Biodiversity Management Proposals

Swindon to Marlborough Traffic-Free Route

March 2012 (revised July 2012)

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Executive Summary

This report comprises an initial appraisal of the ecological interest of the Swindon to Marlborough Greenway and makes habitat management recommendations. The aims of these recommendations are to increase the diversity of the greenway, protect notable species and to increase habitat connectivity through the landscape.

The Swindon to Marlborough Greenway includes Route 482 and a short section of Route 45 of the National Cycle Network and extends between National Grid Reference SU 178 815, south of Swindon, and National Grid Reference SU 199 686, southeast of Marlborough. It is approximately 14.5km in length. The surrounding landscape is very open, characterised by fields and hedges with few copses. The greenway predominantly follows the route of a former railway and passes from Weald to Chalk Downland.

In order to assess the current and potential ecological interest of the route; a desk study and Phase 1 Habitat Survey were conducted. These studies concluded that the route comrpises a mosaic of habitats that were valuable in this intensively managed landscape; providing shelter and increased foraging resources for wildlife in the wider landscape. The mosaic included habitats that are notable because they often support a high diversity of species and rare species and also due to their limited national distribution. Of particular note were patches of calcareous and other semi-improved grasslands, chalk scarp woodland and chalk scrub and hedgerows, although many were defunct, leggy specimens with gaps. Japanese knotweed was noted to the south of Marlborough.

The route is also likely to act as an important corridor for wildlife to move through the landscape. Of particular note were the almost continuous strips of hedgerow, scrub and woodland that increase connectivity between Burderop Wood and other nearby areas of woodland, link the Savernake Forest with woodland on the River Kennet and nearby copses and that form a sheltered feature through an otherwise very bare landscape between Chiseldon and Marlborough.

Badger setts, features suitable for use by roosting bats and birds of conservation concern, including skylark and corn bunting, were noted during the survey. The route is also anticipated to support a variety of invertebrate species, potentially including rare or notable species. Dormice have also been recorded in nearby woodlands and could use the habitats along the route.

Given the notable landscape, habitat and species considerations listed above the primary aims of management of this route have been identified as;

- Maintain a continuous corridor of scrub/hedgerow/woodland along the route especially between the Savernake Forest and Ogbourne St. George where dormice may be present.
- Maintain the calcareous grassland habitats through targeted clearance of the invasive scrub and meadow management.
- Maintain and potentially increase the diversity of the semi-improved grassland patches along the route and identify the botanically most interesting areas for priority management.

- Increase the structural diversity of habitats along the route by creating more scalloped edges, ecotones （graduated edges to the woodland） and open glades.

Another focus of work on the Greenway would be to more accurately identify the ecological baseline of the route. The habitat survey was conducted at a time of year that is suboptimal for botanical studies and the calcareous habitats along this route could support rare and notable species, particularly of lichens, mosses and flowering plants. Calcareous habitats often also support notable and rare invertebrates.

Contents

1. Background to Proposals

1.1 Sustrans and Biodiversity

Habitat fragmentation is widely recognized as a major threat to biodiversity in the UK due to the increased vulnerability of small or isolated populations of wildlife; particularly in the face of environmental change.

The National Cycle Network includes 4,000 miles of Greenway: traffic-free route typically located along disused railways and canal towpaths. These are a transport resource but are also corridors of natural habitat that typically run for many kilometres. They connect to a variety of greenspaces, run close to or through designated sites for nature conservation and transect other linear features such as rivers, canals and railways.

If managed for biodiversity, these greenways will form a landscape-wide network linking otherwise isolated habitats and allowing the movement of species across our country. In recognition of the role of its Greenways to nature conservation Sustrans published its first Corporate Biodiversity Action Plan (BAP) in 2008.

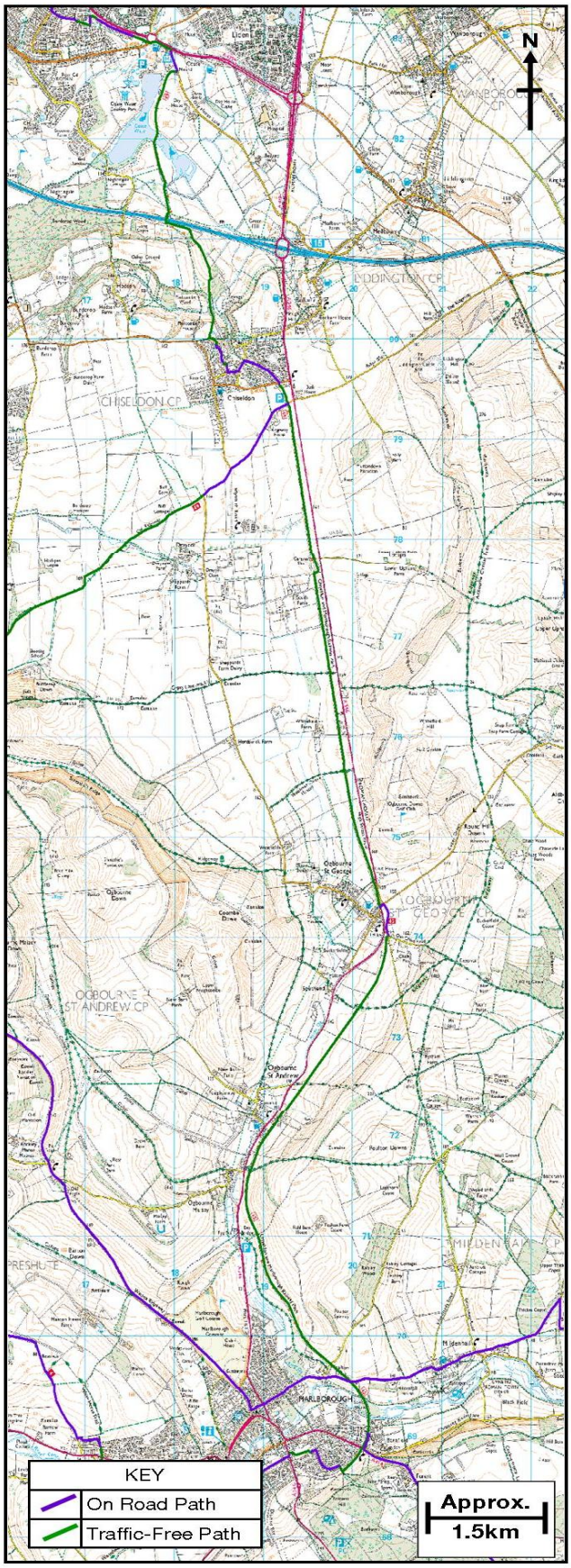
The Biodiversity Action Plan highlights the need to conduct habitat management to maximise the biodiversity along the Greenways. Historically the Greenways have been maintained by Sustrans to keep the paths clear for cycling and walking rather than for biodiversity. As such, the habitats along the Greenways are commonly developing into dense continuous scrub and ruderal vegetation with low diversity and reduced value to wildlife. Species rich habitats with high biodiversity require ongoing management.

This report comprises a preliminary assessment of one of Sustrans Greenways, Swindon to Marlborough to identify its potential role in the landscape and management recommendations. Through appropriate management, the biodiversity along their Greenways can be restored and targeted management can create a network of natural habitats that reconnect natural and wildlife rich habitats.

This has been prompted by the interest of the Sustrans Rangers along this route who wish to start managing the route for biodiversity. It should be note that this is a preliminary study only with basic habitat prescriptions that aim to increase diversity and an aim of the Rangers should be to liaise with local experts to further investigate the nature along the route.

1.2 Greenway Information

The Swindon to Marlborough Greenway includes Route 482 and a short section of Route 45 of the National Cycle Network. It extends between National Grid Reference SU 178 815, south of Swindon, and National Grid Reference SU 199 686, southeast of Marlborough; as illustrated on Drawing 1.1. This section of Greenway is approximately 14.5km in length and predominantly follows the route of a former railway. The surrounding landscape is very open, characterised by fields and hedges with few copses.



Drawing 1.1: Swindon to Marlborough Traffic-Free Path

1.3 Approach

Sustrans has undertaken a desk study and habitat assessment at the site to identify the current and potential ecological baseline of the route. The information gathered by these studies has then been used to identify opportunities and constraints in relation to managing the site for biodiversity.

The desk study was undertaken to determine the presence of any designated nature conservation sites, important habitat types and protected species recorded in the vicinity of the Traffic-Free Route. The following organisations holding ecological data relating to the survey area were consulted;

- Multi-Agency Geographical Information for the Countryside website; and,
- National Biodiversity Network Gateway website.

A site visit was conducted on 23rd and 24th March 2011 by Hannah Lewis MIEEM (Sustrans Ecologist) to record habitats present along the Greenway. The survey visit was conducted at a suboptimal time of year for botanical surveys, but basic habitat types can be determined at any time of year and those that require further botanical investigation identified. The habitats were classified in accordance with the habitat types used in the standard Phase 1 Habitat Survey technique and methodology issued by the Joint Nature Conservation Committee (JNCC, 2010). Species composition, current and historic management and potential for enhancement were noted during the survey. Invasive and notable species were also recorded and mapped. Fauna noted during the site visit were noted and habitats assessed for their potential to support notable species.

This information was then used to formulate some basic habitat management proposals to increase

the diversity of habitats, and the flora and fauna they contain. It is anticipated that these prescriptions will be amended as further information regarding habitats and species is gathered.

2 Desk Study

2.1 Nature Conservation Sites

Wiltshire and Swindon Biological Record Centre identified sites with statutory nature conservation designations and thirty-seven Wildlife Sites within 2km of the cycleway between Coate Water and Savernake Forest.

2.1.1 Statutory Nature Conservation Sites

The four sites with statutory nature conservation designations are summarised below. These were Sites of Special Scientific Interest (SSSI), one of which was also designated as a Local Nature Reserve (LNR). The ecological interest of these sites is described below. Coate Water and Buderop Woodland are situated towards the northern end of the route surveyed, and the Savernake Forect and River Kennet were situated towards the southern end.

Coate Water SSSI and LNR

The northern end of the route starts at this site. This site includes lakes, woodland, meadows and hedgerows.

The lake is noted for the birdlife it supports. It is noted to be significant in the county for its breeding reed warbler *Acrocephalus scirpaceus* and great crested grebe *Podiceps cristatus*. Water rail *Rallus aquaticus* has also recently bred at this site. It is also noted as important for wintering wildfowl and is also used by passage species.

The lake also supports an outstanding assemblage of dragonflies and damselflies with fifteen dragonfly species and six species of damselfly including the red-eyed damselfly *Erythromma najas*, a speices with nationally restricted distribution.

The lakes are also noted for their botanical interest with tall fen community, reedbed and other wetland vegetation around the waters edge. The notable species golden dock *Rumex maritimus* has also been recorded at the site. The meadows also include wet meadows that have areas dominated by sedges *Carex* spp. and rushes *Juncus* spp.

The woodland is an ash *Fraxinus excelsior* and pedunculate oak *Quercus robur* with sallow *Salix* spp. present in wet areas. Ground flora included enchanter's nightshade *Circaea lutetiana*, dog's mercury *Mercurialis perennis* and wood sedge *Carex sylvatica*. The field boundaries are formed by thick old hedges with numerous mature oak and ash trees. The woodland also supports an interesting bird fauna including species such as nightingale *Luscinia megarhynchos*, marsh tit *Poecile palustris* and willow tit *P. montanus*, tawny owls *Strix aluco* and lesser spotted woodpeckers *Dendrocopus minor*.

Burderop Woodland SSSI

This 48.5Ha site is designated for the different woodland characters present and rich ground flora. The site includes extensive areas of permanently saturated ground from numerous springs with wet ash and maple *Acer* sp. woodland. Other areas include acid pedunculate oak, hazel *Corylus avellana* and ash woodland.

The woodland has high structural diversity due to coppicing, thinning, ride management and also due to the effects of Dutch elm disease. This increases the value of the woodland to invertebrate fauna. Large mature oaks are present in the woodland.

A diverse shrub layer is present including, wayfaring tree *Viburnum lantana*, spindle *Euonymus europaeus* and wild privet *Ligustrum vulgare* while coppiced hazel predominates towards the northern edge of the site.

The ground flora includes areas dominated by bracken *Pteridium aquilinum,* areas with dog's mercury and bluebell *Hyacinthoides non-scripta* and wet areas dominated by great horsetail *Equisetum telmateia* with opposite-leaved golden-saxifrage *Chrysosplenium oppositifolium* present. Other notable species present include spiked star-of-Bethlehem *Ornithogalum pyrenaicum*, a species with nationally restricted distribution, herb-paris *Paris quadrifolia*, broadleaved helleborine *Epipactis helleborine*, sweet woodruff *Galium odoratum*, sanicle *Sanicula europaea* and moschatel *Adoxa moschatellina*.

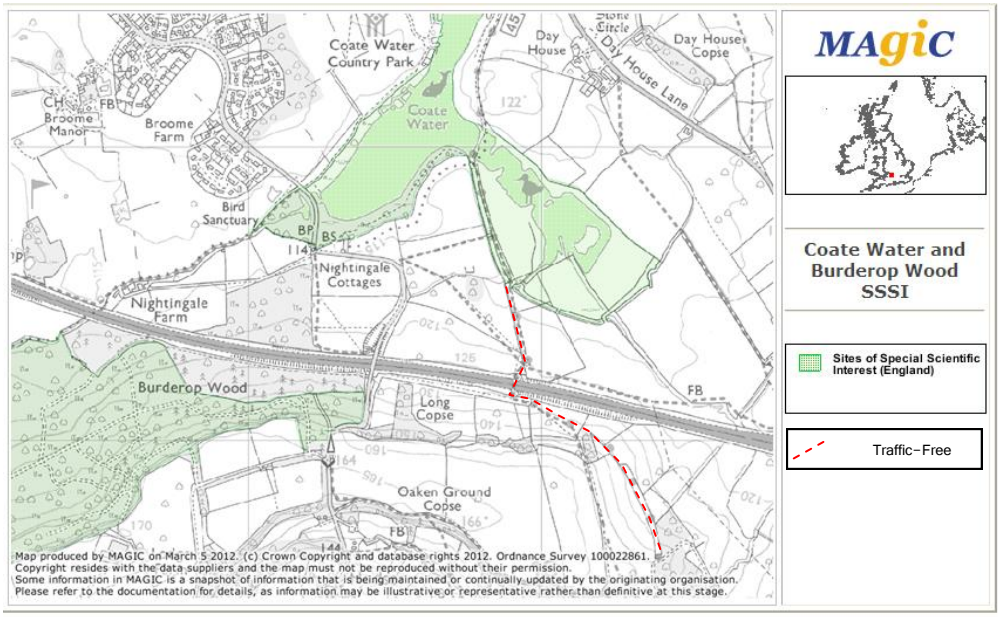


Figure 2.1: Location of Coate Water and Burderop Wood SSSI

Savernake Forest SSSI

This 905ha site is one of the largest woodland in Wiltshire. It is ancient woodland with relict wood pastures and supports an outstanding assemblage of lichens and a variety of other plant species including those with restricted distributions. Over one hundred lichen species have been recorded at this site including several that are characteristic of old forests such as the rare species *Caloplaca herbidella*. Woodland mosses and liverworts are also well represented in the site and include the nationally scarce liverwort *Frullania fragilifolia*. The ground flora includes more than fifty plant species that are typically associated with ancient woodlands including two nationally scarce species; narrow-lipped helleborine *Epipactus leptochila* and green-flowered helleborine *E. phyllanthes*.

Acidic areas in the woodland are characterised by wavy hair-grass *Deschampsia flexuosa* and heath bedstraw *Galium saxatile* with occasional bilberry *Vaccinium myrtillus*, heather or mosses typical of acidic situations.

Grasslands present at the forest edges include neutral grasslands and those with acid and calcareous characteristics. Floristically rich sections of sward in the neutral grassland include meadow saxifrage *Saxifraga granulata*, adder's-tongue *Ophioglossum vulgatum* and the uncommon meadow saffron *Colchicum autumnale.* The acidic areas included heath milkwort *Polygala serpyllifolia* and the small area of chalk heath was dominated by cross-leaved heath *Erica tetralix* and heather *Calluna vulgaris* with wild thyme *Thymus praecox* and common rockrose *Helianthemum nummularium* present

The site also supports an exceptional range of fungi due to the historical continuity of the woodland and the presence of unimproved grasslands. Well over 500 species have been recorded including several uncommon species of *Lepiota*.

The invertebrate fauna in the site is very rich. It includes rare fly species associated with the old beech trees including the very rare cranefly *Ctenophora flaveolata* and rare hoverflies. Several beetles, flies and moths with nationally restricted distributions have been recorded including the rare beetle *Tomoxia bucephala* and the extremely scarce moth *Aplota palpella*. At least twenty-five butterflies breed on the site including purple emperor *Apatura iris* and white-letter hairstreak *Satyrium w-album*. The scarce snail *Helix pomatia* is also found here.

The site supports a diverse assemblage of birds including wood warbler *Phylloscopus sibilatrix*, turtle dove *Streptopelia turtur* and woodcock *Scolopax rusticola*. Tree pipit *Anthus trivialis* and spotted flycatcher *Muscicapa striata* breed in the woodland edges. Other notable fauna present at the site include great crested newts *Triturus cristatus*, dormouse *Muscardinus avellanarius* and bats *Chiroptera*.

River Kennet SSSI.

This 113 ha site is situated along the River Kennet, which flows through marshy grassland, wet woodland and reed beds. The river shows a downstream transition from a chalk stream to clay in the lowlands, which is reflected in the flora present. The river flora has the highest average number of species per site surveyed than any other lowland river in Britain. Stream water-crowfoot *Ranunculus pencillatus*, starwort *Callitriche obtusangula* and watercress *Nasturtium officinale* dominate the upper half of the river. The nationally scarce species river waterdropwort *Oenanthe fluviatilis* has been recorded in the mid to lower Kennet. Downstream a much wider range of species occurs including four species of pondweed *Potamogeton* spp., horned pondweed *Zannichellia palustris*, spiked water-milfoil *Myriophyllum spicatum* and common club-rush *Scirpus lacustris*.

Kennet is noted for its large hatches of mayflies including *Ecdyonorus insignis* and *Ephemerella notata*, species with a very local distribution. Aquatic invertebrates are abundant in the river and include the larvae of the nationally scarce cranefly *Molophilus niger* and the nationally scarce caddis fly *Ylodes conspersus*.

The Kennet is also noted to support good populations of kingfisher *Alcedo atthis* and grey wagtail *Motacilla cinerea* amongst other species; and common sandpiper *Actitus hypoleucos* and redshank *Tringa tetanus* frequently use this river on passage. It also has varied and mixed fishery.

The river has been modified by the construction of the Kennet and Avon Canal, which in some places forms a single channel with the river.

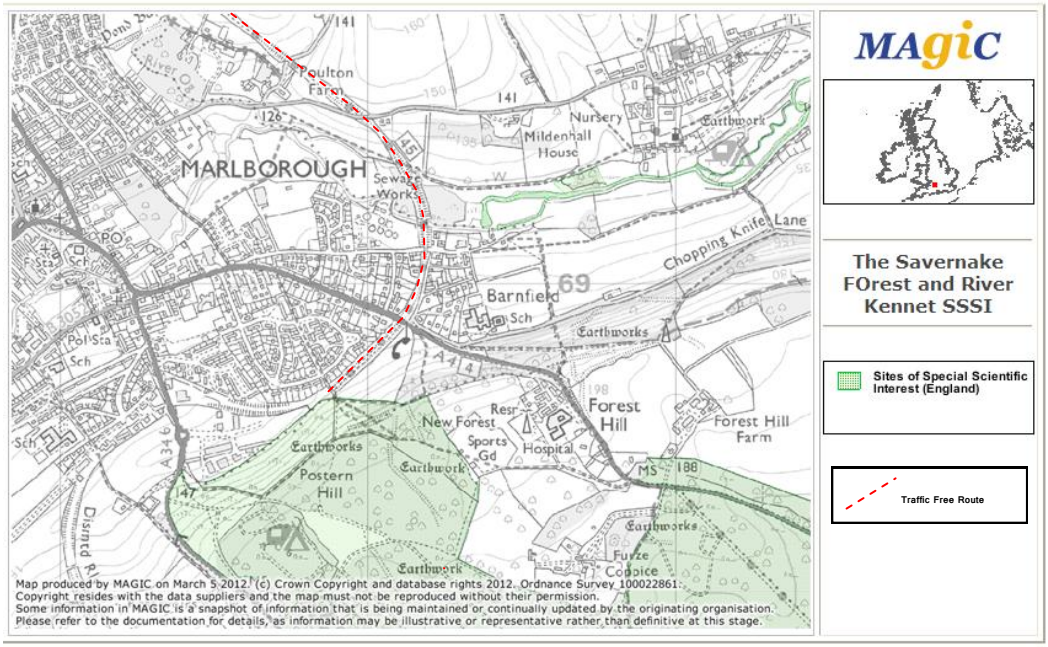


Figure 2.2: Location of Savernake Forest and River Kennet SSSI

2.1.2 Non-Statutory Nature Conservation Sites

The thirty-seven wildlife sites identified by the data search are summarised in Table 2.1.

Site Name	Distance from Route*	Summary
Rivers Kennet & Og	0 km	A 47.14 ha site along the Rivers Kennet and Og

Site Name	Distance from Route*	Summary
Chiseldon to Marlborough Old Railway Line	0 km	A 11.5 km section of disused railway with a habitat mosaic with scrub and grassland habitats including unimproved calcareous grassland.
Ogbourne Down Golf Course	0 km	A 53.15 ha site with calcareous grassland.
Foxlynch Meadow	0 km	A 0.51 flower-rich calcareous meadow with mature hedgerows.
Hodson Scarp	0.10 km west	A 8.18 ha site that comprises a narrow combe with unimproved calcareous grassland on the steeper sections of the slope.
Long Copse and Crook's Copse, Chiseldon	0.15 km east	A 3.37 ha ancient semi-natural broadleaved woodland
Postern Hill Chalk	0.15 km east	A 4 ha north facing site with unimproved and mesotrophic calcareous grassland and dense scrub.
Cow Hill Bank	0.20 km east	A 1.39 ha site including unimproved and semi-improved calcareous grassland and scrub on west and north facing slopes.
Yielding Copse	0.20 km east	A 2.38 ha broadleaved woodland dominated by ash with dogs mercury in the ground flora.
Chopping Knife Lane Bank	0.25 km east	A 23.12 ha north facing embankment with a mosaic of grassland, including calcareous grassland, scrub and mature trees.
Old Chase Road Chalk	0.30 km east	A 2.7 ha chalk pit, seeded with orchids in the 60's and containing calcareous grassland.
Old Chase Road	0.35 km east	A 3.75 ha southwest facing site with fragments of unimproved calcareous grassland.
Pinkcombe Wood	0.40 km west	A 2.89 ha broadleaved woodland
Ogbourne St. Andrew - East	0.50 km east	A 4.56 ha calcareous grassland on an escarpment.
Butts Road Cemetery SU18.087	0.50 km east	A 0.47 ha cemetery with unmown neutral grassland.
Round Hill Downs - South	0.50 km east	A 11.13 ha site with calcareous grassland.
Oaken Ground Copse	0.65 km	A 2.86 ha broadleaved woodland

Table 2.1: Wildlife Sites Identified by the Data Search (Continues)

Site Name	Distance from Route*	Summary
	west	
River Ray and Burderop Plantations	0.65 km west	A 9.96 conifer woodland.
Day House Copse	0.70 km east	A 1.32 ha broadleaved woodland with oak and ash that had formerly been coppiced. Dogs mercury, and indicator of ancient woodland present in the ground flora.
Burderop Wood North	0.75 km west	A 7.02 ha ancient semi-natural woodland with a wet area dominated by ash and maple and other areas dominated by pedunculate oak , ash and hazel. Former coppice management.
River Cole	0.75 km north	A 35.55 ha site situated along the River Cole.
Coombe Down - North	1.00 km west	A 14.21 ha site that includes a chalk pasture, species-rich neutral grassland and small patches of calcareous grassland on steeper slopes and earthworks.
Savernake Forest Ancient Woodland	1.00 km south	A narrow strip of ancient woodland with semi-natural and replanted broadleaved sections and a conifer plantation.
Pantawick	1.10 km southwest	A 2.55 ha ash woodland that is currently unmanaged with hazel and blackthorn thickets and a central grassy area.
Marlborough Railway Tunnel	1.10 km southwest	Disused railway tunnel that supports hibernating bats including barbastelle and natterer's bats.
Folly Copse	1.10 km east	A 3.26 ha ancient semi-natural broasdleaved woodland dominated by ash and field maple.
Granham Hill	1.20km west	A 15.57 ha site with species-rich calcareous grassland on the steep slopes of the north facing escarpment and neutral grassland on the more level ground at the top.
Coombe Down	1.20 km west	A 11.38 ha site with a west facing herb rich calcareous grassland within a field more dominated by ruderal species.
Liddington Castle South	1.50 km east	A 18.91 ha lowland calcareous grassland on a west facing down.
Liddington Hill North	1.50 km east	A 40 ha site comprising north and west-facing downs around a hill-fort with unimproved calcareous grassland.
Barton Copse	1.80 km west	A 4.16 ha ancient broadleaved woodland.

Table 2.1 (Continued): Wildlife Sites Identified by the Data Search (Continues)

Site Name	Distance from Route*	Summary
Chase and Moore's Wood and Wilding's Copse	1.90 km east	A 29.38 ha site with two areas of ancient woodland with a large area replanted with conifers.
Thicket Copse	1.90 km east	A 12.83 ha broadleaved woodland with oak, ash and silver birch with a hazel under-storey. A planted belt of beech and Norway spruce located centrally in this site.
Medbourne Chalk	2.20 km east	A 10.71 ha site comprising two linked, shallow valleys with calcareous grassland. The M4 motorway transects this site.

Table 2.1 (Continued): Wildlife Sites Identified by the Data Search

2.1.3 Landscape and Habitats

The route passes through three Landscape Typology Areas which are characterised by wet pasture, heath and moorland and rough pasture. It transects the River Og and River Kennet and joins habitats associated with them. Satellite imagery shows that the route between Chiseldon and Marlborough is situated in very open arable land but towards Swindon and south and east of Marlborough larger blocks of woodland are present.

The route itself has some sections that are listed on the National Inventory of Woodland and Trees. A traditional orchard is situated adjacent to the old railway line and a number of other habitat types listed on National Inventories are situated within 1 km of the route. These include;

- Ancient woodland;
- Fen (in Coate Water SSSI and LNR);
- Lowland calcareous grassland;
- Lowland meadows;
- Reedbed (in Coate Water SSSI and LNR); and,
- Traditional orchards.

2.2 Protected or Notable Species

Information provided by Wiltshire and Swindon Biological Record Centre identified records of a variety of protected and notable species.

Plants

A large number of plant records were provided by Wiltshire and Swindon Biological Record Centre. These included species on the UK BAP such as eyebright *Euphrasia pseudokerneri* and early

gentian *Gentianella anglica*; nationally scarce species such as bastard toadflax *Thesium humifusum* and yellow vetchling *Lathyrus aphaca* (recorded along the disused railway) and species considered notable in the county, such as tutsan *Hypericum androsaemum* and pale toadflax *Linaria repens* (also recorded on the disused railway line).

Invertebrates

Wiltshire and Swindon Biological Record Centre provided records of a number of invertebrate species; predominantly of beetles, moths and butterflies. These records included notable species and those on the UK red lists and UK BAP. Three butterfly species of note were recorded on the disused railway line itself; small blue butterfly *Cupidus minimus*, wall *Lasiommata megera* and wood white *Leptidea sinapis.*

Amphibians

Records of frog *Rana temporaria*, toad *Bufo bufo* and great crested newt *Triturus cristatus* were provided by Wiltshire and Swindon Biological Record Centre from the 1km radius around the route. The great crested newt records were primarily associated with Coate Water and the north of the route.

Birds

Information provided by Wiltshire and Swindon Biological Record Centre included a large number of bird records. These included twenty species of high conservation concern (on the RSPB Red list), mainly farmland bird such as corn bunting *Emberiza calandra*, yellow hammer *Emberiza citrinalle* and linnet *Carduelis cannabina.*

Mammals

The desk study identified records of eleven bat species within 1km of the site, Savernake Forest contains a disused railway tunnel, designated a Wildlife Site, that is one of the most important hibernation sites for bats in Wiltshire. Also recorded were otter *Lutra lutra*, watervole *Arvicola amphibius*, badger *Meles meles*, dormouse *Musardinus avellana*, hedgehog *Erinaceous europeaus* and harvest mouse *Micromys minutus* .

Reptiles

The desk study identified records of four reptile species within approximately 500m of the route; slow-worm *Anguis fragilis*, grass snake *Natrix natrix*, adder *Vipera berus* and common lizard *Zootoca vivipara.* Slow-worm had been more frequently recorded and more recently. The records of other reptile species were older (ten years old or more) and fewer in number.

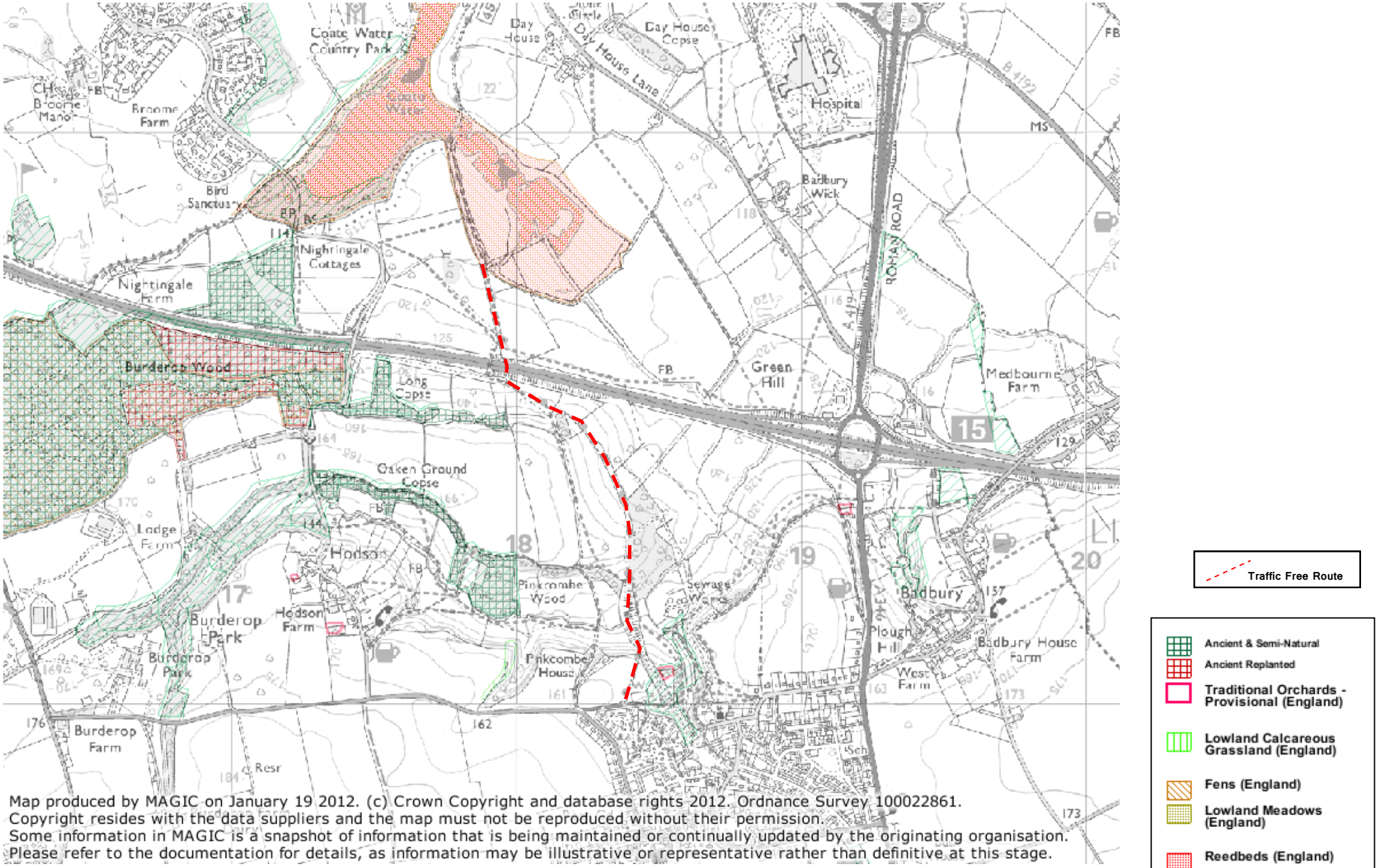


Figure 2.3: Habitat Inventories: Map 1

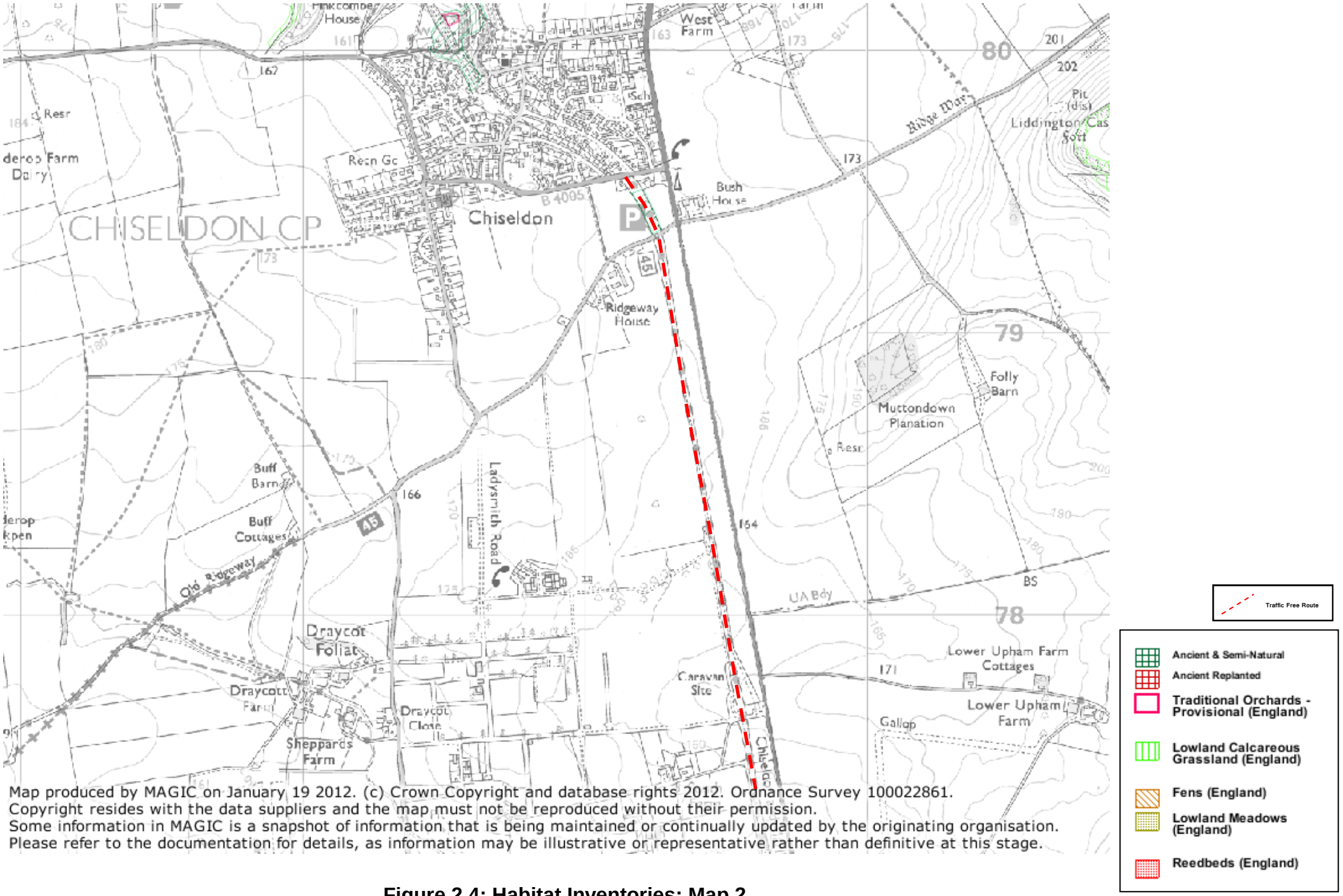


Figure 2.4: Habitat Inventories: Map 2

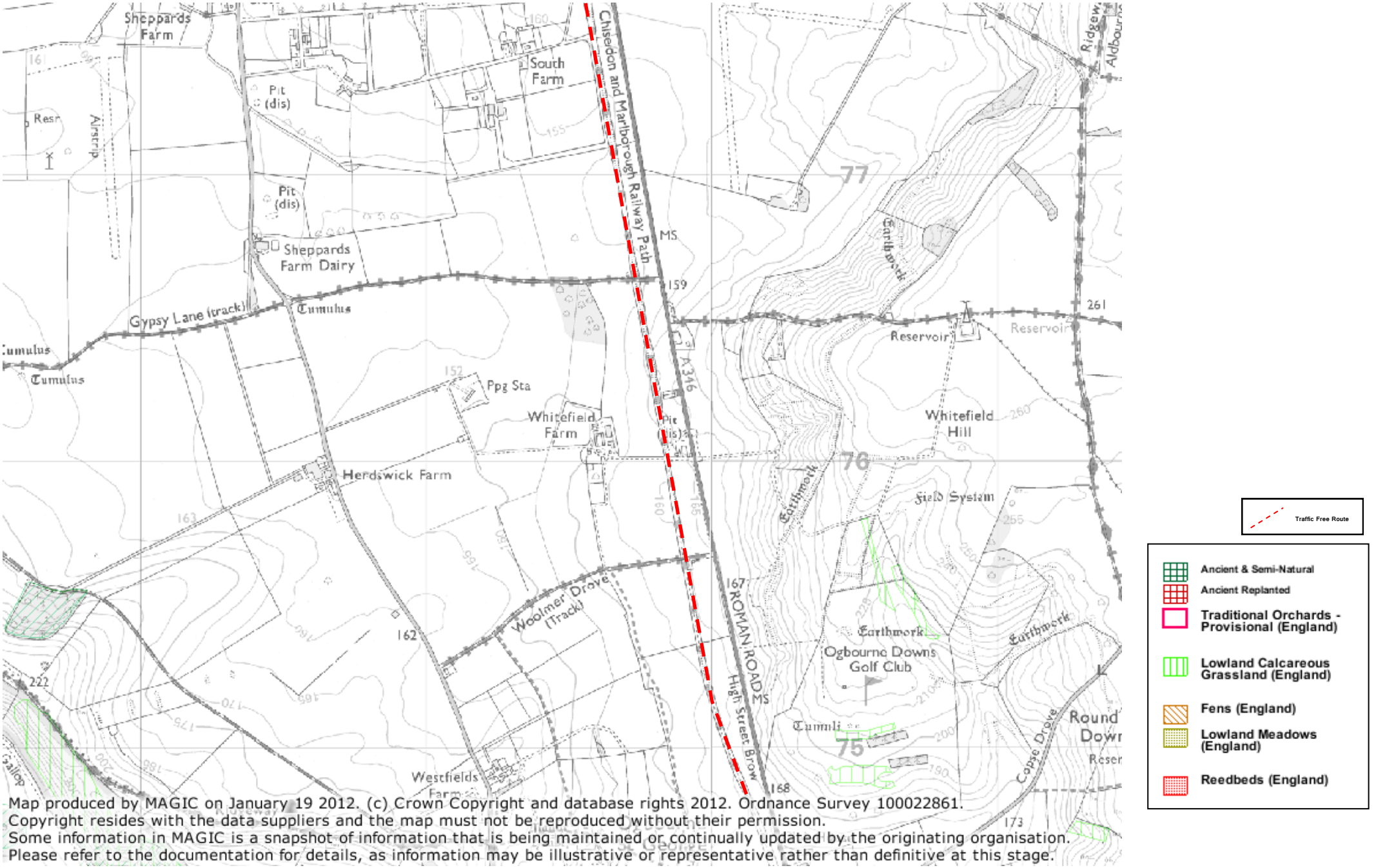


Figure 2.5: Habitat Inventories: Map 3

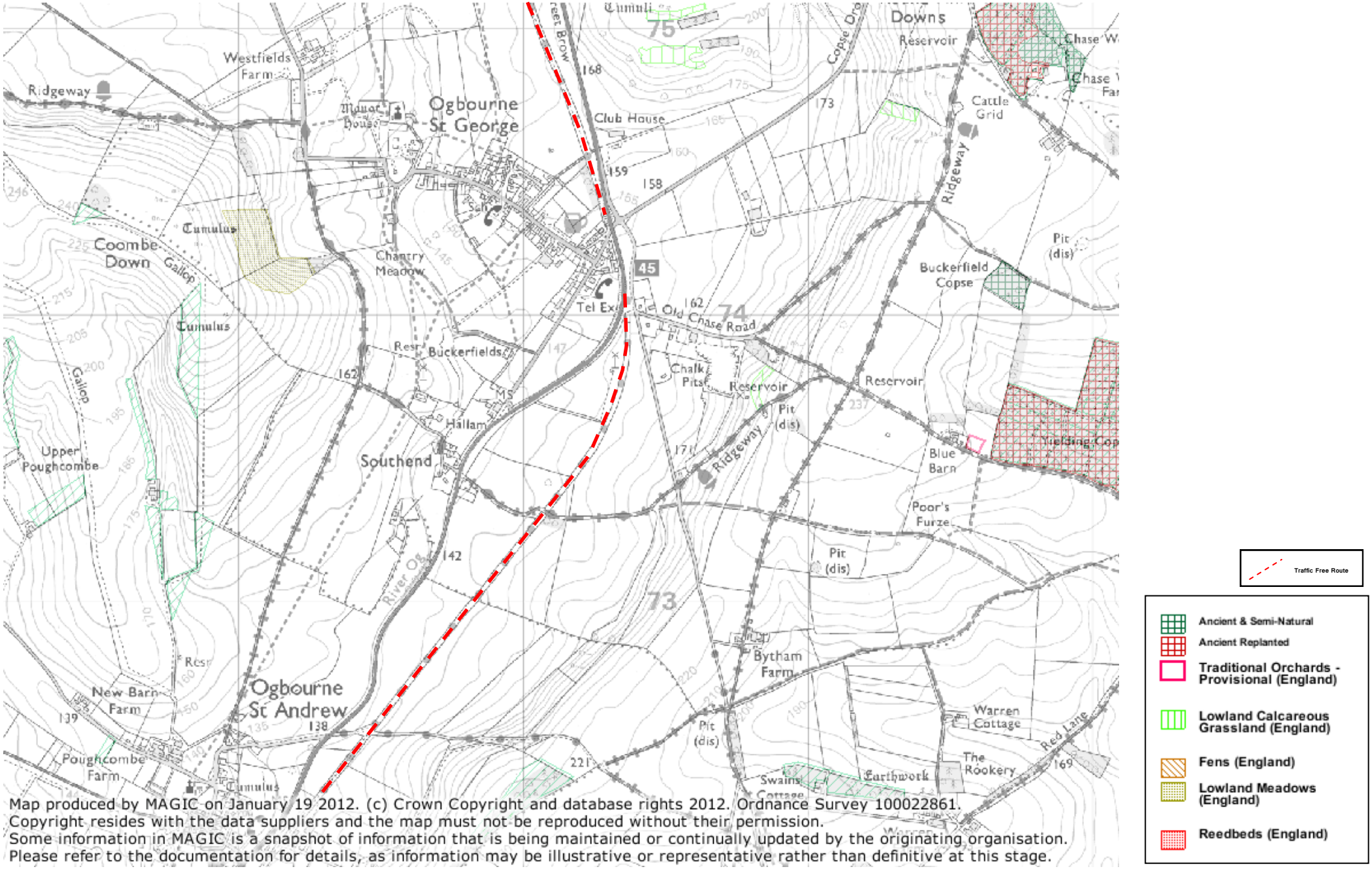


Figure 2.6: Habitat Inventories: Map 4

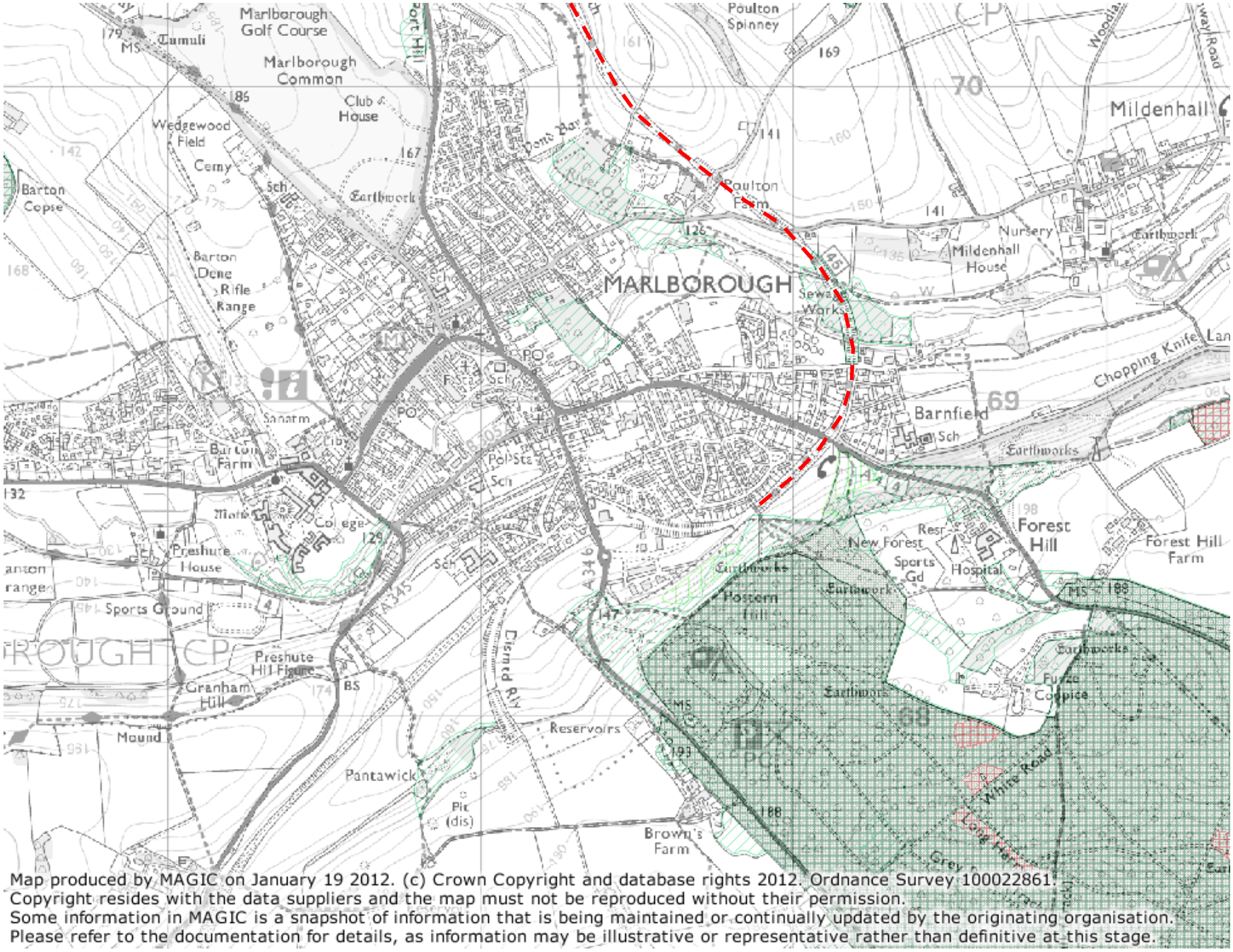


Figure 2.7: Habitat Inventories: Map 5

3 Site Survey

3.1 Habitat Survey

A site visit was conducted to the Swindon to Marlborough Traffic Free Path on 23rd and 24th March 2011 by Hannah Lewis MIEEM (Sustrans Ecologist).

The area under management by Sustrans and adjacent habitats were surveyed. The typical structure of the route comprised a 2 m wide tarmac path, with a 1.5 m mown verge on each side and longer grassland, tall ruderal vegetation, scrub or woodland in the wider verge.

The following Phase 1 habitat types were recorded;

- Amenity Grassland;
- Arable;
- Buildings and hardstanding;
- Dense continuous scrub;
- Dry ditch;
- Fence;
- Improved grassland;
- Intact species-poor hedgerow;
- Intact species-poor hedgerow with trees;
- Plantation woodland;
- Scattered scrub;
- Scattered trees;
- Semi-improved calcareous grassland;
- Semi-improved grassland;
- Semi-natural broadleaved woodland;
- Standing water; and
- Tall ruderal vegetation.

Drawings 3.1 through to 3.8 map out the Phase 1 Habitat Types recorded along the route from north to south. Brief descriptions of the habitats are provided on each drawing. The significance of habitat types and proposed management prescriptions are provided in Section 4.

Oak *Quercus robur* and ash *Fraxinus excelsior*woodland with an understorey of elder *Sambucus nigra* and ground flora of nettle *Urtica dioica*, cleavers *Galium aparine* and lords and ladies *Arum maculatum*.

An area of unmanaged tall ruderal vegetation present dominated by greater willowherb *Epilobium hirsutum* and nettle with other species such as broadleaved dock *Rumex obtusifolium* and hogweed *Heracleum sphondylium* also present.

Semi-natural willow woodland with a ground flora of dogs mercury *Mercurialis perennis*, nettle and lords and ladies.

Plantation woodland comprising cherry *Prunus avium,* lime *Tilia* sp. and field maple *Acer campestre.* Trees are approximately 4m in height and still in rabbit guards.

Hedgerows either side of path. The hedge along the Northern boundary was recently planted in origin in double rows with rabbit guards and growing to 2.5m in height. The other hedgerow was an established hedgerow.

Mature semi-natural oak and ash woodland. The understorey is dominated by dogs mercury and bluebell *Hyacinthoides non-scripta* with lesser celandine *Ranunculus ficaria* present. Sedges, including pendulous sedge *Carex pendula,* and soft rush *Juncus effusus* are also frequent in the sward indicating damp conditions.

Along western side of the path a new hedge was present growing to 2m in height with saplings still in rabbit guards. Hedge comprises blackthorn *Prunus spinosa* and hawthorn *Crataegus monogyna* with dogwood *Cornus sanguinea* also present. Hedge had been flailed recently. Gaps were present in this hedge where a fence acted as the sole filed boundary

Established hedgerow comprising hawthorn, blackthorn and bramble *Rubus fruticosus* agg. located along the eastern side of the path with a dry ditch present. Mature willow *Salix* sp. and oak standards present towards the southern end of this hedge.

Verges and adjacent fields comprised improved grassland.

Approx. 100m

Key

	Buildings and Hardstanding
	Dry Ditch
	Fence
I	Improved Grassland
	Plantation Woodland
	Semi-Natural Broadleaved Woodland
	Species Poor Hedgerow with Trees
	Species-Poor Intact Hedgerow
	Tall Ruderal Vegetation

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Drawing 3.1: Phase 1 Habitat Survey: Map 1

January 2012

Woodland on the west of the path and for approximately 5m on the east of the path comprised semi-natural woodland dominated by oak and willow. Some large mature trees present on both sides of the path. The under-storey included scattered bramble scrub and the ground flora comprised nettle, dogs mercury, lesser celandine, cleavers and lords and ladies.

Map 1

Bramble scrub and dense stands of bracken *Pteridium aquilinum* on edge of woodland.

N

Plantation woodland with trees planted in rows. Young trees approximately 5m in height and of native species including field maple, oak, hazel *Corylus avellana* and cherry. Boundary along path includes mature and very mature specimens assumed to be remnant semi-natural woodland. Understorey comprises grasses and ruderal species such as nettle.

Badger sett with a single entrance recorded immediately adjacent to the path.

Dry ditch alongside path, approximately 1.5m wide and 1.5m deep.

Tall ruderal vegetation included teasel *Dipsacus fullonum* and nettle but was dominated by pendulous sedge indicating slightly wet conditions. Dense continuous bramble scrub present on opposing sides of paths.

Unshaded pond approximately 6m by 3m in size with floating reed grass *Glyceria fluitans* present. The surrounding vegetation was dominated by ruderal vegetation and saplings.

Brick built bridge under adjoining path. In good condition with a blocked archway.

Mature oak specimens at plantation edge including large dead tree.

In the north woodland is mature and dominated by oak with frequent ash, hazel in the understorey and a ground flora that includes dogs mercury.

Route situated on a very high embankment. The steep slopes are wooded and dominated by mature hawthorn. A narrow grassed verge was present along the path edges on the embankment top. These included typical ground flora species including dogs mercury, lords and ladies, nettle and herb Bennet *Geum urbanum* but also species more typical of open grassland such as vetch *Vicia* sp., speedwell *Veronica* sp. creeping buttercup *Ranunculus repens* and ribwort plantain. *Plantago lanceolata.*

At the south of the embankment woodland is more established and includes willow.

Rough hedge comprising a line of young ash trees at the north with a newly planted section of hawthorn hedgerow 1m in height with 3m high young ash standards in the south. A narrow grass verge was present underneath.

Scattered trees on boundary include young ash and young to semi-mature willow with ivy *Hedera helix* dominating the verge.

Approx. 100m

Key	
A	Arable
	Buildings and Hardstanding
	Dense Continuous Scrub
	Dry Ditch
	Fence
	Plantation Woodland
	Scattered Trees
	Semi-Natural Broadleaved Woodland
	Species-Poor Intact Hedgerow
	Standing Water
	Tall Ruderal Vegetation
	Target Note: Feature of Interest too Small to map

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Drawing 3.2: Phase 1 Habitat Survey: Map 2

January 2012

Typical view of this section of the route.

Species-poor semi-improved grassland dominated by perennial rye-grass *Lolium perenne* at the north but becoming more tussocky with species such as cock's-foot *Dactylus glomerata* to the south with forb species tending to be ruderal species more typical of more improved swards such as docks and nettle *Urtica dioica*. Other species present included meadow cranesbill *Geranium pratense*, lesser celandine and vetch *Vicia* sp.

Trees and scrub in this area included ash, field maple and patches of blackthorn and bramble.

Scrub habitats dominated by bramble with semi-mature to mature willows growing amongst the scrub.

Line of hawthorn shrubs likely to be the remnants of a former hedge line, now a gappy line of shrubs. Trees situated approximately 5m apart with ruderal species such as nettle, cleavers and creeping buttercup growing along the boundary.

Mature willow trees

Bramble dominated scrub

3m wide verge comprising semi-improved grassland with high proportions of ruderal species present, predominantly nettle and rosebay willowherb *Epilobium angustifolium.* Scattered hawthorn trees present within the grassland.

Verges dominated by tall ruderal species such as nettle and rosebay willowherb with 3m scattered hawthorn along boundary. Blackthorn invading this habitat from adjacent scrub habitats. Patches of scrub vary, the southernmost being dominated by rose with bramble and hawthorn also present. The northernmost patch dominated by blackthorn with elder and hawthorn occurring at the ends of this habitat patch.

Willow, hawthorn and bramble present on both sides of the path, being scrubby to the east and more resembling scattered trees over a ground flora of nettle to the west. Dog's mercury was present in the groundflora in sections of these habitats. A 1m wide grass verge present along the path was relatively diverse with species such as black knapweed *Cetnaurea nigra,* vetch and herb Robert *Geranium robertianum.*

Scattered willow and hawthorn in a mosaic of tall ruderal vegetation and semi-improved grassland.

Verges dominated by hawthorn and bramble scrub with some patches of tall ruderal vegetation and scattered hawthorn with occasional willow and ash present. The scrub on the western side of the path starting to develop a more woodland type structure for approximately 30m in length. A ditch was present along the base of the eastern embankment.

Verges predominately comprise tall ruderal vegetation, dominated by nettles, with scattered bramble and elder scrub and hawthorn and willow trees.

Plantation of Scots pine with an understorey of nettle, ivy and elder.

Semi-improved grassland with scattered trees. The grassland comprises coarse grasses such as cock's-foot with forbs typical of partially improved swards such as white clover *Trifolium repens* and ribwort plantain. The grassland contains occasional ruderal species such as nettle, broadleaved dock *Rumex obtusifolium*, creeping thistle *Cirsium arvense*. Trees include hazel, willows, ash and Scots pine *Pinus sylvestris*.

Key	
A	Arable
	Buildings and Hardstanding
	Defunct Hedgerow
	Dense Continuous Scrub
	Dry Ditch
	Plantation Woodland
X X	Scattered Scrub
	Scattered Trees
SI	Semi-Improved Grassland
	Tall Ruderal Vegetation

Approx. 100m

Map 4

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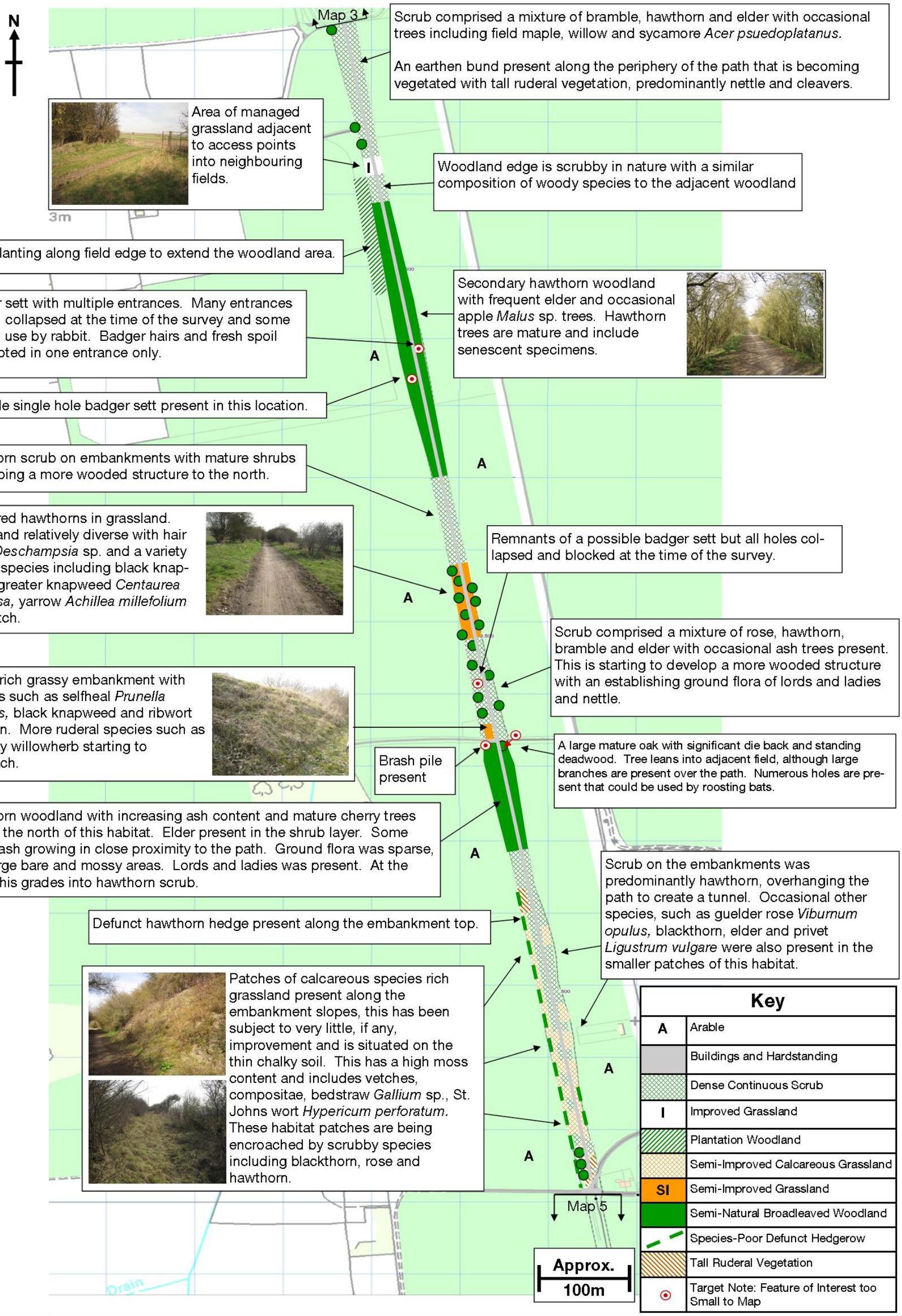
Drawing 3.3: Phase 1 Habitat Survey: Map 3

January 2012



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Drawing 3.4: Phase 1 Habitat Survey: Map 4

January 2012

Map 4

Moderately diverse semi-improved grassland

Tall ruderal vegetation dominated by nettles.

Rough grass and tall ruderal vegetation.

Dense continuous scrub is dominated by semi-mature and mature hawthorn. At the south, the habitat changes to young blackthorn whips with flailed ash and field maple whips.

Flailed species poor hedgerow.

Grassland moderately diverse with species such as greater and black knapweed, bedstraw, vetch and greater mullein *Verbascum thapsus.* Grassland becomes less diverse towards the south and ruderal species such as nettle became more frequent. Scattered hawthorn and a defunct hawthorn hedge were also present in this habitat.

Hawthorn and bramble scrub

Grassland has low diversity with a high proportion of ruderal species such as nettle.

Badger sett with holes on both sides of the path, at the base of the embankments and under the path itself. Likely to be a main sett and was active at the time of the survey with bedding and badger hairs in the spoil at the entrances of the holes.

Dense continuous scrub comprising hawthorn, elder, bramble with scattered trees in the south of this habitat patch and developing a typical woodland ground flora.

Single hole badger sett situated to west of path.

Two hole badger sett situated to the east of the traffic-free path.

More open section of verge with semi-improved grassland with scattered trees and areas of scattered and continuous scrub. The grassland has a variety of forb species present including creeping buttercup, dandelion, vetch and nettle.

Defunct hawthorn hedgerow present along the boundary. Shrubs less sparsely scattered than in other examples of this habitat further north and include mature and younger specimens.

Woodland edge comprises hawthorn and bramble scrub habitat with occasional mature hawthorn. The verges of the path here comprise improved grassland, dominated by perennial rye grass with creeping buttercup, cock's-foot and tall ruderal species such as nettle and hogweed *Sphondylium heracleum*.

Key	
A	Amenity Grassland
A	Arable
	Buildings and Hardstanding
	Intact Species-Poor Hedgerow
	Scattered Trees
	Semi-Improved Grassland
	Semi-Natural Broadleaved Woodland
	Species-Poor Defunct Hedgerow
	Tall Ruderal Vegetation
⊙	Target Note: Feature of Interest too Small to Map

In the northern half of this area of woodland mature ash and willow were present with a dense understorey of hawthorn, willow, dogrose *Rosa canina* and elder. The groundflora is dominated by ivy with lords-and-ladies, bluebell *Hyacinthoides non-scripta* and hart's-tongue fern *Asplenium scolopendrium.* In the southern section, the western embankment comprises self sown ash and willow saplings growing very densely with a defunct hedgerow present on the embankment top.

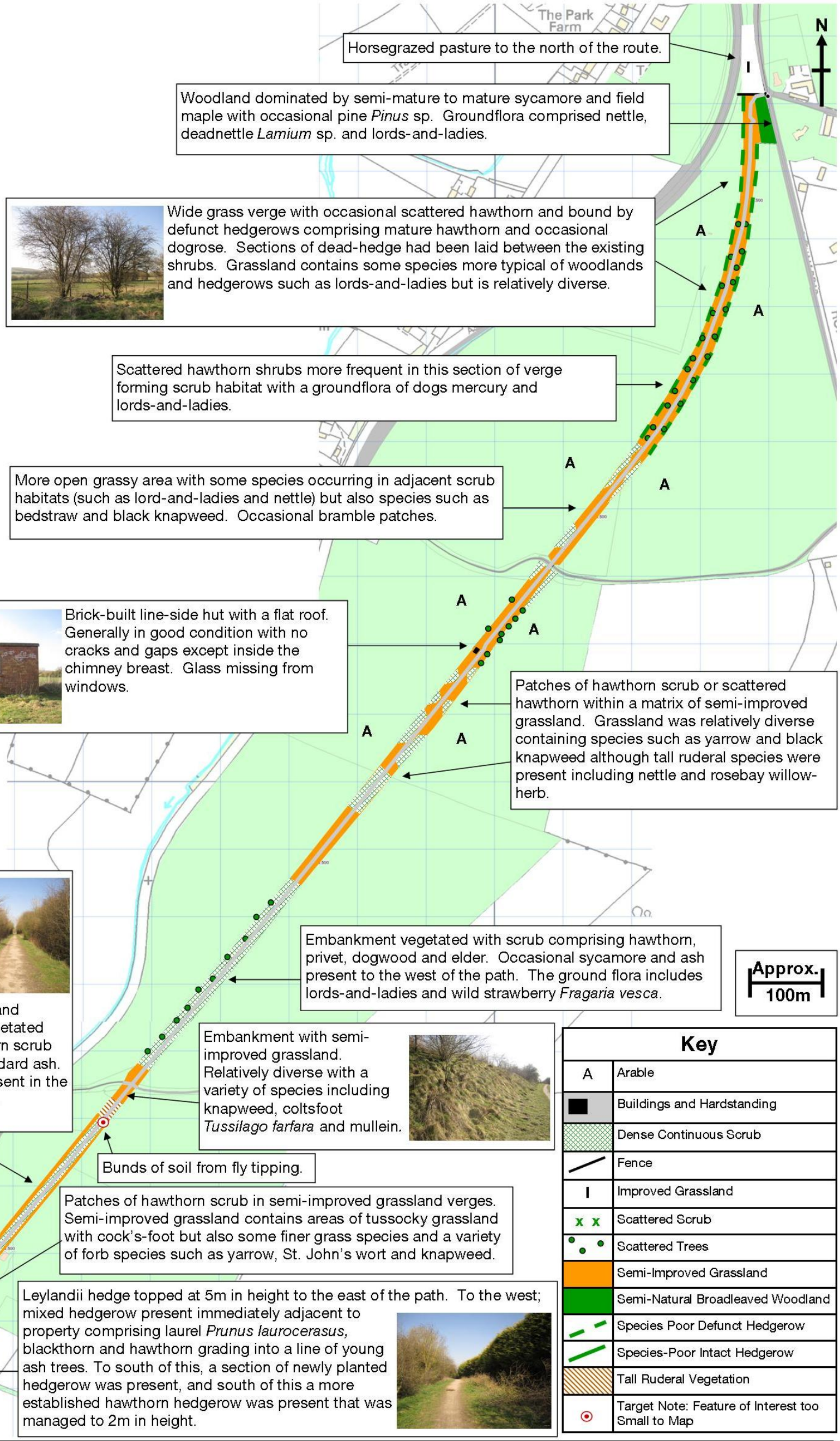
Southern end of woodland comprises a mixture of young, semi-mature and mature trees including sycamore, ash and spruce *Picea* sp. with a ground flora dominated by ivy with bluebells, lords-and-ladies, nettle and cow parsley *Anthriscus sylvestris*.

Approx. 100m

Map 6

Drawing 3.5: Phase 1 Habitat Survey: Map 5

January 2012



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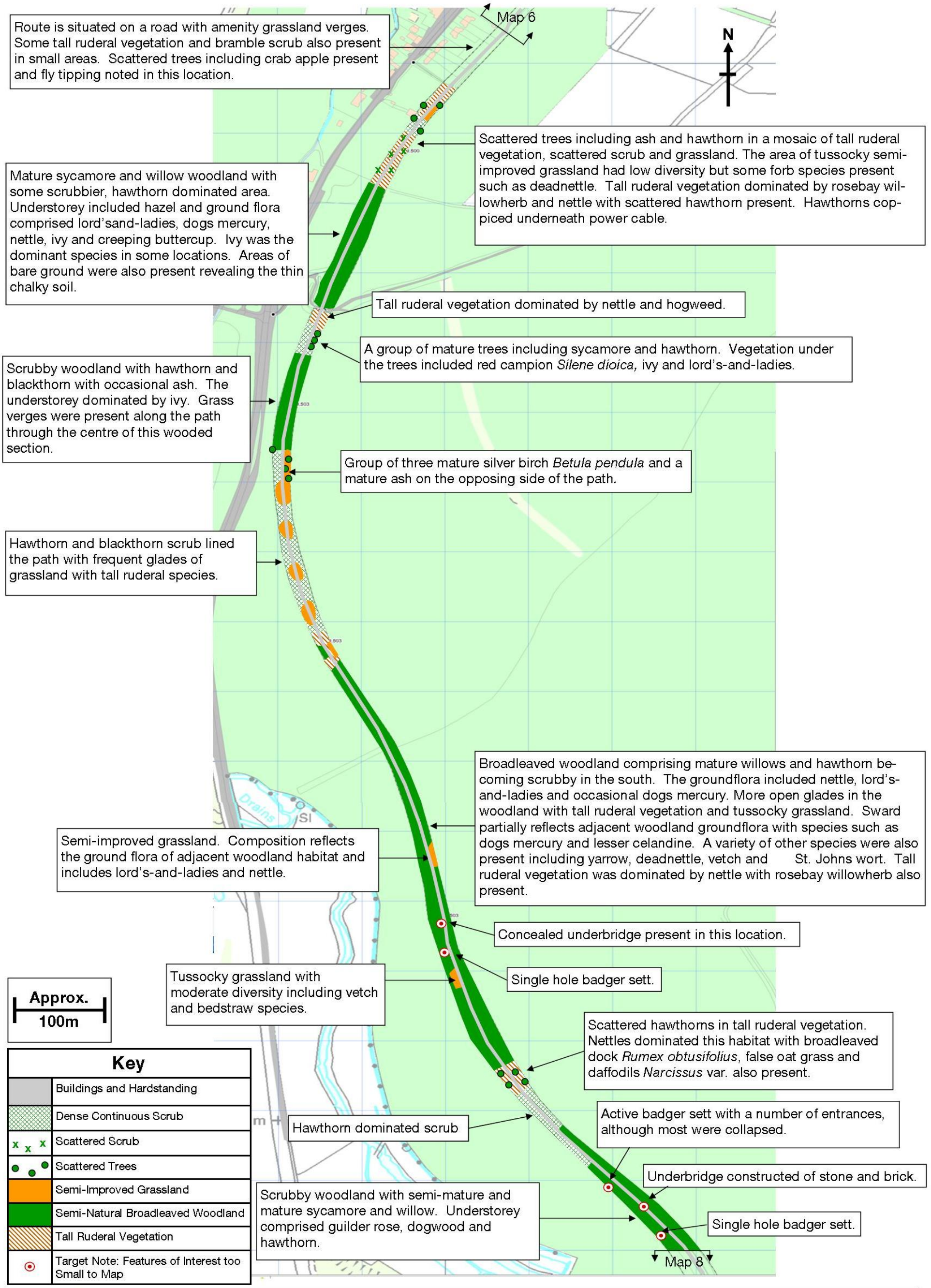
Drawing 3.6: Phase 1 Habitat Survey: Map 6

January 2012



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Drawing 3.7: Phase 1 Habitat Survey: Map 7

January 2012

N

Map 7

Approx. 100m

Diverse scrubby edge to the woodland with elder, hawthron, hazel, dogwood, holly and privet. Some more ash, sycamore and willow present. Groundflora under the scrub is on a thin chalky soil and includes lord's-and-ladies, ivy and wild strawberry with occasional dogs mercury.

Mature woodland dominated by sycamore with ash also present. Ivy covered trees and dominated the ground flora with a variety of other species present including violet *Viola* sp., wild strawberry, herb Bennet and dog's mercury.

Mature sycamore woodland with varied ground flora including ivy, lord's-and-ladies, lesser celandine and nettle.

Mature woodland comprising ash and sycamore. Understorey included stands of saplings in addition to hazel, hawthorn and willow. Again the understorey included ivy, dogs mercury and lord's-and-ladies.

Over-bridge constructed of brick with gaps noted in the brickwork that could be used by roosting bats.

Scrubby trees such as willow and hazel and bramble scrub dominate the area west of the path with nettle growing underneath. The area east of the path was dominated by a dense stand of sycamore growing tightly together. These had an approximate height of 10 to 15m and diameters at 1.5m of less than 10cm.

Over-bridge constructed of brick and stone with numerous gaps noted between the stones that could be used by bats for roosting.

Denser woodland on a less steep embankment. Tree species included hazel, silverbirch, willow and field maple and consequently the woodland had a lower canopy than the adjacent ash/sycamore areas. More saplings present in the understorey with dense growths of whips along the boundary of the path. The ground flora included lord's-and-ladies, dogs mercury and ivy.

Semi-natural broadleaved woodland dominated by ash and sycamore, on a steep embankment. Ivy covers many of the trees. The understorey included elder and currant. The soil was exposed and chalky with a ground flora of nettle, lord's-and-ladies, cleavers, cow parsley and dogs mercury.

Wooded embankment with young to semi-mature ash, willow, hazel and blackthorn. The path verges included woodland species like herb Bennet, creeping buttercup, ivy and lord's-and-ladies with patches of improved grassland, although ruderal species such as nettle, cleavers, dandelion and broadleaved dock were frequent.

The route passes high over River Kennet.

Woodland comprises semi-mature to mature ash and hawthorn with younger beech, hazel and elder present. The groundflora comprised ivy, lord's-and-ladies and violet.

Brick over-bridge with concrete deck.

Row of Lawson cypress *Chamaecyparis lawsoniana* along boundary in rosebay willowherb dominated ruderal vegetation.

Mature sycamore and ash woodland with an understorey of hazel, elder and laurel. Ivy and honeysuckle *Lonicera periclymenum.* More open glades present. Groundflora dominated by tall ruderal species such as cow parsley, cleavers, nettle and jack-by-the-hedge *Alliaria petiolata*. Other species present included bluebell, ground elder, lesser celandine and harts tongue fern.

Line of mature, ivy covered hawthorn shrubs along boundary. Likely remnants of a former boundary hedge.

Area dominated by bindweed.

Brick and stone over-bridge with numerous gaps suitable for roosting bats.

Defunct hazel and blackthorn hedge with ground flora comprising ivy, lesser celandine, hart's-tongue and lord's-and-ladies.

Scattered yew *Taxus baccata*, beech *Fagus sylvatica* , sycamore, cherry, willow, ash and horse chestnut, including mature trees in scrub and tall ruderal vegetation. Ruderal vegetation dominated by nettle but scrub habitat more diverse and included blackthorn, privet, bramble, dogwood and hazel. A 5m by 4m stand of Japanese knotweed was also present in this location.

5m wide band of scrubby woodland comprising ash, sycamore, beech and field maple. Understorey of privet, hazel, yew and holly. Honeysuckle and ivy growing on trees. Ground flora comprised lesser celandine, lord's-and-ladies and ivy. A strip of tall ruderal vegetation, dominated by nettle, was present between the woodland and the residential housing.

Key

	Buildings and Hardstanding
	Dense Continuous Scrub
	Semi-Natural Broadleaved Woodland
	Scattered Trees
	Species-Poor Defunct Hedgerow
	Species-Poor Intact Hedgerow
	Tall Ruderal Vegetation
	Target Note: Feature of Interest too Small to Map

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Drawing 3.8: Phase 1 Habitat Survey: Map 8

January 2012

3.2 Fauna Recorded

Three mammal species were recorded during the field survey; rabbit *Oryctolagus cuniculus*, grey squirrel *Sciurus carolinensis* and shrew *Sorex* sp. Badger *Meles meles* setts were also recorded along the route. The locations and brief descriptions are shown on Drawings 3.1 to 3.8.

Two butterfly species were recorded; peacock *Inachis io* and comma *Polygonia c-album.*

A variety of bird species were recorded, these are listed in Table 3.1 and include common species and those of conservation concern. Nest boxes had been installed in the semi-natural broadleaved woodland on Drawing 3.2. Many of these had missing panels rendering them unusable.

Scientific Name	Common Name
Aegithalos caudatus	Long tailed tit
Alaudia arvensis	Skylark
Anas platyrhynchos	Mallard
Columba oenas	Stock dove
Corvus corone	Crow
Corvus frugilegus	Rook
Cyanistes caeruleus	Blue tit
Cygnus olor	Swan
Dendrocopus major	Great spotted woodpecker
Egretta garzetta	Little egret
Emberiza calandra	Corn bunting
Erithacus rubecula	Robin
Milvus milvus	Red kite
Motacilla alba	Pied wagtail
Parus major	Great tit
Phasianus colchicus	Pheasant
Prunella modularis	Dunnock
Pyrrhula pyrrhula	Goldfinch
Troglodytes troglodytes	Wren
Turdus merula	Blackbird

Table 3.1: Bird Species Recorded

4 Discussion and Management Recommendations

4.1 Discussion

4.1.1 Landscape and Designated Conservation Sites

The disused railway corridor between Chiseldon and Marlborough is designated as a Wildlife Site for its mosaic of habitats with scrub and grassland including unimproved calcareous grassland. The retention of the mosaic effect of habitats and the maintenance of the calcareous grassland are therefore management priorities,

The desk study and field survey identified the following considerations of the proposal in relation to the role of the greenway in the landscape;

- The hedgerow and ditch between Coate Water and the M4 could support notable species found in the SSSI but, from satellite imagery are not thought to be of great significance in connecting features in the landscape.

- The trees and hedgerows along the greenway between the M4 and Chiseldon increase connectivity between Burderop Wood and other nearby areas of woodland. As species associated with ancient woodland often require continuous habitat, this is an important role of this section of route in the landscape.

- The route between Chiseldon and Marlborough forms an almost continuous strip of hedgerow, scrub and trees or woodland through an otherwise very bare landscape dominated by arable land. As such it may act as an important wildlife refuge in the immediate landscape and be used as a commuting route for fauna such as some bat species.

- The almost continuous line of scrub and trees links the Savernake Forest (ancient woodland) with woodland on the River Kennet, and to hedgerows that potentially link it with further copses. Again, this may be important in facilitating the dispersal of species associated with established woodland. Species such as dog's mercury, normally associated with ancient and established woodlands, were noted frequently along the former railway embankments along this section. A gap at Ogbourne St George severs this section from that to the north.

- Small patches of calcareous grassland listed on the national inventory and identified in other Wildlife Sites were scattered through the landscape. Patches of this habitat and other areas of semi-improved grassland may act as habitat stepping stones halving the distance between calcareous grasslands in Marlborough Downs and the Upper Upham area, thus increasing connectivity in the landscape.

4.1.2 Habitats

The mosaic of different semi-natural habitats that occur along the route has very high local value, regardless of the value of individual habitats. In an intensively managed landscape the former

railway line provides shelter and increased foraging resources for wildlife in the wider landscape. The most notable individual habitat types recorded along the route were;

- The patches of calcareous grassland were notable considerations for the management of this route. This habitat is a priority on the Sustrans, UK and Local Biodiversity Action Plans. Wiltshire is internationally noted for its calcareous grassland but this habitat is declining through lack of management. This habitat can support a high diversity including rare and notable species. Information from a local resident indicates that orchids occur in this habitat type. The retention and expansion of these habitat patches is a priority of route management.

- The semi-improved grasslands recorded elsewhere varied in structure and composition. Some patches included species typically associated with calcareous conditions but had a greater level of sward improvement. With appropriate management these could increase in sward diversity and could support species more associated with calcareous grasslands. Further botanical investigation at a more appropriate time of year will clarify the plant communities present.

- Chalk scarp woodland and chalk scrub are also a notable habitat. The adjacent mature woodland at the south of the route was mixed but included beech and yew (typical chalk scarp woodland species) with sycamore and ash also frequent. The majority of woodland and mature scrub along the former railway line comprised hawthorn. Whilst this is not typical of chalk scarp woodland, it may still support the unusual ground flora and fungi that chalk scarp woodland is noted for.

- Hedgerows were present along frequent sections of the boundary of the railway corridor but, through lack of management are developing into lines of leggy shrubs. Hedgerows are a priority on the Sustrans and UK Biodiversity Action Plans and these defunct, gappy specimens have reduced value to wildlife in comparison to an intact hedgerow. Whilst some shrubs may be too mature to easily bring back into hedgerow management others could be and measures to further fill in gaps would be beneficial to a range of fauna.

The presence of Japanese knotweed to the south of Marlborough will also be a consideration of management in that location.

4.1.3 Fauna

Fauna that could be notable considerations of a management plan along this route include;

- Invertebrates: Invertebrate assemblages associated with calcareous habitats, primarily calcareous grasslands but also scrub and woodland on chalk can be very diverse and support unusual species. The desk study identified a number of invertebrate records including species on UK red lists and the UK Biodiversity Action Plan. Management for invertebrates should focus on retaining a mosaic of habitats with high structural and floral diversity. Of the three butterfly species of note recorded on the old railway line the small blue butterfly is dependent on calcareous grassland, the wall butterfly is associated with short

grassland swards with patches of bare ground and the wood white is associated with scrub and woodland clearings. Habitat suitable for all these species was present on site but require management to be maintained in the long-term. Specific recommendations that will do this are provided in the drawing and Section 4.3.

- Birds: Birds recorded or likely to occur along the route included those conservation concern. In this intensively farmed landscape the appropriate management of the route will increase food for birds throughout the year and provide an important food resource. Birds are also a consideration of habitat management they are legally protected whilst nesting and must be considered during vegetation clearance during the nesting season (generally considered to extend between March and September inclusive).

- Bats: Records of ten bat species were identified in the area by the desk study. Bats could roost in the bridges and in the mature trees noted to have holes and crevices. These are a consideration of any tree felling or bridge repair works. The retention of a continuous line of scrub/woodland/trees along the route between Chiseldon and Marlborough would also be important to retain this as a route for bats to commute through the otherwise more inhospitable landscape; this is particularly important given the proximity of the Marlborough Railway Tunnel Wildlife Site.

- Dormouse: Records of dormouse were identified in Savernake Forest and a small woodland patch to the east of Ogbourne Maizey. This species is very dependent on continuous woodland and hedgerow to move through the landscape. These habitats along the route may therefore be important in linking Savernake Forest and the more isolated patches of woodland in the landscape thus allowing them to support a population of this endangered mammal. The retention of hedgerows for dormouse will also benefit species such as harvest mouse.

- Badger: Badger setts are present along the route. They would benefit from any management to increase the invertebrate diversity along the route but are also a consideration of route management works as they are legally protected and could be affected by activities such as tree felling and digging out ditches or repairing the pathway.

Many other species groups, including reptiles, amphibians, birds and mammals will benefit from the appropriate management of habitats for invertebrates as it will improve the foraging value of the land. Any major landscape works should take reptiles and great crested newts into consideration as they receive statutory protection against injury and death caused by construction work. The management prescriptions proposed in this plan, and the ongoing maintenance works are unlikely to pose a risk to amphibians and reptiles.

4.2 Primary Management Aims

Given the notable landscape, habitat and species considerations listed above the primary aims of management of this route should be to;

- Maintain a continuous corridor of scrub/hedgerow/woodland along the route especially between the Savernake Forest and Ogbourne St. George where dormice may be present.

- Maintain the calcareous grassland habitats through targeted clearance of the invasive scrub and meadow management.

- Maintain and potentially increase the diversity of the semi-improved grassland patches along the route and identify the botanically most interesting areas for priority management.

- Increase the structural diversity of habitats along the route by creating more scalloped edges, ecotones (graduated edges to the woodland) and more open glades.

Maps 4.1 to 4.8 list specific management prescriptions in individual locations. These management suggestions contribute to these primary aims and also include more specific localised management recommendations.

Another focus of work on the Greenway would be to more accurately identify the ecological baseline of the route. The calcareous habitats that this route supports could include rare and notable species, particularly of lichens, mosses, invertebrates and flowering plants. The formation of working partnerships with local nature groups and local experts would enable this.

4.3 Habitat Management Prescriptions

Location specific management prescriptions are summarised on the Drawings 4.1 to 4.8 with location specific variations noted on those drawings. Links to further guidance relating to habitat management are provided on the Susnet. Management prescriptions in areas of similar habitat will often be the same. These are referenced on the Drawings 4.1 to 4.8 with location specific variations noted on those drawings and described in more detail below.

Hedgerows

Specific management recommendations have been provided on Drawings 4.1 to 4.8 in relation to recently planted hedgerows.

Bringing defunct hedgerows back into management would be beneficial throughout the route but priority should be given to the section of route between Savernake Forest and Ogbourne St. George where dormice could be present. The extent to which defunct hedgerows can be bought back into management will depend on the frequency and age of existing shrubs. It is anticipated that advice from a hedge laying expert will be required to advise on suitable locations to bring hedgerows back into management and to instruct Rangers in the techniques involved. Where significant gaps exist, infilling these with native species such as hazel, field maple, dog rose and guelder rose would be beneficial. Planting honeysuckle *Lonicera periclymenum* into the hedgerow would also be beneficial to dormouse. Smaller gaps that cannot be filled by laying could be filled by creating a dead

hedge in this location. This helps retain a continuous feature for wildlife to travel along. Instructions on creating a dead hedge are available on the Susnet.

Intact, established hedgerows should be managed in accordance with Ecology Technical Information Note 1, available on the Susnet. The main points to note being;

- Hedgerow trimming should be conducted in Jan/Feb;
- Each hedgerow should be cut approximately every third year; and,
- Hedgerows should be cut on a rotational basis so that not all hedgerows are cut in the same year.

These hedgerows may also need periodic laying or coppicing to keep them in hedgerow for and maintain a dense structure.

Grassland Management

Similar management recommendations are made to manage all the areas of semi-improved grassland with variations from this approach listed on the individual drawings. Grasslands should be managed in accordance with Ecology Technical Information Note 2, available on the Susnet. These areas of grassland could benefit from slightly different management regime dependent on the exact communities present. It is recommended that this basic procedure is followed until further, more detailed information and advice is available. The main points to note being;

- Maintain structural diversity – retain small patches of scrub, small areas of tall ruderal vegetation (nettles and thistles etc), leave any bare ground to re-vegetate naturally and leave some sections of grassland uncut to create a mosaic of longer and shorter grass. Where possible, the boundaries between these zones should be scalloped rather than straight.
- Maintain and enhance species diversity by mowing the grassland annually, after the flowers have set seed (approximately late August to September) and removing the arisings. This will reduce nutrient enrichment and the dominance of grass and ruderal species. The frequency and timing of cuts may be altered upon receipt of more detailed information regarding the communities present,
- Prevent scrub invasion – cut back scrub to prevent significant invasion of the grassland. This should be conducted in a rotational basis so that not all scrub is cut back in one year to maintain structural diversity.

It is anticipated that not all grasslands will be brought into management immediately as it will be labour intensive. The grasslands have therefore been listed as having, high, moderate or low priorities.

- High priority grasslands are the calcareous grassland and semi-improved grasslands with high diversity;

- Moderate priority grasslands are those that have moderate diversity and could be enhanced through the right management or lower diversity grasslands that are an important structurally and at risk of becoming invaded by tall ruderal vegetation/scrub; and,

- Low priority grasslands are more improved swards that the right management would maintain but are less likely to develop into more diverse grasslands without intensive intervention measures.

The grass verges immediately adjacent to the path may need to be mown more regularly than this to prevent vegetation encroaching the path. This should be assessed on a flexible basis, maintaining this grassland management approach wherever possible.

Woodland Management

A non-intervention approach is recommended in the semi-natural woodland areas. This is to maintain naturalness and allow trees to develop into maturity.

Deadwood is a very important feature of woodlands and a variety of deadwood features should be maintained. Where standing deadwood is present, this should be maintained wherever feasible. Where dead trees immediately adjacent to the paths must be removed for health and safety purposes, consideration should be given to leaving a standing trunk or stump in place. Any wood from felled trees or pruning should be used to create log piles within the woodland. Fallen deadwood should not be relocated once it is settled into a location.

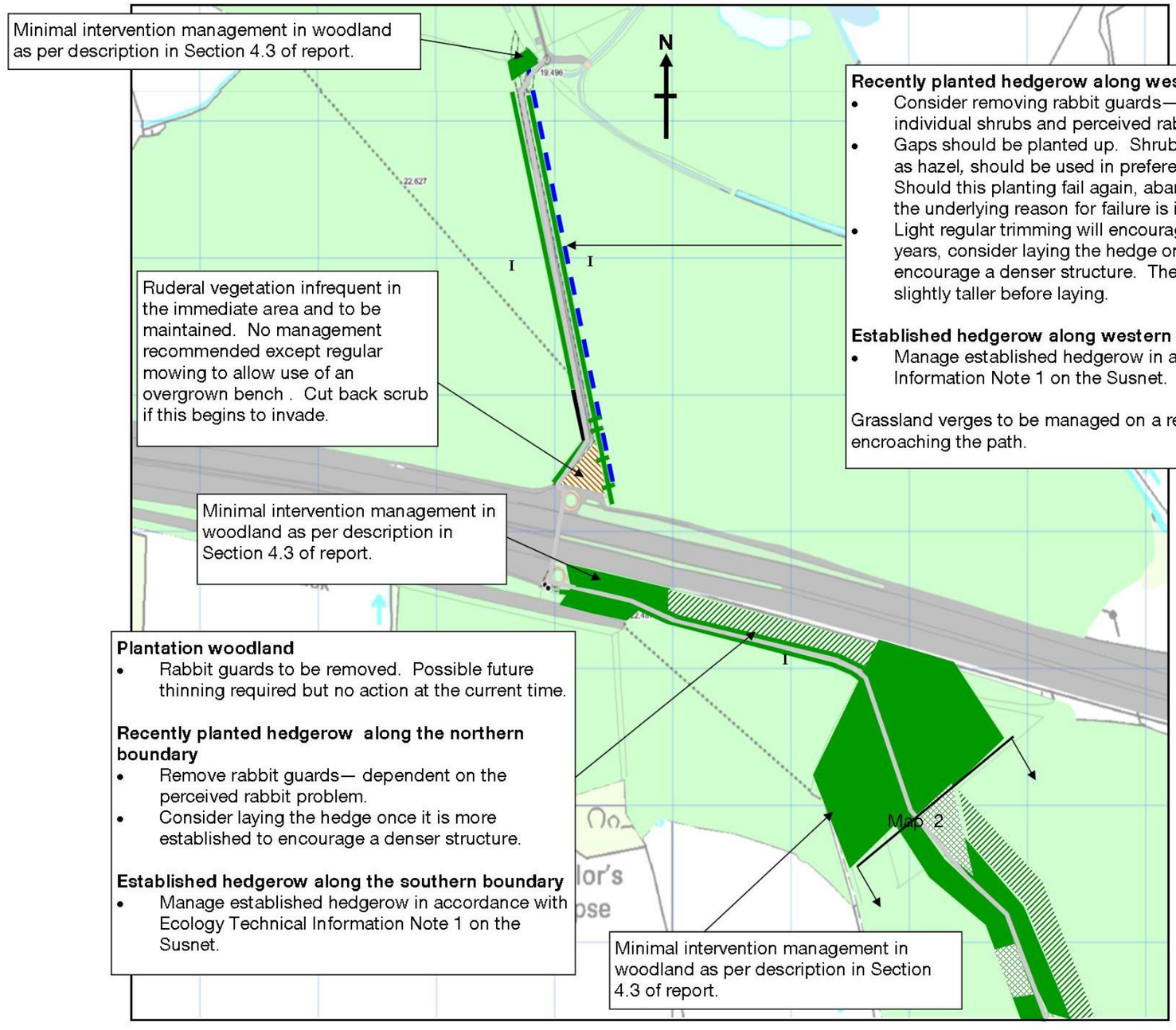
Where tree felling is required be aware of the presence of protected species in the woodland.

- Vegetation clearance should be conducted outside the bird nesting season (which is generally considered to extend between March and September inclusive but is weather dependent).

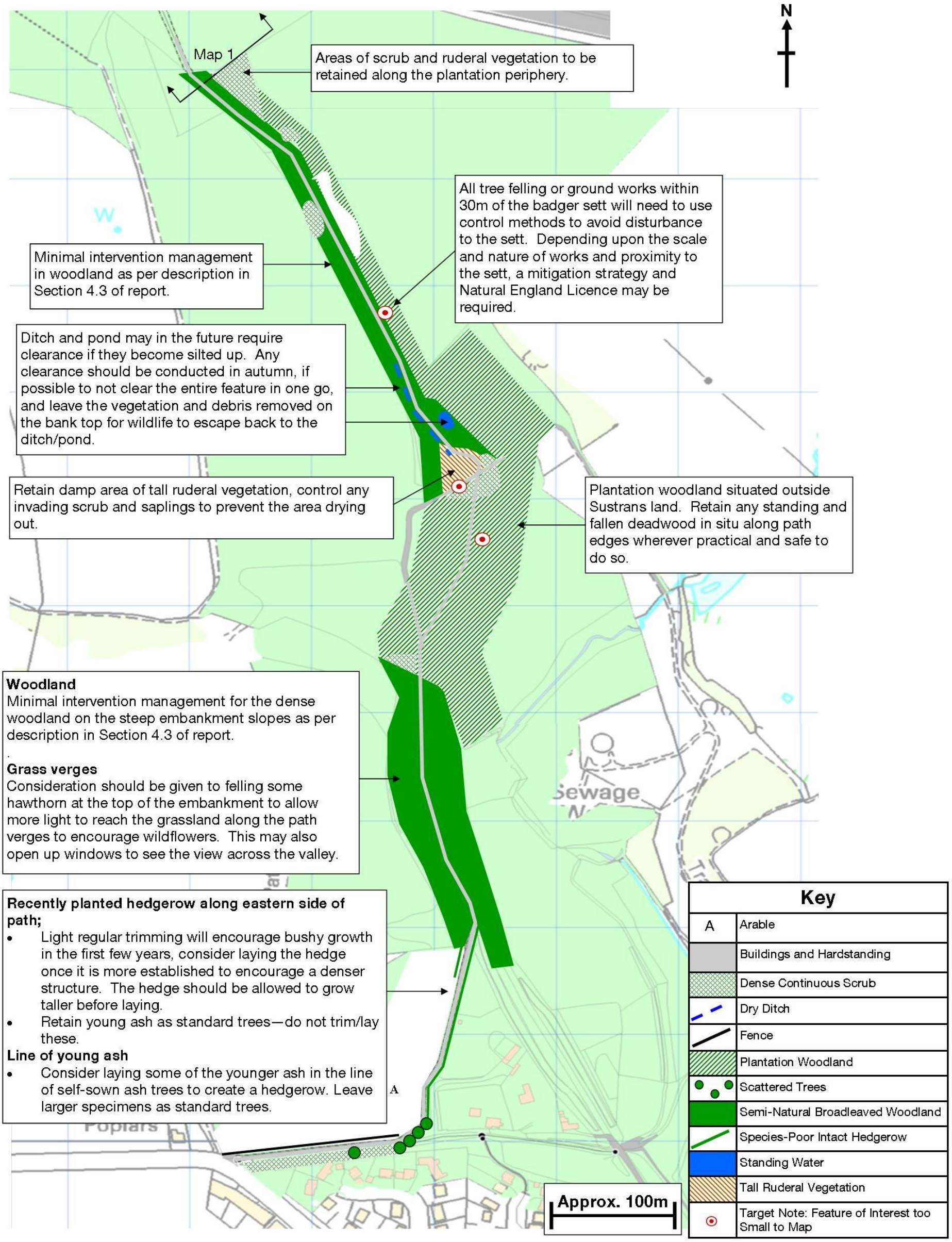
- Consultation with a suitably experienced ecologist is recommended before any significant tree felling within 30m of a badger sett.

- Any trees with holes, cracks or crevices should be inspected for bats by a suitably experienced person prior to felling.

Further botanical study of the scrub and woodland habitat, particularly of their mosses and lichens, would be beneficial to identify flora of interest.



sustrans JOIN THE MOVEMENT	Drawing 4.1: Habitat Management Recommendations: Map 1	January 2012



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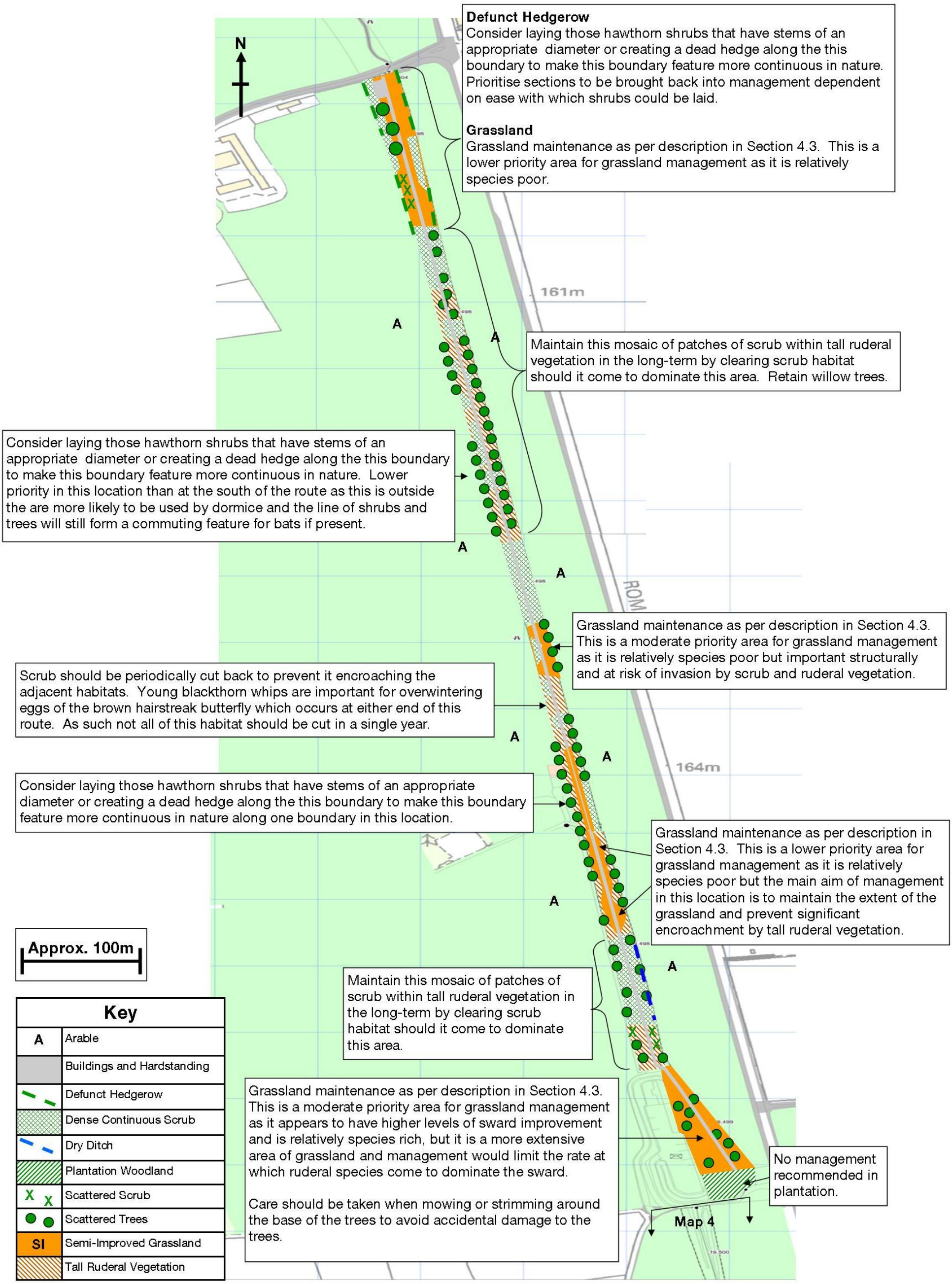

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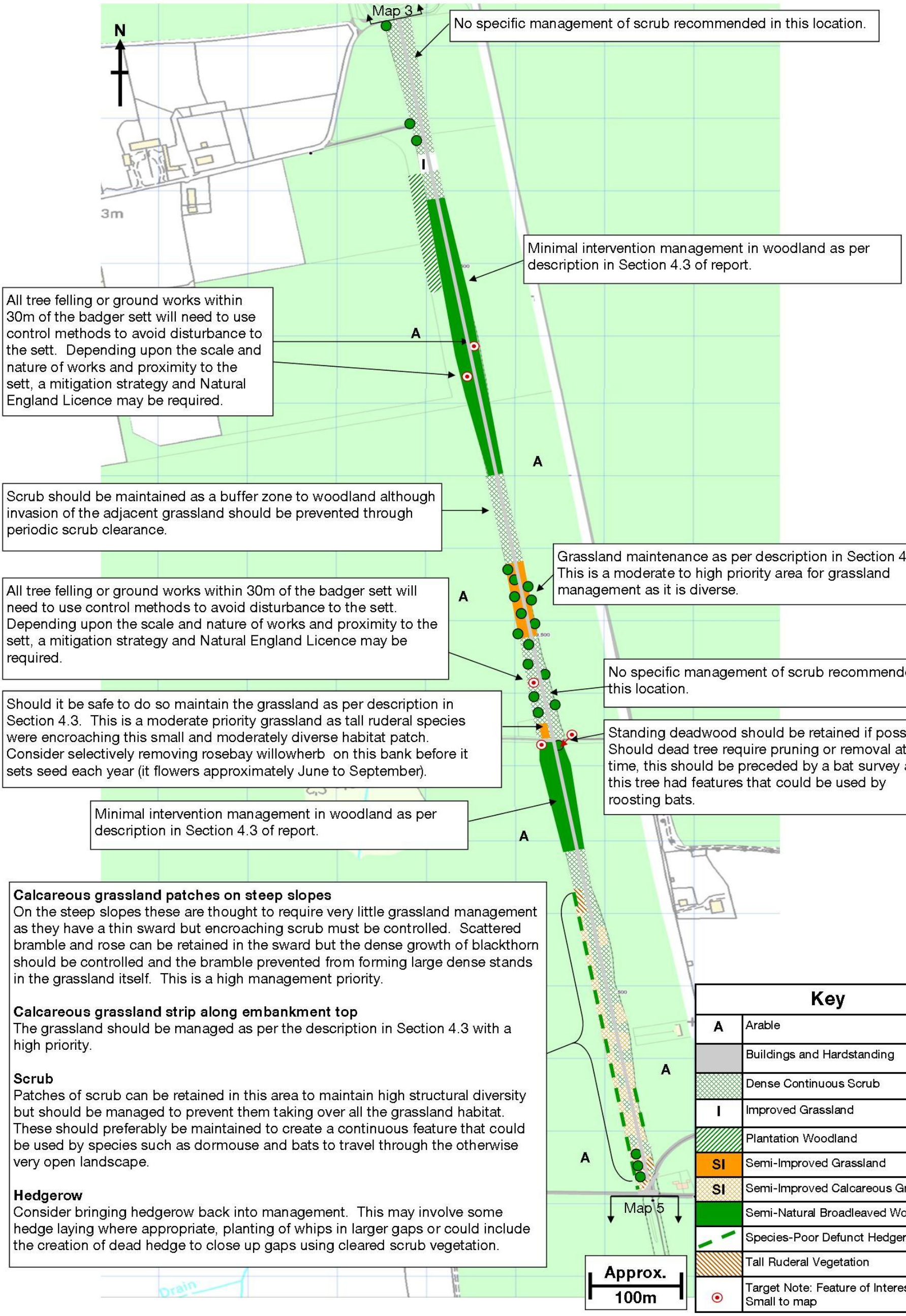
Drawing 4.3: Habitat Management Recommendations: Map 3

January 2012



Calcareous grassland patches on steep slopes
On the steep slopes these are thought to require very little grassland management as they have a thin sward but encroaching scrub must be controlled. Scattered bramble and rose can be retained in the sward but the dense growth of blackthorn should be controlled and the bramble prevented from forming large dense stands in the grassland itself. This is a high management priority.

Calcareous grassland strip along embankment top
The grassland should be managed as per the description in Section 4.3 with a high priority.

Scrub
Patches of scrub can be retained in this area to maintain high structural diversity but should be managed to prevent them taking over all the grassland habitat. These should preferably be maintained to create a continuous feature that could be used by species such as dormouse and bats to travel through the otherwise very open landscape.

Hedgerow
Consider bringing hedgerow back into management. This may involve some hedge laying where appropriate, planting of whips in larger gaps or could include the creation of dead hedge to close up gaps using cleared scrub vegetation.

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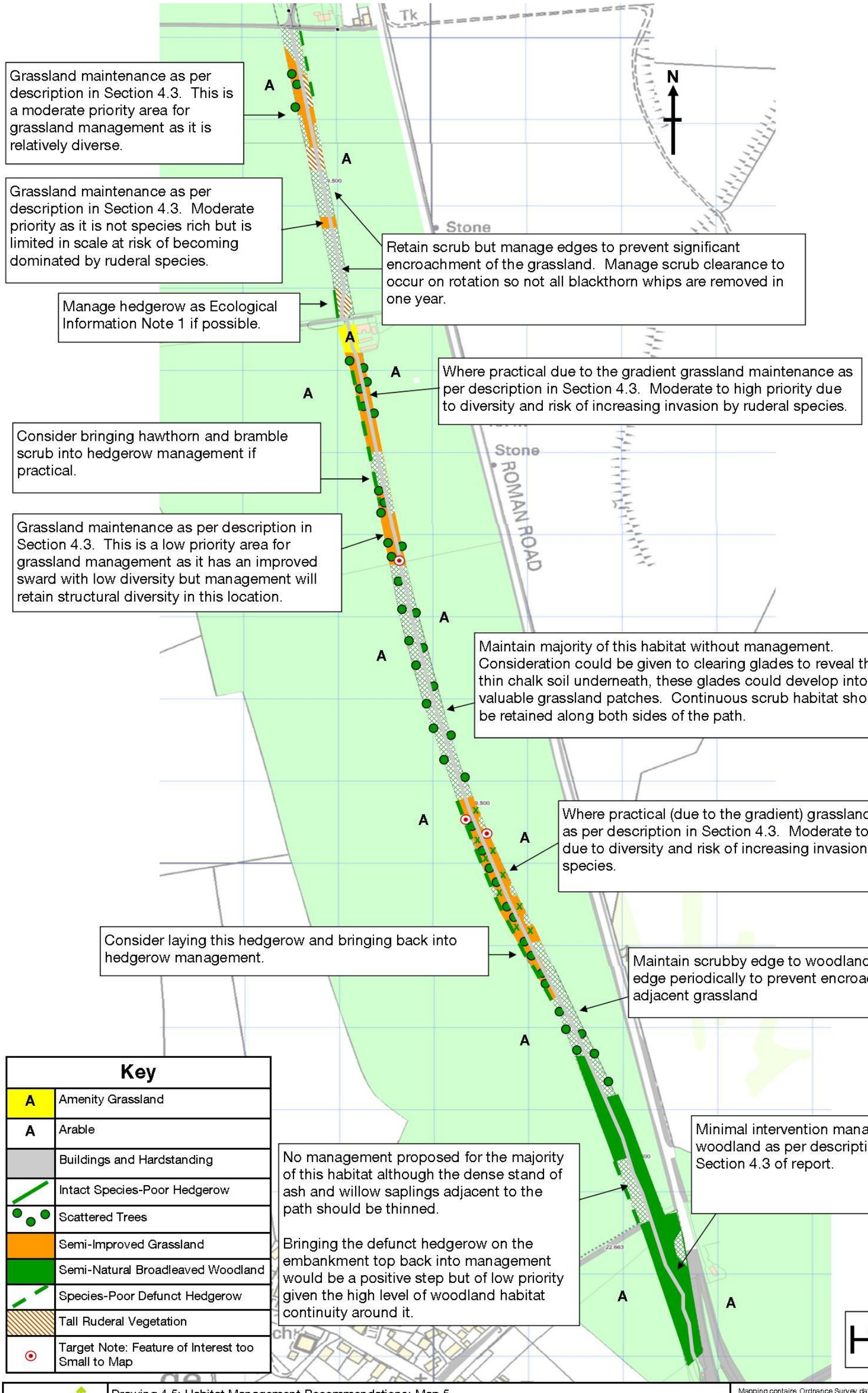
Drawing 4.4: Habitat Management Recommendations: Map 4

January 2012



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Drawing 4.5: Habitat Management Recommendations: Map 5

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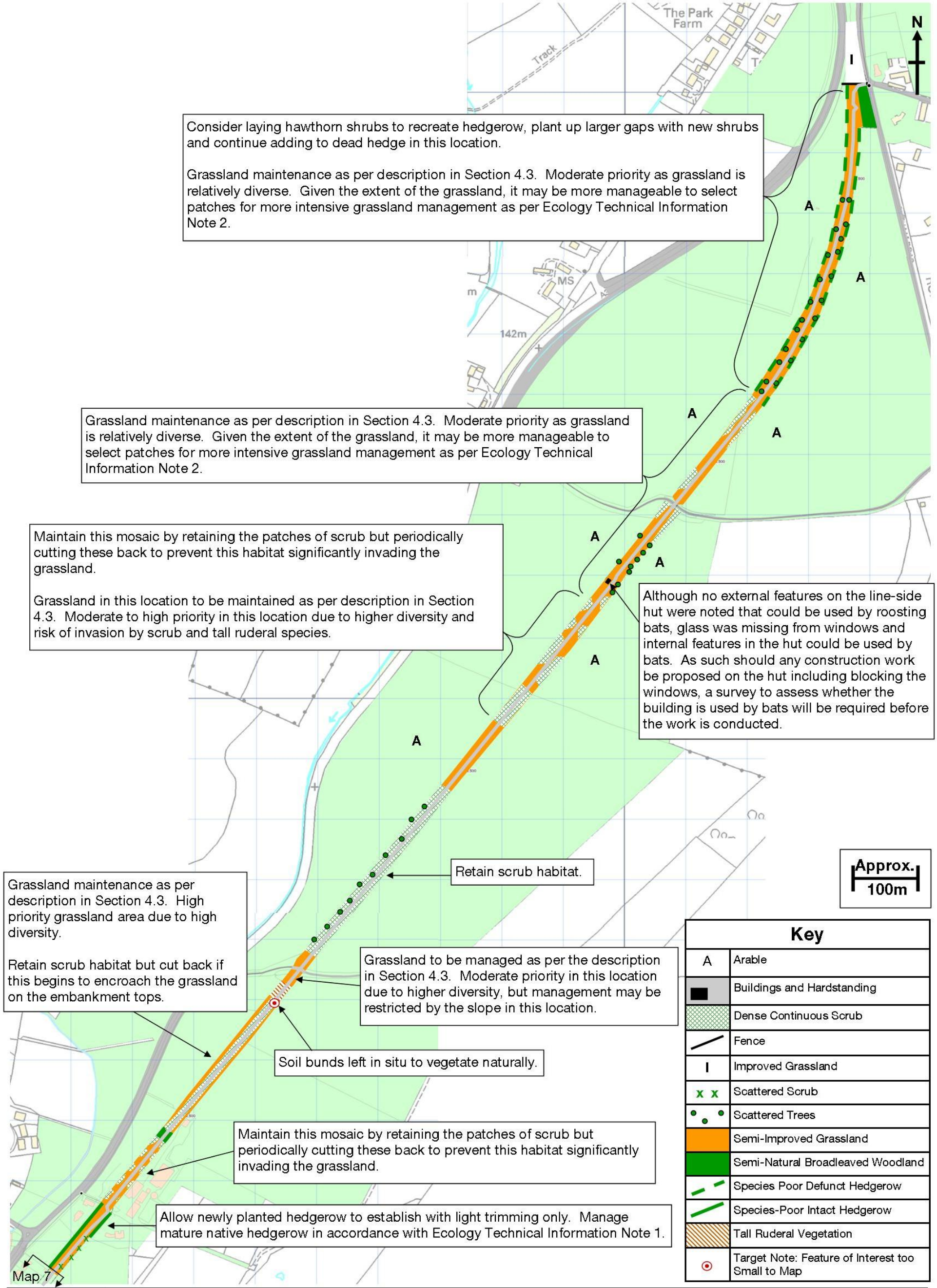

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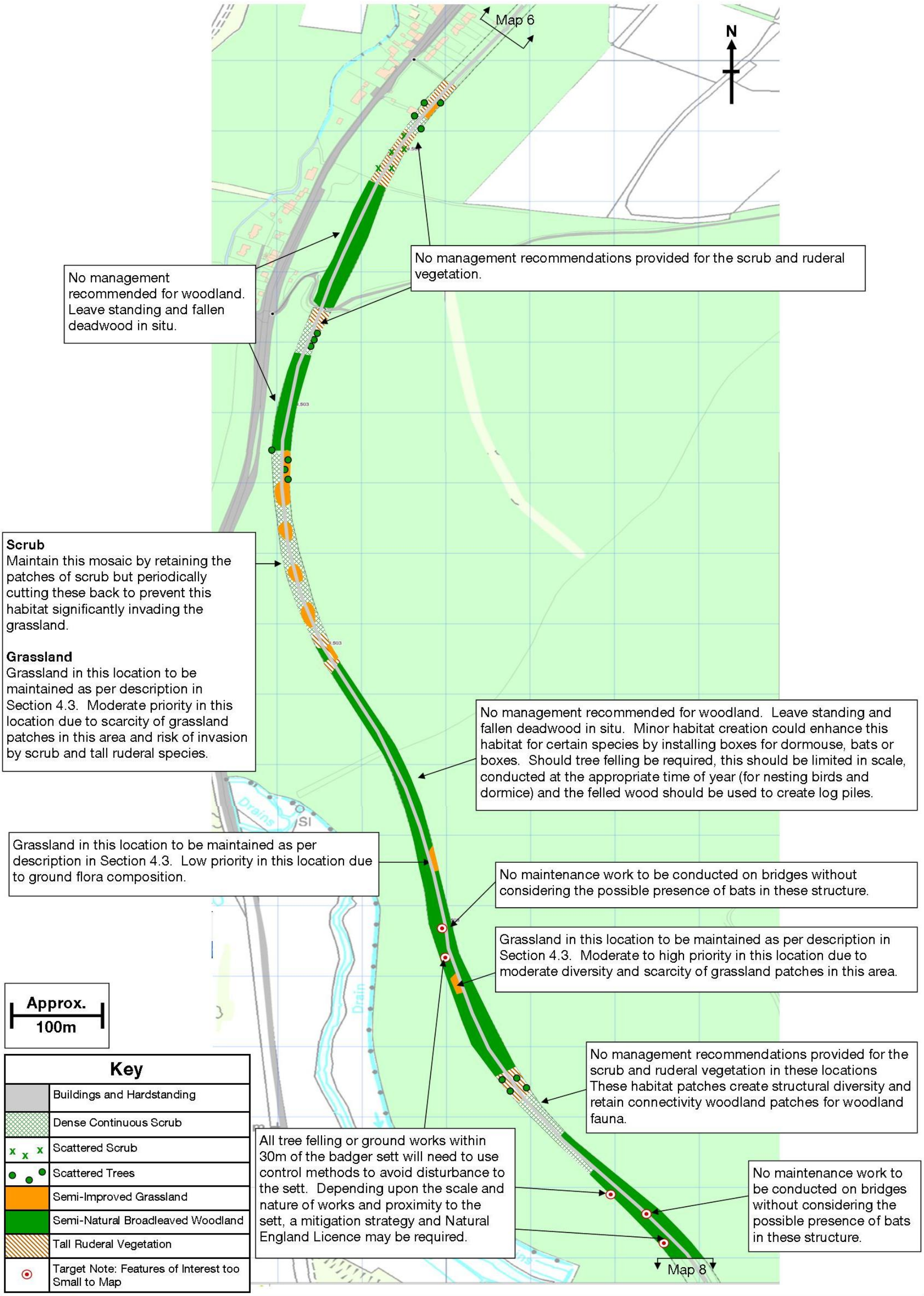
Drawing 4.6: Habitat Management Recommendations: Map 6

January 2012



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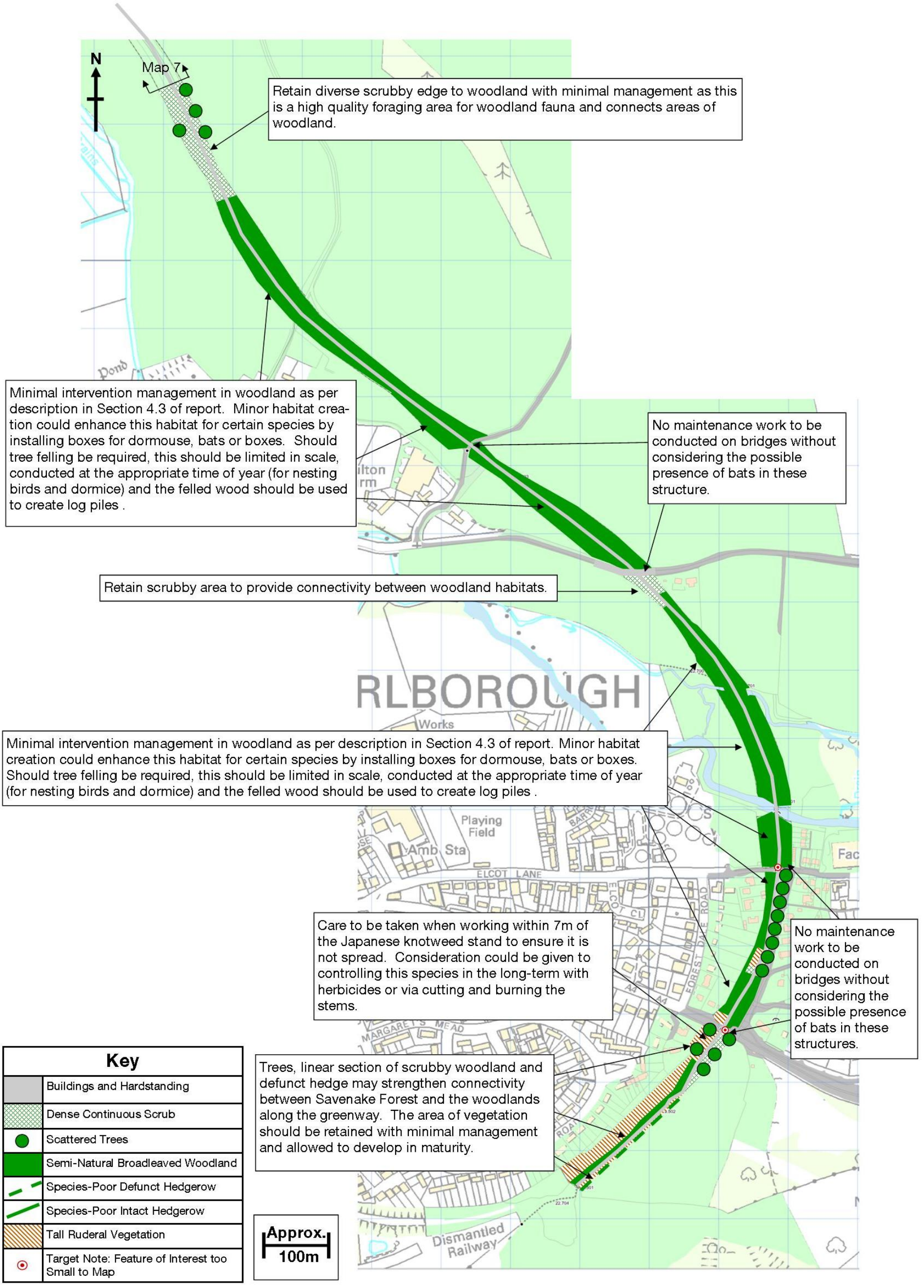
Drawing 4.7: Habitat Management Recommendations: Map 7

January 2012



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4.4 Additional Habitat Enhancement Proposals

The primary aim of management proposals along the route are to manage habitats to increase their structural and species diversity and to combat habitat fragmentation.

Additional species specific enhancements have already been included within the general habitat management prescriptions, but additional measures that could also be considered include;

- The installation of bat, bird and dormouse boxes – although consideration should be given to whether these are at risk from vandalism;
- The creation of deadwood piles for invertebrates and fungi, although again the risk of vandalism will need to be considered; or
- The creation of hibernacula for reptiles and amphibians.

Links to instructions on how to create these can be found on Susnet, and advice can also be sought from local nature interest groups and the Local Authority ecologist.

References and Bibliography

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