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Conservation Objectives Series

Clara Bog SAC 000572

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Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

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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***

000572	Clara Bog SAC
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)
7110	Active raised bogs*
7120	Degraded raised bogs still capable of natural regeneration
7150	Depressions on peat substrates of the Rhynchosporion
91D0	Bog woodland*

Supporting documents, relevant reports & publications

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

NPWS Documents

Year :	2007
Title :	Grasslands monitoring project 2006. Volume I. Project report
Author :	Dwyer, R; Crowley, W; Wilson, F.
Series :	Unpublished report to NPWS
Year :	2009
Title :	Clara Bog high bog survey
Author :	Fernandez Valverde, F.; Wilson, S.
Series :	Unpublished report to NPWS
Year :	2013
Title :	Irish semi-natural grasslands survey 2007-2012
Author :	O'Neill, F.H.; Martin, J.R.; Devaney, F.M.; Perrin, P.M.
Series :	Irish Wildlife Manual No. 78
Year :	2013
Title :	Results of a monitoring survey of bog woodland
Author :	Cross, J.; Lynn, D.
Series :	Irish Wildlife Manual No. 69
Year :	2014
Title :	National raised bog SAC management plan
Author :	Department of Arts, Heritage and the Gaeltacht
Series :	Draft for consultation. 15 January 2014
Year :	2016
Title :	Clara Bog SAC (site code: 572) Conservation objectives supporting document- raised bog habitats V1
Author :	NPWS
Series :	Conservation objectives supporting document

Other References

Year :	2011
Title :	Review and revision of empirical critical loads and dose-response relationships. Proceedings of an expert workshop, Noordwijkerhout, 23-25 June 2010
Author :	Bobbink, R.; Hettelingh, J.P.
Series :	RIVM report 680359002, Coordination Centre for Effects, National Institute for Public Health and the Environment (RIVM)
Year :	2014
Title :	Nitrogen deposition and exceedance of critical loads for nutrient nitrogen in Irish grasslands
Author :	Henry, J.; Aherne, J.
Series :	Science of the Total Environment 470–471: 216–223

Spatial data sources

Year :	2006
Title :	Grassland Monitoring Project 2006
GIS Operations :	Dataset clipped to the SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	6210 (map 2)
Year :	2014
Title :	Scientific Basis for Raised Bog Conservation in Ireland
GIS Operations :	RBSB13_SACs_ARB_DRB dataset, RBSB13_SACs_2012_HB dataset, RBSB13_SACs_DrainagePatterns_5k dataset and RBSB13_SAC_LIDAR_DTMs dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	Potential 7110; digital elevation model; drainage patterns (maps 3 and 5)
Year :	2009
Title :	Clara Bog High Bog Ecological Survey
GIS Operations :	Ecotopes from Clara_2009_map dataset exported to RBMA13_habitats_2007_13_othersources.shp. Dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	7110 ecotopes; 91D0 (map 4)

6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)

To restore the favourable conservation condition of Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) in Clara Bog 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	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco- Brometalia) often occurs in close association with other grassland habitats. Two small areas (1.36ha in total) of this Annex I habitat were identified by Dwyer et al. (2007). NB other areas may be present in the SAC
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 3 for known distribution	The habitat has been mapped at two location as small patches on the esker ridge to the north of Clara Bog. NB other areas may be present in the SAC
Vegetation composition: typical species	Number at a representative number of monitoring stops	At least seven positive indicator species present, including two "high quality" species	List of positive indicator species, including high quality species, identified by the Irish semi-natural grasslands survey (O'Neill et al., 2013). This document should be consulted for further details
Vegetation composition: negative indicator species	Percentage at a representative number of monitoring stops	Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%	List of negative indicator species identified by O'Neill et al. (2013)
Vegetation composition: non-native species	Percentage at a representative number of monitoring stops	Cover of non-native species not more than 1%	Attribute and target based on O'Neill et al. (2013)
Vegetation composition: woody species and bracken	Percentage at a representative number of monitoring stops	Cover of woody species (except certain listed species) and bracken (*Pteridium aquilinum*) not more than 5% cover	Woody species that can occur above 5% cover are juniper (*Juniperus communis*) and burnet rose (*Rosa spinosissima*). Attribute and target based on O'Neill et al. (2013). Dwyer et al. (2007) notes encroaching scrub and bracken (*Pteridium aquilinum*) at this site
Vegetation structure: broadleaf herb: grass ratio	Percentage at a representative number of monitoring stops	Broadleaf herb component of vegetation between 40 and 90%	Attribute and target based on O'Neill et al. (2013)
Vegetation structure: sward height	Percentage at a representative number of monitoring stops	At least 30% of sward between 5cm and 40cm tall	Attribute and target based on O'Neill et al. (2013)
Vegetation structure: litter	Percentage at a representative number of monitoring stops	Litter cover not more than 25%	Attribute and target based on O'Neill et al. (2013)
Physical structure: bare soil	Percentage at a representative number of monitoring stops	Not more than 10% bare soil	Attribute and target based on O'Neill et al. (2013)
Physical structure: disturbance	Square metres	Area showing signs of serious grazing or other disturbance less than 20m²	Attribute and target based on O'Neill et al. (2013)

7110 Active raised bogs

To restore the favourable conservation condition of Active raised bogs in Clara Bog SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Restore area of active raised bog to 179.7ha, subject to natural processes	Active Raised Bog (ARB) habitat was mapped at 111.5ha by Fernandez and Wilson (2009). Area of Degraded Raised Bog (DRB) on the High Bog (HB) has been modelled as 87.6ha. See map 3. However, it is estimated that only 61.3ha is potentially restorable to ARB by drain blocking. The total potential ARB on the HB is therefore estimated to be 172.8ha. Eco-hydrological assessments of the cutover estimates that an additional 6.9ha of bog forming habitats could be restored. The long term target for ARB is therefore 179.7ha. See raised bog supporting document for further details on this and following attributes
Habitat distribution	Occurrence	Restore the distribution and variability of active raised bog across the SAC. See map 4 for distribution in 2009	ARB currently occurs on both the eastern and more abundantly on the western part of Clara bog. DRB occurs on both parts of the bog, and will require restoration measures. There is also potential for ARB restoration on cutover areas of the bog (see area target above). See also the conservation objective for Bog woodland (91D0)
High bog area	Hectares	No decline in extent of high bog necessary to support the development and maintenance of active raised bog. See map 3	The area of HB within Clara Bog SAC in 2012 (latest figure available) was 436.5ha (DAHG 2014)
Hydrological regime: water levels	Metres	Restore appropriate water levels throughout the site	For ARB, mean water level needs to be near or above the surface of the bog lawns for most of the year. Seasonal fluctuations should not exceed 20cm, and should only be 10cm below the surface, except for very short periods of time. Open water is often characteristic of soak systems
Hydrological regime: flow patterns	Flow direction; slope	Restore, where possible, appropriate high bog topography, flow directions and slopes. See map 5 for current situation	ARB depends on mean water levels being near or above the surface of bog lawns for most of the year. Long and gentle slopes are the most favourable to achieve these conditions. Changes to flow directions due to subsidence of bogs can radically change water regimes and cause drying out of high quality ARB areas and soak systems
Transitional areas between high bog and adjacent mineral soils (including cutover areas)	Hectares; distribution	Restore adequate transitional areas to support/protect active raised bog and the services it provides	Studies suggest that the ARB is threatened due to water loss from past drainage and peat cutting in particular along the southern margin of Clara Bog. No natural marginal habitats exist along this margin. Only remnant semi-natural margins occur elsewhere (locally along north-east and east of the bog). Eco-hydrological assessments have evaluated the potential for ARB restoration on cutover areas (see note for habitat area attribute above)
Vegetation quality: central ecotope, active flush, soaks, bog woodland	Hectares	Restore 89.9ha of central ecotope/active flush/soaks/bog woodland as appropriate	At least 50% of ARB habitat should be high quality (i.e. central ecotope/active flush/soaks/bog woodland). Target area of active raised bog for the site has been set at 179.7ha (see area target above)
Vegetation quality: micro-topographical features	Hectares	Restore adequate cover of high quality microtopographical features	High quality microtopography (hummocks, hollows and pools) is well developed in the western part of Clara Bog
Vegetation quality: bog moss (*Sphagnum*) species	Percentage cover	Restore adequate cover of bog moss (*Sphagnum*) species to ensure peat-forming capacity	Clara West has quite extensive areas of wet, central vegetation with permanent pools, typically with high bog moss cover (*Sphagnum cuspidatum* and *S. magellanicum*). Clara East has dried out more and displays more variable *Sphagnum* cover

Typical ARB species: flora	Occurrence	Restore, where appropriate, typical active raised bog flora	Typical flora species include widespread species, as well as those with more restricted distributions but typical of the habitat's subtypes or geographical range
Typical ARB species: fauna	Occurrence	Restore, where appropriate, typical active raised bog fauna	Typical fauna species include widespread species, as well as those with more restricted distributions but typical of the habitat's subtypes or geographical range
Elements of local distinctiveness	Occurrence	Maintain features of local distinctiveness, subject to natural processes	Clara Bog is noted for the presence of soak systems, a rare feature of Irish raised bogs. Two rare mosses (*Tetraplodon angustatus* and *Dicranum undulatum*) and a number of rare terrestrial invertebrates have been reported on the bog
Negative physical indicators	Percentage cover	Negative physical indicators absent or insignificant	Negative physical indicators include: bare peat, algae dominated pools and hollows, marginal cracks, tear patterns, subsidence features such as dry mineral mounds /ridges emerging or expanding and evidence of burning
Vegetation composition: native negative indicator species	Percentage cover	Native negative indicator species at insignificant levels	Native negative indicator species that suggest drying out include abundant bog asphodel (*Narthecium ossifragum*), deergrass (*Trichophorum germanicum*) and harestail cotton-grass (*Eriophorum vaginatum*) forming tussocks; abundant magellanic bog-moss (*Sphagnum magellanicum*) in pools previously dominated by *Sphagnum* species typical of very wet conditions (e.g. feathery bog-moss (*S. cuspidatum*)). Indicators of frequent burning events include abundant *Cladonia floerkeana* and high cover of carnation sedge (*Carex panicea*) (particularly in true midlands raised bogs)
Vegetation composition: non-native invasive species	Percentage cover	Non-native invasive species at insignificant levels and not more than 1% cover	The most common non-native invasive species on raised bogs include lodgepole pine (*Pinus contorta*), rhododendron (*Rhododendron ponticum*) and pitcherplant (*Sarracenia purpurea*)
Air quality: nitrogen deposition	kg N/ha/year	Air quality surrounding bog close to natural reference conditions. The total N deposition should not exceed 5kg N/ha/yr	Change in air quality can result from fertiliser drift; adjacent quarry activities; or other atmospheric inputs. The critical load range for ombrotrophic bogs has been set as between 5 and 10kg N/ha/yr (Bobbink and Hettelingh 2011). The latest N deposition figures for the area around Clara Bog suggests that the current level is approximately 14.1kg N/ha/yr (Henry and Aherne 2014)
Water quality	Hydrochemical measures	Water quality on the high bog and in transitional areas close to natural reference conditions	Water chemistry within raised bogs is influenced by atmospheric inputs (rainwater). However, within soak systems, water chemistry is influenced by other inputs such as focused flow or interaction with underlying substrates. Water chemistry in areas surrounding the high bog varies due to influences of different water types (bog water, regional groundwater and run-off from surrounding mineral lands)

7120 **Degraded raised bogs still capable of natural regeneration**

The long-term aim for Degraded raised bogs still capable of natural regeneration is that its peat-forming capability is re-established; therefore, the conservation objective for this habitat is inherently linked to that of Active raised bogs (7110) and a separate conservation objective has not been set in Clara Bog SAC

Attribute	Measure	Target	Notes

Conservation Objectives for : Clara Bog SAC [000572]

7150	Depressions on peat substrates of the Rhynchosporion

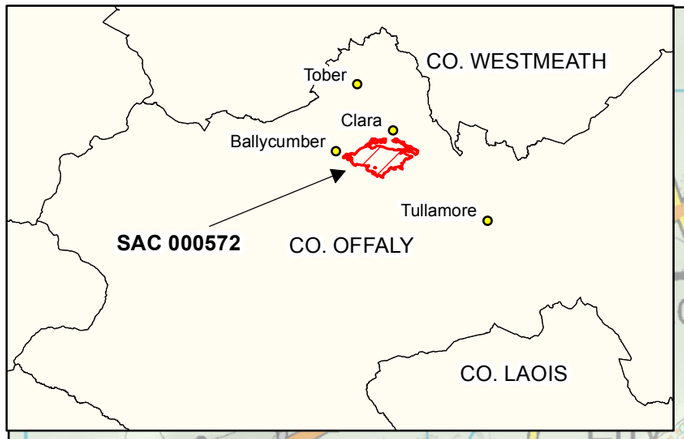
Depressions on peat substrates of the Rhynchosporion is an integral part of good quality Active raised bogs (7110) and thus a separate conservation objective has not been set for the habitat in Clara Bog SAC

Attribute	Measure	Target	Notes

91D0 Bog woodland

To maintain the favourable conservation condition of Bog woodland in Clara Bog 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. At least 1.34ha. See map 4	Bog woodland is regarded as a component of the Active Raised Bog (ARB) habitat (7110) and thus, the conservation objective and supporting document for ARB (7110) are also relevant to this habitat and common attributes have not been repeated here. The latest survey for bog woodland in Clara Bog SAC is reported in Fernandez and Wilson (2009)
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 4	Bog woodland occurs in several small stands and is associated with active flushes on the western side of Clara Bog
Vegetation composition: positive indicator species	Number in a representative number of monitoring stops	Birch (*Betula pubescens*), bog moss (*Sphagnum* species) and at least five other species present	Bog woodland is typically species-poor but with a characteristic and distinctive flora. Positive indicator species are listed in bog woodland monitoring survey (Cross and Lynn, 2013)
Vegetation composition: negative indicator species	Percentage cover at a representative number of 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*) and bramble (*Rubus fruticosus*), which can become invasive if the site begins drying out
Woodland structure: cover and height of birch	Percentage cover and metres at a representative number of monitoring stops	A minimum 30% cover of birch (*Betula pubescens*) with a median canopy height of 4m	Attribute and target based on Cross and Lynn (2013)
Woodland structure: dwarf shrub cover	Percentage cover at a representative number of monitoring stops	Dwarf shrub cover not more than 50%	Attribute and target based on Cross and Lynn (2013)
Woodland structure: ling cover	Percentage cover at a representative number of monitoring stops	Ling (*Calluna vulgaris*) cover not more than 40%	Attribute and target based on Cross and Lynn (2013)
Woodland structure: bryophyte cover	Percentage cover at a representative number of monitoring stops	Bryophyte cover at least 50%, with bog moss (*Sphagnum* spp.) cover at least 25%	Attribute and target based on Cross and Lynn (2013)
Woodland structure: tree size classes	Occurrence	Each size class present	Size classes are defined in Cross and Lynn (2013). The presence of all size classes suggests that a woodland has good structural variety with trees of varying ages
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 over time. However, as birch (*Betula pubescens*) trees seldom exceed 30cm in diameter in this habitat and dead wood rots quickly and is engulfed by bog mosses (*Sphagnum* spp.), volume of dead wood may not be as high in bog woodland as in other woodland types



Clara Bog
Portach Chlóirthi

Clashawaun
Collinstown
Kilnabinnia
Cillín
Erry
Lough Cúirt
Lough Roe
Ballina
Doory
Derries
R436
R420
LC
66MP
64MP
63MP
Br.Ht. 2.79m

Legend

Clara Bog 000572

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Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

MAP 1:
CLARA BOG SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION

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

SITE CODE:
SAC 000572; version 3. Co. Offaly

0 175 350 525 700 875 m

N

Map Version 1
Date: July 2016

Legend

- Clara Bog SAC 000572
- 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (*important orchid sites)

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MAP 2:
CLARA BOG SAC
CONSERVATION OBJECTIVES
SEMI-NATURAL GRASSLANDS

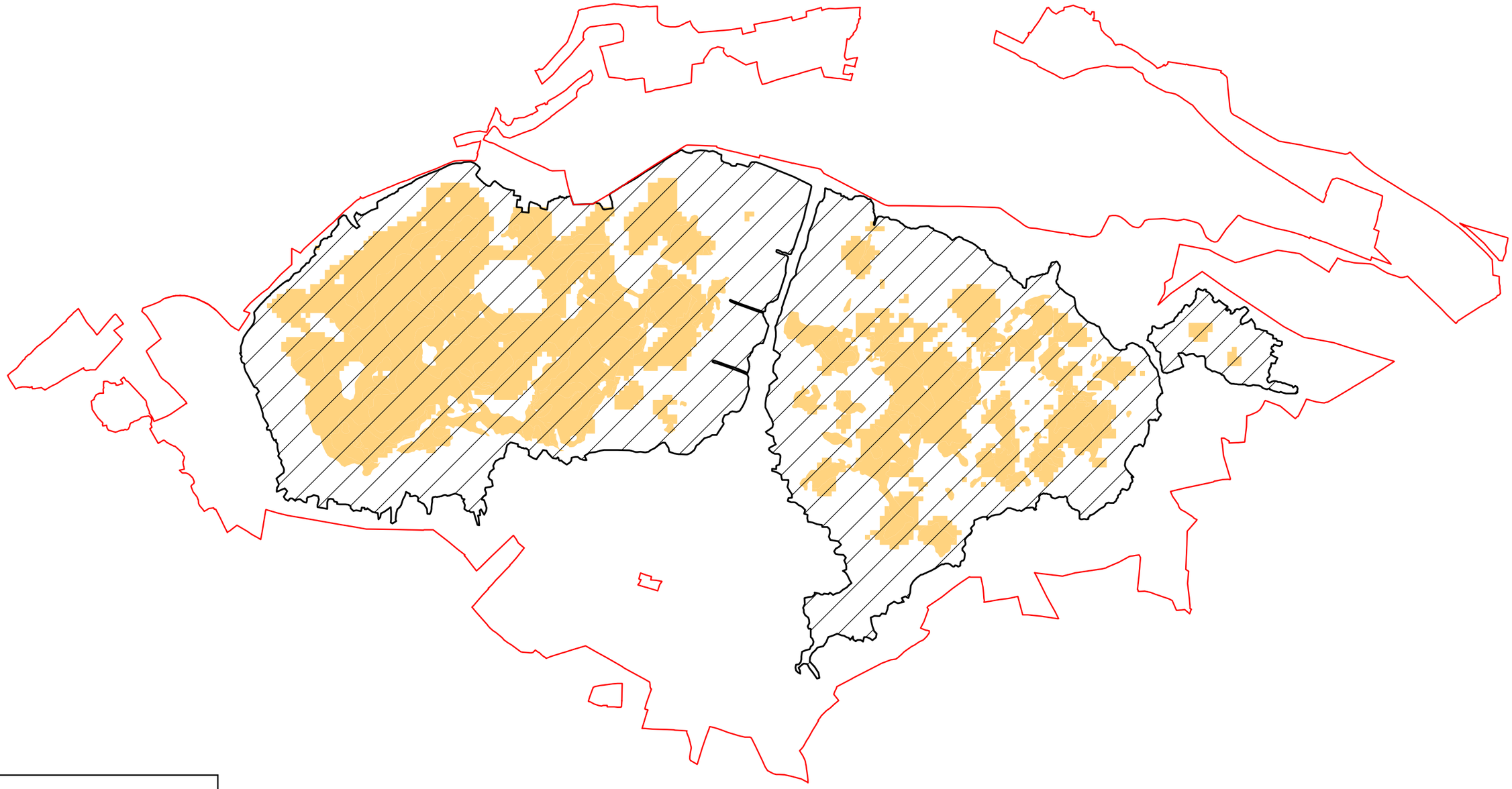
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 000572; version 3. Co. Offaly

0 280 560 840 1,120 m

N

Map Version 1
Date: July 2016



Legend

- Clara Bog SAC 000572
- High Bog Boundary
- Potential 7110 Active Raised Bog

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MAP 3:
CLARA BOG SAC
CONSERVATION OBJECTIVES
EXTENT OF POTENTIAL
ACTIVE RAISED BOGS

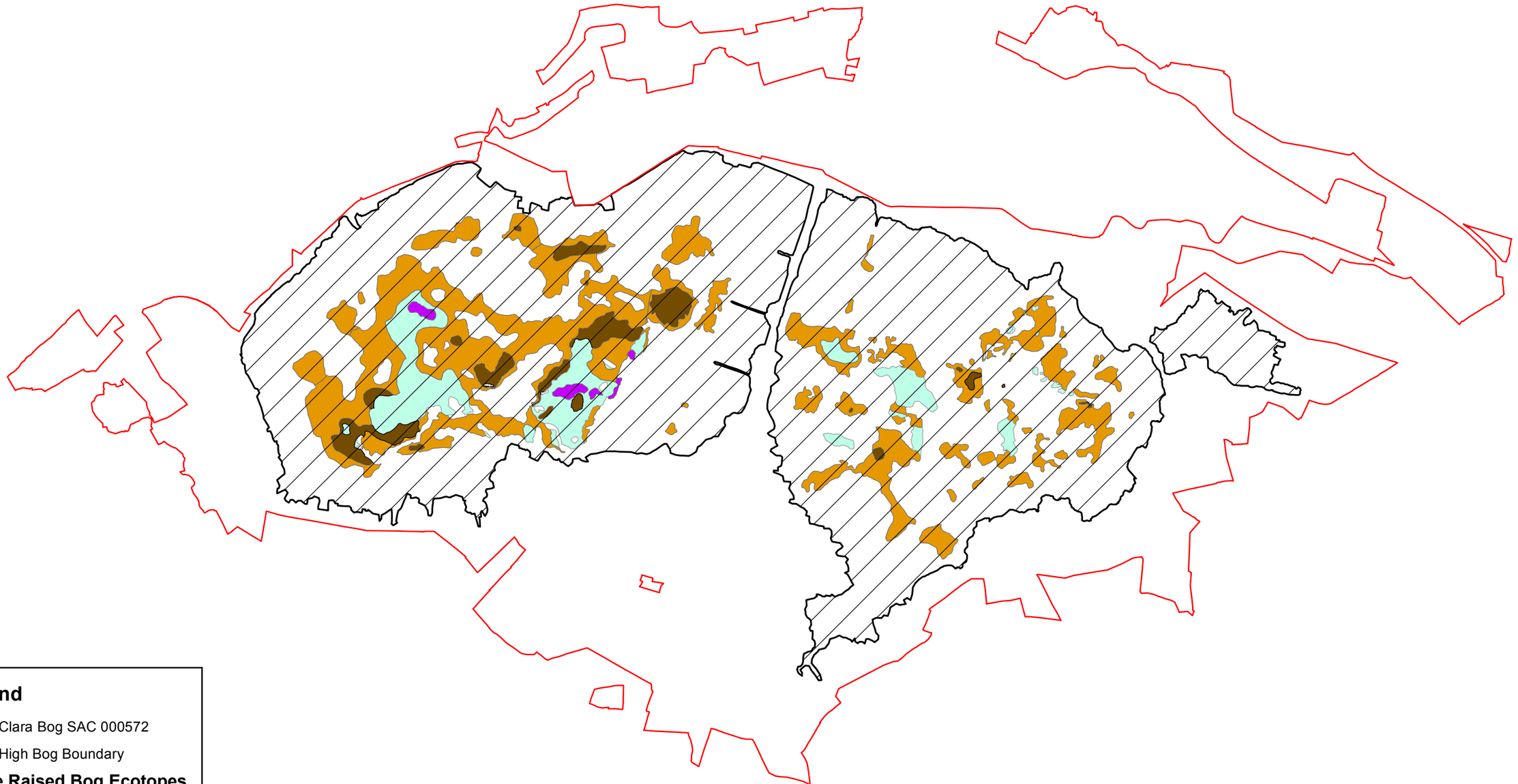
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 000572; version 3. Co. Offaly

0 250 500 750 1,000 m

N

Map Version 1
Date: July 2016



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MAP 4:
CLARA BOG SAC
CONSERVATION OBJECTIVES
ACTIVE RAISED BOGS
ECOTOPES

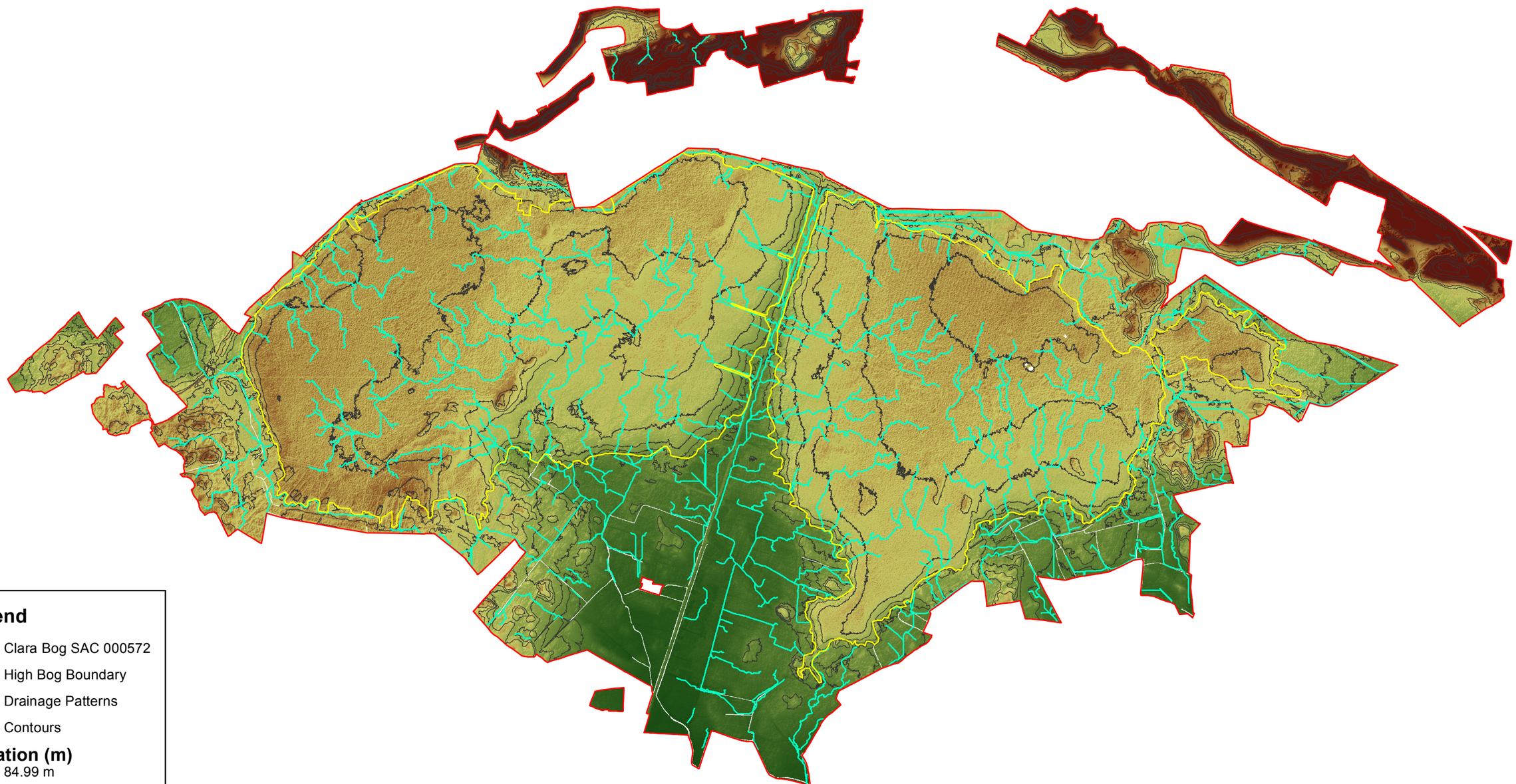
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE:
SAC 000572; version 3. Co. Offaly

0 240 480 720 960 m

N

Map Version 1
Date: July 2016



Legend

- Clara Bog SAC 000572
- High Bog Boundary
- Drainage Patterns
- Contours

Elevation (m)

84.99 m

46.69 m

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MAP 5:
CLARA BOG SAC
CONSERVATION OBJECTIVES
DIGITAL ELEVATION MODEL
& DRAINAGE PATTERNS

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

SITE CODE:
SAC 000572; version 3. Co. Offaly

0 230 460 690 920 m

N

Map Version 1
Date: July 2016