

# National Parks and Wildlife Service

---

## *Conservation Objectives Series*

---

Kilcarren-Firville Bog SAC 000647



*An Roinn  
Ealaíon, Oidhreachta agus Gaeltachta*  

---

*Department of  
Arts, Heritage and the Gaeltacht*



**National Parks and Wildlife Service,  
Department of Arts, Heritage and the Gaeltacht,  
7 Ely Place, Dublin 2, Ireland.  
Web: [www.npws.ie](http://www.npws.ie)  
E-mail: [nature.conservation@ahg.gov.ie](mailto:nature.conservation@ahg.gov.ie)**

**Citation:**

**NPWS (201 ) Conservation Objectives: Kilcarren-Firville Bog SAC 000647.  
Version 1. National Parks and Wildlife Service, Department of Arts, Heritage  
and the Gaeltacht.**

**Series Editor: Rebecca Jeffrey  
ISSN 2009-4086**

## 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*

---

000647	Kilcarren-Firville Bog SAC
<hr/>	
7110	Active raised bogsE
7120	Degraded raised bogs still capable of natural regeneration
7150	Depressions on peat substrates of the Rhynchosporion

## Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: [www.npws.ie/Publications](http://www.npws.ie/Publications)

### NPWS Documents

<b>Year :</b>	2014
<b>Title :</b>	Raised Bog Monitoring and Assessment Survey 2013
<b>Author :</b>	Fernandez, F.; Connolly K.; Crowley W.; Denyer J.; Duff K.; Smith G.
<b>Series :</b>	Irish Wildlife Manual No. 81
<b>Year :</b>	2014
<b>Title :</b>	National raised bog SAC management plan
<b>Author :</b>	Department of Arts, Heritage and the Gaeltacht
<b>Series :</b>	Draft for consultation. 15 January 2014
<b>Year :</b>	2014
<b>Title :</b>	Firville Bog (SAC 000647), Co. Tipperary, Site Report
<b>Author :</b>	Fernandez, F.; Connolly, K.; Crowley, W.; Denyer J.; Duff K.; Smith G.
<b>Series :</b>	Raised bog monitoring and assessment survey 2013
<b>Year :</b>	2014
<b>Title :</b>	Kilcarren Bog (SAC 000647), Co. Tipperary, Site Report
<b>Author :</b>	Fernandez, F.; Connolly, K.; Crowley, W.; Denyer J.; Duff K.; Smith G.
<b>Series :</b>	Raised bog monitoring and assessment survey 2013
<b>Year :</b>	2016
<b>Title :</b>	Kilcarren-Firville Bog SAC (site code: 647) Conservation objectives supporting document-raised bog habitats V1
<b>Author :</b>	NPWS
<b>Series :</b>	Conservation objectives supporting document

### Other References

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

## Spatial data sources

<b>Year :</b>	2014
<b>Title :</b>	Scientific Basis for Raised Bog Conservation in Ireland
<b>GIS Operations :</b>	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
<b>Used For :</b>	potential 7110; digital elevation model; drainage patterns (maps 2 and 4)
<b>Year :</b>	2013
<b>Title :</b>	Raised Bog Monitoring and Assessment Survey 2013
<b>GIS Operations :</b>	RBMA13_ecotope_map dataset clipped to SAC boundary. Appropriate ecotopes selected and exported to new dataset. Expert opinion used as necessary to resolve any issues arising
<b>Used For :</b>	7110 ecotopes (map 3)

**7110 Active raised bogs**

**To restore the favourable conservation condition of Active raised bogs in Kilcarren-Firville 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 92.4ha, subject to natural processes	Active Raised Bog (ARB) habitat was mapped at 28.7ha by Fernandez et al. (2014). Area of Degraded Raised Bog (DRB) on the High Bog (HB) has been modelled as 86.1ha. See map 2. However, it is estimated that only 60.3ha is potentially restorable to ARB by drain blocking. The total potential ARB on the HB is therefore estimated to be 89.0ha. Eco-hydrological assessments of the cutover estimates that an additional 3.4ha of bog forming habitats could be restored. The long term target for ARB is therefore 92.4ha. 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 3 for distribution in 2011	ARB habitat at Kilcarren-Firville Bog SAC is central and sub-central ecotopes and active flush. ARB currently occurs on both bogs. DRB also occurs on both bogs, which will require restoration measures. There is also potential for ARB restoration on cutover areas of the bogs (see area target above)
High bog area	Hectares	No decline in extent of high bog necessary to support the development and maintenance of active raised bog. See map 2	The area of high bog within Kilcarren-Firville Bog SAC in 2012 (latest figure available) was 362.3ha (DAHG 2014)
Hydrological regime: water levels	Centimetres	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 4 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
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	ARB is threatened due to water loss from past drainage and peat-cutting along the margins of Kilcarren and Firville bogs. 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 46.2ha 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 92.4ha (see area target above)
Vegetation quality: microtopographical features	Hectares	Restore adequate cover of high quality microtopographical features	High quality microtopography (hummocks, hollows and pools) is well developed on Kilcarren-Firville Bog
Vegetation quality: bog moss ( <i>Sphagnum</i> ) species	Percentage cover	Restore adequate cover of bog moss ( <i>Sphagnum</i> ) species to ensure peat-forming capacity	<i>Sphagnum</i> cover varies naturally across Ireland with relatively high cover in the east to lower cover in the west. Hummock forming species such as <i>Sphagnum austini</i> are particularly good peat formers. <i>Sphagnum</i> cover and distribution also varies naturally across a site

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	At Kilcarren-Firville Bog SAC, parts of the northern edges of the bogs grade naturally into the adjoining mineral soil forming an infiltration lag
Negative physical indicators	Percentage cover	Negative physical features 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	Disturbance indicators include species indicative of conditions drying out such as abundant bog asphodel ( <i>Narthecium ossifragum</i> ), deergrass ( <i>Trichophorum germanicum</i> ) and haretail cotton-grass ( <i>Eriophorum vaginatum</i> ) forming tussocks; abundant magellanic bog-moss ( <i>Sphagnum magellanicum</i> ) in pools previously dominated by <i>Sphagnum</i> species typical of very wet conditions (e.g. feathery bog-moss ( <i>S. cuspidatum</i> )); and indicators of frequent burning events such as abundant <i>Cladonia floerkeana</i> and high cover of carnation sedge ( <i>Carex panicea</i> ) (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	Most common non-native invasive species include lodgepole pine ( <i>Pinus contorta</i> ), rhododendron ( <i>Rhododendron ponticum</i> ) and pitcherplant ( <i>Sarracenia purpurea</i> )
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 Kilcarren-Firville Bog suggests that the current level is approximately 12.6kg 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)



## Conservation Objectives for : Kilcarren-Firville Bog SAC [000647]

### 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 Kilcarren-Firville Bog SAC

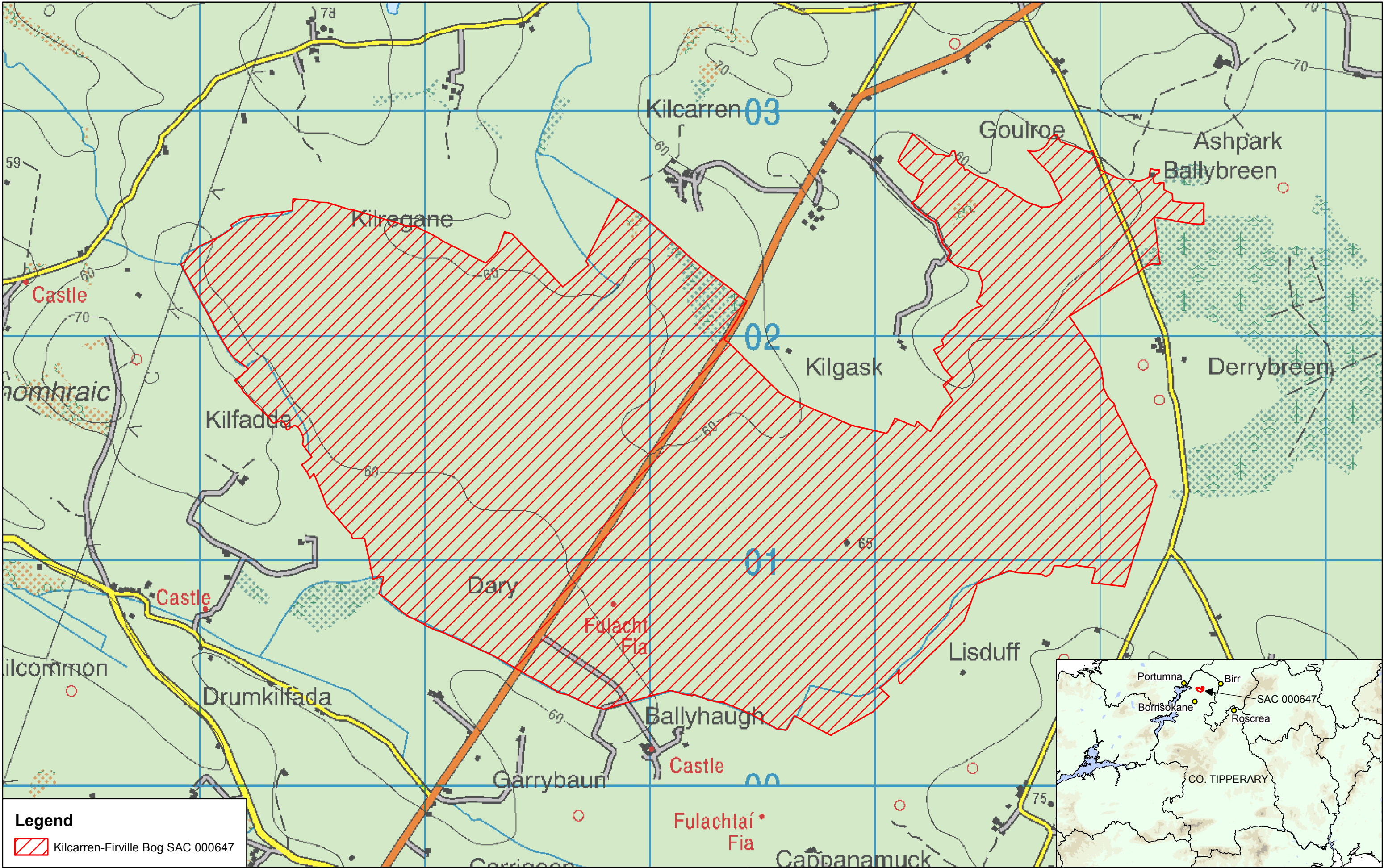
Attribute	Measure	Target	Notes
-----------	---------	--------	-------

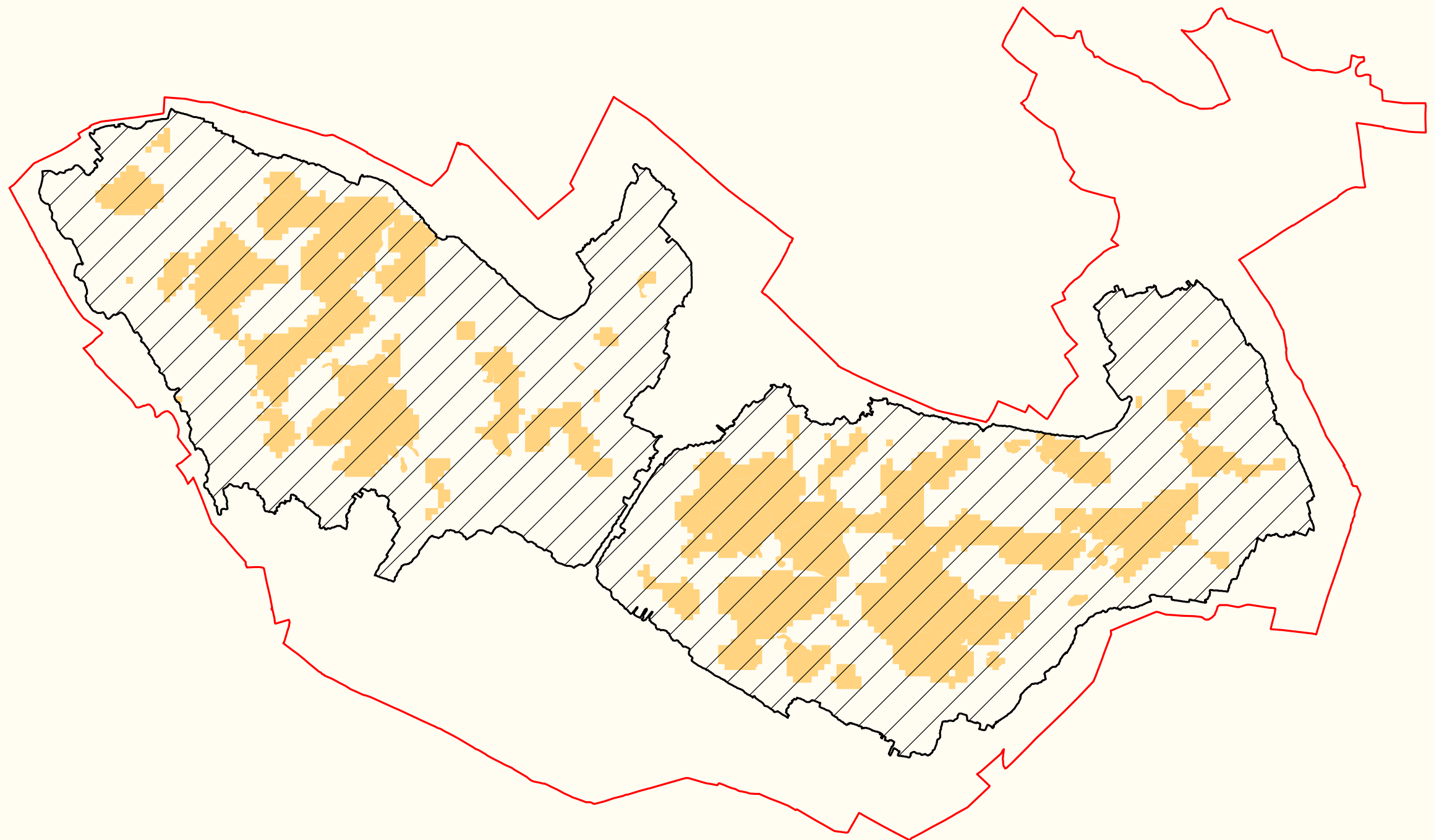
## Conservation Objectives for : Kilcarren-Firville Bog SAC [000647]

### 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 Kilcarren-Firville Bog SAC

Attribute	Measure	Target	Notes
-----------	---------	--------	-------





### Legend

-  Kilcarren-Firville Bog SAC 000647
-  High Bog Boundary
-  Potential 7110 \*Active Raised Bogs



An Roinn  
Ealaíon, Oidhreacht agus Gaeltachta  
Department of  
Arts, Heritage and the Gaeltacht

**MAP 2:**  
**KILCARREN-FIRVILLE 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 000647; version 3.01. Co. Tipperary**

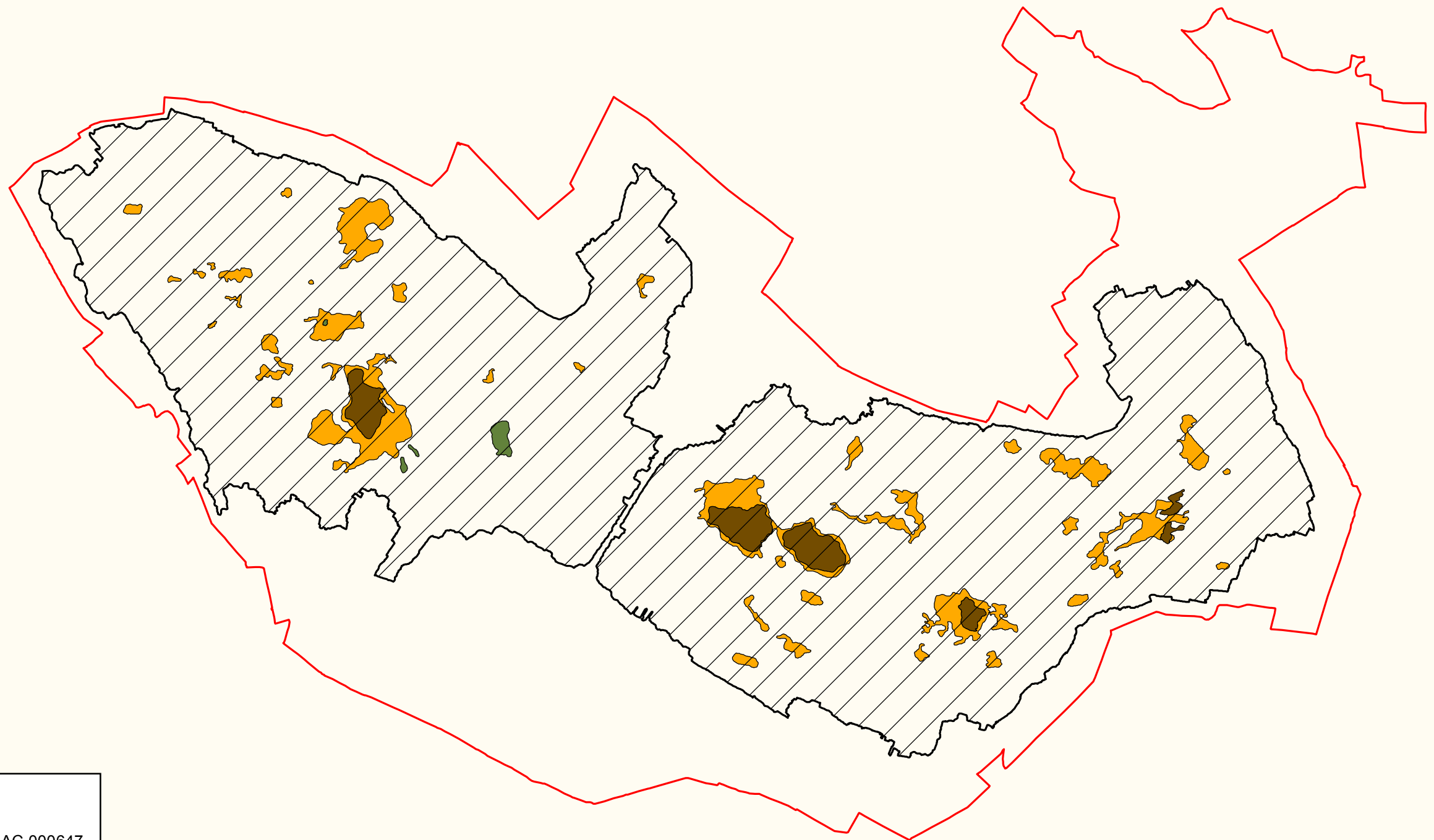
0 250 500 750 1,000 m

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.  
Ordnance Survey of Ireland Licence No EN 0059216. © Ordnance Survey of Ireland Government of Ireland.

Níl sna teorainneacha ar na léarscáileanna ach nod garshuíomhach ginearálta. Féadfar athbheithnithe a déanamh ar theorainneacha na gceantar comharthaíthe. Suirbhéarachta Ordonáis na hÉireann Ceadúnas Uimh EN 0059216. © Suirbhéarachta Ordonáis na hÉireann Rialtas na hÉireann.




**Map Version 1**  
**Date: Jan 2016**





### Legend


 Kilcarren-Firville Bog SAC 000647

 High Bog Boundary

### Active Raised Bogs Ecotopes

 Central ecotope

 Soaks / active flush

 Sub-central ecotope



An Roinn  
Ealaíon, Oidhreacht agus Gaeltachta  
Department of  
Arts, Heritage and the Gaeltacht

### MAP 3: KILCARREN-FIRVILLE BOG SAC CONSERVATION OBJECTIVES ACTIVE RAISED BOGS ECOTOPES

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

SITE CODE:  
SAC 000647; version 3.01. Co. Tipperary

0 250 500 750 1,000 m

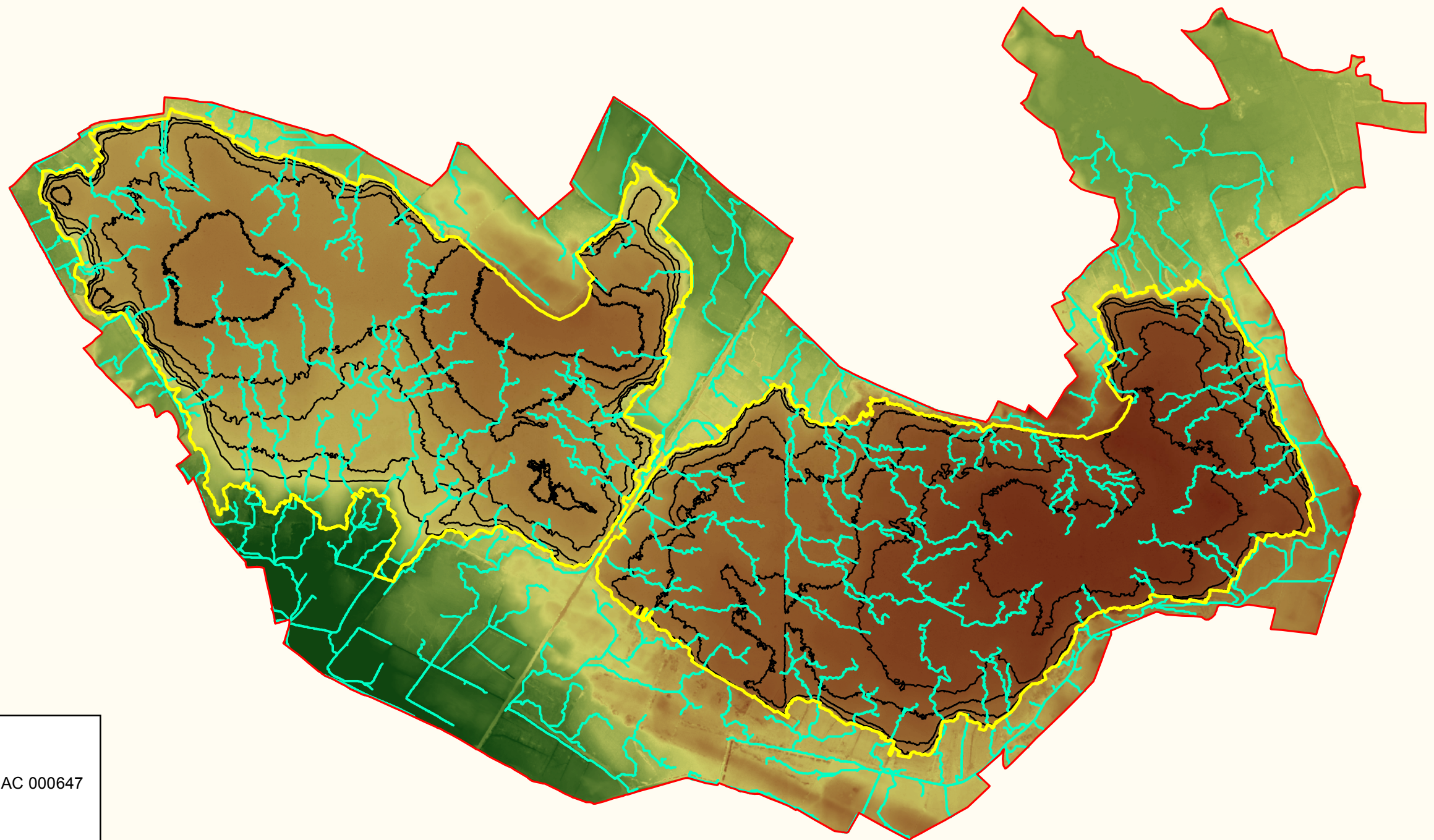
The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.  
Ordnance Survey of Ireland Licence No EN 0059216. © Ordnance Survey of Ireland Government of Ireland.

Níl sna teorainneacha ar na léarscáileanna ach nod garshuíomhach ginearálta. Féadfar athbheithnithe a déanamh ar theorainneacha na gceantar comharthaíthe. Suirbhéarachta Ordonáis na hÉireann Ceadúnas Uimh EN 0059216. © Suirbhéarachta Ordonáis na hÉireann Rialtas na hÉireann.



Map Version 1  
Date: Jan 2016

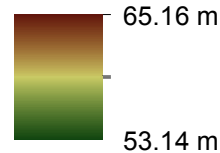




# Legend

- Kilcarren-Firville Bog SAC 000647
- High Bog Boundary
- Drainage Patterns
- Contours

## Elevation

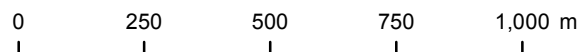


An Roinn  
Ealaíon, Oidhreacht agus Gaeltachta  
Department of  
Arts, Heritage and the Gaeltacht

## MAP 4: KILCARREN-FIRVILLE BOG SAC CONSERVATION OBJECTIVES RAISED BOG DIGITAL ELEVATION MODEL & DRAINAGE PATTERNS

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

SITE CODE:  
SAC 000647; version 3.01. Co. Tipperary



The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.  
Ordnance Survey of Ireland Licence No EN 0059216. © Ordnance Survey of Ireland Government of Ireland.

Níl sna teorainneacha ar na léarscáileanna ach nod garshuíomhach ginearálta. Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaíthe. Suirbhéarachta Ordonáis na hÉireann Ceadúnas Uimh EN 0059216. © Suirbhéarachta Ordonáis na hÉireann Rialtas na hÉireann.



Map Version 1  
Date: Jan 2016