

National Parks and Wildlife Service

Conservation Objectives Series

Peterswell Turlough SAC 000318



An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

**National Parks and Wildlife Service,
Department of Housing, Local Government and Heritage,
90 King Street North, Dublin 7, D07 N7CV, Ireland.
Web: www.npws.ie
E-mail: natureconservation@housing.gov.ie**

Citation:

**NPWS (2021) Conservation Objectives: Peterswell Turlough SAC 000318.
Version 1. National Parks and Wildlife Service, Department of Housing, Local
Government and Heritage.**

**Series Editors: Rebecca Jeffrey and Christina Campbell
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*

000318	Peterswell Turlough SAC
--------	-------------------------

3180	Turloughs*
------	------------

3270	Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidention</i> p.p. vegetation
------	---

Supporting documents, relevant reports & publications

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

NPWS Documents

Year :	1992
Title :	Turloughs over 10ha - Vegetation survey and evaluation
Author :	Goodwillie, R.N.
Series :	Unpublished report to NPWS
Year :	2006
Title :	A survey of rare and scarce vascular plants in County Galway
Author :	Conaghan, J.; Roden, C.; Fuller, J.
Series :	Unpublished report to NPWS
Year :	2015
Title :	Turlough hydrology, ecology and conservation (Part 1)
Author :	Waldren, S. (ed.)
Series :	Unpublished report to NPWS
Year :	2016
Title :	Ireland Red List No. 10: Vascular Plants
Author :	Wyse Jackson, M.; FitzPatrick, Ú.; Cole, E.; Jebb, M.; McFerran, D.; Sheehy Skeffington, M.; Wright, M.
Series :	Ireland Red Lists series, NPWS
Year :	2017
Title :	Conservation objectives supporting document: Turloughs* and Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidenton</i> p.p. vegetation
Author :	O Connor, Á.
Series :	Conservation objectives supporting document
Year :	2018
Title :	A survey of the vegetation of the Habitats Directive Annex I habitat Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidenton</i> p.p. vegetation (3270), in Ireland (2018)
Author :	Conaghan, J.; Fuller, J.
Series :	Unpublished report to NPWS
Year :	2019
Title :	The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments
Author :	NPWS
Series :	Conservation assessments

Other References

Year :	1986
Title :	A study of the geology, hydrology and geomorphology of turloughs
Author :	Coxon, C.
Series :	Unpublished Ph.D. Thesis, Trinity College Dublin
Year :	1994
Title :	Carbonate deposition in turloughs (seasonal lakes) on the western limestone lowlands of Ireland. II: The sedimentary record.
Author :	Coxon, C.E.; Coxon, P.
Series :	Irish Geography, 27: 28–35

Year :	1997
Title :	An Investigation of the Flooding Problems in the Gort–Ardrahan Area of South Galway. Ecology Baseline Study. Vols I and II.
Author :	Southern Water Global and Jennings O'Donovan and Partners (eds)
Series :	The Office of Public Works, Dublin
Year :	2005
Title :	An investigation of the plant, carabid, and staphylinid communities of turloughs in southeast Galway/north Clare, Ireland
Author :	Regan, E.C.
Series :	Unpublished Ph.D. Thesis, National University of Ireland, Galway
Year :	2010
Title :	Modelling a network of turloughs
Author :	Gill, L.W.
Series :	Unpublished Ph.D. Thesis, Trinity College Dublin
Year :	2011
Title :	The hydrology and hydroecology of turloughs
Author :	Naughton, O.
Series :	Unpublished Ph.D. Thesis, Trinity College Dublin
Year :	2012
Title :	Groundwater flooding in Irish karst: The hydrological characterisation of ephemeral lakes (turloughs)
Author :	Naughton, O.; Johnston, P.M.; Gill, L.W.
Series :	Journal of Hydrology, 470-471: 82-97
Year :	2012
Title :	The influence of flood duration on the surface soil properties and grazing management of karst wetlands (turloughs) in Ireland
Author :	Kimberley, S.; Naughton, O.; Johnston, P.M.; Gill, L.W.; Waldren, S.
Series :	Hydrobiologia, 692: 29–40
Year :	2013
Title :	Modeling a network of turloughs in lowland karst
Author :	Gill, L.W.; Naughton, O.; Johnston, P.M.
Series :	Water Resources Research, 49: 3487-3503
Year :	2016
Title :	Quantifying the influence of surface water–groundwater interaction on nutrient flux in a lowland karst catchment
Author :	McCormack, T.; Naughton, O.; Johnston, P.M.; Gill, L.W.
Series :	Hydrology and Earth System Sciences, 20(5): 2119-2133
Year :	2017
Title :	Groundwater flood hazards and mechanisms in lowland karst terrains
Author :	Naughton, O.; McCormack, T.; Gill, L.; Johnston, P.
Series :	Geological Society, London, Special Publications, 466
Year :	2018
Title :	The hydrogeology of the Gort Lowlands
Author :	Naughton, O.; McCormack, T.; Drew, D.; Gill, L.; Johnston, P.; Morrissey, P.; Regan, S.
Series :	Irish Journal of Earth Sciences, 36: 25-44

Year : 2020
Title : An evaluation of semidistributed-pipe-network and distributed-finite-difference models to simulate karst systems
Author : Gill, L.W.; Schuler, P.; Duran, L.; Morrissey, P.; Johnston, P.M.
Series : Hydrogeology Journal, 29: 259–279

Year : 2021
Title : Ecohydrological metrics for vegetation communities in turloughs (ephemeral karstic wetlands)
Author : Bhatnagara, S.; Gill, A.; Waldren, S.; Sharkey, N.; Naughton, O.; Johnston, P.; Coxon, C.; Morrissey, P.; Ghosha, B.
Series : Ecohydrology, DOI: 10.1002/eco.2316

Spatial data sources

Year :	2021
Title :	Goodwillie et al. (1997) Wetland vegetation in the Gort lowlands
GIS Operations :	Goodwillie et al. map scanned and georectified. Turlough as outlined on map digitised. New turlough dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	3180 (map 2)
Year :	2018
Title :	A survey of the vegetation of the Habitats Directive Annex I habitat Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidenton</i> p.p. vegetation (3270), in Ireland
GIS Operations :	Map from report georectified. 3270 habitat as outlined on map digitised. Expert opinion used as necessary to resolve any issues arising
Used For :	3270 (map 3)

Conservation Objectives for : Peterswell Turlough SAC [000318]

3180 Turloughs*

To restore the favourable conservation condition of Turloughs* in Peterswell Turlough 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	In Peterswell Turlough SAC, the southern basin, Blackrock Turlough, is well-studied (Coxon, 1986; Goodwillie, 1992; Goodwillie et al., 1997 in Southern Water Global and Jennings O'Donovan and Partners, 1997; Regan, 2005; Gill, 2010; Naughton, 2011; Waldren, 2015; Bhatnagara et al., 2021), but the northern Bullaunagh basin is less well-known. Goodwillie et al. (1997) described the SAC as having an excellent range of vegetation along the turlough-callow gradient, with a confined circular basin at the south-western end (Blackrock) and a broader valley to the north-east (Bullaunagh), linked by a narrow gorge. The turlough area within the SAC is calculated as 141ha based on Goodwillie et al. (1997). See map 2 for the recorded extent in the SAC. Goodwillie (1992) categorised Blackrock Turlough as being of international ecological importance. Blackrock Turlough was assessed as in poor conservation condition by Waldren (2015). See O Connor (2017) for information on all attributes and targets
Habitat distribution	Occurrence	No decline, subject to natural processes	Distribution based on Goodwillie et al. (1997). See map 2
Hydrological regime	Various	Maintain appropriate natural hydrological regime necessary to support the natural structure and functioning of the habitat	Hydrological regime is sub-divided into more detailed attributes and targets in O Connor (2017). Blackrock-Bullaunagh is the first in a series of conduit-fed turloughs draining to Lough Coy, Coole/Garryland and Caherglassan. Its hydrology is well-studied (Coxon, 1986; Goodwillie, 1992; Gill, 2010; Gill et al., 2013, 2020; Naughton, 2011; Naughton et al., 2012, 2017, 2018; Waldren, 2015; McCormack et al., 2016; Bhatnagara et al., 2021). It is partly fed by the Owenshree river from the acid Slieve Aughtys. This river flows through the basin from the north-east, and is channelised. Blackrock Turlough typically has a significant annual flood event, but is very flashy and has been dry in winter (Waldren, 2015). It had the largest max. floodwater volume, fastest daily inflow and largest drainage capacity in Waldren (2015). Its max. recorded floodwater depth is 18m (2009), but >12m is more typical (Naughton et al., 2017, 2018). Waldren (2015) assessed Blackrock's hydrological regime as Good
Soil type	Hectares	Maintain variety, area and extent of soil types necessary to support turlough vegetation and other biota	The southern basin (Blackrock Turlough) has extensive areas of shallow and very shallow well-drained mineral soils, with the remainder (<i>circa</i> one-third) being shallow and poorly drained (Waldren, 2015). Blackrock soils are moderately acidic (Kimberley et al., 2012; Waldren, 2015). The whole area is drift covered, and the soil on the turlough floor consists of 1-2m of silty clay with stones over bedrock (Coxon, 1986). There are rocks and boulders scattered on the sides of Blackrock Turlough, and some on the undulating floor, and limestone outcrops on the south-eastern and north-eastern sides (Goodwillie, 1992; Goodwillie et al., 1997). Drift cover is thicker in the northern basin and there is no outcropping rock (Goodwillie et al., 1997). For further information on soil type in Peterswell Turlough SAC, see Goodwillie (1992), Goodwillie et al. (1997), Kimberley et al. (2012) and Waldren (2015)

Soil nutrient status: nitrogen and phosphorus	N and P concentration in soil	Maintain/restore nutrient status appropriate to soil types and vegetation communities	Waldren (2015) recorded low mean total nitrogen (TN) within the soils at Blackrock Turlough of 7,050mg/kg TN and very high total phosphorus (TP), mean of 1,123mg/kg TP, which was the second highest of the turloughs studied by Waldren (2015)
Physical structure: bare ground	Presence	Maintain sufficient wet bare ground, as appropriate	See O Connor (2017) for information on this and all attributes and targets
Chemical processes: calcium carbonate deposition and concentration	Calcium carbonate deposition rate/soil concentration	Maintain appropriate calcium carbonate deposition rate and concentration in soil	Soils had a low calcium carbonate content of 5.02% at Blackrock Turlough (Waldren, 2015) and no marl deposits (Coxon and Coxon, 1994; Kimberley et al., 2012)
Active peat formation	Flood duration	Maintain active peat formation	There is no peat in the main basin at Blackrock, but some has accumulated at the southern tip where there is permanent water (Goodwillie, 1992). Waldren (2015) did not record peat soils within Blackrock Turlough, and found that soils had a low (14.6%) mean organic matter content (Waldren 2015)
Water quality	Various	Restore appropriate water quality to support the natural structure and functioning of the habitat	Water quality is sub-divided into more detailed attributes (nutrients, colour, phytoplankton and epiphyton biomass) and targets in O Connor (2017). See also The European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2019. Blackrock Turlough had low alkalinity, high water colour, very high total phosphorus (mean of 52.4µg/l TP), and high total nitrogen (mean of 1.7 mg/l TN) (Waldren, 2015). Mean chlorophyll <i>a</i> was 1.3µg/l and the maximum was 2.5µg/l. No algal mats were observed by Waldren (2015). Peterswell Turlough SAC should, typically, be naturally oligotrophic and requires targets of ≤20µg/l TP, <8.0µg/l annual mean chlorophyll <i>a</i> , <25µg/l annual maximum chlorophyll <i>a</i> , and should maintain trace/absent epiphyton as algal mats (<2% cover) to reach favourable condition
Vegetation composition: area of vegetation communities	Hectares	Restore area of sensitive and high conservation value vegetation communities/units	Goodwillie et al. (1997) surveyed all turlough vegetation in the SAC and found that the Poor Grassland community dominated. The northern basin is eutrophic, with damp grassland throughout and tall herbs in wetter areas. The southern basin was also surveyed by Goodwillie (1992) and Waldren (2015). There were differences in mapping and interpretation of vegetation communities across surveys. Waldren (2015) compared vegetation communities with Goodwillie (1992) only. The dominant vegetation community differed between Waldren (2015) and the 2 earlier surveys. Waldren (2015) attributed the difference to vegetation interpretation and/or increases in <i>Potentilla reptans</i> and nutrients. Waldren (2015) reported loss of limestone grassland mapped by Goodwillie (1992), possibly because of grazing pressure. <i>Filipendula ulmaria</i> - <i>Potentilla erecta</i> - <i>Viola</i> sp., <i>Eleocharis acicularis</i> and <i>Rhamnus</i> communities are of high conservation value (Goodwillie, 1992; Waldren, 2015)

Vegetation composition: vegetation zonation	Distribution	Maintain vegetation zonation/mosaic characteristic of the turlough	The upper vegetation zone at Blackrock Turlough has areas of scrub, woodland and <i>Lolium</i> grassland. Turlough woodland is also found along and north of the central gorge. Goodwillie (1992) and Goodwillie et al. (1997) described a wet annual zone of habitat 3270 (see conservation objective) in the low-lying flat base of Blackrock, with dry <i>Carex nigra</i> upgradient with stands of pure <i>C. nigra</i> , and mixed with <i>Potentilla anserina</i> , <i>Agrostis stolonifera</i> , <i>Rumex crispus</i> and <i>Viola persicifolia</i> . As the soil thins towards the edge of the basin, <i>P. reptans</i> appears with <i>Lotus corniculatus</i> , <i>Galium boreale</i> and others. Goodwillie et al. (1997) described 3 communities above this depending on substrate: <i>Prunus</i> and <i>Rhamnus</i> scrub; limestone grassland; poor grassland. Grassland zones dominated Bullaunagh, with patches of tall herb and marsh. See Goodwillie (1992), Goodwillie et al. (1997) and Waldren (2015) for more information
Vegetation structure: sward height	Centimetres	Restore sward heights appropriate to the vegetation unit, and a variety of sward heights across the turlough	The grazing regime at Peterswell Turlough SAC has changed over time. Waldren (2015) reported that some of the limestone grassland mapped by Goodwillie (1992) seemed to have been lost due to increased grazing pressure in the upper margins of the turlough. Waldren (2015) stated that the entire Blackrock basin is rotationally grazed. Goodwillie et al. (1997) stated that the northern basin was grazed by cattle or horse, or cut for hay. See Goodwillie (1992), Goodwillie et al. (1997) and Waldren (2015) for information on vegetation communities in Peterswell Turlough SAC
Typical species	Presence	Maintain typical species within the turlough	Typical species is sub-divided into more detailed attributes (terrestrial, wetland and aquatic plants, invertebrates and birds) and targets in O Connor (2017). Four notable vascular plant species have been recorded from Peterswell Turlough. Waldren (2015) recorded <i>Viola persicifolia</i> , listed as Near Threatened in Wyse Jackson et al. (2016). <i>Limosella aquatica</i> and <i>Rorippa islandica</i> were recorded by Goodwillie (1992), Goodwillie et al. (1997) and Conaghan and Fuller (2018). <i>Callitriche palustris</i> , listed as Vulnerable in Wyse Jackson et al. (2016), was recorded in a small area of Chenopodium vegetation (Annex I habitat 3270; see the conservation objective) in the turlough (Conaghan and Fuller, 2018). Aquatic invertebrate assemblages are poorly-developed at Blackrock owing to the flashy hydrological regime. The SAC is important for wintering waterbirds, including the EU Birds Directive Annex I species Whooper Swan and Golden Plover (NPWS internal files)
Fringing habitats: area	Hectares	Maintain/restore marginal fringing habitats that support turlough vegetation, invertebrate, mammal and/or bird populations	Peterswell Turlough SAC is of high conservation importance for its mosaic of Annex I and other habitats, particularly the transitions and gradations between habitats, e.g. between turloughs, grassland communities, scrub and woodland. Goodwillie et al. (1997) noted grassland had been reseeded in several places around the margins
Vegetation structure: turlough woodland	Species diversity and woodland structure	Maintain/restore appropriate turlough woodland diversity and structure	Turlough woodland is found on a steep slope on the south-eastern edge of Blackrock, and is dominated by <i>Rhamnus cathartica</i> , with <i>Crataegus monogyna</i> , <i>Fraxinus excelsior</i> and <i>Prunus spinosa</i> , and a few <i>Alnus glutinosa</i> trees (Goodwillie, 1992; Goodwillie et al., 1997; see also Waldren, 2015). Goodwillie (1992) recorded some clearance of this wood. The narrow gorge at Limepark, that joins the two basins, is wooded with a sizable woodland extending to the north-east (Goodwillie et al., 1997). Species recorded include <i>Fraxinus excelsior</i> , <i>Ulmus glabra</i> , <i>Crataegus monogyna</i> , <i>Corylus avellana</i> , <i>Rhamnus cathartica</i> , <i>Euonymus europaeus</i> , <i>Malus sylvestris</i> , <i>Viburnum opulus</i> (Goodwillie, et al., 1997)

Conservation Objectives for : Peterswell Turlough SAC [000318]

3270 Rivers with muddy banks with *Chenopodium rubri* p.p. and *Bidention* p.p. vegetation

To restore the favourable conservation condition of Rivers with muddy banks with *Chenopodium rubri* p.p. and *Bidention* p.p. vegetation in Peterswell Turlough SAC, which is defined by the following list of attributes and targets

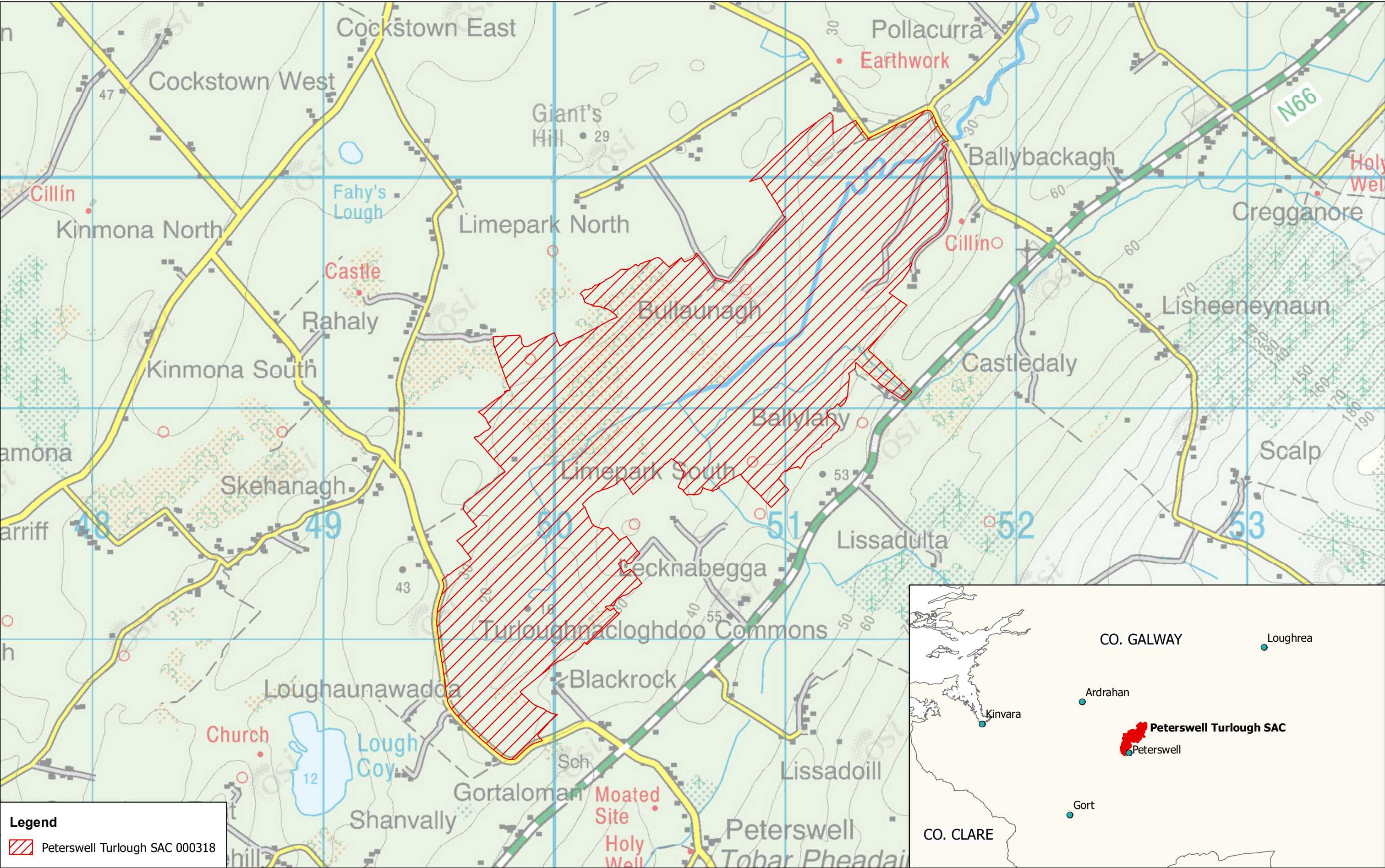
Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable, subject to natural fluctuations	Habitat 3270 within Peterswell Turlough SAC is relatively well-studied, see Goodwillie (1992), Goodwillie et al. (1997) in Southern Water Global and Jennings O'Donovan and Partners (1997), Conaghan et al. (2006), Waldren (2015) and Conaghan and Fuller (2018) for information on the habitat. The area of habitat 3270 can vary significantly inter-annually with flooding regime. Conaghan and Fuller (2018) recorded 0.65ha of 3270 habitat in Blackrock Turlough (the southern basin, also known as Peterswell Turlough; see map 3). Goodwillie (1992) estimated the area of the habitat as 0.3ha. See Conaghan and Fuller (2018) for information on the habitat in Ireland and O Connor (2017) for information on all attributes and targets. Habitat 3270 is a constituent community of the turlough 3180 habitat
Habitat distribution	Occurrence	No decline, subject to natural processes	Distribution based on Conaghan and Fuller (2018). See map 3
Hydrological regime	Various	Maintain appropriate natural hydrological regime necessary to support the natural structure and functioning of the habitat	Hydrological regime is sub-divided into more detailed attributes (groundwater contribution, flood duration, frequency, area and depth, and permanently flooded/wet areas) and targets in O Connor (2017). The habitat occurs on open muddy ground at the edge of the permanent water at Peterswell Turlough SAC (Conaghan and Fuller, 2018). Late drying and long hydroperiod, the supply of fine mud and the gentle slope are key to the area, structure and functioning of the habitat
Soil type	Hectares	Maintain area and extent of soil types necessary to support the habitat	The habitat occurs on exposed mud, much of which was heavily poached by cattle (Goodwillie, 1992; Goodwillie et al., 1997; Conaghan and Fuller, 2018)
Soil nutrient status: nitrogen and phosphorus	N and P concentration in soil	Maintain nutrient status appropriate to soil types and vegetation communities/units	Waldren (2015) recorded low mean total nitrogen (TN) within the soils at Blackrock Turlough of 7,050mg/kg TN and very high total phosphorus (TP), mean of 1,123mg/kg TP, which was the second highest of the turloughs studied by Waldren (2015)
Physical structure: bare ground	Presence	Maintain sufficient wet bare ground	Bare ground results from late drying along the turlough shore and, likely also, the deposition of fine sediment
Chemical processes: calcium carbonate deposition and concentration	Calcium carbonate deposition rate/soil concentration	Maintain appropriate calcium carbonate deposition rate/soil concentration	Soils had a low calcium carbonate content of 5.02% at Blackrock Turlough (Waldren, 2015)

Water quality	Various	Restore appropriate water quality to support the natural structure and functioning of the habitat	Water quality is sub-divided into more detailed attributes (nutrients, colour, phytoplankton and epiphyton biomass) and targets in O Connor (2017). See also The European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2019. Blackrock Turlough had low alkalinity, high water colour, very high total phosphorus (mean of 52.4µg/l TP), and high total nitrogen (mean of 1.7 mg/l TN) (Waldren, 2015). Mean chlorophyll <i>a</i> was 1.3µg/l and the maximum was 2.5µg/l. No algal mats were observed by Waldren (2015). Peterswell Turlough SAC should, typically, be naturally oligotrophic and requires targets of ≤20µg/l TP, <8.0µg/l annual mean chlorophyll <i>a</i> , <25µg/l annual maximum chlorophyll <i>a</i> , and should maintain trace/absent epiphyton as algal mats (<2% cover) to reach favourable condition
Vegetation composition: vegetation communities	Hectares	Maintain area of sensitive and high conservation value vegetation communities/units	The area of 3270 within Blackrock Turlough was dominated by <i>Polygonum aviculare</i> , <i>Persicaria maculosa</i> and <i>Oxybasis rubra</i> (<i>Chenopodium rubrum</i>). <i>Eleocharis palustris</i> dominated in patches and <i>Rorippa islandica</i> was common (Conaghan and Fuller, 2018). Although a number of characteristic species of the 3270 habitat occurred at the site, the vegetation was heavily poached by cattle, was very sparse in some areas, and was generally low growing (<10cm) (Conaghan and Fuller, 2018). Goodwillie et al. (1997) found <i>Juncus bufonius</i> , <i>Rorippa islandica</i> , <i>Persicaria hydropiper</i> , <i>Veronica catenata</i> and scattered <i>Limosella aquatica</i> and <i>Oxybasis rubra</i> . See Goodwillie (1992), Goodwillie et al. (1997), Conaghan et al. (2006), Waldren (2015) and Conaghan and Fuller (2018) for further information on the vegetation communities
Vegetation composition: vegetation zonation	Distribution	Maintain vegetation zonation/mosaic characteristic of the site	The area of 3270 within Blackrock Turlough includes a notable vegetation type at its southern end with abundant <i>Limosella aquatica</i> and occasional <i>Callitriche palustris</i> (Conaghan and Fuller, 2018). Waldren (2015) also recorded a small area of the rare <i>Eleocharis acicularis</i> community at the centre of the 3270 habitat. See Goodwillie (1992), Goodwillie et al. (1997), Conaghan et al. (2006), Waldren (2015) and Conaghan and Fuller (2018) for further information on the vegetation communities
Typical species	Presence	Maintain typical species	Typical plant species and targets are provided in NPWS (2019). See also Conaghan and Fuller (2018) and O Connor (2017). Three notable vascular plant species have been recorded within the area of 3270 within Peterswell Turlough SAC. <i>Limosella aquatica</i> and <i>Rorippa islandica</i> were recorded by Goodwillie (1992), Goodwillie et al. (1997) and Conaghan and Fuller (2018), but not by Waldren (2015). Formerly red-listed, both species are now listed as Least Concern in Wyse Jackson et al. (2016). <i>Callitriche palustris</i> , listed as Vulnerable in Wyse Jackson et al. (2016), was recorded in a small area of 3270 within Peterswell Turlough SAC (Conaghan and Fuller, 2018)


Fringing habitats: Hectares
area and condition

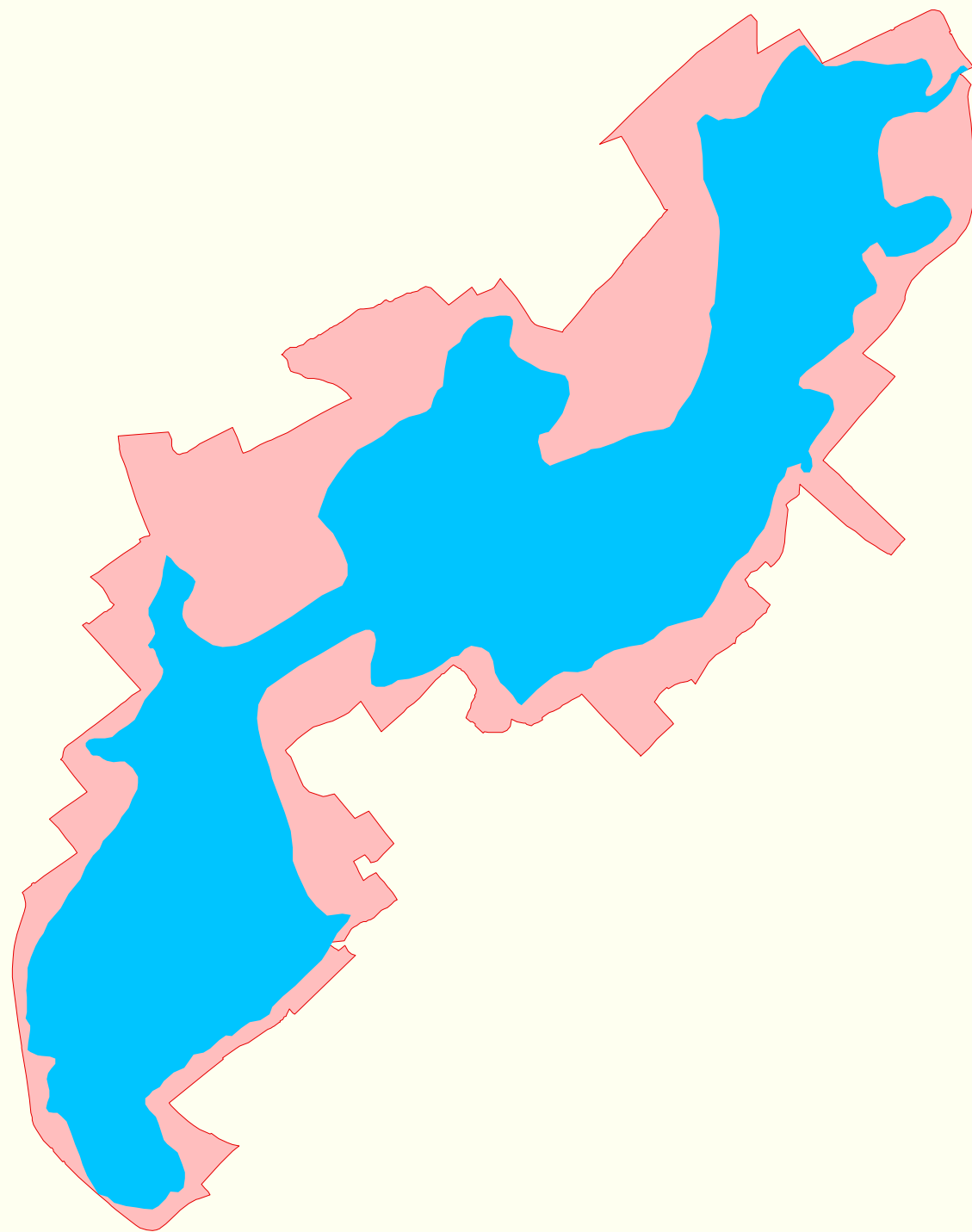
Maintain the area and
condition of fringing
habitats necessary to
support the natural
structure and functioning
of the habitat

Habitat 3270 within Blackrock Turlough is immediately fringed by other turlough communities. Goodwillie et al. (1997) stated that the habitat is surrounded by *Persicaria maculosa* and *Polygonum aviculare* on bare patches within the lower parts of a widespread *Carex nigra* community. The *Carex nigra* community includes pure stands of the species and areas where it is mixed with *Potentilla anserina*, *Agrostis stolonifera*, *Rumex crispus* and, locally, *Viola persicifolia* (Goodwillie et al., 1997). Conaghan and Fuller (2018) also noted weedy species such as *Rumex crispus*, *Persicaria maculosa* and *P. aviculare* within the surrounding vegetation. Waldren (2015) described the vegetation surrounding habitat 3270 as mainly heavily grazed areas of the *Potentilla anserina*-*Potentilla reptans* community



Legend

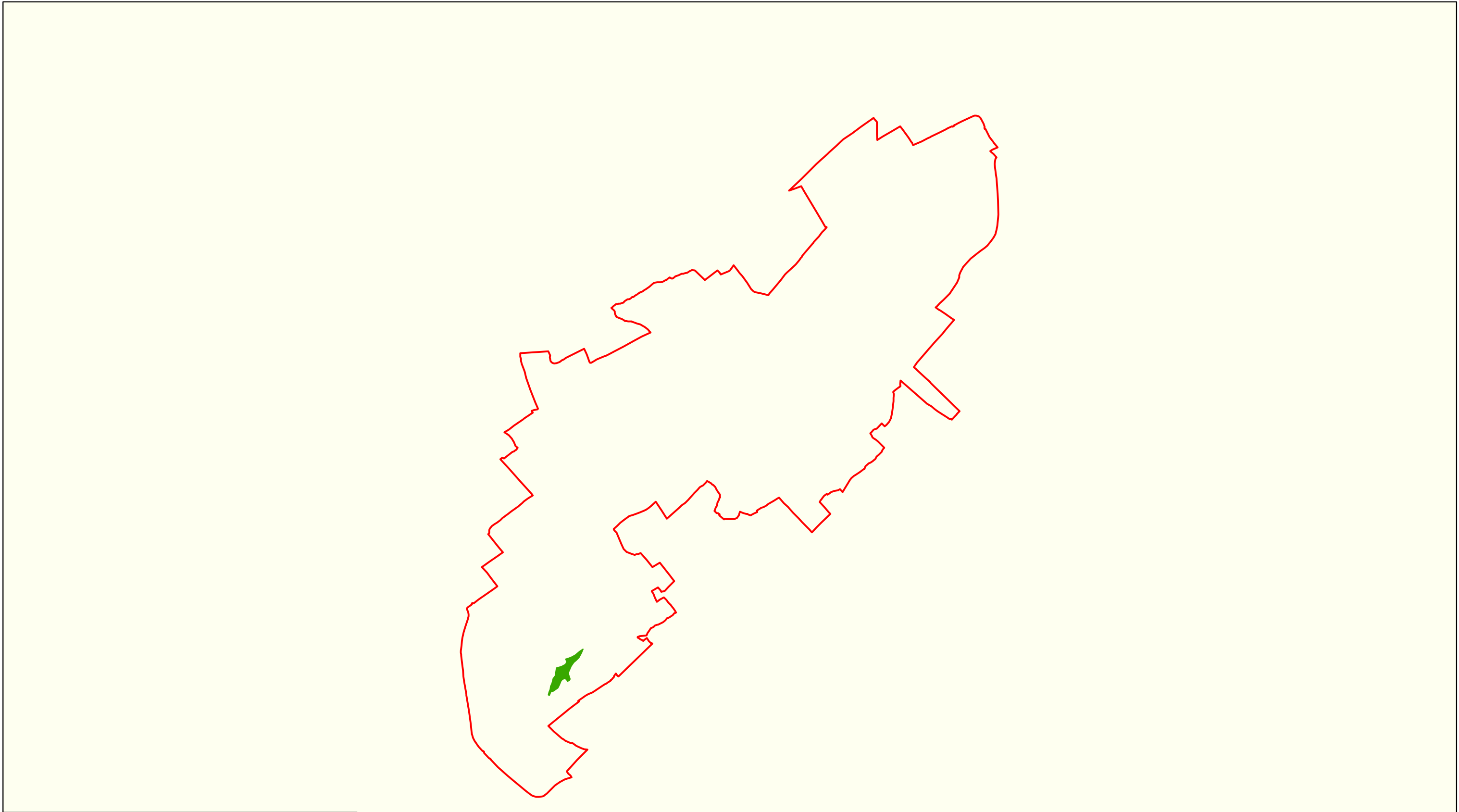
 Peterswell Turlough SAC 000318




Legend


3180 Turloughs*

Peterswell Turlough SAC 000318



Legend

 Rivers with muddy banks with *Chenopodium rubri p.p.* and *Bidention p.p.* vegetation

 Peterswell Turlough SAC 000318