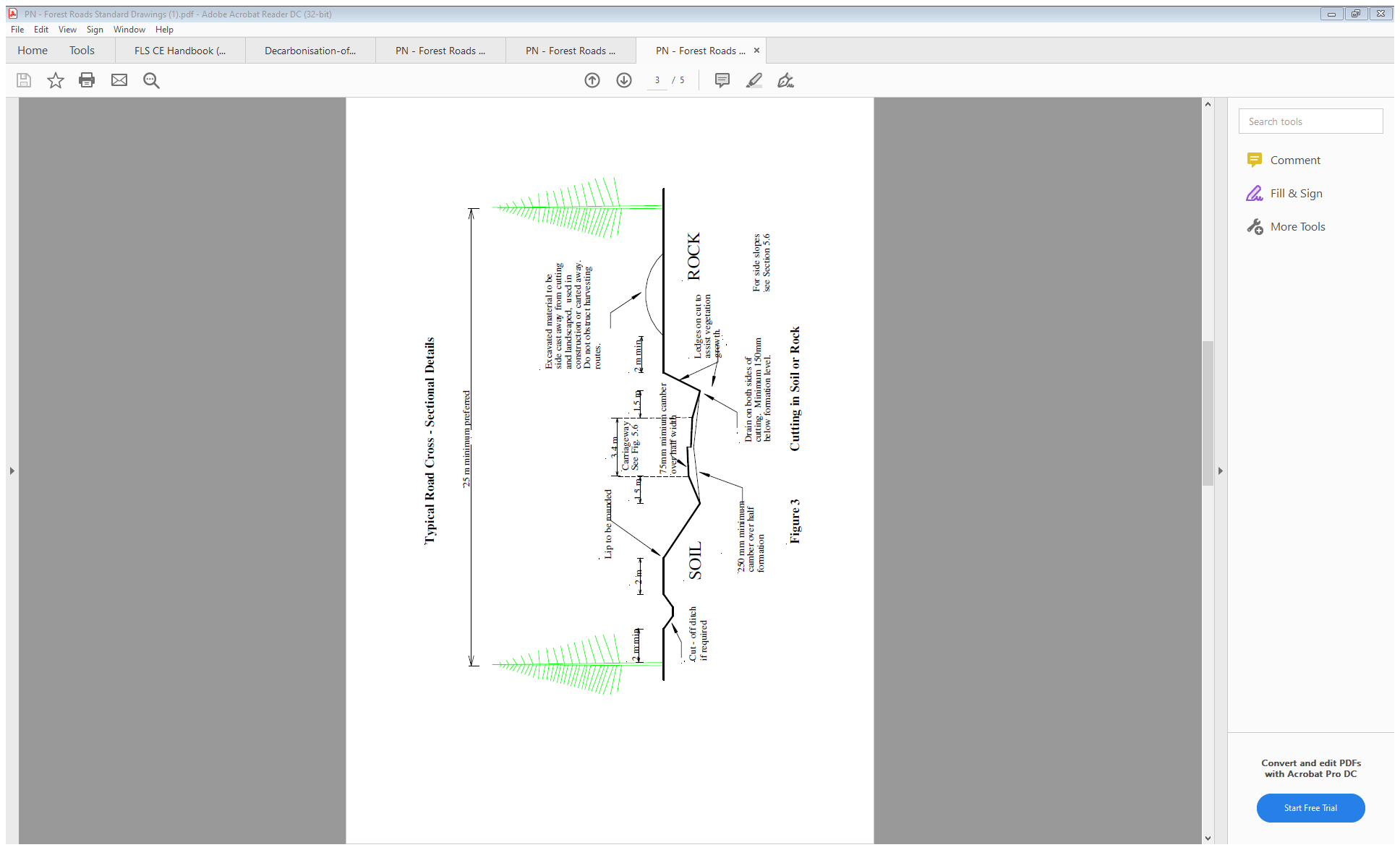
\* Preferred minimum radius

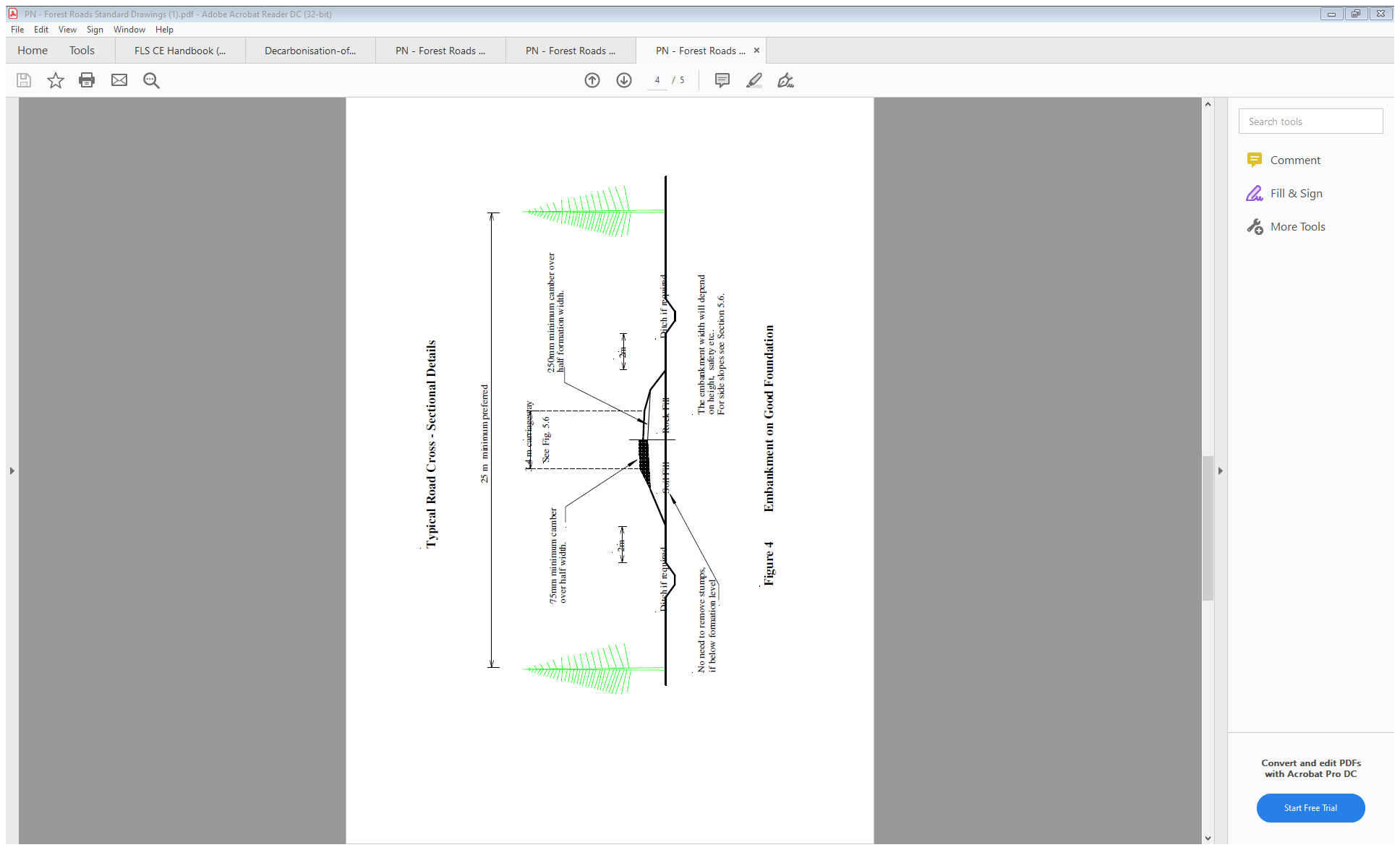
\*\* Absolute minimum hairpin

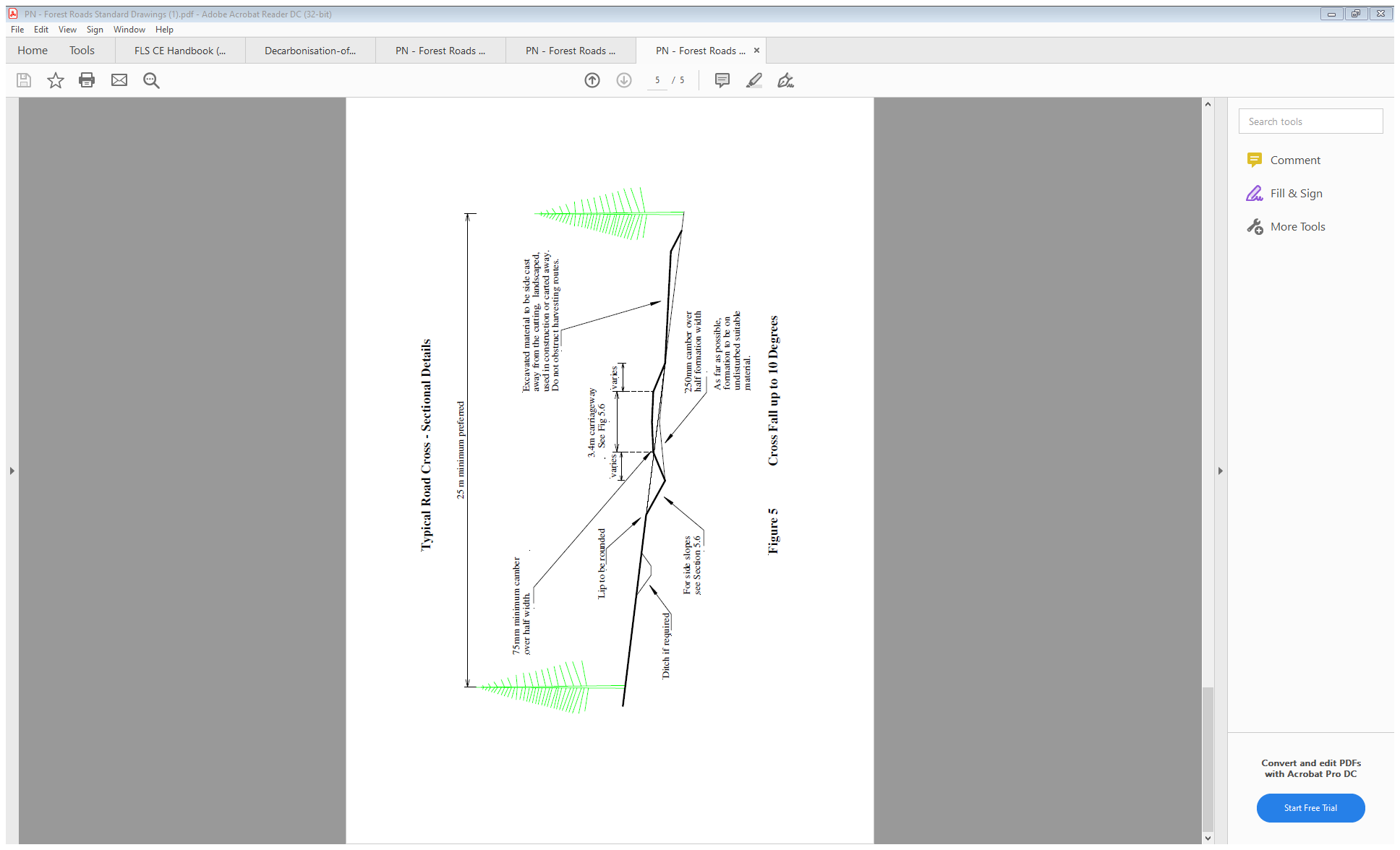












1.3.1.4 - FLS Forwarder Track Specification Appendix 3

Forwarder tracks can be constructed to support harvesting machines using methods that avoid damage to the soil & water environment. They should only be allowed on good solid ground. Other methods should be used on poor or unsuitable ground. All methods are to conform to UK Forestry Standard Guidelines. Junctions with forest roads are to be carefully arranged to avoid disrupting roadside drainage and structural integrity. Ramps & landings should be formed on up or down sides accordingly. Outline specification:

| Forwarder Track | Specification |
| --- | --- |
| Track width | 5m (+/- 500mm) - widened on inside of bends to suit radius. |
| Max gradient | 20% with small lengths (<100m) up to  30% with care to avoid excess erosion & instability. |
| Facilities | Ramps & landings up or down side of forest roads. |
| Track construction  depth | Track depth 300-900mm |
| Construction | Normally waterbound. Material as available. |
| Track drainage | Silt traps at all switch backs and bends. Regular bumps, on tracks drawing water off. Frequency of bumps dependant on gradient. Gradients over 15% bumps every 50m. |
| Culverts | Minimum size 300mm although 450mm preferred.  Spacing 25 to 10m intervals for adequate water control.  Frequency of culvert dictated by water features on site |
| Horizontal bend | Minimum 10m outside radius |

#### 1.3.1.5 – Forwarder Track 5 metre width cross-section Appendix 4



#### 1.3.2.1 – EIA Screening Opinion Request Form – New Planting

Please complete this form to find out if you need consent from Scottish Forestry, under the **Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017**, to carry out your proposed forestry project. Please refer to Schedule 2 Selection Criteria for Screening Forestry Projects under [Applying for an opinion](https://forestry.gov.scot/support-regulations/environmental-impact-assessment/applying-for-opinion). If you are not sure about what information to include on this form please contact your [local Conservancy office](https://forestry.gov.scot/about/structures/local-offices).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Proposed Work | | | | | | | |
| Please put a cross in the box to indicate the type of work you are proposing to carry out. Give the area in hectares and where appropriate the percentage of conifers and broadleaves | | | | | | | |
| Proposed Work | select | Area in hectares | % Conifer | % Broad-leaves | Proposed work | select | Area in hectares |
| Afforestation |  | 25.98 | 37 | 63 | Forest roads |  |  |
| Deforestation |  |  |  |  | Forest quarry |  |  |
| Location of work | | Drimnatorran Forest, Strontian | | | | | |

|  |
| --- |
| Description of Forestry Project and Location |
| Provide details of the forestry project (size, design, use of natural resources such as soil, and the cumulative effect if relevant).  Please attach map(s) showing the boundary of the proposed work and other known details. |
| Coupe 84051A: 6.92ha - commercial conifer to link with commercial conifer site to the west  10% OG; 40% SS; 40% ALP; 10% SP; under 10% PBI - planted at 2500/ha  Coupe 84051B: 4.6ha - native woodland habitat to become an open crowned woodland  30% OG; 50% SP; 10% PBI; 10% ASP; under 10% ROW - planted at 1600/ha  Coupe 84051C: 3.99ha - native woodland habitat to become an open crowned woodland  30% OG; 60% SP; 10% ASP, under 10% ROW - planted at 1600/ha.  Coupe 84051D: 0.51ha - native woodland habitat  60% OG; 30% PBI; 10% ROW - planted at 1600/ha  Coupe 84064A - 9.96ha - native woodland habitat  20% OG; 40% Birches; 20% SP; 10% SOK; 10% NMB - mix of NR & planting at 1600/ha  All native woodland habitats will be planted at variable spacing with density decreasing as elevation increases. They are the transition areas between woodland and open areas. |

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| --- |
| Provide details on the existing land use and the environmental sensitivity of the area that is likely to be affected by the forestry project. |
| The current land use in all new plant areas is non-priority open habitat.  Small watercourses affect some areas. These watercourses eventually feed into the marine features of the Sunart SSSI/SAC designation. Around 16ha of the new plant area lies within the Moidart and Ardgour SPA designation, albeit lying close to infrastructure and settlements.  The vicinity of the powerline in Coupe 84064A is also affected by some heritage features, including a bloomery, cultivation terrace and a lade.  The local Community woodland lies to the West of Coupe 84064A. It is designated as a "Long Established Woodland". |

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| Description of Likely Significant Effects |
| Provide details on any likely significant effects that the project will have on the environment (resulting from the project itself or the use of natural resources) and the extent of the information available to assist you with this assessment. |
| Disturbance of Golden eagle in the SPA area, disturbance of Black grouse in the vicinity of th Fairies' knoll, disturbance to otter within 50 metres of watercourses. |

|  |
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| Include details of any consultees or stakeholders that you have contacted in order to make this assessment. Please include any relevant correspondence you have received from them. |
| None |

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| --- |
| Mitigation of Likely Significant Effects |
| If you believe there are likely significant effects that the project will have on the environment, provide information on the opportunities you have taken to mitigate these effects. |
| There is likely to be very little negative impact resulting from these proposals. There is unlikely to be any ground preparation - so noise disturbance affecting Golden eagle and Black grouse will be limited and watercourses unaffected by the risk of pollution; native broadleaf species will be established in riparian areas to add further resilience to water and soils in the locality and a natural transition between heavily wooded areas and adjacent open ground will be created in a manner sympathetic to the landscape.  The creation of native habitats will further strengthen the biodiversity connectivity in this locality, both within and outwith the FLS land.  Prior to planting, the FLS Environment team will assess the sites for protected species and heritage features. Their observations and guidance will be followed by FLS staff and contractors. This may include specific timings of the operations, buffer zones around heritage features etc. |

|  |  |
| --- | --- |
| Sensitive Areas | |
| Please indicate if any of the proposed forestry project is within a sensitive area. Choose the sensitive area from the drop down below and give the area of the proposal within it. | |
| Sensitive Area | Area |
|  | 16.0 |
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| Property Details | | | |
| Property Name: | Drimnatorran Forest | | |
| Business Reference Number: | 030/519/204 | Main Location Code: |  |
| Grid Reference: (e.g. NH 234 567) | NM 831 628 | Nearest town or locality: | Strontian |
| Local Authority: | | Highland | |

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| --- | --- | --- | --- | --- | --- | --- |
| Owner’s Details | | | | | | |
| Title: | Ms | | Forename: | Christina | | |
| Surname: | Tracey | | | | | |
| Organisation: | Forestry and Land Scotland | | | Position: | Planning Manager | |
| Primary Contact Number: | | 07767251380 | | Alternative Contact Number: | | 0131 370 5530 |
| Email: | christina.tracey@forestryandland.gov.scot | | | | | |
| Address: | FLS West Region, Torlundy Office, Fort William, Inverness-shire. | | | | | |
|  | | | | | | |
| Postcode: | PH33 6SW | | | Country: | Scotland | |
| Is this the correspondence address? | | | |  | | |

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| --- | --- | --- | --- | --- | --- | --- |
| Agent’s Details | | | | | | |
| Title: |  | | Forename: |  | | |
| Surname: |  | | | | | |
| Organisation: |  | | | Position: |  | |
| Primary Contact Number: | |  | | Alternative Contact Number: | |  |
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| Postcode: |  | | | Country: |  | |
| Is this the correspondence address? | | | |  | | |

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| Office Use Only | |
| GLS Ref number: |  |

#### 1.3.2.2 – New Planting map



#### 1.3.3.1 – EIA Screening Opinion Request Form – Deforestation (peatland restoration)

Refer to Appendix VIII – Peatland appendices for details

Please complete this form to find out if you need consent from Scottish Forestry, under the **Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017**, to carry out your proposed forestry project. Please refer to Schedule 2 Selection Criteria for Screening Forestry Projects under [Applying for an opinion](https://forestry.gov.scot/support-regulations/environmental-impact-assessment/applying-for-opinion). If you are not sure about what information to include on this form please contact your [local Conservancy office](https://forestry.gov.scot/about/structures/local-offices).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Proposed Work | | | | | | | |
| Please put a cross in the box to indicate the type of work you are proposing to carry out. Give the area in hectares and where appropriate the percentage of conifers and broadleaves | | | | | | | |
| Proposed Work | select | Area in hectares | % Conifer | % Broad-leaves | Proposed work | select | Area in hectares |
| Afforestation |  |  |  |  | Forest roads |  |  |
| Deforestation |  | 70.77 | 100 | 0 | Forest quarry |  |  |
| Location of work | | Drimnatorran Forest | | | | | |

|  |
| --- |
| Description of Forestry Project and Location |
| Provide details of the forestry project (size, design, use of natural resources such as soil, and the cumulative effect if relevant).  Please attach map(s) showing the boundary of the proposed work and other known details. |
| Use this form in consultation with the "Peatland Appendices" within the LMP, which includes the types of restoration methods, maps and sites details.  Ariundle plateau:  Coupe 84006 - total peatland restoration area is 3ha, of which 1.5ha is forest-to-bog.  Soils comprise of peat types: 9b, 9c, 10b  Strontian river floodplain:  Coupe 84025 - total peatland restoration area is 19.66ha, of which 5.51ha is forest-to-bog.  Soils comprise of peat types: 9a, 9b, 9c  Carnoch Summit:  Coupe 84034 - total peatland restoration area is 65.42ha, of which 37.1ha is forest-to-bog  Soils comprise of peat types: 9b, 9c, 9d, 11b, 11c, 14.  Longrigg:  Coupe 84068 - total peatland restoration area is 27.86ha, of which 26.66ha is forest-to-bog  Soils comprise of peat type: 11b.  All the above peatland restoration areas link with adjacent peatland habitats. |

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| Provide details on the existing land use and the environmental sensitivity of the area that is likely to be affected by the forestry project. |
| The existing land use on the areas for deforestation is commercial (but very poor growth around YC 6), conifer production. |

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| Description of Likely Significant Effects |
| Provide details on any likely significant effects that the project will have on the environment (resulting from the project itself or the use of natural resources) and the extent of the information available to assist you with this assessment. |
| Negative impacts:  Organic material and machine pollution entering watercourses affecting salmonid habitat and drinking water quality.  Also noise and physical disturbance to nesting/lekking Black grouse and hunting Golden eagle.  Positive impacts:  Reduced risk of flooding downstream through the creation of water holding areas.  Reinstating the peatland priority habitat and increasing carbon in soils in Drimnatorran Forest.  Improved water quality resulting in added resilience for the salmonid habitat and drinking water quality by reducing the run-off from the exposed peat and degraded peatland.  Improved biodiversity connectivity between native/natural habitats, and improved riparian habitats within the Drimnatorran Forest area.  Improved habitats for Black grouse and hunting Golden eagle. |

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| --- |
| Include details of any consultees or stakeholders that you have contacted in order to make this assessment. Please include any relevant correspondence you have received from them. |
| FLS National Peatland team |

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| Mitigation of Likely Significant Effects |
| If you believe there are likely significant effects that the project will have on the environment, provide information on the opportunities you have taken to mitigate these effects. |
| The restoration of the peatland is in line with Scottish Government objectives and FLS objectives.  The peatland restoration operations will comply with the UK Forestry Standard 2017, in particular Sections: 6.6 - Forests and Soils, and 6.7 - Forests and Water. This includes SEPA General Binding Rules.  Prior to operations commencing the FLS Environment team will assess the sites for protected or breeding species (such as otter, Golden eagle, other raptors etc), and for heritage features. They will provide guidance which must be followed by FLS staff and contractors. These measures can include: restricting the timing of operations and stipulating protective buffer zones. |

|  |  |
| --- | --- |
| Sensitive Areas | |
| Please indicate if any of the proposed forestry project is within a sensitive area. Choose the sensitive area from the drop down below and give the area of the proposal within it. | |
| Sensitive Area | Area |
|  | 70.77 |
|  | 32.3 |
|  |  |
|  |  |
|  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Property Details | | | |
| Property Name: | Drimnatorran Forest | | |
| Business Reference Number: | 030/519/204 | Main Location Code: |  |
| Grid Reference: (e.g. NH 234 567) | NM 831 628 | Nearest town or locality: | Strontian |
| Local Authority: | | Highland | |

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| --- | --- | --- | --- | --- | --- | --- |
| Owner’s Details | | | | | | |
| Title: | Ms | | Forename: | Christina | | |
| Surname: | Tracey | | | | | |
| Organisation: | Forestry and Land Scotland | | | Position: | Planning Manager | |
| Primary Contact Number: | | 07767251380 | | Alternative Contact Number: | | 0131 370 5530 |
| Email: | christina.tracey@forestryandland.gov.scot | | | | | |
| Address: | FLS West Region, Torlundy Office, Fort William, Inverness-shire. | | | | | |
|  | | | | | | |
| Postcode: | PH33 6SW | | | Country: | Scotland | |
| Is this the correspondence address? | | | |  | | |

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| Agent’s Details | | | | | | |
| Title: |  | | Forename: |  | | |
| Surname: |  | | | | | |
| Organisation: |  | | | Position: |  | |
| Primary Contact Number: | |  | | Alternative Contact Number: | |  |
| Email: |  | | | | | |
| Address: |  | | | | | |
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| Postcode: |  | | | Country: |  | |
| Is this the correspondence address? | | | |  | | |

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| Office Use Only | |
| GLS Ref number: |  |

## 1.4 Other Regulations

### 1.4.1 Standards and guidance

This land management plan has been produced in accordance with a range of government and industry standards and guidance as well as recent research outputs. A full list of these standards and guidance can be found here:

<https://scotland.forestry.gov.uk/managing/plans-and-strategies/land-management-plans/links>

### 1.4.2 Other Tree Felling in Exceptional Circumstances

FLS will normally seek to map and identify all planned tree felling in advance through the LMP process. However, there are some circumstances requiring small scale tree felling where this may not be possible and where it may be impractical to apply for a separate felling permission due to the risks or impacts in delaying the felling.

Felling permission is therefore sought for the LMP approval period to cover the following circumstances.

* Individual trees, rows of trees or small groups of trees that are impacting on important infrastructure (as defined below\*), either because they are now encroaching on or have been destabilised or made unsafe by wind, physical damage or impeded drainage.

\* Infrastructure includes forest roads, footpaths, access (Vehicle, cycle, horse walking) routes, buildings, utilities, services and drains.

The maximum volume of felling in exceptional circumstances covered by this approval is **75** cubic metres per Land Management Plan per calendar year. A record of the volume felled in this way is detailed below and will be considered during the five year Land Management Plan review.

### 1.4.3 Table of Other Felling

| **Date** | **Coupe/Area** | **OS NGR** | **Volume** | **Comments** |
| --- | --- | --- | --- | --- |
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## 1.5 Tolerance Table

|  | Adjustment to felling coupe boundaries | Timing of restocking | Changes to species | Wind blow clearance | Changes to road lines |
| --- | --- | --- | --- | --- | --- |
| Scottish Forestry Approval not normally required (record and notify SF) | <10% of coupe size | Up to 5 planting seasons after felling  (allowing for fallow periods for Hylobius) | Change within species group  E.g. Scots pine to birch,  Non-native conifers e.g Sitka spruce to Douglas fir,  Non-native to native species (allowing for changes to facilitate Ancient Woodland policy) |  | Departures of up to 60m from the centre of the roadline |
| Approval by exchange of emails and maps | 10-15% of coupe size | 5 years + | Change of coupe objective likely to be consistent with current policy (e.g. from productive to open, open to native species). | Up to 5 ha | Departures of greater than 60m from the centre of the roadline |
| Approval by formal plan amendment may be required | > 15% of coupe size |  | Major change of objective likely to be contrary to policy,  E.g. native to non-native species, open to non-native | More than 5 ha | As above, depending on sensitivity |

## 

# 2 LMP ANALYSIS

## 2.1 Introduction

### 

| Key Issue/Feature | Sub issue/feature | Context of new LMP | Relevance to previous LMP |
| --- | --- | --- | --- |
| Resilience | Habitats | Manage felling, future species and open ground to maximise the opportunity to improve habitat for chequered skipper & pearl bordered fritillary butterflies, moths, dragonflies, black grouse, lichens and bryophytes. | Previous plan did not identify black grouse habitat and black grouse core area designation.  Previous FDP had good intentions, but lacked details on how to manage habitats |
|  | Tree species | P’ ramorum, Dothistroma, Chalara exist within the LMP area, or are in the vicinity. Phase the felling of healthy Larch to minimise the impact of disease in the future. Fell the diseased and dying Lodgepole pine crops of the plateau areas. Future species will match tree species to soil type. | These diseases have materialised since the compilation of the last FDP |
|  | Windthrow | Lack of windfirm edges. Plan establishment of permanent riparian woodland around all watercourses. These will be the future conifer windfirm edges. | Previous plan didn’t capitalise on use of riparian woodland to protect conifer crops. UKFS buffer widths increased since last LMP |
| Access | Ranger | Planned roading will gain access for rangers into the Ariundle plateau and parts of Eggadale east | No mention of ranger access, deer management or the negative impact that deer can have on the success of natural regeneration, restocking and priority habitats. |
|  | Harvesting | Many fell phase 1 & 2 coupes are isolated from the forest road network. This plan will prepare a contingency for the possible early removal of Larch from Eggadale east and Carnoch West | Previous plan timed some of these coupes for the next LMP |
|  | Haulage | 1960 metres of planned roads for fell phases 1 in Ariundle plateau. During the first half of the new LMP, 2700 metres of planned road will be constructed in readiness to access the early felling of Larch in the Southern part of Eggadale in the event of an outbreak of P’ ramorum. A further extension 1150 metres of planned roading into Eggadale East will take place early in the next LMP period/ | Previous LMP concentrated on fell areas adjacent to forest roads in South Carnoch and Ariundle. An access road 790 metres in length was constructed which reaches the Southern edge of Ariundle plateau. New access will be an extension of this roading. |
|  | Public | Erect barriers at all entrances to forest to prevent unauthorised access, especially in Carnoch. | Unauthorised public access was not addressed in the previous plan |
| Tree Felling | Awkward coupes | Fell phase 1 prioritises the small awkward coupe in cpt 8216, which is essential to complete the removal of non-native conifer species from the riparian area.  Difficult to access areas on the West side of Carnoch hill with open ground between each isolated block of woodland makes the extraction operations awkward.  Felling in Longrigg will commence in the new LMP period if the sale of the woodland to the local Community does not go ahead. | Felling in previous plan period left difficult to access, small isolated conifer stands in the riparian restoration area.  Longrigg was part of the Sunart plan at the time the previous plan was compiled. |
|  | Difficult sites | Fell Phases 1&2 will address small and isolated coupes within SSSI & Carnoch West. | Previous plan concentrated felling on the more straightforward sites |
|  | Economic | Felling as close to MMAI for Sitka spruce | Previous plan exceeded MMAI – usually in difficult sites. |
| Productivity | Heather | Sitka spruce is the dominant productive species aided by an intimate mix with pines | The issue of heather affecting productivity did not feature in previous LMP. |
|  | Soils | Soils are generally infertile, shallow often exposed and either wet or quite dry. Productive conifer species to be planted in mixtures with pines as a natural fertiliser.  Planting on deep peats will be limited to localised “peatland edge woodland” habitats | Previous plan did not consider depletion of soils over multiple crop rotations, nor did it analyse the structure and nature of the forest soils in Drimnatorran. |
|  | Terrain/DAMS | Parts of Eggadale East and Carnoch hill have steep slopes, some of which are prone to leaching. Elsewhere the slopes are gentle – moderate, especially on the plateau and floodplain areas.  The DAMS scores are mainly 15 – 17 – which is the transition scale from sheltered to exposed sites. Sheltered sites are mainly confined to Ariundle; the South part of Ariundle plateau; localised parts of Eggadale East; the Southern sloping parts of Longrigg; all of Phemie’s Wood and localised areas of Carnoch hill. The is a small area of high exposure on the summit of Carnoch hill.  This LMP limits commercial conifers to areas most likely to grow productive crops. | The previous plan did not consider the environmental factors which inhibit the growth of Sitka spruce on the summit of Carnoch hill and in Longrigg and Ariundle plateaus. |
|  | Conversion to native woodland | This plan proposes replacing SS crops of YC 2 – 8 with native woodland – primarily transition and peatland edge habitat. Supplementary plant the felled areas of Ariundle to achieve full stocking of native species.  The proposal for Eggadale east is for a working native woodland which would include an element of Scots pine. | The previous plan had proposed several blocks of Scots pine, two SS areas, an extension of Coille Dubh ancient woodland and almost 170ha of open ground with 10% Birch in Eggadale East |
|  | Future resilience | The use of ESC 2080, worst case climate scenario, for the soil types is the key to this plan’s future species proposals. The type 1, 2 and 3 soils were considered, as well as the overall SMR and SNR to a given soil. The optimum species were selected to maximise future resilience and production, whilst considering other important management objectives. | The previous plan made no mention of resilience in a changing climate. The issues around accelerated global warming was not as evident at the time of compiling the plan. |
| Environmental | Riparian Management | The final riparian restoration felling operations are programmed for the Fell phase 1 of the new LMP.  A mix of natural regeneration with supplementary planting to achieve a desire native mixture this riparian area.  Management of the restored bog to remove unwanted regenerating species. | The riparian restoration in Ariundle was planned, but not completed.  The change of objective to restore bog in part of the riparian restoration area was made since the previous plan was compiled |
|  | PAWS | PAWS – continuing with the conversion of 85% of the plantations on ancient woodland sites in this LMP will finalise the felling of the riparian restoration area in Ariundle.  Management to secure the establishment of the planted and naturally regenerating ancient woodland areas of Ariundle will be a priority in this LMP period.  The small areas of PAWS restoration in Eggadale East will be outwith this LMP period. | PAWS policy was in its infancy. The long term plan was to concentrate PAWS conversion in the riparian area of lower Ariundle. |
|  | SSSI/SAC designations | Remove the small leaved lime and Sitka spruce from the designated areas. Manage non-native regenerating seeding in from the adjacent NNR, which threatens the designated features | The restoration of the designated areas began in the old FDP. |
|  | Afforested deep peats | Poorly performing Lodgepole pine and Sitka spruce crops will be removed from the deep peats of Drimnatorran Forest during this plan period.  A programme of peatland/ forest-to-bog restoration on most of the deep peats will be completed by 2035 to ensure compliance with Scottish Government “Net Zero” targets will be achieved by 2045. | The previous plan made mention that deep peats can support a limited range of tree species. |
| Deer | Excessive population | Neighbouring stalking estates manage deer populations to be high for sporting return. These wild animals naturally seek refuge in this forest where they severely impact on naturally regenerating native woodland sites and young conifer plantations. There are 25.78ha, (minus the area of bog restoration), of naturally regenerating areas in Ariundle, which are still described as felled - 14.72ha exceed 5 years of age, with 5.93ha exceeding 10 years of age. Deer browsing levels are a little bit high in this area and thus impacts on the natural regeneration.  The strategic deer fence is at the end of its expected lifespan and is planned for total renewal during this LMP period. Planned roading in this LMP will greatly assist ranger access. | This plan did not identify the negative impact of deer pressure on priority habitats and establishing woodland. |
| Health & Safety | Steep ground | There are c10ha of commercial conifer species which lie in scattered blocks on the West side of Carnoch hill. The land here is quite steep in places. Extraction of timber is likely across the slope. Some of this area contains Larch which may have to be felled before its optimum growth has been reached. | N/A |
|  | Public road | The haulage of timber from the Longrigg block will need to travel along a public road which is very narrow and at times lined by houses on both side of the road.  The felling is planned for Phase 1 – the first five years of the plan. Harvesting operations can be managed at a constant but low level output to minimise the haulage on any given day.  A viable planned forest road into the south eastern end of forest block minimises the length of public road and neighbouring homes impacted by haulage. The combination of these measures will help to reduce the impact on this vulnerable public road. | The old FDP had planned for the felling of the entire Longrigg block in one fell coupe in 2027/28. This would involve the haulage of 87ha of mature conifer crop at one time. |

## 2.2 Plan Objectives

* Remove the poor condition and windblow Lodgepole pine and Phytophthora ramorum infected Larch in Ariundle plateau
* Restock the felled areas in Carnoch and secure oak wood restocking adjacent to NNR
* Discuss with NatureScot the future management of the Ariundle NNR
* Construct new roading in Ariundle plateau to enable harvesting operations
* Plan and commence access to Eggadale East
* Plan for, and accelerate the removal of Larch
* Restore damaged peatlands
* Renew the strategic deer fence
* Maintain existing network of recreational facilities, with visitor zone management and the renewal of signs and structures to reflect FLS and new contact details
* Secure the sale of Longrigg

### 

### 2.2.1 Key challenges

* Resilience in the face of climate change. Increasing the resilience of the woodland and the softwoods
* Poor growth of conifers on the high elevations of Eggadale and the issues of access to manage these areas
* Access to the woodland in Ariundle plateau and forest road access to the Eastern side of Eggadale Glen
* Rapid response to Statutory Plant Health Notice (SPHN) in areas with inaccessible Larch.
* Community relations. Harvesting operations in Ariundle and Longrigg impacting local communities and minor public roads.
* Removal of non-native conifers on deep peats and the restoration of bog or bog woodland
* Open/felled area below forest car park – should this be woodland?
* Water management for Upper Strontian in a drinking water catchment and salmonid habitat.
* Future thinning considerations. Steep ground is a challenge for mechanised operations.
* Deer pressure in Ariundle is a bit high for natural regeneration. Renewal of deer fencing post harvesting operations.
* Landscaping issues of commercial crop to the NW of Ariundle NNR – possible 200 metre wide native woodland buffer may be required

## 2.3 Analysis and concept

(See Map 12 – Analysis; Map 13 – Economic & Social Concept; Map 14 – Environmental Concept)

| **Objective** | **Opportunity** | **Constraint** | **Concept** |
| --- | --- | --- | --- |
| **Improve land-use resilience** | **Timber production.**  Sitka spruce is suited to many parts of the forested area. There are localised areas where soil depths and shelter suit a wider range of conifer species.  Improved growth rates of conifer crops will help to mitigate climate change through carbon sequestration by optimising forest management and from carbon storage in timber products.  **Soil management.**  Forest soils and peatlands store carbon. Appropriate forest and peatland management stabilises soils, improves soil fertility and carbon content.  **Water Quality Management**  Improve water quality and secure salmonid habitat, private and public water supplies  **Optimise land use**  Healthy environments are the most resilient to climate change. Threats to these environments and the optimum land use have been identified.  Conifer crops are most productive and profitable on deeper soils and adjacent to forest roads. Native woodland and open priority habitats can provide a continuous link from low lying habitats transitioning to peatland edge habitats.  **Enhance the resilience of priority habitats and priority species**  Future felling and restocking will provide opportunities to improve these habitats and create new permanent ones.  **Improve plant health**  Restructuring will provide the opportunity to address current plant health issues replacing vulnerable species with resilient crops and habitats for a future changing climate. | Localised areas of high DAMS scores, some very steep slopes, areas where soils are thin, wet, fertility is poor, vulnerable to erosion during weather events.  Issue of heather affecting the growth of spruces and firs.  Inaccessible locations – Longrigg, Eggadale East.  Even aged conifer crops affecting Longrigg, Ariundle plateau and Eggadale East  Blanket even aged Sitka spruce crops some of which are planted on very steep slopes with multiple mountain streams in an area of high rainfall, which once exposed by clearfell operations the soil could become susceptible to erosion  Current conifer crops lie within some riparian buffer areas. Water catchment in most of Drimnatorran Forest affects the salmonid breeding and feeding habitats of the Strontian river. All forest operations have the potential to negatively impact on this habitat.  The watershed of Eggadale Glen and Ariundle plateau is the watershed for the local public water supply  Two forest streams are the source of private water supplies for local properties at the foot of Carnoch hill.  Areas of poorly performing conifer crops in marginal environments.  Conifer crops within riparian buffers, designated Oak wood and ancient woodland sites.  Exotic invasive species in localised areas including conifer regeneration in the designated, PAWS and converted riparian management zone areas  Quite high levels of deer and deer damage, strategic deer fencing, inaccessible areas for deer control. Potential loss of future broadleaf habitats which will occupy half of the forested area and impact on other semi-natural habitats  Reduction in funding.  Even age monoculture conifer productive areas.  Conifer regeneration in broadleaf priority habitat and SSSI areas. Some mature oak swamped by conifer crops out with PAWS and SSSI areas  Effective management of the chequered skipper habitat and long term linkages between colonies  Lack of an appropriate woodland edge habitat around the Black Grouse lek.  Some known sightings of red squirrels in and around the LMP area.  Spread of P.- ‘ramorum, DNB and Chalara within the District. Changing climate threatens further spread of existing disease and improve conditions for the introduction and spread of new diseases. Some conifer crops are stressed due to poor, wet and infertile soils, elevation, exposure and the effects of heather check | Plant Sitka spruce (SS) as the main commercial species in an intimate mixture with Alaskan Lodgepole pine (ALP) or Scots pine (SP) to improve soil fertility and mycorrhizal benefits to combat heather check. This will also provide nutrition for 3rd rotation conifer crops.  Areas of poor conifer growth have been identified on upper slopes and areas of outcrops  Limit future conifer crops to areas with deeper soils, near forest roads.  Plan future conifer productive species according to soil types and location using ESC decision tool based on 2050 climate predictions to improve crop resilience.  Create future windfirm edges to minimise the risk of windblow in future crops.  Avoid creating large fell coupes which suddenly expose bare soil over a large expanse of steep ground.  Create a uneven age class future forest to lessen the impact of forest operations on soil in a given area.  Create riparian woodland, some of which will be combined due to the proximity of minor watercourses. These will act as permanent windfirm edges along the boundaries of many conifer coupes, as well as developing a natural means of stabilising streamside soils from erosion.  Design simple shaped fell coupes for easy felling and extraction to roadside to protect soil.  Avoid creating large fell coupes which suddenly expose bare soil over a large expanse of steep ground.  Create a uneven age class future forest to lessen the impact of forest operations on soil in a given area.  Create riparian woodland, some of which will be combined due to the proximity of minor watercourses. These will act as permanent windfirm edges along the boundaries of many conifer coupes, as well as developing a natural means of stabilising streamside soils from erosion.  Design simple shaped fell coupes for easy felling and extraction to roadside to protect soil.  Continue the riparian restoration which commenced during the last FDP. Ensure restock areas have riparian buffers which meet the UKFS 2017 – Forests and Water recommendations.  The establishment of riparian woodland around all watercourses will improve the quality of public and private water supplies.  The use of pine as a nurse species, in commercial conifer crops, replaces the need for fertiliser applications in an area of multiple watercourses and high run-off.  The conversion of commercial conifer land use in Eggadale Glen to a native working woodland with Scots pine will provide improved conditions for water quality, through extended riparian woodland and continuous cover management.  Replace Sitka spruce crops which are of YC 2 – 6 with transitional and peatland edge native woodland. This will also act as a transition habitat between the main forest and the native open upland bog and heathland habitats.  Establish permanent riparian woodland habitats along every watercourse.  Continue with the PAWS conversion from conifer production to native woodland on ancient woodland sites. Remove conifer regeneration from these sites.  Remove rhododendron from the land management area, and remove all exotic invasive tree species from the designated Oak woodland area.  Replace the ring fence of the main woodland block to exclude deer from the neighbouring estate land seeking refuge in the LMP area. This will help secure the establishment of designated woodland areas, conifer productive areas, PAWS conversion sites, the establishment of the riparian restoration area as well as conserving the upland.  Upgrade fencing in Longrigg and Phemie’s Wood after harvesting operations.  Planned roading will allow ranger access to previously inaccessible areas.  Set out an effective deer management plan for Drimnatorran, including the replacement and continual maintenance of strategic deer fencing, the upkeep and creation of ranger access tracks and effective culling.  Design fell areas to ensure the next rotation is more diverse and has a more uneven age class to maximise habitat variation.  Halo thin oaks from competing trees.  Ensure effective management of the chequered skipper habitat. Ensure areas of purple moor grass, (essential for egg laying and food source for caterpillars), along forest edges or under bog myrtle are not lost to rank bracken or conifer regeneration. Allow light deer grazing of open glades and keep these areas flower rich. Control bracken enough to maintain areas of flowering plants such as bluebell and bugle, whilst maintaining the habitat for the Pearl bordered fritillary. Maintain forest roadside to allow chequered skippers to fly between colonies.  Native woodland with juniper species which will replace poorly performing conifer woodland and some open ground on Carnoch hill can provide a habitat suitable for Black grouse.  Although it is not a major influence on woodland management, the planting of alternative conifers, where conditions suit, will provide a future food source for red squirrels. This should include the replacement of small leaved lime with some Hazel, Aspen and Sessile oak in the SSSI restock area.  Larches appear healthy at moment, although a known outbreak of P.-’ramorum occurred in 2019 in a forest in Glen Tarbert to the East of Drimnatorran. Lodgepole pine in the plateaus of Ariundle and Longrigg are affected by DNB, causing poor growth, dieback and death. To mitigate the impact of these diseases affecting the crops, remove Larch which is at, or has exceeded MMAI and plan roading for the removal of Larch in inaccessible locations in the event of a P.- ‘ramorum outbreak. Fell the small pockets of Larch, in the most inaccessible areas, to recycle.  Concentrate conifer production in the more sheltered accessible areas and in locations that are away from more sensitive land uses. Improve health and reduce stress of spruce species by planting in intimate mixture with Alaskan Lodgepole and Scots pines.  Plan the creation of windfirm edges of future crops which will provide localised shelter and will lessen the chances of stress caused by windblow. |
| **Address access, infrastructure and access issues** | Maturing conifer crops and the threat of P.-‘ramorum in Larch will justify the need to construct access for harvesting and haulage operations in difficult to reach forest locations  Restructuring will provide an opportunity to improve operational health and safety on difficult sites and sites adjacent to public roads  The LMP plan will provide the opportunity to review recreation facilities, plan for the removal of redundant structures. | Large areas of inaccessible mature conifer crops, some of which will require felling in the next 10 years.  Areas of maturing Larch crops, some of which, are located in quite inaccessible areas  Reduced budgets impacting on the maintenance of recreation facilities  Current quarry potential is quite limited  Removal of redundant fencing around the forested area, some of it is in difficult to access areas | Plan new roads to access fell phase 1 and 2 areas in Ariundle plateau and in Longrigg (if the sale of the block does not proceed). Commence construction of the planned road from Carnoch hill into Eggadale Glen South in readiness to react to an outbreak of P.-ramorum in Larch.  The Fairies’ Road path requires maintenance and some of the built structures will need replaced or removed altogether. Although this path lies within FLS ground, it is not promoted by FLS. It is categorised by Highland Council as a core path.  Maintenance of recreational facilities will be confined to the formal trails and car park.  Regional managers will need to decide on the future of redundant fencing in the LMP area. Feasibility studies may be required to explore the options and timescales for managing the removal of redundant fencing to meet UKWAS requirement 3.6.2. At minimum an assessment of the quantity of redundant deer fencing in the Drimnatorran LMP should be made, with identifications of challenges and constraints. |
| **Improve the appearance of the forest within the wider landscape** | Implementation of the fell and restock proposals will provide opportunities to improve the design of the forest adjacent to sensitive designated areas and improve the landscaping of the Western boundary of Ariundle plateau and Carnoch hill | Drimnatorran lies in an area which is viewed by much of the population of Ardnamurchan – impacting on the village of Strontian and the surrounding townships of Ardnastang, Longrigg, Scotstown and Anaheilt, as well as the residents from Carnoch to Liddesdale in Morvern.  This area is also a popular tourist destination and thus the visual impact from the A861, A884 and the minor public road from Scotstown to Polloch should be considered.  The adjacent Ariundle Oak wood NNR is iconic and of global importance. The Eastern edge of the conifer crops of parts of Ariundle plateau are visible above the NNR when viewed from the riverside sections of the Ariundle trail. | The proposed restocking of Ariundle plateau will utilise a mixture of land uses (commercial species, riparian woodland and open ground), to improve the visual appearance of the forest as viewed from Scotstown and the minor public road to Polloch.  The restocking will also include a protective native buffer, (which will include Scots pine and a small area of Norway spruce), of about 200 metres width between the commercial conifer crop and the adjacent Oak wood NNR. This buffer will also link with the FLS section of the SSSI/SAC designation. This will improve landscaping at a local level as well as providing a protective zone to minimise seeding of non-native species into designated areas. Most of these improvements are programmed to occur during this LMP period.  The restoration of peatland on the summit of Carnoch along with transition woodland on the summit of Eggadale East will improve the landscaping of the forest as viewed from the Scotstown to Polloch road and from the viewpoint from the A884 South of Liddesdale.  It has been decided that peatland restoration works will occur during the lifetime of this plan where access permits. This ensures that FLS is able to meet the 2035 timescale for most peatland restoration. This allows for a ten year period to halt carbon emissions from these peat areas to meet the Scottish Government’s “Net Zero” goal in 2045.  The restructuring and restocking of Eggadale East from commercial conifer crop to native working woodland with Scots pine will improve the visual appearance of Eggadale Glen, providing a balanced appearance compared to the splitting in two of separate forested land uses by the Strontian river. These are aspirational and will occur outwith this LMP period  The potential for some new native woodland on parts of Carnoch hill, as recommended in a habitat survey will be considered during this LMP period. This would help provide a visual link between the forest in SW Carnoch with the woodland in Eggadale East. Any woodland creation in this area would be sympathetic to the priority habitats that exist and to the folklore associated with Tom an t-Sithein its viewpoint. It will provide an opportunity to create healthy riparian habitats which look right in the landscape, especially when the improved restocking of the current bitty conifer blocks of SW Carnoch create a sense of visual linkage. |
| **Woodland expansion** | Available funding for woodland creation.  Available open ground on Carnoch hill  Recommendation to plant some areas determined as the management prescription in a habitat survey to combat acts of burning and to protect the adjacent open priority habitats  Provide a woodland habitat and visual link between Carnoch West and Eggadale Glen | Some local opposition to planting this open ground.  One private water supply watershed.  No infrastructure in place other than the Fairies’ Road path. Civil engineering infrastructure would be highly visible, contentious and very expensive.  Folklore associated with Tom an t-Sithein. The view from this location is also treasured by the local community. | Explore the possibilities to create new woodland using ESC 2080 worst case climate scenario predictions to identify potential locations. Consider the recommended management prescriptions detailed in the habitat survey.  Concentrate on new native woodland as available land is inaccessible for harvesting and civil engineering operations  The proposals consider the sensitivities of the location and ensure the access to, and the view from Tom an t-Sithein is maintained. The new native woodland which connects the current mixed conifer blocks will comprise of variably spaced trees which will eventually develop into open crowned woodland. This provides a transition habitat between woodland and open habitats in this locality.  This concept will also be applied to the open eastern edge of Carnoch providing a link between the FLS woodland and the neighbouring private woodland. This open crowned woodland habitat will become a permanent feature. |
| **Caring for the Historic Environment** | We will ensure positive conservation management at significant historic assets, undertaking scrub control, condition monitoring and archaeological recording where necessary. | We will undertake suitable work practices on operational sites with known historic assets (and those discovered during operations) | We will ensure that historic assets (both designated and undesignated), are included within our land management plans and are managed in line with the UK Forestry Standard. |

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# 3 LMP Proposals

## 3.1 Management

### 3.1.1 Clear Felling

#### (See Map 2 – Management Coupes & Map 8 – Approved 10 year Felling)

The fell coupes are planned to optimise the return and sustainability of the productive crop, whilst balancing production with other important objectives. The shape and size of the coupes accommodate harvesting methods that are appropriate for the site whilst setting the foundations for future windfirm coupes in a landscape which is often peppered with watercourses. The distribution and size of the coupes are planned to minimise the exposure and leaching of nutrients, on bare vulnerable soils in a wet and sometimes steep locality, which can negatively impact on watercourses.

In Ariundle plateau and Longrigg where the topography is generally more gently sloping and objectives include sizeable areas of native woodland and peatland restoration, fell coupes will be large in size. This will enable the possibility of continual but low levels of harvesting output over a long period which will help to reduce the impact and frequency of haulage on the vulnerable minor public roads and the communities of Ariundle, Anaheilt, Scotstown and Longrigg.

The clearfelling intended for the 10 year period of this LMP are determined in fell phases 1 and 2. Phase 1 felling will harvest trees where the main species element of the coupe has reached or gone beyond the maximum mean annual increment, (MMAI). This felling also prioritises the removal of diseased trees. This includes programming the removal of larch crops. In fell phase 1, 51% of the total Larch crop within Drimnatorran Forest will be harvested. No Larch is planned for felling in phase 2.

Phase 2 felling prioritises the removal of poorly performing commercial conifer crops on areas of deep peat. This felling enables the peatland restoration works to be completed by 2035, which in turn will meet the 2045 “Net Zero” target set by the Scottish Government. All the restored peatlands should be carbon sinks by this date, rather than carbon emitters. The opportunity to remove the difficult to access poorly performing conifers on the higher elevations of Eggadale east near the Coille Dhubh ancient woodland will likely occur at the same time as the felling on Carnoch summit. Access to upper Eggadale may have to follow the route of the fenceline from Carnoch summit.

The plan prepares for the early removal of fell phase 4 and 5 Larch in Eggadale in the event of an outbreak of Phytophthora ramorum, as currently this area is annexed from the forest road network. Civil engineers have already assessed the area and surveyed a viable roadline. A section of Phase 3 felling of Larch lies adjacent to the Carnoch road network. This can easily be felled at short notice in the event of an outbreak of Phytophthora ramorum. Some of the phase 1 and 2 fell coupes are currently not connected to forest roads. The planned road in Ariundle plateau has already been approved by Scottish Forestry under FPA-9713. Approval for the planned road in Longrigg, Phemies’ Wood and the forwarder track in West Carnoch will be required to facilitate harvesting and haulage operations.

The access to Longrigg is proving to be very problematic due the vulnerable state of the minor public road, the narrowness of the road combined with the proximity of buildings preventing any meaningful improvement works by Highland Council. However, a viable route has been identified by FLS, entering the forest at NM 8013 6167, ensuring only the initial 320 metres of the minor public road, (U1321), will be affected by timber haulage operations. This route matches the access route favoured by the local Community if they eventually purchase the Longrigg block.

### 3.1.2 Thinning

#### (See Map 9 - Thinning map)

Thinning will be concentrated in the low-lying and more sheltered conifer areas of Ariundle and Carnoch and in Phemie’s Wood, with amenity thinning around forest trails and forest roads, rights of way and neighbouring houses. This will help to maintain an attractive and safe environment for visitors to the forest, and will help to perpetuate the features of the policy woodland such as the species mixture, specimen trees, age class structure and the maintain the stability of the crop.

### 3.1.3 Low Impact Silvicultural Systems (LISS) / CCF/ min intervention

#### (See Map 2 – Management Coupes)

Phemies’ Wood will be managed under LISS (Low input Silvicultural Systems). This will form a range of interventions depending on objectives to be achieved. Primarily, such interventions will include health and safety management of trees close to trails, infrastructure and neighbouring properties. It will include environmental management of veteran trees, deadwood, bryophytes and lichens. Some amenity felling to maintain some viewpoints or other features of interest may also be required during the plan period. However, there may be a need to carry out group felling of Larch as part of the FLS Larch Strategy in managing the disease known as Phytophthora ramorum. Larch is particularly vulnerable to the spread of this disease both in succumbing to the disease and its part in acting as super host enabling large volumes of sporulation.

[Scottish Forestry - Phytophthora ramorum in Scotland](https://forestry.gov.scot/sustainable-forestry/tree-health/tree-pests-and-diseases/phytophthora-ramorum)

Minimum intervention of the native and designated woodland habitat will be limited to operations which protect veteran trees and priority species, as well as the manipulation of regeneration to achieve the desired species mix . This provides the opportunity to carry out low level environmental work such as the halo thinning of selected Oak to protect its crown, thinning to maintain optimum conditions for the bryophyte and lichen communities which thrive on the trees, removing non-native tree species and invasive non-native plant species to secure the ancient or native woodland habitat.

### 3.1.4 Natural Reserves (NR)

There are no natural reserves within the Drimnatorran LMP area. Through time the designated woodland will act as a native natural reserve.

### 3.1.5 Long Term Retentions (LTR)

There are no designated areas of long term retentions in Drimnatorran Forest. The mature structure of Phemies’ Wood ensures the existence of a variety of tree species which have exceeded their economic optimum. This area also provides excellent large diameter deadwood habitat, as well as an array of future veteran trees, some of which host ferns, lichens and bryophytes.

### 3.1.6 Resilience

RESTRUCTURING:

(See Map 10 – Approved 10 Year restocking & peatland restoration; Map 15 – Future Restock; Map 16 – Future Restock Pure & Mixtures; Map 17 – Future Habitats)

The main purpose of restructuring is to create truly multi-purpose forests meeting a wide range of objectives including enhancing landscape, biodiversity, productivity, community/recreational opportunities whilst protecting and improving the setting of heritage features and restoring priority habitats. Increased species and age class diversity also increases the resilience of the forest. Diversity of species, habitat and stand structure is a key aim of this plan to maximise resilience and optimise carbon management in a changing climate.

In Drimnatorran the FLS commitment to restore 85% of plantations on ancient woodland sites back to native woodland is ongoing. The riparian restoration which commenced in the previous FDP will continue in this LMP with the final phase of felling non-native conifer species in cpt 8216. The open space element in the riparian zone of the Strontian river is vitally important for the survival of the rare invertebrates. Ongoing management will ensure that these habitats will be maintained and improved.

Conifer production will be concentrated on the more productive soils, such as those found on the slopes of Carnoch, and in areas of low environmental value which are within easy reach of the forest road network (Ariundle plateau and Longrigg). Relatively even aged conifer crops will be restructured to provide a more uneven age structure, the most notable are for such change in this LMP will occur in the plateau areas of Ariundle and Longrigg.

The restructuring of Ariundle plateau, (and the Longrigg block if its sale falls through), conifer crops will commence early in this LMP period prioritising the harvesting of the windblown and diseased Lodgepole pine areas. By the end of the LMP period all of these areas will have been felled and most will have been established. Some of the areas expected to naturally regenerate may require up to ten years to establish.

Productive non-invasive conifer crops which are suited to the site conditions and which are resilient to a changing climate will be located in the south western section of Ariundle plateau. The use of Scots pine in variable mixtures with Norway spruce crops should provide a mycorrhizal benefit and thus, an improvement of soil fertility in this locality. The added advantages of the use of Scots pine is the improved growth expected where heather is an issue. A 200 metre wide native woodland buffer will be established between the conifer areas of Ariundle and the NNR. The aim of this buffer is to minimise the seeding of conifer species into the designated woodland areas.

As the felling and restocking progresses, riparian woodland will be created or expanded around all watercourses. This will improve water quality for the species that live downstream and protect the public and private water supplies.

In the long term it is proposed to convert the commercial conifer crops of Eggadale East to native woodland with Scots pine. This would be managed almost as continuous cover and would be appropriate to protect the soils and water in the watershed of the public water supply. It will also allow for conditions to establish which could encourage the expansion of native species from the designated areas of West side of the glen to the East side. Such an expansion would help secure the long term survival of rare species associated with the Atlantic rainforest Oakwoods.

The long term objective for the poorly performing spruce crops on Carnoch summit would be to convert them to peatland edge native woodland, and restore the peatland where soils depths permit. This would be a more appropriate land use for this location.

CLIMATE CHANGE:

Climate change models suggest that the general trend will be towards a significantly warmer climate with higher winter rainfall and lower rainfall in the summer leading to a partial soil moisture deficit during the summer months. In terms of the next rotation these figures have limited impact on species choice according to ESC models (Ecological Site Classification), and the short rotation of SS across much of the site further reduces the risk of climatic impacts. However this level of climatic change is likely to interact in the longer term with soil characteristics and this may have a positive impact on soil structure and widen the range of species potentially suitable for the site. There are also threats to the suitability of SS as a timber species if significant summer droughts become normal. This needs to be reviewed and our response agreed to climate change locally.

The future species were determined using the Forest Research ESC system for the 2080 worst case scenario predicted climate. The soils are very variable in the LMP area, even within a given soil type. These variations were also considered to determine the most suitable species for commercial, environmental and amenity management objectives.

The restoration of eroded peatland habitats and forest-to-bog restoration in the latter half of the plan forms part of the Scottish Government’s drive to restoring Scotland’s peatlands. Currently, much of the deep peats of Drimnatorran are carbon emitters due to damage and areas which were afforested. The removal of poorly performing “commercial” woodland crops will allow access to most of these damaged peatlands for restoration operations.

The peatlands of Ariundle, Eggadale and Carnoch lie within the “Public Drinking Water Catchment” and the salmonid habitat of the Strontian river. These peatlands, once restored, will further improve the quality and resilience of the local water supply and salmonid habitat.

[Restoring Scotland's Peatlands | NatureScot](https://www.nature.scot/professional-advice/land-and-sea-management/carbon-management/restoring-scotlands-peatlands)

TREE DISEASES AND PESTS

(See Map 7 – Civil Engineering)

An increase in the type and scale of tree diseases and pests is increasingly impacting on species choice and forest management.

The most serious disease currently in the region is *Phytophthora ramorum* in Larch and the only one subject to statutory plant health notices (SPHN). Larch is no longer a viable tree species for forestry on the west coast. An accelerated programme to remove the existing stands of larch is underway and it is no longer being planted. Larch is a component of fell phase 1 and 2 areas. Other areas of Larch lie close to the forest road network in Carnoch, however, there are some smaller awkward to reach blocks on the Western slopes of Carnoch where roading will be difficult to construct. This area is programmed for the felling in Phase 1 to remove non-native species. The most inaccessible area of Larch may need to be felled at a later date when it is big enough to accommodate Skyline extraction. Forwarder track construction is required for harvesting access and egress to the Carnoch forest road.

Areas of inaccessible Larch in the Southern part of Eggadale glen are not quite mature enough for harvesting, however, the construction of planned roading to access the Larch will commence early in the LMP period. This will ensure that FLS can respond quickly to the removal of this Larch in the event of an outbreak of P.-ramorum.

Dothistroma needle blight (DNB) affects pine species. Lodgepole pine stands are being monitored and the worse affected brought forward for harvesting. The harvesting of the windblown and diseased Lodgepole pine is being prioritised early in the LMP period. Only the Alaskan lodgepole pine has resistance and Scots pine can be planted as Drimnatorran Forest lies outwith Caledonian pinewood inventory sites. These species will be the nurse species to the spruce crops, and in the case of Scots pine, will be planted commercially in variable mixtures with Norway spruce and in mixture with native broadleaf.

Ash Dieback is working its way through the Region with the expectation that at least 90% of the ash will be lost. Pre-emptive felling of ash is not being undertaken in the hope of being able to identify some resistant trees.

Hylobius is a constant issue on young conifer replant sites. This threat is compounded with the Forest District’s preference to “hot plant” sites and beat-up in areas where vigorous weed growth or heather is problematic.

FIRE RESILIENCE:

Drimnatorran has a history of low – moderate risk of fire. Previous outbreaks of fire have been associated with Carnoch on the South facing slopes adjacent to a privately owned woodland and the open hill ground. The forest lies immediately adjacent to the village of Strontian and the townships of Scotstown, Anaheilt, Ardnastang and Longrigg - which are all well connected by trails, rights of way and public roads. This area is also a popular tourist destination. Much of the LMP area lies in close proximity to natural sources of water, such as Loch Sunart, the Rivers Strontian and Carnoch as well as multiple burns. However, with a changing climate increasing the chances of extreme weather events coupled with the freedom to roam as well as to wild camp, as per the Scottish Outdoor Access Code, the risk of wildfire could increase. The matrix below identifies the issues and analyses constraints, opportunities and threats from wildfire.

| Issue | Constraint | Opportunity | Threat |
| --- | --- | --- | --- |
| Wildfire risk to woodland | - prolonged restock establishment period  - increased tourism and the potential for wild camping/ camp fires  - Upland open habitats adjacent to forest  - open ground on Carnoch which lies adjacent to trails  - peaty areas with windblown and diseased Lodgepole pine crops | - increase deer control and march deer fencing  - reduce fell coupe size  - plant upland native transition and riparian woodland to act as permanent buffers between open habitats and open deer stalking ground as well as providing some permanent windfirm edges for conifer crops  - promote sustainable tourism  - erect barriers at all entrances to forest | - muirburning by neighbouring estates  - illegal camp fires |
| Health and Safety | - proximity of residential and holiday properties  - lack of mobile phone signal  - steep or inaccessible ground (Eggadale East)  - only pedestrian access via wooden bridges to Eggadale Glen East | - reliance on neighbours reporting fire  - convert upper slopes to native woodland  - over the long term create native broadleaf buffer woodlands adjacent to neighbouring property  - long term forest restructuring will create improved broadleaf riparian habitat in public and private water supply catchments | - risk to life and property from effects of fire  - risk to public water supply  - risk to PWS |
| Access for Fire and Rescue responders | - minor public roads are awkward for large vehicles  - access from the public road is limited to the Western and Southern extents of the LMP area  - large areas of productive conifer forest are devoid of roads | - provide forest barrier keys and/or codes to Fire and Rescue Service  - Maintain forest roads and verges on a regular basis and ensure there are adequate turning bays  - progress with planned roading programme early in the new LMP period  - sale of Longrigg | - loss of conifer production areas in Longrigg, Ariundle plateau and Eggadale East |
| Access to water | - No public water supplies or hydrants in Eggadale East, Ariundle plateau and Carnoch  - Eggadale East and Carnoch lie on quite steep ground well away from major watercourses | - progress with planned roading programme early in the new LMP period.  - prioritise the felling of windblown and Dothistroma affected Lodgepole pine in Ariundle plateau and Longrigg | - loss of upland conifer production areas |
| Wildfire risk to designated areas & priority species | - Main recreation areas lie within the most vulnerable habitats (including valuable deadwood), which are at high risk of fire during dry, warm and windy Spring and early Summer conditions | - focus on speedier establishment of natural regeneration sites free from invasive species  - consider the upgrade of information boards to promote responsible and sustainable recreation within internationally important habitats  - establish a protective native woodland buffer of up to 50 – 100 metres between the Ariundle conifer restock crops and the adjacent NNR | - irreparable damage to nationally and internationally important habitats and species |

Thicket stage conifer woodlands, restock broadleaf up to 10 years of age; post harvesting sites with stumps and harvesting residue; mature crops with high levels of dead trees land and forests near houses, paths and public roads; and woodland adjacent to seasonally tinder dry vegetation on open areas can pose a higher wildfire risk. In Drimnatorran there are numerous neighbours with a moderate level of visitors to the recreation sites. Wild camping is not as problematic as it is elsewhere in Lochaber FLS forests.

The main wildfire risk is likely to be associated with felled sites, the open hill ground on Carnoch and young conifer replant sites up to twenty years of age. Currently, there is over 51.46ha of felled/ naturally regenerating sites; 27.85ha of conifer restock areas up to twenty years of age and 13.94ha of broadleaf restock up to 10 years of age; around 100ha of open ground on NW Carnoch which is enveloped by woodland – thus, around 193.25ha of forested area which is of a higher wildfire risk. All these areas lie adjacent to or close to forest roads.

Secondary areas for wildfire risk lie within the windblown and dying Lodgepole pine stands in Ariundle plateau and Longrigg where there is an excess of deadwood. These areas will remain high risk as conifer felling and restocking takes place over the next ten years.

Protecting neighbours and neighbouring properties will be treated as priority, closely followed with areas of important biodiversity value within the Ariundle section of the woodland – the SSSI/SAC (61.5ha); Ariundle PAWS (29.22ha); recent bog restoration areas (20.34ha) and the adjacent SSSI/SAC/NNR (70.72ha)which is owned and managed by NatureScot. The SAC/SSSI woodland designation extends a further 31.94ha North-eastwards beyond NatureScot ownership.

The entire Eggadale Glen catchment lies within the Strontian public water catchment. Localised burns on Carnoch and one in Longrigg currently provide some private water supplies to neighbouring properties.

There are some windfirm edges in the mature even aged conifer crops. Phased felling will expose adjacent standing crops to the risk of windthrow as the restructuring of the forest continues. The long term goal of this plan is to convert some areas of conifer crop to various types of native woodland. This will remove poorly performing and some inaccessible conifer crops from the upper slopes and from riparian areas. There are some watercourses in parts of the forest area that future riparian woodland along with existing semi-mature broadleaf areas will act as the windfirm edge for some future conifer coupes.

FLOOD RISK

The sections of the Drimnatorran LMP area which lie within the Sunart and Moidart Potentially Vulnerable Area (01/26) are Longrigg and Phemie’s Wood. They lie within the Ardnamurchan coastal catchment.

<https://www2.sepa.org.uk/frmstrategies/pdf/pva/PVA_01_26_Full.pdf>

The Highland and Argyll Local Plan District flood risk management plan 2016 – 2022 categorises the Sunart and Moidart potentially vulnerable area (01/26) as low priority. There is no requirement for landowners and land managers in this area to carry out flood protection scheme works or natural flood management works to reduce flood risk.

<https://www.highland.gov.uk/downloads/file/16173/the_draft_highland_7_argyll_local_flood_risk_management_plan_lpd01>

The SEPA Flood Risk map outlines the likelihood of flooding in the following categories: coastal, river and surface water. Forestry operations within the Drimnatorran LMP area have no bearing on Coastal flooding. The river flooding risk is confined to the natural floodplain of the Strontian river and its tributaries with an exaggerated pooling of floodwater concentrated in the Anaheilt section of the river – downstream of the confluence of several streams.

Forestry operations in Ariundle plateau and Eggadale Glen could have a very minor impact on the river flood risk. However, the water holding capacity of the plateau area of Ariundle and of the Strontian river floodplain is likely to mitigate an increase of river flood risk. This is strengthened by the recent bog restoration operation in part of the Strontian river floodplain at Ariundle. Felling coupes will be limited in size to reduce the potential for rapid run-off of water from sites during storm events in the months following harvesting operations. Future flooding resilience will be further strengthened with establishment of riparian woodland around all watercourses and gullies.

Civil engineering work will ensure that: appropriate sized culverts will be installed at stream crossings on new roads; road gradients will be carefully planned to avoid the rapid run-off of water and roadside drainage will avoid directing water into watercourses.

http://map.sepa.org.uk/floodmap/map.htm

### 3.1.7 Operational Access

#### (See Map 7 – Civil Engineering and Map 18 – Approved 10 Year Felling & Haulage)

The South side of Carnoch hill and the lower sections of Ariundle are well served with forest roads. The Fell Phases 1&2 are mainly located in the plateau areas of Ariundle and Longrigg. Both of these areas are devoid of a forest roading network.

Thinning operations are required in Phemie’s Wood to manage health and safety, environmental features and plant health. There are currently no roads in this forest block.

The largest area of Larch lies in the Southern part of Eggadale Glen. This area is very remote from forest roads. Although felling is not planned in this location during this LMP period, roading must commence so that the premature felling, extraction and haulage of Larch in this location is made possible in the event of a P’-ramorum outbreak.

Timber Haulage within and outwith the forest area is set out in the following protocols:

[Timber-Transport-Forum-Road-Haulage-of-Round-Timber-5-Ed-Digital.pdf (timbertransportforum.org.uk)](https://timbertransportforum.org.uk/wp-content/uploads/2021/11/Timber-Transport-Forum-Road-Haulage-of-Round-Timber-5-Ed-Digital.pdf)

[TTF-Publication-2014-Tread-Softly-Low-Resolution.pdf (timbertransportforum.org.uk)](https://timbertransportforum.org.uk/wp-content/uploads/2021/11/TTF-Publication-2014-Tread-Softly-Low-Resolution.pdf)

[Managing-Timber-Transport-Good-Practice-Guide-2012.pdf (timbertransportforum.org.uk)](https://timbertransportforum.org.uk/wp-content/uploads/2022/03/Managing-Timber-Transport-Good-Practice-Guide-2012.pdf)

[Loading-timber-from-roadside-forests.pdf (timbertransportforum.org.uk)](https://timbertransportforum.org.uk/wp-content/uploads/2021/11/Loading-timber-from-roadside-forests.pdf)

[Consultation-and-Engagement-Guidance-Scotland-Revised-Final-Aug-19.pdf (timbertransportforum.org.uk)](https://timbertransportforum.org.uk/wp-content/uploads/2021/11/Consultation-and-Engagement-Guidance-Scotland-Revised-Final-Aug-19.pdf)

The primary “in forest” routes run through the Southern section of Ariundle and through the Southern and Eastern sections of Carnoch hill.

The following public roads are agreed haulage routes which require consultation with Highland Council and the local Community, (Timber Transport Forum):

A861 – Longrigg – Corran ferry and/or Kinlocheil

U1321 – Longrigg

C1188 – Anaheilt

U1317 – Scotstown (route towards Forest car park)

The design of the road will conform to both the Timber Transport Forum document “The design and use of the structural pavement of unsealed roads 2014” [The design and use of the structural pavement of unsealed roads](http://timbertransportforum.org.uk/attachments/article/12/TTF%20The%20design%20and%20use%20of%20the%20structural%20pavement%20of%20unsealed%20roads%202014.pdf)and SNH’s “Constructed tracks in the Scottish uplands – revised Sept 2015” [Constructed Tracks in the Scottish Uplands](https://www.nature.scot/sites/default/files/Publication%202015%20-%20Constructed%20tracks%20in%20the%20Scottish%20Uplands.pdf)

### 

## 3.2 Establishment

(See Map 10 – Approved 10 Year restocking & peatland restoration; Map 15 – Future Restock; Map 16 – Future Restock Pure & Mixtures; Map 17 – Future Habitats)

### 3.2.1 Restocking

There are many objectives for the forested areas of the LMP area. Conifer production will be concentrated in areas of deeper fertile soils such as those found in South Carnoch, and in areas where there are few biodiversity sensitivities such as the wet peatier plateaus of Ariundle and Longrigg. The isolated block of Longrigg is being offered for sale to the local community, and as of yet, it has not been confirmed. A restocking and peatland restoration plan has therefore been created in case the sale does not proceed.

Native woodland natural regeneration with supplementary planting of native species will occur in the areas which are rich in Oak woodland heritage in the Ariundle designated areas and Strontian river floodplain. Riparian woodland will be created around all watercourses and will meet the minimum buffer widths stated in the UK Forestry Standard – Section 6.7: Forests and Water.

In the better soils of the conifer production areas the nutrient and moisture regimes become more favourable for a wider range of alternative conifer species which could include: Norway Spruce (NS), Douglas Fir (DF), Noble Fir (NF), Scots Pine (SP), European Silver Fir (ESF) with other minor conifers such as Serbian Spruce (OMS) as small elements. Some of these species are already present on the site although the softer, diverse conifers are vulnerable to deer damage and to the effects of heather check.

Exposure, poor nutrient status and impeded drainage are factors limiting the choice of productive species at higher elevations, with Sitka Spruce (SS) being the only commercially viable species. On heather and more challenging sites SS & Lodgepole Pine (Alaskan) or Scots Pine mixtures can facilitate the establishment and growth of a productive SS crop.

In the years beyond this LMP period the species mixture in the East side of Eggadale Glen will gradually change from commercial conifer species to native species including Scots pine, much of which is intended to be of a working native woodland management in keeping with the heritage of valued industrial Oakwoods and wood pasture. Poorly performing Sitka spruce crops on deep peat soils on the summit of Carnoch hill will be replaced with restored peatland habitat, with some native species suited to peatland edge conditions and stocking densities. Riparian woodland will establish along watercourses and within gullies.

The continuous cover management of Phemie’s Wood will see very gradual changes to species through natural regeneration and planted stock to reflect its Policy Wood nature

The future species were determined by the use of the Forest Research’s ESC system utilising the 2080 worst case scenario climate prediction model. The species choice took account of the climate, exposure, soil nutrient regime and soil moisture regime for the majority of variations of each soil type. This should build in species resilience to combat and withstand a changing climate.

Conifers will be restocked to a minimum density of 2500/ha net plantable area. Broadleaves will be established through natural regeneration to achieve a minimum stocking density of 1600ha over a 5 to 10 year period, and 1600/ha if planted. Riparian and peatland edge woodland can be established at much lower stocking densities dictated by localised site conditions.

Cultivation methods in future rotations will be selected to aid the establishment of the trees which seek to balance minimising the amount of the soil disturbance and the need for herbicide treatment.

There is currently 4.86ha of felled ground in Ariundle with a further 25.68ha in South Carnoch. The Carnoch areas will be planted with commercial conifer species and the felled land around the restored bog area in Ariundle will be established through a mix of natural regeneration and planting to achieve the desired native species mix.

### 3.2.2 Woodland Creation

(See Map 11 – New Plant)

As part of the Scottish Government’s ambition to mitigate for, and adapt to, the effects of a changing climate, the viability for new native woodland creation will be assessed during the new LMP period. Localised sections of West Carnoch and East Carnoch have been identified for new planting during this plan period. The aim of much of this planting is to eventually create permanent native open crowned woodland habitat which connects areas of woodland and open habitat both within and outwith the LMP area. A small section of new plant will extend the existing commercial conifer land use.

### 3.2.3 Natural Regeneration

(See Map 10 – Approved 10 year restocking & peatland restoration)

Permanent native woodland habitats have been identified for expansion and/or establishment following felling operations. Typically these areas will include open space as well as native broadleaved woodland.

Natural Regeneration Survey of regeneration areas in this plan will be made at year 5 after felling to assess progress. If there is evidence of suitable nat regen and/or the potential for achieving full stocking by year 10 a request will be made to Conservancy to extend the time period for regeneration to occur. If this is not the case the area will be planted.

The natural regeneration of the felled areas in Ariundle was interrupted by the recent bog restoration operations in the Strontian river riparian area. As a result, the natural regeneration outwith the bog will take longer than originally anticipated. Some planting will be anticipated in order to achieve the desired native species mix.

### 3.2.4 PAWS restoration

There is around 52.5ha of ancient woodland designation in the Drimnatorran LMP area, of which, just over 4ha lies on conifer productive land. In recent years over 10ha of conifer plantation has been felled in the Ariundle ancient woodland and is currently establishing as planted native oak woodland. During the new LMP period the aim is to fell the final 2.5ha of conifer woodland in the PAWS section of the riparian restoration zone in Fell Phase 1. The felled areas will be allowed to naturally regenerate and will be assisted with supplementary planted if the need arises. This leaves just under 2ha of future PAWS restoration along the Western edge of Coillie Dubh in Eggadale East to be completed beyond this LMP period.

### 3.2.5 Riparian Management

(See Map 10 – Approved 10 Year restocking & peatland restoration; Map 15 – Future Restock and Map 16 – Future Restock pure and mixtures)

Natural regeneration of native woodland along the riparian corridors will help to alleviate flood risk by reducing the speed of run-off. In some cases supplementary planting will occur to ensure there is the desired species mix and stocking density to promote a healthy riparian habitat.

Riparian habitats will, as a minimum, conform to the sizes recommended in page 170 of the UK Forestry Standard, Section 6.7 – Forests and Water.

[Scottish Forestry - UK Forestry Standard](https://forestry.gov.scot/sustainable-forestry/ukfs-scotland)

There is the potential for natural regeneration of conifer species within the riparian corridor. Ideally this would all be removed but practically up to 15% conifer regeneration will be accepted in the corridor before intervention to remove it.

## 3.3 Open Land

(See Map 10 – Approved 10 Year restocking & peatland restoration and Map 16 – Future Restock pure & mixtures, and Appendix VIII - Peatland)

Integral open ground within the forest area delivers a significant part of the forest’s ecological value and occupies around 12% of the forested area.

Open habitats outwith the forested land occupies 34% of the LMP area. The main open areas are located on Carnoch hill, the plateau area of Eggadale East and the floodplain of the Strontian river. They include almost 300ha of priority habitats which includes: 50ha of fen/marsh/swamp; 60ha of blanket bog; 136ha of upland heathland and 50ha of bracken.

The open ground areas of the Strontian river floodplain will be managed as follows:

* ensure the successful restoration of the bog through the removal of regenerating tree species. Maintain pools for dragonfly habitat
* maintain purple moor grass habitats, including areas containing nectar producing plants to support the chequered skipper population and colonies. This would involve the removal of non-native tree species and encroaching bracken
* Low levels of regenerating Birch can be tolerated and can be coppiced to manipulate conditions for an ideal chequered skipper habitat.
* Maintain open space between colonies to assist the survival of the chequered skipper population. Regular roadside maintenance will assist.
* Maintain existing areas of bracken to support the Pearl Bordered Fritillary habitat by managing regenerating trees.
* Remove rhododendron

The open habitats of Carnoch hill and the plateau area of Eggadale East will be managed as follows:

* Deer browsing levels of open priority habitats to be maintained to levels which minimise damage.
* Remove regenerating conifer species from localised areas of blanket bog on Carnoch hill and from the area surrounding Coille Dubh.
* Monitor Carnoch hill for acts of vandalism which cause fire damage to the open habitat.
* Consider the recommendations of the habitat survey regarding the prospect of woodland creation some fen/marsh/ swamp and upland heathland habitats. These areas include a black grouse lek. Native woodland, (including Juniper), at varied stocking levels could improve the habitat for the black grouse.
* Remove rhododendron.

New open habitats will be created during this new plan period as a result of peatland restoration operations. Forest-to-bog restoration is planned to take place in the following areas:

Ariundle plateau – 1.5ha

Strontian River Floodplain (East) in Eggadale – 5.51ha

Carnoch summit – 37.1ha

Longrigg central – 26.66ha

## 3.4 Deer Management

### (See Appendix V - Deer Management Plan)

Drimnatorran LMP lies within the East Loch Shiel deer management group area. Longrigg and Phemie’s Wood lie within the North Sunart Woodland Group, with the main Drimnatorran block lying within the Western Sub-Group.

Effective deer control and deer protection will become crucial to secure the successful transition of conifer to native woodland (including the native flora) – in the short term in the designated and riparian restoration areas, and in the long term in Eggadale East and Carnoch summit. It is also crucial in the successful establishment of the commercial conifer areas.

The renewal of deer fencing around the main Drimnatorran block will take place in the first half of the LMP period. The strategic Sunart Ring Fence which affects Longrigg and Phemie’s Wood will be assessed for renewal post harvesting operations in Longrigg.

The construction of the planned roading will improve ranger access in Longrigg, Ariundle plateau, Carnoch and Eggadale South. ATV tracks which will be constructed to facilitate the establishment operations will further improve the access for the rangers. The routes of these tracks will be determined post harvesting operations.

## 3.5 Visitor Zones and Public Access

Visitor Zones have been identified in areas where FLS encourage and manage access or where the woodland managed by FLS interacts with popular visitor sites.

In these areas, single trees or small groups of trees will be removed when necessary to protect facilities, infrastructure and trails, or to enhance the setting of features, or to maintain existing views.

Woodland in these zones will also be thinned, or trees re-spaced, for safety reasons (including to increase visibility to ensure that sites are welcoming and feel safe) and where it is necessary to enhance the experience of the forest setting, through the development of large trees, or preferential removal of trees to favour a particular species.

Formal access, which is promoted by FLS, is located in Ariundle and Phemie’s Wood. They are recognised by Highland Council as core paths and they form an important link between Strontian village, the NNR and the surrounding townships.

There is a forest car park at the entrance to Ariundle which serves both FLS and NatureScot NNR visitors. The forest road forms the initial part of the trail which passes through designated Oak woodland. The trail crosses the Strontian river, where the open floodplain area affords views to Sgurr Dhomhnuill to the North and to the NNR Oak wood to the West. Heading North it crosses the Strontian river once more and eventually connects with the NatureScot trails in the Ariundle Oakwood NNR. The Ariundle trail also connects to the Fairies’ Road trail which leads back to the community woodland in Strontian village. A short bridle path leads to a ford on the Strontian to avoid horse riders utilising pedestrian bridges. Both of these pedestrian bridges and another smaller bridge which crosses a stream have reached the end of their expected lifespan. Bridge number 3116 at NM 8323 6357 will be replaced at the beginning of this LMP period. Low level amenity thinning will take place in the vicinity of these areas to maintain viewpoints and safe access as the need arises.

The Ariundle trail and car park will continue to be maintained as formal recreational facilities, including the sections which pass through NatureScot ownership.

The trails at Phemie’s Wood commence in the edge of the village at the A861 at the bridge crossing the Strontian river. They wind their way through the old policy wood, with its majestic conifer and broadleaf trees and their associated deadwood habitats, and connect with the Ardnastang Common Grazings path to the West, and thus, with Longrigg and the Ardnastang – Scotstown track. There is an exit onto the A861 on the South West of the woodland which connects with the township of Ardnastang. This section of path will revert to informal SOAC access.

This entire woodland is a visitor zone: welcome zone at the main entrance; interactive zones around all paths; passive zone in the remaining part of the woodland. Maintenance of the paths will be concentrated along the main sections from the entrance at Strontian village through to the Ardnastang Common Grazing path. A loop section of path containing 120 metres of boardwalk from NM 8088 6153 to NM 6177 will be permanently removed. This section of path will revert to informal SOAC access.

Informal recreation on the forest road network provides cyclists and walkers withopportunities to enjoy and explore the wider area offering spectacular views as you climb the hillside. This informal access is managed under the Scottish Outdoor Access Code (SOAC).

Other recreation is associated with the Fairies’ Road trail which lies totally within FLS ground and links the NNR with Strontian village. This is promoted as a core path by Highland Council, however, it is not promoted by FLS and as such, will not be maintained as a formal trail.

FLS staff carry out regular inspections of the recreational facilities and follow up with repairs as required. They also carry out inspections of the path network in the NNR and pass the recommendations and findings to NatureScot for follow up maintenance. The Ceum Trail within the NNR will be promoted as a separate trail. FLS will carry out the maintenance of this existing trail.

NatureScot are undergoing budgetary constraints which has a severe impact on the management of the NNR. During this LMP period, FLS will liaise with NatureScot regarding the future management of the recreational facilities within the NNR, as they form an integral part of the Ariundle trail network.

There are claimed rights of way (ScotWays), which pass through Phemie’s Wood and also along the forest road in Ariundle.

## 3.6 Heritage Features

There are no Monuments listed under the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) in this LMP area.

The heritage features reflect the history of industrial oak woodland and wood pastures land uses and their associated settlement structures.

These sites will be managed in accordance with Scottish Forestry’s [Forests & the historic environment](https://scotland.forestry.gov.uk/supporting/strategy-policy-guidance/historic-environment) Guidelines and Forestry and Land Scotland’s (FLS’s) own Archaeological guidelines which are summarised below.

Our key priorities for archaeology and the historic environment are to undertake conservation management, condition monitoring and archaeological recording at our significant historic assets; and to seek opportunities to work in partnership to help to deliver Our Place in Time: the Historic Environment Strategy for Scotland and Scotland’s Archaeology Strategy. Significant historic environment features will be protected and managed following the UK Forestry Standard (2017). Harvesting coupes, access roads and fence lines will be surveyed prior to any work being undertaken in order to ensure that upstanding historic environment features can be marked and avoided. At establishment and restocking, work prescriptions remove relevant historic environment features from ground disturbing operations and replanting. Where appropriate, significant historic assets are recorded by archaeological measured survey, see active conservation management and may be presented to the public with interpretation panels and access paths. Opportunities to enhance the setting of important sites and landscapes will be considered on a case -by-case basis (such as the views to and from a significant designated site).

The Regional Historic Asset Management Plan includes conservation management intentions for those designated historic assets in Scotland’s national forests. Details of all known historic environment features are held within the Forester Web Heritage Data (built using national and regional historic environment records) and included within specific operational Work Plans to ensure damage is avoided. Significant historic environment features will be depicted on all relevant operational maps.

## 3.7 Habitats & Species

The following priority species are found in the Drimnatorran LMP area relate to the following schedules of the Wildlife and Countryside Act 1981 (as amended in Scotland) :

Schedule 1a, A1 species: Golden eagle and crossbills

Schedule 5 species: Chequered Skipper, Pearl bordered fritillary, pine marten, red squirrel.

Schedule 6 species: Badger

The following priority species are of European protection under the Habitats Regulation 1994:

Schedule 2: otter, bats, wildcat

Schedule 3: pine marten, Atlantic salmon

Prior to any harvesting operations, FLS will undertake a pre commencement survey in the coupe to check for the presence of any protected species. The relevant FCS guidance notes: Wildlife and Forest. Operations 31- 35d will be adhered to if protected species are found to be present.

There are also Small Pearl Bordered Fritillary and Speckled wood butterflies many dragonflies, (including the Northern Emerald) and damselflies; moths, sparrowhawk, ravens, buzzards, owls, black grouse, brown trout red and roe deer. Red squirrels have been sighted in and close to the forest. Wildcat have been observed in the past in the NNR. The forest area is internationally renowned for is communities of bryophytes, lichen, flora and fungi, which are associated with Atlantic rainforest (Oakwood), habitat.

The future forest habitat will hopefully be more suitable for red squirrels to establish themselves as resident populations especially in Ariundle and Eggadale Glen, with a greater increase in Oak, Scots pine and Hazel. The planting of Norway spruce close to the designated areas where conditions suit should further improve the red squirrel habitat.

The removal of conifer species in the riparian restoration areas will in the future enhance the habitat for the Chequered skipper butterfly and will, in conjunction with the recent improvement work in the designated areas and the bog restoration, provide permanent semi open, sheltered and sunny routes along the forest roads in which to link the butterfly colonies and the open areas they require to thrive.

The LMP lies within a Black grouse core area. There is one known lek in Carnoch, which is located on fen/marsh/swamp habitat which has been subjected to arson in the past. During this LMP period the planting of native woodland will be considered in this general area as recommended in a habitat survey. Any planting will be sympathetic to the black grouse habitat requirements and will ensure that there will be open space containing the desired natural food sources, a variety of woodland edge species, (containing Juniper where ground conditions are appropriate), at irregular stocking densities.

The following priority habitat types are found mostly in open hill ground in 330ha of the LMP area, in particular Carnoch, Eggadale plateau and the Strontian river floodplain: fen/marsh/swamp; blanket bog; upland heathland; bracken wet woodland and upland birch woodland. The management of these areas will require deer control to acceptable browsing levels; the removal of conifer regeneration and exotic invasive species in localised areas, and the management of scrub that may occur in the bracken areas of South Carnoch for Pearl bordered fritillary habitat. Some of this work will be carried out after the construction of phases 1 and 2 of the Carnoch access planned road.

Within the above mentioned habitats, 49ha is regarded as very important: wet heath (4.13ha); wet heath & bog (4.82ha); heath, bog & flush (29.55ha); heath, bog, swamp (4.62ha); birch/oak woodland (0.7ha); upland birch, oak & bracken (3.81ha) and wet woodland (1.41ha). The wet woodland only requires minimum intervention; the birch/ oak woodlands require the removal of non-native conifer species; the open habitats should be maintained removing conifer regeneration as required and avoiding drainage operations.

There are five localised areas of important bog, flush and rock verge habitat. These locations should be avoided during forestry operations. The rock verge habitat on South Carnoch is particularly vulnerable to civil engineering operations, and needs to be managed to be free of conifer regeneration and rhododendron

### 3.8 Invasive Species

Invasive species in the form of rhododendron are present, but in very low numbers. These species are identified and continually added to a programme of work. Non-native conifer species will be classified as an invasive species in priority habitat areas.

## 3.3 Critical Success Factors

| Outcome |  |
| --- | --- |
| Effective deer management strategy | This is key to the successful conversion of conifer to native woodland habitats, especially within the designated Oak wood areas and the protective native woodland buffer, as well as to the successful establishment of conifer restocking. Transitional woodland habitat as well as the important upland habitats will be permanently at risk of deer damage. An impervious strategic fence combined with sustained population control is necessary. |
| Resources to construct new roading and cooperation from neighbours to achieve harvesting in Longrigg | This is key to the restructuring of Longrigg and to the economic return from the sale of the conifer crop to finance the operations required in the LMP area – if the sale of this woodland does not proceed. |
| Sufficient stability in the mature conifer crops to allow the restructuring to occur over the timespan of the full plan | Managing the felling of crops as close to MMAI as possible to avoid over mature crops becoming vulnerable to windthrow. Swift and successful establishment of riparian areas are necessary to create the future windfirm edges. |
| Rapid restocking | The “hot planting “of conifer restocking areas, in combination with effective deer management and the use of pine nurse species, is crucial to the successful establishment of spruce and firs crops on sites that are susceptible to heather regeneration or soil erosion. |
| Resources to manage the natural regeneration to achieve the required species and stocking | This is key to meeting the main objectives of the LMP. The inconsistency of desirable seed sources and the abundance of undesirable seed sources means that intensive work is required during the first decade of natural regeneration sites to ensure the desired woodland habitat is established. |
| Road construction to reach the Larch stands | The construction of forest roads is required to reach Larch Phase 1 and 2 fell coupes. The construction of the first three phases of the Carnoch Access is road is required to reach the largest area of Larch in the LMP at the Southern end of Eggadale Glen rapidly in the event of a P.-‘ramorum outbreak. |

# Appendix I - Land Management Plan Brief

**West Region**

**LMP: Drimnatorran**

**Date: 17/07/2019**

**Planning Team:**

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Jeff Hancox (roads)

Kenneth Knott (lead delivery)

Sam Wilson/ Sarah Hood (GIS support)

**Description:**

Location – Drimnatorran forest, Strontian, Lochaber, West Region. Grid Ref: NM 8327 6318.

The forest lies in close proximity to Strontian village stretching 5.2km north from the northern shore of Loch Sunart at Carnoch to Ariundle. Elevation ranges from 10m at Carnoch South to 290m at An Torra Ban. Total area is 1071ha.

The forest is accessed from the A861 Ardgour – Ardnamurchan public road and by two minor public roads. Currently, the internal road access is limited to localised sections of Ariundle and in Carnoch south.

The forest comprises of one main forest, (955ha), Phemie’s Wood, (29ha), on the western edge of Strontian village, and Longrigg, (87ha), which is 1km farther North West. The main forest occupies Eggadale Glen and the plateau in Ariundle, (almost enveloping a NNR oak wood), as well as the western and southern slopes and crown of Carnoch. The Strontian river dissects Eggadale Glen. The land use throughout is commercial conifer with designated Oak wood, PAWS woodland and riparian native woodland concentrated in Eggadale Glen, once an open hill area in West Carnoch where main streams supply water to neighbouring Drimnatorran Farm. Phemie’s wood can be described as a Policy woodland. It mirrors the local community woodland on the Eastern edge of Strontian on the lower slopes of West Carnoch which neighbours the Drimnatorran main forest. Longrigg is 100% productive conifer, much of which consists of windblown LP. The watershed affecting the main forest impacts on the Strontian river which is used for salmon fishing, the village water supply and flows into Loch Sunart Marine SAC. Some neighbouring houses on the lower slopes of West and South Carnoch have private water supplies fed from burns within the forest uphill.

**Social Factors:**

Drimnatorran forest lies adjacent to Strontian village and the townships of Anaheilt, Scotstown (and Ariundle?). There is a good network of trails – including a car park – linking the village and its community woodland with the Ariundle NNR, Phemie’s wood and Ariundle West. They are well used by locals and tourists, (about 40,000 visits annually), supporting their health and well-being. A claimed Right of Way passes through Phemie’s Wood with another passing through Ariundle on its way from Strontian to Ardgour. The forest has links with other “Sunart Oakwoods” farther West which lie to either side of Loch Sunart. Working native woodland is a major theme within these woodlands, reflected in the remains of heritage within and out with Drimnatorran forest: old townships; charcoal platforms; bloomeries; wood pasture and industrial oakwood remnants as well as the disused mines in the surrounding land. Watercourses that pass through the main forest are valued by the locals for fishing, private and public supplies and amenity.

**Environmental Factors:**

The locality is rich in biodiversity and geodiversity – Sunart SSSI/SAC, (geology, coastal, Ancient Oakwood (18ha at Ariundle), bryophytes, lichen, otter, chequered skipper and Pearl Bordered butterflies, dragonflies, and moths); Ariundle NNR; Loch Sunart MPA (flame shell beds and aggregates of northern feather star and serpulid); Moidart and Ardgour SPA (eagles) and Geological Conservation Review – GCR Loch Sunart; Ancient woodland at Coillie Dubh in East Eggadale (22ha); other woodland – Roy – 5ha at Ariundle and Long Established woodland (20ha) in Phemie’s wood. Bats are also present. The southern and central parts of Drimnatorran lie in LCA area 235 Broad Forested Strath, with most of Eggadale Glen and the upper slopes of Longrigg lying in LCA 245 Plateau moorland. The land skirting the forest to the north and east is designated as Wild Land Area. Veteran trees – particularly Oak - are a feature in parts of lower Eggadale Glen, as well as semi-natural Birch woodland and riparian woodland. Environmental improvements are ongoing such as riparian restoration working in the designated area and its buffer, including areas of bog restoration. The condition of Strontian river and Loch Sunart have been rated as good overall. The forest is important for the ecosystem services it provides – flood management, water supply and water quality, soil stability, carbon sequestration and storage and diverse habitats.

**Economic Factors:**

The commercial conifers, (547ha), supply timber to mills in Lochaber and beyond. The main planting took place in 1986/87 in parts of Phemie’s Wood; 1972 in Longrigg, 1973 in Ariundle plateau, 1990 – 93 in Eggadale east, 1978 – 93 and 2009, with restocking between 1999 and 2003 in Carnoch. The broadleaf woodland is primarily semi-natural, with remnant planted Oak in the SSSI, with some planted stock in Phemie’s wood. New roads will be required to harvest windblown and diseased trees. Previously felled areas in Carnoch need to be restocked and established; riparian restoration work needs to be completed and secured; existing recreational facilities need to be maintained and some structures upgraded and rebranded to reflect FLS, and deer fencing is due for renewal. The sale of Longrigg remains an objective.

**Achieving national priorities locally**

The management of the Forestry and Land Scotland’s Forest Estate is guided by Scotland’s Forestry Strategy 2019 – 2029 and the organisation’s Corporate Plan and is informed by strategies on a range of topics, including land use, economy, climate change, biodiversity and the historic environment.

The Scottish Government has identified three objectives to deliver over the next 10 years:

* Increase the contribution of forests and woodland to Scotland’s sustainable and inclusive economic growth
* Improve the resilience of Scotland’s forests and woodland and increase their contribution to a healthy and high quality environment
* Increase the use of Scotland’s forest and woodland resources to enable more people to improve their health, wellbeing and life chances

This Land Management Plan will help deliver on these objectives, in line with FLS corporate outcomes, to ensure clear linkages through the planning framework and implementation of national and regional priorities. The brief is also guided by the National Spatial Overview, which has identified the focus of effort and investment challenges for this area (further information is provided in the Appendix).

Key contributions that Drimnatorran forest makes to our Priorities, Aims and Objectives are:

| **FLS Corporate Plan outcomes and priorities** | **Key Corporate Actions** | **Drimnatorran LMP priorities** |
| --- | --- | --- |
| Outcome:  “FLS supports sustainable rural economy by managing the national forests and land in a way that encourages business growth, development opportunities, jobs and investments.”  Priority:  Provide sustainable economic benefits from the national forests and land | * Ensure a sustainable balance between the resilience and productivity of the national forest and land * Provide a sustainable supply of timber * Implement the national restocking strategy * Support Scottish tourism and the visitor economy through provision of visitor attractions * Work to release value from rural development opportunities for reinvestment in the national forests and land * Support commercial activity on the national estate which help to sustain rural communities | * Softwood production will be concentrated on accessible areas where soil, topography and shelter will achieve the best growth, whilst avoiding designated Oakwoods, ancient Birch woods and priority open habitats * Coupe size and design, sequence of felling and restocking will be reviewed to better balance priorities of visual amenity; sustainable volume production through optimised rotations, plant health requirements, environmental benefits and resilience * The resilience of future conifer crops will be maximised through the use of species suitable to the site, with soils fertility improved through the use of self-thinning nurse mixtures to promote strong growth and improved quality of timber products * Native broadleaf and Scots pine expansion in the East side of Eggadale Glen, as well as the CCF management of Phemies’ Wood could support longer term opportunities to contribute to local economic activity through job creation by encouraging small scale local markets such as firewood supply, furniture making and wood turning.      * Venison sales resulting from the management of deer provides income as well as a source of healthy free range food products. * Support the sale of the Longrigg block to the local community, which will help to sustain and diversify rural income. * We will support the Scottish Government’s woodland expansion policy by encouraging natural regeneration of native woodland and by planting new conifer and broadleaved woodland in open ground where it is appropriate to do so, whilst avoiding open priority habitats. |
| Outcome:  “Scotland’s national forests are looked after; Biodiversity is protected and enhanced. More environmental services are provided to people”.  Priority:  Ensure forests, woodlands and land are sustainable managed – by woodland expansion, increasing adaptability and resilience and enhancing environmental benefits provided by forests and woodland | * Manage the forests and land to further the conservation and enhancement of biodiversity * Collaborate with partners on integrated landscape scale approaches to habitat management and restoration * Protect and enhance priority species * Contribute to renewable energy targets * Supporting forest research * Managing historic environment assets * Work with neighbouring landowners to control non-native invasive species * Improve the resilience of forests and land to impacts of climate change and tree health threats e.g. Phytophthora ramorum * Contribute to Scotland’s national woodland creation targets | * Review the open hill area to protect open priority habitats and to consider how best to manage the degraded areas   Increase the adaptability and resilience of forests   * Diversify with native species, in particular, to reinstate natural riparian areas in the designated area and where opportunities arise through the restocking programme * Alternative conifer species prioritised on better soils, and Sitka spruce enhanced on poorer soils with self-thinning nurse species * Prepare for, and manage tree disease, prioritising the removal of Dothistroma impacted pines in Ariundle plateau and Longrigg;, anticipating the onset of Phytophthora ramorum, through the construction of roading to reach currently inaccessible Larch crops and ensure at least 20% of the Larch species is removed in Fell Phase 1. Manage Chalara infected Ash trees where they present a danger to the public and property * Aim to achieve favourable condition for the features of the designated woodland. Expand the existing ancient and semi-natural woodland, continue with the conversion of PAWS and maintain and improve priority species management * Address the threats posed by the lack of management of the neighbouring Ariundle oak wood NNR, which is allowing the seeding and establishment of Beech trees, in particular, into the FLS section of the SSSI/ SAC Oakwood * In future, we will maintain tree cover by restocking with optimum/ minimum fallow periods, continuous cover of broadleaves and management of ancient and semi-natural woodland. We will balance fallow length with the need to control weed growth * We will review areas for Long Term Retention (LTR), to improve diversity of age class structure and ensure older age classes are represented in the forest. A proportion of woodland will be managed to provide deadwood habitat where it provides the greatest environmental benefit * Where possible, we will improve resilience to the effects of wind by encouraging green edges on roads and breaks, and reinstating riparian habitat which is substantial enough to create natural breaks and provide environmental benefits * We will monitor the woodlands for significant tree pathogens such as Phytophthora ramorum, Hylobius, Dothistroma and Hymenoscyphus fraxineus * Aim to achieve an open area of 40 – 50m width either side of Strontian river with some outcrops of native trees to manage water quality for the salmonid habitat and quality of public water supply * Consider the scope for conversion to transition woodland; bog woodland and localised peatland restoration on Carnoch and Eggadale East plateaus * We will strive to manage deer to fulfil our land management objectives. We will work with the Deer Management Groups and adjacent landowners to maintain good relations and ensure that views and objectives are taken into account * The forest and land management in Drimnatorran will contribute towards achieving the objectives of the River Basin Management Plan (RBMP) by: ensuring that forest operations are managed in such a way as to ensure they do not cause pollution; and the reinstatement of riparian habitat when restocking presents opportunities * Priority open habitats will be maintained in good ecological condition. A clear rationale for planting open ground will be agreed. * Archaeological remains will be protected according to FLS best practice guidance |
| Outcome:  “Everyone can visit and enjoy Scotland’s national forest and land to connect with nature, have fun, benefit their health and wellbeing and have the opportunity to engage in our community decision making  Priority:  Engage more people and communities in the use and management of forests and woodlands | * Maintain walking trails for everyone to enjoy and gain health and other benefits * Provision of ecosystem services for public benefit * Engage communities in decisions on management of forest and land | * Commit to maintaining recreation facilities which are promoted by FLS * The forests are open to all, within the framework of the Scottish Outdoor Access Code (SOAC), and we will continue to promote best practice in relation to access * CCF/ LISS and compliance to UK Forestry Standard 2017, in particular the Forests and Water Guidelines to improve water quality for salmonids, protect angling and protect the quality of public and private water supplies * Management of woodland and open priority habitats so that nature and species are diverse and resilient to a changing climate, and to be enjoyed by all * Community consultation in forest planning, in particular through the Sunart Community Council |
| Outcome:  “FLS is a supportive safe and inclusive organisation…..”  Priority:  Sustain a safe working environment for people working in, and using our forests and promote healthier lifestyles | * Ensure health and safety of forestry workers and users underpin all forest planning and operations | * Safety considerations will inform decisions on restocking coupes on steep or difficult to access ground * Ensure Visitor inspection programmes identify Ash trees close to recreational facilities so they are felled before they die and become difficult to fell |
| Outcome:  “FLS is recognised as a high performing, efficient and effective, financially sustainable organisation that continues to transform and adapt”  Priority:  Deliver best value in the effective and efficient delivery of public service | * Meet statutory duties as an executive agency * Maintain UKWAS certification * Align Scottish Government targets on carbon emissions, waster, water and chemical use * Working collaboratively, openly and responsibly with partners and others to improve the management of forest estate * Enable and deliver continuous improvement | * The existing restocking programme will be reviewed, to increase diversity of conifer species, whilst considering the threat from pest and disease, and to maximise the establishment of broadleaved species through natural regeneration * All forest planning and operations will meet the UK Forestry Standard 2017 , in particular, Forest and Water Guidelines * Managing the grazing and stripping impact of deer will facilitate natural regeneration of broadleaves, protect planted broadleaves and soft conifers, improve biodiversity and promote restoration and maintenance of priority open habitats * Stakeholders will be consulted on key amendments to planned forest management * We will participate in partnership projects, such as the landscape control of invasive species |

**Issues and challenges:**

* Access to the woodland in NW Ariundle and the Eastern side of Eggadale Glen
* Removal of bog conifers and the restoration of bog or bog woodland
* Public road access to Ariundle and community concerns
* Community relations
* Landscape issues of commercial conifer crop to the NW of Ariundle NNR – possible 50m wide native broadleaf buffer
* Open/felled area below forest car park – should this be woodland?
* Deer pressure in Ariundle is OK although a little bit high for natural regeneration. Maintain deer fence
* Poor growth of conifers above Carnoch to be dealt with in future plans
* Future thinning considerations
* Increasing resilience of the woodland and the softwoods
* Water management for Upper Strontian

**70 Year Vision:**

* Softwood production will continue in Ariundle plateau and Carnoch but will decrease in Eggadale east of the Strontian river as native broadleaf and Scots pine production increases.
* Large scale native woodland expansion
* Access and integration with Strontian

**10 Year Priorities:**

* Dealing with windblow in Ariundle plateau
* Restocking felled areas in Carnoch
* New roading in Ariundle plateau
* Access to Larch in Ariundle plateau
* Removal of non-native conifers from the riparian restoration zone and restore bogs
* Securing the oak wood restocking adjacent to the Ariundle NNR
* Removal of Larch
* Planning and building access to the East side of Eggadale Glen
* Strategic deer fence renewal
* Discuss with SNH the future management of the Ariundle NNR
* Update visitor information and signage to reflect FLS and new contact details
* Maintain existing network of recreational facilities
* Visitor zone management – enhance the woodland experience
* Sale of Longrigg

**Stakeholders & consultation:**

Scottish Forestry

NatureScot

SEPA

Scottish Water

SSE

Highland Council

Lochaber District Salmon Fishery Board

Sunart Community Council

Confor

Strontian Community Company

Lochaber Fisheries Board

East Loch Shiel Deer Management Group

Neighbouring landowners

## Brief - Appendix 1

## National Spatial Overview

**Zone 2: North Western Coast and Skye**

• Rugged, variable topography, with rocky outcrops

• Highly exposed with a wet, oceanic climate, predicted to become wetter with changing climate; and often thin, nutrient poor soils; some peatland

• NFE land use includes largely unthinned conifer and native woodland; some steep ground; high proportion of open land; substantial areas of PAWS; native Atlantic oakwood woodland and Caledonian pinewood;

• Often highly designated for habitats and species as well as landscape and SNH ‘wild land’ areas; includes iconic mountain areas

• High numbers of domestic and international visitors

• Timber markets are relatively distant

**Most significant contributions to Corporate Priorities, Aims and Objectives**

• ***Ecosystem services and additional public benefits*** – permanent native woodland and natural colonisation contributes to carbon sequestration; recreation use of NFE contributes to increased health and well-being; restoration of peatland and blanket bog habitats likely to significantly increase carbon sequestration and improve water quality; scenic quality and visitor attractions contribute to tourism economy; sustainable timber production

• ***Other national commitments*** – working in partnership with communities which are remote from central Scotland; habitat management for white tailed eagle and chequered skipper butterfly

• ***Contribution to financial sustainability*** – standard soft wood markets; good potential for sawlogs

**Focus of effort and investment challenges**

• ***Prepare for potential impacts of windblow,*** recognising that the trees are fast growing in exposed locations. Challenges include large areas of unthinned, similar age crops, the need to develop market connectivity building on the potential for high quality soft wood timber and future native woodland management

• ***Develop sustainable PAWS restoration strategy*** which maximises the habitat, water quality and carbon sequestration opportunities within a planned programme of PAWS restoration including on–going maintenance after restoration has started; working with neighbours to manage deer, capitalising on the removal of non-native trees and integrating on-going management of sites into wider work programmes where possible

• ***Plan and implement an access strategy*** that updates out dated infrastructure and efficiently addresses steep ground constraints. Take into account future infrastructure opportunities in sea-based transport, including possible combined benefits with other industries

• ***Develop a strategy for dealing with potential disease threats***, especially in the light of possible impact on larch

• ***Review options for making the most of increasing visitor numbers*** including engagement with local communities on visitor management in areas of high visitor pressure

# Appendix II: Analysis of Previous Plan

The previous Forest Design Plan (FDP), which covered most of the new LMP area ran for the following periods: 21/02/2008 – 20/02/2018, (extended to 31/03/2020). The it should be noted that the former Sunart woodlands – Longrigg and Phemie’s Wood did not feature in the FDP area in 2008. The following objectives were deemed as high priority.

| **Objectives** | **Achievements/Changes** | **Relevance to the plan revision** |
| --- | --- | --- |
| Timber Production  Protecting and enhancing the landscape  Managing and Improving Wildlife habitats  Promoting recreation and improving public access to the forest resource  Providing employment opportunities  Protecting heritage features | **“Production of timber as per the felling phase sequence with an investment of road building to facilitate access to these coupes”**  0.79km of road constructed in 2011 to facilitate the harvesting in the Western section of Fell phase 1 in cpts 8211/12. Fell phase 1 area was 104ha in size – actual area felled was 52.78ha. Much of the area not felled is mature Oak wood. The difficult area to access – cpt 8216 between the NNR and Strontian river was also not felled.  No Fell Phase 2. Fell Phase 3 (2018 – 2022) in Carnoch was felled – 22.71ha in total during 2012/13.  **“Felled coupes to be restocked for timber according to the Future Structure map”**  The Phase 1 felled areas in cpts 8211/12 were replanted with Oak woodland species in 2018 as per the proposals. The remaining felled areas of Phase 1 were never replanted. Much of this area underwent bog restoration in 2019, with the intention to allow natural regeneration of native species to establish in the rest of the felled sites  **“Continuing to integrate the forest block with the adjacent NNR and Strontian River habitats”**  Part of the Fell phase 1 coupe which was difficult to access had not been felled and thus, this objective was not completed  **“Improving external views with the proposed alteration to the Western margin as seen from the public road and Scotstown dwellings”**  This work did not start.  **“Promoting and protecting native broadleaves and conifers through NR and removal of non-native conifers (where applicable)”**  Much of the conifer removal was achieved during the felling of Phase 1 areas. A reduction was made to the amount of area that was allowed to naturally regenerate with native species. Bog restoration occurred in areas of deeper peat in 2019.  **“Expanding areas of native woodland to encourage wildlife”**  Parts of the Fell phase 1 were planted with native woodland species, particularly Oak  **“Not restocking land immediately adjacent to riparian areas as per Forest and Water Guidelines”**  This was achieved.  **“Improving riparian zones to benefit aquatic habitats”**  This was mostly achieved. The difficult to access fell coupe in cpt. 8216 was not felled.  **“Improving forest margins, in particular those adjacent to the NNR, to encourage flora, fauna, using fell-to-recycle methods where appropriate”**  This was mostly achieved in the area to the South East of the NNR  **“Protecting the isolated bryophyte habitats found on oaks that are surrounded by conifers by retaining the conifers in these locations”**  **“Allowing for the expansion of birch woods”**  This has not been achieved – mostly due to the change of objective to restore the bog areas within the Birch area.  **“Promote recreation by maintaining existing paths and undertaking related works as appropriate”**  This objective has been achieved. There have been regular inspections of facilities with follow up repairs.  **“Monitor visitor numbers via counters and surveys when practicable”**  This was achieved in the earlier years of the previous FDP period. In later years this ceased.  **“Providing local employment opportunities by continuing to harvest timber from marketable quality stands and by conducting restocking operations in a manner that will promote the sustainable future development of the forest”**  The objective to harvest from marketable quality stands was achieved. The restocking to promote sustainable future development of the forest was not achieved. There are many areas which are described as felled.  **“Protecting and promoting recreational activities in order to promote tourism both locally and throughout the Sunart Strategic Management Zone”**  The Fairies’ Road path was constructed between 2000 and 2005 – and is defined by Highland Council as a core path.  A new leaflet to promote FC forest walks in Sunart and Morvern was published in 2016. The Ariundle trail and Phemie’s Walk are promoted in this document.  **“Protecting archaeological sites during forest operations with care taken to remove any harvesting debris from these sites”**  All sites had been assessed by the local Environment Ranger prior to forestry operations.  The updating on heritage features has been an ongoing exercise by the local Environment Ranger.  **“Managing restocking activities to provide for open space buffers between archaeological features and woodland”**  This was achieved. | Prioritise the felling of the non-native species in the difficult to access coupe in cpt 8216. Fell to recycle may be the only option to avoid damage to the NNR which encapsulates this coupe.  Secure the bog restoration areas. Manage deer to ensure the successful establishment of native NR in the peripheral areas of the bog.  Replant the Phase 3 fell areas in Carnoch with commercial conifer species  Prioritise the felling of non-native conifer species in cpt. 8216 to finalise the riparian restoration.  The Ariundle plateau will be restructured over the next 15 years, so the majority of the re-design of this Western boundary will occur within the new LMP period  The land surrounding the recent bog restoration will be managed for the regeneration of native species. Supplementary planting of some native species may be required to achieve the desired species mix for this site.  Adjust the species mix of the planted area to remove Small leaved lime.  Manage the areas around the bog restoration to develop riparian woodland  The UKFS was updated in 2017. The riparian buffer widths were revised.  “Improving riparian zones to benefit aquatic habitats”  Prioritise the felling of non-native species in cpt 8216 – likely to be felled to recycle. This will improve the riparian habitat and will improve the forest margin to the South east of the NNR.  The felled land surrounding the recent bog restoration will be allowed to naturally regenerate with native species which is expected to be dominated with Birch  The routine inspection and maintenance of existing recreation facilities which are promoted by FLS will continue during the new LMP period.  The Visitor Service Team will continue to monitor visits to forests, this will include but is not limited to or any one of the following; person counters, movement detection, monitoring social media interactions, location based information, local staff and local community knowledge.  The restructuring of the conifer areas will continue during the new LMP period, primarily in the plateau area of Ariundle and in Longrigg – if its sale has not materialised.  The felled areas of Carnoch will be replanted with commercial conifer species. The remaining felled areas of Ariundle – outwith the recent bog restoration area will be allowed to naturally regenerate with native species and if necessary supplementary planted to achieve the desired native species mix.  FLS will continue to maintain the Ariundle trail and Phemie’s walk during the LMP period.  Further work will be influenced by budgetary constraints.  The management of the trails within the NatureScot owned NNR may be taken on by FLS to secure safe public access to Ariundle oakwood.  The protection of heritage features during forestry operations will continue in the new LMP period.  The maintenance of heritage protective buffer open space will continue in the replant sites of the previous plan. |

# Appendix III: Background Information

## Physical site factors

#### Geology

The underlying geology within the vast majority of the LMP area consists of the Northern section of the Strontian pluton – a globally important example of a Caledonian igneous plume of granite which formed at a depth of around 14km. It is made up of granodiorite – “acid plutonic igneous rock injected from deeper levels into the Earth’s crust around 435 million years ago when North west Scotland was part of an ancient continent into which another continent was colliding”. A section of the edge of this pluton in Glen Tarbert (to the South east of Drimnatorran), forms part of the geological interest in the Sunart SSSI. This area shows evidence of the rocks shearing likely attributed to movement on the Great Glen Fault system. This pluton, which pushed into the Glenfinnan Group of Moine series bedrock (psammite), is now exposed after millions of years of erosion. Part of this metamorphosed psammite is found in the area to the North of Coille Dubh ancient woodland in the North east part of Eggadale Glen. It is a rock rich in quartzite which was formed under immense heat and pressure.

Since the formation of the Strontian pluton volcanic activity squeezed igneous material through cracks in the bedrock and pluton to form “dykes”. A great example of the largest dyke intrusion within Drimnatorran forest can be viewed from the pedestrian bridge which crosses the Strontian river at the nature reserve. From the bridge you can view a dyke intrusion of microgabbro and basalt in the river bedrock, especially on the upstream side; the colours and shapes of the intrusions kept vivid by the clear running water.

<https://sitelink.nature.scot/site/8174>

Soils

Longrigg comprises of blanket bog with podzolic peaty surface water gley in the South east section of the woodland where the conifer crop is most stable. The soil rooting depths vary from 40cm in most areas with 80cm depth in remaining areas. Soils here are described as wet and nutritionally very poor 3.

Phemie’s Wood consists of an equal mix of indurated podzol and brown earth soil types in the majority of the site with blanket bog/ podzolic peaty surface water gley on the plateau section on the Western boundary. Soil rooting depths are mainly 40cm with 100cm in the remaining areas. The soils here are slightly dry and described as nutritionally very poor 3.

The main Drimnatorran block has a complex mix of soil types. Brown earths and intergrade ironpan soils are mainly found on the moderately steep Southern slopes of Carnoch; on the steepest sections of Eggadale East and in the SSSI oak wood uphill of the Ariundle car park.

Calluna bog dominated soil types are located in the windblown Lodgepole pine area of Ariundle plateau; the Strontian river floodplain and the upland sections of Eggadale East Carnoch North and East – which is in association with poorly performing Sitka spruce crops . Elsewhere the soil type is dominated by peaty surface water gleys. Each soil type is varied so mosaics of other soil types such as rankers, brown earths, podzols and indurated ironpans occur within the main soil types mentioned previously.

The soils with the deepest rooting depths (100cm), are located in the Southern slopes of Carnoch, and steeper mid-section of Eggadale East and in localised areas of Ariundle plateau. Much of Ariundle plateau and the South west section of Eggadale East have soils with rooting depth up to 80cm. Elsewhere, the rooting depth is 40cm. Moist and very moist soils are mainly found in Ariundle plateau and the Southern part of Eggadale East. The brown earths are mainly classified as being of fresh moisture levels. One localised pocket of slightly dry ground is located in the steepest section of Eggadale East. The vast majority of the soils in the main block are described as poor with medium soils confined to the slopes of Southern Carnoch, the Eastern Strontian floodplain and dotted around Ariundle. There are a few localised nutritionally rich areas.

Landform

Longrigg, which is the most Westerly of the three distinct Drimnatorran blocks, is quite plateau like in its centre with moderate South east facing slopes in the Southern section of the site and gentle and moderate South west facing slopes in the Northern section. Elevation ranges from 40 metres in the Southern tip to 170 metres on the North east boundary.

Phemie’s Wood, which is the smallest block lies on the West side of Strontian village. It lies on a gentle – moderate slope with a South east aspect in full view of much of the village. The elevation ranges from 10 metres at the pedestrian access at the bridge on the main road in the village to 80 metres at the summit adjacent to the Ardnastang Common Grazings.

The main block of Drimnatorran lies immediately East of Strontian village and extends a farther 5.9km North east wards. The topography of the main block has distinct components – Eggadale Glen which includes the Strontian river; Ariundle plateau and Carnoch Hill near the shore of Loch Sunart.

Elevation ranges from 10 metres in South Carnoch to 295 metres on the Eggadale East plateau. The highest point in the Ariundle plateau is 230 metres on the North east boundary.

The majority of the land is less than 30% slope gradient. The steep slopes of Eggadale East are over 50% gradient; those in Carnoch South are 35% - 50% with localised areas exceeding 50%, other steep areas have slopes ranging from 35 – 45% gradient.

#### 

#### Water

#### Water is an important component of the Drimnatorran LMP area. By far the largest waterbody affected by this LMP is Loch Sunart – a Nature Conservation Marine Protected Area (NCMPA) for its flame shell beds, Northern feather star aggregations (Leptometra celtica), population and serpulid aggregations; part of the Sunart SAC for its reefs and otter population and part of the Sunart SSSI for its eel grass bed, egg wrack, rocky shore and saltmarsh.

The main river affecting Drimnatorran is the Strontian river, which dissects the main woodland area. It was designated as a SSSI as a good example of an oligotrophic river. Although it has since lost that designation it does remain a river of great biodiversity and geological interest. Its largest tributary is the Allt mo Nighneig which forms a gully between Carnoch hill and Eggadale Glen. In the remaining ground small mountain streams flow into the Strontian river or flow directly into Loch Sunart

The SEPA Water classification hub rates the overall status of Loch Sunart as good with the Strontian River rated as good overall. The Drimnatorran LMP area lies within the Fort William Groundwater in the Scotland river basin district. Overall status for groundwater here is good.

The main Drimnatorran block lies outwith the Sunart and Moidart potentially vulnerable area for flooding as designated by SEPA and managed by Highland Council. However, the two minor woodland areas – Longrigg and Phemie’s Wood do lie inside this zone, albeit in the least affected part of the zone.

Water Supplies:

There is a water supply point in ground to the South west of Longrigg. Streams originating from the Longrigg block affect this water supply point.

A small number of neighbouring properties are not connected to the nearby public water supply and are thus reliant on private water supplies from minor watercourses originating from FLS land. The table below lists the properties with Private Water Supplies from FLS ground in Drimnatorran Forest which are identified on the Drinking Water Quality Regulator for Scotland website.

<https://dwqr.scot/private-supply/pws-location-map/>

| **Location** | **PWS class** | **Local Authority** | **Source Name** | **Properties on Supply** |
| --- | --- | --- | --- | --- |
| Monument Park | A | Highland | PWS Ardgour/124 | 1 |
| Drimnatorran Farm | B | Highland | PWS STRON/123 | 1 |

The majority of the main woodland block of Drimnatorran affects the local public water supply. The weir is located on the Strontian river at the Southern end of Eggadale Glen at Ariundle. The Strontian River Drinking Water Catchment, which is of operational status, occupies most of the river’s watershed.

#### Climate

#### Climate projections point to a warmer climate with lower summer rainfall and higher winter rainfall. Rainfall is predicted to involve increasing weather events.

The climate is mild, wet and windy, with average annual temperatures around 8 – 9 C and precipitation above 1800 mm per year. Although snow is less prevalent than eastern and central Scotland, the region is subject to rain bearing South Westerly winds. Humidity levels are high throughout the year, rarely sinking below 70% relative humidity. The wet conditions contribute to soil leaching and development of gleys and bogs where soils are insufficiently free- draining.

The exposure levels in the main Drimnatorran block are generally moderate with localised areas of high exposure on the summit of Carnoch Hill. Sheltered areas are mainly located in Ariundle South, Coillie Dubh on the East side of Eggadale Glen and lower lying parts of South west Carnoch. Longrigg has a moderate exposure on most of the site with low exposure on the sloping ground in the South of the forest block. Phemie’s Wood id deemed to be of low exposure.

### 

## The existing forest

#### Age structure, species and yield class

#### The Drimnatorran LMP area is around 1071ha in size. This is larger than the previous LMP as the former Sunart LMP blocks of Phemie’s Wood (29ha), and Longrigg (88ha), have been included in Drimnatorran whose main block is 954ha in size. The three blocks share common influences such as: within the Strontian river watershed; within the same public and private water supply watershed; all are directly adjacent to Strontian village and the nearby crofting townships and all need to be considered as one unit in terms of landscaping from prominent viewpoints and shared landscape character areas; all share impact on the Sunart SSSI/SAC designation and all are interconnected by the rights of way and core paths that affect Strontian.

The LMP area comprises of 703.6ha of High Forest and 367.4ha of open ground. The table below shows the breakdown of these land uses.

| **Land Use (LU)** | **Area (ha)** | **LU sub-type** | **Sub-type Area (ha)** | **Sub-type % of forested area** | **Sub-type % of LMP area** |
| --- | --- | --- | --- | --- | --- |
| High Forest | 703.6 | High Forest | 502.67 | 71.44 | 47 |
|  |  | Unplantable/bare | 86.16 | 12.25 | 8 |
|  |  | Windblown | 58.37 | 8.3 | 5.5 |
|  |  | Felled | 51.46 | 7.3 | 5 |
|  |  | Failed | 4.94 | <1 | <1 |
| Open | 367.4 | Open | 367.4 | N/A | 34.3 |
| Total | 1071 |  | 1070 | 100 | 100 |

The main open areas are located on the NW side of Carnoch hill, with smaller areas in the SW and SE of Carnoch, the upper elevations of An Torra Ban in Eggadale East and the floodplain of the Strontian river. A further area of open space lies within the forested area accounting for 12.25% of the high forest land use. The felled areas are temporary areas of open ground. Some of this land use will become permanent open space as part of the bog restoration work in the floodplain section in Ariundle. Other areas are awaiting establishment via native natural regeneration in the vicinity of the bog restoration, whilst the remaining areas in South Carnoch will require planting with commercial conifer species.

SPECIES: (see Species Map)

The distribution of tree species forms very distinct patterns in the LMP area. The wet peaty plateaus of Ariundle and Longrigg are dominated with Lodgepole pine. The drier brown earth and podzols of Phemie’s wood is dominated with mixed conifer species and mixed broadleaf species of both native and non-native species, which is typical of old Policy woodland. The designated Oak wood areas of Ariundle lower slopes and the PAWS, riparian and upper margin native woodland of Eggadale East are dominated with Oak and minor native species on lower ground, with Birch elsewhere. Sitka spruce is the dominant species on Carnoch hill and parts of Eggadale East, as well as the drier areas of Ariundle plateau and Longrigg. Larches are scattered throughout the forested LMP areas. The breakdown of the main species groups, (which excludes forested open space, felled and failed areas (the small areas of woodland which survive in the failed areas are included in the table below)), is shown in the table below.

| **Woodland type** | **Area (ha)** | **Main Species** | **Area (ha)** | **% of Woodland Type** | **% of Forested Area** |
| --- | --- | --- | --- | --- | --- |
| Conifer | 440.74 | Sitka spruce | 231.24 | 52.5% | 41% |
|  |  | Lodgepole pine | 113.56 | 26% | 20% |
|  |  | Scots pine | 17.3 | 4% | 3% |
|  |  | Larches | 66.29 | 15% | 12% |
|  |  | Mixed conifers | 12.35 | 2.5% | 2.25% |
| Native | 115.54 | Birches | 69.42 | 60% | 12.25% |
|  |  | Oak | 17.13 | 15% | 3.25% |
|  |  | Minor Species | 28.99 | 25% | 5.25% |
| Broadleaf | 6.37 | Mixed Broadleaf | 6.37 | 100% | 1% |
| TOTALS | 562.65 |  | 562.65 |  | 100% |

AGE STRUCTURE: (see planting decade map)

The planting decades also follow a distinct pattern which indicate the approximate years when different parts of the LMP area were acquired. The wet peaty plateaus of Ariundle and Longrigg were planted in the 1970’s, and are the main Lodgepole pine areas. This accounts for 33% of the total planted area within the LMP area. The 1990’s were the other big planting decade where much of Eggadale East and the North section of Carnoch hill were established primarily with Sitka spruce. This planting decade represents 40% of the total planted area. The planting during the 1950’s and 60’s were spread through the South facing slopes of Carnoch, the Southern parts of Eggadale East and in parts of Phemie’s Wood. The table below shows the planting by decade and by rotation. This does not include areas where broadleaf species have naturally encroached on open areas within the planted crop. Over time the restructuring of the forest will create an age structure which will be a little more diverse through the creation of more riparian woodland habitat, peatland edge woodland, PAWS conversion, working native woodland in Eggadale East and the breaking up of the main commercial areas to create a more sustainable supply of timber.

| Decade of planting | Area (ha) | % of Total Planting | 1st Rotation | 2nd Rotation | Historically Woodland |
| --- | --- | --- | --- | --- | --- |
| Pre 1900 | 34.32 | 6% | 22.5 | 0 | 11.82 |
| 1950’s & 1960’s | 14.56 | 2.5% | 13.9 | 0 | 0.66 |
| 1970’s | 180.84 | 33% | 179.79 | 0 | 1.05 |
| 1980’s | 54.06 | 9.5% | 44.68 | 9.38 | 0 |
| 1990’s | 223.39 | 40% | 193.5 | 24.79 | 5.1 |
| 2000’s | 30.13 | 5.5% | 10.58 | 14.99 | 4.56 |
| 2010’s | 18.05 | 3.5% | 0 | 10.87 | 7.18 |
| TOTAL | 555.35 | 100% | 464.95 | 60.03 | 30.37 |

The crop rotation shows a woodland that is still relatively young: 83.5% is still in its 1st rotation, with only 11% early into its 2nd rotation and with 5.5% on land that is historically woodland.

YIELD CLASSES:

The yield classes are varied throughout the forested areas due to species variation and environmental influences such as heather, soil type and fertility, moisture, geology, exposure and climate.

The lowest yield classes are found in the broadleaf dominated areas of Ariundle and Eggadale East; the wettest sections of the Lodgepole pine peaty plateaus of Longrigg and Ariundle and in the Sitka spruce crops in the highest sections of Carnoch hill and Eggadale.

The highest yield classes are found in Sitka spruce crops in the better deeper soils of the sheltered and lower lying sections of Longrigg, Eggadale East and the Southern slopes of Carnoch hill. The table below shows the breakdown of the main species groups and the corresponding yield class (YC) and includes the proportion of forest they occupy. It does not include areas where broadleaf species have naturally encroached in open areas within the conifer crop.

#### Species and Yield Class table

| **YC** | **SS** | **LP** | **Larches** | **SP** | **MC** | **Native** | **MB** | **Total (ha)** | **% YC** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 3.08 | 0 | 0 | 0 | 0 | 5.38 | 0 | 8.46 | 1.5% |
| 4 | 1.11 | 29.84 | 6.94 | 10.06 | 10.7 | 100.26 | 5.22 | 164.13 | 29% |
| 6 | 48.54 | 12.19 | 4.54 | 2.03 | 0 | 0.09 | 0 | 67.39 | 12% |
| 8 | 21.99 | 12.92 | 8.42 | 0.76 | 0.03 | 3.45 | 0 | 47.57 | 8.5% |
| 10 | 4.68 | 57.39 | 7.5 | 4.45 | 0 | 6.36 | 1.15 | 81.53 | 14.5% |
| 12 | 7.26 | 1.22 | 8.79 | 0 | 0.68 | 0 | 0 | 17.95 | 3% |
| 14 | 33.04 | 0 | 30.1 | 0 | 0 | 0 | 0 | 63.14 | 11% |
| 16 | 27.67 | 0 | 0 | 0 | 0.33 | 0 | 0 | 28.0 | 5% |
| 18 | 11.54 | 0 | 0 | 0 | 0.44 | 0 | 0 | 11.98 | 2% |
| 20 | 44.76 | 0 | 0 | 0 | 0.14 | 0 | 0 | 44.9 | 8% |
| 22 | 12.83 | 0 | 0 | 0 | 0 | 0 | 0 | 12.83 | 2.5% |
| 24 | 14.74 | 0 | 0 | 0 | 0.03 | 0 | 0 | 14.77 | 3% |
| Total (ha) | 231.24 | 113.56 | 66.29 | 17.3 | 12.35 | 115.54 | 6.37 | 562.65 |  |
| % Species | 41% | 20% | 12% | 3% | 2.25% | 20.75% | 1% |  | 100% |

The dominant Sitka spruce (SS), yield classes (YC), explain the variability of factors which affect tree growth rates within the LMP area. The range of SS YC’s is quite evenly spread: low YC’s (2 – 8) represent 32% of the SS crop, moderate YC’s (10 – 16) represent 32% with high YC’s (18 – 24) representing 36% of the SS crop. Sitka spruce is the crop which produces the greatest yield.

The dominant SS YC is YC 6, which is very low, and represents 21% of the SS crop. On the other hand, the next dominant SS class of growth is YC 20 – which is very good, represents just under 20% of the crop. Sitka spruce is a commercial tree species and, as such, growth rates which are in the YC range between 2 and 6 are deemed to be uneconomical. There may be some justification to replant SS in areas with previous poor growth if the reasons for poor performance are attributed to heather or poor establishment methods. In the case of Drimnatorran, the areas of poor growth in the SS crops are mainly due to environmental factors and, as such, they will be replanted with native species to establish a more natural habitat of transition and peatland edge woodland. Peatland restoration will be considered where site conditions are deemed suitable. This work will occur beyond this LMP period.

The dominant Lodgepole pine (LP), YC is 10, which is good. This accounts for just over 50% of the LP crop, and demonstrates how soil conditions affect tree growth. On the wettest, peatiest areas with lower soil fertility the LP YC drops to YC 4 which is quite poor. The replanting of these areas will take account of localised site conditions, in terms of ground preparation, species choice and allocation of open space.

The larches include, European (EL), Hybrid (HL), and Japanese larch (JL). The best YC’s – 12 – 14 represent 59% of the Larch crop. The lowest YC’s are mainly attributed to EL planted in 1987 in the old Policy woodland of Phemie’s Wood which has a mature mixed conifer and broadleaf crop dating back to 1900.

The broadleaf element is dominated by growth rates of YC 4, (over 86% of the broadleaf crop), where the main species are Downy birch and Sessile oak. This includes some mature and semi-mature native and non-native woodland where growth rates have naturally slowed, as well as broadleaf crops growing on quite marginal areas.

## Neighbouring Land Use

The Drimnatorran LMP lies independent from the nearest FLS owned woodland. This forest comprises of three separate blocks in the locality.

In the West, crofting townships and common grazing land uses surround Longrigg, and separate it from Phemie’s Wood as well as lying adjacent to the Western edge of Ariundle. In the South, Strontian village with its urban land use, community woodland, adjacent farmland and tourism based enterprises separates Phemie’s Wood from the main block of Drimnatorran. To the North of Drimnatorran lies the Ariundle Oakwood NNR , the disused lead mines of Whitesmith, Corrantee, Fee Donald and Middleshop and land used for cattle grazing and some deer stalking.. To the East and North east of Eggadale Glen and Carnoch in the main Drimnatorran block the land use is estate deer stalking with some commercial private forestry, owned by Carnoch Estate. There is area to the East of the main block which is privately owned which appears to be managed for deer stalking. This land is currently for sale.

This can put some pressure on the ability of FLS to manage woodlands, habitats and regeneration within the Glenhurich LMP as deer naturally seek the safety and shelter of woodlands. There are deer fences around the forest area and they are due for renewal.

### Landscape

#### Landscape character assessment

The Drimnatorran LMP area lies within two landscape character assessment (LCA), areas: most of Eggadale Glen, Ariundle plateau, Carnoch plateau and NW half of Longrigg lie within type “No. 245 – Plateau Moorland - Lochaber”; with the remaining area which lies closest to Strontian village within type ”No 235 – Broad Forested Strath”

“Plateau Moorland – Lochaber” Landscape Character Type:

**Key Characteristics**

* An open, exposed moorland landscape of boggy grasses with little heather and few trees.
* Stone dykes on the glen floors often tumbledown and neglected.
* Native oak woodlands with sheltered gullies and glens.
* Many derelict crofts. Development confined to sheltered aspects on the edge of the moor.
* Isolated, simply designed houses, often highlighted by a whitewashed finish.
* Landscape character particularly affected by changing weather conditions.
* Low mists and rain often enhance its wild character.

<https://www.nature.scot/sites/default/files/LCA/LCT%20245%20-%20Plateau%20Moorland%20-%20Lochaber%20-%20Final%20pdf.pdf>

Broad Forested Strath:

**Key Characteristics**

* Broad, low-lying straths with rolling relief and sculptural glacial landforms.
* Simple, large scale mosaic of forested ridges, rolling pastures and heath moorland, but dominated by swathes of forestry.
* A comparatively densely settled landscape with villages, houses and sporadic commercial development.
* Quarries hidden amongst the woodland cover.
* Strong communication and service corridors.
* Long distance views from surrounding hills over the glens, which are framed by steep glen sides.
* Lochs, rivers or canals on glen floor have often been engineered or substantially altered by man.

<https://www.nature.scot/sites/default/files/LCA/LCT%20235%20-%20Broad%20Forested%20Strath%20-%20Final%20pdf.pdf>

#### Landscape Zones

**ZONE 1 – Glen with Industrial woodland heritage zone**

This zone encompasses Eggadale Glen. It is defined by a mix of a relatively sheltered quite steep sided wooded glen, river, mountain streams and quite open floodplain. It contains heritage features of industrial woodland management – coppice oak woods, wood pasture and conifer production, as well as farming.

**ZONE 2 - Plateau Zone**

This zone comprises of wet peaty plateau dominated with conifer woodland.

**ZONE 3 – Rounded hill Zone**

This area contains Carnoch hill which dominates the background of Strontian village and is highly visible from the townships of Anaheilt and Scotstown, the main A861 and the A884 which runs along part of the South side of Loch Sunart. This hill comprises of the most productive conifer area within the LMP as well as open and forested boggy summit; open fallow hill and the odd prominent birch wooded gully.

**ZONE 4 – Wooded loch shore Zone**

This area contains Phemie’s Wood – a long established “Policy” woodland on the Western slopes of the mouth of the Strontian river where it flows into Loch Sunart. It dominates the local landscape viewed from the most populated part of the area, including from the Southern banks of Loch Sunart. The woodland contains some large and veteran conifer and broadleaf trees and is rich with deadwood and lichens.

#### Landscape Guidelines

#### The local landscape and its scale will have the biggest influence on forest design. The varied topography of the Drimnatorran LMP area - of mountain, glen, plateau, rounded hill, steep slopes, former farmland, outcrops and watercourses - will all inform the look of the forested areas. Other important influences include designations, heritage, folklore, native habitats, infrastructure and neighbouring settlements.

#### Landscape designations

Drimnatorran forest lies just outside the Loch Shiel national scenic area.

The most North easterly tip of the forest lies just inside the Ardgour Area of Great Landscape Value (AGLV)/ Local Landscape Area. This area is too small to have any impact on this landscape designation.

<https://www.nature.scot/professional-advice/safeguarding-protected-areas-and-species/protected-areas/local-designations/local-landscape-areas>

The Wild Land Area (WLA) – No.13 – Moidart – Ardgour lies adjacent to the Eastern boundary of the Drimnatorran LMP area. Although this designation lies outside Drimnatorran, the conifer plantation of Ariundle has been described as having a strong influence on the wildness of the WLA as it can be viewed from within the designation. It affects the wildness element by indicating contemporary land use. Forestry activity has been described as affecting the sense of sanctuary of the Wild Land Area.

<https://www.nature.scot/sites/default/files/2017-11/Consultation-response-Description-of-Wild-Land-Moidart-Ardgour-July-2016-13.pdf>

## Environmental designations

#### Special Site of Scientific Interest (SSSI), SAC, SPA (See Map 8 – Approved 10 Year Felling)

**1. Sunart SSSI** – This affects approx. 58ha of broadleaf and mixed woodland on the lower slopes of Ariundle. Within this SSSI designation the notified natural features of national importance are:

Woodlands – Upland oak woodland; Non-vascular plants – Bryophyte assemblage, Lichen assemblage; Vascular plants – Vascular plant assemblage; Mammals – otter; Invertebrates – Dragonfly assemblage, Chequered skipper butterfly, Moths

The objectives for management of the SSSI features which lie within the Drimnatorran LMP area are:

4. To restore the favourable condition of the woodland by:

- Removal of rhododendron and subsequent control of regrowth or seedlings.

- By maintaining a balance of deer grazing to allow for natural regeneration without the formation of unduly thick understorey

- Encouraging the expansion of new native woodland onto appropriate ground around the existing woodland, using natural regeneration where possible or by appropriate planting.

- Improve the structure of the woodland by increasing the proportion of saplings and mature trees present for all native species, increasing the quantities of deadwood which is present, and retaining open glades.

6. To maintain or improve the condition of the vascular plant assemblage through:

- appropriate management of the habitat

7. To safeguard the condition of the non-vascular plant features by:

- Maintaining or improving the structure of the woodland habitat

- Improving the condition of the lichen feature by continuing to control the regeneration of non-native species (rhododendron)

8. To maintain the favourable condition of the invertebrate species by:

- Maintaining a mixed habitat structure, including glades, dense cover and plentiful food plants

- Safeguarding against fire

9. To maintain the favourable condition of otters by:

- Preventing any reduction in the overall number of active holts

- Avoiding undue disturbance

<https://sitelink.nature.scot/site/8174>

**2. Sunart SAC**: This affects the same 58ha of broadleaf and mixed woodland on the lower slopes of Ariundle as the SSSI above. The qualifying reasons for selection of the SAC which affect the Drimnatorran LMP area are:

Old sessile oak woods with Ilex and Blechnum in the British Isles (containing the richest complex of Atlantic bryophyte-rich old sessile oak woods in the UK, supporting a rich fern flora, a wide range of lichens and the chequered skipper butterfly); Otter; Tilio-Acerion forests of slopes, screes and ravines

The Sunart SSSI and SAC lie partly within the LMP area in Ariundle and they lie adjacent to the Southern boundary of Carnoch. All watercourses within Drimnatorran forest eventually run into Loch Sunart. Loch Sunart and its shores are part of these designations.

<https://sac.jncc.gov.uk/site/UK0019803>

**3. Moidart and Ardgour SPA**: This designation lies immediately adjacent to the North west, North and Eastern boundaries of the main Drimnatorran block, and it lies within approx. 228ha of the LMP ground primarily on the open ground and poor performing conifer areas of Carnoch. The qualifying interest is Golden eagle (Aquila chrysaetos), the condition of which is favourable.

The conservation objectives for the SPA area are:

* Population of the species as a viable component of the site
* Distribution of the species within the site
* Distribution and extent of habitats supporting the species
* Structure, function and supporting processes of habitats supporting the species
* No significant disturbance of the species
* <https://sitelink.nature.scot/site/10115>

**4. Ariundle Oakwood National Nature Reserve (NNR)** – owned and managed by NatureScot. The Ariundle section of Drimnatorran Forest almost envelopes this NNR. Although it lies immediately adjacent to the forest it can have a major impact on the FLS owned SAC/SSSI area and vice versa.

NatureScot state that the priority for this NNR “is to keep the woodland in good condition”. They consider that Oak is the dominant tree species and they remove any non-native trees that seed in the forest. They aim to manage deer to sustainable levels and they encourage trees to naturally regenerate, but still maintain open areas to create mixed age woodland with open glades.

There has, in the past, been a management agreement whereby FLS will manage the deer on behalf of NatureScot. FLS also carries out routine inspections of the recreation facilities within the NNR and outline the work required to maintain a safe environment. During this LMP period, FLS and NatureScot will need to revise the working relationship and agree on a means of eradicating the non-native species that exist within the NNR that will negatively impact on the adjacent SSSI and SAC designation in FLS ground. For example the issue of regenerating Beech trees and the persistent seed source from a small number of large Beech trees within the NNR. Much of the necessary work has been severely impacted by a lack of budget and a change of priority for funding NatureScot owned NNRs.

<https://www.nature.scot/enjoying-outdoors/scotlands-national-nature-reserves/ariundle-oakwood-nnr/ariundle-oakwood-nnr-about-reserve>

#### Archaeology: Scheduled Monuments / Unscheduled

There are no scheduled monuments within the Drimnatorran LMP area.

There are fourteen unscheduled monuments which are regarded as being regional importance – ten are buildings or townships; two are walls or enclosures; one is a platform and one is a lade.

There are twenty nine unscheduled monuments which are of local importance – seventeen are walls; four are townships or buildings; four are agricultural structures; two are tracks; one is a peat bank and one is the location of a former village hall and war memorial.

There are twenty four undesignated heritage features – eleven are settlements or huts; five are bloomeries or charcoal pit; four are agricultural structures; three are platforms and one is a lazy bed.

These features are evidence of a thriving industrial native woodland past – from the Vikings valuing the Oak for building and repairing their warships, to wood pasture farming, house building, charcoal production to providing pit props to the thriving adjacent lead mines. Until over one hundred years ago the glen in which Ariundle is located was named Eggadale on old maps. In old Norse and in Danish this translates as Oak Glen.

Other heritage features include the ancient woodland, notably veteran trees, old coppice and other features of a woodland industrial past.

The heritage features will be protected with buffer zones. Many features are completely surrounded by trees, however, after harvesting operations, all other work will ensure compliance with the protective buffers. All work will comply with FLS best practice and the UK Forestry Standard 2017: Forests and Historic Environment. FLS have their own Historic Environment guidance as shown in the table below. It outlines the category of importance of the heritage feature with the size of the associated protective buffer zone. These buffers are normally measured from the outer edge of the feature.

| **Heritage Feature – Category of Importance** | **Required Protective Buffer Width** |
| --- | --- |
| National Importance (Scheduled) | 20 metres |
| Regional Importance | 10 metres |
| Local Importance | 5 metres |
| Uncategorised | 0 metres |

#### **Habitats**

There is a variety of priority habitats especially on the open land which lies outside the forested areas of Eggadale East and Carnoch. The floodplain of the Strontian river and the fringes of Ariundle plateau also contain a variety of habitats.

There are five localised areas of important habitats: bog (NVC1 – M17a); flush, acid flush, basic & acid flush (NVC1 – M10a); and rock verge/rock/dry heath (NVC1 – H10a).

The flushes are located on the Eastern boundary of Eggadale plateau and on the Western edge of Ariundle plateau at Bellsgrove. These areas are to be managed to avoid tree planting and forest drainage.

The bog area lies close to the Allt mo Nighneig on the North end of Carnoch hill. It should be kept free of trees.

The rock verge is adjacent to the forest road on South Carnoch. The associated heath must be kept free of conifer regeneration and rhododendron. Roads maintenance should also avoid degrading this habitat.

The table below outlines the main habitat component and the area of land it covers.

| **Habitat Group** | **Habitat Group Area (ha)** | **Main Habitat Type** | **% of Total Habitat Type** | **Land Use** | **Area (ha)** |
| --- | --- | --- | --- | --- | --- |
| Grassland | 12.21 | Neutral Grassland | 3.5% | Open | 12.21 |
| Wet/ damp/bog | 110.63 | Fen/ Marsh/Swamp | 14.5% | Open | 50.43 |
|  |  | Blanket Bog | 17.5% | Open | 60.2 |
| Dry/ heath | 186.16 | Upland Heathland | 39.5% | Open | 136.1 |
|  |  | Bracken | 14.5% | Open | 50.06 |
| Woodland | 36.22 | Wet Woodland | 3.5% | Semi-natural woodland | 13.11 |
|  |  | Upland Birch woodland | 7% | Semi-natural woodland | 23.11 |
| TOTAL | 345.22 |  | 100% |  | 345.22 |

#### Very Important Habitats

Within these habitats there are areas which are deemed to contain very important habitat as outlined in the table below.

| **Location** | **Habitat type** | **Area (ha)** | **Threat** | **Management prescription** | **Comments** |
| --- | --- | --- | --- | --- | --- |
| Carnoch N | Wet Heath | 4.13 | trees | Maintain open | - |
| Carnoch N | Wet heath/bog | 4.82 | trees | Maintain open | - |
| Carnoch N | Bog/heath/swamp | 4.62 | trees | Maintain open | - |
| Eggadale plateau | Heath/bog/flush | 29.55 | trees | Maintain open | - |
| Carnoch S & Ariundle | Wet woodland | 1.41 | none | Min. intervention | Good area of fen |
| Ariundle | Birch/ Oak wood | 0.7 | conifers | Remove conifer | - |
| Ariundle plateau | Birch/ Oak/ bracken | 3.81 | conifers | Remove conifer | Abundant bryophytes. Ferns abundant in ravine |

#### **Species**

The lower slopes of the Ariundle section of the LMP area lies within the Sunart SSSI and SAC. The features of this designation, which is of national importance, include: upland oak woodland; bryophyte assemblage, lichen assemblage, vascular plant assemblage, otter, dragonfly assemblage (Northern Emerald), moths and chequered skipper butterfly.

Species which are of European importance and are features within the LMP section of the Sunart SAC and the Moidart and Ardgour SPA are: old sessile oak woods otter and Golden eagle.

Out with the designated areas, and other than those species previously mentioned, the LMP area is also home to:

Mammals - badgers, bats, pine marten, Roe and red deer, and the transient presence of red squirrels.

Invertebrates – Pearl-bordered fritillary and Speckled Wood butterflies.

Birds – Black grouse, Raven, buzzard, sparrowhawk and barn owl

Fungi - Ascomycota

#### **Biodiversity**

The ecological potential for deadwood lies within the LMP forested area.

The highest ecological potential for deadwood is found in the SSSI/SAC oak wood; the Coillie Dubh PAWS; and the small riparian woodlands throughout the LMP area. Deadwood in these areas remain on site, ideally, remain in situ.

The areas of medium potential are located where there are more long established tree cover such as within Phemie’s Wood; Ariundle to the North and South of the SSSI oak wood and uphill of Coillie Dubh.

The new LMP restock proposals should enhance the deadwood potential of the forest. The felling to recycle of conifer species in the annexed area of SSSI woodland between the NNR and the Strontian river will produce much deadwood. The establishment or enhancement of riparian woodland through the restructuring of the forest will improve the deadwood potential in years to come. Much of the future riparian woodland to the North of Carnoch connects with the Strontian river, thus, it will provide a permanent link for the movement of species associated with deadwood ecosystems. The management of Phemie’s Wood entails a low level continuous cover manipulation of light and crown space. Large sections of trunk or branch wood are left as deadwood habitat.

PAWS:

Forestry and Land Scotland has an objective to restore 85% of plantations on ancient woodland sites (PAWS). These ancient woodland areas have been identified from appearing on maps created during 1750 and 1860 and having continuous woodland cover since. There is around 52.5ha of ancient woodland designation in the Drimnatorran LMP area, of which, just over 4ha lies on conifer productive land. In recent years over 10ha of conifer plantation has been felled in the Ariundle ancient woodland and is currently establishing as planted native oak woodland. During the new LMP period the aim is to fell another 2.2ha of conifer woodland to restore to native woodland in Ariundle. This leaves just under 2ha of future PAWS restoration along the Western edge of Coillie Dubh in Eggadale East to be completed beyond this LMP period.

Another woodland designation relates to woodland that appeared on the Roy maps, but which do not have continuous woodland habitat to the present day. There is almost 5.5ha of this designation in Ariundle and lies immediately adjacent the ancient SSSI/SAC designated woodland, thus, providing some continuity of potential habitat. Just over 1.9ha of the Roy designation was planted as Oak woodland in 2018; around 1ha is mature Oak about 170 years of age; about 1.5ha is 47 year old Lodgepole pine with a small amount of Sitka spruce and the remaining hectare is open space. Ancient woodland remnants found in these areas will be protected.

Over 20ha of woodland in Phemie’s Wood is classified as “Long established”. This policy woodland, although not native, does contain some ancient woodland features such as woodland flora and veteran or large Oak trees. The long established nature of this woodland has ensured that there is a healthy deadwood ecosystem sustained by sporadic windblown large broadleaf trees and Silver fir. An abundance of lichens, mosses and ferns are also a very interesting feature of this woodland habitat. This type of habitat is mirrored in the policy woodland of a similar age on the East side of Strontian which is under ownership of the local community.

### **Social factors**

#### Recreation & Community

There is a good network of formal recreation in Drimnatorran with almost all FLS paths deemed by Highland Council as core paths. The FLS paths directly connect with the forest road at Ariundle and with the path networks in adjacent properties, thus linking the three Drimnatorran blocks with community owned woodlands, the NNR, Strontian village with the townships of Longrigg and Scotstown and Ariundle.

The formal recreation areas are the trails in Phemie’s Wood; the Ariundle car park and riverside walks as well as the bridal path leading to the ford on the Strontian river.

The Fairies’ Road Walk is not promoted by FLS. It is defined as a core path by Highland Council.

There are around 36,500 annual visits to the Drimnatorran forest areas: c16,500 to Ariundle; 15,000 to Phemie’s Wood with 5,000 to Carnoch. The majority of these are made by locals, but there is also a sizeable number of tourists visiting the NNR and in doing so use the Ariundle car park and forest road.

The Visitor Service Team will continue to monitor visits to forests, this will include but is not limited to or any one of the following; person counters, movement detection, monitoring social media interactions, location based information, local staff and local community knowledge.

The table below details the paths within the LMP area and indicate what upgrades are due within the new LMP period in Ariundle and Phemie’s Wood FLS paths. Also shown below are the estimated upgrade expected for the NNR paths (outside FLS ground), which should be undertaken by NatureScot (NS), but which directly link with the FLS Ariundle paths.

| **Path** | **Total length (m)** | **Gravel (G) sections (metres)** | **Boardwalk**  **(B)**  **sections (metres)** | **Unsurfaced (U)**  **sections (metres)** | **Upgrades**  **Due (metres)** |
| --- | --- | --- | --- | --- | --- |
| Ariundle trail | 1710 | 1470 | 240 | 0 | 1710 metres:  Gravel paths 1470m  Boardwalk 240m |
| Ariundle Bridal | 180 | 180 | 0 | 0 | 180 metres:  Gravel paths 180m |
| Phemies’ Wood | 2310 | 1750 | 280 | 280 | 1600 metres:  Gravel paths 1080m  Boardwalk 240m  Unsurfaced paths 280m |
| Fairies’ Road | 3010 | 3010 | 0 | 0 | 2740 metres:  Informal path, unlikely to be formally maintained |
| NNR NatureScot | 1985 | 865 | 0 | 1120 | 1985 metres:  Gravel paths 865m  Unsurfaced paths 1120m |
| Totals | 9195 | 7275 | 520 | 1400 | 8215 |

The FLS managed Ariundle riverside walks also include two pedestrian bridges which span the Strontian river and one which spans a small stream. All three are due upgrades during the new LMP period as they will have reached or exceeded their expected lifespan.

Currently there is one car park located in Ariundle. This is the main welcome point for both Drimnatorran Forest and the SNH owned NNR which includes the provision of information and picnic tables.

There are two claimed rights of way which affect the LMP area:

The Ariundle – Sallachan route begins in Ariundle and follows the forest road for 1185 metres. Beyond that it follows the track through the NNR to Sallachan via Glen Gour.

The other claimed right of way (990 metres), passes through Phemie’s Wood, linking the township of Ardnastang with Strontian. The route bares no relation to pathways on the ground. There is no evidence of a path following this route in current OS maps nor ones dating back to the 1st edition 6 inch maps .

The Drimnatorran LMP area lies within the Sunart Community Council boundary. There are many properties which lie adjacent to the forest – the East and West boundary of Strontian village and the townships of Ardnastang, Longrigg, Scotstown and Anaheilt.

The local Sunart Community Company own the Strontian River bed and its associated river banks which includes the heritable salmon/ sea trout fishing rights - all of which is managed on their behalf by the Strontian Angling Association.

### LMP – Landscape

Overview:

The landscape within the Drimnatorran LMP area is quite varied considering it is only around 1071ha in size. Its topographical diversity and the fact that it is split into three locations, separated by other land uses, gives the impression it is much larger than it is. There is no vantage point where you can view all of the LMP area. The topography consists of a wooded glen; two wooded plateau areas; a dominant rounded hill and a prominent mature wooded loch side slope. Mountain streams and river; some gullies; floodplains; loch; upland and some open, bog and montane habitats are the other dominant landscape features. Views are most prominent of the Carnoch hill and Phemie’s Wood from the main road, Strontian village and the local townships, with Longrigg easily viewed from Morvern. Eggadale glen is relatively out of sight from the main viewpoints due to its NE/SW orientation and its location to the North of Carnoch hill.

Landscaping Issues:

The relatively steep slopes of Eggadale East are problematic in designing future management coupes as they are easily viewed from Ariundle with few distinct features in which to create obvious windfirm edges which are aesthetically pleasing. There is also a visual imbalance to Eggadale Glen – virtually split in two by the Strontian river; as Ariundle on the West side of the river consisting of protected mature Oak wood with commercial coniferous plantation dominating the East side of the glen.

Carnoch hill also has some landscaping issues with isolated conifer blocks on SW Carnoch acting as a poor link between the commercial conifer Southern slopes with the very large open NW facing slopes. Ideally there should be some wooded link on the West side of Carnoch to Eggadale Glen. Options for woodland creation to resolve this issue will be considered during the new LMP period.

The steepness of some slopes in the LMP area will require extraction by skyline winch, which further restricts the use of sinuous coupe shapes. These same slopes are peppered with small mountain watercourses, many of which do not currently meet the required UKFS standard of riparian buffers. Every attempt should be made to avoid extraction of timber crossing watercourses. A climate which is high in rainfall, combined with soils which are often shallow and quite erodable, and watercourses which provide the local communities with public and private water supplies , means that the management of soils and water are of primary importance.

The objectives of this plan include removing conifer species from the riparian restoration zone and restore bogs. Our commitment is to best practice for riparian and native woodland management – which means the removal of commercial conifer and non-native species from the designated and adjacent riparian area with the replacement being native woodland and open space. The conversion of PAWS sites over time will have a small impact on the landscape. These PAWS areas are located on the lower slopes of Ariundle and in Coillie Dubh in NE Eggadale Glen.

The biggest impact on the landscape is the proposed conversion of commercial conifer production in Eggadale East to a working native woodland which includes Scots pine. This will create a visual balance of woodland habitat.

The areas of poorly performing Sitka spruce on the Carnoch plateau and Eggadale East plateau will be considered for restoration of peatland habitats and some peatland edge woodland. Where the peat exceeds 50 cm depth – the aim is to restore the bog habitat. This will change the appearance of the upper margins of this part of the forest to a softer and more natural logical transition from dense woodland to scattered woodland merging into open habitat.

The positive impact of these objectives is that these native woodland habitats all connect and also link up with the open riparian and upland habitats. This provides a fantastic network for biodiversity and the movement of species and should, in the long term, provide an improved and permanent habitat for some priority species.

Currently there are very few existing rides providing windfirm edges.

Landscaping solutions:

* As the restructuring takes places, adjacent conifer crops become very vulnerable to windblow, thus it is important to harvest crops as close to the maximum mean annual increment (MMAI), as possible to optimise the economic return and minimise the risk of windblow by limiting the amount of older aged conifer crops.
* Many future coupe boundaries will, through time, be defined by the proposed riparian woodland. These riparian areas by their nature will be permanent features linking the floodplain and riparian woodlands with the upland transition/ peatland edge woodlands.
* Scots pine can be planted through the native broadleaf crop of Eggadale glen, with the quantity determined by local site suitability. The Sitka spruce and secondary commercial species of the plateau areas and Carnoch hill can be nursed or in mixture with Alaskan Lodgepole pine or Scots pine – dependent on local site conditions. The quantity of Scots pine mixture can be increased near the upper margins to visually feather the commercial crop with the native woodland which will help dilute the potential for hard edges whilst the crop is growing and after harvesting operations.
* The increase in native woodland habitat will create more diverse woodland structures, as well as creating an ever changing visual experience as the woodland changes with the seasons. The use of Scots pine within the native woodlands, and the commercial crops will provide colour and shelter during the winter months.
* Fell coupe sizes will be kept small enough to minimise the risk of erosion on such steep slopes, but large enough to be economically viable.
* The table below considers the UKFS Forest Design principles for the Drimnatorran LMP

| **Forest design principles** | **Drimnatorran LMP area** |
| --- | --- |
| Shape | The shape of the forested area is quite attractive at present. This will be enhanced through time as the forest is converted to a more native species structure with stocking densities appropriate to location and habitat type. Conversion to a working native woodland in Eggadale East and transition/ peatland edge native habitats will be the biggest change in landscape. Fell coupe shapes will follow natural features such as watercourses, spurs, gullies and outcrops as much as possible. Fell coupe size will be kept to a size which is lessen the risk of erosion on vulnerable steep, shallow and sometimes wet slopes. |
| Landform | The landform within the LMP area is quite varied, creating in effect a glen, two plateaus, a wooded dominant hill and a wooded loch side slope. The angle of Eggadale glen ensures that is hidden from prominent viewpoints and provides relative shelter to the prevailing weather. These features including outcrops, gullies, existing native wooded areas and watercourses determine the natural treeline as well as woodland type which can vary within different sections of the LMP area. In general, woodland will follow the gullies and watercourses uphill and open space and scattered woodland, such as those on mountain spurs and descending ridges will follow downhill. |
| Pattern of enclosure | This is not relevant in Drimnatorran. Although the elevations can be as low as 10 metres around Carnoch near Loch Sunart, this forest is very much upland in nature. |
| Scale | The forest is 1071ha in size and yet the scale, regarding extent, is actually quite intimate. From any one vantage point, only localised parts of the forest are visible, and so visual elements such as fell coupe size should be kept to an appropriate scale. In most areas, fell coupe sizes are around 20ha in size, but in areas such as Longrigg and Ariundle coupe sizes can be around 100ha in size. This is possible because the topography masks the full view of the coupes and because post felling, much of the land will undergo native woodland and peatland restoration. Both of these habitats require good deer management and these large open areas will facilitate these operations. The impression of scale tends to be a vertical one coming from the combination of the narrowness and steepness of the glen and the enveloping of Strontian village in the Southern part of the LMP area. |
| Diversity | The diversity of the woodland is dictated by management objectives, soil, elevation, exposure and watercourses. Open montane and peatland edge habitats will become a feature on the highest elevations. Through time, the commercial conifer wooded areas will be located in the most productive areas of the plateaus and Carnoch hill. They will remain dominated by Sitka spruce, as this is the species most suited to the local conditions. Scots and Lodgepole pines will be used as nurse species where soil conditions are poorer, so in the initial and thicket stages of the crop’s development they will add a textural variety which will help to address issues of uniformity. The native woodland will be dominated by Birch, with elements of Oak and Hazel on the lower slopes of Eggadale glen and in the ravines and gullies. Here Scots pine planted at varying densities, (dependent on local soil conditions), will visually provide winter interest. |
| Unity | Scots pine species links the commercial crops with the native woodlands. The future forest will link native floodplain and loch shore woodlands with upland riparian woodland through the transition/peatland edge woodland to the upland open habitats. As the woodlands ascend, stocking density will decrease visually creating a natural looking transition of habitats. |
| Spirit of the place | Drimnatorran is a special place with a long heritage of oak wood management; prized by the Vikings for boat building; prized for the charcoal it produced for the smelting industries and prized for the pit props for the lead mining industries. It was also valued for the construction of homes and for wood pasture agriculture. Today, it’s oak woodland is prized for the ecological habitat and species that it sustains – some of it of global importance. The return of a native working woodland with Scots pine in Eggadale East (Norse meaning for Egadale is Oak valley) will pay homage to this continuing land use and habitat and through time could expand the home for the protected and designated species.  It is also the location of the Fairy knoll – Tom an T-Sithein – after which the village of Strontian was named. The fairy knoll will be left unplanted in respect of local Highland cultural beliefs and folklore. |

The principles of forest landscaping within this plan follow the guidance in the UK Forestry Standard 2017: section 6.4: Forests and Landscape

<https://forestry.gov.scot/sustainable-forestry/ukfs-scotland>

# Appendix IV: Land Management Plan Consultation Record

| **Statutory Consultee** | **Date contacted** | **Date response received** | **Issue raised** | **FLS West Region Response** |
| --- | --- | --- | --- | --- |
| Scottish Forestry | 07/09/2019 | N/A | Attended the internal scoping meeting.  No issues raised | N/A |
| NatureScot | June to Sept 2019  19/10/2021  Aug/Sept 2022 | June to Sept 2019  04/11/2021 | How to access cpt 8216 to remove non-native invasive conifer species. Access to this area passes through the NatureScot owned Ariundle Oakwood NNR. Also sought the updated Oakwood Management plan to inform the LMP.  Discussions included, machinery access, motor manual FTR, horse extraction.  Consultation regarding acceptable non-native species to be planted in proximity (200m) to the SSSI/SAC and NNR in Ariundle. Species in question have other environmental benefits.  Response: preferred the use of native broadleaf, but SP is fine and NS is also fine if managed on a shorter rotation to avoid seeding.  Planning Forester prepared the SSSI Plan and passed to the FLS Environment Forester for completion. Environment Forester to send the documents to NatureScot to seek consent for proposed works which affect designations. | This discussion continues.  FLS ruled out horse extraction as too difficult for the horse.  Issue of Beech seeding into the FLS section of the SSSI/SAC designation from the NNR. NatureScot have no funding at present to manage the NNR.  The 200m protective buffer around the designations in Ariundle will be restocked with native broadleaf species with Scots pine sprinkled through to ensure a natural transition into adjacent SP crops. |
| SEPA |  |  |  |  |
| Scottish Water |  |  |  |  |
| Historic Environment Scotland |  |  |  |  |
| Highland Council Planning |  |  |  |  |
| Highland Council Archaeology |  |  |  |  |
| Highland Council Roads |  |  |  |  |
| Sunart Community Council |  |  |  |  |
| Lochaber District Salmon Fishery Board |  |  |  |  |
| Confor |  |  |  |  |
| FLS Torlundy & Regional Delivery; Planning,; Environment; Visitor Services; Area Land Agent; Landscape Architect colleagues | 07/09/2019 | 07/09/2019 | Internal Scoping Meeting |  |
| FLS National Advisors | 12/12/2019 | 12/12/2019 – 06/01/2020 | None. Emails were sent to all the National Advisors asking if there were any issues that needed to be addressed in the LMP | N/A |
| Ian McKee  Open Habitat Ecologist | Dec 2020 to Feb 2021 | Dec 2020 to Feb 2021 | How to plan land management on the peatland soils in Drimnatorran Forest | The peat soils were assessed by the newly created National Peatland team. They submitted their findings in July 2021. These were put into the LMP revision complying with Scottish Government objectives and the newly established FLS Peatland best practice and guidance |
| Richard Thompson  Native Woodland Ecologist | 17/12/2020 | 17/12/2020 | Discussion also involved Environment Advisor – Philippa McKee confirming 200m as a desirable buffer to protect designations and ideally PAWS designations | Restock areas - incorporated native and, in places some, non-invasive non-native species within 200m of designations, ASNW and PAWS areas |
| Matt Ritchie  FLS Archaeologist | July – October 2019 | July – October 2019 | Treatment of heritage features in LMPs | Implemented the new “Archaeology and the Historic Environment” guidance into the LMP. |
| Alison Bowman  Landscape Architect | June 2019 to present | Ongoing | Regular contact via monthly meetings and some site visits. Discussions included:  Landscaping, visitor zoning, viewpoints, planned roading, peatland restoration, plant health, species resilience, recreation. |  |
| Francesca Pell  Landscape Technician & Graphics Support | Since April 2021 | Ongoing | Creation of viewsheds, visualisations, compilation of the StoryMap consultation method, creation of posters for public consultation. |  |
| Robin Lunn | Since August 2019 | Ongoing | Survey/ground truth planned road routes to gain access into Ariundle plateau and Eggadale Glen | Seeking approval for these routes |
| FLS Torlundy & Regional Delivery, Planning & Environment, Visitor Services, Land Agent colleagues, Alison Bowman Landscape Architect & Richard Thompson FLS Native Woodland Ecologist | 12/01/2022 | 12/01/2022 | Internal Consultation on proposed felling coupes and future restocking.  Felling Coupes  Restocking – Ariundle plateau south  Public water supply catchment | Agreed that the large fell coupes in Ariundle plateau and Longrigg should be retained. Will need to justify this to SF: reached MMAI; subsequent native woodland habitat restoration; vulnerable approach road issues and negative impact on the local community; the spreading out of the felling over a long period will alleviate the above problems.  Discussed the rationale of felling the upper section of the Phase 6 coupe in Eggadale  Agreed that discussions are required with NatureScot regarding the felling of non-native species in Cpt 8216 and the need to address the Beech seeding issues in the SSSI/SAC designation.  To maximise options for woodland management, retain species composition as NS and SP with Oak introduced based on actual site assessments.  Agreed that the information on our mapping system is incorrect. Check the SEPA/Scottish Water websites.  This was rectified by Alan Gale the FLS Adaptation and Resilience Manager. |
| East Loch Shiel Deer Management Group |  |  |  |  |
| Lochaber Fisheries Trust |  |  |  |  |
| Sunart Community Council |  |  |  |  |

# Appendix V: Deer Management Plan

## West Region Drimnatorran Forest

## Deer Management Plan

## 2022 - 2031



Introduction

The purpose of this Deer Management Plan is to accompany the new Drimnatorran Forest Land Management Plan (LMP). It sets out why the management of deer is necessary to achieve the LMP objectives over the next ten years. The plan outlines how this will be achieved and the monitoring methods required to determine success.

This plan includes deer management within the adjacent NatureScot Ariundle Oakwood National Nature Reserve (NNR)

| Date Plan written | Annual revision dates |
| --- | --- |
| 24/03/2022 |  |
|  |  |
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|  |  |
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|  |  |
|  |  |
|  |  |

1.0 Background information

1.1 Contacts

| Contacts | Name | Contact details |
| --- | --- | --- |
| Owner | Forestry and Land Scotland | [enquiries.west@forestryandland.gov.scot](mailto:enquiries.west@forestryandland.gov.scot)  0300 067 6650 |
| Regional Manager | Andrew Hunt | [Andrew.Hunt@forestryandland.gov.scot](mailto:Andrew.Hunt@forestryandland.gov.scot) |
| Delivery Manager | James Robins | [James.Robins@forestryandland.gov.scot](mailto:James.Robins@forestryandland.gov.scot) |
| Assistant Delivery Manager | Kenneth Knott | [Kenneth.Knott@forestryandland.gov.scot](mailto:Kenneth.Knott@forestryandland.gov.scot) |
| Wildlife Ranger Manager | John Jackson | [John.Jackson@forestryandland.gov.scot](mailto:John.Jackson@forestryandland.gov.scot) |
| Wildlife Ranger | John MacDonald | [John.Macdonald@forestryandland.gov.scot](mailto:John.Macdonald@forestryandland.gov.scot) |
| Plan written by | Catriona MacLennan | [Catriona.Maclennan@forestryandland.gov.scot](mailto:Catriona.Maclennan@forestryandland.gov.scot) |

1.2 Location and property information

1.2.1 Location

| Location | Deer Management Group (DMG) |
| --- | --- |
| **Strontian, Lochaber**  **Drimnatorran Forest – 1071ha**  **1 - Drimnatorran Forest main block**  **NM 8345 6305**  **2 - Phemies’ Wood**  **NM 8095 6167**  **3 - Longrigg**  **NM 7993 6225**  **4 - Ariundle Oakwood National Nature Reserve (Naturescot) – 70.72ha**  **NM 8381 6438** | East Loch Shiel  DMG area – 48,233ha  DMG Deer population density – 9.5 deer/sqkm (4579 deer based on the Naturescot 2019 helicopter count). This assessment only accounted for open ground so when FLS forested ground is removed, the deer population density is representative of 11.9 deer/sqkm outwith FLS properties. |

1.2.2 Land management plan habitats

| Current LMP Habitats | Area (ha) |
| --- | --- |
| **SSSI & SAC woodland** | 48.8ha |
| **SSSI & SAC & NNR woodland owned by NatureScot** | 70.72ha |
| **Ancient semi-natural woodland** | 22.23ha |
| **Semi-natural birch, wet woodland and planted native woodland** | 33.06ha |
| **Other broadleaf woodland** | 17.8ha |
| **Sitka spruce** | 231.24ha |
| **Other conifers** | 209.5ha |
| **Open priority habitats** | 72.06ha |
| **Recently restored peatland** | 20.34ha |
| **Other open and unplantable ground** | 416ha |

1.2.3 Factors affecting deer management

| Deer management factors | Location | Comments |
| --- | --- | --- |
| Access | Ariundle and the NNR  Carnoch south  Eggadale  Phemies’ Wood  Longrigg | Forest roading is confined to the lower slopes of Ariundle.  The recreation paths around the Strontian river offer some ATV access.  Currently Ariundle plateau has no deer management access  The south facing slopes of Carnoch are well served with forest roads.  The recreation paths on the west side of Carnoch can offer some ATV access.  No forest roading or ATV access  No forest roading, but the recreation paths can offer some ATV access  No forest roading and no path network |
| Fencing | Drimnatorran main block  Phemies’ Wood and Longrigg | Ring deer fenced  Protected by the Sunart ring deer fence |
| Cull location hotspots | Ariundle  Carnoch | Around the entrance to the forest  On the summit, open hill, above the quarry and parts of south Carnoch |
| Culling blackspots | Ariundle plateau  Eggadale  Phemies’ Wood  Longrigg | Mature commercial forest with lots of windblow and an absence of roads and paths  Mature commercial forest with some steep slopes and an absence of roads and paths  Close to houses and the network of paths are well used.  Close to houses along the southern boundary. Absence of forest roading and paths. |
| Deer numbers | LMP area  Outwith the LMP area  NatureScot flight April 2022 | A recent Strath Caulaidh report indicated general deer populations ranging from 5-10/km2 in Ariundle and much of Eggadale with 15-20 deer/km2 on the open ground of Carnoch.  This displayed the herding of deer in open ground in the hinterland of Drimnatorran Forest. It showed that a large deer pressure is present to the north and north east of Ariundle in a density of 59 deer/km2. It also showed significant pressure to the west and east of Longrigg of between 30 & 40 deer/km2. This reflects what local Wildlife staff already know |

1.3 Recent culling record

1.3.1 Drimnatorran Forest

| Year | Red Stag | Red Hind | Red Calf | Roe Buck | Roe Doe | Roe Kid | Sika Stag | Sika Hind | Sika Calf | Total |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **2021/22** | 20 | 15 | 9 | 0 | 2 | 0 | 0 | 0 | 0 | 46 |
| **2020/21** | 15 | 11 | 5 | 2 | 2 | 0 | 1 | 0 | 0 | 36 |
| **2019/20** | 13 | 10 | 3 | 5 | 3 | 0 | 0 | 0 | 0 | 34 |
| **2018/19** | 24 | 22 | 11 | 2 | 2 | 4 | 0 | 0 | 0 | 65 |
| **2017/18** | 12 | 10 | 20\* | 1 | 3 | 5\* | 0 | 0 | 0 | 51 |
| **2016/17** | 9 | 5 | 14\* | 2 | 2 | 2\* | 0 | 0 | 0 | 34 |
| Total | 93 | 73 | 62 | 12 | 14 | 11 | 1 | 0 | 0 | 266 |

\* Juveniles and yearling

1.3.2 Ariundle Oakwood National Nature Reserve

| Year | Combined deer species cull |
| --- | --- |
| **2020/21** | 12 |
| **2019/20** | 12 |
| **2018/19** | 12 |
| **2017/18** | 12 |
| **2016/17** | 12 |
| **Total** | 60 |

2.0 Future management

2.1 Land Management Plan Objectives

The long term land management plan objectives are:

* To create resilience in forests, biodiversity, soil and water
* To expand native woodland around the designated woodlands in Ariundle and around the Ancient woodland in Eggadale
* To restore forested peatlands where commercial forestry is not viable
* To manage the forest and land sustainably

The objectives for Drimnatorran over the 10 year period of the new plan are:

* To remove the mature conifer plantation from Ariundle plateau, West Carnoch and Longrigg
* To complete the non-native conifer removal in the SSSI/SAC area in Ariundle
* Expand native woodland in much of the felled areas, in particular Ariundle plateau
* Discuss the future management of the Ariundle Oakwood NNR with Naturescot
* Construct new roading in Ariundle plateau
* Plan and commence new access into Eggadale
* Plan for, and accelerate the removal of Larch
* To renew the strategic ring deer fence around the Drimnatorran main block
* To restore forested bog in the Strontian floodplain, Carnoch summit and small areas of Ariundle plateau
* Restock the current felled areas in Carnoch and Ariundle
* To create small areas of new planting in Carnoch
* To secure the sale of Longrigg to the local community

2.2 Implications for deer management over new LMP 10 year period

* Felling over the 10 year period will see these coupes transition from commercial conifer plantation dominated with Sitka spruce and Lodgepole pine to naturally regenerating native woodland species and restocked soft conifer species. The 2019 nearest neighbour showed 27% conifer browsing with soft conifer and broadleaf species suffering higher browsing in year one.
* The felling will also provide the opportunity to restore all deep peat areas that will be unable to support viable conifer crops. These areas will be vulnerable to deer pressure and ATV access must avoid deep peats. The openness of the restored peats will, however, greatly improve sightlines for culling and stalking purposes.
* Ongoing management includes the maintenance of the 2019 restored peatland; maintaining the features of the SSSI and SAC, including the NNR; management of the Ancient woodland, other native woodland and the open priority Upland Heathland and Blanket Bog habitats.
* Creation of roading into Ariundle plateau and Longrigg will assist deer management access into some of the current culling blackspots.
* The construction of some planned roading will assist deer management access into south Eggadale
* The construction of new ring deer fence will strengthen protection of the main LMP area from the impact of deer. The East Loch Shiel DMG deer population density is above 11.8 deer/sqkm which is too high for all habitat management in Drimnatorran Forest. FLS aims for a deer population density of between 2-7 deer/sqkm, with the most sensitive habitats requiring 0-2 deer/sqkm for sustainable habitats. Deer pressure arising from neighbouring estates is of great concern.

2.3 Deer management proposals

| Management Type | Targets NNR | Targets  FLS | Target date | Monitoring method | Monitoring period and frequency | Responsibility |
| --- | --- | --- | --- | --- | --- | --- |
| Access | N/A | Ariundle plateau  Longrigg | 2027  2027 | Completed road lines surveys updated on Forester web | Completion of work plan | Civils |
| Deer fencing | Ariundle | Ariundle  Fence as close to the March boundary as possible | 2027 | Completed fencing surveys updated on Forester web | Completion of Work plan | Delivery |
| Woodland structure | 0-2 deer/sqkm | 0-2 deer/sqkm | Ongoing | NWSS surveys | Unknown | Environment |
| Ground flora | 0-2 deer/sqkm | 0-2 deer/sqkm | Ongoing | HIA, NWSS surveys | NWSS – unknown | Environment |
| Native woodland, restored peatland, blanket bog | 0-2 deer/sqkm | 0-2 deer/sqkm | 2027 | HIA, NWSS, nearest neighbour, habitat and SDA surveys | NWSS – unknown  HIA & SDA years 1 and 5 of establishment more often for NR sites | Planning/ Environment/ Delivery |
| Soft conifer restocking, Upland Heathland | N/A | 0-5 deer/sqkm | 2027 | HIA, nearest neighbour, habitat and SDA surveys | HIA & SDA years 1 and 5 of establishment | Planning/ Environment/ Delivery |
| SS and LP restocking | N/A | 2 – 7 deer/sqkm | 2023 | HIA, nearest neighbour and SDA | HIA & SDA years 1 and 5 of establishment | Planning/ Environment/Delivery |
| Deer activity and impact score | N/A | N/A | Ongoing | Nearest neighbour assessment  HIA | No set frequency | Delivery/Environment |
| Deer vehicle collisions | N/A | N/A | Ongoing | NatureScot DVC records | Respond to Police Scotland requests. | Delivery |
| FLS Deer management strategic overview | N/A | Aims for 2-7 deer/sqkm overall | Ongoing | Collation of information fed into the FLS Wildlife Management System | Ongoing | National Delivery team |
| East Loch Shiel DMG\* | DMG aims for 10.1 deer/sqkm | DMG aims for 10.1 deer/sqkm | Ongoing | Annually | Annually | DMG |

\*The deer population density for the DMG area is above 11.8 deer/sqkm as only open ground was assessed in the 2019 Naturescot count.

2.4 Deer Management objectives

| FLS only | Targets | Target date | Monitoring method | Monitoring period and frequency | Responsibility |
| --- | --- | --- | --- | --- | --- |
| Deer numbers | 0 – 2 deer/sqkm in vulnerable areas  2-7 deer/sqkm in less vulnerable areas | 2031 | Dung counts  Fecundity assessments  Cohort analysis  Thermal imaging  Visual counts  Population modelling | Annually | Delivery |
| Deer culls | 25% | Annual | FLS Wildlife Management System  FLS Cull records | Annually | Delivery |
| Deer Health | N/A | Annual | Carcass inspection  Reporting of suspected notifiable disease | Continual | Delivery |
| Venison production | N/A | N/A | Visual  FLS Larder records | Continual | Delivery |

3.0 Annually reviewed cull/trend summary

Cull targets and actuals

| Cull | 2022 Target | 2022 Actual | 2023 Target | 2023 Actual | 2024 Target | 2024 Actual | 2025 Target | 2025 Actual | 2026 Target | 2026 Actual | 2027 Target | 2027 Actual | 2028 Target | 2028 Actual | 2029 Target | 2029 Actual | 2030 Target | 2030 Actual | 2031 Target | 2031 Actual |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Red Females |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Red Males |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Red Juveniles |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Roe Females |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Roe Males |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Roe Juveniles |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sika Females |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sika Males |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Sika Juveniles |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Feral pig Boar |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Feral pig Sow |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Feral pig Piglet |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Deer numbers trend |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Impact trend |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DVC trend |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Other trend (state) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

4.0 Appendices

Boundary Map



Deer vulnerability map 2022



Deer vulnerability map 2031



# Appendix VI: Provenance guidance chart

| Species | Guidance |
| --- | --- |
| SS | Improved QSS standard throughout  Alaska (ASS) provenance may be considered (if available) for its slower growing properties in specific locations. i.e. Short Rotation Forestry (SRF) in Windfarm renewables developments. |
| VPSS | Limited use in best locations |
| SP | High rainfall type specified as standard. W20 |
| NSP | From the nearest appropriate zone near CFR areas |
| LP | Only ALP being used in mixture with SS on poorer sites |
| DF | Seed stand or coastal origin |
| ESF | Czech or central European |
| NF | Registered seed stands |
| GF | Scottish registered seed stands |
| WH | Registered seed stands with low fluting |
| WRC | Scottish seed stands |
| NS | Seed stands, Eastern European or Harz |
| JCR | Northern Japanese range |
| NBL | Region of Provenance 10, Native Seed Zone 106 |
| XC | PSSB will advise on any other minor species |

# 

Notes: PSSB can provide the most up to date guidance on provenance selection including advice on best suited seed stands. Virtually all seed supplied by PSSB comes from registered seed stands and is based on geographic area compatibility. Use of VPSS has declined as seed orchard QSS improves and this also has a wider genetic base for resilience purposes.

# Appendix VII:

Abbreviations used in the plan

| **Abbreviation** | **Meaning** |
| --- | --- |
| ASNW | Ancient Semi-Natural Woodland |
| ATV | All Terrain Vehicle |
| CCF | Continuous Cover Forestry |
| DAMS | Detailed Aspect Method of Scoring (A modelled windiness score used to calculate the probability of damaging winds occurring) |
| ESC | Ecological site classification (based on soil and climate information, aids tree species choice) |
| EIA | Environmental Impact Assessment |
| FSC | Forest Stewardship Council |
| FLS | Forestry and Land Scotland |
| Ha | Hectare |
| LISS | Low Impact Silvicultural System |
| LMP | Land Management Plan |
| MAI | Mean Annual Increment (Average annual growth a tree of stand of trees has experienced to a specific age) |
| MI | Minimum intervention (minimum level of management) |
| NR | Natural Reserve |
| NSA | National Scenic Area |
| PAWS | Plantation on Ancient Woodland Site |
| PEFC | Programme for the endorsement of forest certification |
| RBMP | River Basin Management Plan |
| SAC | Special Area of Conservation (habitats) |
| SEPA | Scottish Environmental Protection Agency |
| SF | Scottish Forestry |
| SSSI | Site of Special Scientific Interest |
| SPA | Special Protection Area (birds) |
| SPHN | Statutory Plant Health Notice |
| UKBAP | UK Biodiversity Action Plan |
| UKFS | UK Forestry Standard |
| UKWAS | UK Woodland Assurance Standard |
| YC | Yield Class (Index of potential productivity of even-aged stands of trees. Measured in units of cubic metres per hectare per year) |

| **Species abbreviations** |
| --- |
| AR = Alder  BI = Birch (downy/silver)  CAR = Common Alder  DF = Douglas Fir  EL = European Larch  HAW = Hawthorn  GF= Grand Fir  GWL = Goat Willow  HAZ = Hazel  HL = Hybrid Larch  JL = Japanese Larch  LP = Lodgepole Pine  MB = Mixed Broadleaves SS = Sitka Spruce  MC = Mixed Conifers  MCP = Macedonian Pine  NBL = native broadleaves (including SP where suitable for conservation)  NF = Noble Fir  NS = Norway Spruce  OK = Oak (robur/petreae)  RC = Western Red Cedar  ROW = Rowan  SP = Scots Pine  SS = Sitka spruce  WCH = Wild Cherry / Gean  WH = Western Hemlock  XL = Larch  XWL = Other Willows |

# Appendix VIII: Peatland

Peatland appendix I - LMP Supporting document



Peatland appendix II – Future Management of afforested peatlands

| SUMMARY AREAS | Hectares (ha) 1:10k soils map | Hectares (Ha) JHI map | Comments |
| --- | --- | --- | --- |
| Current management of peatlands in LMP |  |  |  |
| Afforested deep peatlands | 148.74 | 45.9 | Coupe 84001 – 2.6ha – Phemies’ Wood CCF (JHI)  Coupe 84006 – 30.5ha Ariundle plateau  Coupe 84010 – 5.15ha Ariundle SSSI/SAC Bog Birchwood  Coupe 84013 – 10.33ha – Ariundle SSSI/SAC Bog Birch/Oak wood  Coupe 84014 – 14.65ha – Eggadale north  Coupe 84015 – 6.93ha – ASNW – Birchwood  Coupe 84016 – 2.86ha – Eggadale east  Coupe 84017 – 5.04ha – Eggadale SW of ASNW  Coupe 84022 – 0.23ha – Eggadale central – Scots pine  Coupe 84024 – 2.05ha – Eggadale central  Coupe 84025 – 5.51ha Strontian river floodplain (east side)  Coupe 84033 – 10.02ha N of Carnoch summit  Coupe 84034 – 37.1ha Carnoch summit  Coupe 84049 – 14.59ha NW of Carnoch quarry  Coupe 84056 – 1.29ha W of Carnoch quarry  Coupe 84062 – 2.49ha SE of Fairies’ knoll  Coupe 84068 – 43.3ha Longrigg (JHI) |
| Existing open habitat on deep peat | 110.7 | 0 | Blanket bog priority habitat – 60.2ha,  Restored peatland (2019) – 20.34ha  Deep peat soils outwith priority habitats – 30.16ha |
| TOTAL – All deep peat soils | 259.44 | 45.9 | (305.34ha total peat area) |
| Future management of afforested peatlands |  |  |  |
| “Presumption to restore” peatlands  Forest-to-bog restoration of afforested peatlands including the hydrological catchment | 86.58 | 27.86 | Coupe 84006 – Ariundle plateau  Forest-to-bog restoration – 1.5ha (remove scattered trees from open habitat)  Hydrological unit – 1.5ha  Coupe 84025 – Strontian river floodplain  Forest-to-bog restoration – 5.51ha (remove poorly performing SS and ALP)  Hydrological unit – 19.66ha  Coupe 84034 – Carnoch summit  Forest-to-bog restoration – 37.1ha (remove poorly performing SS)  Hydrological unit – 65.42ha  Coupe 84068 – Longrigg  Forest-to-bog restoration – 26.66ha (remove poorly performing LP, Larches and SS)  Hydrological unit – 27.86ha  Total Forest-to-bog restoration – 70.77ha  Total Hydrological unit restoration – 114.44ha |
| “Assess” peatlands  Forest-to-bog restoration to secure carbon store and sequestration, and maximise ecosystem services. | 1.88 | 0 | Coupe 84006  Area lies adjacent to the Presumption to Restore peatlands, but not hydrologically connected.  Forest-to-bog restoration – 1.5ha  Hydrological unit – 1.88ha |
| Peatlands to be restocked | 29.0 | 0 | Coupe 84006  Native woodland habitat – 1600 stems/ha – 10.67ha gross area (8.01ha Nett)  Peatland edge woodland (PEW) – 600 – 1200 stems/ha – 27.97ha gross area (20.99ha Nett) |

Presumption to restore table

The table below is only relevant for Presumption to restore peatlands (Scenario A peat types) where deforestation would prevent the significant net release of greenhouse gases.

|  | Description | Location of described attribute (peat types, part of the forest) |
| --- | --- | --- |
| Open Blanket Bog habitat | Illustrated on map Appendix IVa “Peatland and Habitats” map | Coupe 84006 – Ariundle plateau  Coupe 84025 – Strontian River floodplain  Coupe 84034 – Carnoch summit |
| Peat types present | Illustrated on map Appendix IVa “Peatland and Habitats” map | Coupe 84006 – Ariundle plateau  (mostly open with scattered trees)  Soil types mix of:  9b – (Tussocky molinia bog, Molinia Calluna bog)  9c – (Tussocky molinia, Eriophorum vaginatum bog)  10b – (Upland Sphagnum bog)  Coupe 84025 – Strontian River floodplain  Soil types mix of:  9a – (Molinia, Myrica, Salix bog)  9b – (Tussocky molinia bog, Molinia Calluna bog)  9c – (Tussocky molinia, Eriophorum vaginatum bog)  Coupe 84034 – Carnoch summit  Soil types mix of:  9b – (Tussocky molinia bog, Molinia Calluna bog)  9c – (Tussocky molinia, Eriophorum vaginatum bog)  9d – (Non-tussocky molinia, Eriophorum vaginatum, Trichophorum Bog)  11b – (Calluna, Eriophorum vaginatum Blanket bog)  11c (Trichophorum, Calluna Blanket bog)  14 (Shallow hagged eroded bog)  Coupe 84068 – Longrigg  Soil type:  11b – (Calluna, Eriophorum vaginatum Blanket bog |
| Hydrological units | Illustrated on map in Appendix IVb “Presumption to restore sites” map | Coupe 84006 – Ariundle plateau  Scenario A&B combined peat types in one location with Scenario B peat types in the remaining two locations. These locations coincide with Blanket bog priority open habitat. These peats do contain scattered trees.  The hydrological units are small due to the local topography forming little basins which are contained within the peat soil polygon.  Coupe 84025 – Strontian river floodplain  The Scenario A & B peat types form the same hydrological unit which is formed by much of the flattish floodplain zone contained between the river to the West and the base of the steep slope to the East.  Small watercourses also act as boundaries of the hydrological units.  Coupe 84034 – Carnoch summit  Scenario B peat types with some Scenario A eroded bog, all linked by Blanket bog open priority habitat.  The hydrological units are contained within the flat and gently sloping topography of the summit of the hill. The coupe is dissected by the Allt Mo Nionag and two lesser watercourses which form hydrological unit boundaries.  Coupe 84068 – Longrigg  The hydrological unit is contained within the central northern portion of the site, where the natural topography forms a basin.  The above locations were assessed by the FLS National Peatland team. |

Assessed peatlands table

The table below is only relevant for Assessed Peatlands (Scenario B & C types) where there needs to be clear evidence that restocking on peat soils will produce a yield class equivalent to Sitka spruce YC 8 or more

| Attribute described | Description | Location of described attribute (peat types, part of forest) |
| --- | --- | --- |
| ESC statement (range)  State range respective to peat type | Illustrated on map in Appendix IVc  “Assessed restore and restock sites” map | Forest-to-bog restoration  Coupe 84006  Scenario B - Peat type – 9b (Tussocky molinia bog, Molinia Calluna bog)  ESC range:  No suitable commercial conifers YC 1 - 5  Only suitable native broadleaf is PBI – YC4  This area lies adjacent to presumption to restore peatland.  Restock areas:  Coupe 84006  Scenario B - Peat type – 9b (Tussocky molinia bog, Molinia Calluna bog)  ESC range:  No suitable conifer species (throughout)  PBI – YC 4 (throughout)  CAR – YC 7 (in central and SW sections of the coupe) |
| Accumulated Annual Temperature (range) | Illustrated on map in Appendix IVc  “Assessed restore and restock sites” map | Forest-to-bog restoration  Coupe 84006 – 1144  Restock areas:  Coupe 84006 – 1916 to 2081 |
| DAMS score (range) | Illustrated on map in Appendix IVc  “Assessed restore and restock sites” map | Forest-to-bog restoration  Coupe 84006 – 16  Restock areas:  Coupe 84006 – 15 to 18 |
| Crop deficiencies (needles, colour, leader length) | Illustrated on map in Appendix IVc  “Assessed restore and restock sites” map | Forest-to-bog restoration  Coupe 84006  Current crop is pure LP YC10. Some needle loss and some windblow on the western extent  Restock areas:  Coupe 84006  Central, southern and western section  LP (pure) YC 10 – 100% windblown. Much dieback. The soils in this location tend to consist of 40% 9b peat soils. One location with 60% peat soils.  Southern section – LP is standing but crowns are scant. These crops are likely located on the peatier sections of the soil matrix. |
| Location and extent, proportion of healthy crops (no signs of deficiencies) and reason | Illustrated on map in Appendix IVc  “Assessed restore and restock sites” map | Forest-to-bog restoration  Coupe 84006  Current crop is pure LP YC 10 on previously drained and fertilised site.  Restock areas:  Coupe 84006  Northern section where peat forms 20% of the soil matrix.  LP (pure) YC 8 – mostly standing with some needle loss  JL YC 12 – small areas – looks OK  Southern section  SS YC 24 and JL YC 10- likely to be located on the mineral portion of the soil matrix. |
| Statement of correction factors used to predict of next rotation from ESC outputs  (drainage, fertilising, flushing, heather control, peat compaction, and he combination of all of these per peat type) | The afforested peatlands contain crops which were manipulated to grow on peatland. These interventions include: the use of pure Lodgepole pine (LP) as nothing else was suitable, ploughing and draining the peats and several interventions of fertiliser application. These interventions were necessary to produce artificially high growth rates.  Replanting after felling afforested peatlands will not use these techniques as part of carbon management. | Peat type – (9b -Tussocky molinia bog, Molinia Calluna bog)  Climate scenario:  Medium-high 2080(A1b 3q0/AWC)  No drainage  No fertiliser  Brash management – over 18 months  Exposure – exposed ridge/coastal zone |
| Statement of actions required to limit carbon loss from peatland soil.  For example, partial re-wetting, referencing average water table height and density of drains | Peat dams will be installed in drains to ensure the maximum allowed drainage is not exceeded (250m length of drains per hectare, i.e. average spacing of 40m). If peat cracking is present beneath the ploughed furrows, if possible, “back fill trenches” will be installed. | Coupe 84006 – Ariundle plateau  (Scenario A & B peat restoration areas)  Coupe 84025 – Strontian river floodplain  Coupe 84034 – Carnoch summit  Coupe 84068 – Longrigg |
| Where PEW is proposed, confirm and explain why restoration of deep peatland is not possible | Illustrated on map in Appendix IVc  “Assessed restore and restock sites” map | Coupe 84006  Soil matrix of 20%, 40% and 60% 9b peat in random mixture with PSWG and Peaty ranker soils, forms a complex mosaic which makes restoration operations difficult to achieve and maintain.  These areas form the transition between native woodland habitat, (some of which forms a protective buffer for the adjacent SSSI/SAC Ariundle Oakwood) and commercial Scots pine woodland. Thus, it is best served as a low density native woodland habitat which connects, both ecologically and aesthetically, with other woodland habitats. |

Restoration proposals

The table below is to state and describe the restoration techniques to be applied to the proposed restoration areas.

| **Attribute described** | **Description** | **Location of described attribute (peat type, part of the forest)** |
| --- | --- | --- |
| **Treatments used to restore the hydrology** | Please see standard approach (appendix Vi)  State any site specific specifications or alterations of the approach: | Scenario A peat  Coupes 84006 – Ariundle plateau (includes Scenario B restoration)  84025 – Strontian river floodplain  84034 - Carnoch summit  84068 - Longrigg  These may involve the use of “peat dams” and “re-profiling the drains”. |
| **Treatments used to restore the topography**  **(remove afforestation modifications, and previously hagged sites)** | Please see standard approach (appendix Vi)  State any site specific specifications or alterations of the approach: | Scenario A peat  Coupes 84006 – Ariundle plateau (includes Scenario B restoration)  84025 – Strontian river floodplain  84034 - Carnoch summit  84068 - Longrigg  Will involve the “stump flipping and ground smoothing” and/or “backfill trenches” techniques.  Scenario A peat  Coupe 84034 – Carnoch summit  Areas of hagged eroded bog will undergo peat hag re-profiling restoration techniques. |
| **Treatments used to counteract peat cracking or other modifications caused by the afforestation of the peatland** | Is peat cracking present? | Peat cracking will be assessed as part of the operational planning. Treatments will follow the decision flow approach in Appendix Vi. |

EIA risk assessment

Forest-to-bog peatland restoration is classified as a forestry project under the Forestry (Environment Impact Assessment) (Scotland) Regulations 2017. To obtain consent from Scottish Forestry, an assessment of potential environmental risks as a result of the proposed forestry project is required to allow the determination of whether it is likely to have significant effects on the environment.

| Main risks to assess | Impact assessment |
| --- | --- |
| Population and human health | No impact. Core paths/private water supplies. |
| Biodiversity (habitats, species) | Positive. Restoration of a degraded peatland will restore a priority habitat, benefiting both habitat and its associated species. Pre-operational surveys will identify any protected or breeding species to ensure suitable mitigation is in place to avoid any disturbance. |
| Land | No impact. Where the restoration project is adjacent to agricultural land, boundary drains will not be blocked to ensure neighbouring land is not compromised by re-wetting and increased potential to flooding. |
| Soil – and geology, geomorphology | Positive. Re-wetting the site will benefit the peat soils as forestry modifications will be reversed to stop oxidisation and further degradation and erosion of the peat. |
| Water | Positive. Re-wetting techniques have shown to have no significant adverse effect on water quality. Ultimately, the water quality of the local area will be improved by reducing run-off from the exposed peat and degraded peatland. |
| Air | No impact. |
| Climate | Positive. Afforested peatlands have the potential to emit more GHG emissions than can be absorbed by a growing woodland. Restoration of afforested peatlands, especially “Presumption” to restore peatlands, will prevent the significant net release of greenhouse gases, ultimately benefitting the local climate. |
| Material Asset | No impact. |
| Cultural heritage | No impact. Pre-operational surveys will identify any cultural heritage features to ensure suitable mitigation is in place to avoid any disturbance. |
| Landscape | Positive. Peatland restoration will create more open space within the LMP forest blocks and their local area. This will add more diversity to the forest structure by creating open and associated native woodland habitats. |

Control of Woodland Removal Policy: Peatland restoration projects meet the requirements of the Scottish Government’s Control of Woodland Removal Policy as the deforestation and subsequent restoration will enhance a priority habitat and its (hydrological) connectivity.

Peatland appendix III – Peat type – NVC summary table



Peatland appendix IVa – Peatlands and Habitats map



Peatland appendix IVb – Presumption to restore sites map



Peatland appendix IVc – Assessed restore and restock sites map



Peatland appendix Vi – Peatland restoration: Forest-to-bog methods

