

# National Parks and Wildlife Service

## *Conservation Objectives Series*

### Newport River SAC 002144



An Roinn Cultúir,  
Oidhreacht agus Gaeltachta  
Department of Culture,  
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*

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002144	Newport River SAC
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1029	Freshwater Pearl Mussel <i>Margaritifera margaritifera</i>
1106	Salmon <i>Salmo salar</i>

## Supporting documents, relevant reports & publications

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

### NPWS Documents

<b>Year :</b>	2005
<b>Title :</b>	Monitoring populations of the Freshwater Pearl Mussel <i>Margaritifera margaritifera</i> . Baseline survey of the Newport River cSAC, County Mayo
<b>Author :</b>	Moorkens, E.A.
<b>Series :</b>	Unpublished report to NPWS
<b>Year :</b>	2009
<b>Title :</b>	NS II Freshwater pearl mussel sub-basin management plans: fisheries survey. Stage 1 report
<b>Author :</b>	Paul Johnston Associates
<b>Series :</b>	Unpublished report to NPWS
<b>Year :</b>	2009
<b>Title :</b>	NS II Freshwater Pearl Mussel Sub-basin Management Plans: Monitoring of the Freshwater Pearl Mussel in the Newport
<b>Author :</b>	Moorkens, E.A.
<b>Series :</b>	Unpublished report to NPWS
<b>Year :</b>	2009
<b>Title :</b>	NS2 Freshwater Pearl Mussel Sub-Basin Management Plans. Phytobenthos monitoring of the Newport Catchment, Co. Mayo. (WRBD). June 2009
<b>Author :</b>	Ní Chatháin, B.
<b>Series :</b>	Unpublished report to NPWS
<b>Year :</b>	2009
<b>Title :</b>	NS II Freshwater Pearl Mussel Sub-basin Management Plans: Report on Biological Monitoring of Surface Water Quality in Newport Catchment, Co. Mayo
<b>Author :</b>	Williams, L.
<b>Series :</b>	Unpublished report to NPWS
<b>Year :</b>	2010
<b>Title :</b>	Second Draft Newport Freshwater Pearl Mussel Sub-basin Management Plan (2009-2015). March 2010
<b>Author :</b>	NPWS
<b>Series :</b>	Unpublished document to the Department of Environment, Heritage and Local Government
<b>Year :</b>	2013
<b>Title :</b>	The status of EU protected habitats and species in Ireland. Volume 3. Species assessments
<b>Author :</b>	NPWS
<b>Series :</b>	Conservation assessments
<b>Year :</b>	2017
<b>Title :</b>	Newport River, 2015 <i>Margaritifera</i> monitoring results
<b>Author :</b>	Ross, E.
<b>Series :</b>	Unpublished report to NPWS
<b>Year :</b>	2018
<b>Title :</b>	Electrofishing survey to identify fish hosts for the freshwater pearl mussel <i>Margaritifera margaritifera</i> in 12 populations in the Republic of Ireland. 2017 Survey
<b>Author :</b>	Johnston, P.M.; Moorkens, E.A.
<b>Series :</b>	Unpublished report to NPWS
<b>Year :</b>	in prep.
<b>Title :</b>	The status of EU protected habitats and species in Ireland (2013-2018). Species assessments
<b>Author :</b>	NPWS
<b>Series :</b>	Conservation assessments

## Other References

<b>Year :</b>	1984
<b>Title :</b>	Studies on the biology of freshwater mussels (Lamellibranchia: Unionacea) in Ireland
<b>Author :</b>	Ross, E.D.
<b>Series :</b>	Unpublished MSc thesis. National University of Ireland, Galway
<b>Year :</b>	2006
<b>Title :</b>	The status of host fish populations and fish species richness in European freshwater pearl mussel ( <i>Margaritifera margaritifera</i> ) streams
<b>Author :</b>	Geist, J.; Porkka, M.; Kuehn, R.
<b>Series :</b>	Aquatic Conservation: Marine and Freshwater Ecosystems, 16: 251-266
<b>Year :</b>	2014
<b>Title :</b>	Assessing near-bed velocity in a recruiting population of the endangered freshwater pearl mussel ( <i>Margaritifera margaritifera</i> ) in Ireland
<b>Author :</b>	Moorkens, E.; Killeen, I.
<b>Series :</b>	Aquatic Conservation: Marine and Freshwater Ecosystems, 24(6): 853-862
<b>Year :</b>	2019
<b>Title :</b>	The Status of Irish Salmon Stocks in 2018 with Catch Advice for 2019
<b>Author :</b>	Technical Expert Group on Salmon (TEGOS)
<b>Series :</b>	Report of the Technical Expert Group on Salmon (TEGOS) to Inland Fisheries Ireland (IFI)

## Spatial data sources

<b>Year :</b>	Revision 2012
<b>Title :</b>	Margaritifera Sensitive Areas data
<b>GIS Operations :</b>	Relevant catchment boundaries identified. Expert opinion used as necessary to resolve any issues arising
<b>Used For :</b>	1029 (map 2)
<hr/>	
<b>Year :</b>	2018
<b>Title :</b>	NPWS rare and threatened species database
<b>GIS Operations :</b>	Dataset created from spatial references in database records. Expert opinion used as necessary to resolve any issues arising
<b>Used For :</b>	1029 (map 2)
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## Conservation Objectives for : Newport River SAC [002144]

### 1029 Freshwater Pearl Mussel *Margaritifera margaritifera*

**To restore the favourable conservation condition of Freshwater Pearl Mussel (*Margaritifera margaritifera*) in Newport River SAC, which is defined by the following list of attributes and targets:**

Attribute	Measure	Target	Notes
Distribution	Kilometres	Maintain distribution at 8.82km. See map 2	The conservation objective applies to the Newport freshwater pearl mussel ( <i>Margaritifera margaritifera</i> ) population. The distribution and abundance of the freshwater pearl mussel in the Newport was mapped in 2005, as part of full, baseline monitoring (Moorkens, 2005). Mussels are distributed in the Newport River from c.1.8km downstream of Lough Beltra to the tidal limit. A 1900-1950 record exists for the Crumpaun River, but no mussels were found there in 2015 (Ross, 2017). The tributaries of the Newport and Lough Beltra have been little surveyed and require further investigation. The target is for the species to be sufficiently widespread to maintain itself on a long-term basis as a viable component of the Newport system. See NPWS (2010) for further information
Population size	Number of adult mussels	Restore population to at least 150,000 adult mussels	Moorkens (2009) estimated the Newport population as 150,000. The population is considered to have declined significantly between 1995 and 2005-2009 (Moorkens, 2005, 2009; NPWS, 2010). In 2005, mussels numbers were generally low and the maximum density recorded was 62/m <sup>2</sup> , but mussels were categorised as abundant (>250/100m) in most stretches between the large weir and the estuary (Moorkens, 2005). Mussel density was generally low again in 2009 and 2015 (Moorkens, 2009; NPWS, 2010; Ross, 2017). Moorkens (2009) noted that mussels were concentrated along the channel banks. These results were in contrast to 1995, when mussels were distributed across the width of the channel, with up to 150/m <sup>2</sup> in places (Moorkens, 2009). NPWS (2013, in prep.) assumed that the Newport population had declined at a rate of 3% per year 2007-2012 and 2013-2018. The target is for the species to be sufficiently abundant to maintain itself on a long-term basis as a viable component of the Newport system
Population structure: recruitment	Percentage per size class	Restore to at least 20% of population no more than 65mm in length; and at least 5% of population no more than 30mm in length	Mussels ≤65mm are considered 'young mussels' and may be found buried in the substratum and/or beneath adult mussels. Mussels ≤30mm are 'juvenile mussels' and are always buried in the substratum. See the European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009 and I.S. EN 16859:2017. Size profile studies in the Newport by Ross (1984) and Moorkens (2005, 2009) are summarised in NPWS (2010). The Newport failed both targets in 2005, 2009 and 2015 (Moorkens, 2005, 2009; Ross, 2017). The smallest mussel in 2005 was 59mm (Moorkens, 2005). No juveniles or young mussels were found in 2009 (Moorkens, 2009). No juveniles were observed in 2015, and only a single young mussel (58.4mm) (Ross, 2017). The Newport population is unsustainable owing to lack of survival of juvenile mussels. The target is for sufficient juvenile recruitment to allow the species to maintain itself on a long-term basis as a viable component of the Newport system



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 Newport failed both targets in 2009 (Moorkens, 2009; NPWS, 2010). Overall, a significant reduction in adult numbers was noted between 1995 and 2005-2009, as well as changes in mussel density and distribution (Moorkens, 2005, 2009; NPWS, 2010). Dead shells were common in 2005, 2009 and 2015. Erratic changes in adult numbers in 2015 suggested flood transport of mussels and possible high stress levels (Ross, 2017). The Newport population is unsustainable owing to elevated adult mortality, as well as lack of survival of juvenile mussels. The target is for sufficient survival of adults to allow the species to maintain itself on a long-term basis as a viable component of the Newport system
Suitable habitat: extent	Kilometres	Maintain habitat extent at 8.82km in the Newport River (see map 2) and any additional stretches necessary for salmonid spawning	The extent of the mussel habitat in the Newport River downstream of Lough Beltra is well-documented and is from the confluence of the stream flowing out of Derrynafreva Lough to the tidal limit (Moorkens, 2005, 2009; NPWS, 2010). As noted above, however, further survey for suitable habitat is required in the tributaries of the Newport River and Beltra Lough. Owing to the decline in the mussel population from at least 1995 on, much of the suitable habitat is below carrying capacity and is unsuitable for juvenile recruitment. Siltation and nutrient enrichment are key impacts on the Newport mussel habitat. The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Newport system
Suitable habitat: condition	Kilometres	Restore condition of suitable habitat	The habitat is a combination of 1) the area of habitat adult and juvenile mussels can occupy; 2) the area of spawning and nursery habitats 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 spawning areas that regularly contribute juvenile fish to adult mussel habitat should be considered. Mussel and fish habitat availability is determined by flow and substratum and is highly sensitive to hydromorphological, sedimentation and enrichment pressures from throughout the catchment (map 2). See I.S. EN 16859:2017. Mussel habitat is widespread in the Newport but cannot support sufficient adult or juvenile survival (Moorkens, 2005, 2009; Ross, 2017). The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Newport system
Water quality: macroinvertebrate and phytobenthos (diatoms)	Ecological quality ratio (EQR)	Restore water quality-macroinvertebrates: EQR greater than 0.90 (Q4-5 or Q5); phytobenthos: EQR greater than 0.93	The EQR targets 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). Reaching these targets does not, however, guarantee achieving the targets for the other attributes. In 2009, the habitat in the Newport system failed the macroinvertebrate target, but passed the diatom target (Ní Chatháin, 2009; Williams, 2009; NPWS, 2010). See also The European Communities Environmental Objectives (Surface Waters) Regulations 2009. The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Newport system

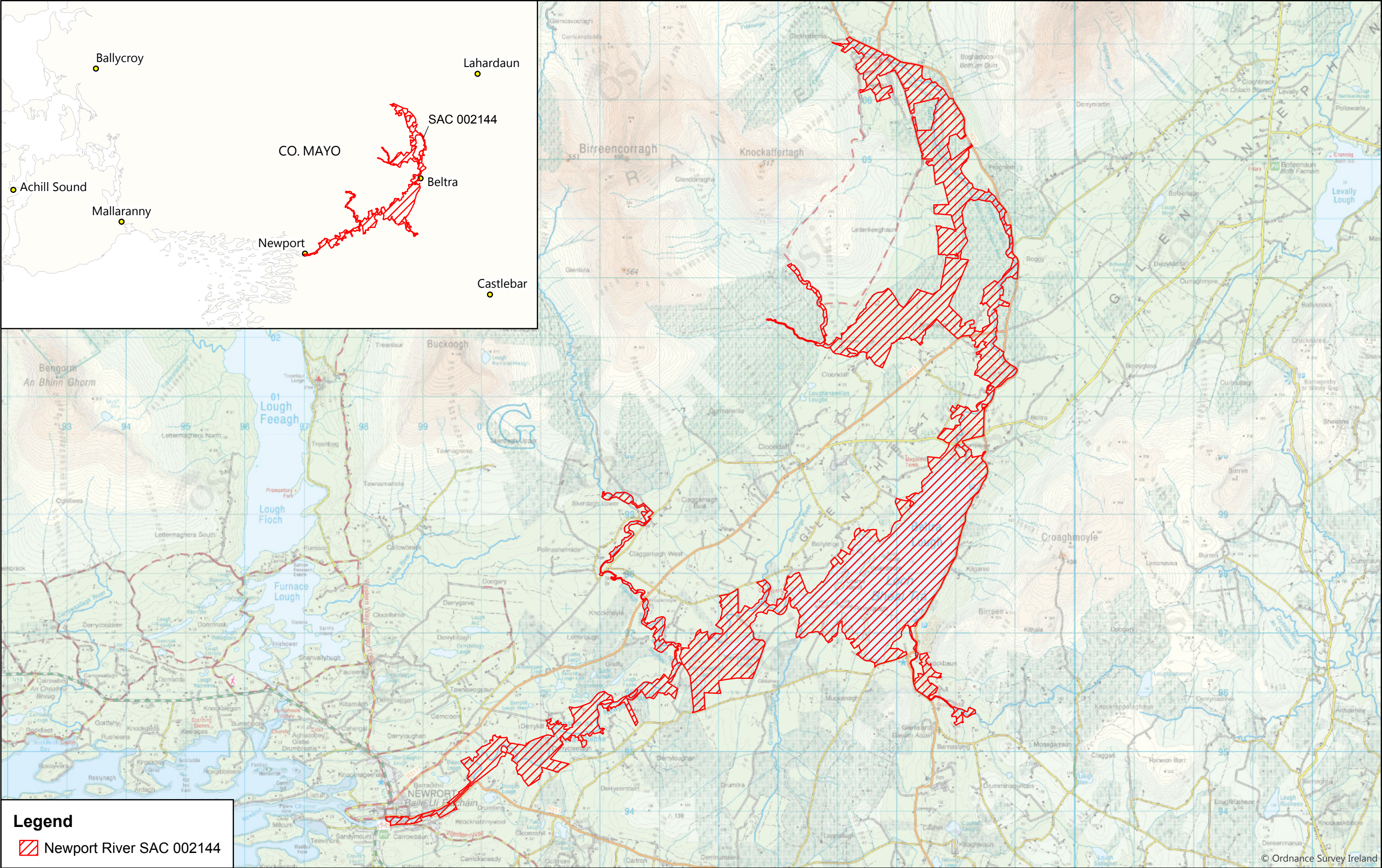
Substratum quality: filamentous algae (macroalgae); macrophytes (rooted higher plants)	Percentage	Restore substratum quality- filamentous algae: absent or trace (less than 5%); macrophytes: absent or trace (less than 5%)	The Newport failed both targets in 2009 (NPWS, 2010). Abundant and luxuriant growth of filamentous algae was recorded throughout the Newport catchment, including the main Newport channel (Ní Chatháin, 2009; Williams, 2009; NPWS, 2010). Algae were also excessively abundant in 2005 (Moorkens, 2005). The cross-sectional distribution of mussels, with mussels more abundant near the river banks, is considered likely to be the result of algal abundance in the unshaded centre of the channel (Moorkens, 2005, 2009; NPWS, 2010). It failed the macrophyte target and passed the algal target in September 2015, but macroalgae were present in July 2015 (Ross, 2017). Sufficient recruitment of juvenile mussels and adult survival is being prevented by the poor condition of the river substratum. The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Newport system
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 Newport failed the target in 2009, with significant silt plumes in mussel habitat (Moorkens, 2009; Williams, 2009; NPWS, 2010). Strong silt plumes were observed despite high flows preceding the survey (Moorkens, 2009; NPWS, 2010). It also failed the target in 2015, with heavy silt plumes recorded on 3 transects (Ross, 2017). Increased sediment and nutrient loads are combining to result in unfavourable mussel habitat condition in the Newport. Sufficient survival of juvenile mussels and adult survival is being prevented by the poor condition of the river substratum. The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Newport system
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. See I.S. EN 16859:2017. The Newport failed the redox target in 2009 (average loss of 28.6% redox potential at 5cm) and 2015 (average of 26.4%) (Moorkens, 2009; NPWS, 2010; Ross, 2017). Habitat condition was very poor and decline in redox very severe in 2005 (Moorkens, 2005, 2009; NPWS, 2010). The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Newport system
Hydrological regime: flow variability	Metres per second	Restore appropriate hydrological regime	The availability of suitable freshwater pearl mussel habitat is largely determined by flow (catchment geology is the other key 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) high flows are not artificially increased so as to cause excessive scour of mussel habitat; 3) low flows do not exacerbate the deposition of fine sediments or growth of algae/macrophytes and 4) low flows do not cause stress to mussels in terms of exposure, water temperatures, food availability or aspects of the reproductive cycle. Groundwater inflow to a river contributes to water-cycling. See Moorkens and Killeen (2014) and I.S. EN 16859:2017 for further information. The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Newport system

Host fish	Number	Maintain sufficient juvenile salmonids to host glochidial larvae	Salmonid fish are host to the larval stage of the freshwater pearl mussel and essential to completion of the life cycle. 0+ and 1+ fish are typically used, both because of habitat overlaps and the development of immunity with age in fish. Fish presence is sufficient, as higher fish density and biomass is 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 mussels and a lack of mussel recruitment, while significantly lower host fish density and biomass were associated with high juvenile mussel numbers. Fish movements must be such that 0+ fish 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. No glochidia were observed in 2009, but glochidia were found on 1 juvenile salmon in April 2017 (Johnston, 2009; NPWS, 2010; Johnston and Moorkens, 2018)
Fringing habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the population	Semi-natural and natural riparian habitats, including those along lake fringes, even where they do not form part of a natural floodplain, are an integral part of the structure and functioning of river systems. Open wetlands, such as wet heath and blanket bog, are particularly critical to the hydrological regime of mussel rivers. Fringing habitats assist in the settlement of fine suspended material, protect banks from erosion and contribute to nutrient cycling, as well as contributing to the aquatic food web (e.g. allochthonous matter from poor fens and flushes) and providing habitat (refuge and resources) for life-stages of fish, birds and aquatic invertebrates. Equally, fringing habitats are dependent on rivers/lakes, particularly their water levels, and support wetland communities and species of conservation concern. The target is for sufficient habitat in favourable condition to allow the species to maintain itself on a long-term basis as a viable component of the Newport system

**Conservation Objectives for : Newport River SAC [002144]****1106 Salmon *Salmo salar*****To maintain the favourable conservation condition of Atlantic Salmon (*Salmo salar*) in Newport River SAC, which is defined by the following list of attributes and targets:**

Attribute	Measure	Target	Notes
Distribution: extent of anadromy	Percentage 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
Adult spawning fish	Number	Conservation limit (CL) for each system consistently exceeded	A conservation limit (CL) 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 Technical Expert Group on Salmon's (TEGOS) annual model output of CL attainment levels. See Technical Expert Group on Salmon (2019) for further details. Stock estimates are either derived from direct counts of adults (rod catch, fish counter) or indirectly by fry abundance counts. Based on rod catch estimates, the Newport River is currently above CL for both one-sea-winter (meeting 165% of CL) and multi-sea-winter salmon (meeting 144% of CL)
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 minutes sampling	Target is threshold value for rivers currently exceeding their conservation limit (CL)
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)

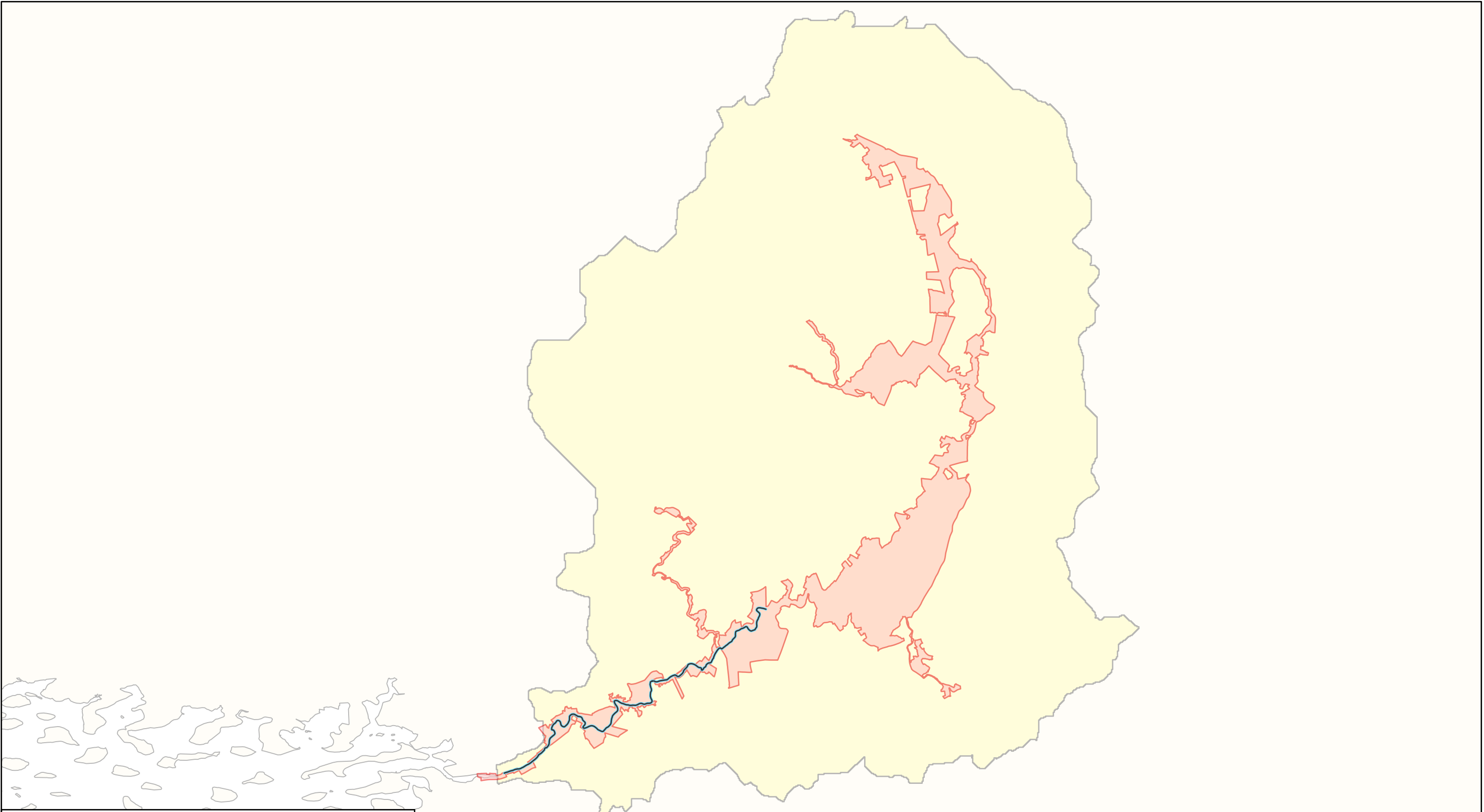




Legend

Newport River SAC 002144





Legend

Newport River SAC 002144

1029 Freshwater Pearl Mussel - *Margaritifera margaritifera* Suitable habitat target

1029 Freshwater Pearl Mussel - *Margaritifera margaritifera* Distribution target

1029 Freshwater Pearl Mussel - *Margaritifera margaritifera* Catchment

OSi Discovery Series County Boundary



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MAP 2:  
NEWPORT RIVER SAC  
CONSERVATION OBJECTIVES  
FRESHWATER PEARL MUSSEL

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

SITE CODE:  
SAC 002144; version 3.01. CO. MAYO.

012345

km

The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.  
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Níl sna teorainneacha ar na léarscáileanna ach nod garshuíomhach ginearálta. Féadfar athbheithnithe a déanamh ar theorainneacha na gceantar comharthaithe. Suirbhéarachta Ordonáis na hÉireann Ceadúnas Uimh EN 0059216. © Suirbhéarachta Ordonáis na hÉireann Rialtas na hÉireann

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Map Version 1

Date: Oct 2018