

National Parks and Wildlife Service

Conservation Objectives Series

Cuilcagh - Anierin Uplands SAC 000584



An Roinn Ealaíon, Oidhreachta,
Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta

Department of Arts, Heritage,
Regional, Rural and Gaeltacht Affairs



**National Parks and Wildlife Service,
Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs,
7 Ely Place, Dublin 2, Ireland.
Web: www.npws.ie
E-mail: nature.conservation@ahg.gov.ie**

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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

000584	Cuilcagh - Anierin Uplands SAC
1393	Slender Green Feather-moss <i>Drepanocladus vernicosus</i>
3110	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>)
3160	Natural dystrophic lakes and ponds
4010	Northern Atlantic wet heaths with <i>Erica tetralix</i>
4030	European dry heaths
4060	Alpine and Boreal heaths
6230	Species-rich <i>Nardus</i> grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)*
7130	Blanket bogs (* if active bog)
7140	Transition mires and quaking bogs
7220	Petrifying springs with tufa formation (<i>Cratoneurion</i>)*
8110	Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>)
8220	Siliceous rocky slopes with chasmophytic vegetation

Supporting documents, relevant reports & publications

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

NPWS Documents

Year :	1990
Title :	A survey to locate lowland blanket bogs of scientific interest in county Donegal and upland blanket bogs in counties Cavan, Leitrim and Roscommon
Author :	Douglas, C.; Dunnells, D.; Scally, L.; Wyse Jackson, M.
Series :	Unpublished report to NPWS
Year :	2009
Title :	Irish Red List No. 1 - Water beetles
Author :	Foster, G.N.; Nelson, B.H.; O Connor, Á.
Series :	Ireland Red List No. 1
Year :	2013
Title :	Conservation status assessment for petrifying springs
Author :	Lyons, M.D.; Kelly, D.L.
Series :	Unpublished report to NPWS
Year :	2013
Title :	A survey of the benthic macrophytes of three hard-water lakes: Lough Bunny, Lough Carra and Lough Owel
Author :	Roden, C.; Murphy, P.
Series :	Irish Wildlife Manual No. 70
Year :	2013
Title :	The status of EU protected habitats and species in Ireland. Volume 2. Habitats assessments
Author :	NPWS
Series :	Conservation assessments
Year :	2013
Title :	The status of EU protected habitats and species in Ireland. Volume 3. Species assessments
Author :	NPWS
Series :	Conservation assessments
Year :	2013
Title :	National survey of upland habitats (phase 3, 2012-2013). Site report no. 13: Cuilcagh-Anierin Uplands cSAC (000584), Cos. Cavan and Leitrim
Author :	Perrin, P.M.; Roche, J.R.; Barron, S.J.; Daly, O.H.; Hodd, R.L.; Muldoon, C.S.; Leydon, K.L.
Series :	Unpublished report to NPWS
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 :	Habitats Directive Annex I lake habitats: a working interpretation for the purposes of site-specific conservation objectives and Article 17 reporting
Author :	O Connor, Á.
Series :	Unpublished document by NPWS
Year :	2015
Title :	Monitoring methods for <i>Hamatocaulis vernicosus</i> (Mitt.) Hedenäs (slender green feather-moss) in the Republic of Ireland
Author :	Campbell, C.; Hodgetts, N.; Lockhart, N.
Series :	Irish Wildlife Manual No. 91

Year : 2016
Title : Cuilcagh - Anierin Uplands SAC (site code: 584) Conservation objectives supporting document- upland habitats V1
Author : NPWS
Series : Conservation objectives supporting document

Other References

Year : 1982
Title : Eutrophication of waters. Monitoring assessment and control
Author : OECD
Series : OECD, Paris

Year : 1989
Title : The genera *Scorpidium* and *Hamatocaulis*, gen. nov., in northern Europe
Author : Hedenäs, L.
Series : Lindbergia, 15: 8-36

Year : 1997
Title : The distribution of aquatic Coleoptera in Northern Ireland. Part 1: Families Haliplidae, Hygrobiidae, Noteridae, Dytiscidae and Gyrinidae
Author : Nelson, B., Foster, G., Weyl, R.; Anderson, R.
Series : Bulletin of the Irish Biogeographical Society, 20: 179-296

Year : 2000
Title : Colour in Irish lakes
Author : Free, G.; Allott, N.; Mills, P.; Kennelly, C.; Day, S.
Series : Verhandlungen Internationale Vereinigung für theoretische und angewandte Limnologie, 27: 2620-2623

Year : 2000
Title : A guide to habitats in Ireland
Author : Fossitt, J.A.
Series : The Heritage Council, Kilkenny

Year : 2002
Title : Deterioration of Atlantic soft water macrophyte communities by acidification, eutrophication and alkalisation
Author : Arts, G.H.P.
Series : Aquatic Botany, 73: 373-393

Year : 2006
Title : A reference-based typology and ecological assessment system for Irish lakes. Preliminary investigations. Final report. Project 2000-FS-1-M1 Ecological assessment of lakes pilot study to establish monitoring methodologies EU (WFD)
Author : Free, G.; Little, R.; Tierney, D.; Donnelly, K.; Coroni, R.
Series : EPA, Wexford

Year : 2008
Title : Water Quality in Ireland 2004-2006
Author : Clabby, K.J.; Bradley, C.; Craig, M.; Daly, D.; Lucey, J.; McGarrigle, M.; O'Boyle, S.; Tierney, D.; Bowman, J.
Series : EPA, Wexford

Year : 2008
Title : *Agabus melanarius* Aubé, 1937 (Coleoptera: Dytiscidae) a water beetle new to Ireland
Author : Nelson, B.
Series : The Coleopterist, 17: 151-153

Year :	2009
Title :	The identification, characterization and conservation value of isoetid lakes in Ireland
Author :	Free, G.; Bowman, J.; McGarrigle, M.; Little, R.; Coroni, R.; Donnelly, K.; Tierney, D.; Trodd, W.
Series :	Aquatic Conservation: Marine and Freshwater Ecosystems, 19 (3): 264–273
Year :	2010
Title :	Water quality in Ireland 2007-2009
Author :	McGarrigle, M.; Lucey, J.; Ó Cinnéide, M.
Series :	EPA, Wexford
Year :	2012
Title :	The impact of conifer plantation forestry on the ecology of peatland lakes
Author :	Drinan, T.J.
Series :	Unpublished PhD thesis, University College Cork
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
Year :	2013
Title :	Interpretation manual of European Union habitats- Eur 28
Author :	European Commission- DG Environment
Series :	European Commission
Year :	2015
Title :	Water quality in Ireland 2010-2012
Author :	Bradley, C., Byrne, C., Craig, M., Free, G., Gallagher, T., Kennedy, B., Little, R., Lucey, J., Mannix, A., McCreesh, P., McDermott, G., McGarrigle, M., Ní Longphuirt, S., O'Boyle, S., Plant, C., Tierney, D., Trodd, W., Webster, P., Wilkes, R. & Wynne, C.
Series :	EPA, Wexford
Year :	in prep.
Title :	Monitoring of hard-water lakes in Ireland using charophytes and other macrophytes
Author :	Roden, C.; Murphy, P.
Series :	Unpublished report to NPWS

Spatial data sources

Year :	2008
Title :	OSi 1:5000 IG vector dataset
GIS Operations :	WaterPolygons feature class clipped to the SAC boundary. Expert opinion used to identify Annex I habitats and to resolve any issues arising
Used For :	3110, 3160 (map 2)
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Year :	2013
Title :	National Survey of Upland Habitats
GIS Operations :	Habitat dataset for site clipped to SAC boundary. Relevant QI selected and exported to new dataset. Expert opinion used as necessary to resolve any issues arising
Used For :	4010, 4030, 4060, 6230, 7130, 7140, 7220, 8110, 8220 (maps 3 to 11)
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Year :	2016
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 :	1393 (map 12)
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Conservation Objectives for : Cuilcagh - Anierin Uplands SAC [000584]

3110 Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)

To maintain the favourable conservation condition of Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) in Cuilcagh - Anierin Uplands 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	Lake habitat 3110 is considered to occur in the larger lakes in Cuilcagh - Anierin Uplands SAC, such as Loughs Nambrack, Derrynananta, Munter Eolus and Knockgorm. Its exact distribution in the SAC is unknown however, as no specific information on the lake vegetation is currently available. Lake habitat 3110 is likely to co-occur with habitat 3160 in most/all lakes. In line with Article 17 reporting (NPWS, 2013), all lakes larger than 1ha have been mapped as 'potential 3110' (see map 2). Two measures of extent should be used: 1. the area of the lake itself and; 2. the extent of the vegetation communities/zones that typify the habitat. Further information relating to all attributes is provided in the lake habitats supporting document for the purposes of site-specific conservation objectives and Article 17 reporting (O Connor, 2015)
Habitat distribution	Occurrence	No decline, subject to natural processes	As noted above, the exact distribution of lake habitat 3110 in the SAC is not known. In map 2, all lakes larger than 1ha (based on 1:5,000 data) have been mapped as potential 3110. All lakes are upland, at altitudes of higher than 350m
Typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution	For lists of typical plant species, see the Article 17 habitat assessment for 3110 (NPWS, 2013) and the lake habitats supporting document (O Connor, 2015). A number of rare and threatened water beetle and water bug species have been recorded on the Fermanagh side of Cuilcagh (Nelson et al., 1997), but the lakes and ponds in this SAC have not been surveyed
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition	The characteristic zonation of lake habitat 3140 has been described (Roden and Murphy, 2013; in prep.), however, significant further work is necessary to describe the characteristic zonation and other spatial patterns in the other four Annex I lake habitats
Vegetation distribution: maximum depth	Metres	Maintain maximum depth of vegetation, subject to natural processes	The maximum depth of vegetation is likely to be specific to the lake shoreline in question. An indicative target has not yet been set for this lake habitat type. Water clarity is expected to be high in upland 3110 lakes, resulting in a large maximum depth of vegetation
Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat	Fluctuations in lake water level are typical in Ireland, but can be amplified by activities such as abstraction and drainage. Increased water level fluctuations can increase wave action, up-root vegetation, increase turbidity, alter the substratum and lead to release of nutrients from the sediment. The hydrological regime of the lakes must be maintained so that the area, distribution and depth of the lake habitat and its constituent/characteristic vegetation zones and communities are not reduced

Lake substratum quality	Various	Maintain appropriate substratum type, extent and chemistry to support the vegetation	Research is required to further characterise the substratum types (particle size and origin) and substratum quality (notably pH, calcium, iron and nutrient concentrations) favoured by each of the five Annex I lake habitats in Ireland. It is likely that lake habitat 3110 is associated with a range of nutrient-poor substrates, from stones, cobble and gravel, through sands, silt, clay and peat. Substratum particle size is likely to vary with depth and along the shoreline within a single lake
Water quality: transparency	Metres	Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	Transparency relates to light penetration and, hence, to the depth of colonisation of vegetation. It can be affected by phytoplankton blooms, water colour and turbidity. A specific target has yet to be established for this Annex I lake habitat. Habitat 3110 is associated with very clear water, particularly upland examples. The OECD fixed boundary system set transparency targets for oligotrophic lakes of $\geq 6\text{m}$ annual mean Secchi disk depth, and $\geq 3\text{m}$ annual minimum Secchi disk depth. Free et al. (2009) found high isoetid abundance in lakes with Secchi depths of more than 3m
Water quality: nutrients	$\mu\text{g/l P}$; mg/l N	Maintain the concentration of nutrients in the water column at sufficiently low levels to support the habitat and its typical species	As a nutrient-poor habitat, oligotrophic and Water Framework Directive (WFD) 'high' status targets apply. Where a lake has nutrient concentrations that are lower than these targets, there should be no decline within class, i.e. no upward trend in nutrient concentrations. For lake habitat 3110, annual average TP concentration should be $\leq 10\mu\text{g/l TP}$, average annual total ammonia concentration should be $\leq 0.040\text{mg/l N}$ and annual 95th percentile for total ammonia should be $\leq 0.090\text{mg/l N}$. See also The European Communities Environmental Objectives (Surface Waters) Regulations 2009
Water quality: phytoplankton biomass	$\mu\text{g/l Chlorophyll } a$	Maintain appropriate water quality to support the habitat, including high chlorophyll <i>a</i> status	Oligotrophic and WFD 'high' status targets apply to lake habitat 3110. Where a lake has a chlorophyll <i>a</i> concentration that is lower than this target, there should be no decline within class, i.e. no upward trend in phytoplankton biomass. The average growing season (March-October) chlorophyll <i>a</i> concentration must be $< 5.8\mu\text{g/l}$. The annual average chlorophyll <i>a</i> concentration should be $< 2.5\mu\text{g/l}$ and the annual peak chlorophyll <i>a</i> concentration should be $\leq 8.0\mu\text{g/l}$. See also The European Communities Environmental Objectives (Surface Waters) Regulations 2009
Water quality: phytoplankton composition	EPA phytoplankton composition metric	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status	The EPA has developed a phytoplankton composition metric for nutrient enrichment of Irish lakes. As for other water quality indicators, habitat 3110 requires WFD high status
Water quality: attached algal biomass	Algal cover and EPA phytobenthos metric	Maintain trace/ absent attached algal biomass ($< 5\%$ cover) and high phytobenthos status	Nutrient enrichment can favour epiphytic and epipelagic algae that can out-compete the submerged vegetation. The cover abundance of attached algae in lake habitat 3110 should, therefore, be trace/ absent ($< 5\%$ cover). EPA phytobenthos can be used as an indicator of changes in attached algal biomass. As for other water quality indicators, habitat 3110 requires high phytobenthos status
Water quality: macrophyte status	EPA macrophyte metric (The Free Index)	Maintain high macrophyte status	Nutrient enrichment can favour more competitive submerged macrophyte species that out-compete the typical and characteristic species for the lake habitat. The EPA monitors macrophyte status for WFD purposes using the 'Free Index'. The target for lake habitat 3110 is high status or an Ecological Quality Ratio (EQR) for lake macrophytes of ≥ 0.90 , as defined in Schedule Five of the European Communities Environmental Objectives (Surface Waters) Regulations 2009

Acidification status	pH units; mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes	Acidification can impact on species abundance and composition in soft water lake habitats. In Europe, acidification of isoetid lakes can lead to loss of isoetids and dominance by submerged <i>Sphagnum</i> mosses and <i>Juncus bulbosus</i> (Arts, 2002). The specific requirements of lake habitat 3110, in terms of water and sediment pH, alkalinity and cation concentration, have not been determined. For lake habitat 3110, and adopting a precautionary approach based on Arts (2002), minimum pH should not be <5.5 pH units. Maximum pH should be <9.0 pH units, in line with the surface water standards established for soft waters (where water hardness is ≤100mg/l calcium carbonate). See Schedule Five of the European Communities Environmental Objectives (Surface Waters) Regulations 2009
Water colour	mg/l PtCo	Maintain appropriate water colour to support the habitat	Increased water colour and turbidity decrease light penetration and can reduce the area of available habitat for lake macrophytes, particularly at the lower euphotic depths. The primary source of increased water colour in Ireland is disturbance to peatland. No habitat-specific or national standards for water colour currently exist. Studies have shown median colour concentrations in Irish lakes of 38mg/l PtCo (Free et al., 2000) and 33mg/l PtCo (Free et al., 2006). It is likely that the water colour in all Irish lake habitats would naturally be <50mg/l PtCo. Water colour can be very low (<20mg/l PtCo or even <10mg/l PtCo) in lake habitat 3110, where the peatland in the lake's catchment is intact
Dissolved organic carbon (DOC)	mg/l	Maintain appropriate organic carbon levels to support the habitat	Dissolved (and particulate) organic carbon (OC) in the water column is linked to water colour and acidification (organic acids). Increasing DOC in water has been documented across the Northern Hemisphere, including afforested peatland catchments in Ireland. Damage and degradation of peatland, leading to decomposition of peat is likely to be the predominant source of OC in Ireland. OC in water promotes decomposition by fungi and bacteria that, in turn, releases dissolved nutrients. The increased biomass of decomposers can also impact directly on the characteristic lake communities through shading, competition, etc.
Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate units	Maintain appropriate turbidity to support the habitat	Turbidity can significantly affect the quantity and quality of light reaching rooted and attached vegetation and can, therefore, impact on lake habitats. The settlement of higher loads of inorganic or organic material on lake vegetation communities may also have impacts on sensitive, delicate species. Turbidity can increase as a result of re-suspension of material within the lake, higher loads entering the lake, or eutrophication. Turbidity measurement and interpretation is challenging. As a result, it is likely to be difficult to set habitat-specific targets for turbidity in lakes
Fringing habitat: area	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110	Most lake shorelines have fringing habitats of reedswamp, other swamp, fen, marsh or wet woodland that intergrade with and support the structure and functions of the lake habitat. In this SAC, active blanket bog and heath communities dominate lake shorelines. Transition mire, fen, flush and grassland may also occur. Equally, fringing habitats are dependent on the lake, particularly its water levels, and support wetland communities and species of conservation concern. Many of the fringing wetland habitats support higher invertebrate and plant species richness than the lake habitats themselves

3160 Natural dystrophic lakes and ponds

To maintain the favourable conservation condition of Natural dystrophic lakes and ponds in Cuilcagh - Anierin Uplands 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	Natural dystrophic lakes and ponds (3160) are scattered throughout the peatland in the SAC. The habitat likely co-occurs with lake habitat 3110 in the larger lakes. Douglas et al. (1990) found blanket bog of very high scientific importance with extensive 3160 pools south of Lough Cratty. Perrin et al. (2013) recorded fire damage in this area. Douglas et al. (1990) also recorded 3160 pools at Levenatalla and tear pools on the border with NI. All lakes and pools are upland and, in line with Article 17 reporting (NPWS, 2013), have been mapped as potential 3160 (see map 2). Note: not all 3160 pools are mapped in the 1:5,000 OSi data. Two measures of extent should be used: 1. the area of the lake itself and; 2. the extent of the vegetation communities/zones that typify the habitat. Further information relating to all attributes is provided in the lake habitats supporting document for the purposes of site-specific conservation objectives and Article 17 reporting (O Connor, 2015)
Habitat distribution	Occurrence	No decline, subject to natural processes	As noted above, the habitat is widespread and of high conservation value in the SAC (see map 2). All lakes have been mapped as potential 3160. See Douglas et al. (1990) and Perrin et al. (2013)
Typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution	For lists of typical plant and invertebrate species, see Article 17 habitat assessment for lake habitat 3160 (NPWS, 2013) and O Connor (2015). A number of rare and threatened water beetle and water bug species has been recorded in 3160 pools and lakes on the Fermanagh side of Cuilcagh, but this SAC has not been surveyed. Beetles included the Endangered <i>Hydroporus longicornis</i> , and Near Threatened <i>Dytiscus lapponicus</i> , <i>Boreonectes (Stictotarsus) multilineatus</i> (= <i>Potamonectes griseostriatus</i>) and <i>Agabus arcticus</i> (see Nelson, 2008; Nelson et al., 1997; Foster et al., 2009). Bugs included <i>Callicorixa wollastoni</i> and <i>Glaenocoris propinqua</i>
Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition	The characteristic zonation of lake habitat 3140 has been described (Roden and Murphy, 2013; in prep.), however, significant further work is necessary to describe the characteristic zonation and other spatial patterns in the other four Annex I lake habitats. Spatial patterns are likely to be relatively simple in 3160 lakes and ponds, with limited zonation
Vegetation distribution: maximum depth	Metres	Maintain maximum depth of vegetation, subject to natural processes	The maximum depth of vegetation is likely to be specific to the lake shoreline in question. An indicative target has not yet been set for this lake habitat type. Upland lakes and ponds naturally have very clear water and, therefore, maximum depth is expected to be large

Hydrological regime: water level fluctuations	Metres	Maintain appropriate natural hydrological regime necessary to support the habitat	Fluctuations in lake water level are typical in Ireland, but can be amplified by activities such as abstraction and drainage. Increased water level fluctuations can increase wave action, up-root vegetation, increase turbidity, alter the substratum and lead to release of nutrients from the sediment. The hydrological regime of the lakes and pools must be maintained so that the area, distribution and depth of the lake habitat and its constituent/characteristic vegetation zones and communities are not reduced. Owing to their size and the sensitivity of peatland, 3160 lakes and pools can easily be damaged or destroyed by drainage
Lake substratum quality	Various	Maintain appropriate substratum type, extent and chemistry to support the vegetation	Research is required to further characterise the substratum types (particle size and origin) and substratum quality (notably pH, calcium, iron and nutrient concentrations) favoured by each of the five Annex I lake habitats in Ireland. It is likely that habitat 3160 is associated with nutrient-poor peat and silt substrates
Water quality: transparency	Metres	Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	Transparency relates to light penetration and, hence, to the depth of colonisation of vegetation. It can be affected by phytoplankton blooms, water colour and turbidity. A specific target has yet to be established for this Annex I lake habitat. Habitat 3160 is associated with very clear water. The OECD fixed boundary system set transparency targets for ultra-oligotrophic lakes of $\geq 12\text{m}$ annual mean Secchi disk depth, and $\geq 6\text{m}$ annual minimum Secchi disk depth
Water quality: nutrients	$\mu\text{g/l P}$; mg/l N	Maintain the concentration of nutrients in the water column at sufficiently low levels to support the habitat and its typical species	As a nutrient-poor habitat, oligotrophic and Water Framework Directive (WFD) 'high' status targets apply. Where a lake has nutrient concentrations that are lower than these targets, there should be no decline within class, i.e. no upward trend in nutrient concentrations. For 3160 lakes and pools, annual average TP concentration should be $\leq 5\mu\text{g/l TP}$, average annual total ammonia concentration should be $\leq 0.040\text{mg/l N}$ and annual 95th percentile for total ammonia should be $\leq 0.090\text{mg/l N}$. See also The European Communities Environmental Objectives (Surface Waters) Regulations 2009
Water quality: phytoplankton biomass	$\mu\text{g/l Chlorophyll } a$	Maintain appropriate water quality to support the habitat, including high chlorophyll <i>a</i> status	Oligotrophic and WFD 'high' status targets apply to lake habitat 3160. The average growing season (March-October) chlorophyll <i>a</i> concentration must be $< 5.8\mu\text{g/l}$ (The European Communities Environmental Objectives (Surface Waters) Regulations 2009). Where a lake has a chlorophyll <i>a</i> concentration that is lower than this target, there should be no decline within class, i.e. no upward trend in phytoplankton biomass. The OECD targets may be more appropriate for habitat 3160: annual average chlorophyll <i>a</i> concentration $< 1\mu\text{g/l}$ and annual peak chlorophyll <i>a</i> concentration $\leq 2.5\mu\text{g/l}$. See also The European Communities Environmental Objectives (Surface Waters) Regulations 2009
Water quality: phytoplankton composition	EPA phytoplankton composition metric	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status	The EPA has developed a phytoplankton composition metric for nutrient enrichment of Irish lakes. As for other water quality indicators, lake habitat 3160 requires WFD high status
Water quality: attached algal biomass	Algal cover and EPA phytobenthos metric	Maintain trace/ absent attached algal biomass ($< 5\%$ cover) and high phytobenthos status	Nutrient enrichment can favour epiphytic and epipelagic algae that can out-compete the submerged vegetation. The cover abundance of attached algae in 3160 lakes and ponds should, therefore, be trace/ absent ($< 5\%$ cover). EPA phytobenthos can be used as an indicator of changes in attached algal biomass. As for other water quality indicators, lake habitat 3160 requires high phytobenthos status

Water quality: macrophyte status	EPA macrophyte metric (The Free Index)	Maintain high macrophyte status	Nutrient enrichment can favour more competitive submerged macrophyte species that out-compete the typical and characteristic species for the lake habitat. The EPA monitors macrophyte status for WFD purposes using the 'Free Index'. The target for 3160 lakes and pools is high status or an Ecological Quality Ratio (EQR) for lake macrophytes of ≥ 0.90 , as defined in Schedule Five of the European Communities Environmental Objectives (Surface Waters) Regulations 2009
Acidification status	pH units; mg/l	Maintain appropriate water and sediment pH, alkalinity and cation concentrations to support the habitat, subject to natural processes	Acidification can impact on species abundance and composition in soft water lake habitats. Although EC (2013) describes habitat 3160 as having pH 3-6, Drinan (2012) found mean pHs of 5.16 and 5.62 in upland and lowland 3160 lakes, respectively. The target for habitat 3160 is pH >4.5 and <9.0 , in line with the surface water standards for soft waters (where water hardness is ≤ 100 mg/l calcium carbonate). See Schedule Five of the European Communities Environmental Objectives (Surface Waters) Regulations 2009. The specific requirements of habitat 3160, in terms of water and sediment pH, alkalinity and cation concentration, have not been determined
Water colour	mg/l PtCo	Maintain appropriate water colour to support the habitat	Increased water colour and turbidity decrease light penetration and can reduce the area of available habitat for lake macrophytes, particularly at the lower euphotic depths. The primary source of increased water colour in Ireland is disturbance to peatland. No habitat-specific or national standards for water colour currently exist. Studies have shown median colour concentrations in Irish lakes of 38mg/l PtCo (Free et al., 2000) and 33mg/l PtCo (Free et al., 2006). It is likely that the water colour in all Irish lake habitats would naturally be <50 mg/l PtCo. Water colour can be very low (<20 mg/l PtCo or even <10 mg/l PtCo) in 3160 lakes and pools where the peatland in the lake's catchment is intact
Dissolved organic carbon (DOC)	mg/l	Maintain appropriate organic carbon levels to support the habitat	Dissolved (and particulate) organic carbon (OC) in the water column is linked to water colour and acidification (organic acids). Increasing DOC in water has been documented across the Northern Hemisphere, including afforested peatland catchments in Ireland. Damage and degradation of peatland, leading to decomposition of peat is likely to be the predominant source of OC in Ireland. OC in water promotes decomposition by fungi and bacteria that, in turn, releases dissolved nutrients. The increased biomass of decomposers can also impact directly on the characteristic lake communities through shading, competition, etc.
Turbidity	Nephelometric turbidity units/ mg/l SS/ other appropriate units	Maintain appropriate turbidity to support the habitat	Turbidity can significantly affect the quantity and quality of light reaching rooted and attached vegetation and can, therefore, impact on lake habitats. The settlement of higher loads of inorganic or organic material on lake vegetation communities may also have impacts on sensitive, delicate species. Turbidity can increase as a result of re-suspension of material within the lake, higher loads entering the lake, or eutrophication. Turbidity measurement and interpretation is challenging. As a result, it is likely to be difficult to set habitat-specific targets for turbidity in lakes
Fringing habitat: area	Hectares	Maintain the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3160	Most 3160 lake and pool shorelines intergrade with active blanket bog, heath, flush or fen habitats and these support the structure and functions of the lake habitat. Equally, fringing habitats are dependent on the lake, particularly its water levels, and can support wetland communities and species of conservation concern

4010 Northern Atlantic wet heaths with *Erica tetralix*

To restore the favourable conservation condition of Northern Atlantic wet heaths with *Erica tetralix* in Cuilcagh - Anierin Uplands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area increasing, subject to natural processes	Cuilcagh - Anierin Uplands SAC was surveyed as part of the National Survey of Upland Habitats (NSUH; see Perrin et al., 2013 and Perrin et al., 2014). Northern Atlantic wet heaths with <i>Erica tetralix</i> was mapped in detail for this SAC (Perrin et al., 2013) and the total current area of the qualifying habitat stated is 80.8ha, covering 0.8% of the SAC. Perrin et al. (2013) report obvious losses of habitat since 1995 of approximately 0.06ha. A summary of the mapping methodology, a brief discussion of restoration potential and further details on this and the following attributes can be found in the Cuilcagh - Anierin Uplands SAC conservation objectives supporting document for upland habitats
Habitat distribution	Occurrence	No decline from current distribution, subject to natural processes. See map 3	Small areas of wet heath were recorded by Perrin et al. (2013) throughout this SAC. Patches occur near the summit of Benbrack and in the vicinity of Alteen. A summary of the mapping methodology is presented in the uplands supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the uplands supporting document for further details
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Perrin et al. (2013) recorded four different wet heath communities within this SAC. Data on the abundance of these communities is reproduced in the uplands supporting document. Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: cross-leaved heath	Occurrence within 20m of a representative number of 2m x 2m monitoring stops	Cross-leaved heath (<i>Erica tetralix</i>) present near each monitoring stop	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50%	Based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented. See the uplands supporting document for further details
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of <i>Cladonia</i> and <i>Sphagnum</i> species, <i>Racomitrium lanuginosum</i> and pleurocarpous mosses at least 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: ericoid species and crowberry	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of ericoid species and crowberry (<i>Empetrum nigrum</i>) at least 15%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: dwarf shrub species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of dwarf shrubs less than 75%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Based on Perrin et al. (2014), where the list of negative indicator species is also presented. See the uplands supporting document for further details
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Based on Perrin et al. (2014). See the uplands supporting document for further details. The non-native moss <i>Campylopus introflexus</i> was recorded within this habitat by Perrin et al. (2013) with evidence that severe burning was facilitating the colonisation of this species.

Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 20%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken (<i>Pteridium aquilinum</i>) less than 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush (<i>Juncus effusus</i>) less than 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation structure: <i>Sphagnum</i> condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the <i>Sphagnum</i> cover is crushed, broken and/or pulled up	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids, crowberry (<i>Empetrum nigrum</i>) and bog-myrtle (<i>Myrica gale</i>) showing signs of browsing	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation structure: burning	Occurrence in local vicinity of a representative number of 2m x 2m monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Based on Perrin et al. (2014), where the list of sensitive areas is also presented. See the uplands supporting document for further details
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Physical structure: drainage	Percentage cover in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	Perrin et al. (2013) compiled and mapped existing rare and notable plant records for the SAC and added any new records collected during the NSUH survey. No relevant species were recorded in this habitat, however, new records should be considered within this attribute. See the uplands supporting document for further details

Conservation Objectives for : Cuilcagh - Anierin Uplands SAC [000584]

4030 European dry heaths

To restore the favourable conservation condition of European dry heaths in Cuilcagh - Anierin Uplands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area increasing, subject to natural processes	Cuilcagh - Anierin Uplands SAC was surveyed as part of the National Survey of Upland Habitats (NSUH; see Perrin et al., 2013 and Perrin et al., 2014). European dry heaths habitat was mapped in detail for this SAC (Perrin et al., 2013) and the total current area of the qualifying habitat stated is 770.5ha, covering 7.9% of the SAC. Perrin et al. (2013) report obvious losses of habitat since 1995 of approximately 0.25ha. A summary of the mapping methodology, a brief discussion of restoration potential and further details on this and the following attributes are presented in the Cuilcagh - Anierin Uplands SAC conservation objectives supporting document for upland habitats
Habitat distribution	Occurrence	No decline from current distribution, subject to natural processes. See map 4.	Dry heath was recorded by Perrin et al. (2013) throughout the SAC, including the western slopes of Slieve Anierin, the ridge between Slieve Anierin and Bencroy, north of the Playbank summit and on the slopes around Benbrack and Cuilcagh. A summary of the mapping methodology is presented in the uplands supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the uplands supporting document for further details
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Perrin et al. (2013) recorded four different dry heath communities within this SAC. Data on the abundance of these communities is reproduced in the uplands supporting document. Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: lichens and bryophytes	Number of species at a representative number of 2m x 2m monitoring stops	Number of bryophyte or non-crustose lichen species present at each monitoring stop is at least three, excluding <i>Campylopus</i> and <i>Polytrichum</i> mosses	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: number of positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species present at each monitoring stop is at least two	Based on Perrin et al. (2014), where the list of positive indicator species for this habitat, which is composed of dwarf shrubs, is also presented. See the uplands supporting document for further details
Vegetation composition: cover of positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50% for siliceous dry heath and 50-75% for calcareous dry heath	Based on Perrin et al. (2014), where the list of positive indicator species for this habitat, which is composed of dwarf shrubs, is also presented. See the uplands supporting document for further details
Vegetation composition: dwarf shrub composition	Percentage cover at a representative number of 2m x 2m monitoring stops	Proportion of dwarf shrub cover composed collectively of bog-myrtle (<i>Myrica gale</i>), creeping willow (<i>Salix repens</i>) and western gorse (<i>Ulex gallii</i>) is less than 50%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Based on Perrin et al. (2014), where the list of negative indicator species is also presented. See the uplands supporting document for further details

Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Based on Perrin et al. (2014), where the list of negative indicator species is also presented. See the uplands supporting document for further details. The non-native moss <i>Campylopus introflexus</i> was recorded within this habitat by Perrin et al. (2013), but did not form extensive carpets
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 20%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken (<i>Pteridium aquilinum</i>) less than 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: soft rush	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of soft rush (<i>Juncus effusus</i>) less than 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation structure: senescent ling	Percentage cover at a representative number of 2m x 2m monitoring stops	Senescent proportion of ling (<i>Calluna vulgaris</i>) cover less than 50%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids showing signs of browsing	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas	Based on Perrin et al. (2014), where the list of sensitive areas is also presented. See the uplands supporting document for further details
Vegetation structure: growth phases of ling	Percentage cover in local vicinity of a representative number of monitoring stops	Outside sensitive areas, all growth phases of ling (<i>Calluna vulgaris</i>) should occur throughout, with at least 10% of cover in the mature phase	Based on Perrin et al. (2014). See the uplands supporting document for further details
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat and no decline in status of hepatic mats associated with this habitat	Perrin et al. (2013) compiled and mapped existing rare and notable plant records for the SAC and added any new records collected during the NSUH survey. No relevant species were recorded in this habitat, however, new records should be considered within this attribute. See the uplands supporting document for further details

4060 Alpine and Boreal heaths

To restore the favourable conservation condition of Alpine and Boreal heaths in Cuilcagh - Anierin Uplands 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	Cuilcagh - Anierin Uplands SAC was surveyed as part of the National Survey of Upland Habitats (NSUH; see Perrin et al., 2013 and Perrin et al., 2014). The total current area of Alpine and Boreal heath in the SAC stated by Perrin et al. (2013) is 92.5ha, covering 1.0% of the SAC. Perrin et al. (2013) report no significant losses of area since 1995. A summary of the mapping methodology and further details on this and the following attributes can be found in the Cuilcagh - Anierin Uplands SAC conservation objectives supporting document for upland habitats
Habitat distribution	Occurrence	No decline from current distribution, subject to natural processes. See map 5	Alpine and Boreal heath was recorded by Perrin et al. (2014) on the high ground across the SAC. A large expanse was recorded on the summit ridge of Cuilcagh. It also notably occurred on the summit of the Playbank, with scattered patches across the summit area of Benbrack. A summary of the mapping methodology is presented in the uplands supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the uplands supporting document for further details
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Perrin et al. (2013) recorded four different Alpine and Boreal heath communities within this SAC. Data on the abundance of these communities is reproduced in the uplands supporting document. Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: lichens and bryophytes	Number of species at a representative number of 2m x 2m monitoring stops	Number of bryophyte or non-crustose lichen species present at each monitoring stop is at least three	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 66%	Based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented. See the uplands supporting document for further details
Vegetation composition: dwarf shrub species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of dwarf shrub species at least 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 10%	Based on Perrin et al. (2014), where the list of negative indicator species is presented. See the uplands supporting document for further details
Vegetation composition: non-native species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Based on Perrin et al. (2014). See the uplands supporting document for further details. The non-native moss <i>Campylopus introflexus</i> was recorded within this habitat by Perrin et al. (2013), but did not form extensive carpets
Vegetation structure: signs of grazing	Percentage of leaves browsed at a representative number of 2m x 2m monitoring stops	Less than 10% collectively of the live leaves of specific graminoids showing signs of grazing	Based on Perrin et al. (2014). See the uplands supporting document for further details, including the list of specific graminoids

Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Less than 33% collectively of the last complete growing season's shoots of ericoids and crowberry (<i>Empetrum nigrum</i>) showing signs of browsing	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning within the habitat	Based on Perrin et al. (2014). See the uplands supporting document for further details
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	Perrin et al. (2013) compiled and mapped existing rare and notable plant records for the SAC and added any new records collected during the NSUH survey. No relevant species were recorded in this habitat, however, new records should be considered within this attribute. See the uplands supporting document for further details

Conservation Objectives for : Cuilcagh - Anierin Uplands SAC [000584]

6230 Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)

To restore the favourable conservation condition of Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)* in Cuilcagh - Anierin Uplands 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	Cuilcagh - Anierin Uplands SAC was surveyed as part of the National Survey of Upland Habitats (NSUH; see Perrin et al., 2013 and Perrin et al., 2014). Species-rich <i>Nardus</i> grassland* was mapped in detail for this SAC and the total current area stated by Perrin et al. (2013) is 1.4ha, covering 0.01% of the SAC. Perrin et al. (2013) report no obvious losses of habitat since 1995. A summary of the mapping methodology and further details on this and the following attributes can be found in the Cuilcagh - Anierin Uplands SAC conservation objectives supporting document for upland habitats
Habitat distribution	Occurrence	No decline from current distribution, subject to natural processes. See map 6	Species-rich <i>Nardus</i> grassland* was recorded by Perrin et al. (2013) in the north-east of the SAC on the slopes around Cuilcagh. A summary of the mapping methodology is presented in the uplands supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the uplands supporting document for further details
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Perrin et al. (2013) recorded two different species-rich <i>Nardus</i> grassland* communities within this SAC. Data on the abundance of these communities is reproduced in the uplands supporting document. Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species present at each monitoring stop is at least seven	Based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented. See the uplands supporting document for further details
Vegetation composition: high quality indicator species	Number of species at a representative number of 2m x 2m monitoring stops	At least two high quality species for base-rich examples of the habitat and at least one for base-poor examples of the habitat	Based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented. See the uplands supporting document for further details
Vegetation composition: species richness	Number of species at a representative number of 2m x 2m monitoring stops	Species richness at each monitoring stop at least 25	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: non-native species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of non-native species less than or equal to 1%	Based on Perrin et al. (2014). See the uplands supporting document for further details. <i>Epilobium brunnescens</i> was recorded within this habitat by Perrin et al. (2013), with a relatively high cover score of 15% within the single monitoring stop
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of negative indicator species individually less than or equal to 10% and collectively less than or equal to 20%	Based on Perrin et al. (2014), where the list of negative indicator species is also presented. See the uplands supporting document for further details
Vegetation composition: <i>Sphagnum</i> cover	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of <i>Sphagnum</i> species less than or equal to 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details

Vegetation composition: <i>Polytrichum</i> cover	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of <i>Polytrichum</i> species less than or equal to 25%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: scrub, bracken and heath cover	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of scrub, bracken (<i>Pteridium aquilinum</i>) and heath collectively less than or equal to 5%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation structure: forb to graminoid ratio	Percentage cover at a representative number of 2m x 2m monitoring stops	Forb component of forb:graminoid ratio is 20-90%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation structure: sward height	Sward height at a representative number of 2m x 2m monitoring stops	Proportion of the sward between 5cm and 50cm tall is at least 25%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation structure: litter cover	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of litter less than or equal to 20%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Physical structure: disturbed bare ground	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than or equal to 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Physical structure: grazing or disturbance	Percentage cover in local vicinity of a representative number of monitoring stops	Area of the habitat showing signs of serious grazing or disturbance less than 20m ²	Based on Perrin et al. (2014). See the uplands supporting document for further details
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	Perrin et al. (2013) compiled and mapped existing rare and notable plant records for the SAC and added any new records collected during the NSUH survey. No relevant species were recorded in this habitat, however, new records should be considered within this attribute. See the uplands supporting document for further details

Conservation Objectives for : Cuilcagh - Anierin Uplands SAC [000584]

7130 Blanket bogs (* if active bog)

To restore the favourable conservation condition of Blanket bogs in Cuilcagh - Anierin Uplands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area increasing, subject to natural processes	Cuilcagh - Anierin Uplands SAC was surveyed as part of the National Survey of Upland Habitats (NSUH; see Perrin et al., 2013 and Perrin et al., 2014). Perrin et al. (2013) state that the current total area of blanket bog is 5,934.8ha (61.1% of the SAC). This comprises 5861.1ha of active blanket bog and 73.7ha of inactive blanket bog. Perrin et al. (2013) also report obvious losses of habitat since 1995 of approximately 5.1ha. However, this is almost certainly an under-estimate, as chronic losses due to erosion since 1995 cannot be quantified (78.5ha were mapped as eroding blanket bog by Perrin et al. (2013)). It should be noted that further restoration of blanket bog would be required in order to fulfil the targets for peat formation and hydrology presented below. A summary of the mapping methodology and a brief discussion of restoration potential are presented in the Cuilcagh - Anierin Uplands SAC conservation objectives supporting document for upland habitats
Habitat distribution	Occurrence	No decline from current distribution, subject to natural processes. See map 7	Extensive areas of blanket bogs were recorded by Perrin et al. (2013) throughout this SAC. A summary of the mapping methodology is presented in the uplands supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the uplands supporting document for further details
Ecosystem function: peat formation	Active blanket bog as a proportion of the total area of Annex I blanket bog habitat	At least 99% of the total Annex I blanket bog area is active	From the habitat areas given by Perrin et al. (2013) above, 98.8% of the Annex I blanket bog habitat is currently actively peat-forming. See the uplands supporting document for further details
Ecosystem function: hydrology	Flow direction, water levels, occurrence of drains and erosion gullies	Natural hydrology unaffected by drains and erosion	Further details and a brief discussion of restoration potential is presented in the uplands supporting document
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Perrin et al. (2013) recorded five different active blanket bogs communities within this SAC. Data on the abundance of these communities is reproduced in the uplands supporting document. Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species at each monitoring stop is at least seven	Based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented. See the uplands supporting document for further details
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of bryophytes or lichens, excluding <i>Sphagnum fallax</i> , at least 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: potential dominant species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of each of the potential dominant species less than 75%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented. See the uplands supporting document for further details

Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Based on Perrin et al. (2014). See the uplands supporting document for further details. The non-native species <i>Campylopus introflexus</i> was recorded within 33.3% of blanket bogs monitoring stops recorded by Perrin et al. (2013), but its cover was not sufficiently high to cause any of these stops to fail
Vegetation composition: native trees and scrub	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation structure: <i>Sphagnum</i> condition	Condition at a representative number of 2m x 2m monitoring stops	Less than 10% of the <i>Sphagnum</i> cover is crushed, broken and/or pulled up	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation structure: signs of browsing	Percentage of shoots browsed at a representative number of 2m x 2m monitoring stops	Last complete growing season's shoots of ericoids, crowberry (<i>Empetrum nigrum</i>) and bog-myrtle (<i>Myrica gale</i>) showing signs of browsing collectively less than 33%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation structure: burning	Occurrence in local vicinity of a representative number of monitoring stops	No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	Based on Perrin et al. (2014), where the list of sensitive areas is also presented. See the uplands supporting document for further details
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Physical structure: erosion	Occurrence in local vicinity of a representative number of monitoring stops	Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas	Based on Perrin et al. (2014). See the uplands supporting document for further details
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	Perrin et al. (2013) compiled and mapped existing rare and notable plant records for the SAC and added any new records collected during the NSUH survey. No relevant species were recorded in this habitat, however, new records should be considered within this attribute. See the uplands supporting document for further details

7140 Transition mires and quaking bogs

To maintain the favourable conservation condition of Transition mires and quaking bogs in Cuilcagh - Anierin Uplands 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	Cuilcagh - Anierin Uplands SAC was surveyed as part of the National Survey of Upland Habitats (NSUH; see Perrin et al., 2013 and Perrin et al., 2014). The total current area of transition mires and quaking bogs in the SAC stated by Perrin et al. (2013) is 17.4ha. This covers 0.2% of the SAC. Perrin et al. (2013) report no significant losses of area since 1995. A summary of the mapping methodology and further details on this and the following attributes can be found in the Cuilcagh - Anierin Uplands SAC conservation objectives supporting document for upland habitats
Habitat distribution	Occurrence	No decline from current distribution, subject to natural processes. See map 8	Transition mire was recorded by Perrin et al. (2013) scattered across the SAC, most notably on the western slopes of Slieve Anierin, along the undulating summit of the ridge of the Playbank and on flatter areas of ground to the south-east of the plateau east of Commas. A summary of the mapping methodology is presented in the uplands supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the uplands supporting document for further details
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Perrin et al. (2013) recorded three different transition mire communities within this SAC. Data on the abundance of these communities is reproduced in the uplands supporting document. Further information on vegetation communities associated with this habitat is presented in Perrin et al. (2014)
Vegetation composition: number of positive indicator species	Number at a representative number of 2m x 2m monitoring stops	Number of positive indicator species at least three for in-filling pools and flushes and at least six for fens	Based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented. See the uplands supporting document for further details
Vegetation composition: number of core positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	At least one core positive indicator species present	Based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented. See the uplands supporting document for further details
Vegetation composition: cover of positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of positive indicator species is at least 25%	Based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented. See the uplands supporting document for further details
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%	Based on Perrin et al. (2014), where the list of negative indicator species for this habitat is also presented. See the uplands supporting document for further details
Vegetation composition: non-native species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Based on Perrin et al. (2014). See the uplands supporting document for further details. No non-native species were recorded within this habitat by Perrin et al. (2013)
Vegetation structure: height	Percentage at a representative number of 2m x 2m monitoring stops	Proportion of live leaves and/or flowering shoots of vascular plants that are more than 15cm above the ground surface should be at least 50%	Based on Perrin et al. (2014). This attribute is only applicable to fen and flush examples, not to in-filling pool examples. See the uplands supporting document for further details

Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of disturbed bare ground less than 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Physical structure: drainage	Percentage area in local vicinity of a representative number of monitoring stops	Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	Perrin et al. (2013) compiled and mapped existing rare and notable plant records for the SAC and added any new records collected during the NSUH survey. No relevant species were recorded in this habitat, however, new records should be considered within this attribute. See the uplands supporting document for further details

Conservation Objectives for : Cuilcagh - Anierin Uplands SAC [000584]

7220 Petrifying springs with tufa formation (Cratoneurion)

To restore the favourable conservation condition of Petrifying springs with tufa formation (Cratoneurion)* in Cuilcagh - Anierin Uplands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Square metres	Area stable or increasing, subject to natural processes	Within Cuilcagh - Anierin Uplands SAC, eight polygons were recorded as having petrifying springs during the National Survey of Upland Habitats (NSUH; see Perrin et al., 2013). The polygons were recorded mainly around the Cuilcagh massif. The overall area of habitat 7220* is given in Perrin et al. (2013) as 0.1ha. The approach to mapping conducted during the NSUH is detailed in Perrin et al. (2014). Note that the NSUH did not undertake a conservation status assessment of this habitat and thus it is not included in the uplands supporting document
Habitat distribution	Occurrence	No decline from current distribution, subject to natural processes. See map 9	This habitat has been recorded from eight polygons within the SAC. Four of the polygons are predominantly covered with the Fossitt (2000) habitat poor fen and flush (PF2), three of the polygons predominantly contain the Annex I habitat Blanket bog (7130*) and the majority of the final polygon supports the Fossitt (2000) habitat wet grassland (GS4). Lyons and Kelly (2013) recognise three main sub-types of spring: wooded springs, inland non-wooded springs and coastal springs. The springs in this SAC fall into the second sub-type, within which springs on steep sites are recognised as a distinct sub-group
Hydrological regime: height of water table/ water flow	Metres/metres per second	Maintain appropriate hydrological regimes	The hydrological regimes of individual springs are currently unknown in detail. Petrifying springs rely on permanent irrigation, usually from upwelling groundwater sources or seepage sources (Lyons and Kelly, 2013)
Water quality	Water chemistry measures	Maintain oligotrophic and calcareous conditions	Water chemistry is currently unknown for springs in this SAC. Characteristically, petrifying spring water has high values for pH, alkalinity and dissolved calcium and is oligotrophic (Lyons and Kelly, 2013)
Vegetation composition: typical species	Occurrence	Maintain typical species	The bryophytes <i>Palustriella commutata</i> (<i>Cratoneuron commutatum</i>) and <i>Cratoneuron filicinum</i> are diagnostic of petrifying springs (EC, 2013) and are found in this habitat in the SAC (Perrin et al., 2013). <i>Palustriella commutata</i> is diagnostic for identifying the NSUH vegetation community SPG2i, this being synonymous with 7220*. Other bryophyte species recorded within the SAC (Perrin et al., 2013), which are listed in Appendix 1 A-C of Lyons and Kelly (2013) as being indicative of petrifying springs are: <i>Aneura pinguis</i> , <i>Bryum pseudotriquetrum</i> , <i>Campylium stellatum</i> , <i>Fissidens adianthoides</i> , <i>Hymenostylium recurvirostrum</i> var. <i>recurvirostrum</i> , <i>Jungermannia atrovirens</i> , <i>Palustriella falcata</i> , <i>Pellia endiviifolia</i> , <i>Philontis calcarea</i> and <i>Pohlia wahlenbergii</i>

Conservation Objectives for : Cuilcagh - Anierin Uplands SAC [000584]

8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)

To restore the favourable conservation condition of Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) in Cuilcagh - Anierin Uplands 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	Cuilcagh - Anierin Uplands SAC was surveyed as part of the National Survey of Upland Habitats (NSUH; see Perrin et al., 2013 and Perrin et al., 2014). The total current area of siliceous scree in the SAC stated by Perrin et al. (2013) is 8.5ha. This covers 0.1% of the SAC. Perrin et al. (2013) report no significant losses of area since 1995. A summary of the mapping methodology and further details on this and the following attributes can be found in the Cuilcagh - Anierin Uplands SAC conservation objectives supporting document for upland habitats
Habitat distribution	Occurrence	No decline from current distribution, subject to natural processes. See map 10	Siliceous scree was recorded by Perrin et al. (2013) throughout the SAC. The most extensive patches occurred on Cuilcagh and Slieve Anierin. A summary of the mapping methodology is presented in the uplands supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the uplands supporting document for further details
Vegetation composition: lichens and bryophytes	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of bryophytes and non-crustose lichen species at least 5%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Proportion of vegetation composed of negative indicator species less than 1%	Based on Perrin et al. (2014), where the list of negative indicator species is also presented. See the uplands supporting document for further details
Vegetation composition: non-native species	Percentage cover at a representative number of 2m x 2m monitoring stops	Proportion of vegetation composed of non-native species less than 1%	Based on Perrin et al. (2014). See the uplands supporting document for further details. The cover of the non-native species <i>Campylopus introflexus</i> in one of four siliceous scree monitoring stops recorded by Perrin et al. (2013) was sufficiently high enough to cause it to fail
Vegetation composition: positive indicator species	Number of species in local vicinity of a representative number of monitoring stops	Number of positive indicator species present in vicinity of each monitoring stop in block scree is at least one	Based on Perrin et al. (2014). The list of positive indicator species for this habitat is presented in Perrin et al. (2014) and is the same as for 8220 Siliceous rocky slopes. Further details can be found in the uplands supporting document
Vegetation composition: grass species and dwarf shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Total cover of grass species and dwarf shrubs less than 20%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: bracken, native trees and scrub	Percentage cover in local vicinity of a representative number of monitoring stops	Total cover of bracken (<i>Pteridium aquilinum</i>), native trees and scrub less than 25%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation structure: grazing and browsing	Percentage of leaves/shoots grazed/browsed at a representative number of 2m x 2m monitoring stops	Live leaves of forbs and shoots of dwarf shrubs showing signs of grazing or browsing collectively less than 50%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Physical structure: disturbance	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Ground disturbed by human and animal paths, scree running, vehicles less than 10%	Based on Perrin et al. (2014). See the uplands supporting document for further details

Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	Perrin et al. (2013) compiled and mapped existing rare and notable plant records for the SAC and added any new records collected during the NSUH survey. No relevant species were recorded in this habitat, however, new records should be considered within this attribute. See the uplands supporting document for further details
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8220 Siliceous rocky slopes with chasmophytic vegetation

To maintain the favourable conservation condition of Siliceous rocky slopes with chasmophytic vegetation in Cuilcagh - Anierin Uplands SAC, which is defined by the following list of attributes and targets:

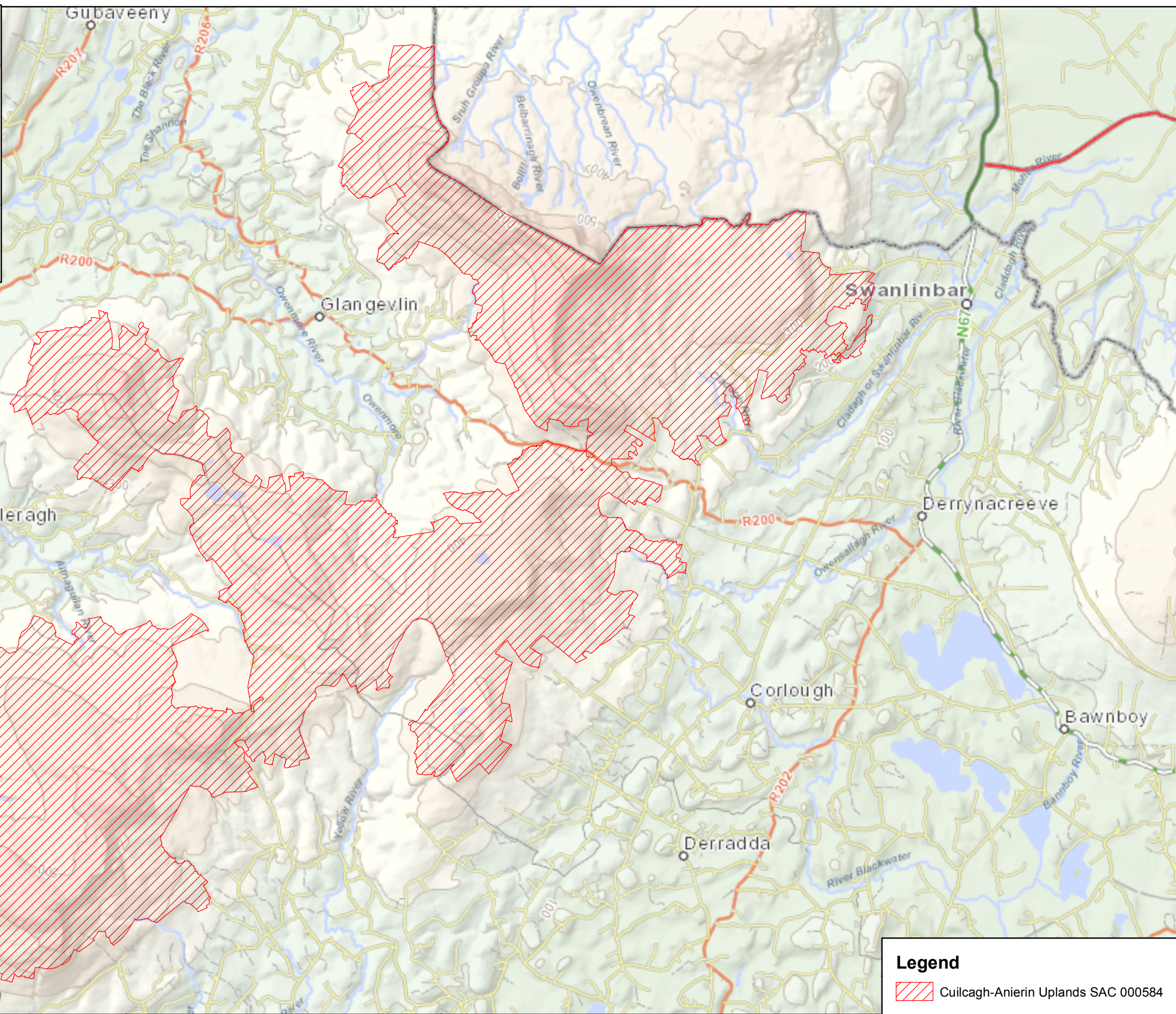
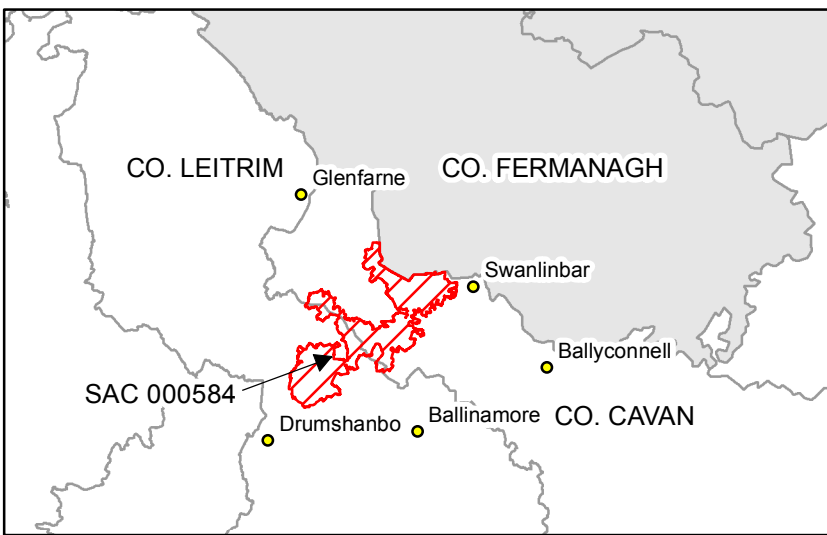
Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes	Cuilcagh - Anierin Uplands SAC was surveyed as part of the National Survey of Upland Habitats (NSUH; see Perrin et al., 2013 and Perrin et al., 2014). Siliceous rocky slopes was mapped in detail for this SAC and the total current area stated by Perrin et al. (2013) is 10.9ha, covering 0.1% of the SAC. Perrin et al. (2013) report no obvious losses of habitat since 1995. A summary of the mapping methodology and further details on this and the following attributes can be found in the Cuilcagh - Anierin Uplands SAC conservation objectives supporting document for upland habitats
Habitat distribution	Occurrence	No decline from current distribution, subject to natural processes. See map 11	Small areas of siliceous rocky slopes were recorded by Perrin et al. (2013) throughout this SAC, with some of the most extensive areas found on the slopes of Slieve Anierin. A summary of the mapping methodology is presented in the uplands supporting document
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range	See the uplands supporting document for further details
Vegetation composition: positive indicator species	Number of species at a representative number of monitoring stops	Number of positive indicator species present in vicinity of each monitoring stop is at least one	Based on Perrin et al. (2014), where the list of positive indicator species for this habitat is also presented. See the uplands supporting document for further details
Vegetation composition: non-native species	Percentage cover in local vicinity of a representative number of monitoring stops	Proportion of vegetation composed of non-native species less than 1%	Based on Perrin et al. (2014). See the uplands supporting document for further details. No non-native species were recorded within this habitat by Perrin et al. (2013)
Vegetation composition: bracken, native trees and scrub	Percentage cover in local vicinity of a representative number of monitoring stops	Total cover of bracken (<i>Pteridium aquilinum</i>), native trees and scrub less than 25%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation structure: grazing and browsing	Percentage of leaves/shoots grazed/browsed in local vicinity of a representative number of monitoring stops	Live leaves of forbs and shoots of dwarf shrubs showing signs of grazing or browsing collectively less than 50%	Based on Perrin et al. (2014). See the uplands supporting document for further details
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat and no decline in status of hepatic mats associated with this habitat	Perrin et al. (2013) compiled and mapped existing rare and notable plant records for the SAC and added any new records collected during the NSUH survey. No relevant species were recorded in this habitat, however, new records should be considered within this attribute. See the uplands supporting document for further details

Conservation Objectives for : Cuilcagh - Anierin Uplands SAC [000584]


1393 Slender Green Feather-moss *Drepanocladus vernicosus*

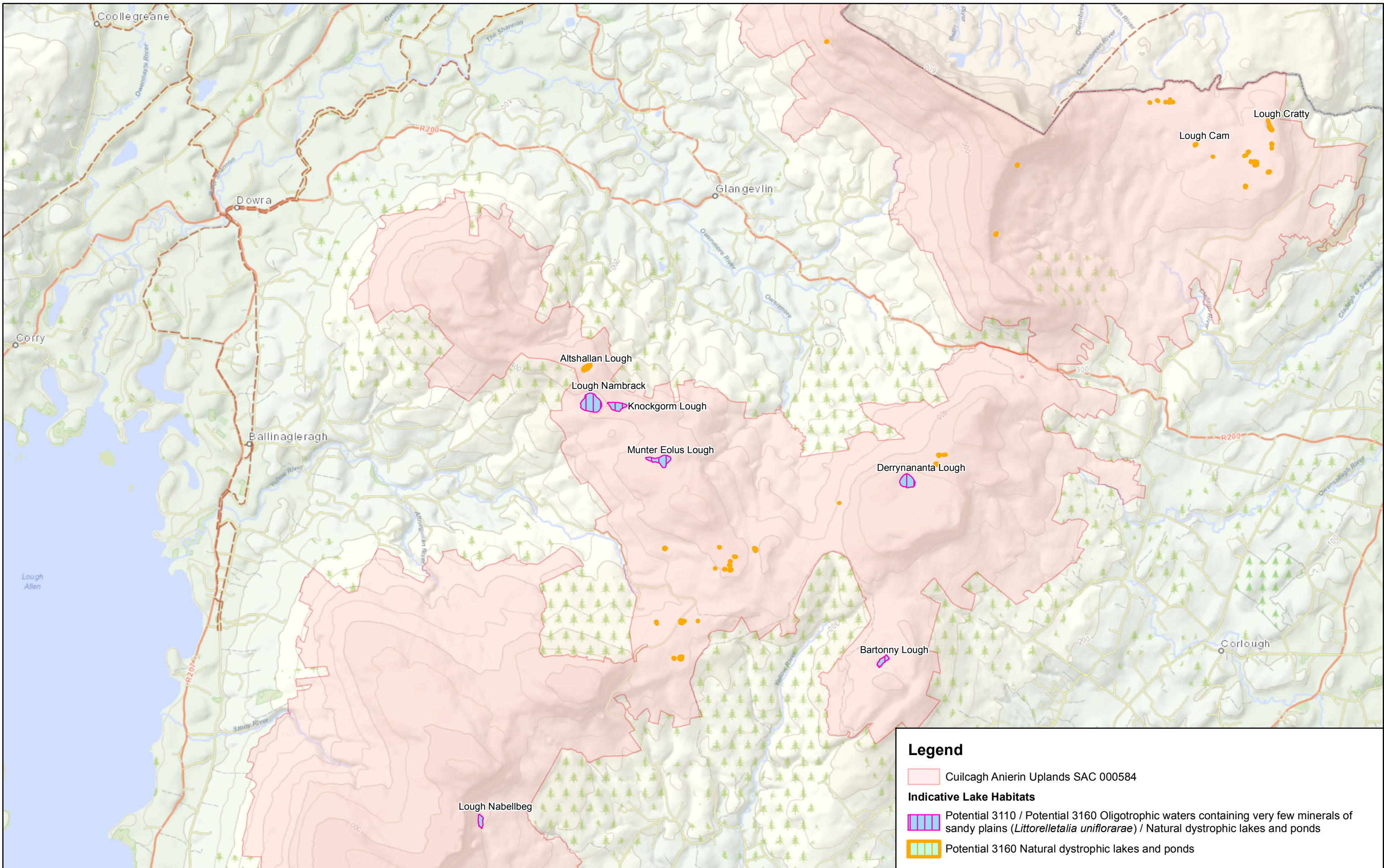
To maintain the favourable conservation condition of Slender Green Feather-moss (Shining Sickle-moss) in Cuilcagh - Anierin Uplands SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution of populations	Number and geographical spread of populations	No decline of known population at Commas. See map 12	(Please note that <i>Drepanocladus vernicosus</i> was reclassified as <i>Hamatocaulis vernicosus</i> by Hedenäs (1989)). The known population of <i>Hamatocaulis vernicosus</i> in Cuilcagh - Anierin Uplands SAC is at Commas, where it occurs in a springhead at the top of a rich flush, east of the summit of Cuilcagh (Perrin et al., 2013). See also Campbell et al. (2015)
Population size	Number of individuals	No decline. The population at Commas is estimated to be c.100 shoots	See Campbell et al. (2015) for further details
Area of suitable habitat	Hectares	No decline. Area of suitable habitat at Commas is estimated at c.0.0002ha	The population at Commas is estimated to occur over an area of c.2m ² (0.0002ha). See Campbell et al. (2015) for further details
Hydrological conditions: water table level	Metres	Maintain suitable hydrological conditions	<i>Hamatocaulis vernicosus</i> is mostly confined to mesotrophic fens, a transitional habitat between acid bog and base-rich fen. This appears to occur in at least two forms in Ireland: upland transitional flushes, where the plants can occur in lawns that rise and fall with fluctuating water table levels, such as the Commas population; and wet lowland sedge meadows, where plants can be inundated in winter, but may be subject to some desiccation in the summer. Based on Campbell (2013) and Campbell et al. (2015)
Vegetation: sward structure and density	Height and percentage cover of vegetation	Maintain open structure with a high percentage cover of bryophytes	<i>Hamatocaulis vernicosus</i> grows in moss-dominated, open communities, generally with a low cover of trees, shrubs and grasses, maintained at some sites by low grazing intensity (usually by sheep), such as at the Commas population. The moss <i>Calliergonella cuspidata</i> , a species often associated with high nutrient conditions, is usually present, but with low cover and never dominant. Rory Hodd (pers. comm., 2012) recorded that grazing pressure was not having any real impact at the Commas, although there were signs of some bare soil and minor erosion on the sides of the small valley in which the flush occurred



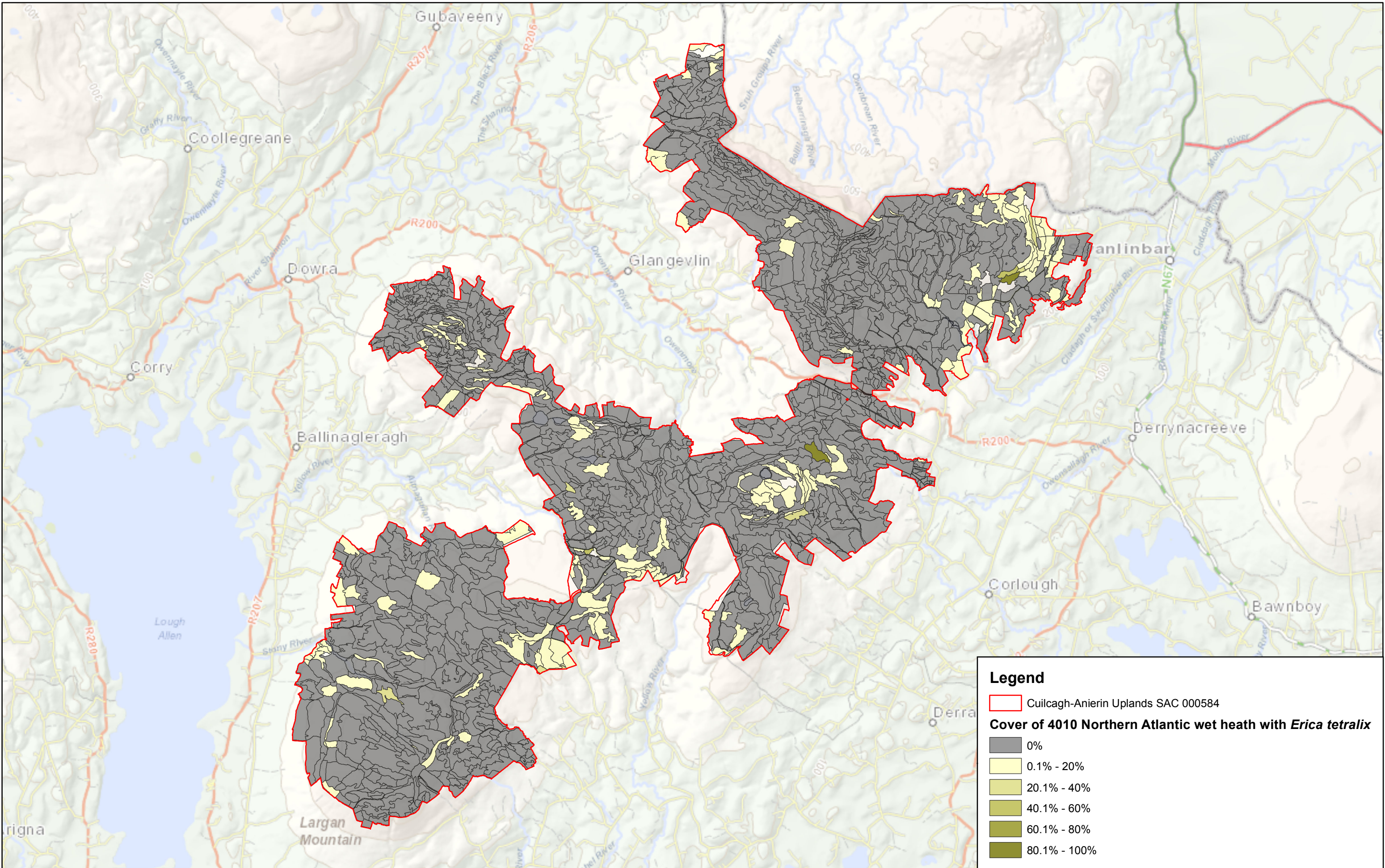
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 Cuilcagh-Anierin Uplands SAC 000584



Legend

- Cuilcagh Anierin Uplands SAC 000584
- Indicative Lake Habitats**
- Potential 3110 / Potential 3160 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorarae*) / Natural dystrophic lakes and ponds
- Potential 3160 Natural dystrophic lakes and ponds

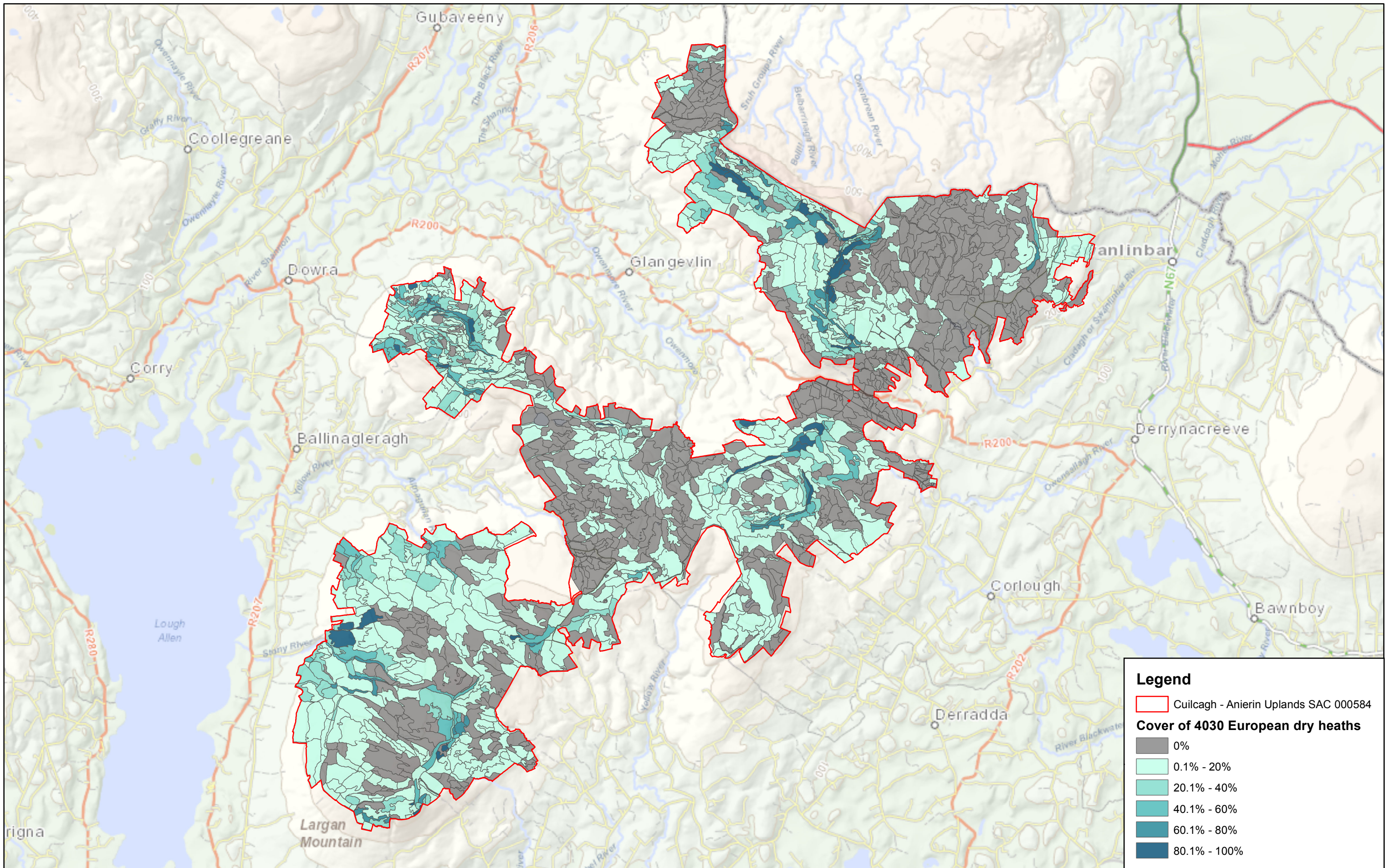


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Cuilcagh-Anierin Uplands SAC 000584

Cover of 4010 Northern Atlantic wet heath with *Erica tetralix*







- 0%
- 0.1% - 20%
- 20.1% - 40%
- 40.1% - 60%
- 60.1% - 80%
- 80.1% - 100%

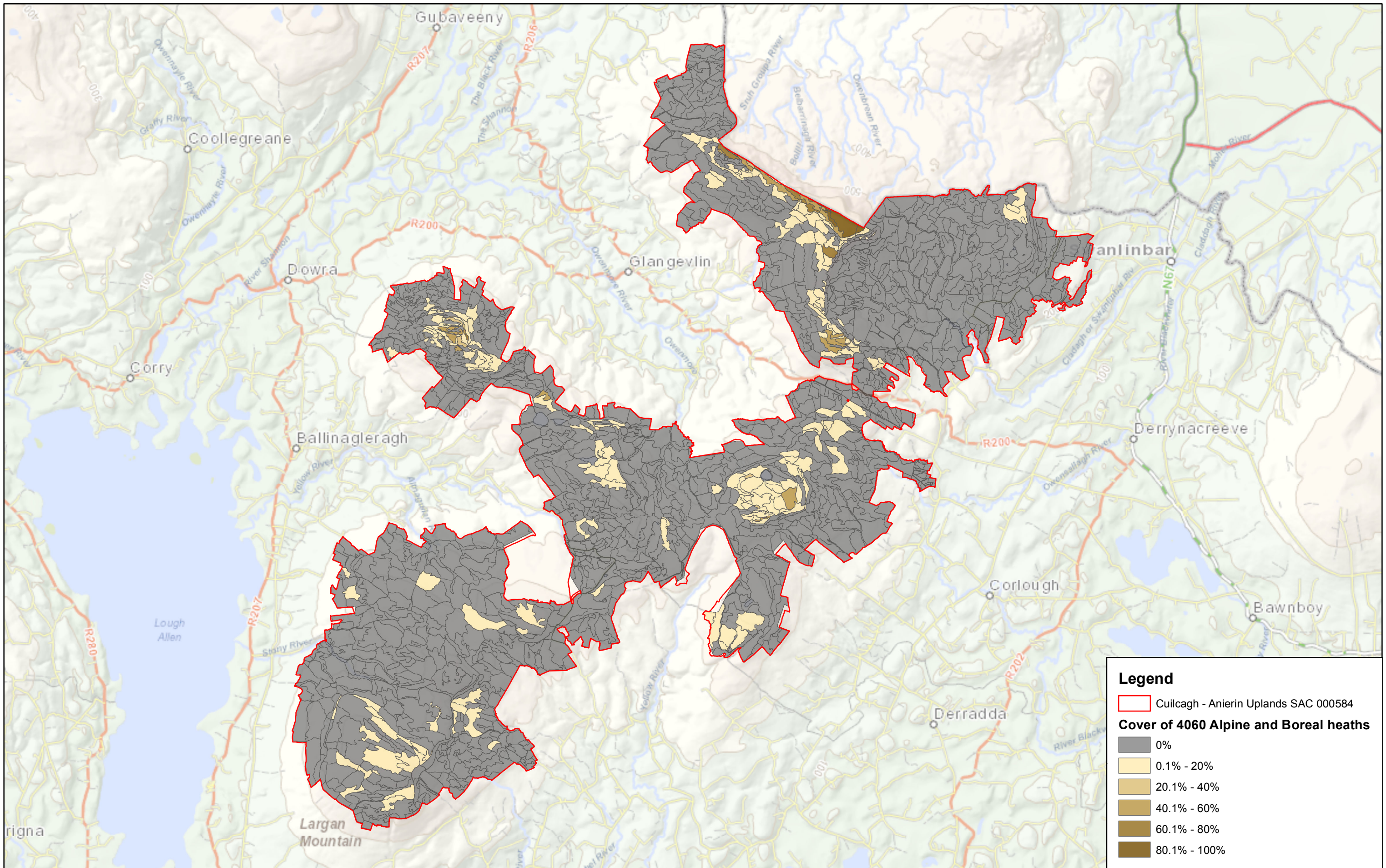


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 Cuilcagh - Anierin Uplands SAC 000584

Cover of 4030 European dry heaths

-  0%
-  0.1% - 20%
-  20.1% - 40%
-  40.1% - 60%
-  60.1% - 80%
-  80.1% - 100%

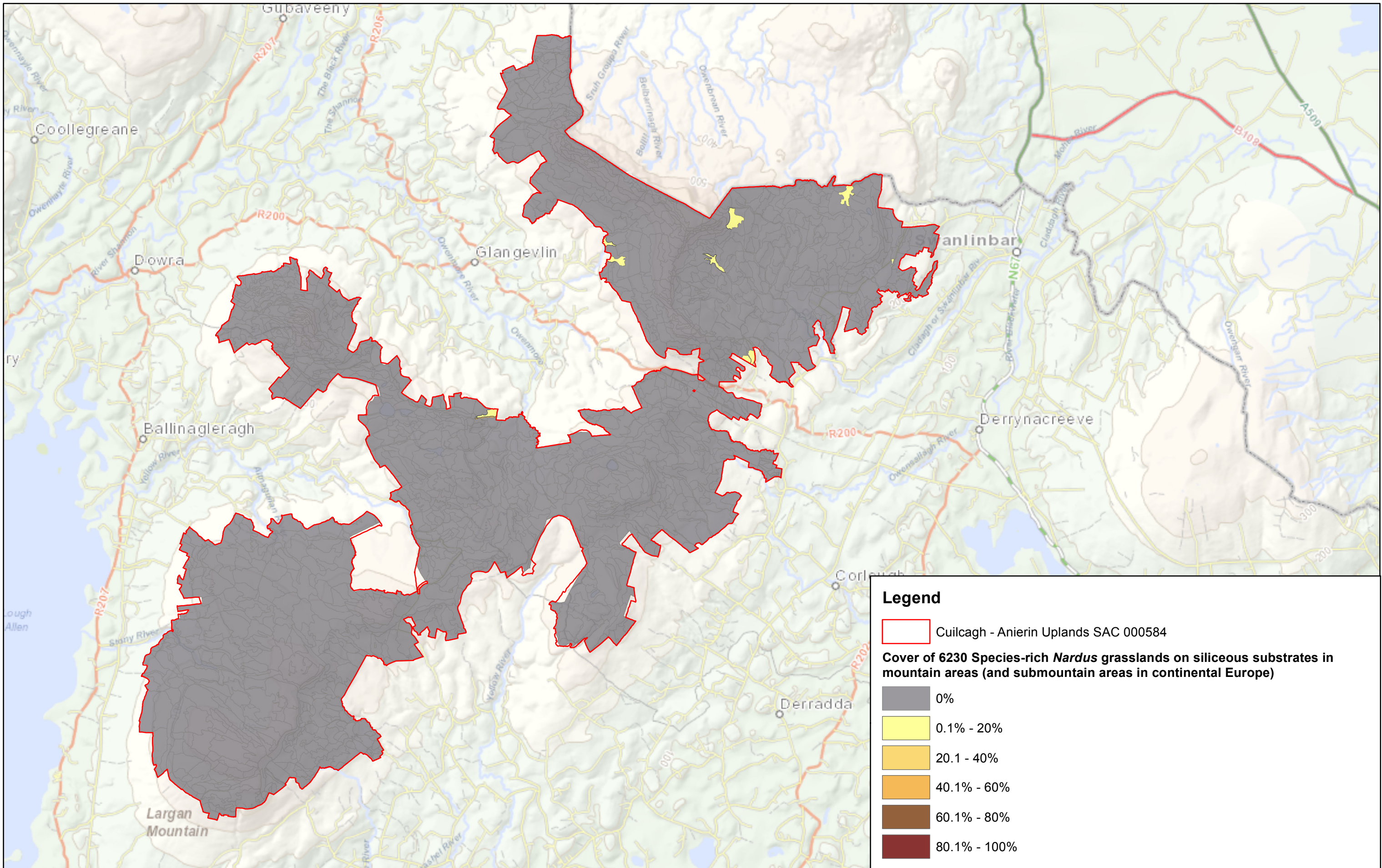


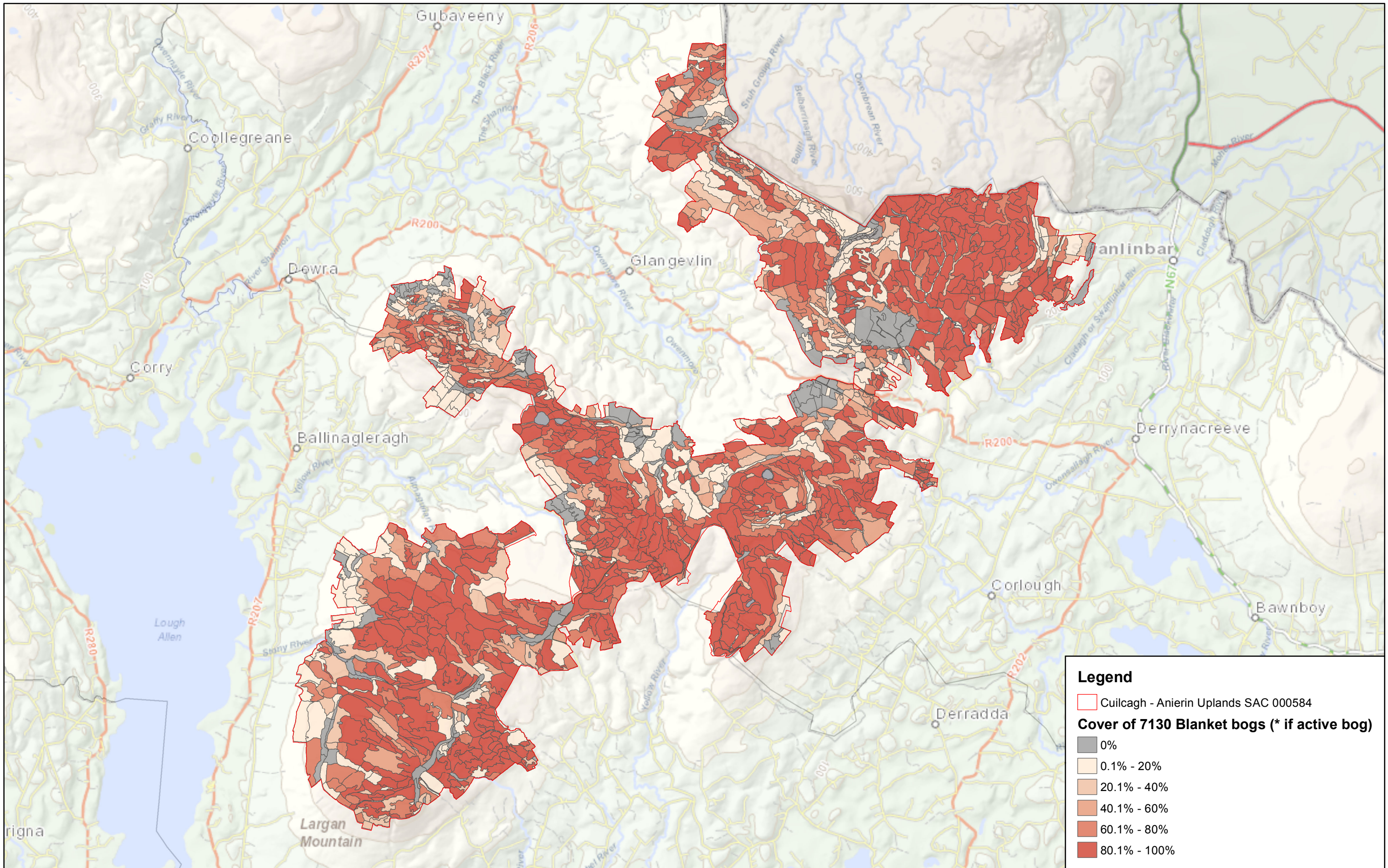
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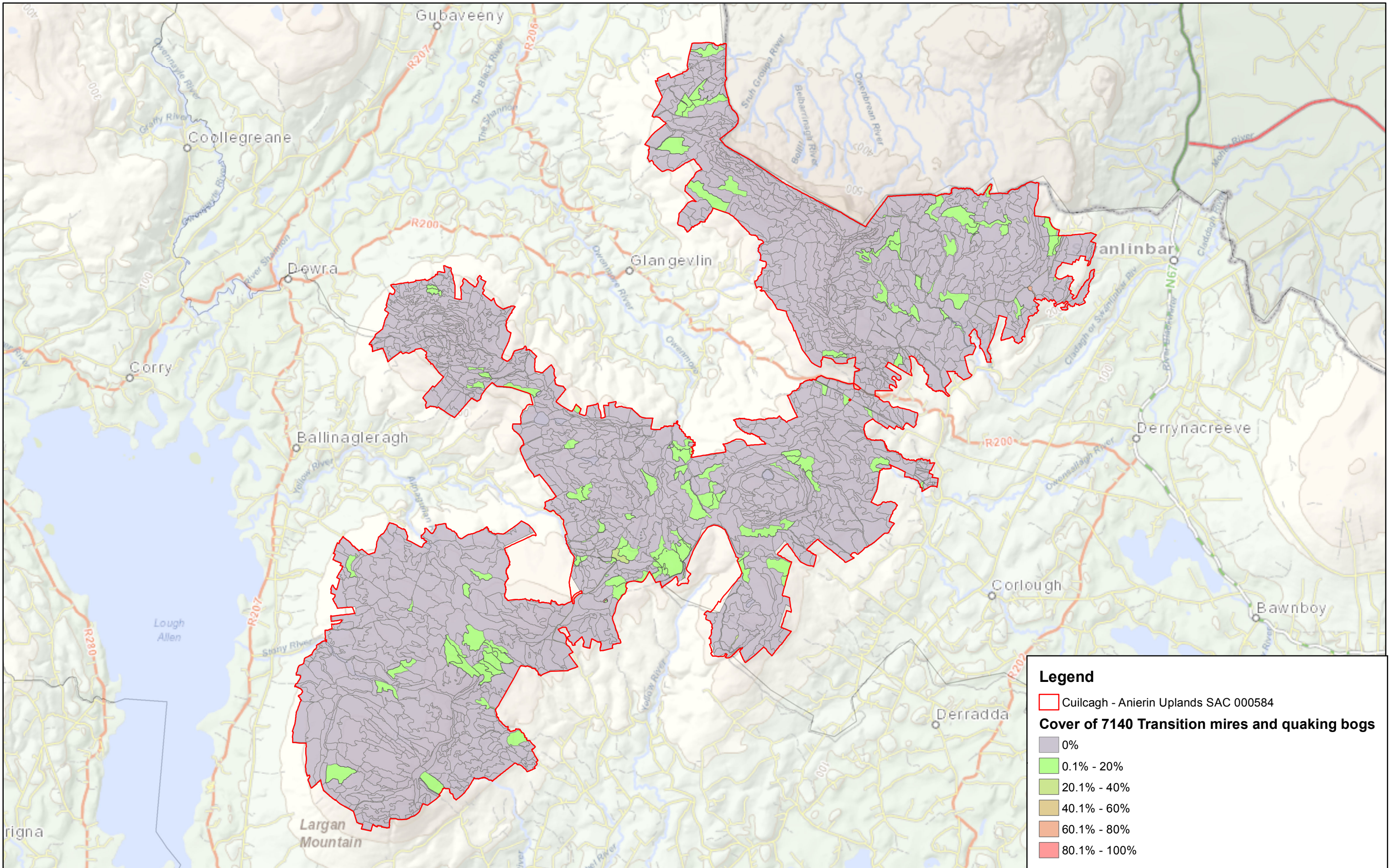
Cuilcagh - Anierin Uplands SAC 000584

Cover of 4060 Alpine and Boreal heaths


- 0%
- 0.1% - 20%
- 20.1% - 40%
- 40.1% - 60%
- 60.1% - 80%
- 80.1% - 100%











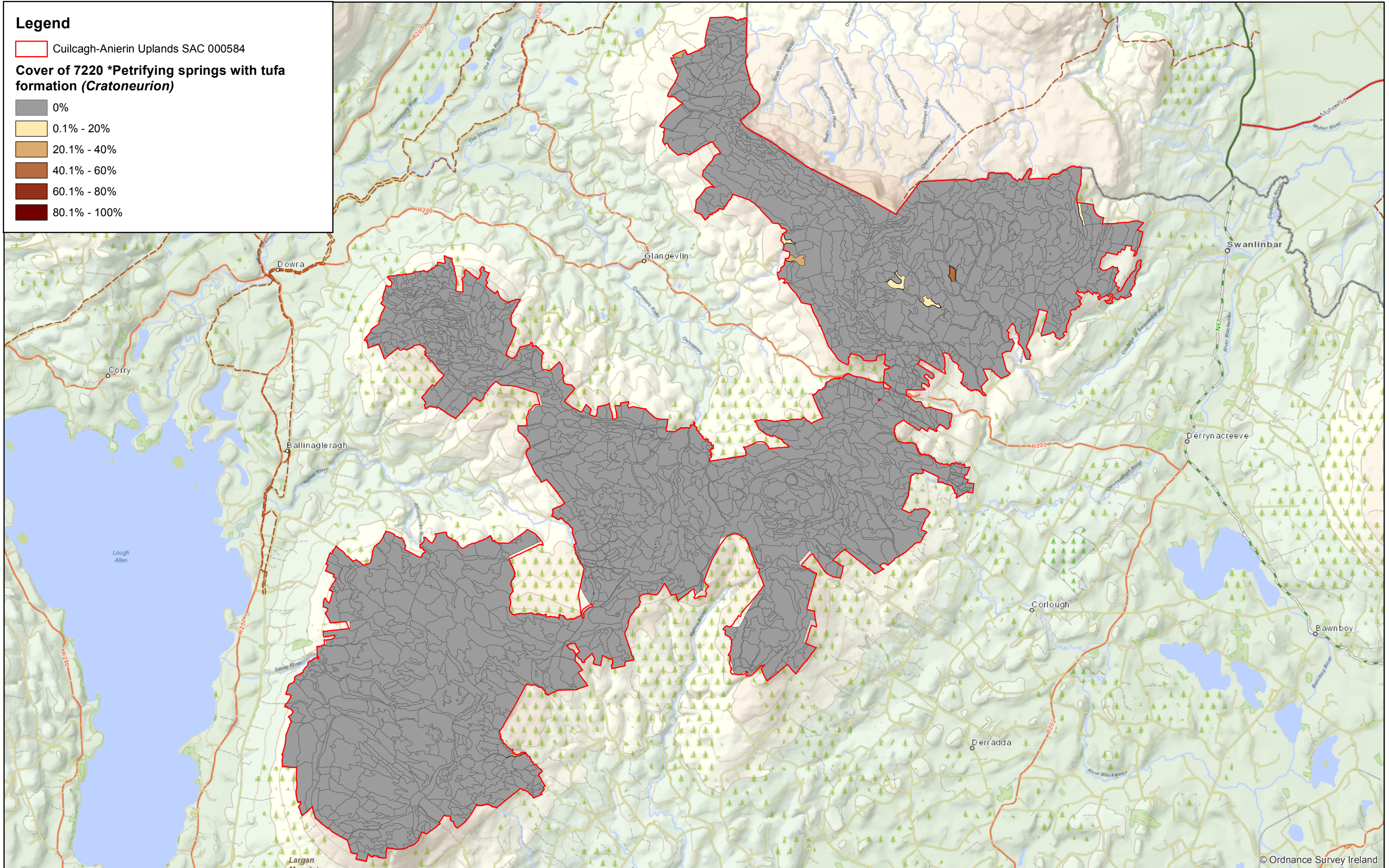


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 Cuilcagh-Anierin Uplands SAC 000584

Cover of 7220 *Petrifying springs with tufa formation (*Cratoneurion*)

-  0%
-  0.1% - 20%
-  20.1% - 40%
-  40.1% - 60%
-  60.1% - 80%
-  80.1% - 100%



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An Roinn Ealaíon, Oidhreacht,
Gnóthaí Réigiúnacha, Tuaithe agus Gaeltachta
Department of Arts, Heritage,
Regional, Rural and Gaeltacht Affairs

**MAP 9:
CUILCAGH - ANIERIN UPLANDS SAC
CONSERVATION OBJECTIVES
PETRIFYING SPRINGS**

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

**SITE CODE:
SAC 000584; version 3.01. CO. CAVAN, CO. LEITRIM.**

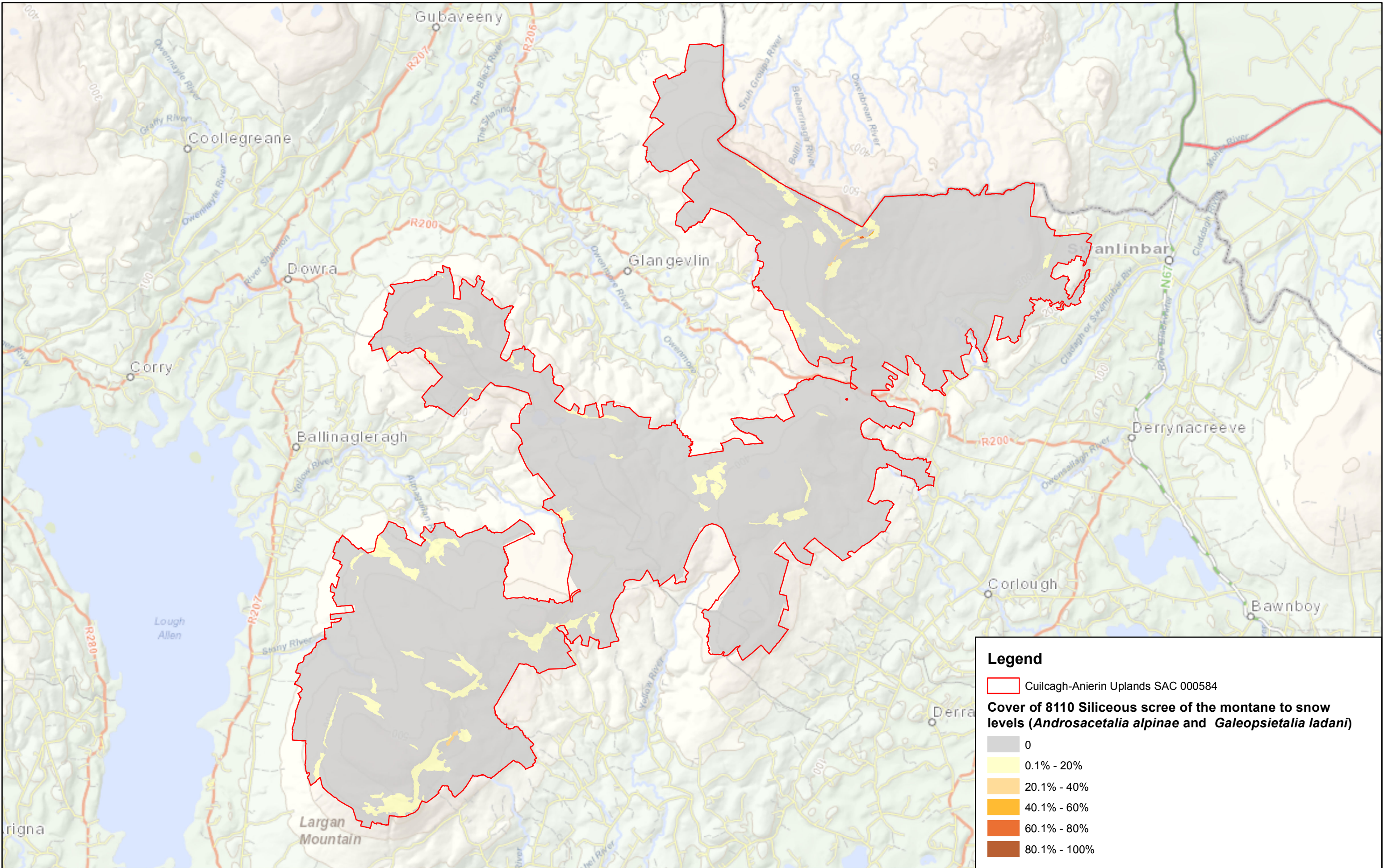


The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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**Map Version 1
Date: July 2016**

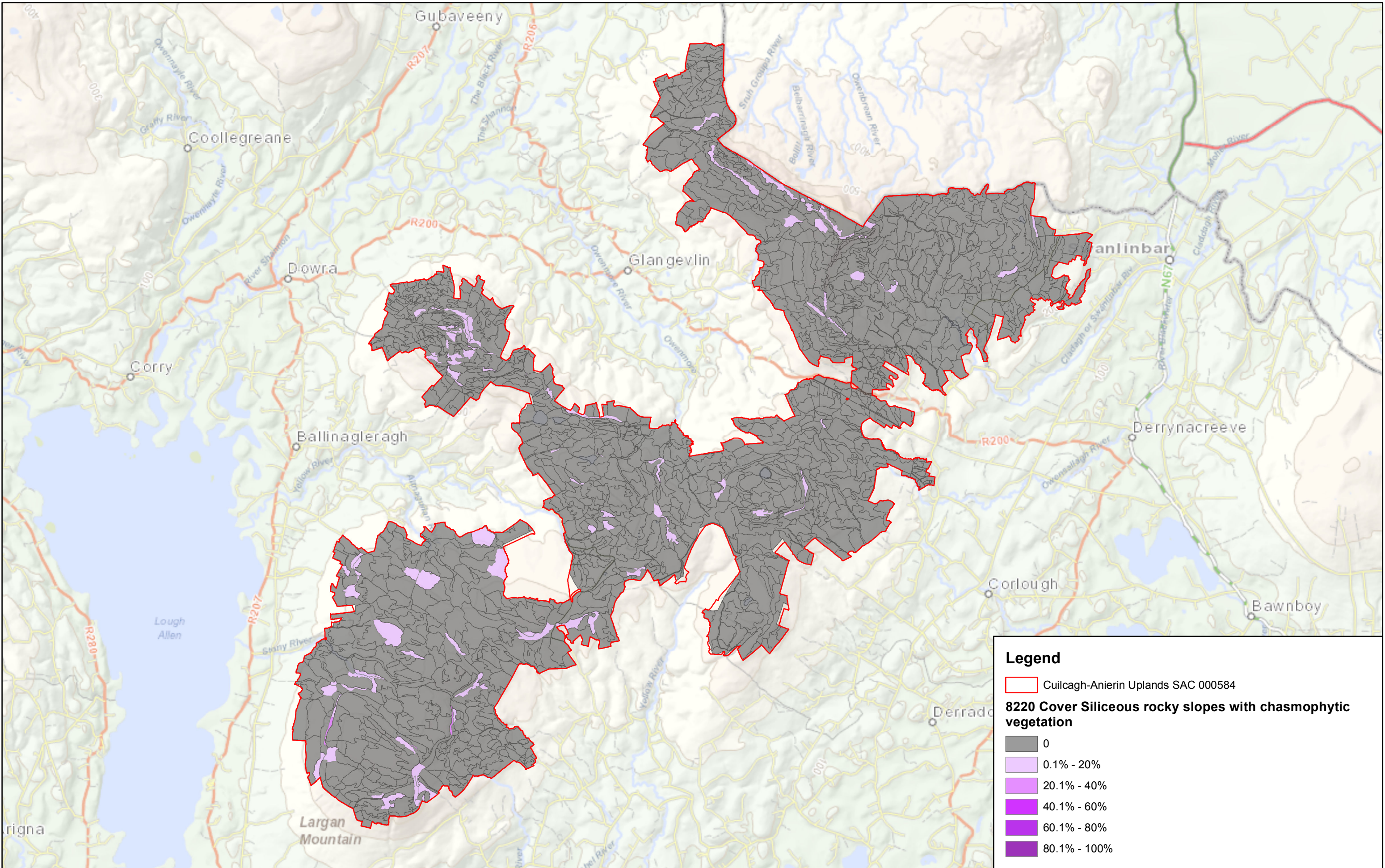


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Cuilcagh-Anierin Uplands SAC 000584

Cover of 8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)

- 0
- 0.1% - 20%
- 20.1% - 40%
- 40.1% - 60%
- 60.1% - 80%
- 80.1% - 100%



Legend

Cuilcagh-Anierin Uplands SAC 000584

8220 Cover Siliceous rocky slopes with chasmophytic vegetation

	0
	0.1% - 20%
	20.1% - 40%
	40.1% - 60%
	60.1% - 80%
	80.1% - 100%

