

National Parks and Wildlife Service

Conservation Objectives Series

Blackwater River (Cork/Waterford) SAC 002170



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



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Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area it covers within that range, are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- the conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

* indicates a priority habitat under the Habitats Directive

002170 Blackwater River (Cork/Waterford) SAC

1029	Freshwater Pearl Mussel <i>Margaritifera margaritifera</i>
1092	White-clawed Crayfish <i>Austropotamobius pallipes</i>
1095	Sea Lamprey <i>Petromyzon marinus</i>
1096	Brook Lamprey <i>Lampetra planeri</i>
1099	River Lamprey <i>Lampetra fluviatilis</i>
1103	Twaite Shad <i>Alosa fallax</i>
1106	Atlantic Salmon <i>Salmo salar</i> (only in fresh water)
1130	Estuaries
1140	Mudflats and sandflats not covered by seawater at low tide
1220	Perennial vegetation of stony banks
1310	<i>Salicornia</i> and other annuals colonizing mud and sand
1330	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)
1355	Otter <i>Lutra lutra</i>
1410	Mediterranean salt meadows (<i>Juncetalia maritimi</i>)
1421	Killarney Fern <i>Trichomanes speciosum</i>
3260	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation
91A0	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles
91E0	*Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)
91J0	* <i>Taxus baccata</i> woods of the British Isles

Please note that this SAC overlaps with Blackwater Estuary SPA (004028), Blackwater Callows SPA (004094) and Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161). It is also adjacent to Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC (000365). See map 2. The conservation objectives for this site should be used in conjunction with those for the overlapping and adjacent sites as appropriate.

Supporting documents, relevant reports & publications (listed by date)

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

Title:	Aspects of brook lamprey (<i>Lampetra planeri</i> Bloch) spawning in Irish waters
Year:	in press
Author:	Rooney, S.M.; O’Gorman, N.M.; Green, F.; King, J.J.
Series:	Biology and Environment
Title:	River Blackwater (Cork/Waterford) SAC (0002170). Conservation objectives supporting document - coastal habitats [Version 1]
Year:	2012
Author:	NPWS
Series:	Unpublished Report to NPWS
Title:	River Blackwater (Cork/Waterford) SAC (0002170). Conservation objectives supporting document - marine habitats [Version 1]
Year:	2012
Author:	NPWS
Series:	Unpublished Report to NPWS
Title:	River Blackwater (Cork/Waterford) SAC (0002170). Conservation objectives supporting document - woodland habitats [Version 1]
Year:	2012
Author:	NPWS
Series:	Unpublished Report to NPWS
Title:	Comparison of field- and GIS-based assessments of barriers to Atlantic salmon migration: a case study in the Nore Catchment, Republic of Ireland
Year:	2011
Author:	Gargan, P. G.; Roche, W. K.; Keane, S.; King, J.J.; Cullagh, A.; Mills, P.; O’Keeffe, J.
Series:	J. Appl. Ichthyol. 27 (Suppl. 3), 66–72
Title:	Second Draft Licky Freshwater Pearl Mussel Sub-basin Management Plan (2009-2015)
Year:	2010c
Author:	DEHLG
Series:	Unpublished Report to NPWS
Title:	Second Draft Allow Freshwater Pearl Mussel Sub-basin Management Plan (2009-2015)
Year:	2010b
Author:	DEHLG
Series:	Unpublished Report to NPWS
Title:	Second Draft Munster Blackwater Freshwater Pearl Mussel Sub-basin Management Plan (2009-2015)
Year:	2010a
Author:	DEHLG
Series:	Unpublished Report to NPWS

Title:	Subtidal benthic investigations in Blackwater River cSAC (Site Code:IE002170) and Blackwater Estuary SPA (IE004028), Co. Cork/Waterford
Year:	2010
Author:	Aquafact
Series:	Unpublished Report to NPWS & MI
Title:	A survey of mudflats and sandflats in Ireland. An intertidal soft sediment survey of the lower Blackwater Estuary
Year:	2010
Author:	ASU
Series:	Unpublished Report to NPWS & MI
Title:	Otter tracking study of Roaringwater Bay
Year:	2010
Author:	De Jongh, A.; O'Neill, L.
Series:	Unpublished Draft Report to NPWS
Title:	A provisional inventory of ancient and long-established woodland in Ireland
Year:	2010
Author:	Perrin, P.M.; Daly, O.H.
Series:	Irish Wildlife Manuals No. 46
Title:	A technical manual for monitoring white-clawed crayfish <i>Austropotamobius pallipes</i> in Irish lakes
Year:	2010
Author:	Reynolds, J.D.; O'Connor, W.; O'Keeffe, C.; Lynn, D.
Series:	Irish Wildlife Manuals No. 45
Title:	Report of the standing scientific committee to the DCENR. The status of Irish salmon stocks in 2010 and precautionary catch advice for 2011
Year:	2010
Author:	SSC
Series:	Unpublished Report to DCENR
Title:	The European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009. [S.I. 296 of 2009]
Year:	2009b
Author:	Government of Ireland
Series:	Irish Statute Book
Title:	The European Communities Environmental Objectives (Surface Water) Regulations 2009. [S.I. 272 of 2009]
Year:	2009a
Author:	Government of Ireland
Series:	Irish Statute Book
Title:	Saltmarsh Monitoring Report 2007-2008
Year:	2009
Author:	McCorry, M.; Ryle, T.
Series:	Unpublished Report to NPWS

Title:	Wildflowers of Cork City and County
Year:	2009
Author:	O'Mahony, T.
Series:	The Collins Press, Cork
Title:	Mitigation of arterial drainage maintenance works on the Awbeg River, Co Cork in relation to conservation of white-clawed crayfish, <i>Austropotamobius pallipes</i> , within the River Blackwater SAC
Year:	2009
Author:	Williams, L.
Series:	Unpublished Report to NPWS
Title:	Flora of County Waterford
Year:	2008
Author:	Green, P.
Series:	The National Botanic Gardens of Ireland, Dublin
Title:	Aspects of anadromous Allis shad (<i>Alosa alosa</i> Linnaeus) and Twaite shad (<i>Alosa fallax</i> Lacépède) biology in four Irish Special Areas of Conservation (SACs): status, spawning indications and implications for cons
Year:	2008
Author:	King, J.J.; Roche, W.K.
Series:	Hydrobiologia 602, 145–154
Title:	Poor water quality constrains the distribution and movements of Twaite shad <i>Alosa fallax fallax</i> (Lacepede, 1803) in the watershed of river Scheldt
Year:	2008
Author:	Maas, J.; Stevens, M. ; Breine, J.
Series:	Hydrobiologia 602, 129 - 143
Title:	All Ireland Species Action Plan - Killarney fern
Year:	2008
Author:	NPWS ; EHS-NI
Series:	Unpublished Report to NPWS & EHS-NI
Title:	National Survey of Native Woodlands 2003-2008
Year:	2008
Author:	Perrin, P.; Martin, J.; Barron, S.; O'Neill, F.; McNutt, K.; Delaney, A.
Series:	Unpublished Report to NPWS
Title:	Evolutionary history of lamprey paired species <i>Lampetra fluviatilis</i> (L.) and <i>Lampetra planeri</i> (Bloch) as inferred from mitochondrial DNA variation
Year:	2007
Author:	Espanhol, R.; Almeida, P.R.; Alves, M.J.
Series:	Molecular Ecology 16, 1909-1924
Title:	Interpretation manual of European Union habitats- EUR 27
Year:	2007
Author:	European Commission
Series:	DG Environment, Brussels

Title:	Supporting documentation for the Habitats Directive Conservation Status Assessment - backing documents, Article 17 forms and supporting maps
Year:	2007
Author:	NPWS
Series:	Unpublished Report to NPWS
Title:	A Survey of Juvenile Lamprey Populations in the Corrib and Suir Catchments
Year:	2007
Author:	O'Connor, W.
Series:	Irish Wildlife Manuals No. 26
Title:	Otter Survey of Ireland 2004/2005
Year:	2006
Author:	Bailey, M.; Rochford, J.
Series:	Irish Wildlife Manuals No. 23
Title:	The status of host fish populations and fish species richness in European freshwater pearl mussel (<i>Margaritifera margaritifera</i>) streams
Year:	2006
Author:	Geist, J.; Porkka, M.; Kuehn, R.
Series:	Aquatic Conservation: Marine and Freshwater Ecosystems 16, 251–266
Title:	The distribution of Lamprey in the River Barrow SAC
Year:	2006
Author:	King, J.J.
Series:	Irish Wildlife Manuals No. 21
Title:	Otters - ecology, behaviour and conservation
Year:	2006
Author:	Kruuk, H.
Series:	Oxford University Press
Title:	Conservation Plan for River Blackwater (Cork/Waterford) SAC. Draft 0 – descriptive section
Year:	2006
Author:	NPWS
Series:	Unpublished Draft Report to NPWS
Title:	The ecology and conservation of the gametophyte generation of the Killarney Fern (<i>Trichomanes speciosum</i> Willd.) in Ireland
Year:	2005
Author:	Kingston, N. ; Hayes, C.
Series:	Biology and Environment: Proceedings of the Royal Irish Academy 105B(2): 71-79
Title:	Initiation of a monitoring program for the freshwater pearl mussel, <i>Margaritifera margaritifera</i> (L.) in the Licky River
Year:	2005
Author:	Ross, E.D.
Series:	Unpublished Report to NPWS

Title:	The status and distribution of lamprey and shad in the Slaney and Munster Blackwater SACs
Year:	2004
Author:	King, J.J.; Linnane, S.M.
Series:	Irish Wildlife Manuals No. 14
Title:	Identifying lamprey. A field key for sea, river and brook lamprey
Year:	2003
Author:	Gardiner, R.
Series:	Conserving Natura 2000 rivers, Conservation techniques No. 4. English Nature, Peterborough
Title:	Monitoring the river, sea and brook lamprey, <i>Lampetra fluviatilis</i> , <i>L. planeri</i> and <i>Petromyzon marinus</i>
Year:	2003
Author:	Harvey, J.; Cowx, I.
Series:	Conserving Natura 2000 Rivers Monitoring Series No. 5. English Nature, Peterborough
Title:	Ecology of Watercourses Characterised by <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> Vegetation
Year:	2003
Author:	Hatton-Ellis, T.W.; Grieve, N.
Series:	Conserving Natura 2000 Rivers Ecology Series No. 11. English Nature, Peterborough
Title:	Ecology of the Allis and Twaite shad
Year:	2003
Author:	Maitland, P.S.; Hatton-Ellis, T.W.
Series:	Conserving Natura 2000 Rivers Ecology Series No. 3. English Nature, Peterborough
Title:	Pondweeds of Great Britain and Ireland
Year:	2003
Author:	Preston, C.D.
Series:	BSBI Handbook, No. 8, London
Title:	A survey of the white-clawed crayfish, <i>Austropotamobius pallipes</i> (Lereboullet) and of water quality in two catchments of Eastern Ireland
Year:	2002
Author:	Demers, A.; Reynolds, J. D.
Series:	Bulletin Français de la Pêche et de la Pisciculture, 367: 729-740
Title:	Reversing the habitat fragmentation of British woodlands
Year:	2002
Author:	Peterken, G.
Series:	WWF-UK, London
Title:	Aquatic Plants in Britain and Ireland
Year:	2001
Author:	Preston, C.D.
Series:	Harley Books, Colchester

Title: National Shingle Beach Survey of Ireland 1999

Year: 1999

Author: Moore, D.; Wilson, F.

Series: Unpublished Report to NPWS

Title: The saltmarshes of Ireland: an inventory and account of their geographical variation

Year: 1998

Author: Curtis, T.G.F.; Sheehy-Skeffington, M.J.

Series: Biology and Environment, Proceedings of the Royal Irish Academy 98B: 87-104

Title: The spatial organization of otters (*Lutra lutra*) in Shetland

Year: 1991

Author: Kruuk, H.; Moorhouse, A.

Series: J. Zool, 224: 41-57

Title: Otter survey of Ireland

Year: 1982

Author: Chapman, P.J.; Chapman, L.L.

Series: Unpublished Report to Vincent Wildlife Trust

Spatial data sources

Year:	2010
Title:	EPA WFD transitional waterbody data
GIS operations:	Clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used for:	1130 (map 3)
Year:	Interpolated 2012
Title:	Mudflat and sandflat survey 2010; subtidal survey 2010
GIS operations:	Polygon feature classes from marine community types base data sub-divided based on interpolation of marine survey data. Expert opinion used as necessary to resolve any issues arising
Used for:	Marine community types, 1140 (maps 4 and 5)
Year:	2005
Title:	OSi Discovery series vector data
GIS operations:	High water mark (HWM) and low water mark (LWM) polyline feature classes converted into polygon feature classes and combined; EU Annex I Saltmarsh and Coastal data erased out if present
Used for:	Marine community types base data (map 5)
Year:	Revision 2010
Title:	Saltmarsh Monitoring Project 2007-2008. Version 1
GIS operations:	QIs selected; clipped to SAC boundary; overlapping regions with Coastal CO data investigated and resolved with expert opinion used
Used for:	1310, 1330, 1410 (map 6)
Year:	Revision 2010
Title:	National Survey of Native Woodlands 2003-2008. Version 1
GIS operations:	QIs selected; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used for:	91A0, 91E0 (map 7)
Year:	2012
Title:	Coillte hardcopy map
GIS operations:	Polygon digitised; clipped to SAC boundary
Used for:	91J0 (map 7)
Year:	Revision 2012
Title:	NPWS conservation plan spatial data 2006
GIS operations:	WN, WD1 and WD2 polygons merged; clipped to SAC boundary
Used for:	semi-natural woodland (map 7)
Year:	Revision 2012
Title:	Margaritifera Sensitive Areas data
GIS operations:	Relevant catchment boundaries identified. Expert opinion used as necessary to resolve any issues arising
Used for:	1029 (map 8)

Year:	2011
Title:	NPWS rare and threatened species database
GIS operations:	Dataset created from spatial references in database records. Expert opinion used as necessary to resolve any issues arising
Used for:	1029, 1092, 1095, 1096, 1099, 1421 (maps 8, 9 and 10)
Year:	2005
Title:	OSi Discovery series vector data
GIS operations:	Creation of an 80m buffer on the marine side of the high water mark (HWM); creation of a 10m buffer on the terrestrial side of the HWM; combination of 80m and 10m HWM buffer datasets; creation of a 10m buffer on the terrestrial side of the river banks data; creation of 20m buffer applied to canal centreline data. These datasets are combined with the derived EPA WFD Waterbodies data for the 1355 CO. Overlapping regions investigated and resolved; resulting dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used for:	1355 (no map)
Year:	2010
Title:	EPA WFD Waterbodies data
GIS operations:	Creation of a 20m buffer applied to river and stream centreline data; creation of 80m buffer on the aquatic side of lake data; creation of 10m buffer on the terrestrial side of lake data. These datasets are combined with the derived OSi data and Coastal Lagoon data for the 1355 CO. Overlapping regions investigated and resolved; resulting dataset clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used for:	1355 (no map)

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1029 Freshwater Pearl Mussel *Margaritifera margaritifera*

To restore the favourable conservation condition of the Freshwater Pearl Mussel in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Kilometres	Maintain at 161km. See map 8	The freshwater pearl mussel is known from the main Blackwater River, two tributaries (Owentaraglin and Allow) and the Licky River, which discharges to the Upper Blackwater Estuary. 168km encompasses the length of channel from the most upstream records of the freshwater pearl mussel to the most downstream records of live mussels, and contained within the freshwater pearl mussel catchment boundaries displayed on map 8
Population size	Number of adult mussels	Restore to 35,000 adult mussels	The SAC has three populations listed on the European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations of 2009 (Government of Ireland, 2009b): Munster Blackwater, Allow (Munster Blackwater) and Licky. The separation of the main channel Blackwater and Allow into two populations is artificial and no longer considered appropriate. The Licky, however, is a distinct population, being separated from the Blackwater by brackish water and a hydrological distance of approx. 30km, making genetic exchange very unlikely. Information on the size of the population in the Blackwater and its tributaries is poor, but estimated at less than 10,000 for the Blackwater main channel (target set at 10,000); and between 10,000 and 20,000 for the Allow tributary (target set at 15,000) (DEHLG, 2010a, 2010b). The Licky population was estimated as just greater than 10,000 in 2005, but was estimated to have declined to approx. 4,700 by 2009 (target set at 10,000) (Ross, 2005; DEHLG, 2010c)

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1029 Freshwater Pearl Mussel *Margaritifera margaritifera*

To restore the favourable conservation condition of the Freshwater Pearl Mussel in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Population structure: recruitment	Percentage per size class	Restore to least 20% of population no more than 65mm in length; and at least 5% of population no more than 30mm in length	Mussels of no more than 65mm are considered 'young mussels' and may be found buried in the substratum and/or beneath adult mussels. Mussels of no more than 30mm are 'juvenile mussels' and are always buried in the substratum. The Blackwater population is believed to be composed entirely of aged adults, with no evidence of recruitment for at least 20 years (DEHLG, 2010a). No juvenile mussels were found in the Allow and 8.3% of the population was no more than 65mm in length in 2009 (DEHLG, 2010b). No young or juvenile mussels were recorded in the Licky during monitoring in 2005 or 2009 and there was no evidence that recruitment had occurred in at least 12 years, with the smallest mussel in 2009 measuring 85.3mm (Ross, 2005; DEHLG 2010c)
Population structure: adult mortality	Percentage	No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution	5% is considered the cut-off between the combined errors associated with natural fluctuations and sampling methods and evidence of true population decline. 1% of dead shells is considered to be indicative of natural losses. The Allow passed the target for live adults, but failed that for dead shells in 2009 (DEHLG, 2010b). The Blackwater and Licky failed both targets in 2009 (DEHLG, 2010a, 2010c)

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1029 Freshwater Pearl Mussel *Margaritifera margaritifera*

To restore the favourable conservation condition of the Freshwater Pearl Mussel in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat extent	Kilometres	Restore suitable habitat in more than 35km (see map 8) and any additional stretches necessary for salmonid spawning	The species' habitat covers stretches of very large, high energy, lowland rivers (Blackwater) and a short coastal river (Licky); and is a combination of 1) the area of habitat adult and juvenile mussels can occupy and 2) the area of spawning and nursery habitats the host fish can occupy. Fish nursery habitat typically overlaps with mussel habitat. Fish spawning habitat is generally adjacent to mussel habitat, but may lie upstream of the generalised mussel distribution. Only those salmonid spawning areas that could regularly contribute juvenile fish to the areas occupied by adult mussels should be considered. The availability of mussel habitat and fish spawning and nursery habitats are determined by flow and substratum conditions. The habitat for the species is currently unsuitable for the survival of adult mussels or the recruitment of juveniles. The target is based on the stretches of river identified, from a combination of dedicated survey and incidental records, as having suitable habitat for the species. As there has been no full baseline survey, the quality of the data from the Blackwater and its tributaries is poor
Water quality: macroinvertebrate and phytobenthos (diatoms)	ecological quality ratio (EQR)	Restore water quality-macroinvertebrates: EQR greater than 0.90; phytobenthos: EQR greater than 0.93	These EQRs correspond to high ecological status for these two Water Framework Directive biological quality elements. They represent high water quality with very low nutrient concentrations (oligotrophic conditions). The habitat in the Blackwater and Licky failed both standards during 2009 sampling for the Sub-basin Management Plans, while the Allow failed the macroinvertebrate target (DEHLG, 2010a, 2010b, 2010c). See also The European Communities Environmental Objectives (Surface Water Objectives) Regulations 2009 (Government of Ireland, 2009a)

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1029 Freshwater Pearl Mussel *Margaritifera margaritifera*

To restore the favourable conservation condition of the Freshwater Pearl Mussel in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Substratum quality: filamentous algae (macroalgae), macrophytes (rooted higher plants)	Percentage	Restore substratum quality- filamentous algae: absent or trace (<5%); macrophytes: absent or trace (<5%)	Significant growth of macrophytes was found at some sites in all three populations sampled during 2009 for the Sub-basin Management Plans (DEHLG, 2010a, 2010b, 2010c). Filamentous algae were below the target at all sites sampled in the Allow, however significant growths were detected at some sampling sites in the Blackwater and Licky (DEHLG, 2010a, 2010b, 2010c). Recruitment of juvenile mussels is being prevented by the poor quality of the river substrate
Substratum quality: sediment	Occurrence	Restore substratum quality- stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment	The habitat for the species is currently unsuitable for the recruitment of juveniles owing to sedimentation of the substratum. In some locations, it is also unsuitable for the survival of adult mussels, notably stretches of the Licky (DEHLG, 2010c). Significant sedimentation has been recorded during all recent mussel monitoring surveys, particularly in the Licky and Allow (DEHLG, 2010a, 2010b, 2010c). Recruitment of juvenile mussels is being prevented by the poor quality of the river substrate
Substratum quality: oxygen availability	Redox potential	Restore to no more than 20% decline from water column to 5cm depth in substrate	Differences in redox potential between the water column and the substrate correlate with differences in oxygen levels. Juvenile mussels require full oxygenation while buried in gravel. In suitable habitat, there should be very little loss of redox potential between the water column and underlying gravels. Redox potential data are currently only available from the Allow, where loss in 2009 was 31.5 - 44.1% at 5cm depth (DEHLG, 2010b)
Hydrological regime: flow variability	Metres per second	Restore appropriate hydrological regimes	The availability of suitable freshwater pearl mussel habitat is largely determined by flow (catchment geology being the other important factor). In order to restore the habitat for the species, flow variability over the annual cycle must be such that: 1) high flows can wash fine sediments from the substratum, 2) low flows do not exacerbate the deposition of fines and 3) low flows do not cause stress to mussels in terms of exposure, water temperatures, food availability or aspects of the reproductive cycle

1029 Freshwater Pearl Mussel *Margaritifera margaritifera*

To restore the favourable conservation condition of the Freshwater Pearl Mussel in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Host fish	Number	Maintain sufficient juvenile salmonids to host glochidial larvae	Salmonid fish are host to the larval form of the freshwater pearl mussel and, thus, they are essential to the completion of the life cycle. 0+ and 1+ fish are typically used, both because of the habitat overlaps and the development of immunity with age in the fish. Fish presence is considered sufficient, as higher densities and biomass of fish are indicative of enriched conditions in mussel rivers. Geist et al. (2006) found that higher densities of host fish coincided with eutrophication, poor substrate quality for pearl mussels and a lack of pearl mussel recruitment, while significantly lower densities and biomass of host fish were associated with high numbers of juvenile mussels. Fish movement patterns must be such that 0+ fish in the vicinity of the mussel habitat remain in the mussel habitat until their 1+ summer. No fish stocking should occur within the mussel habitat, nor any works that may change the salmonid balance or residency time. The Allow and Licky freshwater pearl mussel populations appear to favour native brown trout (<i>Salmo trutta</i>), therefore, it is particularly important that these are not out-competed by stocked fish (DEHLG, 2010b, 2010c). No data on fish preferences are available for the Blackwater

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1092 White-clawed Crayfish *Austropotamobius pallipes*

To maintain the favourable conservation condition of White-clawed Crayfish in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Occurrence	No reduction from baseline. See map 9	Within the Blackwater River system, white-clawed crayfish is present only on the Awbeg River. The Awbeg flows through limestone geology. There are other tributaries of the Blackwater with limestone geology but are not known to contain the species. The main Blackwater is considered chemically unsuitable for the crayfish. However, there have been two recent records from other parts of the river system. One was downstream of the confluence of the Awbeg and Blackwater and may simply represent a specimen moving out of the Awbeg. The second was upstream of Mallow and this may represent a new population or an introduction. More information is needed on these. On the Awbeg, the crayfish is found along the whole length of the designated part of the river. The Environmental Protection Agency (EPA) river quality monitoring on the Awbeg did not detect any crayfish in 2009. However, large numbers were found during river maintenance work in 2009 upstream of Buttevant and these were translocated to undisturbed habitat (Williams, 2009)
Population structure: recruitment	Percentage occurrence of juveniles and females with eggs	Juveniles and/or females with eggs in at least 50% of positive samples	See Reynolds et al. (2010) for further details
Negative indicator species	Occurrence	No alien crayfish species	Alien crayfish species are identified as major direct threat to this species and as disease vector. See Reynolds (1998) for further details
Disease	Occurrence	No instances of disease	Disease is identified as major threat and has occurred in Ireland even in the absence of alien vectors. See Reynolds et al. (2010) for further details
Water quality	EPA Q value	At least Q3-4 at all sites sampled by EPA	Target taken from Demers and Reynolds (2002). Q values based on triennial water quality surveys carried out by the EPA

1092 White-clawed Crayfish *Austropotamobius pallipes*

To maintain the favourable conservation condition of White-clawed Crayfish in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat quality: heterogeneity	Occurrence of positive habitat features	No decline in heterogeneity or habitat quality	Crayfish need high habitat heterogeneity. Larger crayfish must have stones to hide under, or an earthen bank in which to burrow. Hatchlings shelter in vegetation, gravel and among fine tree-roots. Smaller crayfish are typically found among weed and debris in shallow water. Larger juveniles in particular may also be found among cobbles and detritus such as leaf litter. These conditions must be available on the whole length of occupied habitat

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]**1095 Sea Lamprey *Petromyzon marinus***

To restore the favourable conservation condition of Sea Lamprey in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary. See map 10 for recorded distribution	Artificial barriers can block or cause difficulties to lampreys' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. See Gargan et al. (2011)
Population structure of juveniles	Number of age/size groups	At least three age/size groups present	Attribute and target based on data from Harvey and Cowx (2003) and O'Connor (2007)
Juvenile density in fine sediment	Juveniles/m ²	Juvenile density at least 1/m ²	Juveniles burrow in areas of fine sediment in still water. Attribute and target based on data from Harvey and Cowx (2003)
Extent and distribution of spawning habitat	m ² and occurrence	No decline in extent and distribution of spawning beds. See map 10 for recorded locations	Attribute and target based on spawning bed mapping by Inland Fisheries Ireland (IFI). Lampreys spawn in clean gravels. Survey in 2010 indicated accumulations of redds downstream of major weirs. (See also Gargan et al., 2011)
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive. See map 10 for recorded locations	Despite observed spawning activity, sampling for ammocoetes consistently fails to find these in many sampling stations and never in any great numbers. See King and Linnane (2004)

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1096 Brook Lamprey *Lampetra planeri*

To maintain the favourable conservation condition of Brook Lamprey in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	% of river accessible	Access to all water courses down to first order streams	Artificial barriers can block or cause difficulties to brook lampreys migration, both up- and downstream, thereby possibly limiting species to specific stretches and creating genetically isolated populations (Espanhol et al., 2007)
Population structure of juveniles	Number of age/size groups	At least three age/size groups of brook/river lamprey present	Attribute and target based on data from Harvey & Cowx (2003). It is impossible to distinguish between brook and river lamprey juveniles in the field (Gardiner 2003), hence they are considered together in this target
Juvenile density in fine sediment	Juveniles/m ²	Mean catchment juvenile density of brook/river lamprey at least 2/m ²	Juveniles burrow in areas of fine sediment in still water. Attribute and target based on data from Harvey & Cowx (2003) who state 10/m ² in optimal conditions and more than 2/m ² on a catchment basis
Extent and distribution of spawning habitat	m ² and occurrence	No decline in extent and distribution of spawning beds	Spawning site and redd attributes established by IFI (Rooney et al., in press)
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive. See map 10 for recorded locations	Many sites with suitable larval attributes i.e. fine sediment in low velocity habitat, are found not to contain larval lamprey. This may be a function of chance or probability, or may be a consequence of insufficient recruitment to fill all spatial niches. Occupancy in excess of 50% of sites would be 'reasonable' for the Irish catchments examined to date (King and Linnane, 2004; King et al., unpublished data)

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1099 River Lamprey *Lampetra fluviatilis*

To maintain the favourable conservation condition of River Lamprey in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	% of river accessible	Access to all water courses down to first order streams	Artificial barriers can block or cause difficulties to river lampreys' migration, both up- and downstream, thereby possibly limiting species to specific stretches and creating genetically isolated populations (Espanhol et al., 2007)
Population structure of juveniles	Number of age/size groups	At least three age/size groups of river/brook lamprey present	Attribute and target based on data from Harvey & Cowx (2003). It is impossible to distinguish between river and brook lamprey juveniles in the field (Gardiner 2003), hence they are considered together in this target
Juvenile density in fine sediment	Juveniles/m ²	Mean catchment juvenile density of brook/river lamprey at least 2/m ²	Juveniles burrow in areas of fine sediment in still water. Attribute and target based on data from Harvey & Cowx (2003) who state 10/m ² in optimal conditions and more than 2/m ² on a catchment basis
Extent and distribution of spawning habitat	m ² and occurrence	No decline in extent and distribution of spawning beds	Spawning site and redd attributes established by IFI (Rooney et al., in press)
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive. See map 10 for recorded locations of brook/river lamprey juveniles	Many sites with suitable larval attributes i.e. fine sediment in low velocity habitat, are found not to contain larval lamprey. This may be a function of chance or probability, or may be a consequence of insufficient recruitment to fill all spatial niches. Occupancy in excess of 50% of sites would be reasonable for the Irish catchments examined to date (King and Linnane, 2004; King et al., unpublished data)

1103 Twaite Shad *Alosa fallax*

To restore the favourable conservation condition of Twaite Shad in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	In some catchments, artificial barriers block twaite shads' upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Major weirs on the Blackwater prevent potential exploitation of adult spawning grounds
Population structure: age classes	Number of age classes	More than one age class present	Regular breeding has been confirmed in the River Blackwater in recent years (King and Linnane, 2004; King and Roche, 2008)
Extent and distribution of spawning habitat	m ² and occurrence	No decline in extent and distribution of spawning habitats	
Water quality: oxygen levels	Milligrammes per litre	No lower than 5mg/l	Attribute and target based on Maas, Stevens and Briene (2008)
Spawning habitat quality: Filamentous algae; macrophytes; sediment	Occurrence	Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plant) growth	

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1106 Atlantic Salmon *Salmo salar* (only in fresh water)

To maintain the favourable conservation condition of Atlantic Salmon in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	% of river accessible	100% of river channels down to second order accessible from estuary	Artificial barriers block salmon's upstream migration, thereby limiting species to lower stretches and restricting access to spawning areas. Large weirs on the Blackwater may delay salmon upstream migration in certain water conditions but do not generally prevent access to spawning areas
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded	A conservation limit is defined by the North Atlantic Salmon Conservation Organisation (NASCO) as "the spawning stock level that produces long-term average maximum sustainable yield as derived from the adult to adult stock and recruitment relationship". The target is based on the Standing Scientific Committee of the National Salmon Commission's annual model output of CL attainment levels. See SSC (2010). Stock estimates are either derived from direct counts of adults (rod catch, fish counter) or indirectly by fry abundance counts. The Blackwater is currently exceeding its CL for one sea winter salmon and its multi sea winter CL for 2012
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling	Target is threshold value for rivers currently exceeding their conservation limit (CL). As stock estimates are estimated by direct counts for the Blackwater, this attribute is not currently being measured at this site
Out-migrating smolt abundance	Number	No significant decline	Smolt abundance can be negatively affected by a number of impacts such as estuarine pollution, predation and sea lice (<i>Lepeophtheirus salmonis</i>)
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes	Salmon spawn in clean gravels
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA	Q values based on triennial water quality surveys carried out by the Environmental Protection Agency (EPA)

1130 Estuaries

To maintain the favourable conservation condition of Estuaries in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 3	Habitat area was estimated as 1208ha using OSi data and the Transitional Water Body area as defined under the Water Framework Directive. See marine supporting document for further details
Community extent	Hectares	Maintain the extent of the <i>Mytilus edulis</i> -dominated community, subject to natural processes. See map 5	Estimated during 2009 subtidal and intertidal surveys (Aquafact, 2010; ASU, 2010). See marine supporting document for further details
Community structure: <i>Mytilus edulis</i> density	Individuals/m ²	Conserve the high quality of the <i>Mytilus edulis</i> -dominated community, subject to natural processes	Observed during 2009 subtidal and intertidal surveys (Aquafact, 2010; ASU, 2010). See marine supporting document for further details
Community distribution	Hectares	Conserve the following community types in a natural condition: Intertidal estuarine sandy mud community complex; Subtidal estuarine fine sand with <i>Bathyporeia</i> spp. community complex; Sand and mixed sediment with polychaetes and crustaceans community complex; Coarse sediment community complex. See map 5	Habitat structure was elucidated from 2009 subtidal and intertidal surveys (Aquafact, 2010; ASU, 2010). See marine supporting document for further details

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1140 Mudflats and sandflats not covered by seawater at low tide

To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See map 4	Habitat area was estimated using OSi data as 284ha. See marine supporting document for further details
Community extent	Hectares	Maintain the extent of the <i>Zostera</i> - and <i>Mytilus edulis</i> -dominated communities, subject to natural processes. See map 5	Estimated during 2009 intertidal survey (ASU, 2010). See marine supporting document for further details
Community structure: <i>Zostera</i> shoot density	Shoots/m ²	Conserve the high quality of the <i>Zostera</i> -dominated community, subject to natural processes	Described as part of 2009 intertidal survey (ASU, 2010). See marine supporting document for further details
Community structure: <i>Mytilus edulis</i> density	Individuals/m ²	Conserve the high quality of the <i>Mytilus edulis</i> -dominated community, subject to natural processes	Described as part of 2009 intertidal survey (ASU, 2010). See marine supporting document for further details
Community distribution	Hectares	The following community types should be conserved in a natural condition: Intertidal estuarine sandy mud community complex and Sand and mixed sediment with polychaetes and crustaceans community complex. See map 5	Habitat structure was elucidated from 2009 intertidal survey (ASU, 2010). See marine supporting document for further details

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1220 Perennial vegetation of stony banks

To maintain the favourable conservation condition of Perennial vegetation of stony banks in the Blackwater River (Cork/Waterford) 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, including erosion and succession	Current area unknown. It was recorded from Ferrypoint during the National Shingle Beach Survey (Moore and Wilson, 1999). Extent was not mapped, but it was noted as one of the larger systems in County Waterford. NB further unsurveyed areas maybe present within the site
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes	Current distribution unknown
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Based on data from Moore and Wilson (1999). Shingle features are relatively stable in the long term. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from Moore and Wilson (1999). At Ferrypoint, the shingle is associated with shingle-based grassland and a lagoon. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain the typical vegetated shingle flora including the range of sub-communities within the different zones	Based on data from Moore and Wilson (1999). See coastal habitats supporting document for further details
Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Moore and Wilson (1999). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. See coastal habitats supporting document for further details

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1310 *Salicornia* and other annuals colonizing mud and sand

To maintain the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand in the Blackwater River (Cork/Waterford) 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, including erosion and succession	Habitat not recorded by McCorry and Ryle (2009) at Kinsalebeg but is known to occur at Foxhole, Black Bog and Tourig (Curtis and Sheehy-Skeffington, 1998). However, extent is un-mapped. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes	Habitat not recorded by McCorry and Ryle (2009) at Kinsalebeg but is known to occur at Foxhole, Black Bog and Tourig (Curtis and Sheehy-Skeffington, 1998). <i>Salicornia</i> is an annual species, so its distribution can vary significantly from year to year. See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions	Sediment supply is particularly important for this pioneer saltmarsh community, as the distribution of this habitat depends on accretion rates. See coastal habitats backing document for further details
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry and Ryle (2009). Creeks deliver sediment throughout saltmarsh system. Creeks and pan structures well developed in the larger sections of the marsh at Kinsalebeg. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	This pioneer saltmarsh community requires regular tidal inundation. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimeters	Maintain structural variation within sward	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover	Maintain the presence of species-poor communities with typical species listed in saltmarsh Monitoring Project (McCorry and Ryle, 2009)	See coastal habitats supporting document for further details

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1310 *Salicornia* and other annuals colonizing mud and sand

To maintain the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation structure: negative indicator species: <i>Spartina anglica</i>	Hectares	No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual spread of less than 1%	Based on data from McCorry and Ryle (2009). <i>Spartina</i> was recorded at Ferrypoint, but it was not noted to form swards on the mudflats. See coastal habitats supporting document for further details

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

To restore the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) in the Blackwater River (Cork/Waterford) 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, including erosion and succession. For sub-site mapped: Kinsalebeg - 2.77ha. See map 6	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). One sub-site that supported Atlantic salt meadow was mapped (2.77ha) and additional areas of potential saltmarsh (28.13ha) were identified from an examination of aerial photographs, giving a total estimated area of 30.90ha. Saltmarsh habitat also occurs at Tourig Hall and Ballinray House (Curtis and Sheehy-Skeffington, 1998). NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See map 6 for known distribution	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions	See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	Creeks and pan structures well developed at the larger sections of marsh in the Kinsalebeg sub-site. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Atlantic salt meadow occurs in mosaic with Mediterranean salt meadow at the Kinsalebeg saltmarsh. Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimeters	Maintain structural variation within sward	Most of the Atlantic salt meadows habitat at Kinsalebeg is grazed to a high intensity and sward height is quite low. Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of the saltmarsh area vegetated	Bare substrate occurs as a result of overgrazing in places at Kinsalebeg. Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

To restore the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub-communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: negative indicator species - <i>Spartina anglica</i>	Hectares	No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual spread of less than 1%	Based on data from McCorry and Ryle (2009). <i>Spartina</i> occurs at Kinsalebeg sub-site, but does not occupy a significant part of the saltmarsh vegetation. See coastal habitats supporting document for further details

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1355 Otter *Lutra lutra*

To restore the favourable conservation condition of Otter in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Percentage positive survey sites	No significant decline	Measure based on standard otter survey technique. FCS target, based on 1980/81 survey findings, is 88% in SACs. Current range in south-west estimated at 74.5% (Bailey & Rochford 2006)
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 103ha above high water mark (HWM); 1165.7ha along river banks/ around ponds	No field survey. Areas mapped to include 10m terrestrial buffer along shoreline (above HWM and along river banks) identified as critical for otters (NPWS, 2007)
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 647.2ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (HWM) (NPWS, 2007; Kruuk, 2006)
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 599.54km	No field survey. River length calculated on the basis that otters will utilise freshwater habitats from estuary to headwaters (Chapman & Chapman, 1982)
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 25.06ha	No field survey. Area mapped based on evidence that otters tend to forage within 80m of the shoreline (NPWS, 2007)
Couching sites and holts	Number	No significant decline	Otters need lying up areas throughout their territory where they are secure from disturbance (Kruuk, 2006; Kruuk & Moorhouse, 1991)
Fish biomass available	Kilograms	No significant decline	Broad diet that varies locally and seasonally, but dominated by fish, in particular salmonids, eels and sticklebacks in freshwater (Bailey & Rochford 2006) and wrasse and rockling in coastal waters (Kingston et al. 1999)
Barriers to connectivity	Number	No significant increase	Otters will regularly commute across stretches of open water up to 500m e.g. between the mainland and an island; between two islands; across an estuary (De Jongh & O'Neill, 2010). It is important that such commuting routes are not obstructed

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1410 Mediterranean salt meadows (*Juncetalia maritimi*)

To maintain the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*) in the Blackwater River (Cork/Waterford) 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, including erosion and succession. For sub-site mapped: Kinsalebeg: 1.36ha. See map 6	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). One sub-site that supports Mediterranean salt meadows was mapped (1.36ha) and additional areas of potential saltmarsh (8.67ha) were identified from an examination of aerial photographs, giving a total estimated area of 10.03ha. NB further unsurveyed areas maybe present within the site. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 6 for known distribution	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle 2009). See coastal habitats supporting document for further details
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain natural circulation of sediments and organic matter, without any physical obstructions	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). See coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain creek and pan structure, subject to natural processes, including erosion and succession	Based on data from the Saltmarsh Monitoring Project (McCorry and Ryle, 2009). The MSM at Kinsalebeg has a well developed saltmarsh structure in places. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	Mediterranean salt meadow is found high up in the saltmarsh but requires occasional tidal inundation. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated	Based on data from McCorry and Ryle (2009). Grazing intensity is not as high as in the Atlantic salt meadows. See coastal habitats supporting document for further details

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

1410 Mediterranean salt meadows (*Juncetalia maritimi*)

To maintain the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*) in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Vegetation composition: typical species	Percentage cover	Maintain range of sub-communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	Based on data from McCorry and Ryle (2009). See coastal habitats supporting document for further details
Vegetation structure: negative indicator species - <i>Spartina anglica</i>	Hectares	No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual spread of less than 1%	Based on data from McCorry and Ryle (2009). <i>Spartina</i> occurs at Kinsalebeg sub-site, but does not occupy a significant part of the saltmarsh vegetation. See coastal habitats supporting document for further details

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]**1421 Killarney Fern *Trichomanes speciosum***

To maintain the favourable conservation condition of Killarney Fern in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Location	No decline. Two locations known within the SAC. See map 10	Data from NPWS rare and threatened species database
Population size	Number	Maintain size and extent of existing colonies, including sporophyte frond counts and number of gametophyte patches	
Habitat extent	m ²	No loss of suitable habitat, such as shaded rock crevices, caves or gullies in, or near to, known colonies. No loss of woodland canopy at or near to known locations	Based on Kingston & Hayes (2005) and Ni Dhuill (pers comm)
Hydrological conditions: visible water	Occurrence	Maintain hydrological conditions at the locations so that all colonies are in dripping or damp seeping habitats, and water is visible at all locations	Based on Kingston & Hayes (2005) and Ni Dhuill (pers comm)
Hydrological conditions: humidity	Number of dessicated fronds	No increase. Presence of dessicated sporophyte fronds or gametophyte mats indicates conditions are unsuitable	Based on Kingston & Hayes (2005) and Ni Dhuill (pers comm)
Light levels: shading	Percentage	No changes due to anthropogenic impacts	Based on Kingston & Hayes (2005) and Ni Dhuill (pers comm)
Invasive species	Occurrence	Absent or under control	EHS & NPWS (2008) provides further details

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

3260 Water courses of plain to montane levels with the *Ranunculon fluitantis* and *Callitricho-Batrachion* vegetation

To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculon fluitantis* and *Callitricho-Batrachion* vegetation in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat distribution	Occurrence	No decline, subject to natural processes	The full distribution of this habitat and its sub-types in this site are currently unknown. The basis of the selection of the SAC for the habitat was the presence of plant species listed in the Interpretation Manual (European Commission, 2007), recorded during the Natural Heritage Area (NHA) survey of the river (internal NPWS files). Further records of these and other aquatic plant species in the Blackwater can be found in Green (2008) and O'Mahony (2009). The dominant floating-leaved species appears to be the common and widespread stream water-crowfoot (<i>Ranunculus penicillatus</i> subsp. <i>penicillatus</i>) (Green, 2008, O'Mahony, 2009). No high conservation value sub-types are known to occur in the SAC and further survey is required to determine whether any such are present. Only one rare/threatened vascular plant species is known to occur in the SAC, the protected opposite-leaved pondweed (<i>Groenlandia densa</i>), which is abundant in the tidal stretches around Cappoquin (Green, 2008). Note: rooted macrophytes should be absent or trace (< 5% cover) in freshwater pearl mussel (<i>Margaritifera margaritifera</i>) habitat. The freshwater pearl mussel (1029) conservation objective takes precedence over this objective for habitat 3260 in this SAC, because the mussel requires environmental conditions closer to natural background levels
Habitat area	Kilometres	Area stable or increasing, subject to natural processes	The full extent of this habitat in this site is currently unknown. See above

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

3260 Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation

To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Hydrological regime: river flow	Metres per second	Maintain appropriate hydrological regimes	Due to regular disturbance (through variations in flow), river macrophytes rarely reach a climax condition but frequently occur as transient communities. A natural (relatively unmodified) flow regime is required for both plant communities and channel geomorphology to be in favourable condition, exhibiting typical dynamics for the river type (Hatton-Ellis and Grieve, 2003). For most of the sub-types of this habitat, high flows are required to maintain the substratum (see below) necessary for the characteristic species. Flow variation is particularly important, with high and flood flows being critical to the hydromorphology. Other aspects of hydrological regime, such as groundwater discharge are important for certain sub-types of the habitat, which may be present within the SAC
Hydrological regime: tidal influence	Daily water level fluctuations- metres	Maintain natural tidal regime	Tidal regime appears to be an important influence on the distribution of opposite-leaved pondweed (<i>Groenlandia densa</i>) in Ireland. The species is also typical of the tidal reaches of other large Irish rivers, e.g. the Slaney, the Suir and the Shannon (see Preston, 2003; Preston and Croft, 2001). Both the disturbance and substratum associated with the tidal regime may be important drivers
Substratum composition: particle size range	Millimetres	The substratum should be dominated by the particle size ranges, appropriate to the habitat sub-type (typically sands, gravels and cobbles)	The size and distribution of substratum particles is largely determined by the river flow. Different habitat sub-types and species have different substratum requirements. Opposite-leaved pondweed (<i>Groenlandia densa</i>) is typically found on silts (mud), and sometimes sands

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

3260 Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation

To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Water quality: nutrients	Milligrammes per litre	The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition	Phosphorus (MRP) is typically the limiting nutrient, however increased nitrogen (NO ₃ -) negatively impacts upon some aquatic plant communities. Nutrient enrichment typically leads to increased filamentous-green-algal biomass, and consequent changes in other algae, bryophyte and macrophyte species composition and abundance. Water quality should reach a minimum of Water Framework Directive good status, in terms of nutrient and oxygenation standards and EQRs (ecological quality ratios) for macroinvertebrates and phytobenthos. For certain sub-types, other aspects of water quality, such as suspended sediment and minerals, should be considered
Vegetation composition: typical species	Occurrence	Typical species of the relevant habitat sub-type should be present and in good condition	The sub-types of this habitat are poorly understood and their typical species have not yet been defined. Typical species and appropriate targets may emerge to be site-specific. The typical species may include higher plants, bryophytes, macroalgae and microalgae
Floodplain connectivity: area	Hectares	The area of active floodplain at and upstream of the habitat should be maintained	River connectivity with the floodplain is essential for the functioning of this habitat. Floodplain connectivity is particularly important in terms of sediment sorting and nutrient deposition. The Blackwater valley has extensive floodplains. The functioning of these floodplains, in relation to sediment and nutrient dynamics, is currently being impaired by arable agriculture

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

To restore the favourable conservation condition of Old sessile oak woods with *Ilex* and *Blechnum* in the Blackwater River (Cork/Waterford) 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, at least 263.7ha for sub-sites surveyed. See map 7	Minimum area, based on 15 sites surveyed by Perrin et al. (2008) - site codes 1326, 1340, 1354, 1355, 1359, 1459, 1488, 1490, 1492, 1543, 1626, 1819, 1842, 1844, 1846. NB further unsurveyed areas are almost certainly present within the site. Map 7 shows semi-natural woodland extent within the SAC. See woodland habitats supporting document for further details
Habitat distribution	Occurrence	No decline. Surveyed locations shown on map 7	Distribution based on Perrin et al. (2008). NB further unsurveyed areas maybe present within the site. Map 7 shows semi-natural woodland distribution within the SAC. See woodland habitats supporting document for further details
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	The sizes of at least some of the existing woodlands need to be increased in order to reduce habitat fragmentation and benefit those species requiring 'deep' woodland conditions (Peterken, 2002). Topographical constraints may restrict expansion. See woodland habitats supporting document for further details
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer	Described in Perrin et al. (2008). See woodland habitats supporting document for further details
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008). See woodland habitats supporting document for further details
Woodland structure: natural regeneration	Seedling: sapling: pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy	Oak regenerates poorly. In suitable sites ash can regenerate in large numbers although few seedlings reach pole size
Woodland structure: dead wood	m ³ per hectare; number per hectare	At least 30m ³ /ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

To restore the favourable conservation condition of Old sessile oak woods with *Ilex* and *Blechnum* in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Woodland structure: veteran trees	Number per hectare	No decline	Mature and veteran trees are important habitats for bryophytes, lichens, saproxylic organisms and some bird species. Their retention is important to ensure continuity of habitats/niches and propagule sources
Woodland structure: indicators of local distinctiveness	Occurrence	No decline	Includes ancient or long-established woodlands, archaeological and geological features as well as red-data and other rare or localised species. Perrin and Daly (2010) list the 15 sites listed above as containing potential ancient/long established woodlands
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%	Species reported in Perrin et al. (2008)
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including sessile oak (<i>Quercus petraea</i>) and birch (<i>Betula pubescens</i>)	Species reported in Perrin et al. (2008)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control	The following are the most common invasive species in this woodland type: beech (<i>Fagus sylvatica</i>), sycamore (<i>Acer pseudoplatanus</i>), rhododendron (<i>Rhododendron ponticum</i>), cherry laurel (<i>Prunus laurocerasus</i>)

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

91E0 *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, *Alnion incanae*, *Salicion albae*)

To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, *Alnion incanae*, *Salicion albae*) in the Blackwater River (Cork/Waterford) 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, at least 19.2ha for sites surveyed. See map 7	Minimum area, based on 6 sites surveyed by Perrin et al. (2008) - site codes 1343, 1459, 1464, 1488, 1824, 1998. NB further unsurveyed areas are almost certainly present within the SAC. Map 7 shows semi-natural woodland extent within the SAC. See woodland habitats supporting document for further details
Habitat distribution	Occurrence	No decline. Surveyed locations shown on map 7	Distribution based on Perrin et al. (2008). NB further unsurveyed areas may be present within the SAC. Map 7 shows semi-natural woodland distribution within the SAC. See woodland habitats supporting document for further details
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	The sizes of at least some of the existing woodlands need to be increased in order to reduce habitat fragmentation and benefit those species requiring 'deep' woodland conditions (Peterken, 2002). Topographical and land-ownership constraints may restrict expansion
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer	Described in Perrin et al. (2008). See woodland habitats supporting document for further details
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008). See woodland habitats supporting document for further details
Woodland structure: natural regeneration	Seedling: sapling: pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy	Alder and oak regenerate poorly. Ash often regenerates in large numbers although few seedlings reach pole size
Hydrological regime: flooding depth/height of water table	Metres	Appropriate hydrological regime necessary for maintenance of alluvial vegetation	Periodic flooding is essential to maintain alluvial woodlands along river floodplains
Woodland structure: dead wood	m ³ per hectare; number per hectare	At least 30m ³ /ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder)	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem

Conservation objectives for: Blackwater River (Cork/Waterford) SAC [002170]

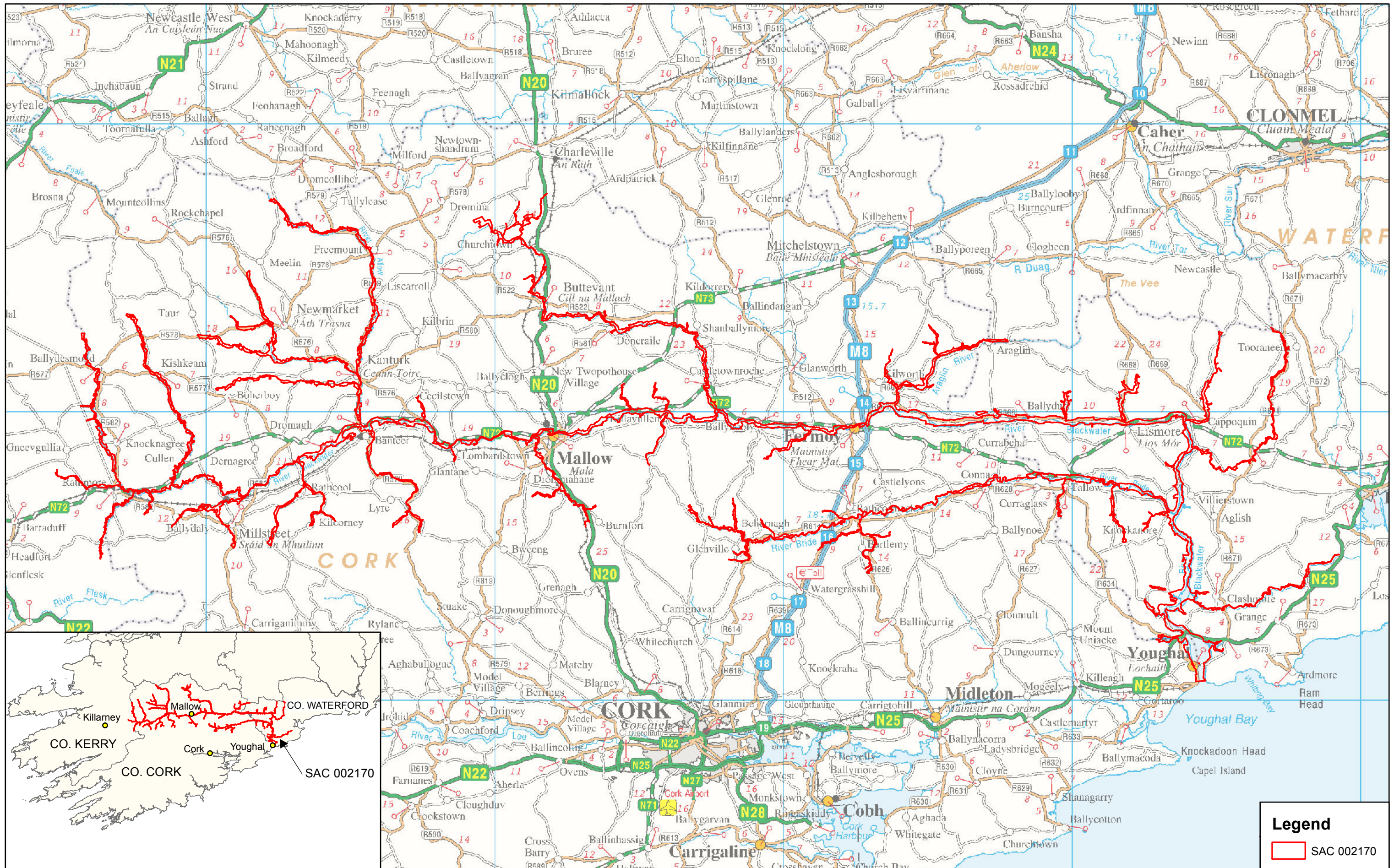
91E0 *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, *Alnion incanae*, *Salicion albae*)

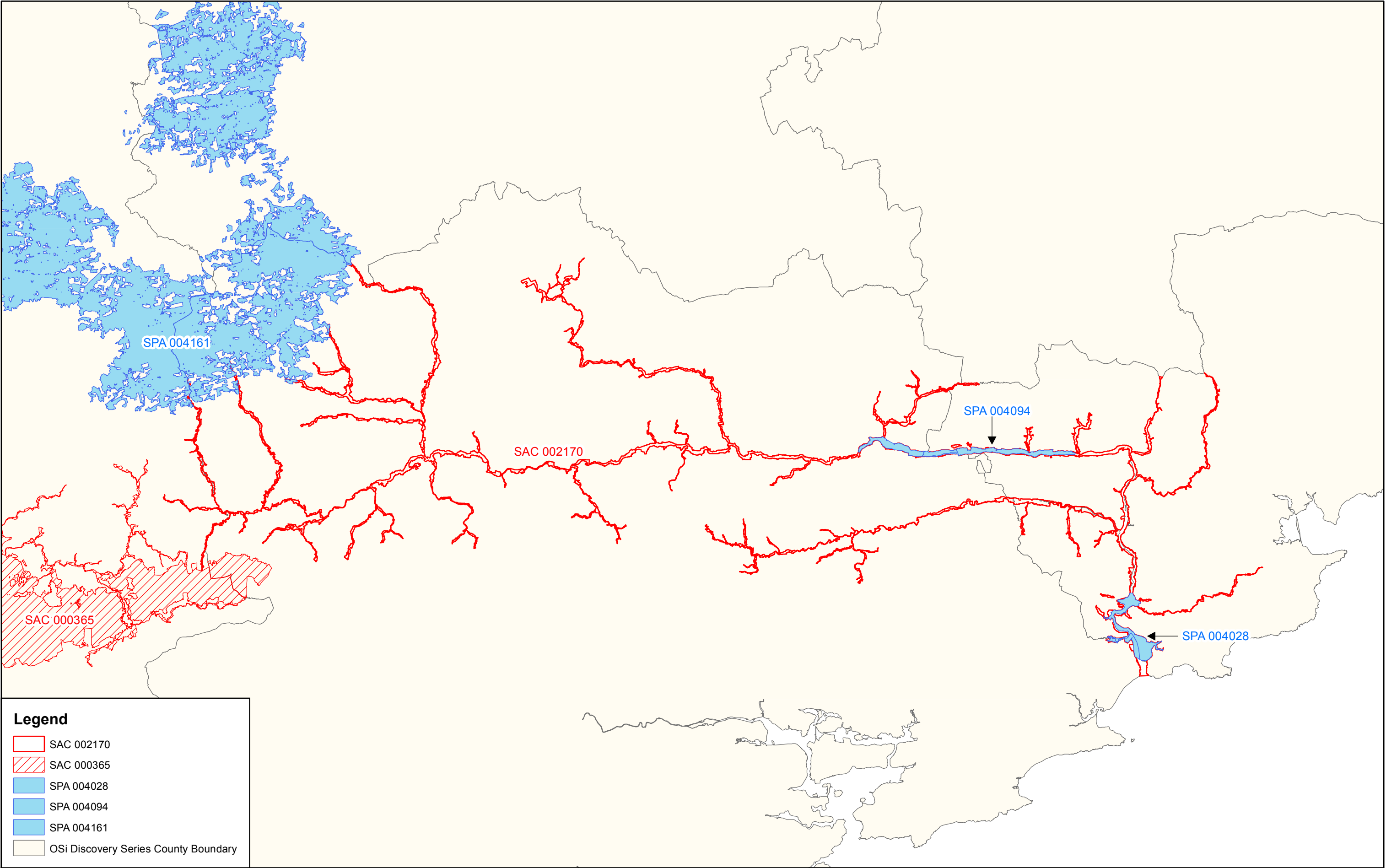
To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, *Alnion incanae*, *Salicion albae*) in the Blackwater River (Cork/Waterford) SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Woodland structure: veteran trees	Number per hectare	No decline	Mature and veteran trees are important habitats for bryophytes, lichens, saproxylic organisms and some bird species. Their retention is important to ensure continuity of habitats/niches and propagule sources
Woodland structure: indicators of local distinctiveness	Occurrence	No decline	Includes ancient or long-established woodlands, archaeological and geological features as well as red-data and other rare or localised species. Perrin & Daly (2010) list three sites as containing potential ancient/long established woodlands in the SAC
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%	Species reported in Perrin et al. (2008)
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including alder (<i>Alnus glutinosa</i>), willows (<i>Salix</i> spp) and, locally, oak (<i>Quercus robur</i>) and ash (<i>Fraxinus excelsior</i>)	Species reported in Perrin et al. (2008)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control	The following are the most common invasive species in this woodland type: beech (<i>Fagus sylvatica</i>), sycamore (<i>Acer pseudoplatanus</i>), cherry laurel (<i>Prunus laurocerasus</i>), Himalayan balsam (<i>Impatiens glandulifera</i>)

91J0 **Taxus baccata* woods of the British Isles


The status of *Taxus baccata* woods of the British Isles as a qualifying Annex I habitat for the Blackwater River (Cork/Waterford) SAC is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this habitat.





Legend

- SAC 002170
- SAC 000365
- SPA 004028
- SPA 004094
- SPA 004161
- OSi Discovery Series County Boundary

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

**MAP 2:
BLACKWATER RIVER SAC
CONSERVATION OBJECTIVES
ADJOINING/OVERLAPPING
DESIGNATIONS**

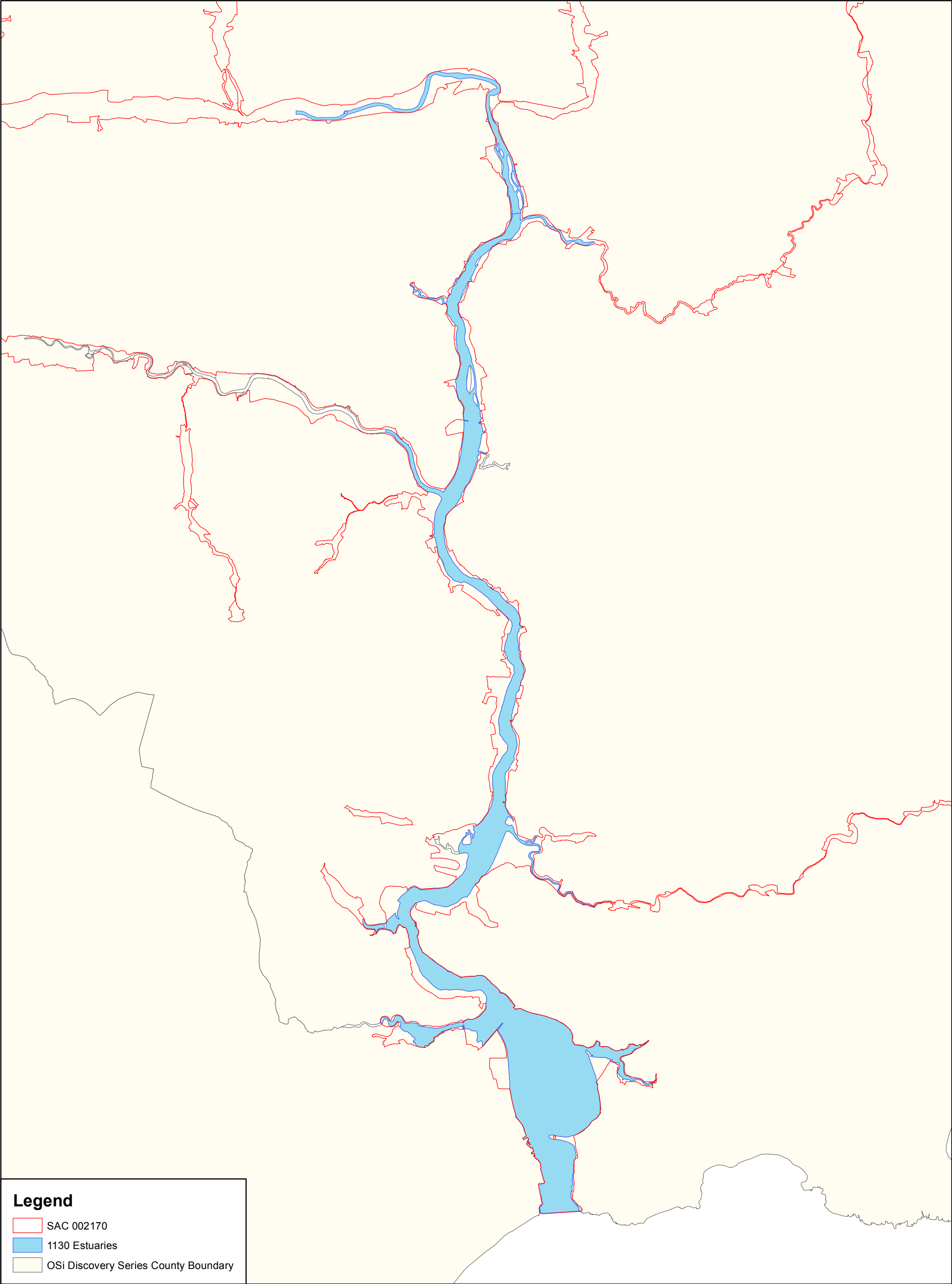
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE: SAC 002170 CO. CORK; version 1.15, CO. KERRY; version 1.04, CO. TIPPERARY; version 1, CO. WATERFORD; version 1.06
SAC 000365 CO. CORK; version 1, CO. KERRY; version 1.19
SPA 004028 CO. CORK; version 1.04, CO. WATERFORD; version 1.02
SPA 004094 CO. CORK; version 1.01, CO. WATERFORD; version 1.02
SPA 004161 CO. CORK; version 2.12, CO. LIMERICK; version 2.14, CO. KERRY; version 2.17




0 5 10 15 20 km

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Níl sna teorainneacha ar na léarscáileanna ach nod garshuíomhach ginearálta. Féadfar athbhreithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis le chead ón Rialtas (Ceadúnas Uimh. EN 0059208)


Map Version 1
Date: March 2012



Legend

-  SAC 002170
-  1130 Estuaries
-  OSi Discovery Series County Boundary

**MAP 3:
BLACKWATER RIVER SAC
CONSERVATION OBJECTIVES
ESTUARIES**

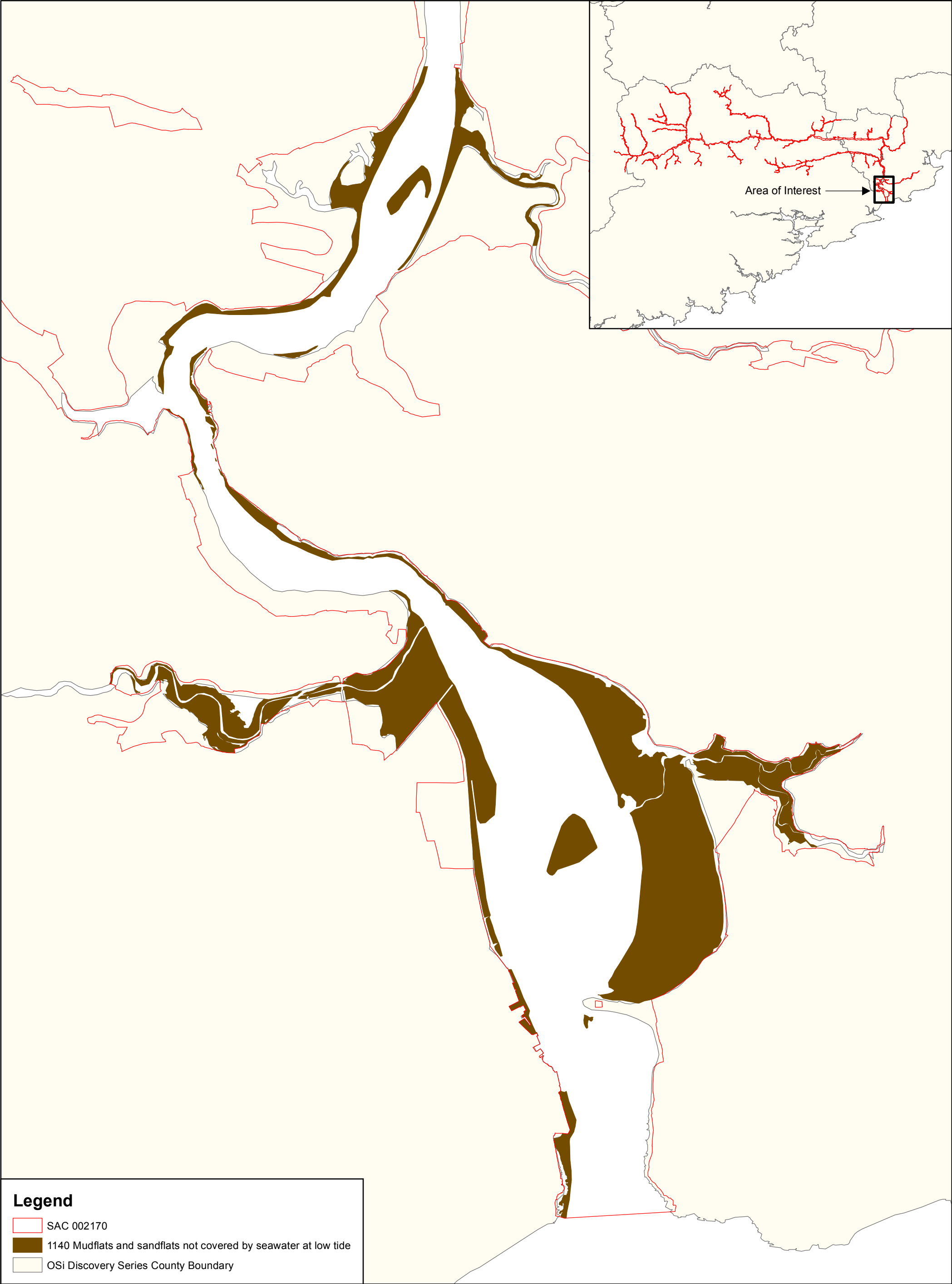
Map to be read in conjunction with the NPWS Conservation Objectives Document.

SITE CODE: SAC 002170
CO. CORK; version 1.15, CO. KERRY; version 1.04,
CO. TIPPERARY; version 1, CO. WATERFORD; version 1.06



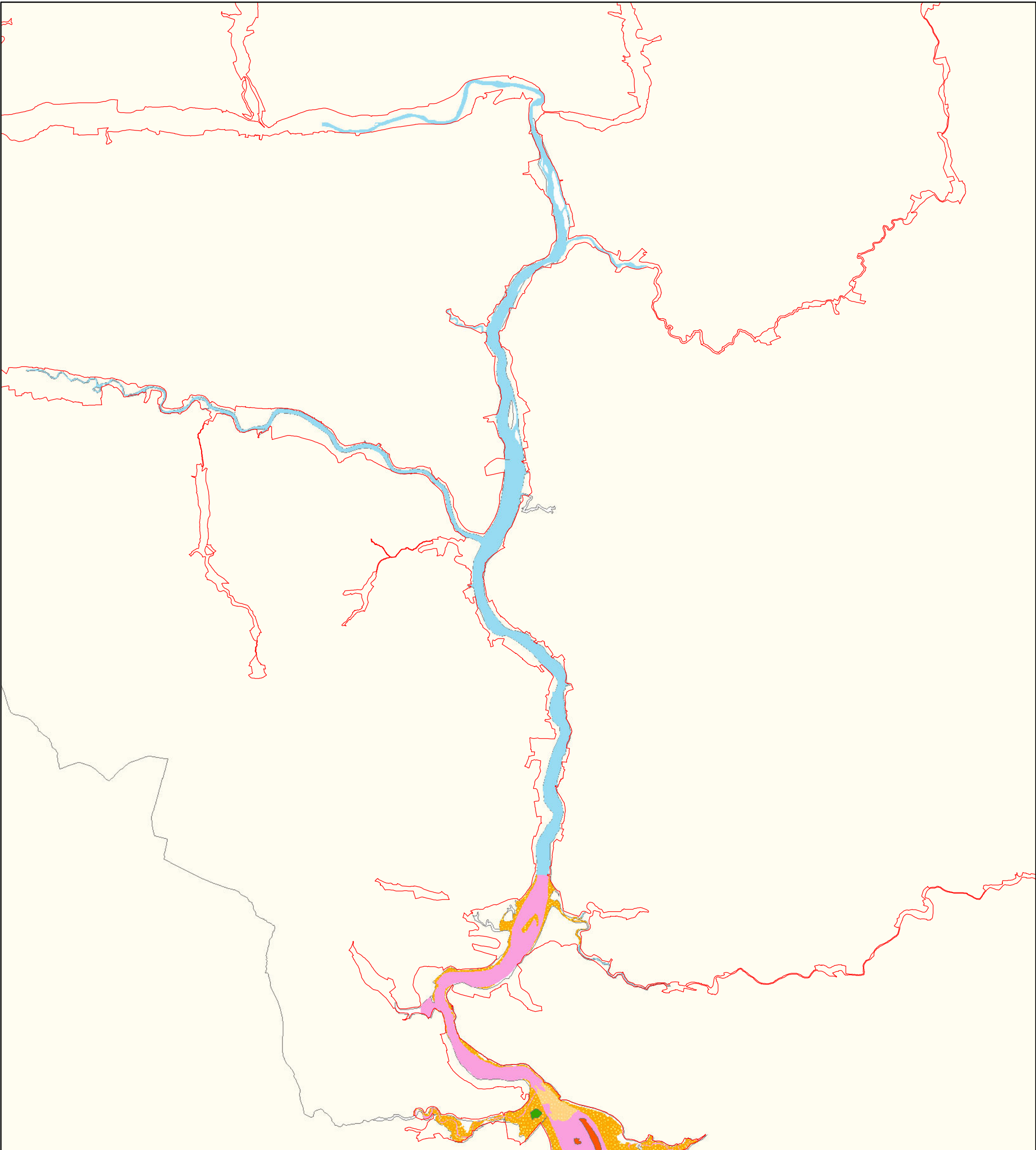
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Níl sna teorainneacha ar na léarscáileanna ach nod garshuíomhach ginearálta.
Féadfar athbhreithnithe a déanamh ar theorainneacha na goeantar
comharthaithe. Macasamhail d'ábhar na Suirbhéarachta Ordonáis
le chead ón Rialtas (Ceadúnas Uimh. EN 0059208)





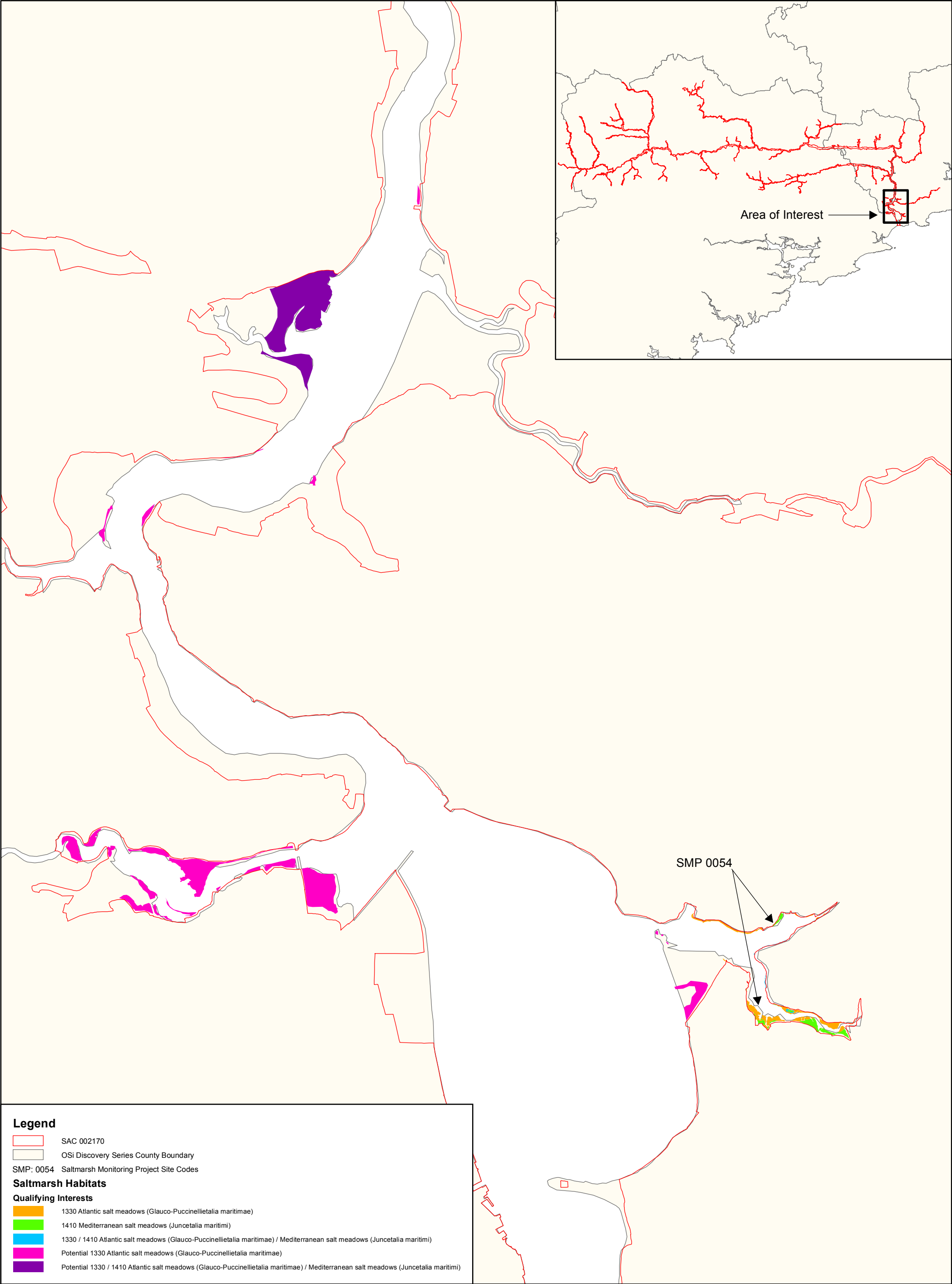
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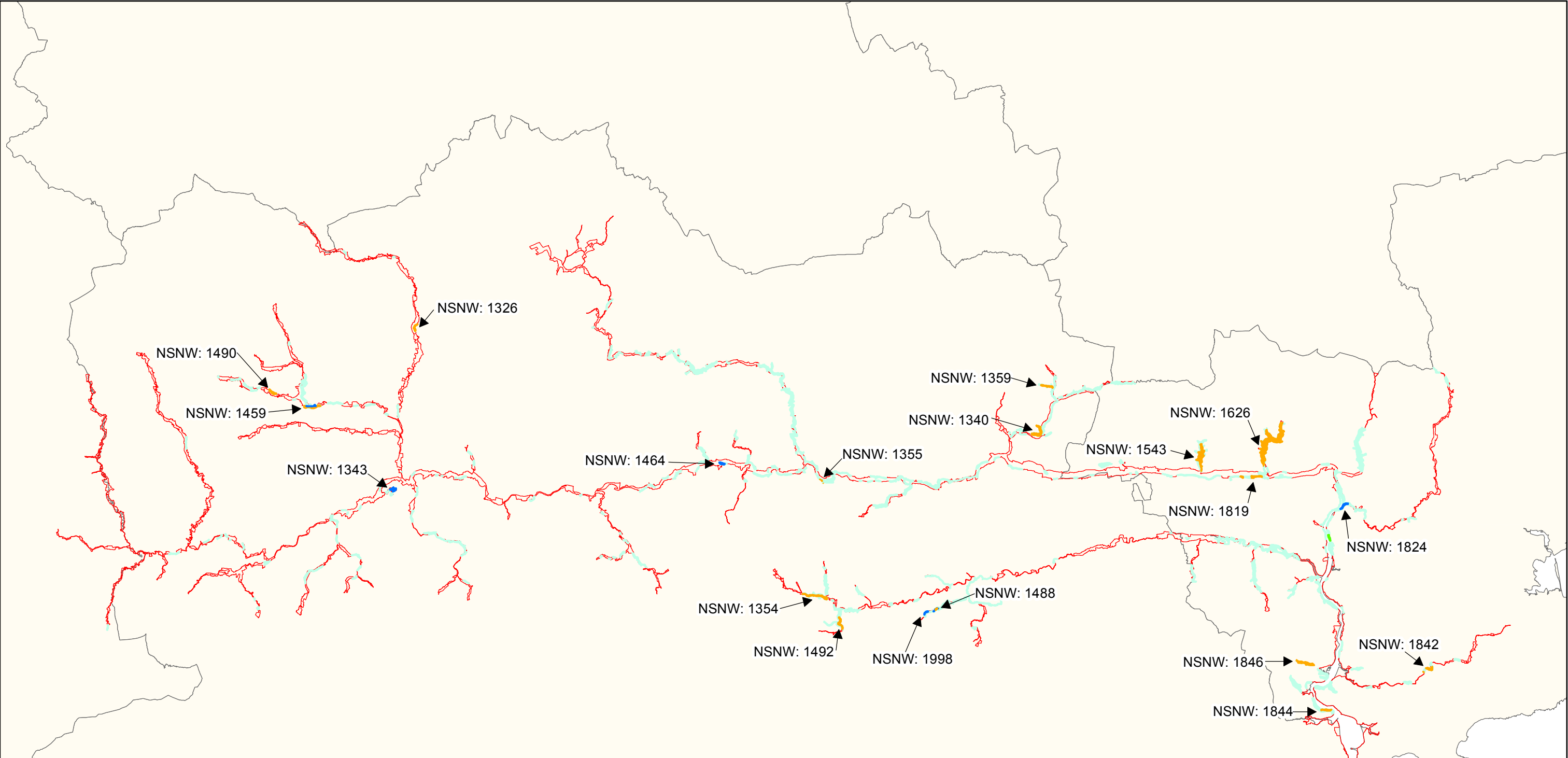
- SAC 002170
- 1140 Mudflats and sandflats not covered by seawater at low tide
- OSi Discovery Series County Boundary



Legend

- SAC 002170
- OSi Discovery Series County Boundary
- Marine Community Type**
- Coarse sediment community complex
- Intertidal estuarine sandy mud community complex
- Mytilus edulis*-dominated community
- River
- Sand and mixed sediment with polychaetes and crustaceans community complex
- Subtidal estuarine fine sand with *Bathyporeia* spp. community complex
- Zostera*-dominated community





Legend

SAC 002170

OSi Discovery Series County Boundary

NSNW: 1326

National Survey of Native Woodland Site Codes

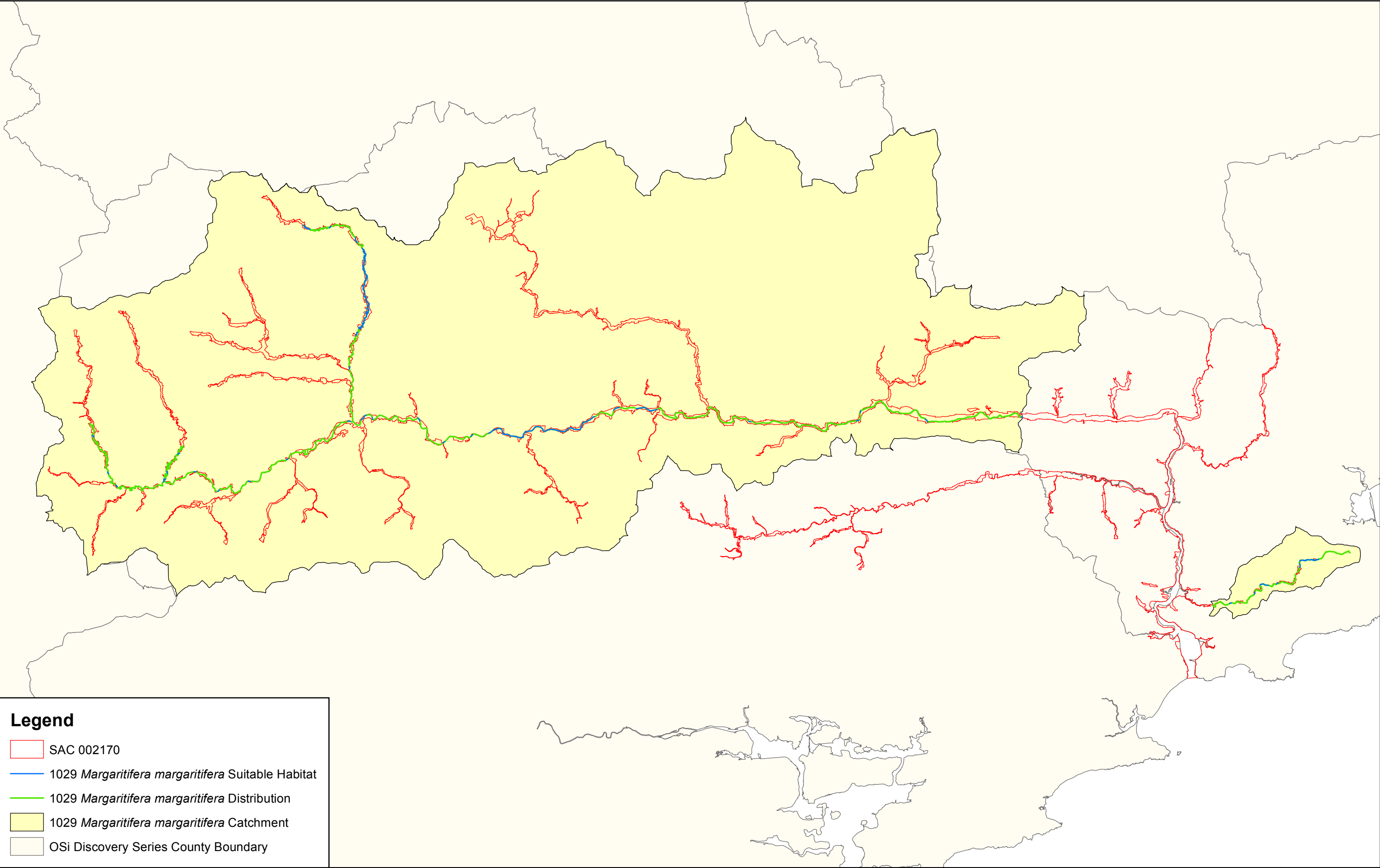
Woodland Habitats

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

91E0 *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-padion, Alnion incanae, Salicion albae)

91J0 **Taxus baccata* woods of the British Isles

Semi-natural Woodland



Legend

SAC 002170

1029 *Margaritifera margaritifera* Suitable Habitat

1029 *Margaritifera margaritifera* Distribution

1029 *Margaritifera margaritifera* Catchment

OSi Discovery Series County Boundary

