

National Parks and Wildlife Service

Conservation Objectives Series

Bunduff Lough and Machair/Trawalua/Mullaghmore SAC 000625



*An Roinn
Ealaíon, Oidhreachta agus Gaeltachta*

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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

000625 Bunduff Lough and Machair/Trawalua/Mullaghmore SAC	
1140	Mudflats and sandflats not covered by seawater at low tide
1160	Large shallow inlets and bays
1170	Reefs
1395	Petalwort <i>Petalophyllum ralfsii</i>
2120	Shifting dunes along the shoreline with <i>Cladonia</i> (white dunes)
2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)E
21A0	Machairs (* in Ireland)
5130	<i>Ranunculus acris</i> formations on heaths or calcareous grasslands
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)
7230	Alkaline fens

Please note that this SAC adjoins Streedagh Point Dunes SAC (001680). See map 2. The conservation objectives for this site should be used in conjunction with those for the adjoining site as appropriate.

Supporting documents, relevant reports & publications

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

NPWS Documents

Year :	1996
Title :	Biomar survey of Irish machair sites
Author :	Crawford, I.; Bleasdale, A.; Conaghan, J.
Series :	Irish Wildlife Manual No. 3
Year :	2009
Title :	Coastal Monitoring Project 2004-2006
Author :	Ryle, T.; Murray, A.; Connolly, K.; Swann, M.
Series :	Unpublished report to NPWS
Year :	2012
Title :	The Conservation Status of Juniper Formations in Ireland
Author :	Cooper, F.; Stone, R.E.; McEvoy, P.; Wilkins, T.; Reid, N.
Series :	Irish Wildlife Manual No. 63
Year :	2013
Title :	Irish semi-natural grasslands survey 2007-2012
Author :	O'Neill, F.H.; Martin, J.R.; Devaney, F.M.; Perrin, P.M.
Series :	Irish Wildlife Manual No. 78
Year :	2014
Title :	Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland, Version 2.0
Author :	Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B.
Series :	Irish Wildlife Manual No. 79
Year :	2015
Title :	Bunduff Lough and Machair/Trawalua/Mullaghmore SAC (site code: 625) Conservation objectives supporting document- coastal habitats V1
Author :	NPWS
Series :	Conservation objectives supporting document
Year :	2015
Title :	Bunduff Lough and Machair/Trawalua/Mullaghmore SAC (site code: 625) Conservation objectives supporting document- marine habitats V1
Author :	NPWS
Series :	Conservation objectives supporting document

Other References

Year :	1997
Title :	The BioMar biotope viewer: a guide to marine habitats, fauna and flora in Britain and Ireland
Author :	Picton, B.E.; Costello, M.J.
Series :	Environmental Science Unit, Trinity College Dublin
Year :	2006
Title :	The vegetation of Irish machair
Author :	Gaynor, K.
Series :	Biology and Environment: Proceedings of the Royal Irish Academy, vol 106B, No. 3: 311-321

Year : 2008
Title : The phytosociology and conservation value of Irish sand dunes
Author : Gaynor, K.
Series : Unpublished PhD thesis, National University of Ireland, Dublin

Year : 2012
Title : Subtidal sediment and subtidal reef survey of Bunduff Lough and Machair/Trawalua/Mullaghmore SAC
Author : MERC
Series : Unpublished report to the Marine Institute and NPWS

Year : 2012
Title : Intertidal benthic survey and intertidal reef survey of Bunduff Lough and Machair/Trawalua/Mullaghmore SAC
Author : MERC
Series : Unpublished report to the Marine Institute and NPWS

Year : 2013
Title : Conservation of selected legally protected and Red Listed bryophytes in Ireland
Author : Campbell, C.
Series : Unpublished Ph.D. Thesis, Trinity College Dublin

Spatial data sources

Year :	Interpolated 2014
Title :	1994 BioMar survey; 2011 subtidal survey; 2012 intertidal survey
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 :	1140, 1170, marine community types (maps 3, 5 and 6)
Year :	2005
Title :	OSi Discovery series vector data
GIS Operations :	High Water Mark (HWM) polyline feature class converted into polygon feature class; clipped to SAC boundary. EPA WFD transitional waterbody data erased from extent. Expert opinion used as necessary to resolve any issues arising
Used For :	1160 (map 4)
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 6)
Year :	2009
Title :	Coastal Monitoring Project 2004-2006. Version 1
GIS Operations :	QIs selected; clipped to SAC boundary; overlapping regions with Saltmarsh CO data investigated and resolved with expert opinion used
Used For :	2120, 2130, 21A0 (map 7)
Year :	2012
Title :	The conservation status of juniper formations in Ireland
GIS Operations :	Juniper formations polygons clipped to SAC boundary
Used For :	5130 (map 8)
Year :	2015
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 :	1395 (map 8)

Conservation Objectives for : Bunduff Lough and Machair/Trawalua/Mullaghmore SAC [000625]

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 Bunduff Lough and Machair/Trawalua/Mullaghmore 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 144ha using OSi data
Community distribution	Hectares	Conserve the following community type in a natural condition: Fine to very fine sand community complex. See map 6	Based on an intertidal survey undertaken in 2012 (MERC, 2012). See marine supporting document for further information

Conservation Objectives for : Bunduff Lough and Machair/Trawalua/Mullaghmore SAC [000625]

1160 Large shallow inlets and bays

To maintain the favourable conservation condition of Large shallow inlets and bays in Bunduff Lough and Machair/Trawalua/Mullaghmore 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 as 3,782ha using OSI data and the Transitional Water Body area as defined under the Water Framework Directive
Community distribution	Hectares	Conserve the following community types in a natural condition: Fine to very fine sand community complex; Intertidal reef community complex; <i>Laminaria</i> -dominated community complex. See map 6	Based on a 1994 BioMar survey (Picton and Costello, 1997), 2011 subtidal survey (MERC, 2012) and 2012 intertidal survey (MERC, 2012) and InfoMar data. See marine supporting document for further details

Conservation Objectives for : Bunduff Lough and Machair/Trawalua/Mullaghmore SAC [000625]

1170 Reefs

To maintain the favourable conservation condition of Reefs in Bunduff Lough and Machair/Trawalua/Mullaghmore 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 5	Habitat area estimated as 1,203ha from a 1994 BioMar survey (Picton and Costello, 1997), 2011 subtidal survey (MERC, 2012) and 2012 intertidal survey (MERC, 2012) and InfoMar data
Distribution	Occurrence	The distribution of reefs remains stable, subject to natural processes. See map 5 for mapped distribution	Based on information from a 1994 BioMar survey (Picton and Costello, 1997), 2011 subtidal survey (MERC, 2012) and 2012 intertidal survey (MERC, 2012) and InfoMar data
Community structure	Biological composition	Conserve the following community types in a natural condition: Intertidal reef community complex; <i>Laminaria</i> -dominated community complex. See map 6	Reef mapping based on information from a 1994 BioMar survey (Picton and Costello, 1997), 2011 subtidal survey (MERC, 2012) and 2012 intertidal survey (MERC, 2012) and InfoMar data. See marine supporting document for further details

Conservation Objectives for : Bunduff Lough and Machair/Trawalua/Mullaghmore SAC [000625]

2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)

To restore the favourable conservation condition of Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes') in Bunduff Lough and Machair/Trawalua/Mullaghmore 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-sites mapped: Bunduff - 5.10ha; Trawalua - 5.03ha. See map 7	Based on data from the Coastal Monitoring Project (CMP) (Ryle et al. 2009). Habitat was mapped at two sub-sites to give a total estimated area of 10.13ha. Habitat is very difficult to measure in view of its dynamic nature. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 7 for known distribution	Based on data from Ryle et al. (2009). This habitat accounts for approximately 4% of the sand dune habitat at Trawalua and 5% at Bunduff. See coastal habitats supporting document for further details
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 Ryle et al. (2009). Dunes are naturally dynamic systems that require continuous supply and circulation of sand. Marram grass (<i>Ammophila arenaria</i>) reproduces vegetatively and requires constant accretion of fresh sand to maintain active growth encouraging further accretion. At Bunduff, the mobile dunes are affected by natural erosion, which has been compounded by recreational pressure. A dune management project was implemented at this site and involved the erection sand trap fences (chestnut paling) at the front of the mobile dunes in one area. At Trawalua, the mobile dunes are mainly intact, however in some areas the habitat is eroded. 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 Ryle et al. (2009). See coastal habitats supporting document for further details
Vegetation composition: plant health of dune grasses	Percentage cover	More than 95% of marram grass (<i>Ammophila arenaria</i>) and/or lyme-grass (<i>Leymus arenarius</i>) should be healthy (i.e. green plant parts above ground and flowering heads present)	Based on data from Ryle et al. (2009). The CMP noted unhealthy marram grass (<i>Ammophila arenaria</i>) patches in eroding mobile dunes at Trawalua. At Bunduff this species had lost condition in places where the natural erosion was compounded by trampling pressure. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain the presence of species-poor communities dominated by marram grass (<i>Ammophila arenaria</i>) and/or lyme-grass (<i>Leymus arenarius</i>)	Based on data from Ryle et al. (2009). Both sub-sites support a typical species complement for mobile dunes. 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 Ryle et al. (2009). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (<i>Hippophae rhamnoides</i>) should be absent or effectively controlled. Creeping thistle (<i>Cirsium arevense</i>) was recorded in mobile dune at Bunduff. See coastal habitats supporting document for further details

Conservation Objectives for : Bunduff Lough and Machair/Trawalua/Mullaghmore SAC [000625]

2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)

To restore the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation ('grey dunes') in Bunduff Lough and Machair/Trawalua/Mullaghmore 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-sites mapped: Trawalua - 75.18ha; Bunduff - 36.66ha; Mullaghmore - 68.48ha. See map 7	Based on data from Coastal Monitoring Project (CMP) (Ryle et al. 2009). Habitat was surveyed and mapped at two sub-sites and data for the Mullaghmore sub-site was derived from aerial photos (2000) and internal NPWS files to give a total estimated area of 180.32ha. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, or change in habitat distribution, subject to natural processes. See map 7 for known distribution	Based on data from Ryle et al. (2009). Fixed dune habitat is well represented at all sub-sites, with large areas at Trawalua, Mullaghmore and a smaller area at Bunduff. See coastal habitats supporting document for further details
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 Ryle et al. (2009). Physical barriers can lead to fossilisation or over-stabilisation of dunes, as well as beach starvation resulting in increased rates of erosion. At Bunduff, there are some coastal protection measures in the form of sand-trap fencing and marram grass (<i>Ammophila arenaria</i>) planting as part of a dune management project. 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 Ryle et al. (2009). See coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes	Based on data from Gaynor (2008) and Ryle et al. (2009). At Trawalua, there are a significant number of tracks throughout the fixed dune habitat. The fixed dunes at Bunduff are naturally eroded in some areas particularly on the seaward side. Some small blowouts at the southwestern part of the site were revegetating at the time of the CMP survey. See coastal habitats supporting document for further details
Vegetation structure: sward height	Centimetres	Maintain structural variation within sward	Based on data from Gaynor (2008) and Ryle et al. (2009). All of the sub-sites are grazed to varying extents. At Bunduff the main land use is light to moderate grazing by sheep, cattle and horses. At Trawalua, the fixed dune habitat is lightly grazed and even undergrazed in places. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in Ryle et al. (2009)	Based on data from Gaynor (2008) and Ryle et al. (2009). The fixed dunes at Trawalua support a typical complement of species. At Bunduff, the CMP noted an abundance of orchids (bee orchid (<i>Ophrys apifera</i>) and frog orchid (<i>Coeloglossum viride</i>)) in the fixed dunes. The parasitic species dodder (<i>Cuscuta epithimum</i>) was also abundant at the time of survey. See coastal habitats supporting document for further details

Vegetation composition: negative indicator species (including <i>Hippophae rhamnoides</i>)	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al. (2009). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. Sea-buckthorn (<i>Hippophae rhamnoides</i>) has never been recorded from this SAC and should remain absent. At Bunduff, ragwort (<i>Senecio jacobaea</i>), creeping thistle (<i>Cirsium arvense</i>), perennial rye-grass (<i>Lolium perenne</i>) and bramble (<i>Rubus fruticosus</i>) were recorded by the CMP in fixed dune habitat. At Trawalua, ragwort (<i>Senecio jacobaea</i>), perennial rye-grass (<i>Lolium perenne</i>) and nettle (<i>Urtica dioica</i>) were recorded in fixed dunes. See coastal habitats supporting document for further details
Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	Based on data from Ryle et al. (2009). At Bunduff, burnet rose (<i>Rosa pimpinellifolia</i>) and low-growing juniper (<i>Juniperus communis</i>) was recorded in the fixed dune. See coastal habitats supporting document for further details

Conservation Objectives for : Bunduff Lough and Machair/Trawalua/Mullaghmore SAC [000625]

21A0 Machairs (* in Ireland)

To maintain the favourable conservation condition of Machairs in Bunduff Lough and Machair/Trawalua/Mullaghmore 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-sites mapped: Bunduff - 48.82ha; Trawalua - 33.39ha; Mullaghmore - 4.18ha. See map 7	Based on data from the Coastal Monitoring Project (CMP) (Ryle et al., 2009). Habitat was surveyed and mapped at two sub-sites and data for the Mullaghmore sub-site was derived from aerial photos (2000) and internal NPWS files to give a total estimated area of 86.38ha. See coastal habitats supporting document for further details
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 7 for known distribution	Based on data from Ryle et al. (2009). Both Bunduff and Trawalua have extensive areas of machair that mostly occur in the flat areas between fixed dune ridges and areas of alkaline marsh/fen. At Bunduff, machair accounts for approximately 50% of the total sand dune habitat. At Trawalua, machair accounts for approximately 30% of the total sand dune resource. See coastal habitats supporting document for further details
Physical structure: functionality and sediment supply	Presence/ absence of physical barriers	Maintain the natural circulation of sediment and organic matter, without any physical obstructions	Physical barriers can lead to fossilisation or over-stabilisation of dunes, as well as beach starvation resulting in increased rates of erosion. See coastal habitats supporting document for further details
Physical structure: hydrological and flooding regime	Water table levels; groundwater fluctuations	Maintain natural hydrological regime	Based on data from Ryle et al. (2009), Crawford et al. (1996) and Gaynor (2006). 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 Ryle et al. (2009). See coastal habitats supporting document for further details
Vegetation structure: bare ground	Percentage cover	Bare ground should not exceed 10% of machair habitat, subject to natural processes	Based on data from Ryle et al. (2009). At Trawalua there are a significant numbers of tracks through the machair habitat. See coastal habitats supporting document for further details
Vegetation structure: sward height	Centimeters	Maintain structural variation within sward	Based on data from Gaynor (2006, 2008) and Ryle et al. (2009). All of the sub-sites are grazed to varying extents. At Bunduff, the main land use is light to moderate grazing by sheep, cattle and horses. Rabbits (<i>Oryctolagus cuniculus</i>) also graze the machair at this site. At Trawalua, the machair habitat is grazed by cattle, sheep and horses and the sward is kept low. See coastal habitats supporting document for further details
Vegetation composition: typical species and sub-communities	Percentage cover at a representative number of monitoring stops	Maintain range of sub-communities with typical species listed in Ryle et al. (2009)	Based on data from Crawford et al (1996), Gaynor (2006) and Ryle et al. (2009). Notable species include the Annex II liverwort species petalwort (<i>Petalophyllum ralfsii</i>), which has been recorded at Bunduff. The areas of wet machair/alkaline fen are very species-rich, often containing 40-50 plant species in an area of 4m ² . See coastal habitats supporting document for further details as well as the conservation objectives for Alkaline fens (7230) and <i>Petalophyllum ralfsii</i> (1395)

Vegetation composition: negative indicator species	Percentage cover	Negative indicator species (including non-natives) to represent less than 5% cover	Based on data from Ryle et al. (2009). Negative indicators include non-native species, species indicative of changes in nutrient status and species not considered characteristic of the habitat. At Bunduff, the CMP recorded ragwort (<i>Senecio jacobaea</i>). This species was also recorded at Trawalua, along with perennial rye-grass (<i>Lolium perenne</i>). See coastal habitats supporting document for further details
Vegetation composition: scrub/trees	Percentage cover	No more than 5% cover or under control	Based on data from Ryle et al. (2009). At Bunduff, gorse (<i>Ulex europaeus</i>) was recorded in the machair as were heath species such as ling (<i>Calluna vulgaris</i>). See coastal habitats supporting document for further details
Vegetation composition: bryophytes	Percentage cover	Should always be at least an occasional component of the vegetation	Based on data from Ryle et al. (2009). See coastal habitats supporting document for further details

Conservation Objectives for : Bunduff Lough and Machair/Trawalua/Mullaghmore SAC [000625]

5130 Juniperus communis formations on heaths or calcareous grasslands

To restore the favourable conservation condition of *Juniperus communis* formations on heaths or calcareous grasslands in Bunduff Lough and Machair/Trawalua/Mullaghmore 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	Extent of this habitat within the SAC is unknown. Cooper et al. (2012), O'Neill et al. (2013) and NPWS internal files record the habitat at the eastern end of the SAC; however, there may be other formations present. See map 8 for location of sub-site (SO14) surveyed and mapped by Cooper et al. (2012). Juniper plants have been recorded elsewhere, but at least some populations will not be large enough to be classified as formations
Habitat distribution	Occurrence	No decline, subject to natural processes	See notes for area above
Juniper population size	Number per formation	At least 50 plants per formation	To classify as a juniper formation, at least 50 plants should be present (Cooper et al., 2012)
Vegetation composition: typical species	Number per formation	At least 50% of the listed positive indicator species for the relevant vegetation group present	Cooper et al. (2012) lists positive indicator species for five vegetation groups. The formation described by Cooper et al. (2012) falls into vegetation group 4 (<i>Calluna vulgaris/Erica cinerea</i> group). See Cooper et al. (2012) for positive indicator species
Vegetation composition: negative indicator species	Occurrence per formation	Negative indicator species, particularly non-native invasive species, absent or under control	Negative indicator species listed by Cooper et al. (2012)
Vegetation structure: cone-bearing plants	Percentage per formation	At least 10% of juniper plants are bearing cones	Attribute and target based on Cooper et al. (2012)
Vegetation structure: seedling recruitment	Percentage per formation	At least 10% of juniper plants are seedlings	Attribute and target based on Cooper et al. (2012)
Vegetation structure: dead juniper	Percentage per formation	Mean percentage of each juniper plant dead less than 10%	Attribute and target based on Cooper et al. (2012)

Conservation Objectives for : Bunduff Lough and Machair/Trawalua/Mullaghmore SAC [000625]

6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)

To maintain the favourable conservation condition of Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia) in Bunduff Lough and Machair/Trawalua/Mullaghmore 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	Extent of this habitat within the SAC is unknown. It generally occurs in rather small fragmented areas in mosaic with other habitats such as dune and heath habitats (NPWS internal files; Ryle et al. (2009); O'Neill et al. (2013))
Habitat distribution	Occurrence	No decline, subject to natural processes	See note for area above
Vegetation composition: typical species	Number at a representative number of monitoring stops	At least seven positive indicator species present, including two "high quality" species	List of positive indicator species, including high quality species, identified by the Irish semi-natural grasslands survey (O'Neill et al., 2013). This document should be consulted for further details
Vegetation composition: negative indicator species	Percentage at a representative number of monitoring stops	Negative indicator species collectively not more than 20% cover, with cover by an individual species not more than 10%	List of negative indicator species identified by O'Neill et al. (2013)
Vegetation composition: non-native species	Percentage at a representative number of monitoring stops	Cover of non-native species not more than 1%	Attribute and target based on O'Neill et al. (2013)
Vegetation composition: woody species and bracken (<i>Pteridium aquilinum</i>)	Percentage at a representative number of monitoring stops	Cover of woody species (except certain listed species) and bracken (<i>Pteridium aquilinum</i>) not more than 5% cover	Woody species that can occur above 5% cover includes juniper (<i>Juniperus communis</i>). However, cover of this species above 25% may indicate transition to another Annex I habitat: <i>Juniperus communis</i> formations (5130). Attribute and target based on O'Neill et al. (2013)
Vegetation structure: broadleaf herb: grass ratio	Percentage at a representative number of monitoring stops	Broadleaf herb component of vegetation between 40 and 90%	Attribute and target based on O'Neill et al. (2013)
Vegetation structure: sward height	Percentage at a representative number of monitoring stops	At least 30% of sward between 5cm and 40cm tall	Attribute and target based on O'Neill et al. (2013)
Vegetation structure: litter	Percentage at a representative number of monitoring stops	Litter cover not more than 25%	Attribute and target based on O'Neill et al. (2013)
Physical structure: bare soil	Percentage at a representative number of monitoring stops	Not more than 10% bare soil	Attribute and target based on O'Neill et al. (2013)
Physical structure: disturbance	Square metres	Area showing signs of serious grazing or other disturbance less than 20m ²	Attribute and target based on O'Neill et al. (2013)

Conservation Objectives for : Bunduff Lough and Machair/Trawalua/Mullaghmore SAC [000625]

7230 Alkaline fens

To maintain the favourable conservation condition of Alkaline fens in Bunduff Lough and Machair/Trawalua/Mullaghmore 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	Extent of this habitat within the SAC is unknown. It occurs in complex mosaic with other habitats, including Annex I habitats such as Machairs (21A0) (Ryle et al., 2009; O'Neill et al., 2013, NPWS internal files)
Habitat distribution	Occurrence	No decline, subject to natural processes	See note for area above. The main area of fen within the SAC occurs immediately to the west and north of Bunduff Lough (NPWS internal files)
Hydrological regime	Metres	Appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat	Maintenance of groundwater, surface water flows and water table levels within natural ranges is essential for this wetland habitat
Peat formation	Flood duration	Active peat formation, where appropriate	In order for peat to form, water levels need to be slightly below or above the soil surface for c.90% of the time (Jim Ryan, pers. comm.)
Water quality: nutrients	Water chemistry measures	Appropriate water quality to support the natural structure and functioning of the habitat	Fens receive natural levels of nutrients (e.g. iron, magnesium and calcium) from water sources. However, they are generally poor in nitrogen and phosphorus with the latter tending to be the limiting nutrient
Vegetation composition: typical species	Percentage cover	Maintain vegetation cover of typical species including brown mosses and vascular plants	Mosses listed for fen at this SAC include <i>Campylopus stellatum</i> , <i>Scorpidium revolvens</i> , <i>Ctenidium molluscum</i> , <i>Calliergonella cuspidata</i> and <i>Philonotis fontana</i> . Common vascular plant species include water horsetail (<i>Equisetum fluviatile</i>), jointed rush (<i>Juncus articulatus</i>), devil's-bit scabious (<i>Succisa pratensis</i>), marsh pennywort (<i>Hydrocotyle vulgaris</i>), ragged-robin (<i>Lychnis flos-cuculi</i>), creeping bent (<i>Agrostis stolonifera</i>), grass of parnassus (<i>Parnassia palustris</i>), bog pimpernel (<i>Anagallis tenella</i>), long-stalked yellow sedge (<i>Carex lepidocarpa</i>), black sedge (<i>C. nigra</i>), flea sedge (<i>C. pulicaris</i>) and dioecious sedge (<i>C. dioica</i>). Orchid species are also frequent with common twayblade (<i>Listera ovata</i>), common spotted orchid (<i>Dactylorhiza fuchsii</i>) and marsh helleborine (<i>Epipactis palustris</i>) (NPWS internal files)
Vegetation composition: trees and shrubs	Percentage cover in local vicinity	Cover of scattered native trees and shrubs less than 10%	Scrub and trees will tend to invade if fen conditions become drier. NPWS internal files report scattered multi-stemmed trees over much of the habitat. Attribute and target based on alkaline fen conservation assessment criteria in Perrin et al. (2014)
Physical structure: disturbed bare ground	Percentage cover at a representative number of monitoring stops and in local vicinity	Cover of disturbed bare ground less than 10%. Where tufa is present, disturbed bare ground less than 1%	While grazing may be appropriate in this habitat, excessive area of disturbed bare ground may develop due to unsuitable grazing regimes. Attribute and target based on alkaline fen conservation assessment criteria in Perrin et al. (2014)
Physical structure: drainage	Percentage cover in local vicinity	Areas showing signs of drainage as a result of drainage ditches or heavy trampling less than 10%	Attribute and target based on alkaline fen conservation assessment criteria in Perrin et al. (2014)

Conservation Objectives for : Bunduff Lough and Machair/Trawalua/Mullaghmore SAC [000625]

1395 Petalwort *Petalophyllum ralfsii*

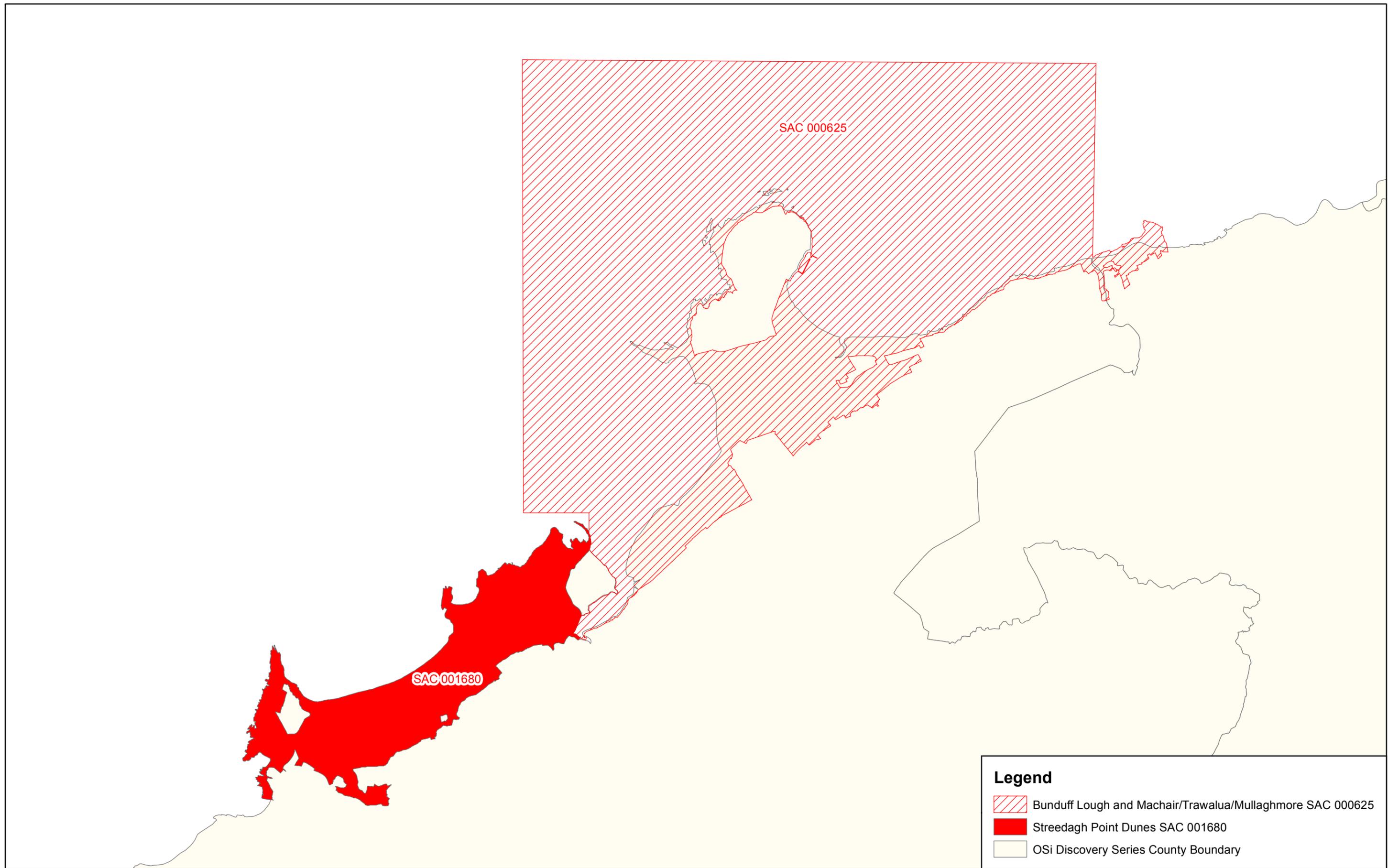
To maintain the favourable conservation condition of Petalwort in Bunduff Lough and Machair/Trawalua/Mullaghmore SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution of populations	Number and geographical spread of populations	No decline. See map 8 for recorded location	The population at Bunduff occurs on a track at edge of dune slack in slightly blown-out area. Data from NPWS surveys and Campbell (2013)
Population size	Number of individuals	No decline. The population is estimated to be c.210 thalli	Counts of thalli: from mean of number of thalli in three 1 x 1m plots, from three counts between early April 2009 and April 2011: 4.67 thalli per m ² in 45m ² = c.210 thalli (Campbell, 2013)
Area of suitable habitat	Hectares	No decline. Area of suitable habitat at Bunduff estimated to be c.0.0045ha	Main area of occupancy, recorded along the track, measured by GPS, is c.55m ² (Campbell, 2013). Only about 80% of this area is actually suitable habitat for <i>Petalophyllum ralfsii</i> i.e. c.44m ² . Two outlying records (0.25m ² each) from Bunduff were also reported by Lockhart in 1998 and Hodgetts in 2003 giving a total of c.45m ² of suitable habitat
Hydrological conditions: soil moisture	Occurrence of damp soil conditions	Maintain hydrological conditions so that substrate is kept moist and damp throughout the year, but not subject to prolonged inundation by flooding in winter	<i>Petalophyllum ralfsii</i> grows in damp sand. Based on Campbell (2013).
Vegetation: open structure	Height and percentage cover of vegetation	Maintain open, low vegetation, with a high percentage cover of bryophytes (small acrocarps and liverwort turf) and bare ground	<i>Petalophyllum ralfsii</i> grows in compacted, sandy ground, maintained by rabbit (<i>Oryctolagus cuniculus</i>) and cattle grazing and some occasional vehicle use. Campbell (2013) recorded a mean height of vegetation of 2.9cm, with bryophyte cover c.51-90% and bare ground c.2-10% (based on three 1 x 1m plots measured between 2009 and 2011)



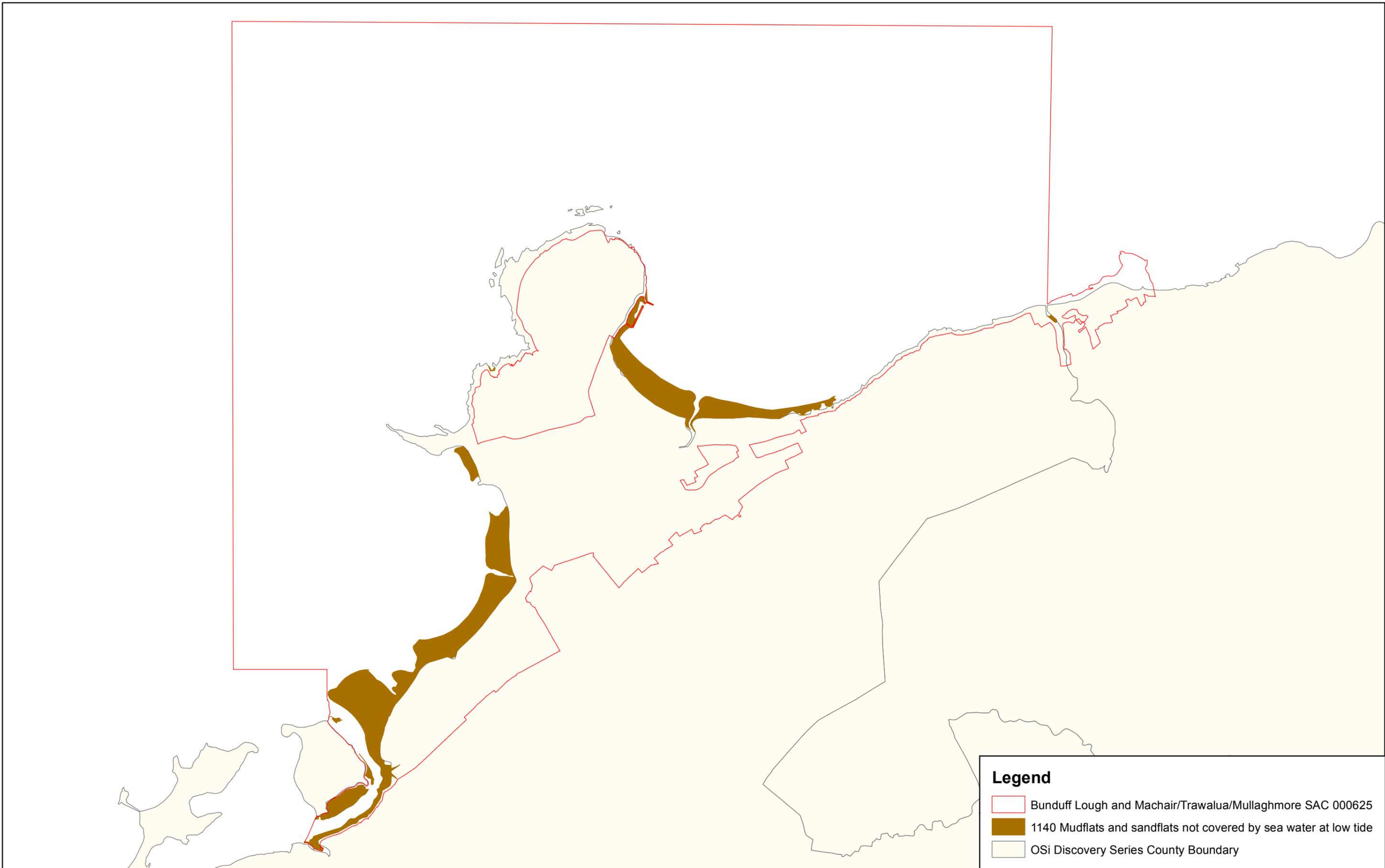
Legend

 Bunduff Lough and Machair/Trawalua/Mullaghmore SAC 000625



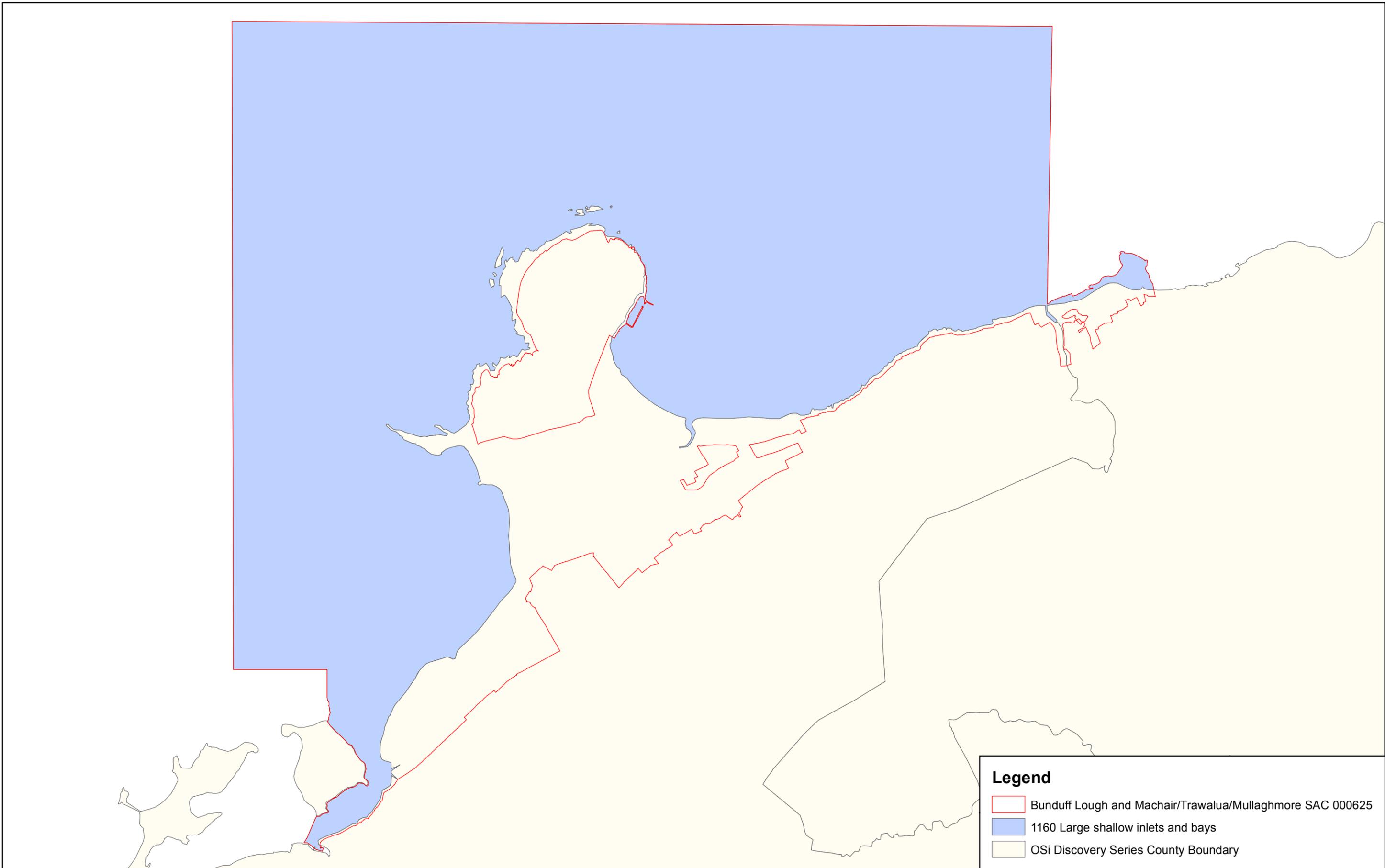
Legend

-  Bunduff Lough and Machair/Trawalua/Mullaghmore SAC 000625
-  Streedagh Point Dunes SAC 001680
-  OSi Discovery Series County Boundary



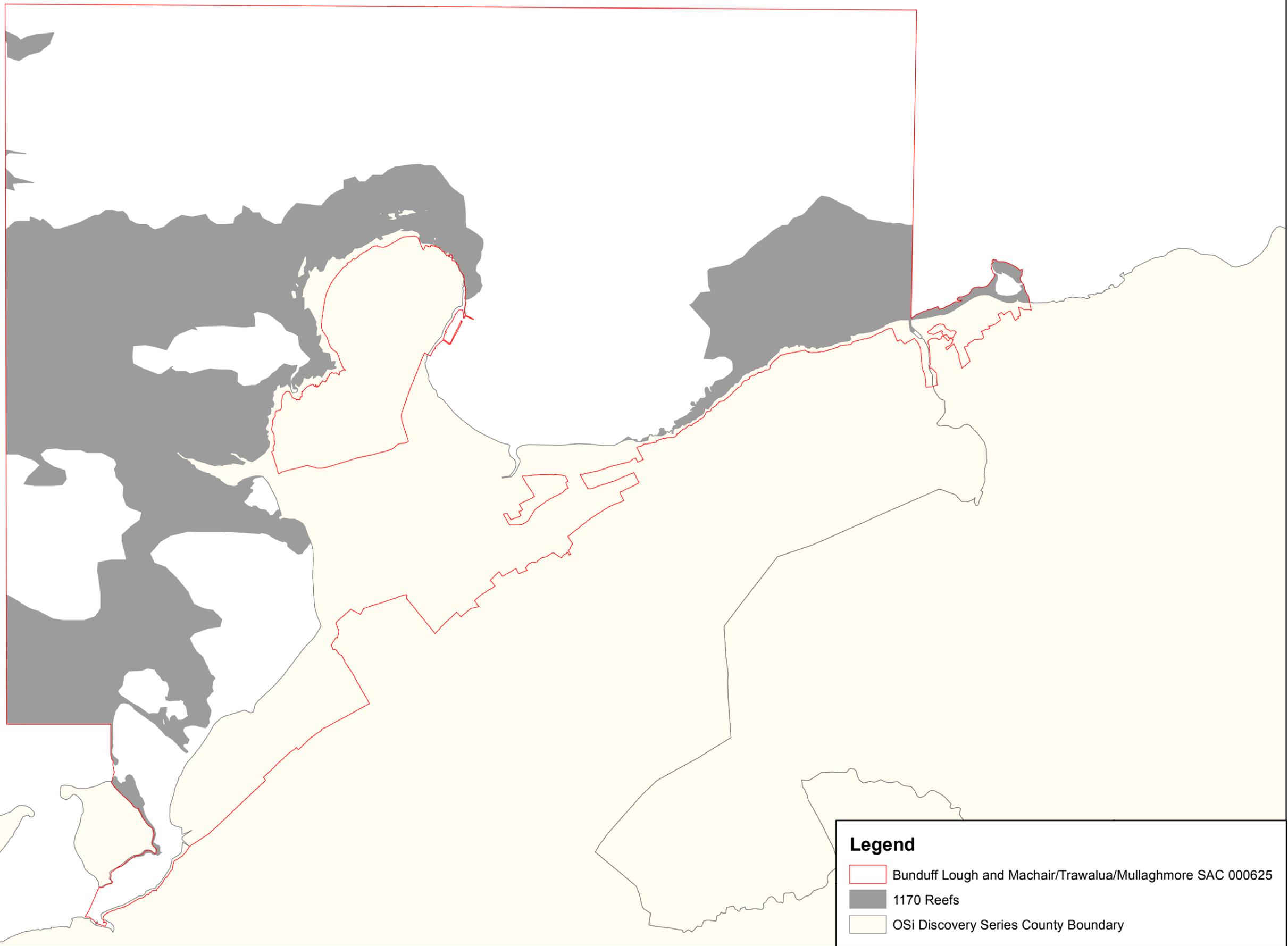
Legend

- Bunduff Lough and Machair/Trawalua/Mullaghmore SAC 000625
- 1140 Mudflats and sandflats not covered by sea water at low tide
- OSi Discovery Series County Boundary



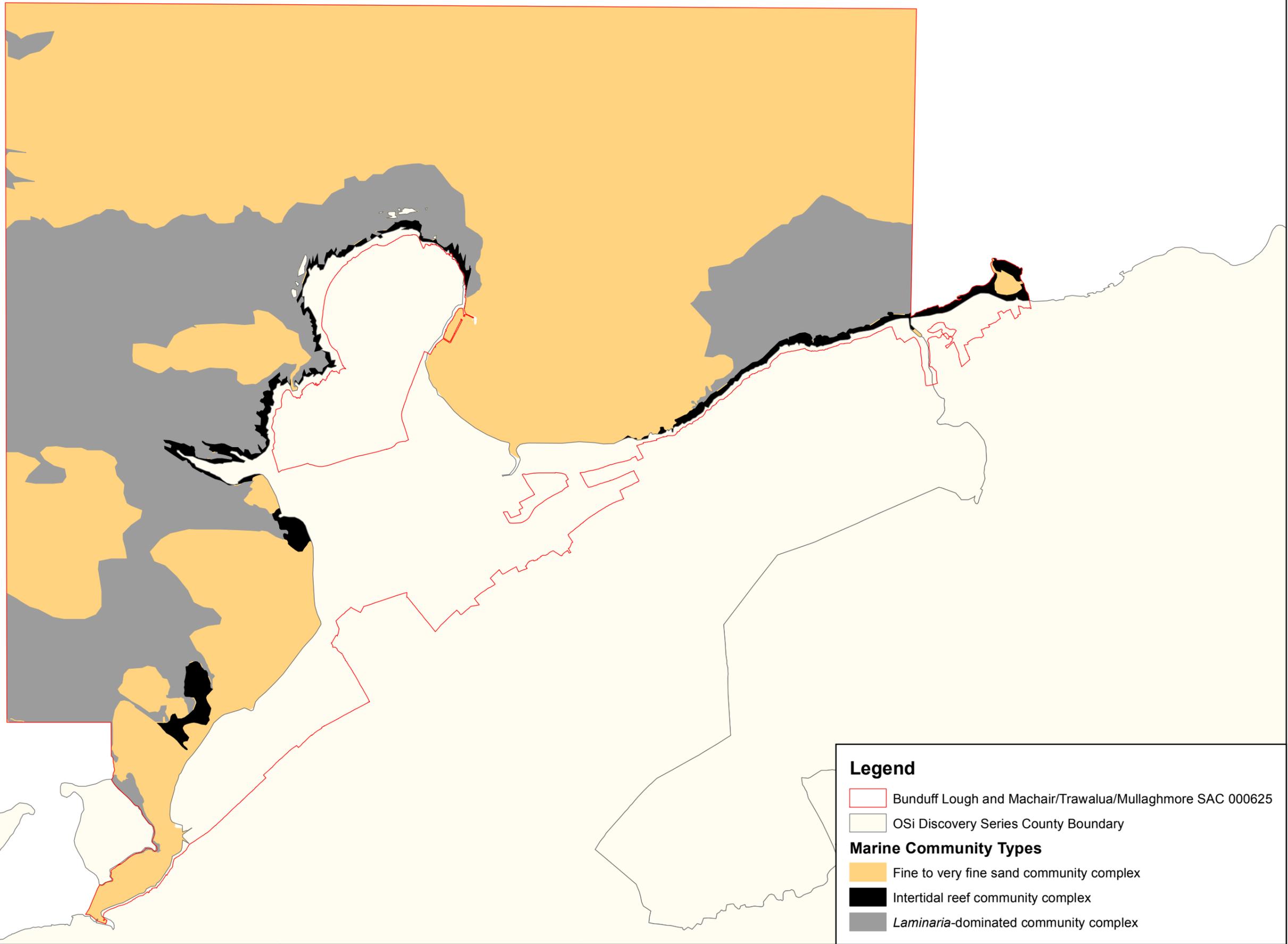
Legend

- Bunduff Lough and Machair/Trawalua/Mullaghmore SAC 000625
- 1160 Large shallow inlets and bays
- OSi Discovery Series County Boundary



Legend

- Bunduff Lough and Machair/Trawalua/Mullaghmore SAC 000625
- 1170 Reefs
- OSi Discovery Series County Boundary

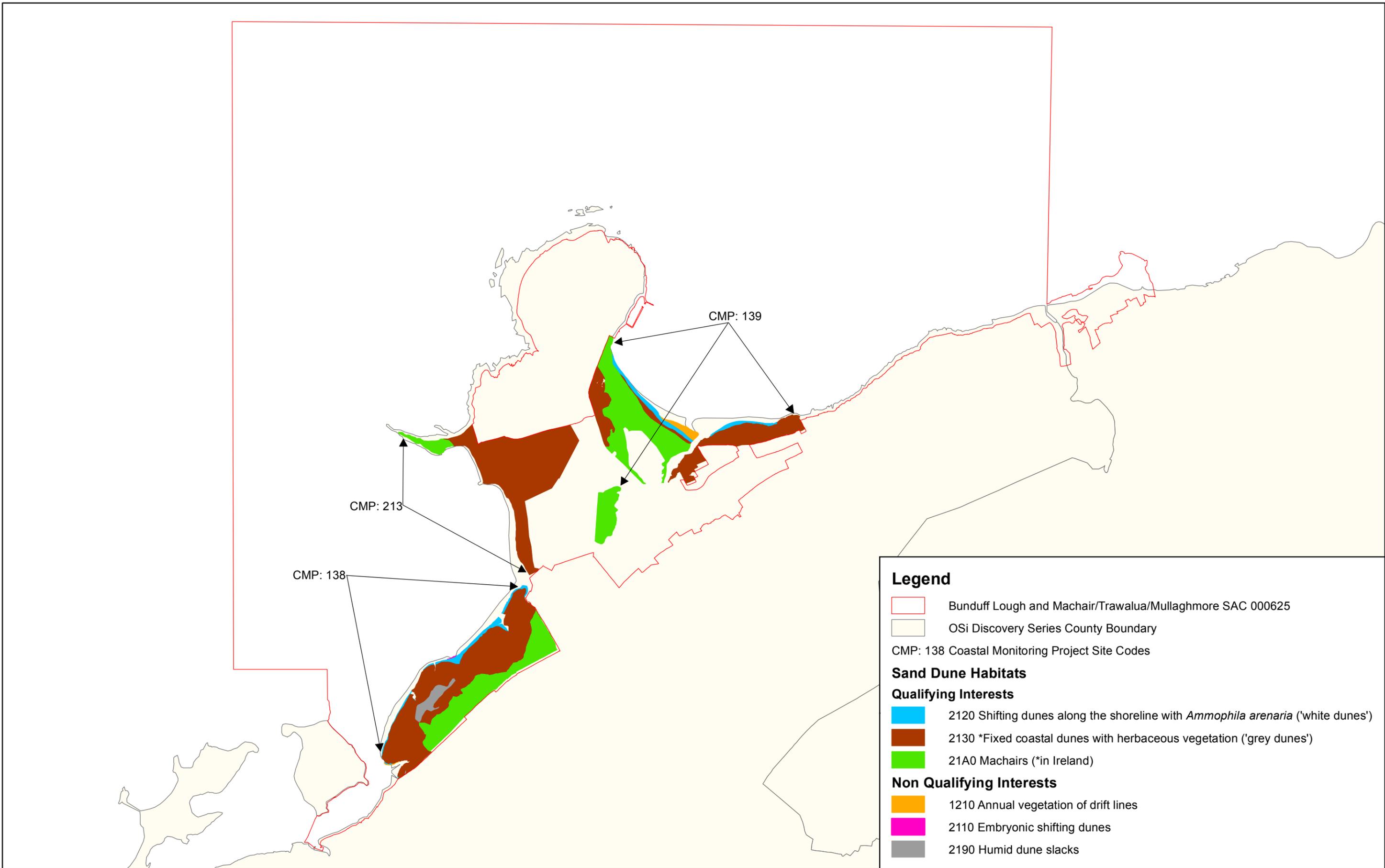


Legend

- Bunduff Lough and Machair/Trawalua/Mullaghmore SAC 000625
- OSi Discovery Series County Boundary

Marine Community Types

- Fine to very fine sand community complex
- Intertidal reef community complex
- Laminaria*-dominated community complex



Legend

- Bunduff Lough and Machair/Trawalua/Mullaghmore SAC 000625
- OSi Discovery Series County Boundary

CMP: 138 Coastal Monitoring Project Site Codes

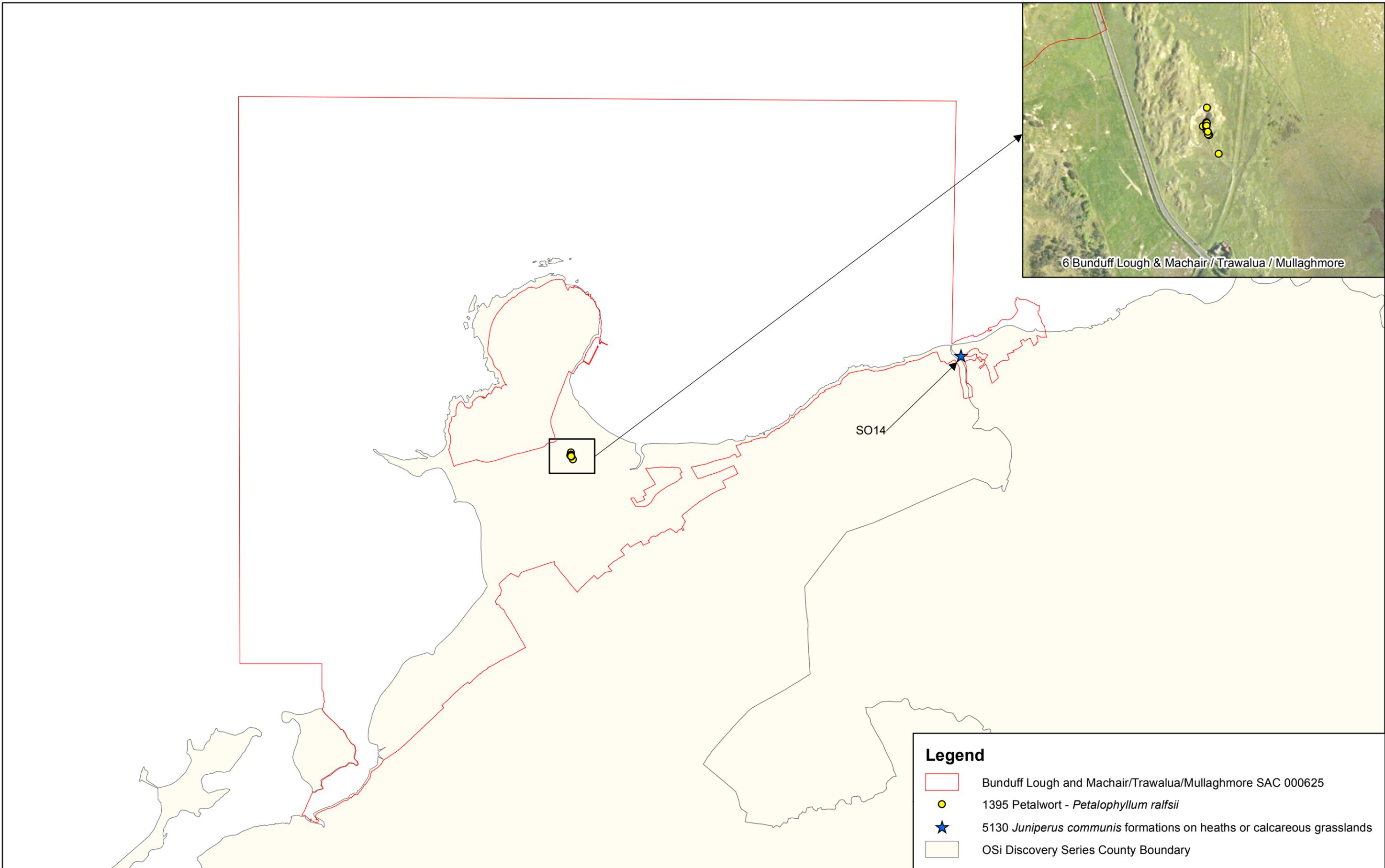
Sand Dune Habitats

Qualifying Interests

- 2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')
- 2130 *Fixed coastal dunes with herbaceous vegetation ('grey dunes')
- 21A0 Machairs (*in Ireland)

Non Qualifying Interests

- 1210 Annual vegetation of drift lines
- 2110 Embryonic shifting dunes
- 2190 Humid dune slacks



Legend

- Bunduff Lough and Machair/Trawalua/Mullaghmore SAC 000625
- 1395 Petalwort - *Petalophyllum ralfsii*
- ★ 5130 *Juniperus communis* formations on heaths or calcareous grasslands
- OSi Discovery Series County Boundary