Forestry and Land Scotland
Coilltearachd agus Fearann Alba

Black Isle

Land Management Plan 2023-2033 North Region

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We manage Scotland's national forests and land to the United Kingdom Woodland Assurance Standard – the standard endorsed in the UK by the international Forest Stewardship Council® and the Programme for the Endorsement of Forest Certification. We are independently audited.

Our land management plans bring together key information, enable us to evaluate options and plan responsibly for the future. We welcome comments on these plans at any time.

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1.0 Objectives and Summary

1.1 Plan overview and objectives

Plan name	Black Isle
Forest blocks included	Black Isle Main Block, Black Isle West
Size of plan area (ha)	5110.3
Location	See **Map 1 – Location & Viewpoints**

Long Term Vision
50 Year vision *The biodiversity and quality of the native woodlands, open habitats and designated sites will have improved due to continuous effort of managing open space, rewetting, removal of invasive non-native species and increased age and species diversity. The resilience of these ecologically valuable areas will have increased due to complementary management on adjacent ground. Riparian woodland will have established along watercourses increasing water quality and buffering forest operations. Populations of red squirrel as well as species associated with deadwood are thriving as a result of proactive management to benefit these species.* *The forests on the Black Isle will be actively used by the local communities for recreation. Walking, mountain biking, horse riding and other forms of recreation will be commonplace. The local highlights such as the Clootie well and Learnie Red Rocks will attract locals as well as people from further away. Local communities are benefitting from cooperative initiatives where the forests are used for education, recreation and food.* *Considering the soil composition and predicted climate change the suitability for Scots pine will remain high. The main tree species will therefore still be Scots pine with other species being used where soils and growing conditions allow. The biggest change to the forest will be from single-storey, single-aged, monoculture forests to multi-aged and sometimes multi-storied and multispecies forests. These forests are more resilient whilst still producing high quality sawlog for timber markets.*
Management Objectives
1. Diversify age structure to improve resilience against wind, disease and climate change 2. Promote recreational use by improving recreational value and access 3. Produce high quality sawlog for local timber markets 4. Diversify species to mitigate against climate change and disease 5. Establish riparian woodland along watercourses

Critical Success Factors
• Large scale strip felling will need to be taking place across the Land Management Plan Area • Where felling takes place alongside watercourses riparian woodland will need to be established • A steady flow of timber will need to be harvested from the Black Isle to supply local markets and achieve the other management objectives • Deer densities need to remain at a level to allow for regeneration • Cooperation with local user groups will need to continue to ensure recreational value is retained and improved where possible

1.2 Summary of planned operations

Table 1: Summary of operations over the plan period

Summary of Operations over the Plan Period	
Clear felling (gross)	446.6 ha
Thinning (potential area)	4966.6 ha
Restocking (phase 1-3)	567.6 ha
Afforestation	0 ha
Deforestation	0 ha
Forest roads	480 m
Forestry quarries	0 ha

The forest is managed to the UK Woodland Assurance Standard – the standard endorsed in the UK by the *Forest Stewardship Council and the Programme for the Endorsement of Forest Certification*. Forestry and Land Scotland is independently audited to ensure that we are delivering sustainable forest management.

2.0 Analysis and Concept

The planning process was informed by collecting information about the woodland which is presented in **Appendix 1 – Description of Woodlands** and on **Map 2 – Key Features**. During the development of this plan we have consulted with the local community and other key stakeholders, and a Consultation Record is presented in **Appendix 3 – Consultation Record**.

Through a process of internal and external scoping an overview of the current status of the plan was made. This was related to the national and regional objectives and from this process the main issues of the area were identified. These are shown spatially on **Map 4 – Analysis & Concept**. The main issues in the main block are the lack of species and age diversity and the presence of extremely infertile soils. In the woods near the main population centres the recreational, environmental and production objectives need to be balanced carefully. The hills to the south-east are highly visible and well used for recreation and these values need to be balanced with productivity and the environment yet again.

The main issues, together with the regional and national objectives have been used to compile a list of the objectives for the plan area and how the key features present opportunity or constraints (see table 2). The Analysis of these form the concept for this LMP.

Different management options for achieving the plan's objectives were considered against the constraints and opportunities identified during scoping and consultation. The preferred approach is summarised on **Map 4 – Analysis & Concept**.

Table 2 : Analysis and concept

Objective	Opportunities	Constraints	Concept
Diversify age structure to improve resilience against wind, disease and climate change	High percentage of mature Scots pine makes it economically viable to restructure Good access across the Black Isle will improve chance of success	Continuous Cover Forestry on the Black Isle with Scots pine is difficult due to the limited rooting depth and the silvicultural characteristics of Scots pine	Strip felling will be used across the main block as this allows for access for ground disturbance, shooting and enough light for Scots pine to regenerate. Strips will be narrow enough to allow for seeding. No or little seed trees will be used as these would likely blow over.
Promote recreational use by improving recreational value and access	Several active user groups in place with which cooperation is possible to improve recreational value Objectives such as diversifying age and species structure will likely improve recreational value as well	Recreational use and operations exclude one another for safety reasons which can lead to negative impact on either. Limited budgets for creation and maintenance of recreational facilities	Good communication and cooperation with active user groups will result in minimal disturbance to recreation as a result of forest operations and input from user groups can be used to improve recreational value
Produce high quality sawlog for local timber markets	Soils on the Black Isle allow for the growing of high quality sawlog Good Access to timber markets, increases timber value	General yield classes are low due to infertile soils particularly on the main ridge of the Black Isle Rooting depths are generally poor	All productive areas on the Black Isle will be thinned where possible to ensure highest quality of timber. Scots pine will mostly be used in areas of low fertility using strip felling. Higher yielding species such as firs and spruces will be used in more nutrient rich areas using group or single tree selection.
Diversify species to mitigate against climate change and disease	Apart from the main ridge the Black Isle has decent soils and a climate allowing for the use of a large variety of species	Constraints such as LEPO and PAWS as well as SSSI's/SPA's and SAC's limit use of non-native species and native species are limited. On the main ridge of the Black Isle species choice is very limited due to low fertility	The main ridge of the Black Isle contains large areas of PAWS and is nutrient poor. Species choice will be limited to Scots pine with elements of native broadleaved species. Non PAWS areas on the ridge might contain elements of larch, spruces and firs. Native broadleaves will be tolerated and

			encouraged in forest edges, around waterbodies and on operationally difficult ground. A variety of species will be used lower down on the more fertile soils. Productive broadleaves will be tried where maintenance is easy. Potentially viable species will tried as and when they are available.
Establish riparian woodland along watercourses	Establishment of riparian woodland will reduce risk of polluting watercourses during future operations as well as improving the aquatic habitat and providing corridors of native low intervention woodland	Deer numbers might make it difficult to establish more palatable species Most riparian areas have currently got a non-native crop on them which is not ready to be felled yet	Riparian zones will be established after the current crop reaches an economically viable age for felling. This will allow for the operations to be integrated in adjacent restock works and should result in better ability to manage deer and lower cost of establishment Continued deer management will keep numbers at a level which allows successful establishment Where necessary tubes will be used to ensure successful establishment.

3.0 Management Proposals - regulatory requirements

This LMP was produced in accordance with a range of government and industry standards and guidance as well as recent research outputs, recognised at the time of its production. A full list of the current standards and guidance which guide the preparation and delivery of FLS LMP's can be found using the link HERE.

3.1 Designations

The Key Features map (**Map 2**) and Key Water Features map (**Map 3**) show the location of all designated areas and significant features. Any deep peats are indicated on the Soils map (**Map 9**).

The plan area forms part of, includes, or is covered by the following designations and significant features.

Table 3 : Designations and significant features in the Black Isle LMP area

Designations and significant features		
Feature type	**Present**	**Note**
Site of Special Scientific Interest (SSSI)	Yes	Monadh Mor SSSI (bordering on FLS land), Dam Wood SSSI
National Nature Reserve (NNR)	No	
Special Protection Area (SPA)	No	
Special Area of Conservation (SAC)	Yes	Monadh Mor SAC, Dam Wood SAC
World Heritage Site (WHS)	No	
Scheduled Monument (SM)	Yes	See **Appendix 5 – Environmental features Black Isle**
National Scenic Area (NSA)	No	
National Park (NP)	No	
Deep peat soil (>50 cm thickness)	Yes	
Tree Preservation Order (TPO)	No	
Biosphere reserve	No	
Local Landscape Area	Yes	Slight overlap with 'Sutors of Cromary, Rosemarkie and Fortrose' LLA
Ancient woodland	Yes	See **Appendix 5 – Environmental features Black Isle**
Acid sensitive catchment	No	
Drinking Water Protected Area (Surface)	No	

3.2 Clear felling

Sites proposed for clear felling in the plan period are identified as Phase 1 and Phase 2 coupes on **Map 5 – Management Coupes.**

Table 4: Phase 1 Clearfell Summary by Coupe Number

1.1 Table of Clearfelling (Phase 1)									
Coupe No.	**Fell Year**	**Total Area (Ha)**	**Spp by Ha (SS)**	**Spp by Ha (SP)**	**Spp by Ha (Larch)**	**Spp by Ha (DF)**	**Spp by Ha (other)**	**Restock Year**	**Monitoring Comments**
61365	23/24	2.2	1.1	1.1				28/29	
62160	23/24	6.7		6.7				28/29	
62048	23/24	2.9	2.9					28/29	
61008	23/24	13.8	12.8	1				28/29	
62135	23/24	0.8				0.8		28/29	
62023	23/24	5.7	0.7	1		2	2	28/29	
62077	23/24	24.4		18	1.4	5		28/29	
61923	23/24	4.8	0.3	2.8	1.7			28/29	
61251	23/24	1.6		1	0.6			28/29	
61936	23/24	0.9		0.9				28/29	
61085	23/24	1.9					1.9	28/29	
62064	23/24	1.2	0.3				0.9	28/29	
61701	24/25	1.6					1.1	29/30	LP, work in conjuntion with thinning, .5ha open
62106	24/25	7.6		6.9			0.7	29/30	10% windblow
61033	24/25	23.6		20.2	0.8		2.6	29/30	
61123	24/25	2.9					2.9	29/30	Grand Fir, work with adjacent thin
61124	24/25	1.4					1.4	29/30	Grand Fir, work with adjacent thin
61140	24/25	22.0		12.6	3.7			29/30	5.7ha previously felled
62165	24/25	6.2		6.2				29/30	Retain seed trees
61094	25/26	17.7		12.2	4.3		1.2	30/31	
62059	25/26	1.1	0.2	0.3			0.6	30/31	
62002	25/26	25.0		19.2	4.1	1.7		30/31	
61006	25/26	5.4	2.7				2.7	30/31	
61013	26/27	18.3		8.1	9.2		1	31/32	1ha of windblow
62132	26/27	3.0				2.5	0.5	31/32	Heart and buttrot
62155	26/27	2.9	1.8	0.3			0.8	31/32	
61129	26/27	1.0		1				31/32	
61163	26/27	1.4		0.4	0.4		0.6	31/32	
62041	26/27	14.5	8.2	6.3				31/32	
62046	26/27	27.8		23.2	4.2		0.4	28/29	Thin adjacent coupe, promote regen
Totals		250.3	31.0	149.4	30.4	12.0	21.3		

Table 5: Phase 2 Clearfell Summary by Coupe Number

1.2 Table of Clearfelling (Phase 2)									
Coupe No.	**Fell Year**	**Total Area (Ha)**	**Spp by Ha (SS)**	**Spp by Ha (SP)**	**Spp by Ha (Larch)**	**Spp by Ha (DF)**	**Spp by Ha (other)**	**Restock Year**	**Monitoring Comments**
62100	27/28	12.7	0.9	10.8	1			32/33	
61030	27/28	6.5		0.2	6.3			32/33	
61031	28/29	18.4		18.4				33/34	
62189	28/29	9.6		8.2	1.4			33/34	
62039	29/30	6.3	0.6	5.7				34/35	
62076	29/30	13.2		6.3		0.3	6.6	34/35	
62147	29/30	23.1	5.8	12.1			5.2	34/35	
62071	30/31	13.4		11.6	1.8			35/36	
62161	30/31	6.1	2				4.1	35/36	
61016	31/32	35.8	28.4	4			3.4	36/37	
62082	31/32	3.6		1.2	2.4			36/37	
61073	31/32	34.2	0.4	32.5			1.3	36/37	
62026	31/32	15.7	2.1	11.5	0.8		1.3	36/37	
Totals		198.6	40.2	122.5	13.7	0.3	21.9		

Table 6 Scale of Proposed Felling Areas

Scale of Proposed Felling Areas										
Total Woodland Area			**4867.6** ha							
Felling	Phase 1	%	Phase 2	%	Phase 3	%	Phase 4	%	Long Term Retention	%
Net Area (ha)	250.3	5.1	198.6	4.0	245.8	5.0	213.5	4.4	132.3	2.7

3.3 Strip Felling

Sites for strip felling in the plan period are identified on the Management Coupes and Strip Felling Coupes maps (**Map 5 & 10**) and on the table below. The coupe number in table 7 corresponds to the coupe numbers on **Map 10 – Strip Felling Coupes**.

Table 7 Proposed Strip Felling by phase and coupe number

1.3 Table of Strip Felling (Phase 1)					
Coupe No.	**Coupe size (Ha)**	**Max. strip area within coupe(Ha)**	**Year**	**Spp**	**Monitoring Comments**
61121	16.7	5.6	23/24	SP	2nd set of strips, work in conjunction with thin 61927
61611	7.5	2.5	23/24	SP	
61568	21.3	7.1	23/24	SP/LP/JL	
61400	19.6	6.5	24/25	SP	
61201	154	51.3	25/26	SP/LP/JL/WH	
61891	62	20.7	25/26	SP/JL	
61095	72.5	24.2	25/26	SP/JL	
61040	40.3	13.4	25/26	SP/JL	
61660	39.5	13.2	26/27	SP/JL/SS/DF	
61799	97.9	32.6	26/27	SP/JL/SS/DF	
61619	21.3	7.1	26/27	SP/JL/SS/DF	
61865	33.1	11.0	26/27	SP/JL/SS/DF	
Totals	585.7	195.2			
1.4 Table of Strip Felling (Phase 2)					
61010	35.9	12.0	27/28	SP/WH/JL/SS	
61011	50.7	16.9	27/28	SP/WH/JL/SS	
61072	21.3	7.1	28/29	SP/EL	
61061	63.9	21.3	28/29	SP/DF/EL	
Totals	171.8	57.3			

3.4 Thinning

Potential sites for thinning in the plan period are identified on **Map 7 – Thinning Coupes** and in the table below.

Table 8 Scale of Proposed Thinning Areas (part 1)

1.5 Table of Thinning (Phase 1 & 2)							
Coupe No.	**Total Area (Ha)**	**Thin Year**	**Species**	**Prescription for Thinning**	**Final Thinned Area (Ha)**	**Final Vol/Ha Removed**	**Monitoring Comments**
62918	28.6	23/24	SS/DF/SP/WH/EL/NS	Standard thinning in SP south of the Big Burn combined with felling of 62064. Group Selection felling in SS north of Big Burn, current groups of regen will be expanded. Natural regen expected, nat-regen monitoring to be carried out. Careful thinning near Clootie well of EL/SP. DF retained for amenity value			To be absorbed in regional Nat Regen surveys, to be replanted if no nat-regen comes up.
62910	50.9	23/24	SS/SP/BI/HL/EL	1st thin in BI/HL and SS. Standard thinning in SP and EL			Monitor regen near car-park
61913	24.6	23/24	SS/SP/NS	Standard thinning in SP, attempt to thin SS (trench mounding), open up NS to allow for a group shelterwood system in the future			
62917	128.8	23/24	SS/SP/BI/DF	1st thin in SS/SP. Final thin in mature SP along road. Promote regen by opening up small holes			
62920	16.1	23/24	DF/SP/SS	1st thin, rack and thin, work together with adjacent felling			
62913	19.3	23/24	DF,SS,OK,NS	1st thinning, rack and thin			
61927	94.3	23/24	SP/SS	1st thin SS, rack and thin. Thin area of strip felling and open up future seed trees (Strip fell 61121/61611/61568)			
62949	1.4	23/24	MB	1st thin, rack and thin			Work in conjunction with 62106
61911	130.1	23/24	SP/SS/EL	1st thin, rack and thin			
62931	37	24/25	SP/SS/JL	Final thin mature SP p.51. 1st thin, rack and thin SP p.01			
62922	8.6	24/25	SP	1st thin, rack and thin. Work in conjunction with adjacent felling			
61937	44.8	24/25	SP/HL/SS/DF	1st thin DF/SP/HL, rack and thin. Mature SP thin and strip fell (61400)			
61903	30	24/25	SP/SS	1st thin SS p.99, thin SP/SS p.49, open up small holes to allow for regen to come in			
61930	46.9	24/25	SP/SS	Thin SP p.27, protect regen, create small holes to promote regen			
61029	13.7	24/25	SS/JL/SP	Expand holes to allow for further regen of SS			
61941	117	24/25	SS/SP/HL	1st thin, rack and thin			
61916	90.9	24/25	SS/SP/JL/WH	1st thin, rack and thin			
61936	40.5	24/25	SP/EL/JL	1st thin, rack and thin			
61915	41.3	24/25	SS/SP/JL/EL/WH	1st thin, rack and thin			
61943	154	25/26	SP/LP/WH/JL/EL	Stripfell p.41 SP (61201), retain elements of JL/EL as seedsource. Thin rest of the coupe and halo-thin future seed-trees. 1st thin p.05 SP			
61949	44.1	25/26	SS/JL/DF/SP	1st thin, rack and thin			
61909	174.2	25/26	SP/WH/JL	Stripfell p.41 SP (61095/61891/61040), retain JL as seedsource			

Table 9 Scale of Proposed Thinning Areas (part 2)

1.5 Table of Thinning (Phase 1 & 2)							
Coupe No.	**Total Area (Ha)**	**Thin Year**	**Species**	**Prescription for Thinning**	**Final Thinned Area (Ha)**	**Final Vol/Ha Removed**	**Monitoring Comments**
62933	43.2	25/26	SP/SS/EL/DF	1st thin, rack and thin			
62919	32.3	25/26	SP/SS/NS/BI	Rack and thin in BI, expand gaps of regen in mature SP/SS/NS			Work in conjunction with 62945
62929	113.1	25/26	SP/SS	1st thin, rack and thin			
62915	33.7	26/27	WH/SP/LP/SS/NS/EL	Remove peri, rack understory of WH. Promote regen in EL. 1st thin SS			
62923	84.7	26/27	DF/SP/SS/NS/JL	1st thin except for hilltop, thin hilltop to promote further JL regen prior to removal of crop			
61928	234.3	26/27	SP/JL/DF/SS	Stripfell (61660, 61799, 61685, 61619) light thinning in surrounding crop, hal-thin future seed-trees			
61904	21.3	26/27	SP/HL/SS	1st thin, rack and thin			
61919	221.6	26/27	SP/DF/WH/JL	Standard thin			
61939	14.4	26/27	SS/DF	1st thin, rack and thin			
62948	96.5	27/28	SS/SP/NS	Standard thin			
62911	48.2	27/28	SP/SS/JL	Expand holes in SP to allow for further regen of SS, standard thin pure SS crops			
61908	82.2	27/28	SP/EL/SS	1st thin, rack and thin			
61924	145.6	27/28	SP/LP/EL/SS/JL	Thin to improve crop and promote further regen of JL/SS and SP.			
61933	156.5	27/28	SP/WH/EL/JL/SS	Stripfell (61010,61011), thin surrounding crop, halo-thin future seed-trees			
61949	47.6	27/28	SP/NS/WCH/SS	1st thin SP (remove peri), 1st thin SS/WCH, thin NS to promote regen			
62926	73.5	28/29	SP/JL/BI	1st thin in SP/JL/BI, light thin in mature SP			
61912	29	28/29	SS/SP/EL	1st thin, rack and thin			
61932	19.1	28/29	SP/HL	1st thin, rack and thin			
61917	235.5	28/29	SP/JL/SS/EL/	Stripfell (61072,61061), Expand holes (61028), standard thin throughout rest of the coupe			
61954	24.5	28/29	SS/EL	1st thin, rack and thin			
62907	20.6	29/30	EL/SP/SY/BI	1st thin, rack and thin			
62939	3.9	29/30	SS	1st thin, rack and thin			
62906	144.1	29/30	SS/SP/JL/NS/HL	Standard thin			
62936	19.5	29/30	SS/SP	1st thin, rack and thin			
61938	17.4	29/30	SP/HL	1st thin, rack and thin			
61920	9.6	29/30	SP/JL	1st thin, rack and thin			
61926	21	29/30	SP/SS/HL	1st thin, rack and thin			
61906	20.6	29/30	SP	1st thin, rack and thin			
61948	31.1	29/30	DF/EL/WCH/SS/HL	1st thin, rack and thin			
Roadside	62.8	N/A	N/A	5 metre buffer along all forest roads will be mapped to allow roadside vegetation with over 10cm stem diameter to be cut. Map 7 shows these areas			
Various	1519.8	N/A	N/A	Thinning approval requested in case growth rates exceed expectations			
Total	**4964.3**				**0**	**0**	

This covers an area of 4964.3 ha

Thinning will normally be carried out at, or below, the level of marginal thinning intensity (i.e. removing no more than 70% of the maximum MAI, or YC, per year). Higher intensities (no more than 140 % of maximum MAI, or YC, per year) may be applied where thinning has been delayed, larger tree sizes are being sought or as part of a LISS prescription. In all cases work plans will define the detailed thinning prescription before work is carried out and operations will be monitored by checking pre and post thinning basal areas for the key crop components.

3.5 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 of 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 and services, and drains.*

The maximum volume of felling in exceptional circumstances over the plan area covered by this approval is 75 cubic metres per calendar year.

A record of the volume felled in this way will be maintained and will be considered during the five year LMP review.

[N.B. Trees may be felled without permission if they: are of less than 10 cm diameter at breast height (1.3 m); pose immediate danger to persons or property; are completely dead; or are part of Authorised Planning Permission works or wayleave agreements].

3.6 Restocking / New Planting

Proposed restocking and new planting is shown on the Future Habitats and Species map (**Map 6** and **Tables 10/11/12**). Subsequently the proposed regeneration of the strip felling is shown in **Tables 13/14.**

Table 10: Proposed areas of phase 1 restocking

Phase 1 Restock (2023-2027)										
Coupe No.	**Total Area (Ha)**	**SP (Ha)**	**SS (Ha)**	**DF(Ha)**	**Other Conifer (Ha)**	**Native B/Leaf**	**Open (Ha)**	**Year**	**Method ***	**Monitoring Comments**
62061	2	1.3				0.2	0.5	24/25	NR/R	
62094	16.1	4.8	8.1			1.6	1.6	24/25	R	
62112	6.9		5.5			0.7	0.7	24/25	R	
62116	7.7		5.6			1.3	0.8	25/26	R	
62117	6.5		5.1			0.7	0.7	25/26	R	
62016	3.8		3			0.4	0.4	23/24	R	
62009	4	3.2				0.4	0.4	23/24	R	
61217	2	1.6				0.2	0.2	23/24	R	
62072	8.6		6.9			0.9	0.8	24/25	R	
62683	16.5	8.3			5	1.6	1.6	25/26	R	
61027	24.4	12.2			7.3	2.5	2.4	25/26	R	
61222	22.5	11.3			6.8	2.2	2.2	25/26	R	
Total	**121**	**42.7**	**34.2**	**0**	**19.1**	**12.7**	**12.3**			

Table 11: Proposed area of phase 2 restock

Phase 2 Restock (2028-2032)										
Coupe No.	**Total Area (Ha)**	**SP (Ha)**	**SS (Ha)**	**DF(Ha)**	**Other Conifer (Ha)**	**Native B/Leaf**	**Open (Ha)**	**Year**	**Method ***	**Monitoring Comments**
62046	27.8	13.9			8.3	2.8	2.8	28/29	R	
61365	2.2	0.9				0.9	0.4	28/29	NR	
62160	6.7	5.3				0.8	0.6	28/29	R/NR	
62048	2.9		1			1	0.9	28/29	R/NR	
61008	13.8		11			1.4	1.4	28/29	R	
62135	0.8		0.6			0.1	0.1	28/29	R	
62023	5.7		2.9	1.7		0.6	0.5	28/29	R	
62077	24.4	9.2		2.1	8.3	2.4	2.4	28/29	NR/R	
61923	4.8	3.8				0.5	0.5	28/29	R	
62064	1.2		0.5		0.5	0.2		28/29	NR	
61251	1.6	0.5	0.8			0.2	0.1	28/29	R	
61936	0.9	0.3	0.5			0.1		28/29	R	
61085	1.9		1.5			0.2	0.2	28/29	R	
61701	1.6	0.6				0.6	0.4	29/30	R/NR	
62106	7.6			3.8	2.3	0.8	0.7	29/30	R	
61033	23.6	10.9	2.4		5.7	2.3	2.3	29/30	R	
61123	2.9		2.3			0.3	0.3	29/30	R	
61124	1.4	1.1				0.2	0.1	29/30	R	
61140	22.0	11			6.6	2.2	2.2	29/30	NR/R	
62165	6.2	3.1			1.9	0.6	0.6	29/30	R/NR	
61094	17.7	14.1				1.8	1.8	30/31	R/NR	
62059	1.1	0.3	0.6			0.1	0.1	30/31	NR	
62002	25.0	11.7			7	3.7	2.6	30/31	R	
61006	5.4	2.8			1.6	0.5	0.5	30/31	R	
61013	18.3	5.5		9.2		1.8	1.8	31/32	R	
62132	3.0		2.4			0.3	0.3	31/32	R	
62155	2.9		2.3			0.3	0.3	31/32	R	
61129	1.0	0.4				0.4	0.2	31/32	R	
61163	1.4					0.8	0.6	31/32	R	
62041	14.5	11.6				1.5	1.4	31/32	R	
Total	**250.3**	**107.0**	**28.8**	**16.8**	**42.2**	**29.4**	**26.1**			

Table 12: Proposed area of phase 3 restock

Phase 3 Restock (2032-2036)										
Coupe No.	**Total Area (Ha)**	**SP (Ha)**	**SS (Ha)**	**DF(Ha)**	**Other Conifer (Ha)**	**Native B/Leaf**	**Open (Ha)**	**Year**	**Method ***	**Monitoring Comments**
62100	12.7	4	6.1			1.3	1.3	32/33	R	
61030	6.5	3.3			2	0.6	0.6	32/33	R	
61031	18.4	14.7				1.9	1.8	33/34	R	
62189	9.6	4.8			2.9	1	0.9	33/34	R	
62039	6.3	3.2			1.9	0.6	0.6	34/35	R	
62076	13.2	3.9	4.9	1.6	0.2	1.3	1.3	34/35	R	
62147	23.1	11.6	5.2			3.5	2.8	34/35	R	
62161	6.1		4.9			0.6	0.6	35/36	R	
62071	13.4	6.7			4	1.4	1.3	35/36	R	
61016	35.8	27.8			1	3.5	3.5	36/37	R	
62082	3.6	1.8			1.1	0.4	0.3	36/37	R	
61073	34.2	10.3	17.1			3.4	3.4	36/37	NR/R	
62026	15.7	7	4.2			2.4	2.1	36/37	R	
Total	**198.6**	**99.1**	**42.4**	**1.6**	**13.1**	**21.9**	**20.5**			

* replant (R) / plant (P) / natural regeneration (NR) / plant alternative area (ALT) / no restocking (None)

Table 13: Proposed area of natural regeneration in strip fells in phase 2

Phase 2 Natural Regeneration in Strip Fells					
Coupe No.	**Coupe size (Ha)**	**Max. total strip size (Ha)**	**Year**	**Spp**	**Monitoring Comments**
61121	16.7	5.6	28/29	SP	
61611	7.5	2.5	28/29	SP	
61568	21.3	7.1	28/29	SP/LP/JL	
61400	19.6	6.5	29/30	SP	
61201	154	51.3	30/31	SP/LP/JL/WH	
61891	62	20.7	30/31	SP/JL	
61095	72.5	24.2	30/31	SP/JL	
61040	40.3	13.4	30/31	SP/JL	
61660	39.5	13.2	31/32	SP/JL/SS/DF	
61799	97.9	32.6	31/32	SP/JL/SS/DF	
61619	21.3	7.1	31/32	SP/JL/SS/DF	
61865	33.1	11.0	31/32	SP/JL/SS/DF	
Totals	585.7	195.2			

Table 14: Proposed area of natural regeneration in strip fells in phase 3

Phase 3 Natural Regeneration in Strip Fells					
61010	35.9	12.0	32/33	SP/WH/JL/SS	
61011	50.7	16.9	32/33	SP/WH/JL/SS	
61072	21.3	7.1	33/34	SP/EL	
61061	63.9	21.3	33/34	SP/DF/EL	
Totals	171.8	57.3			

If the Restock or natural regeneration should fail to reach 1600 stems per hectare (Native Broadleaves) or 2500 Stems per hectare (Productive Conifers) the site will be beaten-up to the required planting density. This will be assessed at year 3 and year 5 after planting with beat up by at least year 5.

3.7 Species diversity and age structure

The following tables show how the proposed management of the forest will help to maintain or establish a diverse species composition and age-class structure, as recommended in the UK Forestry Standard.

Stands adjoining felled areas will be retained where possible until the restocking of the first coupe has reached a minimum height of 2m. Where this is not possible (e.g. due to windblow(risk) or disease), the planned approach to achieving height separation between adjacent coupes will be achieved through delaying restocking.

Table 15: Species diversity

Plan area by Species						
Species	Current Area (ha)	%	Year 10 Area (ha)	%	Year 20 Area (ha)	%
Sitka spruce	700.3	14%	719.1	14%	760.4	15%
Scots Pine	2609.2	51%	2315.1	45%	2459.5	48%
Larches	443.3	9%	306.1	6%	254.7	5%
Douglas Fir	114.4	2%	118.9	2%	113.1	2%
Other conifers	218.9	4%	280	5%	317.5	6%
Native broadleaves	281.5	6%	297	6%	307.2	6%
Fallow	178.4	3%	632.2	12%	467.7	9%
Open ground	537.7	11%	430	8%	415	8%
Other	26.6	1%	11.9	0%	15.2	0%
Total	5110.3	100%	5110.3	100%	5110.3	100%

Figure 1: Bar chart demonstrating species diversity

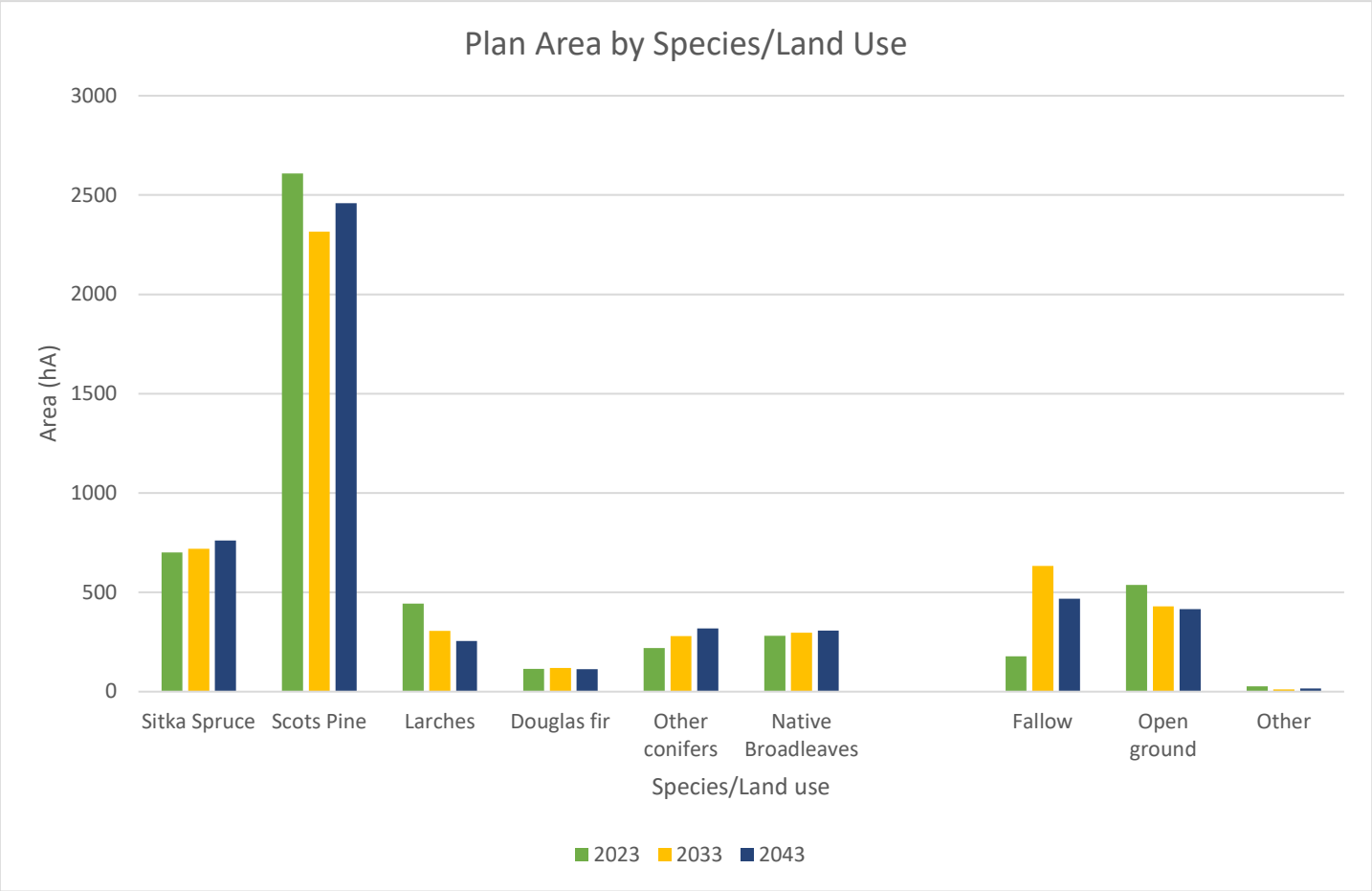
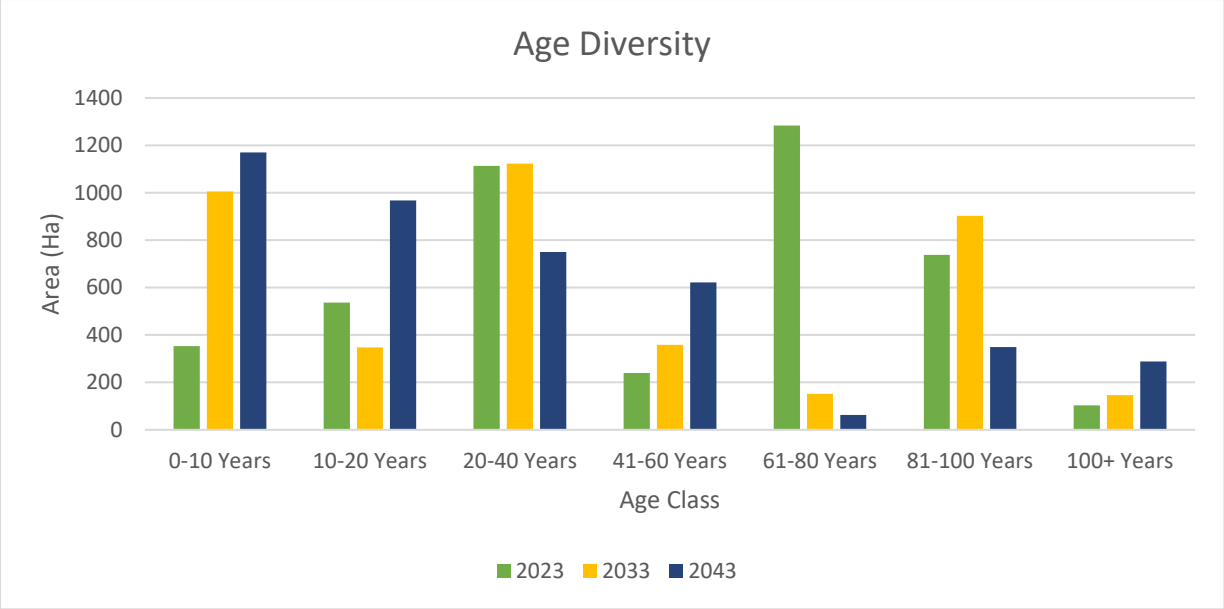


Table 16: Age diversity

Plan area by Age						
Age Class (years)	Current Area (ha)	%	Year 10 Area (ha)	%	Year 20 Area (ha)	%
0 – 10	353.2	8%	1005.2	25%	1170.5	28%
11 – 20	537.4	12%	347.3	9%	967.6	23%
21 – 40	1113	25%	1123.5	28%	750.6	18%
41 – 60	239.4	5%	359.2	9%	622	15%
60-80	1283.5	29%	151.6	4%	63.2	2%
80-100	737.7	17%	903.1	22%	349.6	8%
100+	103.4	2%	146.4	4%	288.5	7%
Total	4367.6	100%	4036.3	100%	4212	100%

Figure 2: Bar chart demonstrating age diversity



3.8 Road Operations and Quarries

Planned civil engineering operations are shown on **Map 8 – Roads and Infrastructure** and in the table below.

Table 17: Civil Operations

Forest Road Upgrades, Realignments, New Roads and New Quarrying				
Phase	Name / Number	Length (m)	Year	Operation
1	Shantullich Extension	480	2023/2024	Road extension and bridge

3.9 Environmental Impact Assessment (EIA)

No afforestation or deforestation is proposed in this LMP. Proposed roading and quarry works are below EIA thresholds, therefore no EIA scoping opinion request has been carried out. The proposed roading is approximately 0.5 ha and is not on sensitive areas and therefore the threshold of 1 ha applies. For the quarrying at Learnie no expansion is planned at this point and therefore no EIA scoping is necessary.

Table 18: Environmental Impact Assessment Summary

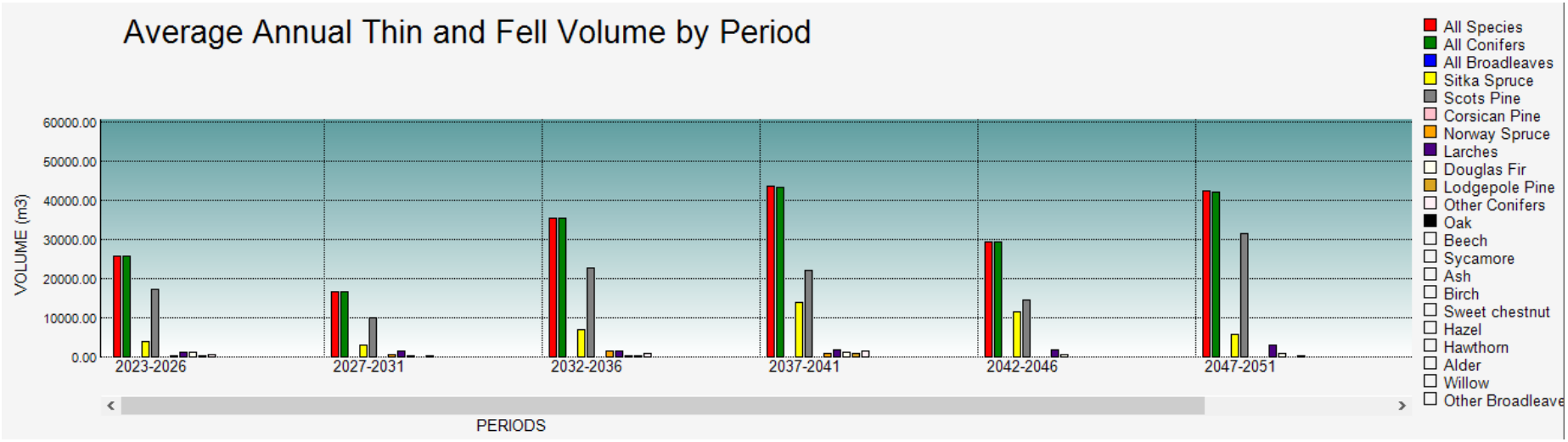
Potential EIA projects in the plan area		
Type of project	Yes / No	Note
Afforestation	No	
Deforestation	No	
Forest roads	Yes	Shantullich Extension – 480m
Forestry quarries	Yes	Quarrying at Learnie

3.10 Tolerance table

Working tolerances agreed with Scottish Forestry are shown in **Appendix 4 – Tolerance Table**.

3.11 Volumes coming phases

Figure 3: Predicted future volumes per phase



4.0 Management Proposals – guidance and context

4.1 Silviculture

4.1.1 Clear felling

Coupe detail can be found in section 3.2 and **Map 5 – Management Coupes.**

Clearfelling in this plan area is largely driven by signs of instability, over maturity and the desire to fell at the right time to be able to influence the next generation. Coupes at Monadh Mor, Gallow Hill, Learnie, Belmaduthy and Bogallan contain sporadic windblow and sometimes diseases related to overmaturity. Most of these are also close to or past their MaxMAI. The Sitka spruce in the Monadh Mor area will be felled to limit reseeding and allow the entire area to develop as native woodland. Similarly the area of Scots pine and western hemlock in the main block will be felled to limit seeding of the western hemlock and to allow for PAWS restoration in the long term.

To a lesser extent some of the felling is driven by the threat of *Phytophthora ramorum.* The felling coupes around Learnie contain large amount of larch which, with regards to the '2022 FLS Larch Strategy', we would look to reduce. However, as most of the Black Isle is within the 'PAZ less vulnerable zone' no felling targets have been defined.

Most of the Black Isle is well roaded and coupes are generally on flat terrain with organo-mineral soils allowing for relatively straightforward harvesting and restocking using harvester/forwarder combinations. However, coupes 62046 and 61033 at Drumderfit and Learnie are on steep terrain with limited access by forest road. Upon inspection it is deemed feasible to harvest these using harvester/forwarder combinations for the majority of the site with elements of hand felling on the steeper areas.

4.1.2 Thinning

The thinning coupes can be viewed in Tables 8 and 9 – Thinning Coupes and on Map 7 – Thinning Coupes.

The forests on the Black Isle lend themselves exceptionally well to thinning from an operational point of view. The geology and geomorphology mean that machines can easily traverse the ground and due to the good road network extraction distances are short. Nearby sawmills mean that operational costs are reduced making thinning operations more viable.

The main challenge with thinning on the Black Isle is the stability of the stands. Most of the soils on the Black Isle consist of surface water gleys and ironpans (see **Map 9 – Soils**). Both these soil types have a limited rooting depth due to either high water tables or the forming of an impregnable ironpan, potentially resulting in high water tables as well. On these soils rooting depth often does not exceed 40cm which severely impacts stability of stands. Thinning needs to be carried out carefully and timely to ensure stable crops. Crops which have not been thinned or have had a delayed thinning are sometimes not considered suitable for further thinning operations anymore and will therefore be clear-felled when most suitable.
Another issue limiting the thinnable area on the Black Isle is the historical use of deep plowing. Areas in the north of the main block, particularly around Braefindon and Agneshill, were deep plowed prior to restocking. The depth of plowing limits the accessibility with machines making it unfeasible to thin. In these areas, such as in coupe 61016, clear-felling will take place when crops are at MaxMAI.

The thinning map (**Map 7**) shows the coupes where thinning will take place. Thinning will be done to increase timber quality or to promote a specific species composition and therefore selection is done predominantly on crown health, form and species. An outline thinning prescription for the upcoming coupes has been determined and is shown in the Activity tables in section 2, **Tables 8 & 9** .

As roadside management is necessary at regular intervals a 'Road buffer' has been defined on the thinning maps. This management involves felling or mulching regenerating trees to prevent retention of moisture in the road and to prevent roadside ditches from getting blocked.

4.1.3 Low Impact Silviculture Systems (LISS) / Continuous Cover Forestry (CCF)

Continuous Cover Forestry has a multitude of advantages over a clearfell and restock management system. It positively contributes to soil health, carbon capture, ecology and forest aesthetics (Forestry Commission, 2008). For these reasons FLS has looked to maximize areas of CCF within its Estate . To allow for use of these systems a site has to be thinnable and, as mentioned above, on the Black Isle this is largely the case. As a result the areas intended for CCF stretch over a large section of the Black Isle LMP area as can be seen on **Map 5 – Management Coupes**.

Depending on species, exposure and soil, different silvicultural systems will be used on the Black Isle. The main ones being Group Shelterwood, Strip Shelterwood and Group Selection. Below a short description is given per silvicultural system to further explain how these will be used on the Black Isle.

Group Shelterwood

This system regenerates a mature stand by cutting small holes within the original stand. Depending on the shade tolerance of the species holes are generally between 1 and 3 tree lengths but potentially bigger depending on land form, aspect and species. When working with shade tolerant species such as Norway spruce and Western hemlock small gaps will be used whereas in crops with light demanding species such as larch and pine much larger holes will be cut. As a rule gaps within Group Shelterwood systems will not exceed .5 ha to ensure the maximum benefit of the CCF system is maintained.

Strip Shelterwood

Strip shelterwoods are fairly similar to group shelterwoods but generally better suited to areas where the forest is likely to be unstable, such as on the Black Isle. In strip shelterwoods strips of forest, usually between 1 and 3 tree lengths wide, are harvested from a stand.

Subsequent strips are felled once the first strips have regenerated. Generally, the strips are perpendicular to prevailing wind direction and felling is done into the wind to minimize risk of windthrow. The regeneration period is depending on the amount of strips necessary for full regeneration and the fertility of the soil. On the Black Isle most strip felling coupes will be regenerated using four subsequent strip felling operations. It is expected that full regeneration will take approximately 35 years.

Strip width in these shelterwood systems is dependent on light demand of species, seed dispersal abilities, aspect and soil. On the Black Isle strip shelterwoods will generally be applied to Scots pine stands which are highly light demanding. Strip width will therefore be approximately 60m and not exceed 80m. This will allow for seed dispersal across the strip and maximize sunlight. Strip length will generally be as long as the coupe is long but might be broken up with small borders of trees as seedsource, windbreak and for aesthetic reasons.

Group Selection

Group selection systems differ from group shelterwood system in that the age structure is more diverse. In a group shelterwood a regeneration process is started and within a few decades the whole coupe is cut and regenerated after which the coupe will be managed as more or less even-aged again. Group selection systems are used in blocks where there is already more spread in age class and this is retained by felling smaller blocks over longer periods of time. Group size again depends on light demand of the species. Generally this management system will be applied in shade tolerant species on the Black Isle. Several areas of mature Sitka spruce and Douglas fir are starting to regenerate in pockets and this management type will be used to support and promote this process. Group sizes will generally not exceed two tree lengths but as a rule will not exceed .5 ha in size.

4.1.4 Long term retention (LTR) / Minimum intervention (MI) / Natural reserve (NR)

The Black Isle contains a mix of LTR, MI and NR sites, these are illustrated spatially in **Map 5 – Management Coupes**. These will be managed in accordance with FLS guidance for these respective management classifications.

The Black Isle LMP area only contains one Natural Reserve. This can be found to the northeast of Monadh Mor SSSI/SPA and contains a spectacular mosaic of bog and pinewood. The more open bog is classed as Natural Reserve and the pinewood on the higher ridges in between is classed as continuous cover forest to ensure this habitat is retained in perpetuity. This NR, like any other NR, will be managed by minimum intervention unless alternative management has higher conservation or biodiversity value. Any management operations proposed will solely be to protect the integrity of the habitat.

Minimum interventions can be found throughout the block with the most substantial area on and adjacent to the the Monadh Mor SSSI/SPA. Other minimum interventions of significance can be found on top of Millbuie and along the north edge of the main block. The aim of MI's is to develop semi-natural habitats in the future. Depending on how the woodland structure develops, it might be desirable to change the management type, so some thinning and/or felling can take place to diversity stand or species composition. Use of the MI classification allows this change to be made as MI's do not have to apply in perpetuity.

Long term retentions comprise over 138ha of the Black Isle. These areas have been designated because the trees in this area or the habitat they provide are deemed an important feature for retention. On the Black Isle this is largely because of the importance and the presence of raptors in the landscape. LTR's have been proposed where it is desirable to retain the existing stand beyond normal economic maturity for benefits noted, but there is no imperative to retain permanent woodland cover once the existing stand has fulfilled its objective.

There are large areas of land in the current Black Isle plan which have been designated as CCF of which the aim is to change these to one of the above prescriptions in the future. Riparian areas for example have, in previous plans, been marked as Minimum Intervention zones. However, to facilitate removal of mature non-native species and to allow for management of regenerating non-native species these are now classified as part of the management coupes/thinning coupes where appropriate. It is expected that after the initial interventions these areas can be designated as minimum intervention. Similarly an area in the north of Teanahuig which used to be MI has now been classed as CCF as this will allow for supplementation with native species to further improve ecological value.

4.1.5 Tree species choice / Restocking

Restocking will be done according to **Map 6 - Future Habitats and Species** and **Appendix 6 - Restock Prescriptions**. A variety of restock prescriptions are proposed dependent on the main objectives of the area in question. Stocking densities, species and main objectives are given in these restock prescriptions.
Restocking in productive areas will aim to maximise the productive capacity of the forest. The brief guidelines below will be followed to ensure adequate restocking:

- To obtain maximum benefits from restructuring, contiguous restocking areas will not be less than 1 ha per individual shape (except in CCF areas) or exceed 40 ha unless forest health issues, open habitat restoration feasibility or windblow dictate otherwise.
- Restock coupes adjacent to the forest roads should be restocked to within 5 metres of the forest road for at least 30% of the coupe frontage to facilitate future access and to limit potential for soil disturbance of compaction.
- Areas of non - productive broadleaved trees within productive coupes will be located where they will be of greatest ecological benefit; along drainage channels, adjacent to open ground, other broadleaf woodland or around archaeological features to enhance their setting.
- Commercial restocking will not be undertaken on soil types 9e, 11c, 11d due to the intensive drainage regimes and high fertiliser inputs that would be required to achieve successful establishment.

The LMP seeks approval for restocking of areas felled prior to the plan period, species enhancement operations and in those coupes felled within the first 5 years of the plan. The conventional 5 year fallowing period generally means that all coupes felled in the second phase of the plan will be restocked beyond the approval period. Pine weevil numbers will be assessed on a site by site basis using the Hylobius Management Support System (HMSS). If numbers are predicted to low and/or when there are other drivers that might dictate restocking early, such as gorse or landscape issues, restock will be pulled forward. If an early restock is deemed feasible and desirable this will be recorded using our Workplan process. In order to secure approval for the restocking of coupes felled in the second phase of the plan the restock proposals for these coupes are also shown on **Map 6 – Future Habitats and Species**.

The Restocking Strategy for Scotland's National Forest Estate aims to minimise chemical usage in restocking (i.e. application of insecticides and/or herbicides) by considering adequate ground preparation at site level, and using tactics such as delayed planting (i.e. applying five year fallowing) to achieve this.

4.1.6 Natural regeneration

Natural regeneration will be used extensively within the next plan period on the Black Isle.. In strip felling areas in particular natural regeneration will be used to recruit the next

rotation of trees. To ensure adequate stocking in these and other areas where natural regeneration is used ground preparation such as screefing, mounding and/or scarifying might be used to optimize the seedbed. This decision will be made by the FM forester and is based on the amount of vegetation, seed source, soil properties and the future species and management types. Ground preparation will take place at the earliest convenient time to maximise successful germination of seed.
Stocking density and species will be monitored through the natural regeneration survey program. Felled sites will be assessed at year 3 or 4 depending on fertility. The results of the survey will update the sub-compartment database and a decision by the local forester and planner will be made;

- If stocking density is not adequate but still increasing significantly another survey will be done the following year.
- If stocking density is too low and unlikely to increase the site will be planted/beaten up to adequate density.
- Where the natural regeneration is not the desired species it will be considered against the plan objectives and tolerance table and either accepted (with a plan amendment if necessary) or removed.
- Where stocking density exceeds targets respacing will be considered.

When the site is deemed sufficiently established the sub-compartment database will be updated with the details from the natural regeneration survey and standard FLS year 5 SDA will be done.

There should be a preference for natural regeneration of broadleaf areas (to maintain provenance and improve the chances of establishment) but where this is unlikely or has not been successful then these areas should be planted/beaten up to the required stocking density and site requirements. In those areas where recruitment is insufficient supplement planting will take place.

It is expected that some of the riparian zones, designed open ground and broadleaf areas will fill in with natural regeneration of both conifers and broadleaves. This will be managed in such a way as to ensure that, where practicable, it does not significantly impose a negative impact upon the objectives of the plan or create a negative impact upon the watercourse in terms of shading and acidification.

4.1.7 New planting

No new planting is proposed in this LMP.

4.1.8 Wildlife Management

The Deer Management Plan can be found in **Appendix 11**.

4.1.9 Fire

The Fire Plan can be found in **Appendix 12.**

4.1.10 Tree health

One of the main objectives of this LMP is increasing the resilience of the forest to climate change, disease and windblow. There are currently several pests and diseases impacting the forests on the Black Isle and more are coming. As a result of climate change it is expected that more pests and diseases will arrive and impact on forest management will increase.

One of the main diseases currently impacting forest management across Scotland is *Phytophthora ramorum*. In the south and west of the country infections of this disease are leading to mass die-off and large scale removal of the species. To reduce impact of the disease to forest management Forestry and Land Scotland published it's Larch Strategy (FLS, 2020) to which larch on the Black Isle will be managed. As mentioned in 4.1.1 most of the forests of the Black Isle LMP fall within the 'PAZ less vulnerable zone' for which no felling targets apply. The plan has considered the implications outbreak(s) of *P. ramorum* might have and is therefore proposing removal of larch in several locations. These locations are selected because the areas of larch are close to their economic optimal felling age and operations can be tied in with ongoing works. This will reduce risk of infection and maximise financial return.
On the other hand the long term objective is not removal of all larch on the Black Isle. As stated in the Phytopthora Ramorum Action Plan (Scottish Forestry, 2021) the purpose of the PAZ is 'to eradicate local infections by felling affected trees rapidly after detection' (Scottish Forestry, 2021). However the action plan also states that larch in this zone 'may still have a long term future' (Scottish Forestry, 2021). As larch is particularly well suited to the poor soils on the main ridge of the Black Isle and has great potential for natural regeneration it is intended to be used as a component in mixture with Scots Pine in places where access is easy. This would ensure that, in case of a Statutory Plant Health Notice (SPHN), removal will be quick and cheap. This approach will be kept under review depending on progress of *P. ramorum*.

Besides *P. ramorum* there are some other tree health concerns in the area. Mainly in overmature Douglas fir and Sitka spruce a high prevalence of buttrot species can be found. Both *Heterobasidion annosum* and *Phaeolus schwienitzii* have been found to cause substantial damage to conifer species. In areas where buttrot is present and there is the desire to retain productive conifer the fungi might pose a serious threat in future crops. As both *H. annosum* and *P. schwientizii* are found in similar coupes the choice of more resistant species is limited. In these areas a mixture of species will be used in the hope that his provides adequate protection from large scale infestation. Furthermore, rotation periods will not be extended passed MaxMAI in the next rotation to prevent over maturity which results in higher buttrot susceptibility.

Resin-top, *Peridermium pini,* is a species of fungus which can be found throughout the Black Isle in Scots pine stands. This fungus impacts a percentage of Scots pine depending on the genetics of the stock and usually causes dieback from the top down. Incidence varies throughout the block as a result of the difference in genetic susceptibility to the disease and historical management. Notably high incidence is occurring in and around the Grey Cairn

area and near Shantullich. As this fungus seems to effect Scots pine from the age of 30 onwards normal thinning regimes adequately manage the impact on the forest. During each thinning operation any trees showing signs of *Peridermium pini* will be removed. Increase in incidence should be picked up during normal tree health monitoring operations and will be reported if deemed out of the ordinary.

Large pine weevil (*Hylobius abietus*) remains a constraint to forest management. Because of weevil populations density assessments will be done to determine when restock success will be likely. Ideally restock will follow felling within one or two years as this reduces nutrient run-off and reduces the need for herbicide. Whether this is possible will be determined using the *Hylobius* Management Support System. If weevil populations are too high restocking early would risk high mortality or excessive use of pesticide which is undesirable and therefore a fallow period of maximum five years will be applied. Where gorse is a substantial threat restocking might take place directly or shortly after felling to allow for establishment of the next crop. If weevil populations prove to be high pesticide spraying might take place to prevent crop failure.

4.1.11 Road operations, Timber haulage and other infrastructure

Map 8 – Roads and Infrastructure shows the existing forest road network, quarries, planned new roads and agreed Timber Transport Routes.

Most of the Black Isle has a well-developed road network and therefore limited new roading is proposed. The only new roading proposed is the Shantullich extension to Teanahuig. The existing access is restricted as it is shared with a neighbour and bordered by a powerline and water pipeline. For future resilience the new planned road avoids this entrance altogether and uses FLS's Shantullich entrance. This road will be built to the road specification as set out in the 2014 'The Design and Use of the Structural Pavement of Unsealed Roads' (TTF).

Several quarries are found throughout the Black Isle but none have been used in recent years. Learnie quarry contains high quality stone and FLS will therefore be using this quarry again during this LMP period. Stone will be hauled through the Learnie and Callachy blocks onto the A832 from where it will be moved to the required location on the Black Isle.

The agreed timber haulage routes can also be found on **Map 8 – Roads and Infrastructure.** Haulage will mostly take place over forest roads and Agreed Routes. Where Consultation Routes are needed to be used Forestry and Land Scotland will consult with the Highland Council regarding haulage restrictions.

Where roading, bridging or quarrying is to take place Prior Notification, or Planning Permission if needed, will be applied for with the Highland Council by the Civil Engineering

team. Water crossings for proposed roads infrastructure, such as at Shantullich, will be planned and delivered in accordance with the Engineering in the Water Environment Best Practice Guide (River Crossings) (2010) and within the structure of the Controlled Activities Regulations (CAR). The appropriate licensing from SEPA for such activities will be sought prior to commencement of operations.

4.2 Biodiversity

4.2.1 Designated sites

Designated sites in the area are listed in **Table 3** in **3.1**. The HRA and DSP can be found in **Appendices 9 and 10**. There are two designated sites in the LMP area; Monadh Mor SAC and Dam Wood SAC/SSSI.

Monadh Mor is an SAC for bog woodland and very wet mires and contains a SSSI for native pinewood adjacent to FLS ground. As detailed in the HRA, felling will be taking place adjacent to the SAC/SSSI. Restocking will be done only with native species to limit regeneration of non-native species on the SAC/SSSI in the future. Approval for thinning in the north-eastern part of the SAC is requested to allow for management of the Scots pine on the ridges between the bogs and mires. Thinning operations will increase the likelihood of creating a stable mature Scots pine stand which could be perpetuated in the future.

Dam Wood SAC/SSSI is designated for its juniper on heaths or calcareous grasslands and base-rich fens. A management agreement is currently in place with Scottish Wildlife Trust for the management of this SAC/SSSI. The designated site is surrounded by young stands of non-native species. It is proposed that these are removed before their optimum economical felling age to reduce seeding onto the SSSI. This will be out with the current plan period and will be reviewed at subsequent LMP revisions. A buffer of successional open habitat is proposed to replace the current productive stand in which native species will be allowed to regenerate. In the long term this will further safeguard the water quality of the site as well as reduce the natural regeneration of non-native species.

Both sites are at low risk from invasion from invasive non-native species (INNS), for more information on the management of INNS see 4.2.7.

4.2.2 Native woodland

The Native Woodland Survey of Scotland (Scottish Forestry, 2022) demonstrates the condition and extent of natural and semi natural woodland in Scotland.

On the Black Isle this covers large areas of PAWS which will be discussed in 4.2.3 in detail. A notable feature of the native woodland survey is the low percentage native species on the main ridge of the Black Isle. These areas primarily consist of Scots pine woodlands but due to this species not being considered a regional native species the percentage of native

species is low. However, the pinewood habitats on the Black Isle are well developed and diverse as demonstrated by the presence of the Monadh Mor SSSI for native pinewood.

Herbivore impacts across the Black Isle are generally medium to high. Areas of more palatable species in remote corners tend to have high to very high herbivore impact.

Due to the suitability of Scots pine and the availability of seed source of birch the majority of the species composition will be native. Most of these areas will be managed to produce timber for local markets but will contribute to biodiversity nonetheless. Where high quality native woodlands exist these will be managed to retain or enhance their ecological value.

4.2.3 Ancient woodland / Plantation on Ancient Woodland sites (PAWS)

Ancient woodland sites can be viewed on **Map 2 – Key Features** and in **Appendix 5 – Environmental Features**. As can be seen in the appendix a large proportion of PAWS areas is threatened. Mostly this is due to the presence of non-native species such as Norway spruce, Sitka spruce and larch. Future management operations will favour native species and thereby slowly eliminate non-native species from the crop.
Due to its early seeding age and prolific seeding, Western Hemlock is more difficult to remove from PAWS areas. Felling is therefore proposed in some areas with Western Hemlock seed source to try and reduce the amount of regenerating fir and accelerate the change to native species.
Any felling coupes within PAWS areas will be restocked with mainly native species with one exception mentioned below. As mentioned in the chapter 4.2.2, Scots pine is not considered a regional native species. Scots pine will however be used in the restock of PAWS areas as the Scots pine habitats on the Black Isle are well developed and essential for some of the priority habitats and species. By exception an element of Norway Spruce (maximum 10% of area) might be planted within PAWS restock coupes for the benefit of red squirrel. This will be done on a site-by-site basis and will need to be confirmed with the environment team and recorded in the Workplan.
Map 2 shows one exception to the restock prescription in PAWS and shows an area of PAWS mapped as 'Suspected non-PAWS'. When cross referencing the historical maps of the Black Isle with the Ancient Woodland Inventory it was discovered that this area had no woodland on it. Considering this, the soils, and the previous crop, it is proposed to be restocked with a majority non-native conifer species.
Most areas that are not PAWS within the Black Isle LMP area are Long Established Plantation Origin (LEPO). Management and restocking in LEPO areas will be dependent on the quality of the current habitat and the potential for native woodland.

4.2.4 Protected and priority habitats and species

A detailed list of protected and priority habitats and species can be found in **Appendix 5 – Environmental Features.**

All forest management operations involve a planning process before work commences which includes checks for wildlife and important habitats. Work plans will be adjusted when necessary to avoid disturbance, and opportunities to further protect species or enhance habitats will be identified.

A large part of the main block of the Black Isle LMP area is designated as a squirrel stronghold and sightings of red squirrels are commonplace in the block. The proposals in this plan have therefore been assessed using the practise guide 'Managing forests as red squirrel strongholds' (Forestry Commission Scotland, 2012). The proposals in this LMP are largely in line with the practise guide. In particular the objectives of improving age and species structure should benefit red squirrel.

FLS has a single licence to cover forest management activities that may affect red squirrels on the national forest estate (NFE). This is in accord with the Scottish Biodiversity Strategy's aim to resolve species management issues. All works within the Plan area will follow the assessment and mitigation actions set out as conditions of this licence.

4.2.5 Open ground

Priority open habitats present within the plan area are described in **Appendix 5 – Environmental Features** and **Map 2 – Key Features**. Open habitats on the Black Isle are rare due to the location, elevation and soils of the area. Where open habitats exist they are often threatened by regenerating trees. This is for example the case at Monadh Mor, Culbokie Loch and Dam Wood. These existing priority open habitats will be monitored and protected. If regeneration threatens the integrity of this habitat it will be removed.

Within restocks opportunities will be sought to create high value open habitats in areas of extreme infertility, waterlogged soils and/or to buffer existing open habitat. There are several lochans and pools which provide habitat for a large variety of species. These will be surrounded by open ground and native planting after the current crop is removed. The restock prescriptions as detailed in **Appendix 6** have allowance for these elements within the coupe.

4.2.6 Dead wood

Opportunities for retaining or creating deadwood will be identified during the planning of all felling and thinning works, favouring areas with the highest deadwood ecological potential. Valuable deadwood and deadwood areas will be marked on contract maps. Areas of natural reserve will offer some of the best opportunities for the development of standing and fallen deadwood. Where it is safe to do so, standing mature dead trees will be retained as these offer excellent potential for a range of species.

All deadwood creation will be done in accordance with the FLS guidance document 'FLS Deadwood Management (FLS, September 2021)' which can be provided on request. This document should be seen as a supplement to the Scottish Forestry Practise Guide 'Managing deadwood in forests and woodlands (Humprey & Bailey, 2012)'.

4.2.7 Invasive species

Several invasive non-native species (INNS) are present within the Black Isle LMP area. A list is provided in **Appendix 5 – Environmental Features.** Presence of INNS is limited and therefore impact on the native habitats is small. Extensive INNS removal has been carried out in the past and currently populations are monitored and removed as necessary.

4.3 Historic Environment

Scheduled Ancient Monuments (SAM) and other heritage features can be found on **Map 2 – Key Features.** Most notable is the Carn Mor Dun, an interesting example of an Iron Age enclosed dun. Interpretation was installed at the site on the informal trail in 2018. Detail of the SAMs can be found in **Appendix 5 – Environmental Features.**

Our key priorities for archaeology and the historic environment are to undertake conservation management, condition monitoring and archaeological recording at 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 (2014) and Scotland's Archaeology Strategy (2015). Significant archaeological sites will be protected and managed following the UK Forestry Standard (2017) and the FCS policy document Scotland's Woodlands and the Historic Environment (2008). 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 designated historic assets on the National Forest Estate. Details of all known historic environment features are held within the Forester Web Heritage Data and included within work plans for specific operations to ensure damage is avoided. Significant historic environment features will be depicted on all relevant operational maps.

Areas of historic environment interest should be checked both on FLS's internal historic environment records and also with the Council's HER prior to the commencement of forestry activities. Any upstanding features should be clearly marked, both on the ground and on operational maps. Care should be taken to avoid any damage to surviving structural elements.

If works that might impact a SAM are to take place Scheduled Monument Clearance will be applied for with Historic Environment Scotland through our workplan process. An example of this can be found in coupe 61013 (Map 5 – Management Coupes) which contains SM4561. This felling coupe consists of partly windblown crop surrounding the SAM. During the workplan preparation the site and potential impact to the SAM will be carefully assessed by our Environment team. If there is a risk of impact to the SAM Scheduled Monument Clearance will be applied for ahead of operations to ensure the right permissions are in place.

4.4 Landscape

See Appendix 7 – Landscape and Appendix 2 - Visualisations

4.5 People

4.5.1 Neighbours and local community

We have been encouraged by the keen interest of locals in the development of this plan and the level of feedback we have received for consideration. Their aspirations have been incorporated where they do not conflict with the objectives of the plan and are consistent with FLS's approach to land management.

We recognise that the main users of the FLS woodlands on the Black Isle are local residents and they have a strong attachment to their local facilities. The main recreational use is at Culbokie, Munlochy, Learnie Red Rocks and Monadh Mor.

Munlochy Clootie Well is linked with ancient healing and we are keen that both locals and visitors continue to take part in the tradition of tying cloots around the well. The site will be subject to harvesting operations and we will be continuing to consult with residents regarding the impact on facilities during this time.

Monadh Mor has significant ecological interest and is a very popular site locally. We are exploring options to improve the facilities for visitors at this site.

Culbokie is very popular and we are fortunate to have input from Culbokie Community Trust to assist us in managing these woodlands and we are keen to continue to have excellent working relations with this group.

Many sites across the Black Isle have active community groups which we are in regular contact with. We have active MOU's in place with Black Isle Trail Association (BITA) for Learnie Red Rocks and the Culbokie Community Trust and we participate in dialogue with the Friends of Munlochy Clootie Well. We value these community connections and are open

to consultation with local communities to discuss how we can work together to further improve our recreational offering or to find opportunities to develop new facilities or partnerships.

4.5.2 Public access

Visitors are welcome to explore FLS land, and will only be asked to avoid routes while certain work is going on that will create serious or less obvious hazards for a period (e.g. tree felling). Scotland's outdoors provides great opportunities for open-air recreation and education, with great benefits for people's enjoyment, and their health and well-being. The Land Reform (Scotland) Act 2003 ensures everyone has statutory access rights to most of Scotland's outdoors, if these rights are exercised responsibly, with respect for people's privacy, safety and livelihoods, and for Scotland's environment. Equally, land managers have to manage their land and water responsibly in relation to access rights and FLS will only restrict public access where it is absolutely necessary, and will keep disruption to a minimum. We acknowledge feedback regarding the restriction of access to multiple sites in an area due to harvesting and we are committed to review our schedules to reduce impact on local users. For more information and to understand our minimum standard please read 'Practise Note; Managing Public Safety on Harvesting Sites' (*Forestry Commission, 2013*).

Waymarked trails
We plan to maintain our current waymarked infrastructure. We will continue to facilitate community led projects and appropriate when approached.

The John O'Groats trail runs through many of the Black Isle sites. We will continue to update the trail association of when harvesting operations may impact the trail to allow them to operate workable diversions when required.

Mountain Bike Trails
Learnie Red Rocks is a valued site in the Black Isle and offers a unique experience to mountain bikers. The car park and skills area will be upgraded in the near future.

The felling proposals in the area have been consulted on with BITA and the Black Isle Mountain Bike Club (BIMBC). The felling sequence in the plan will allow for continued use of the facility by closing one section of Learnie at a time. We will work with the local user groups to minimise disturbance as a result of harvesting.

The trails will be re-graded as part of a national project to improve safety for users. We are working with BITA and BIMBC to explore funding opportunities which would allow us to improve the facilities at this site.

Car parks

Our car parks are well utilised and we are reviewing facilities with the aim of making improvements in well used sites where we have available funding. We will look for opportunities to improve parking at Monadh Mor following harvesting operations.

The car park at Learnie Red Rocks will be extended and upgraded to increase accessibility for users.

We are in the process of procuring additional visitor counters so that we can monitor visitor numbers at all sites.

Woodland Management in Visitor Zones

Visitor Zones have been identified at Learnie and Munlochy. Visitor zones area areas where FLS encourage and manage access or where the woodland managed by FLS interacts with popular visitor sites or access routes. Visitor Zones are mapped separately on the **Map 7 – Thinning Coupes**. As these zones overlap with the thinning coupes they've not been added separately in Table 8 & 9 – Thinning coupes.

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.

4.6 Soils

4.6.1 Protection and Fertility

Brash mats (or alternative measures) will be used to protect sensitive soils on areas where harvesters and forwarders are being used. Felling residue will usually be left on site to allow nutrient recycling, with consideration for the practicalities of restocking.

The extended fallow periods (generally up to five years) that are required prior to restocking, to allow pine weevil populations to abate, have the negative effect of compounding nutrient deficit because nutrient released from decaying leaf litter will have largely been flushed from the site by the fifth year. Therefore it is possible that post planting applications of fertiliser, containing phosphates and potassium, might be required on the upper (more nutrient poor) margins of the forest with further remedial applications required in some crops in line with industry best practice (Taylor, 1991).

However, appropriate choice of silvicultural mixtures and well-timed heather control is preferable to fertilizer application. In this plan the choice of species has taken into account the fertility of the site to the extent that it anticipates no fertiliser will be used during restock and woodland creation. Broadleaf species will be incorporated within silvicultural mixtures to improve soil function and encourage a sympathetic and characteristic field layer to develop.

4.6.2 Cultivation

Where required, the choice of ground cultivation technique will consider the short-term benefits for establishment against any long-term side effects on tree stability, access for future forest operations and the environment. There will be a preference for the least intensive technique.
A mix of scarifying, mounding and flat/screef planting will be used depending on soil type, weed growth, geomorphology and the desired species.
Scarifying may be used in those areas where natural regeneration of Scots pine is desirable. This will likely be limited to areas of strip felling as these have been specifically selected on the seeding potential of the surrounding crop and the opportunity to expose the mineral layer.

4.6.3 Deep peats

As can be seen on **Map 9- Soils** the Black Isle LMP area does not contain large expanses of deep peat. The soils on which the forests are found are generally a mixture of surface water gleys, ironpans and podzols.
Some unique and highly designated deep peats and fens are however found in the Black Isle LMP area at Monadh Mor and Dam Wood. As these areas are SSSI's and SAC's are management plans can be found in **Appendices 9 & 10 – Habitats Regulations Appraisal**

and Designated Site Plan. Currently there are no plans for large scale intervention as these sites are in a 'Favourable' status. Regeneration of trees on the bog habitats is being monitored and removed where necessary.
Another area of deep peat is found at what used to be Culbokie Loch. This is currently an open habitat but due to declining water levels this is threatened by regenerating trees. Some interesting and unique open habitat types are found in this area and therefore we will be looking for opportunities to safeguard and improve this habitat.
As a rule we refer to the guidance 'Deciding Future Management Options for Afforested Deep Peatland' (Scottish Forestry, 2015) on any deep peats to determine our future management options.

4.7 Water

Two private water supplies are found on the boundary of the National Forests and Land. Impact of proposed operations has been assessed in detail and mitigation and future management determined. FLS's guidance on managing private water supplies has been followed during the creation of this LMP and will be followed through the workplan process. UKFS requirements on water supplies and CONFOR's 'Protecting Private Water Supplies during Forestry Activities' will be adhered to.

For more detail of this and management of water and catchments see **Appendix 8 – Water and Catchment Management** and **Map 3 – Key Water Features**.

For enquiries about this plan please contact:

Eelco de Jong
Planning Forester
Forestry and Land Scotland
North Region
Golspie Office
Golspie Business Park
Golspie KW106UB

eelco.dejong@forestryandland.gov.scot