Hamilton Low Parks Woodland Herbivore Impact Assessment

&

Roe Deer Management Recommendations

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Principal Ecologist

Parnassus Ecology

On behalf of Scottish Natural Heritage

23rd May 2018

PARNASSUS ECOLOGY

Scottish Natural Heritage
Dualchas Nàdair na h-Alba
All of nature for all of Scotland
Nàdar air fad airson Alba air fad

Indicator	Impact Rating
Basal Shoots	HIGH
Epicormic Growth & Lower Shoots	MEDIUM
Seedlings and Saplings	HIGH
Preferentially browsed or grazed plants	VERY HIGH
Bark Stripping, fraying & stem breakage	LOW
Sward	LOW
Ground Disturbance	LOW

A Habitat and Roe Deer Site Management Statement summarising key management aspects at Hamilton Low Parks has been produced; see below:

Habitat and Roe Deer Site Management Statement

Site Name: Hamilton Low Parks	**Statement Period:** 2018-2023
Site Area (ha): SSSI = 106ha; Surrounding area = 200ha (*inc* South Haugh, race course, *etc*)	**Location (Grid Reference):** NS 7203 5675
Ownership Details: South Lanarkshire Council, Almada Street, Hamilton, South Lanarkshire, ML3 0AA [*Contact:* Malcolm Muir, Countryside and Greenspace Manager, Facilities, Waste and Grounds Services, Community and Enterprise Resources' South Lanarkshire Council: Malcolm.muir@southlanarkshire.gsx.gov.uk]	
Priority Features & Current Condition	1. SSSI: Biological: Birds: Grey heron, *Ardea cinerea*, breeding: **Favourable Maintained**
Key Site Management Issues	1. Native tree and shrub regeneration within mature woodland within Hamilton Low Parks SSSI.
	2. Replacement of dead and dying trees in Heronry to ensure longterm availability of heron nesting sites.
	3. Concern over local Deer Vehicle Collision (DVC) hotspot at Junctions 5 & 6 and adjacent M74.
	4. Illegal deer poaching in the Hamilton Low Parks area.
Current Herbivore Impact Assessment Overall Rating:	HIGH – Roe Deer
Herbivore Impact Summary	The current evidence points to high and very high impacts upon basal shoot growth, preferentially browsed species, such as bramble, and upon new seedlings and young saplings across much of the mixed mature woodland. The general paucity of seedlings and smaller saplings also demonstrates a lack of recent tree and shrub regeneration over much of Barmichael Plantation and Low Park Wood. Many areas fall into Woodland Structure Class 6 (mature woodland, no understorey). Significant areas of mature Willow scrub were in a healthy condition but can regenerate vegetatively.

If applicable, most recent Deer Vehicle Collision (DVC) data adjacent to site:					
Year: 2014	6	**Year: 2015**	6	**Year: 2016**	6

Is there a current Deer Management Plan covering the site? (if Yes, name of plan): No
Is there a current *Roe* Deer Management Plan covering the site? (if Yes, name of plan): No

Is there a Herbivore Impact Assessment Report? (if Yes, name of plan): **Yes** Hamilton Low Parks Site of Special Scientific Interest (SSSI): Woodland Herbivore Impact Assessment & Roe Deer Management Recommendations (April 2018)	
Roe Deer Control on site? By Who?	Not at this time.
Most Recent Roe Deer Cull Data: Not applicable	

Year	Adult Bucks	Adult Does	Buck Kids	Buck Does	Total

Estimated Roe Deer Numbers on the site?	*c.* 75 animals
Methods used to estimate Roe Deer numbers:	Incomplete thermal, field counts & trail camera surveys

Site Management Vision:

Management of the woodland at Hamilton Low Parks will focus on ensuring the long-term conservation of the site as a heronry. It will also aim to provide the conditions for establishing a more structurally-diverse, species-rich mixed woodland and the conservation of a range of other wetland habitats. All work will be carried out within a sustainable, agreed roe deer management framework, which ensures roe deer populations do not cause significant adverse impacts upon public interests in the area. Roe deer browsing pressures will be maintained at a LOW impact rating.
Roe Deer Management in the area will aim to reduce the number of DVCs to 1-2 per annum, a 60%80% reduction on current recorded incidents, with no incidents of illegal deer poaching recorded with the main SSSI area.

Site Management Main Objectives and Key Actions:

Objective	Action	Lead	Date
1. Woodland Management: Tree-planting to conserve Heronry	1.1. Plant fast-growing conifers (*e.g.* Sitka, Scot's Pine) within and adjacent to heronry	SLC/SNH	Winter 2018/2019
2. Woodland Management: Establishment of diverse woodland	**2.1.** Produce a detailed woodland management plan for Barmichael Plantation, Low Park Wood and adjoining areas *(to include saproxylic invert survey)*	SLC/SNH	2019/2020

3. Woodland Management: Management of Willow Carr and Scrub within SSSI	**3.1.** Retain the current extent of Willow and Hawthorn scrub within the SSSI	SLC/SNH	Annual
4. Sustainable Roe Deer Management: Strategic Context	**4.1.** Obtain formal SLC support for the implementation of the recommendations within this plan.	SLC	By end of 2019
5. Sustainable Roe Deer Management: Establish Hamilton Low Parks Roe Deer Management Group	**5.1.** Approach all land managers in the Hamilton Low Parks area and organise meeting to establish the new Group	SLC/SNH	By end of 2020
6. Sustainable Roe Deer Management: Roe Deer Reduction Cull	**6.1.** Obtain permissions from landowner (SLC) and statutory authorities (SNH) to commence roe deer shooting in the Hamilton Low Parks SSSI	SLC/SNH	By end of 2020
	6.2. Appoint a stalker(s), with agreed contract, in order to commence roe deer shooting, with aim to have a 60% cull in first year (and possibly second), thereafter, a 30% cull, subject to annual review.	SLC/SNH & Transport Scotland	By end of 2020
7. Sustainable Roe Deer Management: DVC Reduction Management Measures	**7.1.** Installation of mobile vehicle messaging sign at Junction 6 slip road(s)	Transport Scotland, ScotlandTranServ, SLC, SNH	April -July 2019
8. Monitoring and Research:	**8.1.** Carry out annual Level 1 HIA on woodland within the Hamilton Low Parks area	SLC/SNH	Annual
	8.2. Carry out repeat Level 2 HIA on woodland as per 2018.	SNH	2023

	8.3. Carry out annual thermal field counts of roe deer	Appointed Stalker	Annual (twice a year: Oct & March)
	8.4. Carry out more trail camera and field surveys to provide more extensive baseline data on roe deer within 200m of M74/Junctions 5/6 & extent of their movements.	SNH, Scotland TranServ, Transport Scotland	ASAP (to include key period of Apr-July)
	8.5. Establish robust system to ensure that all DVCs in area are reported to national database and new HLP Roe Deer Mgt. Group	Hamilton Low Parks Roe Deer Management Group	Annual, commencing 2020
Does this Statement comply with the Deer Code?	Yes – see Compliance Checklist		
Statement Review Date: 2023 (but annual reviews)			
Lead Contact(s): Gail Foster (SNH) and Malcolm Muir (SLC)			

Deer Code Compliance Checklist

It is essential to ensure that this assessment and management plan has taken full account of all relevant legislation stated in the Deer Code, as well as key guidance, throughout its processes and the thinking behind its management objectives. The following checklist, based on key aspects highlighted within the Deer Code, has been produced in order to act as an aide-memoire during the management plan process but also to report back to all with an interest in deer for this site.

Key Criteria	Comments
1. Does the plan comply with and take full account of all relevant deer, access and nature conservation legislation?*	Yes – all relevant legislation was taken into full account during process.
2. Does the plan take full account of deer welfare? **The definition of welfare in relation to wild deer is *'concern for their physical and psychological well being'*.**	Yes – plan has given full consideration to ensuring that actions will not bring unnecessary harm upon deer. Management has aimed to reduce risk of DVCs upon resident roe deer population as well as reducing risk of illegal poaching.
3. Does the plan address deer impacts upon a designated site, helping to ensure that it is managed to allow favourable condition, and wider ecosystem services?	Yes – plan includes detailed recommendations to address adverse impacts upon Hamilton Low Parks SSSI.

4. Has the plan used sound methods to assess the impacts of deer upon public interests?**	Yes – method agreed with SNH prior to commencement of field survey work.
5. Does the plan take full account of the impact of management objectives upon other economic activities in the locality? (*e.g*. forestry, agriculture, game management, tourism).	Yes – plan takes full account of other interests via consultation and engagement with local managers.
6. Does the plan adequately address the issue of venison production from any proposed deer culling?	Yes – recommendations state that any stalker arrangements include confirmation that culled deer will be used for venison. In addition, it is recommended that the proposed local roe deer management group & partners investigate developing a local market, including in partnership with other groups, including community/social/homeless groups.
7. Has the plan process satisfactorily engaged with local landowners and relevant stakeholders?	Yes – full consultation with all relevant land managers in the Hamilton Low Parks area took place as part of plan process.
8. Has the plan engaged with the relevant	Yes – detailed discussions with the South
deer management group, where such a group exists?	Lanarkshire Deer Management Group took place as part of process.
9. Does the plan adequately cover indirect effects upon other deer management in the surrounding area? *e.g.* displacement of deer	Yes – management recommendations have taken full account of indirect effects of management, especially upon deer around the M74 and race course.
10. Does the plan take full account of its effects upon local DVCs and other social issues in the area *e.g*. ticks and Lyme Disease, mental well-being?	Yes – plan directly addresses current DVC issues on the M74 and associated junctions. Any significant reduction in deer will likely reduce the number of ticks in the area and the likelihood of Lyme Disease transmission to people.
11. Does the plan take full account of any associated wildlife crime issues in the area?	Yes – the plan has collected information on illegal poaching and includes recommendations relating to this.
12. Does the plan deal with health & safety risks associated with its objectives?	Yes – there are high H&S issues in such an urban area during proposed culling operations.
13. Are the proposed management objectives sustainable in the long-term?	Yes – annual culling is recommended in the longterm on the site.

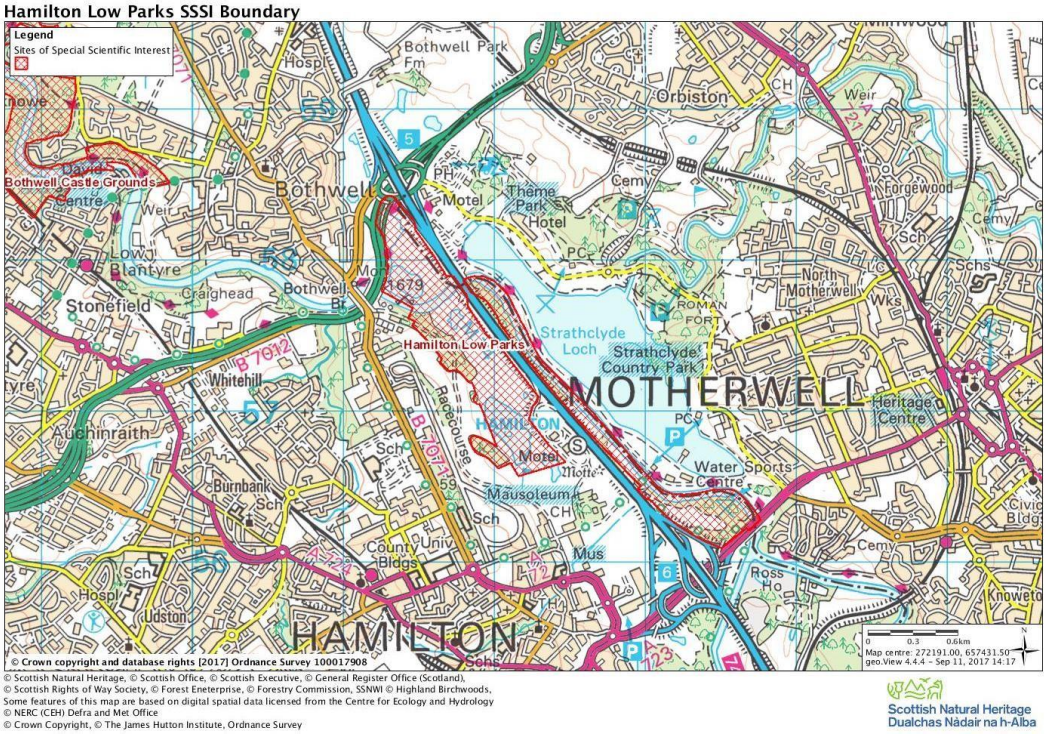
14. Has a date been set to review the management actions proposed in the plan?	Yes – 2023 but management actions will be reviewed annually in light of monitoring information and cull data.
15. Have SNH been consulted on the plan objectives?	Yes – SNH commissioned the plan.

* Legislation includes the following:

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

** Deer Code = *The assessment of damage involves 'a judgement, based on clear evidence that the impacts are deleterious in a particular location at a particular time'*.

Map 1: Hamilton Low Parks SSSI Boundary and immediate environs



Local signs aimed at roe deer poachers; Barmichael Plantation

Map 2: Area of Consideration

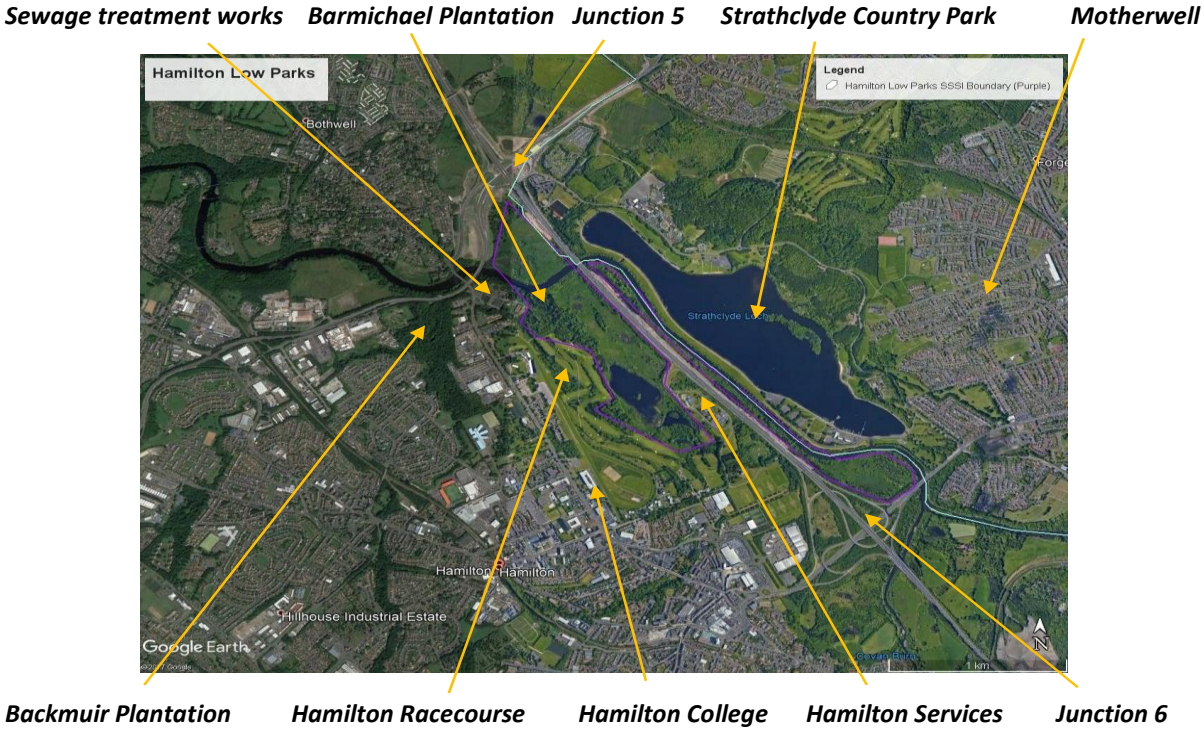
Roe Buck and Doe photographed by trail camera beside Bothwell Bridge, beside sewage works, 2018

Table 1 : Roe Deer issues in the Hamilton Low Parks Area

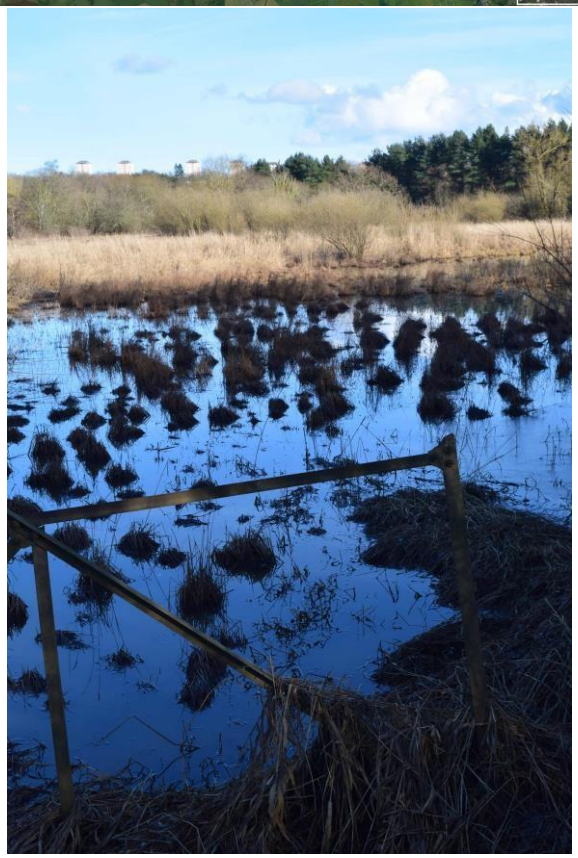
Ownership or Agent	Roe Deer Sightings	Comments
SNH	n/a	Concern over roe deer impacts upon woodland within SSSI and DVCs.
SLC	n/a	Concern over roe deer impacts upon woodland within SSSI and DVCs.
Hamilton Race Course	High nos – Group of 13 spotted on race course in Feb 2018; they are not afraid of people.	Like them but concern about the large recent increases of roe deer on the course as could increase risk of a collision/disturbance between a roe deer and race horse during a race (open between May-Sept); they eat the office flowers; live in scrubland in loop of golf course; seen no evidence of poaching on their land (gates locked at night & track manager lives on site); have concerns about possible DVCs.
Hamilton College	4 spotted on rugby pitch and 2 known in wood in Feb 2018	No concerns and like them.
Roadchef (Hamilton Services)	See them regularly alongside motorway and in/around their grounds	Never caused a problem and no issues to date.
Hamilton Golf Course (SLC)	See them regularly; LMK counted 7 on last fairway whilst groundstaff have counted a group of 13 in 2018.	No concerns and like them.

Golf range (by Mausoleum)	Have the odd 1 or 2 on the range	No concerns and like them.
Hamilton High Flats (overlooking golf course)	No information on numbers	Agents in charge of property grounds have had no complaints about roe deer to date.
Strathclyde Country Park (N. Lanarkshire Council Ranger Service)	See them regularly around park but not in huge numbers	Not causing a problem at this time and getting plenty of regeneration of Ash and Holly within their woodland (H. Boyle, pers comm); never seen roe deer cross R.Clyde or footbridge but are known to appear on loch island. Only see remains of deer from poaching activities, and aware of 1 or 2 incidents a year.
SSPCA Centre	Don't see them in grounds	No immediate local issues with roe deer.
Scotland TranServe & Transport Scotland	Maintain records of DVCs	Concerns at this time and keen to ensure that all can be reasonably done to reduce risk of DVCs.

Map 3: Overview of Plan Area



Map 4: Strategic Overview of Plan Area



Mature Willow scrub and wetland communities at North Haugh

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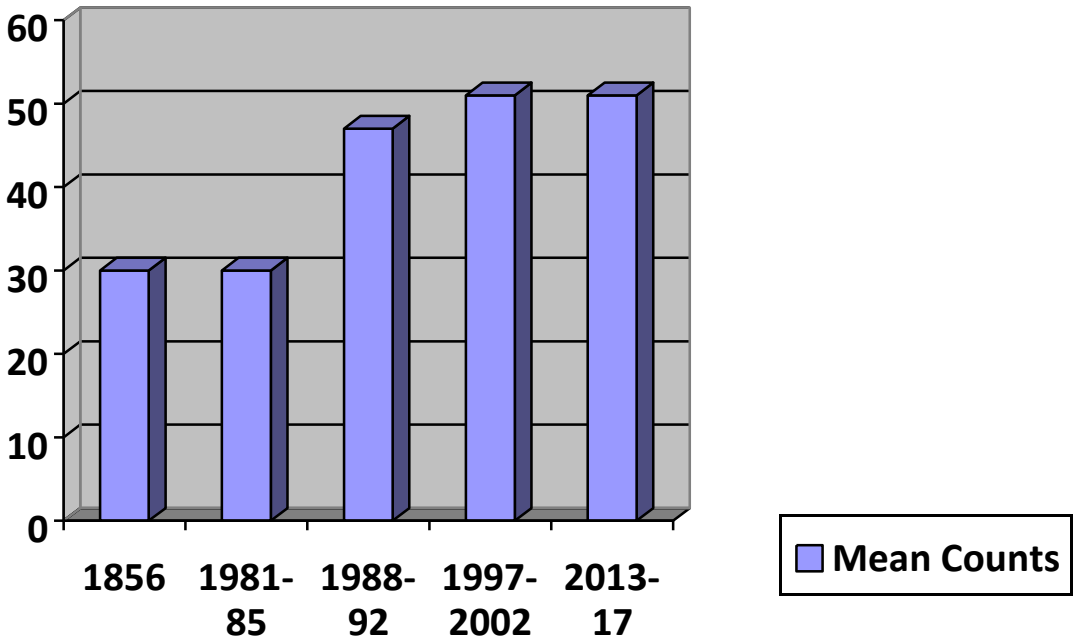
Table 2: The Mean Number of Occupied Heron nests; Barmichael Plantation



Typical mature woodland at Barmichael Plantation, showing Yew in background and leaf liiter

Typical mature willow scrub at Hamilton Low Parks

Barmichael Plantation

North Haugh

South Haugh

Table 3: Impact Indicators

1.	Basal shoots
2.	Epicormic /lower shoots
3.	Seedlings /saplings
4.	Preferentially browsed or grazed plants – *full list included on WGT website.*
5.	Bark stripping and stem breakage
6.	Sward
7.	Ground disturbance

Table 4: Woodland Structure Class

Class 1: Open ground, simple
Class 2: Open ground, complex
Class 3: Dense regeneration on previously open ground
Class 4: Young, dense woodland in the thicket, stem exclusion, or early maturity stage
Class 5: Mature woodland, understorey regeneration
Class 6: Mature woodland, no understorey regeneration
Class 7: Post-mature woodland, dead canopy trees, complex
Class 8: Post-mature woodland, dead canopy trees, simple
Class 9: Open canopy, open-grown trees, complex
Class 10: Open canopy, open-grown trees, simple

	Seedlings (<50 cm tall)[1]			**Saplings (50 – 200 cm tall)**		
Density Class	**Average space between trees (m)**	**Density (Number /ha)**	**Number in a 20 m radius plot**	**Average space between trees (m)**	**Density (Number /ha)**	**Number in a 20 m radius plot**
Dominant (D)	≤ 1	≥ 10,000	≥ 1,250	≤ 1.5	≥ 5,000	≥ 620
Abundant (A)	2	2,500	310	3	1,100	140
Frequent (F)	3	1,100	140	5	400	50
Occasional (O)	10	80	10	16	40	5
Rare (R)	>20	>25	>3	>35	>8	>1

[1] Do not include seedlings that have germinated in the most recent season since many, if not all, of these may disappear, due to a wide range of factors, before they reach one-year-old.

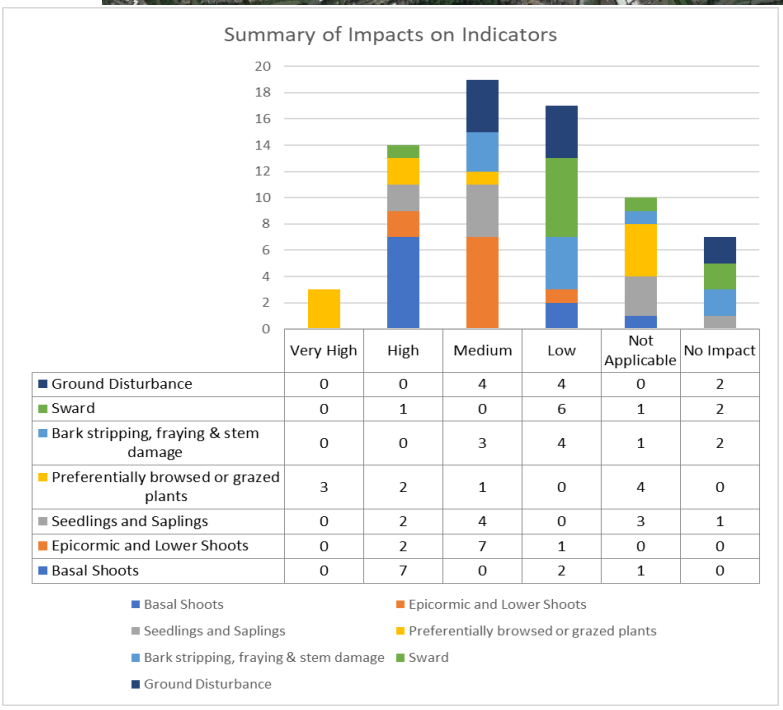
Typical plot with yellow-painted marker post at its centre

4.6.3. Results and Discussion:

The following 10 plots were marked out within Hamilton Low Parks, in order to obtain a representative sample of the woodland habitats, as per **Map 5 and Table 6** below. Table 6: Plot Locations

Plot Number	10 Figure Grid reference (accuracy = 3m)
1	NS 71585 57464
2	NS 71574 57602
3	NS 71680 57682
4	NS 72024 57707
5	NS 71668 57392
6	NS 71821 57278
7	NS 71955 56726
8	NS 71984 56799
9	NS 73365 56379
10	NS 73457 56397

Map 5: Plot Locations: *See Appendix 5 for Enlarged Map*

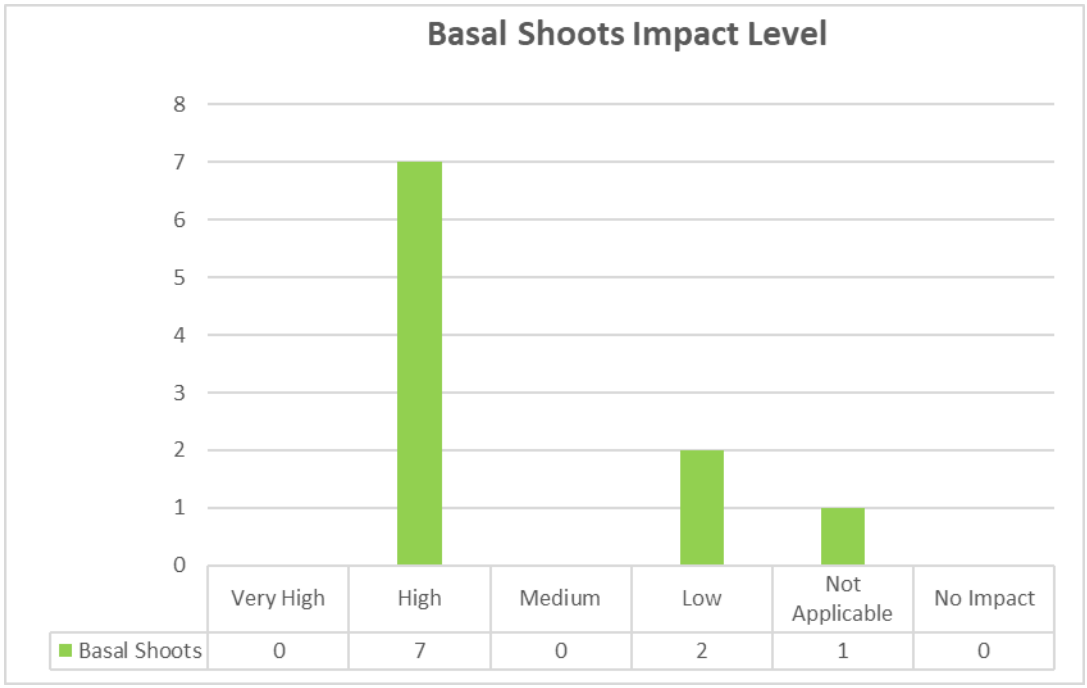


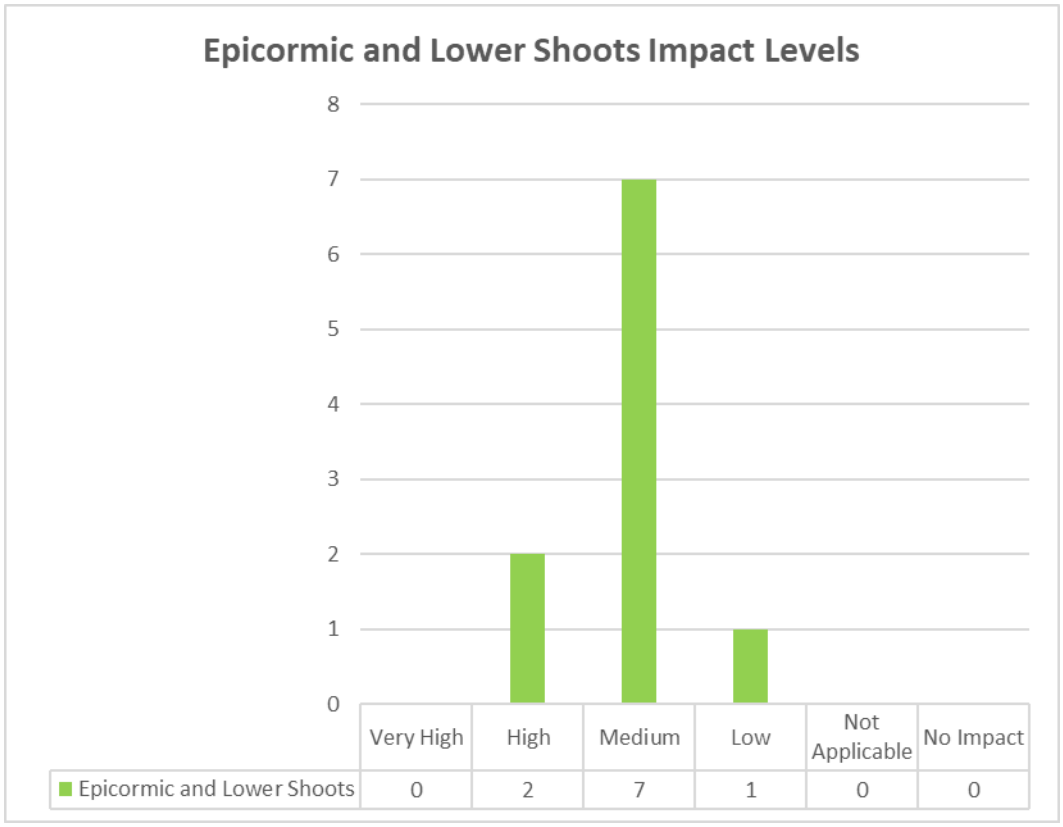
	Very High	High	Medium	Low	Not Applicable	No Impact
Ground Disturbance	0	0	4	4	0	2
Sward	0	1	0	6	1	2
Bark stripping, fraying & stem damage	0	0	3	4	1	2
Preferentially browsed or grazed plants	3	2	1	0	4	0
Seedlings and Saplings	0	2	4	0	3	1
Epicormic and Lower Shoots	0	2	7	1	0	0
Basal Shoots	0	7	0	2	1	0

Table 7(a): Hamilton Low Parks Woodland Herbivore Impact Assessment Plot Summary

	.evel 2 Stop (Plot) Numbers										
Impact Indicator	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Indicator Summary**
Basal Shoots	H	H	H	n/a	H	H	H	H	n/a	L	H
Epicormic & Lower Shoots	H	M	M	M	M	H	M	M	M	L	M
Seedlings & Saplings	M	M	n/a	n/a	H	M	M	H	n/a	n/a	H
Preferentially browsed or grazed plants	VH	n/a	n/a	n/a	VH	VH	H	H	M	n/a	VH
Bark stripping, fraying & stem damage	M	L	L	M	NI	L	NI	M	L	n/a	L
Sward	H	L	n/a	NI	L	L	L	L	L	NI	L
Ground Disturbance	NI	L	M	NI	L	M	M	M	L	L	L

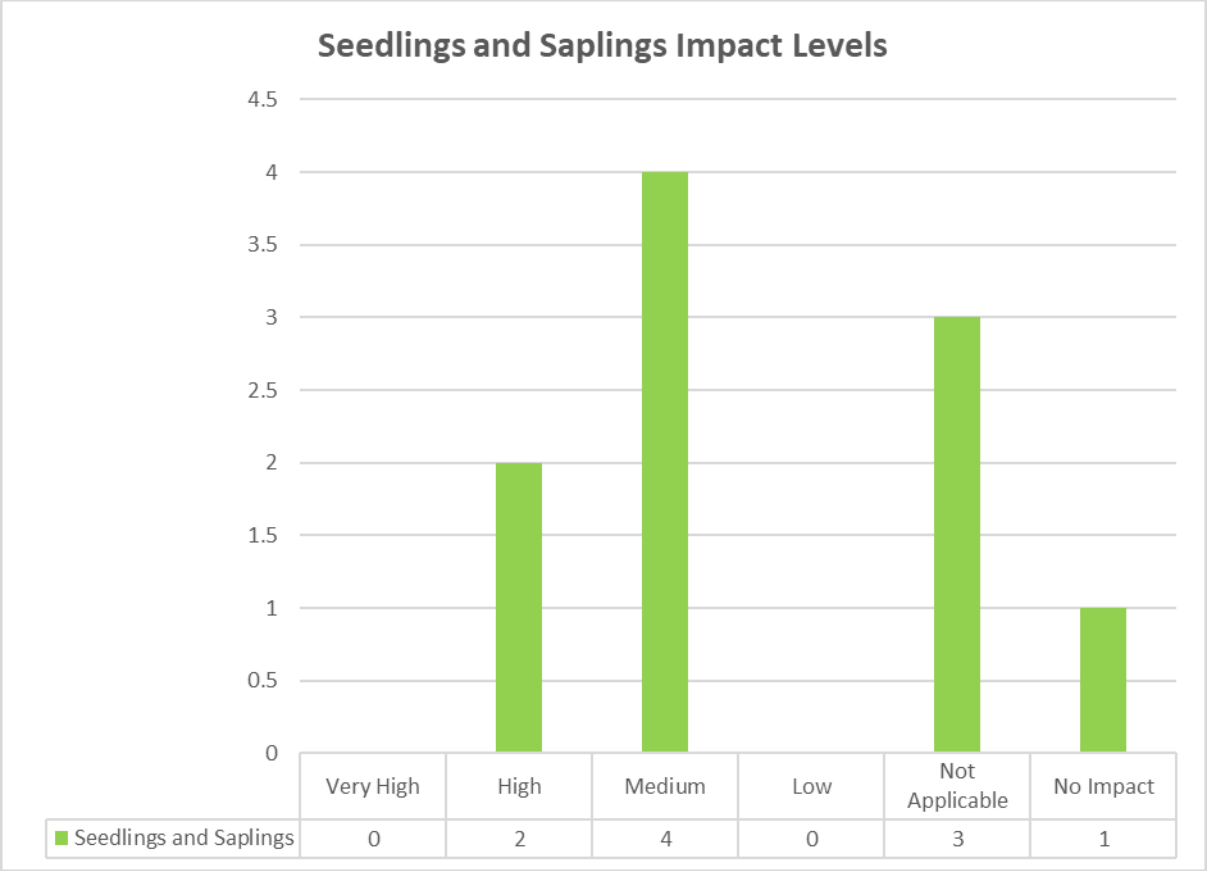
VH = Very High; H = High; M = Medium; L = Low; NI = No Impact; n/a = Not applicable (absent)

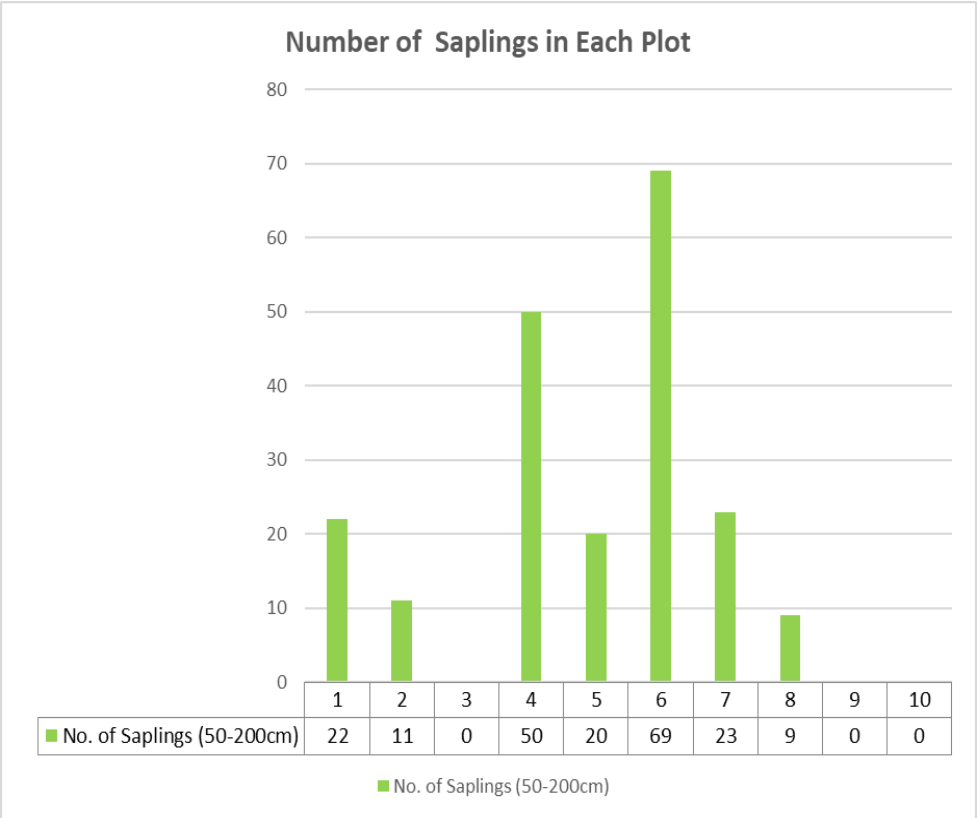

Basal Shoots Impact Level
8
7
6
5
4
3
2
1
0
Very High
High
Medium
Low
Not Applicable
No Impact
Basal Shoots
0
7
0
2
1
0



Plot 1: Typical browsed lower shoots on holly (above) and Rhododendron (below)

This type of browsing was common throughout the woodland, and as a result of the degree

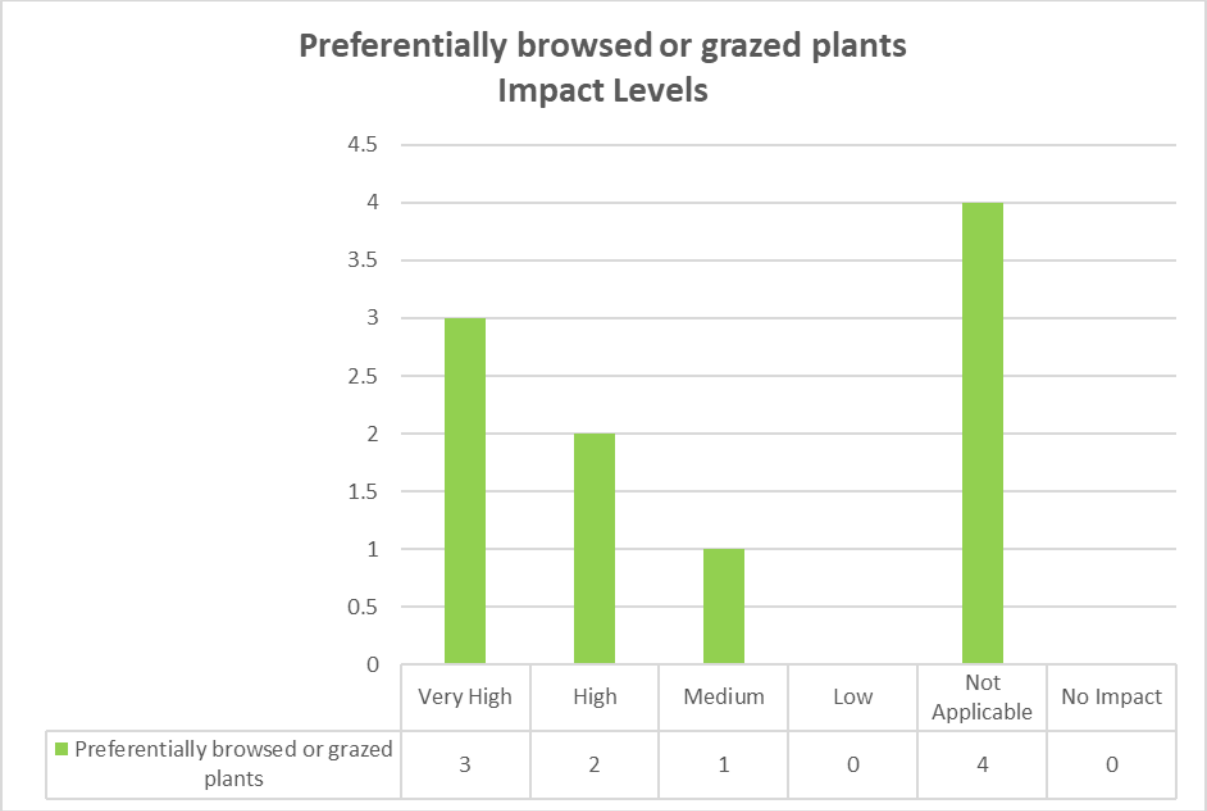




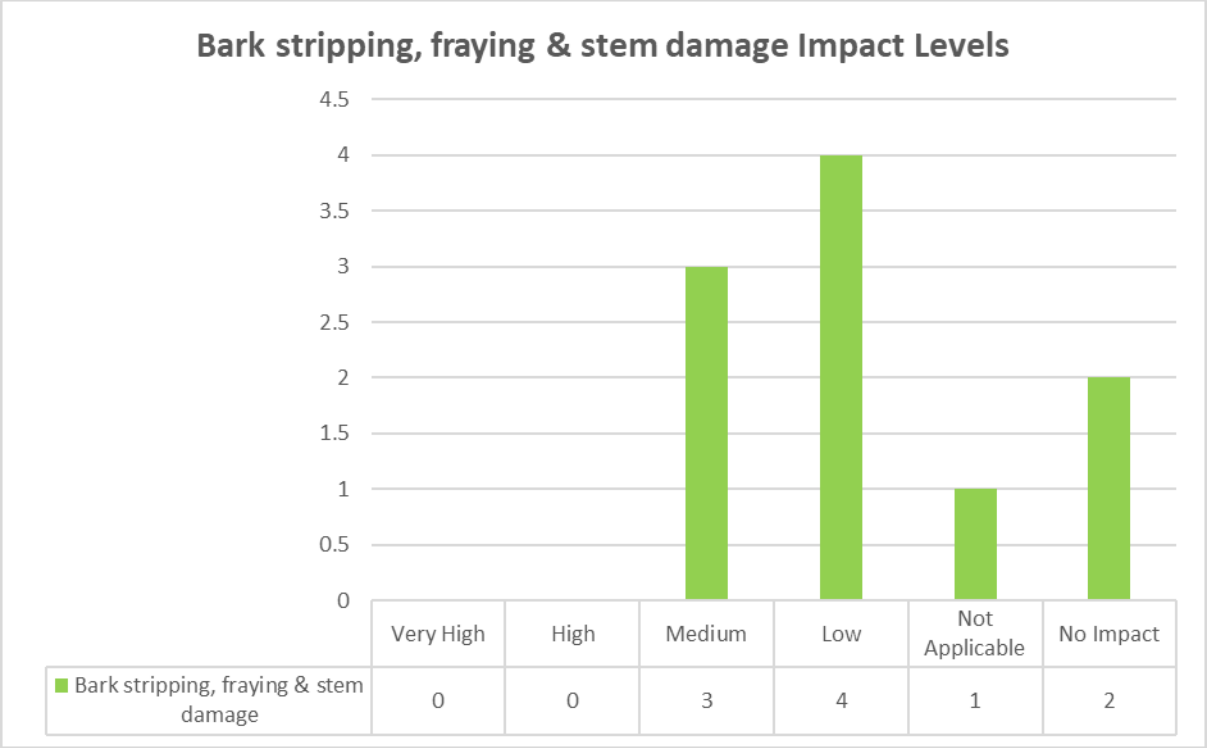
Plot 5: Ash old seedlings (browsed): miniature forest garden: a typical scene in several areas of the woodland

Plot 8 (just outside area): Surge of ash regeneration, including older saplings that have got away from heavily browsed 'ash seedling garden'.

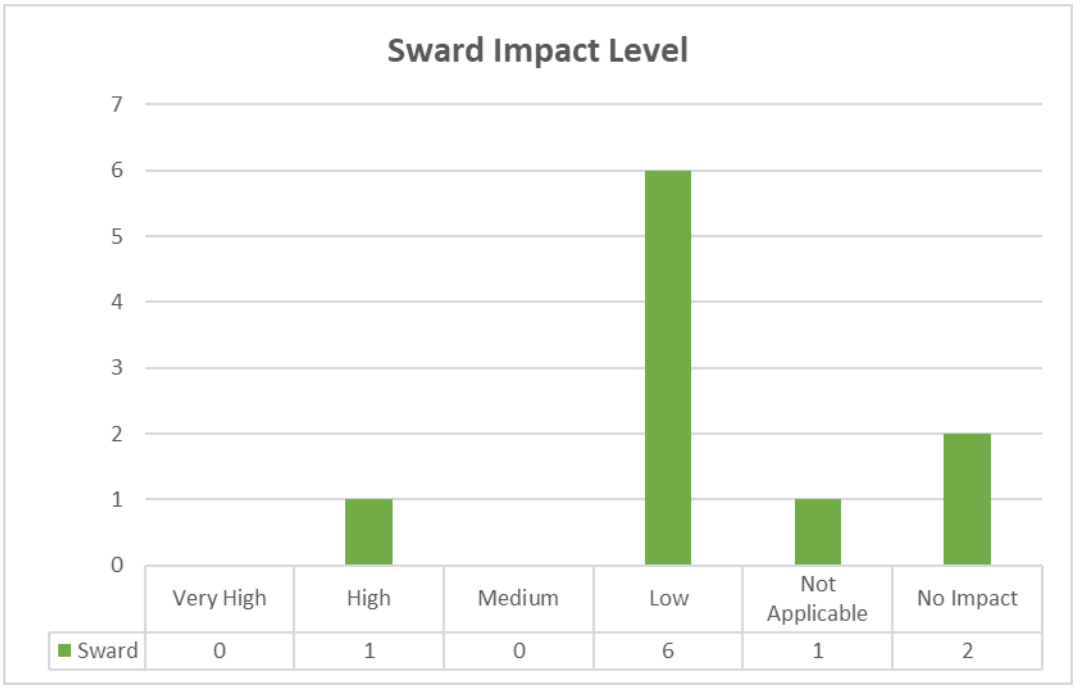
Evidence of past planting was frequent within the mature woodland



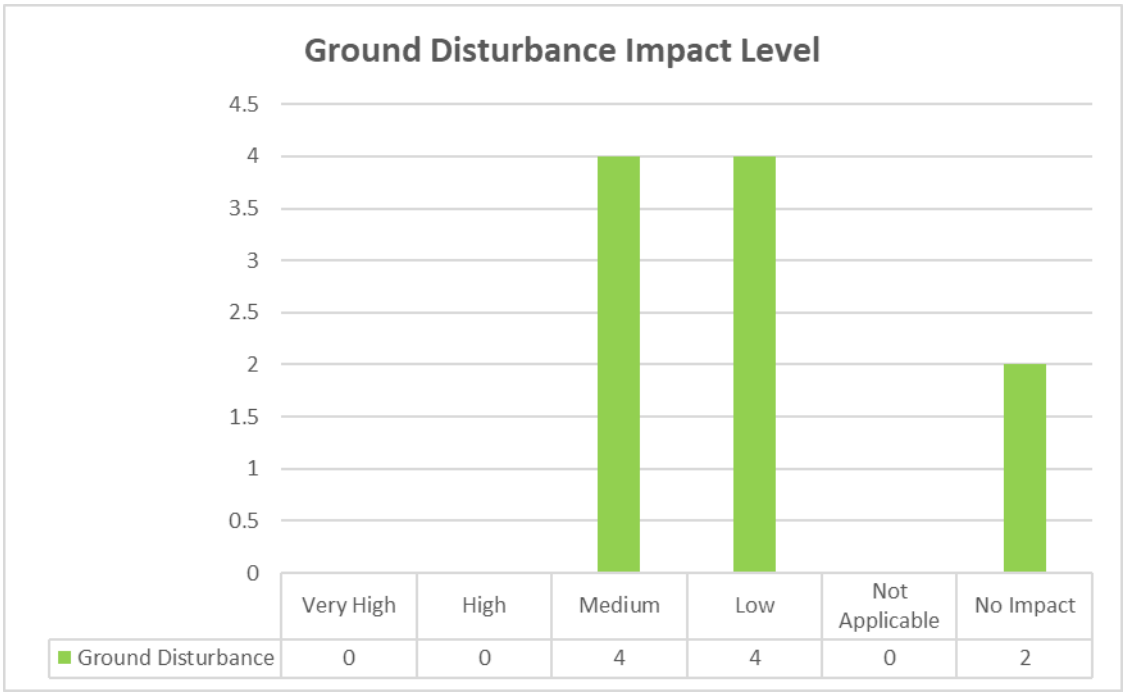
Typical heavily browsed Bramble (left) and Buckler fern (plot 9) (right)



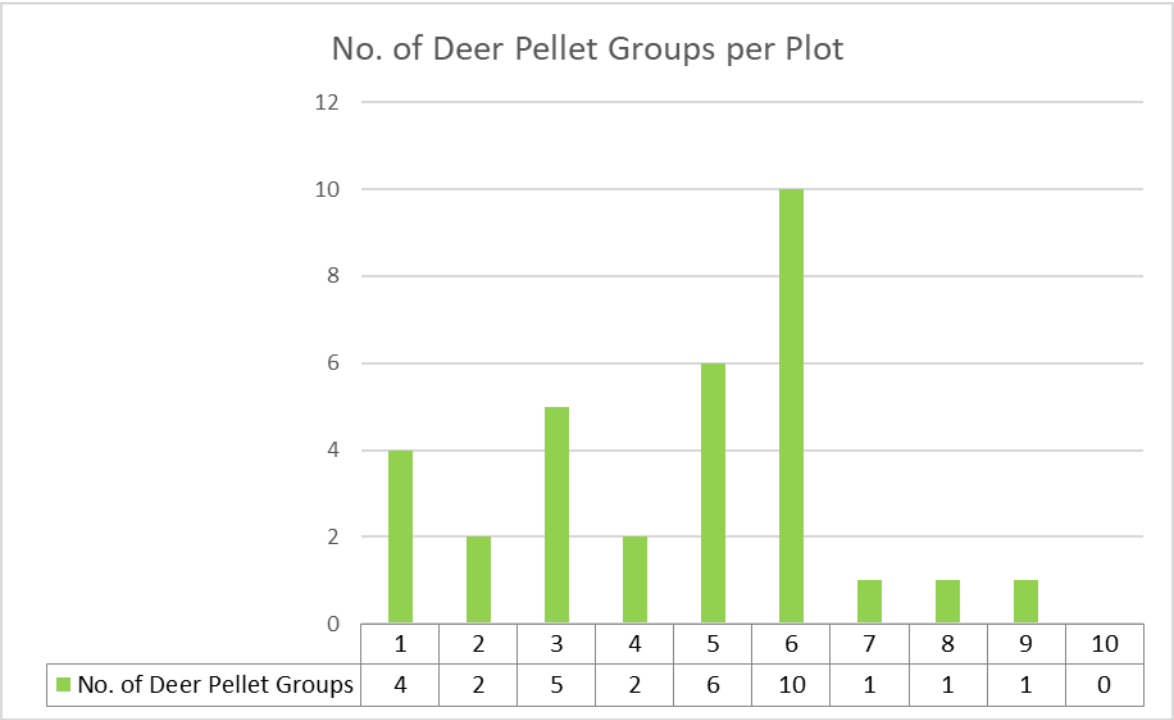
Typical roe deer fraying and stem damage on a sapling beside a motorway underpass



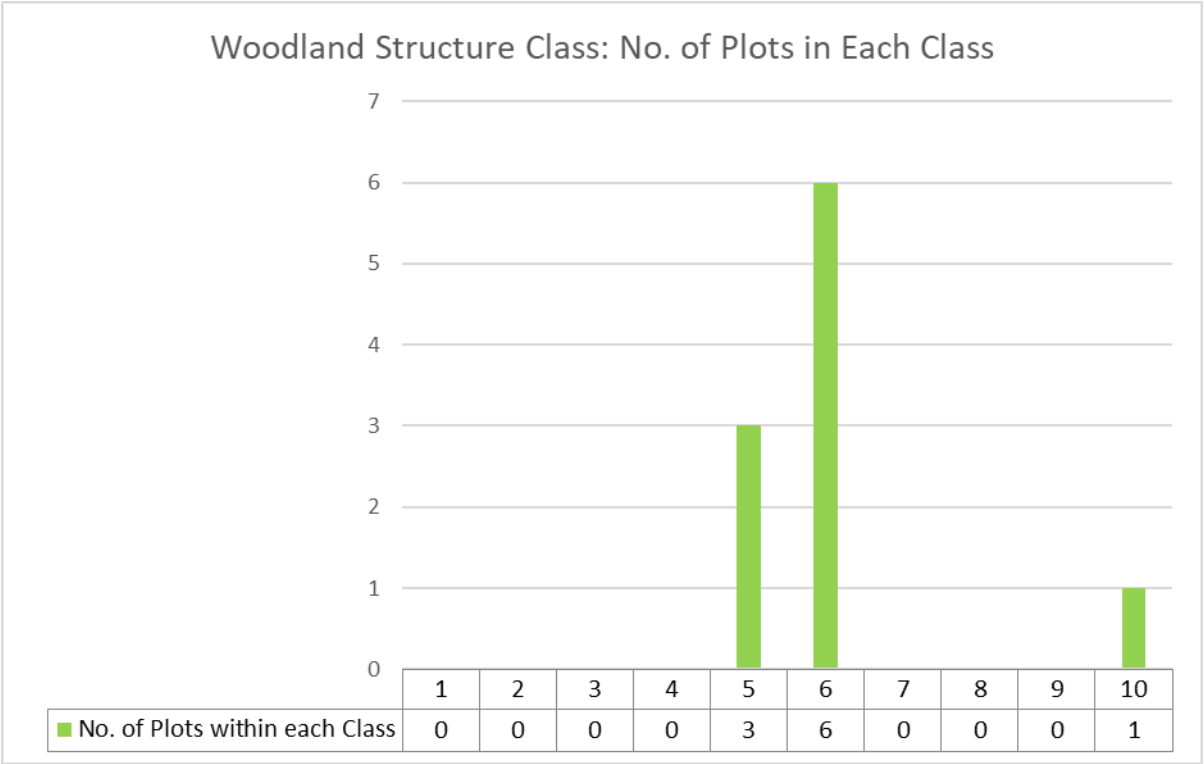
Plot 7: Typical bare area under mature Beech, Sycamore and Yew within the SSSI woodland.



Typical roe deer trail (this one coming from Low Park Wood into golf course) (left); big roe deer trail going into willow scrub near plot 10 (right)



	1	2	3	4	5	6	7	8	9	10
No. of Deer Pellet Groups	4	2	5	2	6	10	1	1	1	0



	1	2	3	4	5	6	7	8	9	10
No. of Plots within each Class	0	0	0	0	3	6	0	0	0	1

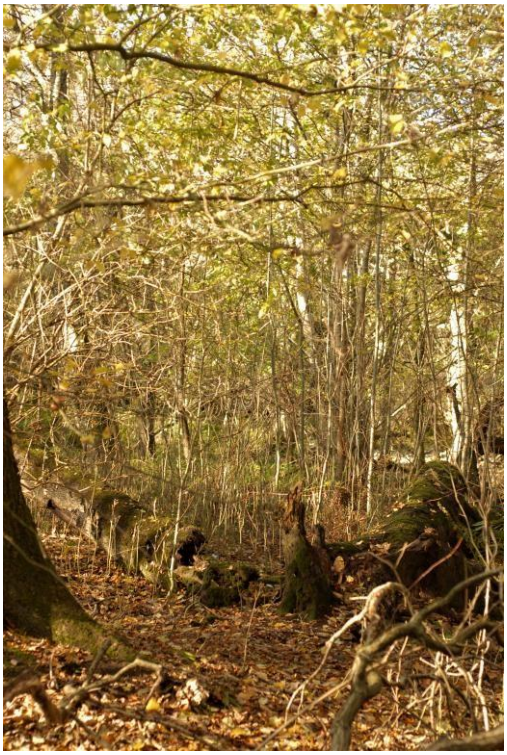
Mature Woodland, no understorey (plot 8)

Plot 9: Mature and self-regenerating willow scrub: Mature woodland, understorey regeneration (Class 5)

Plots	1	2	3	4	5	6	7	8	9	10
Woodland Structure Class	6(5)	6(5)	5	10	6(7)	6(7)	6(7)	6	5	5

Post-mature woodland, dead canopy trees, complex (Plot 6)

Plot 4: Open canopy, open-grown trees, simple (Class 10)



Small patch of thick regeneration at Barmichael Plantation (late 2017)

Heavy long-term basal browsing within Barmichael Plantation

Plot 8: 'Coppiced' Ash: probably as a result of past roe deer activity.

Plot 6 : Classic holly browse-line

Typical browsed Holly: note one sapling has got away (left); Heavily browsed basal growth on oak within North Haugh area.

Indicator	Impact Rating
Basal Shoots	HIGH
Epicormic Growth & Lower Shoots	MEDIUM
Seedlings and Saplings	HIGH
Preferentially browsed or grazed plants	VERY HIGH
Bark Stripping, fraying & stem breakage	LOW
Sward	LOW
Ground Disturbance	LOW

Lawn and scrub edge habitat at Hamilton Motorway Services

* *For the avoidance of confusion, all figures highlighted here relate to DVCs actually on Junction 5 (and*

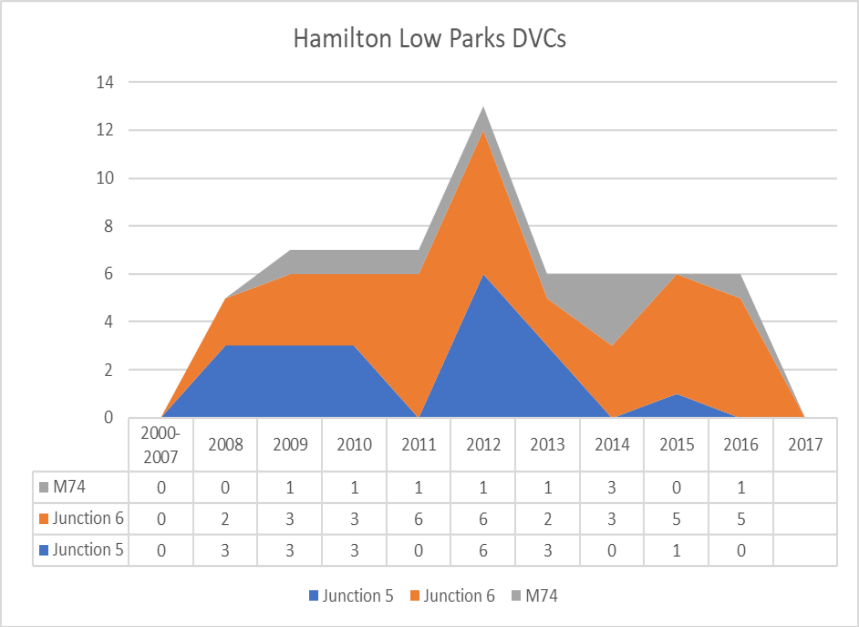
Trail camera on 'South Island' (left) and 'submerged' trail camera by M74/R/Clyde Underpass (right); Primus 03 trail camera – after flooding! (below)

Year	Junction 5	Junction 6	M74 between Junctions 5 & 6	Total
2000-2007	-	-	-	-
2008	3	2	-	**5**
2009	3	3	1	**7**
2010	3	3	1	**7**
2011	-	6	1	**7**
2012	6	6	1	**13**
2013	3	2	1	**6**
2014	-	3	3	**6**
2015	1*	5	-	**6**
2016	-	5	1**	**6**
2017	*Awaiting info#*	*Awaiting info#*	*Awaiting info***	***Awaiting info#***
Total	**19**	**35**	**9**	**63**

* = Just to west of Junction 5 # = 3 DVCs reported at J6 only by ScotlandTranServ in 2017.

** = Police Scotland reported 6 incidents involving deer here between March 2016 and March 2018 but currently unclear if they were also referring to Junctions 5 & 6 too.

Table 8(a): DVCs alongside the M74 at Hamilton Low Parks (2000-2016)



	2000-2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
M74	0	0	1	1	1	1	1	3	0	1	
Junction 6	0	2	3	3	6	6	2	3	5	5	
Junction 5	0	3	3	3	0	6	3	0	1	0	

Table 8(b): DVCs per month alongside the M74 at Hamilton Low Parks (2008-2015)*(Source: J.Langbein)*

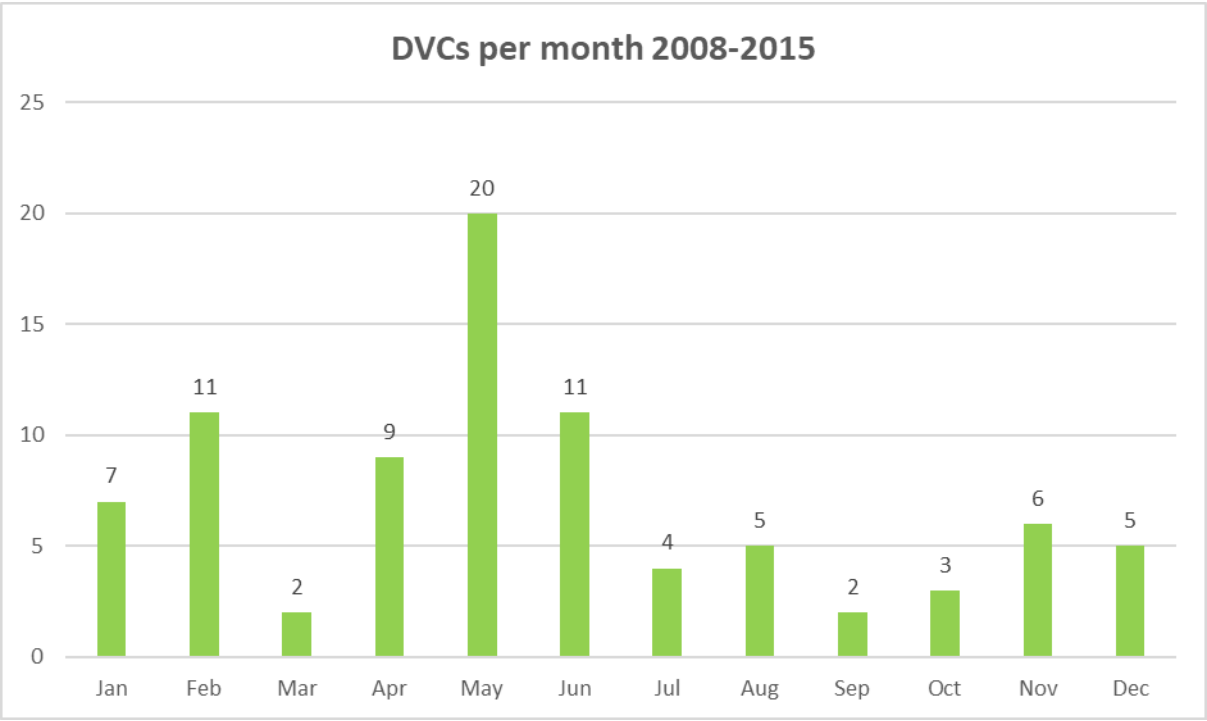


Table 9: Thermal & Other Roe Deer Count data within 100m of M74 (Source SNH & Parnassus Ecology):

Year	Junction 5 Complex	Junction 6 Complex	M74 Stretch between Junctions	Total
February 2013 (Thermal)	9	4 (approx. 60% area covered)	8	21
January 2018 (Thermal)	Not covered (tbc)	0 (approx. 10% area covered)	3	3
Jan-March 2018 (Trail Camera Survey & Field Observations*)	Not covered as removed from study area	14	9	23

* = Casual Dawn count with David Quarrell & LMK along western part of Hamilton Low Parks SSSI, adjacent to M74 (**See Appendix 3**) and observations during course of herbivore impact assessment survey work by LMK. Note trail camera survey count for Junction 6 has taken into account probable duplicate sightings for trail cameras, through recognition of individuals. Count around M74 straight stretch has been reduced by 4 in case the same animals seen near the north end of the site during the DQ/LMK dawn count were the same animals as those seen around the adjacent M74 underpass by LMK and trail cameras approx. 200m away earlier in the year.

Table 10: Summary of Trail Camera Roe Deer Data:

Trail Camera Location	Grid Ref	Dates	Bucks	Does	Yearlings	Total
Bothwell Bridge (by sewage works)	NS 7112 5774	22/1-13/2	1	1	-	2
M74 River Clyde Underpass	NS 7184 5779	22/1-22/1	2	-	-	2
Junction 6 North Haugh M74 edge	NS 7343 5611	22/1-13/2	1	2	4	7

Junction 6 North Haugh N. footbridge	NS 7355 5612	13/2-4/3	-	1**	-	1**
Junction 6 West Island	NS 7318 5606	13/2-4/3	-	-	-	0
Junction 6 South Haugh	NS 7344 5570	22/1-13/2	2	2	3	7
Junction 6 South Island	NS 7318 5568	13/2-4/3	1*	1*	1*	3*
Total			**6**	**5**	**7**	**18**

* = Same animals photographed at Junction 6 South Haugh

** = Probably photographed at Junction 6 North Haugh M74 edge too nearby.

2 separate bucks photographed at South Haugh camera: note well-used trail, which was located about 20m from motorway


PRIMOS
42F6C
02-15-2018
THU
03:01:24 AM
PROOF
CAMERA 03

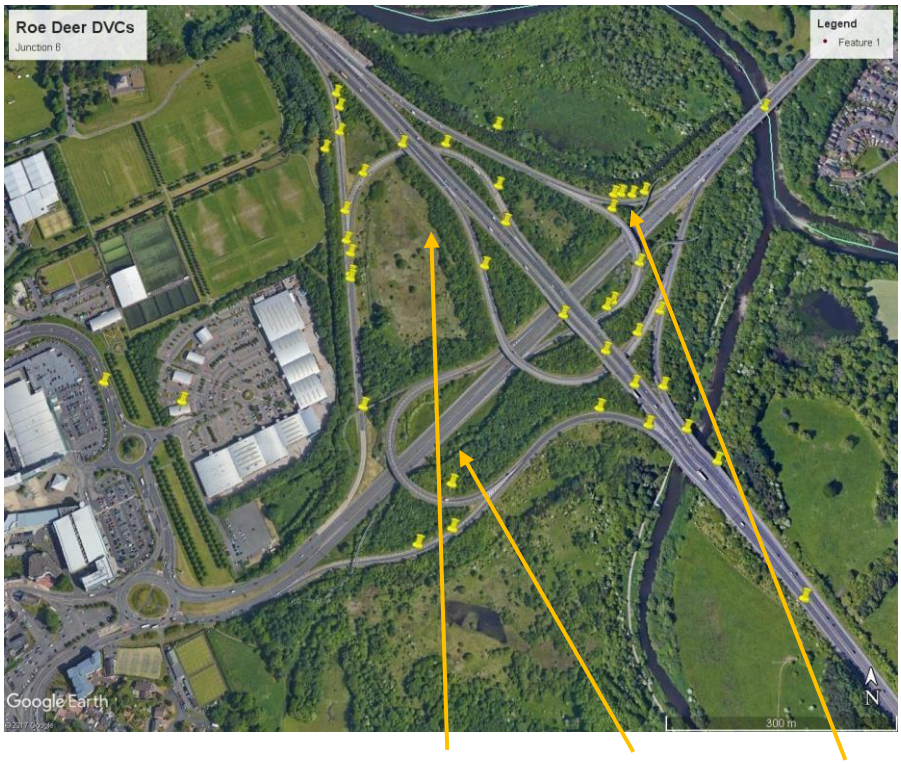

PRIMOS
42F6C
01-24-2018
WED
05:26:54 PM
PROOF
CAMERA 03

Figure 1: Key Roe Deer Movements

Well-used roe deer trails (hoof prints seen along them): one below the River Clyde pedestrian footbridge going across to Strathclyde Country Park (left), the other along the woodland at North Haugh (right): this latter location was where signs of potential deer poaching net poles were found.

West Island; Junction 6: trail on right hand side heading towards sliproads going north on to M74 and Hamilton Low Parks north.

Figure 2: DVCs and Roe Deer Trails



Junction 6 DVCs (from SNH Database): West Island, South Island & Junction 6 North Haugh footbridge (photo below) trail camera locations

Well-used trail leads to route over Junction 6 at south end of North Haugh, by footbridge, but only one roe deer was recorded here over 2 week period.

Large group of ~ 12 roe deer; Hamilton Race Course, January 2018 (Photo: S Varma)

Table 11: Management Options Table:

Possible Management Remedy	Associated Issues at Hamilton Low Parks	Probability of Success at Hamilton Low Parks
1). Fence off carriageways from surrounding land	- Very expensive and associated maintenance costs *e.g.* vandalism - Problems of making an effective fencing barrier at the complex Junction 6 area. - Will potentially isolate and fragment existing roe deer populations in area, whilst significantly hindering movement of other wildlife. - Will likely displace roe deer into other areas *e.g.* towards Bothwell Bridge, and generate new movement corridors. - may trap deer on carriageway where they do find a way round fencing *i.e.* can't escape off motorway	Variable: High – often recommended for motorway/trunk roads[6] as proven to be effective where used properly and in combination with other methods. Probably easiest along straight stretch of M74. Low – The highly complex area around Junction 6, including footbridges, paths and many wooded islands, would make siting an effective fence here a challenge.

2). Drift fencing	- Needs to form part of overall roe deer management for an area, based on robust information on roe deer movements in the area (this is not available for Hamilton Low Parks at this time)	High if located properly[6] but Low at present due to lack of information on roe deer movements over the entire year.
3). Reduction, then maintenance, culls at Hamilton Low Parks, North & South Haugh	- Public safety and anti-hunting concerns about shooting in an urban area - Requires highly experienced, responsible and public-savvy stalkers - needs to be backed up with monitoring of woodland and roe deer populations to show that it is effective.	High - experience elsewhere *e.g.* The Marches Deer Management Project (Herefordshire), has demonstrated that local, wellorganised & sustained culling can reduce DVCs substantially (~80% reduction)[1].

4). Motorway deterrent devices/scarers	- Relatively inexpensive - Some reflectors are ineffective[2] - Many systems unproven at this time	Low (*at this time*) - Simple light deflectors have been shown to be ineffective in stopping deer crossing motorways[2]. ? = However, a new type, the DD series of Deerdeter lights are being tested in England[5] at the moment and have had some success on the Continent, however, require further testing.

5). Habitat Management (removal of woodland cover within 40m of Junction 6 and M74)[4]	- Significant landscape (and noise) impacts with loss of cover and screening - Will not stop deer from trying to cross area (but will allow drivers better chance at seeing them) - Ineffective in many areas as many roads sit *above* woodland areas, such that deer 'pop up' from banks below without much notice. - If recently cut areas are not managed regularly, will probably create wood edge habitat which will attract deer to area, thus increasing DVC risk.	Low - but would be expected to reduce DVCs at one or two points.
6). Reduction of traffic speeds going around Junction 6[6]	- Traffic needs to speed up to come on to M74 and will be travelling fast coming off it, such that speeds on this stretch of the M74 would need to be generally lowered, however this could be done seasonally at peak deer movement periods via motorway signs	Medium - traffic speeds have been demonstrated to be a factor in DVCs.[6]
7). Signage, including warning signs	- Many drivers ignore signs - Simple and inexpensive	Low/Medium - Has had success in other areas in the shortterm, reducing DVCs by 34%[4] but doubts over long-term efficacy.
8). Combination of several methods.	- Allows remedies to be tailored to the specific nature of the problem.	High – where there is concerted buy-in to the strategy by all key partners.

Table 11 references:

[1] = Cordery, J. (South East Region Deer Liaison Officer, The Deer Initiative) from talk during South Downs Tree Health Conference, July 2013

[1] = Quarrell, D. (2012): 'Controlling Urban Deer': guidance published on www.stalkingdirectory.co.uk

[2] = Brieger, F., Hagenl, R., Kroschel, M., Hartig, F., Petersen, I., Ortmann, S., Suchant, R. (Aug 2017): *'Do roe deer react to wildlife warning reflectors? A test combining a controlled experiment with field observations'* Eur. J.Wild. Res; DOI 10.1007/s10344-017-1130-5.

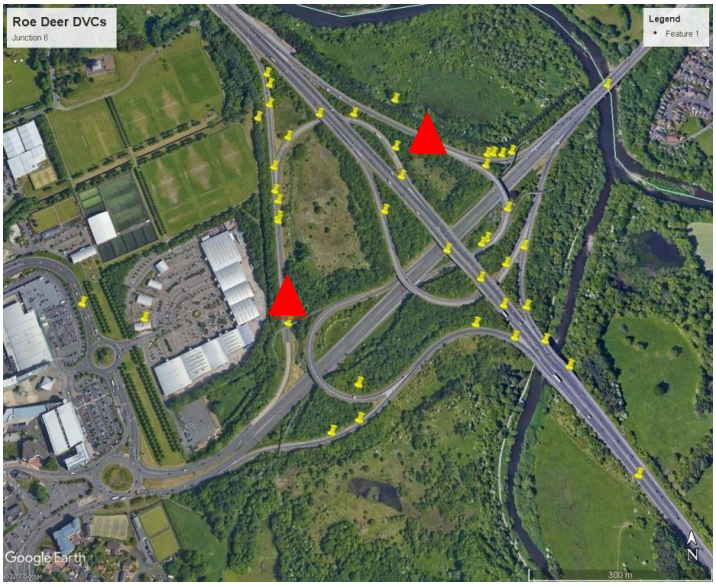
[3] = Found, R. & Boyce, M. (2011): '*Predicting deer-vehicle collisions in an urban area'*; Journal of Env. Mgt. 92(2011) 2486-2493

[4] = Found, R. & Boyce, M. (2011): '*Warning signs mitigate deer-vehicle collisions in an urban area*'; Wildlife Society Bulletin, Sept 2011, 10.1002/wsb.12

[5] = Personal communication with Dr. Jochen Langbein.

[6] = Putman, R.J., Langbein, J., Staines B.W. (2004): Deer and Road Traffic Accidents: A Review of Mitigation Measures: Costs and Cost-Effectiveness [Report for the Deer Commission for Scotland; Contract RP23A]

Figure 3: Recommended Locations to trial mobile VMS Units



Ash Seedling growing at Barmichael Plantation, late 2017.

Year 1 Cull Proposals:

Adult Bucks	Adult Does	Female Yearlings	Male Yearling	Total
9	23	10	3	45