Whitesands Quarry Restoration Project

Management and Maintenance Plan

2016-2020

Produced for TARMAC A CRH COMPANY

By rspb giving nature a home

Supported by EcoCo Life

Joining up nature across central Scotland

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With support from Dave Hurcombe, Mike Thornton, Mike Fraser and Neil Clarke

Long –Term Vision for the Site

The Whitesands Quarry Restoration Project will create a wetland ecosystem of regional importance for wintering, passage and breeding birds. Post industrial mosaic habitats and scrub will be created and species rich grassland will be managed to maximize biodiversity on the site. It will provide a natural space for local people and visiting tourists to watch and enjoy wildlife and participate in nature-based tourism. The project will demonstrate best practice in habitat creation/restoration and public engagement through an effective partnership between RSPB Scotland and Tarmac and through regular liaison and consultation with the local community. The project, amongst the first of its kind in Scotland, will provide inspiration, encouraging similar work at other quarry restoration sites.

Contents

1. SITE INFORMATION

1.1 Site location and relevant authorities

Site name	Tarmac North West Quarry, Dunbar
Area (ha)	100ha
Grid ref (centre of site)	NT 704 771
District	East Lothian
Local Authority	East Lothian Council
Community Council	Dunbar Community Council
SNH Office	Lothian Office, Silvan House, Edinburgh
Local SEPA Office	Edinburgh

2. EVALUATION and RATIONALE FOR MANAGEMENT

2.1 Current issues and constraints

- Legal framework (Water framework directive CAR; Polution prevention control permits; wildlife and countryside act; mines and quarries regulations), quarry operational requirements and resource availability

- Financial resource is limited to funding which has already been secured

- Ongoing maintenance and management is a key consideration, as there will be an ongoing resource ask of Tarmac and RSPB

- Visitor perception and expectations will need to be managed very carefully so that it is clear we are carrying out habitat creation and management in partnership with Tarmac and the implications of this for visitor access

- The North West Quarry (NWQ) is part of the Tarmac quarrying estate and as such experiences heavy numbers of large vehicle traffic. Any increase in visitor numbers to the restoration area will have to be carefully managed in terms of safe access and viewing

- It has been confirmed by the Planning Authority that significant re-profiling of the landforms and the development of a different public access network to the one consented in 2002 will require an amendment to the existing consent

- A CAR licence (CAR/L/1010832) was issued to Blue Circle Industries Ltd in September 2006 which covers abstraction and return of water for both the Whitesands Quarry and the North East Quarry. This licence controls abstraction up to a daily rate of 2,520 m^3. Any change to the methods and volumes of abstraction and discharge will require a variation to the current CAR licence, and it will be the responsibility of Tarmac to apply to SEPA for this variation

- During site restoration in 2010, when there were still significant areas of bare substrate exposed, the restoration project area supported up to eight breeding pairs of ringed plover (I. Andrews pers. comm. 2013). Ground nesting species such as ringed plover and terns have come under increasing pressures along the East Lothian Coast due to coastal squeeze processes, habitat change, recreational disturbance and predation pressure. The cycle two Site Condition Monitoring assessment of the breeding bird assemblage of the Firth of Forth SSSI reported an 86% decline in breeding ringed plover numbers since 1986 (SNH unpublished report 2007). The restoration project area has the potential to function as an important refuge for some of these ground-nesting species, particularly if undisturbed, predator-free islands are created within the Lake

- In July 2012 the water level rose to 4.45m AOD, causing the adjacent golf course to flood. Given that water is currently being pumped from the lake to maintain safe levels, a longer term solution is required, hence the planned installation of a tilting weir system to allow control of the water level throughout the year. This facility will compliment the wetland habitat creation, allowing the water level to be raised and lowered at prescribed times throughout the year for the maximum benefit to wildlife

2.2 Identification of the Features Influencing Management of the site

The following table lists all the important **Features Influencing Management**.
These include:
** = Features which are the prime reason for maintaining the site and which will drive its management.
* = Other important conservation features whose requirements need to be taken into account when deciding upon management of the site.

Important feature	Influencing management?	Why?
Wetland		
Assemblage of wintering wildfowl	**	Potential to create regionally important site for wintering wildfowl, many of which are amber listed.
Assemblage of passage waders	**	Potential to create regionally important high tide roost site for passage waders, many of which are amber or red listed.
Breeding ringed plover	**	Opportunity to encourage colonisation as breeder on the site – suffered regional and national decline, amber listed species, reserves priority species.
Breeding common tern	**	Opportunity to encourage colonisation as breeder on the site – suffered regional decline, amber listed species.
Grassland		
Lowland meadow	*	Loss of habitat in the wider landscape. Increased species diversity of grassland.
Small blue butterfly	*	BAP priority and regionally rare species. Potentially scope to introduce to the site.
Calcareous grassland/post industrial mosaic habitat establishment	*	Opportunity to create area of calcareous grassland/post industrial mosaic habitat by stripping top soil in prescribed area of existing species poor neutral grassland. Both are rare habitats in Scotland.
Breeding skylark, meadow pipit and reed bunting	*	Opportunity to maintain breeding populations on site – red listed species, skylark RSPB priority 44 species, reed bunting RSPB reserves priority 101 species.
Migrant passerines	*	Potential to attract and support important migrant passerine populations such as grasshopper warbler (RSPB priority 44 species) through grassland and scrub management. Wildlife watching opportunity for birdwatchers.
Brown hare	*	All nature priority species.
Breeding sand martin population	*	Opportunity to provide breeding habitat in a simple, innovative way that can be shared as best practice for the benefit of this amber listed species.
Scrub		
Native scrub	*	Opportunity to increase avian and invertebrate species diversity and create attractive wildlife watching feature on site.

2.3 Condition of the Features Influencing Management and the Main Factors affecting them

The following tables identify the target condition of the Features Influencing Management and the Main Factors influencing whether these target conditions are attained.

Wetland

Feature	Attribute(s)	Current	Target(s) for attribute(s)	Main factor(s)	Target for main factor(s)	Comments
Open freshwater	Area of drawdown.	Approx. 30ha open water. Level currently managed by diesel-powered pump. Little ecotonal habitat.	Manipulation of level between +2.6m and +3.1m AOD through use of tilting weir system. Seasonally create muddy edge habitat and scrapes.	Planning application approval and installation and efficiency of tilting weir system.	Installation of an effective, simple system to manipulate the water level accurately.	Failure to achieve required levels will substantially reduce feeding area.
Wildfowl assemblage	Species richness, abundance.	17 wildfowl species 2011 – 2014 (WeBS data).	Maintain or increase richness and abundance of wildfowl by maximising area of islands and muddy edge habitat.	Provision of undisturbed loafing and feeding areas.	Creation of shallow water, islands and muddy edges.	Subsequent vegetation management on islands potentially necessary.
Passage waders	Species richness, abundance.	8 wader species 2011 – 2014 (WeBS data).	Maintain or increase richness and abundance of waders by maximising muddy, shallow feeding habitat.	Creation of muddy edge habitat and undisturbed, islands.	Creation of maximum area of muddy edges and islands.	Failure to achieve required levels will substantially reduce feeding area.
Breeding ringed plover	Breeding pairs.	0 breeding pairs.	Create maximum area of good breeding habitat to encourage colonisation as breeding species.	Provision of undisturbed shingle habitat.	Creation of shingle edges and shingle islands.	Maintain open aspect.
Breeding common terns	Breeding pairs.	0 breeding pairs.	Create 64m² of good breeding habitat to encourage colonisation as breeding species.	Provision of undisturbed shingle habitat.	Creation of 64m² undisturbed nesting habitat on floating raft with an audio lure and decoys.	Location mindful of predation, raft wear and tear and visitor viewing.

Grassland

Feature	Attribute(s)	Current	Target(s) for attribute(s)	Main factor(s)	Target for main factor(s)	Comments
Lowland meadow	Area.	Approx. 4ha.	Maintain current area as lowland meadow (i.e. prevent succession)	Availability of cutting equipment and personnel.	Effective cutting regime with means of lifting cuttings.	Cut and lift biannually (March and late August).
Calcareous grassland/ post industrial mosaic habitat	Area.	0	Establish 2ha trial area.	Specific make-up of substrate. Aim to expose limestone bedrock and retain a very thin layer of subsoil if possible.	Strip prescribed area of species poor neutral grassland to encourage establishment.	Carry out when delivering other landforming work. Subsequent stripping of topsoil required to maintain habitat.
Skylark	Presence as breeding species.	Current breeding species on site.	Maintain breeding population.	Invertebrate population, disturbance and access to ground for feeding in summer.	Cut lowland meadow in March and late August. Increase invertebrate diversity through native scrub planting.	Cutting to be sympathetic to breeding birds, wildflowers and leverets.
Migratory and resident passerine birds	Species richness, abundance.	Assemblage of meadow pipit, reed bunting, sedge warbler.	Maintain.	Healthy mosaic of grassland and scrub habitats, good invertebrate population.	Management of lowland meadow, creation of calcareous grassland and planting of native scrub.	Unmanaged grassland left for potential colonisation by grasshopper warbler.
Breeding sand martins	Breeding pairs.	Existing breeding colony of c. 200 pairs situated at temporary site in working area of active NE quarry.	Maintain. Provide permanent alternate habitat within the restoration project area. Locate this in south west corner near the lake edge.	Ensure bank is >2m high and water at base to deter predation. Concave structure to encourage colonisation.	Develop existing bank with advice from the sand martin trust. Use substrate from current nesting bank if required.	Monitoring and management required; stability of structure to be monitored annually.

Scrub

Feature	Attribute(s)	Current	Target(s) for attribute(s)	Main factor(s)	Target for main factor(s)	Comments
Native scrub	Area.	Approx. 2ha.	Increase by planting Hawthorn, Blackthorn and Elder.	Resource and time required to prepare ground and plant scrub species.	Tree guards to be used to deter deer browsing. To be planted in areas which will enhance connectivity of existing habitat network.	Long term management to be discussed and agreed: scrub development out with defined areas may prove detrimental to the site's attraction to waterbirds.
Native woodland planting	Area.	Approx. 3ha.	Maintain.			Long term management required as above.

3. MANAGEMENT OBJECTIVES

3.1. Conservation Objectives

To manage 100ha of wetland, grassland and scrub for the benefit of BAP and RSPB priority species and habitats.

Species targets

Wetland

- Maintain or increase richness and abundance of wintering wildfowl population.
- Maintain or increase richness and abundance of passage wader population.
- Create the maximum area possible of undisturbed shingle habitat to encourage colonisation by ringed plover as breeding species.
- Create and maintain 64m² of good habitat to encourage colonisation by breeding common terns.

Grassland

- Maintain a breeding skylark population.
- Maintain abundance and diversity of migratory and resident passerine bird assemblages.
- Create maximum area possible for breeding sand martin colony.

Scrub

- Increase area of native scrub to maintain existing migrant and resident passerine bird and invertebrate assemblages and to encourage further colonisation.

Habitat conditions

Wetland

- Increase area of edge/water habitat.

Grassland/post industrial mosaic habitat

- Maintain extent and species richness of lowland meadow.
- Create calcareous grassland and/or post industrial mosaic habitat trial area by stripping top soil in suitable area of species poor neutral grassland.

Scrub

- Maintain 3ha of woodland.
- Increase area of native scrub.

Summary management.

- Manipulate water levels biannually.
- Create islands and bays
- Create scrapes.
- Install tern raft.
- Strip topsoil in prescribed area to encourage calcareous grassland/post industrial open mosaic habitat establishment.
- Cut and lift lowland meadow in March and late August.
- Plant native scrub species – Hawthorn, Blackthorn and Elder.
- Create and maintain sand martin bank.

Summary monitoring

- Ensure monthly monitoring of wetland birds through WeBS counts.
- Monitor shingle islands in summer for breeding ringed plover.
- Monitor tern raft in summer for breeding terns.
- Monitor sand martin bank in summer for breeding sand martins.
- Fixed point photography/visual monitoring/quadrat sampling of calcareous grassland establishment.
- Fixed point photography/visual monitoring/quadrat sampling of lowland meadow.
- Fixed point photography/visual monitoring of scrub and establishment rates of new scrub.

3.2 Objectives for People

To provide current visitors with wildlife watching opportunities while not promoting the site beyond current levels.

People targets

- Maintain current usage levels.
- Provide interpretation material at good viewing locations on-site to advise about the project.

Summary management

- Create new viewing point at South East corner of site.
- Produce and install interpretation.
- Maintain interpretation in good condition.

3.3 Delivery of Objectives

To manage 100ha of wetland, grassland and scrub for the benefit of BAP and RSPB priority species and habitats.

Wetland

- Maintain or increase richness and abundance of wildfowl by creating maximum area of islands and muddy edge habitat.
    - Install and manage water outflow system and manipulate water levels at prescribed times throughout the year; start to drop to 2.6m AOD from early April, begin to raise to 3.1m AOD from September onwards
    - Create scrapes and islands at south eastern end of lake.
    - Maintain open aspect for roosting/feeding wildfowl.
    - Provide signage at appropriate locations to advise visitors about habitat works and disturbance.
    - Ensure the continued completion of monthly WeBS.

- Maintain or increase richness and abundance of passage waders using the site for feeding and roosting.
    - Install and manage water outflow system and manipulate water levels at prescribed times throughout the year; start to drop to 2.6m AOD from early April, begin to raise to 3.1m AOD from September onwards
    - Create scrapes and islands at southern end of lake.
    - Maintain open aspect for roosting/feeding wildfowl.
    - Provide signage at appropriate locations to advise visitors about habitat works and disturbance.
    - Ensure the continued completion of monthly WeBS.

- Create the maximum area possible of good breeding habitat to encourage colonisation by ringed plover as breeding species.
    - Install and manage water outflow system and manipulate water levels at prescribed times throughout the year; start to drop to 2.6m AOD from early April, begin to raise to 3.1m AOD from September onwards
    - Create shingle-topped, predator-free islands towards the south eastern side of the lake.
    - Maintain open aspect.
    - Monitor islands throughout the summer for breeding ringed plover

- Install a 64m² floating, shingle-covered raft for breeding terns.
    - Install decoy terns and an audio lure prior to the breeding season in first year.
    - Provide tiles/shelters for tern chicks.
    - Monitor the mooring to maintain ideal location and prolong life of the structure.
    - Monitor in summer to ascertain breeding success annually.
    - Monitor raft for weed growth. Act if necessary.

Grassland

- Manage lowland meadow to maintain area and species diversity.
    - Cut and lift lowland meadow in March and late August. (Avoid cutting the sparsely vegetated areas/open mosaic habitat on previously disturbed land, until vegetation succession changes these to lowland meadow).
- Encourage calcareous grassland and/or post industrial open mosaic habitat establishment in prescribed area.
    - Whilst carrying out landforming and island creation, strip topsoil and sub soil exposing limestone bedrock with a shallow covering of subsoil in selected trial area to encourage calcareous grassland and/or post industrial open mosaic habitat establishment.
- Create nesting bank for breeding sand martins.
    - Cut away existing land in South West corner near lake edge and add sandy substrate if needed.
    - Cut channel at base of bank to allow water to restrict access to predators.
    - Monitor structural stability of the bank at prescribed intervals.
    - Annually cut away bank face to expose fresh substrate if needed
    - Monitor breeding activity in the summer annually.

Scrub

- Increase area of native scrub.
    - Prepare ground in selected area(s).
    - Plant Hawthorn, Blackthorn and Elder in prescribed area.
    - Protect from deer browsing through the use of tree guards and stakes until establishment has been secured.
- Maintain approx 3ha of woodland habitat.

4. DELIVERY WORK PROGRAMMES

4.1 WORK PROGRAMME

ACTIVITY Work	Lead partner	2016
Install tilting weir system	Tarmac	January
Create additional visitor viewing area in South East corner	RSPB	February
Install shingle-covered tern raft	RSPB	March
Install tern decoys and an audio lure on tern raft	RSPB	March
Commence wader scrape and lsland habitat creation	Tarmac	March
Strip topsoil in prescribed area of species poor neutral grassland	Tarmac	March
Prepare ground and plant Hawthorn, Blackthorn and Elder with tree guards and stakes	RSPB	March
Provide signage at both viewing areas	RSPB	March
Create sand martin nest bank with water channel at base	Tarmac	March
Cut and lift lowland meadow	Tarmac	March and late August
Begin drawdown of water level to 2.6m AOD	Tarmac	April
Retrieve audio lure for maintenance	RSPB	October

4.2 MAINTENANCE PROGRAMME

ACTIVITY		Year				
Maintenance	**Lead partner**	**2017**	**2018**	**2019**	**2020**	**Hours/month**
Check structural stability of sand martin bank	Tarmac	January, April and October	January, April and October	January, April and October	January, April and October	2
Cut away bank face to expose fresh substrate if needed	Tarmac	March	March	March	March	3
Cut and lift lowland meadow	Tarmac	March and late August	March and late August	March and late August	March and late August	7.5
Begin drawdown of water level to 2.6m AOD	Tarmac	April	April	April	April	1
Visual checks of tern raft mooring	Tarmac	May, August and November	May, August and November	May, August and November	May, August and November	0.5
Check tern raft substrate for weed growth, act if necessary	Tarmac	May, August and November	May, August and November	May, August and November	May, August and November	0.5
Install tern decoys and audio lures on tern raft	RSPB	March	March	March	March	7.5
Check interpretation is in good condition - clean/fix if required	Tarmac	May, August and November	May, August and November	May, August and November	May, August and November	1
Begin increase of water level to 3.1m AOD	Tarmac	September	September	September	September	1
Retrieve tern decoys and audio lures for maintenance	RSPB	October	October	October	October	7.5

4.3 MONITORING PROGRAMME

ACTIVITY	Lead partner	Year				
Monitoring		**2017**	**2018**	**2019**	**2020**	**Hours/month**
Ensure completion of monthly WeBS counts of the lake and scrapes	RSPB	All year	All year	All year	All year	0.25
Monitor islands for breeding ringed plover	RSPB	June and July	June and July	June and July	June and July	2.5
Monitor tern raft for breeding terns	RSPB	June and July	June and July	June and July	June and July	2.5
Monitor sand martin bank for breeding birds	RSPB	June and July	June and July	June and July	June and July	2.5
Monitor scrub and calcareous grassland establishment	RSPB	July	July	July	July	2.5
Monitor condition of open mosaic habitat on previously disturbed land and decide if cut and lift is needed to maintain habitat	RSPB	Late August	Late August	Late August	Late August	2.5

5. APPENDICES

5.1 Appendix A - BACKGROUND

5.1.1 History and recent management

Quarrying at Dunbar, which began in 1963 was transferred from the original South Quarry to what was known as the North Quarry by virtue of a planning consent granted in 1979 (ref. 410/78). Because of the complex geology, North Quarry had to be exploited in two phases from west to east. The first area developed was the North West Quarry (the current restoration project area), which would be gradually developed eastwards until having to terminate at a geological fault zone. The North West Quarry commenced development in 1980. On completion of the North West Quarry, development would then "jump" over to a second quarry, which would continue eastwards as the North East Quarry. Development of the North East Quarry commenced in 2007 and quarrying operations were gradually run down in the North West Quarry as production built up in the North East Quarry. The final transfer of production from the North West Quarry to the North East Quarry was completed in 2010. During its lifespan, the North West Quarry produced approximately 40 million tonnes of limestone and 100 million tonnes of overburden (shale, sandstone and glacial drift).

The remaining land consented for quarrying in the North East Quarry runs along a coastal strip, amounting to approximately 320ha, which extends down to the Dry Burn. It has been estimated that the North East Quarry will produce approximately 40 million tonnes of limestone and over 120 million tonnes of overburden during the next 40 years.

5.1.2 Statutory planning and other designations

The original planning consent for the north west quarry was issued in 1979 (ref: 410/78), and required the land to be restored to full agricultural use in accordance with a restoration scheme attached to the planning permission. However, in 2001, the quarry operators identified a shortfall of some 4 million cubic meters of overburden which was required for restoration fill, with the result that a concave rather than a convex topography would be achievable. In addition, it was determined that the volume and quality of topsoil required to return the land back to its original agricultural use was insufficient.

In November 2001, Blue Circle Industries Ltd submitted a planning application for an alternative, more varied restoration scheme. This scheme included the creation of grassland, woodland and wetland habitats, as well as the development of a public access infrastructure. This scheme was subsequently consented in 2002. Although this alternative restoration scheme has been on the whole implemented, completion of a footpath and cycleway network to the required standards is still pending and is dependent upon adequate ground settlement. It has been confirmed by the Planning Authority that significant re-profiling of the landforms and the development of a different public access network to the one consented in 2002 would require an amendment to the existing consent. The nature and extent of any such changes will need to be discussed in due course.

5.1.3 Geology and Soils

The predominant bedrock geology for the site consists of carboniferous lower limestone inter-bedded with sandstones (BGS Survey data). Shale also forms beds within the main limestone strata. Along the northern cliff within the restoration project area, an exposure of diatomite, a biogenic rock deposited during the Pleistocene, lies within sandstone strata.
The principal soil type within the restoration project area is formed from glacial drift, which contains sands and gravels, with some clay deposits, and is relatively nutrient poor. A number of chemical properties in the soils used to restore the land at Whitesands Quarry have been recorded. The pH of top soils was higher than typical values for Scottish soils, averaging 8.08. This is probably because limestone residues are present in the sub-soil and topsoil material which was used to restore the land surface after quarrying. The concentrations of magnesium and potassium varied from low to medium.
The sub-soils and top soils were progressively stripped off the site prior to quarrying from 1980 onwards. These soils were stockpiled on site, and subsequently replaced on overburden. Some of these soils were stockpiled for more than a decade. The rocks on the adjacent shore are notable as a geological SSSI.

5.1.4 Hydrology

Whitesands Quarry is located downstream within a relatively small (250ha) coastal catchment that tapers westward to the watershed on Doon Hill, and terminates downstream in a series of springs that disgorge onto the easterly facing foreshore. There is a small feeder stream that enters the lake from the south at NT70382 76915. This stream runs through arable fields to the south of the site. Its channel to the north of the A1 trunk road is lined with concrete paving slabs. Approximately half way between the A1 and the railway line, the stream enters a culvert, whereby it flows under the railway and quarry perimeter road before discharging into the quarry from a 450 mm diameter pipe. This is an ephemeral stream, and although its water volume has not been quantified, it is likely to be only a fraction of the total annual inflow to the lake. Whitesands Quarry lake currently comprises approximately 30ha of the wider 100ha restoration project area. The lake has formed principally from net seepage from confined/semi-confined aquifers subsequent to the cessation of dewatering in October 2009. In addition to this, an average daily rate of 2,520 m^3 (data for 2012) is pumped into the lake from the NE Quarry. Two water pumps were installed at the lake, one in May 2012 and a second in July 2012. These pumps have been pumping out approximately 10,000 m^3/day of water into settling ponds located just to the NW of the quarry lake. Water levels in the lake are monitored on a daily basis and have risen from -16.02m AOD in 2009 to a peak of +4.45m AOD in July 2012. The water level in the lake started to fall in July 2012 and currently varies between 1.5m and 2.0m AOD.

5.2 Appendix B – BIOLOGICAL INFORMATION

5.2.1 Habitats

The distribution of habitats on the site is shown in Map 1.C. There has not been a Phase 1 habitat survey of the site to date.

5.2.2 Important plant and animal species

Species	Population	Status	Comments
Plants			
Wood small-reed, *Calamagrostis epigejos*	Present	Only known site in East Lothian	According to BSBI maps this is the first record of the plant (which is uncommon in Scotland) within East Lothian. To be maintained.
Mammals			
Brown hare, *Lepus europaeus*	Present		
Roe Deer, *Capreolus capreolus*	Present		Regular sightings, potentially important visitor feature
Badger, *Meles meles*	Present		
Fox, *Vulpes vulpes*	Present		
Stoat, *Mustela erminea*	Present		
Hedgehog, *Erinaceus europaeus*	Present		
Amphibians			
Common toad, *Bufo bufo*	Present	RSPB priority species	
Invertebrates - Lepidoptera			
Holly blue, *Celastrina argiolus*	Present	Not threatened	Not common in Scotland, recent colonist.Presence at Whitesands could do with confirmation
Small heath, *Coenonympha pamphilus*	Present	Not threatened	Significant decline in lowland populations
Speckled wood, *Pararge aegeria*	Present	Not threatened	Not common in south east Scotland. Recent colonist to this area

Non-breeding birds

Species	Population*	Status	Comments
Lapwing	97	Red, RSPB priority 44 species	
Curlew	43	Amber, RSPB priority 44 species	
Ringed plover	Present	Amber, RSPB Reserves priority 101 species	Opportunity to create undisturbed breeding habitat on site
Redshank	5	Amber, RSPB priority 44 species	
Wigeon	90	Amber	

Species	Population*	Status	Comments
Pochard	27	Amber	
Teal	34	Amber	
Pink-footed goose	31	Amber	
Gadwall	4	Amber	
Goldeneye	16	Amber	
Mallard	135	Amber	
Shelduck	6	Amber	
Tufted duck	62	Amber	
Whooper swan	2	Amber	
Oystercatcher	4	Amber	
Greylag goose	92	Amber	
Mute swan	5	Green	
Canada goose	36	No status	

*Mean of peak WeBS counts 2011/12 – 2014/15.

Breeding birds

Species	Population*	Status	Comments
Skylark	35	Red, RSPB priority 44 species	
Reed bunting	7	Amber, RSPB Reserves priority 101 species	
Meadow pipit	11	Amber	
Sand martin	c. 200 – anecdotal figure from Tarmac staff	Amber	Existing colony is in temporary bank in working area of quarry
Peregrine	1	Green	
Pied wagtail	2	Green	
Goldfinch	4	Green	
Sedge warbler	2	Green	

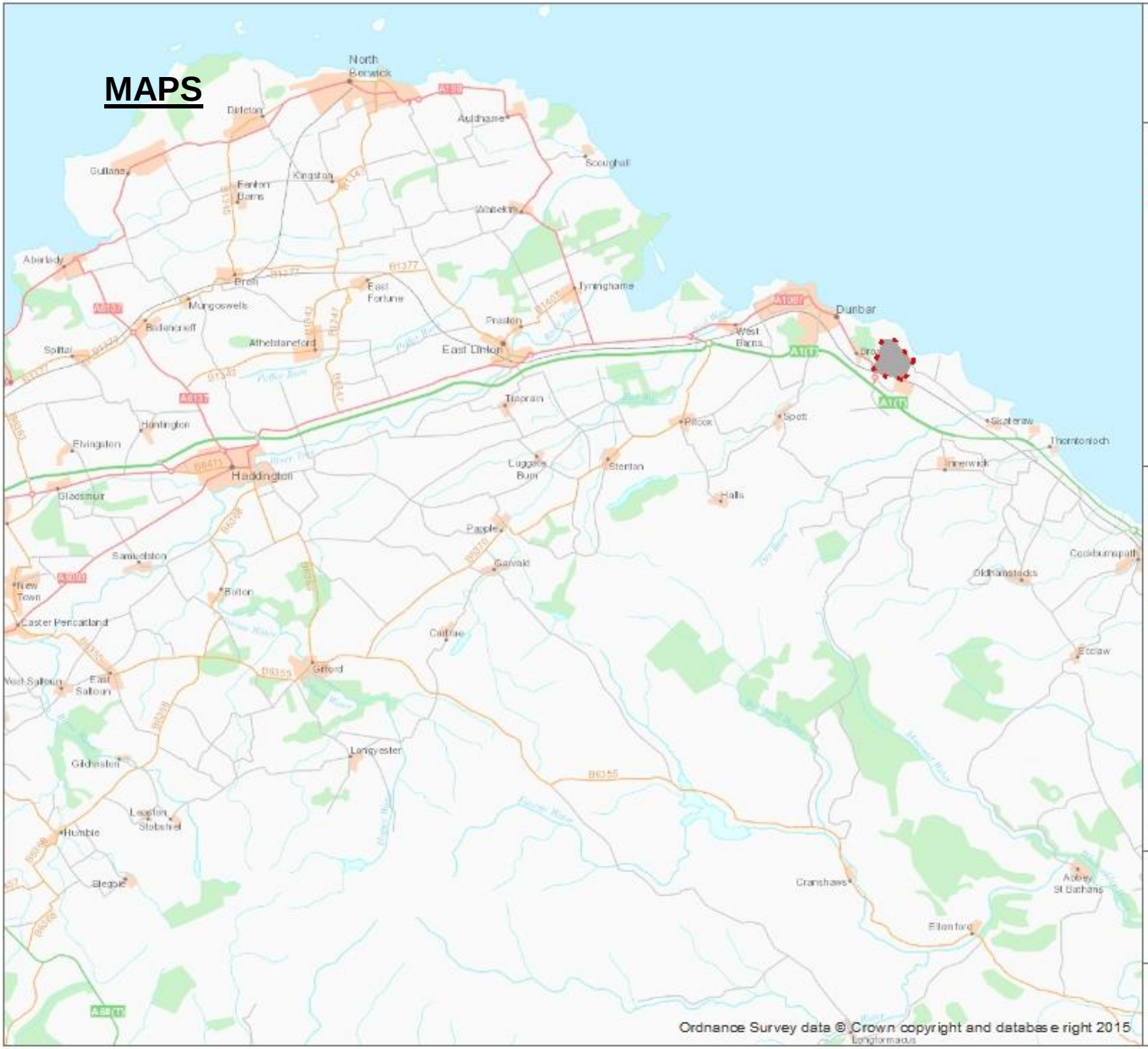
*Based on only BBS data available (2015).

5.3 Appendix C – Aspirational site management

The following table identifies the target condition of the Features Influencing Management and the Main Factors influencing whether these target conditions are attained. These features and management options represent potential areas of work to be researched further, and to be discussed for implementation in the future if they are deemed necessary and/or beneficial in assisting the achievement of project aims and objectives.

Feature	Attribute(s)	Current	Target(s) for attribute	Main factor(s)	Target for main factor(s)	Comments
Grassland						
Lowland meadow	Area.	Approx. 4ha.	Maintain current area as lowland meadow (i.e. prevent succession).	Aftermath grazing at low livestock density.	Implement effective grazing regime to improve species richness.	Ecologically the preferable long-term management option in association with one late summer cut. Dependent on continued partnership and on-going resource.
Small blue butterfly	Presence.	None.	Establish population.	Continued resource and time allocation.	Development of suitable habitat through soil stripping.	Dependent on colonisation of suitable vegetation after soil stripping.Resource ask and external collaboration required.
Open water						
Floating islands	Presence.	None.	Establish as habitat on site.	Continued resource and time allocation.	To be explored as an option and kept as an idea to further improve the site dependent on on-going resource.	Discussions to continue, to be fulfilled with ongoing resource. On-going management of islands potentially necessary.
Other						
Hibernacula for reptiles	Presence.	0	Establish presence.	Provision of hibernacula in sunny, south-facing areas.	Create stony, undisturbed areas in sunny, south-facing parts of the site.	Relatively easy to create habitat but may not be present or colonise site
Fish – free amphibian ponds	Presence.	None.	Establish as habitat on site.	Continued resource and time allocation.	Creation of several, different sized ponds in sunny areas that should remain fish-free and could attract amphibians.	Discussions to continue, to be fulfilled with ongoing resource.

MAPS



MAP 1.A. Site location

Legend:

Site boundary

Acknowlegements & notes:

Inset map:

Date printed: 29/09/2015

Created by:
Mark Mitchell, RSPB

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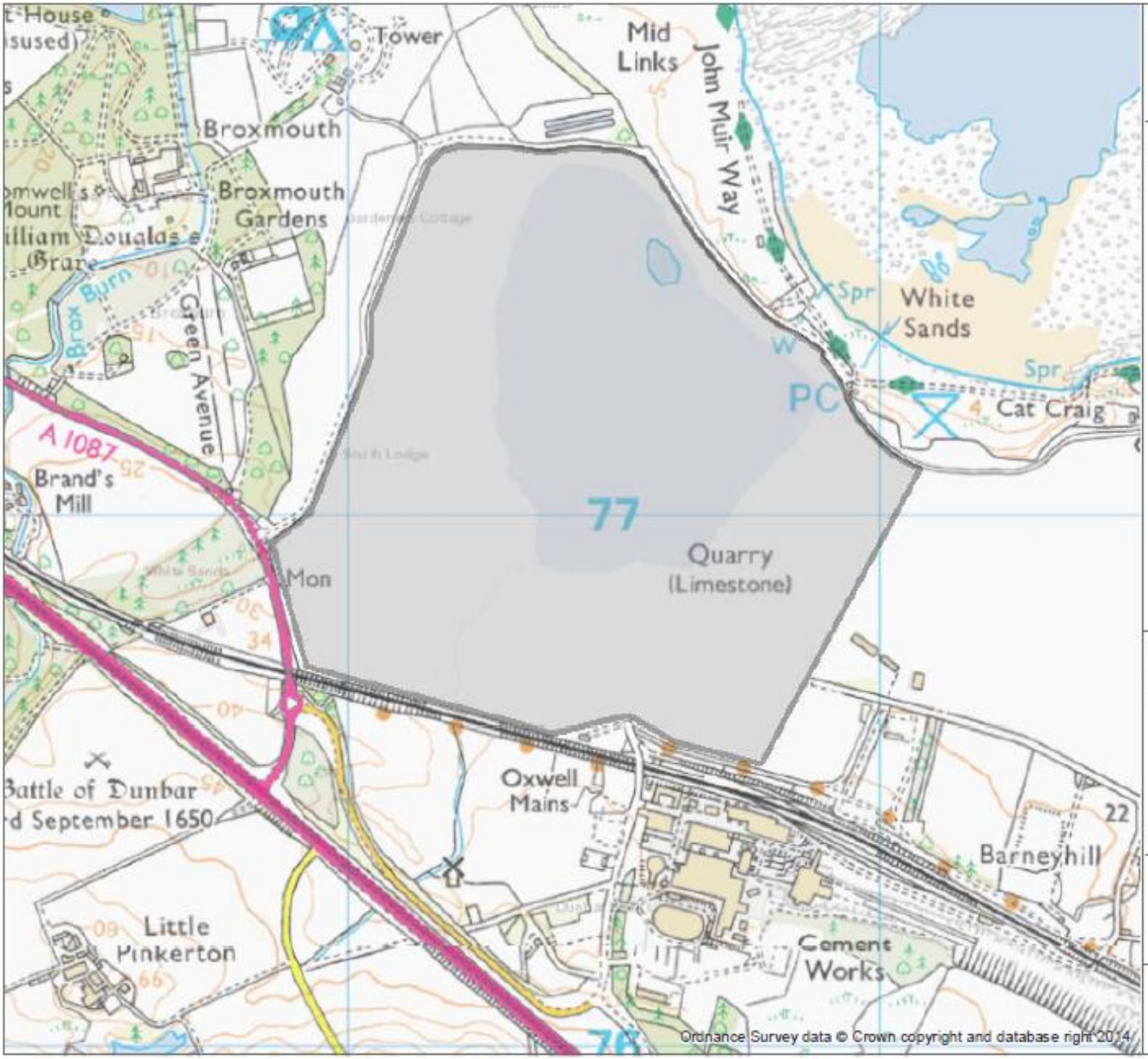
Map scale = 1:158,346

0 1.75 3.5 7 km

giving nature a home



Map 1.B Site Boundary

Legend:

Site boundary

Acknowledgements & notes:

Created by: Mark Mitchell, RSPB

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Map scale = 1:10,153

Date printed: 06/07/2015

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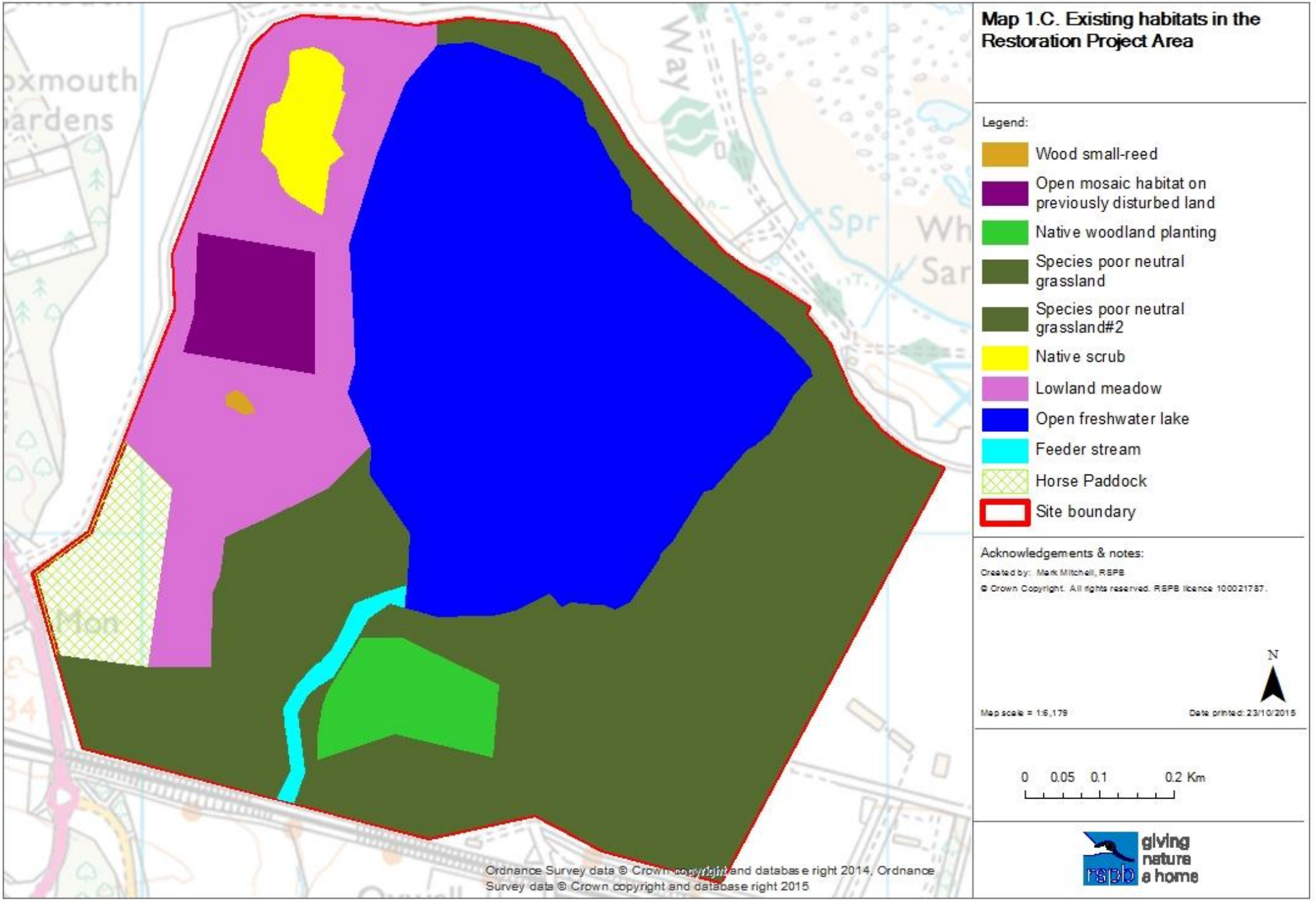
Map 1.C. Existing habitats in the Restoration Project Area
Legend:
Wood small-reed
Open mosaic habitat on previously disturbed land
Native woodland planting
Species poor neutral grassland
Species poor neutral grassland#2
Native scrub
Lowland meadow
Open freshwater lake
Feeder stream
Horse Paddock
Site boundary
Acknowledgements & notes:
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N
Map scale = 1:6,179
Date printed: 23/10/2015
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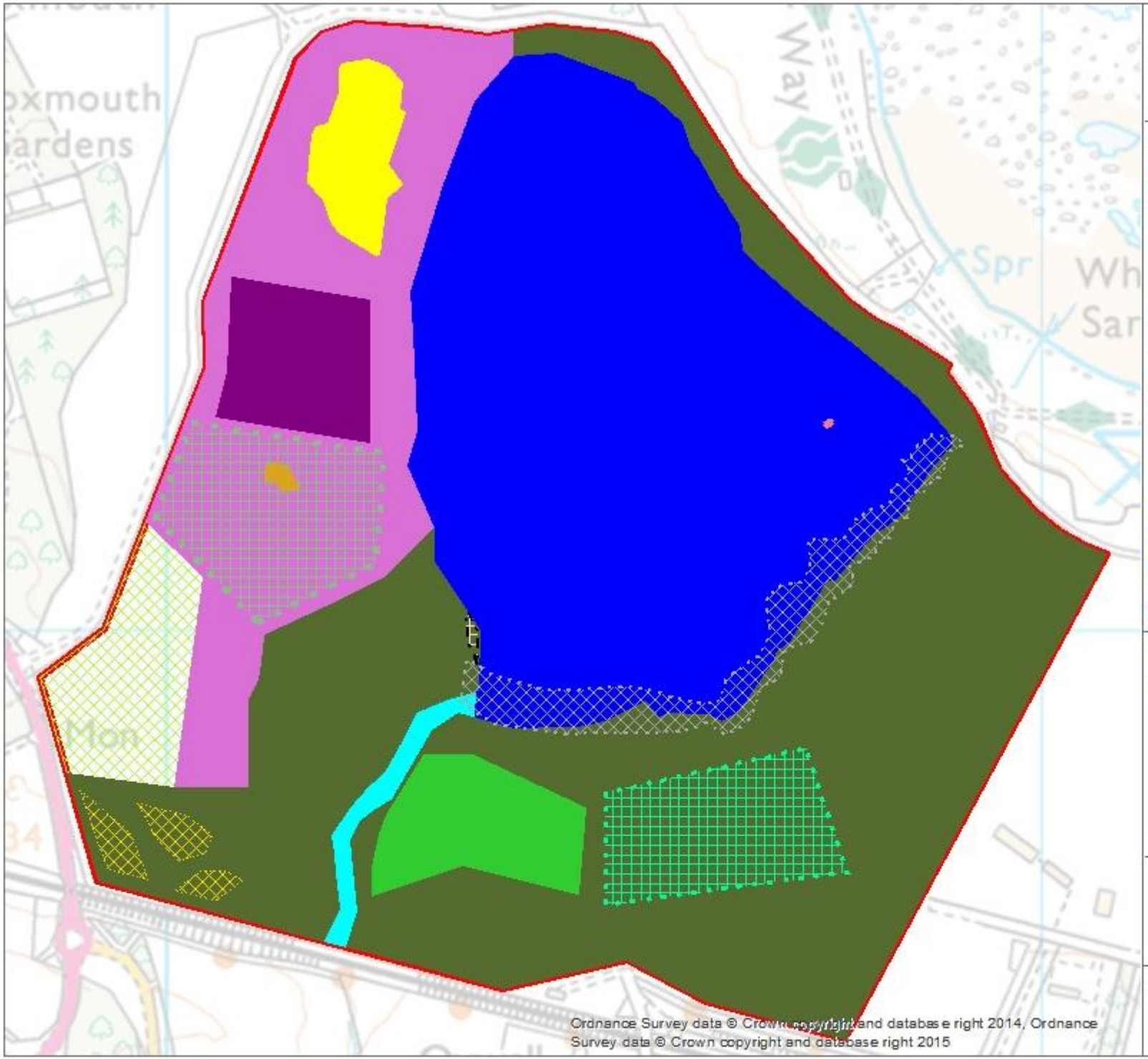

Map 1.D. Management and maintenance over the period 2016 - 2020

Legend:

- Wood small-reed
- Strip land for calcareous grassland (exact area to be confirmed)
- Hawthorn, Blackthorn and Elder planting
- Create sand martin nesting bank
- Wader scrape and island habitat creation
- Tern raft
- Biannual cut and lift of lowland meadow (exact area to be confirmed)
- Open mosaic habitat on previously disturbed land
- Native woodland planting
- Species poor neutral grassland
- Species poor neutral grassland#2
- Native scrub
- Lowland meadow
- Open freshwater lake
- Feeder stream
- Horse Paddock
- Site boundary

Acknowledgements & notes:

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Map scale = 1:6,181

Date printed: 05/11/2015

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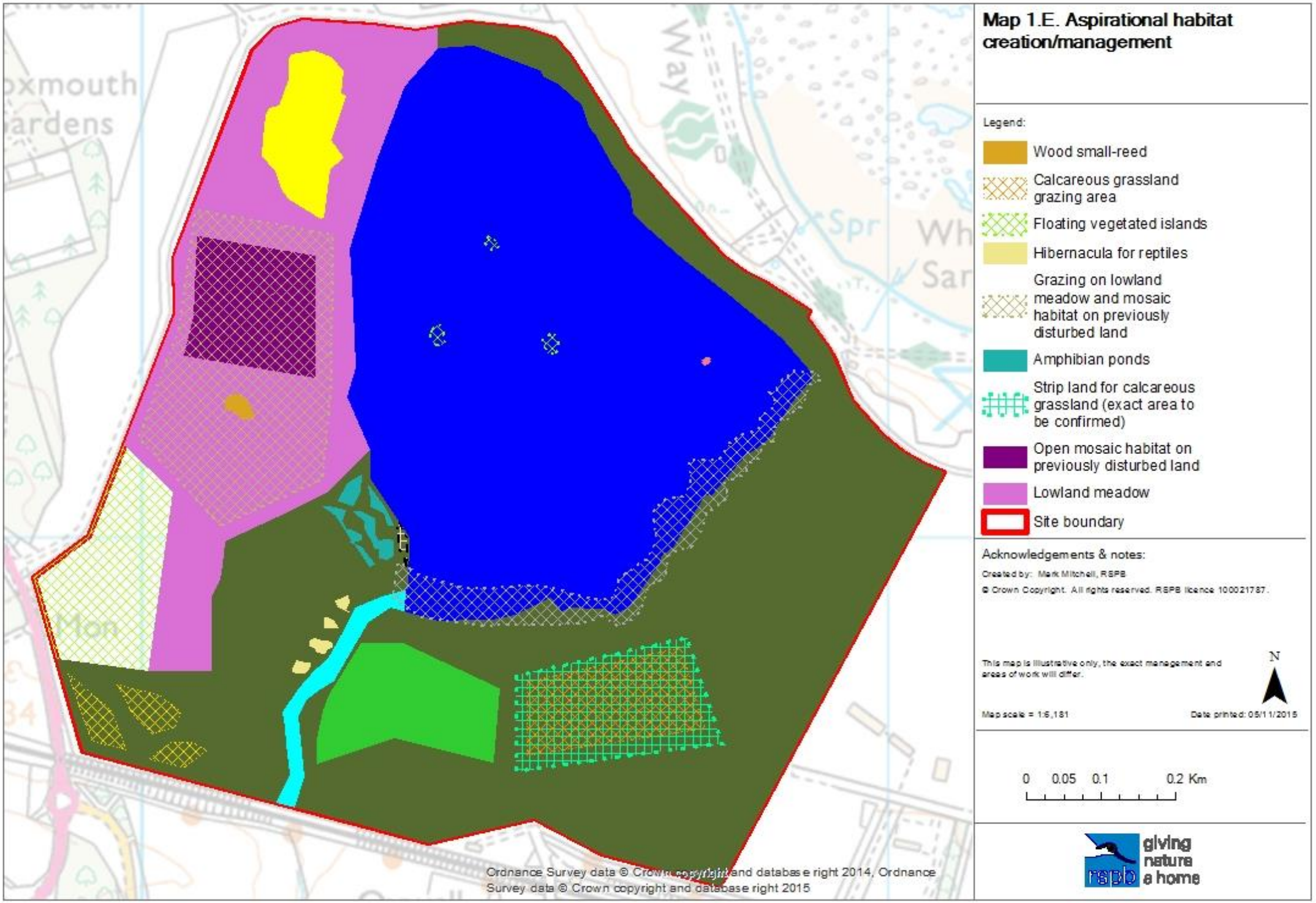
Map 1.E. Aspirational habitat creation/management
Legend:
Wood small-reed
Calcareous grassland grazing area
Floating vegetated islands
Hibernacula for reptiles
Grazing on lowland meadow and mosaic habitat on previously disturbed land
Amphibian ponds
Strip land for calcareous grassland (exact area to be confirmed)
Open mosaic habitat on previously disturbed land
Lowland meadow
Site boundary
Acknowledgements & notes:
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This map is illustrative only, the exact management and areas of work will differ.
N
Map scale = 1:6,181
Date printed: 05/11/2015
0 0.05 0.1 0.2 Km
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