South East Trunk Road Unit

Landscape Development Process
Annual Landscape Management Report
South East Unit

Date: July 2021

experience that delivers

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1 Introduction

1.1 Purpose of document

1.1.1 The preparation of the Annual Landscape Management Report (ALMR) is required as part of the NMC South East Contract as described in Schedule 2 Clause 3.5.31. The ALMR requires the Operating Company (OC) to provide a review of all landscaping Operations undertaken within the Unit during the Annual Period.

1.1.2 The ALMR is required to correspond to the various routes within the Unit as described in the routine maintenance and management function of the Integrated Roads Information System (IRIS).

1.2 Contents

1.2.1 The ALMR is required to provide a record and details of the following:

- general condition of the landscape areas within the Unit;
- effectiveness of the maintenance operations undertaken;
- details of the effectiveness of approved changes to maintenance operations;
- summary of all operations undertaken as part of Landscape Development Plan;
- additional landscape areas (completed by others) added into the maintenance programme;
- all newly created landscape areas (complete by OC) and subject to establishment maintenance;
- performance of any contractors and sub-contractors;
- progress on delivering the requirements of the Landscape Strategy;
- summary of Pesticide Plan achievements;
- biodiversity and nature conservation enhancement;
- problems or specific unforeseen issues experienced and that affected the delivery of the landscaping requirements and recommendations; and
- significant amendments to the Landscape Inventory.

1.2.2 In addition the following reports and plans are required and are included in the appendices to the ALMR:

- Appendix A - Grassland Report
- Appendix B - Injurious Species Report
- Appendix C - Road Kill Record Summary Report
- Appendix D - Pesticide Plan
- Appendix E - Deer Management Plan.

2 Management and Maintenance Report

2.1 South East Unit General Conditions

2.1.1 The majority of roads in the South East Unit (SE Unit) are in a moderate or good condition. The grass verges are generally well maintained and works to clear naturally regenerated scrub vegetation from the back of the verges is ongoing on most roads to improve sightlines. The control of invasive scrub species such as gorse and broom has been completed where an issue arises for safety or 3rd party. In the annual period hazardous drive-by tree inspection was undertaken by BEAR Scotland and subsequent removal of trees was completed across the SE Unit. On the majority of roads the back of verge / remote drainage systems are in need of maintenance to clear scrub vegetation and trees that have established. In many locations on the network, the established woodland areas adjacent to the roads are in need of management works to encourage the development of the woodland structure and to remove branches overhanging the road.

2.2 South East Unit Route Conditions

A1

2.2.1 The condition of the landscape along the A1 corridor is generally good and reflects the rural nature of most of the route, although the condition reduces to moderate near laybys. Mostly grassland verges are under a low or minimal cut frequency. Management or control of roadside vegetation has improved the corridor between Old Craighall Roundabout and Thistly Cross Roundabout, but in some areas between Innerwick Junction and Burnmouth trees have grown to obstruct sightlines to signs notably at Houndwood, with branches on some larger trees protruding very close to the carriageway.

2.2.2 Gorse and broom and naturally regenerated scrub woodland are common throughout the route. Hazardous tree removal works were undertaken at Dunbar (see Table 4) adjacent to the boundary with Network Rail ensuring no disruption to their service. In some other areas along the southern sections of the route naturally regenerated trees are growing against VRS barriers, which are a potential failure hazard if impacted. Gorse was cleared at the entrance to Penmanshiel Farm to maintain sightlines for slower moving vehicles emerging onto the carriageway. Fly tipping and litter build-up is evident in laybys throughout the route; the addition of no ‘fly tipping signs’ and improving the surrounding woodland areas would benefit the landscape appearance generally.

A7

2.2.3 The condition of the landscape along the A7 corridor is in an moderate condition for the majority of the route. The grassland sward is generally acceptable however salt spray damage is evident in certain locations. In places verges in laybys appear worn and in poor condition and/or the surfaces are damaged by vehicle overrun. Litter has be a problem with laybys, although it’s targeted through litter collection. Along the route, vegetation is overgrown in areas and contains a number of dead trees due to Dutch Elm disease and Ash Dieback have been identified. The existing roundabout in Hawick is in poor condition due to lack of accessibility for maintenance works. Communication is however progressing with Hawick Community Council regarding a new design that reduces maintenance operations, as well as, improving the local landscape aesthetics. This was in previous Operating Company’s Landscape Strategy. Where public footpaths are running adjacent to the carriageway, Rosebay willowherb and encroaching vegetation is common.

2.2.4 The requirement to cut back branches over hanging the carriageway and to undertake scrub clearance along verges and footpaths is evident along several sections. The management of invasive species along embankments is ongoing and is continually reviewed by landscape inspections. The presence of litter is low, apart from the laybys, where there are also signs of vehicle overrun. A higher grass cutting frequency would potentially benefit the landscape appearance.

A68

2.2.5 The condition of the landscape along A68 corridor is generally good. Grass verges are well maintained in the majority of areas, mostly under a low maintenance frequency of three cuts per year. In other southern sections of the of the route in places recent tree growth is now obstructing sightlines to signs, with branches on some of the larger trees extending close to the carriageway. Areas of scrub species such as gorse and brambles have been identified during the route inspections and initial control will be completed through programmed schemes, although where was an issue relating to safety appropriate action has been taken. Giant hogweed and Japanese knotweed have been identified in areas and will continue to be prioritised for control. There are notable infestations of Rosebay willowherb established throughout the route. The overrun of the verges is a key issue for this route, especially in laybys but also in close bends.

A702

2.2.6 The condition of the landscape along the A702 corridor is generally poor to moderate. The route is predominately rural and contains only a narrow asset strip lined by mature trees and boundary hedges with limited available space for the woodland or extensive landscape features. There are a significant number of mature trees within adjacent landowner's ownership but located directly adjacent to the network and within close proximity of the road, a feature which characterises the route. There are a number of deteriorating or dead mature trees identified during route inspections where adjacent landowners will need to be identified to remove them as potential hazards. Damage from salt spray appears to have an impact on the narrow vegetation strips. Approaches to Biggar lend themselves to landscape enhancement. . Where required it appears overgrown scrub areas have been managed. Rosebay willowherb is evident along the route as is docks and and Common Ragwort. Prioritisation of treatment of Common Ragwort adjacent to grazing areas required focused action.

A720

2.2.7 The condition of the landscape along the A720 corridor is generally moderate to good. Verges are well maintained and grasslands extend beyond the regularly maintained verges and visibility splays. Weed control can however degrade their appearance in places. . Management of roadside vegetation to address the impact on sightlines associated with CCTV camera at Calder Junction was undertaken, resulting in improve visability. Careful consideration to the balance of vegetation control and providing visibility to CCTV will be required to similar schemes going forward. This includes looking at the grass cutting frequency. . The management of invasive species along embankment such as Giant hogweed are ongoing.

2.2.8 On stretches of the route, semi-mature woodlands have begun to spread towards neighbouring boundaries and may require further investigation. At Caiyside near Swanston, two hazardous trees were identified and removed after concerns from the adjacent property owner, although many complaints are now being received from neighbours asking that trees be topped, and this requires an appropriate solution going forward.

A876

2.2.9 The condition of the landscape along the A876 corridor is generally poor to moderate with grassland appearing to fail in close proximity to the Forth due to erosion. Options for revegetating these locations should be investigated further including a soil analysis of the area. . The Higgins Neuk roundabout is struggling aesthetically and would benefit from an redesign. Scrub and overhanging branches north of Kincardine Bridge obstruct road signs in sections and are programmed for future maintenance.

A6091

2.2.10 The condition of the landscape along the A6091 corridor is generally good. Grassland is will maintained with the route containing the well-known 'Golden Mile' daffodil planting. Scrub encroachment requires to be managed along the route to retain the rough grassland areas where bulbs and wildflowers can thrive. Rosebay willowherb is evident along this route.

M8

2.2.11 The landscape along the M8 corridor is made up of mature vegetation , with grassland, verges, and woodland areas all in moderate condition. The verges are reasonably well maintained, although litter can be an issue particularly at the exit routes from Harthill Service Station and within the red chip central reservations. Maturing woodland areas throughout the section would benefit from scrub thinning and prunningto the back of the verges. Management of roadside vegetation at Hermiston Gate to address sightline visibility for CCTV cameras was undertaken. . The grass cutting frequency in relation to visibility along sightlines may require consideration. The management of invasive species along embankment such as Giant hogweed are ongoing, particularly around Hermiston Gate.

M9

2.2.12 The condition of the landscape along the M9 motorway corridor is generally moderate. Verges are well maintained however sections of grassland areas are deteriorating, particularly sections where erosion and salt spray from the road impact the sward condition. Bulbs and wildflowers are present along the route and this could possibly to extended going forward. . The central reserve along the route regularly suffers from litter and areas are degraded with notable weed growth. Recent management of roadside vegetation has reduced areas of woodland encroachment however sections between Jct 9 and Jct 11 still need attention. Vegetation adjacent to Wallace Crescent has also been cleared of protruding branches for improved safety. Monitoring at Jct 10 Craigforth for larch regeneration is ongoing. Rosebay willowherb occurs throughout the route, although the control of invasive species such as Giant hogweed and Japanese knotweed has been prioritised.

M80

2.2.13 The condition of the landscape along the M80 motorway corridor is generally good. The varying verges are reasonably well maintained, receiving a minimal frequency cut. Woodland management has been undertaken throughout the route between Haggs and Stirling Services. Rosebay willowherb is the dominant weed recorded across the route, although there are areas of Japanese knotweed and Giant hogweed, particularly in the vicinity of the Bannockburn Junction. Scrub management has been undertaking along the route. The central reserve along the route is in a worn condition with large bare areas.

M876

2.2.14 The condition of the landscape along the M876 corridor is generally good. Grassland is well maintained, although the verges include encroaching scrub, such gorse which are being controlled and removed where possible. Rosebay willowherb is the obvious weed and there are significant areas of *Rhododendron ponticum* recorded. Maturing woodlands have been maintained well to ensuring visibility of signage, however woodland areas near Junction 8 are beginning to encroach the carriageway and may require control in the short term. The central reserve along the route is in poor condition with nortable weed growth.

A977

2.2.15 The condition of the landscape along the A977 corridor is generally moderate and the assets extent is limited. The grassland are well maintained and receives regular cuts, although in areas is negatively impacted by erosion. Rosebay willowherb growth was observed. Many of the woodland sections on this route require management to remove overhanging branches and to thin out naturally regenerated trees. Emergency works were undertaken at Tulliallan to remove snapped branches hung up in the canopy.

A985

2.2.16 The condition of the landscape along the A985 corridor is generally poor. Grass verges are well maintained in most areas, but are significantly damaged by spray from the road. Management of roadside vegetation is required extensively, particularly where maturing woodland has grown to obstruct signs and where branches are protruding close to the carriageway. The control of gorse is evident throughout the route.

M90 Junction 1a Humbie to A90 Scotstoun Junction

2.2.17 The condition of the landscape along this corridor is generally good. Grassed verges are impacted by erosion and weed growth in areas, particularly rosebay, however common ragwort is also appearing in the gravelled central reservation. Woodland areas across the route are maturing and are in good condition but would benefit from selective thinning to remove any weak stock. Scrub encroachment has been highlighted during route inspections and will require to be controlled.

A90 Dalmeny Junction to Scotstoun Junction

2.2.18 The condition of the landscape between Dalmeny Junction and Scotstoun Junction is generally good. Some weed growth and erosion was observed in grass verges and in areas the grass growth is struggling.. The woodland sections along the route are well maintained, although would benefit from selective thinning.

A9000 Echline Junction to A90 Ferrytoll Junction

2.2.19 The landscape between Echline Junction and Ferrytoll Junction is currently subject to a five-year maintenance period . The condition of the landscape is generally moderate. Most of the grassland areas are under a low maintenance regime with weeds and erosion found in sections . Scrub species along the route such as gorse require management to control their spread.

M90 Ferrytoll Junction to M90 Junction 3 Halbeath

2.2.20 The landscape between Echline Junction and Ferrytoll Junction is currently subject to a five-year maintenance period. The condition of the landscape is moderate. Grassland areas along this route are well maintained, although issues like erosion and the presence of weeds were observed. Scrub areas require management particularly on steep embankments and especially after Junction 2 Masterton. The woodland sections on this corridor have reached a level of maturity where thinning is appropriate and require attention.

A823(M)

2.2.21 The condition of the landscape along the A823(M) corridor is generally moderate to good. The route runs between Junction 2 Masterton Pitreavie roundabout and is lined with semi-mature trees and areas of scrub. The verges are well maintained, receiving a low maintenance cut, although weeds and erosion are evident. Management or control of roadside vegetation is required and in sections maturing woodland sections would benefit from thinning. The control of gorse is evident along the route.

2.3 Maintenance Operations Undertaken

2.3.1 Table 1 includes all planned schemes completed during the 2020-2021 annual period. The majority of the planned works included vegetation encroachment clearance along barriers, laybys, carriageway, footpaths and clearance of overgrown ditches, resulting in improved safety and enhanced visual amenity.

2.3.2 Planned works included felling of hazardous trees, based on route inspections executed by Bear Scotland where identified. A drive-by roadside survey was carried out between August 2020 and October 2020 to gain oversight of the arboriculture concerns along the routes.

Table 1. Planned Schemes completed during 2020-2021 period

Network	Scheme Number	Route	Location	Operation
SE	20/NSE/0313/007	M80	Junction 7 to Junction 9	Woodland edge management & selective thinning of woodland areas.
SE	20/NSE/0313/003	A720/M8	Calder Junction & Gogar Station Road	Selective felling of woodland edges and scrub management around CCTV cameras.
SE	20/NSE/0313/010	M9	Wallace Crescent	Removal of encroaching vegetation onto adjacent properties.

2.4 Effectiveness of Maintenance Operations

2.4.1 Operations undertaken during the 2020-2021 annual period include Cyclic, Planned, Category 2, and Emergency Services. The list of completed Planned jobs are included in Table 1.

2.4.2 Table **Error! Reference source not found.**1 contains tabulated information on each planned (including Category 2 jobs) and cyclic / routine maintenance operation undertaken during the annual period on the followings:

- operation type;
- contractual requirement;
- BEAR practice including frequency, locations & references to corresponding Appendices;
- effectiveness and impact / outcome
- further works required/information to feed into Strategy report.

2.4.3 Details on the above listed are included of the following maintenance operations in Table 2:

- Weed control (total / selective / injurious),
- Control of Rabbits and Deer,
- Establishment maintenance for Planting,
- Grass and wildflower seeding and Turfing,
- Grass, Bulbs and wildflower / Maintenance cutting regimes,
- Maintenance of Established Trees and Shrubs,
- Management of self-seeded scrub,
- Management of Waterbodies,
- Special Ecological Measures
- Litter picking,
- Cyclic Maintenance of Filter Material
- Maintenance of Drainage
- Maintenance of structures

2.4.4 Removal of fallen trees across the network required immediate action and completed through Emergency Services. The list of completed Emergency jobs is included Table 3.

2.4.5 Category 1 Defect" means a Defect that necessitates prompt attention and required to be completed within 28 days. No category 1 defects associated with Landscape delivery were recorded during the first annual period.

2.4.6 "Category 2 Defect" means any Defect which is not a Category 1 Defect and have been completed through Planned jobs during the annual period (Table 1)

Table 2. Effectiveness of maintenance operations undertaken across the network during the 2020-2021 annual period

Type of maintenance operation		Contract Specification reference	Contract Specification Requirements	Location	BEAR practice Frequency / dates	Effectiveness and impact, Further work required / Information to feed into the Strategy Reports
Total weed control	Cyclic	C-S5 SE - Appendix 30/2 – Weed Control Volume 1, Series 3010 Sub-Clauses	**<u>Appendix 30/2</u>** The Operating Company shall apply contact, translocated or residual herbicide for total weed control. **1.** The Operating Company shall control all injurious weed species throughout all Annual Periods at sufficient frequency to restrict their growth and prevent their spread. The Operating Company's programme of weed control shall ensure there shall be a significant reduction in the occurrences and extent of these species each successive year for the duration of this Contract wherever they occur.	• Structures, • Paved areas, • Kerbs, • Hard standings, • Filter drains, • Gravel areas (including gravelled central reserves).	Due to the timing of Contract commencement no weed control works were undertaken in the first Annual Period.	The weeds take generally 3 weeks to show dieback and a further several weeks to disappear from view.
Selective Weed Control - Inc. Injurious weeds /	Cyclic	C-S5 SE - Appendix 30/2 – Weed Control	**<u>Appendix 30/2</u>** The Operating Company shall control all injurious weed species which shall be	• Nonhardened verges, • Central reserves,	Selective – injurious – weed control operations were not	The target is to reduce the level of infestation

Frequency of treatments		Volume 1, Series 3010 Sub-Clauses	defined for this Appendix as being those listed in sub-clause 3002.1 with the addition of Oil Seed Rape, Rosebay Willowherb and Rhododendron Ponticum within or associated with the Unit and throughout all Annual Periods at sufficient frequency to restrict their growth and prevent their spread. The Operating Company's programme of weed control shall ensure there shall be a significant reduction in the occurrences and extent of these species each successive year for the duration of this Contract wherever they occur.	• other grassed areas throughout the Site including embankments and cuttings.	undertaking due to the date of commencement of the first annual period.	identified during the next annual period.
			Series 3010 Cultivated beds shall receive weed control treatment • four times per year during the growing season.	• Planted areas, • Hedgerow areas.	Due to date of Contract commencement no weed control treatment was undertaken during the first annual period.	
			<u>Appendix 30/2</u> The application shall be at sufficient frequency to restrict their growth and prevent their spread. The Operating Company's programme of weed control shall ensure there shall be a	• Wildflower areas	Weed control within wildflower areas have not been undertaken during the annual period.	N/A

			significant reduction in the occurrences of these species each successive year for the duration of this Contract wherever they occur. Hand weeding shall be undertaken at appropriate locations. Hand weeding shall be undertaken where the application of herbicide may cause damage within: (i) ornamental shrub beds (ii) hedgerow planting (iii) around planting stations in existing woodland, (iv) within plant protectors and tree/shrub shelters, (v) where necessary throughout or associated with the Unit for the control of Ragwort and Oil Seed Rape, and (vi) in areas densely populated with desirable broadleaved species			
Weed control by cutting	Cyclic	C-S5 SE -Appendix 30/2	The Operating Company shall cut weeds listed in paragraph 1 of this Appendix throughout or associated with the Unit that have become unsightly or a nuisance or to prevent such weeds becoming	Throughout the Unit	Due to date of Contract commencement no weed control by cutting was	

			unsightly or a nuisance or to facilitate effective control by herbicide.		undertaken during the first annual period.	
Control of Rabbits and Deer	Routine	C-S5 SE - Appendix 30/3 Volume 1, Series 3003 sub-clauses	Appendix 30/3 The specification only refers to rabbit, hare and deer control within new planting / seeding. Areas of brambles and herbage that interfere with the control of rabbit or deer shall be cut (outside of the bird nesting season). Series 3003 Initial clearance and thereafter effective control of rabbit infestations shall be undertaken within the road boundary. Effective control is defined as no damage to verges, embankments/cuttings, site furniture or drains; no fresh signs of bark stripping on woody plants; few fresh droppings seen; no new appreciable grazing seen; no complaints from adjoining landowners. The Contractor shall replace any plant material damaged by rabbits or deer.		N/A	N/A
Planting	Routine	C-S5 SE- Appendix 30/6 – Planting	Any planting design shall be accompanied by written confirmation from the Operating Company that, in respect of the planting	At locations in the Landscape Inventory.	N/A	N/A

			proposed, the United Kingdom native plant species of trees, shrubs climbers and wildflower (seeds and plants) will be sourced from the highest available preference for selecting native seed sources. This confirmation shall be provided prior to the commencement of the landscape planting operations and shall consist of the completed Provenance Certificates in the format shown in this Appendix. Where there is a choice of form of plant, preference shall be given to the most local provenance.			
Establishment maintenance for Planting	Cyclic	C-S5 SE- Appendix 30/9 – Establishment Maintenance for Planting	All planting and planting areas shall be maintained by the Operating Company for the duration of the period of establishment maintenance in accordance with subclauses 3009.2 to 3009.25. The period of establishment maintenance shall be three years minimum or otherwise as consented to in writing by the Overseeing Organisation.	At locations in the Landscape Inventory.	N/A	N/A
Grass and wildflower seeding and Turfing	Routine	C-S5 SE- Appendix 30/5 – Grass Seeding, Wildflower Seeding and Turfing	Wildflower seeding shall be undertaken typically in early Spring or early Autumn and following best horticultural practice appropriate to the species involved.	At locations in the Landscape Inventory.	N/A	N/A

			Grass and wildflower/grass seed mixtures shall be selected by the Operating Company and submitted to the Overseeing Organisation for written consent prior to ordering The number of establishment cuts for all newly-established/sown grass shall be 4 for high amenity areas and 2 for all other grass areas.			
Grass, Bulbs and wildflower Maintenance Cutting regimes	Cyclic	Volume 1, Series 3007 sub-clauses C-S5 SE - Appendix 30/7 - Grass, bulbs and wildflower maintenance Schedule 5, 3007SR	General grass areas/Low frequency: • at least 3 times/growing season	Verge, Central reserves visibility splays.	Due to date of Contract commencement restricted cutting operations were undertaken during the first annual period.	Sightlines are kept clear to allow as much forward visibility as practicably possible to allow safe driving on the network
			Medium frequency: • at least 7 times/growing season	Amenity grass areas	Due to date of Contract commencement restricted cutting operations were undertaken during the first annual period.	Sightlines are kept clear to allow as much forward visibility as practicably possible to allow safe driving on the network

			High frequency: • 14 times/growing season	High amenity areas	Due to date of Contract commencement restricted cutting operations were undertaken during the first annual period.	Sightlines are kept clear to allow as much forward visibility as practicably possible to allow safe driving on the network Sightlines are kept clear
			Minimal frequency cutting: • Once during the Second Annual Period and once per two years thereafter	At locations in the Landscape Inventory not covered by any of the high, medium or low frequency regimes.	Due to date of Contract commencement no cutting was undertaken during the first annual period.	This has a positive effect on the environment and regenerates wildlife habitats
			In the locations stated in the landscape inventory, grassed banks and ditches shall be cut to a height of between 60 and 80mm, at a frequency of once per year. The arisings shall be dispersed evenly over the sward avoiding blockage of drains and ditches.	At locations in the Landscape Inventory.	Due to date of Contract commencement restricted cutting operations were undertaken during the first annual period.	
Maintenance of Established Trees and Shrubs Pruning/trimming/cutting back	Cyclic and Routine	C-S5 SE - Appendix 30/10 Volume 1, Series 3010 sub-clauses	Trimming/pruning: • Once every two years where this causes no operational issues. This should be increased to once every year in ornamental areas.	**Hedges** Which are distinct linear planting strips within the road corridor which are intended to	N/A	N/A

		C-S5 SE – amendments to Volume 1 including alterations to existing clauses (3070AR to 3075AR)		be formally shaped and maintained. Locations as defined within the Landscape Inventory.		
			Pruning/cutting back: • High Maintenance: Once per year • Medium Maintenance: Once per year • Low Maintenance: Once every two years The category of maintenance and frequency relates to the category of the adjacent grass cutting.	**Shrubs** Ornamental (planted as a visual element of the road corridor – usually associated with settlements and urban roundabouts) and Informal shrubs (generally native major and minor shrub species - excluding gorse and broom - informally planted or developing along the road corridor up to a maximum height of approximately 3.5m)	Due to date of Contract commencement minimal pruning / cutting was undertaken during the first annual period.	This is very effective and controls the growth levels of the shrub beds
	Ordered	C-S5 SE Appendix 30/10 Volume 1,	Pruning cutting back of all types of woodland areas: • When the subject of an Order Clearing/felling of all types of woodland areas:	**Woodland** <u>New Woodland:</u> Under 5 years old, a newly planted or self-seeded	Felling of hazardous trees, based on Tree Survey reports prepared by Bear Scotland was	During the annual period, damaged and hazardous trees were identified

		Series 3010 sub-clauses C-S5 SE – amendments to Volume 1 including alterations to existing clauses (3070AR to 3075AR)	When the subject of an Order.	area of predominantly tree species with the potential of developing into a mature wooded area. Establishing Woodland: between 5 and 10 years old, a developing area of tree species with or without woodland shrubs and with the potential of developing into a mature wooded area. Maturing Woodland: over 10 years old, an established area of dense tree cover.	undertaken through planned works (completed planned jobs are listed in Table 11). Emergency works, such as removal of fallen and leaning trees and dangerous tree/branch removal of diseased trees were required to be undertaken in a number of locations throughout the Unit. Table 3 provides the list of completed emergency jobs during the annual period. Woodland edge and verge management at M80 between Junction 7 and Junction 9 (n/b and s/b). The scheme	through the drive through tree inspection and subsequently removed successfully, resulting in improved safety across the network. A Detailed tree survey is required to be undertaken in order to identify hazardous trees and to eliminate the need of emergency works required as much as possible. Further drive-by and detailed tree inspections are programmed to be carried out in

					(order no 20/NSE/0313/007) was completed by Complete Weed Control. The scheme included the removal of intermediate and suppressed trees <4m from carriageway, crown lift all dominant and co-dominant trees to 6m, clear all other vegetation <4m from carriageway where necessary to gain entrance to undertake tree surgery / removal. See Photo 1, Photo 2, Photo 3 before and Photo 4, Photo 5, Photo 6 during / after constructionTable	the 2021-2022 annual period.
Maintenance of Established Trees and Shrubs Pruning/trimming/cutting back	Ordered	C-S5 SE Appendix 30/10 Volume 1,	Cutting back, clearing and removal / disposal or arisings: • when the subject of an Order (<u>except </u>where scrub grown is impacting on – or has the	**Scrub** Areas of self-seeded vegetation, predominantly (but not	Through planned works (Table 11)	This is effective and controls the growth levels of scrub in many areas

		Series 3010 sub-clauses C-S5 SE – amendments to Volume 1 including alterations to existing clauses (3070AR to 3075AR)	potential to impact on – a sightline area when scrub shall be cut back as required.)	exclusively) gorse, broom, birch and/or bramble, up to a height of approx. 2.5m.		
Self-seeded Scrub Maintenance of Established Trees and Shrubs Pruning cutting back/clearing, felling	Cyclic and Routine	C-S5 SE Appendix 30/10 Volume 1, Series 3010 sub-clauses C-S5 SE – amendments to Volume including alterations to existing clauses (3070AR to 3075AR)	Where scrub grown is impacting on (or has the potential to impact on) a sightline area when scrub shall be cut back/cleared as required. Appendix 30/10 A translocated herbicide shall be applied during the period of active growth in accordance with clause 3001. Scrub control is required on rock ledges and scree where appropriate.	**Scrub** Areas of self-seeded vegetation, predominantly (but not exclusively) gorse, broom, birch and/or bramble, up to a height of approx. 2.5m.	Through Planned works (Table 1)	This is effective and controls the growth levels of scrub in many areas to keep to a manageable level
Maintenance of Established Trees and Shrubs Pruning/trimming/cutting back	Ordered	C-S5 SE Appendix 30/10 Volume 1, Series 3010 sub-clauses	Pruning/Cutting back, clearing and treatment of arisings: • When the subject of an Order	**Individual trees** which are lone trees, or trees with no interlocking canopy with the nearest neighbours, and sporadic trees where there is a loose	Through Planned works – vegetation encroachment clearance. Felling of hazardous trees, based on Tree	During the annual period, damaged and hazardous trees were identified through the drive through tree

		C-S5 SE – amendments to Volume 1 including alterations to existing clauses (3070AR to 3075AR)		arrangement of established trees with occasional interlocking canopies.	Survey reports prepared by Bear Scotland was undertaken through planned works. Completed planned jobs are listed in Table 1.	inspection and subsequently removed successfully, resulting in improved safety across the network. A Detailed tree survey is required to be undertaken in order to identify hazardous trees and to eliminate the need of emergency works required as much as possible. Further drive-by and detailed tree inspections are programmed to be carried out in the 2021-2022 annual period.

Management of Waterbodies		C-S5 SE Appendix 30/11	The Operating Company shall eliminate injurious weeds as listed in clause 3002 growing within or immediately adjacent to water bodies. All reed beds and marginal plants planted as part of the Operations shall be maintained by the Operating Company for the duration of the period of establishment maintenance with any failed or defective plants replaced in accordance with sub-clause 3006.6 -90 inclusive. All existing reed beds and marginal vegetation shall be inspected twice annually in accordance with sub-clause 3011.9. The Operating Company shall comply with the Schedule of Commitments associated with the Forth Replacement Crossing	Waterbodies throughout the Unit.	N/A	N/A
Special Ecological Measures	Routine	C-S5 SE Appendix 30/12	In February and October each year for the duration of this Contract the Operating Company shall inspect all fencing, tunnels, underpasses, wildlife reflectors and all other provisions for wildlife contained within the within the Unit or as listed in the Inventory of Wildlife Mitigation		Ecological surveys (nesting bird, bat and otter surveys) are undertaken by Bear Scotland prior to tree felling works.	

			Measures in accordance with sub-clause 3012.5.			

Photo 1. M80_Woodland Edge and Verge Management, Denny – (20/NSE/0313/007) – Before Construction.

Photo 2. M80_Woodland Edge and Verge Management, Easterton – (20/NSE/0313/007) – Before Construction.

Photo 3. M80_Woodland Edge and Verge Management, Auchenbowie – (20/NSE/0313/007) – Before Construction.

Photo 4. M80_Woodland Edge and Verge Management, Denny Northbound – (20/NSE/0313/007) – After Construction.

Photo 5. M80_Woodland Edge and Verge Management, Denny Northbound – (20/NSE/0313/007) – After Construction

Photo 6. M80_Woodland Edge and Verge Management, Auchenbowie – (20/NSE/0313/007) – After Construction.

Table 3. Emergency jobs completed during the 2020-2021 annual period

SE Route	Location	Operation	Date completed
M80	Head of Muir	Emergency tree felling	10/05/2021
A720	Caiyside	Emergency tree felling	06/04/2021
A1	Innerwick	Emergency tree felling	03/10/2020

Table 4. Category 1 jobs completed during the 2020-2021 annual period

SE Route	Location	Operation	Date completed
None	None	None	N/A

2.5 Effectiveness of the changes to Maintenance Operations

2.5.1 There were no changes to the Cyclic Operation during the 2020/21 annual period.

2.6 Development Plan Operations Progress Summary

2.6.1 The annual period of 2020/21 is the first on the NMC. No Landscape Development Plan has been compiled to date by BEAR, although the previous LDP has been provided by AMEY as part of the handover.

2.7 Additional Landscape Area Maintenance

2.7.1 No additional landscape areas currently undergoing establishment maintenance by BEAR Scotland.

2.8 New Landscape Area Establishment Maintenance

2.8.1 No new landscape areas currently undergoing establishment maintenance by BEAR Scotland.

2.9 Contractor and Sub-Contractor Performance

2.9.1 Table 5 includes details on the performance of sub-contractors used for works undertaken in the first Annual Period.

Table 5. Contractor and Sub-Contractor Performance

Route	Location	Operation	Work description	Subcontractor	Performance
M80	Junction 7 to Junction9	Construction	Woodland edge management & selective thinning of woodland areas.	Complete Weed Control	Works done to a high standard. Daily briefing sheets and records were provided by the Contractor along with before and after photographs. It was highlighted that chippings had been left after clearance works.
A720 / M8	Calder Junction & Gogar Station Road	Construction	Selective felling of woodland edges and scrub management around CCTV cameras.	Complete Weed Control	Works done to a high standard. Daily briefing sheets and records were provided by the Contractor along with before and after photographs.
M9	Wallace Crescent	Construction	Removal of encroaching vegetation onto adjacent properties.	Complete Weed Control	Works done to a high standard. Daily briefing sheets and records were provided by the Contractor along

Route	Location	Operation	Work description	Subcontractor	Performance
					with before and after photographs.

2.10 Landscape Strategy Delivery Progress

2.10.1 The annual period of 2020/21 is the first on the NMC. No Landscape Strategy has been compiled to date by BEAR, although the previous document has been provided by AMEY as part of the handover

2.11 Pesticide Plan – Usage Update

2.11.1 During the first annual period, weed spraying activities were not undertaken due to being outwith the growing season. The 2021/22 season will be used as a baseline for forward years.

2.12 Biodiversity Enhancement and Nature Conservation

2.12.1 Operations have been planned for the 2021/22 period in support of enhancing biodiversity and nature conservation, e.g. grass cutting methodology and creation of new habitat by leaving logs on the site where appropriate. Where requested by interested parties or adjacent landowner's verges cutting regimes have been altered to ensure wildflower growth is enhanced and or preserved.

2.12.2 Table provides a summary of measures identified to assist and improve future biodiversity enhancement and nature conservation.

Table 6. Biodiversity and Wildlife Mitigation Measures

Biodiversity and Wildlife Mitigation Measures
Development of database of road-kill reports, assisting in the measurement of the state of individual species. Road-kill is a significant issue for animals such as deer, red squirrel, badgers and hedgehogs and rabbits. However, it was suggested that road-kill is not necessarily all bad, as more road-kill can indicate a species is thriving in that area.
Closer co-ordination with national Biodiversity Implementation Team.
Inclusion of records of locations of invasive species within digitised landscape inventory plans.
Consideration of amendments to the standard verge cutting regimes in order that variations may be agreed which are more appropriate to the local areas, with adjustments to reflect the local "dynamic" level.
Production and treatment of arisings from tree felling operations. The operating company contracts permit the spreading of chippings but only to a depth of 25mm, out of sight of the road user, and only in locations where it will not restrict the growth of desirable vegetation. Although there are various potential after-uses for this material, the removal of chippings from site for re-use is precluded by the current waste management regulation, which defines this material as "waste", for which a waste exemption license would be required in order to take material off site. Removal for after use has also to be balanced against the carbon released in the chipping and transportation operations. The alternative is to stack timber on site (habitat piles) which is an accepted treatment within the trunk road contract but is not always appropriate or possible due to restrictions in verge width, slope gradients and on safety grounds.
The Scottish trunk road network supports and maintains many culverts and smaller wildlife underpasses. In terms of road crossing facilities for animals it is generally most cost effective to construct dry tunnels (i.e. pipe and cover) or wet culverts with ledges. Few exist on the network. Development of such features should be considered following study to determine appropriate locations.

Bat roosts within bridge structures are not currently formally identified. Bridge inspection teams do not receive specific training on treatment of bat roosts where discovered. There would be merit in introducing more formal training and identifying locations commonly used as bat roosts

2.13 Problems or Issues Experienced

2.13.1 No problems or issues have been encountered in the first Annual Period.

2.14 Detailed Inspections and Landscape Inventory Status

2.14.1 The requirements for detailed inspections of grass bulbs and wildflower areas, trees and shrubs, as defined in the landscape inventory drawings, are given within Schedule 2 Section 3.5 of the Term Maintenance Contract. This requirement extends to verges, central reserve areas, cuttings and embankments.

2.14.2 Inspections are to be carried out on an annual basis within the exception of central reserve areas of dual carriageways or motorways where lane occupation would be required. In such areas detailed inspections are to be carried out on a bi-annual basis. Detailed inspections of bulb and wildflower areas are to be carried out where possible during their growing season.

2.14.3 Detailed inspections of trees will be carried out throughout SE Unit as a part of the 5-year tree inspection conducted by professional arboriculturist. No previous 5-year tree inspection was included as part of the handover information. A drive-by roadside survey was carried out between August 2020 and October 2020 to gain oversight of the arboriculture concerns along the routes

2.14.4 Safety inspections are carried out on a weekly basis throughout the network. Although primarily carried out to identify safety related defects, safety inspectors are also encouraged to identify and report the above in order that prompt attention may be given where necessary.

2.14.5 Landscape Inventory plans were made available during mobilisation period, populated with the known landscape inventory received from the outgoing Operating Company. A review was undertaken of the current of the current inventory stored within the RMMS function within IRIS and this was found to be accurate. Works will continue to keep this updated as appropriate. This information is due to be transitioned to AMPS during the 2021/22 period and review will be required to ensure the information has been transferred accurately.

Annex 1 Pesticide Record Forms

No Pesticide Treatment Records are available for the first annual period as described in section 2.10.

Appendix A BEAR Grassland Report

Grass cutting during the first Annual Period was limited due to the timing of Contract commencement. The works undertaken concentrated on verge and sightline cutting to ensure that the network remained in a safe operational condition. For future periods the methodology being adopted will be similar to those detailed below: -

The grass swards are divided into 4 categories because of the cutting regime within the requirements of the contract.

1. **Verge and sightline cutting**

These works are completed 3 to 4 times per year depending on location. The cultivars within these locations were typical of a low frequency cut. There are a few locations that require to be considered for verge improvement or height reduction.

1st cut generally starts at the beginning of May and takes 4 to 5 weeks.
2nd cut starts at the beginning of June and takes 7 to 8 weeks.
3rd cut starts at the beginning of August and takes 6 to 7 weeks.

This regime ties in with the generic grass growth periods, whilst there is a slight variation within grass heading times annually it is generally around the end of June.

Works were undertaken during the annual period to ensure these areas were maintained in a safe manner in accordance with the Contract requirements.

2. **Medium frequency Amenity areas**

These works are completed 7 times per year, and are mainly laybys, bus stops and rural amenity areas. The grass swards are in good condition with some locations showing fatigue from vehicle run over. There may be a requirement for selective herbicide within some locations to improve the overall appearance.

The medium amenity cutting is completed within the annual programme on a start at A and go to B basis which remains the same for the summer in rotation.

3. **High Frequency Amenity areas**

These locations are completed as per the contract with 14 planned cuts per. There may be a requirement for selective herbicide within some locations to improve the overall appearance.

The High Amenity cutting is completed within the annual programme on a start at A and go to B basis which remains the same for the summer in rotation.

4. **Minimal cutting**

These locations are defined within IRIS and are maintained once every 3 years.

Due to the limited grass cutting operations undertaken during the first annual period it is not possible to provide commentary on the specifics detailed below.

As per clause Schedule 2, Appendix 3, Attachment 3.3, Clause 3.3.1.3
As well as any location specific objectives which may have been determined, other more general objectives could include:

(i) Safety

(ii) Integration with the wider landscape

(iii) Encouragement of ecological diversity

(iv) Visual interest and amenity.

As per clause Schedule 2, Appendix 3, Attachment 3.3, Clauses 3.3.1.4 & 3.3.1.5
Provide an overview of the broad condition of the grass within defined character zones and in response to specific areas of interest, such as junctions, settlements and the like.

The grassland report should include:

(i) general description of existing grassland within the unit
(ii) specific Route grassland areas
(iii) current maintenance regime
(iv) issues arising from current maintenance regime
(v) high amenity grass areas
(vi) amenity grass areas
(vii) general grass
(viii) rough grass
(ix) specific issues
(x) sward health
(xi) sight line areas
(xii) weed content
(xiii) erosion/over-run,
(xiv) bulbs, and
(xv) specific opportunities for amending grass maintenance regimes.

Appendix B Injurious Species Report

Injurious Species Management Plan

The Landscape Development Plan will include an Injurious Species Management Plan. This plan will layout our method of injurious Weed infestation reduction. The species will address the following weeds:

(i) Broad leafed dock.
(ii) Curled dock.
(iii) Spear thistle.
(iv) Creeping thistle.
(v) Common ragwort.
(vi) Himalayan Balsam.
(vii) Giant hogweed.
(viii) Japanese knotweed.
(ix) Oil Seed Rape.
(x) Rosebay Willowherb.
(xi) Rhododendron Ponticum.

1. Introduction

The weeds are divided into several categories depending on their type and level of control required.

a. Broadleaved and Curled Dock, Spear and Creeping Thistle. These are normally a problem around pastures of farming areas. They are part of the Weeds Act 1958, and are reduced through cultural control and weed control.
b. Common Ragwort which has become prevalent about 10 years ago before a good level of control was introduced. This control is mainly by cultural control. Areas also maybe hand pulled and sprayed where there is immediate danger to horses or livestock.
c. Himalayan Balsam requires chemical control and is relatively easily controlled.
d. Giant Hog weed requires chemical control and is completed annually. The infected ground could take years to control, where thousands of seeds may lie dormant in the soil.
e. Japanese Knotweed is become more difficult to control with the reduced level of chemical option that are effective. The roots may be deep and far reaching, but with constant weed control the level of infestation can be reduced.
f. Oil seed rape is relatively controllable where it is not genetically engineering to resist the only chemicals that we have left to eradicate the infestations which normally appear with the central reserve.
g. Rosebay Willowherb has become more prevalent within the verge but can be controlled by cultural methods and chemical weed control.
h. Rhododendro Ponticum can also be chemical and culturally control, however care should be taken as Ponticum in some areas have been natural to the look and is typical to some particular location.

2. 2020/2021 Operations

Due to the date of commencement of the first Annual Period no injurious species treatments were undertaken.

3. 2021/2022 Target

Our target is to reduce the level of infestation identified during the first Annual Period. This reduction would expect to be specific to species and location. The average reduction across the species would be approximately 10% but will take many years for Giant Hogweed, Japanese Knotweed and some rosebay willow herb locations.
It is not until the following season can the effectiveness be accurately be predicted, until it regrows.

The reduction is difficult to predict as is affected by weather, poor choice of effective chemicals and may well die back but be just as strong 2 -3 years later.

Appendix C Road Kill Summary Report

A total of 277 deer, 109 badgers, and 104 foxes, recorded in the Road Kill Summary Report for the year 2020/2021. The numbers, in particular, on the A1 and M9 are concerning and requires further investigation. Consideration should be given to improving fencing on the A720, M9, M8 and A1 that have the highest deaths of foxes and badgers crossing these high-speed roads. Table 7 includes records of roadkill on a route by route basis in the 2020-2021 annual period.

Table 7. Summary of roadkill from 2014 to 2021 annual period

Deer

Route	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	Total
A1	14	43	23	63	59	52	55	309
M9	2	18	14	28	36	27	39	164
M8		8	5	19	21	29	51	133
M876	1	9	7	18	18	17	31	101
A720	5	5	4	16	15	16	26	87
A985	4	4	5	9	7	18	20	67
A68		4	3	11	9	11	11	49
M80	2	2	1	14	9	8	9	45
A702			4	6	5	5	7	27
A876	2	1	1	5	1	5	5	20
A7	2	7		1	1	3	3	17
M90							8	8
M823							7	7
A977			1	2	1	1	2	7
A90							3	3
N/A		1						1
Total	**32**	**102**	**68**	**192**	**182**	**192**	**277**	**1045**

Badgers

Route	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	Total
M9	2	6	8	16	22	16	42	**112**
A1	6	10	12	22	18	15	20	**103**
A720	3	8	4	14	15	7	16	**67**
M8	1	5	2	10	8	15	16	**57**
A68	1	5	1	1	3	6	2	**19**
A702		2		4	8	1		**15**
M876		1	3		1	2	6	**13**
M80				4	2		5	**11**
A7		4						**4**
A6091	1							**1**
M823							1	**1**
M90							1	**1**
Total	**14**	**41**	**30**	**71**	**77**	**62**	**109**	**404**

Foxes

Route	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	Total
A720	10	14	16	23	31	30	33	**157**
M9	6	5	6	13	18	15	28	**91**
M8	3	4	4	12	10	7	21	**61**
A1	9	6	9	12	7	9	7	**59**
M876			2	2	2	1	4	**11**
A985		1		1	2		2	**6**
M80							3	**3**
A702	1					1	1	**3**
A977				2			1	**3**
A876	1						1	**2**
M90							2	**2**
M823							1	**1**
Total	**30**	**30**	**37**	**65**	**70**	**63**	**104**	**399**

Appendix D Pesticide Plan

CONTENTS

1. Introduction

Pesticides are a necessary part of roadside maintenance. However, as environmental awareness increases, we must make accurate assessments with the aim of reducing the pesticides we use and, ultimately, finding alternatives to pesticide use.

Pesticides can be divided into two main categories, residuals and non-residuals. Residuals remain in the ground and one application can remain active for several months. Non-residuals are application only; and therefore, will only have an effect on vegetation with which contact is made. Non-residuals have no lasting effect. In the past, residual pesticides were very popular. However, as a direct result of increasing environmental awareness, this popularity has reduced as better chemical technology has become available.

Pesticide reduction is not only about reducing the amount of pesticide applied, and the amount of applications that take place. It is also about producing new pesticides which are less harmful than their predecessors. This often means replacing residual products with non-residuals; and the pesticide industry can help itself here. New technology has seen dramatic improvements in the effect non-residuals have. As long as accurate spray techniques are maintained, these pose a much lesser threat to the surrounding environment.

BEAR Scotland Ltd will look to reduce annual pesticide application year on year on our network. Year 2021/22 will be used as a baseline to determine the required quantities of pesticide applications prior to implementing methods to reduce this usage. Such reductions can be achieved in many ways. Spraying machines can be made more efficient, and tailor made for the job in hand. Nozzles must be maintained and adjusted or replaced to ensure that only the areas requiring pesticide are treated. Sprayer operators should be trained to high standards, ensuring they are aware of the benefits and requirements of reduced pesticide use, through accurate and effective spraying techniques.

2. Strategic Aims of the Plan

The overall aim of the plan is to reduce where possible the amounts of pesticides used on the network, through promotion of alternative methods. However, the plan also has a number of strategic aims over and above the control of weed growth. These are outlined below:

- Reduced water pollution caused by pesticides to the standards required by the European Community’s water framework directive.
- Reverse the loss of biodiversity caused by pesticides.
- Encourage introduction of more alternative chemicals, and greater use of integrated crop management with lower pesticide dependency.
- Establish best practice in the use of pesticides in the amenity sector.
- Minimise the risk of environmental damage through inappropriate disposal of amateur products.

3. Considerations

Definitions: A weed – a plant growing in the wrong place.

Generally, weed seeds are very successful in their ability to germinate and are able to thrive in very harsh conditions and impoverished soil. They can also lay dormant for extremely long periods of time until conditions are right to grow.

Eradication Appraisal: Sites of known weed growth are assessed for weed eradication based on mechanical, biological or manual methods of control. Such methods must also take cognisance of the requirements of the Term Maintenance Contract as stipulated in Appendix 30/2 and Clause 3002 of the Specification for Highway Works.

Weed Category: There are many hundreds of weeds which grow in various categories.

General Weeds: where these are standard weeds and are controlled with normal weed control methods.

Noxious Weeds: These are list within their own category and consist within the TS boundary mainly as Ragwort, Japanese Knotweed, Himalayan Balsam, Giant Hogweed.

The Environmental Protection Act 1990 is another broad ranging piece of legislation that singles out Japanese Knotweed and Giant Hogweed for a special mention. Under the Act it places a 'Duty of Care' on the producer and anyone they employ to dispose of soil or other material contaminated with Japanese Knotweed or Giant Hogweed. It becomes a controlled waste which can only be taken to licensed landfill sites who must deal with it in an appropriate way. There are only a limited number of Landfill sites willing to take this material and they must be informed prior to the material being taken to them.

The Ragwort Control Act 2003. This is an enabling Act and has resulted in the issuing in a Code of Practice for the control of Ragwort.

The Weeds Act 1959 (7 & 8 Eliz. II c. 54) is an Act of the Parliament of the United Kingdom regarding the control of several injurious weed species throughout the UK. It received Royal Assent on 16 July 1959,[1] and aims to prevent the spread of the Broad Leaved Dock, Common Ragwort, Creeping Thistle, Curled Dock and the Spear Thistle.[2] It allows the Secretary of State, or any person acting on their behalf or the Secretary of State for Environment, Food and Rural Affairs, to use measures of enforcement to prevent the spread of weeds on private land,[3] which, if not adhered to by the owner of said land, can lead to a fine up to £1000.00 and further punishment.[1] This Act is amended by the Ragwort Control Act 2003.

Contents:

Invasive Weeds: These are generally more difficult to control and may cross over with noxious weeds and on the network would be Mare's Tail, Moss, Sycamore seeds, for example. These types of weeds require specific weed control treatment and cannot be categorised within the general weeds category.

Injurious Weeds: Are covered within the Weeds Act 1959

Range of use: Weed control is required on all areas within the network boundary where the following exist:

- Amenity grassland areas – present in defined areas through the network as identified within the Landscape Inventory Drawings.
- Shrub/rose/flower bed areas – present in defined areas through the network as identified within the Landscape Inventory Drawings.
- Hardstanding areas – located throughout the network. These areas are made up from gravel, kerbs, flag stones, block paving, etc.
- Filter drains – present adjacent and remote from carriageways over approximately 40% of the network length.
- Woodland areas – as identified within the Landscape Inventory Drawings.
- Noxious weeds – as defined within Contract specification and present in varying intensities on verge locations over large extents of the network length.
- Aquatic areas – as identified within the Landscape Inventory Drawings.

4. Contract Requirements

Weed control requirements are as specified within Appendix 30/2 of the Contract Documents and Clause 3002 of the Specification for Highway Works. Definitions allow the use of translocated, contact or residual herbicides within situations of weed control on the network.

5. Alternative Methods of Control to Herbicide Treatment

A balance must be reached between use of pesticides and effective management of weed control. There are a number of alternative methods of weed control that can be used, not all of which involve the use of pesticides. Different methodologies are effective for different issues in different locations. A variety of treatments therefore need to be adopted and applied throughout the network.

In some cases there will be additional costs to start the change process. However, the long-term effect may be almost as economic and will certainly be better for the environment.

A. Toleration:

To most observers, the main reason for the control of weeds on Hardstanding and shrub beds is aesthetic (it looks neat and tidy). However, important additional benefits are also seen.

- Weeds will compete with plants for light, moisture and nutrients.
- If allowed to flourish, weed growth can damage hard surfaces, penetrate cracks and result in degradation and eventual maintenance liability.
- Non-treatment can result in lack of control of noxious weeds.

The key to control of the above is in treatment in order to prevent growth to a size where when damage/competition can occur. It may therefore require to be accepted that small weed growth be seen on the network, on the understanding that treatment be undertaken prior to excessive growth.

In managing the hardstanding and shrub beds, the question of toleration needs to be looked at in each site. Do we need this path/hardstanding/shrub bed to be 100% weed free? If it is determined that certain paths/shrub beds do not need to be 100% weed free, then tolerance levels need to be agreed and set. The method of control may vary dependent upon the answer to this question.

The continual use of chemical will not create a weed free environment with glyphosate, as a leaf is required in order to give a surface plant area for the chemical to enter the plant, then there will be weeds present within the location in order for glyphosate to be effective. Continual spraying of locations will affect the pesticide target records.

B. Mulching:

The amount of residual herbicides used can be greatly reduced by using mulch across the top of the shrub/rose beds. There is a range of products that can be used for mulching:

- Bark
- Spent mushrooms
- Well-rotted farmyard manure
- Organic compost
- Leaf litter
- Mypex
- Plastic sheeting
- Gravel

Each one of these products has different qualities and need to be applied at sufficient depth to work correctly. Organic mulches require regular topping up but have the advantage of improving the soil and adding nutrients.

All mulches should be applied to a weed free surface. A well applied mulch will not only look attractive but it will also ensure a virtually weed free surface. Mulches should ideally be applied in autumn while the heat is still in the ground. The mulch then acts as an insulating layer, trapping the heat in and protecting the plants. If applied in spring, the reverse can occur and the soil may take longer to warm up.

C. Hoeing:

The garden hoe is one of the main weapons to control weeds. There are two basic types of hoe:

- The Dutch Hoe
- The Swan Neck Hoe

It is important to use a sharp hoe to ensure effective working. Hoeing is mainly used to remove individual weeds and is a very good method of control for annual weeds: it is not such a good control of perennials, as a cut stem will grow back again from the rootstock.

Hoeing on a regular basis also has a residual control as it creates a “dust mulch” on the surface of the beds by breaking the water capillaries just under the surface. The dust mulch helps reduce the ability of weed seeds to germinate. The dust mulch will be broken during irrigation or rainfall.

The ability to effectively use hoeing on the trunk road network is restricted through the requirement to ensure effective safety zones and working spaces. Working with l9ng tools can result in hazard if good separation is not ensured between workforce and live traffic. Expensive and restrictive traffic management may also therefore be required in locations close to traffic lanes. Regular hoeing can be effective in more remote shrub beds where access restrictions are not so great.

D. Strimming:

Nylon corded strimmers can be used to remove weeds from hard standing. They should not be used for weeding beds as they can often result in damage to adjacent plants if not very carefully operated. Despite guarding, strimmers may also catch stones and throw them, so should not be utilised directly adjacent to parked trafficck or in areas of close pedestrian usage. They are also noisy and use in public places needs to be carefully considered.

Strimmers are particularly effective on annual weeds or in areas where the weeds can be tolerated to a height limit. They are very effective and quick in skilled hands. With brush-cutting heads fitted strimmers are able to cut down dense non-woody vegetation. Strimming will not however, kill the weed and repeat growth is inevitable when using such methods, however will be considered where it will reduce growth year on year.

E. Mechanical Flailing:

Metal flails can be used to cut down weeds where there are large areas reachable by machine. Such areas will primarily be on wide motorway or dual carriageway verge locations. The finish achieved through mechanical flailing can be limited and therefore operations should not be undertaken in areas which may be highly visible to the public. This option is used for Ragwort where it grows within the 4 mtrs of the verge, normally completed on the network, during the 3rd cut.

F. Manual Weeding:

Manual weeding is still the only effective way of removing plants from certain situations without causing any chemical damage. It is expensive and slow because it is very labour intensive. It can also be hazardous in areas where sharps are found. It is a good method of removing perennial weeds. Protective clothing must be worn at all times.

6. Standard Operating Procedures

People handling or applying pesticides will have acquired the NPTC certificate for safe use of pesticides (Foundation module) PA1 and an accompanying application test certificate, module PA6 for knapsack application, module PA6A for CDA application or module PA2 for tractor mounted equipment (a pass in module PA2 provides exemption on PA6), (A pass on module PA6 provides exemption on module PA6A).

The storage, transport, use and disposal methods used are as set out in the Food and Environment Protection Act (1984) Pesticide Regulations.

Approved products: Only approved amenity pesticides maybe used on the Network. These products will be identified with a Maff No. and will be registered with the UK Pesticide Guide.

Areas involved in herbicide application:
Application is undertaken in the following areas:

- Kerbs, filter drains, gravel areas, hardstanding's.
- Ditches, streams, ponds.
- Noxious weeds.

Scope of Use/application Products:

- Total non-residual translocated herbicide – Glyphosate (active ingredient)
- Total residual herbicide – propyzamide , flazasulfuron
- Selective non-residual Herbicide – 2-4D, tryclopyr, clopyralid
- Selective residual herbicide – No longer available.

All products need to be approved by the authorised officer before application is permitted.

7. Summary Proposals for Treatment

- Hardstanding areas are too large and variable to consider any other method than chemical application. This application must contain non-residual herbicide as the chemical is being applied over filter drains, gullies, and waterway areas. The only recommended chemical that can be applied to these areas is glyphosate. Glyphosate is a non-residual glycine derivative herbicide. It is used on annual and perennial weeds.

  This product can only be effective when used in dry situations, this causes ongoing weed growth problems within our present wet weather environment. Where areas have had rain, it will take 3 weeks to discover that there has been no effect and re-programme a respray. It will take a further 3 weeks for this to show complete dieback effect, therefore it may take over 2 months to complete an area when there is a continually rainy period. Where practicable, in areas where there has been known to have rained after spraying, re-spraying is undertaken the next day, in order to ensure maximum efficacy.

- Noxious weeds are treated through a variety of spraying and strimming treatments, carried out on a planned basis dependant on growth status during the period.
- Ragwort – Requires to be treated in August/September when most of the yellow heads have appeared. This allows for easier identification of the weed within long grass. The chemical (tryclopyr, clopyralid) was used in the past creating a good level of reduction year on year. The chemicals available now in these locations are glyphosate or 2-4D amine will arrest the development of seeds within 24 hours. Hand pulling has been tried however apart from transportation and disposal issues, it was found to cause repetitive strain disorder to the spinal region. Large open areas are cut mechanically where possible.

  Areas for priority treatment are:

  A. Agricultural Areas, cattle, horses etc.

B. Public areas, Laybys etc.
C. Customer Care Concerns.

- Giant Hogweed requires to be treated in June, when the leaves have reached maximum height. This gives maximum leaf surface area so as to maximise chemical into roots.
- Japanese Knotweed – This is to be sprayed in late August/September when again there is maximum leaf coverage. There are no seed issues as the seeds are unfertile.
- Rosebay Willow herb – is to be treated using similar methodologies to those employed within the Ragwort treatment programme.
- Himalayan Balsam – There is no significant reports of this weed on the network, manly around the Fort William area out with the TS boundary.
- Shrub beds are treated with glyphosate. The use of manual treatment will not create a sufficient level of control unless the beds are treated every 2 weeks.
- The application totals for this year were higher than targeted due to a 3rd spray being carried out due to a flush of weeds after the 2nd spray. The existing weeds were checked and seen to have died back from the 2nd spray.

Appendix E Deer Management Plan

Table 6 provides a summary of measures identified to assist and improve biodiversity enhancement and nature conservation. It refers to the development of database of road-kill reports, assisting in the measurement of the state of individual species.

Table 7 shows the record of deer killed along all routes since 2014/2015 annual period.

A review will be undertaken in future periods to identify trends and look to see what measures can be implemented to reduce the impact the trunk road has on deer.