

NPWS

Lady's Island Lake SAC  
(site code: 000704)

**Conservation objectives supporting document-  
Coastal lagoons**

Version 1  
April 2019

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**Please note that this document should be read in conjunction with the following report: NPWS (2019) Conservation Objectives: Lady’s Island Lake SAC 000704. Version 1.0. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.**

## 1. Introduction

### 1.1 Lady's Island Lake SAC

Lady's Island Lake SAC, situated in the south-east of Ireland in Co. Wexford, encompasses a large shallow, brackish coastal lagoon separated from the sea by a sand and shingle barrier. Oliver (2007) describes the lagoon as "an excellent example of a large, natural sedimentary lagoon and based on geomorphology alone is one of the largest and best examples of a coastal lagoon in Ireland".

This Special Area of Conservation (SAC) is selected for reefs (EU Habitats Directive code 1170) and perennial vegetation of stony banks (1220), as well as coastal lagoons (1150); all habitats listed on Annex I of the Habitats Directive.

"Coastal lagoons" is a priority habitat on Annex I of the EU Habitats Directive. A coastal lagoon is a lake or pond that is fully or partially separated from the sea by a permeable barrier that can be entirely natural, such as shingle, or can be an artificial embankment. Salinity varies depending on factors such as freshwater inputs and barrier permeability. Lagoons support unique assemblages of flora and fauna, particularly invertebrates. In Ireland, coastal lagoons are considered to be in bad conservation status due to issues such as drainage and water pollution (NPWS, 2013).

A single lagoon, Lady's Island Lake, is listed for this SAC (Oliver, 2007). The table below gives the conservation status assessment of this lagoon as outlined in Oliver (2007). See the map in Appendix 1 and see Appendix 2 for an account of the Lady's Island Lake site (from Oliver, 2007).

Code <sup>1</sup>	Name	County	Conservation Assessment
IL006	Lady's Island Lake	Wexford	Unfavourable - bad

<sup>1</sup> Code is that used in Oliver (2007)

### 1.2 Conservation objectives

A site-specific conservation objective aims to define the favourable conservation condition of a habitat or species at site level. The maintenance of habitats and species within sites at favourable condition will contribute to the maintenance of favourable conservation status of those habitats and species at a national level.

Conservation objectives are defined using attributes and targets that are based on parameters as set out in the Habitats Directive for defining favourable status, namely area, range, and structure and functions.

Provisional reference conditions for Irish lagoons are proposed by Roden and Oliver (2013). Reference conditions aim to define ecological status prior to human impacts (i.e. "natural" conditions). The targets for the water quality attributes given below are based on reference values given by Roden and Oliver (2013).

Attributes and targets may change/become more refined as further information becomes available.

## 2. Area

The favourable reference area for Lady's Island Lake is 299.6ha.

Code <sup>1</sup>	Name	Area (ha) <sup>2</sup>
IL006	Lady's Island Lake	299.6

<sup>1</sup> Code is that used in Oliver (2007).

<sup>2</sup> Area is calculated from spatial data derived from Oliver (2007).

The target for habitat area is: stable or increasing, subject to natural processes.

## 3. Range

The mapped distribution of the lagoon habitat (i.e. Lady's Island Lake) in Lady's Island Lake SAC is shown in Appendix 1.

The target for the habitat distribution attribute is: no decline, subject to natural processes.

## 4. Structure and functions

Structure and functions relates to the physical components of a habitat ("structure") and the ecological processes that drive it ("functions"). For lagoons, these include attributes such as salinity, hydrology and various water quality attributes.

### 4.1 Salinity regime

Lagoons can vary considerably in salinity both within and between sites depending on the volume and timing of inflowing and outflowing freshwater and seawater. Salinity is probably the most important variable in the classification of lagoon types (Roden and Oliver, 2013). Freshwater enters Lady's Island Lake by a few small streams on the northern and north-western sides of the lake and leaves by percolation through the barrier at its southern end. The water level rises according to rainfall, thus typically in winter, and the barrier is usually manually breached in spring to prevent flooding of adjacent land. The lagoon then becomes tidal until there is a natural closure of the barrier, which generally takes two weeks to six months. Seawater also enters by seepage and overwash of the barrier. Salinity fluctuates widely according to season and the extent of tidal flow. In October 1996, 4–15psu (practical salinity units) was measured at the north end, 23–26psu near the barrier and 6–10psu in an isolated pool. Using information from Oliver (2007), the following table gives the salinity class for this lagoon. See Roden and Oliver (2013) for further information on salinity classes and see Appendix 2 for the site report.

Code	Name	Salinity
IL006	Lady's Island Lake	Meso-euhaline

The target for the salinity regime attribute is: median annual salinity and temporal variation within natural range.

## 4.2 Hydrological regime

Fluctuations in water depth are a natural feature of lagoon hydrology. However, if water levels fluctuate beyond their natural values due to issues such as drainage, the condition of the habitat can deteriorate. Lady's Island Lake can be classified largely as shallow (maximum depth is recorded as 6m), thus, even small changes in water depth can cause significant losses in habitat area. Further information is required to investigate historic fluctuations to enable more specific targets to be set. See Appendix 2 for the site report.

The target for hydrological regime is: annual water level fluctuations and minima within natural ranges.

## 4.3 Barrier: connectivity between lagoon and sea

The morphology of the barrier between a lagoon and the sea determines how it functions ecologically. Changes to the barrier can be due to natural processes such as storms, but they can also be modified through human intervention. Active management is sometimes necessary, particularly if the lagoon is artificial. Lady's Island Lake is a natural sedimentary percolating lagoon, separated from the sea by a sand and gravel barrier and dunes, which is summarised in the following table (after Oliver, 2007). See also the site report in Appendix 2.

Code	Name	Barrier Type
IL006	Lady's Island Lake	Natural sedimentary lagoon with a sand-gravel barrier

The target for the attribute barriers: connectivity between lagoon and sea is: appropriate hydrological connections between lagoons and sea, including where necessary, appropriate management.

## 4.4 Water quality - Chlorophyll *a*

This attribute indicates the level of phytoplankton in the water column. Roden and Oliver (2013) make the assumption that, for shallow lagoons in "natural" condition, primary productivity is dominated by the benthos rather than the plankton. Phytoplankton tends to increase in density in response to increasing nutrient levels. Excessive shading from phytoplankton can reduce submergent macrophyte colonisation of the littoral zone of lagoons.

The target for the attribute water quality - Chlorophyll *a* is: median annual chlorophyll *a* within natural ranges and less than 5µg/L. The target is based on Roden and Oliver (2013).

## 4.5 Water quality - Molybdate reactive phosphorus (MRP)

The target for the attribute water quality - Molybdate Reactive Phosphorus (MRP) is: median annual MRP within natural range and less than 0.1mg/L. The target is based on Roden and Oliver (2013).

This limit is required to ensure that excessive shading from phytoplankton does not reduce submergent colonisation of the littoral zone.

#### **4.6 Water quality - Dissolved inorganic nitrogen (DIN)**

The target for the attribute water quality - Dissolved Inorganic Nitrogen (DIN) is: median annual DIN within natural ranges and less than 0.15mg/L. The target is based on Roden and Oliver (2013).

As for phosphorus, the limit set for nitrogen is to ensure that excessive shading from phytoplankton does not reduce submergent colonisation.

#### **4.7 Depth of macrophyte colonisation**

The maximum depth recorded at Lady's Island Lake is 6m. It is expected that macrophytes would extend down to a depth of at least 2m.

The target for the attribute depth of macrophyte colonisation is: macrophyte colonisation to at least 2m depth.

#### **4.8 Typical plant species**

As lagoonal specialist species do not easily recolonise, their presence is one of the indicators of long-term continuity of quality. The plant species recorded in Lady's Island Lake is summarised in Oliver (2007). Species considered to be lagoonal specialists include *Chara canescens*, *Lamprothamnium papulosum*, *Ruppia maritima* and *Ruppia cirrhosa*. See Appendix 2 for the site report.

The target for the attribute typical plant species is: maintain number and extent of listed lagoonal specialists, subject to natural variation.

#### **4.9 Typical animal species**

Some invertebrate species are regarded as lagoonal specialists and their presence can indicate long-term quality. As species found within each lagoon can vary considerably, depending on other attributes such as salinity, the target is based on site-specific species lists. The species recorded in Lady's Island Lake are summarised in Oliver (2007). See Appendix 2 for the site report.

The target for the attribute typical animal species is: maintain listed lagoonal specialists, subject to natural variation.

#### **4.10 Negative indicator species**

Negative indicator species include non-native alien species as well as those that are not typical of the habitat. For example, accelerated encroachment by reedbeds can be caused by low salinity, shallow water and elevated nutrient levels.

The target for the attribute negative indicator species is: negative indicator species absent or under control.

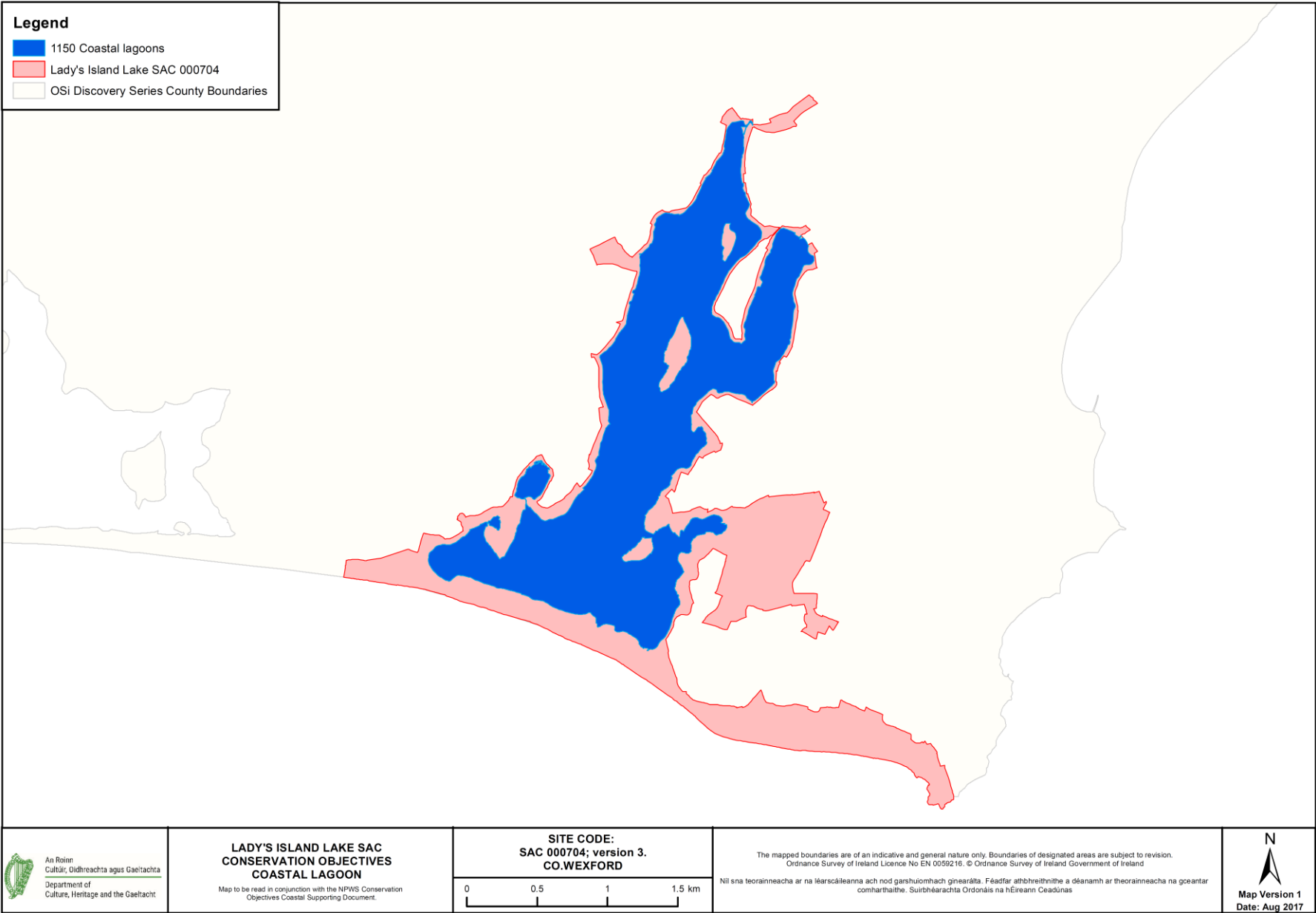
## **5. References**

NPWS (2013) The status of EU protected habitats and species in Ireland. Unpublished report, National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.

Oliver, G. (2007) Inventory of Irish coastal lagoons (version 2). Unpublished report to the National Parks and Wildlife Service.

Roden, C.M. and Oliver, G. (2013) Monitoring and assessment of Irish lagoons for the purpose of the EU Water Framework Directive. Unpublished report to the Environmental Protection Agency.

# Appendix 1 Distribution map of coastal lagoons in Lady's Island Lake SAC





## Appendix 2 Site report

The following is the site account from Oliver (2007)

<b>Code<sup>1</sup></b>	<b>Name</b>
IL006	Lady's Island Lake

<sup>1</sup> Code is that used in Oliver (2007).