



Whitewell House
Kilshanvy
Tuam
Co Galway

15 November 2025

Observation

Re: Application Number: PAX07.323699

Proposal by RWE Renewables Ireland Limited to erect eleven wind turbines of 180m within the townlands of Beagh, Beagh More, Cloonbar, Cloonmweelaun, Cloonaglasha, Cloonteen, Corillaun, Derrymore, Ironpool, Shancloon, Toberoe and Tonacooleen, Co. Galway.

Request for planning permission lodged on 19.09.2025

Friends of Kilconly Wetlands is a voluntary group dedicated to the protection, restoration, and celebration of the local wetlands. The group works to engage the community through conservation, education, and arts-based projects, fostering a living connection to the wetlands that encompasses both ecological importance and community engagement.

The proposed Shancloon Wind Farm is located within areas of Kilconly's peatlands, a landscape of ecological, cultural, and recreational significance. These bogs provide habitats for rare and protected species, act as an important carbon sink, and support hydrological stability in the surrounding landscape. Friends of Kilconly Wetlands is concerned that construction and operation of the turbines could destroy sensitive habitats, displace wildlife, and fragment populations of species dependent on the peatland ecosystem. In addition, changes to hydrology and access could disrupt the community's ongoing relationship with the bog, including recreational, educational, and cultural activities.

Cloonbar East Wetland (The Commonage)

Since we live in the area, we are very well acquainted with our local wetlands, particularly our raised bogs, turloughs and the commonage at Cloonbar. We are so lucky to live in a biodiversity hotspot and were shocked that the EIAR undertaken for the proposed wind farm did not record even a few of our more notable species. In particular, we record sightings of the Annex II Marsh Fritillary butterfly every Summer both within and around the footprint of the proposed windfarm – yet the EIAR reports that there was no record of this species in the area. We are particularly proud to have the Near Threatened Autumn Gentian (*Gentianella*

amarella subsp. Hibernica) growing on the commonage but this also went unnoticed in the EIAR vegetation report for that area. Indeed, the vegetation report for the commonage was completely misleading in classifying it as Dry Humid Acid Grassland which “is of limited use to pollinators”. This commonage consists of up to three potential EU annex habitats and an esker, none of which were recorded in the EIAR. As for the commonage being of limited use to pollinators, why then has the Red-Listed, Near Threatened Moss Carder Bee (*Bombus muscorum*) been recorded there by an ecologist?

It was disappointing to see that no vegetation sampling appeared to take place on the Commonage during July or August, a time when pollinators are more active. One of our visitors to Cloonbar Bog also recorded, close to the footprint of the proposed windfarm, the Large Heath butterfly, a peatland specialist which is listed as Vulnerable (VU) on the European and Irish Red List for Butterflies. A member of our group who has an interest in moths, has also recorded the White Ermine (*Spilosoma lubricipeda*), Garden Tiger (*Arctia caja*) and Heath Rustic (*Xestia agathina*) all of which are associated with raised bog but also classed as Vulnerable (VU) and therefore requiring our protection.

Turloughs and water birds

We also live in an area with a very high concentration of turloughs (disappearing lakes) which because, in the west of Ireland, we experience a moist, oceanic climate, are unique in how they flood – some can even flood during a wet Summer. These turloughs and the bog provide a home for the many EU Annex and Red and Amber-listed bird species which spend their winters here. We are also close to the Lough Corrib SPA, so there is a frequent movement of birds between the lake and the turloughs.

Living here, you notice that the types and numbers of birds living on the turloughs varies dramatically throughout the Winter and seem to depend, at least to some extent, on the level of flooding and whether the turlough basin is shallow or deep. Flooding patterns are influenced primarily by rainfall, but it is not that simple. If you talk to farmers, they’ll tell you that a turlough that used to empty fast has suddenly started to empty slowly or vice-versa and this could be due to sediments blocking underground streams and rivers slowing down the natural drainage of the turlough or water pressure building up behind an underwater blockage and suddenly releasing vast amounts of water. Others will tell you of turloughs that do not seem to respond to local rainfall levels but to rainfall events many miles away.

Turloughs could almost be called floodplains of underground rivers and because these rivers are underground, we still do not know fully how the different turloughs are connected and how they influence each other. The flooding patterns can be so variable during the winter or in different years, not even the scientists fully understand how the birds interact with a wetland that could be there one day but gone a few days later or from providing deep water for the diving ducks such as Pochard (Red Listed) or Tufted Duck (Amber Listed) for a few days to being too shallow for them and being only able to accommodate the dabbling ducks such as Shoveler (Red Listed) and Teal (Amber Listed). This constantly changing water

resource means that birds are frequently on the move with species like Snipe, Curlew, Golden Plover (all Red-Listed species) and Annex I species such as Whooper Swan and Greenland White-fronted Goose flying between turloughs across the bog where the proposed wind farm is planned to be located. They also frequently fly at night-time when no bird surveys were undertaken for the EIAR and it is of great concern that bird collisions with the turbines could happen at night. No in-depth scientific study that we know of has been undertaken to date to determine how the birds use these turloughs and we firmly believe that the bird surveys undertaken for the EIAR which are used to measure bird activity in lakes or rivers, simply are not sufficient to determine potential impacts of the proposed wind farm on these birds which use a turlough landscape where feeding resources are constantly changing. There are simply too many unanswered questions that need to be addressed first.

Ireland's waterbirds have declined by 40% since the mid-1990s and until we know more about bird-turlough interactions, the precautionary principle must be applied in this instance. We welcome the news that the University of Galway has embarked on a study to determine the movements of two Annex I species (Greenland White-fronted Goose and the Whooper Swan) in our area and we hope that this will continue in the future for other red and amber-list bird species until we have a clearer picture.

Peatlands

As members of the Friends of Kilconly Wetlands we are also committed to protecting the bogs through restoration with active community engagement to ensure a just transition so that everyone is a winner, not only for today but for generations to come. We are members of the Community Wetlands Forum and have had discussions with the Galway County Council Biodiversity Officer and met with our local LawPro representative. A recent survey of just one third of one of our bogs by a peatland expert has revealed that it has more EU Priority Habitat Annex I Active Raised Bog (*7110) than in some existing Special Areas of Conservation (SACs) in other parts of the country (see appendix 1). Based on this exciting finding, the Peatlands Unit of the National Parks & Wildlife Service has met with us to advise us on setting out a roadmap for potential restoration (mission statement below). We also have strong links with the University of Galway where staff have given talks (on bogs and bats), led training sessions (turlough bird identification, bat surveys) and visited the local primary school to encourage the children to get to know the wonderful environment in which they live.

Friends of Kilconly Wetlands is currently working with local landowners to restore sections of the bog, with a view to expanding these efforts once successful. The proposed wind farm would directly impact this restoration work, which contributes to carbon storage, habitat improvement, and the mitigation of climate change. We already have bog plot owners who are excited about bog restoration which will provide a long-term solution not only to carbon sequestration that will last for generations but will protect those bog specialist species, many of which are declining as can be seen from some of the examples above. Putting wind

turbines on our local bogs will effectively prevent any restoration taking place under the Nature Restoration Law while damaging the bog irreversibly. If this happens, the links between nature and a whole generation of local children and pride of place will be irrevocably lost with significant impacts on generations to come.

Community Engagement

The wetlands are also a vital space for community engagement, recreation, and learning. As a living landscape, the bog is central to a sense of place, memory, and cultural continuity. Through the Friends of Kilconly Wetlands' artist residency programme, a visual artist works closely with the local community through projects such as Bog Fam and Tales from the Bog, recording oral histories, preserving traditional knowledge, and exploring contemporary relationships with the land through art and storytelling. These projects represent intangible cultural heritage, carried forward through the practices and experiences of the community in the landscape itself. While the EIAR methodology cites EPA and UNESCO guidance, which includes intangible cultural heritage, the assessment focuses almost entirely on archaeology and architecture. Intangible elements were considered only through desktop research, with no community consultation or recognition of the artists, educators, and residents who continue to shape meaning in this place.

Friends of Kilconly Wetlands also undertakes practical conservation and educational activities, including guided walks, workshops and events like Culture Night, and community monitoring days. These initiatives introduce participants to the ecology of the bog, foster understanding of peatland conservation, and support engagement with the landscape as a place of learning and wellbeing. The proposed wind farm poses a risk to these ongoing practices, including limitations on access, noise disturbance, and potential impacts on the bog itself that are essential to these activities.

National Biodiversity Action Plan

The activities of the Friends of Kilconly Wetlands described above align perfectly with the **National Biodiversity Action Plan (2023-2030)** which implements actions within the framework of five strategic objectives:

Objective 1 - Adopt a Whole of Government, **Whole of Society Approach to Biodiversity**

Objective 2 - Meet Urgent **Conservation and Restoration Needs**

Objective 3 - Secure **Nature's Contribution to People**

Objective 4 - Enhance the **Evidence Base for Action on Biodiversity**

Objective 5 - Strengthen Ireland's Contribution to International **Biodiversity Initiatives"**

Under the **National Adaptation Framework Planning for a Climate Resilient Ireland 2024**, we believe that if An Coimisiún Pleanála approves planning permission for the proposed Shanclon Wind Farm, a number of cases of maladaptation will apply (see below).

Maladaptation refers to *“actions or strategies that, while intended to address the challenges posed by climate change, inadvertently exacerbate the problem, or create new vulnerabilities. This can occur when adaptation measures are poorly planned, misaligned with the local conditions, or fail to account for long-term consequences”*

	National Adaptation Framework Recommendation (2024)	Maladaptation if Shanclon Wind Farm Proceeds
Avoiding Maladaptation	<i>Ensure that adaptation actions do not inadvertently create new vulnerabilities or exacerbate existing ones</i>	Increased levels of: <i>Carbon emissions Risk of flooding Biodiversity decline</i>
Just Resilience	<i>Prioritise vulnerable and marginalised communities, ensuring that adaptation efforts are inclusive, and support fair and equitable outcomes.</i>	Denies the rights of owners of peatland plots to engage in future peatland restoration schemes with fair and equitable financial and ecological outcomes.
Sustainability	<i>Ensure that adaptation measures promote long-term sustainability, minimising negative environmental and social impacts.</i>	Prevents peatland restoration with long-term benefits for carbon sequestration, water regulation, climate stabilisation and biodiversity
Ecosystem-based / nature-based options for adaptation	<i>Employ ecosystem or nature-based adaptation options, to reflect the biodiversity-rich ambition of the national climate objective.</i>	Prevent the restoration of local bogs under EU Regulation 2024/1991 on Nature Restoration, which mandates rewetting and peatland restoration to mitigate climate change.

Conclusion

This planning application argues that the proposed wind farm is the only viable path to a greener future for Kilconly. We strongly disagree. Our bogs are a key part of that future.

Our peatlands are natural carbon sinks and we have begun the work needed to protect and restore them so they can continue to play a vital role in mitigating the effects of climate change.

Our approach ensures that the wetlands remain a living landscape - one that supports biodiversity, preserves cultural heritage, and continues to offer space for our community to enjoy. A wind farm would not. It would remove the possibility of full restoration, undermine the living heritage of our landscape, and diminish what should be protected for future generations.

When we speak to our community, they tell us repeatedly what a remarkable asset our wetlands are. There is a deep love and respect for our overwintering birds, and the bog is cherished as a place for walking, reflection, and quiet connection with the land.

We also believe that the EIAR for the proposed Shancloon Wind Farm is not fit for purpose and request that An Coimisiún Pleanála take this into account, particularly in relation to EU Directive 2011/92/EU as amended by 2014/52/EU under Article 3(1). We welcome the commencement of research on bird-turlough interactions in our area, especially given the major gaps in current knowledge. However, until the results of these and other essential studies on our overwintering birds are completed, An Coimisiún cannot permit this development. To do so would be to rely on an inadequate adherence to the regulations of this Directive, and therefore the application must be refused.

For these reasons, we strongly object to this development and urge An Coimisiún Pleanála to refuse planning permission.

Yours sincerely

Andrew Colledge

Secretary

Mission Statement

Our mission is to secure a living future for Cloonbar Bog through restoration, respect, and shared stewardship. This plan will try to protect one of Ireland's most westerly raised bogs by restoring its natural hydrology, safeguarding its rare habitats, and ensuring that local people are recognised and rewarded as active partners in conservation.

Through collaboration with landowners, community members, and conservation experts, we aim to:

Restore and Reconnect

Rewet and rehabilitate degraded areas of high and cutover bog; restoring the peatland's ability to store carbon, regulate water, and support diverse native species.

Reward Stewardship

Develop fair and transparent mechanisms that recognise the role of local peatland owners as custodians of this landscape, ensuring that restoration delivers tangible economic and social benefits to the community.

Empower the Community

Encourage local involvement through education, creative engagement, and citizen science so that the people of Cloonbar and surrounding areas can take pride and ownership in the bog's renewal.

Protect for the Future

Integrate biodiversity protection, climate resilience, and community well-being at the heart of all decision-making, ensuring that restoration today creates a legacy of sustainability for future generations.

This conservation plan envisions Cloonbar Bog as a thriving, biodiverse landscape - restored by science, sustained by community, and valued as a living heritage for all.



CLOONBAR BOG ECOLOGICAL SURVEY

3RD DECEMBER 2024

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1 INTRODUCTION

1.1 Context

Cloonbar Bog is a small area of remnant raised bog in Cloonbar, Cloonteen and Cloonnaglasha townlands located about 7 km north-west of Tuam, Co. Galway. It is one of the last remaining areas of high bog in a formerly extensive raised bog complex. Peat extraction for domestic use is ongoing around the perimeter of most of the high bog.

Dr George F Smith of Blackthorn Ecology has been commissioned to carry out an ecological survey of Cloonbar Bog to assess its conservation significance and to inform future efforts to conserve and promote biodiversity on the bog. Dr Smith is a Chartered Ecologist and an experienced peatland ecologist and bryologist.

1.2 Raised Bogs

Raised bogs are a type of wetland habitat governed by wet, nutrient-poor, acidic conditions. This challenging environment restricts the species that can survive in raised bogs to a small number of species, many of which are specialists that are found in few other habitats. The environmental conditions significantly hamper decomposition of dead plant material, which over thousands of years, leads to the deposition of deep layers of peat. In Ireland, raised bogs form domes of peat sometimes over 10 m deep in former lake basins, principally in the Midlands. Blanket bogs in contrast form shallower peat deposits over upland and lowland landscapes in the west of Ireland where rainfall is higher and evapotranspiration is lower.

Sphagnum mosses are the keystone species of raised bogs. *Sphagnum* more than tolerates the bog environment, it actively creates its own habitat. *Sphagnum* mosses capture and retain water in their cells, in their leaves and in the dense hummocks formed by several species. They also actively acidify their environments by releasing hydrogen ions. The peat underlying raised bogs consists mainly of partly decomposed *Sphagnum*. The surface of intact raised bogs in good condition is a mosaic of microtopographical features – pools, lawns and hummocks – created by different species of *Sphagnum* (Table 1) and other specialist bog plants.



Sphagnum subnitens

Because of the long history of drainage and exploitation of raised bogs in Ireland and Europe, intact, wet, peat-forming raised bogs are recognised as a priority habitat of European conservation interest in Annex I of the EU Habitats Directive, known as 'active raised bog

(*7110)' (European Commission, 2013). Ireland has a special responsibility for raised bog conservation as it hosts more than half of the Atlantic sub-type that remains in Europe. Damaged raised bog that is no longer peat forming but that has the potential for restoration within 30 years is also recognised as an important habitat type in Annex I of the Habitats Directive, known as 'degraded raised bog (7120)'.

Table 1. Common raised bog *Sphagnum* species and their microhabitat associations

Species	Microhabitat
<i>Sphagnum austinii</i>	Hummocks
<i>Sphagnum beothuk</i>	Hummocks
<i>Sphagnum rubellum</i>	Low hummocks and lawns
<i>Sphagnum subnitens</i>	Low hummocks and lawns
<i>Sphagnum tenellum</i>	Low hummocks and lawns
<i>Sphagnum papillosum</i>	Lawns and pool margins
<i>Sphagnum medium</i>	Lawns and pool margins
<i>Sphagnum cuspidatum</i>	Pools

Cutover bogs are bogs that have been exploited for peat in the past. They are very variable habitats, depending on the history and methods of peat extraction, especially the surface relief and depth of peat remaining after exploitation has ceased. Where sufficient peat depth remains, the cutover bog surface remains isolated from groundwater and has the potential to regenerate typical bog species. In most cutover bog, the drains installed for peat extraction still function and the surface is uneven, resulting in dry peatland habitats with little or no cover of *Sphagnum*. In some places, however, cutover bog can support local depressions or impounded areas that collect water. *Sphagnum* can recolonise these areas, and over time, active raised bog habitat can develop on cutover (Smith and Crowley, 2020).

Raised bogs can provide several ecosystem services, such as spaces for walking and engaging with nature, habitat for important species, such as curlew, or sources of inspiration for art. Intact or restored bogs can provide a water regulation function by capturing excess water in a catchment and releasing it gradually, thus reducing flood peaks further downstream. Perhaps most importantly, raised bogs in good condition that are actively forming peat have a role in carbon sequestration. When drained and degraded, however, raised bogs emit carbon due to the decomposition of dry peat, switching from being a carbon sink to a carbon source. This trajectory can be slowed and even reversed, however, through rewetting and restoration of *Sphagnum*-rich, actively peat-forming bog (Wilson et al., 2022).

2 METHODS

A desk study was conducted prior to the field survey to uncover existing information on the site. This included a review of records held by the National Biodiversity Data Centre, the early 19th century Bog Commission maps, the *North East Galway Wetland Audit 2021* (Foss et al., 2021) and aerial imagery.

A field survey of Cloonbar Bog was carried out on 28th March 2024. During the survey, habitats were mapped and any plant species found were recorded. As the focus was mapping existing habitats, a comprehensive botanical inventory of the site was not conducted. Only the southern part of Cloonbar Bog was surveyed, as time did not permit a survey of the northern section.

Raised bog habitats were classified and mapped into raised bog ecotopes and community complexes, following the definitions of Fernandez *et al.* (2012). This scheme, based on work by Kelly and Schouten (2002), divides raised bogs into five ecotopes: Central, Subcentral, Submarginal, Marginal, and Facebank. Central and Subcentral are the wettest, most *Sphagnum*-rich ecotopes, and they correspond to EU Habitats Directive Annex I 'active raised bog (*7110)'. Submarginal ecotope is not considered active raised bog, but still supports a moderate cover of *Sphagnum* (typically 11-40%) and may have good potential for restoration to active raised bog if hydrological and topographical conditions are favourable. Community complexes describe the vegetation occurring in an area of raised bog, and a given ecotope may comprise one or more community complexes.

As the focus of the survey was the high bog, cutover bog habitats were not surveyed in detail. Where relevant, areas of cutover bog were classified according to the habitat types defined by Smith and Crowley (2020). In this scheme, an area of cutover bog is characterised according to cover of bare peat and cover of *Sphagnum* into a habitat group: Bare Peat (BP), Low *Sphagnum* (LS), Moderate *Sphagnum* (MS) or High *Sphagnum* (HS). Each of these groups is further divided into habitat types, based on the vegetation community present. High *Sphagnum* cutover bog habitats support more than 40% *Sphagnum* cover and are of the greatest conservation value. Some but not all examples of High *Sphagnum* cutover bog may correspond to Annex I 'active raised bog (*7110)' (Smith and Crowley, 2020).

Habitats, ecotopes and community complexes were mapped in the field using an Android tablet running QField, the mobile data collection app for QGIS (QGIS Development Team, 2024).

Scientific names of species mentioned in text are provided in Appendix B. As a thorough botanical survey was not part of the survey objectives, this list cannot be considered comprehensive.

3 SITE ECOLOGY

3.1 Context

Cloonbar Bog is located approximately 8.6 km north-west of Tuam, Co. Galway in the townlands of Cloonbar, Cloonteen and Cloonnaglasa. It is a western outlier of the cluster of raised bogs that stretch across north-east Galway, west Roscommon and east Mayo and is one of the most westerly raised bogs remaining in Ireland. Cloonbar Bog was formerly part of a vast bog that occupied the lowlands in the locality, leaving higher ground to emerge from the wetlands as islands of relatively dry mineral soil. Cloonbar appears on the 1812 Bog Commissioners' map¹, where grid lines show proposed drains for large-scale reclamation (Figure 1). The legend names bog "No. 6" on the map as "Clonbar Castlegrove and Clare Tuam", which was surveyed as occupying 4,555 Irish acres at the time, equivalent to approximately 3,000 ha.



Figure 1. Cloonbar Bog and the surrounding bog complex as shown in the 1812 Bog Commissioner's map

¹ https://www.bordnamonalivinghistory.ie/wp-content/themes/living-history/assets/maps/index.htm?start_scene=scene Map - Galway Mayo - District of Lough Corrib

At present, Cloonbar Bog is a fragment of its former extent. It is divided into two irregularly shaped parts by a bog road. It has been cut away from all sides, and the southern part is being actively excavated for peat around most of its perimeter from the north-west to the south-eastern sides. Peat extraction is also ongoing in a section of the northern part of the bog.

Cloonbar Bog is not designated for nature conservation. It is listed in the *North East Galway Wetland Audit 2021* (Foss et al., 2021) as “Cloonteen Cloonbar Toberroe Cutover Complex”, which is recorded as being unsurveyed with unknown conservation value. It was not surveyed as part of a follow-up field survey in 2022 (W. Crowley, pers. comm.). Cloonbar Bog was identified during the most recent national habitat conservation assessment (National Parks and Wildlife Service, 2019) as potentially supporting Annex I ‘active raised bog (*7110)’, based on inspection of aerial imagery.

Cloonbar Bog is an example of the western raised bog subtype. Western raised bogs occur in areas of higher annual rainfall than the true midlands subtype, and this contributes to differences in the vegetation of the two subtypes. This is discussed further in the sections below.

3.2 Ecotopes

3.2.1 Summary

The ecotopes in Cloonbar Bog are mapped in Figure 2 in Appendix A according to the method of Fernandez *et al.* (2012). Figure 3 identifies the community complexes (Fernandez Valverde et al., 2012) that occur in a series of points across the bog. The total areas occupied by each ecotope at Cloonbar Bog are shown in Table 2.

Table 2. Ecotope areas at Cloonbar Bog

Ecotope	Area (ha)
Central	0.3
Subcentral	5.5
Submarginal	42.2
Marginal	1.3
Inactive Flush	7.6
Total	57.0

As central and subcentral ecotopes correspond to Habitats Directive ‘active raised bog (*7110)’, there is a total of 5.8 ha of ‘active raised bog (*7110)’ in the southern section of Cloonbar Bog. There are five main areas of ‘active raised bog (*7110)’, they are labelled C1 and SC1-4 in Figure 2 and discussed in more detail below.

3.2.2 Central

C1

Central ecotope is the wettest of the raised bog ecotopes and describes intact, near-virgin raised bog habitat. Accordingly, central ecotope is rare in Ireland and most areas of high bog do not contain any central ecotope. There is a small area of central ecotope in the south-eastern lobe of Cloonbar Bog, labelled C1 in Figure 2, that shows many of the characteristics typical of western raised bogs in good conservation condition.



Central ecotope at Cloonbar Bog

The area of central ecotope consists of a series of interconnected pools that cover 40% of the bog surface. The vegetation corresponds to community complex 35 (Fernandez Valverde et al., 2012), the typical central complex of western raised bogs. *Sphagnum* cover averages 65% with good cover of *Sphagnum papillosum* and *Sphagnum rubellum* between the pools, which themselves support abundant *Sphagnum cuspidatum*. Among the vascular plants, white beak-sedge is the most abundant, with heather, cross-leaved heath, hare's-tail and common bog-cottons, and carnation sedge all frequently found. The abundance of carnation sedge in wet, active parts of the bog is a characteristic feature of western raised bogs. Bog myrtle is also frequent in the area, suggesting slightly flushed conditions caused by steadily flowing surface water.

3.2.3 Subcentral

Subcentral ecotope is wet, *Sphagnum*-rich and actively peat-forming. *Sphagnum* cover in this ecotope averaged around 30-40% on Cloonbar Bog. These areas, however, show some signs of drying out, such as smaller pools or flats dominated by bog asphodel in the place of former *Sphagnum* lawns.

SC1

The best parts of the westernmost area of subcentral ecotope consist of community complex 4/35 (Figure 2 and Figure 3). This vegetation is similar to that in C1 but with less cover of *Sphagnum*, especially within pools. There is some evidence of shallow pools drying out and becoming colonised by *Sphagnum papillosum* and white beak-sedge. Towards the edges of SC1, the bog becomes more degraded and is occupied by community complexes 9/7/4+P and

9/7+P. In these, pools are smaller with patchy cover of *Sphagnum cuspidatum* and algae, although the areas around the pools support good cover of *Sphagnum papillosum* and *Sphagnum rubellum*. In complex 9/7/4+P, the vegetation is characterised by abundant white beak-sedge and hare's tail bog cotton, whereas in 9/7+P, hare's-tail bog cotton and heather dominate the sward. To the north of this area, the bog surface slopes down relatively steeply towards active turbary.

SC2

This small area of subcentral ecotope has only a few small pools, but supports lawns of *Sphagnum papillosum* and white beak-sedge and low hummocks of *Sphagnum rubellum*. Hare's-tail bog cotton and heather are the most abundant flowering plants. This area was classified as community complex 4/10 (Figure 3).



Bog pool in SC3

SC3

The largest subcentral area has several old, hand-dug drains running through it, orientated north to south. These have largely infilled with vegetation and function as bog pools. The best part of this area supports community complex 3/35, which is similar to the vegetation in C1 but with less cover of *Sphagnum*, especially within pools. Carnation sedge is particularly prominent between the pools, where it is accompanied by hare's-tail and common bog cottons, heather and bog asphodel. Towards the edges of the subcentral area, interconnected pools remain common and support *Sphagnum cuspidatum* and *Sphagnum auriculatum*. Much



Infilling drain in SC3

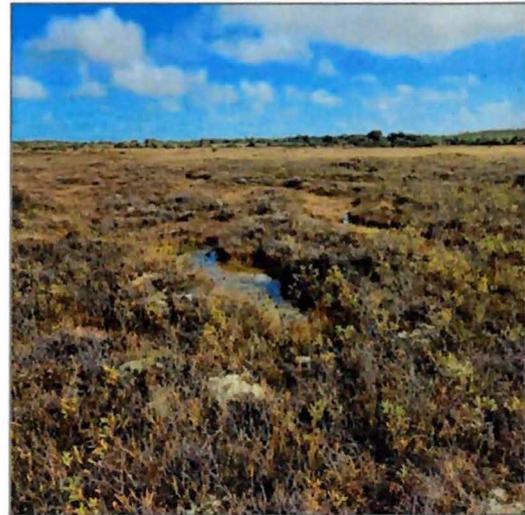
of the *Sphagnum* in the pools appears moribund, however, suggesting significant water level decreases in the summer.

Between the pools, the bog is higher and drier with abundant reindeer lichen, little *Sphagnum*, and frequent heather, cross-leaved heath and common bog cotton. In community complexes 3/9+P and 6/9+P, carnation sedge or bog asphodel, respectively, are abundant between the pools. In community complex 4+P, interpool areas tend to be lower and wetter and support frequent white beak-sedge.

SC4

Subcentral ecotope area SC4 surrounds the area of central ecotope C1 (Figure 2). The shape of the area reflects the flow of water from west towards the eastern bog margin. The frequency of bog myrtle here also reflects the flushed conditions caused by constant surface water flow. In the eastern tail of the subcentral area, *Sphagnum* cover is generally low outside old pools that are infilling with *Sphagnum papillosum* and *Sphagnum rubellum* (community complex 9/7+P). In some localised depressions, community complex 9a/10 can be found, where *Sphagnum papillosum* forms lawns around emergent common bog-cotton stems.

Around C1, the subcentral area is of good quality, but with less *Sphagnum* cover within pools and drier conditions between pools. As usual, heather, cross-leaved heath, hare's-tail and common bog-cottons, and bog myrtle made up the flowering plant cover and *Sphagnum papillosum* and *Sphagnum rubellum* were the main plant species. The vegetation was classified as one of three community complexes: 3/35, 4/35 or 6/35 depending on whether carnation sedge, white beak-sedge or bog asphodel, respectively, were the main accompanying species.



SC4 with frequent bog myrtle

3.2.4 Submarginal



Example of submarginal ecotope with abundant hare's-tail bog cotton

The most widespread ecotope at Cloonbar was submarginal, which is typical of most raised bogs. This ecotope is not considered priority Annex I 'active raised bog (*7110)', but is still of high conservation value and some areas may qualify as Annex I 'degraded raised bog (7120)'. *Sphagnum* cover averaged about 20-30%. As is common in western raised bogs, community complex 9/7/3 was the most widespread. Here, heather and hare's-tail bog cotton were the most abundant species with few or no bog

pools. Carnation sedge was also frequent, occupying flats and low hummocks. Slightly better quality submarginal ecotope supported higher cover of pools (>10%), but unlike subcentral and central ecotopes, these tended to be smaller, less connected, and had only patchy cover

of *Sphagnum cuspidatum*. This vegetation was classified as community complex 9/7/3+P. Another submarginal variant where bog asphodel occupied dried out pools and carnation sedge was less abundant was mapped as complex 9/7/6. East of SC4, where conditions were somewhat flushy, complex 9/7 was recorded. This was characterised by dense, tussocky hare's-tail bog cotton amongst heather with few other indicator species.

Drains often extend into the submarginal ecotope from facebanks where ongoing peat extraction is occurring. These are drying out the bog and in some places are obviously responsible for submarginal ecotope replacing subcentral. For example, north of SC4 is a series of drains measuring 50 cm x 50 cm at 15-20 m intervals. The northern extent of SC4 is clearly defined by the ends of these drains. To the west of SC3 are several old drains ranging from 1.5-2 m wide and 50-75 cm deep. They are still functioning to remove water from the bog, but are infilling with a variety of vegetation, including purple moor-grass, common bog cotton, *Sphagnum cuspidatum* and *Sphagnum auriculatum*.

To the south-west of SC4, there are relatively steep slopes down towards ongoing peat extraction. This has led to concentrated flows of surface water strong enough to erode former pools and prevent vegetation reestablishment.

3.2.5 Marginal

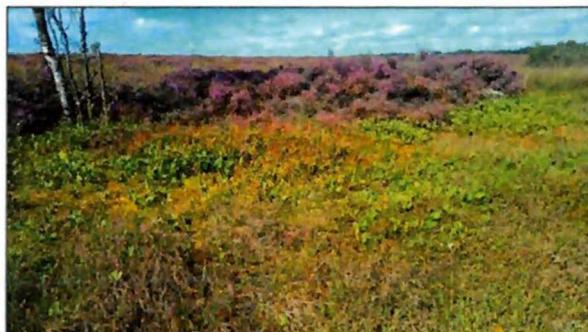
There is little marginal ecotope at Cloonbar Bog. Marginal ecotope develops at the driest margins of the bog and is characterised by firm and irregular surfaces resulting from uneven subsidence and erosion. Most of the marginal areas were characterised by abundant heather and were located along facebanks where peat extraction has ceased. The speed at which the high bog is being lost where peat extraction is ongoing means that the bog has not had enough time to dry out before it is removed.

3.2.6 Inactive Flushes

Inactive flushes are areas of raised bogs where surface water flow is concentrated but that are not wet enough to be actively peat forming. They may be natural features but are more often symptoms of stress and subsidence. The two large flushes at Cloonbar Bog are dominated by purple moor-grass accompanied by tall, leggy heather bushes. They appear to have been formed by accelerated water flows towards the south, where peat extraction is taking place. The smaller flush is different and may be more of a natural feature. It is characterised by leggy heather along with abundant bog myrtle and the moss *Hypnum jutlandicum*. Also frequently occurring are Scots pine saplings, common reed and *Sphagnum rubellum*.

3.2.7 Cutover Bog

Due to time constraints, the cutover bog surrounding Cloonbar was not surveyed, but some observations were made of old, abandoned cutover viewed from the high bog. At the western end of the bog, there is an area of bog that has been cut apparently by hand in shallow, irregular trenches. *Sphagnum*-rich pools have developed in the trenches, while the higher ground between is dominated by heather or purple moor-grass. To the east



'Active raised bog (*7110)' developing on cutover at Clara Bog

of SC3 is a similar area with water-logged trenches divided by drier ridges, one of which is surrounded by remnant high bog. This latter area was identified as an example of HS1 *Sphagnum subnitens*-*Erica tetralix* cutover bog, a wet cutover bog habitat of conservation interest; some examples of this cutover bog type can be considered 'active raised bog (*7110)' (Smith and Crowley, 2020). Common reed is frequent in the trenches in the eastern old cutover. Some have been dug deep enough to be influenced by groundwater, as demonstrated by the occasional presence of black bog-rush, an alkaline fen rather than a bog species.

Some old areas of shallow peat cutting were difficult to distinguish from intact but degraded high bog, especially near the track. In some places it appeared that a tractor-drawn "sausage machine" had been used to extract sod peat in the past. It is likely that some areas of cutover bog near the track and east of SC3 have been incorrectly mapped as marginal or submarginal ecotope.

3.3 Species

The plants of Cloonbar Bog are characteristic of western raised bogs. The abundance of carnation sedge in subcentral and good quality submarginal ecotopes has been noted above. Other western raised bog species recorded included *Campylopus atrovirens*, a moss resembling black bear fur that grows at pool margins, and *Racomitrium lanuginosum*, a whitish, woolly moss that forms tall hummocks. They were occasionally found across the bog.

Bog pools occasionally supported bogbean and great and/or intermediate sundew (plants were not developed enough at the time of survey for definite identification). These species are characteristic of bogs with well-developed pool systems.

In addition to the more widespread and common *Sphagnum* species, relict hummocks of *Sphagnum austinii* and *Sphagnum beothuk* were recorded in a few places. These bog mosses flourish only in the wettest, intact parts of raised bogs, but they may hang on, slowly declining for many years after conditions are no longer suitable, because of the exceptional water-holding capabilities of their hummocks. Another interesting bog moss recorded was *Sphagnum divinum*, which has been recently separated from *Sphagnum medium*; previously both were named *Sphagnum magellanicum*. Unlike *Sphagnum medium*, which prefers midlands bogs, *Sphagnum divinum* appears to prefer somewhat flushed conditions.

Although recording fauna was not an objective of the survey, Skylark and Snipe were noted on the bog.



Hummock of *Sphagnum austinii* on Garriskil Bog with A4 size tablet for scale

4 CONSERVATION ASSESSMENT

4.1 Conservation Value

The conservation value of Cloonbar Bog is surprisingly high. A total of 5.8 ha of priority Annex I 'active raised bog (*7110)' occurs on site, of which 0.3 ha is central ecotope, the highest quality raised bog habitat. For comparison, the NPWS has published data on raised bog ecotopes for 48 Special Areas of Conservation (SACs) where 'active raised bog (*7110)' is a qualifying interest, and in 10 of the 48 SACs there was less 'active raised bog (*7110)' than was recorded at Cloonbar. The vegetation and species that occupy Cloonbar Bog are characteristic of western raised bogs, and the full suite of typical species are present, including some that are uncommon indicators of quality, such as *Sphagnum austinii* and *Sphagnum beothuk*. The bog is also notable as one of the most westerly raised bogs in Ireland.

Conservation value of ecological sites is normally assessed on a geographic scale ranging from local importance through to international importance for biodiversity. There are no nationally accepted criteria for assessing conservation value, although Chartered Institute of Ecology and Environmental Management (2018) guidelines provide advice and evaluation criteria, such as naturalness, presence of rare or irreplaceable habitats, habitat size, and connectivity. In addition, Transport Infrastructure Ireland (TII) has published assessment criteria (National Roads Authority, 2009) that have been used by ecologists outside the context of national roads projects. Under these criteria, sites "containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive" are evaluated as being of *National Importance* for biodiversity. A 'viable area' is defined as an area of sufficient size and shape that would maintain its integrity in the face of random change, such as climate variation (National Roads Authority, 2009).

A review of raised bog Natural Heritage Areas (NHAs) and undesignated bogs was carried out that included assessments of the ecological value of sites (Department of Arts, 2014). As the national conservation designation, NHAs are considered to be of *National Importance* for biodiversity. Using the criteria in the NHA review, the ecological scoring for Cloonbar Bog is summarised in Table 3 below. When these are compared with the scores for existing raised bog NHAs in Addendum 1 of the review (Department of Arts, 2014), Cloonbar Bog's scores are similar to many NHAs and better than some.

Table 3. Cloonbar Bog scoring using the NHA review criteria (Department of Arts, 2014)

Attribute	Cloonbar Bog Score	Possible Scores	Criterion
Area of active raised bog	C (moderate-high)	A (excellent), B, C, D, E (low)	5-10 ha
Range (geographic)	D (moderate)	B, D, E	Site located at edge of known range
Habitat quality	C (moderate-high)	B, C, D, E	Best quality active raised bog (central ecotope) is present
Ecological diversity	B (high)	B, D, E	Specific features present which contribute to the range of variation (local distinctiveness)

The TII/NRA criteria for *International Importance* include "sites containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive" (National Roads Authority, 2009), although there is no advice on how to define 'best examples'. Most of the sites designated as SACs for the presence of 'active raised bog (*7110)' can be considered 'best examples' of the habitat. Where this is not the case, such as the 10 SACs with less 'active raised bog (*7110)' than Cloonbar, most have other characteristics that increase their conservation value, such as being part of a larger SAC with additional qualifying interests or being part of a cluster of bogs. Other raised bog SACs may have originally supported excellent examples of 'active raised bog (*7110)' when they were designated in the late 1990s, but ongoing peat extraction and long-term drainage has reduced the area of good quality habitat. In these cases, it could be argued that these SACs no longer meet the criteria for International Importance.

The relatively large area of 'active raised bog (*7110)' at Cloonbar Bog can be considered a viable area, as there is enough to be robust to random change and to persist in the absence of damaging activities. Its presence at the edge of the range of raised bogs in Ireland and its distinctive western raised bog flora are further features that increase its conservation value. Although Cloonbar Bog does not appear to meet the criteria for International Importance, it can be concluded that Cloonbar Bog is of **National Importance** for biodiversity.

4.2 Threats and Pressures

Despite the high conservation value of Cloonbar Bog, it is suffering from significant threats to biodiversity. The most immediate and significant threat is peat extraction, which is taking place around most of the perimeter of the bog. If peat extraction continues, it will destroy most of the high bog and eliminate 'active raised bog (*7110)' from any remnants that are left.

There are several drains on the high bog, some of which are new or being actively maintained and some of which are old. Both new and old drains function to dry out the bog surface, and



Old, still functional drain on raised bog

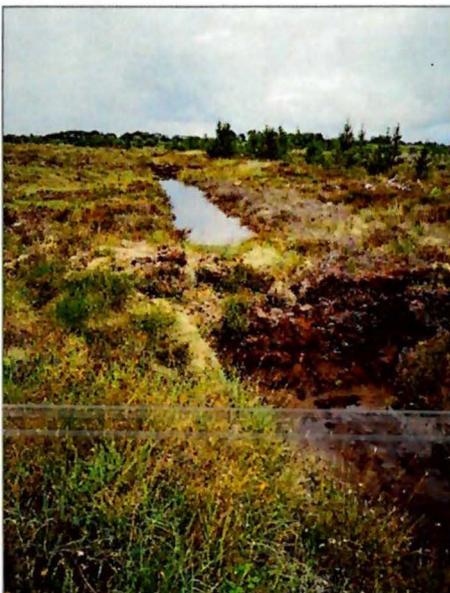
even in the absence of peat extraction, drains can continue to negatively affect the high bog and cause reductions in the area of 'active raised bog (*7110)'.

New developments or drainage projects, such as construction of wind farms or agricultural reclamation of cutover bog, have the potential to compromise the hydrology of Cloonbar Bog. Drainage or other excavations in the vicinity of the bog may intercept the groundwater table and lower the local water table. Although bogs receive all their water from the rain, raised bogs can be dependent on groundwater pressure to slow infiltration through the bog and maintain high and stable water levels (Kilroy et al., 2008). For example, installation of a deep drain that intercepted the water table along the south-west margin of Clara Bog has led to lower water levels throughout that part of the bog and significant drying out and subsidence of the bog surface (Regan and Johnston, 2010).

5 RECOMMENDATIONS

The following recommendations are made to conserve and enhance the biodiversity of Cloonbar Bog.

- Additional ecological survey work should be carried out to build upon the work described in this report. This should include a survey of the northern section of the high bog and a survey of the surrounding cutover bog. The prime objective should be to map additional areas of 'active raised bog (*7110)', including on old cutover bog.
- Peat extraction should cease as soon as possible, supported by appropriate compensation packages for affected turf cutters.
- A plan for restoring the high bog and cutover bog should be prepared. This should be informed by the necessary hydrological, topographical and drainage surveys. The plan should include blocking existing drains on the high bog and on the cutover as well as additional works, such as contour or cell bunding, as appropriate.
- Any developments or drainage projects in the vicinity of the bog should ensure that there are no negative effects on raised bog hydrology, including the local groundwater table. In addition, developments in the area should ensure that future restoration works on the high bog or cutover are not compromised.
- The biodiversity value of Cloonbar Bog and the ecosystem services it provides should be promoted locally. This could include events such as bog walks, planning a walking route in and around the bog, school projects, or interpretive signs. The Community Wetlands Forum could provide useful experiences and advice on community engagement.

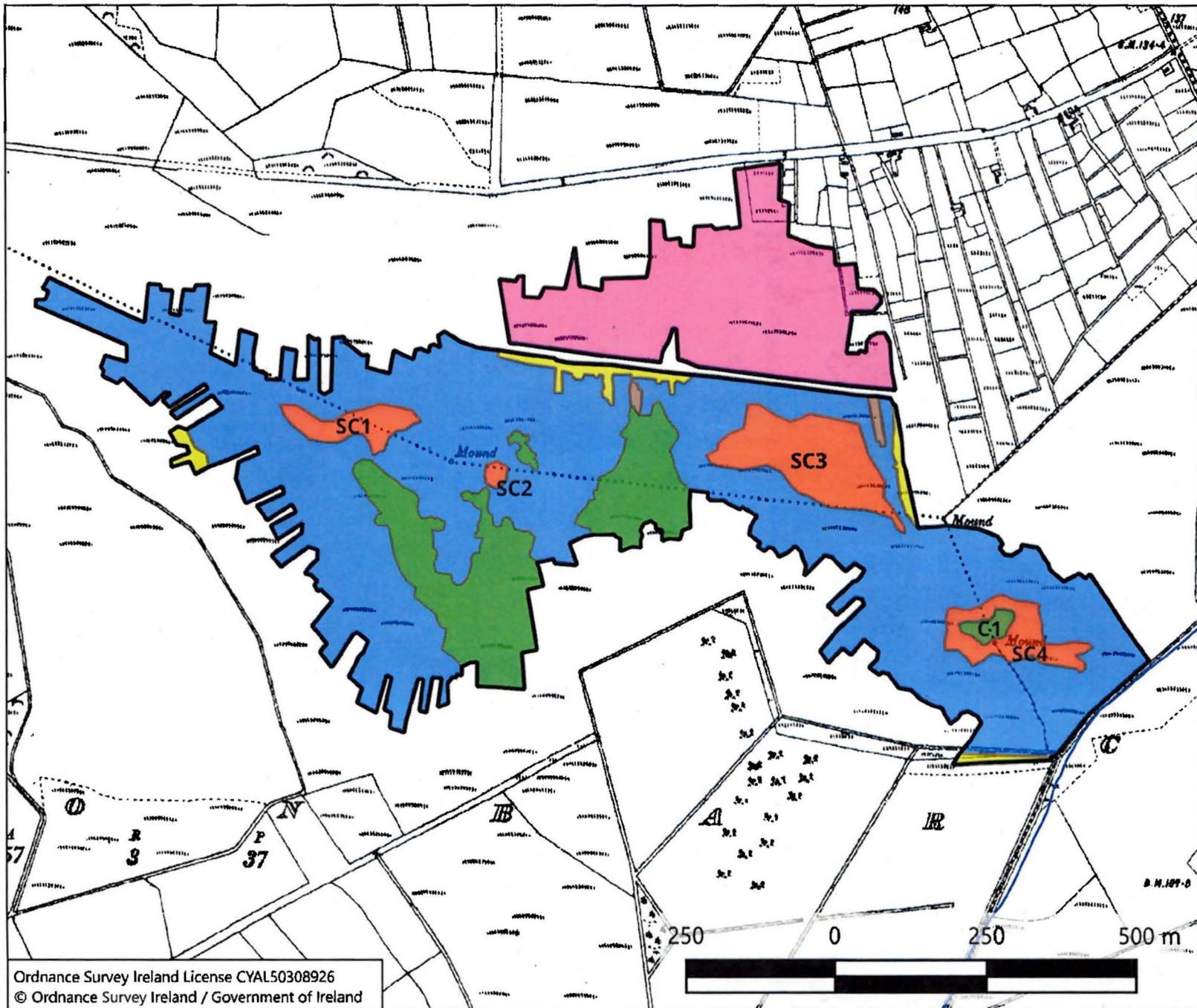


Blocked drain on raised bog

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APPENDIX A MAPS



Legend

-  High bog margin
-  Watercourses
- Ecotopes**
-  Central
-  Subcentral
-  Submarginal
-  Marginal
-  Inactive Flush
-  Cutover
-  Unserved High Bog

Figure 2. Raised bog ecotopes

Cloonbar Bog Ecological Survey

Scale 1:9000
17-10-2024
Rev 1



APPENDIX B SPECIES LIST

Vascular plant species, bryophytes and lichens (*Cladonia* species only) recorded during the field surveys are listed in the below table. Nomenclature for vascular plants follows Stace (2019), bryophytes follow Blockeel *et al.* (2021), and lichens follow Coppins (2002).

Note that this species list is not comprehensive.

Common Name	Scientific Name	Notes
Vascular Plants		
black bog-rush	<i>Schoenus nigricans</i>	
bog asphodel	<i>Narthecium ossifragum</i>	
bog-myrtle	<i>Myrica gale</i>	
bogbean	<i>Menyanthes trifoliata</i>	
carnation sedge	<i>Carex panicea</i>	
common bog-cotton	<i>Eriophorum angustifolium</i>	
common reed	<i>Phragmites australis</i>	
cross-leaved heath	<i>Erica tetralix</i>	
great sundew	<i>Drosera anglica</i>	Probable. Time of year not suitable for detecting and identifying <i>Drosera</i> species.
hare's-tail bog-cotton	<i>Eriophorum vaginatum</i>	
heather	<i>Calluna vulgaris</i>	
intermediate sundew	<i>Drosera intermedia</i>	Possible. Time of year not suitable for detecting and identifying <i>Drosera</i> species.
purple moor-grass	<i>Molinia caerulea</i>	
Scots pine	<i>Pinus sylvestris</i>	
white beak-sedge	<i>Rhynchospora alba</i>	
Bryophytes		
a bog moss	<i>Sphagnum auriculatum</i>	
a bog moss	<i>Sphagnum austinii</i>	relict positive indicator
a bog moss	<i>Sphagnum beothuk</i>	relict positive indicator
a bog moss	<i>Sphagnum cuspidatum</i>	
a bog moss	<i>Sphagnum divinum</i>	
a bog moss	<i>Sphagnum papillosum</i>	
a bog moss	<i>Sphagnum rubellum</i>	
a moss	<i>Campylopus atrivirens</i>	western raised bog indicator

Common Name	Scientific Name	Notes
a moss	<i>Campylopus introflexus</i>	
a moss	<i>Hypnum jutlandicum</i>	
a moss	<i>Racomitrium lanuginosum</i>	western raised bog indicator
Lichens		
reindeer lichen	<i>Cladonia portentosa</i>	



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