

# EAST LOCH SHIEL DEER MANAGEMENT GROUP

## Appendix 15

### POPULATION MODELS AND TARGETS

### 2020/21

ELS 20 Population model 2020 narrative Autumn

#### **POPULATION MODELS: - August 2020 update.**

##### **Introduction: -**

The 'Populations Model and Targets' is now a 'stand-alone' document which is Appendix 15 to the Action Plan – Working Document and is no longer incorporated in main body of the Action Plan – Working Document. This allows both the Action Plan and the Population Model to be updated independently of each other at appropriate intervals.

It must be understood from the outset that a forecast is an estimate of what might happen given certain parameters and making certain assumptions. The forward-looking Population Models will need updating annually with input of up to date figures and information with revised assumptions, targets, etc.

Our Population Models calculate the deer density from the 2009/10 deer census/counts with further inputs from the 2016 and 2019 counts also including 2020 recruitment and mortality assessment data allowing us to understand our population dynamics, to confirm, and calibrate our forward-looking Population Models.

To produce the East Loch Shiel DMG population model, it is necessary to show the relationship between the Western Working Group (WWG) and Eastern Working Group (EWG) areas with their own models.

The Population Models below which project forward from the January 2019 helicopter count shows our projected population to Spring 2025. Our models are adaptive and reactive with regular updates and re-setting of population and cull targets as appropriate.

##### **Deer Density: -**

The SNH 10<sup>th</sup> of January 2019 aerial count shows the ELSDMG density of 10 deer/km<sup>2</sup> over the whole group, which is at the lower end of the SNH medium rated category of 8 to 15 deer/km<sup>2</sup>. FLS advise the 2010 census of their woodlands established a density of 7.5 deer/km<sup>2</sup>.

##### **Mortality and recruitment: -**

Mortality assessment and recruitment counts. At the 12/11/2019 meeting SNH advises that for adult deer mortality we use the SNH standard of 2% with variation, if applicable, based

on the observations of the stalkers. For calves, carry out sample recruitment counts late spring by which time the winter mortality will have occurred. This then gives the actual 'post-winter mortality' recruitment figure with no need to calculate further. These figures can then be applied to the Population Model. This method is applied from the 2020/21 season.

In the Western Working Group area FLS advise they have higher recruitment levels of 45% of all hinds or 65% of sexually mature hinds due to the better feed and shelter in their woodland areas. As both the offered calving figures give a virtually equal calving rate for the whole consort the figure of 45% of all hinds is used for ease of calculation. FLS advise they operate a shoot the calves first policy which will mean a higher proportion of calves: hinds culled than the actual population ratio. The figures in the historic culls do not demonstrate a higher calving rate than the 45% for all hinds we have used. The 5-year average calf/ hind cull ratio to the 2019/20 season for the WWG area shows a nett 41% calf/hind cull rate.

Open range sample recruitment counts were carried out late spring 2020 on Carnoch, Conaglen, Glen Scaddle, and Sunart. The results suggest an open range post mortality recruitment rate of 25% for 2019/20.

**Migration: -**

FLS say their higher recruitment levels explain the sustained high level of culls achieved in their woodlands. (See Mortality and Recruitment above.)

Using the SNH model to calculate the population required to sustain the FLS average cull a density of  $\approx 27$  deer/km<sup>2</sup> would be necessary, i.e. 3.6 times higher than the 7.5 deer/km<sup>2</sup> stated.

The population models, evidence on the ground e.g. porous fences, tracking through the fences, stalkers/consultants' observations, etc. all confirm migration is occurring. Since the 2019/10 deer census the FLS grounds have accounted for around 1200 deer culled more than their calculated recruitment whilst over the same period a significant number cannot be accounted for on the open range. In the absence of later data, a deer density of 7.5 /km<sup>2</sup> is used as the spring population in the FLS woodlands.

The emigration of deer from the open range through porous forestry fences is detrimental to the open range sporting interests in regard to Sections 5, 10, 11, and 13 of the 'Benchmark' and Sections 2, 3, 5, 6, 8, 9, 10, 11, 12 and 14 of the 'Public Interest'. Whilst at the same time being detrimental to the enclosed woodlands interests in regard to Sections 5, 10 and 11 of the 'Benchmark' and Sections 2, 3, 5, 6, 8, 10, 11 and 12 of the 'Public Interest'. The losses to the sporting members are detrimental to capital values, capital utilisation, revenue, primary and secondary employment, training prospects, housing prospects, increased impacts on habitats & etc. At the same time the costs of deer control, crop damage, increased impacts on habitats, capital values & etc. are detrimental to the mainly publicly owned forestry business interests.

**Herbivore impacts: -**

Refer to the ELS Appendix 13 HIA Log Revision 2 – July 2020 which shows overall deer impacts to be within the DMG target.

**Deer Condition: -**

The condition of the deer was reported as 'excellent' at the 12/11/2019 DMG meeting and again this summer.

**Availability of Forage and Shelter: -**

There have been no significant changes in availability of Forage and Shelter availability since the last season (2019/20) Population Model update. Heather is showing mainly low or medium browsing impacts indicating the deer are not struggling to find winter forage.

**Local Economy: -**

Many local businesses, enterprises and people are reliant on the income, employment and the diverse benefits generated from and around deer management.

Deer management in the open range areas provides for both primary and secondary employment with deer stalking being a key source of revenue and employment. As well as the obvious primary income and employment derived from the commercial stalking on the open range sporting estates there are many other often less tangible but no less important economic and social benefits both for the local communities and the wider public including estate investment, estate project investment, employee and community housing, social well-being, sense of community, mental and physical well-being, & etc.

The constraints imposed by the loss of deer from the open range via migration diminishes the local economy, local employment and housing prospects, as well as the broad spectrum of benefits shown above. Local employment is covered in more detail in section 12 of the ELSDMG DMP Background Information and identifies 8 full time and 9 seasonal or part time jobs plus opportunity for a full time HNC/HND trainee. A further 7 full time and 32 part time people are engaged with and reliant on secondary employment relating to the open range sporting deer management.

The non-targeted emigration of deer from the open range is having a negative effect on both the local and broader economy. Despite there being a strong demand for deer stalking for sport our open range sporting members are unable to meet the full demand and capacity, often having to turn away stalking guests and their parties due to the lack of sporting stags and hinds/calf's available, leading to a loss for both the local and the broader economy.

Meanwhile, the nett cost of FLS culling operations is significant with a major part of their costs incurred culling deer that have migrated onto the FLS estate, the bill for this being picked up by the taxpayer. The FLS deer management team provide 1.6 FTE jobs in East Loch Shiel. There is little opportunity for additional secondary employment.

Venison production will be the same whichever side of the fence the deer are culled.

**Broader Economy: -**

In the broader economy, employment and earnings from the open range landholdings deer management continue to multiply with e.g. contractor and professional services, equipment suppliers, trade associations, gun shops, garages, trophy preparation, transport, tourism, and so on, all benefiting. Direct taxation is generated for the exchequer by way of Income Tax, National Insurance, VAT, Property/ Business Rates & etc.

**Primary objectives: -**

The primary objectives for the individual landholdings are set out in the ELSDMP Background Information Section 7.

The primary objective for most of the open range landholdings is for sustainable deer stalking enterprises with, in some cases agricultural interests, thus providing for the broad spectrum of benefits shown above and satisfying the public interest.

In the enclosed commercial woodlands, the primary objective is for timber production.

**Population Targets: -**

Taking all the above factors into consideration: -

The open range population is to remain at a sufficient density to deliver the collective objectives of the DMG members as well as public interest.

The Western Working Group area Sporting Stag target is for 20 to 25 stags per annum from Resipole Farm and Sunart Estate open range. The SNH model spreadsheet suggests a deer density of 7.5 to 9.5 deer/km<sup>2</sup> will provide for this.

No target is given for the FLS population or cull, simply they aim to keep deer impacts to an acceptable minimum in their commercial woodlands, although the DMG was advised that FLS is being tasked to further increase their cull nationally by 10%.

The Eastern Working Group Area Sporting Stag target is for 160 stags per annum but is currently constrained to around 120 by apparent losses due to migration. The Eastern Working Group calculate that to support a 160-sporting stag target a population of 1200 stags, 1200 hinds and 360 calves is suggested, without migration losses, by the SNH model equivalent to a density of 8.2 deer/km<sup>2</sup>, which would allow for a >22% reduction from the 2019 count.

The DMG Eastern Working Group population target is for an open range Spring 2020 deer density of 10.1 deer/km<sup>2</sup> +/- 5%, not wishing to increase the overall deer density but at the same time supporting sustainable estate, deer stalking and secondary business enterprises, providing for the broad spectrum of benefits shown above and satisfying the public interest, albeit constrained by the non-targeted losses due to emigration.

**Last Season (2019/20) Cull.**

**Cull Targets: -**

The Group area cull target for the 2019/20 season was 299 Stags, 333 Hinds and 125 Calves to achieve the Group population target shown as group wide and for each sub-group.

The Cull Target was: -

Area	Stags	Hinds	Calves	Total
ELS Group	299	333	125	757
Western WG	154	123	54	331
Eastern WG	145	210	71	426

**Achieved Cull 2019/20 Season**

The Cull achieved was: -

Area	Stags	Hinds	Calves	Total
ELS Group	306	331	132	769
Western WG	196	160	64	420
Eastern WG	110	171	68	349

The difference to the target was: -

Area	Stags	Hinds	Calves	Total	
ELS Group	+7	-2	+7	+12	+1.5%
Western WG	+42	+37	+10	+89	+27%
Eastern WG	-35	-39	-3	-77	-18%

It is noted that the WWG cull is growing year on year with the 3year rolling average culls shown in the following table.

WWG 3yr Rolling Average Cull	Stags	Hinds	Calves	Total	% Change
2016/17	160	121	54	335	
2017/18	167	120	50	337	
2018/19	175	139	59	373	+11%
2019/20	195	158	67	420	+13%

The WWG nett recruitment is calculated from their figures as  $\approx$  185 per year.

**The 2020/21 season forward looking Population Models: -**

**Population Targets**

The open range population is to remain at a sufficient density to deliver the collective objectives of the DMG members as well as public interest objectives.

The Western Working Group area Sporting Stag target is for 20 to 25 stags per annum from Resipole Farm and Sunart Estate open range.

No population target is given for the FLS population, simply they aim to keep deer impacts to a minimum in their commercial woodlands.

The Eastern Working Group area Sporting Stag target is for 160 stags per annum but is currently constrained to around 120 by apparent losses due to migration.

Until the migration issue is resolved the DMG Eastern Working Group population target is to maintain an open range Spring deer density sufficient to support the sustainable estate, deer stalking and secondary business enterprises, providing for the broad spectrum of benefits shown above and satisfying the public interest, albeit constrained by non-targeted losses due to emigration. This is currently calculated at 10.1 deer/km<sup>2</sup> +/- 5% with the cull targets set out below to achieve our density target.

**Cull Targets**

The last two years seasonal weather variation have led to a lower than average calving and nett recruitment rate of ≈25% in the open range. After allowing also for adult mortality, the surplus of deer for the 2020/21 season to be culled to meet the Group population target is calculated as follows.

The total Group cull target for the 2020/21 season to achieve the population targets is: -

Area	Stags	Hinds	Calves	Total
ELS Group	271	278	94	643
Western WG	146	123	55	324
Eastern WG	125	155	39	319

The Western Working Group area open range cull targets for the 2020/21 season are: -

Area	Stags	Hinds	Calves	Total
Resipole Farm	14	15	5	34
Sunart Estate	10	15	5	30
Rest of WWG	122	93	45	260

The Eastern Working Group open range cull targets for the 2020/21 season are: -

Area	Stags	Hinds	Calves	Total
Ardgour Estate	13	30	7	50
Conaglen Estate	37	74	20	131
Druim Laith	11	9	3	23
Glen Scaddle	23	15	4	42
Inversanda	11	8	2	21
Rest of EWG	30	19	3	52

Individual Estates/landholdings will target culls in their areas to address any specific local deer impacts or issues.

**Current population model spreadsheets: -**

The Whole Group Combined model spreadsheet (Page 8) is for the 2020/21 season with the whole East Loch Shiel DMG Area cull target set to maintain the deer density target.

The following Western (Page 9) and Eastern (Page 10) Working Group models calculate for the expected migration between Working Group areas. Whilst migration is not targeted the model spreadsheets show an estimated cull apportionment based on previous years outcomes.

The following forward-looking Population Model spreadsheets project forward to the 2025 Spring population.

ELS Population Models and Targets 2020/21

ELSDMG POPULATION MODEL				Whole group combined			2020/21
Target Spring Density	9.17						
Management area Km2	454						
Target population	4165						
Counted January 2019	Stags	Hinds	Calves	Total	Density	%Calving	
Current Winter Population	1347	2428	778	4553	10.0	32.0	
Year	Population Model	Stags	Hinds	Calves	Total Cull	Density	
Datum	Datum count	1347	2428	778		10.0	
		1347	2428	778			
	Post count cull	46	130	46	222		
	Post count mortality	27	49	47			
	Post count migration 1/3 of ave	0	0	0			
2019/20	2019 Spring population	1274	2249	685	4209	9.3	
	Year 2 Summer population	1617	2592	832			
	Year 2 Cull achieved	306	331	132	769		
	Year 2 Mortality	32	52	0			
	Migration	0	0	0			
2020/21	2020 Spring population	1278	2209	635	4122	9.1	
	Year 3 Summer population	1596	2527	812			
	Year 3 Cull Target	271	278	94	643		
	Year 3 Mortality	32	51	49			
	Migration	0	0	0			
2021/22	2021 Spring population	1293	2198	670	4160	9.2	
	Year 4 Summer population	1628	2533	813			
	Year 4 Cull	273	274	99	646		
	Year 4 Mortality	33	51	49			
	Migration	0	0	0			
2022/23	2022 Spring population	1322	2208	666	4196	9.2	
	Year 5 Summer population	1655	2541	814			
	Year 5 Cull	275	271	97	643		
	Year 5 Mortality	33	51	49			
	Migration	0	0	0			
2023/24	2023 Spring population	1347	2219	669	4234	9.3	
	Year 6 Summer population	1681	2553	818			
	Year 6 Cull	278	267	95	641		
	Year 6 Mortality	34	51	49			
	Migration	0	0	0			
2024/25	2024 Spring population	1369	2235	673	4278	9.4	
	Year 7 Summer population	1706	2572	823			
	Year 7 Cull	281	264	94	639		
	Year 7 Mortality	34	51	49			
	Migration	0	0	0			
	2025 Spring population	1391	2256	680	4327	9.53	
	Target Population/Density	1470	2114	703	4287	9.44	
					40		
	SNH standards						
	2% 2% Stag Mortality						
	2% 2% Hind Mortality						
	6% 6% Calf Mortality						
	1:1 Hind/Stag Calving Ratio						
	No immigration/emigration						



ELS Population Models and Targets 2020/21

ELSDMG POPULATION MODEL				Western Working Group		2020/21	
Target Spring Density	7.5	NOTES: -					
Management area Km2	124	Starts 2019 using January count data less cull and mortality post count.					
Target population	865	1					
Counted January 2019	Stags	Hinds	Calves	Total	Density	%Calving	
Current Winter Population	290	470	211	971	7.8	45.0	
Year	Population Model	Stags	Hinds	Calves	Total Cull	Factor +/-	Density
Datum	Datum count	290	470	211			7.8
		290	470	211		1	CR
	Post count cull	43	72	25	140		
	Post count mortality	6	9	13		1	M
	Post count migration 1/3 of ave	29	25	8			
2019/20	2019 Spring population	270	414	181	865		7.0
	Year 2 Summer population	361	504	227		1	CR
	Year 2 Cull achieved	196	160	64	420		
	Year 2 Mortality	7	10			1	M
	Migration	112	77	22			
2020/21	2020 Spring population	270	411	185	866	0.45	7.0
	Year 3 Summer population	362	504	227		1	CR
	Year 3 Cull Target	146	123	55	324		
	Year 3 Mortality	7	10	14		1	M
	Migration	60	40	12			
2021/22	2021 Spring population	269	411	170	849		6.8
	Year 4 Summer population	354	495	223		1	CR
	Year 4 Cull	142	119	54	315		
	Year 4 Mortality	7	10	13		1	M
	Migration	60	40	12			
2022/23	2022 Spring population	265	406	168	839		6.8
	Year 5 Summer population	349	490	221		1	CR
	Year 5 Cull	137	116	52	305		
	Year 5 Mortality	7	10	13		1	M
	Migration	60	40	12			
2023/24	2023 Spring population	265	405	167	837		6.7
	Year 6 Summer population	348	488	220		1	CR
	Year 6 Cull	133	112	51	296		
	Year 6 Mortality	7	10	13		1	M
	Migration	60	40	12			
2024/25	2024 Spring population	268	406	168	842		6.8
	Year 7 Summer population	352	490	221		1	CR
	Year 7 Cull	129	109	49	287		
	Year 7 Mortality	7	10	13		1	M
	Migration	60	40	12			
	2025 Spring population	276	412	170	858	6.92	
	Target Population/Density	270	414	181	865	6.98	
					-7		
	SNH standards						
	2% 2% Stag Mortality						
	2% 2% Hind Mortality						
	6% 6% Calf Mortality						
	1:1 Hind/Stag Calving Ratio						

ELS Population Models and Targets 2020/21

ELSDMG POPULATION MODEL				Eastern Working Group		2020/21	
Target Spring Density	10	<b>NOTES:-</b>					
Management area Km2	330	Starts 2019 using January count data less cull and mortality post count.					
Target population	3300	Assumes no change to fencing status, or FLS cull policy					
Counted January 2019	Stags	Hinds	Calves	Total	Density	%Calving	
Current Winter Population	1057	1958	567	3582	10.9	29.0	
Year	Population Model	Stags	Hinds	Calves	Total Cull	Factor +/-	Density
Datum	Datum count	1057	1958	567			10.9
		1057	1958	567		1 CR	
	Post count cull	3	58	21	82		
	Post count mortality	21	39	34		1 M	
	Post count migration 1/3 of ave	-29	-25	-8			
2019/20	2019 Spring population	1004	1836	504	3344		10.1
	Year 2 Summer population	1256	2088	605		1 CR	
	Year 2 Cull achieved	110	171	68	349		
	Year 2 Mortality	25	42		Delete mort	1 M	
	Migration	-112	-77	-22			
2020/21	2020 Spring population	1009	1798	450	3256	0.25	9.9
	Year 3 Summer population	1233	2023	586		1 CR	
	Year 3 Cull Target	125	155	39	319		
	Year 3 Mortality	25	40	35		1 M	
	Migration	-60	-40	-12			
2021/22	2021 Spring population	1024	1787	500	3311		10.0
	Year 4 Summer population	1274	2037	590		1 CR	
	Year 4 Cull	131	155	45	331		
	Year 4 Mortality	25	41	35		1 M	
	Migration	-60	-40	-12			
2022/23	2022 Spring population	1057	1802	498	3356		10.2
	Year 5 Summer population	1306	2050	594		1 CR	
	Year 5 Cull	138	155	45	338		
	Year 5 Mortality	26	41	36		1 M	
	Migration	-60	-40	-12			
2023/24	2023 Spring population	1082	1814	501	3398		10.3
	Year 6 Summer population	1333	2065	598		1 CR	
	Year 6 Cull	145	155	45	345		
	Year 6 Mortality	27	41	36		1 M	
	Migration	-60	-40	-12			
2024/25	2024 Spring population	1101	1829	505	3435		10.4
	Year 7 Summer population	1354	2081	603		1 CR	
	Year 7 Cull	152	155	45	352		
	Year 7 Mortality	27	42	36		1 M	
	Migration	-60	-40	-12			
	2025 Spring population	1115	1845	510	3469	10.5	
	Target Population/Density	1200	1700	522	3422	10.4	
					47		
	SNH standards						
	2% 2% Stag Mortality						
	2% 2% Hind Mortality						
	6% 6% Calf Mortality						
	1:1 Hind/Stag Calving Ratio						