

National Parks and Wildlife Service

Conservation Objectives Series

Errit Lough SAC 000607



An Roinn
Cultúir, Oidhreachta agus Gaeltachta

Department of
Culture, Heritage and the Gaeltacht



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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*

000607	Errit Lough SAC
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3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.
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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 :	2013
Title :	A survey of the benthic macrophytes of three hard-water lakes: Lough Bunny, Lough Carra and Lough Owel
Author :	Roden, C.; Murphy, P.
Series :	Irish Wildlife Manual No. 70
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

Other References

Year :	1982
Title :	Eutrophication of waters. Monitoring assessment and control
Author :	OECD
Series :	OECD, Paris
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 :	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 :	EPA, Wexford
Year :	in prep.
Title :	Monitoring of hard-water lakes in Ireland using charophytes and other macrophytes
Author :	Roden, C.; Murphy, P.
Series :	Unpublished report to NPWS

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 :	3140 (map 2)

Conservation Objectives for : Errit Lough SAC [000607]

3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.

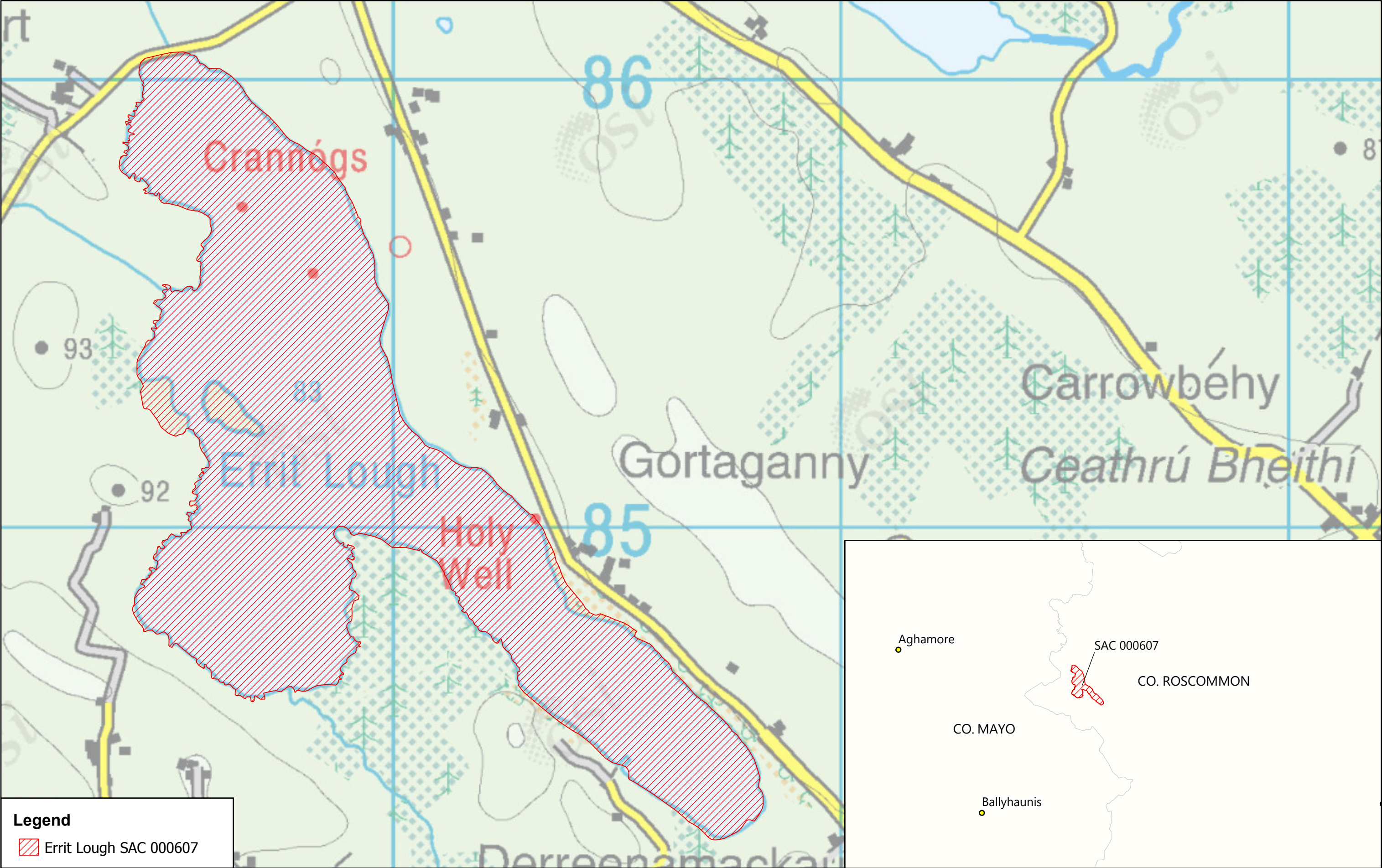
To maintain the favourable conservation condition of Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. in Errit Lough SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Errit Lough is a marl lake containing lake habitat 3140. Its vegetation was surveyed in August 1978 (Heuff, 1984) and again in 2012 (Roden and Murphy, in prep.). Two measures of extent should 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	No decline, subject to natural processes	As noted above, lake habitat 3140 occurs in Errit Lough in the SAC. See map 2
Vegetation composition: typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution	For lists of 3140 typical species (cyanobacteria, algae, higher plants and water beetles), see the Article 17 habitat assessment for lake habitat 3140 (NPWS, 2013) and the lake habitats supporting document (O Connor, 2015). Heuff (1984) includes general descriptions of the vegetation of Errit Lough and data for three relevés. <i>Chara</i> spp. dominate and vascular species include <i>Littorella uniflora</i> , <i>Nuphar lutea</i> and <i>Potamogeton perfoliatus</i> (Heuff, 1984). In 2012, Roden and Murphy (in prep.) recorded the following species in Errit Lough: <i>Chara aculeolata</i> , <i>C. contraria</i> , <i>C. curta</i> , <i>C. rudis</i> , <i>C. virgata</i> , <i>Elodea canadensis</i> , <i>Equisetum fluviatile</i> , <i>Littorella uniflora</i> , <i>Nuphar lutea</i> , <i>Potamogeton gramineus</i> , <i>P. praelongus</i> , <i>P. zizij</i> , <i>Schoenoplectus lacustris</i> and <i>Utricularia</i> sp.
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition	The characteristic zonation of 3140 is described in Roden and Murphy (2013). Heuff (1984) recorded the zonation at Errit Lough: sparse reedbeds on the sheltered south-western shore, a <i>Chara aculeolata</i> zone to 1m water depth, with <i>C. rudis</i> at the southern end of the lake, a <i>C. curta</i> -dominated zone with some <i>Littorella uniflora</i> from 1-2m, a <i>C. globularis</i> zone from 2-3m followed by a sparse band of <i>Nuphar lutea</i> , and <i>Potamogeton perfoliatus</i> at 4m. Roden and Murphy (in prep.) stated charophyte zones were not well-developed in Errit in 2012, with only <i>C. aculeolata</i> and <i>C. rudis</i> forming substantial beds and no charophytes below 3m. Krustenstein was well-developed on rocks in shallow water. <i>Littorella uniflora</i> and <i>Scorpidium</i> sp. were recorded at some shallow-water stations, rather than the typical charophytes (Roden and Murphy, in prep.). The condition of Errit may have deteriorated 1978 to 2012


Vegetation distribution: maximum depth	Metres	Maintain/restore maximum depth of vegetation, subject to natural processes	Maximum vegetation depth is expected to be deep in clear, hard water lakes, and extremely clear marl lakes can have charophyte vegetation to more than 9m (e.g. Lough Rea has charophytes to 10-11m, Coolorta >9m) (Roden and Murphy, in prep.). The indicative target of >6m for lake habitat 3140 may need to be modified based on the habitat sub-type/form and/or the specific lake in question (Roden and Murphy, 2013, in prep.). In this SAC, the maximum depth of vegetation at Errit Lough was 4m in 1978 (Heuff, 1984) and 3-3.5m in 2012 (Roden and Murphy, in prep.). The water is highly coloured in Errit Lough, and this appears to limit vegetation development in deeper water. The areas of drained peatland (for turf-cutting and conifer forest) in the catchment of Errit Lough are likely to artificially increase the lake's water colour
Hydrological regime: water level fluctuations	Metres	Maintain appropriate hydrological regime necessary to support the habitat	The hydrological regime of lakes with habitat 3140 is driven by groundwater flows. Groundwater can discharge directly to the lake, via springs or seepages, or to in-flowing rivers. 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 and turbidity, up-root vegetation, alter the substratum and lead to nutrient release from sediment. The hydrological regime, particularly the groundwater contribution, 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	The hard water lake habitat (3140) is associated with a range of base-rich substratum types, from marl and limestone bedrock, through rocks, cobbles, gravel, muds and even peat. Further research into substratum quality (notably calcium, iron and nutrient concentrations) in the hard water lake habitat would be beneficial. The exposed eastern shore of Errit Lough is stony/rocky, while much of the lake has sandy marl (Heuff, 1984). Roden and Murphy (in prep.) also recorded peat
Water quality: 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. A target of >6m has been set for hard water lakes (3140) (Roden and Murphy, in prep.). The OECD fixed boundary system set transparency targets for oligotrophic lakes of ≥ 6 m annual mean Secchi disk depth and ≥ 3 m annual minimum Secchi disk depth. Hard water lakes typically have high transparency, particularly in the very clear and typical marl forms (Roden and Murphy, in prep.). Secchi depth at Errit Lough was 2.7m in 2001 (Free et al., 2006) and 3m in 2012 (Roden and Murphy, in prep.)
Water quality: nutrients	$\mu\text{g/l P}$; mg/l N	Maintain the concentration of nutrients in the water column at sufficiently low levels to support the habitat and its typical species	Lake habitat 3140 is typically associated with high water quality, as demonstrated by naturally low dissolved nutrients. The target for Errit Lough is Water Framework Directive (WFD) High Status or oligotrophic (OECD, 1982). Annual average total phosphorus (TP) concentration should be $\leq 10\mu\text{g/l}$ TP, average annual total ammonia concentration should be $\leq 0.04\text{mg/l N}$ and annual 95th percentile for total ammonia should be $\leq 0.09\text{mg/l N}$. Where nutrient concentrations are lower than the targets, there should be no upward trend in concentrations. See also The European Communities Environmental Objectives (Surface Waters) Regulations 2009. Free et al. (2006) measured $<10\mu\text{g/l}$ TP in Errit Lough in April 2001

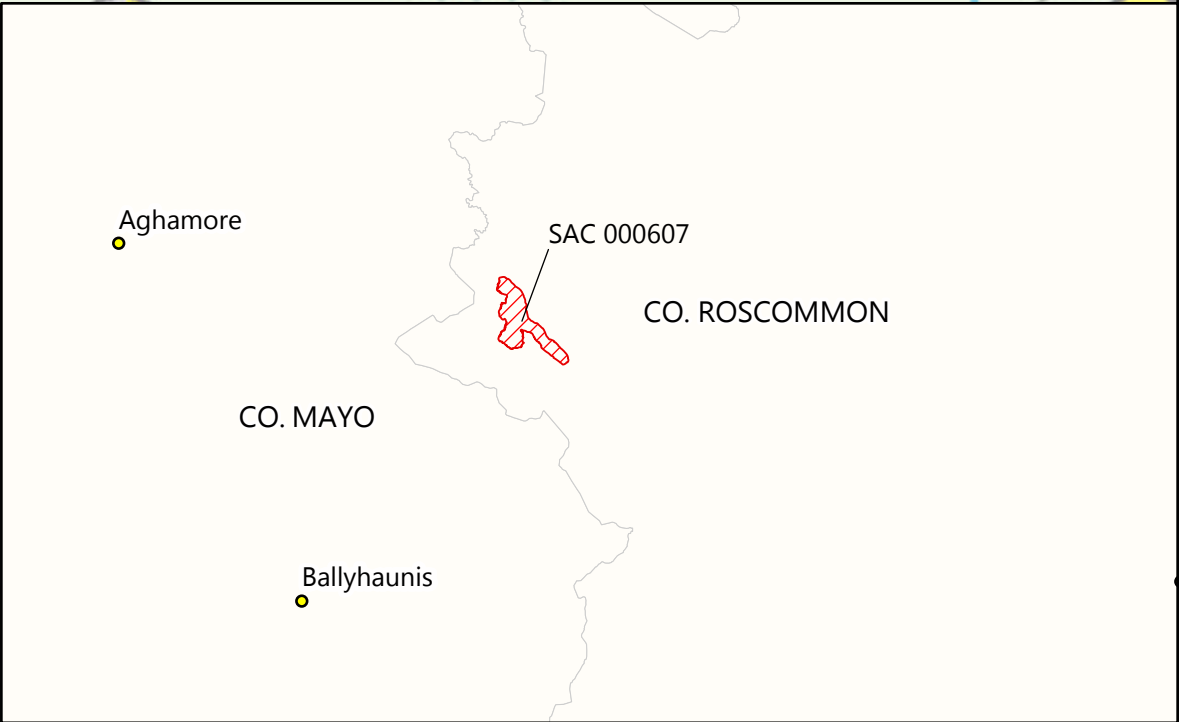
Water quality: phytoplankton biomass	µg/l Chlorophyll <i>a</i>	Maintain appropriate water quality to support the habitat, including high chlorophyll <i>a</i> status	Lake habitat 3140 is associated with high water quality, as demonstrated by naturally low algal growth. As for nutrients, the default target is WFD High Status or oligotrophic (OECD, 1982). Average growing season (March-October) chlorophyll <i>a</i> concentration must be <5.8µg/l. Annual average chlorophyll <i>a</i> concentration should be <2.5µg/l and the annual peak should be <8.0µg/l. Where chlorophyll <i>a</i> concentrations are lower than the targets, there should be no upward trend in phytoplankton biomass. See also The European Communities Environmental Objectives (Surface Waters) Regulations 2009. Free et al. (2006) measured 6.3µg/l chlorophyll <i>a</i> in Errit Lough in April 2001
Water quality: phytoplankton composition	EPA phytoplankton composition metric	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status	The Environmental Protection Agency (EPA) has developed a phytoplankton composition metric for nutrient enrichment of Irish lakes. As for other water quality indicators, the default target for lake habitat 3140 is WFD high status
Water quality: attached algal biomass	Algal cover and EPA phytobenthos metric	Maintain trace/absent attached algal biomass (<5% cover) and high phytobenthos status	Nutrient enrichment can favour epiphytic and epipelic algae that can out-compete the submerged vegetation. The cover abundance of attached algae in hard water lakes (3140) should, therefore, be trace/absent (<5% cover). EPA phytobenthos status can be used as an indicator of changes in attached algal biomass. As for other water quality indicators, the default target for lake habitat 3140 is high phytobenthos status
Water quality: macrophyte status	EPA macrophyte metric (The Free Index)	Maintain high macrophyte status	Nutrient enrichment can favour more competitive submerged macrophyte species that out-compete the typical and characteristic species for hard water lakes (3140). The EPA monitors macrophyte status for WFD purposes using the 'Free Index'. The target for lake habitat 3140 is high status or an Ecological Quality Ratio (EQR) for lake macrophytes of ≥0.90, as defined in Schedule Five of the European Communities Environmental Objectives (Surface Waters) Regulations 2009
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 lake habitat 3140, in terms of water and sediment pH, alkalinity and cation concentration, have not been fully determined. Acidification is not considered a threat to lake habitat 3140; 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, in line with the surface water standards. See Schedule Five of the European Communities Environmental Objectives (Surface Waters) Regulations 2009
Water colour	mg/l PtCo	Restore appropriate water colour to support the habitat	Increased colour decreases light penetration and reduces the area of macrophyte habitat, particularly at the lower euphotic depths. Higher colour also appears to favour angiosperms over charophytes in hard water lakes (Roden and Murphy, in prep.). The primary source of increased colour in Ireland is peatland disturbance. No habitat-specific or national standards for water colour 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). Lake habitat 3140 is typically associated with very clear waters and expected colour would be <10mg/l PtCo or, more likely, <5mg/l PtCo. Free et al. (2006) recorded colour of 46mg/l PtCo in Errit Lough and Roden and Murphy (in prep.) noted high water colour in 2012, a very shallow euphotic zone, low Secchi depth and stated peat-staining from disturbed bogland may have reduced water transparency


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. As noted above, increased water colour, low transparency and shallow vegetation zones at Errit Lough appear to be linked to peatland disturbance
Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate unit	Maintain 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 the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3140	Most lake shorelines have fringing habitats of reedswamp, other swamp, fen, marsh or wet woodland that intergrade with and support the structure and functions of the lake habitat. Equally, fringing habitats are dependent on the lake, particularly its water levels, and support wetland communities and species of conservation concern. Many of the fringing wetland habitats support higher invertebrate and plant species richness than the lake habitats themselves. Fringing fen habitats can be particularly important around hard water lakes, notably the Annex I habitats alkaline fen, <i>Cladium</i> fen and petrifying springs (habitat codes 7230, 7210 and 7220 respectively). Sparse reedbeds (<i>Schoenoplectus lacustris</i> , <i>Phragmites australis</i>) and marginal swamp (<i>Carex rostrata</i> , <i>Eleocharis palustris</i>) occur on the south-west shore of Errit Lough (Heuff, 1984). Deciduous woodland, heath and wet grassland also fringe Errit Lough



Legend

 Errit Lough SAC 000607





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**MAP 1:
ERRIT LOUGH SAC
CONSERVATION OBJECTIVES
SAC DESIGNATION**

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

**SITE CODE:
SAC 000607 ; version 3. CO. ROSCOMMON**

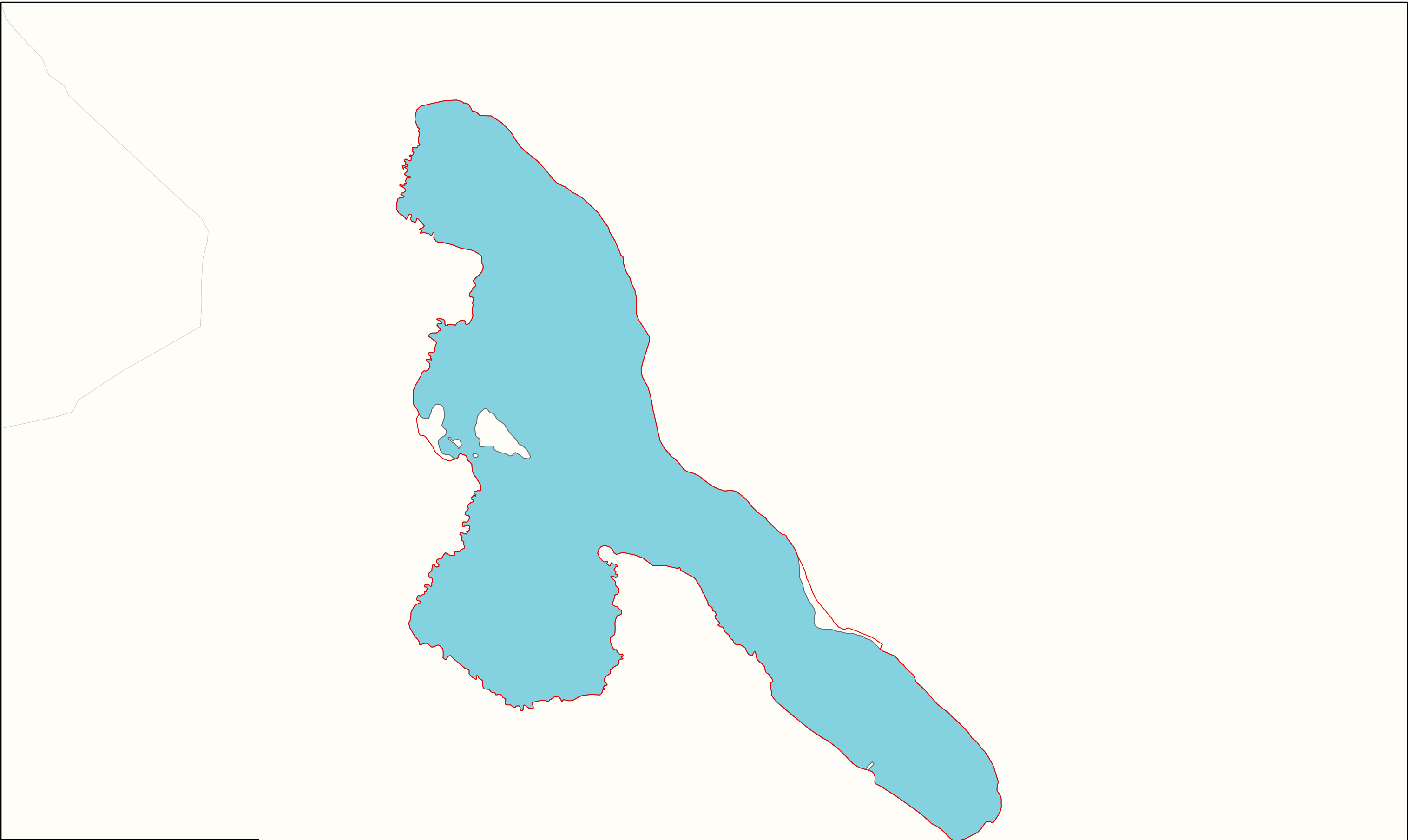
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**Map Version 1
Date: Nov 2017**



Legend

- 3140 Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.
- Errit Lough SAC 000607
- OSi Discovery Series County Boundary



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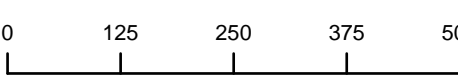
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**MAP 2:
ERRIT LOUGH SAC
CONSERVATION OBJECTIVES
INDICATIVE LAKE HABITATS**

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

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**Map Version 1
Date: Nov 2017**