



Ramsar Information Sheet

Published on 11 July 2024

Update version, previously published on : 11 June 1996

Ireland Lough Ennell



Designation date	7 June 1996
Site number	848
Coordinates	53°28'05"N 07°24'04"W
Area	1 404,00 ha

Color codes

Fields back-shaded in light blue relate to data and information required only for RIS updates.

Note that some fields concerning aspects of Part 3, the Ecological Character Description of the RIS (tinted in purple), are not expected to be completed as part of a standard RIS, but are included for completeness so as to provide the requested consistency between the RIS and the format of a 'full' Ecological Character Description, as adopted in Resolution X.15 (2008). If a Contracting Party does have information available that is relevant to these fields (for example from a national format Ecological Character Description) it may, if it wishes to, include information in these additional fields.

1 - Summary

Summary

Lough Ennell is located in the Upper Shannon River Basin; south of Mullingar in Co. Westmeath. It is a large, open, steep-sided lake. The maximum depth is 30m, though the lake is generally much shallower, with an average depth of 7m. The lake bottom is comprised of limestone with a marl deposit. The water is markedly alkaline and mesotrophic. The catchment has a complex network of rivers and streams. The main inflowing and outflowing river is the Brosna, while the Dysart stream is also a source of surface water for the lake. The lake is fringed by numerous habitats such as fens, reedbeds, freshwater marsh, calcareous grassland, woodland, cutover bog and drainage ditches. Several lake isles are covered with deciduous woodland. The lake level has been lowered several times by drainage resulting in a lakeshore, formerly part of the lake bed, that is rather dry with stony ground and colonised by calcareous grassland. Lough Ennell is of significance as a highly productive lake, it's rich variety of habitats support a specialist and diverse aquatic flora dominated by stoneworts and a variety of invertebrate species. The site is also important for wintering waterbirds, especially duck and historically Greenland White-fronted Goose.

Lough Ennell has been designated as a Special Area of Conservation (SAC) under the EU Habitats Directive, as it contains two representative and unique examples of natural wetland types within the Atlantic biogeographic region: Hard Water Lakes and Alkaline Fens. The various habitats and the shallow nature of the lake provide important resources for waterbirds and make it one of the most important midland lakes for wintering waterfowl. Lough Ennell is designated as a EU Natura 2000 site (Special Protection Area) due to important populations of migratory Pochard, Tufted Duck and Coot. The Mute Swan population at the site exceeds the international threshold for the species.

Lough Ennell is an important brown trout fishery presently supporting one of the finest stocks of wild brown trout ever noted in an Irish fishery. Lough Ennell is an important amenity area and is much used for bathing, fishing, shooting, water-sports, boating and camping.

2 - Data & location

2.1 - Formal data

2.1.1 - Name and address of the compiler of this RIS

Responsible compiler

Institution/agency	National Parks and Wildlife Service, Department of Housing, Local Government and Heritage
Postal address	National Parks and Wildlife Service, 90 North King Street, Smithfield, Dublin, Ireland D07 N7CV

National Ramsar Administrative Authority

Institution/agency	National Parks and Wildlife Service, Department of Housing, Local Government and Heritage
Postal address	National Parks and Wildlife Service, 90 North King Street, Smithfield, Dublin, Ireland D07 N7CV

2.1.2 - Period of collection of data and information used to compile the RIS

From year

To year

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)

Unofficial name (optional)

2.1.4 - Changes to the boundaries and area of the Site since its designation or earlier update

(Update) A. Changes to Site boundary Yes No

(Update) B. Changes to Site area No change to area

(Update) For secretariat only: This update is an extension

2.1.5 - Changes to the ecological character of the Site

(Update) 6b i. Has the ecological character of the Ramsar Site (including applicable Criteria) changed since the previous RIS?

2.2 - Site location

2.2.1 - Defining the Site boundaries

b) Digital map/image

<2 file(s) uploaded>

Former maps

Boundaries description

The boundary of Lough Ennell Ramsar site was delineated as the same boundary as the original Special Protection Area in 1994. This site is contained within the boundaries of both the EU Birds Directive (2009/147/EC) Special Protection Area for Lough Ennell together with the EU Habitats Directive (92/43/EEC) boundary for Lough Ennell Special Area of Conservation. The Ramsar site is smaller than the SAC which includes some adjacent wetland habitats and a large area of grassland with two inflowing streams on its western shore. Details of the SAC/SPA can be found on the NPWS website at: <https://www.npws.ie/protected-sites>.

Within the boundary a number of GIS data layers were used to define the Ramsar habitats within the site. These included:

- NPWS data (Site-Specific Conservation Objectives)
- CORINE (Co-Ordinated Information on the Environment) land cover data sets (2012).
- Bing Maps Aerial - © Harris Corp, Earthstar Geographics LLC © 2017 Intermap Earthstar Geographics SIO © 2017 Microsoft Corporation.
- Environmental Protection Agency of Ireland Rivers and Lakes layers data layers.

The mapped layers were subsequently inspected by a site visit to confirm the presence of the habitats. Habitat areas were subsequently estimated by reference to the available imagery and layers and should be considered representative but approximate.

2.2.2 - General location

a) In which large administrative region does the site lie?

b) What is the nearest town or population centre?

2.2.3 - For wetlands on national boundaries only

a) Does the wetland extend onto the territory of one or more other countries? Yes No

b) Is the site adjacent to another designated Ramsar Site on the territory of another Contracting Party? Yes No

2.2.4 - Area of the Site

Official area, in hectares (ha):

Area, in hectares (ha) as calculated from GIS boundaries

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
EU biogeographic regionalization	Atlantic

Other biogeographic regionalisation scheme

3 - Why is the Site important?

3.1 - Ramsar Criteria and their justification

Criterion 1: Representative, rare or unique natural or near-natural wetland types

Hydrological services provided

Lake and groundwater bodies are part of the Lough Ennell Ramsar site and provide many key hydrological services including flood protection (water storage during high rainfall events allowing slow downstream release) and water storage (surface and groundwater) which can buffer the effects of drought. The ability of surface and groundwaters to store water is important for many reasons including provision of drinking water, maintaining wetland habitat and it can influence local climate regulation. Lough Ennell is important for seasonal water retention for wetlands and has a major hydrological influence in the context of maintaining wetland systems within the Ramsar site. Fen habitat which is present on the lake shore has a high biodiversity of species and acts in a number of ways to regulate the environment i.e. water purification, flood prevention and carbon storage.

Other ecosystem services provided

Freshwater systems such as Lough Ennell have a key role in: the decomposition and cycling of nutrients (through aquatic plants and algae), carbon sequestration (through wetland plant communities), erosion prevention (where bankside and riparian vegetation remains in place and are important for soil retention), maintaining populations and habitats (e.g. plant communities, birds, invertebrates, mammals all associated with and reliant upon wetland habitats) and pollination (associated with wet grassland and other wetland habitats with flowering plants).

Lough Ennell provides drinking water for Mullingar town.

Other reasons

Recreation and amenity - Lough Ennell is an important brown trout fishery, according to Inland Fisheries it presently supports one of the finest stocks of wild brown trout ever noted in an Irish fishery. The lake is an important amenity area, much used for fishing, boating and camping. Sections of the shoreline are managed for visitor access and amenity, Lough Ennell is designated as an Area of High Amenity by Westmeath County Council.

Biodiversity - Lough Ennell is of significance as a highly productive lake with a wide variety of habitats that support a diverse aquatic flora and fauna. The site is designated as a EU Natura 2000 site (Scientific Area of Conservation) and is of significant conservation value because it supports good examples of habitats (hard water lakes and Alkaline fen) listed on Annex I of the E.U. Habitats Directive. The lake contains numerous islands, and is fringed by extensive wetland habitats of swamp, reedbeds, freshwater marsh and fen. Other habitats adjacent to the site include calcareous grassland, dry broad-leaved and mixed woodland, cutover bog and drainage ditches.

Criterion 2 : Rare species and threatened ecological communities

Optional text box to provide further information

Rare (high conservation concern) wintering bird species are defined as:
 Regularly occurring species (occurring in at least 3 out of 10 seasons of monitoring or 30% of seasons; based on I-Webs data from 2006/07 to 2015/16) and that are:
 - Red Listed in Ireland's national Red List (Birds of Conservation Concern in Ireland (BoCCI) published by Colhoun and Cummins (2013)
 - Classified as VU in IUCN Global and/or European regional list
 - Listed in Annex I of the European Union Birds Directive

Criterion 3 : Biological diversity

Justification

The site supports a rich and diverse macroalgal community associated with hard water lakes which have a restricted distribution in Ireland. Lough Ennell supports a community with a good diversity of charophytes, including some of the rare species of calcareous water.

Areas of Alkaline Fen and freshwater marsh also occur around the lake margins. These marginal habitats have an important role in maintaining the structure and function of the site and maintaining its biodiversity. The site forms part of a cluster of freshwater lakes in the midlands of Ireland. These sites (four of which are listed as Ramsar sites) are of importance as a source of wetland dependent species dispersing to surrounding areas as well as for their significance in maintaining the characteristic regional biodiversity of the area. Recent research (Biochange 2011) has found that small, isolated wetlands often maintain high biodiversity. These sites are equally as worthy of conservation effort as the larger, more intact systems are usually targeted for conservation action.

Lough Ennell supports the White-clawed Crayfish (*Austroptamobius pallipes*) which has been assessed as Endangered under criterion A2ce of the IUCN Red list.

Criterion 4 : Support during critical life cycle stage or in adverse conditions

Optional text box to provide further information

The site is of national importance for its wetlands and the over wintering waterbirds which it supports. The open water and associated wetland habitats are important for feeding and roosting waterbirds. These wetland habitats remain largely ice free over the winter providing a key feeding resource for wintering bird populations.

3.2 - Plant species whose presence relates to the international importance of the site

Phylum	Scientific name	Criterion 2	Criterion 3	Criterion 4	IUCN Red List	CITES Appendix I	Other status	Justification
Plantae								
CHAROPHYTA/ CHAROPHYCEAE	<i>Chara denudata</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	Irish Red List for Charaphytes	Listed as Rare in Ireland
CHAROPHYTA/ CHAROPHYCEAE	<i>Chara tomentosa</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	Irish Red List for Charaphytes	Listed as Rare in Ireland

Chara denudata, an aquatic charophyte species listed in the Charophyte Red Data Book, is reported from the site and is listed as Rare in Ireland (Nelson et al, (2019). This plant species only occurs at five sites in Co. Westmeath, is restricted to highly calcareous lakes, and is intolerant of pollution. This plant is apparently confined to deep clear water in limestone lakes. Listed as rare by Stewart and Church (1992). Outside Ireland, it is extremely rare in Europe (e.g. it is not found in Britain and has only five stations in Germany); thus the Irish populations are of European significance.

Chara tomentosa listed as rare by Stewart and Church (1992) and by Nelson et al, (2019).

3.3 - Animal species whose presence relates to the international importance of the site

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
Birds																	
CHORDATA/AVES	<i>Anas clypeata</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8	2011-2015			<input type="checkbox"/>	<input type="checkbox"/>	Red-listed in Birds of Conservation Concern in Ireland (Colhoun and Cummins 2013)	National (BoCCI) classification, part of wintering assemblage
CHORDATA/AVES	<i>Anas crecca</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18	2011-2015		LC	<input type="checkbox"/>	<input type="checkbox"/>	Amber-listed in Birds of Conservation Concern in Ireland (Colhoun and Cummins 2013)	Part of wintering assemblage, maintaining biodiversity.
CHORDATA/AVES	<i>Anas penelope</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7	2011-2015			<input type="checkbox"/>	<input type="checkbox"/>	Red-listed in Birds of Conservation Concern in Ireland (Colhoun and Cummins 2013)	National (BoCCI) classification, art of wintering assemblage.
CHORDATA/AVES	<i>Aythya ferina</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	258	2011-2015		VU	<input type="checkbox"/>	<input type="checkbox"/>	Red-listed in Birds of Conservation Concern in Ireland (Colhoun and Cummins 2013), and Vulnerable classification IUCN Global & Europe)	National (BoCCI) and IUCN classifications, part of wintering assemblage.
CHORDATA/AVES	<i>Aythya fuligula</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	449	2011-2015		LC	<input type="checkbox"/>	<input type="checkbox"/>	Red-listed in Birds of Conservation Concern in Ireland (Colhoun and Cummins 2013)	National (BoCCI) classification, part of wintering assemblage.
CHORDATA/AVES	<i>Bucephala clangula</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14	2011-2015		LC	<input type="checkbox"/>	<input type="checkbox"/>	Red-listed in Birds of Conservation Concern in Ireland (Colhoun and Cummins 2013)	National (BoCCI) classification, part of wintering assemblage.
CHORDATA/AVES	<i>Cygnus cygnus</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16	2011-2015		LC	<input type="checkbox"/>	<input type="checkbox"/>	Listed on Annex I (Birds Directive), Amber-listed in Birds of Conservation Concern in Ireland (Colhoun and Cummins 2013)	Annex I listing, and National (BoCCI) classification, part of wintering assemblage.
CHORDATA/AVES	<i>Cygnus olor</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	164	2011-2015		LC	<input type="checkbox"/>	<input type="checkbox"/>	Amber-listed in Birds of Conservation Concern in Ireland (Colhoun and Cummins 2013)	Part of wintering assemblage, maintaining biodiversity.
CHORDATA/AVES	<i>Gallinago gallinago</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	2011-2015		LC	<input type="checkbox"/>	<input type="checkbox"/>	Amber-listed in Birds of Conservation Concern in Ireland (Colhoun and Cummins 2013)	Part of wintering assemblage, maintaining biodiversity.
CHORDATA/AVES	<i>Numenius arquata</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16	2011-2015		NT	<input type="checkbox"/>	<input type="checkbox"/>	Red-listed in Birds of Conservation Concern in Ireland (Colhoun and Cummins 2013), and Vulnerable classification IUCN Europe region)	National (BoCCI) and IUCN classifications, part of wintering assemblage.
CHORDATA/AVES	<i>Phalacrocorax carbo</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	23	2011-2015		LC	<input type="checkbox"/>	<input type="checkbox"/>	Amber-listed in Birds of Conservation Concern in Ireland (Colhoun and Cummins 2013)	Part of wintering assemblage, maintaining biodiversity.
CHORDATA/AVES	<i>Pluvialis apricaria</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	720	2011-2015		LC	<input type="checkbox"/>	<input type="checkbox"/>	Listed on Annex I (Birds Directive), Red-listed in Birds of Conservation Concern in Ireland (Colhoun and Cummins 2013)	Annex I listing, and National (BoCCI) classification, part of wintering assemblage.
CHORDATA/AVES	<i>Podiceps cristatus</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	39	2011-2015		LC	<input type="checkbox"/>	<input type="checkbox"/>	Amber-listed in Birds of Conservation Concern in Ireland (Colhoun and Cummins 2013)	Part of wintering assemblage, maintaining biodiversity.
CHORDATA/AVES	<i>Tachybaptus ruficollis</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	71	2011-2015		LC	<input type="checkbox"/>	<input type="checkbox"/>	Amber-listed in Birds of Conservation Concern in Ireland (Colhoun and Cummins 2013)	Part of wintering assemblage, maintaining biodiversity.
CHORDATA/AVES	<i>Vanellus vanellus</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	472	2011-2015		NT	<input type="checkbox"/>	<input type="checkbox"/>	Red-listed in Birds of Conservation Concern in Ireland (Colhoun and Cummins 2013), and Vulnerable classification IUCN Europe region)	National (BoCCI) and IUCN classifications, part of wintering assemblage.

1) Percentage of the total biogeographic population at the site

Wintering bird species listed under 3.3 have been selected based on an assessment of Irish Wetland Bird Survey data from the period 2006/07 to 2015/16. Lough Ennell is a Special Protection Area (SPA) for birds, however not all species listed for the SPA may be listed under 3.3 (or vice versa) as the SPA designation is based on other data and criteria.

Lough Ennell is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Pochard, Tufted Duck and Coot. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

3.4 - Ecological communities whose presence relates to the international importance of the site

Name of ecological community	Community qualifies under Criterion 2?	Description	Justification
Alkaline fen community	<input checked="" type="checkbox"/>	This site is noted for being a location of the rare Fibrous Tussock Sedge (<i>Carex appropinquata</i>). This species has a disjunct distribution, being recorded only from Co. Clare and from two midland counties (Westmeath and Offaly).	Annex I (Habitats Directive)
Charophyte community	<input checked="" type="checkbox"/>	Restricted distribution in Ireland	Two species within this community are listed in the Irish Red Data book.
Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140]	<input checked="" type="checkbox"/>		Annex I (Habitats Directive)

4 - What is the Site like? (Ecological character description)

4.1 - Ecological character

The site consists of a range of interdependent freshwater and wetland habitats, which contribute to the overall ecological character of the site. The dominant feature of the site is the lake itself, which supports a diverse aquatic flora and rich variety of invertebrate species. Lough Ennell is a large, open, steep-sided lake with a bottom geology comprised of limestone with a marl deposit. The water is markedly alkaline and mesotrophic, possibly owing to effluents received from Mullingar town and to fertilizer inputs from farmland surrounding the lake. Much of the lakeshore consists of dry, stony ground colonised by calcareous grassland. These areas were formerly part of the lakebed but are now exposed as a consequence of drainage. Alkaline fen is found on the lakeshore and reed beds and species-poor swamp vegetation fringe the lake in places, particularly around the points of inflow and outflow, and on the eastern shore. Mixed woodland containing a variety of native and non-native species fringes the lakeshore to the north-west. The chemical composition of effluent from the Mullingar sewage treatment plant has a significant impact on the water quality of Lough Ennell. The mid-1970s saw the introduction of treatment of the sewage to reduce phosphates, with a resulting improvement in water quality. However, levels of planktonic algal growth in the lake water continue to fluctuate, in response to the variable efficiency of the phosphate removal facility at the sewage treatment plant and the re-mobilization of phosphate from the lake sediments (NPWS, 2013). The site is important for wintering birds and provides suitable habitat for a flock of Greenland White-fronted Geese, which has been known to use Lough Ennell in the past. The flock uses a larger area around Lough Ennell, including Loughs Iron, Glen and Owel (which are also Ramsar sites). In the past, relatively small numbers of the geese used Lough Ennell as a migratory site.

4.2 - What wetland type(s) are in the site?

Inland wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
Fresh water > Lakes and pools >> O: Permanent freshwater lakes	Lakes	1	1164	Representative
Fresh water > Marshes on inorganic soils >> Tp: Permanent freshwater marshes/pools	reedbeds	3	40	Representative
Fresh water > Marshes on peat soils >> U: Permanent Non-forested peatlands	peatlands	2	180	Representative

Other non-wetland habitat

Other non-wetland habitats within the site	Area (ha) if known
Agricultural Grassland/ Woodland and scrub	20

(ECD) Habitat connectivity

The freshwater lake, reed beds, marsh areas and wet woodland form an intrinsic unit which are interconnected and serve to maintain the structural biodiversity of the site and the species it supports. The site forms part of a cluster of freshwater lakes in

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Phylum	Scientific name	Position in range / endemism / other
TRACHEOPHYTALILIOPSIDA	<i>Carex appropinquata</i>	Red Listed in Ireland (Near Threatened)
TRACHEOPHYTALILIOPSIDA	<i>Hydrocharis morsus-ranae</i>	Stable. Critically endangered to Vulnerable in parts of Europe

Optional text box to provide further information

This site is noted for being a location of the rare Fibrous Tussock Sedge (*Carex appropinquata*). This species has a disjunct distribution, being recorded only from Co. Clare and from two midland counties (Westmeath and Offaly).

H. morsus-ranae is classed as Critically Endangered in Spain, Endangered in Switzerland and Norway and Vulnerable in the United Kingdom. Otherwise, it is fairly widespread and abundant throughout its range. This species is classed as Least Concern on Ireland's Red List of Vascular Plants (Wyse-Jackson et al, 2016). as it is widespread and, despite local declines, it has overall stable populations and does not face any major threats.

4.3.2 - Animal species

Other noteworthy animal species

Phylum	Scientific name	Pop. size	Period of pop. est.	% occurrence	Position in range /endemism/other
CHORDATA/AVES	<i>Fulica atra</i>	651	2011-2015		Occurs in nationally important numbers
ARTHROPODA/INSECTA	<i>Limnephilus nigriceps</i>				
ARTHROPODA/INSECTA	<i>Metalype fragilis</i>				
ARTHROPODA/INSECTA	<i>Picromerus bidens</i>				
CHORDATA/AMPHIBIA	<i>Rana temporaria</i>				Protected. Irish Wildlife Act (1976, amended 2000)
CHORDATA/ACTINOPTERYGII	<i>Salmo trutta</i>				A widespread species and overall Least Concern. However, anadromous part of populations (sea trout) and many lacustrine stocks have in many cases markedly declined because of pollution
ARTHROPODA/INSECTA	<i>Tinodes maculicornis</i>				

4.4 - Physical components

4.4.1 - Climate

Climatic region	Subregion
C: Moist Mid-Latitude climate with mild winters	Cfb: Marine west coast (Mild with no dry season, warm summer)

4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres)

a) Maximum elevation above sea level (in metres)

- Entire river basin
- Upper part of river basin
- Middle part of river basin
- Lower part of river basin
- More than one river basin
- Not in river basin
- Coastal

Please name the river basin or basins. If the site lies in a sub-basin, please also name the larger river basin. For a coastal/marine site, please name the sea or ocean.

Shannon International River Basin District (IRBD)
 Lower Shannon Water Framework Directive Catchment
 Brosna_040 River Sub Basin
 Brosna_SC_010 Sub Catchment
 (EPAmaps.ie)

4.4.3 - Soil

Mineral

(Update) Changes at RIS update No change Increase Decrease Unknown

Organic

(Update) Changes at RIS update No change Increase Decrease Unknown

No available information

Are soil types subject to change as a result of changing hydrological conditions (e.g., increased salinity or acidification)? Yes No

Please provide further information on the soil (optional)

Land to the east of Lough Ennell consists of Grey Brown Podzolics derived from Limestone Till. Fen Peat occurs at the north and south of Lough Ennell. Some gley soils are present near Kilcooley around the mid-west of Lough Ennell and the area around Dysart is derived from lake alluvium. Cutover raised bog is present at Friarstown south of Lough Ennell

4.4.4 - Water regime

Water permanence

Presence?	Changes at RIS update
Usually permanent water present	No change

Source of water that maintains character of the site

Presence?	Predominant water source	Changes at RIS update
Water inputs from precipitation	<input checked="" type="checkbox"/>	No change
Water inputs from surface water	<input type="checkbox"/>	No change
Water inputs from groundwater	<input type="checkbox"/>	No change

Water destination

Presence?	Changes at RIS update
To downstream catchment	No change

Stability of water regime

Presence?	Changes at RIS update
Water levels largely stable	No change

(ECD) Stratification and mixing regime

4.4.5 - Sediment regime

Sediment regime unknown

(ECD) Water turbidity and colour

(ECD) Light - reaching wetland

(ECD) Water temperature

4.4.6 - Water pH

Alkaline (pH>7.4)

(Update) Changes at RIS update No change Increase Decrease Unknown

Unknown

4.4.7 - Water salinity

Fresh (<0.5 g/l)

(Update) Changes at RIS update No change Increase Decrease Unknown

Unknown

(ECD) Dissolved gases in water

4.4.8 - Dissolved or suspended nutrients in water

Mesotrophic

(Update) Changes at RIS update No change Increase Decrease Unknown

Unknown

Please provide further information on dissolved or suspended nutrients (optional):

The lake is classified as a mesotrophic system though it had been eutrophic in the past. Current data (EPA, 2018) lists the lake as Ecological Status/Potential-Good; Biological Status/ Potential-Good; Hydromorphological Conditions-High; Supporting Chemistry Conditions-Good.:
 Nitrate (as N) 0.299mg/L; Nitrite (as N) 0.008mg/L
 ortho-Phosphate (as P) - unspecified 0.005mg/L
 Silica (as Si) 0.855mg/L

(ECD) Dissolved organic carbon

(ECD) Water conductivity

4.4.9 - Features of the surrounding area which may affect the Site

Please describe whether, and if so how, the landscape and ecological characteristics in the area surrounding the Ramsar Site differ from the i) broadly similar ii) significantly different site itself:

- Surrounding area has greater urbanisation or development
- Surrounding area has higher human population density
- Surrounding area has more intensive agricultural use

Surrounding area has significantly different land cover or habitat types

Please describe other ways in which the surrounding area is different:

Lough Ennell is surrounded by generally good quality pasture land consisting of grey brown podzols type soils. Many farmers graze dairy cows, cattle and sheep on their holdings. A few farmers are participants in agri-environmental schemes. These farmers are restricted on fertiliser usage and must comply with environmental regulations regarding storage and disposal of organic wastes, application rates of chemical fertiliser and protection of watercourses. Participation in the scheme is beneficial to Lough Ennell in controlling excess nutrients that may be washed into the lake and thus alter the lake's water quality. There is a mixed woodland to the northwest of the site. The area is a high amenity area, with many recreational activities such as hunting and fishing, water sports, camping, golf, picnics and outings.

4.5 - Ecosystem services

4.5.1 - Ecosystem services/benefits

Provisioning Services

Ecosystem service	Examples	Importance/Extent/Significance
Food for humans	Sustenance for humans (e.g., fish, molluscs, grains)	Low
Wetland non-food products	Peat	Low

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Maintenance of hydrological regimes	Groundwater recharge and discharge	Medium
Pollution control and detoxification	Water purification/waste treatment or dilution	Low
Climate regulation	Local climate regulation/buffering of change	Low
Climate regulation	Regulation of greenhouse gases, temperature, precipitation and other climactic processes	Low
Hazard reduction	Flood control, flood storage	Low

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Water sports and activities	Medium
Recreation and tourism	Recreational hunting and fishing	Medium
Recreation and tourism	Picnics, outings, touring	Medium
Recreation and tourism	Nature observation and nature-based tourism	Medium
Scientific and educational	Long-term monitoring site	Medium
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	Medium

Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part	High
Soil formation	Accumulation of organic matter	not relevant for site
Soil formation	Sediment retention	not relevant for site
Nutrient cycling	Storage, recycling, processing and acquisition of nutrients	not relevant for site
Nutrient cycling	Carbon storage/sequestration	not relevant for site

Other ecosystem service(s) not included above:

The fen habitat functions in water purification, flood prevention and carbon storage.

Within the site:

Outside the site:

Have studies or assessments been made of the economic valuation of ecosystem services provided by this Ramsar Site? Yes No Unknown

4.5.2 - Social and cultural values

i) the site provides a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland

ii) the site has exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland

- iii) the ecological character of the wetland depends on its interaction
with local communities or indigenous peoples

Description if applicable

There is much evidence of prehistoric activity in and around Lough Ennell. A number of crannógs are present in the lake. Crannógs are artificial lake islands constructed primarily as dwellings, but also with other uses, such as places for metal work, fishing, or as hunting stations. While not unique to Ireland, It is believed the largest concentration of Crannógs known occur anywhere in the world occur at Irish lake sites. Crannógs were used as lake dwellings from the late Bronze Age up to medieval times.

These lake dwellers would have shaped the surrounding landscape by clearing the existing forest for agricultural use and it is likely these people would have played a significant role in in shaping the ecological character of the site as it appears at the present time.

- iv) relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological
character of the wetland

4.6 - Ecological processes

<no data available>

5 - How is the Site managed? (Conservation and management)

5.1 - Land tenure and responsibilities (Managers)

5.1.1 - Land tenure/ownership

Public ownership

Category	Within the Ramsar Site	In the surrounding area
Provincial/region/state government	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Private ownership

Category	Within the Ramsar Site	In the surrounding area
Other types of private/individual owner(s)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

5.1.2 - Management authority

Please list the local office / offices of any agency or organization responsible for managing the site:

National Parks & Wildlife Service (NPWS), Department of Housing, Local Government and Heritage
 Department of Communications, Climate Action and Environment.
 Westmeath County Council.
 Environmental Protection Agency (EPA),
 Inland Fisheries Ireland.
 Shannon Regional Fisheries Board.
 Coillte Teoranta.

Provide the name and/or title of the person or people with responsibility for the wetland:

Maurice Eakin

Postal address:

National Parks and Wildlife Service, Department of Housing, Local Government and Heritage
 90 North King Street,
 Smithfield, Dublin,
 Ireland
 D07 N7CV

E-mail address:

maurice.eakin@housing.gov.ie

5.2 - Ecological character threats and responses (Management)

5.2.1 - Factors (actual or likely) adversely affecting the Site's ecological character

Human settlements (non agricultural)

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Housing and urban areas	High impact		<input type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

Water regulation

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Drainage	unknown impact		<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Wood and pulp plantations	Medium impact		<input type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Livestock farming and ranching	Low impact		<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

Biological resource use

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Hunting and collecting terrestrial animals	Low impact		<input checked="" type="checkbox"/>	No change	<input type="checkbox"/>	No change
Fishing and harvesting aquatic resources	Medium impact	High impact	<input checked="" type="checkbox"/>	No change	<input type="checkbox"/>	No change

Human intrusions and disturbance

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Recreational and tourism activities	Low impact		<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Vegetation clearance/ land conversion	Low impact		<input type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Household sewage, urban waste water			<input checked="" type="checkbox"/>		<input type="checkbox"/>	
Agricultural and forestry effluents	Low impact		<input checked="" type="checkbox"/>	No change	<input type="checkbox"/>	No change
Excess heat, sound, light	Low impact		<input checked="" type="checkbox"/>	No change	<input type="checkbox"/>	No change
Unspecified			<input checked="" type="checkbox"/>		<input type="checkbox"/>	

Please describe any other threats (optional):

The chemical composition of effluent from the Mullingar sewage treatment plant has a significant impact on the water quality of Lough Ennell. The mid-1970s saw the introduction of treatment of the sewage to reduce phosphates, with a resulting improvement in water quality (according to data compiled during 1987-90). However, levels of planktonic algal growth in the lake water continue to fluctuate, in response to the variable efficiency of the phosphate removal facility at the sewage treatment plant and the re-mobilization of phosphate from the lake sediments. (NPWS, 2013).

5.2.2 - Legal conservation status

Regional (international) legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
EU Natura 2000	Lough Ennell Special Area of Conservation. Site Code:000685	https://www.npws.ie/protected-sites/sac/000685	whole
EU Natura 2000	Lough Ennell Special Protection Area Site Code:004044	https://www.npws.ie/protected-sites/spa/004044	whole

Non-statutory designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Important Bird Area	Lough Ennell	http://datazone.birdlife.org/site/factsheet/lough-ennell-iba-ire land	whole

5.2.3 - IUCN protected areas categories (2008)

- Ia Strict Nature Reserve
- Ib Wilderness Area: protected area managed mainly for wilderness protection
- II National Park: protected area managed mainly for ecosystem protection and recreation
- III Natural Monument: protected area managed mainly for conservation of specific natural features
- IV Habitat/Species Management Area: protected area managed mainly for conservation through management intervention
- V Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation
- VI Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems

5.2.4 - Key conservation measures

Legal protection

Measures	Status
Legal protection	Implemented

Habitat

Measures	Status
Improvement of water quality	Implemented
Catchment management initiatives/controls	Implemented

Species

Measures	Status
Threatened/rare species management programmes	Implemented

Human Activities

Measures	Status
Management of water abstraction/takes	Implemented
Regulation/management of wastes	Implemented
Livestock management/exclusion (excluding fisheries)	Implemented
Fisheries management/regulation	Implemented
Research	Implemented
Regulation/management of recreational activities	Implemented
Harvest controls/poaching enforcement	Implemented

Other:

The Lough Ennell Ramsar site lies within the Lough Ennell SAC and SPA. Under European and national legislation, Ireland must maintain at favourable conservation status areas designated as Special Areas of Conservation and/or Special Protection Areas. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites. Conservation objectives of this site have been set for both the SAC and the SPA; they are summarised below and can be accessed on NPWS.ie.

- The main objectives are to maintain the Annex I habitats for which the SAC has been selected at a favourable conservation status i.e. hard water lake and alkaline fen;
- To maintain the species for which the SPA has been selected at favourable conservation status, i.e. Pochard (*Aythya ferina*), Tufted Duck (*Aythya fuligula*) and Coot (*Fulica atra*).

Legislation in the Republic of Ireland affords protection to bird species outside of designated sites e.g. all wild bird species are afforded protection by The Wildlife Act 1976. Waterfowl shooting is under license only, managed by the National Parks & Wildlife Service. A River Basin District plan details effective measures for improved water management. The Brown trout fishery is managed and developed by the 'Midland Fisheries Group' of Inland Fisheries Ireland. Anglers require a fishing permit to fish the lake.

5.2.5 - Management planning

Is there a site-specific management plan for the site? No

Has a management effectiveness assessment been undertaken for the site? Yes No

If the site is a formal transboundary site as indicated in section Data and location > Site location, are there shared management planning processes with another Contracting Party? Yes No

5.2.6 - Planning for restoration

Is there a site-specific restoration plan? No need identified

5.2.7 - Monitoring implemented or proposed

Monitoring	Status
Animal species (please specify)	Implemented
Water regime monitoring	Implemented
Water quality	Implemented
Birds	Implemented
Plant species	Implemented

Under the Water Framework Directive the Environmental Protection Agency (EPA) monitors watercourses in the vicinity of the Ramsar site and the main lake waterbody at regular intervals. As a EU Natura 2000 site, it is required under Article 12 and 17 of the EU Birds and Habitats Directives respectively, that the status and trends of the conservation objectives within the site are monitored and reported on every 6 years. The site is monitored under the I-WEBS scheme which provides regular counts on wintering bird use. The site is regularly inspected by the National Parks and Wildlife Service Conservation Rangers for the area.

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

Biochange Biodiversity and Environmental Change: An Integrated Study Encompassing a Range of Scales, Taxa and Habitats. EPA. PO Box 3000, Johnstown Castle, Co. Wexford, Ireland.

Colhoun, K. and Cummins, S. 2013. Birds of conservation concern in Ireland 2014-2019. Irish Birds 9: 523-544

Kingston, N. (2012) Checklist of protected & rare species in Ireland. Unpublished National Parks & Wildlife Service Report.

Marnell, F., Kingston, N. & Looney, D. (2009) Ireland Red List No. 3: Terrestrial Mammals, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

Nelson, B., Cummins, S., Fay, L., Jeffrey, R., Kelly, S., Kingston, N., Lockhart, N., Marnell, F., Tierney, D. and Wyse Jackson, M. (2019) Checklists of protected and threatened species in Ireland. Irish Wildlife Manuals, No. 116.

NPWS (2016) Conservation objectives for Lough Ennell SAC [000685]. Generic Version 5.0. Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS (2013) Site Synopsis for Lough Ennell SAC [000685]. Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS (2015) Lough Ennell SAC [000685] Natura 2000 Form. Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS (2016) Conservation objectives for Lough Ennell SPA [004044]. Generic Version 5.0. Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS (2015) Lough Ennell SPA [004044]. Natura 2000 Form. Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

NPWS (2014) Site Synopsis for Lough Ennell SPA [004044]. Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

O Connor, Á. (2015) Habitats Directive Annex I lake habitats: a working interpretation for the purposes of site-specific conservation objectives and Article 17 reporting. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.

Roden, C. and Murphy, P. (2013) A survey of the benthic macrophytes of three hard-water lakes: Lough Bunny, Lough Carra and Lough Owel. Irish Wildlife Manuals, No. 70. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.

Stewart, N. F. and Church, J. M. (1992) Red Data Books of Britain and Ireland, Charophytes. Joint Nature Conservation Committee and Office of Public Works.

Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) Ireland Red List No. 10: Vascular Plants. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

Biodiversity Action Plan for County Westmeath (2014-2020) (www.westmeathcoco.ie/).

IUCN 2014. IUCN Red List of Threatened Species. Version 2014.2. . Downloaded on June 2017.

<http://www.catalogueoflife.org/>

Inland fisheries Ireland: <http://www.fisheriesireland.ie/>

BirdwatchIreland.ie

<http://www.ramsar.org>

The Irish Wetland Bird Survey (I-WeBS).

6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)

<no file available>

ii. a detailed Ecological Character Description (ECD) (in a national format)

<no file available>

iii. a description of the site in a national or regional wetland inventory

<no file available>

iv. relevant Article 3.2 reports

<no file available>

v. site management plan

<no file available>

vi. other published literature

<no file available>

<no data available>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:



Lough Ennell (National Parks and Wildlife Service, 3/7/2017)



Lough Ennell (National Parks and Wildlife Service, 3/7/2017)



Lough Ennell (National Parks and Wildlife Service, 3/7/2017)

6.1.4 - Designation letter and related data

Designation letter

<1 file(s) uploaded>

Date of Designation 1996-06-07