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Conservation Objectives Series

Lough Oughter and Associated Loughs SAC 000007

An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

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Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

**** indicates a priority habitat under the Habitats Directive***

000007	Lough Oughter and Associated Loughs SAC
1355	Otter *Lutra lutra*
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation
91D0	Bog woodland*

Please note that this SAC overlaps with Lough Oughter SPA (004049). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping site as appropriate.

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	1984
Title :	The vegetation of Irish lakes
Author :	Heuff, H.
Series :	Unpublished report to NPWS
Year :	2006
Title :	Otter survey of Ireland 2004/2005
Author :	Bailey, M.; Rochford, J.
Series :	Irish Wildlife Manuals, No. 23
Year :	2007
Title :	Supporting documentation for the Habitats Directive Conservation Status Assessment - backing documents. Article 17 forms and supporting maps
Author :	NPWS
Series :	Unpublished report to NPWS
Year :	2008
Title :	National survey of native woodlands 2003-2008
Author :	Perrin, P.M.; Martin, J.; Barron, S.; O'Neill, F.H.; McNutt, K.E.; Delaney, A.
Series :	Unpublished report to NPWS
Year :	2010
Title :	A provisional inventory of ancient and long-established woodland in Ireland
Author :	Perrin, P.M.; Daly, O.H.
Series :	Irish Wildlife Manuals, No. 46
Year :	2013
Title :	National otter survey of Ireland 2010/12
Author :	Reid, N.; Hayden, B.; Lundy, M.G.; Pietravalle, S.; McDonald, R.A.; Montgomery, W.I.
Series :	Irish Wildlife Manuals, No. 76
Year :	2013
Title :	Results of a monitoring survey of bog woodland
Author :	Cross, J.; Lynn, D.
Series :	Irish Wildlife Manuals, No. 69
Year :	2013
Title :	The status of EU protected habitats and species in Ireland. Volume 2. Habitats assessments
Author :	NPWS
Series :	Conservation assessments
Year :	2015
Title :	Habitats Directive Annex I lake habitats: a working interpretation for the purposes of site-specific conservation objectives and Article 17 reporting
Author :	O Connor, Á.
Series :	Unpublished document by NPWS
Year :	2019
Title :	The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments
Author :	NPWS
Series :	Conservation assessments

Year :	in prep.
Title :	The monitoring and assessment of four EU Habitats Directive Annex I woodland habitats
Author :	Daly, O.H.; O'Neill, F.H.; Barron, S.J.
Series :	Irish Wildlife Manuals

Other References

Year :	1975
Title :	A preliminary survey of Irish lakes
Author :	Flanagan, P.J.; Toner P.F.
Series :	An Foras Forbartha
Year :	1982
Title :	Otter survey of Ireland
Author :	Chapman, P.J.; Chapman, L.L.
Series :	Unpublished report to Vincent Wildlife Trust
Year :	1982
Title :	Eutrophication of waters. Monitoring assessment and control
Author :	OECD
Series :	OECD, Paris
Year :	1991
Title :	The spatial organization of otters (*Lutra lutra*) in Shetland
Author :	Kruuk, H.; Moorhouse, A.
Series :	Journal of Zoology, 224: 41-57
Year :	1999
Title :	Bog Woodland Survey in the Lough Oughter Proposed Special Area of Conservation
Author :	Nairn, R.; Duff, K.
Series :	Unpublished report submitted to Cavan County Council
Year :	2000
Title :	Colour in Irish lakes
Author :	Free, G.; Allott, N.; Mills, P.; Kennelly, C.; Day, S.
Series :	Verhandlungen Internationale Vereinigung für theoretische und angewandte Limnologie, 27: 2620-2623
Year :	2002
Title :	Reversing the habitat fragmentation of British woodlands
Author :	Peterken, G.
Series :	WWF-UK, London
Year :	2006
Title :	Otters - ecology, behaviour and conservation
Author :	Kruuk, H.
Series :	Oxford University Press
Year :	2006
Title :	A reference-based typology and ecological assessment system for Irish lakes. Preliminary investigations. Final report. Project 2000-FS-1-M1 Ecological assessment of lakes pilot study to establish monitoring methodologies EU (WFD)
Author :	Free, G.; Little, R.; Tierney, D.; Donnelly, K.; Coroni, R.
Series :	Environmental Protection Agency, Wexford

Year :	2009
Title :	Water Quality in Ireland 2007-2008. Key Indicators of the Aquatic Environment
Author :	Lucey, J.
Series :	Environmental Protection Agency, Wexford
Year :	2010
Title :	Otter tracking study of Roaringwater Bay
Author :	De Jongh, A.; O'Neill, L.
Series :	Unpublished draft report to NPWS
Year :	2010
Title :	Water Quality in Ireland 2007-2009
Author :	McGarrigle, M.; Lucey, J.; Ó Cinnéide, M.
Series :	Environmental Protection Agency, Wexford
Year :	2015
Title :	Water Quality in Ireland 2010-2012
Author :	Bradley, C.; Byrne, C.; Craig, M.; Free, G.; Gallagher, T.; Kennedy, B.; Little, R.; Lucey, J.; Mannix, A.; McCreesh, P.; McDermott, G.; McGarrigle, M.; Ní Longphuirt, S.; O'Boyle, S.; Plant, C.; Tierney, D.; Trodd, W.; Webster, P.; Wilkes, R.; Wynne, C.
Series :	Environmental Protection Agency, Wexford
Year :	2016
Title :	Irish Vegetation Classification: Technical Progress Report No. 2
Author :	Perrin, P.
Series :	Report submitted to National Biodiversity Data Centre

Spatial data sources

Year :	2008
Title :	OSi 1:5000 IG vector dataset
GIS Operations :	WaterPolygons feature class clipped to the SAC boundary. Expert opinion used to identify Annex I habitat and to resolve any issues arising
Used For :	3150 (map 3)
Year :	Revision 2010
Title :	National Survey of Native Woodlands 2003-2008. Version 1
GIS Operations :	QIs selected; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	91D0 (map 4)
Year :	2018
Title :	Woodland Monitoring Survey 2017-2018
GIS Operations :	QIs selected; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	91D0 (map 4)

3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation

To restore the favourable conservation condition of Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation in Lough Oughter and Associated Loughs SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Little is known about the characteristics or ecology of lake habitat 3150 in Ireland. It is associated with base-rich lakes, with circumneutral or higher pH, in low-lying, large, naturally more productive catchments, and is characterised by high abundance and diversity of pondweeds (*Potamogeton* spp.) and mesotrophic values for total phosphorus and chlorophyll. It is considered likely to occur in Lough Oughter and the *circa* 90 other inter-drumlin lakes in Lough Oughter and Associated Loughs SAC (see map 3). Two measures of extent can be used: 1. the area of the lake itself and; 2. the extent of the vegetation communities/zones that typify the habitat. Further information relating to all attributes is provided in the lake habitats supporting document for the purposes of site-specific conservation objectives and Article 17 reporting (O Connor, 2015)
Habitat distribution	Occurrence	Restore, subject to natural processes	As noted above, habitat 3150 is considered to occur in many or all of the lakes in this SAC (see map 3). Eutrophication has increased the trophic status of these lakes, however. Lough Oughter is known to be impacted by nutrients/organic matter since the 1970s (Flanagan and Toner, 1975; Lucey, 2009; McGarrigle et al., 2010; Bradley et al., 2015). It is likely, therefore, that the habitat is in unfavourable condition, or has been lost, in impacted lakes. Furthermore, it is possible that at least some of the lakes naturally contained a less productive habitat, such as Annex I habitats 3140 (Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.) or 3130 (Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea)
Vegetation composition: typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution	For lists of typical plant species, see the Article 17 habitat assessments for 3150 (NPWS, 2013, 2019) and O Connor (2015). The aquatic flora of the SAC is varied with several pondweeds such as *Potamogeton obtusifolius, P. lucens, P. natans, P. alpinus* and *P. gramineus. Nuphar lutea, Hippuris vulgaris, Myriophyllum spicatum, Veronica beccabunga* and *Callitriche* sp. are common. Duckweed species also occur. Heuff (1984) reports on a 1977 survey of Round Lough, which was fringed with *Phragmites australis* and *Schoenoplectus lacustris* and had abundant *Lemna trisulca, Elodea canadensis* and *Stratiotes aloides. Chara rudis, Nuphar lutea, Littorella uniflora* and *Cladophora* also occurred. The macrophytes in some of the lakes in the SAC, including Annagh, Ardan, Bawn, Corglass, Cullinaghan, Derrybrick, Farnharn, Mill and Oughter, are monitored on a three-year cycle by the Environmental Protection Agency (EPA)
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition	Further work is necessary to describe the characteristic zonation and other spatial patterns in lake habitat 3150 (see O Connor, 2015)

Vegetation distribution: maximum depth	Metres	Maintain maximum depth of vegetation, subject to natural processes	The maximum depth of vegetation is likely to be specific to the lake shoreline in question. Further work is necessary to develop indicative targets for lake habitat 3150. The maximum depth of vegetation in Round Lough was 5m in 1977 (Heuff, 1984). Maximum vegetation depth is likely to have declined in lakes in the SAC as a result of eutrophication
Hydrological regime: water level fluctuations	Metres	Maintain appropriate hydrological regime necessary to support the habitat	Fluctuations in lake water level are typical in Ireland, but can be amplified by activities such as abstraction and drainage. Increased water level fluctuations can increase wave action, up-root vegetation, increase turbidity, alter the substratum and lead to release of nutrients from the sediment. The hydrological regime must be maintained so that the area, distribution and depth of the lake habitat and its constituent/characteristic vegetation zones and communities are not reduced
Lake substratum quality	Various	Maintain appropriate substratum type, extent and chemistry to support the vegetation	Research is required to further characterise the substratum types (particle size and origin) and substratum quality (notably pH, calcium, iron and nutrient concentrations) favoured by each of the five Annex I lake habitats in Ireland. It is likely that soft muddy substrata dominate habitat 3150. Substratum particle size is likely to vary with depth and along the shoreline within a single lake. Heuff (1984) noted a substratum of soft, black mud at Round Lough
Transparency	Metres	Maintain/restore appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	Transparency relates to light penetration and, hence, to the depth of colonisation of vegetation. It can be affected by phytoplankton blooms, water colour and turbidity. Specific targets have yet to be established for lake habitat 3150 (O Connor, 2015). Habitat 3150 is associated with lower transparency than the other lake habitats. The OECD fixed boundary system set transparency targets for mesotrophic lakes of 6-3m annual mean Secchi disk depth, and 3-1.5m annual minimum Secchi disk depth. Heuff (1984) noted transparency of 4m at Round Lough in 1977. Eutrophication is likely to have led to reduced transparency in lakes in the SAC
Nutrients	µg/l P; mg/l N	Restore the concentration of nutrients in the water column to sufficiently low levels to support the habitat and its typical species	As a relatively productive habitat, mesotrophic and Water Framework Directive (WFD) 'good' status targets apply. Where a lake has nutrient concentrations that are lower than these targets, there should be no decline within class, i.e. no upward trend in nutrient concentrations. For lake habitat 3150, annual average total phosphorus (TP) concentration should be ≤25µg/l TP, average annual total ammonia concentration should be ≤0.065mg/l N and annual 95th percentile for total ammonia should be ≤0.140mg/l N. See also The European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2019. The WFD monitoring lakes in the SAC include Annagh, Ardan, Bawn, Corglass, Cullinaghan, Derrybrick, Farnharn, Mill and Oughter
Phytoplankton biomass	µg/l chlorophyll *a*	Restore appropriate water quality to support the habitat, including good chlorophyll *a* status	Mesotrophic and WFD 'good' status targets apply to habitat 3150. Where a lake has a chlorophyll *a* concentration that is lower than this target, there should be no decline within class, i.e. no upward trend in phytoplankton biomass. The average growing season (March-October) chlorophyll *a* concentration should be <10µg/l. The annual average chlorophyll *a* concentration should be 2.5-8.0µg/l and the annual peak chlorophyll *a* concentration should be 8.0-25.0µg/l (OECD, 1982). See also The European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2019

Phytoplankton composition	EPA phytoplankton composition metric	Restore appropriate water quality to support the habitat, including good phytoplankton composition status	The EPA has developed a phytoplankton composition metric for nutrient enrichment of Irish lakes. As for other water quality indicators, habitat 3150 requires WFD good status
Attached algal biomass	Algal cover	Maintain/restore trace/absent attached algal biomass (<5% cover)	Nutrient enrichment can favour epiphytic and epipelic algae that can out-compete the submerged vegetation. The cover abundance of attached algae in habitat 3150 should, ideally therefore, be trace/absent (<5% cover). Heuff (1984) noted *Cladophora* and other filamentous algae at Round Lake in 1977
Water quality: macrophyte status	EPA macrophyte metric (The Free Index)	Restore good macrophyte status	Nutrient enrichment can favour more competitive submerged macrophyte species that out-compete the typical and characteristic species for the lake habitat. The EPA monitors macrophyte status for Water Framework Directive purposes using the 'Free Index'. The target for lake habitat 3150 is good status or an Ecological Quality Ratio (EQR) for lake macrophytes of ≥0.68, as defined in Schedule Five of The European Communities Environmental Objectives (Surface Waters) Regulations 2009 and the amendment Regulations (Statutory Instrument 77 of 2019). Most lakes monitored in the SAC have less than good macrophyte status
Acidification status	pH units, mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes	The specific requirements of habitat 3150, in terms of water and sediment pH, alkalinity and cation concentration, have not been fully determined. Acidification is not considered a threat to habitat 3150; however, eutrophication can lead to at least temporary increases in pH to toxic levels (>9/9.5 pH units). Maximum pH should be <9.0 pH units. See The European Communities Environmental Objectives (Surface Water Objectives) Regulations 2009 and The European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2019
Water colour	mg/l PtCo	Maintain/restore appropriate water colour to support the habitat	Increased water colour and turbidity decrease light penetration and can reduce the area of available habitat for lake macrophytes, particularly at the lower euphotic depths. The primary source of increased water colour in Ireland is disturbance to peatland. No habitat-specific or national standards for water colour currently exist. Studies have shown median colour concentrations in Irish lakes of 38mg/l PtCo (Free et al., 2000) and 33mg/l PtCo (Free et al., 2006). It is likely that the water colour in all Irish lake habitats would naturally be <50mg/l PtCo
Dissolved organic carbon (DOC)	mg/l	Maintain/restore appropriate organic carbon levels to support the habitat	Dissolved (and particulate) organic carbon (OC) in the water column is linked to water colour and acidification (organic acids). Increasing DOC in water has been documented across the Northern Hemisphere, including afforested peatland catchments in Ireland. Damage and degradation of peatland, leading to decomposition of peat is likely to be the predominant source of OC in Ireland. OC in water promotes decomposition by fungi and bacteria that, in turn, releases dissolved nutrients. The increased biomass of decomposers can also impact directly on the characteristic lake communities through shading, competition, etc.

Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate units	Maintain/restore appropriate turbidity to support the habitat	Turbidity can significantly affect the quantity and quality of light reaching rooted and attached vegetation and can, therefore, impact on lake habitats. The settlement of higher loads of inorganic or organic material on lake vegetation communities may also have impacts on sensitive, delicate species. Turbidity can increase as a result of re-suspension of material within the lake, higher loads entering the lake, or eutrophication. Turbidity measurement and interpretation is challenging. As a result, it is likely to be difficult to set habitat-specific targets for turbidity in lakes
Fringing habitat: area and condition	Hectares	Maintain/restore the area and condition of fringing habitats necessary to support the natural structure and functioning of lake habitat 3150	3150 lakes typically have well-developed reedswamp, fen and/or marsh communities along their shoreline and would, historically have been surrounded by woodland. These fringing habitats intergrade with and support the structure and functions of the lake. Equally, fringing habitats depend on the lake, particularly its water levels, and support wetland communities and species of conservation concern. Many fringing wetland habitats support higher invertebrate and plant species richness than the lake habitats themselves. See Mainstone et al. (2016). Many lakes in the SAC have well-developed swamp, marsh and wet grassland, which include less widespread species such as *Eleocharis acicularis, Epipactis palustris, Rumex hydrolapathum, Sium latifolium, Cicuta virosa, Carex elata, Stratiotes aloides, Sagittaria sagittifolia, Butomus umbellatus* and *Ranunculus lingua*. Wet and dry deciduous woodland has re-established behind the reedbeds, with willows, alder and downy birch common

91D0 Bog woodland*

To maintain the favourable conservation condition of Bog woodland* in Lough Oughter and Associated Loughs SAC, which is defined by the following list of attributes and targets:

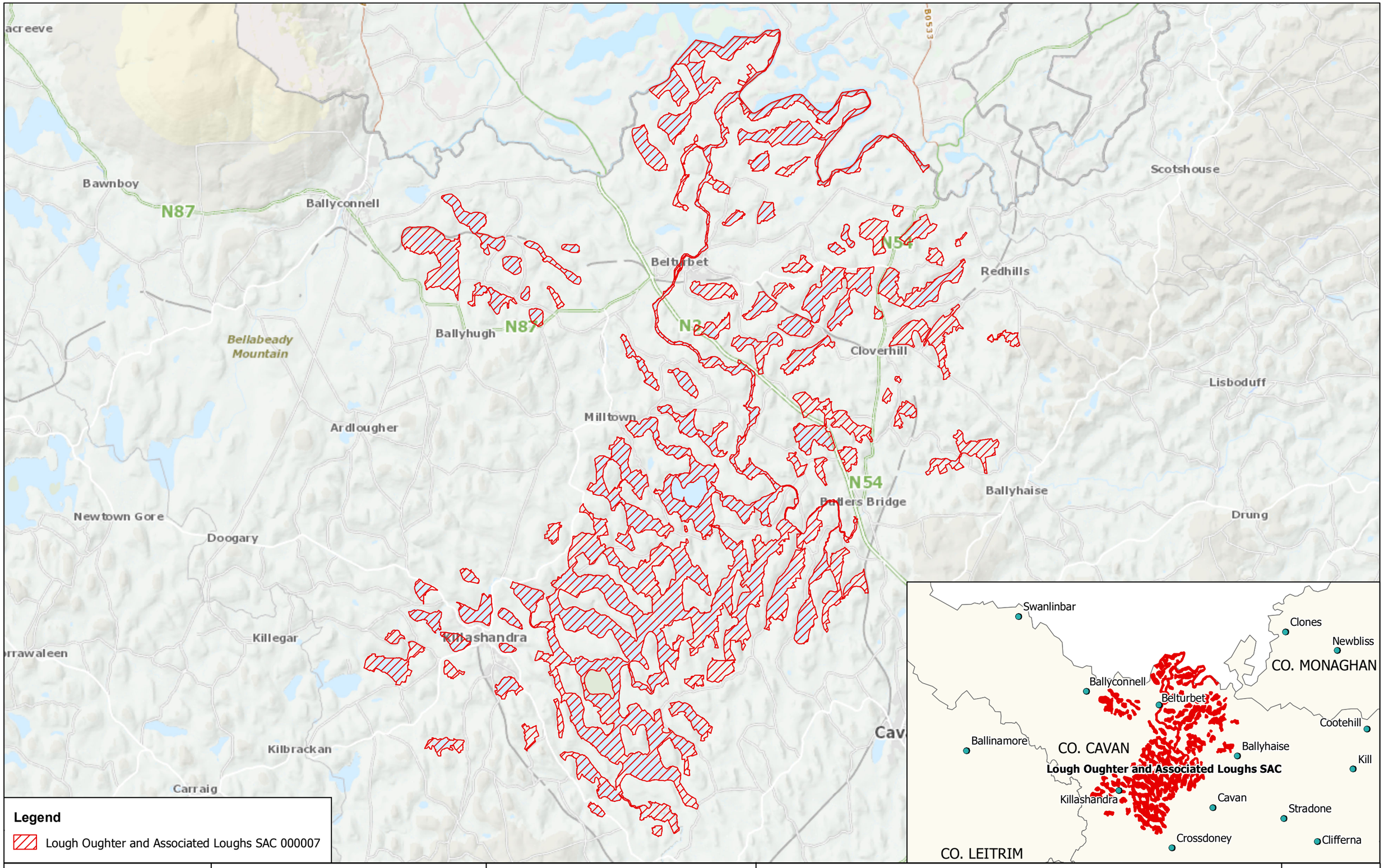
Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Bog woodland is present within Lough Oughter and Associated Loughs SAC. As part of the National Survey of Native Woodlands (NSNW), the sub-site Annagh Wood West (NSNW site code 465) was surveyed by Perrin et al. (2008). Annagh (code 465) was also included in a national monitoring survey (Cross and Lynn, 2013; Daly et al., in prep.). Map 4 shows the minimum area of bog woodland within the SAC, which is estimated to be 2.77ha (Daly et al., in prep.). However, Nairn and Duff (1999) recorded 108ha of birch woodland on peat within the SAC, terming this "potential bog woodland", which suggests that further areas of 91D0 habitat are likely to be present within the SAC
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 4 for the habitat extent recorded by Daly et al. (in prep.)	Distribution based on Daly et al. (in prep.). It is important to note that further areas of the habitat are likely to be present within the SAC
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	The target areas for individual woodlands aim to reduce habitat fragmentation and benefit those species requiring 'deep' woodland conditions (Peterken, 2002). The artificial expansion of new bog woodland is likely to be difficult, although creation of the right hydrological conditions may shift vegetation in the direction of bog woodland. As part of a LIFE Project (LIFE05 NAT/IRL/000182), felling of adjacent conifers at Annagh has resulted in bog woodland developing in the former plantation (Cross and Lynn, 2013)
Woodland structure: canopy cover and height	Percentage cover; metres	Total canopy cover at least 30%; downy birch (*Betula pubescens*) comprises at least 50% of canopy cover; median canopy height at least 4m	Attribute and target based on Daly et al. (in prep.) and Cross and Lynn (2013)
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008). See also the Irish Vegetation Classification (Perrin, 2016; www.biodiversityireland.ie/projects/ivc-classification-explorer)
Woodland structure: tree size classes	Occurrence	Downy birch (*Betula pubescens*) present in each tree size class	Attribute and target based on Daly et al. (in prep.) and Cross and Lynn (2013). The presence of all size classes indicates that a woodland has good structural diversity with trees of varying ages
Woodland structure: regeneration	Occurrence	At least one downy birch (*Betula pubescens*) sapling of at least 1m tall present within each monitoring stop	Attribute and target based on Daly et al. (in prep.) and Cross and Lynn (2013)
Woodland structure: senescent and dead wood	Occurrence	Senescent or dead wood present	Mature and veteran trees and dead wood are important for bryophytes, lichens, saproxylic organisms and some bird species. Their retention within a woodland is important to ensure continuity of habitats/niches and propagule sources. However, as downy birch trees seldom exceed 30cm in diameter in this habitat and fallen dead wood rots quickly and is engulfed by bog mosses, dead wood may be less frequent in bog woodland than in other woodland types (Cross and Lynn, 2013)

Woodland structure: indicators of local distinctiveness	Occurrence; population size	No decline in distribution and, in the case of red listed and other rare or localised species, poulation size	Includes ancient or long-established woodlands (see Perrin and Daly, 2010), archaeological and geological features as well as red listed and other rare or localised species
Woodland structure: indicators of overgrazing	Occurrence	All four indicators of overgrazing absent	There are four indicators of overgrazing within 91D0*: topiary effect on shrubs and young trees, browse line on mature trees, abundant dung, and severe recent bark stripping (Daly et al., in prep.)
Woodland structure: dwarf shrub cover	Percentage cover at a representative number of monitoring stops	Native dwarf shrub layer cover less than 50%; ling (*Calluna vulgaris*) cover less than 40%	Attribute and target based on Daly et al. (in prep.) and Cross and Lynn (2013)
Woodland structure: bryophyte cover	Percentage cover at a representative number of monitoring stops	Bryophyte cover at least 50%; bog moss (*Sphagnum* spp.) cover at least 25%	Attribute and target based on Daly et al. (in prep.) and Cross and Lynn (2013)
Vegetation composition: positive indicator species	Occurrence within monitoring stops	Downy birch (*Betula pubescens*), bog moss (*Sphagnum* spp.) and at least five other positive indicator species present	Bog woodland is typically species-poor but with a characteristic and distinctive flora. Positive indicator species for 91D0* are listed in Daly et al. (in prep.) and Cross and Lynn (2013)
Vegetation composition: negative indicator species	Percentage cover within monitoring stops	Both native and non-native invasive species absent or under control. Total cover should be less than 10%	Negative indicator species include bracken (*Pteridium aquilinum*), bramble (*Rubus fruticosus* agg.) and any non-native species, including herbaceous species. In general, Rhododendron (*Rhododendron ponticum*) and non-native conifers are the most common non-native species in bog woodland (Daly et al., in prep.). As part of a LIFE Project (LIFE05 NAT/IRL/000182), clearance of adjacent non-native conifers at Annagh c. 2008 had a positive impact on the 91D0* habitat by increasing light levels and providing potential for expansion (Cross and Lynn, 2013)

1355 Otter *Lutra lutra*

To maintain the favourable conservation condition of Otter (*Lutra lutra*) in Lough Oughter and Associated Loughs SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Percentage positive survey sites	No significant decline	Measure based on standard otter survey technique. Favourable Conservation Status (FCS) target, based on 1980/81 survey findings, is 88% in SACs. Current range is estimated at 93.6% (Reid et al., 2013)
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 364.4ha along river banks/ lake shoreline/around ponds	No field survey. Areas mapped to include 10m terrestrial buffer, identified as critical for otters (NPWS, 2007), along rivers and around water bodies
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 71.3km	No field survey. River length calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman and Chapman, 1982)
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 1,730.6ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (NPWS, 2007)
Couching sites and holts	Number	No significant decline	Otters need lying up areas throughout their territory where they are secure from disturbance (Kruuk and Moorhouse, 1991; Kruuk, 2006)
Fish biomass available	Kilograms	No significant decline	Broad diet that varies locally and seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater (Bailey and Rochford, 2006; Reid et al., 2013)
Barriers to connectivity	Number	No significant increase	Otters will regularly commute across stretches of open water up to 500m e.g. between the mainland and an island; between two islands; across an estuary (De Jongh and O'Neill, 2010). It is important that such commuting routes are not obstructed



An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage

MAP 1:
LOUGH OUGHTER AND ASSOCIATED LOUGHS SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

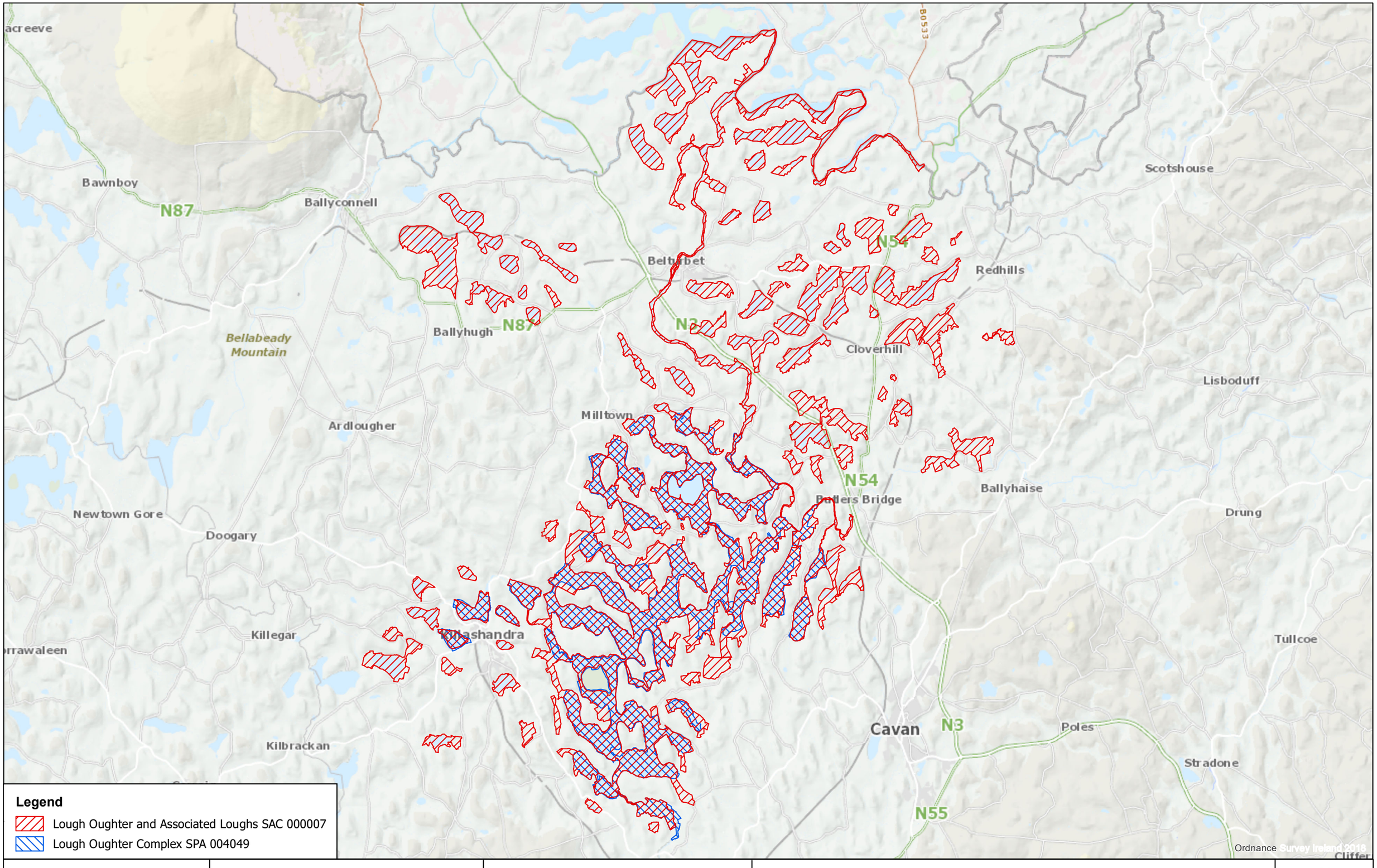
Map to be read in conjunction with the NPWS Conservation Objections Document

SITE CODE:
SAC 000007; version 3.01. CO. CAVAN

0 1 2 4 Kilometres

N

Date: December 2020



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Department of Housing, Local Government and Heritage

MAP 2:
LOUGH OUGHTER AND ASSOCIATED LOUGHS SAC
CONSERVATION OBJECTIVES
OVERLAPPING SITE

Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SAC 000007; version 3.01. CO. CAVAN

0 1 2 4 Kilometres

N

Date: December 2020

Legend

- 3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation
- Lough Oughter and Associated Loughs SAC 000007
- OSi Discovery Series County Boundary

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage

MAP 3:
LOUGH OUGHTER AND ASSOCIATED LOUGHS SAC
CONSERVATION OBJECTIVES
INDICATIVE LAKE HABITATS

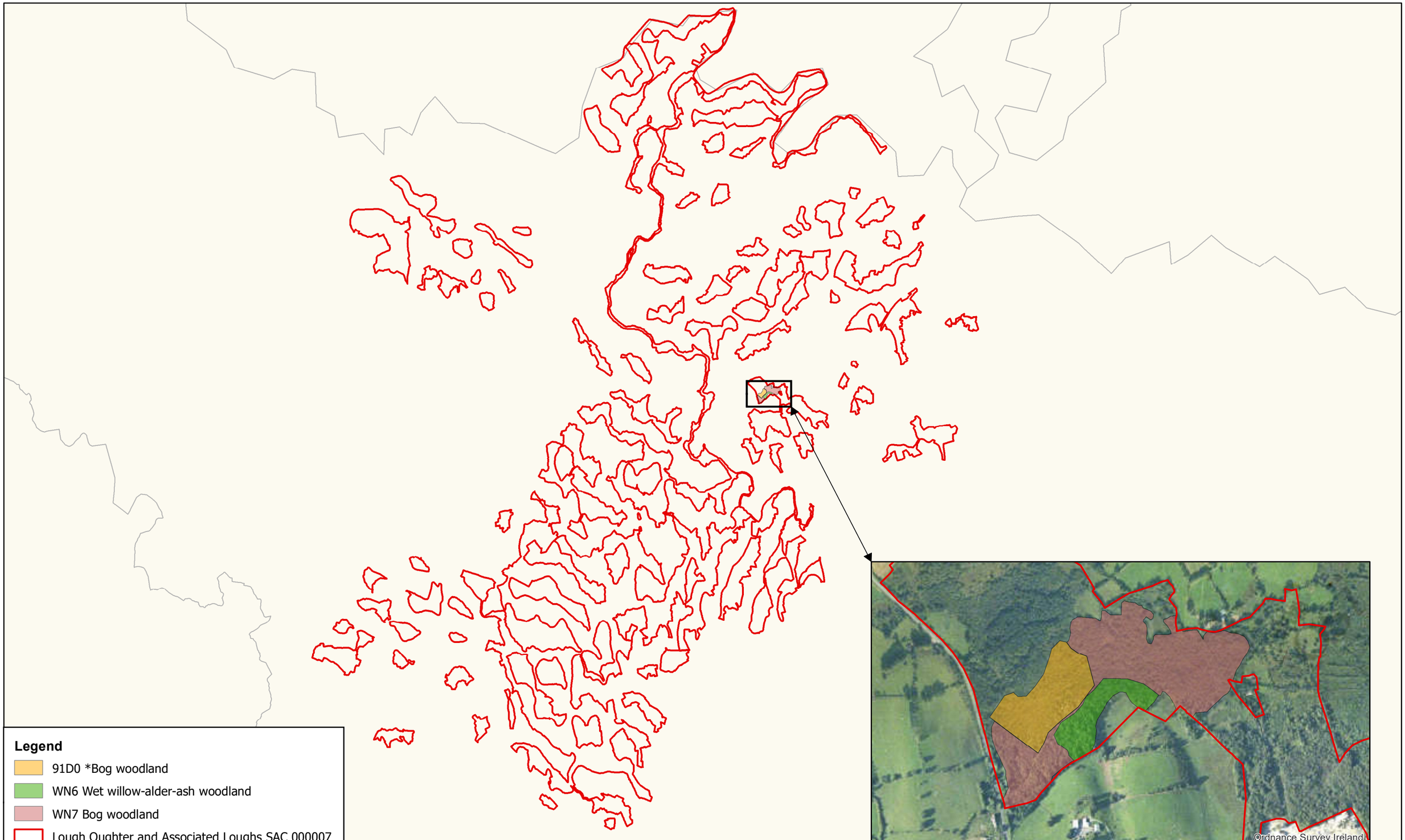
Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SAC 000007; version 3.01. CO. CAVAN

0 1 2 4 Kilometres

N

Date: January 2021



Legend

- 91D0 *Bog woodland
- WN6 Wet willow-alder-ash woodland
- WN7 Bog woodland
- Lough Oughter and Associated Loughs SAC 000007
- OSi Discovery Series County Boundary

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MAP 4:
LOUGH OUGHTER AND ASSOCIATED LOUGHS SAC
CONSERVATION OBJECTIVES
WOODLAND HABITATS

Map to be read in conjunction with the NPWS Conservation Objectives Document

SITE CODE:
SAC 000007; version 3.01. CO. CAVAN

0 1 2 4 Kilometres

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Date: January 2021