

# National Parks and Wildlife Service

## *Conservation Objectives Series*

### Comeragh Mountains SAC 001952



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

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## Introduction

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

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

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

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

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

### Notes/Guidelines:

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

## Qualifying Interests

\* indicates a priority habitat under the Habitats Directive

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### 001952 Comeragh Mountains SAC

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- 3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
- 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation
- 4010 Northern Atlantic wet heaths with *Erica tetralix*
- 4030 European dry heaths
- 4060 Alpine and Boreal heaths
- 6216 Slender Green Feather-moss *Hamatocaulis vernicosus*
- 7130 Blanket bogs (\* if active bog)
- 8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)
- 8210 Calcareous rocky slopes with chasmophytic vegetation
- 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](http://www.npws.ie/Publications)

### NPWS Documents

<b>Year :</b>	1984
<b>Title :</b>	The vegetation of Irish lakes
<b>Author :</b>	Heuff, H.
<b>Series :</b>	Unpublished report to NPWS
<b>Year :</b>	2009
<b>Title :</b>	Ireland Red List No. 2: Non-marine molluscs
<b>Author :</b>	Byrne, A.; Moorkens, E.A.; Anderson, R.; Killeen, I.J.; Regan, E.C.
<b>Series :</b>	Ireland Red List series, NPWS
<b>Year :</b>	2010
<b>Title :</b>	Ireland Red List No. 4: Butterflies
<b>Author :</b>	Regan, E.C.; Nelson, B.; Aldwell, B.; Bertrand, C.; Bond, K.; Harding, J.; Nash, D.; Nixon, D.; Wilson, C.J.
<b>Series :</b>	Ireland Red List series, NPWS
<b>Year :</b>	2012
<b>Title :</b>	Ireland Red List No. 8: Bryophytes
<b>Author :</b>	Lockhart, N.; Hodgetts, N.; Holyoak, D.
<b>Series :</b>	Ireland Red List series, NPWS
<b>Year :</b>	2014
<b>Title :</b>	Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland, Version 2.0
<b>Author :</b>	Perrin, P.M.; Barron, S.J.; Roche, J.R.; O'Hanrahan, B.
<b>Series :</b>	Irish Wildlife Manuals, No. 79
<b>Year :</b>	2014
<b>Title :</b>	National Survey of Upland Habitats (Pilot Survey Phase, 2009-2010), Site Report No. 3 (Revision): Comeragh Mountains cSAC (001952) Co. Waterford
<b>Author :</b>	Roche, J.R.; Perrin, P.M.; Barron, S.J.; Daly, O.H.
<b>Series :</b>	Unpublished report to NPWS
<b>Year :</b>	2015
<b>Title :</b>	Habitats Directive Annex I lake habitats: a working interpretation for the purposes of site-specific conservation objectives and Article 17 reporting
<b>Author :</b>	O Connor, Á.
<b>Series :</b>	Unpublished document by NPWS
<b>Year :</b>	2015
<b>Title :</b>	Monitoring methods for <i>Hamatocaulis vernicosus</i> (Mitt.) Hedenäs (Slender green feather-moss) in the Republic of Ireland
<b>Author :</b>	Campbell, C.; Hodgetts, N.; Lockhart, N.
<b>Series :</b>	Irish Wildlife Manuals, No. 91
<b>Year :</b>	2015
<b>Title :</b>	Survey of Flora Protection Order Bryophytes 2015
<b>Author :</b>	Hodd, R.L.
<b>Series :</b>	Unpublished report to NPWS
<b>Year :</b>	2016
<b>Title :</b>	Ireland Red List No. 10: Vascular Plants
<b>Author :</b>	Wyse Jackson, M.; FitzPatrick, Ú.; Cole, E.; Jebb, M.; McFerran, D.; Sheehy Skeffington, M.; Wright, M.
<b>Series :</b>	Ireland Red Lists series, NPWS

- Year :** 2019
- Title :** The monitoring and assessment of *Hamatocaulis vernicosus* (Slender Green feather-moss) in the Republic of Ireland 2015–2017
- Author :** Campbell, C.; Hodd, R.; O'Neill, F.
- Series :** Irish Wildlife Manuals, No. 110
- 
- Year :** 2020
- Title :** Monitoring of the Annex V Clubmoss group (*Lycopodium* spp.) in Ireland 2015-2018
- Author :** O'Neill, F.H.; Long, M.P.; Hodd, R.L.
- Series :** Irish Wildlife Manuals, No. 117
- 

## 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 :** 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 :** 2002
- Title :** Deterioration of Atlantic soft water macrophyte communities by acidification, eutrophication and alkalinisation
- Author :** Arts, G.H.P.
- Series :** Aquatic Botany, 73: 373-393
- 
- Year :** 2003
- Title :** Ecology of watercourses characterised by Ranunculion fluitantis and Callitriche-Batrachion vegetation
- Author :** Hatton-Ellis, T.W.; Grieve, N.
- Series :** Conserving Natura 2000 Rivers Ecology Series No. 11. English Nature, Peterborough
- 
- 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 :** Environmental Protection Agency, Wexford
- 
- Year :** 2008
- Title :** Flora of County Waterford
- Author :** Green, P.
- Series :** The National Botanic Gardens of Ireland, Dublin
- 
- Year :** 2010
- Title :** A new county record for alpine clubmoss (*Diphasiastrum alpinum*) from the Comeragh Mountains, Co. Waterford (H6)
- Author :** Roche, J.R.; Perrin, P.M.
- Series :** Irish Naturalists' Journal, 31: 149-150
-

**Year :** 2011  
**Title :** New records for *Diphysiastrum alpinum* L. (Holub) and their implications for the species' conservation status in Ireland  
**Author :** Roche, J.R.  
**Series :** Irish Botanical News, No. 21: 16-20

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**Year :** 2012  
**Title :** Rare and threatened bryophytes of Ireland  
**Author :** Lockhart, N.; Hodgetts, N.; Holyoak, D.  
**Series :** National Museums Northern Ireland

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**Year :** 2012  
**Title :** The Geological Heritage of Waterford. An audit of County Geological Sites in Waterford  
**Author :** Parkes, M.; Meehan, R.; Prètesseille, S.  
**Series :** Geological Survey of Ireland

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**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

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**Year :** 2013  
**Title :** Interpretation manual of European Union habitats- Eur 28  
**Author :** European Commission- DG Environment  
**Series :** European Commission

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**Year :** 2016  
**Title :** A narrative for conserving freshwater and wetland habitats in England  
**Author :** Mainstone, C.; Hall, R.; Diack, I.  
**Series :** Natural England Research Reports Number 064

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**Year :** 2017  
**Title :** Irish Vegetation Classification: Technical Progress Report No. 3  
**Author :** Perrin, P.  
**Series :** Report submitted to National Biodiversity Data Centre

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## Spatial data sources

<b>Year :</b>	2008
<b>Title :</b>	OSi 1:5000 IG vector dataset
<b>GIS Operations :</b>	WaterPolygons feature class clipped to the SAC boundary. Expert opinion used to identify Annex I habitat and to resolve any issues arising
<b>Used For :</b>	3110 (map 2)
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<b>Year :</b>	2010
<b>Title :</b>	National Survey of Upland Habitats
<b>GIS Operations :</b>	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
<b>Used For :</b>	4010, 4030, 4060, 7130, 8110, 8210, 8220 (map 3, 4, 5, 6, 7, 8, 9)
<hr/>	
<b>Year :</b>	2021
<b>Title :</b>	NPWS rare and threatened species database
<b>GIS Operations :</b>	Dataset created from spatial references in database records. Expert opinion used as necessary to resolve any issues arising
<b>Used For :</b>	6216 (map 10)
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## Conservation Objectives for : Comeragh Mountains SAC [001952]

### 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 Comeragh Mountains 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	Comeragh Mountains SAC has small, corrie lakes at altitudes of c.380-520m that are likely to contain an upland variant of the isoetid habitat 3110, and/or the acid oligotrophic habitat (3160). The Comeragh Mountains are an Old Red Sandstone (principally conglomerate) plateau with deep corries, recessional moraines and often very large erratic boulders (Parkes et al., 2012). Green (2008) stated that there are 13 lakes in the Comeraghs within nine distinct areas. Most are small, the largest being Coumshingaun (c.15ha), which was surveyed in 1978 (Heuff, 1984). Pater Noster lakes are found at Coum Iarthar and Sgilloge (Parkes et al., 2012). Further study of these upland lakes is required. 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, Green (2008) recorded 13 lakes in nine separate areas. The lakes are distributed in corries cut into the northeast-southwest plateau of Devonian sandstones and conglomerates. Lakes are found at Coumshingaun, Coumgaurha (Crotty's Lough), Coum Iarthar (Boola), Coumduala, Sgilloge Loughs, Coumfea, Coumalocha and Coumtay. Smaller lakes and ponds may not be shown on available map bases. The corries are deep with almost-vertical cliffs, rising to 400m at Coumshingaun, and corrie-edge recessional moraines with very large erratic boulders (Parkes et al., 2012). Corries at Coumshingaun and Coumfea-Coumalocha are separated by fine, jagged arête ridges (Parkes et al., 2012)
Vegetation composition: typical species	Occurrence	Typical species present, in good condition, and demonstrating typical abundances and distribution	Heuff (1984) provides data from her 1978 survey of Coumshingaun when only <i>Nitella flexilis</i> s.l. and occasional patches of <i>Potamogeton polygonifolius</i> were recorded. Green (2008) states that <i>Littorella uniflora</i> occurs in all of the lakes and some out-flowing streams in the Comeragh Mountains. Despite thorough searches of lakes with records for <i>Isoetes lacustris</i> , only a single plant was found at Coumduala (Green, 2008). Green (2008) states that <i>Ranunculus peltatus</i> has a long history at Coumshingaun. There are also records for mud-dwelling <i>Ranunculus</i> species and starworts ( <i>Callitriche stagnalis</i> , <i>C. brutia</i> subsp. <i>hamulata</i> and subsp. <i>brutia</i> , and <i>C. platycarpa</i> ) in the Comeraghs (Green, 2008). These small, upland, corrie lakes with steeply sloping shorelines are likely to contain a natural variant of habitat 3110 with a different suite of characteristic species and appear to be naturally species-poor

Vegetation composition: characteristic zonation	Occurrence	All characteristic zones should be present, correctly distributed and in good condition	Neither emergent nor floating-leaved zones were found in Coumshingaun, and vegetation zonation was restricted to a band of sparse <i>Nitella flexilis</i> s.l. (Heuff, 1984). Occasional patches of <i>Potamogeton polygonifolus</i> occurred within the <i>Nitella</i> band to 2.5m, but from 2.5-5m, only the charophyte occurred (Heuff, 1984). Steep littoral zones, small size and highly oligotrophic conditions are likely to naturally limit the vegetation zones/communities in the lakes in Comeragh Mountains SAC
Vegetation distribution: maximum depth	Metres	Maintain maximum depth of vegetation, subject to natural processes	Heuff (1984) recorded maximum vegetation depths of 5m/lake bottom in Coumshingaun, where water clarity and transparency were very high, and postulated that summer stratification may limit the lower depth of vegetation colonisation. Further work is necessary to develop indicative targets for lake habitat 3110, and type or site-specific targets may be needed for these soft-water, clear, upland lakes
Hydrological regime: water level fluctuations	Metres	Maintain appropriate hydrological regime necessary to support the habitat	The lakes in Comeragh Mountains SAC have very small catchments, often limited to the steep upgradient corrie slopes. Pater Noster lakes occur at Coum Iarthar (Boola lakes) and Sgilloge Loughs. Upgradient overgrazing and peat erosion, as well as alteration of outflows, could impact on the natural hydrological regime of the corrie lakes. 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	Heuff (1984) described the substratum at Coumshingaun as fine mud with rocks in the shallows, and stated that <i>Nitella flexilis</i> s.l. was rooted in fine mud or a very thin layer of silt overlaying rocks and stones. 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 varies with catchment geology, and with depth and along shorelines in an individual lake
Transparency	Metres	Maintain appropriate Secchi transparency. There should be no decline in Secchi depth/transparency	Heuff (1984) recorded very high transparency and a Secchi depth of over 12m in Coumshingaun. The OECD fixed boundary system set transparency targets for oligotrophic lakes of $\geq 6$ m annual mean Secchi disk depth, and $\geq 3$ m annual minimum Secchi disk depth. Ultra-oligotrophic targets are probably more appropriate for the corrie lakes in the Comeragh Mountains, however, i.e. $\geq 12$ m annual mean, and $\geq 6$ m annual minimum Secchi disk depth. 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

Nutrients	µg/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	Heuff (1984) categorised Coumshingaun as an extreme oligotrophic and species-poor lake. As a nutrient-poor habitat, oligotrophic and Water Framework Directive (WFD) 'High' status targets apply to lakes with 3110. Where a lake has nutrient concentrations that are lower than these targets, as is likely in the corrie lakes in Comeragh Mountains SAC, reference condition or ultra-oligotrophic standards may be more appropriate, and there should be no decline within class, i.e. no upward trend in nutrient concentrations. The OECD (1982) boundary for ultra-oligotrophic lakes is ≤4µg/l total phosphorus (TP). High Status/Oligotrophic has annual average TP concentration ≤10µg/l TP, average annual total ammonia concentration ≤0.040mg/l N and annual 95th percentile for total ammonia ≤0.090mg/l N. See also O Connor (2015) and The European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2019
Phytoplankton biomass	µg/l chlorophyll <i>a</i>	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. These are annual average chlorophyll <i>a</i> concentration <2.5µg/l and annual peak chlorophyll <i>a</i> concentration ≤8.0µg/l, and average growing season (March-October) chlorophyll <i>a</i> concentration <5.0µg/l. Where a lake has a chlorophyll <i>a</i> concentration that is lower than this target, as is likely in the corrie lakes in Comeragh Mountains SAC, reference condition or ultra-oligotrophic standards may be more appropriate, and there should be no decline within class, i.e. no upward trend in phytoplankton biomass. The growing season mean for reference condition lakes is <2.5µg/l. The OECD (1982) boundary for ultra-oligotrophic lakes is annual mean <1µg/l and maximum <2.5µg/l. See also The European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2019
Phytoplankton composition	EPA phytoplankton composition metric	Maintain appropriate water quality to support the habitat, including high phytoplankton composition status	The Environmental Protection Agency (EPA) has developed a phytoplankton composition metric for nutrient enrichment of Irish lakes; however, this method may not be appropriate for small upland lakes such as those in Comeragh Mountains SAC
Attached algal biomass	Algal cover	Maintain trace/absent attached algal biomass (<5% cover)	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)
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 Macrophyte Index'; however, this method may not be appropriate for small, upland lakes such as those in Comeragh Mountains SAC. The target for lake habitat 3110 is high status or an Ecological Quality Ratio (EQR) for lake macrophytes of ≥0.90, as defined the European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2019

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 bog mosses ( <i>Sphagnum</i> spp.) and bulbous rush ( <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 lakes with 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 also The European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2019
Water colour	mg/l PtCo	Maintain appropriate water colour to support the habitat	Heuff (1984) found extremely clear water in Coumshingaun. Overgrazing, burning and peat erosion have all been documented in the Comeragh Mountains and these can increase colour in downgradient lakes. 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. 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 lakes with 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	Overgrazing, burning and peat erosion in the Comeragh Mountains may have increased organic carbon levels in receiving waters. 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; however, it can result from the mineralisation of any organic matter. 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	Overgrazing, burning and peat erosion in the Comeragh Mountains may have increased turbidity levels in receiving waters. 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: Hectares  
area and condition

Maintain/restore the area and condition of fringing habitats necessary to support the natural structure and functioning of habitat 3110

Many of the corrie lakes in Comeragh Mountains SAC are fringed by other Annex I habitats, such as wet heath (4010), and siliceous scree (8110) and rocky slopes (8220) habitats; dry heath (4030) and Alpine or Boreal heath (4060) also occur, as well as species-rich *Nardus* grassland (6230) and some calcareous rocky slopes (8210). Fringing habitats may be dependent on the lake, particularly its water levels, and support wetland communities and species of conservation concern. Many of the fringing wetland habitats support high invertebrate and plant species richness than the lake habitats themselves. See also Mainstone et al. (2016)

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## Conservation Objectives for : Comeragh Mountains SAC [001952]

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

To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation in Comeragh Mountains SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Kilometres	Area stable or increasing, subject to natural processes	Conservation objectives for habitat 3260 concentrate on the high conservation value sub-types. Selection of this SAC for 3260 used a broad interpretation and was based on the occurrence of multiple upland, eroding rivers, as well as associated springs and headwaters. Little is known of the characteristics or distribution of the habitat in the SAC. Coum Mahon holds one of Ireland's finest waterfalls, Mahon Falls (Parkes et al., 2012). As well as the Mahon River, the Colligan/Araglin, Nier, Clodiagh and Tay rise in the Comeraghs. The SAC is an Important Bryophyte Area (Lockhart et al., 2012). Many of the rivers are likely to be macroalgal and bryophyte dominated; however, the rare and threatened bryophytes are not specifically associated with lotic habitats. Further investigation is required
Habitat distribution	Occurrence	No decline, subject to natural processes	The description of 3260 is broad, covering from upland bryophyte/macroalgal dominated stretches, to lowland depositing rivers with pondweeds and starworts (European Commission, 2013), and further study is needed of Irish sub-types and their conservation value. As noted above, little is known about the distribution of the habitat and its sub-types in the SAC. The rivers and streams are generally fast flowing, with cascades and waterfalls, and are likely dominated by macroalgae and bryophytes, with limited submerged and little emergent higher plants. Green (2008) includes records for aquatic plants in rivers in the Comeraghs, including <i>Ranunculus peltatus</i> in slow-moving rivers
Hydrological regime: river flow	Metres per second	Maintain appropriate hydrological regimes	Parkes et al. (2012) describes the River Mahon as rising from a series of seeps in blanket peat in the high plateau of the Comeraghs, before flowing down the backwall of the corrie creating a series of stepped waterfalls, or cascades, over each of the thicker conglomerate or sandstone beds. High conservation value sub-types in the SAC are associated with natural, unmodified hydrological regime. A natural flow regime is required for both plant communities and channel geomorphology to be in favourable condition, exhibiting typical dynamics for the river type (Hatton-Ellis and Grieve, 2003). For many of the sub-types of this habitat, high flows are required to maintain the substratum necessary for the characteristic species. Flow variation can be particularly important, with high and flood flows being critical to the hydromorphology. Peatlands and lake outflows also have slow-flowing or ponded streams and rivers, with biotic communities likely to resemble those in associated lakes
Hydrological regime: groundwater discharge	Metres per second	Maintain appropriate hydrological regime	The groundwater contribution to rivers in the SAC is likely to be small, owing to the geology (predominantly conglomerates) and dominance of blanket peat soils. Even small groundwater contributions, however, can significantly alter the hydrochemistry, particularly where there is basic bedrock and/or subsoils

Substratum composition: particle size range	Millimetres	Maintain appropriate substratum particle size range, quantity and quality, subject to natural process	Many of the high conservation value sub-types are dominated by coarse substrata, and bedrock, boulders, cobbles and coarse gravels are likely to be common in this SAC. The size and distribution of particles is largely determined by the river flow. The chemical composition (particularly minerals and nutrients) of the substratum is also important. The quality of finer sediment particles is a notable driver rooted plant communities
Water quality	Various	Maintain appropriate water quality to support the natural structure and functioning of the habitat	The specific targets may vary among sub-types. The rivers within Comeragh Mountains SAC are considered to be naturally very nutrient-poor and, therefore, to typically require Water Framework Directive high status, or possibly reference condition, in terms of nutrient and oxygenation standards, and EQRs (Ecological Quality Ratios) for macroinvertebrates and phytobenthos
Typical species	Occurrence	Typical species of the relevant habitat sub-type should be present and in good condition	The sub-types of this habitat are poorly understood and their typical species have not yet been fully defined. The typical species may include higher plants, bryophytes, macroalgae and microalgae, and invertebrates
Riparian habitat: area and condition	Hectares	Maintain the area and condition of fringing habitats necessary to support the habitat and its sub-types	Riparian habitats, including those along lake fringes, even where they do not form part of a natural floodplain, are an integral part of the structure and functioning of river systems. Fringing habitats can contribute to the aquatic food web (e.g. allochthonous matter such as leaf fall), provide habitat (refuge and resources) for certain life-stages of fish, birds and aquatic invertebrates, assist in the settlement of fine suspended material, protect banks from erosion and contribute to nutrient cycling. Shade may also be important in suppressing algal growth in enriched rivers and moderating temperatures. Equally, fringing habitats are dependent on rivers/lakes, particularly their water levels, and support wetland communities and species of conservation concern. See Mainstone et al. (2016). The rivers and streams in Comeragh Mountains SAC are likely to be fringed by upland grassland, blanket bog, heath, flush/poor fen and riparian woodland

## Conservation Objectives for : Comeragh Mountains SAC [001952]

### 4010 Northern Atlantic wet heaths with *Erica tetralix*

**To restore the favourable conservation condition of Northern Atlantic wet heaths with *Erica tetralix* in Comeragh Mountains 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	Comeragh Mountains SAC was surveyed as part of the National Survey of Upland Habitats (NSUH; see Roche et al., 2014 and Perrin et al., 2014). Northern Atlantic wet heaths with <i>Erica tetralix</i> was mapped in detail for the SAC and the total area of the qualifying habitat stated by Roche et al. (2014) is 527.9ha, covering 8.39% of the SAC. Roche et al. (2014) report obvious losses of the habitat since 1995 of approximately 0.41ha, due to afforestation with non-native species and the development of tracks and car parks. Further information can be found in Roche et al. (2014). Further details on this and the following attributes can be found in the Comeragh Mountains SAC conservation objectives supporting document for upland habitats where a summary of the mapping methodology and a brief discussion of restoration potential are also presented
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 3	Roche et al. (2014) recorded wet heath throughout the SAC, with extensive patches along the valley of the Mahon River, on south-westerly facing slopes at Barracreemountain and at Lyre Mountain. 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 pH and nutrient status within natural ranges	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	Roche et al. (2014) 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 the vegetation communities associated with this habitat is presented in Perrin et al. (2014). See also the Irish Vegetation Classification (Perrin, 2017; <a href="http://www.biodiversityireland.ie/projects/ivc-classification-explorer/">www.biodiversityireland.ie/projects/ivc-classification-explorer/</a> )
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 within a 20m radius of each monitoring stop	Attribute and target 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%	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is presented. Further details can be found in the uplands supporting document
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%	Attribute and target 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%	Attribute and target 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%	Attribute and target 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%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat is 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%	Attribute and target based on Perrin et al. (2014). See the uplands supporting document for further details. The non-native moss <i>Campylopus introflexus</i> was recorded by Roche et al. (2014) as forming extensive carpets within this habitat in the SAC
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%	Attribute and target 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%	Attribute and target 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%	Attribute and target 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	Attribute and target 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	Attribute and target 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	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas for this habitat is 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%	Attribute and target 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%	Attribute and target 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	This includes species on the Flora (Protection) Order, 2015 and/or Red Lists (Byrne et al., 2009; Regan et al., 2010; Lockhart et al., 2012; Wyse Jackson et al., 2016, etc.). Roche et al. (2014) compiled and mapped existing rare and notable plant records for the SAC and added any new records collected during the NSUH. No relevant species were recorded in this habitat during the NSUH; however, new records should be considered within this attribute. See the uplands supporting document for further details

## Conservation Objectives for : Comeragh Mountains SAC [001952]

### 4030 European dry heaths

**To restore the favourable conservation condition of European dry heaths in Comeragh Mountains 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	Comeragh Mountains SAC was surveyed as part of the National Survey of Upland Habitats (NSUH; see Roche et al., 2014 and Perrin et al., 2014). European dry heaths was mapped in detail for the SAC and the total area of the qualifying habitat stated by Roche et al. (2014) is 2,094.6ha. It is the most extensive Annex I habitat, covering 33.28% of the SAC. Roche et al. (2014) report obvious losses of habitat since 1995 of approximately 0.84ha. Further information can be found in Roche et al. (2014). Further details on this and the following attributes can be found in the Comeragh Mountains SAC conservation objectives supporting document for upland habitats where a summary of the mapping methodology is also presented
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 4	Dry heath was recorded by Roche et al. (2014) throughout Comeragh Mountains SAC, but was less frequent to the west of Coumfeea. Extensive patches occur in the north-west and east and at Farbreaga in the south. 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 pH and nutrient status within natural ranges	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	Roche et al. (2014) 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 the vegetation communities associated with this habitat is presented in Perrin et al. (2014). See also the Irish Vegetation Classification (Perrin, 2017; <a href="http://www.biodiversityireland.ie/projects/ivc-classification-explorer/">www.biodiversityireland.ie/projects/ivc-classification-explorer/</a> )
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 at least three, excluding <i>Campylopus</i> and <i>Polytrichum</i> mosses	Attribute and target 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 at least two	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat, which is composed of dwarf shrubs, is 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	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat, which is composed of dwarf shrubs, is 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%	Attribute and target 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%	Attribute and target 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, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). See the uplands supporting document for further details. The non-native moss <i>Campylopus introflexus</i> was recorded by Roche et al. (2014) as forming extensive carpets within this habitat in the SAC
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%	Attribute and target 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%	Attribute and target 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%	Attribute and target 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%	Attribute and target 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	Attribute and target 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	Attribute and target 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	Attribute and target 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%	Attribute and target 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	This includes species on the Flora (Protection) Order, 2015 and/or Red Lists (Byrne et al., 2009; Regan et al., 2010; Lockhart et al., 2012; Wyse Jackson et al., 2016, etc.). Roche et al. (2014) compiled and mapped existing rare and notable plant records for the SAC and added any new records collected during the NSUH. Hepatic mat vegetation was recorded in the habitat by Roche et al. (2014). Any new records should be considered within this attribute. See the uplands supporting document for further details

## Conservation Objectives for : Comeragh Mountains SAC [001952]

### 4060 Alpine and Boreal heaths

**To restore the favourable conservation condition of Alpine and Boreal heaths in Comeragh Mountains 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	Comeragh Mountains SAC was surveyed as part of the National Survey of Upland Habitats (NSUH; see Roche et al., 2014 and Perrin et al., 2014). Alpine and Boreal heath was mapped in detail for the SAC and the total area of the qualifying habitat stated by Roche et al. (2014) is 32.3ha. It is relatively infrequent, covering only 0.51% of the SAC. Roche et al. (2014) report no significant losses of area since 1995. Further information can be found in Roche et al. (2014). Further details on this and the following attributes can be found in the Comeragh Mountains SAC conservation objectives supporting document for upland habitats where a summary of the mapping methodology is also presented
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 5	Alpine and Boreal heath, as recorded by Roche et al. (2014), is limited in extent being found at the Coumfea corrie and on the high ground of the central plateau. 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 pH and nutrient status within natural ranges	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	Roche et al. (2014) recorded two 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 the vegetation communities associated with this habitat is presented in Perrin et al. (2014). See also the Irish Vegetation Classification (Perrin, 2017; <a href="http://www.biodiversityireland.ie/projects/ivc-classification-explorer/">www.biodiversityireland.ie/projects/ivc-classification-explorer/</a> )
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 at least three	Attribute and target 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%	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is 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%	Attribute and target 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%	Attribute and target 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%	Attribute and target based on Perrin et al. (2014). See the uplands supporting document for further details. No non-native species were recorded within this habitat by Roche et al. (2014)
Vegetation structure: signs of grazing	Percentage of leaves grazed 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	Attribute and target 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	Attribute and target 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	Attribute and target 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%	Attribute and target 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	This includes species on the Flora (Protection) Order, 2015 and/or Red Lists (Byrne et al., 2009; Regan et al., 2010; Lockhart et al., 2012; Wyse Jackson et al., 2016, etc.). Roche et al. (2014) compiled and mapped existing rare and notable plant records for the SAC and added any new records collected during the NSUH. Alpine clubmoss ( <i>Diphasiastrum alpinum</i> ) was recorded in the habitat at the head of Coumlara in the SAC during the NSUH (Roche et al., 2014; see also Roche and Perrin, 2010; Roche, 2011). Alpine clubmoss is included on Annex V of the Habitats Directive (see O'Neill et al., 2020) and is classified as Near Threatened in Ireland (Wyse Jackson et al., 2016). See the uplands supporting document for further details

## Conservation Objectives for : Comeragh Mountains SAC [001952]

### 7130 Blanket bogs (\* if active bog)

**To restore the favourable conservation condition of Blanket bogs (\* if active bog) in Comeragh Mountains 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	Comeragh Mountains SAC was surveyed as part of the National Survey of Upland Habitats (NSUH; see Roche et al., 2014 and Perrin et al., 2014). Roche et al. (2014) state that the total area of blanket bog in the SAC is 907.2ha (14.4% of the SAC). The comprises 838.0ha of active blanket bog and 69.2ha of inactive blanket bog. Roche et al. (2014) report obvious losses of habitat since 1995 of approximately 0.04ha. However, this is almost certainly an underestimate, as chronic losses due to erosion since 1995 cannot be quantified (42.6ha were mapped as eroding blanket bog by Roche et al., 2014). 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 uplands supporting document
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 6	Blanket bog was recorded by Roche et al. (2014) across the SAC, but was most abundant on the plateau of Knockaunapeebra. See Roche et al. (2014) for further information. Further details on this and the following attributes can be found in the Comeragh Mountains SAC conservation objectives supporting document for upland habitats where a summary of the mapping methodology and a brief discussion of restoration potential are also presented
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil pH and nutrient status within natural ranges	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 areas given by Roche et al. (2014) above, 92.4% of the Annex I blanket bog habitat is currently active. 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	Roche et al. (2014) recorded five different active blanket bog communities within this SAC. Data on the abundance of these communities is reproduced in the uplands supporting document. Further information on the vegetation communities associated with this habitat is presented in Perrin et al. (2014). See also the Irish Vegetation Classification (Perrin, 2017; <a href="http://www.biodiversityireland.ie/projects/ivc-classification-explorer">www.biodiversityireland.ie/projects/ivc-classification-explorer</a> )
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 at least seven	Attribute and target based on Perrin et al. (2014), where the list of positive indicator species for this habitat is 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%	Attribute and target 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%	Attribute and target based on Perrin et al. (2014). See the uplands supporting document for further details, including the list of potentially dominant species

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%	Attribute and target 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, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). See the uplands supporting document for further details. No non-native species were recorded within this habitat in the SAC by Roche et al. (2014)
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 10%	Attribute and target 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	Attribute and target 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%	Attribute and target 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	Attribute and target based on Perrin et al. (2014), where the list of sensitive areas is 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%	Attribute and target 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%	Attribute and target based on Perrin et al. (2014). See the uplands supporting document for further details
Physical structure: erosion	Percentage area in local vicinity of a representative number of monitoring stops	Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas	Attribute and target 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	This includes species on the Flora (Protection) Order, 2015 and/or Red Lists (Byrne et al., 2009; Regan et al., 2010; Lockhart et al., 2012; Wyse Jackson et al., 2016, etc.). Roche et al. (2014) compiled and mapped existing rare and notable plant records for the SAC and added any new records collected during the NSUH. No relevant species were recorded in this habitat during the NSUH; however, new records should be considered within this attribute. See the uplands supporting document for further details

## Conservation Objectives for : Comeragh Mountains SAC [001952]

### 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 Comeragh Mountains 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	Comeragh Mountains SAC was surveyed as part of the National Survey of Upland Habitats (NSUH; see Roche et al., 2014 and Perrin et al., 2014). Siliceous scree of the montane to snow levels ( <i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i> ) was mapped in detail for the SAC and the total area of the qualifying habitat stated by Roche et al. (2014) is 44.1ha, covering 0.7% of the SAC. Roche et al. (2014) report no significant losses of area of the habitat in the SAC since 1995. Further information can be found in Roche et al. (2014). Further details on this and the following attributes can be found in the Comeragh Mountains SAC conservation objectives supporting document for upland habitats where a summary of the mapping methodology is also presented
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 7	Siliceous scree was recorded by Roche et al. (2014) throughout Comeragh Mountains SAC, in association with steeper ground. 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 pH and nutrient status within natural ranges	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%	Attribute and target 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%	Attribute and target based on Perrin et al. (2014), where the list of negative indicator species for this habitat 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	Proportion of vegetation composed of non-native species less than 1%	Attribute and target based on Perrin et al. (2014). See the uplands supporting document for further details. Excessive cover of the non-native moss <i>Campylopus introflexus</i> was recorded by Roche et al. (2014) within the habitat in the SAC
Vegetation composition: positive indicator species	Number of species in local vicinity of a representative number of monitoring stops	At least one positive indicator species present in vicinity of each monitoring stop in block scree	Attribute and target based on Perrin et al. (2014). The list of positive indicator species for this habitat is also 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%	Attribute and target based on Perrin et al. (2014). See the uplands supporting document for further details
Vegetation composition: bracken, native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Total cover of bracken ( <i>Pteridium aquilinum</i> ), native trees and shrubs less than 25%	Attribute and target 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%	Attribute and target 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 or vehicles less than 10%	Attribute and target 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	This includes species on the Flora (Protection) Order, 2015 (FPO) and/or Red Lists (Byrne et al., 2009; Regan et al., 2010; Lockhart et al., 2012; Wyse Jackson et al., 2016, etc.). Roche et al. (2014) compiled and mapped existing rare and notable plant records for the SAC, including the FPO listed and Endangered liverwort ( <i>Barbilophozia atlantica</i> ) which was subsequently recorded associated with the habitat by Hodd (2015). Roche et al. (2014) recorded the moss <i>Andreaea megistospora</i> , listed as Vulnerable in Lockhart et al. (2012), in the habitat in the SAC. Any new records should also be considered within this attribute. See the uplands supporting document for further details

## Conservation Objectives for : Comeragh Mountains SAC [001952]

### 8210 Calcareous rocky slopes with chasmophytic vegetation

**To restore the favourable conservation condition of Calcareous rocky slopes with chasmophytic vegetation in Comeragh Mountains 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	Comeragh Mountains SAC was surveyed as part of the National Survey of Upland Habitats (NSUH; see Roche et al., 2014 and Perrin et al., 2014). Calcareous rocky slopes with chasmophytic vegetation was mapped in detail for the SAC and the total area of the qualifying habitat stated by Roche et al. (2014) is 0.02ha. It is, a marginal habitat covering only 0.0003% of the SAC. Roche et al. (2014) reported no significant losses of area since 1995. Further information can be found in Roche et al. (2014). Further details on this and the following attributes can be found in the Comeragh Mountains SAC conservation objectives supporting document for upland habitats where a summary of the mapping methodology is also presented
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 8	Calcareous rocky slopes was recorded by Roche et al. (2014) from just one area in Comeragh Mountains SAC. This was on the corrie wall associated with Coumshingaun Lough in the east of the 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 pH and nutrient status within natural ranges	See the uplands supporting document for further details
Vegetation composition: positive indicator fern and <i>Saxifraga</i> species	Number of species in local vicinity of a representative number of monitoring stops	Number of ferns and <i>Saxifraga</i> indicators in vicinity of each monitoring stop at least one	Attribute and target 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: positive indicator species	Number of species in local vicinity of a representative number of monitoring stops	Number of positive indicator species in vicinity of each monitoring stop at least three	Attribute and target based on Perrin et al. (2014) where the list of positive indicator species for this habitat is presented. Further details can be found in the uplands supporting document
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%	Attribute and target based on Perrin et al. (2014). See the uplands supporting document for further details. No non-native species were recorded within this habitat by Roche et al. (2014)
Vegetation composition: bracken, native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Total cover of bracken ( <i>Pteridium aquilinum</i> ), native trees and shrubs less than 25%	Attribute and target 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%	Attribute and target 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	This includes species on the Flora (Protection Order, 2015 (FPO) and/or Red Lists (Byrne et al., 2009; Regan et al., 2010; Lockhart et al., 2012; Wyse Jackson et al., 2016, etc.). Roche et al. (2014) compiled and mapped existing rare and notable plant records for the SAC and added any new records collected during the NSUH. Roche et al. (2014) recorded the FPO listed moss <i>Hedwigia integrifolia</i> , listed as Vulnerable in Lockhart et al. (2012), in the habitat in the SAC. Any new records should also be considered within this attribute. See the uplands supporting document for further details

## Conservation Objectives for : Comeragh Mountains SAC [001952]

### 8220 Siliceous rocky slopes with chasmophytic vegetation

**To restore the favourable conservation condition of Siliceous rocky slopes with chasmophytic vegetation in Comeragh Mountains 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	Comeragh Mountains SAC was surveyed as part of the National Survey of Upland Habitats (NSUH; see Roche et al., 2014 and Perrin et al., 2014). Siliceous rocky slopes with chasmophytic vegetation was mapped in detail for the SAC and the total area of the qualifying habitat stated by Roche et al. (2014) is 72.3ha, covering 1.15% of the SAC. Roche et al. (2014) report obvious losses of habitat since 1995 of approximately 0.02ha. Further information can be found in Roche et al. (2014). Further details on this and the following attributes can be found in the Comeragh Mountains SAC conservation objectives supporting document for upland habitats where a summary of the mapping methodology is also presented
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 9	Siliceous rocky slopes was recorded by Roche et al. (2014) scattered throughout Comeragh Mountains SAC. Significant patches were recorded on the spur to the south of Coumshingaun Lough and the corrie wall at Coumtay by Roche et al. (2014). 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 pH and nutrient status within natural ranges	See the uplands supporting document for further details
Vegetation composition: positive indicator species	Number of species in local vicinity of a representative number of monitoring stops	At least one positive indicator species present in vicinity of each monitoring stop	Attribute and target based on Perrin et al. (2014). The list of positive indicator species for this habitat is also presented in Perrin et al. (2014) and is the same as for 8110 Siliceous screes. Further details can be found in the uplands supporting document
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%	Attribute and target based on Perrin et al. (2014). See the uplands supporting document for further details. During the NSUH, excessive cover of the non-native New Zealand willowherb ( <i>Epilobium brunnescens</i> ) was recorded within this habitat by Roche et al. (2014)
Vegetation composition: bracken, native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Total cover of bracken ( <i>Pteridium aquilinum</i> ), native trees and shrubs less than 25%	Attribute and target 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%	Attribute and target 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	This includes species on the Flora (Protection) Order, 2015 (FPO) and/or Red Lists (Byrne et al., 2009; Regan et al., 2010; Lockhart et al., 2012; Wyse Jackson et al., 2016, etc.). Roche et al. (2014) compiled and mapped existing rare and notable plant records for the SAC and added any new records collected during the NSUH. During the NSUH, the FPO listed moss <i>Hedwigia integrifolia</i> , classified as Vulnerable in Ireland (Lockhart et al., 2012) was recorded from this habitat. This species was subsequently recorded by Hodd (2015). Any new records should also be considered within this attribute. See the uplands supporting document for further details



## Conservation Objectives for : Comeragh Mountains SAC [001952]

### 6216 Slender Green Feather-moss *Hamatocaulis vernicosus*

To restore the favourable conservation condition of Slender Green feather-moss (*Hamatocaulis vernicosus*) in Comeragh Mountains SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Number and geographical spread of populations	No decline, subject to natural processes. See map 10 for the recorded locations at the three known populations: Below Sgilloge Loughs (site code Hv08a), Nier River Valley (Hv08b) and Countay (Hv08c)	There are three known populations of slender green feather-moss ( <i>Hamatocaulis vernicosus</i> [formerly <i>Drepanocladus vernicosus</i> , species code 1393; see Hedenäs, 1989]) in Comeragh Mountains SAC: Below Sgilloge Loughs (site code Hv08a in Campbell et al., 2019), occurring in flushes on north/north-west-facing slopes, Nier River Valley (Hv08b), occurring in a flush on a north-facing slope just above the riverbank, and Countay (Hv08c), in a flush on a south-facing slope. See map 10 for locations of the recorded populations. Data from NPWS surveys (NPWS internal files), Campbell (2013) and Campbell et al. (2015, 2019)
Population size	Number of individuals	No decline, subject to natural processes	The population at Below Sgilloge Loughs (Hv08a), Nier River Valley (Hv08b) and Countay (Hv08c) was estimated by Campbell et al. (2019) to be c.35,884,800 shoots, c.22,345,000 shoots and c.13,000 shoots, respectively. The estimate of shoots is based on the mean of number of shoots in 10cm x 10cm areas in four 2m x 2m monitoring stops (plots) at Hv08a and two monitoring stops each at Hv08b and Hv08c, extrapolated to 14,400 shoots/m <sup>2</sup> in 2,492m <sup>2</sup> at Hv08a, 41,000 shoots/m <sup>2</sup> in 545m <sup>2</sup> at Hv08b and 5,000 shoots/m <sup>2</sup> in 2.6m <sup>2</sup> at Hv08c (Campbell et al., 2019). The density target set by Campbell et al. (2015) at Hv08a was 12,500 shoots/m <sup>2</sup> and that at Hv08b was 29,000 shoots/m <sup>2</sup> . See Campbell et al. (2015, 2019) for further details on this and all attributes
Population cover	Percentage cover in a representative number of 2m x 2m monitoring stops	Mean percentage cover of slender green feather-moss ( <i>Hamatocaulis vernicosus</i> ) should be at least 25% at Hv08a, 40% at Hv08b and 3.2% at Hv08c	The targets at Hv08a and Hv08b are based on Campbell et al. (2015); the target at Hv08c is based on Campbell et al. (2019). The mean percentage cover of slender green feather-moss ( <i>Hamatocaulis vernicosus</i> ) recorded in four 2m x 2m monitoring stops at Hv08a by Campbell et al. (2019) was c.35% and that recorded in two monitoring stops at Hv08b was c.35%; however, the attribute was allowed to pass on expert judgement. The mean percentage cover of slender green feather-moss recorded by Campbell et al. (2019) in two monitoring stops at Hv08c was c.4%. The target figure is c.80% of the recorded cover to allow for margin of error and variability over monitoring seasons. See Campbell et al. (2015, 2019) for further details
Area of suitable habitat	Hectares	No decline, subject to natural processes	The extent of occurrence at Hv08a was estimated by Campbell et al. (2019) to be c.7,119m <sup>2</sup> (c.0.712ha; see map 10); however, within this, only c.35% is considered suitable habitat for the species, i.e. c.2,492m <sup>2</sup> (0.249ha). The extent of occurrence at Hv08b was estimated by Campbell et al. (2019) to be c.1,156m <sup>2</sup> (c.0.116ha; see map 10) and, within this, only c.35% is considered suitable habitat for the species, i.e. c.545m <sup>2</sup> (0.055ha). The extent of occurrence at Hv08c was estimated by Campbell et al. (2019) to be c.64m <sup>2</sup> (c.0.006ha; see map 10) and within this, only c.4% is considered suitable habitat for the species, i.e. c.2.6m <sup>2</sup> (0.0003ha). See Campbell et al. (2015, 2019) for further details

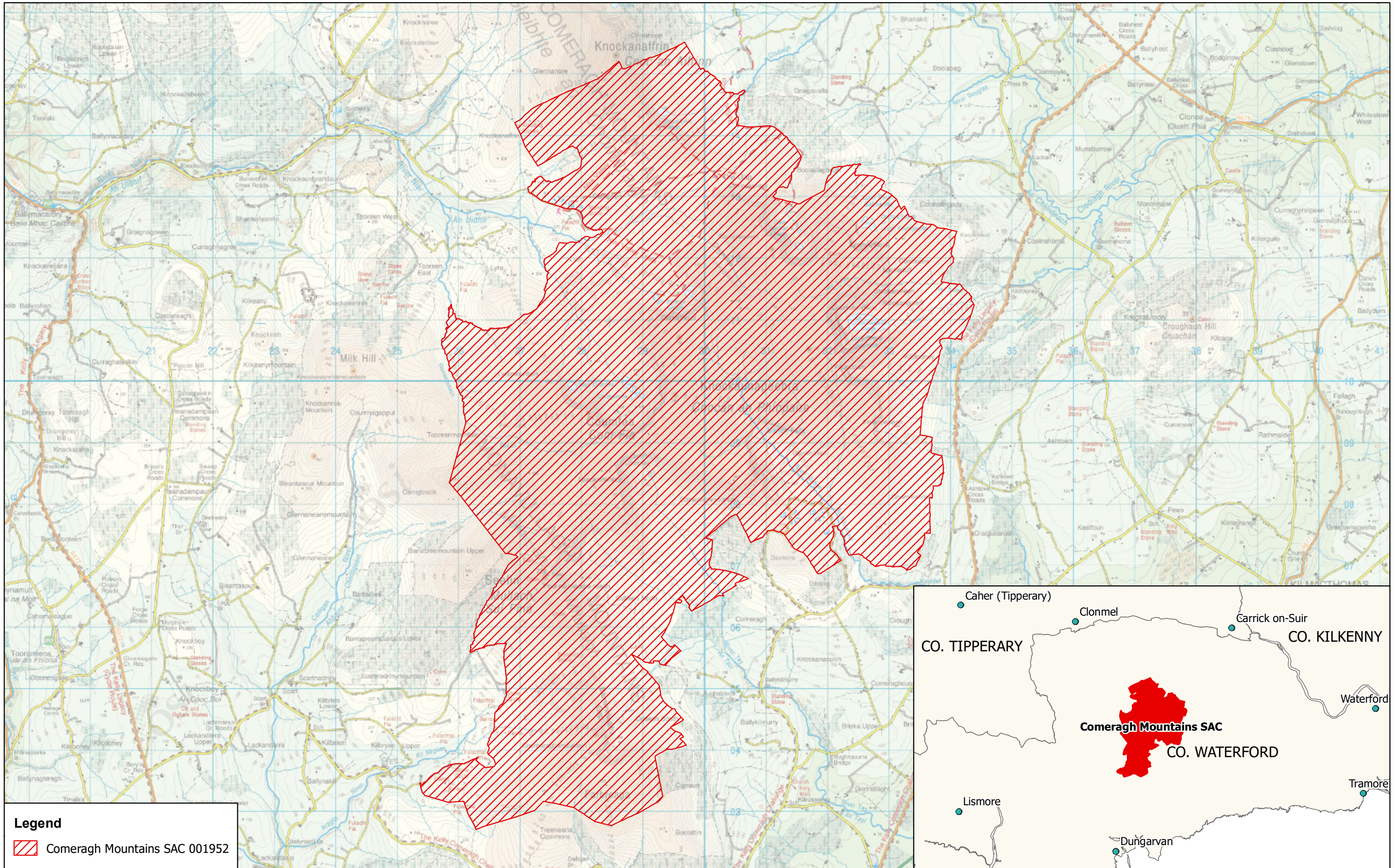


Hydrological conditions: water table level	Metres	Maintain the appropriate hydrological conditions necessary to support the habitat for the species	Slender green feather-moss ( <i>Hamatocaulis vernicosus</i> ) is mostly confined to mesotrophic fens, a transitional habitat between acid bog and base-rich 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 at the known populations in Comeragh Mountains SAC; 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 composition: tree cover	Percentage cover in a representative number of 2m x 2m monitoring stops	Mean percentage tree cover should be less than 15%	Attribute and target based on Campbell et al. (2015). Slender green feather-moss ( <i>Hamatocaulis vernicosus</i> ) grows in moss-dominated, open communities, generally with a low cover of trees and shrubs. Campbell et al. (2019) recorded 0% tree cover in four 2m x 2m monitoring stops at Hv08a and two monitoring stops each at Hv08b and Hv08c. See Campbell et al. (2015, 2019) for further details
Vegetation composition: shrub cover	Percentage cover in a representative number of 2m x 2m monitoring stops	Mean percentage shrub cover should be less than 20%	Attribute and target based on Campbell et al. (2015). Slender green feather-moss ( <i>Hamatocaulis vernicosus</i> ) grows in moss-dominated, open communities, generally with a low cover of trees and shrubs. Campbell et al. (2019) recorded 0% tree cover in four 2m x 2m monitoring stops at Hv08a and two monitoring stops each at Hv08b and Hv08c. See Campbell et al. (2015, 2019) for further details
Vegetation composition: grass cover	Percentage cover in a representative number of 2m x 2m monitoring stops	Mean percentage grass species cover should be less than 25%	Attribute and target based on Campbell et al. (2015). Slender green feather-moss ( <i>Hamatocaulis vernicosus</i> ) grows in moss-dominated, open communities, generally with a low cover of grasses (Campbell, 2013; Campbell et al., 2015). Campbell et al. (2019) recorded a mean grass cover of c.5% in four 2m x 2m monitoring stops at Hv08a, c.25% in two monitoring stops at Hv08b and c.27.5% in two monitoring stops at Hv08c. There may be some eutrophication occurring at Hv08c from overstocking (the slopes surrounding the flush were recorded by Campbell et al. [2019] as being heavily overgrazed) as water sample analysis from the flush indicated high levels of ammonium and total phosphate; this may be a factor in the mean grass cover failing the attribute target. See Campbell et al. (2019) for further details
Vegetation composition: bryophyte cover	Percentage cover in a representative number of 2m x 2m monitoring stops	Mean percentage bryophyte cover should be more than 50%	Attribute and target based on Campbell et al. (2015). Campbell et al. (2019) recorded a mean bryophyte cover of c.70% in four 2m x 2m monitoring stops at Hv08a, c.80% in two monitoring stops at Hv08b and c.27.5% in two monitoring stops at Hv08c; thus, Hv08c failed the target for this attribute. See Campbell et al. (2015, 2019) for further details
Vegetation composition: negative indicator species	Percentage cover in a representative number of 2m x 2m monitoring stops	Mean percentage cover of <i>Calliergonella cuspidata</i> should be less than 15%	<i>Calliergonella cuspidata</i> , a moss species often associated with high nutrient conditions, is usually present, but with low cover and is rarely dominant. Attribute and target based on Campbell et al. (2015). Mean cover of <i>Calliergonella cuspidata</i> was c.5% in four 2m x 2m monitoring stops recorded by Campbell et al. (2019) at Hv08a, c.10% in two monitoring stops at Hv08b and c.27.5% at two monitoring stops in Hv08c. There may be some eutrophication occurring at Hv08c from overstocking (the slopes surrounding the flush were recorded by Campbell et al. [2019] as being heavily overgrazed) as water sample analysis from the site indicated high levels of ammonium and total phosphate; this may be a factor in causing excessive cover of <i>C. cuspidata</i> at Hv08c. See Campbell et al. (2019) for further details


Vegetation structure: vegetation height	Centimetres in a representative number of 2m x 2m monitoring stops	Mean vegetation height should not exceed 40cm	Attribute and target based on Campbell et al. (2015). Campbell et al. (2019) recorded a mean vegetation height of c.34cm in four 2m x 2m monitoring stops at Hv08a, c.33cm in two monitoring stops at Hv08b and c.18cm in two monitoring stops in Hv08c. See Campbell et al. (2015, 2019) for further details
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**Legend**

 Comeragh Mountains SAC 001952

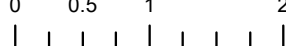
 **An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta**  
 Department of Housing, Local Government and Heritage

**MAP 1:  
 COMERAGH MOUNTAINS SAC  
 CONSERVATION OBJECTIVES  
 SAC DESIGNATION**

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


**SITE CODE:  
 SAC 001952; version 3.  
 CO. WATERFORD**

0 0.5 1 2 Kilometres



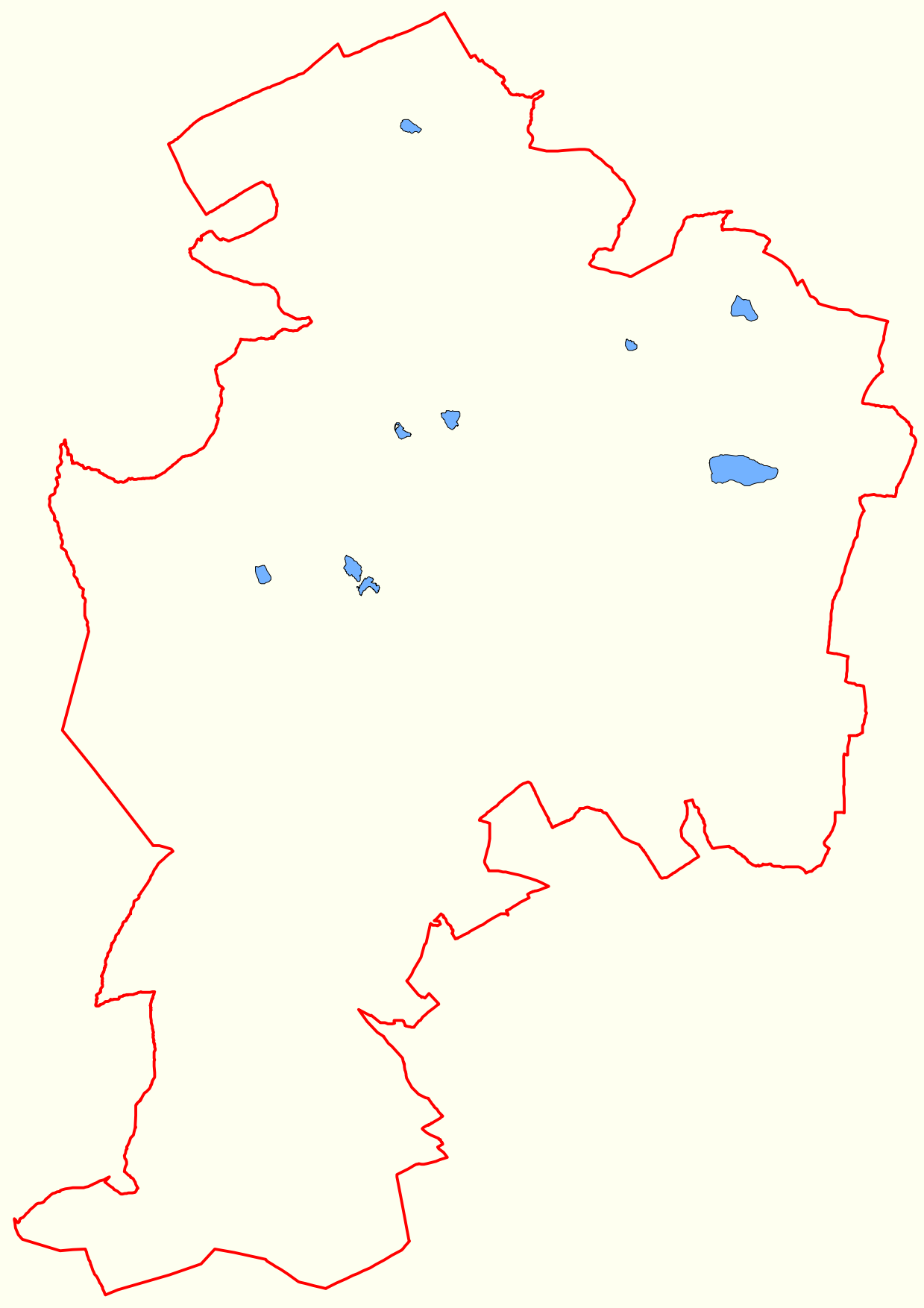
The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.  
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Níl sna teorainneacha ar na léarscáileanna ach nod garshuíomhach ginearálta. Féadfar athbheithnithe a déanamh ar theorainneacha na gceantar comharthaíthe. Suirbhéarachta Ordonáis na hÉireann Ceadúnas Uimh OSI-NMA-014. © Suirbhéarachta Ordonáis na hÉireann Rialtas na hÉireann



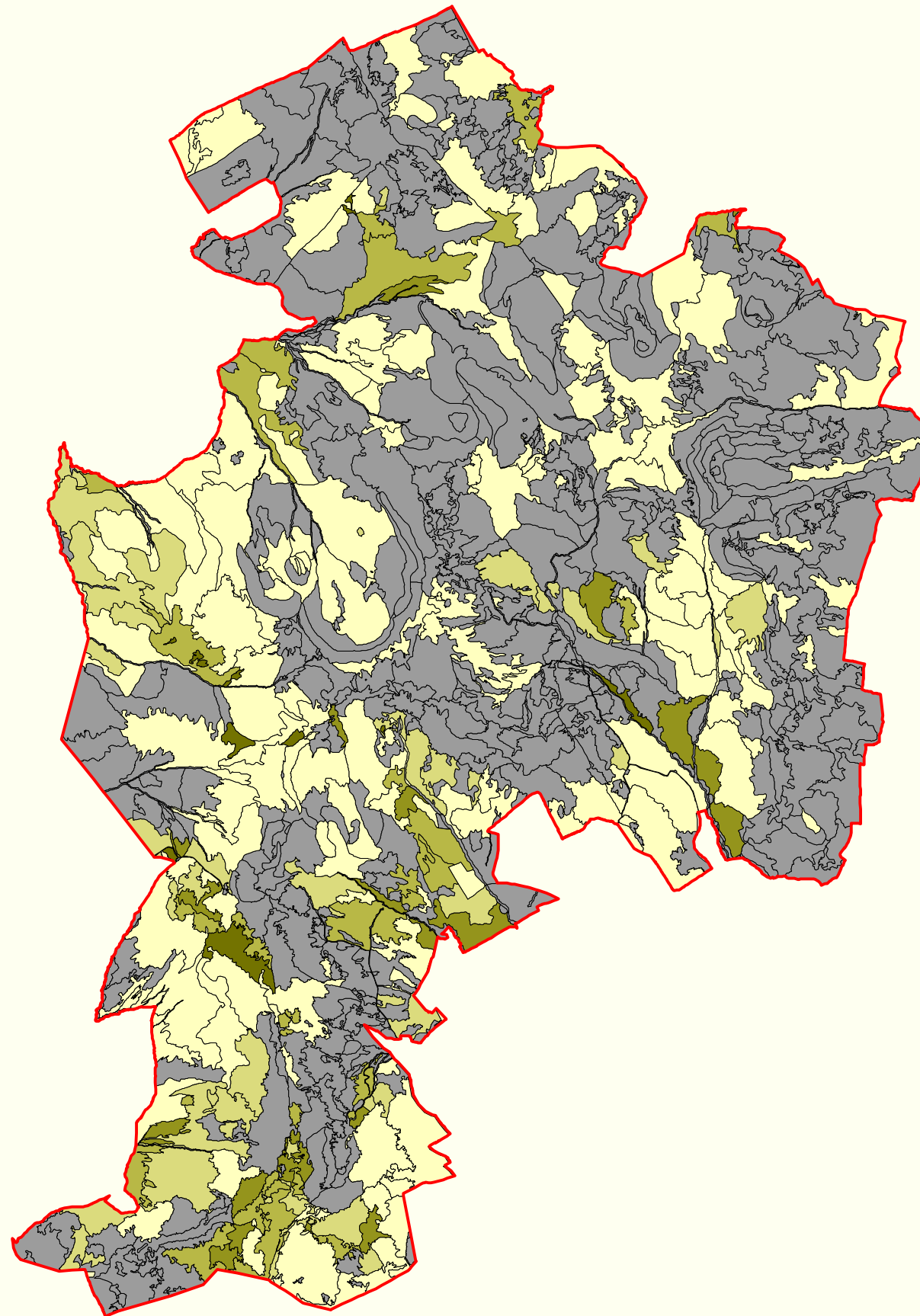
**Date: October 2021**





**Legend**

- Potential 3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea*
- Comeragh Mountains SAC 001952



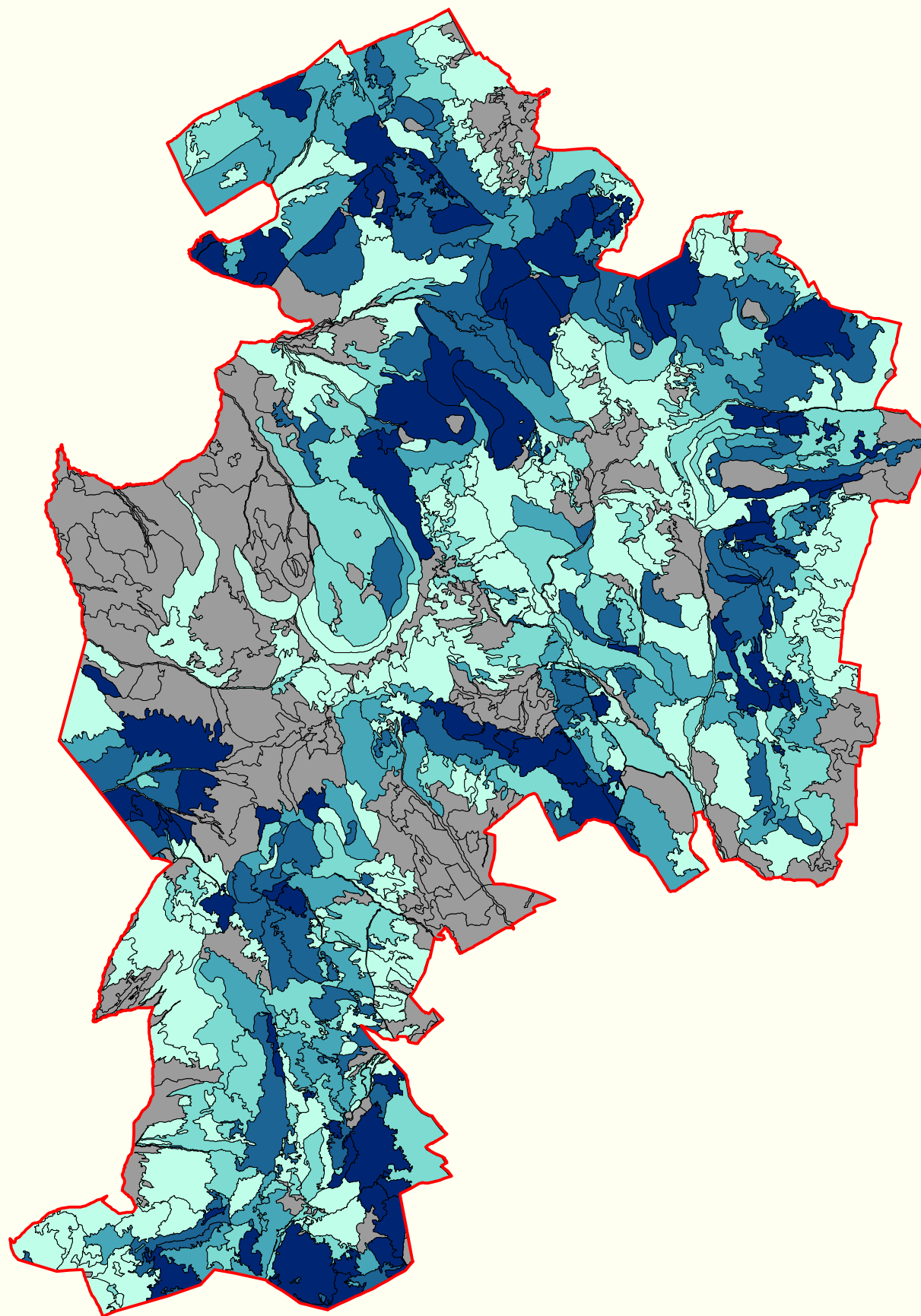
**Legend**

Comeragh Mountains SAC 001952

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

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





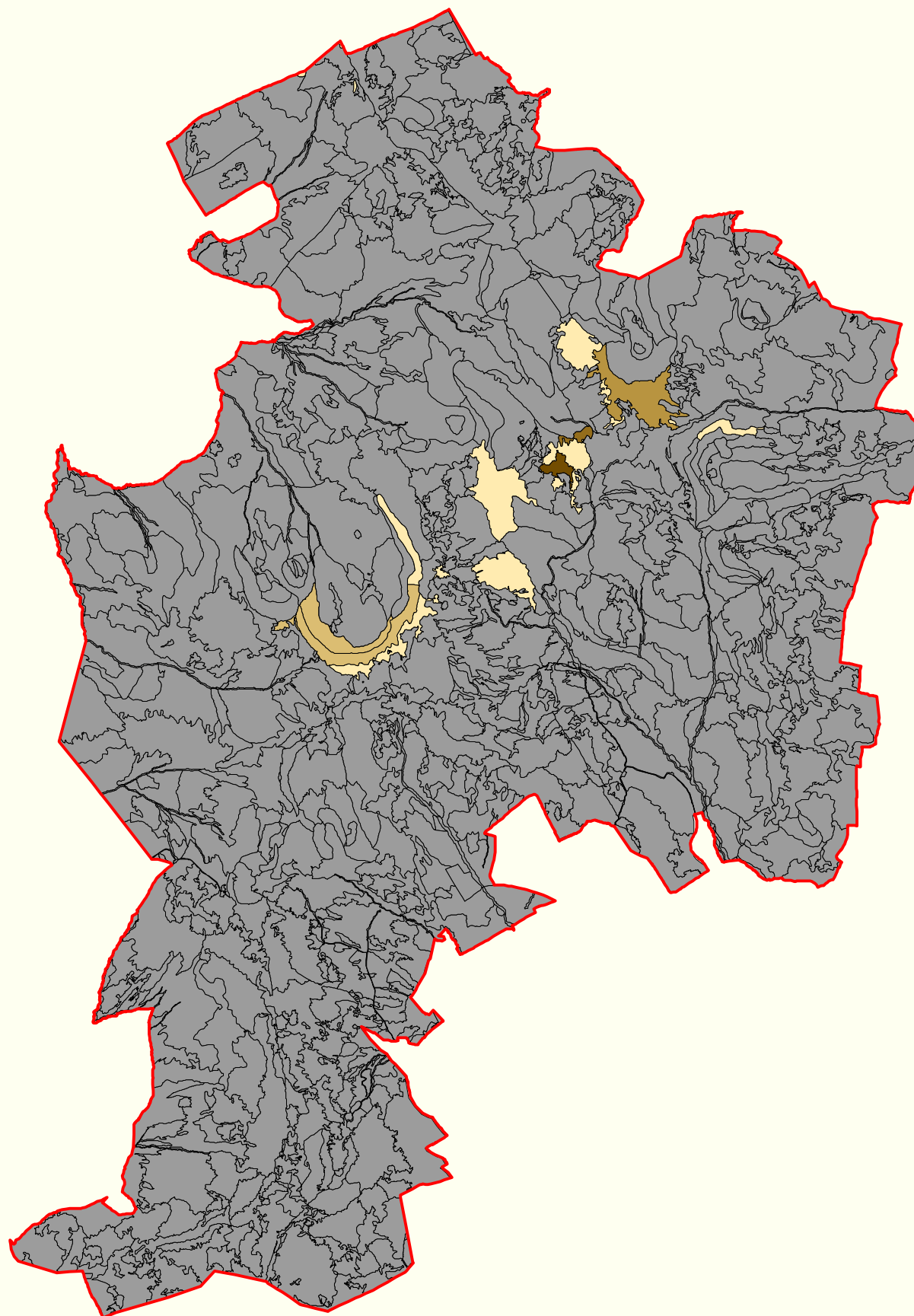
**Legend**

Comeragh Mountains SAC 001952

**Cover of 4030 European dry heaths**

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











**Legend**

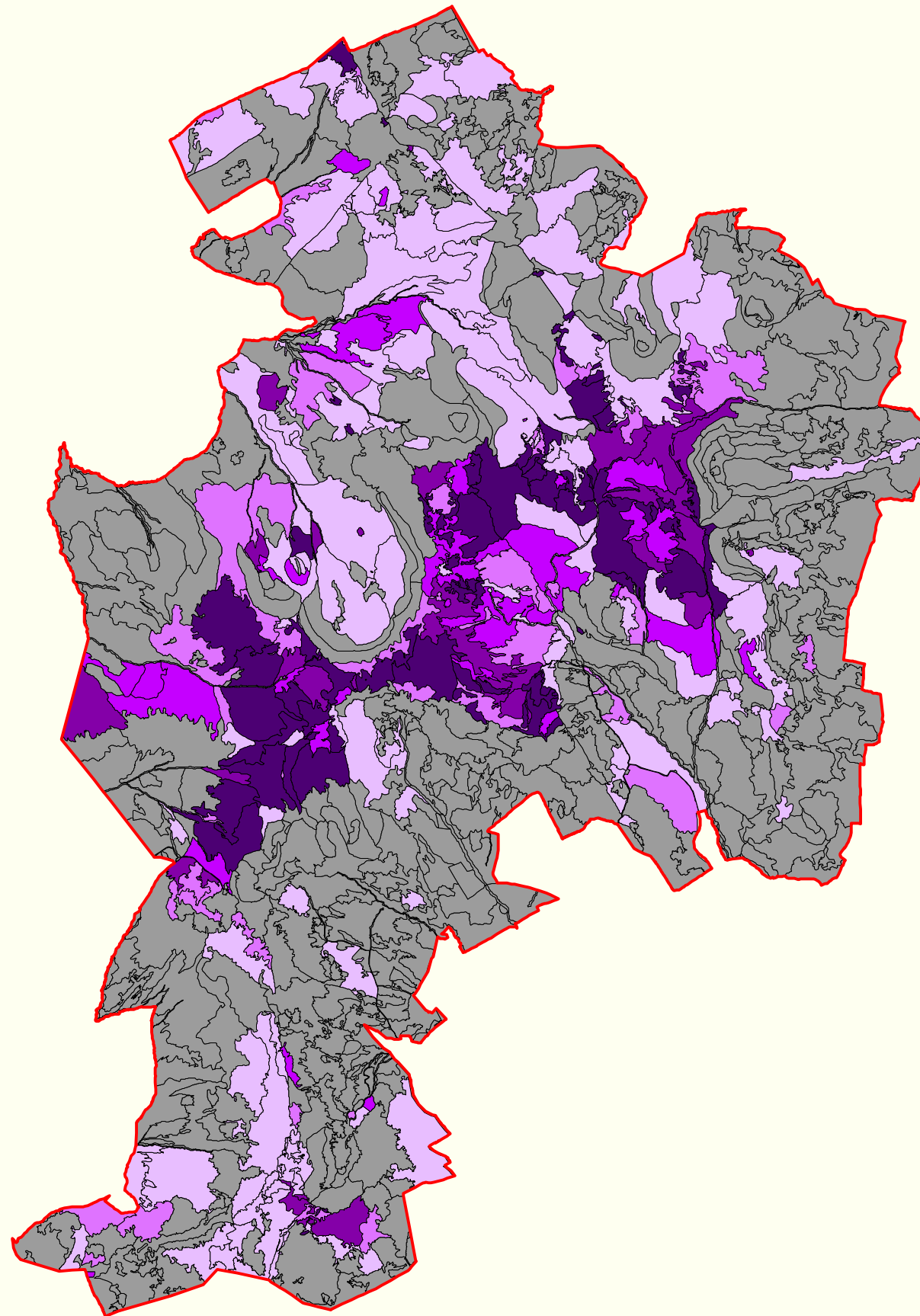
 Comeragh Mountains SAC 001952

**Cover of 4060 Alpine and Boreal heaths**

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













**Legend**

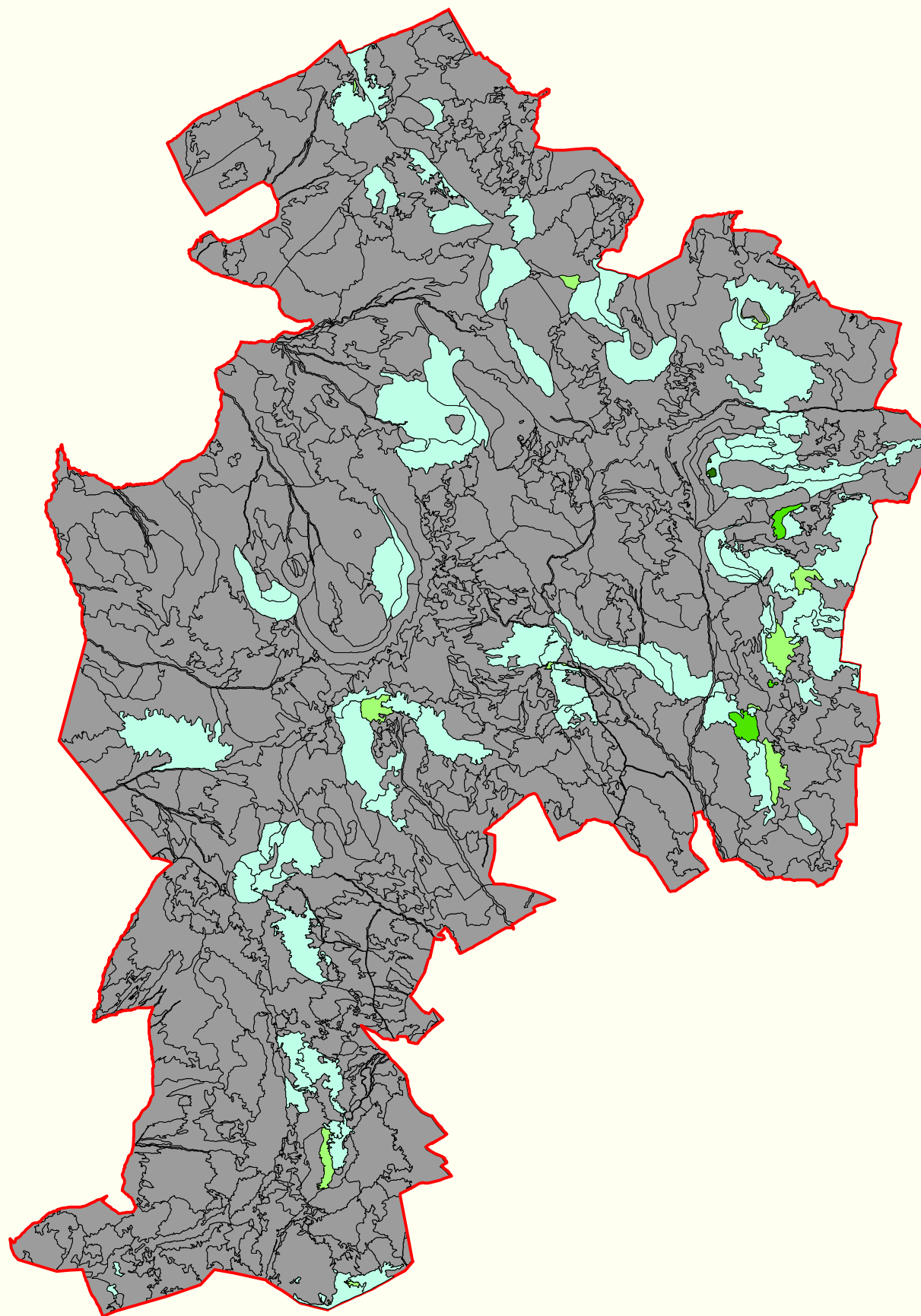
 Comeragh Mountains SAC 001952

**Cover of 7130 Blanket bogs (\* if active bog)**

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







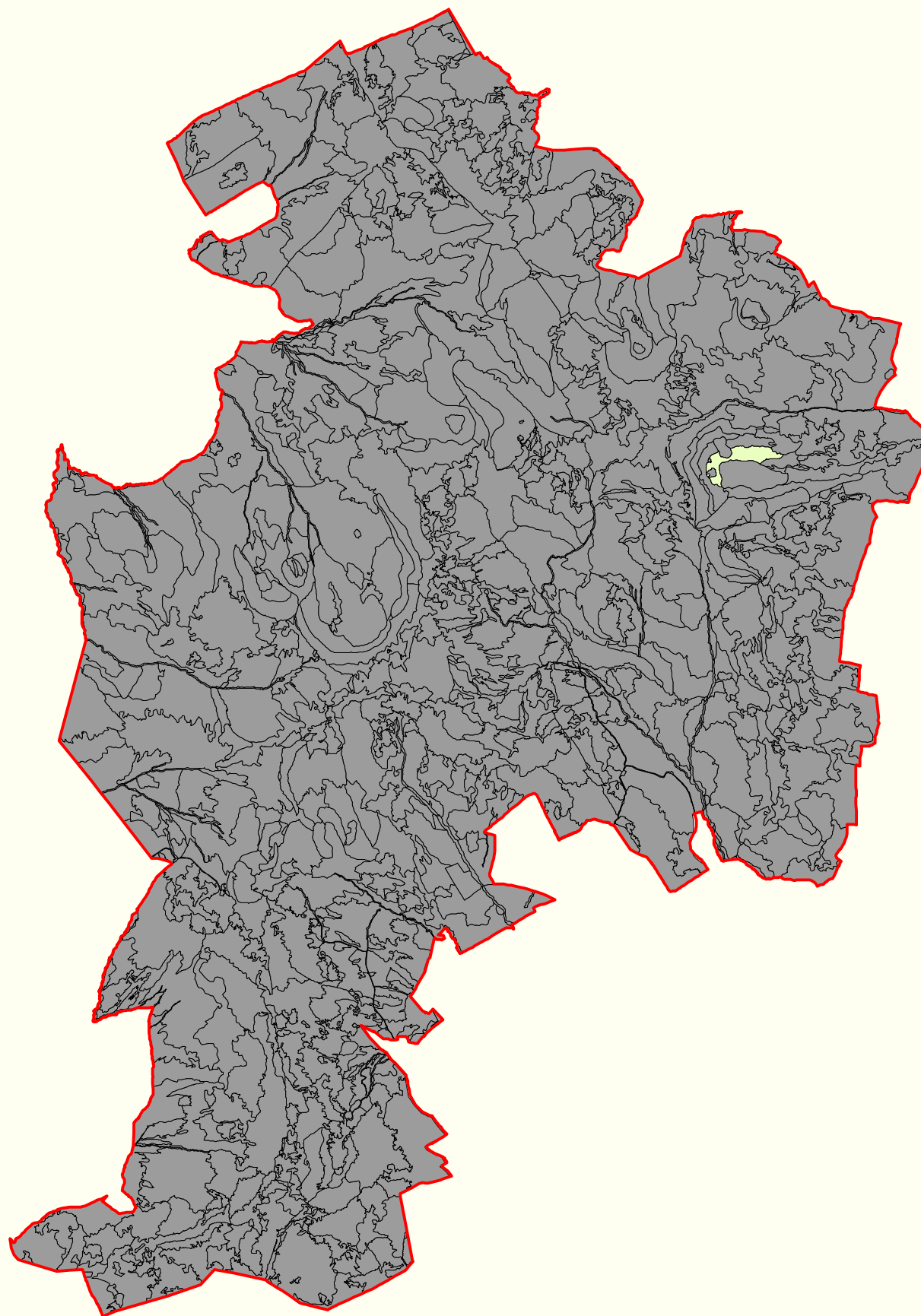
**Legend**

Comeragh Mountains SAC 001952

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

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






**Legend**

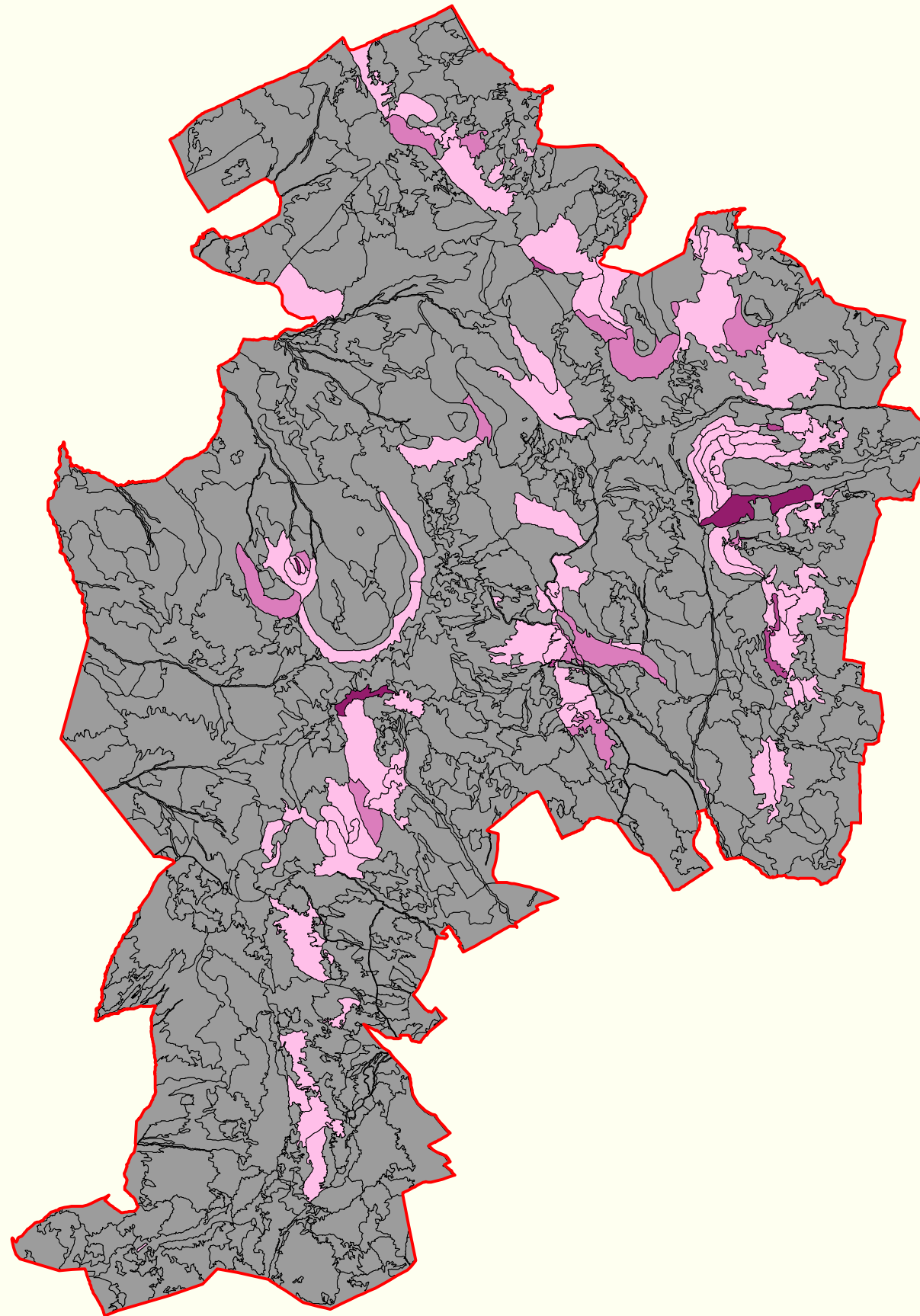
 Comeragh Mountains SAC 001952

**Cover of 8210 Calcareous rocky slopes with chasmophytic vegetation**

 0%

 0.1% - 20%





**Legend**

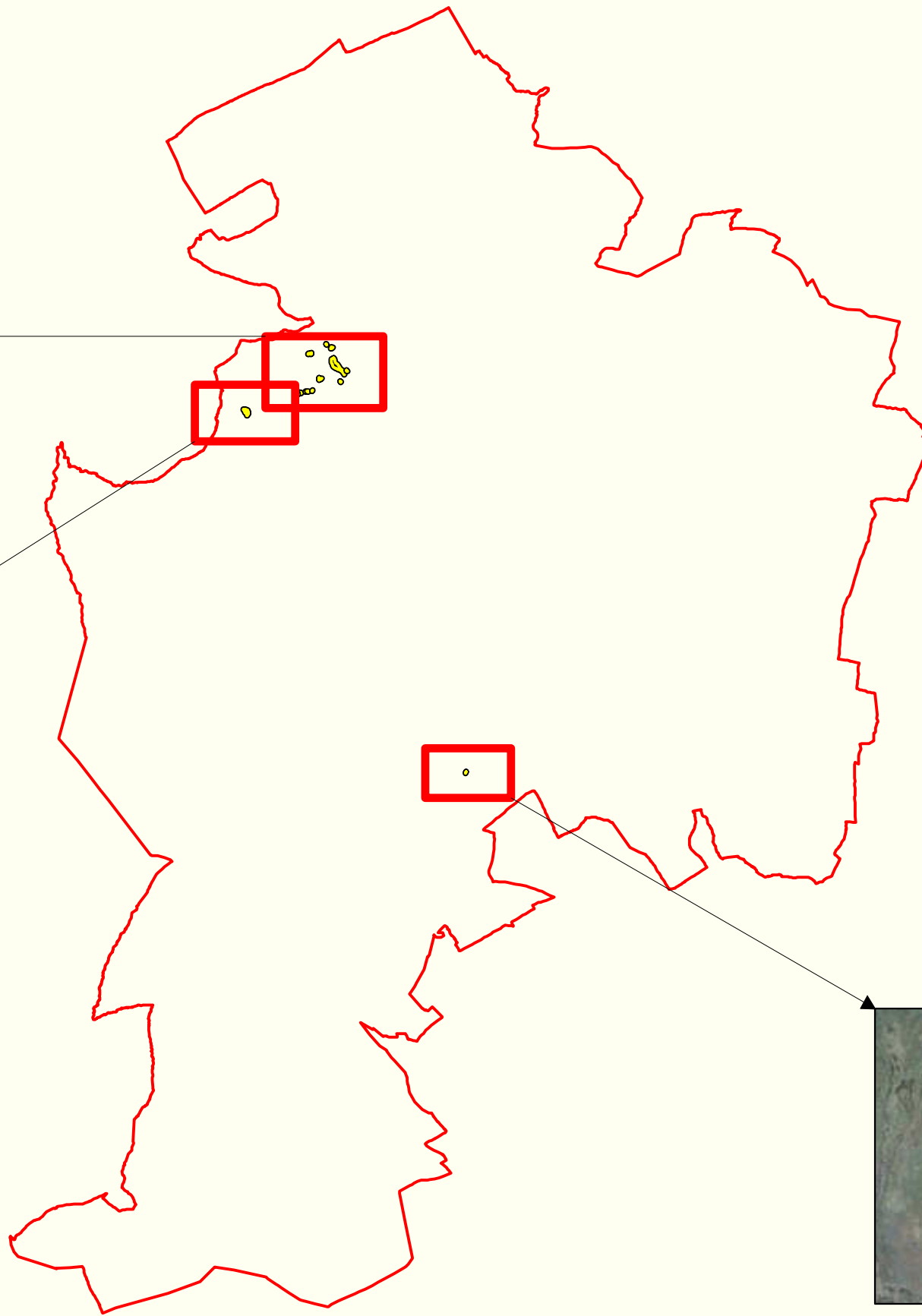
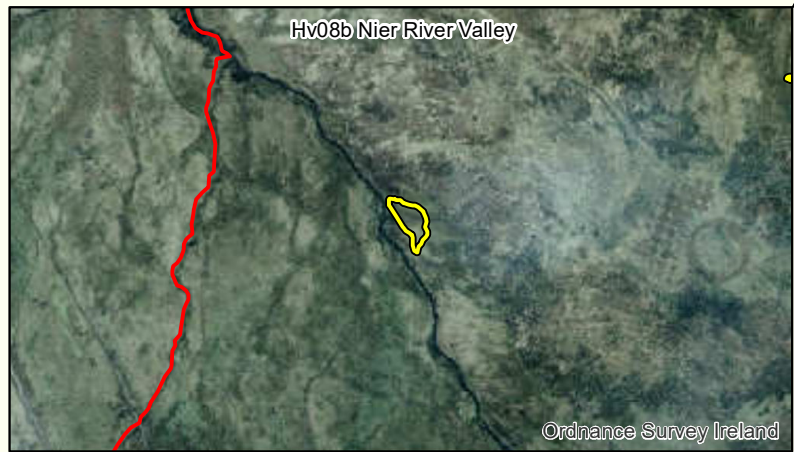
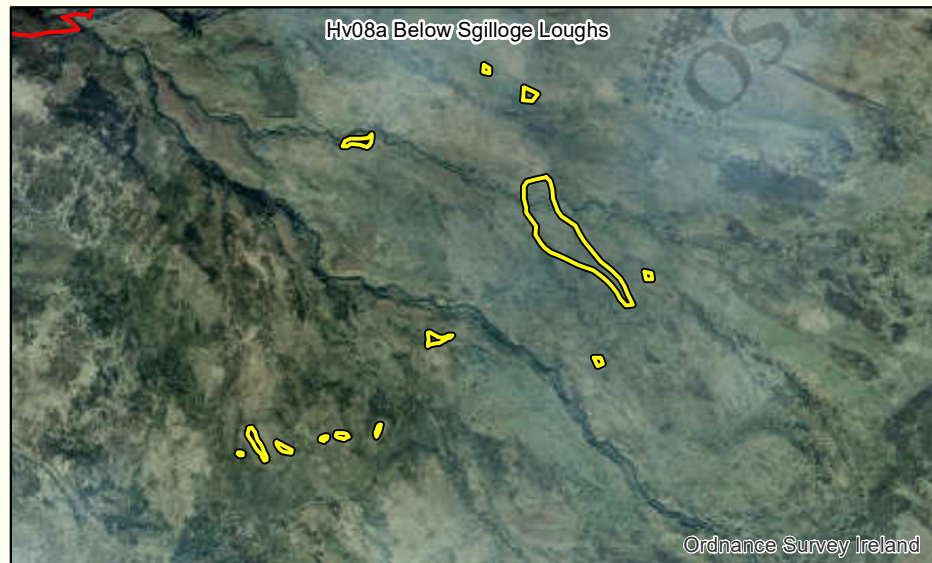
Comeragh Mountains SAC 001952

**Cover of 8220 Siliceous rocky slopes with chasmophytic vegetation**

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







**Legend**

- Comeragh Mountains SAC 001952
- 1393 Slender Green Feather-moss - *Hamatocaulis vernicosus*