The Nottinghamshire Biodiversity Opportunity Mapping Project

The Trent Valley

February 2016

The Nottinghamshire Biodiversity Opportunity Mapping Project

The Trent Valley (version 1)

Credits:

Report produced by Nick Crouch (Nottinghamshire County Council), with mapping and data analysis undertaken by Karen Taylor (Nottinghamshire County Council). Additional mapping carried out by Chris Jackson (Notts BAG).The production of this report was made possible due to funding by the Trent Vale Landscape Partnership, Nottinghamshire County Council, the Environment Agency, Broxtowe Borough Council and Rushcliffe Borough Council.

1. Aim of the Project

The aim of this Project was to produce a Biodiversity Opportunity Map (BOM) for the Trent Valley through Nottinghamshire. This work was carried out specifically to support delivery within the Trent Vale Landscape Partnership Scheme area, and the Nottinghamshire Minerals Local Plan, but also to help underpin the wider work of the Nottinghamshire Biodiversity Action Group (BAG), Nottinghamshire's Local Biodiversity Action Plan (LBAP) partnership.

2. Background and methodology

For information about the rationale for producing a Biodiversity Opportunity Map, and the methodology used to do so, please see the Nottinghamshire Biodiversity Opportunity Mapping Project – Background Information Report, dated February 2016.

3. Workshops

Stakeholder workshops were held on 17th April 2013 (Trent Vale area); 21st June 2013 (Nottingham to Newark area); 26th November 2013 (Rushcliffe West and Broxtowe) and 10th February 2015 (Rushcliffe East.) The four workshops involved 41 individuals from 19 organisations; see Appendix 1 for details.

4. Outputs

The Trent Valley BOM Project has four mapping outputs:

a) "*The Basemap*" (Appendix 2), which shows all habitats across 576.6 sq km within the project area (including a 250m buffer), based on the digitised 1997-8 Phase 1 survey, updated with reference to aerial photography, the BAG's LBAP habitat mapping data, and knowledge of Local Wildlife Sites from the NBGRC.

b) "*The Habitat Network Maps*" (Appendix 3), which have been produced in MapInfo using the National Forest's Habitat Network Model, for each of the four broad habitat types (woodland, grassland, wetland and heathland/acid grassland).

c) The "*Biodiversity Opportunity Maps*" (see Section 7 – Maps and tables), which incorporate (i) the "Long Term 50 Year Opportunities" and (ii) the "*Short Term 10 Year Opportunities*". The former are BAG partners' shared vision and aspirations for what might be achieved over a 50 year time frame, based on the assumptions of a sympathetic funding and planning climate and guided by the current distribution of habitats and their potential for extension based primarily on geology, soils and hydrology. This map also includes details of the longer-

term landscape scale visions and targets of BAG partners where they are already in place, but is moderated by immutable constraints such as large settlements and roads. The latter, which overlay the Long Term 50 Year Opportunities, show shorter-term aspirations based upon current or proposed projects and known constraints such as substantial approved development sites, new planned infrastructure and areas of highest value farmland. Each area on the maps is numbered, with a description of the opportunity contained in Appendix 7.

d) The "*Focal Area Maps*" (see Section 7 – Maps and tables), identifying locations where there appears to be a particular concentration of opportunities, which may be for the same habitat type or across different habitat types. These can be used to prioritise activities so that they have the maximum benefit.

5. What the BOM shows

The following conclusions have been drawn following the workshops and the production of the Biodiversity Opportunity Maps:

i. Priority habitats

Perhaps unsurprisingly, the BOM maps indicate that wetland habitats are considered to be the habitats which should be subject to most activity, with considerable opportunities identified for the re-creation of extensive areas of reedbed and wet grassland within the Trent Valley.

However, there are also opportunities for action on the other three broad habitat types. Woodland within the Trent Valley is rather limited, but concentrations do occur, especially towards the north of the area, and along the steep bluff between East Bridgford and Syerston airfield. There are opportunities in these locations to create extensive areas of new woodland to improve connectivity. The creation of wet woodland elsewhere within the Trent floodplain is also considered to be an opportunity.

Areas of grassland occur especially on the western side of the Trent Valley, and there are opportunities to improve, extend and link these. However, many grassland sites are small and isolated, and opportunities to significantly extend or link such sites are likely to be limited at the current time. However, changes to agriculture and land-use patterns in response to economic and climatic changes, may mean that opportunities arise in the future.

Acid grassland and heathland habitat is limited in its distribution within the Trent Valley, centred on an area east of the River Trent around Besthorpe and Spalford and Stapleford Woods/Turfmoor. Opportunities relating to these habitats are the most limited, constrained by the presence of areas of wind-blown sand in this small area only, but underlines their local importance.

ii. Focal Areas

The BOM maps show that there are several areas where existing habitats and associated opportunities are concentrated, referred to here as 'Focal Areas'. Input by participants at the workshops has shown that there are substantial opportunities in both the short and long term to expand these habitats, to buffer them and to link them up to create a stronger habitat network across a landscape scale. These Focal Areas, shown on Maps 13 to 15 in Section 7, are:

1. **South and West of Gainsborough**: opportunities for wetland creation, including wet grassland, centred on the existing Beckingham marshes site and covering land within the floodplain to the north and south.
2. **Langford Lowfields to Girton:** an area of restored, working and proposed sand and gravel works within the floodplain, with significant opportunities for wetland and heathland creation and enhancement, including reedbed, and wet grassland and acid grassland/heathland, the latter associated with the coversands in the north-eastern part of this Focal Area.
3. **Lady Bay to Gunthorpe:** potential for improving the wetland and grassland networks in a large block centred on Holme Pierrepont. A number of existing sites have been identified as requiring maintenance, enhancement and buffering. There is also lots of potential for improving habitat connectivity between sites. Potential future sand and gravel works provide opportunities for the creation and enhancement of wetland habitat, including reedbed and wet grassland.
4. **Wilford to Thrumpton**: potential for improving the wetland and grassland networks. A number of existing sites provide good areas of core habitat and the surrounding floodplain offers potential areas where habitat connectivity can be improved.

iii. Wider Landscape

It is significant that the BOM identifies a large number of smaller habitat cluster areas, scattered throughout the Trent Valley, but also appears to indicate that there are large parts of the Trent Valley where there are no opportunities. However, in these areas, opportunities do exist: improved hedgerow networks and shelterbelts can be used to improve linkages between woodlands; grassland strips around fields and along roads can help link up isolated grassland sites, and the improved management of ditches and other watercourses can link up wetlands. Although not specifically picked out in the BOM, such opportunities can be delivered through things like agri-environment schemes. It should also be noted that the BOM picks out the River Trent itself as a key feature which can be used to improve connectivity along the whole Trent Valley; other rivers and streams are likely to provide similar opportunities to improve linkages across the landscape.

iv. Conflicts and other considerations

It is evident that some areas are appropriate for the creation of more than one type of habitat. In such instances, it may be possible to incorporate both (or all) habitats into a single location through careful planning; alternatively, it may be that one habitat is deemed to be more important than another. Similarly, there may be instances where habitat creation at one location will affect an adjacent area where habitat currently exists (or could be created). Such instances should be looked at on a case-by-case basis as and when opportunities arrive, with the help of specialist ecological input.

It should also be noted that these are ecological opportunities; no account has been taken at this time of other factors such as land ownership and current landuse, or of other factors such as flood risk management or public access. These would, of course, need to be considered at the time that opportunities are taken forward.

v. Opportunities for species

The BOM focuses on habitats, but implicit within this is the expectation that works to make habitats better and bigger, to create more of them, and to ensure that they are linked up, will also benefit the priority species[1] which use these habitats. The species which are likely to particularly benefit from the opportunities identified in this report are:

- Birds, such as breeding waders and wintering wildfowl (using wet grassland), reedbed specialists (such as bittern), and scrub species such as willow tit and turtle dove
- Mammals, including bats, water vole and harvest mouse
- Herpetofauna, including common frog, common toad and grass snake
- Fish, including brown trout, salmon, bullhead and spined loach
- Lepidoptera, including habitat-specialist butterflies and moths

6. Next steps

The opportunities highlighted in this report will be quantified and used to estimate the scale of habitat creation and restoration that can be delivered in the Trent Valley, and used as part of the next round of target setting for the Nottinghamshire Local Biodiversity Action plan (LBAP).

[1] Species of Principal Importance for Conservation in England, as identified through Section 41 of the Natural Environment and Rural Communities Act (2006)

7. Maps and tables

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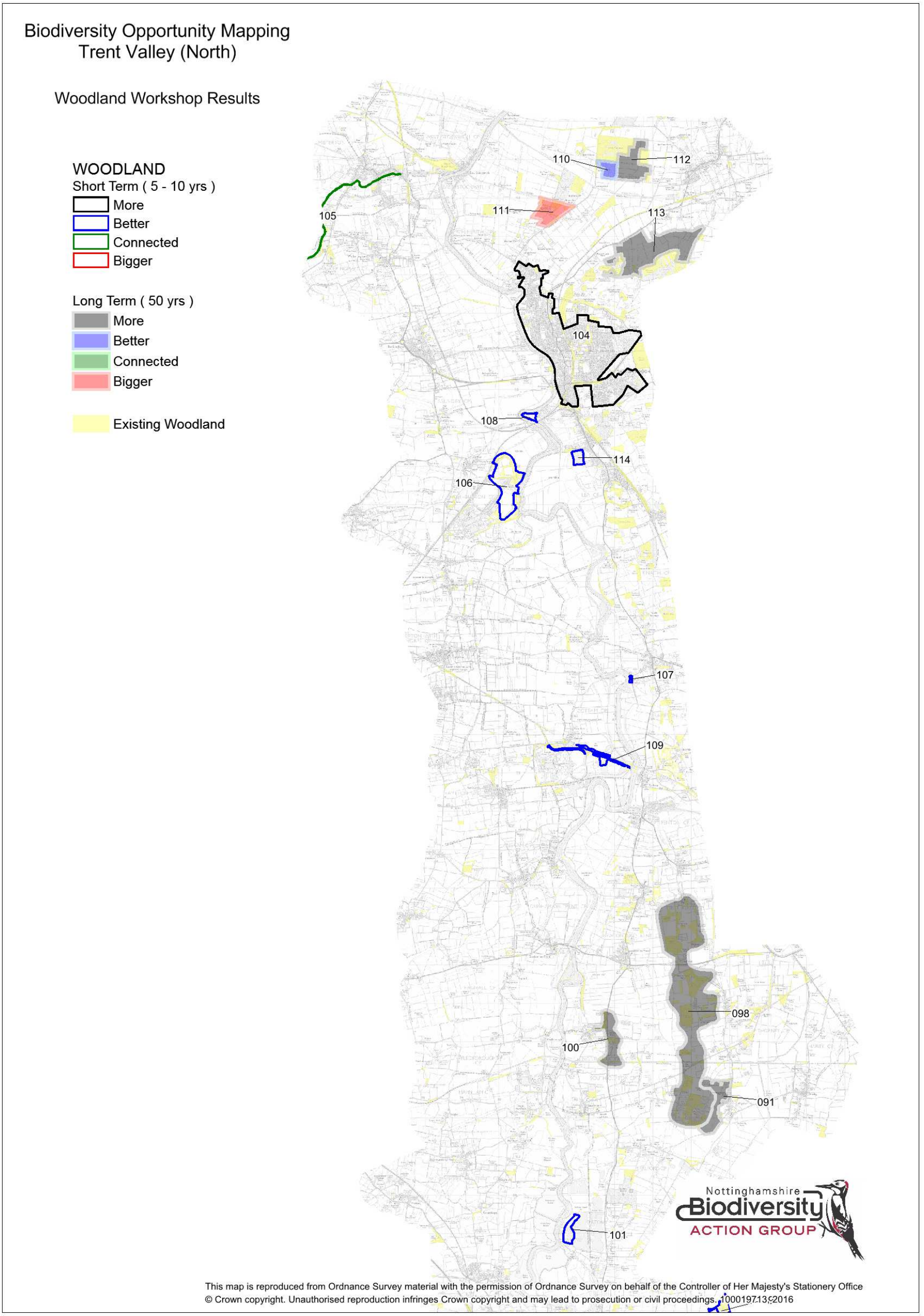
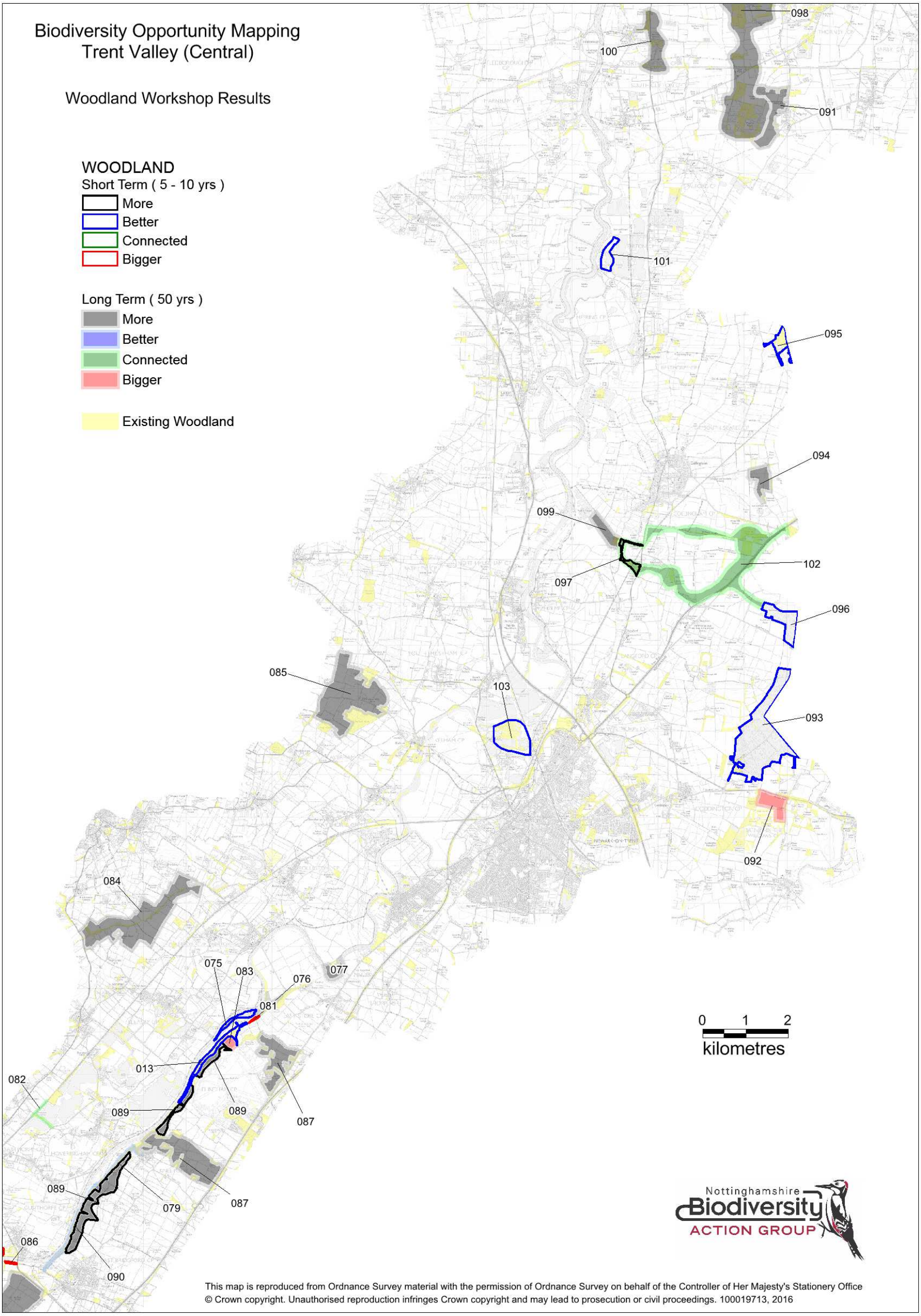
Map 1 - Woodland Biodiversity Opportunity Map (North)



Map 2 - Woodland Biodiversity Opportunity Map (Central)



Map 3 - Woodland Biodiversity Opportunity Map (South)

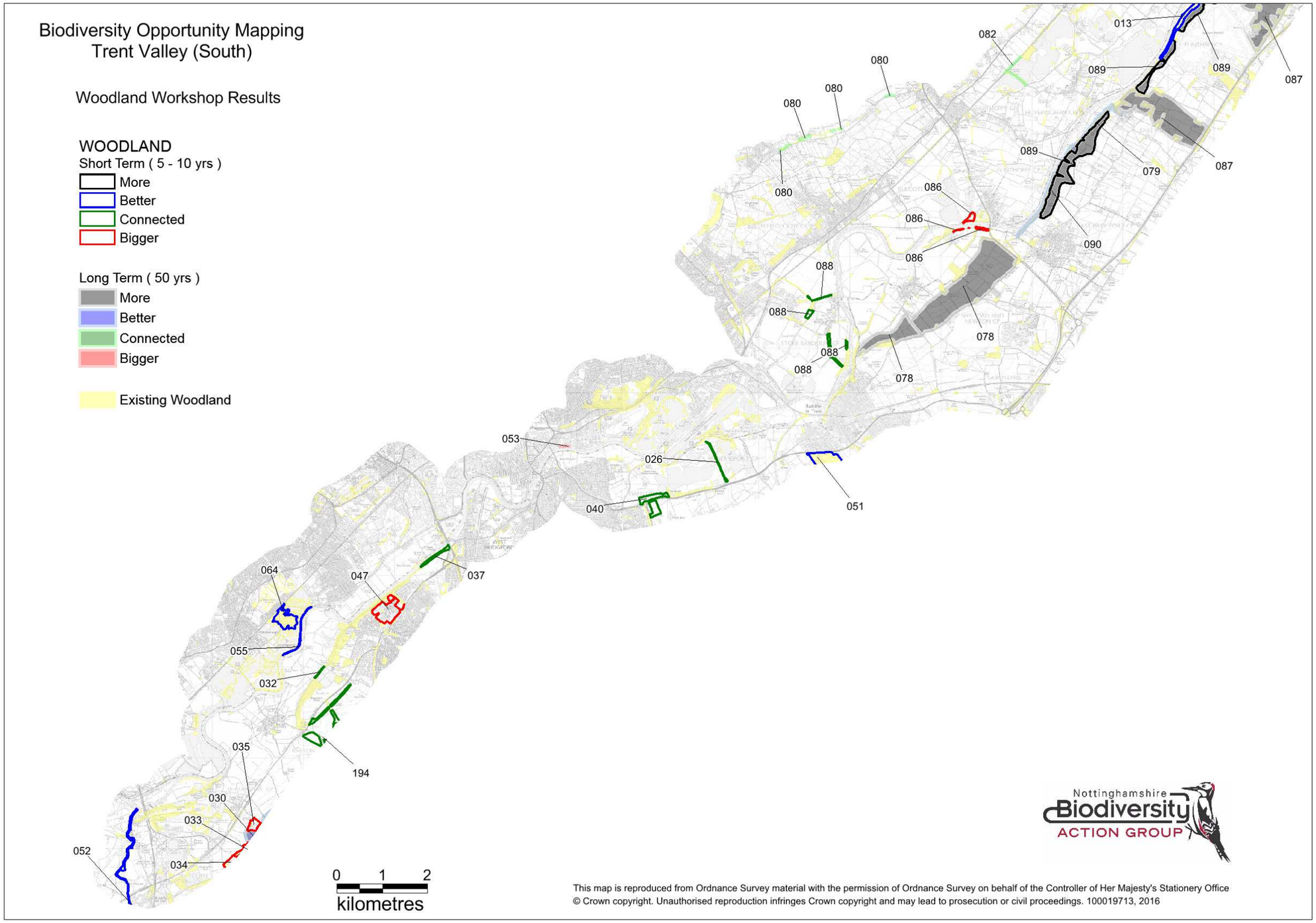
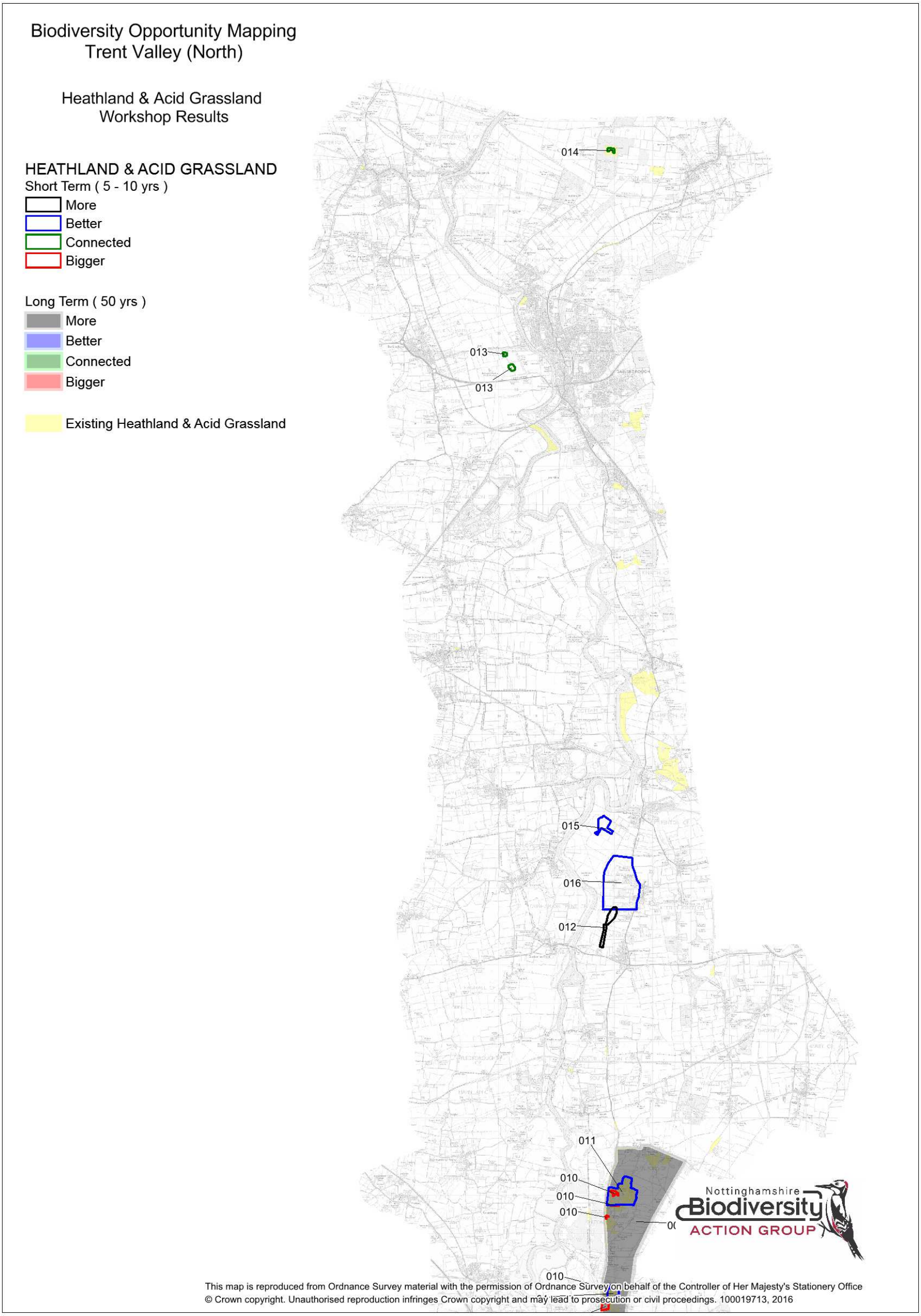


Table 1 - Biodiversity Opportunity table for Woodland (W)

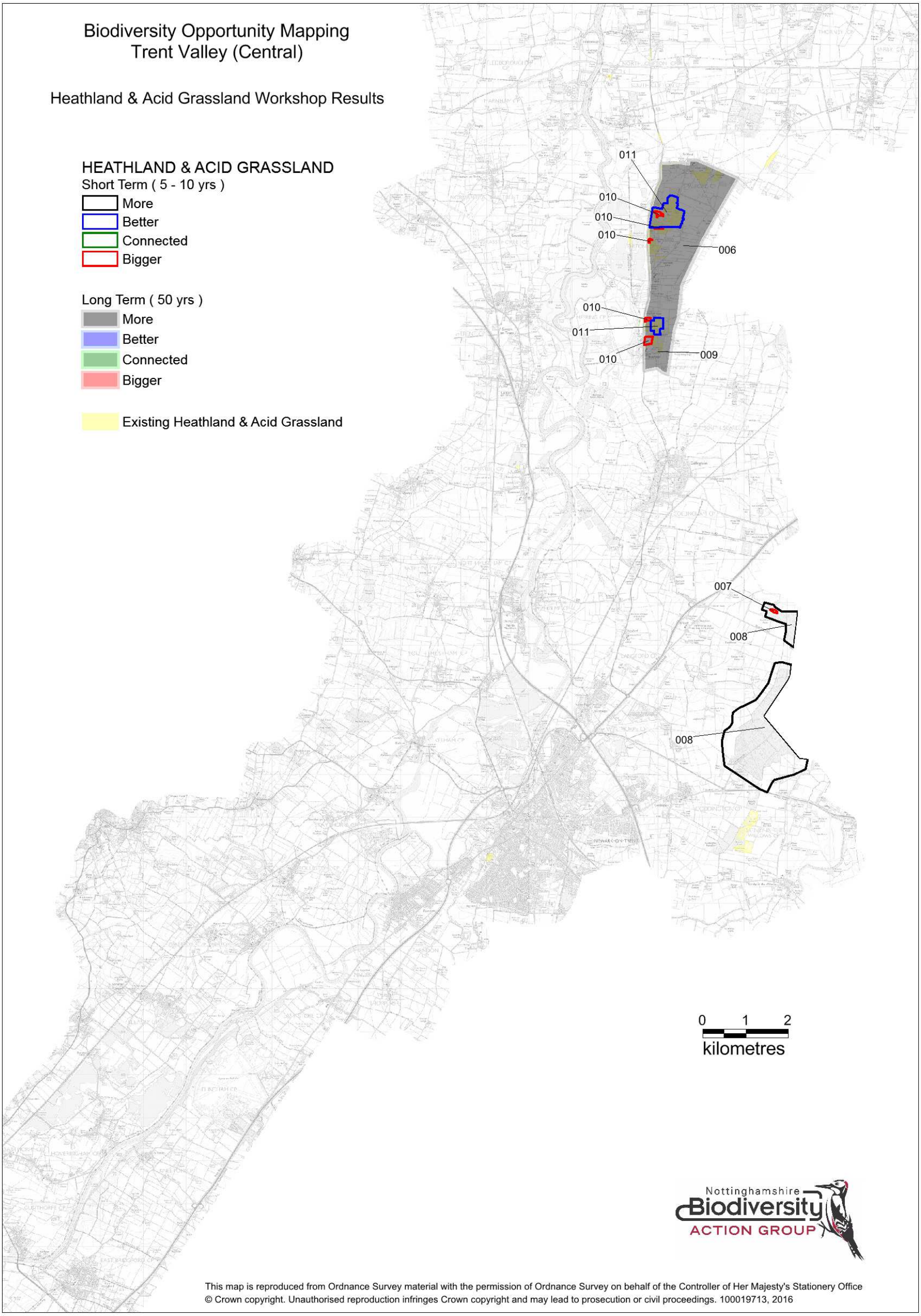
Map Display ID	Opportunity
13	Improve condition of Flintham Wood. (NP)
26	Enhance existing hedgerow to connect woodlands. MGW.
30	Plantation woodland, great scope for habitat management. Few years ago owner contacted NWT about purchase (may still have contacts). GD.
32	Non arable mixed heathland, opportunity for tree planting to bridge gap. Potential flooding but unlikely. HT.
33	Opportunity for infill and linking through. GD.
34	Opportunity for woodland linking in. GD.
35	Opportunity to link up isolated copse with larger woodland. GD.
37	Connect woodlands. MGW.
40	Connect up woodland strips north end of Lings Bar and that of A 52. JEO.
47	Clifton campus-heart of campus redevelopment. 30,000 m2 new landscaping to be staged. NTU Estates department. HT.
51	Naicent Woodland owned by Wheatcrofts, approx 140 acres. Planted around 12 years ago, with wide rides, and areas of south facing and north facing slopes. Rides wide but straight. A woodland with substantial grassland areas, good for wildlife. Flower rich fields on southern side of wood. BB.
52	River Soar, riparian tree/woodland improvements. C&RT working with L&RWT on the 'rewilding the Soar' to change the management of trees. This will also help navigation and safety needs. RB.
53	Pocket of wet woodland on Trent. Potential to extend through influencing planning permission for re-development along this zone. EA/FA.
55	Riparian trees along R.Trent (including Attenborough Reserve). Change and improve the management of riverside trees/woodland by C&RT and NWT (Attenborough). RB.
64	Enhanced wet woodland.
75	The Nabbs SINC/Hazelford Island. Scrub dominated island, potential to modify management for different stages of succession. RB, C and RT.
76	Small area of woodland to expand and link existing corridor.
77	Wet woodland in meander.
78	Create woodland along the escarpment. JMB.
79	Trent Hills Wood. This section is not as good as section North and South. Important bat habitat (roosting and foraging). MGW.
80	Cocker Beck. Connectivity to Lambley Dumbles, Ploughman Wood, Gedling Pit-top country park. JO.
81	Patchwork of wet woodland, grassland and wetland creation-good connection with linear woodland along Trent Hills. DJW.
82	Connect woodlands. MGW.
83	New woodlands on airfield connecting with Trent Hills.
84	Extend and connect woodland. R Bennett.
85	Create substantial new woodland, linking existing patches. JMB.
86	Linking areas of existing woodland around Gunthorpe. There is already an area of existing wet woodland on the Shelford side, and by Crown estates, where heron ringing has previously taken place. Any new habitat or enhancements should take this into account. JRB.
87	Connect Trent hills woodland to Flintham woodlands.
88	Link Stoke lock woodland to other woods in Stoke Bardolph via corridors (south Trent owned). R Bennett.
89	Expand Trent hills woodland. MGW.
90	Management Required? Risk as not valued by landowner?? PP.
91	Re-creation of parkland landscape. JMB.
92	Newark Gold Course. Increase size and connect woodland. MW.
93	Stapleford wood. More broadleaf in existing conifer plantation, Forestry Commission owned. MW. Barbastelle bat recorded at Norton Disney north of Stapleford wood.
94	Create new woodland-link existing fragments. JMB.
95	Better management of woodland. JMB.

96	Convert to broad-leaved woodland - improve edges with broad-leaves. CC.
97	Existing scrub and shelter belts connected with woodland planting and edge softening. MC
98	Extensive connection of fragmented woodland sites around the ridge. JMB.
99	Proposed wet woodland creation linked to silt lagoons/restoration. MC.
100	Connection of fragmented woodlands. JMB.
101	Girton pits (scrub/willow) - enhance to benefit e.g. willow tit.
102	Connect woods, create shelterbelts, field corners etc. to provide barbastelle corridors. JMB.
103	Enhance scrub/wet scrub in grounds of sugar beet factory and camp site. CC.
104	As a general comment - consider appropriate areas for scrub/wet scrub, especially for turtle dove + willow tit - include linking up extant mature hedgerows. CC.
105	Hedgerow along Chesterfield Canal. Could be 200 years old - potential to improve connectivity along the whole length.
106	Enhance scrub at West Burton power station - important site for scrub birds, turtle dove and willow tit. CC.
107	Trent Port - Includes hedgerow boundary and willow woodland on river bank. Improved management possible, following on from wetland work in 2012.RB.
108	Currently scrub/willow and regularly inundated from the Trent. Potential to improve to wet woodland, or clear to create wet floodplain. SN.
109	Scrub on railway embankment at Torksey. Possible scope for improved management. RB.
110	Fell coniferous woodland to improve grassland. MS.
111	Reconnect and expand woodland (dry). JMB.
112	Reconnect and expand woodland. JMB.
113	Substantial woodland creation - GI for Gainsborough. JMB.
114	Plantation adjacent to Lea Marsh SSSI - could be reverted to wetland habitat. JMB.
194	The proposed housing estate at Clifton includes a proposal for green infrastructure. The GI includes a network of woodland belts that link exisitng blocks of woodland. GD.

Map 4 – Heathland and Acid Grassland Biodiversity Opportunity Map (North)



Map 5 - Heathland and Acid Grassland Biodiversity Opportunity Map (Central)



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Map 6 - Heathland and Acid Grassland Biodiversity Opportunity Map (South)

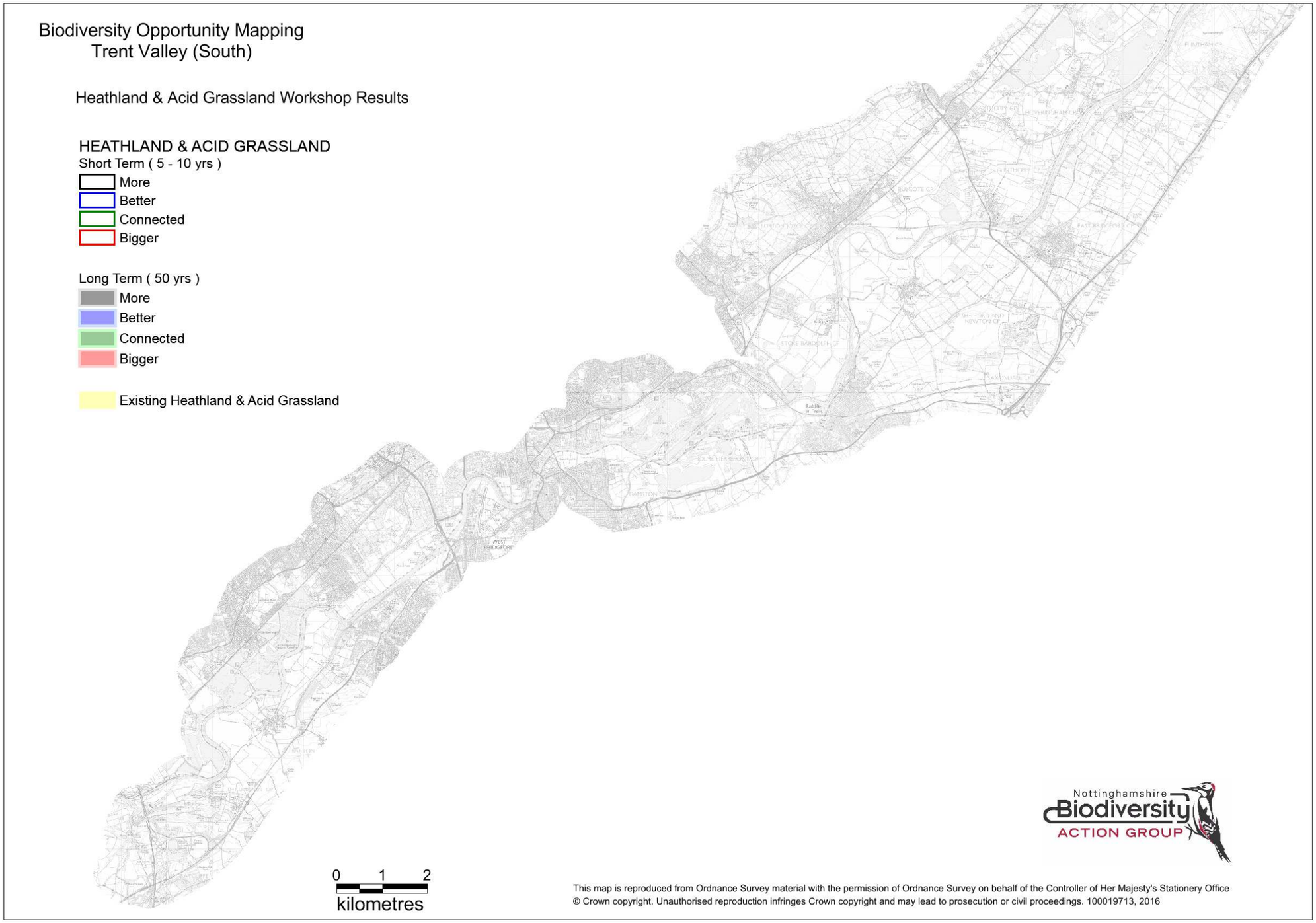


Table 2 - Biodiversity Opportunity table for Heathland and Acid Grassland (H)

Map Display ID	Opportunity
6	Re-create acid grassland and heath to join Spalford and Besthorpe warren SSSI's. JMB.
7	Make existing acid grassland patch larger (historic glow-worm records).
8	Enhance areas of heathland within woodland. MW.
9	Coversands - creation of additional acid grassland habitat between/around Besthorpe and Spalford Warren SSSI's
10	Spalford Warren SSSI - conifer woodland restored to heathland - HLS agreement NWT reserve. Multiple small potential sites for recreation of blown sands habitats. JMB.
11	Besthorpe Warren SSSI - heathland in need of management. BD.
12	Scrub/open sandy area bordering floodplain, uncertain extent. AH.
13	Two dots - just making connections between these very small networks.
14	Seems like a potential to 'fill in' if not otherwise wholly improved as woodland?? Woodland Trust owned site. SN.
15	Small area of windblown sand in wider area (shown dotted) of pasture. Potential for improved management and expansion. JF.
16	Broom Hills has huge potential for better management and until about 2 years ago, supported the only Lincs population of *Orobanche rapum-genistae*, which was destroyed, possibly to prevent obstacles to expansion of caravan park. Larger area has potential if sandy. JF.

Map 7 - Grassland Biodiversity Opportunity Map (North)

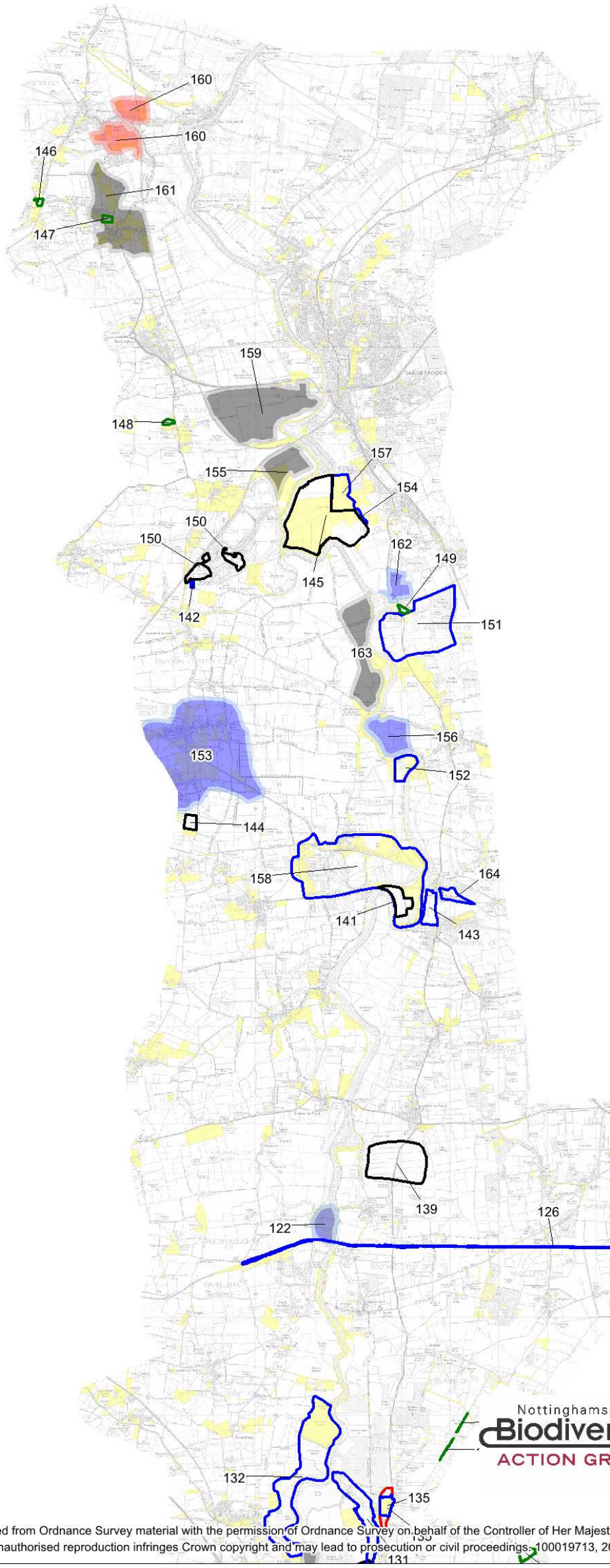
Biodiversity Opportunity Mapping
Trent Valley (North)

Grassland Workshop Results

GRASSLAND
Short Term (5 - 10 yrs)
More
Better
Connected
Bigger

Long Term (50 yrs)
More
Better
Connected
Bigger

Existing Grassland



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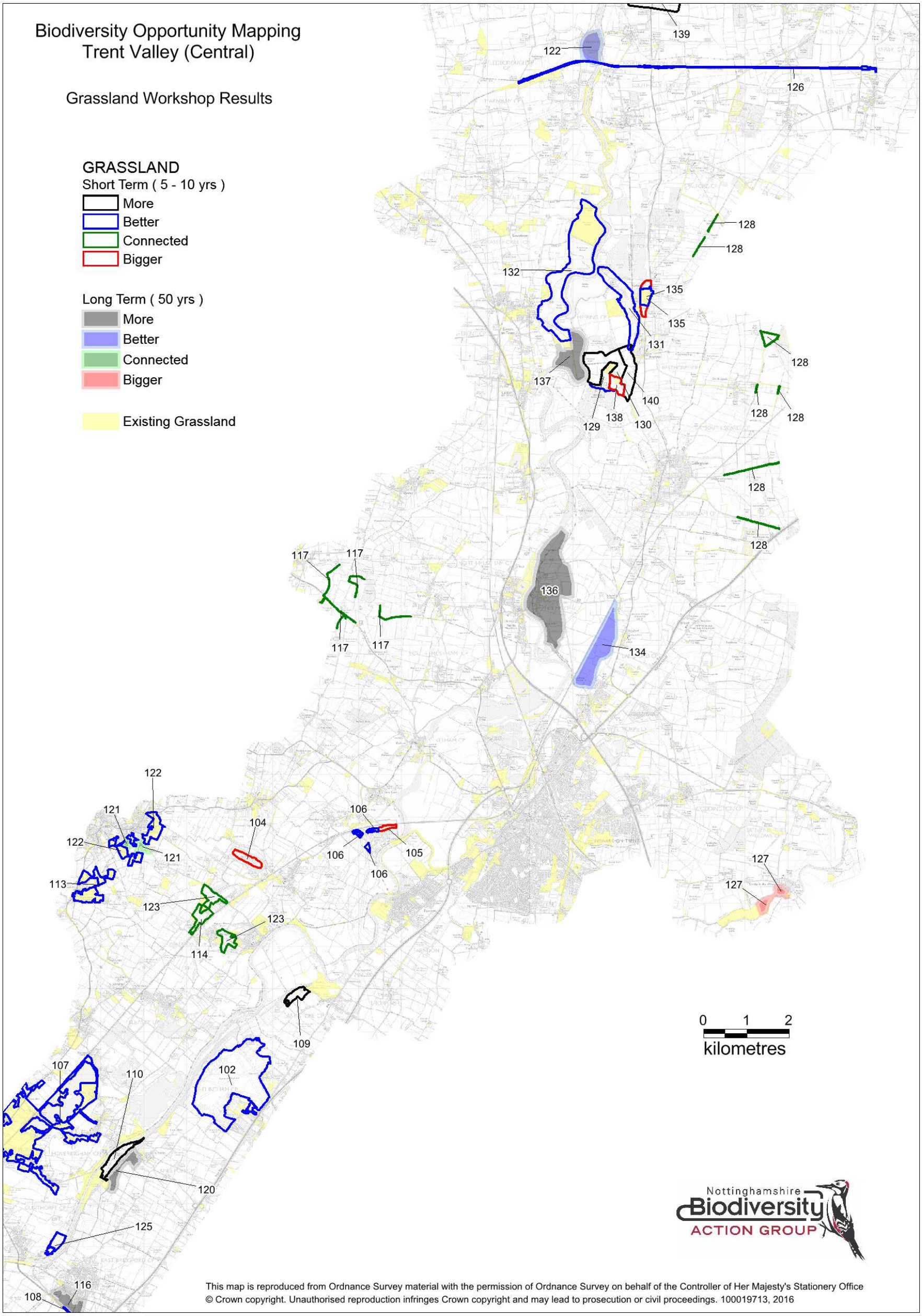
Map 8 - Grassland Biodiversity Opportunity Map (Central)



Map 9 - Grassland Biodiversity Opportunity Map (South)

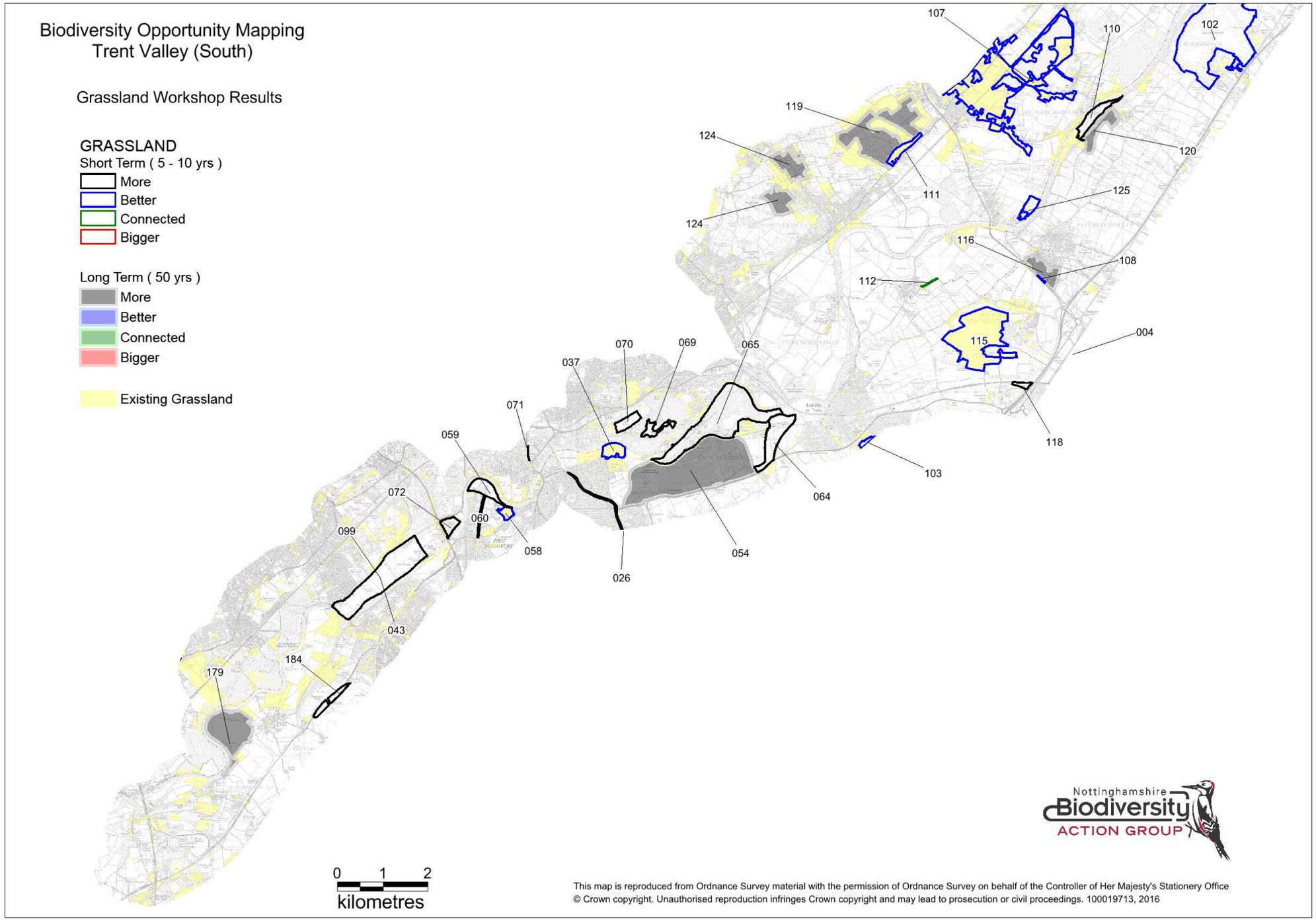


Table 3 - Biodiversity Opportunity table for Grassland (G)

Map Display ID	Opportunity
4	Development within local plan - opportunity for green infrastructure. PP
26	Grantham canal - could we improve the grass verge by changing mowing regime to allow cowslips etc in the spring. CC
37	Simkin Farm-management agreement potential. PP
43	Improve grassland sports pitches as habitat. Amenity grassland management at present. Area is flood alleviation owned by Nottingham University. JEO
54	Grassland improvements within the Holme Lakes complex including C/P. GD
58	Gresham Marsh dry grassland improvement management. GD
59	Area of rough grassland beyond flood bank. Opportunities for improvement. Land owned by Environment Agency. GD
60	Old railway embankment - did contain fragments of species rich-heavily scrubbed over. GD
64	Revert recent arable land back to species rich grassland. NC
65	Improvements to grassland management around rowing course. NC
69	Colwick Country Park, room for better grassland management, enhance diversity of site. EA/FA
70	Nottingham Racecourse, semi-improved grassland, room for improved management. EA/FA
71	Nottingham Beeston Canal, potential for grassland habitat along towpath and adjacent land. Currently amenity grassland, but could be changed to meadow by removal of topsoil, seeding and management. RB
72	Queens Drive Park & Ride, has a meadow with native neutral species. EA/FA
99	Clifton Grove Farm grasslands, owned by Nottingham University Sports Grounds. Possible potential for grassland improvements. FA/EA.
102	Syerston Airfield. Improve existing grassland. Some is managed with wildlife in mind. RAF seem responsive to suggestions. MGW
103	Dewberry Hill to be leased from NCC by Radcliffe on Trent parish council for 50 years. Potential to improve grassland. GD
104	Improve to neutral grassland. BT
105	Improve and extend existing grassland area, through re-seed/diversifying sword at Staythorpe Power Station. JRB
106	Improve management of existing species rich grassland a Staythorpe Power Station. JRB
107	Check data to make sure it is arable grassland. GC
108	Managed by East Bridgford Wildlife Group. Area of grassland potential for improvement. PP
109	Improve/convert to grassland habitat and to connect small sites to larger area. BT
110	Bankside grassland at Kneeton. Currently grazed with cattle but could be improved, would connect Trent Hills woodland to river habitat. Important bat foraging area. Barbastelle!
111	A612 steep grassland. Improve botanical diversity. NC
112	Farm track with grassland fringes possible for improvement and links to woodland.
113	Brackenhurst Farm-potential to work with NFU to enhance their management of grasslands. Check the extent of grassland-is this arable.
114	Improve/convert to grassland habitat and to connect sites. BT
115	Protect and enhance airfield grassland-diversify sward and manage as hay meadow. JMB
116	Farmland linking various grassland areas. Potential to improve links and areas covered. GD
117	Generally improve connectivity between small sites (can apply across the area) BT
118	Area of infill between disused railway (Grizzled skipper) and main road, potential for improvement. GD
119	Recreate grassland on steeper slopes to link existing block. JMB
120	Improve quality of poor condition grassland. MGW

121	Southwell grassland connection. Look to return to grassland the area of arable between existing grasslands.
122	Southwell grasslands. Look to enhance the existing network of grasslands.
123	Improve/convert to create connectivity between existing sites (and generally across area). BT
124	Check status of existing habitat-recreate grassland across a wide area. JMB
125	Gunthorpe grassland (left bank, d/s of lock) grazed parkland, previously SINC. Canal and River Trust owned. RB
126	Harby to High Marnham, disused railway. Improve grassland/scrub. Slow-worm/grass snake/common lizard populations. JO
127	Improved and enhanced grasslands to connect existing resource. JRB
128	Improve grassland connectivity through better verge management. BT
129	Improve Besthorpe Meadow - through hydrological regime. Currently HLS managed NWT reserve. JMB.
130	Possible extend Besthorpe Meadows including into restored Besthorpe Wharf. JMB.
131	Enhancement of wet grassland along the Fleet. JMB.
132	Enhance value of Holmes grasslands botanically and for waders. JMB.
134	Unusual/used (?) to be dug for sand and gravel. Good potential between railway and Fleet. AH.
135	Girton Grasslands - enhance further and extend through further management agreements. JMB.
136	Recreation of extensive grassland (species rich and wet) in Holme Parish. JMB. Land adjacent to river has paleochannel earthworks and is improved. HLS scheme. BD.
137	Arable reversion to grassland. CC.
138	Species rich grassland creation from former arable land. HLS scheme.
139	Anglian Water reservoir being built in this area - management of grassland around reservoir. CC.
140	Wet grassland on low land. Besthorpe is on higher ground. CM.
141	Revert arable fields to grassland. Complement marshy grassland adjacent. No idea if landowner wants to do this. CC/SN
142	West Burton SINC/NWT Reserve. Neutral/species rich grassland. Continue management. BD
143	Torksey castle and surrounding land. Improved management of grassland and reverting arable to grassland. RB.
144	Ashton's Meadow SSSI - potential to expand north which is setaside (use green hay?). BD
145	See wetland for grassland (Enlarge SSSI - subject to water management)
146	A connection that will join networks - doesn't have to be this exactly just looking at ways to link networks. FH.
147	As G6. FH.
148	As G6. FH.
149	As G6. FH.
150	Enhance grassland within grounds of West Burton power station - currently areas of improved 'amenity' grassland along entrance road and around cooling towers. CC
151	Knaith Park, Lincs parkland - target for restoration. BD.
152	Coates Wetland - used as a dredging disposal site under Environmental permit. Site has succession of habitats wetland/grassland/scrub and woodland. Management to remove woodland to reset succession, especially if combined with reuse of material for wetland restoration elsewhere if possible. RB.
153	Better management - create botanically richer sward.
154	Small strip of good grassland cut for hay in 2006. Clearly partially improved, and better at the north end. Scatter of MG4 species such as *Sanguisorba officinalis* and *Silaum silaus*. Connected to SE corner of Lea Marshes SSSI. JF.
155	Bole Ings ash disposal tip. Restoration to species rich grassland as part of restoration scheme.
156	Enhancement of grassland botanically and for waders. JMB.
157	Lea Marshes SSSI - two fields. Only Lincs site for *Oenanthe silaifolia*, I think. Also, only Lincs site for *Scirpus sylvaticus* in a large clump on drain (see target note in report from 2006. JF.
158	Restoration of Cottam power station site to mosaic of wetland, grassland and scrub. JMB.
159	Potential rich flower meadows on EA land holding sensitive to farming management and windfarm potential. MC.
160	Reconnect and expand grassland sites. JMB.
161	Reconnect and expand grassland sites. JMB.

162	Permanent grassland. Nice bit noted in south-west corner next to river, but rest not really known. Could be acid grassland or neutral, depends on extent of sand. JF.
163	Potential wet grassland creation + mother drain + the river. JMB.
164	Former (2006) marshy grassland and ponds, apparently not developed as was anticipated in 2006. Also amenity grassland immediately to the north holding *Trifolium subterraneum, T. scabrum* and *T. striatum.*
179	A habitat link between the grasslands at Thrumpton and the rest of the Trent Valley. PP
184	The proposed housing estate at Clifton includes a proposal for green infrastructure to the northern side of the A453 close to Brands Hill. The GI includes a large strip of new grassland. GD

Map 10 - Wetland Biodiversity Opportunity Map (North)

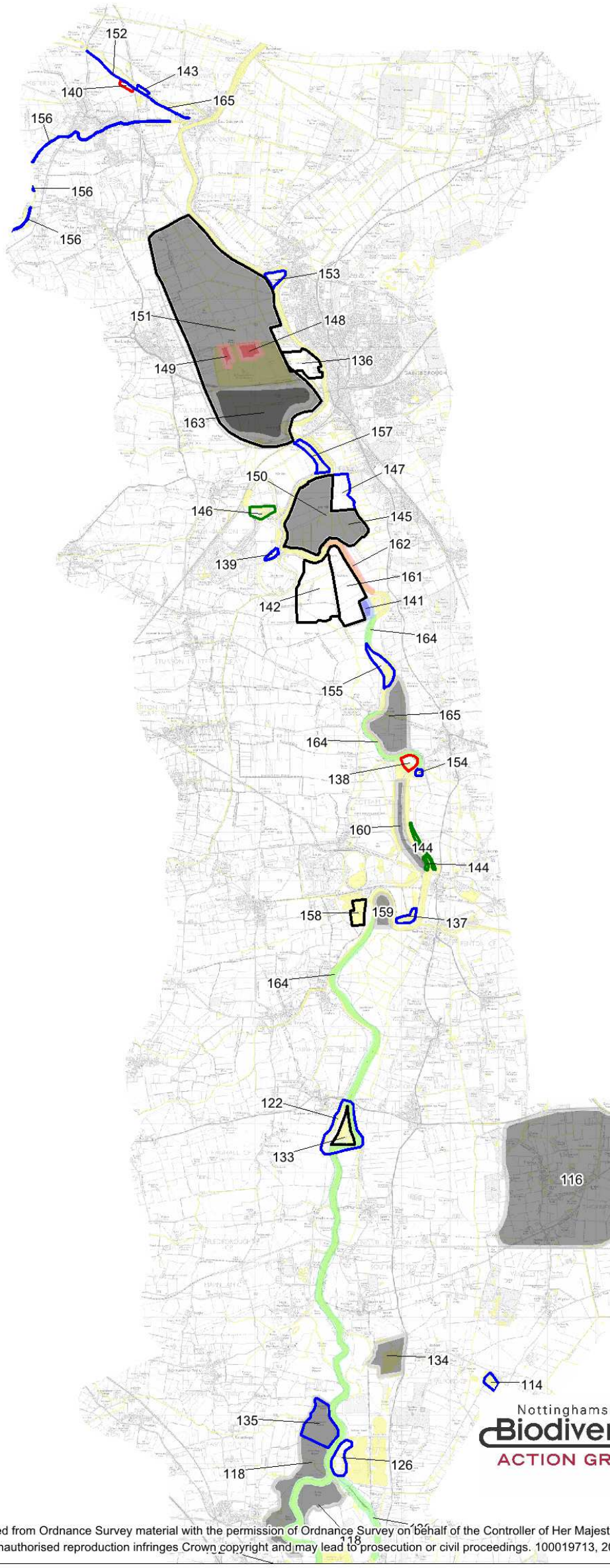
Biodiversity Opportunity Mapping
Trent Valley (North)

Wetland Workshop Results

WETLAND
Short Term (5 - 10 yrs)
More
Better
Connected
Bigger

Long Term (50 yrs)
More
Better
Connected
Bigger

Existing Wetland



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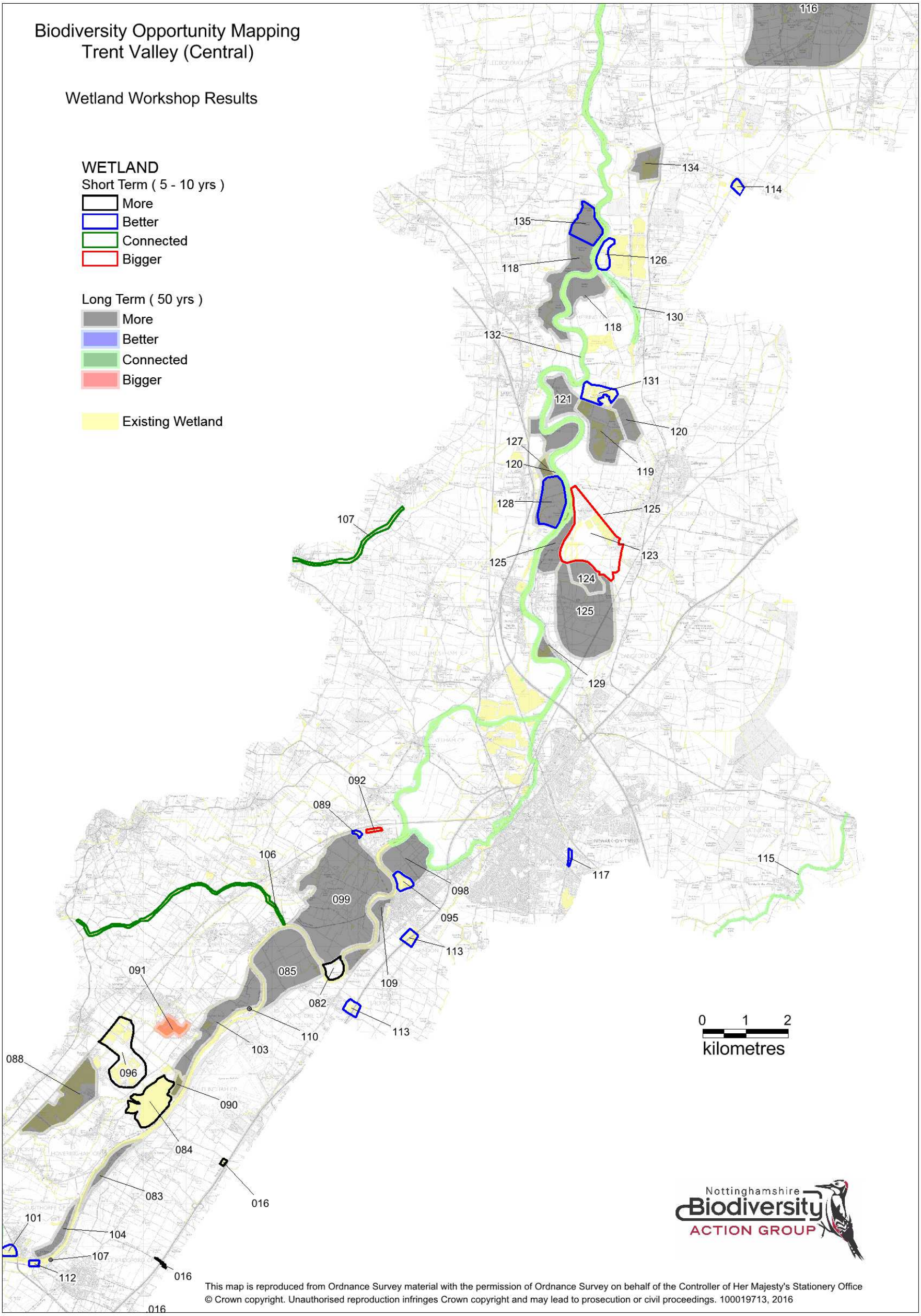
Map 11 - Wetland Biodiversity Opportunity Map (Central)



Map 12 - Wetland Biodiversity Opportunity Map (South)

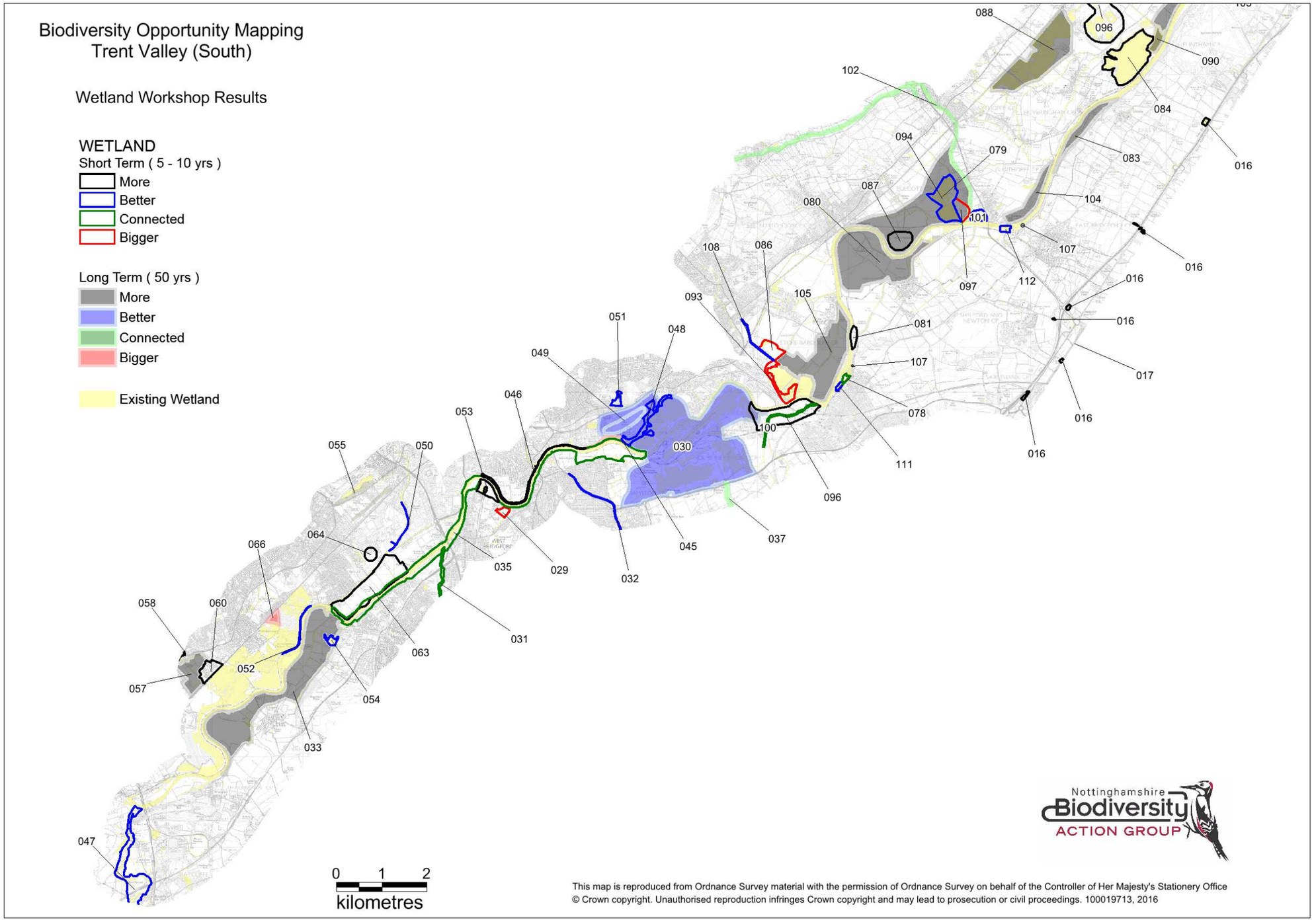


Table 4 - Biodiversity Opportunity table for Wetland (M)

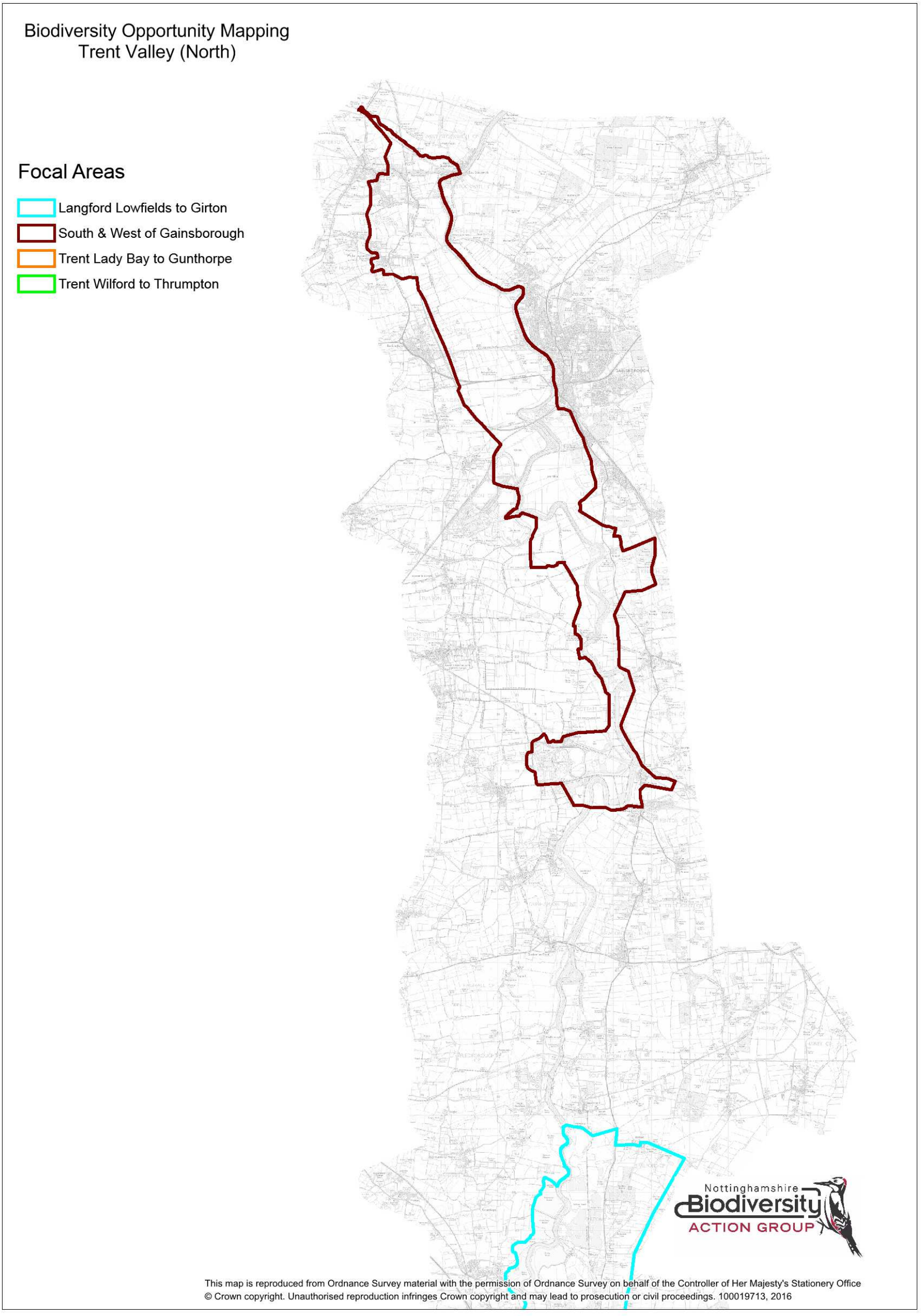
Map Display ID	Opportunity
16	The woodland that is part of Kinoulton Marsh SSSI doesn't seem to be marked but exists. Enhance the condition of this woodland. (CC)
17	Remove conifer and replace with broadleaves. (NC)
29	Gresham Marsh PLNR. PP
30	Improve wet habitats, lakeside margins, wet grassland, wet woodland. Important bat, reptile and amphibian populations. Breeding and wintering birds. Land to the south may be put into local development plan so funds may become available to enhance adjacent habitats. MGW
31	Fairham Brook restoration project - river restoration/enhancement, and associated habitat creation. JB
32	Maintain connectivity between Grantham Canal and River Trent corridor. Grass snake populations along canal and amphibians in non-flowing sections. Build hibernacula. JEO. Improve value of Grantham Canal: maintain water levels; create offline ponds and associated habitat; long term habitat restoration. PP.
33	Re-creation of marsh/fen/wet grassland habitat, in floodplain. JB
35	Enhance habitat along River Trent and to tributary's generally. JEO
37	Polser Brook improvement. PP
45	Extension of habitat along the River Trent, Meadow Lane/Trent Basin etc. Extension of existing wet woodland and other wetland habitats. FA
46	Long term improvements of riparian habitats along the Trent. Options for reducing areas of hard engineering. Possible wetland improvements at the Embankment. EA/FA
47	River Soar: C&RT working with L&RWT "Re-Wilding the Soar". Includes management of Riparian trees and woodland. Many sites along the Soar are owned and managed by C&RT. RB
48	Colwick Country Park, enhancements to wetland habitats at CCP. Existing wildlife lake surrounded by areas of wet woodland/ marsh areas. Possible 5-10 year project with volunteers. EA/FA
49	Nottingham Racecourse: 2 x existing LWS, ditches and ponds with *Typha* bed and transitional habitat. Potential scope for wetland creation as site is often damp and racecourse leaseholders have problems with land drainage, possible reedbed/ attenuation pond. EA
50	Notts Beeston canal and Boots Campus: ditch alongside canal has potential for improved management for wetland spp (including water vole). RB Pre-app Planning advice given to 'boots' applicant for re-development. Step back from the canal and have habitat and access creation by canal. EA
51	Colwick Woods: new pond created in 2005. Potential for more wetland and improved marsh wet woodland areas. EA/FA
52	Riverbank alongside Attenborough Nature Reserve. Potential to improve tree management. Partnership work between C&RT and NWT. RB
53	Iremongers Pond: riparian improvements as part of NET Phase2. Potential for wetland enhancements to north. Managed by NWT and Friends Group. EA/FA
54	Holme Pit: Has reduced in Ecological status of SSSI. Water quality issues and causes being looked into. Land around Holme Pit SSSI is City Council owned but has long term lease with local farmers. Suitable for wetland creation, but has implications for farming community and income for council. EA
55	Tottle Brook through Highfields, and Pasture Lane Brook through Dunkirk Ponds. Potential to improve wetlands around corridors on each site. Current project at Highfields and Beeston Sidings managed by NWT. EA/FA
57	Wetland habitat creation to connect to Attenborough Nature Reserve. DJW.
58	EA owned site potential to create wetland habitat such a scrapes/reed beds. Extends corridor from Attenborough NR. Potential to create a grazing marsh. DJW.
60	Reedbed creation on all outfalls to sewage works. Trowell, Newthorpe, Langley Mill. SPF.
63	Potential to create wet grassland on existing farmland. SPF.
64	Habitat creation as part of Boots development (and Severn Trent site) SPF.
66	Cemex works will be restored to mire/grassland.
78	Land at top of Radcliffe Cliffs (upstream of weir) has standing open water, and recently purchased by R.o.T Parish Council. Opportunity for better management (less balsam, litter) and links to adjacent sites. RB
79	Potential flood alleviation scheme which could provide wetland habitat. Delivery date is unknown as are the potential habitats. Can revise timescales at a later date. Mosaic of wetland habitats. DJW
80	Large scale habitat creation-wet grassland and reedbed and river 'channel' re-branding or creation of back-channel. JMB
81	Tall ruderal floodplain with potential for scrapes, mires and wet grassland. GD
82	Gowburn Holt wetland creation. NC/DW
83	Improved grassland on flood plain, potential for acres of wet grassland. GD

84	Hoveringham Sailing Lake. The sailing club may be/are moving to another lake which gives an opportunity to improve fringing habitat. Woodland on opposite bank of Trent is very important for bats. Improving lake fringes will increase foraging potential. MGW
85	Wetland creation within meander-floodplain grazing marsh-conversion from arable. NC/DW
86	Teal close development proposed ecology park with ponds and wetland scrapes. GC
87	Reinstatement of flooded pool at Burton Meadows. JEO
88	Substantial habitat enhancement, restoration and creation-reshaping lagoons-reedbed. JMB
89	Better management of existing pond and marginal habitat at Staythorpe Power Station. Landowners are sympathetic and open to management changes, but often require help with finding. JRB
90	Better marshes (wetland) edge habitat. DJW
91	Reconnection and enhancement and 'creation' of habitats-reedbed;swamp. JMB
92	Potential for the creation of scrapes and new ponds in area of Staythorpe Power Station. JRB
93	Netherfield Lagoons. Enhance existing margins and wet grassland. Create reedbed and wader scrapes. MGW
94	Habitat enhancement of existing wetlands. Reshape margins; reedbeds. JMB
95	Improved wetland habitat.
96	Bleasby and Holme Pierpoint. Management to consider local grass snake and amphibian populations. JEO
97	Habitat creation-wet grassland-part of Gunthorpe flood remediation scheme. JMB
98	Grazing marsh creation and open pools similar to nature reserve habitat. DJW
99	Prioritise floodplain grazing marsh-but generally a mosaic of wetland habitats (Verify with 1:20 year outlines). BT
100	Polser Brook. Connecting stream out past skylarks into Rushcliffe (potential route of canal). GD
101	Gunthorpe Gravel Pits. Management to consider significant toad, frog and smooth newt population. JEO
102	Cocker Beck. Improve wetland connectivity along Cocker Beck from River Trent to Lambley Dumbles, Ploughman Wood, Gedling Country Park. JEO
103	Mosaic of wetland habitats. Priorities being wetland grazing marsh and marshy habitats. DJW
104	Mosaic of wetland habitats.
105	Land around Netherfield lagoon - wet grassland and ditches could be improved - some could be 5-10 years. GD
106	Dumbles. Generally improve connectivity along Dumble streams. JEO
107	Enhance Caunton Beck to connect habitats including ancient woodland and generally all dumbles and becks. BT
108	Ouse dyke. Enhance dyke. GC
109	Mosaic of wetland habitats.
110	Fish passes at Stoke, Gunthorpe, Hazelford Weirs. Connectivity (for fish) between stretches of river. R Bennett.
111	Trentside grassland pond, Radcliffe on Trent. Acquired by RoT parish council from angling club. To be managed as a Nature Reserve (needs management plan creating). PP
112	Trentside, East Bridgford. I think owned by E Bridgford parish council - is currently unmanaged. PP
113	Opportunity for better management? New wetland sites next to A46. Balancing ponds, ridge and furrow wet grassland, 2 x wet grassland fields. CC
114	Improved management of existing gravel pit and marginal habitat (including reedbed). JRB
115	Enhancement of River Witham corridor-improved riparian and marginal habitats, buffer strips, margins etc
116	Thorney C.P. Creation of pondscape to enhance GCN population. JEO
117	Lake (SINC) Improve management. This is a toad site with some reedbed. CC
118	Trent Holmes area - wet grassland creation on Holmes. Improves connectivity along Trent between Besthorpe and Girton. NC. North Holme already functions as a wet grassland. BD.
119	Active sand and gravel quarry. Proposed NWT reserve. Creation of reedbed and open water habitat. MW.
120	4 areas - potential for extensive habitat creation (possible through mineral extraction). JMB.
121	Possible extensive arable reversion. JMB.

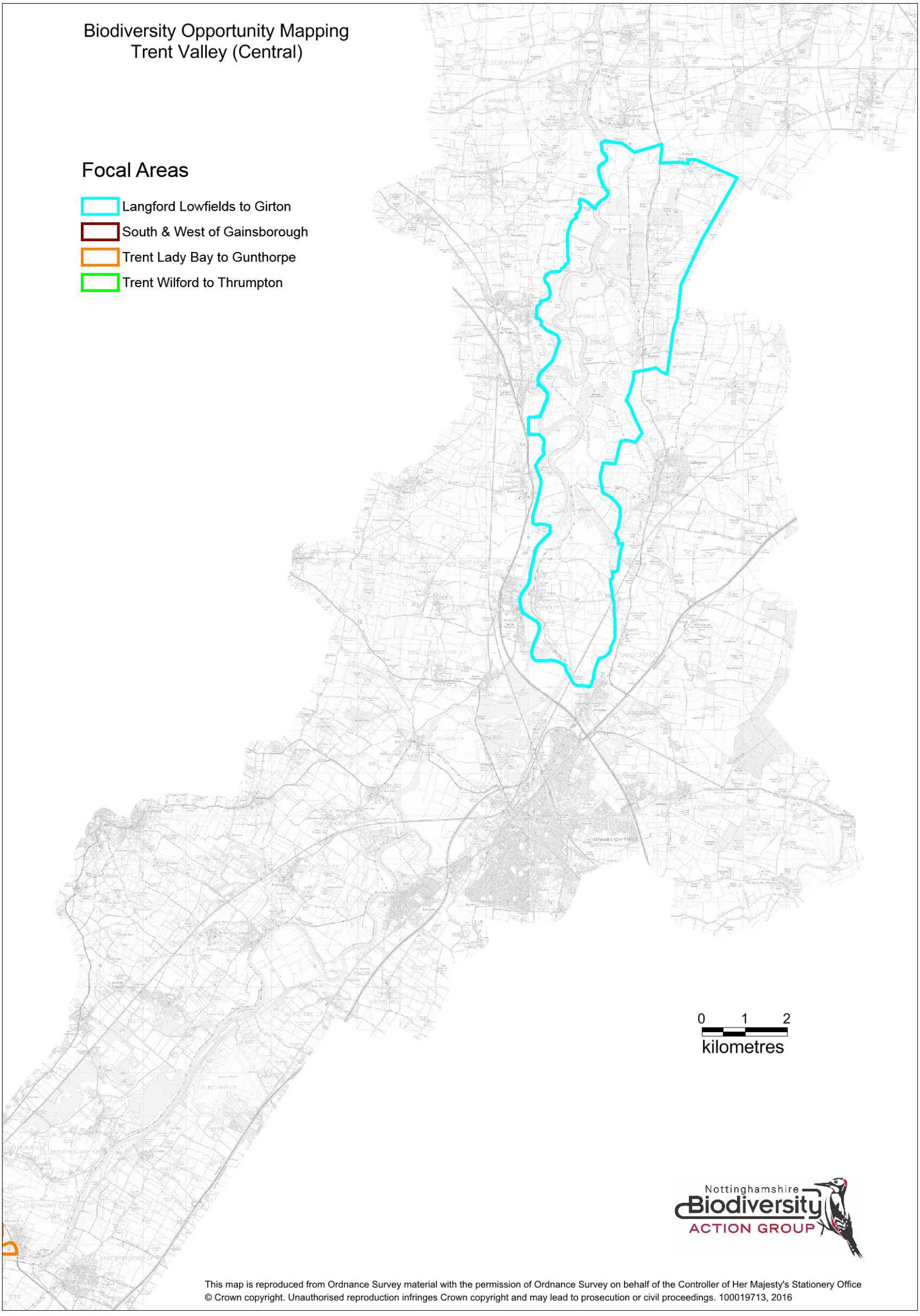
122	Potential wetland creation from EA partnership to reedbed 20ha. MC.
123	175ha wetland site - 100ha reedbed, 10ha wet woodland, 10ha swamp/marsh, 45ha rich grassland. MC.
124	Existing extension for wetland creation post mineral extraction. MC.
125	Wetland creation post mineral extraction - nominated sites. MC.
126	Girton former plant site - enhance ephemeral wetlands and wetter grasslands. JMB.
127	Cromwell - habitat creation (or enhancement?) - reedbed, wet grassland (through restoration). NC.
128	CEMEX Cromwell South Site - improve extant restoration scheme. JMB.
129	Winthorpe Lake - habitat creation - reedbed, marginal habitats etc. NC.
130	The Fleet - Improving connectivity via enhancement/creation of fringing habitat, backwaters and ponds. NC.
131	Ongoing enhancements to wetland margins and fringing reeds site included open water and large wooded island. MW.
132	River Trent - improvements to management of banks/marginal vegetation along whole length to improve connectivity.
133	Dunham - land on NE side of toll bridge is basin - 1ha. Potential for excavation for wetland habitat creation RB. And/or reduce flood cell size and increased frequency of wetting with Highways/EA.
134	Girton North Quarry - Tarmac site, currently mothballed - restoration. CC.
135	Normanton Holme - 50ha wet grassland HLS agreement. Grazed. Sluice in floodbank to control water levels. BD.
136	Colin Clark HLS agreement, 30ha wet grassland creation from arable land. May revert back to arable when scheme ends? BD.
137	Enhance waterbodies - reprofile margins for reedbed. EA have said they will fund this - perhaps!! CC/SN
138	Coates Wetland - used as a dredging disposal site under Environmental permit owned by CRT. The north part of the site is scrub/willow as a result of succession. Removal of scrub and/or export of the sand/gravel would reset succession back to wetland. So this is 'bigger'. Note - opportunity for this material to be used in landscaping for gravel pit restoration. RB.
139	Reedbed adjacent to West Burton power station in need of restoration. BD.
140	Wet grassland on lowland against Mother Drain. CM.
141	Removed this screening woodland when quarrying is finished. CC.
142	If quarrying happens restore to 1-2 key habitats. CC. Extant permission for quarry - required to restore to wet grassland reedbed, open water and fen. JMB.
143	Creation of 2 new ponds. MS.
144	Connect these exiting networks up to create a larger continuous network. I don't know the area, I don't know how feasible this is but it seems obvious. FH.
145	Proposal for quarry at Lea Marsh area - restore to 1 or 2 key habitats. CC.
146	Wetland area already located within boundary of West Burton power station - consider improved connection between wetland and Wheatley Beck. SN.
147	Bring Lea Marsh SSSI into favourable condition and enlarge.
148	Two dots. Create more habitat here to make this large area more resilient - large edge effects on these sections next to arable - don't know how feasible this is, don't know the area. FH.
149	Enlarge SSSI - subject to water management.
150	EA land holding - study undertaken by JBC for EA, IDB and RSPB to enhance ditch water level management.
151	Mother Drain SSSI requires scrub removal in some areas to restore to reedbed/open water. BD.
152	EA site - write management plan to target biodiversity delivery. SN.
153	Trent Port - improved management possible - following the open water recreation in 2012, grazing of grassland surrounding the open water and management of hedgerow and trees. RB.
154	Enhance Littleborough Lagoons - lake margins and improve management of grassland (currently overgrazed with horses). HLS application 2013. CC
155	Chesterfield Canal SINC and SSSI. Improved management by adjacent land measures to decrease diffuse water pollution. RB.
156	Potential reedbed/swamp for restoration - SINC. BD.
157	Former Rampton Quarry - will be restored to scrapes, wet and dry grassland, and scrub. JMB.
158	Loop of Trent. Remove floodbank and rewet.

159	Cottam to Marton. Wetland creation on species poor grassland.
160	Create extensive wet grassland habitat to link Sturton Quarry to the Trent. JMB.
161	Potential for river rebraiding through quarrying. JMB.
162	Potential. EA landholding for FSR. Could be wet grassland or flower rich meadows - note windfarm. MC.
163	River Trent - connectivity along river channel to link patches.
164	Area important for rarer county dragonfly species - variable damselfly and black darter. Maintain ditches in suitable conditions. MW. River Idle, Misterton Soss - moth SINC, site for grass snake, otters. JO.
165	Marton - Removal of floodbank realignment to natural ridgeline. Wet grassland/reedbed creation.

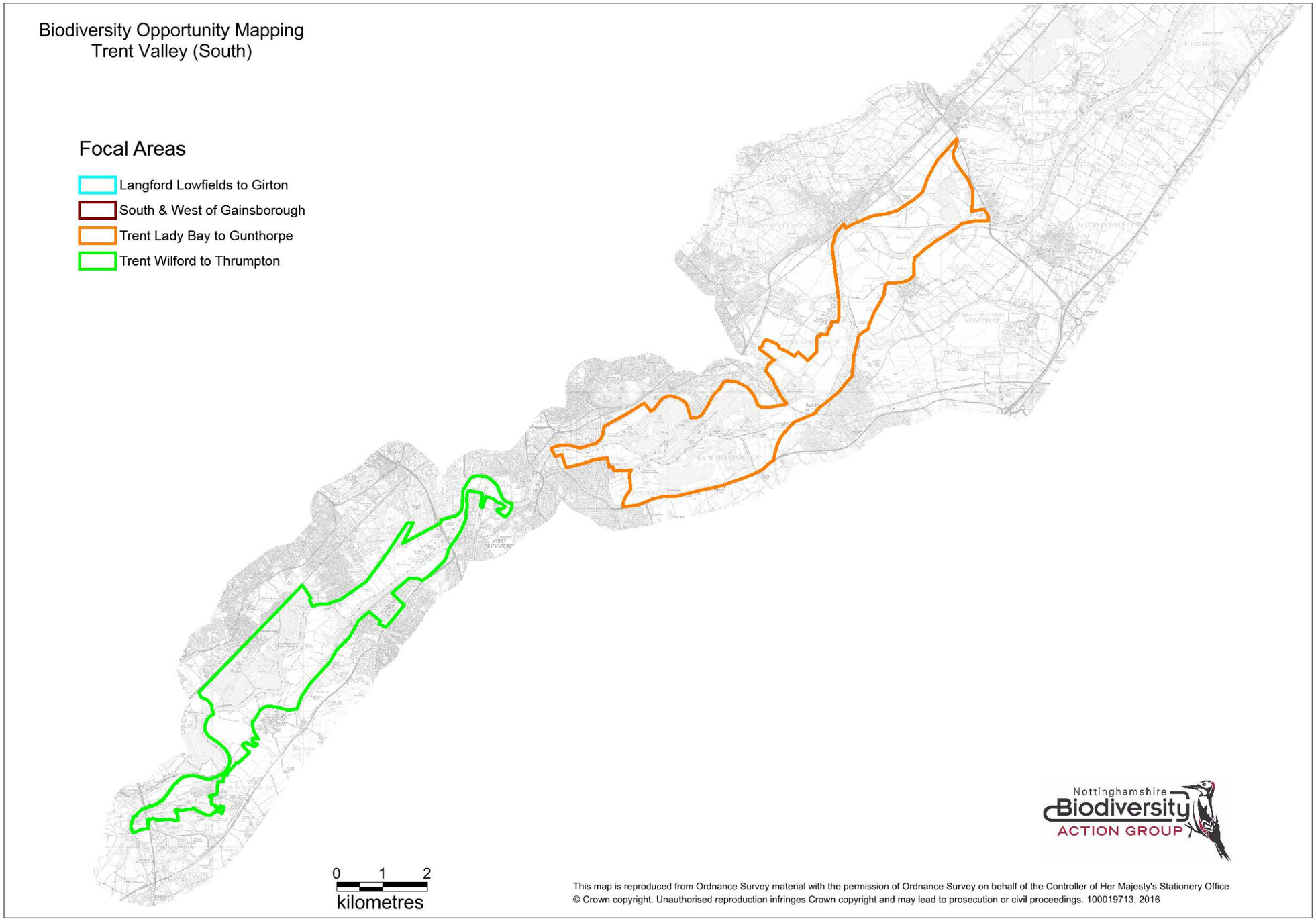
Map 13 – Focal Areas (North)



Map 14 – Focal Areas (Central)



Map 15 – Focal Areas (South)



Appendix 1 - List of workshop attendees

Trent Vale BOM Workshop, 17th April 2013 - list of Attendees			
Name	**Organisation**	**Position**	**E-mail**
Richard Bennett	Canal and River Trust	Senior Ecologist	richard.bennett@canalrivertrust.org.uk
Jenni Blakeman	Nottinghamshire Wildlife Trust	Wetland Projects Officer	jblakeman@nottswt.co.uk
Janice Bradley	Nottinghamshire Wildlife Trust	Head of Conservation Policy and Planning	Jbradley@nottswt.co.uk
Michael Copleston	RSPB	Site Manager Langford Lowfields and Beckingham Marshes	michael.copleston@rspb.org.uk
Carl Cornish	RSPB	Conservation Officer (Notts and Lowland Derbys)	ccornish@rspb.org.uk
Nick Crouch	Nottinghamshire County Council	Senior Practitioner Nature Conservation	nick.crouch@nottscc.gov.uk
Dot Driver	Amphibian and Reptile Conservation	Species Co-ordinator and GCN Conservation Officer	dorothy.driver@arc-trust.org
Brian Dunning	Natural England	Lead Adviser Notts	brian.dunning@naturalengland.org.uk
Jeremy Fraser	Lincolnshire Wildlife Trust	Wildlife Sites Officer	jfraser@lincstrust.co.uk
Andrew Hindmarsh			andrewhindmarsh@yahoo.co.uk
Fran Hitchinson	Greater Lincs Nature Partnership	GLNP Manager	fran.hitchinson@glnp.org.uk
Chris Jackson	Notts BAG	Biodiversity Officer	chris.jackson@nottscc.gov.uk
Chris Manning	Trent Valley IDB	Environment Officer	chris.manning@lmdb.co.uk
Ruth Needham	OnTrent/Trent Rivers Trust	OnTrent Project Manager	on-trent@staffs-wildlife.org.uk
Swati Nettleship	Environment Agency	Biodiversity Officer	swati.nettleship@environment-agency.gov.uk
John Osborne		County Herp Recorder	jeosbourne@btinternet.com
Adrian Southern	RSPB	Futurescapes Project Manager (Midlands)	adrian.southern@rspb.org.uk
Mark Speck	Nottinghamshire Wildlife Trust	Northern Conservation Officer	mspeck@nottswt.co.uk
Michael Walker	Nottinghamshire Bat Group	Chair	mwalker@nottswt.co.uk

Trent Newark to Nottingham BOM Workshop, 21st June 2013 - list of Attendees			
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Jenni Blakeman	Nottinghamshire Wildlife Trust	Wetland Projects Officer	jblakeman@nottswt.co.uk
Janice Bradley	Nottinghamshire Wildlife Trust	Head of Conservation Policy and Planning	Jbradley@nottswt.co.uk
Gary Cragg	Nottinghamshire Wildlife Trust	Conservation Assistant	GCragg@nottswt.co.uk
Nick Crouch	Nottinghamshire County Council	Senior Practitioner Nature Conservation	nick.crouch@nottscc.gov.uk
Gordon Dyne	Rushcliffe Nature Conservation Strategy Implementation Group	Chair	gordon.dyne@gmail.com
Chris Jackson	Notts BAG	Biodiversity Officer	chris.jackson@nottscc.gov.uk
John Osborne		County Herp Recorder	jeosbourne@btinternet.com
Adrian Southern	RSPB	Futurescapes Project Manager (Midlands)	adrian.southern@rspb.org.uk
Bill Thomson	Natural England	Central Landscape Scale Delivery Team	Bill.Tomson@naturalengland.org.uk
Michael Walker	Nottinghamshire Bat Group	Chair	mwalker@nottswt.co.uk
Dan Widdowson	Environment Agency	Biodiversity Officer	dan.widdowson@environment-agency.gov.uk
Viewed maps and added comments on Tuesday 25th June 2013			
Carl Cornish	RSPB	Conservation Officer (Notts and Lowland Derbys)	ccornish@rspb.org.uk
Paul Phillips	Rushcliffe Borough Council	Community Environment Officer	pphillips@rushcliffe.gov.uk

Broxtowe Rushcliffe BOM Workshop, Tuesday 26th November 2013 – list of Attendees			
Name	**Organisation**	**Position**	**E-mail**
Richard Bennett	Canal and River Trust	Senior Ecologist	richard.bennett@canalrivertrust.org.uk
Janice Bradley	Nottinghamshire Wildlife Trust	Head of Conservation Policy and Planning	Jbradley@nottswt.co.uk
Gary Cragg	Nottinghamshire Wildlife Trust	Conservation Assistant	GCragg@nottswt.co.uk
Nick Crouch	Nottinghamshire County Council	Senior Practitioner Nature Conservation	nick.crouch@nottscc.gov.uk
Brian Dunning	Natural England	Land Management Adviser	Brian.Dunning@naturalengland.org.uk
Gordon Dyne	Rushcliffe Nature Conservation Strategy Implementation Group	Chair	gordon.dyne@gmail.com
Steve Fisher	Broxtowe Borough Council	Section Engineer - Countryside Liaison and Design	Steve.Fisher@broxtowe.gov.uk
Chris Jackson	Notts BAG	Biodiversity Officer	chris.jackson@nottscc.gov.uk
Gaynor Jones-Jenkins	Nottinghamshire Wildlife Trust	Senior Conservation Officer	GJJenkins@nottswt.co.uk
John Osborne		County Herp Recorder	jeosbourne@btinternet.com
Rose Perkins	Groundwork Greater Nottingham	Landscape Architect	Rose.Perkins@groundworknottingham.org.uk
Jo Phelan	Groundwork Greater Nottingham		Jo.Phelan@groundworknottingham.org.uk
Paul Phillips	Rushcliffe Borough Council	Community Environment Officer	pphillips@rushcliffe.gov.uk
Neil Pinder	Friends of Keyworth	Volunteer	neil.pinder@ntlworld.com
Chris Riley	Broxtowe Borough Council	Parks Development Officer	Chris.Riley@broxtowe.gov.uk
Michael Walker	Nottinghamshire Bat Group	Chair	mwalker@nottswt.co.uk
Dan Widdowson	Environment Agency	Biodiversity Officer	dan.widdowson@environment-agency.gov.uk

Rushcliffe East BOM Workshop, Tuesday 10th February 2015 - list of Attendees			
Name	**Organisation**	**Position**	**E-mail**
Bill Bacon	Butterfly Conservation East Midlands	Chair	rwilliambacon@gmail.com
David Bate	Friend of Fishpond Wood, Owthorpe	Volunteer	dgba@bgs.ac.uk
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Mark Speck	Nottinghamshire Wildlife Trust	Northern Conservation Officer	mspeck@nottswt.co.uk
Ruth Tall	Natural England	Lead Advisor, Land Management Team	ruth.tall@naturalengland.org.uk
Michael Walker	Nottinghamshire Bat Group	Chair	mwalker@nottswt.co.uk
Dan Widdowson	Environment Agency	Biodiversity Officer	dan.widdowson@environment-agency.gov.uk
Viewed maps and added comment during week beginning Monday 23rdFebruary 2015			
Hannah Hogan	Environment Agency	FCRM Officer	
Matthew Buck	Environment Agency	Fisheries Technical Advisor	
Graham Dixey	Environment Agency	Environment Officer	

Appendix 2 – The Basemap

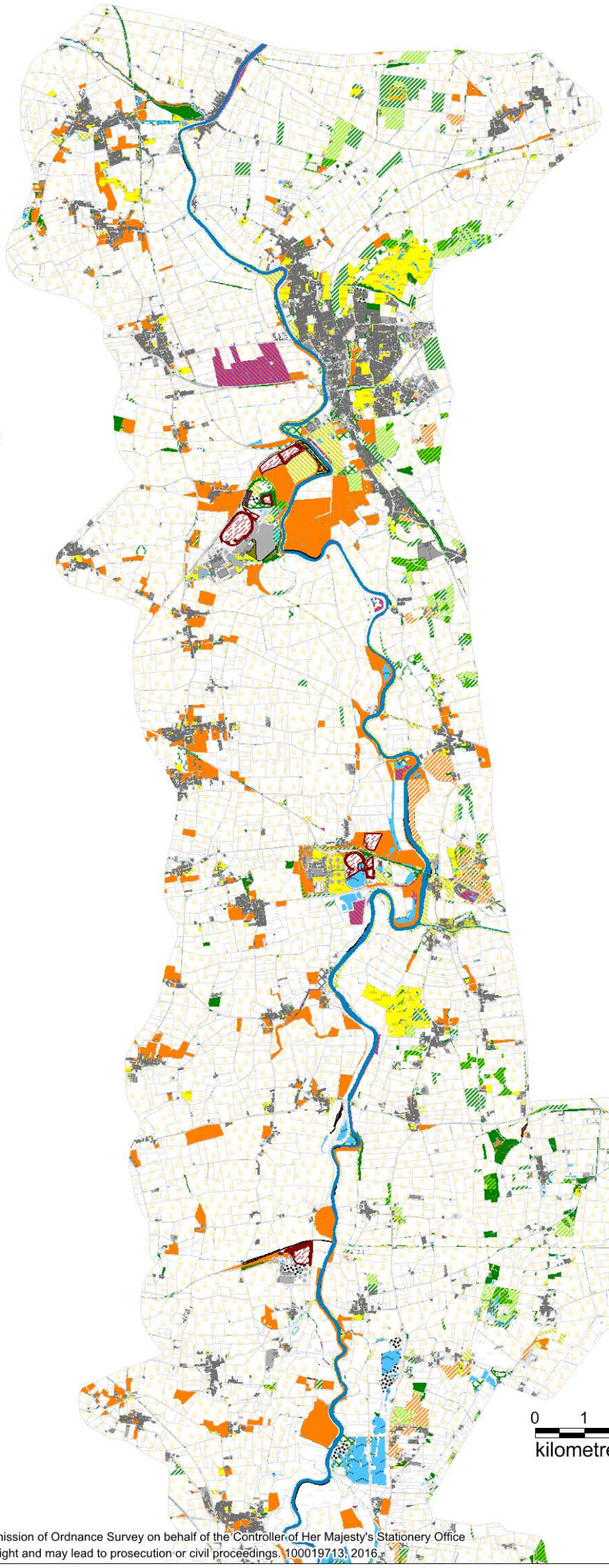
Map 1- Phase 1 in the Trent Valley (North)
Map 2 - Phase 1 in the Trent Valley (Central)
Map 3 - Phase 1 in the Trent Valley (South)

Map 1 - Phase 1 in the Trent Valley (North)

Phase1 (Map 1)
Trent Valley (North)

Phase 1 Habitat Key
Labels shown in brackets

- A or B road
- Acid grassland - semi-improved (SI)
- Acid grassland - unimproved
- Bare ground
- Beach
- Bracken - continuous
- Bracken - scattered
- Broadleaved woodland - plantation
- Broadleaved woodland - semi-natural
- Buildings
- Calcareous grassland - semi-improved
- Calcareous grassland - unimproved
- Caravan site
- Change
- Coniferous woodland - plantation
- Coniferous woodland - semi-natural
- Cultivated/disturbed land - amenity grassland (A)
- Cultivated/disturbed land - arable (A)
- Dry ditch
- Dry dwarf shrub heath - acid
- Dry heath/acid grassland mosaic
- Dry modified bog
- Fen - flood plain mire
- Fen - valley mire
- Improved grassland
- Introduced shrub
- Marginal/inundation - marginal
- Marsh/marshy grassland
- Mixed woodland - plantation
- Mixed woodland - semi-natural
- Neutral grassland - semi-improved (SI)
- Neutral grassland - unimproved
- Non-ruderal
- Open Mosaic Habitat
- Other exposure - acid/neutral
- Other exposure - basic
- Parkland and scattered trees - broadleaved
- Parkland and scattered trees - coniferous
- Parkland and scattered trees - mixed
- Poor semi-improved grassland (SI)
- Quarry (Q)
- Railway line
- Recently felled woodland - coniferous
- Reedbed
- Running water
- Running water - eutrophic
- Scrub - dense/continuous
- Scrub - scattered
- Spoil (S)
- Standing water
- Standing water - eutrophic
- Standing water - mesotrophic
- Suburban/rural development
- Swamp
- Tall ruderal
- Track or minor access road
- Unknown
- Wet heath/acid grassland mosaic



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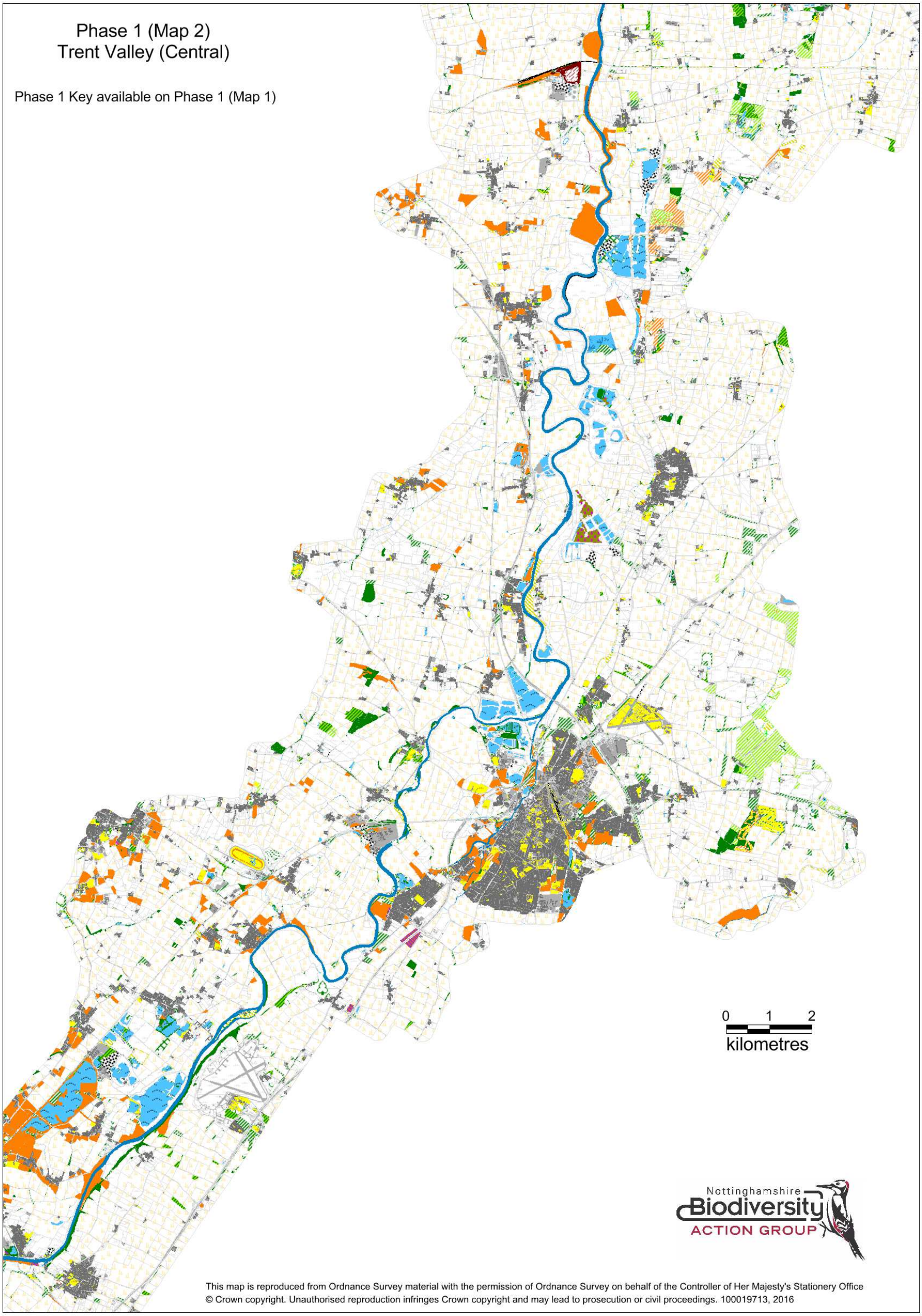
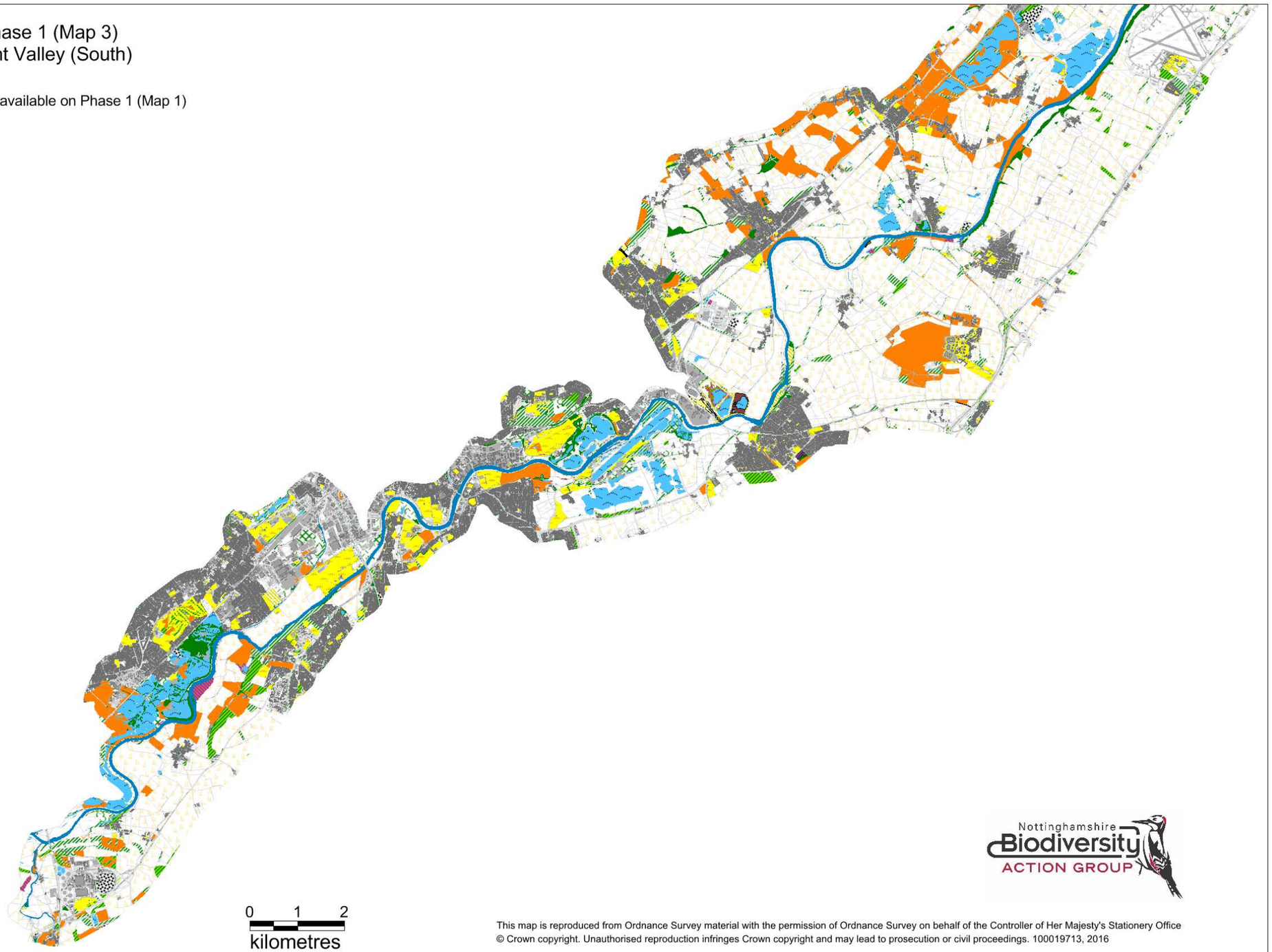
Map 2 - Phase 1 in the Trent Valley (Central)



Map 3 - Phase 1 in the Trent Valley (South)

Phase 1 (Map 3)
Trent Valley (South)

Phase 1 Key available on Phase 1 (Map 1)



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Appendix 3 – Habitat Network maps

Map 1 - Current Woodland Connectivity (North)
Map 2 - Current Woodland Connectivity (Central)
Map 3 - Current Woodland Connectivity (South)

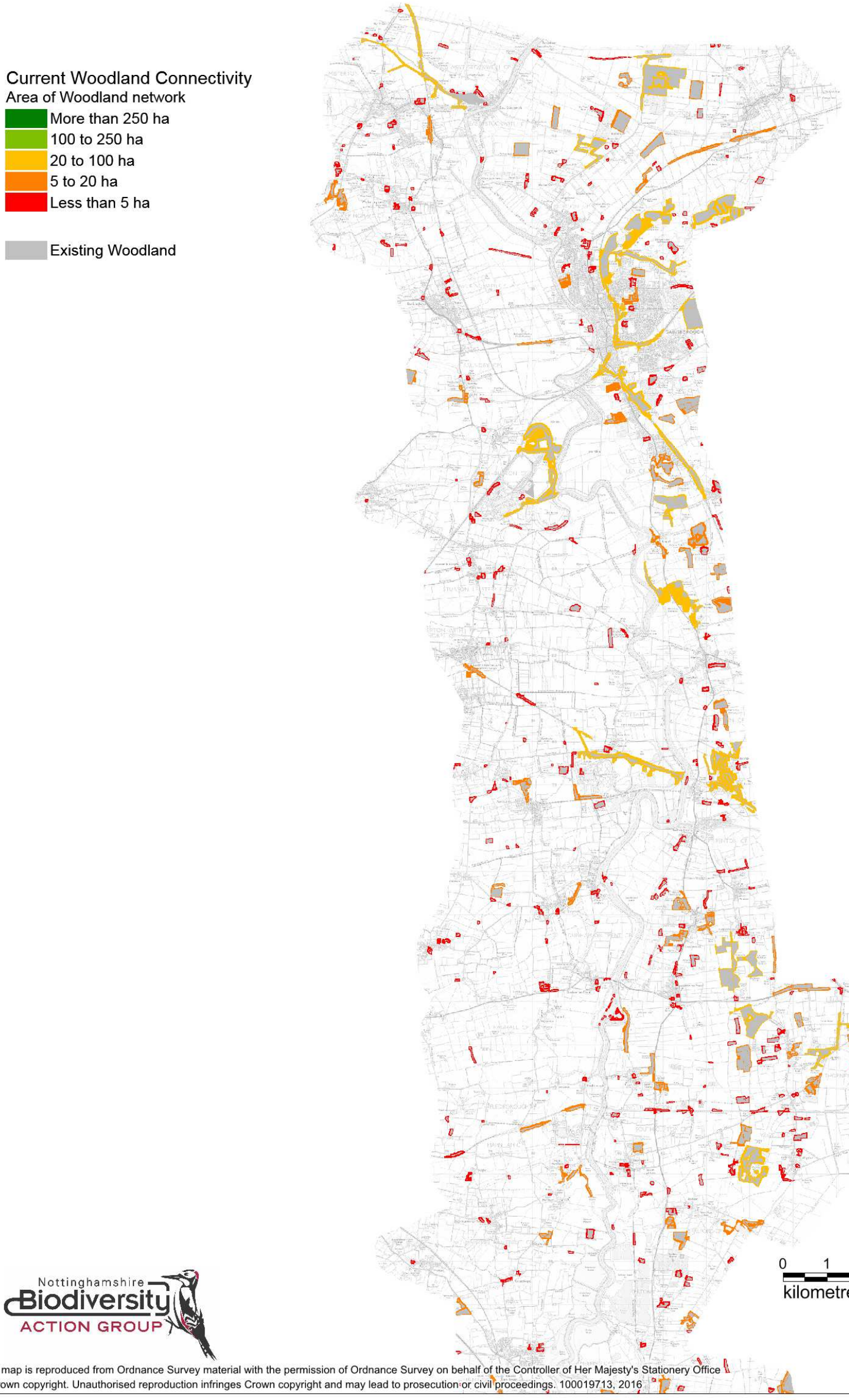
Map 4 - Current Heathland & Acid Grassland Connectivity (North)
Map 5 - Current Heathland & Acid Grassland Connectivity (Central)
Map 6 - Current Heathland & Acid Grassland Connectivity (South)

Map 7 - Current Grassland Connectivity (North)
Map 8 - Current Grassland Connectivity (Central)
Map 9 - Current Grassland Connectivity (South)

Map 10 - Current Wetland Connectivity (North)
Map 11 - Current Wetland Connectivity (Central)
Map 12 - Current Wetland Connectivity (South)

Map 1 - Current Woodland Connectivity (North)

Biodiversity Opportunity Mapping
Trent Vale (North)



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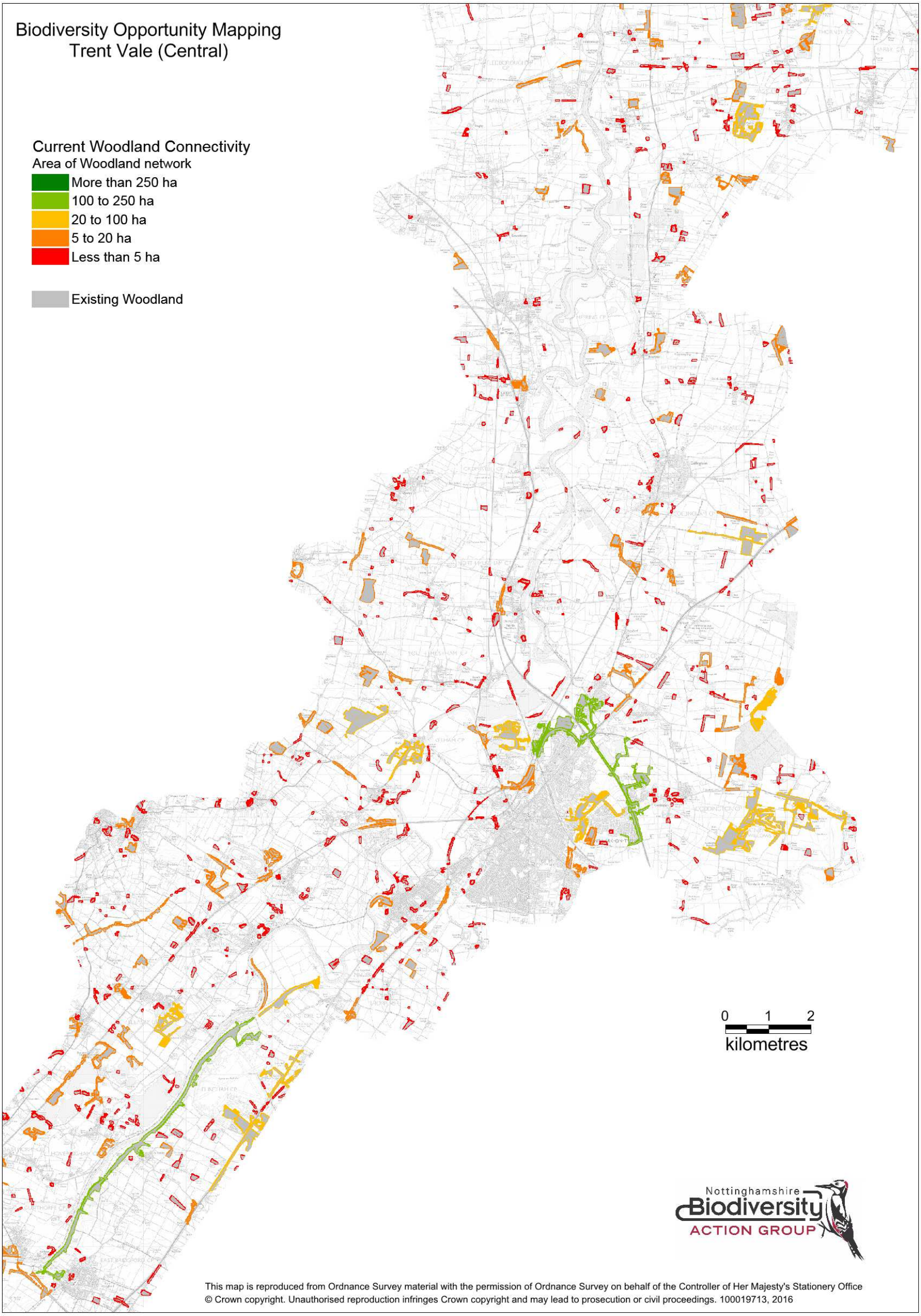
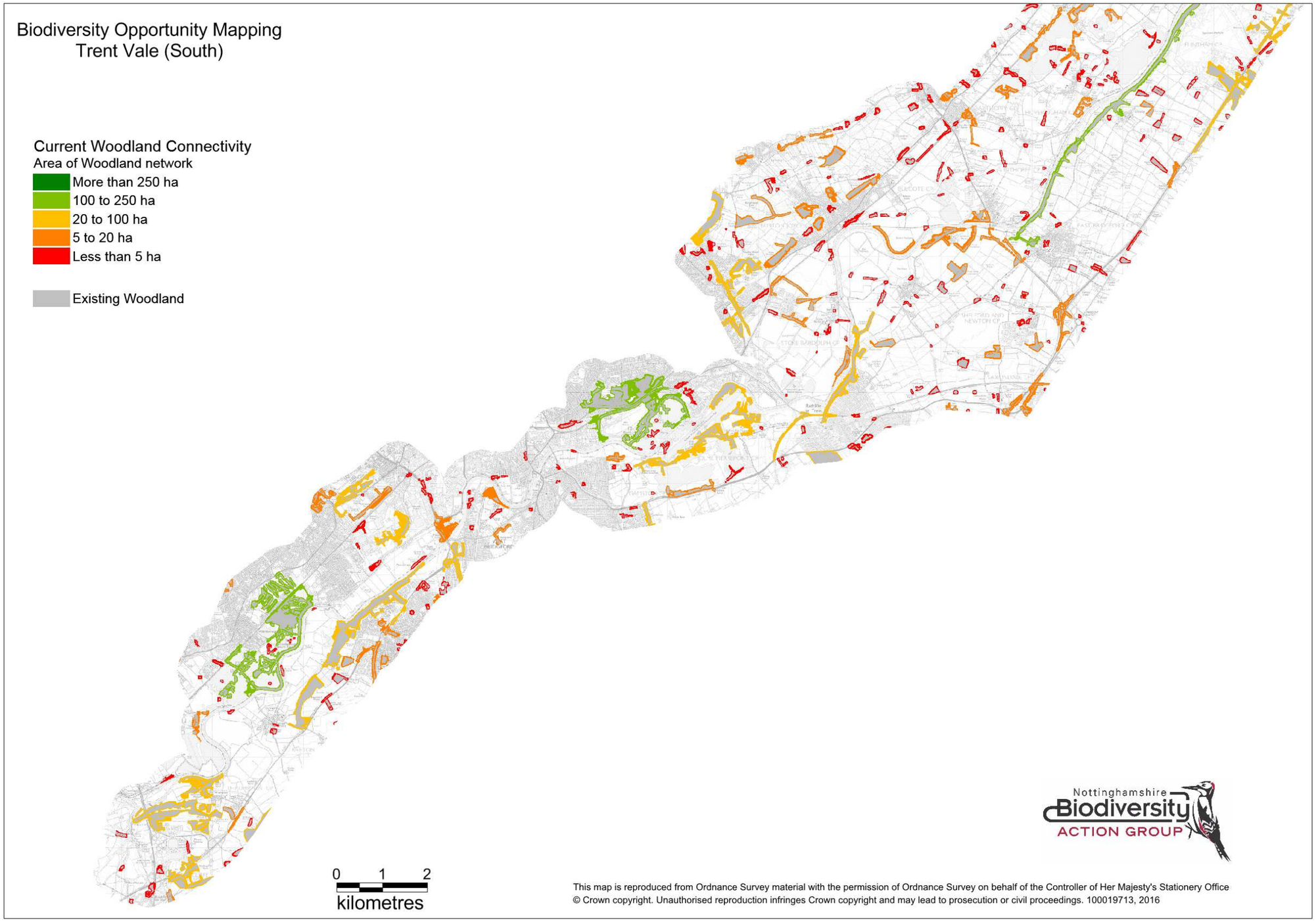
Map 2 - Current Woodland Connectivity (Central)

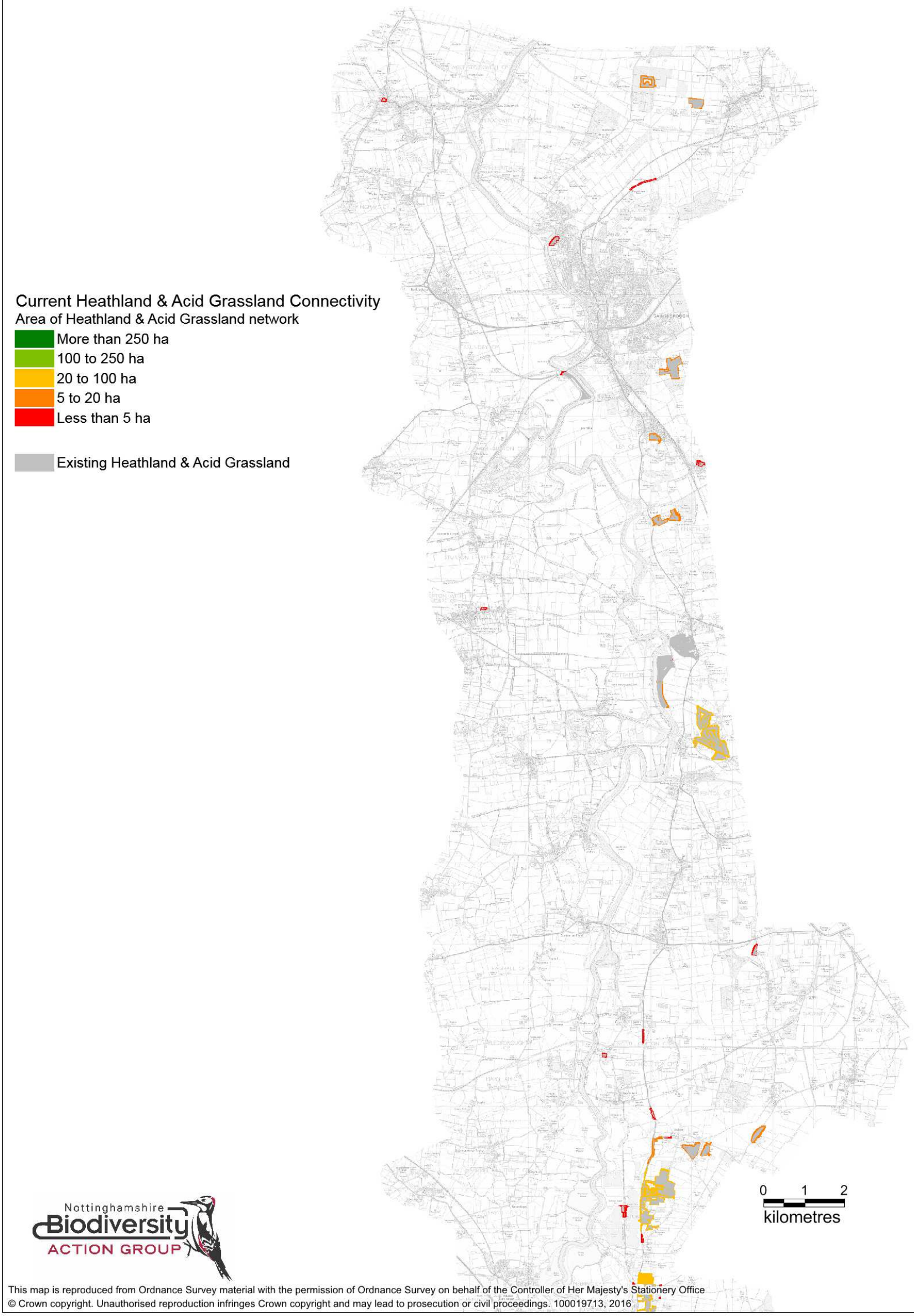


Map 3 - Current Woodland Connectivity (South)



Map 4 - Current Heathland & Acid Grassland Connectivity (North)

Biodiversity Opportunity Mapping
Trent Vale (North)



Nottinghamshire Biodiversity Action Group

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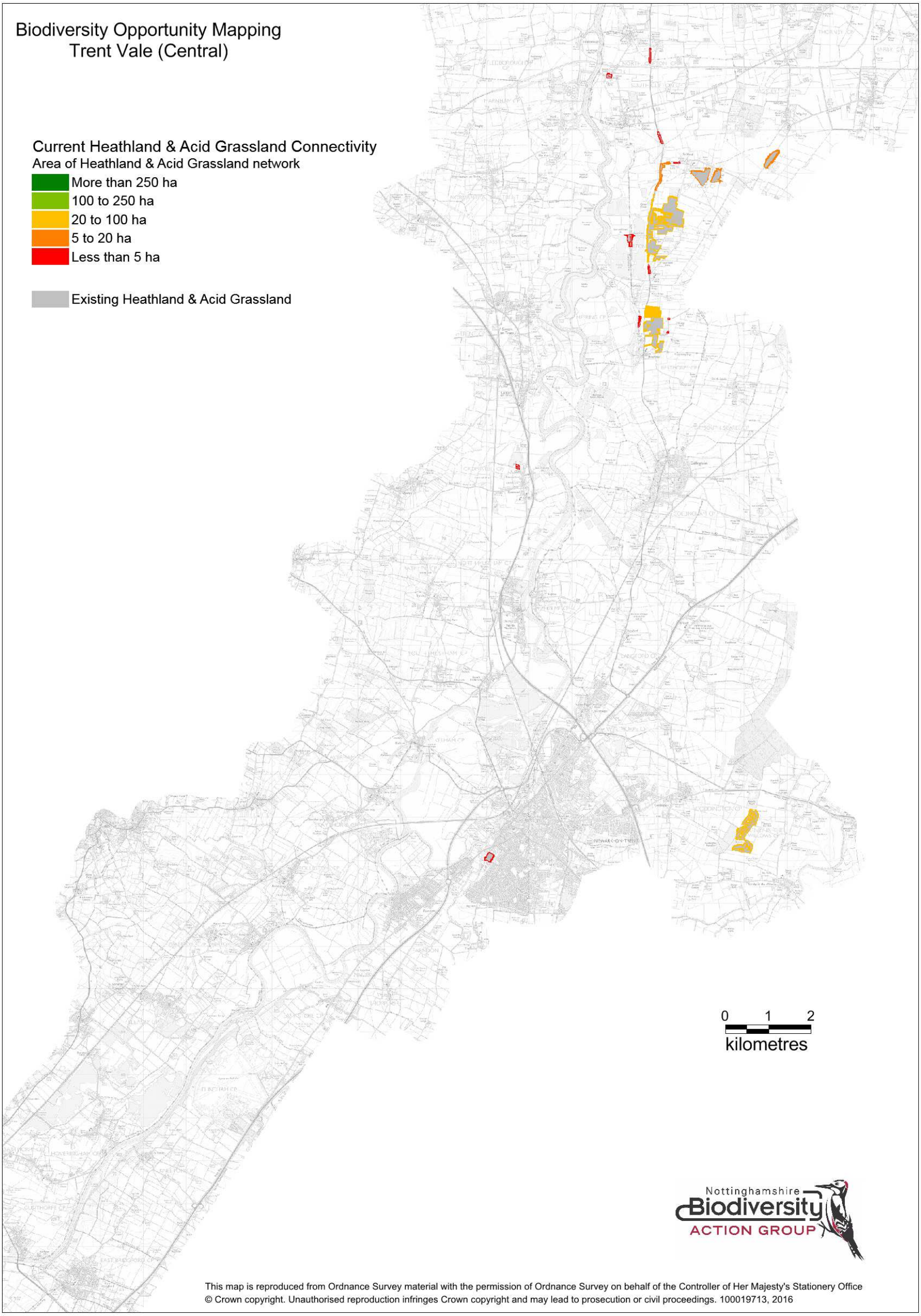
Map 5 - Current Heathland & Acid Grassland Connectivity (Central)



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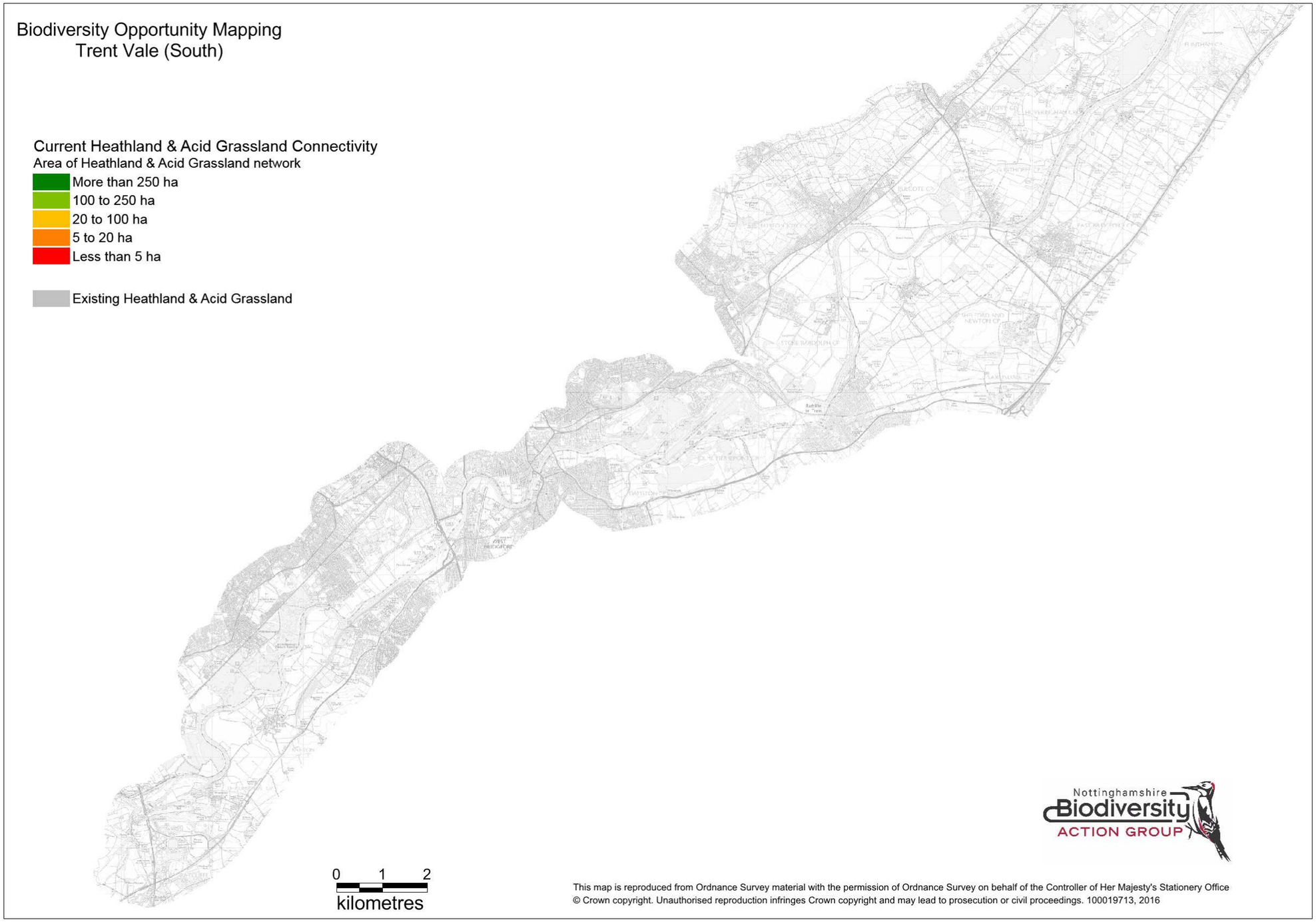
Map 6 - Current Heathland & Acid Grassland Connectivity (South)



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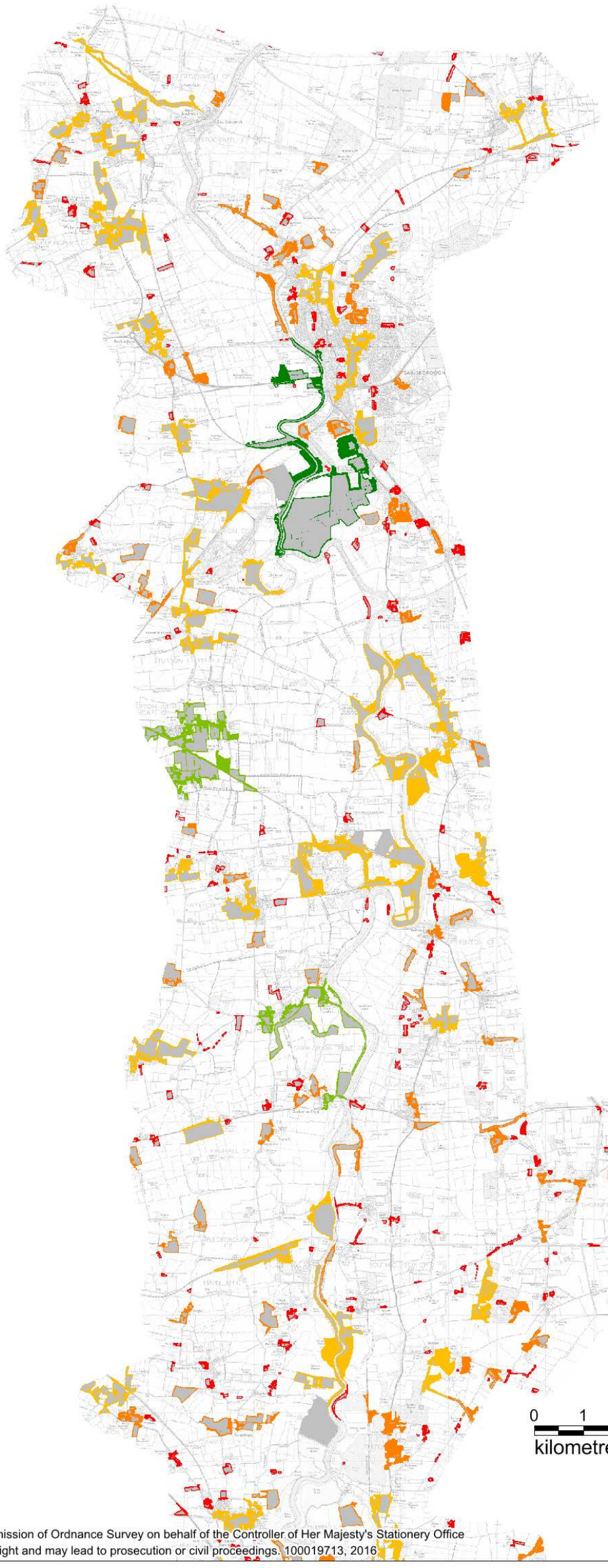
Map 7 - Current Grassland Connectivity (North)

Biodiversity Opportunity Mapping
Trent Vale (North)

Current Grassland Connectivity
Area of Grassland network

- More than 250 ha
- 100 to 250 ha
- 20 to 100 ha
- 5 to 20 ha
- Less than 5 ha

- Existing Grassland



0 1 2
kilometres

Nottinghamshire Biodiversity Action Group

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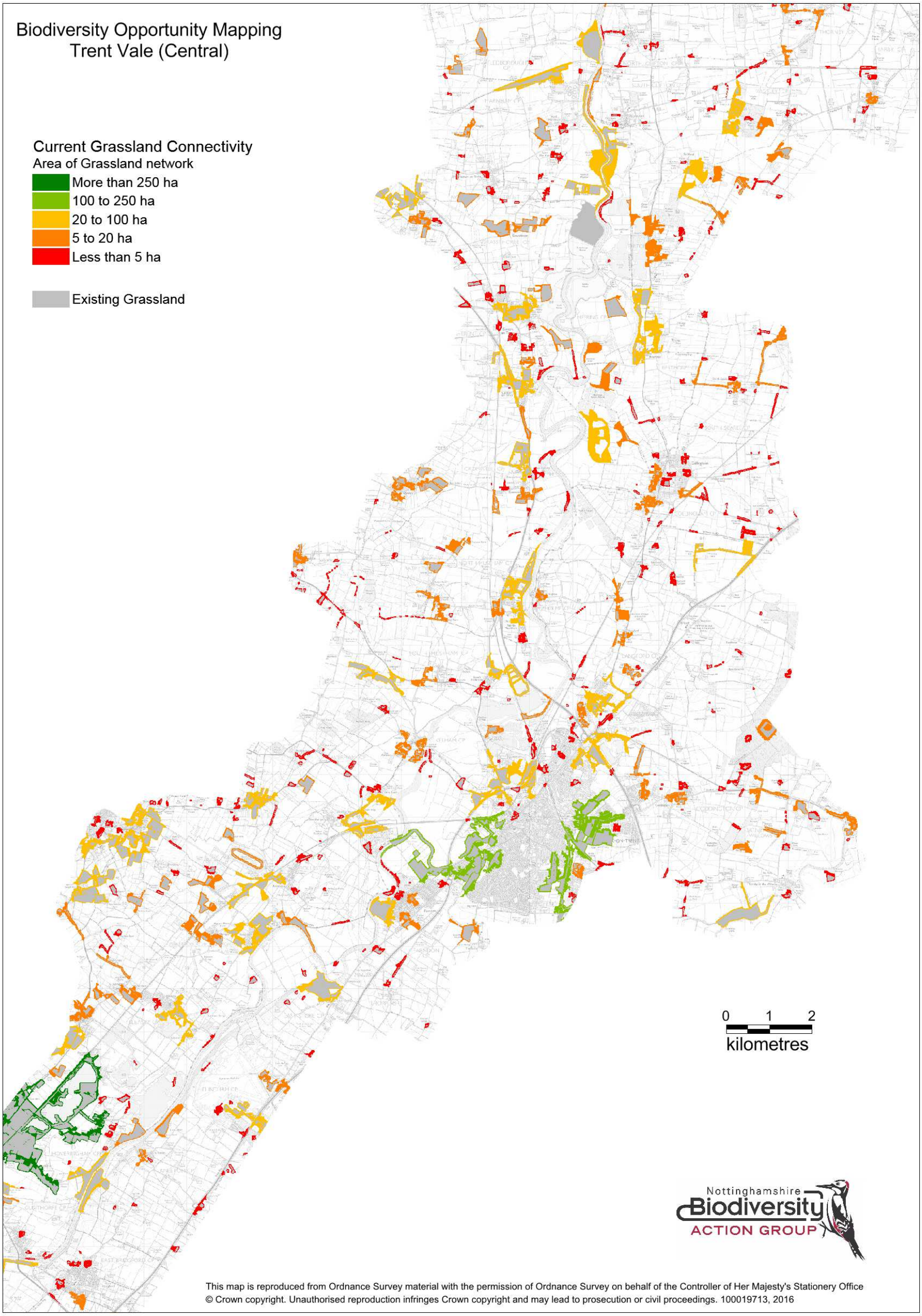
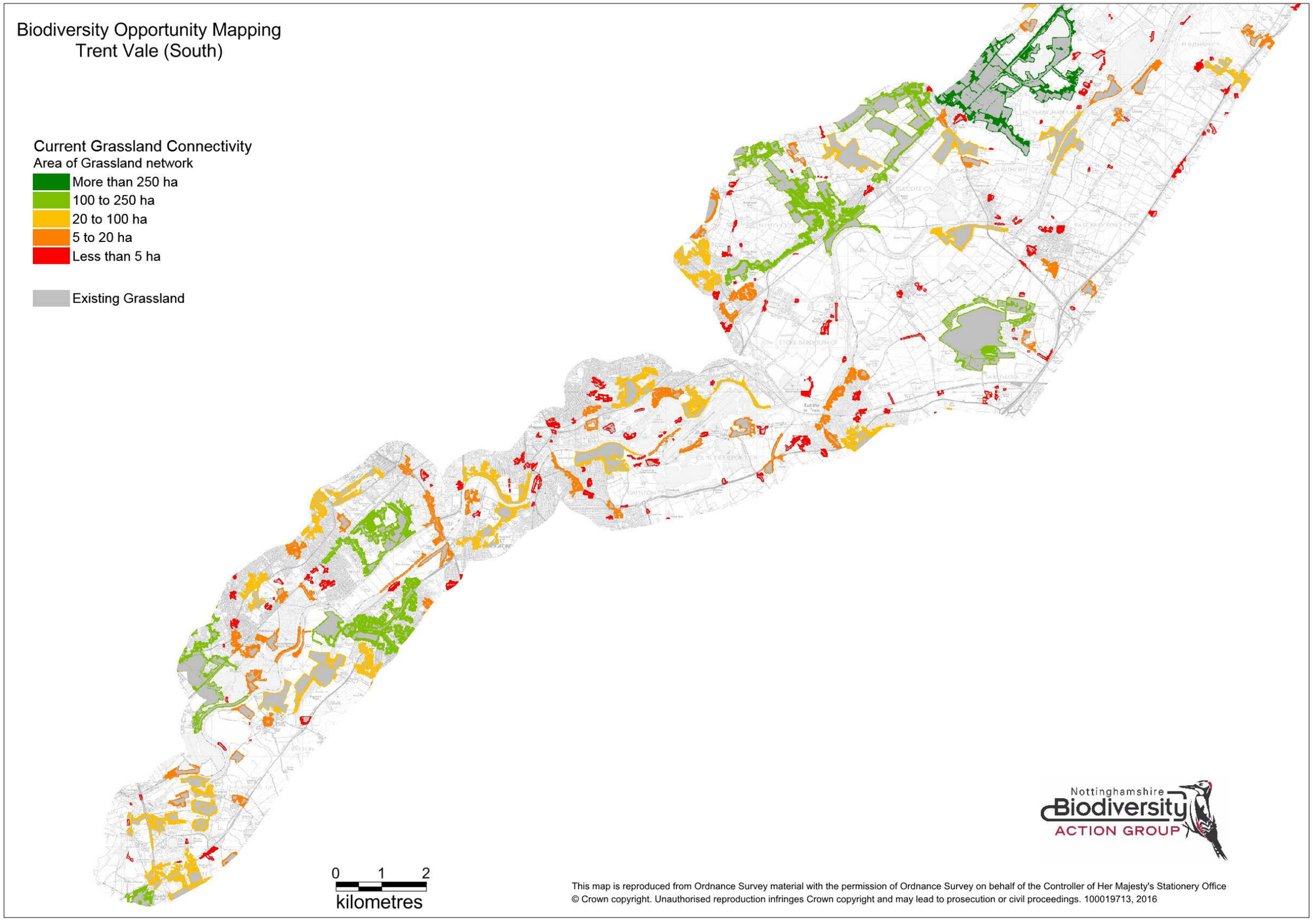
Map 8 - Current Grassland Connectivity (Central)

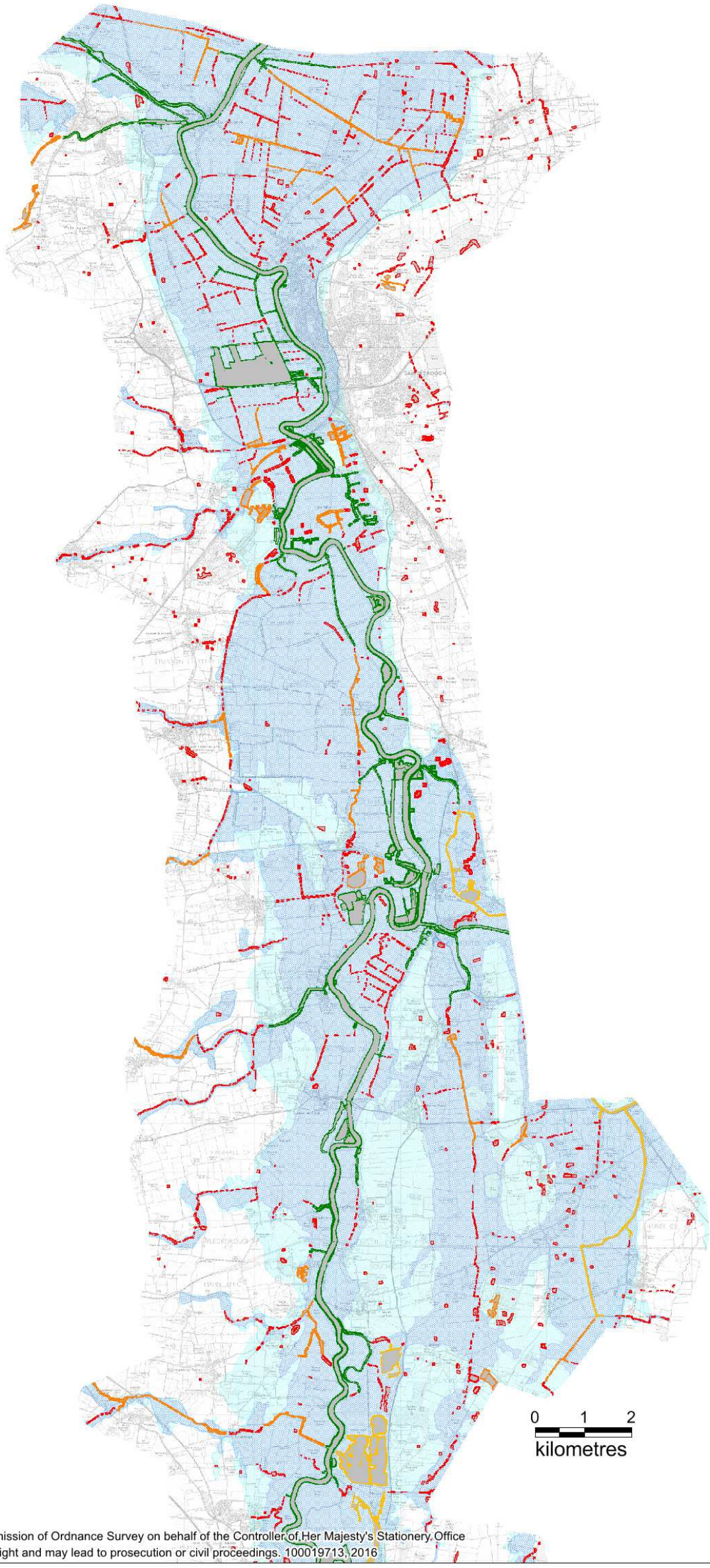


Map 9 - Current Grassland Connectivity (South)



Map 10 - Current Wetland Connectivity (North)

Biodiversity Opportunity Mapping
Trent Vale (North)



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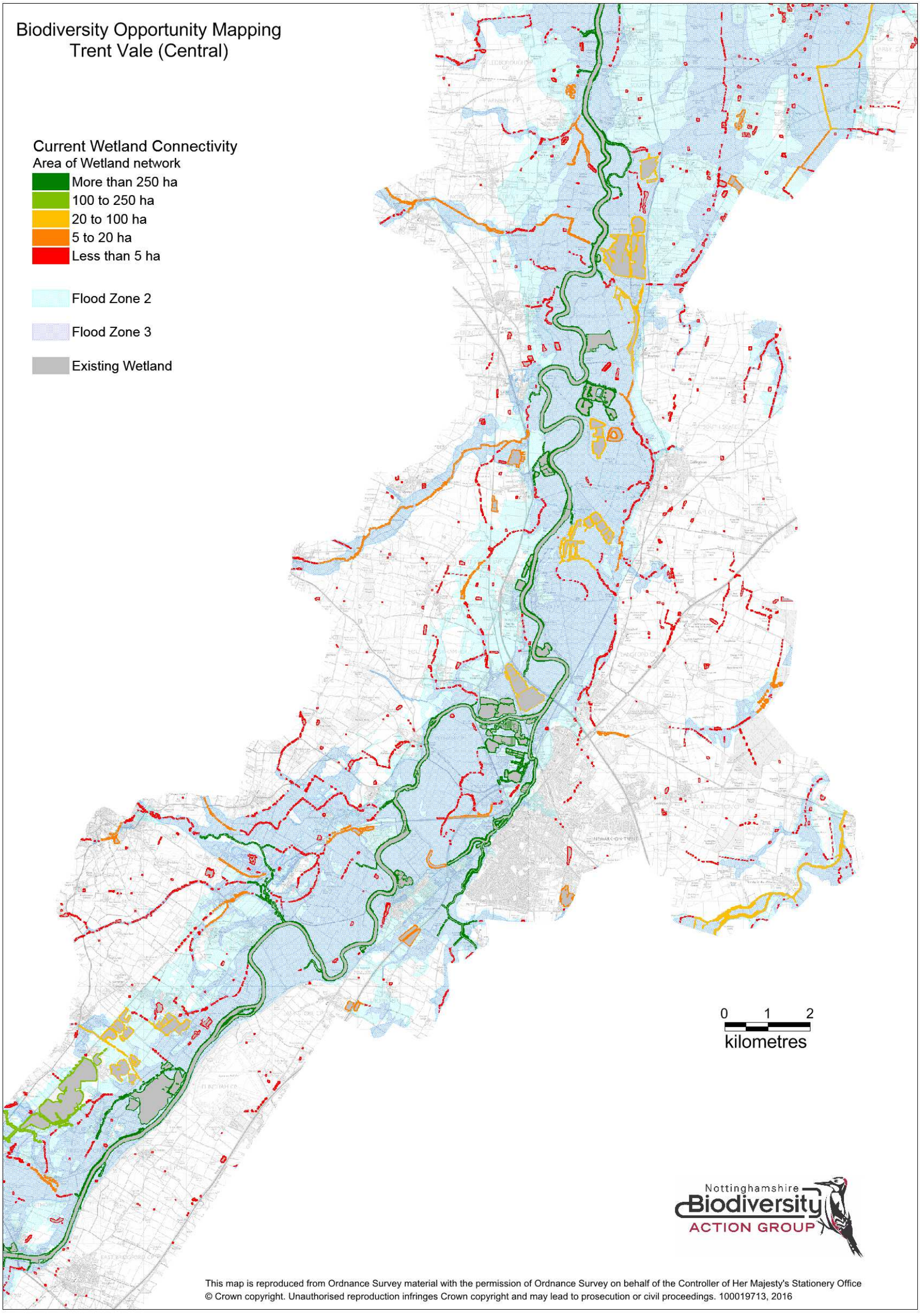
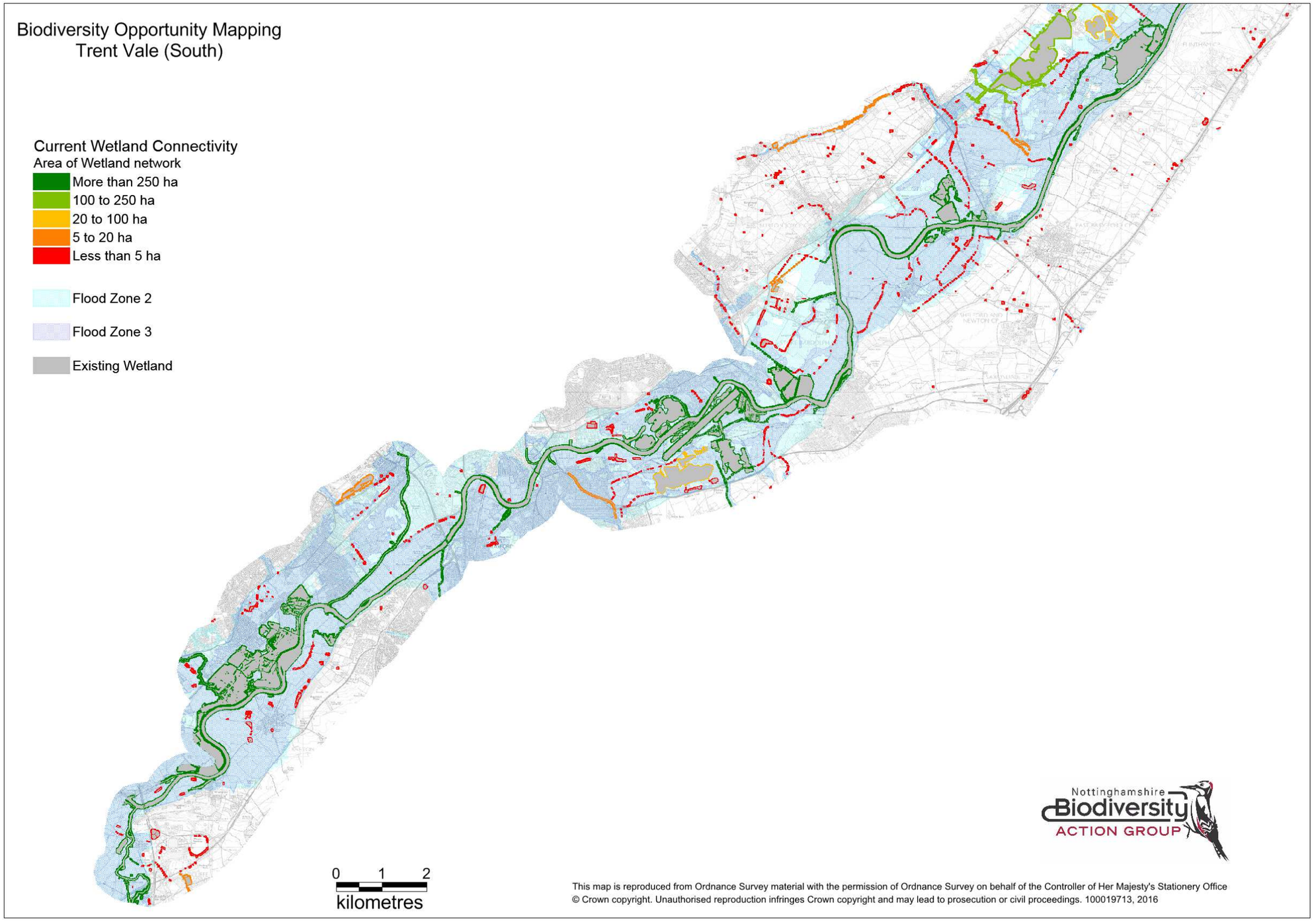
Map 11 - Current Wetland Connectivity (Central)



Map 12 - Current Wetland Connectivity (South)



The Nottinghamshire Biodiversity Opportunity Mapping Project

Background Information Report

February 2016

The Nottinghamshire Biodiversity Opportunity Mapping Project

Background Information Report (version 1)

Credits:

This report has been produced by Nick Crouch (Nottinghamshire County Council) and Chris Jackson (Nottinghamshire Biodiversity Action Group), based on information produced by Janice Bradley (Nottinghamshire Wildlife Trust). Particular thanks go to Sam Lattaway (the National Forest Company) for providing their Habitat Network Model for use in the Nottinghamshire Biodiversity Opportunity Mapping Project.

1. Summary and aims of the project

This report details the background work undertaken as part of a project run by the Nottinghamshire Biodiversity Action Group to deliver a Biodiversity Opportunity Mapping (BOM) project for the county. This BOM will provide a spatial vision of how Nottinghamshire could look in 50 years' time, by focussing on areas where action to enhance, enlarge, expand and link up habitats would have the most benefit for the county's biodiversity.

The BOM will be used to underpin the work of the Nottinghamshire Biodiversity Action Group, by helping to focus action, given limited resources, and to help set targets for the restoration and creation of priority habitats in the county. It should, however, be noted that the inclusion of an area within the BOM does not necessarily mean that activities will take place, as other constraints and considerations will come into play.

2. Background and context to the Project

In 2008 the BAG resolved to produce a Biodiversity Opportunity Map for the County, in order to:

- Help us have a better understanding of the current distribution of biodiversity in the County
- Provide a spatial vision of how the biodiversity of the county could look in the short and longer term
- Identify the most effective way to re-create habitat networks at a landscape-scale
- Help to focus partners' resources on optimising biodiversity gain
- Help to deliver our contribution to the England Biodiversity Strategy, such as for monitoring and reporting, and target-setting for habitats and species
- Inform spatial planning, including the delivery of Green Infrastructure
- Inform agri-environment targeting
- Underpin Biodiversity Offsetting
- Guide the work of the Local Nature Partnership and Local Enterprise Partnership
- Inform a wide range of other strategies, such as for climate change and ecosystem services
- Provide a robust case for developing funding bids
- Influence policy makers, landowners and land managers

Initially, the BAG intended to adapt the Regional BOM (which was under development at the time) into a County model, but over the next two years it became clear that for technical reasons this was not possible, so partners resolved to develop our own model that would best suit our needs in Nottinghamshire and would draw widely on best practice from around the UK. The availability of funds to progress the work was,

however, a seriously limiting factor, particularly as the County Phase 1 mapping was only available as a hard copy and has never been digitised (due to cost).

A task and finish group of the BAG was established - the BOM Working Group (see Appendix 1) - to determine the best approach on behalf of partners, and after reviewing several models from other Counties, a decision was made in 2012 to utilise the Habitat Network Model developed in the National Forest, as this was most closely correlated to what we aimed to achieve and could be run on the computer software (MapInfo) available to the partners. The National Forest Company team was willing to share both their Habitat Network Model and their considerable staff expertise, having developed their model in-house.

Subsequently, the BOM process is being applied to discrete parts of the county, as and when funding has been secured to pay for staff time to undertake the significant amount of work involved as part of the process. It is envisaged that once all areas of Nottinghamshire have been subject to Biodiversity Opportunity Mapping, a single BOM report will be produced covering the whole county.

3. Methodology

The following methodology has been used in undertaking the BOM process, which has been agreed by the BOM Working Group and the BAG:

- Geo-rectification of 1997-8 Phase 1 habitat map image files within MapInfo
- Digitisation of the Phase 1 habitat maps using MapInfo
- Updating of the Phase 1 habitat maps using aerial photography interpretation (2007, 2009 and 2013 flights), BAG LBAP habitat mapping data, and latest Local Wildlife Site knowledge from the Nottinghamshire Biological and Geological Records Centre (NBGRC)
- Assigning relevant habitats to one of the four broad habitat types - woodland, acid grassland and heathland, other grassland, and wetland (see Appendix 2 for details of which habitats make up the four broad habitat types)
- Data cleaning within MapInfo to ensure that there were no gaps or overlaps in the mapped data
- Running of the Habitat Network Modelling (see below for further details of the model)
- Stakeholder workshops to annotate the Habitat Network maps (see below) based on the four broad habitat types (woodland, acid grassland and heathland, other grassland, and wetland)
- Collation and digitisation of the workshop outputs to produce Biodiversity Opportunity Maps for the four broad habitat types
- Identification of focal areas; areas where there appears to be a particular concentration of biodiversity opportunities
- Production of draft report for comment

- Amendment of Biodiversity Opportunity Maps following feedback and production of final report]

4. The Habitat Network Model

The Habitat Network Model developed by the National Forest Company is based on the permeability of different habitats to the movement of species. It uses a generic 'focal' species to represent each of the four habitat networks (i.e. woodland, acid grassland and heathland, other grassland, and wetland), and every Phase 1 habitat that is mapped is assigned a permeability value for each of the four generic species. The permeability values are based on the work of Roger Catchpole at Natural England and have been slightly modified to reflect Nottinghamshire circumstances (see Appendix 3).

The Model then uses "least cost analysis" to calculate how far the focal species can move from its core habitat, with species moving further through more permeable habitats than through less permeable ones; for example, the woodland focal species can move well through habitats that are similar to woodland, such as scrub, but not through habitats which are very different to woodland, such as arable farmland or grassland. Therefore, core habitats that are surrounded by more permeable habitats will allow for stronger networks than those separated by impermeable ones. Where areas of core habitat become linked, these are referred to as Habitat Networks. To assist in the interpretation of this data, Habitat Networks have been placed into different categories depending on their size (which is the size of the Habitat Network, not the size of the core habitat contained within the Habitat Network), so that large Habitat Networks (containing areas of well-connected habitats) can be distinguished from small Habitat Networks (representing isolated and fragmented areas of habitat).

5. Identifying opportunities

Stakeholder workshops are a key part of the BOM process, and will be held for all individual BOM's, involving a range of nature conservation practitioners, organisations and local people. During the workshops, participants are asked to identify biodiversity opportunities by annotating the Habitat Network maps for each of the four broad habitat types, for two timescales – a long term 50 year period, and a shorter term 10 year period. Participants were asked to resist the temptation to necessarily try and link together all the Habitat Networks, and to think about the size and scale of habitats to be created, and where these might be best located within the landscape. Participants were also asked to follow the principles set out in 'Making Space for Nature' – Better, Bigger, More, Connected, using the following definitions:

Better: *Areas of existing, but degraded habitat, which need their condition improved*, e.g. scrubby heathland or mixed woodland with a high

proportion of non-natives. This particularly relates to those sites that are in (very) poor condition.

Bigger: *Areas onto which existing habitat can be expanded*, e.g. adjacent areas of conifer plantation or arable land, which help make existing areas larger and also buffer them from other land uses. For the purposes of this workshop, an arbitrary limit will be used whereby ‘bigger’ can be up to doubling of the site (after which time it becomes 'more').

More: *New areas of habitat to increase the overall resource* - e.g. creation of new heathland or woodland on arable land, in areas that do not abut existing habitat that can be made 'bigger' (or where the size of an existing site is more than doubled).

Connected: *Enhancing existing, and creating new, connections between existing or planned areas of habitat*, either through continuous corridors or by using stepping stones, so that currently isolated habitat blocks are linked up. Obviously 'bigger' and 'more' may result in the creation of new connections anyway, and 'better' may result in the enhancement of existing connections, so this relates particularly to things like narrow, linear linking strips of habitat (along road verges or disused railway lines) or very small patches of habitat that will act as stepping stones which on their own don’t deliver substantial areas of new habitat.

A range of other data was available to workshop participants to help assist in determining where activities to best deliver these principles should be located. This was:

- Phase 1 habitat maps
- Statutorily designated site boundaries (Sites of Special Scientific Interest)
- Locally designated site boundaries (Local Wildlife Sites, known locally as Sites of Importance for Nature Conservation, and Local Nature Reserves)
- Underlying geology (bedrock layer and superficial deposits)
- Zone 2 and Zone 3 flood maps
- Agricultural Land Classification
- Environmental Stewardship and English Woodland Grant Scheme agreements
- Species data (limited to riparian mammals)
- Land owned by BAG partners (Nottinghamshire Wildlife Trust, Royal Society for the Protection of Birds, Forestry Commission and Nottinghamshire County Council)
- Landscape-scale priority areas for partners (the Wildlife Trust’s Living Landscapes and the RSPB’s Futurescapes boundaries)
- Heathland Extent and Potential (HEaP) maps
- Wetland Vision map (for reedbed and floodplain grazing marsh)

- Woodland for Water mapping: opportunities for woodland with respect to the Water Framework Directive (Forestry Commission & Environment Agency)

6. Outputs of the Project and interpretation

Each BOM Project report has four mapping outputs:

a) "*The Basemap*", which shows all habitats across the project area, based on the digitised 1997-8 Phase 1 survey, updated with reference to aerial photography, the BAG's LBAP habitat mapping data, and knowledge of Local Wildlife Sites from the NBGRC.

b) "*The Habitat Network Maps*", which are produced in MapInfo using the National Forest's Habitat Network Model, for each of the four broad habitat types (woodland, grassland, wetland and heathland/acid grassland).

c) The "*Biodiversity Opportunity Maps*", which incorporate (i) the "Long Term 50 Year Opportunities" and (ii) the "*Short Term 10 Year Opportunities*". The former are BAG partners' shared vision and aspirations for what might be achieved over a 50 year time frame, based on the assumptions of a sympathetic funding and planning climate and guided by the current distribution of habitats and their potential for extension based primarily on geology, soils and hydrology. This map also includes details of the longer-term landscape scale visions and targets of BAG partners where they are already in place, but is moderated by immutable constraints such as large settlements and roads. The latter, which overlay the Long Term 50 Year Opportunities, show shorter-term aspirations based upon current or proposed projects and known constraints such as substantial approved development sites, new planned infrastructure and areas of highest value farmland.

d) The "*Focal Area Map(s)*", identifying locations where there appears to be a particular concentration of opportunities, which may be for the same habitat type or across different habitat types. These can be used to prioritise activities so that they have the maximum benefit.

It should be noted that large areas of privately owned land, including land that is used for the production of food, have been identified as opportunities for habitat expansion and creation. These opportunities have been identified purely from a wildlife perspective, and are a guide as to where new habitat would be best located to meet the 'better, bigger, more, connected' objectives listed above; this is a vision of what things *could* look like in the medium and longer term, but will only be achieved in co-operation with landowners. The BOM is therefore a tool for deciding where new habitat would be best located and in that respect can be used for targeting agri-environment schemes and for making decisions on a more local scale. The BOM can also be used

to help with the interpretation of other tools, such as the Woodlands for Water, the Wetland Vision and Heathland Extent and Potential mapping.

Appendix 1 - BOM Working Group

Environment Agency (Dan Widdowson)
Nottinghamshire Biodiversity Action Group (Chris Jackson)
Nottinghamshire Biological and Geological Records Centre (Rob Johnson)
Nottinghamshire County Council (Nick Crouch, Karen Taylor)
Nottinghamshire Wildlife Trust (Janice Bradley)
Royal Society for the Protection of Birds (Adrian Southern)
The National Forest Company (Sam Lattaway)

Appendix 2 - Composition of broad habitat types

The following table indicates the phase 1 habitats that form the four broad habitat types.

Broad habitat type - WOODLAND	
PBW	Broadleaved woodland - plantation
BW	Broadleaved woodland - semi-natural
PMW	Mixed woodland - plantation
MW	Mixed woodland - semi-natural
Broad habitat type - HEATHLAND & ACID GRASSLAND	
SAG	Acid grassland - semi-improved
AG	Acid grassland - unimproved
ADH	Dry dwarf shrub heath - acid
BDH	Dry dwarf shrub heath - basic
DGM	Dry heath/acid grassland mosaic
WH	Wet dwarf shrub heath
WGM	Wet heath/acid grassland mosaic
Broad habitat type – OTHER GRASSLAND	
SCG	Calcareous grassland - semi-improved
CG	Calcareous grassland - unimproved
SNG	Neutral grassland - semi-improved
NG	Neutral grassland - unimproved
SBW	Parkland and scattered trees - broadleaved
Orchard	Parkland and scattered trees - broadleaved
SCW	Parkland and scattered trees - coniferous
SMW	Parkland and scattered trees - mixed
Broad habitat type - WETLAND	
BB	Blanket bog
DB	Dry modified bog
BM	Fen - basin mire
FPM	Fen - flood plain mire
VM	Fen - valley mire
AF	Flush and spring - acid/neutral flush
BF	Flush and spring - basic flush
IV	Marginal/inundation - inundation
MV	Marginal/inundation - marginal
MG	Marsh/marshy grassland
RB	Raised bog
Reedbed	Reedbed
SP	Swamp
WB	Wet modified bog

Appendix 3 - Permeability values

The following four tables provide a list of Phase 1 habitats and the permeability scores assigned to each of these Phase 1 habitats. The four tables correspond to one of the four broad habitat types (woodland, acid grassland and heathland, other grassland and wetland), and the permeability scores listed indicate how permeable each Phase 1 habitat is to the relevant generic 'focal' species associated with the broad habitat type in question. The permeability score given for each Phase 1 habitat falls between 1 and 50. A score of 1 indicates that the habitat is a core/source habitat for the broad habitat type. A low score above 1 indicates a habitat that is very permeable to the generic focal species associated with the broad habitat type in question, whilst a score of 50 indicates that the habitat is very impermeable for that focal species.

The final column in each table indicates the source of the information. Where the source is given as JNCC the information has come directly from work by Natural England (Catchpole 2010). Where the source is given as NFC the information has come from the habitat network modelling work undertaken by the National Forest Company. The data from NFC principally relates to a variety of urban habitats not listed in the Phase 1 habitat survey handbook, such as roads, tracks, buildings, airports, railways, suburbs, gardens etc. The exception to this is orchards for which a permeability value has been given based on a similar Phase 1 habitat type (in this case parkland/scattered trees).

In addition, some of the permeability scores devised by Catchpole have been altered to best serve local biodiversity conditions, and some additional habitats have been added to the list of habitats and assigned a permeability score based on similarly structured/functioning habitats. In this case the source of the data is given as NCC. These local amendments are highlighted below:

- The BOM working group agreed that acid grassland and heathland should be dealt with in the same broad habitat group. Nationally, acid grassland is dealt with in the same broad habitat group as 'other grassland' types. As a result of this change acid grassland has had its permeability score altered to reflect this change. Within the broad habitat of 'Other Grassland' the permeability score has been altered to 2 (rather than 1) and within the broad habitat of heathland and acid grassland it has had it's permeability score given a value of 1 (to ensure that it is picked up as core/source habitat within this broad habitat type).
- To reflect the importance of Open Mosaic Habitat on Previously Developed Land in Nottinghamshire this habitat has been assigned its own Phase 1 habitat code. The permeability scores have been based on similar open habitat types.
- To identify the importance of Reedbed restoration work within Nottinghamshire this habitat was assigned its own Phase 1 habitat code. The permeability scores have been based on similar habitat types.

Reference: Catchpole, R. (2010) England Habitat Network (EHN 2.0) – Metadata. *Natural England*

GRASSLAND

GRASSLAND			
Phase 1 Code	**Phase 1 Habitat Name**	**Grassland Cost**	**Definition Source**
ROAD	A or B road	50	NFC
SAG	Acid grassland - semi-improved	2	NCC
AG	Acid grassland - unimproved	2	NCC
RUNWAY	Airport runway	50	NFC
BG	Bare ground	20	JNCC
P	Bare peat	5	JNCC
BB	Blanket bog	20	JNCC
X	Boundary removed	0	JNCC
CB	Bracken - continuous	10	JNCC
SB	Bracken - scattered	10	JNCC
PBW	Broadleaved woodland - plantation	20	JNCC
BW	Broadleaved woodland - semi-natural	20	JNCC
BUILD	Buildings	20	NFC
Building	Buildings	20	NFC
Buildings	Buildings	20	NFC
SCG	Calcareous grassland - semi-improved	1	JNCC
CG	Calcareous grassland - unimproved	1	JNCC
CS	Caravan site	0	JNCC
CA	Cave	50	JNCC
PCW	Coniferous woodland - plantation	20	JNCC
CW	Coniferous woodland - semi-natural	20	JNCC
AM	Cultivated/disturbed land - amenity grassland	50	JNCC
A	Cultivated/disturbed land - arable	50	JNCC
ESP	Cultivated/disturbed land - ephemeral/short perennial	5	JNCC
DD	Dry ditch	0	JNCC
ADH	Dry dwarf shrub heath - acid	10	JNCC
BDH	Dry dwarf shrub heath - basic	10	JNCC
DGM	Dry heath/acid grassland mosaic	2	JNCC
DB	Dry modified bog	20	JNCC
EB	Earth bank	0	JNCC
BM	Fen - basin mire	5	JNCC
FPM	Fen - flood plain mire	5	JNCC
VM	Fen - valley mire	5	JNCC
F	Fence	0	JNCC
AF	Flush and spring - acid/neutral flush	5	JNCC
BF	Flush and spring - basic flush	5	JNCC
PH-	Hedges - defunct - species-poor	20	JNCC
RH-	Hedges - defunct - species-rich	20	JNCC
PH	Hedges - intact - species-poor	20	JNCC
RH	Hedges - intact - species-rich	20	JNCC
PHT	Hedges - with trees - species-poor	20	JNCC
RHT	Hedges - with trees - species-rich	20	JNCC
I	Improved grassland	50	JNCC
AC	Inland cliff - acid/neutral	50	JNCC
BC	Inland cliff - basic	50	JNCC
IS	Introduced shrub	20	JNCC
LH	Lichen/bryophyte heath	15	JNCC
LP	Limestone pavement	50	JNCC
IV	Marginal/inundation - inundation	20	JNCC
MV	Marginal/inundation - marginal	20	JNCC
MG	Marsh/marshy grassland	5	JNCC
MI	Mine	20	JNCC
PMW	Mixed woodland - plantation	20	JNCC
MW	Mixed woodland - semi-natural	20	JNCC
MH	Montane heath/dwarf herb	15	JNCC
MWAY	Motorway or major dual carriageway	50	NFC
SNG	Neutral grassland - semi-improved	1	JNCC
NG	Neutral grassland - unimproved	1	JNCC
NR	Non-ruderal	10	JNCC
OMHOPDL	Open Mosaic Habitat	5	NCC
AR	Other exposure - acid/neutral	50	JNCC
BR	Other exposure - basic	50	JNCC
SBW	Parkland and scattered trees - broadleaved	1	JNCC
Orchard	Parkland and scattered trees - broadleaved	1	NFC
SCW	Parkland and scattered trees - coniferous	1	JNCC
SMW	Parkland and scattered trees - mixed	1	JNCC
SI	Poor semi-improved grassland	2	JNCC
Q	Quarry	50	JNCC
RAIL	Railway line	50	NFC
RB	Raised bog	20	JNCC
FB	Recently felled woodland - broadleaved	20	JNCC
FC	Recently felled woodland - coniferous	20	JNCC
FM	Recently felled woodland - mixed	20	JNCC
Reedbed	Reedbed	20	NCC
R	Refuse tip	20	JNCC
RW	Running water	50	JNCC
RWB	Running water - brackish	50	JNCC
RWD	Running water - dystrophic	50	JNCC
RWE	Running water - eutrophic	50	JNCC
RWC	Running water - marl	50	JNCC
RWM	Running water - mesotrophic	50	JNCC
RWO	Running water - oligotrophic	50	JNCC
AS	Scree - acid/neutral	50	JNCC
BS	Scree - basic	50	JNCC
DS	Scrub - dense/continuous	20	JNCC
SS	Scrub - scattered	20	JNCC
SWALL	Sea wall	0	JNCC
S	Spoil	20	JNCC
SW	Standing water	50	JNCC
SWB	Standing water - brackish	50	JNCC
SWD	Standing water - dystrophic	50	JNCC
SWE	Standing water - eutrophic	50	JNCC
SWC	Standing water - marl	50	JNCC
SWM	Standing water - mesotrophic	50	JNCC
SWO	Standing water - oligotrophic	50	JNCC
SUBURB	Suburban/rural development	10	NFC
Gardens	Suburban/rural development	10	NFC
Paved	Suburban/rural development	50	NFC
SP	Swamp	20	JNCC
TR	Tall ruderal	10	JNCC
TRACK	Track or minor access road	50	NFC
Path	Track or minor access road	50	NFC
?	Unknown	50	NFC
INDUST	Urban industrial development	30	NFC
URBAN	Urban residential/commerical development	20	NFC
W	Wall	0	JNCC
WH	Wet dwarf shrub heath	10	JNCC
WGM	Wet heath/acid grassland mosaic	2	JNCC
WB	Wet modified bog	20	JNCC

HEATHLAND & ACID GRASSLAND

HEATHLAND & ACID GRASSLAND			
Phase 1 Code	**Phase 1 Habitat Name**	**Heathland & Acid Grassland Cost**	**Definition Source**
ROAD	A or B road	50	NFC
SAG	Acid grassland - semi-improved	1	NCC
AG	Acid grassland - unimproved	1	NCC
RUNWAY	Airport runway	50	NFC
BG	Bare ground	30	JNCC
P	Bare peat	20	JNCC
BB	Blanket bog	3	JNCC
X	Boundary removed	0	JNCC
CB	Bracken - continuous	20	JNCC
SB	Bracken - scattered	20	JNCC
PBW	Broadleaved woodland - plantation	35	JNCC
BW	Broadleaved woodland - semi-natural	35	JNCC
BUILD	Buildings	50	NFC
Building	Buildings	50	NFC
Buildings	Buildings	50	NFC
SCG	Calcareous grassland - semi-improved	50	JNCC
CG	Calcareous grassland - unimproved	40	JNCC
CS	Caravan site	0	JNCC
CA	Cave	50	JNCC
PCW	Coniferous woodland - plantation	20	JNCC
CW	Coniferous woodland - semi-natural	20	JNCC
AM	Cultivated/disturbed land - amenity grassland	50	JNCC
A	Cultivated/disturbed land - arable	50	JNCC
ESP	Cultivated/disturbed land - ephemeral/short perennial	50	JNCC
DD	Dry ditch	0	JNCC
ADH	Dry dwarf shrub heath - acid	1	JNCC
BDH	Dry dwarf shrub heath - basic	1	JNCC
DGM	Dry heath/acid grassland mosaic	1	JNCC
DB	Dry modified bog	3	JNCC
EB	Earth bank	0	JNCC
BM	Fen - basin mire	30	JNCC
FPM	Fen - flood plain mire	30	JNCC
VM	Fen - valley mire	30	JNCC
F	Fence	0	JNCC
AF	Flush and spring - acid/neutral flush	30	JNCC
BF	Flush and spring - basic flush	30	JNCC
PH-	Hedges - defunct - species-poor	10	JNCC
RH-	Hedges - defunct - species-rich	10	JNCC
PH	Hedges - intact - species-poor	10	JNCC
RH	Hedges - intact - species-rich	10	JNCC
PHT	Hedges - with trees - species-poor	10	JNCC
RHT	Hedges - with trees - species-rich	10	JNCC
I	Improved grassland	50	JNCC
AC	Inland cliff - acid/neutral	50	JNCC
BC	Inland cliff - basic	50	JNCC
IS	Introduced shrub	10	JNCC
LH	Lichen/bryophyte heath	10	JNCC
LP	Limestone pavement	50	JNCC
IV	Marginal/inundation - inundation	40	JNCC
MV	Marginal/inundation - marginal	40	JNCC
MG	Marsh/marshy grassland	30	JNCC
MI	Mine	30	JNCC
PMW	Mixed woodland - plantation	35	JNCC
MW	Mixed woodland - semi-natural	35	JNCC
MH	Montane heath/dwarf herb	10	JNCC
MWAY	Motorway or major dual carriageway	50	NFC
SNG	Neutral grassland - semi-improved	30	JNCC
NG	Neutral grassland - unimproved	30	JNCC
NR	Non-ruderal	20	JNCC
OMHOPDL	Open Mosaic Habitat	10	NCC
AR	Other exposure - acid/neutral	50	JNCC
BR	Other exposure - basic	50	JNCC
SBW	Parkland and scattered trees - broadleaved	30	JNCC
Orchard	Parkland and scattered trees - broadleaved	30	NFC
SCW	Parkland and scattered trees - coniferous	30	JNCC
SMW	Parkland and scattered trees - mixed	30	JNCC
SI	Poor semi-improved grassland	30	JNCC
Q	Quarry	50	JNCC
RAIL	Railway line	50	NFC
RB	Raised bog	3	JNCC
FB	Recently felled woodland - broadleaved	10	JNCC
FC	Recently felled woodland - coniferous	10	JNCC
FM	Recently felled woodland - mixed	10	JNCC
Reedbed	Reedbed	40	NCC
R	Refuse tip	30	JNCC
RW	Running water	50	JNCC
RWB	Running water - brackish	50	JNCC
RWD	Running water - dystrophic	50	JNCC
RWE	Running water - eutrophic	50	JNCC
RWC	Running water - marl	50	JNCC
RWM	Running water - mesotrophic	50	JNCC
RWO	Running water - oligotrophic	50	JNCC
AS	Scree - acid/neutral	50	JNCC
BS	Scree - basic	50	JNCC
DS	Scrub - dense/continuous	10	JNCC
SS	Scrub - scattered	10	JNCC
SWALL	Sea wall	0	JNCC
S	Spoil	30	JNCC
SW	Standing water	50	JNCC
SWB	Standing water - brackish	50	JNCC
SWD	Standing water - dystrophic	50	JNCC
SWE	Standing water - eutrophic	50	JNCC
SWC	Standing water - marl	50	JNCC
SWM	Standing water - mesotrophic	50	JNCC
SWO	Standing water - oligotrophic	50	JNCC
SUBURB	Suburban/rural development	50	NFC
Gardens	Suburban/rural development	50	NFC
Paved	Suburban/rural development	50	NFC
SP	Swamp	40	JNCC
TR	Tall ruderal	20	JNCC
TRACK	Track or minor access road	50	NFC
Path	Track or minor access road	50	NFC
?	Unknown	50	NFC
INDUST	Urban industrial development	50	NFC
URBAN	Urban residential/commerical development	50	NFC
W	Wall	0	JNCC
WH	Wet dwarf shrub heath	1	JNCC
WGM	Wet heath/acid grassland mosaic	1	JNCC
WB	Wet modified bog	3	JNCC

WETLAND

WETLAND			
Phase 1 Code	**Phase 1 Habitat Name**	**Wetland Cost**	**Definition Source**
ROAD	A or B road	50	NFC
SAG	Acid grassland - semi-improved	20	NCC
AG	Acid grassland - unimproved	20	NCC
RUNWAY	Airport runway	50	NFC
BG	Bare ground	40	JNCC
P	Bare peat	20	JNCC
BB	Blanket bog	1	JNCC
X	Boundary removed	0	JNCC
CB	Bracken - continuous	30	JNCC
SB	Bracken - scattered	30	JNCC
PBW	Broadleaved woodland - plantation	50	JNCC
BW	Broadleaved woodland - semi-natural	50	JNCC
BUILD	Buildings	50	NFC
Building	Buildings	50	NFC
Buildings	Buildings	50	NFC
SCG	Calcareous grassland - semi-improved	40	JNCC
CG	Calcareous grassland - unimproved	50	JNCC
CS	Caravan site	0	JNCC
CA	Cave	50	JNCC
PCW	Coniferous woodland - plantation	40	JNCC
CW	Coniferous woodland - semi-natural	40	JNCC
AM	Cultivated/disturbed land - amenity grassland	50	JNCC
A	Cultivated/disturbed land - arable	50	JNCC
ESP	Cultivated/disturbed land - ephemeral/short perennial	40	JNCC
DD	Dry ditch	0	JNCC
ADH	Dry dwarf shrub heath - acid	5	JNCC
BDH	Dry dwarf shrub heath - basic	5	JNCC
DGM	Dry heath/acid grassland mosaic	5	JNCC
DB	Dry modified bog	1	JNCC
EB	Earth bank	0	JNCC
BM	Fen - basin mire	1	JNCC
FPM	Fen - flood plain mire	1	JNCC
VM	Fen - valley mire	1	JNCC
F	Fence	0	JNCC
AF	Flush and spring - acid/neutral flush	1	JNCC
BF	Flush and spring - basic flush	1	JNCC
PH-	Hedges - defunct - species-poor	30	JNCC
RH-	Hedges - defunct - species-rich	30	JNCC
PH	Hedges - intact - species-poor	30	JNCC
RH	Hedges - intact - species-rich	30	JNCC
PHT	Hedges - with trees - species-poor	30	JNCC
RHT	Hedges - with trees - species-rich	30	JNCC
I	Improved grassland	50	JNCC
AC	Inland cliff - acid/neutral	50	JNCC
BC	Inland cliff - basic	50	JNCC
IS	Introduced shrub	30	JNCC
LH	Lichen/bryophyte heath	20	JNCC
LP	Limestone pavement	50	JNCC
IV	Marginal/inundation - inundation	1	JNCC
MV	Marginal/inundation - marginal	1	JNCC
MG	Marsh/marshy grassland	1	JNCC
MI	Mine	40	JNCC
PMW	Mixed woodland - plantation	50	JNCC
MW	Mixed woodland - semi-natural	50	JNCC
MH	Montane heath/dwarf herb	20	JNCC
MWAY	Motorway or major dual carriageway	50	NFC
SNG	Neutral grassland - semi-improved	30	JNCC
NG	Neutral grassland - unimproved	20	JNCC
NR	Non-ruderal	30	JNCC
OMHOPDL	Open Mosaic Habitat	20	NCC
AR	Other exposure - acid/neutral	50	JNCC
BR	Other exposure - basic	50	JNCC
SBW	Parkland and scattered trees - broadleaved	30	JNCC
Orchard	Parkland and scattered trees - broadleaved	30	NFC
SCW	Parkland and scattered trees - coniferous	30	JNCC
SMW	Parkland and scattered trees - mixed	30	JNCC
SI	Poor semi-improved grassland	30	JNCC
Q	Quarry	50	JNCC
RAIL	Railway line	50	NFC
RB	Raised bog	1	JNCC
FB	Recently felled woodland - broadleaved	20	JNCC
FC	Recently felled woodland - coniferous	20	JNCC
FM	Recently felled woodland - mixed	20	JNCC
Reedbed	Reedbed	1	NCC
R	Refuse tip	40	JNCC
RW	Running water	1	NCC
RWB	Running water - brackish	1	NCC
RWD	Running water - dystrophic	1	NCC
RWE	Running water - eutrophic	1	NCC
RWC	Running water - marl	1	NCC
RWM	Running water - mesotrophic	1	NCC
RWO	Running water - oligotrophic	1	NCC
AS	Scree - acid/neutral	50	JNCC
BS	Scree - basic	50	JNCC
DS	Scrub - dense/continuous	30	JNCC
SS	Scrub - scattered	30	JNCC
SWALL	Sea wall	0	JNCC
S	Spoil	40	JNCC
SW	Standing water	1	NCC
SWB	Standing water - brackish	1	NCC
SWD	Standing water - dystrophic	1	NCC
SWE	Standing water - eutrophic	1	JNCC
SWC	Standing water - marl	1	JNCC
SWM	Standing water - mesotrophic	1	JNCC
SWO	Standing water - oligotrophic	1	JNCC
SUBURB	Suburban/rural development	50	NFC
Gardens	Suburban/rural development	50	NFC
Paved	Suburban/rural development	50	NFC
SP	Swamp	1	JNCC
TR	Tall ruderal	30	JNCC
TRACK	Track or minor access road	50	NFC
Path	Track or minor access road	50	NFC
?	Unknown	50	NFC
INDUST	Urban industrial development	50	NFC
URBAN	Urban residential/commercial development	50	NFC
W	Wall	0	JNCC
WH	Wet dwarf shrub heath	5	JNCC
WGM	Wet heath/acid grassland mosaic	5	JNCC
WB	Wet modified bog	1	JNCC

WOODLAND

WOODLAND			
Phase 1 Code	**Phase 1 Habitat Name**	**Woodland Cost**	**Definition Source**
ROAD	A or B road	50	NFC
SAG	Acid grassland - semi-improved	30	NCC
AG	Acid grassland - unimproved	30	NCC
RUNWAY	Airport runway	50	NFC
BG	Bare ground	40	JNCC
P	Bare peat	25	JNCC
BB	Blanket bog	30	JNCC
X	Boundary removed	0	JNCC
CB	Bracken - continuous	20	JNCC
SB	Bracken - scattered	20	JNCC
PBW	Broadleaved woodland - plantation	1	JNCC
BW	Broadleaved woodland - semi-natural	1	JNCC
BUILD	Buildings	40	NFC
Building	Buildings	40	NFC
Buildings	Buildings	40	NFC
SCG	Calcareous grassland - semi-improved	30	JNCC
CG	Calcareous grassland - unimproved	30	JNCC
CS	Caravan site	0	JNCC
CA	Cave	50	JNCC
PCW	Coniferous woodland - plantation	20	JNCC
CW	Coniferous woodland - semi-natural	20	JNCC
AM	Cultivated/disturbed land - amenity grassland	50	JNCC
A	Cultivated/disturbed land - arable	50	JNCC
ESP	Cultivated/disturbed land - ephemeral/short perennial	40	JNCC
DD	Dry ditch	0	JNCC
ADH	Dry dwarf shrub heath - acid	25	JNCC
BDH	Dry dwarf shrub heath - basic	25	JNCC
DGM	Dry heath/acid grassland mosaic	25	JNCC
DB	Dry modified bog	30	JNCC
EB	Earth bank	0	JNCC
BM	Fen - basin mire	20	JNCC
FPM	Fen - flood plain mire	20	JNCC
VM	Fen - valley mire	20	JNCC
F	Fence	0	JNCC
AF	Flush and spring - acid/neutral flush	20	JNCC
BF	Flush and spring - basic flush	20	JNCC
PH-	Hedges - defunct - species-poor	1	JNCC
RH-	Hedges - defunct - species-rich	1	JNCC
PH	Hedges - intact - species-poor	1	JNCC
RH	Hedges - intact - species-rich	1	JNCC
PHT	Hedges - with trees - species-poor	1	JNCC
RHT	Hedges - with trees - species-rich	1	JNCC
I	Improved grassland	50	JNCC
AC	Inland cliff - acid/neutral	50	JNCC
BC	Inland cliff - basic	50	JNCC
IS	Introduced shrub	1	JNCC
LH	Lichen/bryophyte heath	40	JNCC
LP	Limestone pavement	50	JNCC
IV	Marginal/inundation - inundation	20	JNCC
MV	Marginal/inundation - marginal	20	JNCC
MG	Marsh/marshy grassland	20	JNCC
MI	Mine	40	JNCC
PMW	Mixed woodland - plantation	1	JNCC
MW	Mixed woodland - semi-natural	1	JNCC
MH	Montane heath/dwarf herb	40	JNCC
MWAY	Motorway or major dual carriageway	100	NFC
SNG	Neutral grassland - semi-improved	30	JNCC
NG	Neutral grassland - unimproved	30	JNCC
NR	Non-ruderal	20	JNCC
OMHOPDL	Open Mosaic Habitat	5	NCC
AR	Other exposure - acid/neutral	50	JNCC
BR	Other exposure - basic	50	JNCC
SBW	Parkland and scattered trees - broadleaved	5	JNCC
Orchard	Parkland and scattered trees - broadleaved	5	NFC
SCW	Parkland and scattered trees - coniferous	30	JNCC
SMW	Parkland and scattered trees - mixed	5	JNCC
SI	Poor semi-improved grassland	30	JNCC
Q	Quarry	50	JNCC
RAIL	Railway line	50	NFC
RB	Raised bog	30	JNCC
FB	Recently felled woodland - broadleaved	5	JNCC
FC	Recently felled woodland - coniferous	5	JNCC
FM	Recently felled woodland - mixed	5	JNCC
Reedbed	Reedbed	20	NCC
R	Refuse tip	40	JNCC
RW	Running water	50	JNCC
RWB	Running water - brackish	50	JNCC
RWD	Running water - dystrophic	50	JNCC
RWE	Running water - eutrophic	50	JNCC
RWC	Running water - marl	50	JNCC
RWM	Running water - mesotrophic	50	JNCC
RWO	Running water - oligotrophic	50	JNCC
AS	Scree - acid/neutral	50	JNCC
BS	Scree - basic	50	JNCC
DS	Scrub - dense/continuous	1	JNCC
SS	Scrub - scattered	1	JNCC
SWALL	Sea wall	0	JNCC
S	Spoil	40	JNCC
SW	Standing water	50	JNCC
SWB	Standing water - brackish	50	JNCC
SWD	Standing water - dystrophic	50	JNCC
SWE	Standing water - eutrophic	50	JNCC
SWC	Standing water - marl	50	JNCC
SWM	Standing water - mesotrophic	50	JNCC
SWO	Standing water - oligotrophic	50	JNCC
SUBURB	Suburban/rural development	25	NFC
Gardens	Suburban/rural development	25	NFC
Paved	Suburban/rural development	50	NFC
SP	Swamp	20	JNCC
TR	Tall ruderal	20	JNCC
TRACK	Track or minor access road	50	NFC
Path	Track or minor access road	50	NFC
?	Unknown	50	NFC
INDUST	Urban industrial development	50	NFC
URBAN	Urban residential/commerical development	40	NFC
W	Wall	0	JNCC
WH	Wet dwarf shrub heath	25	JNCC
WGM	Wet heath/acid grassland mosaic	25	JNCC
WB	Wet modified bog	30	JNCC