

BARKWAY CHALK PIT

GREENSPACE ACTION PLAN (GAP)

2018 – 2023



Site Summary

Site name:	Barkway Chalk Pit
Site Address:	Royston Road, Barkway, Royston, Hertfordshire
Grid Ref:	TL 381 366
Size:	0.33 ha
Ownership:	North Hertfordshire District Council
Designations:	Local Wildlife Site 08/020 Regionally Important Geological Site (RIGS) Denotified SSSI (1953-87)

Brief

Barkway Chalk Pit is a secluded site, of interest both for its geology and for its potential to support areas of rare chalk grassland. This Greenspace Action Plan proposes actions to:

- Protect and enable viewing of the geological interest
- Maximise the site's ecological value through chalk grassland restoration
- Put in place a schedule of ongoing management to maintain the site and access in the longer term
- Implement signage and interpretation to raise awareness of the site.

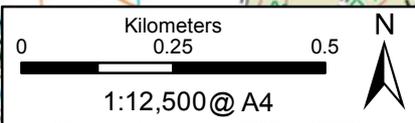
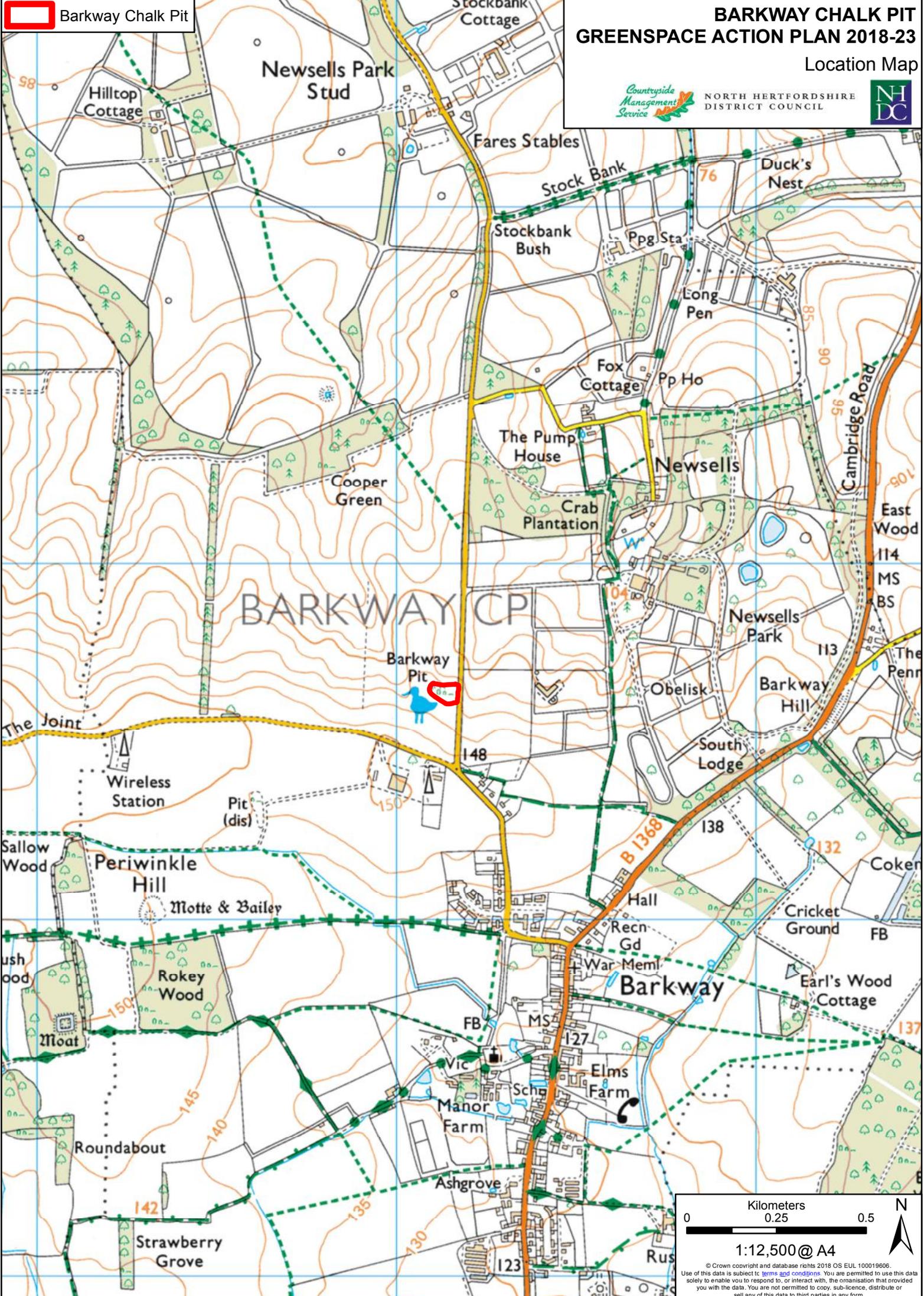
 Barkway Chalk Pit

BARKWAY CHALK PIT GREENSPACE ACTION PLAN 2018-23

Location Map



NORTH HERTFORDSHIRE
DISTRICT COUNCIL



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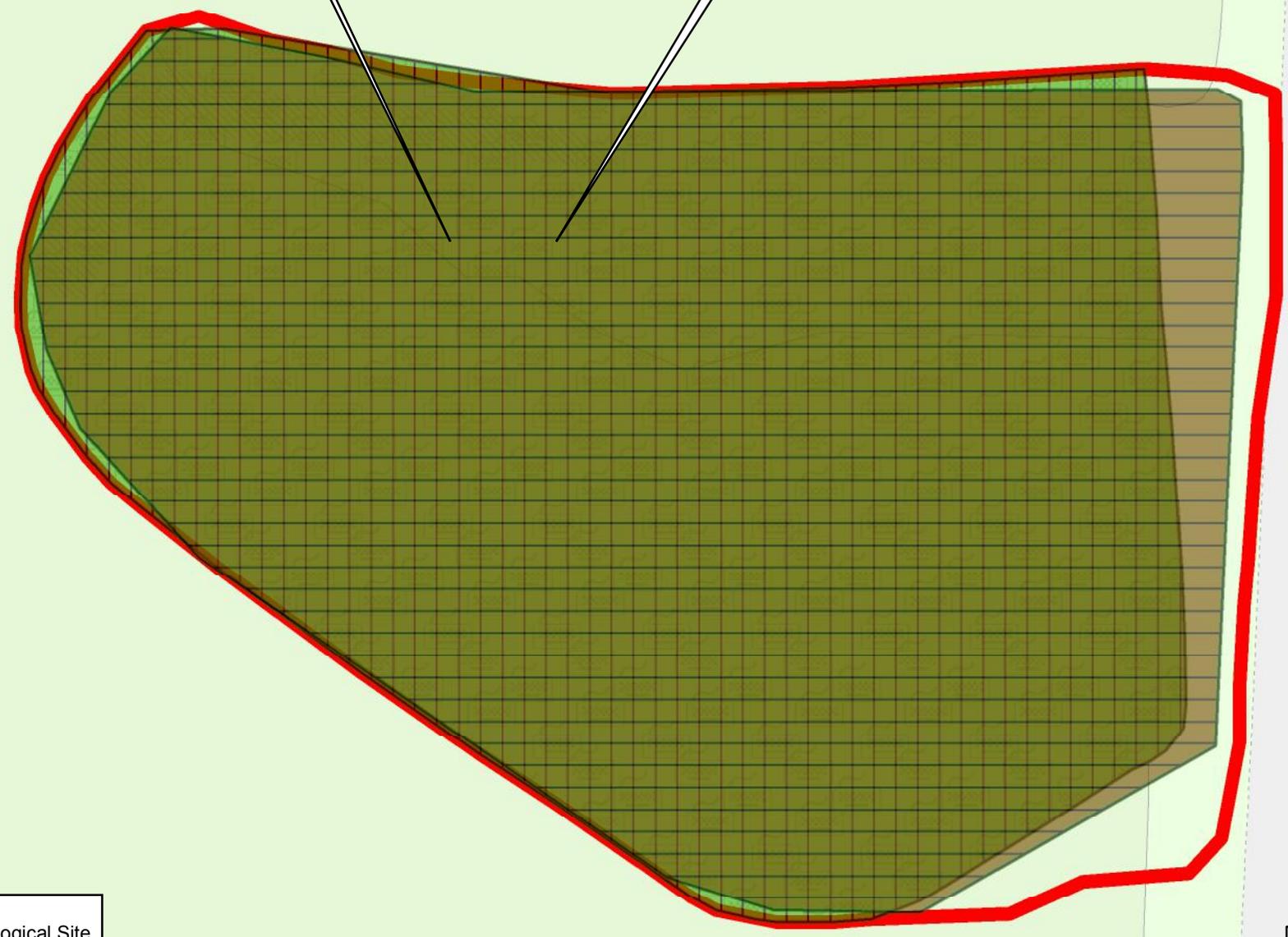
Regionally Important Geological Site

Local Wildlife Site
(Barkway Chalk Pit, 08/020)

Local Geological Site

Wildlife Site

Site boundary

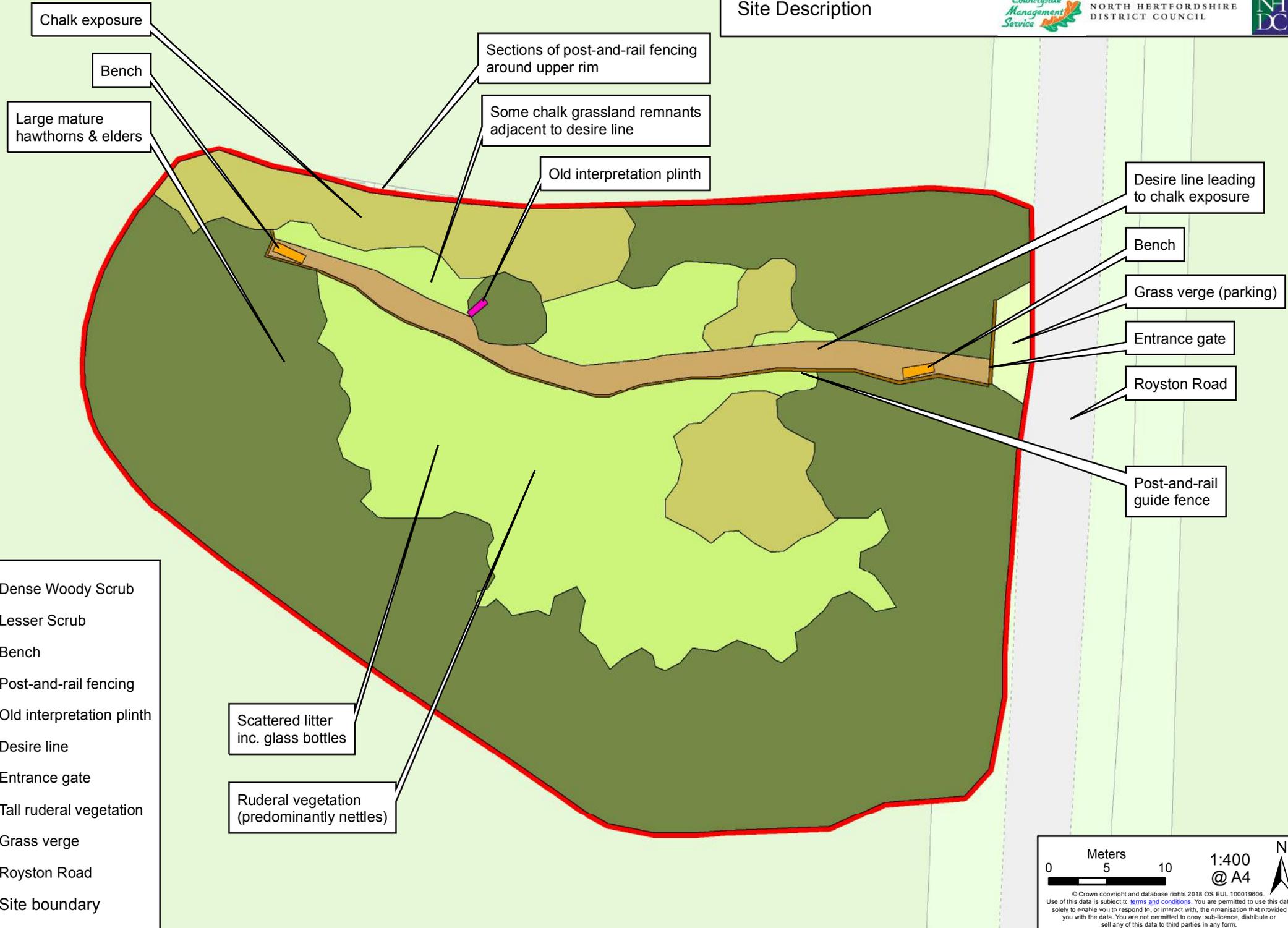


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- Dense Woody Scrub
- Lesser Scrub
- Bench
- Post-and-rail fencing
- Old interpretation plinth
- Desire line
- Entrance gate
- Tall ruderal vegetation
- Grass verge
- Royston Road
- Site boundary

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1 Site Description

1.1 Introduction

Barkway Chalk Pit is a small disused chalk pit which lies 0.7km to the north of the village of Barkway and 4km south of Royston, near the top of the north-facing chalk scarp slopes. The site is of geological interest due to the chalk exposure, which was pushed over boulder clay by the Anglian Stage Glacier over 400,000 years ago. This geological feature was revealed by the excavation of chalk but is currently partially obscured by bramble (*Rubus fruticosus* agg.). Today, the pit is smothered by a vigorous crop of tall, ruderal vegetation predominantly comprised of common nettle (*Urtica dioica*). The edges of the pit are cloaked in mature scrub, which is gradually encroaching inwards. The site is presumed to have few visitors due to its location; however, it is known to have previously held interest for students and geological societies.

1.2 Designations

1.2.1 Local Wildlife Site – Barkway Chalk Pit 08/020

Local Wildlife Sites are non-statutory sites designated at a county level as being of conservation importance for biodiversity and/or geology. The purpose of this designation is twofold: to protect such sites from land management changes that would lessen their conservation interest; and to encourage sensitive management in order to maintain and enhance their importance. Whilst Local Wildlife Sites do not benefit from statutory protection, they are a material consideration in the determination of planning applications. The Wildlife Site description for Barkway Chalk Pit is as follows:

Disused chalk pit of geological interest showing chalk exposure pushed over boulder clay by the action of ice during the Anglian Ice Advance. The surrounding vegetation is mainly chalk scrub with remnants of chalk grassland. A range of mosses have been recorded from the site including *Seligeria calcarea* (a nationally scarce species).

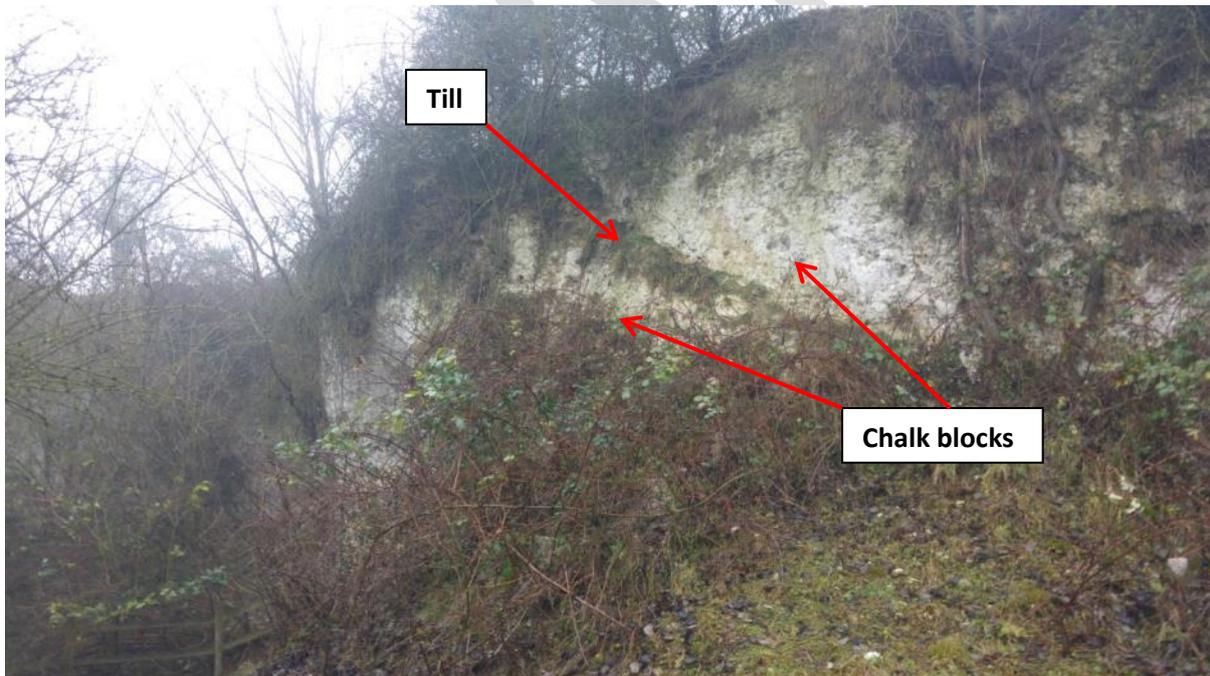
1.2.2 Denotified SSSI (1953-87)

Barkway Chalk Pit was notified as a Site of Special Scientific Interest (SSSI) in 1953 and denotified in 1987, when it was designated a Regionally Important Geological Site (RIGS). RIGS were originally SSSIs which were denotified after the Geological Conservation Review (1977-1990), as the statutory agencies wished to secure their conservation in another form.

1.2.3 Regionally Important Geological Site (RIGS)

Regionally Important Geological Sites (RIGS) are non-statutory earth science sites of local or regional importance where '...consideration of their importance becomes integral to the planning process' according to the Earth Science Conservation Strategy (ESCS). The exposure at Barkway is the result of the action of the ancient ice sheet that once covered East Anglia and which crumpled the chalk and pushed it over the boulder clay; Barkway Chalk Pit contains an important, perhaps unique, exposure of massive chalk disturbed and thrust over boulder clay by the action of ice during the Anglian Ice Advance. Ammonite, sponge and gastropod fossils have been found in the chalk.

The RIGS statement for Barkway Chalk Pit reads as follows: "Section through two glaciotectonically moved blocks of chalk containing the chalk rock and beds immediately above and below. The succession in the larger block extends down to the sub-chalk rock (Reed marl). This block is traversed by a fault that repeats the higher part of the succession. The two blocks are separated by Anglian till and are faulted against till. This is one of a group of pits (including Reed Chalk Pit) where 'out of position' chalk is exposed as a result of being displaced by the Anglian glacier impinging on the Chalk scarp."



1.3 Geography and Landscape

Barkway Chalk Pit lies near the top of the north-facing scarp slopes south of Royston (near the south-eastern boundary of Landscape Character Area 228). The wider geography is, broadly, a scarp

slope incised by dry, water cut valleys, resulting in an undulating landform with steeper slopes towards the upper plateau edge to the south.

The site is nestled amongst fields in the rural agricultural landscape of North Hertfordshire. Large, rectilinear arable fields are widespread and are often open without hedge boundaries, and bisected by long, straight roads.

Small coverts of trees stud the landscape, and there are no discernible water courses other than localised drainage ditches.

1.4 History and Geology

Barkway Chalk Pit is owned by North Hertfordshire District Council but was previously managed by Herts and Middlesex Wildlife Trust, from 1965 until 2016.

Geological evidence in the Barkway Pit demonstrates the effects of the ice movements up the steep slope of the chalk escarpment during the Anglian Glaciation 190,000 years ago. Although similar disruption of the ground beneath the ice sheets must have occurred in many places in the South East, opportunities for studying the effects at close quarters are very limited. Barkway Pit is, in its own way, unique in Britain.

The chalk pit at Barkway is of great geological interest. In the first place it exposes the Chalk Rock, an unusual development of nodular, glauconite-stained and often phosphatized chalk. The Chalk Rock horizon, laid down during a phase of shallowing of the Chalk Sea, also yields a distinctive fauna of ammonites, sponges and gastropods, different from the echinoid-brachiopod-lamellibranch fauna of the overlying Upper and underlying Middle Chalk.

Secondly, the bed dips steeply to as much as 60°, very different from the dip of only a few degrees from the horizontal which one finds in nearly all other chalk pits in Hertfordshire. Moreover the beds, particularly the lines of flint nodules, are often broken and disturbed. These disturbances are due not to earth movements, but to the disruptive effects of the Pleistocene ice sheets. Whilst the glacial disturbances at Barkway are not nearly so spectacular as those to be seen in the cliffs to the west of Cromer in Norfolk or at Mons Klint in Denmark, they are of the same kind, and are a type of geological phenomenon to be seen at only a few localities.

1.5 Habitats and Wildlife

The vegetation currently consists of tall ruderal species (mainly nettles), small remnants of chalk grassland, and steadily encroaching scrub. Remnant chalk-loving plants include cowslip (*Primula*

veris), wild basil (*Clinopodium vulgare*), and salad burnet (*Poterium sanguisorba*). Other flowering species include common dog-violet (*Viola riviniana*), wild parsnip (*Pastanica sativa*), and tufted vetch (*Vicia cracca*).

A range of mosses have been recorded from the site, including the nationally scarce chalk rock-bristle (*Seligeria calcarea*) in 1980; this bryophyte favours shaded chalky slopes.

Bird records for the site include the UK red-listed corn bunting (*Emberiza calandra*), yellowhammer (*Emberiza citronella*) (NERC Act Section 41), linnet (*Linaria cannabina*) and song thrush (*Turdus philomelos*), and amber-listed swallow (*Hirundo rustica*), whitethroat (*Sylvia communis*), and bullfinch (*Pyrrhula pyrrhula*).

Mammals previously recorded include brown hare (*Lepus europaeus*) (NERC Act Section 41), while red fox (*Vulpes vulpes*) and fallow deer (*Dama dama*) have been seen on site visits. The latticed heath moth (*Chiasmia clathrata*) (NERC Act Section 41) has also been recorded in recent years.

The primary habitat of interest is the chalk grassland, present in small remnant patches but surrounded by later successional stages of both tall herbaceous vegetation comprising competitive ruderal species (e.g. the central part of the chalk pit), and encroaching scrub. The main pit is dominated by a head-high crop of common nettle (*Urtica dioica*) with a ground layer of moss carpeting the thatched surface, with the uniformity broken only by a small patch of ground elder (*Aegopodium podagraria*) to the south. Scrub species include hawthorn (*Crataegus monogyna*), elder (*Sambucus nigra*), blackthorn (*Prunus spinosa*), dogwood (*Cornus sanguinea*) and bramble (*Rubus fruticosus* agg.).

The western quarter of the pit is dominated by a scrub layer of mature hawthorn and elder, with a ground layer of moss. Nettle growth is far less vigorous here and so there is a lesser degree of thatching of dead vegetation across the topsoil.

1.6 Access, Facilities and Infrastructure

The vegetation has recently (spring 2018) been cleared around the small entrance and the gate is now visible from the road, but it is easy to miss and unclear as to what lies beyond as no signage is present. The site gate is wobbly and scrub is encroaching on the southern side at head height.



A post and rail fence acts as a guide between the entrance gate and the chalk exposure, alongside which a desire line runs. Two benches are present on site: one by the gate, and one adjacent to the chalk exposure. Both show strimming damage and are insecure.

A post and rail fence runs along part of the northern rim of the pit, but it is wobbly and unstable. Where there is no fence, scrub mostly screens the edge, but it is gappy in places and the steep drop is a significant hazard. This is not a 'public access' part of the site, but it is accessible from the main site if a detour is taken from the main pathway through the open scrub.

Informal car parking is possible on the raised grass verge immediately in front of the entrance gate, with room for one or two cars.

1.7 Community, Management and Events

There are no immediate residents, with the nearest habitation, the village of Barkway, lying 0.7km to the south. Site usage is thought to be minimal, although it should be noted that a previous visitor had taken the time to scratch some graffiti onto the gate fixings suggesting, quite sensibly, that they thought the site might benefit from the removal of the nettles.

2. Management Prescriptions

2.1 Vegetation management

The two overarching site management aims are to ensure that visibility and access to the chalk exposure is maintained in order to uphold the geological interest of the site, and to increase the amount of chalk grassland present on the site. Chalk grassland is a rare habitat type in Hertfordshire and restoration also represents an opportunity to increase potential habitat for pollinators within an arable landscape.

2.1.1 Vegetation management – Year 1

An initial experimental plot will be used to ascertain the likelihood of chalk grassland restoration success before expanding this approach to the rest of the site. This initial stage will be achieved through a one-off CMS midweek volunteer task which will be scheduled to clear the ruderal vegetation and scrub from within the pit and either burn onsite or remove.

Once the ruderal vegetation is cleared, a 5 x 5m experimental area will be 'reset' to recreate chalk grassland. This will be achieved by scraping the topsoil off (c. 5cm) to remove the thatch of dead vegetation, exposing bare chalk, and enabling natural recolonization by chalk grassland species. The limited topsoil created by this experimental plot can be lost on site. The plot should be monitored annually for at least one year and longer if necessary to determine whether the restoration experiment is succeeding or if a revision to the plan is necessary. Success can be defined in this case as the colonisation of plant species characteristic of chalk grassland and the absence of a dense cover of ruderals (e.g. nettles). If unsuccessful, a reassessment will be undertaken based on the results.

The scrub should be cleared from the interior and around the edges of the pit and pushed back as much as possible, to leave a minimum of 4m of scrub around the perimeter of the site, with the exception of the north face. The scrub on the north face of the pit will be cut back as far as is practical in order to maintain visibility of the chalk exposure and maximise the amount of south-facing slope for botanical and invertebrate interest. Areas for scrub clearance are marked on the year 1 action plan map. If possible, the material should be burnt on site, gathering all material in one location within the cleared area.

The encroaching scrub around the entrance gate should be cut back, as the current overhanging vegetation gives a poor initial impression of the site as a dark and unwelcoming place.

2.1.2 Vegetation management – Year 2

If the experimental plot proves to be a success, a one-off contractor job to reset the scrub and ruderal vegetation across the interior of the pit should be undertaken. A mini-excavator should be used to knock over and uproot all scrub encroaching into the pit and around the edges, but excluding the area immediately around the chalk exposure (to avoid damage) as well as a 4m perimeter ring of scrub around the rest of the site, which is to remain in order to continue to provide bird nesting habitat (in practice this 4m ring would be likely to be inaccessible to an excavator due to the steep sloping edges of the pit).

Scrub removal is to include the mature hawthorns and elders in the west of the pit, in order to maximise the area of potential chalk grassland. Areas for scrub clearance are marked on the year 2 action plan map. If possible, the material should be burnt on site, gathering all material in one location within the cleared area.

The use of an excavator to clear the scrub, rather than cutting, means that the stumps will be removed without the additional need for grinding, making future open habitat management significantly easier and removing the nutrients from the woody material. However, it is possible that the south side of the site has been used as an informal rubbish dump in the past, and this should be investigated more fully before using a scrub clearance method which involves ground disturbance.

Following the scrub removal and subject to the outcome of the trial plot in year 1, the mini-excavator should be used to scrape off the topsoil within the pit in all scrub-free areas, excluding any remnant chalk grassland patches (to be identified by the supervising officer), exposing the underlying chalk. The topsoil should be removed from the site.

As in year 1, the scrub on and immediately around the chalk exposure on the north face should be manually cut back as far as is practical.

The scrub within the pit, including the mature hawthorns, would make a significant contribution to nutrient levels through annual leaf fall if left to remain, and thus clearance is sensible from a grassland restoration perspective. However, the benefits of leaving a ring of scrub around the perimeter are twofold: it will provide habitat for scrub-favouring species, such as breeding birds and invertebrates, and it will act as a protective screen against any spray drift from the surrounding arable farmland.

2.1.3 Ongoing vegetation management

Following this scrub clearance, maintenance of the chalk grassland restoration area will require annual summer cutting and raking of the grass, removing it to a sacrificial area under the marginal scrub on the eastern edge of the site. Given the generally nutrient poor soil, this is not likely to create much material. Creating compost heaps from the vegetation will provide potential habitat for slow worms (*Anguis fragilis*) and invertebrates. 1m margins around the scrub should be cut and raked once every other year to provide an overwintering refuge for invertebrates.

Winter scrub clearance may be required around the chalk exposure and to keep encroachment in check around the perimeter of the pit. Scrub should be monitored and maintenance scheduled when necessary. Smaller scale vegetation works can be carried out through the summer in order to keep access open, including the grass verge in front of the entrance gate.

We would be keen to investigate opportunities for grazing the site as a long-term management option. Grazing is the most sustainable way to maintain biodiversity on sites such as this, as it minimises further scrub encroachment and reduces the abundance of rough grasses, to the benefit of wildflowers. Given the size of the site, a small number of sheep or goats would be ideal. However, this would require a suitable local grazer to be found and the installation of fencing around the entire site perimeter i.e. the upper rim of the pit. This fencing is also recommended as an Access and Safety feature (see below).

Grazing would require further consultation and assessment of feasibility. If not deemed to be possible or appropriate, the necessary vegetation works could be carried out on an annual basis by volunteers or contractors.

2.2 Access & Safety

The entrance gate should be kept clear from encroaching vegetation and firmed up, and the adjacent grass verge should be subject to a regular cut to facilitate visitor car parking. The desire line from the entrance gate to the chalk exposure is the only pathway through the site, and this should also be maintained by a regular cut through the growing season.

The two unstable benches should be removed, with a replacement bench to be installed in front of the chalk exposure.

Large quantities of broken glass and bottles, as well as litter such as pans and crockery are present on the site which should be removed.

A dangerous drop is currently present from the adjacent arable land into the pit, with little protection apart from a short section of unstable post-and-rail fencing and scrub of variable thickness. Fencing should be installed around the rim of the pit; timber post-and-rail fencing would be the preferred option – although more expensive initially, it is durable and it is easier to maintain and repair individual damaged sections. This would also deter access to the rim from within the chalk pit.

2.3 Interpretation & education

The existing plinth which faces the chalk face should be removed and replaced with a new interpretation panel, designed to the standard NHDC template. The existing location should be retained as it is suitably positioned in front of the chalk exposure.

A sign should be installed on the entrance gate to highlight the presence of the site. Finger posts should be installed at the end of the two nearby Rights of Way which terminate on Royston Road (Footpath 26 to the north, and Bridleway 18 to the south) as these will be beneficial in directing passers-by to the site who would otherwise be unaware of its presence.

3 Action Plan and Maps

3.1 One-off Actions (year 1, 2018-19)

Action	Timing	Delivery	Est. Cost	Spec. Ref	Status
Clear ruderal vegetation within pit (nettles, brambles etc.); burn on site.	Winter	CMS Volunteers			
Clear scrub from interior and around edges of pit, leaving min. 4m of perimeter scrub.	Winter	CMS Volunteers			
Topsoil removal to expose bare chalk from 5 x 5m experimental plot (lose on site).	Winter	CMS Volunteers			
Install timber fencing around upper rim of chalk pit.	Winter	CMS Volunteers			
Remove 2x existing benches.	Winter	CMS Volunteers			
Remove site litter.	Winter	CMS Volunteers			
Design and install new signage at site entrance, and firm up entrance gate.		CMS/NHDC			
Install finger posts at Rights of Way/Royston Road junctions.		CMS/NHDC			

3.2 One-off Actions (year 2, 2019-20)

Action	Timing	Delivery	Est. Cost	Spec. Ref	Status
Excavator to uproot, stack and burn all scrub excluding 4m perimeter scrub and avoiding area around chalk exposure. Burn on site.	Winter	CMS/Contractor			
Topsoil (5cm) removal across pit to expose bare chalk (excluding any remnant chalk grassland patches); remove from site.	Winter	CMS/Contractor			
Remove existing post-and-rail guide fence.	Winter	CMS Volunteers			
Install 1x new bench.	Winter	CMS Volunteers			
Design and install new interpretation panel (remove existing plinth).		CMS/NHDC			
Grazing feasibility – seek suitable local grazier.		CMS/NHDC			

3.3 Annual and Regular Actions (years 1 – 5, 2018-23)

Action	Timing	Delivery	Est. Cost	Spec. Ref	Status
Cut back scrub and vegetation around site entrance.	Winter	CMS Volunteers			
Cut back scrub on north face as far as practical to maintain chalk exposure visibility and maximise south-facing area. Take care not to damage chalk exposure.	Winter	CMS Volunteers			
Monitor encroaching scrub and cut when required.	Winter	CMS Volunteers			
Cut and rake restored chalk grassland. Create compost piles with arisings under scrub on east of pit.	Summer, year 2 onwards	CMS Volunteers			
Cut and rake 1m buffer between scrub and chalk grassland – cut halves in alternate years and add to compost piles.	Summer, year 3 onwards	CMS Volunteers			
Minor vegetation works – maintain entrance & access.	Summer	CMS Volunteers			

BARKWAY CHALK PIT GREENSPACE ACTION PLAN 2018-23

Year 1 Actions (2018-19)



NORTH HERTFORDSHIRE DISTRICT COUNCIL



Remove bench 

Install timber fencing around rim 

Install finger post at end of Footpath 26 (500m to north)  

Remove bench 

Design & install new entrance sign; Firm up gate  

Clear scrub from interior & edges of pit, leaving min. 4m perimeter of scrub 

Install finger post at end of Bridleway 18 (200m to south)  

Remove site litter 

Clear ruderal vegetation and burn onsite 

Remove topsoil (5cm) in 5 x 5m experimental plot 

- Delivery
- NHDC 
 - CMS 
 - Volunteers 
 - Contractor 

-  Fence
-  Experimental plot
-  Manual scrub removal
-  Dense Woody Scrub
-  Lesser Scrub
-  Bench
-  Post-and-rail fencing
-  Old interpretation plinth
-  Desire line
-  Entrance gate
-  Tall ruderal vegetation
-  Grass verge
-  Royston Road
-  Site boundary

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Grazing feasibility - seek
suitable local grazier

Remove post-and-rail guide fence

Excavator to uproot, stack and burn all scrub, excluding 4m perimeter of scrub

Install bench

Design & install new interpretation panel (remove old plinth)

Delivery

NHDC

CMS

Volunteers

Contractor

Fence

Bench

Excavator scrub removal

Dense Woody Scrub

Lesser Scrub

Post-and-rail fencing

Old interpretation plinth

Desire line

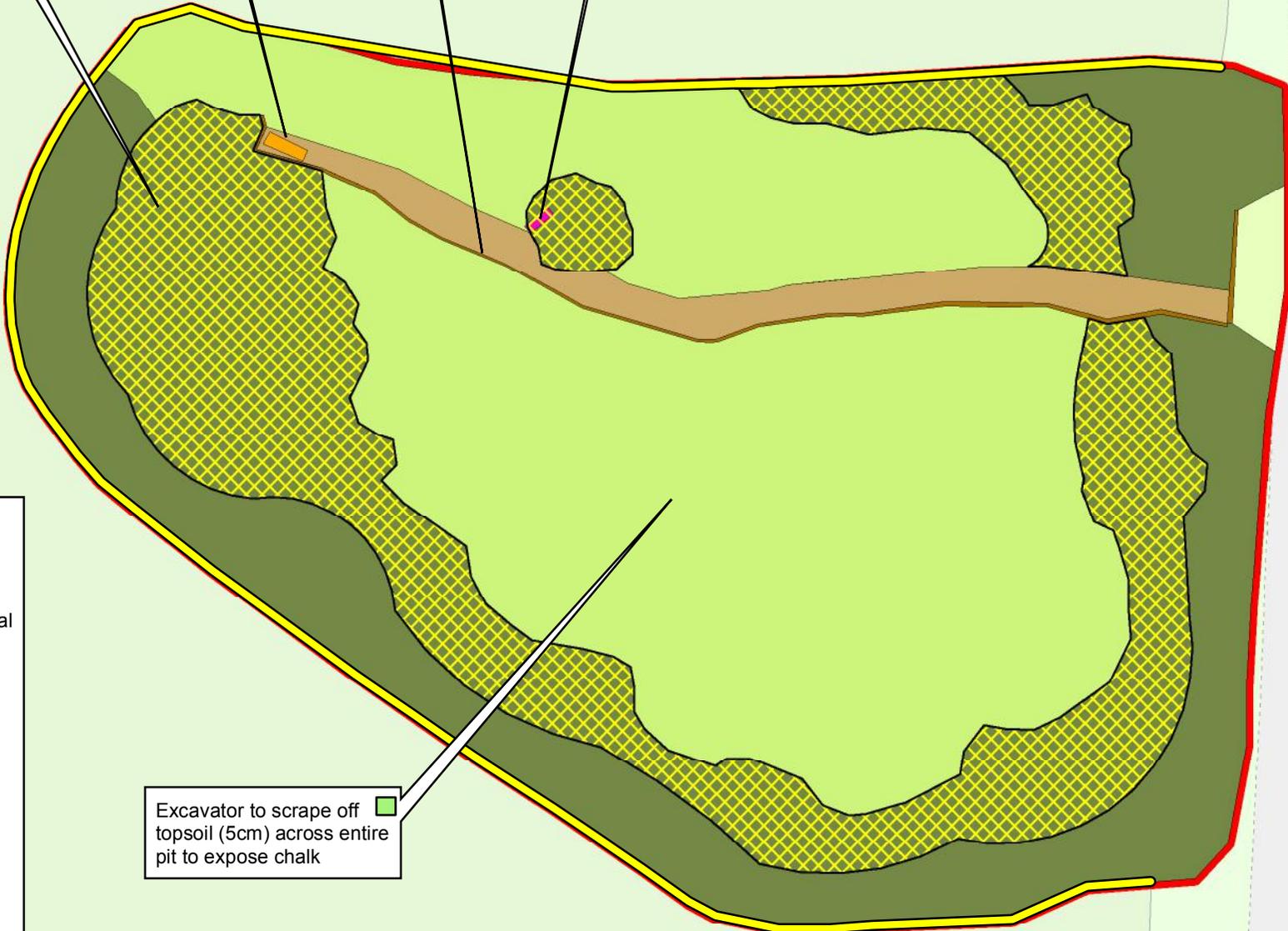
Entrance gate

Tall ruderal vegetation

Grass verge

Royston Road

Site boundary



Excavator to scrape off topsoil (5cm) across entire pit to expose chalk

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BARKWAY CHALK PIT GREENSPACE ACTION PLAN 2018-23

Annual and Regular Actions
(2018-23)



NORTH HERTFORDSHIRE
DISTRICT COUNCIL



Monitor scrub development and plan scrub clearance when necessary

Minor vegetation works - maintain access and entrance

Cut back scrub on north face to maintain chalk exposure visibility and maximise south-facing area

Cut back scrub & vegetation around site entrance

Delivery

- NHDC
- CMS
- Volunteers
- Contractor

- Fence
- Bench
- Interpretation panel
- Desire line
- Entrance gate
- Chalk grassland
- Grassy margin (east)
- Grassy margin (west)
- Dense Woody Scrub
- Grass verge
- Royston Road
- Site boundary

Cut and rake restored chalk grassland (year 2 onwards)

Cut and rake 1m buffer between scrub and chalk grassland, alternating between east and west halves annually (year 3 onwards)

Use arisings to create compost piles in eastern scrub

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4 Work Specifications

1. Scrub clearance over chalk grassland
 - a. Use an excavator to uproot all scrub within the central part of the chalk pit, excluding the chalk exposure and a 4m ring of scrub around the edge of the pit.
 - b. Cut back roadside vegetation around site entrance to improve site visibility.
 - c. Stack all felled and uprooted material within the cleared area in a location agreed with the supervising officer, and burn.
2. Design and install new interpretation
 - a. Design and produce an A1 interpretation board which provides orientation for visitors and information on the geological and botanical interest of the site, and provide PDF version of the same
 - b. Design to be based around a full colour illustration of the geological interest of the site, accompanied by photographs and text, and a computer-generated inset map of the site.
 - c. The design should be based on the NHDC house style.
 - d. Provide two proof stages of full colour design in hard copy and PDF format.
 - e. Supply on an angled lectern frame incorporating a GRP panel
 - f. Quantity: 1
 - g. Delivery to CMS for installation by volunteers
3. Design and install fingerposts
 - a. Supply two wooden fingerposts of green English oak, with a smooth sanded natural finish.
 - b. The dimensions of each post should be: length 1800mm x width 100mm x depth 100mm with a four-way weathered top.
 - c. The wooden fingers should be routed with the text 'Barkway Chalk Pit' on both sides, infilled with white paint appropriate for external use.
 - d. Provide a proof stage of the design prior to production.
 - e. Delivery to CMS for installation by volunteers.