RAISED BOG RESTORATION PROJECT

A CONTINUATION OF THE INVESTIGATION INTO THE CONSERVATION AND RESTORATION OF SELECTED RAISED BOG SITES IN IRELAND

PART 2
SITE REPORTS
AUGHRIM-CLARE ISLAND

A REPORT TO DÚCHAS, THE HERITAGE SERVICE, DUBLIN.

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AUGHRIM/AGHRANE BOG, CO. GALWAY

1. SUMMARY OF SITE DETAILS

NHA no.:	1227	6" Sheet:	GY33
Grid Ref.:	M780 565	1:126,000 Sheet	12
G.S.I. Aerial Photo:	34 (7534)	1:50,000 Sheet:	40
Other Photo:	M216	High bog area (ha):	158.90
Date(s) of Visit:	26/1/2000		

Townlands: Monasternallea/Abbeygrey, Knockaunarainy, Clooncannon, Aghrane/Castlekelly

2. INTRODUCTION

2.1 BACKGROUND

This site was selected as part of this survey, as it was relatively intact with little active peat cutting. An old trackway runs across the bog and there is extensive forestry on the cutaway. Despite this however it was visited in 1994 as part of the NHA survey and it was described as having a good pool system.

This site is located close to the River Suck and by protecting would enhance the habitat diversity for the area.

2.2 LOCATION AND ACCESS

A large, bog located 10km east-southeast of Glenamaddy and 4km northwest of Ballygar. It can be accessed from a forestry/bog track off the local road from Ballygar to Creggs.

3. METEOROLOGY

No meteorological measurements have been made on this bog. Rainfall data from the nearby Ballygar weather station for the years 1969-90, indicated that the area recieves appproximately 1026mm of rainfall annually (R). The nearest synoptic station at Claremorris indicates that the site has up to 177 wet days annually. (Wet day is defined as a day when > 1mm of rainfall recieved).

Evapotranspiration measurements are only available for synoptic stations. With the large exposed areas on high bogs, actual evapotranspiration rates would probably be higher than at the nearest synoptic station. The effective rainfall (ER) rate for a site is the annual rainfall (R), less the actual evapotranspiration (AE). With only the potential evapotranspiration (PE) rate available for Claremorris of 415 the effective rainfall for the site is calculated as less than (R - PE) i.e. ER< 1026 - 415 = 611mm (See Fig. 1)

4. GEOMORPHOLOGY

4.1 TOPOGRAPHY OF THE HIGH BOG

This bog has numerous steep internal slopes associated with the central trackway and drainage.

4.1.1 Slopes of the High Bog

Slope 1: A series of marginal slopes along the northern margin and down to the central trackway (1m/50m).

Slope 2: A series of marginal slopes associated with the northern and south-western margins and the eastern trackway (1m/100m).

Slope 3: A series of long, internal slopes, probably originating due to the trackway and internal drainage (50cm/100m).

Slope 4: A steep, marginal slope leading to the northern cutaway (1.5m/50m).

Slope 5: An internal slope associated with the central trackway (1m/25m).

Slope 6: An internal slope associated with the flushed area at the end of the trackway (50cm/50m).

Slope 7: A series of internal slopes associated with the flushed area at the end of the trackway (1m/100m).

Slope 8: An internal slope associated with the central trackway (50cm/50m).

4.2 TOPOGRAPHY OF THE BOG MARGINS

The old cutaway to the north is level, but further west it slopes away to the coniferous forestry. Old cutaway in the north-west slopes away from the cut-face towards a reclaimed field of agricultural grassland. The cutaway to the south has been planted with forestry and slopes towards the high bog.

5. HYDROLOGICAL SYSTEM

5.1 GEOLOGY/HYDROLOGY

5.1.1 Bedrock

According to the 1840's map, this bog is surrounded by limestone drift.

5.1.2 Subsoils

No data was available for sub-soils for this site

5.1.3 Peat

The peat type for this site is classified by Hammond as Man-modified

5.2 HYDROLOGY

5.2.1 High Bog Hydrology (see Drains map)

There is extensive drainage on the high bog associated with the trackway running through the centre of the bog. Due to the internal slopes associated with this drainage, this bog has very good potential for re-wetting on the high bog.

Drain D1: A deep drain running alongside the main trackway. It is 1.5m wide and 2-3m deep. It is steep-sided and lined with tall *Calluna vulgaris*, *Molinia caerulea*, *Betula pubescens* and *Ulex europaeus*. There is water flowing in an easterly direction at its base. At the western end of this drain, it is 0.5m wide and 1m deep with water flowing at its base. It is lined with *C. vulgaris* and *Pteridium aquilinum*. The very end of this drain past the end of the trackway adjoins a pool system. It is water-filled and in-filling with *Eriophorum angustifolium* and *Myrica gale*.

Drain 1A: On the opposite side of the track to D1. At its western end this drain is 1m wide, water-filled, and contains *Eriophorum angustifolium*, *Myrica gale* and *Sphagnum cuspidatum*. The drain extends 50m past the end of the trackway and towards the centre it is 3m deep and 2m wide with water flowing into D15.

Drain D2: Narrow shallow drains at the margin to forestry on high bog. These drains also run through the forestry. They are 0.5m wide and 30cm deep and algal. *Calluna vulgaris* is growing in from the margins.

Drain D3: In the centre of the bog, there is a ring drain system which is present on the 6" map. The outer ring drain (D3) is 0.5m wide and 1m deep. It is in-filled with *Eriophorum vaginatum* and *Calluna vulgaris*.

Drains D4: A series of drains run between D3 and the central drain (D5). These are narrow (20cm wide) and are in-filled with *Calluna vulgaris*, *Eriophorum vaginatum* and *Cladonia portentosa*.

Drain D5: This is the central drain to this system. It is 1m wide with some subsidence of its banks. It is in-filling with *Sphagnum capillifolium*, *S. papillosum* and *Eriophorum angustifolium* and lined with *Calluna vulgaris*. There is some water at its base with *S. cuspidatum* and it is flowing south to the trackway. This drainage system was probably associated with a planned trackway across the bog at this point.

Drains D6: A series of small drains running off the bog to the trackway drains. These are less than 0.5m wide and are lined with *Calluna vulgaris*. Further east these drains are wider and deeper (1.5x1) with some water flowing into D1A. These are in-filling with *Rhynchospora alba* and *Eriophorum angustifolium*.

Drains D7: A series of drains 10m apart running to active cutaway. They are 0.5m wide and in-filled with *Sphagnum. capillifolium*, *Calluna vulgaris* and *Cladonia portentosa*. The most easterly drain is wider (1m) and is in-filling with *Eriophorum vaginatum*, *S. capillifolium* and *C. vulgaris*. There is a slight flow of water at its base to the cutaway.

Drain D8: An in-filled drain along the townland boundary as seen on the 6" map. It is 1m wide and in-filling with *Sphagnum cuspidatum*, *Narthecium ossifragum*, *Eriophorum angustifolium* and *Calluna vulgaris*.

Drain D9: A completely in-filled drain running to the cutaway. It is in-filled with *Eriophorum vaginatum*, *Calluna vulgaris*, *Cladonia portentosa* and *Sphagnum capillifolium*.

Drain D10: A 1m wide drain, in-filled with tall *Calluna vulgaris*, *Eriophorum vaginatum* and *Molinia caerulea* with some small *Betula pubescens* and *Pinus* species.

Drain D11: An old drain seen on the 6" map which is 0.5 m wide and in-filled with *Calluna vulgaris* and *Myrica gale*. There is some water present at its base and it is lined with tall *C. vulgaris* and *M. gale*.

Drain D12: A series of drains running south-east from D11. These are water-filled with *Sphagnum cuspidatum* and *Rhynchospora alba*. Tear pools between these drains join up to these drains.

Drain D13: A 1m wide, water-filled drain by the edge of cleared forestry. There is very little flow and there is some *Sphagnum cuspidatum*. At its eastern end, the drain is 1.5m wide and water-filled with *S. cuspidatum* and *Calluna vulgaris* growing in it.

Drain D14: A 1m wide, 1.5m deep drain with water at its base, flowing towards forestry at its southern end. It is lined with *Calluna vulgaris* and small lateral drains flowing into it. Further into the bog the flow is towards the trackway and D1A.

Drain D15: A deep, wide drain lined with *Betula pubescens, Pinus sylvestris* and *Picea sitchensis* with dense *Pteridium aquilinum* along its banks. There is also some *Molinia caerulea* present. The drain is 1.5m wide and 2.5m deep with water flowing quite fast, southwards towards cutaway. This drain acts as the outflow for most of the bog, draining D1A and possibly D1. This makes bog restoration work quite feasible as the drainage is quite uniform.

Drain D16: A 1m wide water-filled drain with *Sphagnum cuspidatum, S. auriculatum, Calluna vulgaris* and *Eriophorum angustifolium*. Running from D15 to D13 and flowing south-east off the high bog..

Drains D17: A series of 0.5m wide, *Sphagnum cuspidatum*-filled drains.

Drain D18: An old drain 0.5 m wide, which is present on the 6" map. It is filled with *Sphagnum cuspidatum* and lined with *Calluna vulgaris*, in-filling with *Eriophorum angustifolium*.

Drain D19: A 3m wide, 2.5m deep drain along south-eastern side-trackway. It narrows to 1m at its base where there is some water, no flow. It is lined with *Calluna vulgaris* and *Rhododendron ponticum*.

Drain D20: Along the north-eastern side-trackway, this drain is 1.5m wide and 3m deep with water at its base. Smaller drains run into this and it is lined with tall *Calluna vulgaris* and *Ulex europaeus*.

Drain D21: On the opposite side of the track from D20. It is completely filled with *Molinia caerulea* and lined by *Ulex europaeus*.

Drain D22: An older drain running parallel to D20. It is 1m wide and 0.5m deep and lined with *Calluna vulgaris*. There is some *Sphagnum cuspidatum* in places.

5.2.2 Bog Margin Hydrology

There was little drainage associated with the cutaway.

Drain d1: A 1m wide drain in active cutaway in the north-west of the site. It is water-filled with *Juncus effusus*. It is lined with *Ulex europaeus* and *Pteridium aquilinum*.

5.3 GEOHYDROLOGICAL OVERVIEW

Description of the bog in the 19th century
This bog originally bordered the River Suck in the east and was separated from Ballygar bog in the south by a forested mineral ridge. A stream flowed along its northern boundary draining into the Suck and there were numerous mineral ridges to the south-east. There was the site of an old ruin (Abbey Grey) on higher ground to the north-west of the bog.

Description of the present day bog
There has been extensive cutaway to the east and south-west, but the remaining high bog still retains its boundary with the ridge to the south. The building of trackways through the centre of the bog has led to subsidence on the high bog. The internal slopes thus created are suitable for bog restoration work. The drainage outflow is in the south of the site and blocking of these drains should lead to re-wetting of the bog surface. There is some level cutaway at the northern margin which would be suitable for re-wetting procedures also.

6. VEGETATION

6.1 VEGETATION SUMMARY

There was no central ecotope vegetation found on this bog and only a very small area of sub-central vegetation. There was a lot of marginal areas associated with the central trackway.

6.2 DETAILED VEGETATION OF HIGH BOG

6.2.1 Complexes

Marginal Complexes

Complex 1

The vegetation of this complex is dominated by tall *Calluna vulgaris* and on this bog, it is also associated with the central trackway in the east.

Complex 3 + Cl

A dried out area sloping down to the old central track and another area along the northern margin. The vegetation is co-dominated by *Carex panicea* (40%) and *Cladonia portentosa* (40%) with prominent *Calluna vulgaris* (20%) and *Trichophorum caespitosum* (15%) tussocks. *Eriophorum angustifolium* (5%) is growing through the *Carex panicea*. There are areas of bare ground between the *Cladonia portentosa* carpets and these contain *Rhynchospora alba*, *Campylopus introflexus*, *Cladonia coccifera*, *Cladonia pyxidata* and *Cladonia floerkeana*. There are occasional patches of *Sphagnum* (<5%) with *S. capillifolium, S. papillosum* and *S. magellanicum*. *Erica tetralix* (<5%) and *Andromeda polifolia (+)* are also present. Further up the slope, it is more level, there is less *Cladonia portentosa* (20%) and the *Sphagnum* (20%) cover has increased. *Hypnum jutlandicum*, *Racomitrium lanuginosum*, *Cladonia uncialis* and *Pleurozia purpurea* are all present here too. Also up on this level area there are a lot of small hollows with standing water. Some of these are algal and *Narthecium ossifragum* (10%) has also colonized. A couple of large, dried-out hummocks of *Breutelia chrysocoma* and *Leucobryum glaucum* are prominent here. All of the larger hummocks are drying out. Apart from the odd hummocks and young *Betula pubescens* and *Pinus* sylvestris trees, the whole area is quite flat with a gradual slope eastwards (Slope 2). None of the *Calluna vulgaris* plants are healthy with most dead or dying - a contrast to the vigorous and healthy plants on the face-bank.

Complex 3/2

The vegetation is co-dominated by *Carex panicea* (70%) and *Trichophorum caespitosum* (30%). There are some *Cladonia portentosa* (10%) and *Sphagnum* (5%) comprising *S. capillifolium* and *S. papillosum*. *Huperzia selago* (+) is obvious here with occasional *Andromeda polifolia*. *Rhynchospora alba* is noted especially on the water flow channels. There is a small amount of *Calluna vulgaris* (10%) most of which is dead. Some *Narthecium ossifragum* (5%) and *Hypnum jutlandicum* (+) are present here.

Complex 3/7 + Cl + Myrica

This area is steeply sloped down to the central trackway. It is criss-crossed by old drains and channels and dominated by *Myrica gale* (60%), *Carex panicea* (30%) and *Cladonia portentosa* (60%) with large *Calluna vulgaris* (30%) hummocks in between. Some of these hummocks feature *Vaccinium myrtillus* (+). There is a large patch of *Molinia caerulea* (10%) near the trackway. *Sphagnum* cover is poor with just small patches of *S. capillifolium* on the *Calluna vulgaris* hummocks. Moving west, the *Cladonia portentosa* decreases to around 30% and the *Sphagnum* cover improves to around 20% consisting of *S. capillifolium, S. magellanicum* and *S. papillosum*. *Myrica gale* and *Carex panicea* are spreading up towards the *Molinia caerulea* flush. *Narthecium ossifragum* increases nearer the flush also, and is especially obvious in the hollows.

Complex Cl + *Eriophorum angustifolium*/7

The vegetation is co-dominated by *Cladonia portentosa* (70%)/ *Eriophorum angustifolium* (30%)/ *Calluna vulgaris* (30%). Some *Trichophorum caespitosum* (5%), *Eriophorum vaginatum* (5%) and *Erica tetralix* (5%) are present here. The ground is soft underfoot but there is no real acrotelm. There are, however, several old tear pools with some associated *Sphagnum* cover (15%). The species present are mainly *S. capillifolium*, *S. papillosum* and *S. cuspidatum*. There were a few trees namely *Betula pubescens* and *Picea sitchensis*. *Narthecium ossifragum* occurs in hollows and *Carex panicea* (5%) is notable. *Menyanthes trifoliata* and *Drosera anglica* are present in some of the pools. Most pools are lined with *Rhynchospora alba* which also grows in some of them.

Complex 3/7 + Cl + TP

This area has a varied microtopography and is generally sinking towards the coniferous forestry to the south. The vegetation is dominated by *Carex panicea* and *Cladonia portentosa* with *Calluna vulgaris*. *Huperzia selago* is plentiful and there are numerous tear pools most of which are in-filled with *Narthecium ossifragum* and *Rhynchospora alba*.

Complex 7/3 + Cl

The vegetation is dominated by *Carex panicea* (30%)/ *Cladonia portentosa* (30%)/ *Calluna vulgaris* (30%). There are a lot of small eroded wet gullies with *Rhynchospora alba* and *Eriophorum angustifolium*. *Trichophorum caespitosum* (20%) is plentiful. The ground is wet and sloppy with no acrotelm. *Sphagnum* (5%) cover is patchy with *S. cuspidatum* in the drains, and patches of *S. capillifolium* and *S. tenellum* through the vegetation. There plenty of large heather hummocks which get more numerous near the drain edge where the *Calluna vulgaris* can be described as face-bank. *Narthecium ossifragum* (15%) is prominent, especially in the hollows. In the eastern margins, *Calluna vulgaris* (15%) is less dominant where much of it was dead. The other shrub, *Erica tetralix* (15%) appears healthier.

Complex 7/3/2

North of Complex 7/10 + ER + Cl + TP, towards the central track, dead *Sphagnum* and *Calluna vulgaris* become more obvious. *Carex panicea* (20%) and *Trichophorum caespitosum* (20%) take over dominance and *Myrica gale* dominates in a flush in the north-eastern corner of this section. Note that the southern part of the bog seems to be 1m lower than the top of the bog on the northern side.

Complex 7/3/2 + TP

Carex panicea and *Trichophorum caespitosum* dominate on the slope here, there are numerous tear pools in-filling with *Rhynchospora alba*. There is some *Sphagnum cuspidatum* present but the pools are drying out due to drainage. *Calluna vulgaris* co-dominates and there is some scattered *Myrica gale*. This area becomes very wet in places but *Carex panicea* and *Trichophorum caespitosum* still dominate with *Narthecium ossifragum* in the wet hollows.

Complex 7/9 + Cl

Calluna vulgaris (40%) in this section is healthier than that seen on the neighbouring sub-marginal complex 7/9 + Cl. The vegetation is co-dominated by *Cladonia portentosa* (60%) and *Eriophorum vaginatum* (30%). There is some *Carex panicea* (10%) and *Trichophorum caespitosum* (5%) present. The ground is wet underfoot but there is no acrotelm although some *Sphagnum* (15%) is present. This is mostly *S. capillifolium* and *S. papillosum* with *S. cuspidatum* in some of the wet hollows.

Sub-Marginal Complexes

Complex 7/3 + Cl + TP

Past the *Molinia caerulea* flush there is *Myrica gale* flush vegetation interspersed with tear pools. These pools contain *Sphagnum* cuspidatum and *S. auriculatum*. Moving up the slope, the *Myrica gale* disappears and the pools became algal and the basic vegetation type is co-dominated by *Carex panicea* (30%)/ *Cladonia portentosa* (30%)/ *Calluna vulgaris* (30%) with prominent *Trichophorum caespitosum* (15%) and *Sphagnum* (25%). The acrotelm is variable at 0-5cm. The water level is lower with a lot of algae and some *Menyanthes trifoliata* and *Eriophorum angustifolium* in the pools. The *Sphagnum* cover is mostly *S. capillifolium* and *S. papillosum* but there are *S. cuspidatum* and *S. auriculatum* in the pools with the occasional *S. tenellum, S. fuscum* and *S. subnitens* noted. *Sphagnum imbricatum* is also noted in a few hummocks. Striking brown *Cladonia gracilis* and some *Cladonia uncialis* (+) are also present. Several instances of dead moss were noted.

Complex 10/7/9+CL

Overall *Calluna vulgaris* (60%) is co-dominating with *Cladonia portentosa* (40%), *Eriophorum vaginatum* (25%) and *Trichophorum caespitosum* (15%) prominent. Wet underfoot with a variable acrotelm of 0-5cm. The *Sphagnum* cover overall is quite good (40%) with *S. capillifolium, S. papillosum, S. tenellum, S. magellanicum, S. fuscum* and *S. subnitens*. *Erica tetralix* (5%), *Carex panicea* (5%), *Huperzia selago* and *Andromeda polifolia* (+) are present. There are occasional instances of dead *Sphagnum*.

Complex 7/9/3 + TP
The vegetation in this area is similar to Complex 7/9/10 + Cl but there is less *Cladonia portentosa*, probably due to the wetter situation with more frequent tear pools. *Carex panicea* co-dominates in this area close to the southern margins of the bog. Like Complex 7/9/10 + Cl, the *Sphagnum* cover (25%) is good here with *S. capillifolium, S. papillosum, S. fuscum* and *S. tenellum*.

Complex 7/10 + ER + Cl + TP
The vegetation of this area is similar to Complex Cl + ER/7 with *Calluna vulgaris, Cladonia portentosa* and *Eriophorum angustifolium* co-dominating. There is, however, a higher *Sphagnum* cover (30%) in this area with *S. capillifolium, S. papillosum, S. magellanicum, S. subnitens, S. fuscum* and *S. imbricatum*. Quite a good 0-5cm acrotelm but this decreases moving towards central track. There are occasional tear pools in this area.

Sub-Central Complexes

Complex 7/9/10 + Cl+TP
On the relatively flat area in the east of this high bog, the *Calluna vulgaris*(60%) becomes more prominent and healthier. Here there is a good area of *Calluna vulgaris* hummocks with *Narthecium ossifragum* (10%) in the hollows and tear pools. These pools contain some *Sphagnum cuspidatum, N. ossifragum* and *Eriophorum angustifolium.*

Complex 10/7/9 + TP
An area of frequent tear pools with fluctuating water levels. These are big and contain *Sphagnum cuspidatum, Eriophorum angustifolium* and *Rhynchospora alba*. The vegetation in between is co-dominated by *Calluna vulgaris* (30%)/ *Eriophorum vaginatum* (30%)/ *Sphagnum*(40%). Most is *S. papillosum* and *S. capillifolium* but some *S. imbricatum* is noted. *Trichophorum caespitosum* (10%) *Erica tetralix* (5%), *Cladonia portentosa* (15%) and *Carex panicea* (10%) are also prominent. *Eriophorum angustifolium* (15) and *Rhynchospora* alba (15) are notable, especially at the pool edges. Some of the pools are algal, most have *Sphagnum cuspidatum* - some have *S. auriculatum, Drosera anglica* (+) and *Menyanthes trifoliata*. Small patches of *Racomitrium lanuginosum* and *Pleurozia purpurea* are noted. There is a quaking area with a reasonable acrotelm (5cm) and this area is the best part of this complex. Moving to the margins of this complex the *Sphagnum* cover decreases and there is less of an acrotelm (0-5cm). *Rhynchospora fusca* is noted in some of the pools and *Campylopus atrovirens* is growing in an island in one of the larger pools. *Narthecium ossifragum* (10%) becomes more prominent here. Carpets of *Sphagnum magellanicum* and *S. tenellum* and occasional patches of *S. fuscum* are noted in the margins of this complex. The microtopography is varied with several *Calluna vulgaris* and *Cladonia portentosa* hummocks. The pools become increasingly less frequent all the way out to forestry edge in Complex 7/9/3 + TP.

Central Complexes

No central complexes were seen on this bog.

6.2.2 Flushes and Soaks

Flush 1
Moving towards the *Molinia caerulea* flush the ground becomes very difficult to traverse with a varied microtopography of quite hard tussocks of *Eriophorum vaginatum* and hummocks of *Calluna vulgaris* with standing water in between. The flush is nearly 100% *Molinia caerulea* although there are occasional *Myrica gale* bushes. A swallow-hole at the southern end of the flush has *Osmunda regalis* and *Vaccinium myrtillus* and *Dryopteris dilatata* growing around it. There are signs of an old burn with *Polytrichum commune, Dicranum scoparium* and *Cladonia pyxidata.*

6.3 DETAILED VEGETATION OF THE BOG MARGINS

Extensive coniferous forestry occurs in the southern and eastern cutaway. In the past this extended onto the high bog but this has been recently cleared. There is a thin cutaway margin in the west with *Betula pubescens* woodland. In the north, the cutaway is dominated by *Molinia caerulea* and *Calluna vulgaris* with *Ulex europaeus* scrub.

7. BOG TYPE

This is probably a broad floodplain type bog due to its location to the river suck floodplain.

8. HUMAN IMPACT

8.1 RECENT HUMAN IMPACT (see Landuse map)

8.1.1 Peat Cutting

There is some active peat cutting in the north-west.

8.1.2 Forestry

There is extensive forestry in the south and east with some forestry to the north.

8.1.3 Fire History

There is no sign of recent burning.

8.1.4 Dumping

At the start of the bog track there is some dumping.

8.2 NHA BOUNDARY CHANGES

The NHA boundary needs to be expanded to include the high bog in the south-west and the cutaway under forestry to the south.

9. INTER-RELATIONSHIPS OF VEGETATION, HYDROLOGY, TOPOGRAPHY AND LOCATION

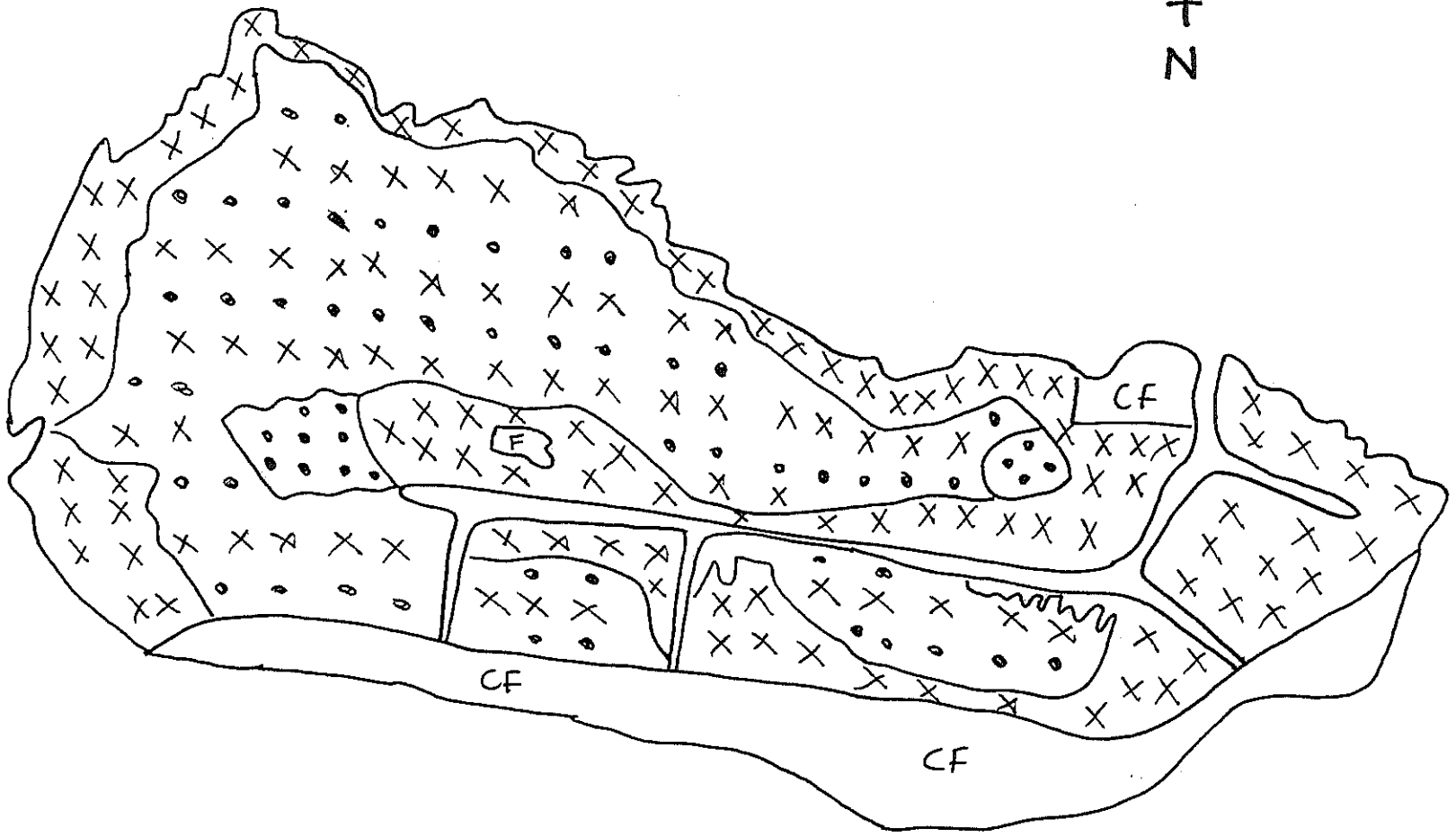
1. This site was surveyed because it was relatively intact despite the trackway and there was very little active peat cutting. There was, however, extensive forestry plantations.

2. The survey confirmed that there was damage resulting form the trackway but the bog had settled and the tear pools resulting from this damage were in good condition. Also the internal slopes would make bog restoration feasible with the blockage of drains resulting in re-wetting of the bog.

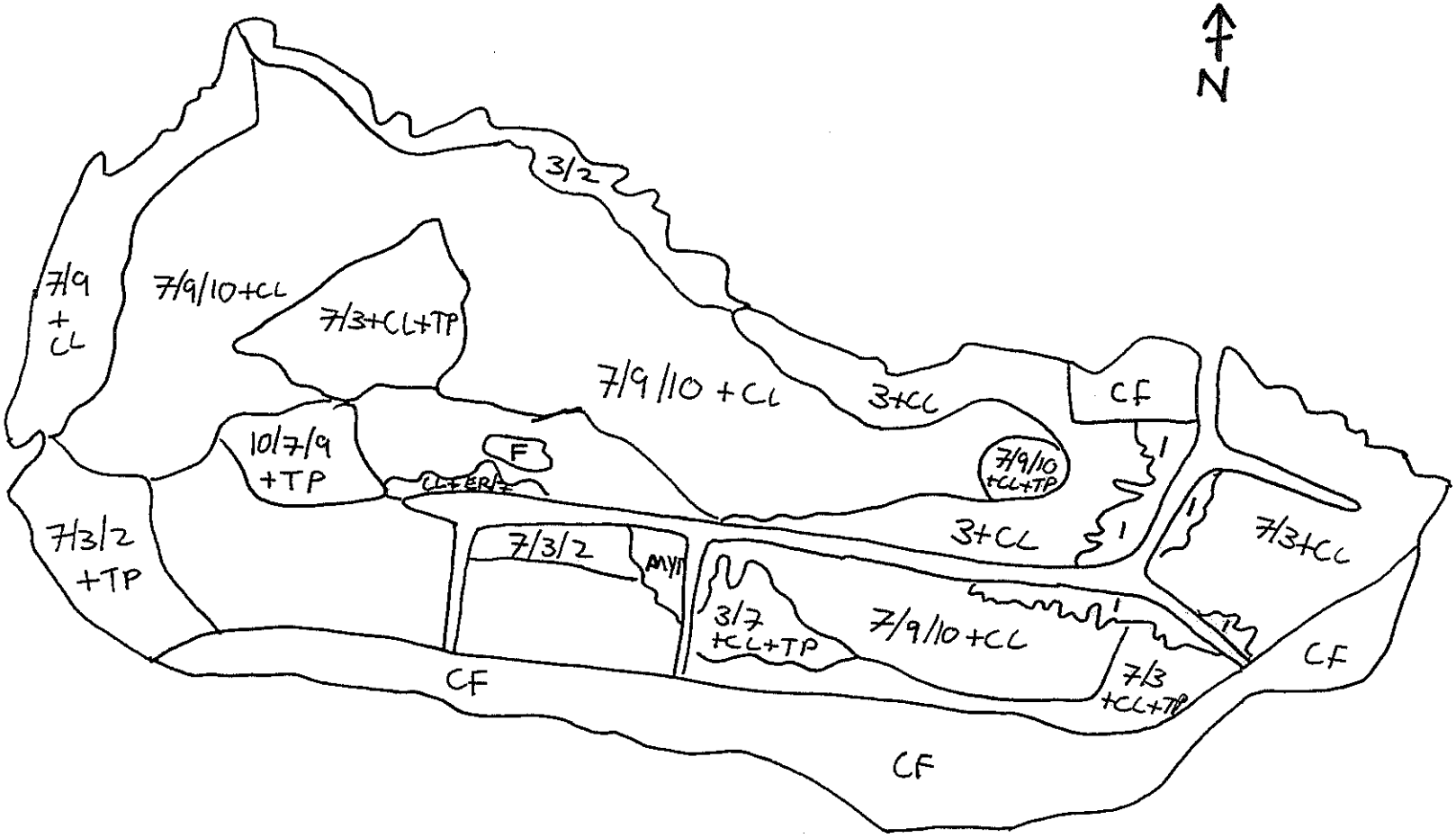
3. There was extensive drainage associated with the central trackway but these drains if blocked would aid restoration.

4. There is some level cutaway to the north of the site which would be suitable for re-wetting but the remaining cutaway margins are narrow and unsuitable for restoration.

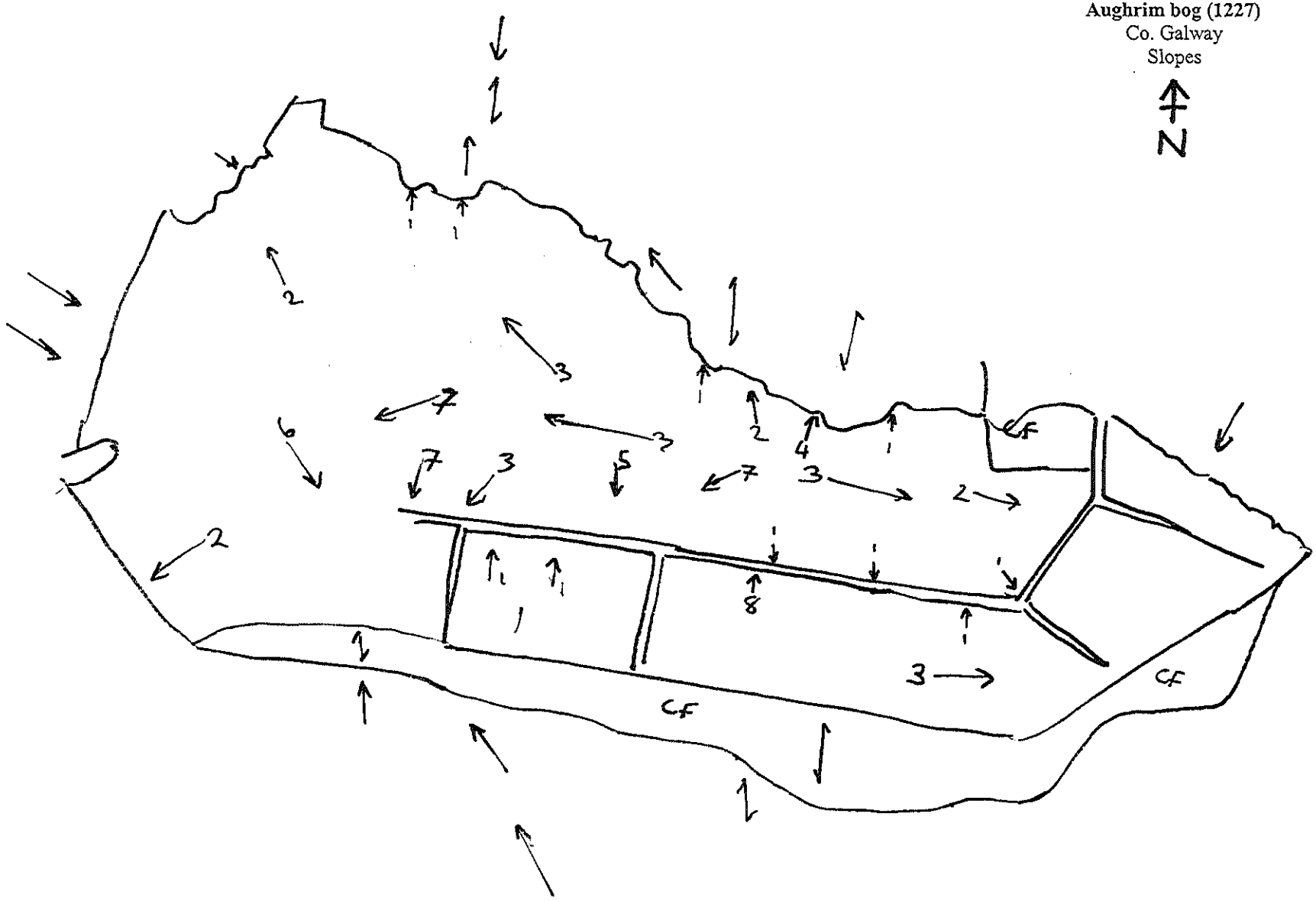
Aughrim bog (1227)
Co. Galway
Ecotopes



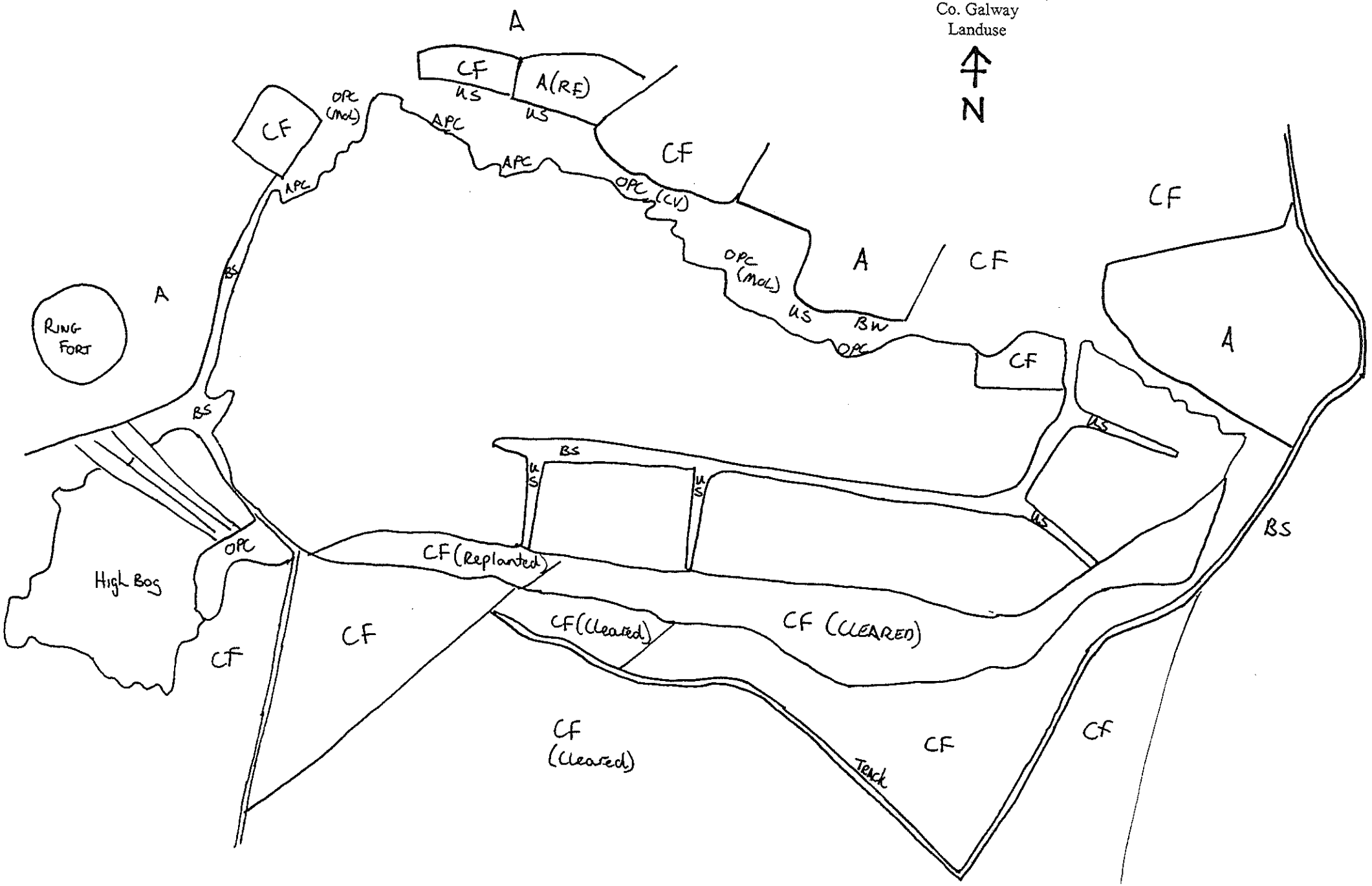
Aughrim bog (1227)
Co. Galway
Vegetation complexes



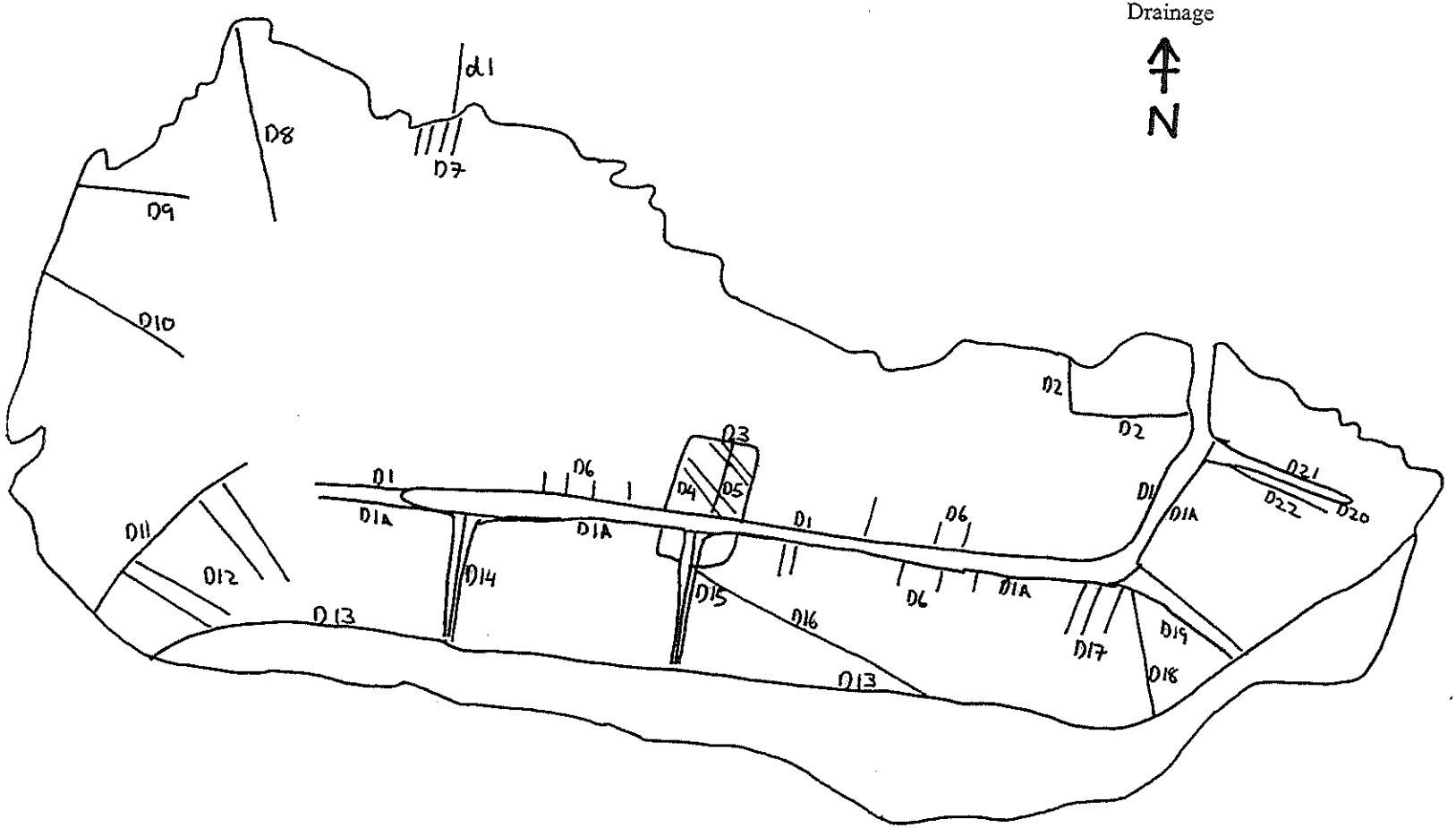
Aughrim bog (1227)
Co. Galway
Slopes



Aughrim bog (1227)
Co. Galway
Landuse



Aughrim bog (1227)
Co. Galway
Drainage



BALLYGAR BOG, CO. GALWAY

1. SUMMARY OF SITE DETAILS

NHA no.:	229	6" Sheet:	GY33
Grid Ref.:	M780 530	1:126,000 Sheet	12
G.S.I. Aerial Photo:	35 (7445)	1:50,000 Sheet:	40
Other Photo:	M215	High bog area (ha):	106.3
Date(s) of Visit:	24/1/2000		

Townlands: Hermitage, Ballygar.

2. INTRODUCTION

2.1 BACKGROUND

This site was selected as part of this survey because although it is small, it appears to be relatively intact. The aerial photograph of '95 indicatesthat a pool system is present.

It was surveyed in 1993 as part of the NHA survey and was described as having hummocks and pools. It was however drying out due to forestry. This site is beside Aughrim bog and could act as a support site to this bog.

2.2 LOCATION AND ACCESS

A small bog, located 1km north-west of Ballygar village. It can be accessed off the local road heading northwards from Ballygar crossroads.

3. METEOROLOGY

No meteorological measurements have been made on this bog. Rainfall data from the nearby Ballygar weather station for the years 1969-90, indicated that the area recieves appproximately 1026mm of rainfall annually (R). The nearest synoptic station at Claremorris indicates that the site has up to 177 wet days annually. (Wet day is defined as a day when > 1mm of rainfall recieved).

Evapotranspiration measurements are only available for synoptic stations. With the large exposed areas on high bogs, actual evapotranspiration rates would probably be higher than at the nearest synoptic station. The effective rainfall (ER) rate for a site is the annual rainfall (R), less the actual evapotranspiration (AE). With only the potential evapotranspiration (PE) rate available for Ballygar of 415 the effective rainfall for the site is calculated as less than (R - PE) i.e. ER< 1026 - 415 = 611mm. (See Fig. 1)

4. GEOMORPHOLOGY

4.1 TOPOGRAPHY OF THE HIGH BOG

The bog was relatively flat with slight internal slopes associated with flushes on the high bog. There were also gradual marginal slopes to the cutover.

4.1.1 Slopes of the High Bog

Slope 1: A steep, marginal slope to the cutover (1m/25m).

Slope 2: A marginal slope to the cutaway in the north (50cm/50m).

Slope 3: Internal slopes associated with a central depression and also with drainage in the south (50cm/50m).

Slope 4: Long internal slopes associated with the central depressions (1m/100m).

Slope 5: Steep internal slopes associated with one of the central depressions (25cm/50m).

4.2 TOPOGRAPHY OF THE BOG MARGINS

The cutaway to this bog is very limited. To the north and east it is level and wet between the bog and the road, but this area is very narrow. To the south-west and south the narrow margin of cutaway is level but has been reclaimed for agriculture, with agricultural land sloping down to it. The only area of extensive level cutaway occurs in the south-east where there is level, active cutaway, backed by sloping agricultural land. This area and the wet wood by the road are the most suitable areas for re-wetting.

5. HYDROLOGICAL SYSTEM

5.1 GEOLOGY/HYDROLOGY

5.1.1 Bedrock

This bog is surrounded by limestone drift according to the 1840's map.

5.1.2 Subsoils

No data was available for sub-soils for this site

5.1.3 Peats

The peat at this site is classified by Hammond as Man-Modified.

5.2 HYDROLOGY

5.2.1 High Bog Hydrology (see Drains map)

The drainage on the high bog is associated with the road and old cutaway to the north-east of this bog. There is an extensive drainage system to the east associated with old cutaway. In the south there are old in-filled drains associated with townland boundaries and cutaway.

Drain D1: A series of parallel drains running from the cutaway to D3. These are dry, 1.5m wide and 0.5m deep and in-filled with *Calluna vulgaris, Myrica gale* and *Narthecium ossifragum.*

Drain D2: A long drain running parallel to cut-face. It is 1.5m wide and 0.5m deep with a *Calluna vulgaris* ridge along one side. It is in-filled with *Eriophorum vaginatum, Calluna vulgaris, Narthecium ossifragum, Carex panicea* and *Myrica gale.* There is some *Sphagnum cuspidatum* present in places. Other drains run across this towards D3.

Drain D3: A narrow drain, 0.5m wide running parallel to D2. It is in-filled with *Calluna vulgaris, Carex panicea, Narthecium ossifragum* and *Erica tetralix* at its southern end. There is plentiful *Sphagnum capillifolium* also. Further into the bog this drain is water-filled with *S. cuspidatum.* Numerous drains flow into this drain.

Drain D4: Running parallel to D3, this drain is 0.5m wide and 0.5m deep with some open water present. There is no flow visible. *Sphagnum cuspidatum* and *S. capillifolium* are present with *Calluna vulgaris, Narthecium ossifragum* and *Erica tetralix* in-filling from the sides. There is some *Molinia caerulea* at its southern end.

Drain D5: This drain is wetter than those described in D1. It is 0.5m wide and water-filled with *Sphagnum cuspidatum*. It is in-filling with *Rhynchospora alba*, *Narthecium ossifragum* and *Calluna vulgaris*. There are deer tracks along the bank of this drain.

Drain D6: Wider drain, 1m wide, in-filled with *Rhynchospora alba, Sphagnum capillifolium, Narthecium ossifragum* and *Calluna vulgaris*.

Drain D7: Drain in-filled by *Myrica gale* flush also containing *Molinia caerulea* and *Sphagnum capillifolium*.

Drain D8: At the northern end of D3, an old drain runs towards cutaway. It is 0.5m wide and filled with *Myrica gale, Eriophorum vaginatum* and *Sphagnum cuspidatum*.

Drain D9: A 0.5m wide drain running parallel to D8 with *Eriophorum vaginatum, Narthecium ossifragum* and *Sphagnum cuspidatum*.

Drain D10: A 1.5 m wide completely in-filled drain, running parallel to the bog margin. Tall *Calluna vulgaris* and *Eriophorum vaginatum* hummocks are present with *Sphagnum capillifolium*. There is some *Molinia caerulea, Betula pubescens* and *Pinus* spp. along margins. Towards the north-west this drain becomes narrower and deeper, 1m deep and 1m wide. It is completely in-filled at its base with *Eriophorum vaginatum* except for a patch of *Sphagnum cuspidatum* in some open water.

Drain D11: A series of drains running parallel to the cutaway. They are 0.5m wide and in-filled with *Calluna vulgaris, Eriophorum vaginatum* and *Cladonia portentosa*.

Drain D12: Two in-filled drains running from cut-face into the bog. These are 1m deep at the cut-face but are completely in-filled with *Calluna vulgaris, Eriophorum vaginatum* and *Sphagnum capillifolium* further into the bog.

Drain D13: An in-filled drain 0.5m wide running from the cut-face across this small southern lobe. It is completely in-filled with *Narthecium ossifragum, Eriophorum vaginatum* and some *Molinia caerulea*.

Drain D14: An in-filled drain not visible on the aerial photo but present on the 6'' map. It is less than 0.5m wide and in-filled with *Narthecium ossifragum, Calluna vulgaris* and *Trichophorum caespitosum*. It appears on the map to join up to D4.

Drain D15: An old in-filled drain 1m wide, in-filled with *Narthecium ossifragum, Calluna vulgaris, Sphagnum capillifolium* and *Cladonia portentosa*. Associated with old cutaway.

Drain D16: A 1m wide drain in-filled with tall *Calluna vulgaris, Sphagnum capillifolium, Carex panicea* and *Cladonia portentosa*.

Drain D 17: A 1m wide and 1m deep drain with 50cm of standing water. It is mainly algal with some *Sphagnum cuspidatum*. It is lined by tall *Calluna vulgaris* with some *C. vulgaris* and *S. capillifolium* growing in from the margins.

Drain D18: An in-filled drain running across the southern half of the bog. It is 0.5m wide with some *Sphagnum cuspidatum, Narthecium ossifragum, Eriophorum vaginatum* and *Calluna vulgaris*. This drain is present on the 6" map running across the whole bog, but it is completely overgrown at its northern end.

5.2.2 Bog Margin Hydrology

The main cutaway drainage is associated with the road and some active peat cutting in the south.

Drain d1: A water-filled drain, running alongside road. It is 1m wide and lined by *Betula pubescens* scrub with some conifers. There is some *Sphagnum cuspidatum* present in places.

Drain d2: A 1.5m wide drain in active cutaway. It is water-filled with *Sphagnum cuspidatum* and lined with *Calluna vulgaris* and small *Betula pubescens*. It is in-filling with *Molinia caerulea* and *Juncus effusus* from the margins.

5.3 GEOHYDROLOGY OVERVIEW

Description of the bog in the 19th century
This bog lies at the base of a hill to the north of Ballygar village. It was originally surrounded by mineral soil and separated from Aughrim bog by a forested mineral ridge.

Description of the present-day bog
A new road from Ballygar runs through the eastern section along the margin of the remaining intact high bog. The area to the east of this road has gone to forestry. A large section to the south-west has been cutaway and is now reclaimed for agriculture. To the south and west there has been limited peat cutting with the sloping mineral land coming close to the high bog. There may be some potential to create a lagg zone here with runoff from the mineral slopes and the high bog. Wet woodland also occurs along the thin margin between the road and the high bog.

There is an extensive drainage system to the south-east of this site. This is old and in-filling with numerous *Myrica gale* flushes associated with it. Blocking of these drains would improve re-wetting of the high bog.

6. VEGETATION

6.1 VEGETATION SUMMARY

There is no central ecotope on this bog. There is a large area of sub-central ecotope and three flushes occur on the high bog. There is also coniferous forestry at the north-western end of the high bog. There appear to be *Myrica gale* flushes all along the eastern half of this bog - presumably linked to the gradual slope across the bog. It appears that the dark blotches on the photo correspond to the *Myrica gale* flushes. Over the whole bog *Calluna vulgaris* is dead or dying, presumably as a result from a beetle infection.

6.2 DETAILED VEGETATION OF HIGH BOG

6.2.1 Complexes
Marginal Complexes

Complex 7
A few marginal areas of *Calluna vulgaris* dominate vegetation. These are associated with cutaway slopes.

Complex 9/7 + Cl
The margin to cutaway is dominated by *Eriophorum vaginatum* and tall *Calluna vulgaris* with *Cladonia portentosa*. There is no slope here and there are some Pines encroaching from the margin.

Complex 3/7/4
This vegetation occurs at the edge of the old cutaway in the south-east. *Calluna vulgaris* (30%) is the dominant at the edges and then the vegetation opens out with *Carex panicea* (30%) lawns and prominent *Rhynchospora alba* (20%). *Narthecium ossifragum* (15%), *Erica tetralix* (15%) and *Cladonia portentosa* (15%) are also very prominent. *Trichophorum caespitosum* (10%) tussocks are prominent near the edges. There are also a few hummocks of *Sphagnum capillifolium* (5%) and *S. papillosum* in the wetter areas where there is some standing water. This vegetation continues in a band up to a very old drain, in-filled with *Calluna vulgaris*, *Eriophorum vaginatum* and *Myrica gale*. There are quite a few young *Pinus sylvestris* dotted across the bog here.

Complex 7/3/2
The vegetation is co-dominated by *Carex panicea* (30%) and *Trichophorum caespitosum*(30%) with 30% cover of dead and dying *Calluna vulgaris* bushes. This runs to the margin where there is lots of poaching and large patches dominated by *Carex panicea*. There is some scattered *Betula pubescens* and *Pinus sylvestris* along the margin to this complex, and *Molinia caerulea* is encroaching.

Sub-Marginal Complexes

Complex 7/10+ Cl
Abundant *Cladonia portentosa* with tall *Calluna vulgaris* hummocks. *Carex panicea* and *Narthecium ossifragum* are present and there is *Sphagnum* cover of about 20%. The acrotelm is patchy at 0-5cm, but in some places *Sphagnum* cover reaches 50%. *Narthecium ossifragum* (15%) is prominent with *Cladonia portentosa* (25%). Very dark red *Sphagnum capillifolium* (15%) with some *S. cuspidatum* occurs in the hollows. *S. papillosum* and some *Hypnum jutlandicum* are also present.

Complex 7/9/3
The hummock-hollow system of Complex 7/3/4 + TP is not present here and the *Calluna vulgaris* in this area is dying out. *Eriophorum vaginatum* and *Carex panicea* co-dominate and there is poor *Sphagnum* cover.

Complex 7/3/4
The vegetation change here from Complex 7/3 + Cl is the decrease in *Cladonia portentosa* cover to around 15%. The vegetation is co-dominated by *Carex panicea* (30%)/ *Calluna vulgaris* (30%)/ *Rhynchospora alba* (30%). *Eriophorum vaginatum* (10%), *Trichophorum caespitosum* (10%) and *Erica tetralix* (10%) are also prominent. *Sphagnum* (15%) is noted in low hummocks of *S. capillifolium* and *S. papillosum*. A few large, drying hummocks of *S. fuscum* are also present. *Racomitrium lanuginosum* (+) and *Pleurozia purpurea* (+) are also present. There are hollows of standing water - occasionally with *S. cuspidatum* (+).

Complex 7/3 + Cl
The *Myrica gale* growth in Complex 9 + Cl ends abruptly at Flush 1. Beyond the double drains here (D8 and D9), the vegetation is co-dominated by *Calluna vulgaris* (30%)/ *Cladonia portentosa* (60%)/ *Carex panicea* (30%). *Eriophorum vaginatum* (20%) is also prominent. There are small amounts of *Erica tetralix* (5%) and *Eriophorum angustifolium* (5%) with some standing water. There are occasional occurrences of *Andromeda polifolia* (+) and *Trichophorum caespitosum* (+). The acrotelm is variable (0-5cm) with some *Sphagnum* (5%) patches, however, *Cladonia portentosa* cover is very dense at 90% in places and this appears to be blocking out light from *Sphagnum papillosum and S. capillifolium* which are growing underneath.

Complex 9 + Cl
The area south of the flush F1 is co-dominated by *Eriophorum vaginatum* (50%) and *Cladonia portentosa* (50%). The ground is very wet underneath with a shallow acrotelm. There are a few patches of *Sphagnum* (15%) with *S. papillosum* and *S. capillifolium*. *Trichophorum caespitosum* (10%) and *Erica tetralix* (10%) are prominent with some *Eriophorum angustifolium* (5%). There are also a few *Calluna vulgaris* bushes and occasional *Andromeda polifolia* (+).

Complex 3/7/4 + Tear Pools
The vegetation is similar to the marginal complex 3/7/4 but there are scattered, small algal pools. The vegetation is co-dominated by *Calluna vulgaris* (30%)/ *Carex panicea* (30%)/ *Rhynchospora alba* (30%) with prominent *Cladonia portentosa* (15%) cover. *Eriophorum angustifolium* (15%) is in-filling pools. *Eriophorum vaginatum* (15%) and *Trichophorum caespitosum* (5%) are noted present with a 20% cover of *Sphagnum* made up of *S. capillifolium, S. magellanicum* and *S. papillosum* on the wetter parts. The acrotelm, however, is patchy. Some parts of this area have *Myrica gale* flushes which are wetter underfoot than other areas. These *Myrica gale* flushes have a higher *Sphagnum* cover with bigger, taller *Carex panicea.*

Complex 2/6/3 + Tear Pools
The vegetation is co-dominated by *Trichophorum caespitosum* (30%)/ *Narthecium ossifragum* (30%)/ *Carex panicea* (30%). There are scattered in-filling pools with a 20% cover of dead and dying *Calluna vulgaris*. The area is very wet underfoot with a variable acrotelm of 0-5cm. The *Sphagnum* spp (20%) present are *S. capillifolium, S. magellanicum, S. fuscum* and *S. papillosum*. Pools are algal with *Drosera anglica* and *S. cuspidatum. Cladonia portentosa* (25%) is prominent. Several rings of *Myrica gale* are visible on the aerial photo and these areas are co-dominated by *Myrica gale* (40%) with prominent *Eriophorum vaginatum* (30%), *Eriophorum angustifolium* and *Erica tetralix*.

Complex 7/4/2 + Tear Pools
The vegetation is co-dominated by *Rhynchospora alba* (30%)/ *Calluna vulgaris* (30%)/ *Trichophorum caespitosum* (30%). There are frequent in-filling pools with *Sphagnum cuspidatum,* S. *magellanicum* and *Narthecium ossifragum*. There is prominent *Sphagnum* cover (20%) with *S. capillifolium, S. magellanicum* and *S. papillosum.* The pools are drying out and algal with *Eriophorum angustifolium* leaf bases exposed as the water level is lowering. Some pools are very large with expansive carpets of *Sphagnum cuspidatum* and some *Drosera anglica*. There are occasional *Cladonia portentosa* (5%) and *Andromeda polifolia.*

Complex 7/3/4 + Tear Pools
This complex is similar vegetation to Complex 7/3/4 but has small in-filling pools and some are algal. *Rhynchospora alba* is concentrated around these pools. There are occasional young *Pinus sylvestris* trees on this area. Moving northwards towards the forestry, *Narthecium ossifragum* (15%) becomes more frequent. In one small area *N. ossifragum* is the dominant species on what appears to be an old pool area which is dried and in-filled with no *Sphagnum*. This small area is the margin to the tear pools that occur in Complex 7/10/9 + TP.

Sub-Central Complexes

Complex 7/10/9 + Tear Pools
Many of the pools are bordered by *Sphagnum capillifolium, S. papillosum* and contained *S. cuspidatum, Menyanthes trifoliata* and *Drosera anglica*. The pools were in-filling. *Pleurozia purpurea* occurred in quite prominent patches in some places. The *Sphagnum* cover (30%) is good, *S. capillifolium, S. papillosum* with *S. cuspidatum* in a few of the pools but there are quite a few drying *Sphagnum* hummocks. The acrotelm, however, is good at 5-10cm and the ground is very difficult to traverse. There are also several *Huperzia selago* plants in the area and a few large hummocks of *Sphagnum imbricatum*. The general vegetation is co-dominated by *Calluna vulgaris* (40%)/ *Rhynchospora alba* (30%)/ *Eriophorum vaginatum* (30%). There are also several young *Pinus sylvestris* saplings. *Cladonia portentosa* (15%) and *Erica tetralix* (5%) are also present. There are occasional occurrences of *Andromeda polifolia, Eriophorum angustifolium* (+), *Cladonia uncialis* (+) and *Carex panicea* (+). In some parts the *Sphagnum* carpet increases to 80%. *Sphagnum imbricatum* is also present with lichen epiphytes on many of the *Calluna vulgaris*.

Central Complexes
No central complexes are present on this bog.

6.2.2 Flushes and Soaks

Flush 1 (R4, P19)
A narrow flush running from the centre of the bog towards the drainage system in the east. It is dominated by several 5m high *Betula pubescens* and a 4m high *Pinus sylvestris* tree. These trees are surrounded by a *Myrica gale* flush. Some of the bushes are reaching 1m. The ground cover is dominated by *Cladonia portentosa*. The ground is very wet underfoot with some large *Sphagnum* hummocks of *S. papillosum* and *S. capillifolium*. There are some robust *Calluna vulgaris* bushes and also a few small *Picea sitchensis* saplings. The *Erica tetralix* and *Carex panicea* plants are large and *Andromeda polifolia* and *Molinia caerulea* were also present.

Flush 2
The vegetation of this area opens out onto the pale patch on the photo. The acrotelm is patchy and the vegetation is co-dominated by *Carex panicea* (60%) and *Eriophorum vaginatum* (30%). *Calluna vulgaris* (10%) is unhealthy looking. *Andromeda polifolia* and *Vaccinium oxycoccus* are noted with a large patch of *Empetrum nigrum* indicating flushing. *Narthecium ossifragum* (10%) is prominent in spots. *Erica tetralix* (15%) and *Cladonia portentosa* (15) are prominent. *Cladonia uncialis* (+) is noted and there is patchy *Sphagnum* cover (20%) of *S. capillifolium*, S. *imbricatum, S. papillosum, S. subnitens* and *S. magellanicum*. *Trichophorum caespitosum* (20%) tussocks are prominent. *Calluna vulgaris* is stunted here but there are a few *Pinus sylvestris* and *Picea sitchensis* saplings. Further down the flush towards a copse of more mature *Pinus sylvestris*, the *Sphagnum* (40%) and *Calluna vulgaris* (30%) improved and *Carex panicea* (25%) declined slightly. At the base of the depression of this flush the *Sphagnum* cover increases to 80% and *Vaccinium oxycoccus* becomes very noticeable over it. Hummocks of *Leucobryum glaucum, Pseudoscleropodium purum, Polytrichum juniperinum* and *Sphagnum auriculatum* are found under the mature *Pinus sylvestris*. This area is poached by deer.

Flush 3
A flush dominated by *Molinia caerulea, Eriophorum angustifolium* and *Cladonia portentosa* with 30% cover by dead *Calluna vulgaris* bushes. *Sphagnum* cover is expansive (60%) with prominent *Empetrum nigrum* in places. *Vaccinium oxycoccus* and *Aulacomnium palustre* are growing through *Sphagnum* which is also dying in places. Like *Empetrum nigrum, Vaccinium oxycoccus* is profuse in places. *Eriophorum vaginatum* is also notable along with large hummocks of dying *Pleurozium schreberi. Polytrichum juniperinum, Dicranum scoparium* and *Andromeda polifolia* are present along with a few *Picea sitchensis* saplings and a young *Rhododendron ponticum* in this area. The *Calluna vulgaris* plants are healthier here on the very wet slight slope leading northwards down into the flush.

6.3 DETAILED VEGETATION OF THE BOG MARGIN

Most of the cutaway on this bog is wooded. To the north-west there is a conifer plantation which extends onto the high bog. Along the northern and eastern margins there is a thin band of mixed forestry between the bog and the road. This is a nice, wet cutaway dominated by *Betula pubescens* with *Juncus effusus* and the localized occurrence of *Sphagnum cuspidatum*. But there are some conifers present. To the west and south-west the cutaway has been reclaimed for agricultural grazing with some areas dominated by *J. effusus* and scattered *Ulex europaeus* scrub. There is a small area of peat cutting to the south with *J. effusus* on the active cutaway and *Calluna vulgaris* and *U. europaeus* scrub on the old cutaway.

7. BOG TYPE
This is probably a basin bog.

8. HUMAN IMPACT

8.1 RECENT HUMAN IMPACT (see Landuse map)

8.1.1 Peat Cutting
There was limited active peat cutting to the south of this bog.

8.1.2 Forestry
There was a plantation to the north-west which extended onto the high bog.

8.1.3 Fire History
There was no evidence of burning on the bog.

8.1.4 Dumping
There was no dumping at this bog.

8.1.5 Agriculture
To the south-west and south the thin margin of cutaway has been reclaimed for agriculture. There is also a small area of cutaway under cultivation in the east with a small allotment of vegetables by the access path to the bog.

8.2 NHA BOUNDARY CHANGES

No NHA boundary changes are necessary for this site.

9. INTER-RELATIONSHIPS OF VEGETATION, HYDROLOGY, TOPOGRAPHY AND LOCATION

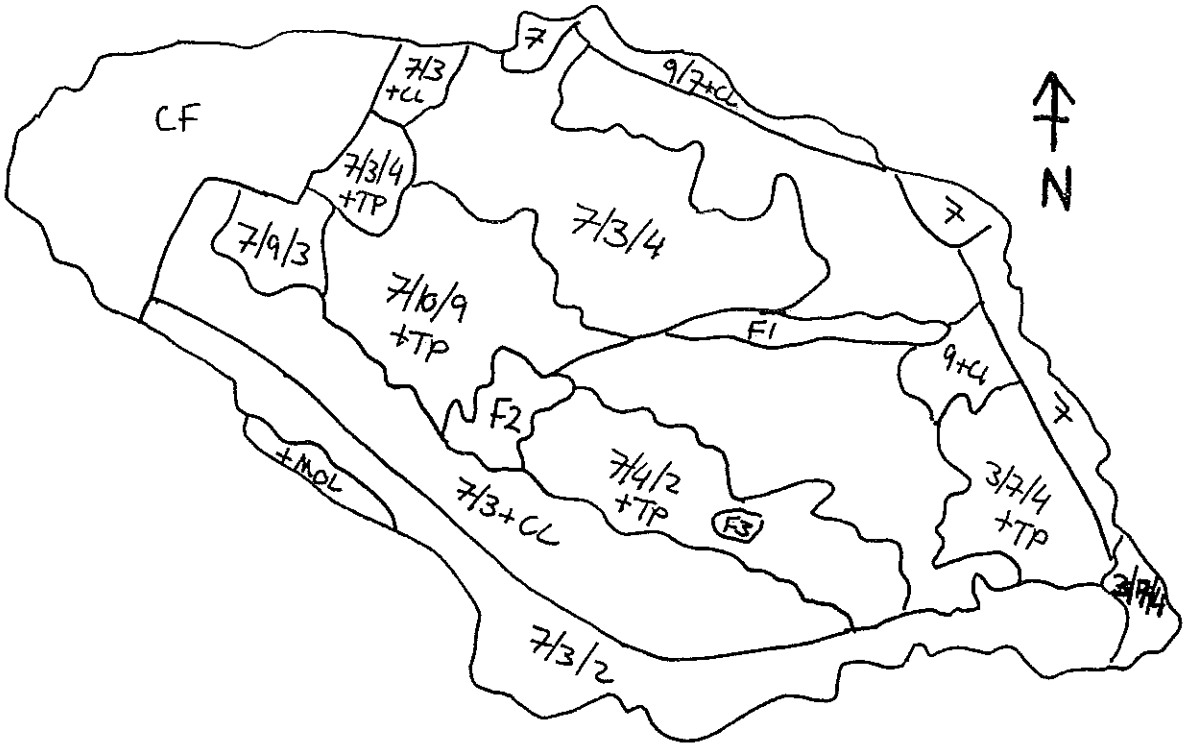
1. This site was surveyed because it was a bog that appeared to have extensive pool systems on the aerial photograph. It also looked like a extensive area of undisturbed high bog. There was very little active peat cutting evident.

2. There were some tear pool systems present but these were mainly associated with flushes. The dark patches on the aerial photograph turned out to be small *Myrica gale* flushes and not extensive pool systems. Although a lot of the bog was undisturbed, the area of the bog was very small with no central ecotope found.

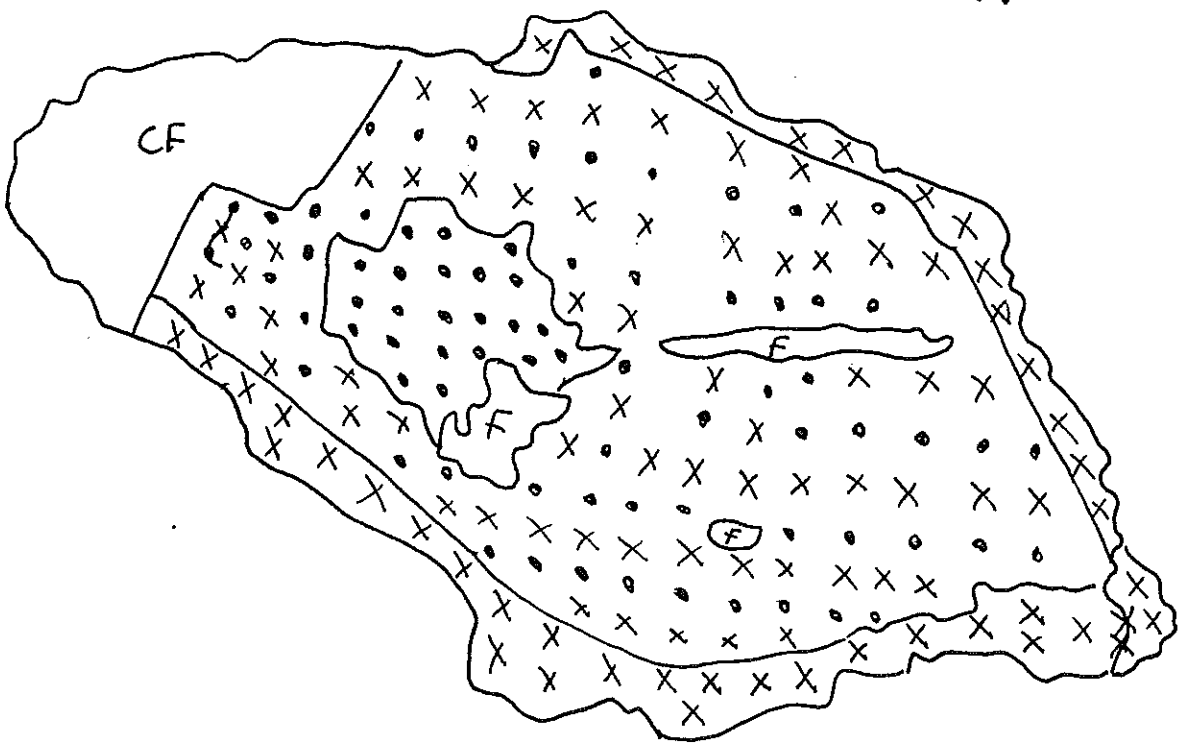
3. There was no active drainage on the bog but there was a large drainage system to the east of the site associated with old cutaway. All drains were old and in-filling and provide little potential for re-wetting on the high bog apart from the extreme easterly margin.

4. The only area of extensive level cutaway occurs in the south-east where it is active, backed by sloping agricultural land. This area and the wet woodland along the eastern margin, by the road are the most suitable areas for re-wetting. The remaining cutaway is reclaimed for agriculture or under coniferous plantations.

Ballygar bog (229)
Co. Galway
Vegetation complexes



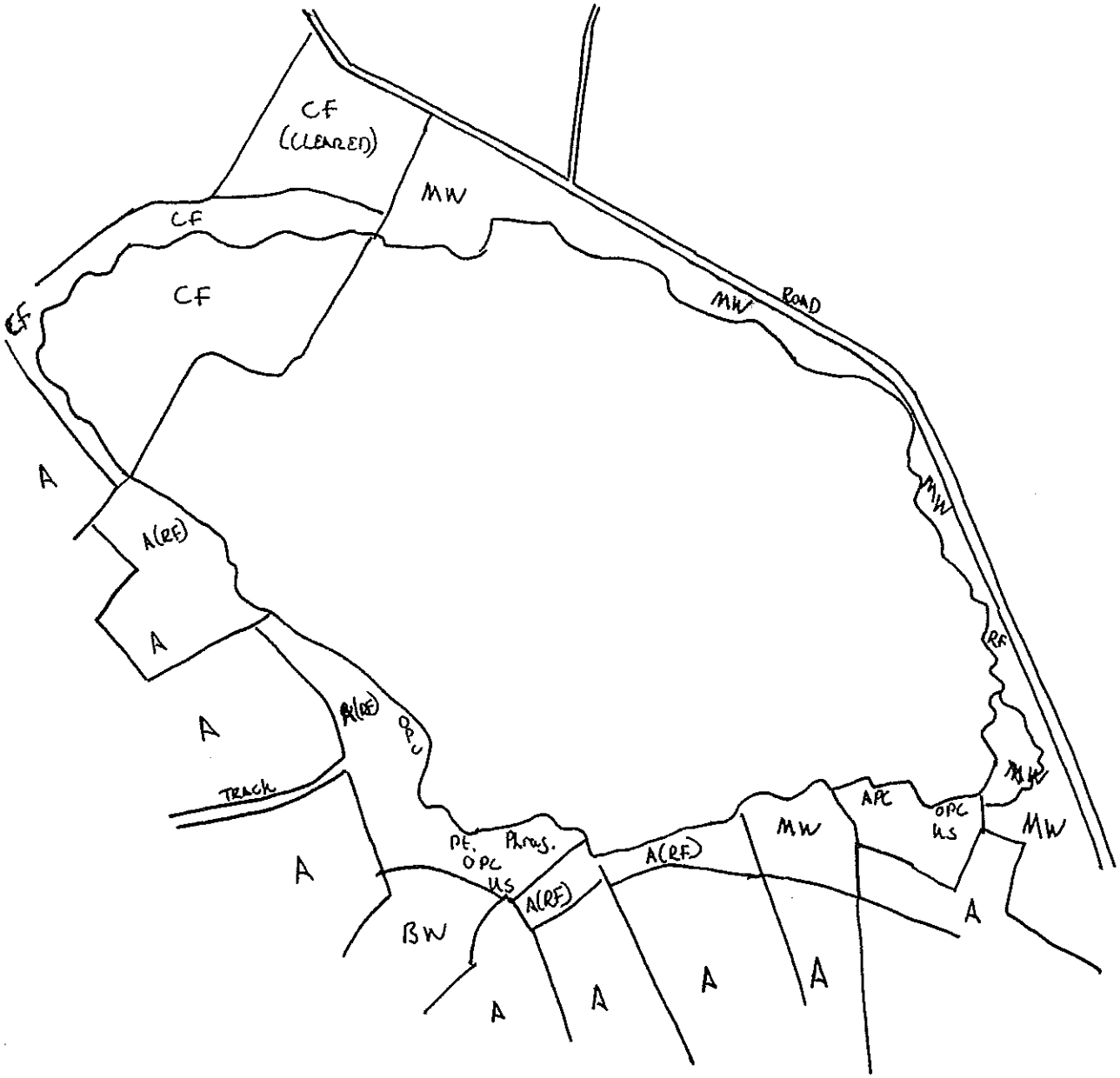
Ballygar bog (229)
Co. Galway
Ecotopes



Ballygar bog (229)
Co. Galway
Slopes

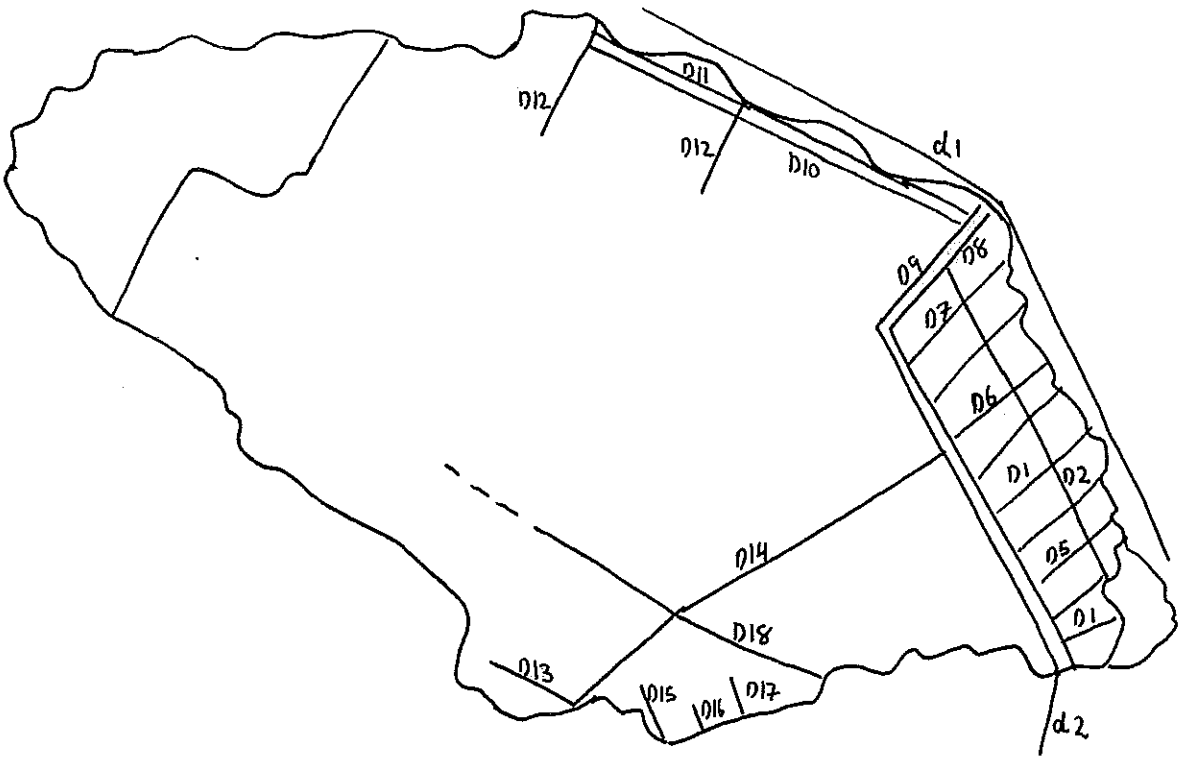
N

Ballygar bog (229)
Co. Galway
Landuse



Ballygar bog (229)
Co. Galway
Drainage

N



BALLYNAGRENIA BOG, CO. WESTMEATH

1. SUMMARY OF SITE DETAILS

NHA no.:	674	6" Sheet:	WH30 & 31
Grid Ref.:	N210 410	1:126,000 Sheet:	12
O.S.Aerial Photo ('95):	36 (7360)	1:50,000 Sheet:	48
Other Photo:	N576	High bog area (ha):	130.4
Date(s) of Visit:	19/1/2000		

Townlands: Ballynagrenia, Ballynagall, Ballydoogan, Clonthread, Ballinderry, Clooneen, Ballybroder.

2. INTRODUCTION

2.1 BACKGROUND

This site along with Ballinderry represent a large area of raised bog habitat in the midlands. The two bog were origionally one unit, but are now divided by cutaway.

The 1994 NHA survey describes this bog as wet and spongy with good *Sphagnum* cover. In 1998 new drainage and tracks were dug in advance of peat extraction. This has been stopped, but the new drains will cause damage to the bog.

2.2 LOCATION AND ACCESS

A large bog situated about 3km north-east of Moate. It can be accessed from a local road between Moate and Moyvoughly.

3. METEOROLOGY

No meteorological measurements have been made on this bog. Rainfall data from the nearby Moate (Coolatore) weather station for the years 1961-90, indicated that the area recieves appproximately 946mm of rainfall annually (R). The nearest synoptic station at Mullingar indicates that the site has up to 159 wet days annually. (Wet day is defined as a day when > 1mm of rainfall recieved).

Evapotranspiration measurements are only available for synoptic stations. With the large exposed areas on high bogs, actual evapotranspiration rates would probably be higher than at the nearest synoptic station. The effective rainfall (ER) rate for a site is the annual rainfall (R), less the actual evapotranspiration (AE). With only the potential evapotranspiration (PE) rate available for Mullingar of 455 the effective rainfall for the site is calculated as less than (R - PE) i.e. ER< 946 - 455 = 491mm. (See Fig. 1)

4. GEOMORPHOLOGY

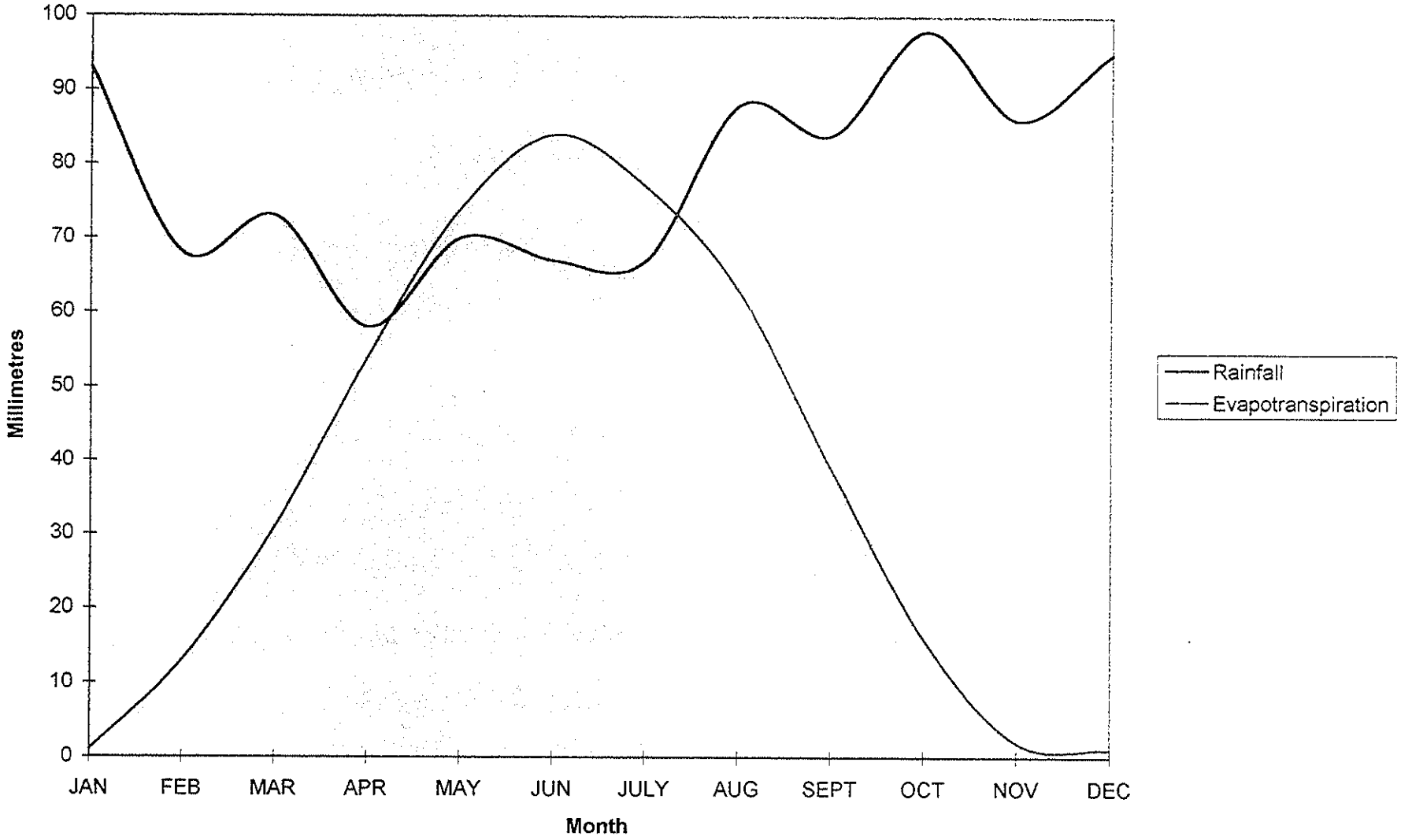
4.1 TOPOGRAPHY OF THE HIGH BOG

This is a large site with steep marginal slopes associated with cutaway and a few gradual internal slopes associated with a central depression.

4.1.1 Slopes of the High Bog

Slope 1: A series of gradual drains from the high bog to the margins (50cm/100m).

Ballynagrenia/Ballinderry



Slope 2: A series of steep marginal slopes to active cutaway (50cm/50m).

Slope 3: A marginal slope towards old cutaway (1m/50m).

Slope 4: A series of steep marginal slopes associated with cutaway (50cm/25m).

Slope 5: A series of internal slopes in a northerly direction (25cm/100m).

Slope 6: A series of internal slopes associated with the central depression (25cm/50m).

4.2 TOPOGRAPHY OF THE BOG MARGINS

Agricultural land slopes down to the bog on all sides. There is an esker ridge which separates Ballynagrenia Bog from the much lower Ballinderry Bog. Most of the cutaway that has not been reclaimed for agriculture is small in area and has slopes unsuitable for restoration work. There are two areas of extensive cutaway to the north-east and north-west of the bog which has suitable slopes for restoration work and are backed by higher agricultural land. The fact that a ridge is present between the two bogs indicates that these two bogs are always separated in the past.

5. HYDROLOGICAL SYSTEM

5.1 GEOLOGY/HYDROLOGY

5.1.1 Bedrock

This bog is underlain by Argillaceous Bioclastic limestone (ABL) according to the GSI/Chevron series maps.

5.1.2 Subsoils

No data was available for sub-soils for this site

5.1.3 Peat

The peat at this site was classified by Hammond as Man-Modified Type.

5.2 HYDROLOGY

5.2.1 High Bog Hydrology (see Drains map)

There has been extensive new drainage along the southern margin of Ballinagrenia bog. The drainage pattern indicates that further peat extraction is planned along this margin. Otherwise the high bog is relatively free of drains.

Drain D1: An in-filled drain which runs to the active cutaway. It is less than 0.5m wide and is completely in-filled with *Eriophorum angustifolium, Sphagnum magellanicum, Narthecium ossifragum* and *S. capillifolium*. It has closed-in further into the bog and is indistinguishable from the rest of the vegetation.

Drain D2: A narrow in-filled drain which runs from the old cutaway. It is 0.5m wide and in-filled with *Molinia caerulea, Erica tetralix* and *Narthecium ossifragum*.

Drain D3: An old in-filling drain across the centre of the bog. It follows the line of a townland boundary on the 6" map. It is 1m wide and water-filled, with *Sphagnum cuspidatum*. It is in-filling from the sides with *Eriophorum vaginatum, Narthecium ossifragum* and *S. capillifolium*. At the eastern end the drain connects with long tear pools. It is on a slope to the bog margin and the water flow is in this direction. It is 0.5m wide here and containing some *S. cuspidatum*. The drain is in-filling from the sides with *Calluna vulgaris* and *Eriophorum vaginatum*.

Drain D4: A newly excavated drain which runs south from D3 and then turns to the west (R4, P5-P8). It is 1m wide and 1m deep with 10cm of water. There are fresh spoil heaps beside this new drain. Further west this drain is 2m wide and 2m deep with fast flowing water towards D5.

Drain D5: An old in-filled drain at the corner of D4. Water flows out of D4 into this drain and out of the bog. It is 0.5m deep and in-filled with *Calluna vulgaris, Sphagnum capillifolium* and *Narthecium ossifragum.*

Drain D6: A terminal drain to D7 drains which links these to D4. It is 1m wide and 1.5m deep with 20cm of water flowing into D4. This drain has been recently excavated with fresh spoil heaps present.

Drains D7: A series of recently excavated drains, 1m wide and 1m deep dug 10m apart (R4, P7; P9 & P10). There is 10cm of water flowing out of these drains into D6. A line of yellow stakes marks the line of the innermost drain. More stakes are visible further into the bog possibly indicating further drainage planned.

Drain D8: More recently excavated drains running parallel to D7 but extending further west (R9, P11 & P12). One of these joins up with the old drain D11.

Drain D9: An old drain in-filled with *Molinia caerulea* on the high bog margin.

Drain D10: An old in-filled drain running alongside D11 to D12. It is 1m wide and filled with *Sphagnum capillifolium, Eriophorum vaginatum* and *Erica tetralix*. There is some *Sphagnum cuspidatum* in places.

Drain D11: An in-filled drain running from D8 to D12. It is 0.5m wide and in-filled with *Sphagnum cuspidatum, S capillifolium, Erica tetralix, Narthecium ossifragum* and *Calluna vulgaris.*

Drain D12: A recently deepened drain which runs from the new trackway into the bog. It is 1.5m wide and 1.5m deep with a slight flow of water at its base. This drain becomes narrower past D11.

Drains D13: A series of water-filled drains, which run into d1. They are 0.5m wide, lined with *Calluna vulgaris* and in-filling with *Sphagnum magellanicum* and *S. papillosum.*

5.2.2 Bog Margin Hydrology

There is some drainage along the margin of the bog associated with peat extraction.

Drain d1: A small narrow drain with flowing water by track to the west of the bog. It flows northwards and is bordered by *Calluna vulgaris.*

Drain d2: A recently cleared drain, 1m wide with high peat mounds on either side. Active peat cutting occurs here.

Drains d3: A series of *Juncus effusus*-filled drains in old cutaway. They are 1m wide with *Ulex europaeus* growing along the margins.

Drain d4: A deep drain in active cutaway. It is 2m wide and 1m deep with a slight flow to the east. Seen on 6" map.

Drain d5: A deep drain recently excavated as part of the new track construction. It is 3m wide and 4m deep, reaching the marl substrate. There is very little water present.

5.3 GEOHYDROLOGICAL OVERVIEW

Description of both Ballynagrenia and Ballinderry bogs in the 19th century
These two bogs were originally part of one large complex. They were bordered by mineral soil and numerous mineral ridges. The two bogs were linked by a narrow section between two esker ridges and the peat was probably shallow here.

Description of the present-day bogs
The bogs are now separated by a narrow section of completely cutaway bog with mineral ridges and Betula scrub. Ballinderry bog is much lower than Ballynagrenia with the cutaway sloping towards Ballinderry. There could be some potential of utilising drainage outflow from Ballynagrenia to re-flood this region.

There has been extensive peat cutting on Ballinderry bog, with large areas to the south cutaway. Most of this cutaway has been reclaimed for agriculture, but a section of active cutaway occurs to the south-east between the reclaimed fields and the high bog. This area slopes away from the face-bank and is unsuitable for restoration work. There is a small area of level cutaway to the south adjoining reclaimed fields.

A road runs to the west of the intact bog. Between the road and the high bog there is level cutaway dominated by *Betula* and *Ulex europaeus* scrub. There is reclaimed agriculture grassland to the north-west. The northern cutaway slopes from an esker ridge to the bog and may be suitable for the creation of a lagg zone.

Ballinderry Bog is more intact than Ballinderry, with very little cutaway to the north and south. There has been extensive cutaway to the west, between the high bog and the road. There are ridges here and a lot of the cutaway has been reclaimed for agriculture. An esker ridge that was an outcrop on the bog is now in reclaimed fields. There is an area of level cutaway to the north-west, with slopes from the trackway. This would be suitable for restoration work.

To the north there is a narrow margin of cutaway between the high bog and the sloping mineral soil. This area could be restored to a lagg zone using runoff from the bog and the mineral soil. To the north-east there is an extensive area of level cutaway, dominated by *Molinia caerulea*. The agricultural land is undulating and there has been some agricultural restoration.

The extensive area of cutaway to the east is dominated by *Molinia caerulea* and *U. europaeus* scrub and slopes towards the cut-face. This area would not be suitable for restoration work.

Along the southern boundary to Ballynagrenia, there is a mineral ridge sloping down to the bog. There is a narrow margin of Molinia dominated cutaway between the high bog and the slope. This area could be suitable for the creation of a lagg zone. However extensive drainage work and trackway construction has occurred along this margin.

6. VEGETATION

6.1 VEGETATION SUMMARY

There is no central ecotope found on this bog, however, a large area of sub-central vegetation is located around the central depression. There are two small dry flushes, one is *Calluna vulgaris*-dominated and the other is dominated by *Pteridium aquilinum*.

6.2 DETAILED VEGETATION OF HIGH BOG

6.2.1 Complexes

Marginal Complexes

Complex 1

Tall *Calluna vulgaris*-dominated vegetation typical of the face-banks. This occurs in isolated patches on the cut-face.

Complex 2

Trichophorum caespitosum-dominated slopes down to the margins all around the bog. The vegetation is co-dominated by *T. caespitosum* (40%)/ *Erica tetralix* (20%)/ *Calluna vulgaris* (20%). *Narthecium ossifragum* (15%) is prominent and the ground is hard. *Sphagnum* cover (10%) is not good. The occasional hollows are filled with *Sphagnum cuspidatum* and patches of *S. capillifolium, S. papillosum,* and *S. magellanicum*. There is some *Eriophorum angustifolium* (+) with small patches of *Cladonia portentosa* (+).

Complex 2/7

The vegetation is co-dominated by *Trichophorum caespitosum* (30%)/ *Calluna vulgaris* and *Erica tetralix* (30%)/ *Narthecium ossifragum* (30%) with prominent *Carex panicea* (20%). *Sphagnum* cover has decreased to 10-15%.

Complex 2/7 - burnt

This vegetation is similar to that described for Complex 2/7 above but the more extensive area has been burnt within the past 2 years. There is 70% vegetation cover with 40% covered by *Trichophorum caespitosum* tussocks and 30% cover by young <10cm *Calluna vulgaris*. *Campylopus introflexus* and young *Cladonia* species make up 10%. The ground is very hard and black, burnt since the 1995 aerial photograph which seems to show a previous burn in this area. The ground is uneven with dead moss hummocks.

Complex 3/7/2

The vegetation is co-dominated by *Carex panicea* (30%)/ *Calluna vulgaris* (30%)/ *Trichophorum caespitosum* (20%). In the west by the drain d1, there is a very narrow band of low (40cm) face-bank *Calluna vulgaris* around the drain and this also has plenty of *Cladonia portentosa*. There is a low cover of *Narthecium ossifragum* (5%). There is plenty of bare ground (20%) with *Cladonia floerkeana* and *Campylopus introflexus*. In the west this vegetation leads onto Complex 10/7/3 B with hummocks of *Sphagnum capillifolium* and *S. papillosum* becoming common.

Complex 7 - burnt

This area has hard, uneven ground indicative of a previous burn. The *Calluna vulgaris* (60%) and *Erica tetralix* (15%) grow to 20cm in some places but the ground is hard with notable *Campylopus introflexus*. There are also notable amounts of *Trichophorum caespitosum* (15%) and *Eriophorum vaginatum* (25%). A few of the hollows contain *Sphagnum cuspidatum* and standing water.

Complex 7/6 - burnt

Calluna vulgaris dominates vegetation on a slight slope which has been burnt. *Calluna vulgaris* covers about 60% but *Narthecium ossifragum* covers about 30% with *Sphagnum* covering 15% and *Carex panicea* about 10%. *Erica tetralix* (15%) is prominent. *Sphagnum* is mostly *S. magellanicum* with *S. capillifolium* and *S. papillosum*. There are also small patches of *Cladonia portentosa* (5%).

Complex 7/9 + Drains

At the southern margin, there are extensive new drains. The vegetation is co-dominated by *Calluna vulgaris* and *Eriophorium vaginatum*. The new drains have led to the drying out of the bog surface and there are numerous dead *Sphagnum* hummocks and bare peat patches. There are large fresh spoil heaps beside the new drains

Sub-Marginal Complexes

Complex 10/7/3 - burnt
The first narrow band of vegetation Complex 3/7/2 quickly changes to complex 10/7/3 B. This area has been burnt as evidenced by blackened *Calluna vulgaris* branches. It is quite wet underfoot and *Sphagnum* is prominent (40%) - *S. capillifolium, S. magellanicum* and *S. papillosum. Hypnum jutlandicum* and *Campylopus introflexus* are also present. There is no acrotelm apart from the low *Sphagnum* carpets. The vegetation is co-dominated by *Carex panicea* (30%)/ *Sphagna* (40%)/ *Calluna vulgaris* (30%). *Eriophorum vaginatum* and *E. angustifolium* together compose another 30%. There are remnants of former pools now filling in with *S. cuspidatum, Calluna vulgaris* and *Eriophorum angustifolium.* The area is making a very good recovery from a fire and it is difficult to determine when the fire occurred. There is no sign of the burn on the aerial photograph of 1995 and yet the *Calluna vulgaris* appears to be about 5 years old. *Erica tetralix* (15%), *Narthecium ossifragum* (10%) and *Trichophorum caespitosum* (15%) are notable through the vegetation. *Andromeda polifolia* and *Drosera rotundifolia* are noted growing through the *Sphagnum.* In the west there is a Caterpillar machine trail going through the vegetation towards the centre. Also a thin margin of this vegetation occurs on a slope in the north-east.

Complex 10/7/9 - burnt (ii)
In the west, moving in from Complex 10/7/3B *Carex panicea* gives way in co-dominance to *Eriophorum vaginatum.* The dominant vegetation composition is *Sphagnum* (40%)/ *Calluna vulgaris* (30%)/ *Eriophorum vaginatum* (30%). *Trichophorum caespitosum* (15%) is still prominent as the occasional tussock. *Sphagnum magellanicum* is dominant with *S. capillifolium* and *S. papillosum* and *S. fuscum* is also present. *Narthecium ossifragum* (15%) is prominent in hollows with notable *Erica tetralix* (15%) through the vegetation. *Carex panicea* (5%) occurs but is not prominent. The ground bared by fire is colonized by *Campylopus introflexus* which is growing on dead moss hummocks. This vegetation occurs at the top of the slope, between the marginal areas and the sub-central area 10/7/9 b(i) which is similar in composition, but has a greater *Sphagnum* cover.

Complex 10/7/9 - burnt + tear pools
Similar vegetation to that described above for Complex 10/7/9 - burnt (2) but there are frequent tear pools here. These pools are associated with the slope to the margin. Many are algal and seem to be drying-out. Many contain *Sphagnum cuspidatum* and *Drosera anglica.* The *Sphagnum* cover is restricted to the margins of these pools.

Sub-Central Complexes

Complex 10/7/9 - burnt (I)+ Pools
The same vegetation as Complex 10/7/9 - burnt (2) but Sphagnum cover has increased to 60% and the area is interspersed with scattered, big pools. All pools contain *Drosera anglica* and *Menyanthes trifoliata.* All pools are bordered by *Sphagnum capillifolium, S. papillosum* with some *Rhynchospora alba.* Some pools are almost completely in-filled with *S. cuspidatum, Rhynchospora alba* and *Eriophorum angustifolium. S. fuscum* occurs around a few pools which are becoming increasingly more in-filled and algal towards the margins. The bog is quaking slightly here. The ground is very wet underfoot with a variable acrotelm (0-10cm) which is good in most places. *Cladonia portentosa* (10%) occurs in some parts.

Complex 10/7/9
A very nice area that does not appear to have been burnt. The vegetation is co-dominated by *Sphagnum* (60%)/ *Calluna vulgaris* (40%)/ *Eriophorum vaginatum* (30%). A good acrotelm of 5cm everywhere. Epiphytic lichens are found on *Calluna vulgaris.* There are small patches of *Cladonia portentosa* (+). There are many hollows of standing water, filling with *Narthecium ossifragum* and *S. cuspidatum. S. magellanicum, S. capillifolium* and *S. papillosum* occur on the drier parts. *N. ossifragum* (15%) is very prominent and *Eriophorum angustifolium* (5%) and *Erica tetralix* (5%) are notable. Flush F1 occurs at the centre of this vegetation complex.

Complex 7/10 - burnt
Calluna vulgaris (50%) is co-dominant with *Sphagnum* (50%), with *Eriophorum vaginatum* (20%), *Trichophorum caespitosum* (15%) and *Carex panicea* (15%) all prominent. *Erica tetralix* (10%) is notable and there is sparse *Narthecium ossifragum* (+) with some *Cladonia portentosa*. The *Sphagnum* cover consists of hummocks of *S. capillifolium, S. papillosum, S. fuscum* and *S. magellanicum*. The ground is soft with an acrotelm of 0-5cm. There are occasional patches of dried-out hummocks with *Leucobryum glaucum* and *Hypnum jutlandicum* colonizing. *Cladonia portentosa, C. floerkeana, C. pyxidata* and *Andromeda polifolia*. Some hollows feature *Rhynchospora alba* and *Narthecium ossifragum*.

Complex 10/14 - burnt
An area of frequent pools with up to 90% *Sphagnum* cover with *S. capillifolium* and *S. papillosum*. This area appears white on the aerial photograph indicating a burn. The area is so wet, that it has recovered well with the only noticeable burn evidence being the low cover of *Calluna vulgaris*. There are frequent pools, all of which are small and mostly in-filled with *Sphagnum cuspidatum* and *Narthecium ossifragum*. The vegetation is co-dominated by *Sphagnum* (80%)/ *Erica tetralix* (20%)/ *Eriophorum vaginatum* (30%)/ *Trichophorum caespitosum* (20%). *Narthecium ossifragum* (20%) and *Calluna vulgaris* (15%) are prominent.

Central Complexes

There were no central complexes found on this bog.

6.2.2 Flushes and Soaks

Flush F1
A mound of face-bank type *Calluna vulgaris* (1.5m tall) with carpets of *Hypnum jutlandicum* underneath. This mound is situated in a central depression in the middle of Complex 10/7/9. There is probably some kind of up-welling as there are a few patches of *Phragmites australis*. All around the mound there is profuse *Cladonia portentosa* with *Calluna vulgaris* and *Eriophorum angustifolium* but the ground is quite hard with no acrotelm.

Flush F2
The ground is very hard and dry underfoot. The vegetation is co-dominated by *Calluna vulgaris* (60%)/ *Eriophorum vaginatum* (40%). There are also prominent *Trichophorum caespitosum* (15%) tussocks. *Erica tetralix* (10%) is prominent but moss cover is at a minimum on the bare, hard burnt ground with just small clumps of *Campylopus introflexus* and *Cladonia floerkeana*. *Eriophorum vaginatum* is growing in tussock form on top of pronounced peat hags. The ground gets wetter approaching the *Pteridium aquilinum* patch described below.

An area immediately west of the *Calluna vulgaris*-dominated area above. This small area is 100% covered in *Pteridium aquilinum* (R4, P14). The Caterpillar machine has driven over most of it, flattening the vegetation *en route* to the drains. *P. aquilinum* is surrounded by *Calluna vulgaris* (40%)/ *Trichophorum caespitosum* (40%) /*Campylopus introflexus* (10%) growing over the burnt area. Good *Calluna vulgaris* and *Erica tetralix* growth is interspersed with pronounced *T. caespitosum* tussocks. *Cladonia floerkeana* (10%) grows on the hard ground.

6.3 DETAILED VEGETATION OF THE BOG MARGINS

The old cutaway to the west and east of Ballynagrenia Bog is dominated by *Molinia caerulea* and *Ulex europaeus* scrub. There is some dense patches of *Pteridium aquilinum* alongside the track to the west. To the north there is some agricultural reclamation and *Betula pubescens* scrub. To the south, the bog is bordered by an esker which separates this bog from Ballinderry Bog. It is mainly agricultural grassland with some *Betula pubescens* wood at its margin. A thin margin of *Molinia caerulea* and *Ulex europaeus* scrub occurs between the bog and this esker.

7. BOG TYPE

This is probably a basin bog.

8. HUMAN IMPACT

8.1 RECENT HUMAN IMPACT (see Landuse map)

8.1.1 Peat Cutting

There is active peat cutting to the north-west and east of the bog and the extensive drainage along with a new track to the south indicates that further peat extraction is planned.

8.1.2 Forestry

There is no forestry associated with this bog.

8.1.3 Fire History

Most of the bog has been extensively burnt a number of times in the recent past.

8.1.4 Dumping

There is some dumping noted along tracks to the west and east of the bog.

8.1.5 Agriculture

There has been agricultural reclamation of cutaway to the west and north of the bog for grazing.

8.2 NHA BOUNDARY CHANGES

No changes to the NHA boundary of this site are needed

9. INTER-RELATIONSHIPS OF VEGETATION, HYDROLOGY, TOPOGRAPHY AND LOCATION

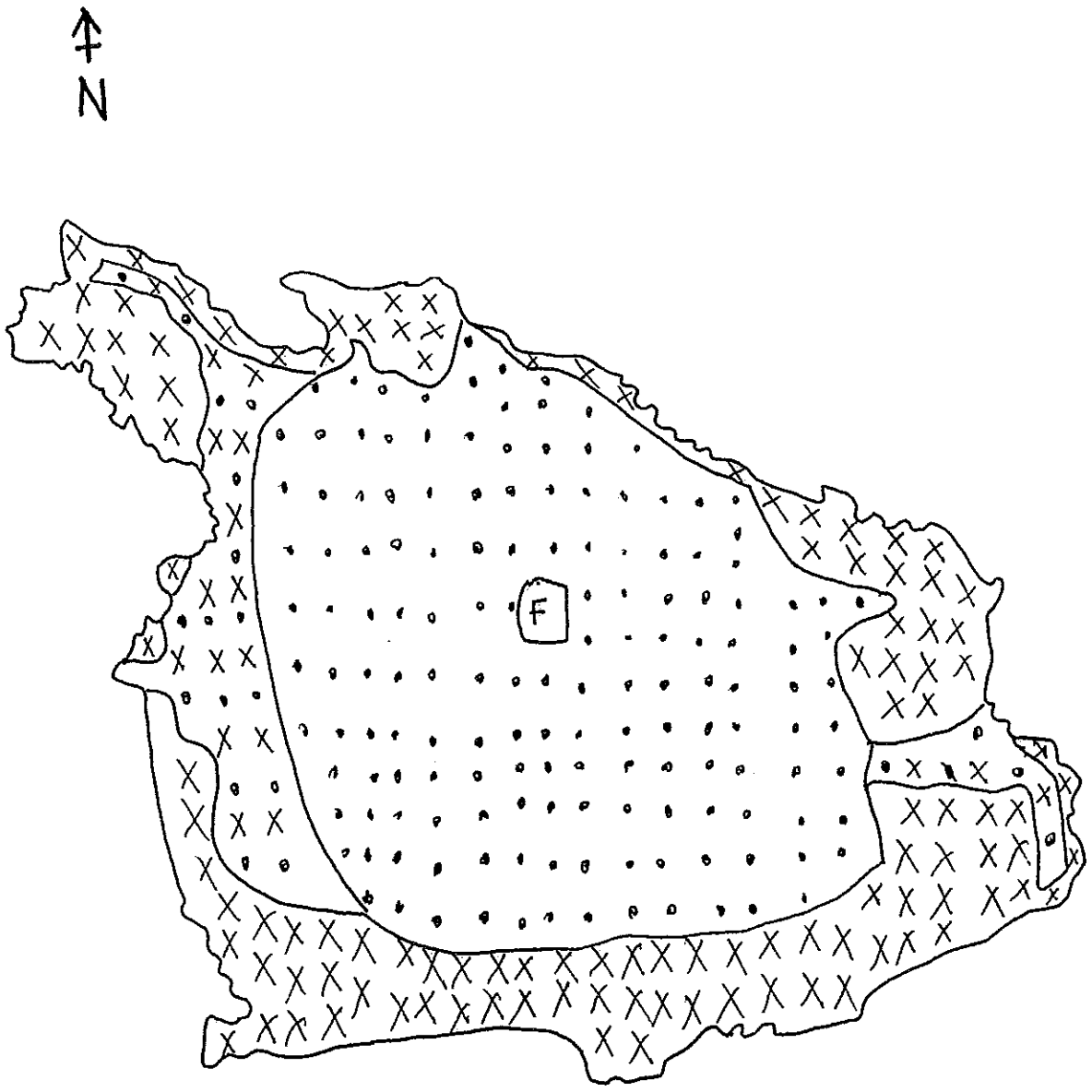
1. This site was visited because it was a large area of high bog apparently unaffected by drainage. Also there was smaller, adjacent bog, Ballinderry Bog.

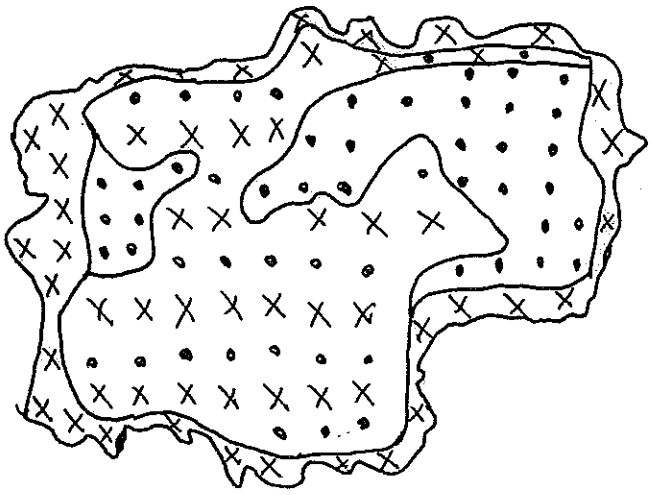
2. This visit confirmed that a large area was unaffected by drainage but had been extensively burnt.

3. New drainage had been very recently excavated in the southern region of the bog indicating planned peat extraction.

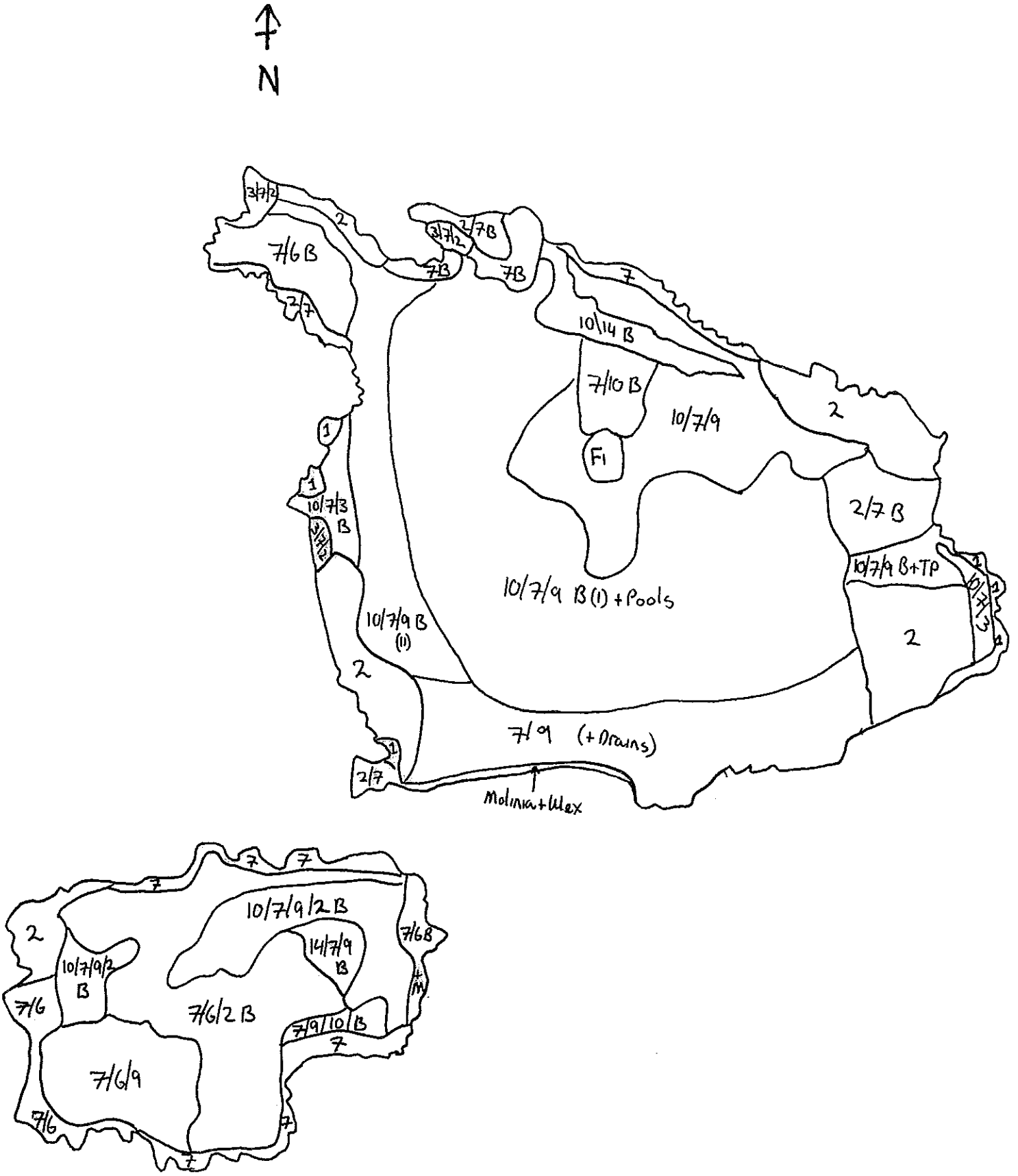
4. Most of the cutaway that has not been reclaimed for agriculture is small in area and has slopes unsuitable for restoration work. There are two areas of extensive cutaway to the north-east and north-west of the bog which have suitable slopes for restoration work and are backed by higher agricultural land. There is a mineral ridge separating this bog form Ballinderry bog. The fact that a ridge is present between the two bogs indicates that these two bogs were always separated in the past.

Ballynagrenia & Ballinderry bogs
Co. Westmeath
Ecotopes

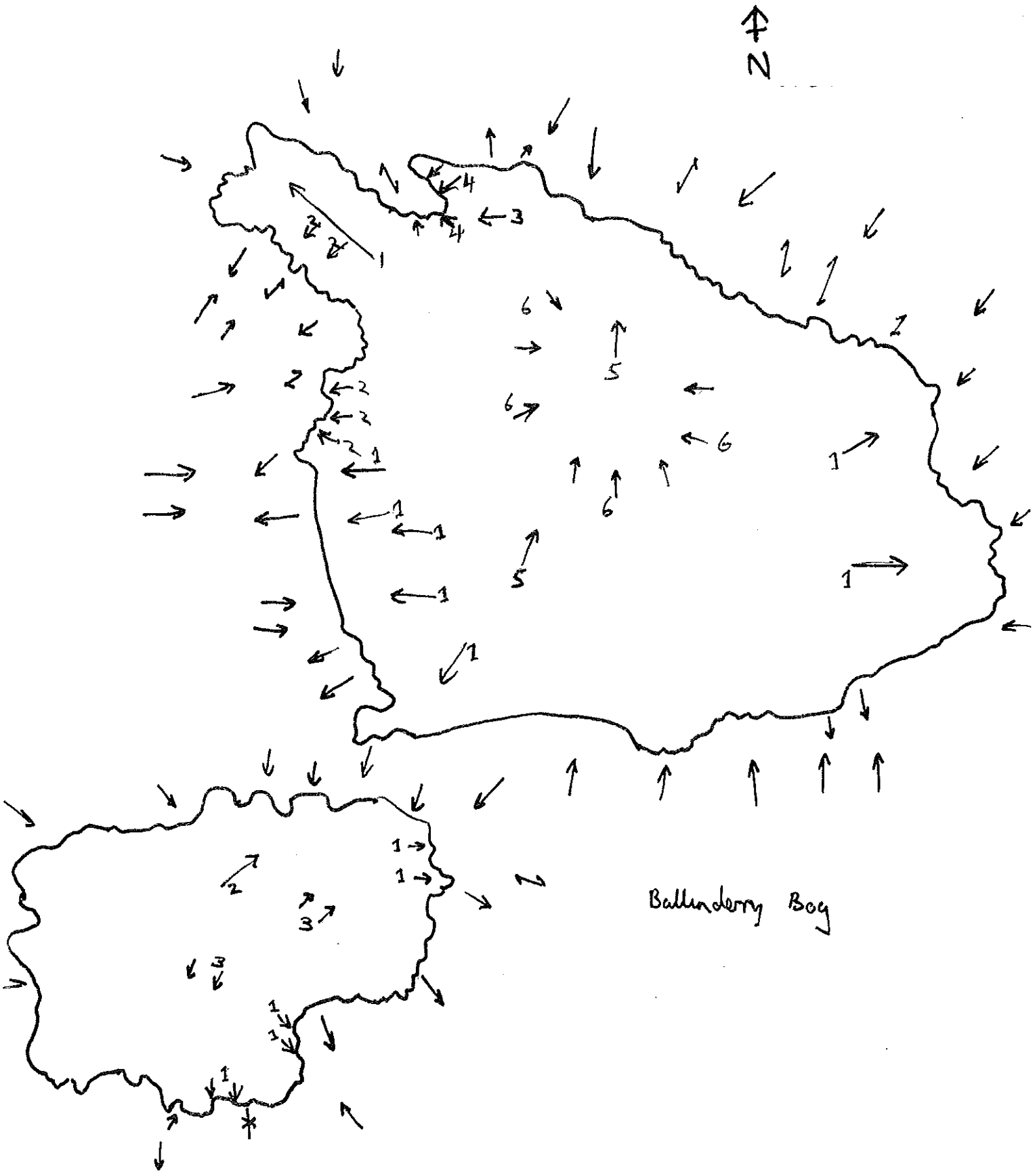




Ballynagrenia & Ballinderry bogs
Co. Westmeath
Vegetation complexes

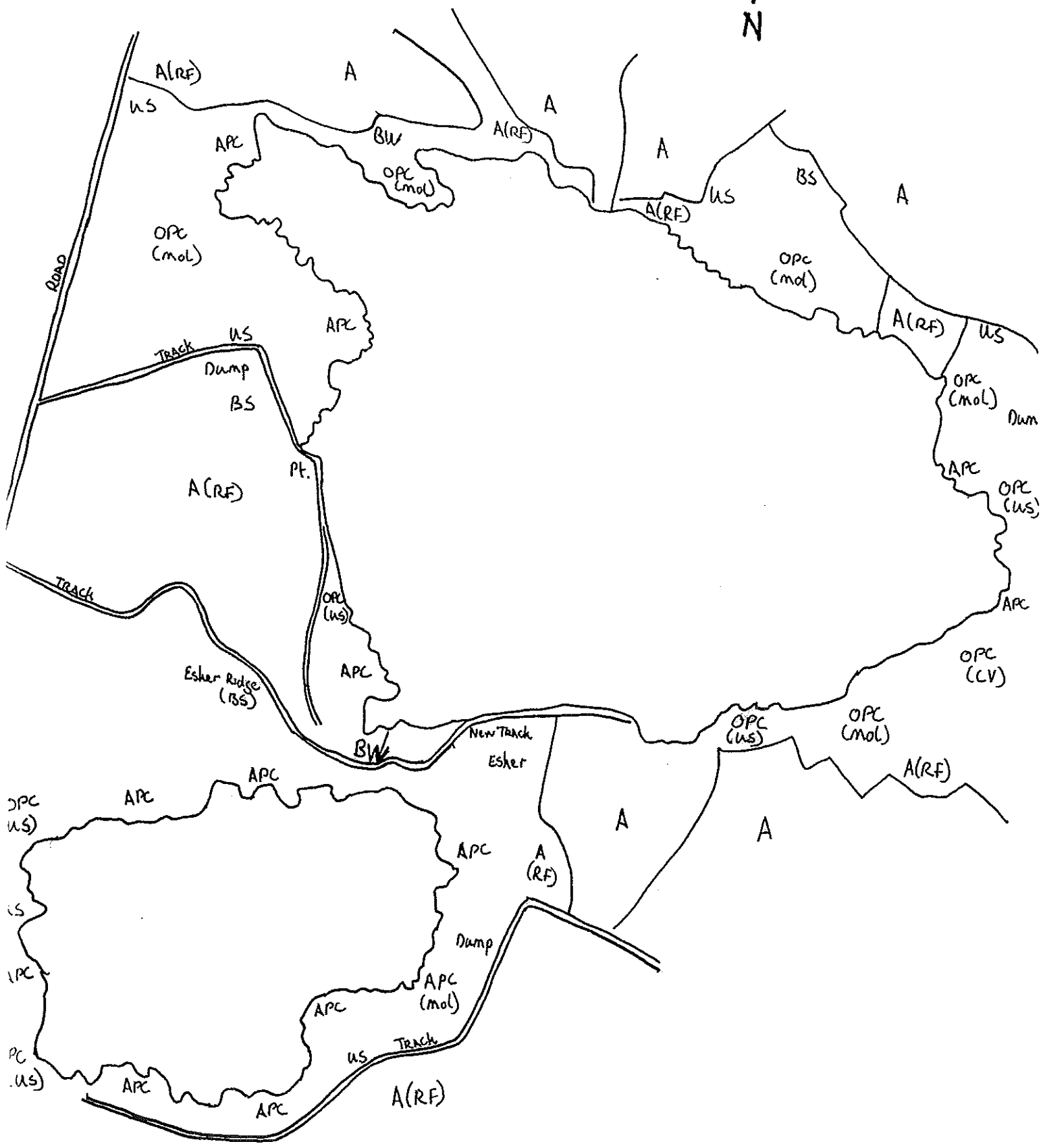


Ballynagrenia & Ballinderry bogs
Co. Westmeath
Slopes



Ballynagrenia & Ballinderry bogs
Co. Westmeath
Drainage

Ballynagrenia & Ballinderry bogs
Co. Westmeath
Landuse



BALLINDERRY BOG, CO. WESTMEATH

1. SUMMARY OF SITE DETAILS

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G.S.I. Aerial Photo:	36 (7360)	1:50,000 Sheet:	48
Other Photo:		High bog area (ha):	43.7
Date(s) of Visit:	20/1/2000		

Townlands: Ballinderry, Clooneen, Clonthread.

2. INTRODUCTION

2.1 BACKGROUND

This site along with Ballingrenia represent a large area of relatively undisturbed raised bog and so was selected for this survey. These two bogs were origionally one intact unit which has been divided by cutaway. There appears to be active peat cutting around this bog.

The 1994 NHA survey found that this small bog was damaged by fire, but unaffected by drainage.

2.2 LOCATION AND ACCESS

A small bog located 2km north-east of Moate and in close proximity to Ballynagrenia Bog. It can be accessed from bog tracks off the local road between Moate and Rosemount.

3. METEOROLOGY

No meteorological measurements have been made on this bog. Rainfall data from the nearby Moate (Coolatore) weather station for the years 1961-90, indicated that the area recieves appproximately 946mm of rainfall annually (R). The nearest synoptic station at Mullingar indicates that the site has up to 159 wet days annually. (Wet day is defined as a day when > 1mm of rainfall recieved).

Evapotranspiration measurements are only available for synoptic stations. With the large exposed areas on high bogs, actual evapotranspiration rates would probably be higher than at the nearest synoptic station. The effective rainfall (ER) rate for a site is the annual rainfall (R), less the actual evapotranspiration (AE). With only the potential evapotranspiration (PE) rate available for Mulingar of 455 the effective rainfall for the site is calculated as less than (R - PE) i.e. ER< 946 - 455 = 491mm.
(See Fig. 1)

4. GEOMORPHOLOGY

4.1 TOPOGRAPHY OF THE HIGH BOG

This is a small flat bog with some short internal slopes and slopes associated with cutaway. This bog is much lower than Ballynagrenia Bog to the north-east (R4, P18).

4.1.1 Slopes of the High Bog

Slope 1= A series of marginal slopes associated with active peat cutting (25cm/50m).

Slope 2 = A gradual slope to the north-east across the high bog (50cm/100m).

Slope 3 = A series of short, internal slopes across the high bog (25cm/50m).

4.2 TOPOGRAPHY OF THE BOG MARGINS

To the north of this bog, there are slopes off the esker ridge towards the cutaway. To the south-east the cutaway slopes away form the bog towards reclaimed agricultural land. The only area of level cutaway occurs to the west and south of this bog.

5. HYDROLOGICAL SYSTEM

5.1 GEOLOGY/HYDROLOGY

5.1.1 Bedrock

The site is underlain by Argillaceous bioclastic limestone (ABL).

5.1.2 Subsoils

No data was available for sub-soils for this site

5.1.3 Peat

The peat at this site was classified by Hammond as a mix of Man-Modified and True Midland Types.

5.2 HYDROLOGY

5.2.1 High Bog Hydrology (see Drains map)

Ballinderry bog has only one in-filled drain on the high bog, marking a townland boundary.

Drain D1: A wide in-filled drain running across the bog along a townland boundary. It is 1.5m wide and in-filled with *Calluna vulgaris, Eriophorum vaginatum* and *Sphagnum cuspidatum*. At its northern end this drain is 1m wide, water-filled with *S. cuspidatum*. It is in-filling from the margins with *C. vulgaris, Narthecium ossifragum* and *S. capillifolium*.

5.2.2 Bog Margin Hydrology

Drainage on the bog margin is associated with peat cutting.

Drain d1: A deep, wide drain running through active cutaway on the bog, linking up with the southern trackway. It is 2m wide and 2m deep with 1m of water. It is lined with *Ulex europaeus, Betula pubescens* and *Molinia caerulea* with some *Typha latifola* in places.

Drain d2: A series of drains which run from the cut-face to d1. They are 1.5m wide and water-filled. Some *Juncus effusus* and *Potomogeton* spp. are growing in them and they are lined with *Betula pubescens, Molinia caerulea* and *Ulex europaeus*.

Drain d3: A series of drains on active cutaway, running from the cut-face to d1 at the track. These are 0.5m wide and are lined with *Ulex europaeus*. There is some water at their bases. These drains have been extended into the high bog for 10m where active cutting occurred.

6. VEGETATION

6.1 VEGETATION SUMMARY

No central ecotope occurs on this bog, but there are two relatively large areas of sub-central ecotope vegetation.

6.2 DETAILED VEGETATION OF HIGH BOG

6.2.1 Complexes

Marginal Complexes

Complex 7
A small area dominated by *Calluna vulgaris* close to the face-bank.

Complex 7/6 - burnt + *Myrica gale*
A well-drained area which leads to the bog margin. The vegetation is co-dominated by *Calluna vulgaris* (50%) and *Narthecium ossifragum* (50%). *Myrica gale* (20%) occurs in prominent patches. There is plenty of *Campylopus introflexus* (5%) on bare ground. There is some *Sphagnum* (10%) cover but it appears to be drying out with many dead hummocks. *Erica tetralix* (15%) and *Eriophorum angustifolium* (10%) are prominent. The bog appears quite flat and there is no acrotelm in this area. *Trichophorum caespitosum* (5%) and *Carex panicea* (5%) are noted with occasional *Andromeda polifolia* (+). There is low cover of *Sphagnum capillifolium* and *S. papillosum* with a few areas of standing water where *S. cuspidatum* is found.

Complex 7/6
A marginal complex to the south-west which is similar to the one described above with the absence of *Myrica gale*. The ground is dry and hard but there is no evidence of burning.

Complex 2
A *Trichophorum caespitosum*-dominated marginal area sloping to the cutaway. *Calluna vulgaris* and *Narthecium ossifragum* are also present.

Sub-Marginal Complexes

Complex 7/6/2 - burnt
The vegetation is similar to Complex 7/6 B + *Myrica gale* but *M. gale* is absent and *Trichophorum caespitosum* (20%) is more prominent. The vegetation is still co-dominated by *Narthecium ossifragum* and *Calluna vulgaris* but *Eriophorum vaginatum* has disappeared. There is no acrotelm apart from a few *Sphagnum* (10%) patches of *S. capillifolium, S. papillosum* and *S. magellanicum* with occasional *S. cuspidatum* in the standing water. *Carex panicea* (10%) is prominent with occasional *Andromeda polifolia* (+). *Campylopus introflexus, Cladonia floerkeana* and *Cladonia pyxidata* occur on bare ground with some *Hypnum jutlandicum* on dry spots. There are also several areas of standing water after recent heavy rain.

Sub-Central Complexes

Complex 7/9/10 - burnt
Calluna vulgaris and *Erica tetralix* are more robust in this area.. *Eriophorum vaginatum* (40%) is co-dominant. The *Sphagnum* cover (40%) is quite good with *S. magellanicum, S. capillifolium* and *S. papillosum*. *Narthecium ossifragum* is prominent with *Eriophorum angustifolium*. There are occasional occurrences of *Andromeda polifolia*. This area has been burnt with plenty of dead *Sphagnum* hummocks indicating a good hummock/hollow system prior to the burn. The mosses *Campylopus introflexus, Hypnum jutlandicum* (+) and *Aulacomnium palustre* (+) are all present.

Complex 10/7/9/2 - burnt
Further into the bog it becomes wetter and there is higher *Sphagnum* cover (70%). *Calluna vulgaris* and *Erica tetralix* together make up 40% cover and *Eriophorum vaginatum* (35%) is prominent. *Trichophorum caespitosum* (20%) tussocks are also prominent. *Narthecium ossifragum* (10%), *Eriophorum angustifolium* (10%) and *Carex panicea* (5%) are also present. *Sphagnum* species are *S. capillifolium, S. magellanicum, S. papillosum* and occasional *S. fuscum* and *S. cuspidatum* in the water. The acrotelm is very good reaching 10cm in places. *Drosera rotundifolia* (+) is noted coming up through the *Sphagnum*. In this area there are two rings of *Myrica gale*, within which *Polytrichum juniperinum* grows on burnt hummocks. Also the *Calluna vulgaris* plants are much taller than the surrounding *C. vulgaris* and *Rubus fruticosus* also present. These are small flushes with good *S. magellanicum, S. cuspidatum* and *Vaccinium oxycoccus*. *Aulacomnium palustre* is also present here. This vegetation also occurs in the west of the bog.

Complex 14/7/9
In the centre of Complex 10/7/9/2 B, there are frequent pools and higher *Sphagnum* cover. These contain *Sphagnum cuspidatum* with *S. capillifolium* and *S. magellanicum* at their borders. *Eriophorum angustifolium* and *Calluna vulgaris* are growing in the pools which appear to be in-filling. The whole area has obviously been burnt but with 90% *Sphagnum* cover and a good acrotelm, it appears to have made a good recovery.

Central Complexes
No central complexes were found on this bog.

6.2.2 Flushes and Soaks

No extensive flushes or soaks occur on this bog. Small patches of *Myrica gale* have been included in the vegetation complexes described above.

6.3 DETAILED VEGETATION OF THE BOG MARGIN

To the east of Ballinderry Bog there is agricultural reclamation of old cutaway, with the active cutaway dominated by *Molinia caerulea*. To the south-west there is a small *Betula pubescens* wood and *Ulex europaeus* scrub dominated the western cutaway. There is active peat cutting to the north of this bog which is backed by *Betula pubescens* scrub along the esker ridge.

7. BOG TYPE
This is probably a ribge basin bog due to the proximity of eskers.

8. HUMAN IMPACT

8.1 RECENT HUMAN IMPACT (see Landuse map)

8.1.1 Peat Cutting
There is extensive peat cutting along the north, east and southern margins to Ballinderry Bog.

8.1.2 Forestry
There is no forestry associated with this bog.

8.1.3 Fire History
There is evidence of recent burning over much of the bog.

8.1.4 Dumping
There is domestic waste dumped on the south-eastern cutaway.

8.1.5 Agriculture

Extensive areas to the east of the bog have been reclaimed for agricultural grassland.

8.2 NHA BOUNDARY CHANGES

No change to the NHA boundary of this site is needed.

9. INTER-RELATIONSHIPS OF VEGETATION, HYDROLOGY, TOPOGRAPHY AND LOCATION

1. This small bog was visited as it was in close proximity to Ballynagrenia Bog and the surface appeared to be unaffected by drainage.

2. The visit found the bog to be extensively damaged by burning with *Myrica gale* patches occurring on areas that may be flushed due to subsidence.

3. There was no active drainage with only one in-filled townland boundary drain.

4. The cutaway to the north of this bog slopes down from the esker ridge and would be unsuitable for restoration work. The active cutaway to the east slopes towards reclaimed agricultural land. The only area of cutaway suitable for restoration work would be the thin margin in the southern, active cutaway and the abandoned cutaway to the west.

BALLYNAMONA BOG, CO. ROSCOMMON

1. SUMMARY OF SITE DETAILS

NHA no.:	590	6" Sheet:	RN48 & 51
Grid Ref.:	M940 430	1:126,000 Sheet:	12
O.S. Aerial Photo:	36 (7353)	1:50,000 Sheet:	47
Other Photo:	M394	High Bog area:	61.0ha
Date(s) of Visit:	18/1/2000		

Townlands: Ballymullavill, Knocknanool, Pollalaher, Corkip, Skeanamuck.

2. INTRODUCTION

2.1 BACKGROUND

This small site was selected for this survey as it has a large wooded flush and is in close proximity to Corkip Turlough. This large *Betula* flush is clearly visible on the aerial photograph and very little active peat cutting is evident. There is also no drainage on the high bog.

The 1984 survey rated the lichen flora of the flush as very important. *Rhynchospora fusca* and *Carex limosa* were also found. The 1993 NHA survey describes a very good quality flush and good *Sphagnum* regeneration despite repeated burning. The close proximity of the turlough provides good habitat diversity at this site.

2.2 LOCATION AND ACCESS

This is a small bog 8km west of Athlone and 2km south-east of Brideswell village. It can be accessed from bog tracks off the local road (R362) between Athlone and Brideswell.

3. METEOROLOGY

No meteorological measurements have been made on this bog. Rainfall data from the nearby Strokestown weather station for the years 1964-87, indicates that the area recieves appproximately 1008mm of rainfall annually (R). The nearest synoptic station at Claremorris indicates that the site has up to 159 wet days annually. (Wet day is defined as a day when > 1mm of rainfall recieved).

Evapotranspiration measurements are only available for synoptic stations. With the large exposed areas on high bogs, actual evapotranspiration rates would probably be higher than at the nearest synoptic station. The effective rainfall (ER) rate for a site is the annual rainfall (R), less the actual evapotranspiration (AE). With only the potential evapotranspiration (PE) rate available for Claremorris of 415 the effective rainfall for the site is calculated as less than (R - PE) i.e. ER< 1008 - 415 = 593mm.
(See Fig. 1)

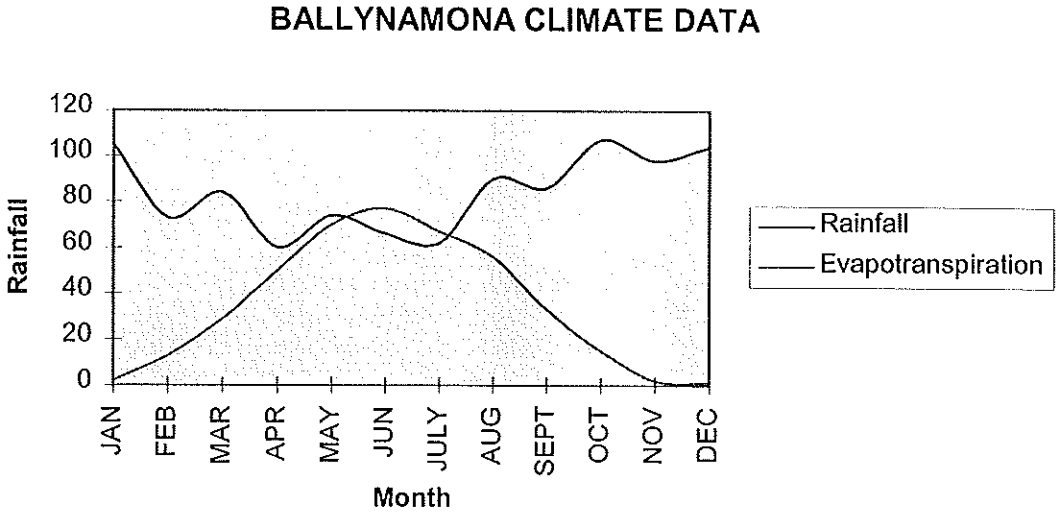


FIG. 1: Meteorology for Ballynamona

4. GEOMORPHOLOGY

4.1 TOPOGRAPHY OF THE HIGH BOG

This is a relatively flat bog with generally gradual, marginal slopes associated with cutaway.

4.1.1 Slopes of the High Bog

Slope 1: A steep marginal slope on the face-bank (1m/50m).

Slope 2: A series of gradual slopes off the high bog to the margins (25cm/100m).

Slope 3: A series of gradual slopes off the high bog to the margins (50cm/100m).

4.2 TOPOGRAPHY OF THE BOG MARGINS

There are extensive areas of level cutaway suitable for restoration work on this bog. To the south, esker ridges slope steeply down to the cutaway, which gently slope to the cut-face. In the north-east there is level cutaway backed by esker ridges. The cutaway to the north slopes away towards the adjoining turlough and there is extensive level cutaway to the north-east.

5. HYDROLOGICAL SYSTEM

5.1 GEOLOGY/HYDROLOGY

5.1.1 Bedrock

The site is underlain by Grey Limestone according to the 1840s GSI maps.

5.1.2 Subsoils

No data was available for sub-soils for this site

5.1.3 Peat

The peat at this site was classified by Hammond as Man-Modified.

5.2 HYDROLOGY

5.2.1 High Bog Hydrology (see Drains map)

There is very little drainage on the high bog.

Drain D1: A completely in-filled townland boundary drain. It is less than 0.5m wide and filled with *Sphagnum capillifolium, Eriophorum vaginatum, Calluna vulgaris* and *Polytrichum commune.* It is hard to distinguish the drain from the surrounding vegetation. The only distinguishing feature is the line of small *C. vulgaris* hummocks along its length.

Drain D2: An old in-filled drain with *Calluna vulgaris* at the top of the cutaway slope.

5.2.2 Bog Margin Hydrology

There are drains in the cutaway associated with active peat cutting to the east and west. Also there is drainage in the south-east and north-west associated with agricultural reclamation.

Drain d1: A fast-flowing drain 3m wide and 3m deep. There is 2m of peat above 1m of mineral substrate. There is about 1m of water in this drain, flowing north-east. The sides of this drain have been recently cleared.

Drain d2: This drain runs through reclaimed fields and flows north into d1. It is 1.5m wide and water-filled. There is some *Typha latifolia* present.

Drain d3: A series of drains, 0.5m wide, which run from the cut-face to the track. There is some active peat cutting associated with these drains. They are lined with *Calluna vulgaris* and some *Ulex europaeus* and *Molinia caerulea*. There is some *Typha latifolia* present.

Drain d4: This 1m wide drain runs across the drains d3 and into drain d1. It is lined by *Ulex europaeus*.

Drain d5: Two drains on either side of active peat cutting in the east of the bog. They are 1m wide and 0.5m deep. They are lined with *Calluna vulgaris* and are in-filling with *Eriophorum vaginatum*. These run to the drain d6 at the base of a mineral slope.

Drain d6: A 1m wide drain which runs alongside a mineral ridge. It is lined with *Betula pubescens* and *Ulex europaeus* scrub.

Drain d7: A 1m wide drain 1.5m deep with 0.5m water. It runs west-south-west from the face-bank to d6 and is lined with *Calluna vulgaris*.

Drain d8: A 2m wide water-filled drain, lined with *Calluna vulgaris*. It runs north-west from the face-bank across d6 and into agricultural land. *Phragmites australis* is present at the junction with d6.

Drain d9: An old, dry drain at the margin to a reclaimed field in the south. It is 2m wide and 1.5m deep and *Calluna vulgaris* is growing at its base and lining the margins. There are some tussocks of *Juncus effusus* and some *Pteridium aquilinum*.

5.3 GEOHYDROLOGICAL OVERVIEW

Description of the bog in the 19th century
This was originally part of a much larger bog complex. There were numerous esker ridges and mineral outcrops. There was a stream running across the bog complex and this was the southern limit of this bog. This stream flowed into Corkip Lough, a turlough at the south-west margin of the bog. The west and north were bordered by mineral slopes.

Description of the present-day bog
There has been extensive cutaway to the north-east of the site. This is level and dominated by *Molinia caerulea* and *Betula* scrub. There is a trackway running near the cut-face. There is level cutaway between the track and the cut-face, dominated by *Calluna vulgaris* and *Eriophorum angustifolium*. This area would be suitable for restoration work.

To the north there is extensive cutaway which slopes away from the high bog. Some of this has been reclaimed for agriculture. To the north-west there is cutaway with a slight slope towards the cutaway. It is dominated by *Calluna vulgaris* and *Molinia caerulea* and has good regeneration potential.. This is backed by undulating land of esker ridges and hollows. Most of the land slopes towards the bog but there are areas of low-lying land leading towards the turlough. The land here is reclaimed but it may be possible to restore the bog-turlough complex.

To the south-west there is old cutaway sloping towards the cut-face with *Calluna vulgaris*, *Juncus effusus* and *Molinia caerulea*. There is some reclaimed cutaway in the south and some old cutaway. The original drainage system has been channelled here and there is a fast flow to the north-east away from the turlough.

The eastern cutaway has some reclaimed grassland and coniferous forestry plantations. There is some old cutaway sloping away from the face-bank to the forestry. An extensive wooded flush occurs on this bog. There are two areas dominated by *Betula pubescens*, linked by areas with high *Sphagnum* cover. This type of habitat is rare and needs to be protected.

6. VEGETATION

6.1 VEGETATION SUMMARY

No central or sub-central ecotopes were found on this bog but there is a large *Betula pubescens* flush dominating the central regions.

6.2 DETAILED VEGETATION OF HIGH BOG

6.2.1 Complexes
Marginal Complexes

Complex 1
Typical face-bank vegetation dominated by *Calluna vulgaris*. This complex is noted on the margins in the south and west of the bog.

Complex 7/3/6
Edge effects are obvious in this area with apparently old pools now in-filled with *Narthecium ossifragum* hollows. The vegetation is dominated by *Calluna vulgaris* (30%), *Narthecium ossifragum* (30%) and *Carex panicea* (30%). *Cladonia portentosa* (20%), *Eriophorum angustifolium* (10%), *Erica tetralix* (10%) and *Trichophorum caespitosum* (15%) are prominent and *Cladonia uncialis* is present. The acrotelm is not good at the edges.

Complex 3
Carex panicea-dominated area sloping down to the cutaway. The ground is hard with water flowing over the surface. *Calluna vulgaris* becomes more prominent further up towards the level interior of the bog.

Complex 2/7
By the northern cutaway *Trichophorum caespitosum* and *Calluna vulgaris* dominates on the marginal slope. *Carex panicea* and *Narthecium ossifragum* are also present.

Complex 7/3 + *Eriophorum angustifolium*
A burnt area with scattered in-filling pools dominated by *Eriophorum angustifolium* (30%)/ *Calluna vulgaris* (30%) and *Carex panicea* (30%). The acrotelm is variable (0-5cm) and *Sphagnum* (20%) is prominent in and around the pools with *S. cuspidatum, S. papillosum, S. capillifolium, S. fuscum,* and *S. imbricatum. Trichophorum caespitosum* (10%) and *Narthecium ossifragum* (10%) are prominent. *Andromeda polifolia* (+), *Vaccinium oxycoccus* (+), *Hypnum jutlandicum* (+) and *Erica tetralix* (5%) are present. *Cladonia uncialis* and *Cladonia portentosa* occur in small patches. The vegetation is a mosaic formed by *Eriophorum angustifolium* and *Carex panicea* swapping dominance across the area.

Sub-Marginal Complexes

Complex 7/3/6+tear pools
Tear pools in this area are algal with a little *Sphagnum cuspidatum.* The vegetation is dominated by *Calluna vulgaris* (30%)/ *Narthecium ossifragum* (30%)/ *Carex panicea* (30%), but patches of thick *Sphagnum* (15%) and *Hypnum jutlandicum* are evidence of the former vegetation of the area. *Vaccinium oxycoccus* is noted creeping over *S. capillifolium. Cladonia portentosa* (20%), *Eriophorum angustifolium* (10%), *Erica tetralix* (10%) and *Trichophorum caespitosum* (15%) are prominent and *Cladonia uncialis* is present. The acrotelm is quite good with *S. papillosum, S. capillifolium, S. magellanicum, S. fuscum, S. imbricatum* and *Eriophorum vaginatum* further into the bog. There are occasional patches of *Myrica gale* noted through this vegetation. These patches are clearly seen on the aerial photograph.

Complex 7/3/6 + pools - Burnt
This complex occurs on the north-east margin of the large central flush and has been burnt in the past. There are good, long, sinuous pools with *Sphagnum cuspidatum* and these are filling in some parts with *S. capillifolium, S. magellanicum* and *S. papillosum.* Between the pools the acrotelm is variable with low *Sphagnum* (5%) cover. Pools were present close to the margin of the bog but the water level has dropped. There is plenty of *Drosera anglica* and some *Rhynchospora alba, Narthecium ossifragum. Eriophorum angustifolium* is growing through the in-filling *Sphagnum.* The vegetation in between shows signs of drying out as *Carex panicea* (30%) and *Narthecium ossifragum* (20%) co-dominate with *Calluna vulgaris* (40%). Much of the *Calluna vulgaris* is encrusted with epiphytic lichens. *Trichophorum caespitosum* (10%), *Eriophorum angustifolium* (10%), *Eriophorum vaginatum* (5%) and *Erica tetralix* (10%) also feature.

Complex 7/3/6 + Pools
This vegetation complex occurs in two narrow bands on either side of the southern section of the central flush. The vegetation is similar to Complex 7/3/6 but it also has scattered algal pools.

Sub-Central Complexes

No Sub-central complexes were noted on this bog.

Central Complexes

No central complexes were noted on this bog.

6.2.2 Flushes and Soaks

Most of the high bog is covered in a species-rich flush which is wooded in the centre and treeless around its periphery. The flush is rich in *Sphagnum* over all of its extent and the wooded part is dominated by lichen-festooned *Betula pubescens* trees. The slopes at the edges are gradual and no flow off the flush was noted.

Flush 1

Section A
A flushed area with lush *Calluna vulgaris* (30%), *Eriophorum vaginatum* (30%) and *Sphagnum* (40%). *Cladonia portentosa* (25%) is prominent along with robust *Hypnum jutlandicum* (30%) hummocks and *Vaccinium oxycoccus* (5%) and *Andromeda polifolia* (+). *Sphagnum* is mostly *S. capillifolium* and *S. papillosum* (+) with some *S. cuspidatum* in the small areas of standing water. There are still some leaves of *Carex panicea* (+) and the occasional *Trichophorum caespitosum* (+) plant. Other mosses present are *Polytrichum commune* (5%), *Aulacomnium palustre* (5%) and *Pleurozium schreberi* (+). There are occasional bare peat patches with *Cladonia pyxidata* (+). Much of the *Calluna vulgaris* features lichen epiphytes (R4, P3). There are a couple of *Pinus sylvatica* young trees and their numbers increase going back towards Section E.

Section B
This part of the flush has frequent pools with lush vegetation between. These pools improve towards Section E where they contain *Menyanthes trifoliata* and are bordered by *Sphagnum papillosum, S. fuscum* and *S. imbricatum*. Occasional *Leucobryum glaucum* hummocks appear to be drying out. The acrotelm varies between 10-15cm but there are some bare peat patches featuring *Cladonia floerkeana*. *S. cuspidatum* occurs in wetter hollows. There are occasional drier patches with *S. capillifolium, S. papillosum*. *Eriophorum angustifolium* grows very tall in these patches and *Polytrichum juniperinum* and *Empetrum nigrum* become obvious. *Molinia caerulea* and *Betula pubescens* are also found in the centre of these small areas. *Vaccinium oxycoccus, Andromeda polifolia* and *Aulacomnium palustre* are prominent and a small *Juncus effusus* was noted.

Section C - burnt
Moving north-west from Section B, it quickly becomes obvious that there has been a burn. The ground becomes harder underfoot and hummocks of dead moss are present. The bare ground is colonized by *Cladonia floerkeana* and *Campylopus introflexus*. Burnt *Calluna vulgaris* branches are also noted. Apart from these signs, the area is well vegetated with young *Calluna vulgaris* and *Eriophorum vaginatum*. *Sphagnum* cover is very good at 30%, comprising *S. capillifolium* and *S. papillosum*. There are in-filling pools with a little standing water. These are mostly in-filled with *S. cuspidatum* and *S. capillifolium*. There are occasional lush carpets of *S. fuscum* and notable patches of *S. imbricatum*. *Carex panicea* becomes prominent where the ground is hard and very small clumps of *Cladonia portentosa* are present.

Section D
Immediately north of the *Betula pubescens* dominated section of the flush, the vegetation is dominated by *Sphagnum* (60%)/ *Calluna vulgaris* (30%)/ *Eriophorum vaginatum* (30%) and *E. angustifolium*. *Sphagnum* species are mostly *S. capillifolium* and *S. imbricatum*. *Empetrum nigrum* (15%) is very prominent. The area has obviously been burnt but *Cladonia portentosa* (5%) is returning well. There is a lot of *Hypnum jutlandicum* and *Aulacomnium palustre* creeping through the *Sphagnum*. *Narthecium ossifragum* (5%), *Trichophorum caespitosum* (5%) and *Erica tetralix* (5%) are prominent. *Andromeda polifolia* and *Vaccinium oxycoccus* are growing over and through the *Sphagnum*. *Cladonia floerkeana* is noted on bare peat patches. Old pools are noted in-filling with *Sphagnum cuspidatum, S. capillifolium, N. ossifragum* and *Eriophorum angustifolium*. The burn stopped short of the *Betula pubescens* soak.

Section E
Inside the *Betula pubescens* soak, the vegetation is similar to previous sections except for frequent lichen-encrusted *Betula pubescens* trees of all ages (R4, P4). *Pteridium aquilinum* and *Aulacomnium palustre* are more frequent and *Calluna vulgaris* is taller. *Molinia caerulea* and *Juncus effusus* also occur here. The understorey forms a thick, dense carpet of *Sphagnum capillifolium, S. cuspidatum, S. subnitens, S. tenellum, Breutelia chrysocoma, Aulacomnium palustre, Pleurozium scherberi, Hylocomium splendens, Empetrum nigrum*, and practically erect *Vaccinium oxycoccus*. Very tall plants of *Andromeda polifolia* are also present. *Drosera rotundifolia* with large flower-heads is growing through *Aulacomnium palustre*. A patch in between the two groves of *Betula pubescens* appears to have been burnt a long time ago as there are no mature *Betula pubescens* but plenty of young saplings. The vegetation underneath is the same except for the occasional hummocks of *Polytrichum juniperinum* and occasional occurrences of *Cladonia floerkeana*. *Pteridium aquilinum* is a lot more common here. The second grove of *Betula pubescens* is interspersed with in-filled pools of *Sphagnum cuspidatum*. Foliose *Peltigera* sp. is growing through the lush, understorey vegetation. A large *Rhododendron ponticum* bush is growing at the north-western end of this second grove and *Pinus sylvestris* trees are noted growing on the edge of this grove.

6.3 DETAILED VEGETATION OF THE BOG MARGINS

There is coniferous forestry to the east of the site with reclaimed fields to the south-east and south. Along the south-west and west there are esker ridges sloping down to the cutaway margin. These ridges are agricultural grassland and the old cutaway here between these ridges and the high bog are dominated by *Calluna vulgaris, Molinia caerulea* and *Juncus effusus*. There is some *Ulex europaeus* and *Betula pubescens* scrub along the track and d6. The extensive cutaway in the north-west is dominated by *Molinia caerulea* and *Calluna vulgaris*. This area slopes away to low-lying agricultural land behind. This area is flooded in places and a turlough occurs here (Corkip Lough). There is extensive level cutaway to the north. This is dominated by *Calluna vulgaris, Molinia caerulea* and *Betula pubescens* scrub. Between the track and the bog, there is some active cutaway with bare peat, *Juncus effusus* and *Eriophorum angustifolium*.

7. BOG TYPE

This is probably a ridge river bog type associated with the nearby turlough.

8. HUMAN IMPACT

8.1 RECENT HUMAN IMPACT (see Landuse map)

There are signs up claiming that the area is a private bird sanctuary (R4, P2).

8.1.1 Peat Cutting

There is limited peat cutting to the north-east and south-west of this bog. Most of the cut-face has been abandoned.

8.1.2 Forestry

There is some coniferous forestry to the east of this site.

8.1.3 Fire History

There is evidence of burning over most of the bog apart from the *Betula pubescens* groves.

8.1.4 Dumping

There is a traveller encampment on the southern track and there is some dumping around this area.

8.1.5 Agriculture

There is reclamation of cutaway to agricultural grassland to the south and south-east of this site.

8.2 NHA BOUNDARY CHANGES

No change to the NHA boundary is needed.

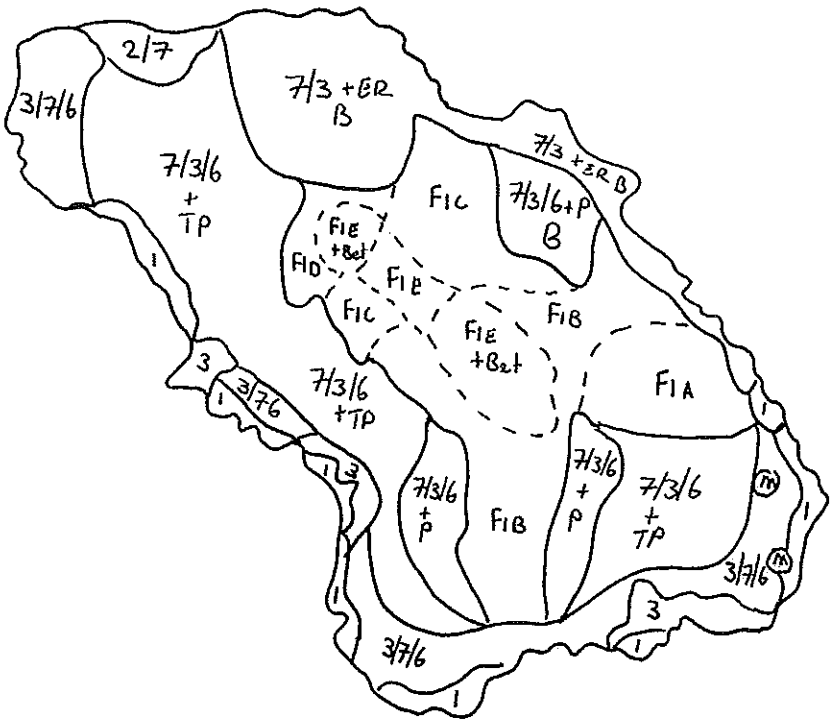
9. INTER-RELATIONSHIPS OF VEGETATION, HYDROLOGY, TOPOGRAPHY AND LOCATION

1. This bog was surveyed because there was a notable , large wooded and treeless flush on the bog.

2. The survey confirmed the presence of an extensive flush. This flush had both treeless and wooded sections and a very rich moss flora. The presence of a turlough to the north of the bog adds interest to the site.

3. There is no active drainage on the high bog.

4. There were extensive areas of suitable cutaway for restoration work on this bog. Esker ridges slope steeply down to the cutaway in the west, south-west north-west with a narrow margin of cutaway between the ridges and the high bog. The cutaway to the north, slopes away towards the adjoining turlough and there is extensive level cutaway to the north-east. All these areas would be suitable for restoration.



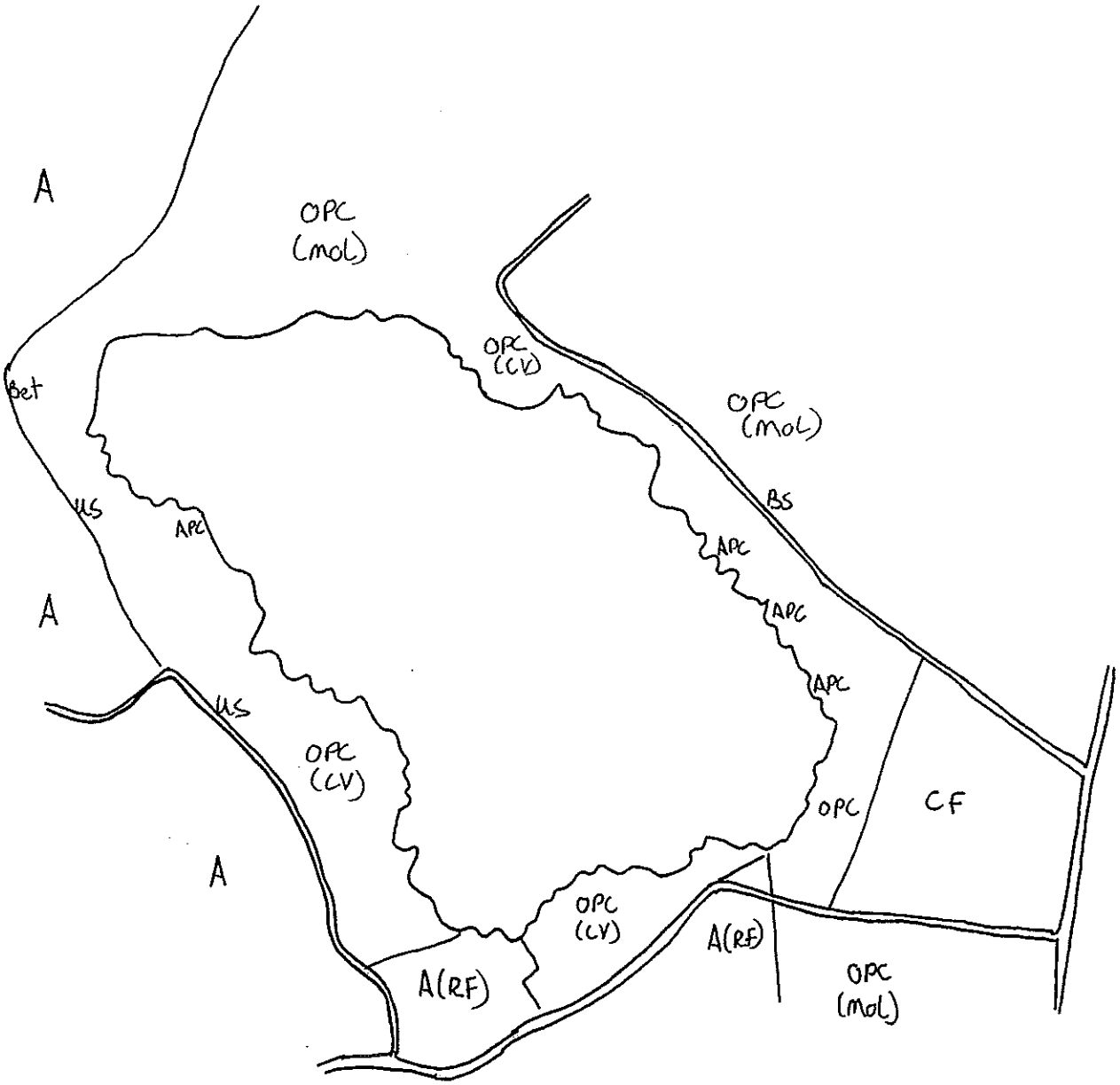
Ballynamona bog (590)
Co. Roscommon
Vegetation complexes

N

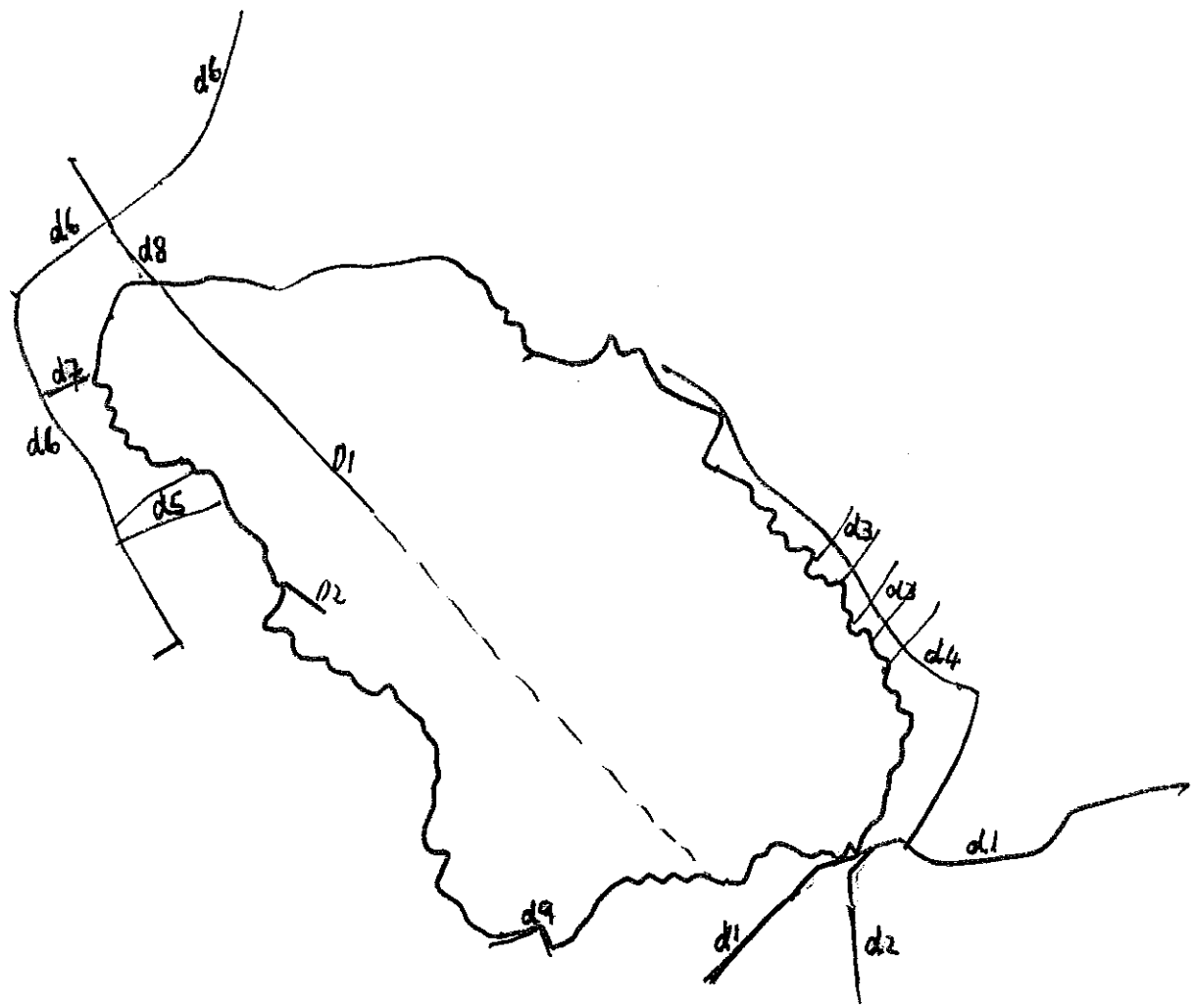
Ballynamona bog (590)
Co. Roscommon
Ecotopes

N

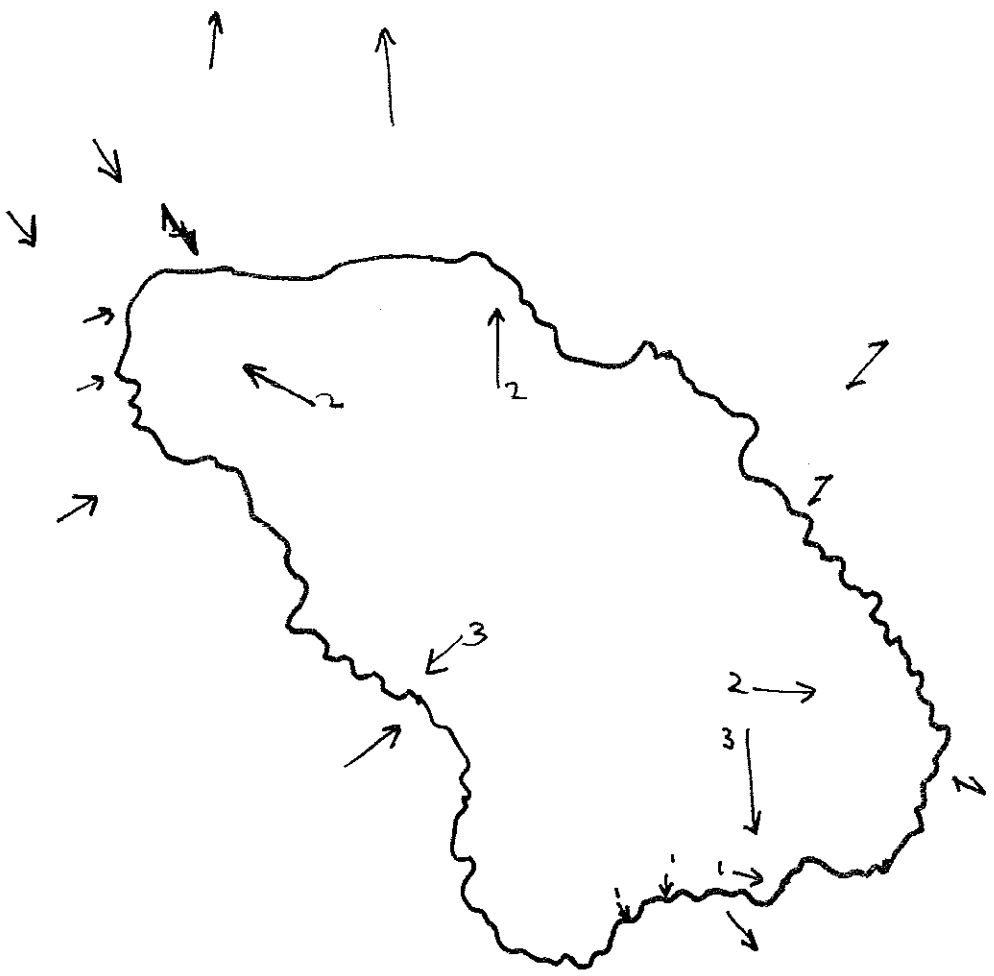
Ballynamona bog (590)
Co. Roscommon
Landuse



Ballynamona bog (590)
Co. Roscommon
Drainage



Ballynamona bog (590)
Co. Roscommon
Slopes



CARN PARK BOG, CO. WESTMEATH

1. SUMMARY OF SITE DETAILS

NHA no.:	676	6" Sheet:	WH29 & 30
Grid Ref.:	N115 420	1:126,000 Sheet:	12 & 15
O.S. Aerial Photo:	37B (6747)	1:50,000 Sheet:	47
Other Photo:	N323	High bog area:	156.4ha
Date(s) of Visit:	17/1/2000		

Townlands: Carn Park, Tullywood, Cappaghbrack, Warren High, Moydrum.

2. INTRODUCTION

2.1 BACKGROUND

This site was selected for this survey because, although there is a lot of forestry on the high bog, there is still a large area of undisturbed high bog.

The 1994 NHA survey found a remarkable abundance of *Sphagnum pulcrum* and stated that the bog to the south of the mineral ridge was extensive and intact.

2.2 LOCATION AND ACCESS

A small bog, located 7km east of Athlone and 1km south-east of the village Bealin. The site can be accessed from the local road running south from Bealin towards Moate.

3. METEOROLOGY

No meteorological measurements have been made on this bog. Rainfall data from the nearby Athlone weather station for the years 1962-90, indicated that the area recieves appproximately 925mm of rainfall annually (R). The nearest synoptic station at Mullingar, indicates that the site has up to 159 wet days annually. (Wet day is defined as a day when > 1mm of rainfall recieved).

Evapotranspiration measurements are only available for synoptic stations. With the large exposed areas on high bogs, actual evapotranspiration rates would probably be higher than at the nearest synoptic station. The effective rainfall (ER) rate for a site is the annual rainfall (R), less the actual evapotranspiration (AE). With only the potential evapotranspiration (PE) rate available for Mullingar of 455 the effective rainfall for the site is calculated as less than (R - PE) i.e. ER< 925 - 455 = 470mm. (See Fig. 1)

4. GEOMORPHOLOGY

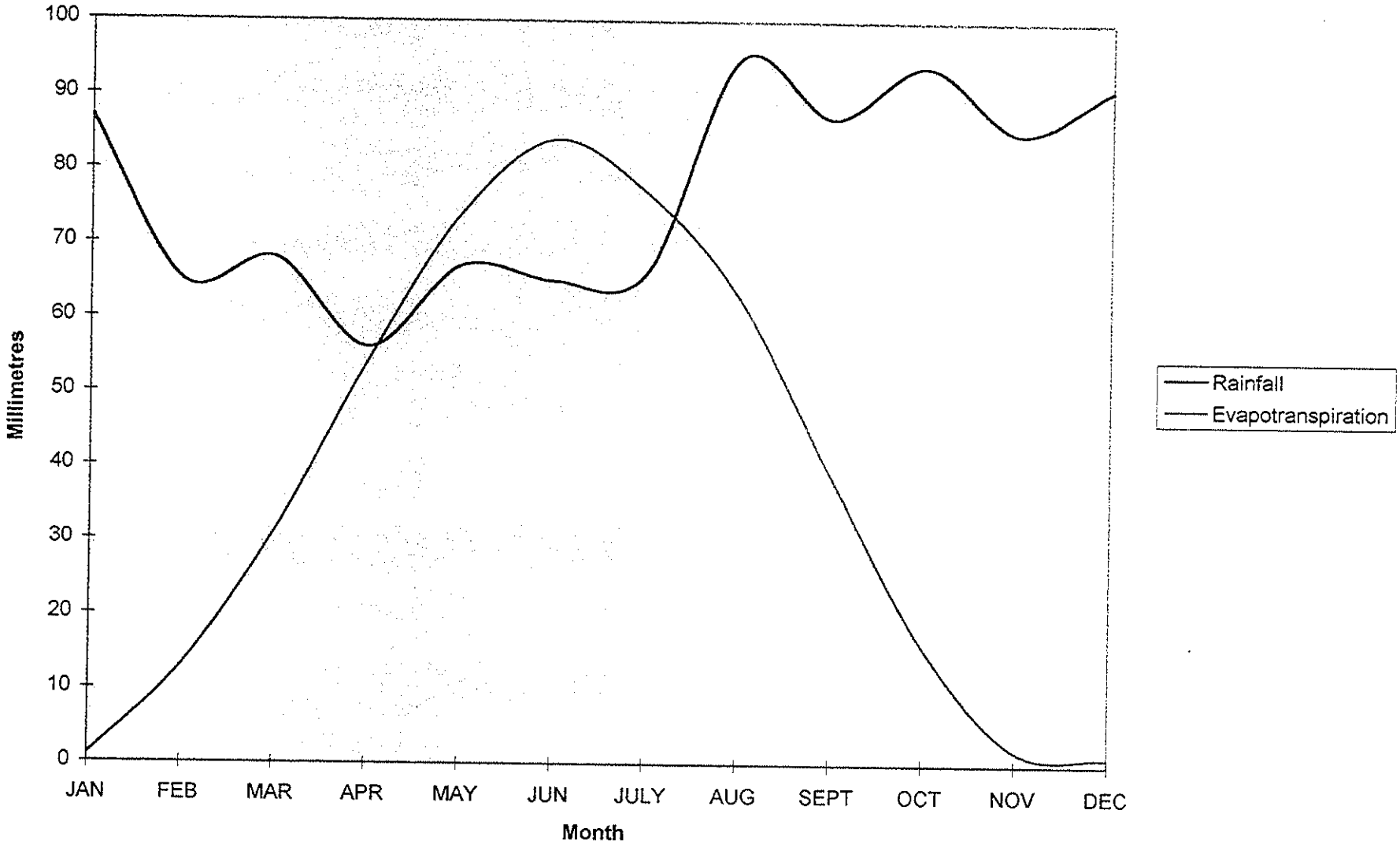
4.1 TOPOGRAPHY OF HIGH BOG

There are many gradual internal slopes associated with forestry.

4.1.1 Slopes of the High Bog

Slope 1= A series of marginal slopes associated with cutaway in the west and south of the site (75cm/50m).

CARN PARK CLIMATE DATA



Slope 2 = A series of gradual internal slopes running south towards forestry and the margin (25cm/100cm).

Slope 3 = A gradual internal slope eastwards across the high bog (25cm/100cm).

4.2 TOPOGRAPHY OF THE BOG MARGINS

A mineral outcrop slopes down to the north-east of the bog with a small area of level cutaway between the high bog and this hill. There is a small area of level cutaway to the south and west, backed by sloping land. These small areas may be suitable for restoration work.

5. HYDROLOGICAL SYSTEM

5.1 GEOLOGY/HYDROLOGY

5.1.1 Bedrock

This bog is underlain by basinal limestones (CPL) according to the GSI/Chevron series maps.

5.1.2 Subsoils

No data was available for sub-soils for this site

5.1.3 Peats

The peat at this site was classified by Hammond as a mix of True Midland and Man-Modified types.

5.2 HYDROLOGY

5.2.1 High Bog Hydrology (see Drains map)

Drainage on the high bog is associated with cutaway margins and forestry. The only drain across the centre of the high bog is completely in-filled and is a townland boundary drain.

Drain D1: A narrow drain by the forestry margin on high bog. It does not run along the whole length of the margin but turns into the forestry. It is 0.5m wide and 0.5m deep and is water-filled with *Sphagnum cuspidatum*. There is no flow visible in this drain.

Drains D2: A series of small parallel drains running through the forestry plantation. These drains are 30cm wide and 20cm deep with little flow.

Drain D3: A completely in-filled drain, lined by tall *Calluna vulgaris* and in-filled with *C. vulgaris*, *Sphagnum capillifolium* and *Eriophorum vaginatum*. It is 0.5m wide.

Drain D4: An in-filled drain along a townland boundary. It is 0.5m wide and in-filled with *Rhynchospora alba, Calluna vulgaris, Eriophorum angustifolium* and *Sphagnum capillifolium*. It is completely in-filled by the western forestry where it is hardly noticeable and not visible on the aerial photo.

Drains D5 and D6: Two in-filling drains along the margin of the forestry plantation in the south-east of the high bog. They are 0.5m wide and filled with *Sphagnum cuspidatum, Eriophorum angustifolium* and *Calluna vulgaris* in-filling from the margins.

Drain D6 This drain starts alongside the plantation, but further east it turns into the bog and is 5m away from the forestry margin.

Drains D7: A series of narrow drains which run from D6 into the bog. These are 0.5m wide and filled with *Sphagnum cuspidatum*. There is *Calluna vulgaris* and *Sphagnum magellanicum* growing in from the margins.

Drains D8: A series of completely in-filled drains which run from old cutaway into the bog. They are 0.5m wide and filled with *Calluna vulgaris, Narthecium ossifragum, Eriophorum vaginatum* and *Sphagnum capillifolium*. There are some patches of *Myrica gale* associated with these drains.

Drains D9: A series of drains 20m apart which are 0.5m wide and water-filled *with Sphagnum cuspidatum*. There is *Calluna vulgaris* at the margins and these drains run north into d3.

5.2.2 Bog Margin Hydrology

Drainage on the cutaway is confined to drains associated with peat cutting and forestry. There are large drains in the south and west associated with peat cutting and in the north there is a drain by the cut-face associated with forestry.

Drain d1: A large drain which runs along the western bog trackway. It is 2m wide and 2m deep, with water flowing in a south-westerly direction at its base. It is lined by *Ulex europaeus, Betula pubescens* and *Pteridium aquilinum*. A series of smaller drains run from the cut-face where there is some active peat cutting to this drain.

Drain d2: A *Ulex europaeus*-lined drain in cutaway with *Betula pubescens* and *Pteridium aquilinum*. A series of smaller drains run from this drain to the cut-face. These are also lined with *U. europaeus*.

Drain d3: A large drain which runs along the northern margin of the bog. It is 1m wide and 1.5m deep and smaller drains (D8) run into it. It contains 50cm of water and is filled with *Sphagnum cuspidatum*. The banks of this drain have been cleared recently along with the forestry on its northern bank. There is some *Calluna vulgaris* and *Molinia caerulea* present and some dumping has occurred here.

5.3 GEOHYDROLOGY OVERVIEW

Description of the bog in the 19th century
This bog was originally much larger and bordered on all sides by mineral soil. There was a large mineral outcrop stretching into the bog in the north-east. This was wooded and there were wooded mineral slopes to the west and east.

Description of the present-day bog
A road separates the western section from the remaining bog. This has been extensively cutaway and afforested. There has been peat cutting between this road and the intact high bog. This is level and dominated by *Molinia caerulea* and *Juncus effusus*. It is backed by sloping mineral soil and would be suitable for restoration work. There has also been peat cutting around the mineral outcrop. This has been afforested, but most of the plantation has been recently felled.

There has been limited peat cutting to the south of this bog. There is level cutaway between the southern track and the high bog, but this has been partially reclaimed for agriculture. To the south-east and south-west there is forestry plantations which extend onto the high bog.

To the east there is *Betula* woodland on the cutaway, with a new conifer plantation on the high bog margin. The level cutaway between the high bog and the mineral outcrop may be suitable for the creation of a lagg zone, using runoff from the bog and the slope.

6. VEGETATION

6.1 VEGETATION SUMMARY

No flushes or central ecotope were found on this bog. There is a large sub-central area and a lot of the high bog is afforested. Compared to other bogs surveyed, there is a remarkable amount of *Sphagnum pulchrum* growing on this bog.

6.2 DETAILED VEGETATION OF HIGH BOG

6.2.1 Complexes

Marginal Complexes

Complex 3/7 + Cladonia

The vegetation is co-dominated by *Calluna vulgaris* (30%)/ *Carex panicea* (40%) and *Cladonia portentosa* (30%). There are scattered small clumps of *Sphagnum* (10%) including *S. capillifolium, S. subnitens* and *S. papillosum*. The *Sphagnum* cover, however, is not enough for there to be an acrotelm. *Eriophorum vaginatum* (5%) is noticeable growing in tussocks. *Trichophorum caespitosum* (10%) and *Erica tetralix* (5%) are also present. Further into this complex the ground gets wetter underfoot with standing water in patches but still no acrotelm. A dying hummock of *Leucobryum glaucum* is noted. *Sphagnum* cover improves to 15% and *Sphagnum magellanicum* is present. There are occasional *Calluna vulgaris* hummocks with plenty of *Cladonia portentosa* and a few *Betula pubescens* saplings. These hummocks also feature thick *Hypnum jutlandicum* growth along with *Eriophorum vaginatum* and *Eriophorum angustifolium*. In the middle of this area there is a very wet, lush area that may have been a large pool in the past (6m x 3m). It has in-filled with dense carpets of *S. magellanicum* and *S. cuspidatum* and *Eriophorum vaginatum*. This shows up clearly on the aerial photograph as light coloured patch. Around the edges of this old pool there is dense *Calluna vulgaris* and *Eriophorum vaginatum* with carpets of *S. capillifolium, S. papillosum, Hypnum jutlandicum* and *S. subnitens*. The ground was very difficult to walk over, it was quaking, hummocky and had an acrotelm of 10cm. Outside this former pool and moving towards the forestry, there is an acrotelm but it is patchy (0-5cm). *Rhynchospora alba* (+) and *Eriophorum angustifolium* (+) are present. Along the very edges of the forestry *Calluna vulgaris* is most dominant. At the northern margin and lobe, there are many small in-filling pools. All are algal and in-filling with *R. alba, Carex panicea* and *Eriophorum angustifolium*. There are several *Pinus contorta* and *P. sylvestris* saplings and plenty of dead *Sphagnum* hummocks.

By the margin of the south-west forestry *Eriophorum vaginatum* cover increases to 15%. Otherwise the vegetation is co-dominated by *Calluna vulgaris* (30%)/ *Cladonia portentosa* (30%)/ *Carex panicea* (30%). *Sphagnum* (15%) is notable with *S. capillifolium, S. papillosum* and *S. magellanicum*. Some *S. pulchrum* is also noted. There are plenty of bare ground hollows which are mostly covered by *Narthecium ossifragum* (15%) and *Carex panicea*. There are hummocks of dead leaf bases and there is hardly any acrotelm (<5cm where it occurs). Some standing water occurs in places. *Erica tetralix* (5%), *Cladonia uncialis* and *Eriophorum angustifolium* (+) are notable with *Trichophorum caespitosum* (5%) and *Rhynchospora alba* (<5%) growing through the vegetation. There are occasional occurrences of *Campylopus introflexus, Hypnum jutlandicum* and *Andromeda polifolia*. Close to the forestry edges *T. caespitosum* grew in tussocks.

Complex 3/7 + *Myrica gale*

Near the north-east margin there is a ring of *Myrica gale*. Between this ring and the cutaway margin the vegetation is co-dominated by *Carex panicea* (40%) and *Calluna vulgaris* (30%) with prominent *Cladonia portentosa* (25%). *M. gale* becomes dominant every so often and *Eriophorum angustifolium* (10%), *Eriophorum vaginatum* (10%) and *Trichophorum caespitosum* (15%) are notable. There is no acrotelm with only small patches of *Sphagnum capillifolium* and *S. subnitens*. There are signs of desiccation with plenty of *Pinus* saplings and dead tussocks of graminoid leaf bases. There are occasional hummocks of *Campylopus introflexus* and *Cladonia floerkeana*. *Narthecium ossifragum* (15%) is very obvious in hollows. *Erica tetralix* (5%) and *Pleurozia purpurea* (+) are notable with *Huperzia selago* also noted in the eastern lobe.

Complex 7/3 + Cladonia

The bog margin in the west is very cracked and a lot of the marginal areas have collapsed. The vegetation is co-dominated by *Calluna vulgaris* (40%)/ *Cladonia portentosa* (50%)/ *Carex panicea* (30%). There are many *Trichophorum caespitosum* tussocks although it is not dominant. The ground is hard with no acrotelm. The collapsed, marginal parts have exposed, dead *Sphagnum* species. A few *Pinus* trees have invaded, all are under 2m. A couple of dead hummocks of *Hypnum jutlandicum* are present. There is a good algal mat covering the ground. Any bare ground is covered with *Cladonia portentosa* and *Carex panicea*. *Narthecium ossifragum* (5%) and *Erica tetralix* (5%) are prominent.

Complex 7/3 + Pines

An area of frequent *Pinus contorta* and *P. sylvatica* trees of all ages which have colonized the bog edge. The ground in between has become noticeably harder although it is still co-dominated by *Calluna vulgaris* (30%)/ *Carex panicea* (30%)/ *Cladonia portentosa* (30%). There is plenty of *Eriophorum vaginatum* (5%) and *Trichophorum caespitosum* (10%). Several old pools are in-filling with *Sphagnum cuspidatum, Rhynchospora alba* and *Eriophorum angustifolium*. There are some carpets of *S. capillifolium, S. papillosum* and *S. fuscum* (10%). *Narthecium ossifragum* (10%) is prominent.

Sub-Marginal Complexes

Complex 7 + *Cladonia* + *Eriophorum angustifolium* + Pines

Vegetation is similar to Complex 3/7 + *Cladonia* except *Eriophorum angustifolium* (30%) has taken over co-dominance from *Carex panicea* which is present with a cover of 10%. There are occasional *Pinus sylvatica* and *P. contorta* trees and *Calluna vulgaris* hummocks. These hummocks feature mature *Calluna vulgaris* with foliose lichen epiphytes, plenty of *Cladonia portentosa*, *Eriophorum vaginatum* and a large hummock of *Aulocomnium palustre* is also present. The acrotelm is good in places although absent from others (0-5cm). There are some large carpets of *Sphagnum* (20%) with *S. capillifolium* and *S. magellanicum*. There are odd hummocks of *S. fuscum* and patches of *S. papillosum* with carpets of *S. pulchrum* also present. *Cladonia uncialis* occurs occasionally and *Pinus* saplings become more frequent approaching the eastern margin of the bog.

Sub-Central Complexes

Complex 10/9/7 + Cladonia

This vegetation complex is marked by the co-dominance of *Eriophorum vaginatum* (40%). There is a definite acrotelm of around 5cm although there are some bare peat patches with hummocks of dead and drying mosses. *Calluna vulgaris* (30%) and *Cladonia portentosa* (30%) are prominent. *Trichophorum caespitosum* (5%) and *Erica tetralix* (5%) are noted growing through the vegetation. The *Sphagnum* species are co-dominant with 50% cover comprising *S. capillifolium, S. magellanicum* and *S. papillosum*. Both *Hypnum jutlandicum* (+) and *Carex panicea* (+) are present. *Narthecium ossifragum* occurs in hollows and there are occasional occurrences of *Drosera rotundifolia* (+) and hummocks of dead *Sphagnum*. The pale area on the photo is a large area of in-filled pools. These are filled with *S. cuspidatum, S. magellanicum, S. capillifolium, Eriophorum vaginatum* and *E. angustifolium*. There is very little actual open water left but there are long sinuous carpets of *S. cuspidatum*. *S. pulchrum* occurs at a pool margin. *Andromeda polifolia* and *Drosera anglica* are growing through the *Sphagnum*. Even in this wet region there are plenty of *Trichophorum caespitosum* and *Carex panicea*. Desiccation, however, is evidenced by patches of dead leaf bases with *Cladonia floerkeana* and *Campylopus introflexus*.

Complex 10/9/7 + Cladonia + Pools

The vegetation is co-dominated by *Eriophorum vaginatum* (30%)/ *Calluna vulgaris* (30%)/ *Cladonia portentosa* (30%). This area appears to be in-filled frequent pools. Former pools are hollows filled with *Narthecium ossifragum* (15%) and *Eriophorum vaginatum*. Between the pool areas *Sphagnum* (40%) is common with *S. capillifolium, S. imbricatum, S. magellanicum* and *S. papillosum*. Some of which form thick carpets with a variable acrotelm of 0-5cm.

There is still some open water with a few pools remaining - these are algal and contain *S. cuspidatum* and *Rhynchospora alba*. *Carex panicea* (5%) is present with *Erica tetralix* (5%) and *Trichophorum caespitosum* (5%) tussocks are prominent. There are occasional occurrences of *Andromeda polifolia* (+) and *Hypnum jutlandicum* (+).

Central Complexes

No central complexes were found on this bog.

6.2.2 Flushes and Soaks

No flushes or soaks were found on this bog.

6.3 DETAILED VEGETATION OF THE BOG MARGINS

Coniferous forestry dominates most of the cutaway. In the north, there is a coniferous forestry plantation along the mineral outcrop which juts into the bog. There is some cutaway here with mixed woodland of *Betula pubescens* and *Pinus* spp. Some of this forestry has been cleared. There are plantations in the south also with some old cutaway reclaimed for agricultural grazing. The cutaway in the west is dominated by *Molinia caerulea* and *Juncus effusus*. By the road in the north there is old cutaway with *Ulex europaeus* scrub. Some of this has been reclaimed for agriculture. To the east there is *B. pubescens* scrub on the old cutaway.

7. BOG TYPE

This is probably a basin bog type.

8. HUMAN IMPACT

8.1 RECENT HUMAN IMPACT (see Landuse map)

8.1.1 Peat Cutting

There is active peat-cutting to the west and north-west of this site.

8.1.2 Forestry

Forestry is the main landuse on the cutaway with coniferous forestry plantations to the north, south, east and south-west

8.1.3 Fire History

There is no evidence of burning on this bog.

8.1.4 Dumping

There is some domestic dumping on the bog road to the west.

8.1.5 Agriculture

There is some agricultural grazing to the south and north-west.

8.2 NHA BOUNDARY CHANGES

No change to the NHA boundary for this site is needed.

9. INTER-RELATIONSHIPS OF VEGETATION, HYDROLOGY, TOPOGRAPHY AND LOCATION

1. This bog was surveyed because it appeared to have an intact, large central area. Also an abundance of *Sphagnum pulchrum* had been previously reported.

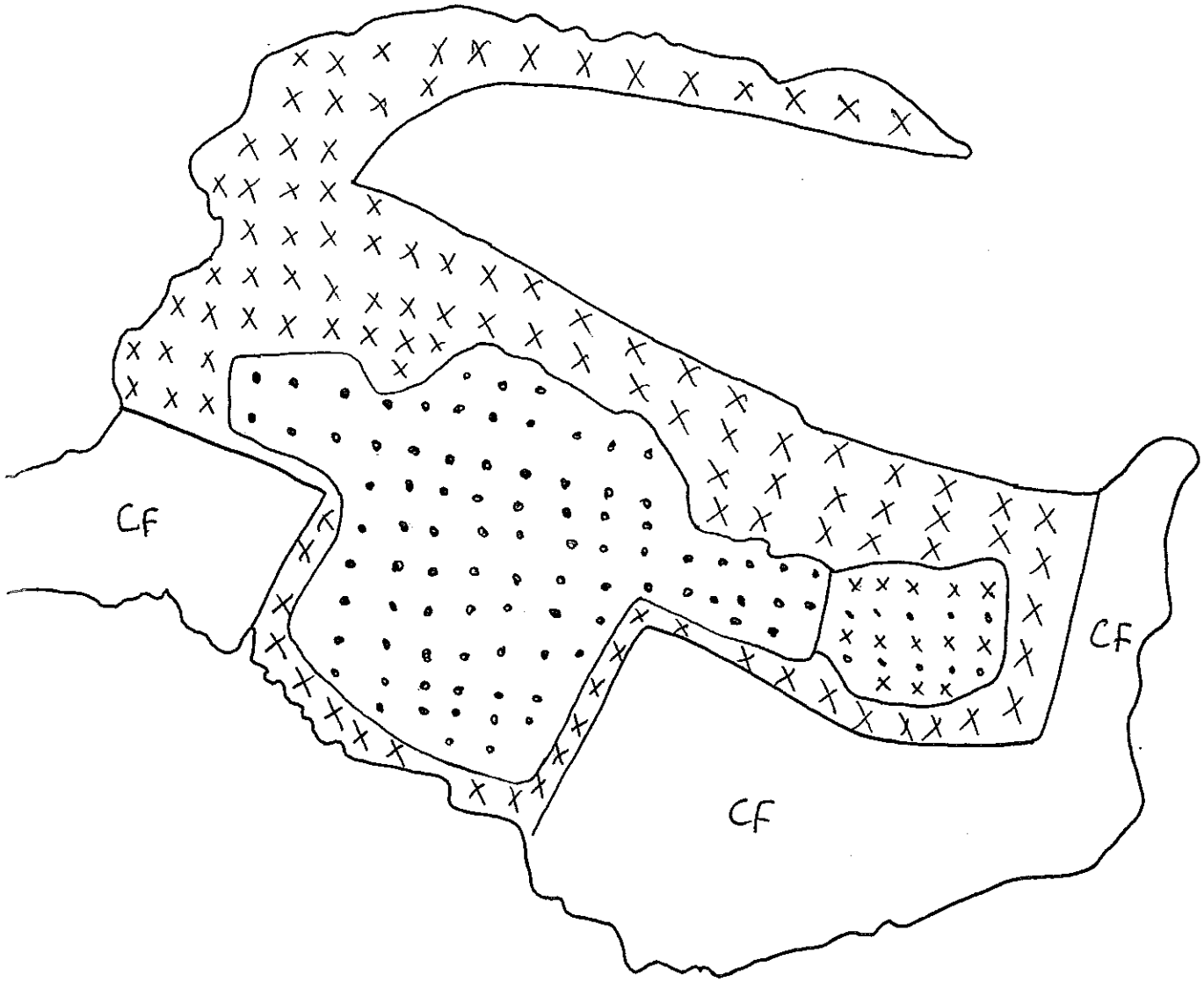
2. The visit noted the plentiful presence of *Sphagnum pulchrum*. The whole bog had, however, been affected by the surrounding forestry.

3. Apart from forestry drainage, the bog has little active drainage. If the forestry was cleared there may be some potential for re-wetting the high bog.

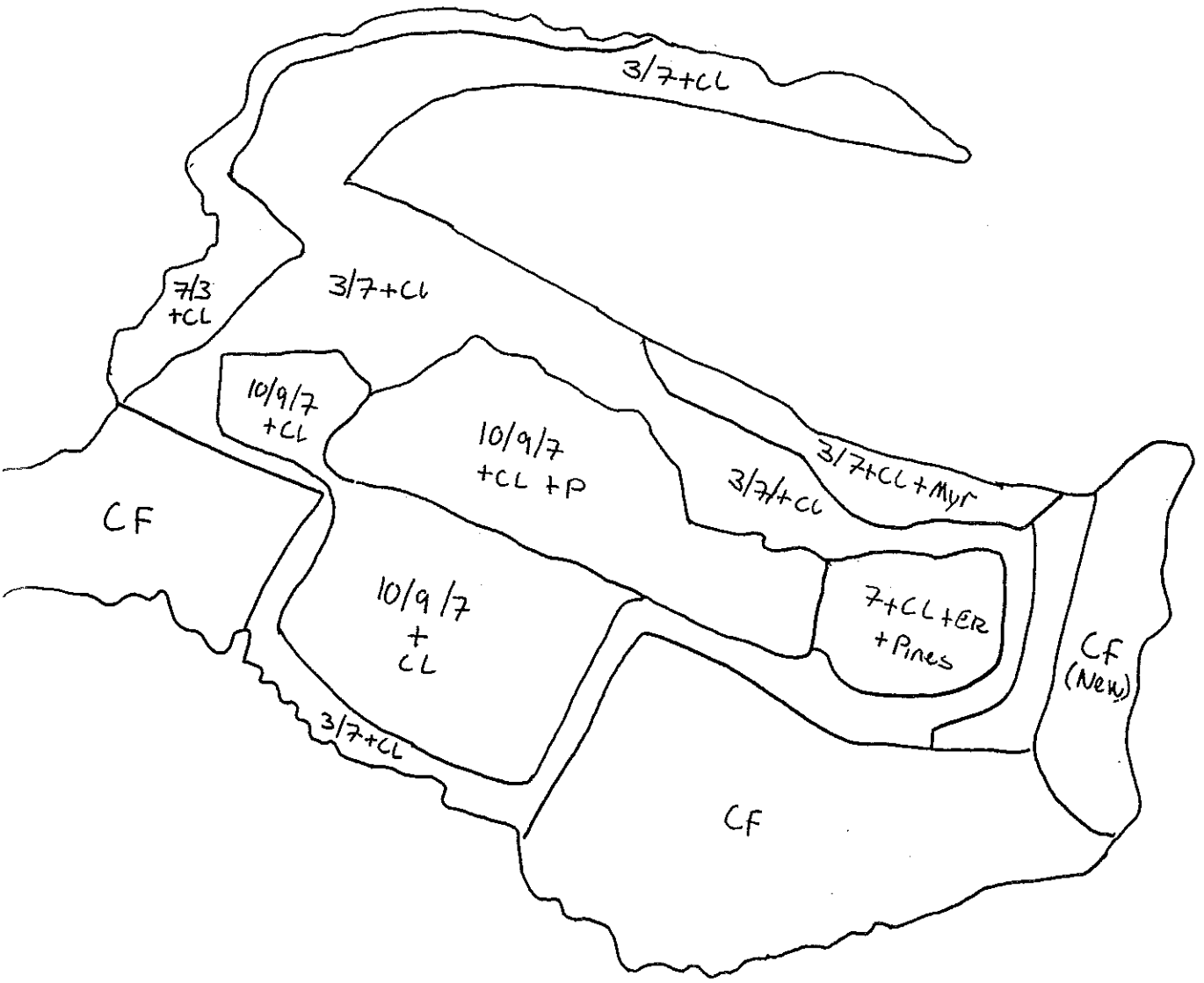
4. There was small margin of level cutaway to the south and west of this bog which are backed by sloping, agricultural land. Also between the mineral ridge in the north and the cut-face, there is an area of level cutaway which has recently been cleared of forestry. These areas provide a limited area for bog margin restoration.

Carn Park bog (676)
Co. Westmeath
Ecotopes

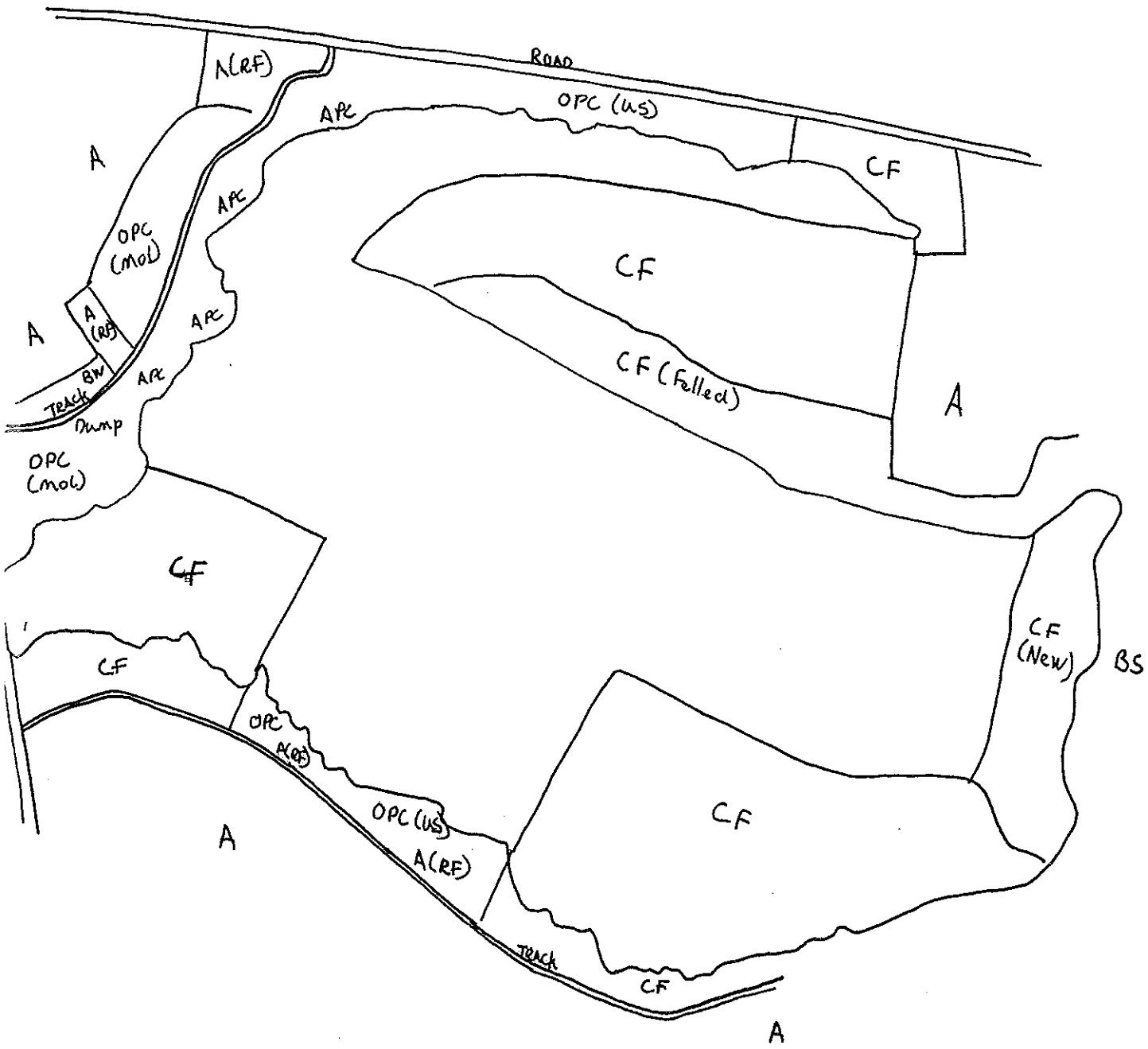
N



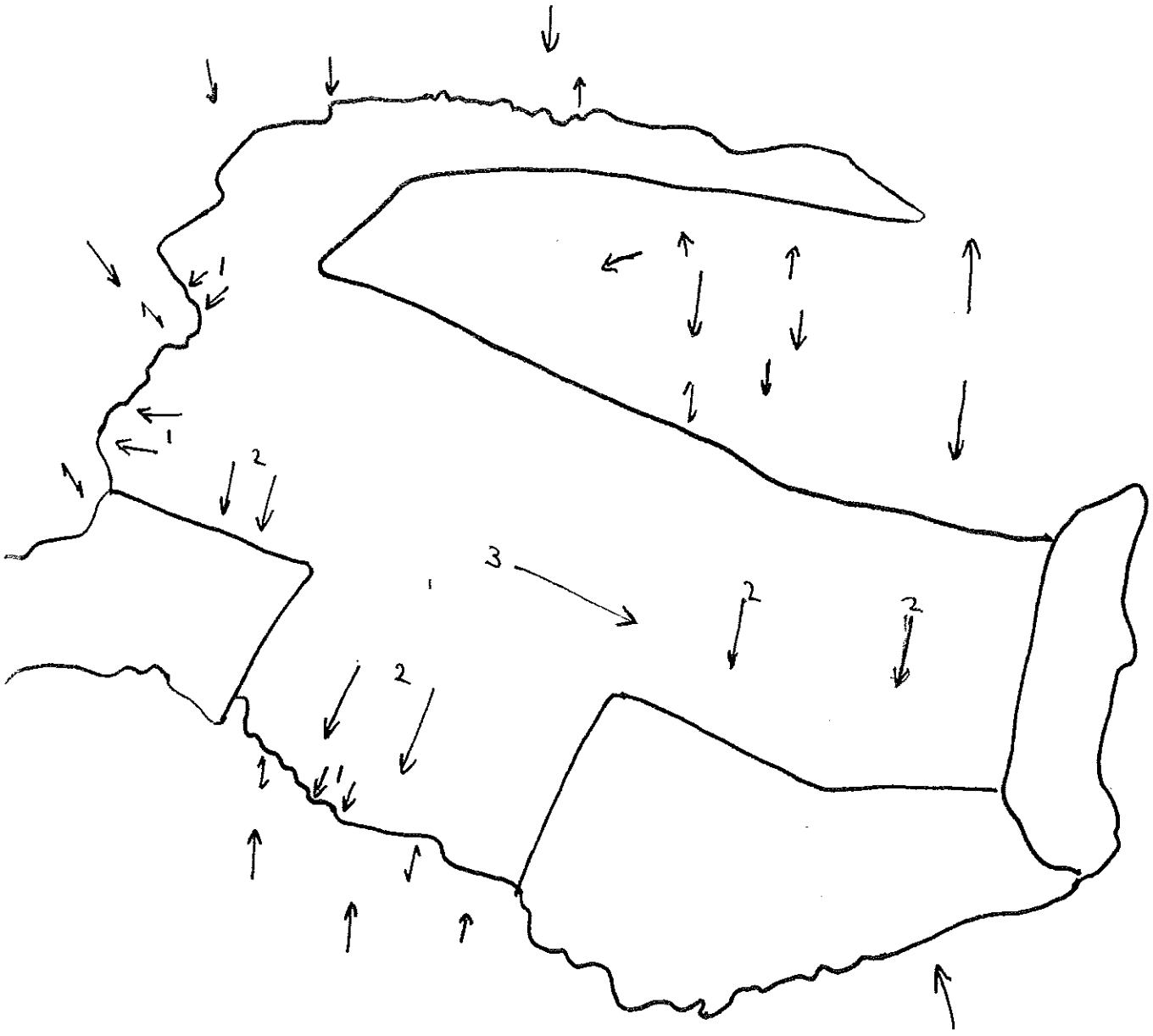
Carn Park bog (676)
Co. Westmeath
Vegetation complexes



Carn Park bog (676)
Co. Westmeath
Landuse

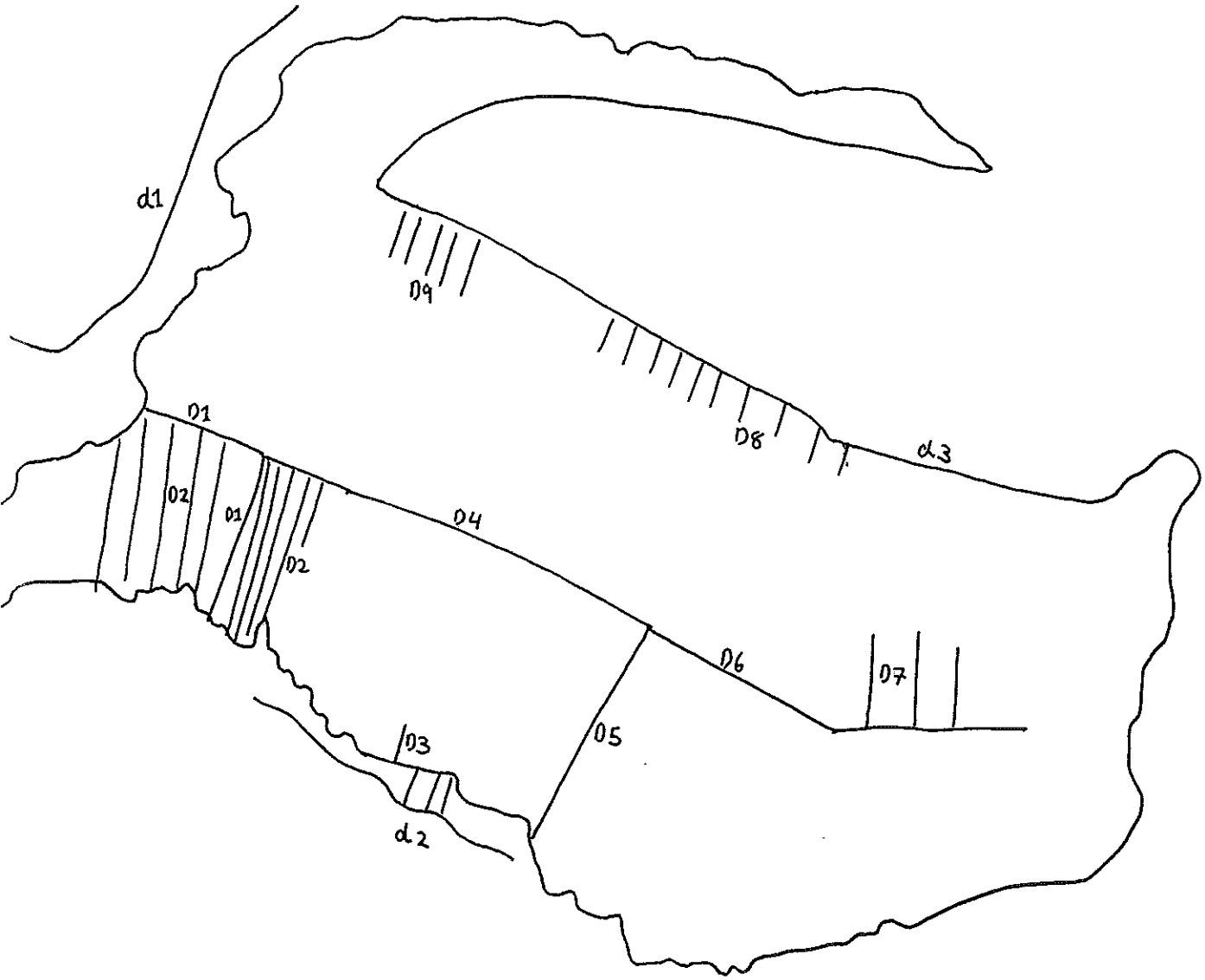


Carn Park bog (676)
Co. Westmeath
Slopes



Carn Park bog (676)
Co. Westmeath
Drainage

N



CLARE ISLAND BOG, CO. WESTMEATH

1. SUMMARY OF SITE DETAILS

NHA no.:	987	6" Sheet:	WH1
Grid Ref.:	N425 815	1:126,000 Sheet:	12
O.S. Aerial Photo:	31 (8149)	1:50,000 Sheet:	34
Other Photo:	N37	High bog area (ha):	69.0
Date(s) of Visit:	14/1/2000		

Townlands: Clare Island/Derrymacegan, Williamstown

2. INTRODUCTION

2.1 BACKGROUND

This narrow small bog is part of the Lough Sheelin NHA complex. It was selected for survey as it had not been surveyed in detail previously and appeared to have a semi-natural margin with the lake shore. It is also located to the north-east margin of the range of raised bogs to be surveyed.

The 1994 NHA survey gives only a brief description stating that it was relatively intact with little turf cutting and no active drainage.

2.2 LOCATION AND ACCESS

A small, linear bog located on the south-western shore of Lough Sheelin, 2km east of Finnea village. The bog can be accessed off the local road between Finnea and Ross.

3. METEOROLOGY

No meteorological measurements have been made on this bog. Rainfall data from the nearby Multyfarnham weather station for the years 1960- 93, indicated that the area recieves appproximately 931mm of rainfall annually (R). The nearest synoptic station at Mullingar indicates that the site has up to 159 wet days annually. (Wet day is defined as a day when > 1mm of rainfall recieved).

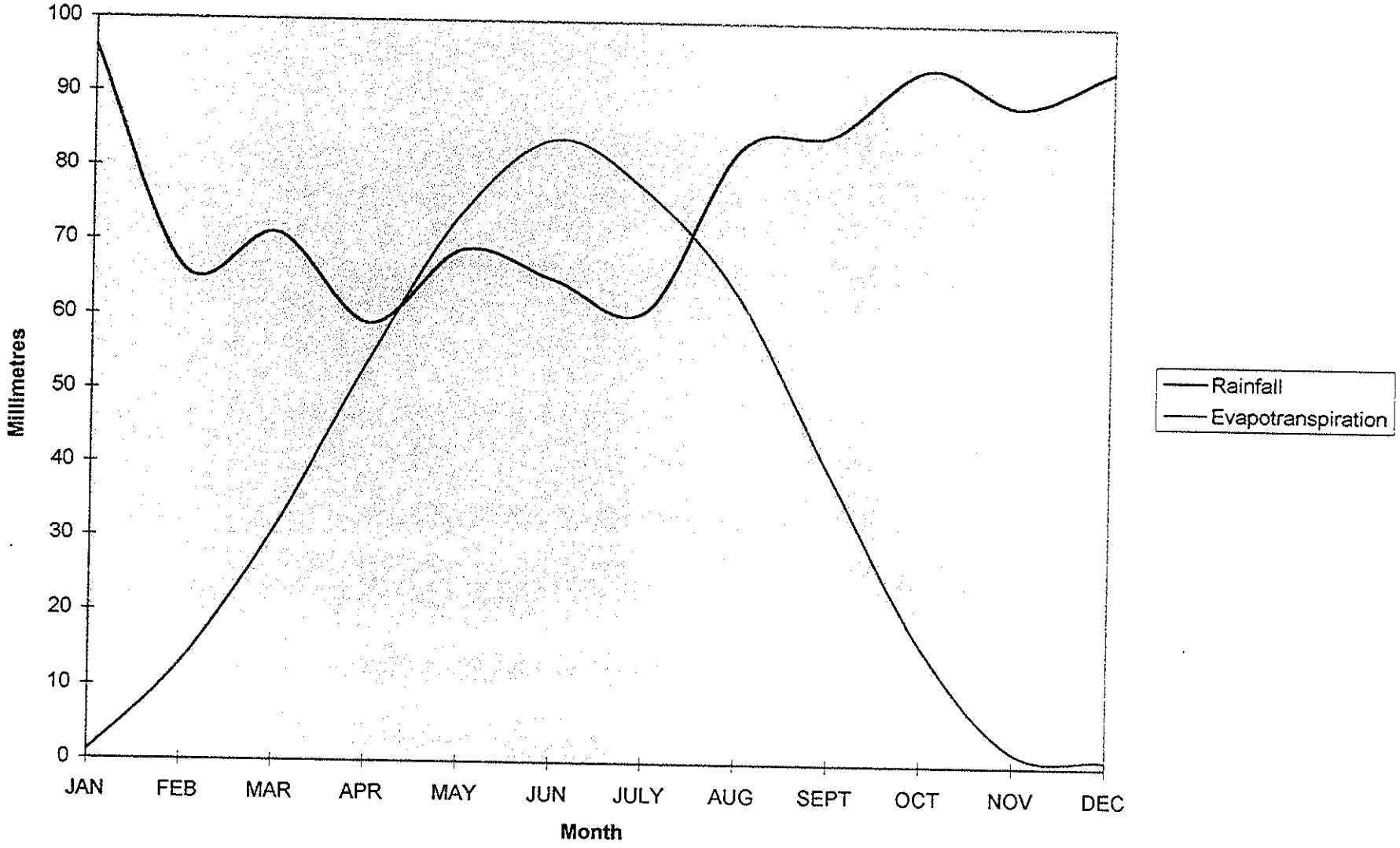
Evapotranspiration measurements are only available for synoptic stations. With the large exposed areas on high bogs, actual evapotranspiration rates would probably be higher than at the nearest synoptic station. The effective rainfall (ER) rate for a site is the annual rainfall (R), less the actual evapotranspiration (AE). With only the potential evapotranspiration (PE) rate available for Mullingar of 455 the effective rainfall for the site is calculated as less than (R - PE) i.e. ER< 931 - 455 = 476mm. (See Fig. 1)

4. GEOMORPHOLOGY

4.1 TOPOGRAPHY OF THE HIGH BOG

There are steep marginal slopes associated with cutaway and the road. The only internal slope is a gradual one towards the lake with a steep slope at the lake margin. This is a narrow bog sandwiched between the road and the lakeshore.

CLARE ISLAND CLIMATE DATA



4.1.1 Slopes of the High Bog

Slope 1: A short slope associated with a small depression in the south-eastern corner of the bog (0.5m/50m).

Slope 2: A series of marginal slopes associated with drainage in the south and east of the bog (0.5m/100m).

Slope 3: A series of marginal slopes in the north of the bog, associated with the natural slope down to the lakeshore (1m/50m.).

Slope 4: A series of gradual, internal slopes towards the lakeshore from the central region of the bog (0.25m/100m).

Slope 5: A series of steep slopes associated with active peat-cutting in the west of the bog (2m/50m).

4.2 TOPOGRAPHGY OF THE BOG MARGINS

There are natural slopes from the high bog to the lakeshore similar to Slope 3 above. The cutaway to the west is level with agricultural land sloping down to this. The cutaway to the north-west slopes towards the bog.

5. HYDROLOGICAL SYSTEM

5.1 GEOLOGY/HYDROLOGY

5.1.1 Bedrock

This bog is underlain by basinal limestones (CPU) according to the GSI/Chevron series maps.

5.1.2 Subsoils

No data was available for sub-soils for this site.

5.1.3 Peats

The peat at this site was classified by Hammond as True Midland Type.

5.2 HYDROLOGY

5.2.1 High Bog Hydrology (see Drains map)

The bog is divided along its length by an old, in-filled townland boundary drain. There are numerous small drains running from this to the shoreline.

Drain D1: A completely overgrown drain, shown on the 6" map which runs from D2 to the shoreline. It is 1m wide and in-filled with tall *Calluna vulgaris* and *Sphagnum capillifolium*. There is no water visible.

Drain D2: A long drain running the length of the bog with numerous drains linking up with it. It is 1m wide and 0.5m deep, completely in-filled with *Narthecium ossifragum*, *Calluna vulgaris* and *Eriophorum vaginatum*. Tall *C. vulgaris* lines this drain which joins up with d2 at its eastern end. At the western end of the bog, this drain is completely in-filled with *C. vulgaris* and very hard to distinguish from the surrounding vegetation. This drain follows a townland boundary.

Drain D3: A 2m wide drain shown on the 6" map which is completely in-filled with *Calluna vulgaris*, *Eriophorum vaginatum* and *Narthecium ossifragum*, with some *Sphagnum capillifolium*. It is very shallow, just a small depression on the bog surface.

Drains D4: A series of in-filled drains running from D2 to d2. These are 0.5m wide, lined with *Calluna vulgaris* and completely in-filled with *C. vulgaris*, *Eriophorum vaginatum* and *Molinia caerulea*.

Drain D5: A deep drain shown on the 6" map. It is 0.5m wide and 2m deep with tall *Calluna vulgaris* on its banks.

Drain D6: A 1m wide shallow drain which is completely in-filled with *Calluna vulgaris*, *Eriophorum vaginatum*, *Sphagnum capillifolium* and *Vaccinium myrtillus*. It is lined with tall *C. vulgaris* and runs from D2 to the lake shore.

Drain D7: A short drain running from D8 which is lined with *Calluna vulgaris*. It is 0.5m wide and completely in-filled with *Eriophorum vaginatum* and *C. vulgaris*.

Drain D8: A 1m wide drain lined with *Calluna vulgaris* and runs from D2 to the lake shore. It is completely in-filled with *C. vulgaris*, *Eriophorum vaginatum*, *Sphagnum magellanicum*, *Polytrichum commune* and *Cladonia portentosa*.

Drain D9: Either a completely in-filled drain or a *Calluna vulgaris* ridge running to D11.

Drain D10: A narrow in-filled drain running to the lake shore. It is in-filled with *Calluna vulgaris*, *Eriophorum vaginatum* and *Sphagnum capillifolium*.

Drain D11: Completely in-filled drain, shown on the 6" map running from D2 to the lake. It is 0.5m wide and lined with *Calluna vulgaris*. It is in-filled with *C. vulgaris*, *Eriophorum vaginatum*, *Andromeda polifolia*, *Vaccinium myrtillus*, *Hypnum jutlandicum*, *Polytrichum commune* and *Cladonia portentosa*.

Drain D12: A completely in-filled drain running from D13 to D11. It has a ridge of tall *Calluna vulgaris* on one side. It is wet and completely in-filled with *C. vulgaris*, *Eriophorum vaginatum*, *Sphagnum capillifolium*, *Vaccinium myrtillus* and *Cladonia portentosa*.

Drain D13: A 0.5 m wide drain in-filled with *Calluna vulgaris*, *Eriophorum vaginatum* and *Sphagnum capillifolium*.

Drain D14: A narrow drain lined with *Calluna vulgaris* and in-filled with *C. vulgaris*, *Cladonia portentosa* and *Hypnum jutlandicum*.

Drain D15: A 0.5m wide drain in-filled with *Calluna vulgaris*.

Drain D16: An old drain 1m wide, in-filled with *Calluna vulgaris*, *Eriophorum vaginatum*, *Sphagnum capillifolium* and *Cladonia portentosa*.

5.2.2 Bog Margin Hydrology

Lough Sheelin borders the bog along the full length of its northern margin. There is a roadside drain along its southern margin and a drain by a trackway along its eastern margin.

Drain d1: An old, deep drain running along the eastern margin of the bog. It is also present on the 6" map. It is 2m wide and 2m deep with a small amount of water at its base flowing towards the lake. It is lined by tall *Calluna vulgaris* on the bog margin and the opposite side is lined by *Ulex europaeus* scrub. There is *C. vulgaris* and *Molinia caerulea* growing on it steep sides.

Drain d2: A 2m wide drain, 3m deep running alongside the road. The bank is only 1m on the bogside. There is 20cm of water flowing east in this drain. It is on bare peat with some mineral substrate and lined with *Molinia caerulea* and thick *Ulex europaeus* scrub.

5.3 GEOHYDROLOGICAL OVERVIEW

Description of the bog in the 19th century
This bog occurred along a thin margin between mineral slopes and the lake shore of Lough Sheelin. It had an extensive natural margin to the lake from the River Inny in the west to Derrymacegan headland in the east. This headland separated this bog from Moneybeg bog.

Description of the present-day bog
A road between Finnea and Ross now runs across the southern margin of the bog. This separates the southern margin from the intact high-bog. This southern margin has been afforested and also has scrub encroachment of *Betula pubescens* and *Ulex europaeus*. The thin roadside margin of the intact high-bog is also dominated by *B. pubescens* and *U. europaeus* scrub.

To the east separated from the high bog by a deep drain there is a small area of level cutaway. This is dominated by *Molinia caerulea* and *U. europaeus* scrub. The drain flows towards the lake and there is a slope across the high bog to the lake also. By the lake there is a steep semi-natural slope with tall *Calluna vulgaris*. This gives way to *B. pubescens* and *U. europaeus* by the lake margin. This semi-natural lake margin is a rare bog habitat and is worth preserving.

To the north-west there is some cutaway by the lake shore. This slopes from a track towards the bog and is backed by *B. pubescens* scrub at the shore-line. There is cutaway to the west, between the high bog and sloping mineral soil. This is level in places and may be suitable for restoration work, with the run-off from the mineral slopes creating a lagg zone.

The drainage system on this bog is associated with the lake and blockage of these drains will aid re-wetting of the high bog.

6. VEGETATION

6.1 VEGETATION SUMMARY

There is a central ecotope located on this bog and there is a natural progression through all ecotopes towards the lakeshore. There is a small area of sub-marginal vegetation in the bog centre associated with the central drain D2.

6.2 DETAILED VEGETATION OF HIGH BOG

6.2.1 Complexes

Marginal Complexes

Complex 1
Down at the lake edge, the bog slopes down naturally with an occurrence of natural face-bank type vegetation. There are very tall *Calluna vulgaris* (95%) bushes (±1m tall) with tall *Erica tetralix* (+) and *Andromeda polifolia* (+) growing up through them. Under the bushes, there are lush carpets of *Hypnum jutlandicum* (10%) with large hummocks of *Sphagnum capillifolium* (10%) (R3, P21). There are also large patches of *Cladonia portentosa*. Young *Vaccinium myrtillus* plants are found growing up through the *Calluna vulgaris*. There are many long cracks in the peat due to the natural slope down to the lakeshore.

Complex 2
On sloped cutaway *Trichophorum caespitosum* (60%) dominates with *Calluna vulgaris* (40%).

Complex 4 + *Eriophorum angustifolium* + *Erica tetralix*
This complex occurs in the south, south-east (R3, P19) and west of this site. The vegetation is co-dominated by *Rhynchospora alba* (30%)/ *Eriophorum angustifolium* (30%)/ *Erica tetralix* (30%) with prominent *Trichophorum caespitosum* (20%) tussocks. In the south-east there is a lot of standing water in hollows created by machinery linked to Difco cutting (R3, P20). Plenty of *Cladonia portentosa* (10%) indicates no recent burning. *Calluna vulgaris* (20%) is also prominent. There are several patches of bare peat colonized by *Campylopus introflexus* (5%), *Cladonia floerkeana* (+) and *Cladonia pyxidata* (+). *Hypnum jutlandicum* (+) and young *Ulex europaeus* (+) are noted on the drier parts. There are a couple of young conifers and a *Betula pubescens* tree on the rise up to the high bog.

Sub-Marginal Complexes

Complex 7 +Cl
The vegetation on the slopes leading down to the face-bank of *Calluna vulgaris* and lake are dominated by *Calluna vulgaris* (70%) and *Cladonia portentosa* (40%). *Eriophorum vaginatum* (5%) and *Eriophorum angustifolium* (5%) occur through shrubs with occasional *Trichophorum caespitosum* (+). There is a healthy *Sphagnum* (25%) cover of *S. capillifolium* and *S. subnitens*. *Hypnum jutlandicum* (5%) is plentiful and *Erica tetralix* (5%) is notable. The ground is soft and wet underfoot (acrotelm <5cm). *Narthecium ossifragum* becomes more prominent further up the slope.

Complex 7/6 + *Erica tetralix*
Vegetation is obviously impacted upon by the old central drain. The vegetation is co-dominated by *Calluna vulgaris* (30%)/ *Erica tetralix*(30%)/ *Narthecium ossifragum* (25%). There is prominent *Cladonia portentosa* (20%), *Eriophorum vaginatum* (15%) and *Eriophorum angustifolium* (15%). The acrotelm is variable at 0-5cm but the ground is not too soft. *Sphagnum* cover is quite good at 15-20% with *S. capillifolium* and *S. magellanicum*. *Hypnum jutlandicum* (15%) is plentiful.

Complex 7/6/10
This vegetation type is similar to Complex 7 + *Cl* but *Narthecium ossifragum* at 30% is co-dominant with *Calluna vulgaris*(60%). The *Narthecium ossifragum* is concentrated in the many hollows between *Calluna vulgaris*. *Erica tetralix* (+), *Cladonia portentosa* (15%), *Eriophorum angustifolium* (10%) and *Eriophorum vaginatum* (10%) are all prominent. The ground is quite soft with a variable acrotelm of 0-5cm. *Sphagnum* cover of 25% is mostly *S. capillifolium* with some *Sphagnum magellanicum* (+). *Hypnum jutlandicum* (5%) is notable and *Andromeda polifolia* (+) only occurs occasionally. *Trichophorum caespitosum* (5%) tussocks are also noted. Patches of *Cladonia gracilis* (+) and *Cladonia floerkeana* (+) are noted on bare patches.

Sub-Central Complexes

Complex 7/9/10
On the high bog, the ground becomes softer and wetter underfoot with a definite acrotelm (±5cm). The vegetation is co-dominated by *Calluna vulgaris* (60%)/ *Eriophorum vaginatum* (40%)/ *Cladonia portentosa* (30%). *Erica tetralix* (5%) and *Narthecium ossifragum* (5%) are notable through the vegetation with occasional *Eriophorum angustifolium* (+) and *Andromeda polifolia* (+). *Sphagnum* spp (40%) form carpets under the *Calluna vulgaris*, these are mostly *Sphagnum capillifolium* with occasional *S. magellanicum*. Hummocks of *Hypnum jutlandicum* are also noted.

Complex 15/7/9
Similar vegetation to Complex 14/7/9 but the pools are less frequent and some have algae.
Trichophorum caespitosum (20%) is prominent with *Eriophorum angustifolium* (10%) also.
The main *Sphagnum* spp. between the pools are *S. capillifolium*, *S. papillosum* and *S. magellanicum*. These co-dominate with *Calluna vulgaris* and *Eriophorum vaginatum*.

Central Complexes

Complex 14/7/9
This is the wettest part of the bog with frequent pools. Most of these pools are in-filling with *Narthecium ossifragum, Rhynchospora alba, Calluna vulgaris* and *Sphagnum* spp. These species also occur around the pool edges - especially *Sphagnum capillifolium, S. papillosum* and *S. magellanicum. Sphagnum cuspidatum* is submerged in the pools. *Sphagnum fuscum* is also noted at the pool edges. The vegetation in between the pools is co-dominated by *Calluna vulgaris* (30%)/ *Sphagnum* spp (50%)/ *Eriophorum vaginatum* (30%). There is a lot of *Cladonia portentosa* (5%) with *Andromeda polifolia* (+) and *Vaccinium oxycoccus* (+) growing over and through the *Sphagnum* spp. *Narthecium ossifragum* (10%) and *Erica tetralix* (10%) are also prominent. The area is well punctuated by *Calluna vulgaris* hummocks (described earlier). *Hypnum jutlandicum* (+) is notable. The pools are good with *Drosera anglica* also present. The acrotelm of 5-10cm, is very soft, quaking in some places.

6.2.2 Flushes and Soaks

No flushes or soaks were found at this site.

6.3 DETAILED VEGETATION OF THE HIGH BOG MARGINS

On the northern margin there is a natural transition down to the lake edge with tall *Calluna vulgaris* giving way to *Ulex europaeus* and *Betula pubescens* right beside lake edge. There is some old peat cutting in the north-west which is dominated by *C. vulgaris*. Further west, around the north-western lobe of the bog, there is some active peat cutting and the area is mainly bare peat with some *Eriophorum angustifolium. Betula pubescens* scrub dominates the south-western corner and *B. pubescens* and *U. europaeus* scrub line the road margin. To the east there is an area of old peat-cutting dominated by *Molinia caerulea* with encroaching *U. europaeus* scrub.

7. BOG TYPE

This is probably a broad floodplain bog associated with lough Sheelin.

8. HUMAN IMPACT

8.1 RECENT HUMAN IMPACT (see Landuse map)

8.1.1 Peat Cutting

There is active peat cutting to the west and north-west of the site. This Hopper peat cutting is restricted to the margins of the north-western lobe of the bog.

8.1.2 Forestry

There is coniferous forestry to the south of the bog across the road.

8.1.3 Fire History

There is no evidence of burning.

8.1.4 Dumping

There is no dumping at the site.

8.2 NHA BOUNDARY CHANGES

No changes to the NHA boundary of this site are needed.

9. INTER-RELATIONSHIPS OF VEGETATION, HYDROLOGY, TOPOGRAPHY AND LOCATION

1. This site was surveyed because it was one of the most north-easterly sites along with Moneybeg Bog. Clare Island Bog had not been previously surveyed. The natural margin from the bog to the lake appeared intact and worthy of investigation.

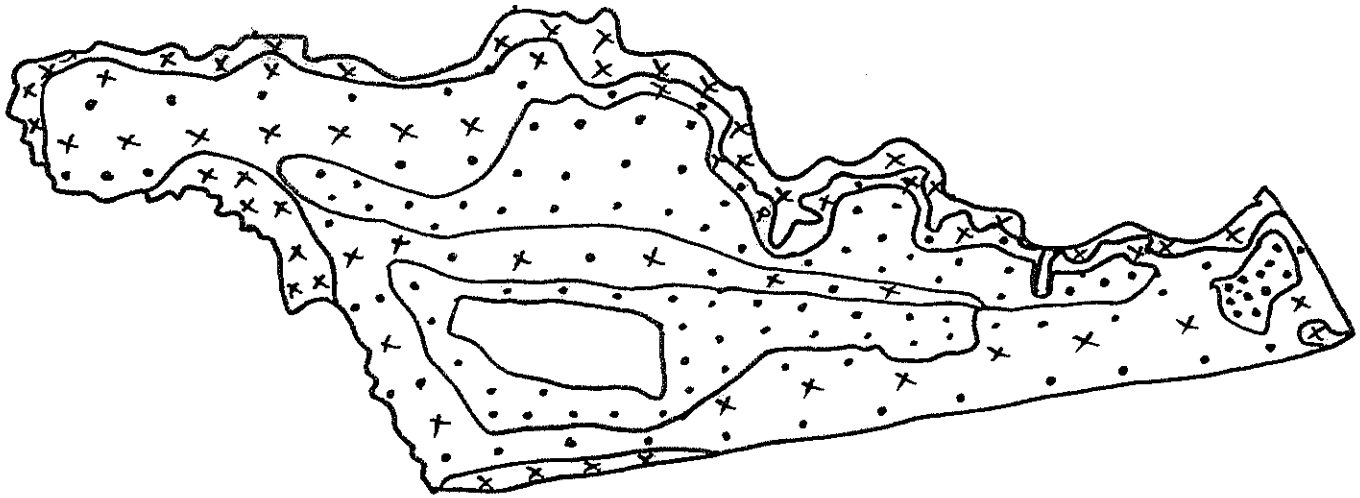
2. The survey found an intact natural margin with the lakeshore and examples of all four ecotopes typical of an active raised bog.

3. There is a large, old drain bissecting the site with numerous drains running from this to the lakeshore, these are all old and in-filled and may already have had an effect on the vegetation.

4. A small area of cutaway in the west would be suitable for restoration work, however, the natural margin with the lakeshore makes this bog very interesting.

Clareisland bog
Cos Westmeath & Cavan
Ecotopes

N



Clareisland bog
Cos Westmeath & Cavan
Vegetation complexes

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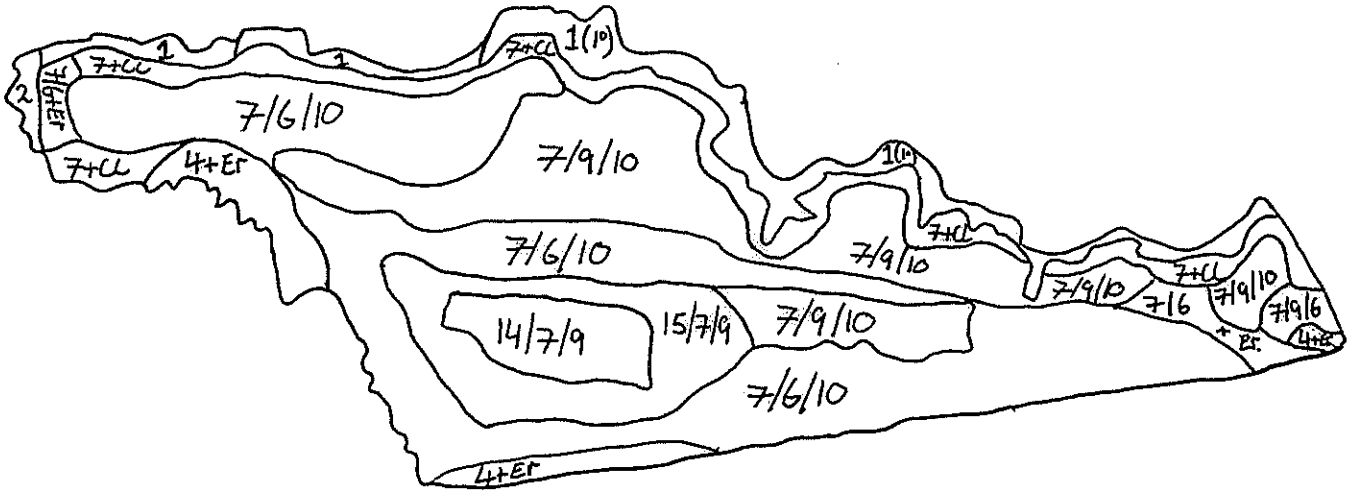

Clareisland bog
Cos Westmeath & Cavan
Slopes

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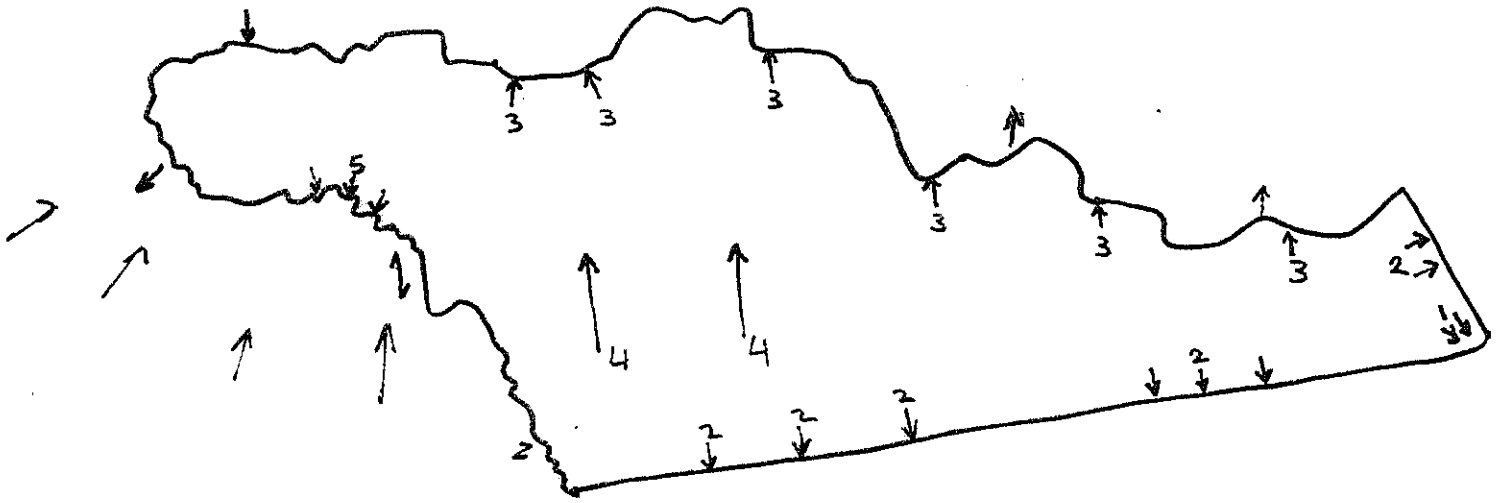

Clareisland bog
Cos Westmeath & Cavan
Drainage

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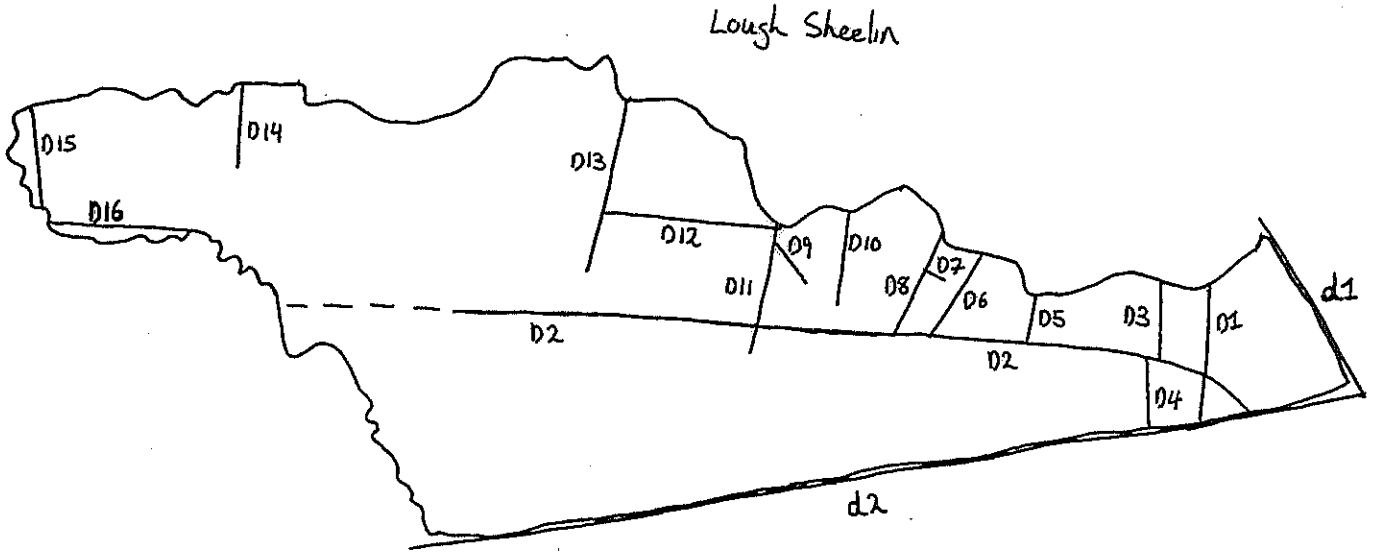

Clareisland bog
Cos Westmeath & Cavan
Landuse

N