Jim Ryan's copy

TURLOUGHS OVER 10ha

Vegetation Survey & Evaluation

A Report for the

National Parks & Wildlife Service

Office of Public Works

Roger Goodwillie

1992

CONTENTS

1. ORIGINS AND PURPOSE

This report fulfills a contract with the Wildlife Service whose terms were to:-

1) Describe, delimit, classify and evaluate all (undrained) turloughs over 10ha in area.

2) Produce a report on their status and value containing site descriptions/evaluations in a format compatible with the CORINE database.

The contract commenced in April and terminated in December 1990. It was under the supervision of Mr Jim Ryan, Wildlife Service, Bray, who spent some time in the field in the early part of the season and was of assistance throughout.

The help of Nick Stewart, Tim Rich, Donal Synnott and Caitriona Douglas with certain plant identifications is acknowledged as is the ornithological and other information received from Donal Daly, Padraig Comerford, David Silk and John Wilson.

2. METHODS

The turloughs to be examined (Table 1 & Figure 1) during the survey were taken as the list of undrained examples in Coxon (1986) with the addition of a site in Kilkenny (Loughans) which she classified as drained. Local knowledge is however that it floods regularly. Another undrained turlough (Four Roads) came to light after fieldwork was finished and it is included in the list of sites (Tables 1 & 6) for completeness.

Each of the turloughs was visited and the plant communities occurring there were recorded, together with other features of physical and biological interest. One or a series of field cards (p 6-7) was completed for each site and mapping information written onto a 1:10560 map.

At the outset of each visit the topmost edge of the turlough was established insofar as this could be done. The evidence was generally taken from the vegetation (see below) but because the spring of 1990 had seen high floods there was quite frequently a line of flood debris, at least on the windward shore. The exceptional levels in the Gort and Coole Lough turloughs were not used for mapping since these were way above 'normal' flood height. The floods that had occurred in this basin earlier in the year are reckoned to be once in 70 year floods (Daly, pers. comm.).

At practically all sites the edges were considerably further out than those shown on the 6" O.S. surveys (and followed by Coxon). As a consequence the areas included in this report are larger by 10-30% than those recorded previously. The justification for including such an area within the site boundary is that all of the vegetation is subject to periodic inundation and may therefore contain special genotypes and unique plant communities. The areas of the turloughs are given in Table 1 which also includes the river systems in which the turloughs lie.

An effort was made to record the waders nesting in each area during the breeding season. Other items of faunal interest were obtained from the literature and unpublished surveys but this aspect of the report should in no way be regarded as complete. The majority of wildfowl figures are from Sheppard (in prep.).

TABLE 1 SUMMARY OF TURLOUGHS: Hydrology

	Name	County	Grid Ref.	Size (x)	River System	Estim. Catchment (y)	y/x
1.	Turloughmore	Sligo	G5413	25.7	Owenmore	40	1.6
2.	Doocastle	Mayo	G5809	38.2	Owenmore	48	12.6
3.	Moylough	Sligo	G5408	19.5	Moy	80	4.1
4.	Killaturly L.	Mayo	M4198	34.0	Moy	562	16.5
5.	Balla	Mayo	M2685	35.0	Manulla (Moy)	723	20.7
6.	Slishmeen	Mayo	M2279	19.6	Manulla/ L. Carra	361	18.4
7.	Ballyglass	Mayo	M2378	25.9	L. Carra	562	21.7
8.	Corbally	Roscommon	M8480	9.2	Scramogue (Shannon)	803	87.3
9.	Mullygollan	Roscommon	M8079	31.8	Scramogue (Shannon)	963	30.3
10.	Castleplunket	Roscommon	M7877	60.0	Smaghraun (Suck)	80	1.3
11.	Brierfield	Roscommon	M8177	52.9	Scramogue (Shannon)	642	12.1
12.	Carrowreagh	Roscommon	M7975	26.3	Smaghraun (Suck)	161	6.1
13.	Rathnalulleagh	Roscommon	M7874	26.4	"	963	36.5
14.	Newtown	Roscommon	M7873	12.4	"	482	38.9
15.	Attishane	Roscommon	M5373	17.2	Dalgan (Clare)	321	18.7
16.	Coolcam	Roscommon /Galway	M5871	67.1	Island (Suck)	963	14.4
17.	Croaghill	Galway	M6071	37.4	"	402	10.8
18.	Ballinastack	Galway	M6565	24.9	Springfield (Suck)	300	12.1
19.	Boyounagh	Galway	M6063	21.2	Sinking (Clare)	402	19.0
20.	Glenamaddy	Galway	M6461	177.5	Shiven (Suck)	1365	7.7
21.	Kilkerrin	Galway	M6356	16.6	"	241	14.5
22.	Levally L.	Galway	M5354	48.5	Grange (Clare)	562	11.6
23.	Carrowkeel	Mayo	M3069	30.1	Robe	562	18.7
24.	Scardaun	Mayo	M3469	18.3	"	402	22.0
25.	Kilglassan	Mayo	M2864	49.9	"	1285	25.8
26.	Caheravoostia	Mayo	M2665	23.8	"	1285	53.9
27.	Greaghans	Mayo	M2963	36.5	"	241	6.6
28.	Skealoughan	Mayo	M2563	28.0	L. Corrib/ Cross R.	482	17.2
29.	Ardkill	Mayo	M2763	16.0	Robe	40	2.5
30.	Rathbaun	Galway/ Mayo	M3561	66.9	Clare	1245	18.6

	Name	County	Grid Ref.	Size (x)	River System	Estim. Catchment (y)	y/x
31.	Shrule II	Mayo	M2654	104.1	Black (L. Corrib)	522	5.0
32.	Turlough O'Gall	Galway	M3551	50.9	"	241	4.7
33.	Belclare	Galway	M3850	98.8	Clare	281	2.8
34.	Turlough Monaghan	Galway	M3346	26.8	L. Corrib	401	15.0
35.	Fearagha	Galway	M3445	18.8	L. Corrib	482	25.6
36.	Fortwilliam	Longford	N0263	44.0	L. Ree	321	7.3
37.	Ballinturly	Roscommon	M8460	130.4	Suck	160	1.2
38.	Lisduff	Roscommon	M8455	54.1	Suck	80	1.5
38A.	Four Roads	Roscommon	M8451	59.1	Suck	460	7.8
39.	Lough Croan	Roscommon	M8849	106.9	Cross (Shannon)	482	4.5
40.	Feacle	Roscommon	M9143	15.7	"	201	12.8
41.	Kiltullagh	Galway	M3730	28.9	Clare	200	7.0
42.	Rahasane	Galway	M4820	267.1	Dunkellin	20073	75.1
43.	Caranavoodaun	Galway	M4515	24.8	Dunkellin	106	4.3
44.	Ballinderreen	Galway	M4015	47.2	Galway Bay	321	6.8
45.	Kiltiernan	Galway	M4314	12.2	Galway Bay	490	40.2
46.	Peterswell	Galway	M5008	40.3	Owenshree (Gort)	5620	139.0
47.	Caherglassaun	Galway	M4106	41.8	Gort	32437	776
48.	Garryland	Galway	M4104	20.4	Gort	31990	1568
49.	Newtown/ (Coole)	Galway	M4303	138 (280)	Gort	161 (31795)	1.2 (113)
50.	Lough Mannagh	Galway	M4001	23.4	Gort	642	27.4
51.	Termon Lough	Galway	R4197	38.2	Fergus	640	16.8
52.	Turloughna-gullaun	Clare	M2804	20.4	Galway Bay	640	31.5
53.	Turloughmore	Clare	M3500	21.7	Fergus	161	7.4
54.	Carran	Clare	R2999	90.3	"	1607	17.8
55.	Castle Lough	Clare	R3598	35.4	"	803	22.7
56.	Lough Aleenaun	Clare	R2595	10.7	"	482	45.0
57.	Knockaunroe	Clare	R3194	42.5	"	348	8.1
58.	Lough Gash	Clare	R3968	21.9	Fergus/ Shannon	480	22.0
59.	Loughmore	Limerick	R5453	30.0	Shannon	480	16.1
60.	Liskeenan	Tipperary	R9799	26.0	L. Derg	241	9.3
61.	Loughans	Kilkenny	S3164	21.7	Goul (Nore)	562	25.9

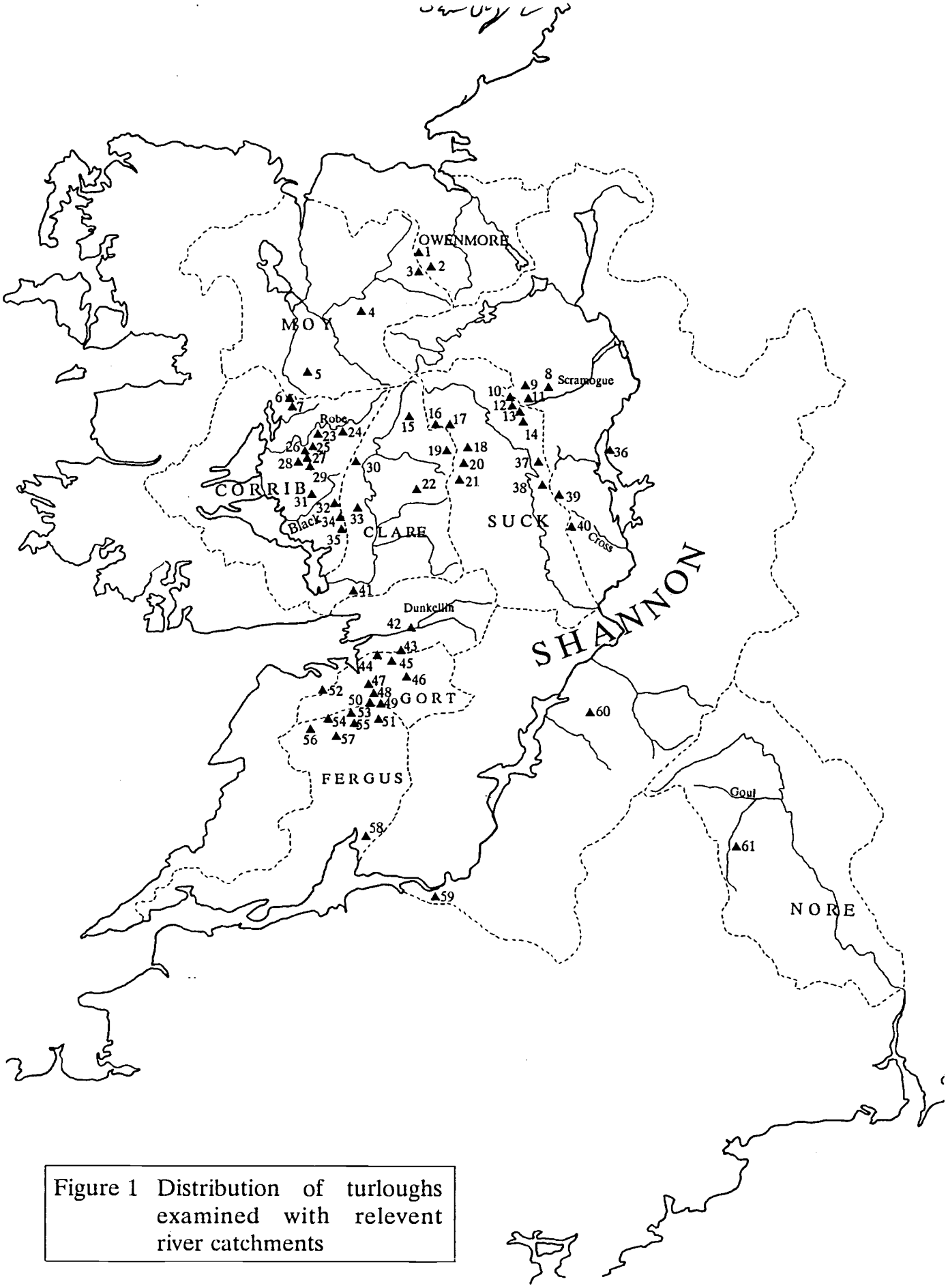

Figure 1 Distribution of turloughs examined with relevent river catchments

TURLOUGH SURVEY

Site Name | Grid Ref.

Site complex | County

Altitude | Area | Recorder

Physiography

Soil

Vegetation

Rare spp.

Birds seen

Evaluation

Flooding

Drainage

Vulnerability

Land Use

Ownership

References

TOT % COVER
ANGIOSP.
BRYOPHYTES
LITTER
HT. OF VEG.
SOIL

GRID REF.

		1	2	3	4	5
7	Achil mil					
9	ptar					
40	Agrost cap					
39	stol					
57	Alch fil					
60	xanth					
63	Alisma					
82	Alop gen					
85	prat					
109	Angelica					
121	Anthox od					
135	Apium inun					
138	nodi					
224	Baldellia					
231	Bellis					
234	Berula ere					
241	Bidens cer					
256	Briza med					
3032	Calli brut					
3071	plat					
307	stag					
310	Caltha					
325	Capsella					
329	Card hirs					
331	prat					
361	Carex demi					
367	disti					
371	elata					
376	flacc					
	* flava					
381	hirta					
382	host					
387	lepido					
393	nig					
400	panice					
414	rostr					
424	vesic					
433	Catabrosa					
444	Centa nig					
467	Ceras font					
515	Cirs arv					
516	diss					
520	pal					
522	vulg					
523	Cladium					

		1	2	3	4	5
569	Crat mono					
576	Crep pal					
597	Cyno crist					
607	Dactylis					
1915	Danthonia					
627	Desch caes					
673	Eleo acic					
674	mult					
675	pal					
33	Elym rep					
697	Epil pal					
698	parv					
712	Equis arv					
717	pal					
740	Erioph ang					
762	Euonymus					
813	Fest arun					
821	ovin					
823	prat					
824	rub					
833	Filip ulm					
841	Fraxinus					
	Gal bor					
882	pal					
888	ver					
924	Geum riv					
932	Glyc dec					
933	fluit					
936	plic					
968	Heracl					
981	Hippuris					
983	Holc lan					
999	Hydroc vul					
1020	Hypoch rad					
1038	Iris					
1050	Junc acut					
1054	artic					
1057	buf					
1058	bulb					
1063	congl					
1067	eff					
1987	Koel mac					
1103	Lamium pur					
1116	Lath prat					
1126	Lemn min					
1128	tris					
1129	Leont aut					
1130	hisp					
502	Leuc vulg					
1175	Littorella					
1183	Lolium per					
1191	Lotus corn					
1227	Lyth salic					

		1	2	3	4	5
1250	Medic lup					
1272	Menth aq					
1273	arv					
1289	Menyanthes					
1307	Molinia					
1319	Myos laxa					
1322	scorp					
1330	Myrio alt					
1331	spic					
1348	Nast off					
1358	Nymphaea					
1361	Odontites					
1381	Ophiogl					
1454	Phal arun					
2247	Phleum pra					
1465	Phragmites					
1487	Plant lanc					
1488	maj					
1489	mar					
1495	Poa annua					
1506	prat					
1507	triv					
1515	Polyg vul					
1521	Polyg amph					
1522	avic					
1530	hydro					
1535	min					
1537	pers					
1559	Potam berch					
1568	gram					
1569	luc					
1570	nat					
1584	Poten ans					
1588	erec					
1589	frut					
1592	pal					
1594	rept					
1610	Prunel vulg					
1617	Prunus spin					
1619	Pteridium					
1642	Ran acris					
16431	aquat					
1651	flam					
16432	pelt					
1660	rep					
1664	trich					
1675	Rhamnus					
1701	Rorip amph					
1702	isl					

		1	2	3	4	5
1703	pal					
1708	Rosa can					
1719	pimp					
1726	Rubus caes					
1728	frut					
1734	Rum actosa					
1741	congl					
1742	crisp					
1748	obtus					
1753	sang					
1802	Salix rep					
1817	Samolus					
1855	Schoenus					
1851	Scirp lac					
1047	set					
1875	Sedum acre					
1888	Selaginel					
1891	Senec aq					
1899	jac					
1908	Sesleria					
1947	Sol dulc					
1983	Sparg em					
1981	erec					
1982	min					
2012	Stell med					
2021	Succisa					
20341	Tarax pal					
20342	vulg					
2045	Teuc scort					
2060	Thym praec					
2091	Trif prat					
2092	rep					
2102	Trigl pal					
2126	Urtic di					
2129	Utric int					
2132	vulg					
2140	Valer off					
2163	Veron an-aq					
2166	becca					
2167	cat					
2168	cham					
2179	scut					
2180	serp					
2185	Viburn op					
2189	Vicia crac					
2207	Viola can					
2219	persic					
2218	riv					
2237	Zann pal					

	Amblystegi					
	Anomodon					
	Barbula					
	Brachythec					
	B.					
	Breutelia					
	Callierg cusp.					
	C.					
	Campylopus					
	C.					

	Cinclidot					
	climacium					
	Cratoneur					
	Ctenidium					
	Ditrichum					
	Drepanocl					
	D.					
	Eurynchium					
	E.					
	Fissidens					

	Fontinalis					
	Homalothec					
	Hylocomi					
	Hypnum cup					
	Leskea					
	Neckera					
	Plagiochila					
	Plagiomnium					
	P.					
	Pseudoscl					

	Radula					
	Rhycost					
	Rhytid					
	Rhizomnium					
	Scapania					
	Scorpidium					
	Thamnobry					
	Thuidium					
	Tortella					
	Trichostom					

2.1 Vegetation

The purpose of the survey was to discover both the habitat variation and the flora of the turloughs so that they could evaluated for their ecological interest. Plant communities indicate habitat variation better than the actual presence or absence of species so the work was concentrated on them.

This approach involves the identification of distinctive communities or groupings of species that are repeated in different turloughs, presumably under the same habitat conditions. In fact the plant communities are often difficult to identify because they are disguised by the presence of ubiquitous species that occur almost from the edges to the base of a turlough. Similarly, communities are difficult to separate or map as they appear to merge very gradually together. However there are plants that are less widely distributed and grow only under a narrow range of habitat conditions. It is these indicator or character species that have to be distinguished before the communities can be defined and mapped.

In traditional phytosociology the communities are identified in an abstract way, by ordering mechanically a mass of releves into those that most resemble each other. This is a lengthy process requiring almost complete data collection before it yields any resultant community. Since there was insufficient time in a one year survey to do this, a conspectus of possible communities was drawn up at the outset from the literature, chiefly from MacGowran (1985), O'Connell, Ryan & MacGowran (1984), Louman (1984), Vink & van Kruysbergen (1987) and White & Doyle (1982). These were then checked in the early days of the field survey by doing releves in likely vegetation. The communities were adjusted to fit in with the visually apparent vegetation and some more were added. The end result was a group of 32 recognizable vegetation units (Table 3). The majority of these are based on phytosociological communities but some are defined more by their physiognomy, e.g. flooded limestone pavement, tall sedge stands, or by certain conditions of management.

These units were then used on the field survey to record the variation within each turlough and to map the vegetation pattern. A partial key was written in order to help with community identification but this was later abandoned in favour of an aide memoire of abundant and distinctive species (see Appendix 1).

It often happened, especially during the first part of the season, that communities were not immediately recognized. In this case a list was written of the major and other noticeable species. These lists are recorded on the field cards which have been deposited at the Wildlife Service Research Branch. They are the foundation of the descriptive lists which are used to characterize the communities (see Appendix 2). Because of their original purpose

which was to separate and define the plant communities, very widespread species such as *Agrostis stolonifera* were not always included. The lists cannot be treated therefore as objective releves. As has been noted some actual releves were taken during the fieldwork and these have been retained.

Some mapping was done in the field and it was later augmented by the 1972 aerial photographs which turned out to be of more value after the field survey than during it.

3. TURLOUGH TYPES

3.1 Physiography

A turlough, simply defined, is a limestone basin that floods annually but is without overground outflow. The inflow may come from a stream or river or from the groundwater but the temporary lake so accumulated never flows out over the rim. It lies there until a fall in the ground watertable allows release through a porous part of the floor and until evaporation dries out the surface.

The 'typical' turlough has a impermeable floor of lake clay or marl with one or several connections to groundwater (*swallow holes) some way above the lowest point. These holes fill and empty the basin as the ground watertable rises and falls. Their position above the lowest point also allows water to persist on the floor even after the groundwater has sunk some distance below it. Additional water may enter through springs on the side slopes of the basin and these usually give rise to peat deposits which require summer dampness. If present, an inflowing stream or river normally sinks into its own bed as this is washed free of impermeable material. It thus fills the turlough in the autumn but does not necessarily keep it damp in the summer.

The variation in turloughs becomes more complicated the more examples are looked at. In Table 2 details of their overall character, water relations and apparent alkalinity are included as well as their substrate type. There are dry turloughs (some of which have been affected by artificial drainage) and damp turloughs, and both of these may have a river flowing into them. Damp turloughs in general accumulate some organic matter but there are many examples where purer and thicker peat dominates parts of the floor. These sites must remain wet all through the year to maintain it. A few turloughs, especially in the Burren region, have significant amounts of bedrock exposed in the basin, while marl accumulation is common, either in the present or the past. The hardness of the floodwater was not recorded directly since the turloughs were dry when visited. However an indication is given in Table 2 as to the degree of calcium content involved. Hardness seems to be a critical factor in determining the present vegetation as the more calcareous the water becomes, the less nutrients it holds in available form. Highly calcareous turloughs therefore are very oligotrophic, for example those around Mullaghmore in the eastern Burren.

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*the term swallow hole in this report includes both entry and exit holes, estavelles, sinks etc.

TABLE 2 PHYSICAL FEATURES OF TURLOUGHS

	NAME	OVERALL CHARACTER DRY	DAMP	AQUATIC HABITAT	INFLOW	ALKALINITY LEVEL (A-D)	APPARENT DRAINAGE	PEAT	MARL	ROCK
1.	Turloughmore	+				A		+		
2.	Doocastle		+			B				
3.	Moylough	+		+		A	?			
4.	Killaturly L.		+	+	+	B		+	+	
5.	Balla		+			B		+	+	
6.	Slishmeen	+		+		B	+			
7.	Ballyglass		+			B	+	+		
8.	Corbally		+			B				
9.	Mullygollan		+	+	+	B		+		+
10.	Castleplunkett	+	+			C		+		
11.	Brierfield		+		+	B		+		
12.	Carrowreagh	+			+	B	?			
13.	Rathnalulleagh	+				B				
14.	Newtown	+				B				
15.	Attishane	+				B	+			
16.	Coolcam		+	+		C		+	+	
17.	Croaghill		+	+	+	B		+		
18.	Ballinastack		+		+	A		+		
19.	Boyounagh		+		+	A	+	+		
20.	Glenamaddy		+		+	A		+		
21.	Kilkerrin	+				B	?			
22.	Levally L.		+	+		B		+	+	
23.	Carrowkeel		+	+		B				
24.	Scardaun		+		+	A	+	+		
25.	Kilglassan		+			B		+		
26.	Caheravoostia		+	+		B				
27.	Greaghans	+			+	B				
28.	Skealoughan		+	+		C		+		
29.	Ardkill		+	+		C				+
30.	Rathbaun	+			+	C	+			
31.	Shrule II		+	+	+	C		+	+	
32.	Turlough O'Gall	+		+		B	?		+	
33.	Belclare	+				B	+	+		
34.	Turlough Monaghan	+				B	?			+
35.	Fearagha	+				B	?			
36.	Fortwilliam	+		+		C			+	
37.	Ballinturly		+	+	+	D		+	+	
38.	Lisduff		+			D		+	+	
39.	Lough Croan		+	+		B	?	+		
40.	Feacle	+				B				
41.	Kiltullagh	+				B	?			
42.	Rahasane	+	+	+	+	B				+
43.	Caranavoodaun		+			D		+	+	+
44.	Ballinderreen	+	+	+		D		+	+	+
45.	Kiltiernan	+				B	?			
46.	Peterswell	+			+	B		+		+
47.	Caherglassaun	+		+		B				+
48.	Garryland		+	+		B				+
49.	Newtown/Coole	+	+	+	+	C/B		+	+	+
50.	L. Mannagh		+	+	+	C		+	+	+
51.	Termon Lough			+		B		+		
52.	Turloughnagullaun	+				C				+
53.	Turloughmore	+				B				+
54.	Carran		+	+	+	D		+	+	+
55.	Castle Lough		+	+	+	D		+	+	
56.	Lough Aleenaun	+				C				+
57.	Knockaunroe		+	+		D		+	+	+
58.	Lough Gash		+		+	B				
59.	Loughmore	+				B	?	+		
60.	Liskeenan		+	+		B	+	+		
61.	Loughans	+	+			B				

A high level of calcium also promotes the growth of charophyte and other algae which produce marl (precipitated calcium carbonate). This material is the most effective block to drainage and in most cases it causes some permanent water to persist in the turlough in summer. There is then an opporunity for peat to accumulate on the marl layer, as in the case of raised bogs.

It is obvious from sediment cores that the hydrology of many turloughs changes quite naturally from time to time and was doing so before the advent of modern drainage schemes. Thus there are many cores in Coxon (1986) where marl, indicating open lake conditions, is overlain by peat which shows the colonisation of such waterbodies by plants and then overlain again by marl, indicating reflooding. These shifts are caused by changes in the drainage systems of the underlying rock or bottom sediments as swallow holes and fissures become opened or blocked. There is thus an abrupt character in the dynamics of the turlough habitat which is largely absent from other natural habitats. Around a swallow hole or, especially, a sinking river (e.g. Rahasane) it is clear that new holes and collapses are constantly being formed, even during a single year.

Changes to turloughs induced by man may therefore in some cases simulate a natural occurrence in the habitat. While all intentional changes have in the past been biassed towards drainage rather than an increase in wetness, it will be possible also sometimes to reflood a basin, if desired. For this reason the inflow of a river has been noted in the overall evaluation of the turloughs as a definite plus for management.

3.2 **Vegetation**

Turloughs are usually thought of as grassy hollows in the limestone which are devoid of trees and shrubs and where the moss *Cinclidotus* covers any exposed rocks and walls. The absence of woody plants is primarily caused by flooding, locally augmented by grazing. This was clearly shown in early 1990 which was a year of exceptional floods. In many turloughs the flooding levels were higher than within living memory and local opinion gave 40-100 years for the last comparable water levels. Many woody species were killed around the edges, including *Juniperus* and *Ulex, Prunus spinosa* and *Fraxinus*. *Rhamnus* appeared to be killed outright in certain cases but later in the year it generally sprouted new shoots from the trunk. *Prunus spinosa* also resprouted or sent up new suckers from roughly the same position. Branches of *Ilex* that had been covered underwent a total leaf fall and some dieback though new leaves were produced in many cases. This species seems highly sensitive to flooding and it appeared to record the highest water levels as a horizon around the edge of, for example, Newtown/Coole turlough.

The vegetation outside a turlough that is flooded so infrequently and for such a short time as to be unaffected either consists of dry ash/hazel woodland, limestone heath, grassland of various sorts or bog. A number of typical edge species were recognised during the survey work. In the woodland situation hazel itself is a good indicator as are *Anthriscus sylvestris* and *Conopodium majus*. Where limestone grassland adjoins the basin *Thymus praecox, Juniperus communis, Pilosella* and *Sesleria albicans* are rarely flooded. *Calluna* may occur in rather dwarf form at the very edge of the regular flood. In acidic grassland *Cirsium palustre, Holcus lanatus* and *Anthoxanthum* are the best indicators and their dead remains may stay standing as an obvious shoreline after the winter's floods. In more eutrophic grassland *Dactylis* along with *Holcus lanatus* shows ground out of the range of flooding. *Cirsium arvense* is also frequent but it does extend some distance down into the basin. The unflooded level on bogs and wet heaths around a few turloughs is marked by the appearence of *Carex echinata, C.binervis, Juncus squarrosus* and *Luzula multiflora* in the general vegetation of *Molinia, Nardus* and *Succisa* (all of which withstand flooding).

Originally the edging communities were recorded during the site visits but since this took too much time it was later dropped. They were classified as the community Type 1 in the series of 1-12 vegetation divisions (see below) encountered with increasing depth. At any level the communities were roughly split into the eutrophic ones (A), less enriched and often less managed types (B), the oligotrophic calcareous (C) and peaty (D&E) types and those containing woody species (W). The resulting classification includes 32 identifiable communities with distinctive vegetational and occasionally physical factors (see Table 3). It was largely an intuitive classification, based on appearence and relative position not on actual measurement of depth. In some turloughs Type 5 communities may be present below those of Type 6, for example. At certain levels there seem to be gaps in the eutrophic-oligotrophic range and no appropriate community was recognised (e.g.4A, 7C).

The species composition of the each community type is included in Appendix 1. As mentioned above it is a summary derived from lists written in the field, not an objective record of plant frequency.

TABLE 3. VEGETATION TYPES RECORDED IN TURLOUGHS.

Increasing depth 2-12. Trophic status A(eutrophic) -D

Eutrophic	*Mesotrophic*	*Oligotrophic*	
		Calcareous	*Peaty*
2A Lolium grassland	2B Poor grassland	2C Limestone grassland	2D Peat grassland
3A Tall herb	3B Sedge heath	3C Flooded pavement	-
-	4B Pot. reptans (spp. rich)	-	4D Schoenus fen
5A Dry weed	5B Pot. reptans (spp. poor)	5D Sedge fen	5E Carex flava
6A Dry C.nigra	6B Wet C.nigra	-	6D Peaty C.nigra
7A P.amphibium (grassy)	7B Tall sedge	-	-
8A P.amphibium	8B Wet annuals	8C Cladium fen	-
9A Temporary pond	9B Eleocharis acicularis	9C Marl pond	*Woodland*
10A Oenanthe aquatica	10B Ditch	-	2W Quercus wood
			3W Rhamnus wood
11A Reedbed	11B Peaty pond	-	
			4W Frangula/ Pot.fruticosa
12 Open water	-	-	

4. VEGETATION TYPES

The total area of each vegetation type in the 61 turloughs is given in order to show their coverage and possible significance in national terms. The number of species is taken from the field lists accumulated at each site and is an indication of species richness rather than an absolute total.

A description of each vegetation type is given first followed by comments on its phytosociology. It is interesting that there are few strictly comparable communities outside the turlough habitat and therefore that most of the parallels are drawn with work already done in Ireland by continental and other workers. In particular there are very few similarities with British vegetation as described in the draft accounts of the National Vegetation Classification (Rodwell, in press).

2A. **Lolium grassland** Area 120 ha (4.4%) No. of species 104

This community is found on the more eutrophic fields around turlough margins. Such sites may be naturally rich, especially if there is limestone near the surface, or they may be fertilized and grazed. The main species in terms of coverage are usually *Agrostis stolonifera, Leontodon autumnale* and *Plantago lanceolata* but at times *Trifolium repens, Festuca rubra, Lolium perenne* or *Calliergon cuspidatum* may be almost as common. *Poa* species are important in many places, both *P.pratensis* and *P.trivialis*, but often *Bellis perennis, Ranunculus acris* and *R.repens* are more conspicuous. Late in the season *Cynosurus* and locally *Cirsium arvense* invite attention because of their size and persistence. *Cerastium fontanum* and *Odontites verna* are practically restricted to this community.

The community was usually recognised by the presence of *Lolium, Festuca rubra, Trifolium repens, Bellis, Cirsium arvense* and *Poa* spp. It is especially common in the drier turloughs in good land, for example Belclare and Peterswell.

Phytosociology: MacGowran (1985) refers to this community as the *Lolium perenne* variant of the **Ranunculo-Potentilletum anserinae** association and in his Table 23 it occupies releves 18-28. It seems clear that this community may be derived in two separate ways, either from the Plantaginetea Majoris Tx. et Prsg. 1950, a vegetation of rosette and creeping hemicryptopytes which is characteristic of disturbed habitats and ecotones, or from the Molinio-Arrhenatheretea Tx. 1937, the common anthropogenic lowland meadows and pastures. Indeed the flooding and trampling of one of the latter's associations, in particular the **Centaureo-Cynosuretum**

Br.-Bl. et Tx. 1952, followed by the invasion of some weedy species, would seem a likely route.

2B. **Poor grassland** Area 161 ha (6.0%) No. of species 120

This would seem to be the more natural type of fringing grassland at the upper levels of a turlough where there has been no management as pasture and the soil is naturally damp. *Trifolium repens, Potentilla anserina* and *Agrostis stolonifera* are the main species with a substantial amount of *Filipendula ulmaria, Carex hirta, Ranunculus repens* and often of *Calliergon cuspidatum, Poa trivialis* and *Festuca arundinacea* also. As in the last community there is often *Lolium* in small quantity along with *Leontodon autumnale, Taraxacum officinale* and *Plantago lanceolata. Phleum pratense* is often noticeable in its native form (ssp. *bertolonii*) while *Elymus repens* locally forms colonies.

The community was recognised by the presence of *Festuca arundinacea, Carex hirta, Phleum, Filipendula* and *Potentilla anserina*. It is the most widespread of the vegetation types, occurring in more than 80% of turloughs. Since it usually forms a fringe it seldom covers a lot of ground and the larger sites have the greatest area (e.g. Ballinturly).

Phytosociology: This community is not recognized as such by MacGowran (1985) who seems to includes it with his *Agrostis stolonifera-Festuca rubra* community (see below) and also with his *Lolium perenne* variant, just described. In fact it is rare around the Clare and south Galway turloughs that he studied so probably went unrecognised. It is most likely an unfertilized Molinio-Arrhenatheretea Tx. 1937 association such as the **Senecioni-Juncetum acutiflori** Br.-Bl. et Tx. 1952 or one included in the Agropyro-Rumicion crispi Nordh. 1940 em. Tx. 1950 alliance within the Plantaginetalia majoris.

2C. **Limestone grassland** Area 96 ha (3.5%) No. of species 96

A dwarf, grazed grassland is frequently found around limestone pavement or on other shallow calcareous soils. It appears very species-rich but in fact covers a more defined habitat than, for example, 2B so has a lower number of species altogether. *Festuca rubra* and *Agrostis stolonifera* are the most frequent grasses, often with some *Lolium* and *Cynosurus cristatus. Trifolium repens, Galium verum, Potentilla anserina, Plantago lanceolata* and *Carex panicea* and/or *C.flacca* are also important species though *Bellis perennis, Achillea millefolia, Lotus corniculatus* and *Centaurea nigra* are more noticeable. Because of the western location of most turloughs *Plantago maritima* is quite frequently found in this community and it may also be enriched with certain limestone specialities like *Campanula rotundifolia, Pimpinella minor, Daucus carota, Thymus praecox* or, in the Burren, *Filipendula vulgaris*.

Its occurrence is limited to dryish, shallow soils on or close to limestone outcrops. Normally it is found as a narrow band around the margins of a turlough but in a few cases, as at Killtullagh and Rahasane, it covers extensive areas.

Phytosociology: This community seems practically identical with the *Agrostis stolonifera-Festuca rubra* community of MacGowran (1985), if anything more closely associated with dry limestone. Though he includes it within the Plantaginetea Majoris, the absence of weed species would appear to make it much closer to the galietosum sub-association of the **Centaureo-Cynosuretum** (White and Doyle, 1982) which is included in the more undisturbed Arrhenatheretalia. Vink & van Kruysbergen (1987) created a new association, the **Seslerio-Cynosuretum** for the distinctive type of this vegetation at Newtown/Coole.

2D. **Peat grassland** Area 82 ha (3.0%) No. of species 105

This community occurs on peaty ground where there is continual moisture in the rooting zone even if this does not visibly flow into the turlough during the summer. It is usually present where a turlough floods an adjoining bog and the calcareous water moderates the natural acidity. Though no releves are available for this vegetation it is usually dominated by *Molinia caerulea, Carex panicea* and *Succisa* with frequent *Cirsium dissectum, Carex nigra* and *Filipendula*. Some amount of rush growth is normal and the size of these species, *Juncus conglomeratus, J.effusus* and sometimes *J.inflexus*, makes them very noticeable. *Deschampsia cespitosa, Lychnis flos-cuculi* and *Myrica gale* are similarly prominent in the lists. The mixed trophic status of the community is emphasized by *Potentilla erecta* and *Anthoxanthum odoratum* on the one hand and *Ranunculus acris* and *Filipendula* on the other.

The community was usually recognized by the presence of *Molinia, Succisa* and *Juncus* spp. Its distribution is limited to sites with a peat influence around the edge and it is well shown at Glenamaddy and Ballinastack.

Phytosociology: The vegetation is not included in MacGowran (1985) because the strongly calcareous nature of most of his habitats militate against its development. It seems most likely to be an association within the Junco conglomerati-Molinion Westhoff 1968, part of the Molinietalia side of the lowland grasslands. In some places it is probably closer to a Nardetalia association such as the **Hylocomio-Centaureetum nigrae** Br.-Bl. et Tx. 1952.

2W. **Dry wood** Area 5 ha (0.2%) No. of species 34

'Ordinary' woodland seldom has much chance of developing around a turlough because of the grazing pressure. It is more usual for a

scrub rich in spiny plants like *Crataegus* and *Rhamnus* to be present and in places there is some invasion of *Fraxinus* into this. Only in the former estate of Coole does well developed oak woodland impinge on turlough areas. Here the main species are *Fraxinus, Crataegus, Quercus robur* and *Salix cinerea* which form a well grown canopy of normal height. The evidence of *Cinclidotus* on the branches where there is sufficient light shows that the trees are sometimes flooded to 2m or so but presumably for relatively short periods during their dormant season. Summer flooding probably never reaches into the woodland.

Smaller shrubs include *Rhamnus catharticus, Salix aurita* and a little *Corylus. Malus sylvestris* and *Ulmus glabra* occurred at a single site. The ground surface is covered largely by *Filipendula, Glechoma* and *Viola riviniana* and the presence of sheep and other animals which lie up in the woodland introduces much *Stellaria media*.

Traces of this community were found in eight separate turloughs but only covered measurable areas at Coole and Fortwilliam.

Phytosociology: MacGowran (1985) does not record *Quercus robur* in his stands of arbuscular vegetation. Moreover the frequency of *Prunus spinosa* and the relative rarity of *Fraxinus* suggests that he is dealing with different vegetation.

This community should probably be included within the Alno-Padion alliance of the Querco-Fagetea though the small sample size means that few of the indicator species were found. Despite occasional flooding the soil would seem to be well-drained and mineral-rich.

3A. **Tall Herb** Area 62 ha (2.2%) No. of species 120

This is a tall (more than 50cm) community that grows round the edges of some turloughs and often adjoins rocks, woodland or hedges. It consists of *Filipendula ulmaria, Agrostis stolonifera, Phalaris* and *Potentilla anserina*, often with *Festuca arundinacea* and, more locally, *Carex disticha* and *Iris*. It is largely ungrazed and thus in some instances may represent the development of the 2B or 4B community. However the occurrence of more water-demanding species such as *Polygonum amphibium, Lysimachia vulgaris, Phalaris* and *Caltha palustris* suggest that it should be differentiated as a separate entity. As well as these 'lower' species, the first two of which extend almost to the full vertical range of turloughs, this community retains high level plants like *Vicia cracca, Plantago lanceolata* and *Galium verum* as well as occasional seedlings of *Fraxinus* and *Crataegus. Rubus caesius, Solanum dulcamara* and *Thalictrum flavum* are characteristic though local.

The community was recognised by the presence of well grown *Phalaris* and *Filipendula* with *Vicia cracca* and/or *Festuca arundinacea*. It is most abundant in the drift-filled turloughs of

north Roscommon where *Iris* is characteristic, for example Castleplunket and Carrowreagh.

Phytosociology: MacGowran (1985) seems to include this in either his *Agrostis stolonifera-Festuca rubra*, his *Senecio aquaticus* or *Potentilla reptans* variants of the **Ranunculo-Potentilletum anserinae**, depending on the presence of his various indicator species. In the present survey both *S.aquaticus* and *P.reptans* were found to be rather too broad in their habitat ranges to be regarded as strictly differential species.

Physiognomically the 3A community stands out from other turlough vegetation because of its height. It seems related to Filipendulion (Duvigneaud 1946) Segal 1966 associations and has features of both the **Valeriano-Filipenduletum** and **Filipendulo-Iridetum pseudacori** (White and Doyle, 1982). It differs in being irregularly flooded.

3B. Sedge heath Area 146 ha (5.4%) No. of species 133

Sedge heath is usually a short, sheep-grazed vegetation on quite level ground near the top edge of the turlough basin. The soil is peaty but dries out in the summer months except for local seepages. In some cases the community covers old cultivation ridges and it seems likely that some leaching takes place. The plant cover is made up of sedges, especially *Carex panicea* and *C.flacca*, with *Festuca rubra, Succisa, Lotus corniculatus, Leontodon autumnale* (and *L.taraxacoides*), *Potentilla erecta* and usually *Calliergon cuspidatum. Deschampsia cespitosa, Festuca arundinacea, Danthonia decumbens, Molinia caerulea* and *Nardus stricta* are found with lower frequency while *Carex hostiana, C.nigra* and *C.pulicaris* occur in places.

Sedge heath is the most species-rich community of any of those described since, in different places, it is subject to both leaching and calcareous seepage. It has elements of limestone grassland with *Plantago maritima, Prunella, Ranunculus acris, Bellis perennis* and *Potentilla reptans* as well as fen species like *Cirsium dissectum, Briza media* and *Parnassia palustris*.

The community was recognised usually by the presence of *Deschampsia, Carex flacca, Danthonia, Nardus* or *Leontodon taraxacoides*.

Phytosociology: Sedge heath is not an extensive community around the turloughs of the Burren, occurring more widely in the drift-filled basins of Mayo and Roscommon. MacGowran (1985) seems to include it his *Agrostis stolonifera-Festuca rubra* and upper *Potentilla reptans* communities. However the results of the present survey suggest that it should be distiguished from the limestone grassland because of its different soil conditions. At the same time *P.reptans* is so infrequent in it that it cannot be identified by this species.

It appears that this community should be placed in the Junco conglomerati-Molinion Westhoff 1968 of the Molinietalia order which is described as unmanured wet meadow on poor soils which dry out somewhat in summer (White and Doyle, 1982). The difference to the rest of this alliance is the regular but short-lived flooding with calcareous turlough water which makes it comparable in some ways to the **Cirsio-Molinietum** Siss. et De Vries 1942.

3C. **Flooded pavement** Area 5 ha (0.2%) No. of species 87

This is a distinct habitat rather than plant community and was recorded to be able to compare habitat diversity between turloughs. It contains widely different vegetation depending on the level of the rocks involved. On the floor of a basin it often includes *Cladium, Carex elata* and sometimes *Frangula alnus* which are clearly in contact with groundwater throughout the year. At mid-level *Rhamnus, Carex flacca, Galium boreale* and *Leontodon hispidus* are frequent, with *Rubus caesius, Schoenus nigricans* or occasionally *Thalictrum flavum*. At higher levels *Sedum acre, Lotus corniculatus* and *Plantago* spp. are characteristic, with *Calluna, Vicia cracca, Antennaria dioica* and, in the Burren, *Euphorbia exigua*.

Phytosociology: The vegetation is encompassed by the Molinio-Arrhenatheretea, the Parvocaricetea and the Franguletea.

3W. **Rhamnus wood** Total Area 32 ha (1.2%) No. of species (52)

This is woodland and scrub that is regularly flooded, occurring at the upper levels and often in the more rocky sites. It is scarcely grazed but its edges are used by cattle and sheep for shelter. There is thus sometimes an input of weed species such as *Stellaria media* and *Urtica dioica*. The community consists of *Crataegus monogyna, Rhamnus catharticus* and *Prunus spinosa* with some *Fraxinus excelsior, Viburnum opulus* and *Euonymus europaeus*. The floor is usually very mossy with *Thamnobryum alopecurum* in large hummocks and *Cinclidotus fontinaloides* on rocks, roots and occasionally branches. *Hypnum cupressiforme* occurs in smaller quantity and there may be *Leskea polycarpa* and species of *Amblystegium* and *Rhychostegium*. Clearings or gaps are often present where *Pseudoscleropodium purum* and *Rhytidiadelphus squarrosus* can grow. *Rubus caesius, Filipendula ulmaria* and *Glechoma hederacea* are the commonest herbs.

Rhamnus was taken as the main indicator species for this community, along with *Crataegus* and *Rubus caesius*. Associated plants were seldom recorded which results in a small overall species number.

Phytosociology: This community is clearly part of the Prunetalia spinosae Tx. 1952 order which is woodland margin vegetation. It seems to be an annually flooded form of the **Primulo-Crataegetum** Br.-Bl. et Tx. 1952 with a reduced herb flora.

4B. **Potentilla reptans (species rich)** Total Area 102 ha (3.8%) No. of species 79

P.reptans covers a considerable height range in turloughs and seems able to grow on any well-drained soil, either stony or peaty. The 4B community occupies the upper shores, often just below and grading into sedge heath. It is composed of *P.anserina, Filipendula ulmaria, Agrostis stolonifera, Ranunculus repens* and *Leontodon autumnale* with frequent *Carex nigra, Viola canina* and *Plantago lanceolata*. The distinctive species are *P.reptans, Galium boreale, Lotus corniculatus, Salix repens* and *Ophioglossum vulgatum. Climacium dendroides* and *Calliergon cuspidatum* are the most frequent bryophytes. There is clearly a link with the 3A community but *Phalaris* and *Festuca arundinacea* are much rarer here and both *Vicia cracca* and *Agrostis capillaris* absent. This community represents the top limit of *Viola persicifolia*.

Phytosociology: The nomenclature of this community follows MacGowran (1985) who includes all *P.reptans* stands together in his analysis while distinguishing a species-rich from a species-poor type. He states that the 4B type is flooded for 16 weeks or longer and that the soil water table retreats some 4m below the surface in summer. MacGowran classifies this community as the *P.reptans* variant of the **Ranunculo-Potentilletum anserinae** Br.-Bl. et Tx. 1952 em. O'Connell, Ryan & MacGowran (1984). This is an association within the Plantaginetea majoris.

4D. **Schoenus fen** Total area 85 ha (3.1%) No. of species 55

This is an easily distinguished vegetation type in which *Schoenus nigricans* forms a regular cover of tussocks, with *Molinia caerulea, Carex panicea, C.hostiana* and some *C.lepidocarpa* in between. It is almost never grazed due to unpalatibility so it reaches a height of 40cm or more. It grows on alkaline peat that seems to be flooded annually and retains a high water table for most of the year. *Cirsium dissectum* is a frequent and noticeable species but there is also some *Parnassia palustris, Dactylorhiza incarnata, Achillea ptarmica, Linum catharticum* and, in some cases, *Myrica gale* and *Salix repens. Hydrocotyle vulgaris, Anagallis tenella* and *Scorpidium scorpioides* show the contiuing wetness of the stands at depth despite their superficial crispness.

Phytosociology: MacGowran (1985) classifies this community as **Cirsio dissecti-Schoenetum nigricantis molinietosum** on the basis

of an absence of some characteristic fen species, especially *Parnassia* and *Pinguicula vulgaris*. Since both these plants occur in the community outside the Burren sites, the distinction is not maintained in this report where the community may be thought of as **Cirsio dissecti-Schoenetum nigricantis** Br.-Bl. et Tx. 1952.

4W. **Frangula Wood** Total Area 3 ha (0.1%) No. of species 27

This community is characteristic of the Burren turloughs where limestone slabs break through the floor or surround the edges of the basin. The commonest species is *Frangula* itself followed by *Potentilla fruticosa, Rhamnus* and *Rubus caesius*. *Salix repens, Viburnum opulus* and *Euonymus* are occasional. The *Potentilla* is more locally distributed than *Frangula* and was found only in Knockaunroe, Castle Lough and Carran. There is little shade in these stands and *Molinia, Deschampsia* and *Festuca arundinacea* may grow between the shrubs. The stands resemble Flooded pavement (3C) but seem to be in contact with deeper soil. They have few of the shallow rooted species such as *Sedum acre, Briza* and *Thymus*.

Phytosociology: MacGowran (1985) identifies a *Potentilla fruticosa* community in the turloughs about Mullaghmore where it grows with *Rosa pimpinellifolia* and *Fissidens adianthoides* but only in one instance with *Frangula*. It is clear that he is dealing with higher levels of vegetation and that 4W has more affinity with the Franguletea than with the Parvocaricetea.

5A. **Dry Weed** Total Area 18 ha (0.7%) No. of species 60

Disturbed soil occurs in most grazed turloughs either in field entrances, on the shores at flood level or around swallow holes. It thus may include soil and rock substrates but seldom marl which occurs at lower levels. The plant community varies with the site and its history so that there is no pre-eminent species: *Potentilla anserina, Agrostis stolonifera, Phalaris arundinacea* and *Rumex* spp often cover the most ground but *Stellaria media, Polygonum amphibium, P.aviculare* and *P.persicaria* are also frequent. The *Rumex* species include *R.crispus, R.obtusifolius* and *R.conglomeratus* and on level sites they are often the most conspicuous plants. They are characteristic of a Dry Carex nigra community (q.v.) that is being subjected to overgrazing and is breaking down. *Phalaris, Carex hirta, P.amphibium, Myosotis scorpioides, Potentilla reptans* and *Rorippa palustris* are important near swallow holes.

Phytosociology: The community seems to include both examples of the **Polygono-Matricarietum matricarioidis** (Siss. 1969) Tx.1972 and associations within the Agropyro-Rumicion cripi Nordh. 1940 em. Tx. 1950 alliance depending on the amount of disturbance to the soil profile.

5B. **Potentilla reptans (species poor)** Total area 233 ha (8.6%) No of species 61

This is a distinctive community covering large areas of drift-filled turloughs where superficial drainage is quite good, for example in the Rahasane southern basin. It consists of *Carex nigra, Potentilla anserina, Agrostis stolonifera* with a constant presence of *P.reptans, Mentha aquatica* and *Ranunculus repens*. *P.reptans* itself is much outweighed by *P.anserina* but its leaves can usually be found with little searching even if it flowers rather seldom. The vegetation is usually closely grazed, frequently by sheep, and the *Phalaris* and *Carex hirta* which are often present are much reduced in height. This community often grades into Wet Carex nigra below and the other *P.reptans* community (4B) above. It is the main location for *Viola persicifolia* with some *V.canina* while in certain turloughs it includes *Teucrium scordium* and *Taraxacum* sect. *palustris*. MacGowran (1985) states that the water table is 1m or less below the surface in the summer months and that the community is flooded for up to 30 weeks.

In the field the community was identified by *P.reptans* and *Carex nigra* with significant amounts of *Phalaris* and *Mentha aquatica*.

Phytosociology: MacGowran (1985) identifies this community also as the species-poor *Potentilla reptans* variant of the **Ranunculo-Potentilletum anserinae** Br.-Bl. et Tx. 1952 em. O'Connell, Ryan & MacGowran (1984).

5D. **Sedge Fen** Total Area 173 ha (6.4%) No. of species 83

A characteristic community of highly calcareous turloughs is Sedge fen made up of a uniform sheet of *Carex panicea, C.hostiana* and a little *C.flacca* and *C.nigra* with *Potentilla erecta, Molinia caerulea, Cirsium dissectum, Succisa pratensis* and *Plantago lanceolata*. *P.maritimum* also is quite frequent, along with *Taraxacum* sect. *palustris* and, in wetter places, *Hydrocotyle vulgaris* and *Carex lepidocarpa*. *Carex flava* agg. is sometimes recorded thus because of the difficulty in distinguishing its constituent species. Many of the plants seem to be *C.demissa* which may be favoured by the strongly oligotrophic nature of the habitat.

This community is lightly grazed and grows on peat at a deeper level than the pure *Schoenus* stands, though this species is usually present at low density. The leaves of *C.hostiana* which yellow soon after reaching their full length give the whole community a yellowish look, quite different from a *C.nigra* stand. In the field it was usually identified by the amount of this species in conjunction with little *Schoenus*. The presence of *Lotus*

corniculatus, *Potentilla erecta* and *Plantago maritima* also distinguish it from 4D.

Phytosociology: This community largely corrisponds to the *Juncus articulatus-Carex lepidocarpa* community of MacGowran (1985) though his omission of *Carex hostiana* and the lower frequencies of *Cirsium dissectum* and *Molinia* are points of difference. It seems that his community is slightly lower in level and that some stands of his **Cirsio dissecti-Schoenetum nigricantis molinietosum** are included in Sedge fen. *Carex hostiana* is more of a Molinietalia species and it may be that its prevalence in turloughs justifies the creation of a new association. Vink & van Kruysbergen (1987) in fact created the **Drepanoclado-Caricetum hostianae** for this purpose and their wetter subassociation, filipenduletosum, is quite close to 5D.

5E. **Carex flava** Total area 28 ha (1.0%) No. of species 25

This community resembles the last to a certain extent and is sometimes contiguous with it. However *Carex hostiana* is almost absent and it is replaced by *C.flava* agg in such a small and unflowering state that it is impossible to identify further. The vegetation is therefore made up of *C.panicea*, *C.flava* and *C.nigra* with significant amounts of *Calliergon cuspidatum* and *C.giganteum*, *Agrostis stolonifrea*, *Potentilla anserina*, *Campylium stellatum* and *Drepanocladus revolvens*. *Hydrocotyle vulgaris*, *Ranunculus flammula* and *Caltha palustris* are present in small quantity. Although species-poor it is likely that the total number of species would be higher than that recorded if further releves had been done.

It seems that Carex flava (5E) is less oligotrophic than Sedge fen (5D), occurring at a slightly lower level and being flooded for a few weeks longer. Its substrate is peat and MacGowran (1985) maintains that at Carran it is one of the successional stages in the recolonisation of cutover peat. The present survey supports such a view as bare peat was also involved at some sites outside the Burren. In some places it seemed that cattle damage or even erosion had created the bare peat and the community was not covering all of the ground yet. Odd tufts of *C.flava* were growing by themselves among mosses and algae. In this state they resemble *C.serotina*.

Phytosociology: The data collected on this survey agrees with the description of the *Carex flava* agg. community in MacGowran (1985) which is the same as the species-poor variant of the *Carex panicea-Carex flava* agg. community of O'Connell *et al.*(1984).

6A. **Dry Carex nigra** Total Area 197 ha (7.3%) No. of species 63

There are extensive stands of *Carex nigra* towards the base of many turloughs where they approach the long-lasting pools or permanent

ponds. In terms of cover *Potentilla anserina, Agrostis stolonifera* and *Ranunculus repens* may be the dominant plants but there is usually abundant *C.nigra* and often *C.hirta* and *Phalaris arundinacea*. *Mentha aquatica, Filipendula* and *Rumex crispus* are widespread along with *Lotus corniculatus* and *Drepanocladus revolvens*. Despite its name there are places in which *C.nigra* is rare or absent, perhaps in response to nutrient enrichment or trampling by cattle. Here *P.anserina* and *A.stolonifera* may cover almost all the ground.

The substrate for this community seems generally to be mineral rather than peaty and some of the purest stands grow on marl and clay.

Phytosociology: MacGowran (1985) calls this community the typical variant of the **Ranunculo-Potentilletum anserinae** Br.-Bl. et Tx. 1952 em. O'Connell, Ryan & MacGowran (1984). As such it lies in the Plantaginetalia majoris and is quite eutrophic. Vink & van Kruysbergen (1987) maintain that it should be included in the **Triglochino-Agrostietum stoloniferae** Sykora 1982, despite the absence of *Triglochin palustris*. This association would accomodate some of the next community (6B) also.

6B. **Wet Carex nigra** Total area 396 ha (14.6%) No. of species 95

This community is more widespread than the last in most areas and is characteristic of a turlough that retains some dampness into the summer with the watertable just below the surface. The substrate is a peaty silt or even well-humified peat. *Carex nigra* is frequent as in 6A and often it covers more ground than in that community. It is joined by *Potentilla anserina, Ranunculus repens* and *Agrostis stolonifera* but also by a suite of 'wetter' species like *Eleocharis palustris, Hydrocotyle vulgaris, Galium palustre, Caltha palustris* and *Senecio aquaticus*. In places *Glyceria fluitans, Phalaris arundinacea* and *Myosotis scorpioides* enter the picture with a little *Polygonum amphibium* locally. The species list is longer than in 6A: partly this is because more information was collected, partly because the community grows on a broader range of habitats, involving seepage water on the sides of turloughs as well as static groundwater at the base. This brings about stands where *Molinia, Carex disticha, Potentilla palustris* or *Veronica scutellata* occur and link the community with the next vegetation type, Peaty Carex nigra. In calcareous circumstances *Carex lepidocarpa* and *Scirpus fluitans* link it with the wetter Marl pond (9A).

A particular type of this community with *Lysimachia vugaris, Sparganium emersum* etc. among rather sparse *C.nigra* is present in the lengthy flooding conditions of Glenamaddy turlough.

Phytosociology: Vink & van Kruysbergen (1987) would include most of these stands in the **Triglochino-Agrostietum stoloniferae** Sykora 1982. MacGowran (1985) however distinguishes it as the *Senecio*

aquaticus variant of the **Ranunculo-Potentilletum anserinae**. On the present evidence it does seem distinct and would justify a separate name. MacGowran notes that the soil beneath the stands is waterlogged for most if not all of the year and the wet nature of the surface stands out in the field. A somewhat similar community is included by Rodwell (in press) as the *Agrostis stolonifera* sub-community of the *Eleocharis palustris* swamp. In Britain this has a maritime distribution respoding to periodic flooding.

It is probable that 6B extends somewhat lower than MacGowran's community as it lacks *Bellis* and *Lolium* but includes *Glyceria fluitans* at reasonable frequency. He suggests that the community should be ascribed to the Plantaginetea majoris rather than the Molinio-Arrhenatheretea but it seems that it could equally form part of the Calthion palustris of the latter. Turloughs would seem to require a *Juncus*-free association in this alliance which, as mentioned by White & Doyle (1982), needs further elucidation in Ireland.

6D. **Peaty Carex nigra** Total Area 51ha (1.9%) No. of species 62

This community resembles the last (6B) in many ways and shares most species with it. The habitat is more consistently damp however and certain plants suggest that there is abundant water in the peat layer in which they grow. *Carex nigra* is again the dominant species but it is usually associated with *Potentilla palustris, Carex rostrata, Menyanthes trifoliata, Equisetum fluviatile* and *E.palustris. Caltha palustris, Filipendula ulmaria* and *Agrostis stolonifera* remain widespread but *Potentilla anserina* is rare. Three species are noticeable because of their size: *Lythrum salicaria, Lysimachia vulgaris* and *Salix aurita.*

The community appears to be more dependant on substrate than on the frequency of flooding and it occurs at widely different levels. In some cases it grows on the remaining peat beside cutover areas and it would seem to be a stage in the eventual transition of turlough to bog. It does not occur in the most calcareous basins where Schoenus fen would occupy the same niche.

Phytosociology: The rarity of the community in the Burren means that MacGowran (1985) does not distinguish it from the widespread Wet Carex nigra (6B). In some cases it may also be included in the 'communities from the bottoms of turloughs' (his table 26) though the occurrence of *Chara* spp and *Littorella* in most of these suggests that they are wetter. It seems best to consider Peaty Carex nigra as a Parvocaricetea association, probably within the Caricetalia nigrae.

7A. **Polygonum amphibium (grassy)** Area 76 ha (2.8%)
No. of species 57

As befits its name *Polygonum amphibium* has a great range within turlough vegetation. It occurs on the fringes of some basins, around swallow holes on the mid-slopes and in permanent ponds at the bottom. It is most common in channels and long-lasting pools where moving water concentates nutrients and allows eutrophic vegetation even in an oligotrophic basin. The present community is characteristically green and luxuriant and is made up of *P.amphibium* scattered through a dense mat of *Agrostis stolonifera, Potentilla anserina, Myosotis scorpioides* and *Ranunculus repens*. Locally *Alopecurus geniculatus* and *Carex vesicaria* are frequent while *Galium palustre, Eleocharis palustris* and *Phalaris arundinacea* are more constantly found. The other sedges are *C.nigra* and *C.hirta* in small quantity. *Fontinalis* and *Drepanocladus* spp are found in some stands but they are apt to get swamped by the blanket of grasses.

The substrate generally seems to be silty though there may be peat below the surface.

Phytosociology: MacGowran (1985) classifies this community as the *Polygonum amphibium* variant of the **Ranunculo-Potentilletum anserinae** association. He does not distinguish divisions within the variant so includes some swallow hole communities (5A) as well as pure *P.amphibium* pools (8A) that are treated separately in this survey.

7B. **Tall sedge** Total area 74 ha (2.7%) No. of species 43

Tall sedge is a physiognomic unit rather than one based on phytosociology because sedge stands are rare in turloughs and often monospecific. *Carex rostrata* forms the majority of stands as in the Carran turlough, and it may be mixed with *C.nigra, Eleocharis palustris* and *Menyanthes*. In more eutrophic basins *C.acuta* is present occasionally but *C.elata* covers extensive areas: it is scattered and small with poorer nutrition. At Lough Croan and Termon Lough *C.elata* occurs in mixture with *Phragmites* and *Scirpus lacustris*. *Carex vesicaria* is associated with drift-filled basins or shallow peat while *C.aquatilis* grows only in a few peaty sites.

This vegetation is recognized by the dominance of large sedges in the vegetation. Occasional shoots of *C.lasiocarpa* or *C.rostrata* growing through other plants do not qualify.

Phytosociology: MacGowran (1985) recognises a Magnocaricion alliance in his communities, separating stands into **Caricetum rostratae, Caricetum elatae** and **Cladietum marisci** as appropriate. Both his data and those of this survey seem inadequate to justify further division of the Magnocaricion in the turlough context.

Rodwell (in press) describes a *Carex vesicaria* swamp which may be similar to some peaty stands in turloughs. The *Carex rostrata* sub-community could include the *C.aquatilis* stand found in Mullygollan (#9).

In this survey *Cladium* stands are classified separately because of their highly calcareous nature.

8A. **Polygonum amphibium** Area 144 ha (5.3%) No. of species 61

As noted above (7A) *P.amphibium* sometimes occurs in dense patches in long-lasting pools and channels associated with water movement. This community consists of the purer stands of the species which occurs with, but usually dominates, *Agrostis stolonifera, Fontinalis,* and *Eleocharis palustris.* More aquatic species are also present, *Glyceria fluitans, Apium inundatum, Rorippa amphibia* and *Calliergon giganteum* are the most frequent. The community was recognised by the abundance of the dominant species.

Phytosociology: There is little phytosociological distinction to be drawn between 7A and 8A and both seem included by MacGowran's *Polygonum amphibium* variant of the **Ranunculo-Potentilletum anserinae** Br.-Bl. et Tx. 1952 em. O'Connell, Ryan and MacGowran (1984).

8B. **Wet Annuals** Total Area 21 ha (0.8%) No. of species 67

A community based on *Polygonum* spp is characteristic of lower sites in many turloughs, growing in bare places where water lies into early summer or where the turf is broken by animal damage. *P.persicaria, P.aviculare* and *P.hydropiper* are common with a little *P.minus* in wetter places and *P.arenastrum* in drier ones. *Stellaria media* is frequent also. All these plants grow in other communities also but there is a suite of more restricted ones: *Filaginella uliginosa, Rorippa islandica, R.palustris, Chenopodium rubrum* and *Juncus bufonius* are the most distinctive. Since the community is an open one many other 'weed' species can get a foothold and *Chamomilla suaveolens, Atriplex patula* and *Capsella bursa-pastoris* are sometimes found.

This community grows on silt or clay, often over peat, with a skin of algae that develops in spring. Such sites may be reflooded at any time by wet weather and the watertable is never far below the surface. Some of them, e.g. Lough Gash, remain too soft to walk on in places, right through the growing season.

Phytosociology: MacGowran (1985) notes that there is considerable overlap between the Bidention communities at the bases of his turloughs and seems to refer to this one as the *Polygonum persicaria* community though most of his releves include few other annuals. The wider spread of this survey gives evidence for the

existence of a more distinctive community centred on *Rorippa islandica, Filaginella uliginosa* and *Chenopodium rubrum* which is probably restricted to the turlough habitat. It is close to the **Polygono-Bidentetum** Koch 1926 em. Siss. 1946 but may not be synonymous with it.

8C. **Cladium Fen** Total Area 59 ha (2.2%) No. of species 36

Cladium mariscus is scattered in tall sedge stands in some turloughs but in the more calcareous ones it occurs at greater density, often with *Schoenus nigricans* and *Carex rostrata* and sometimes also with *C.elata, C.acuta* and *C.lasiocarpa*. The stands are wetter than Schoenus fen (q.v.) and may include both *Phragmites* and *Scirpus lacustris. Chara* spp grow in the marly substrate with *Scorpidium scorpioides* and a little *Potamogeton coloratus*. The community is of limited occurrence in turloughs and was recognized by the presence of *Cladium* and/or the other species growing in shallow, standing water.

Phytosociology: The community seems to be the **Cladietum marisci** (Allorge 1922) Zobrist 1935. It was noted in two turloughs in the Burren by MacGowran (1985). *Cladium mariscus* sedge swamp is recognised by Rodwell (in press) and it would seem that his *Cladium mariscus* sub-community occurs at Termon Lough (#51) and his *Menyanthes trifoliata* sub-community at Ballinturly (#37).

9A. **Temporary Pond** Total Area 73 ha (2.7%) No. of species 73

In most turloughs water lies into the summer in certain places, whether these are natural or artificial drinking ponds. This community grows in the more eutrophic of such sites, often on a surface of poached mud. The sites dry out eventually in the summer but by that time they carry too dense a vegetation for many annuals to become established. The main species are *Agrostis stolonifera, Glyceria fluitans, Myosotis scorpioides* and *Eleocharis palustris* but the more distinctive ones include *Veronica catenata, Ranunculus trichophyllus, Apium inundatum* and *Rorippa amphibia*. These channel and pond areas often abut both wetter and drier habitats so that species like *Potamogeton natans* and *Alisma plantago-aquatica* may grow beside *Potentilla anserina* or *Rumex crispus* in a mosaic that is difficult to classify.

Phytosociology: MacGowran (1985) identifies a **Glycerietum fluitantis** association from the stream in Lough Aleenaun and this seems close to the present community in most respects. However the marked annual fluctuautions of water level implied by *Apium inundatum* and *Rorippa amphibia, Polygonum amphibium* and *P.minus* do not find an echo in the **Glycerietum fluitantis** of Wilzek 1935 nor in the *Glyceria fluitans* sub-community of Rodwell's (in press) *G.fluitans* swamp.

9B. **Eleocharis acicularis** Area 5 ha (0.2%) No. of species 27

Eleocharis acicularis is a restricted species in turloughs and was found only in those around Gort and in Rahasane. However where it does occur it forms closed patches by means of its many rhizomes and these create a distinct community. Some *E.palustris* is usually present but *Limosella aquatica, Littorella uniflora, Lythrum portula, Polygonum minus* and *Callitriche stagnalis* make up the more characteristic species. *Rorippa islandica* is occasional also. In terms of coverage larger plants like *Potentilla anserina, Carex vesicaria, Agrostis stolonifera* and *Rorippa amphibia* may be important but the distinctive species still grow in their interstices. The nutritional conditions in the Coole turloughs and Rahasane are relatively eutrophic but not highly calcareous.

The substrate seems usually to be a fine peaty mud subject to frequent but intermittent flooding: at Caherglassaun daily flooding occurs on a tidal pattern and a similar rise and fall has been noted in a pool in Garryland (MacGowran, 1985).

Phytosociology: MacGowran (1985) recognizes an **Eleocharetum acicularis** Koch 1926 which is similar to this community. He does not include *Lythrum portula* in it however. This species figures only in the Isoeto-Nano Juncetea Br.-Bl. et Tx. 1952 in White and Doyle (1982) which is pioneer vegetation on sandy, peaty or muddy soils.

MacGowran distinguishes an *Eleocharis palustris* community in certain turloughs but because of its similarity with the present one includes it in the Eleocharition acicularis Pietsch 1966 em. Dierssen 1975. Single species stands of *E.palustris* were also met with on this survey but they seemed to fit in more easily to other communities, e.g. 8A, 9A, 9C, rather than be accorded separate status.

9C. **Marl Pond** Total Area 129 ha (4.8%) No. of species 76

This community is characteristic of the pool areas in highly calcareous turloughs so is most frequent in areas of exposed limestone, e.g. Clare/Galway. Such sites seem extremely oligotrophic and the flora includes species normally associated with acidic habitats as well as those found on limestone. They are thus of peculiar ecological interest. The most distinctive species for this community are *Juncus bulbosus, Baldellia ranunculoides, Littorella uniflora, Potamogeton gramineus* and *Scorpidium scorpioides*. Less frequent but no less characteristic are *Samolus valerandi, Eleocharis multicaulis, Scirpus fluitans, Potamogeton polygonifolius* and *P.coloratus*. Some of these plants cover extensive areas but the commoner turlough plants like *Carex nigra, Mentha aquatica, Galium palustre* and *Hydrocotyle vulgaris* are often important also.

The community grows in shallow semi-permanent water with marl usually deposited on peat. *Scirpus fluitans* and *Carex lepidocarpa* are especially associated with peat.

Phytosociology: This community is in the Hydrocotylo-Baldellion Tx. et Dierssen 1972 alliance which is in the Littorelletea uniflorae. It would seem to include elements of three of the four associations listed in White and Doyle (1982), namely **Scorpidio-Eleocharietum multicaulis, Baldellio-Littorelletum** and even the **Hyperico-Potametum oblongi.** Its variations may however be accomodated in the **Baldellio-Littorelletum** Ivimey-Cook et Proctor 1966, which MacGowran (1985) follows. The deeper water sites may hold communities which would be more appropriate in the Potamion graminei Westhoff et Den Held 1969.

There are some parallels between this community and the *Littorella uniflora* sub-community of the *Eleocharis palustris* swamp, as defined by Rodwell (in press).

10A. **Oenanthe aquatica** Area 58 ha (2.1%) No of species 52

Oenanthe aquatica is a feature of many waterbodies in the drift-filled turloughs of the north Midlands. It grows in water that is shallow for most of the spring and summer but dries out eventually in most years. The vegetation is mostly about 50cm high but the *Oenanthe* stands out above this if it is not damaged by cattle. The community includes much *Sparganium emersum, Rorippa amphibia, Polygonum amphibium* and *Glyceria fluitans. Fontinalis* is abundant and there is often *Ranunculus trichophyllus, Alisma plantago-aquatica* and *Eleocharis palustris.* The deeper water maintains *Potamogeton natans, P.crispus* and *Equisetum fluviatile* while the shallows may have *Hippuris, Veronica catenata, Apium inundatum* and even *Potentilla anserina* and *Ranunculus repens* at times. At Carrowkeel turlough this community contained *Bidens tripartita* and *Alisma lanceolatum*: at Lough Gash both *Bidens* species.

The substrate is soft mud, rich in organic material and without any accumulation of marl. Occasionally the peat forms a scraw.

Phytosociology: The community fits best in the Oenanthion aquaticae Henjy 1948, most probably in the **Rorippo-Oenanthetum aquaticae** (Soo 1927) Lohm 1950 association though it has also elements of the **Sparganio-Sagittarietum** Tx. 1953. White and Doyle (1982) describe this vegetation as growing in shallow, nutrient-rich water subject to a fluctuating watertable and state that it is found mostly in old stream channels. It has not been identified in Ireland as yet but there is now strong evidence that it occurs in eutrophic turloughs. It is not recorded in the Burren turloughs by MacGowran (1985).

10B. **Ditch** Total Area 3 ha (0.1%) No. of species 58

Many turlough have streams flowing into them for most of the year and there also may be moving water in artificial drains and ditches. This habitat brings in a range of species that are not found elsewhere in turloughs though they are of widespread occurrence outside. The community is identified by *Apium nodiflorum* and *Nasturtium officinale* agg. with *Berula erecta, Veronica beccabunga* and, more rarely, *V.anagallis-aquatica*. There is much *Glyceria fluitans, Myosotis scorpioides, Polygonum amphibium* and *Alisma plantago-aquatica*, with *Sparganium erectum* and *S.emersum* scattered at intervals.

The habitat varies from peaty to mineral and the most consistent feature is the presence of moving water. In overall area the community covers very little ground but it forms a significant linear feature in many turloughs, for example Rahasane.

Phytosociology: This community is encompassed by the Nasturtio-Glycerietalia Pignatti 1953 em. Segal in Westhoff et Den Held 1969 and is most probably in the Apion nodiflori Segal. White and Doyle (1982) describe this alliance as the vegetation of clear, eutrophic, mostly calcareous, running water.

11A. **Reedbed** Total Area 53 ha (2.0%) No. of species 64

Small areas of reedbed may occur in wet turloughs and are characteristic of the more eutrophic sites with a permanent water source. They cover a significant part of a few sites, for example Carrowkeel, Lough Croan and Termon Lough. In highly calcareous basins reed growth is thin and may be replaced by *Cladium* (8C) though the two communities often exist side by side. *Scirpus lacustris* is the most consistent member of this community with *Phragmites australis, Carex rostrata, Equisetum fluviatile* and *Menyanthes* present in many stands. The generally good nutrition brings in such species as *Hippuris vulgaris, Ranunculus lingua, Polygonum amphibium, Sparganium erectum, Lemna trisulca* and even *Iris pseudacorus* in some cases. *Fontinalis* is usually abundant in the water, often with *Drepanocladus revolvens* and *Calliergon giganteum*. At the edges of reedbeds, the taller vegetation may gives way to *Carex elata* tussocks or other Magnocaricion communities.

The community is based in shallow water during the summer and while there is some peat accumulation it is often possible to walk through the stands on a firm footing.

Phytosociology: The community seems likely to be a species-poor example of the **Scirpo-Phragmitetum** Koch 1926 em. Segal et Westhoff in Westhoff et Den Held 1969.

11B. **Peaty Pond** Total Area 25 ha (0.9%) No. of species 70

Standing water in turloughs is found either where there has been peat cutting in the past or where natural ponds persist all through the year. The community was at first divided into two types on the basis of substrate but there were so many intermediates that this could not be maintained. It covers little ground overall and is modified sometimes by cattle treading and excavation. The basic community consists of *Equisetum fluviatile*, *Menyanthes trifoliata* and *Alisma plantago-aquatica* with such species as *Potamogeton natans*, *Sparganium emersum* and *S.erectum*, *Polygonum amphibium*, *Carex rostrata* and *Glyceria fluitans* mixed in depending on habitat conditions. There are traces of the small *Potamogeton* community (see below) and usually much floating *Lemna* (including all four species). *Callitriche obtusangula* is the commonest member of this genus. Around the shore *Carex nigra* and *Polygonum amphibium* take over, sometimes with patches of the Wet annual community (8B).

Phytosociology: This community is in part the *Equisetum fluviatile-Menyanthes trifoliata* of MacGowran (1985) which he includes under the Magnocaricion. As now described it would seem also to fit into the Glycerio-Sparganion Br.-Bl. et Siss. in Boer 1943 em. Segal in Westhoff et Den Held 1969, because of the presence of several eutrophic plants. Vink & van Kruysbergen (1987) consider the community as in the Phragmition for similar reasons.

12. **Open Water** Total Area 11 ha (0.4%) No. of species 48

This community consists of submerged or floating-leaved plants found in the deeper areas of permanent water that exist in some turloughs. *Potamogeton* spp are an important segment: *P.natans*, *P.berchtoldii* and *P.crispus* are the most frequent though there is a little *P.pectinatus* and *P.pusillus* locally. *Polygonum amphibium* also plays a part in this community as it does in most others. *Elodea canadensis* and *Zannichellia palustris* are present in a few sites with *Myriophyllum spicatum*, *Sparganium emersum* and *Chara* spp. more frequent. Both *Nymphaea alba* and *Nuphar luteum* are rare, the former in the more oligotrophic sites, e.g. Carran.

Phytosociology: This is clearly an amalgam of different associations which are not shown well enough in the turlough habitat to be treated separately. The community was first divided into two, corrisponding roughly to the Magnopotamion and the Parvopotamion of Den Hartog et Segal 1964 but this could not be sustained. It is thought better to lump all lists into the Potametea Tx. et Prsg 1942.

4.1 Notes on plant species

The purpose of this section is to draw attention to certain rare or characteristic plants of turloughs which have some interest from an ecological or conservation point of view. It also notes those that are much less frequent than expected.

Rare species were defined as those wetland plants of limited distribution countrywide which might reasonably be expected in the turlough habitat but which occurred in less than 25% (15) of the sites. They thus exclude those wetland species that are much commoner outside the habitat, for example *Salix cinerea* or *Nasturtium officinale*, and also the species that occur occasionally by chance (e.g. *Spergula arvensis*). The term does include some species that are quite frequent in other habitats but occur consistently in a certain type of turlough, for example *Scirpus fluitans* or *Juncus bulbosus*.

Table 4 (in back cover) is an overall list of the less frequent species recorded. Those that were used in the scoring process for evaluation are marked with a triangle.

Alisma lanceolatum A plant recorded from very few sites in the country and usually with a single station in the vice-counties where it occurs. It was found only in Carrowkeel turlough where it grew in a scraw of *Agrostis stolonifera, Eleocharis palustris* and *Oenanthe aquatica*. This, its phytosociologically appropriate community, is part of the Oenanthion aquaticae Hejny 1948.

Bidens tripartitus The rarity of this species in the turlough habitat in general is remarkable considering its dominance of many parts of Lough Gash where it grows with *Rorippa islandica* and *Chenopodium rubrum*. Its ecology must be suited by late exposed mud of moderate calcium content. Elsewhere it was only found in Carrowkeel.

Carex aquatilis As a northern species requiring winter flooding *C.aquatilis* might be considered a likely plant in the wetter turloughs of the north midlands. However it does seem to avoid the limestone and occurred only in Mullygollan on deep peat.

Carex acuta The difficulties of identification of this species against non-tussocky *C.elata* in the west of Ireland make its real distribution difficult to work out. It was recorded at two turloughs in the eastern Burren and also at Ballinturly and Lough Croan.

Carex vesicaria This is a very characteristic plant of drift-filled turloughs and occurs through the full range from Doocastle

in the north through Roscommon and Mayo to Garryland and Newtown/Coole. It is often grazed and appears quite palatable.

Ceratophyllum demersum This species generally occurs in eutrophic waters and is known to respond rapidly to artificial eutrophication, as in the Norfolk Broads. It is found only in Garryland and Caherglassaun which are naturally eutrophic (and not highly calcareous) sites fed by the Owenshree River from the Slieve Aughty mountains.

Chara spp. Since the distribution of charophytes in general is poorly known in Ireland and in particular no systematic recording has been done in turloughs, the main species found are mentioned here. The specimens were collected from shallow water and identified by N.Stewart whose distribution maps (National Parks & Wildlife Service, in prep.) are also followed. The most frequent species was *C.vulgaris* which is common everywhere in alkaline small waterbodies. *C.curta* was also reasonably common, especially in those turloughs with peat, where it grew in old cuttings as well as in more natural lakes. *C.hispida* was widespread and where it occurred it was often in extensive stands which dried out in the summer. *C.rudis* was only recorded once, in shallow water in Balla turlough. *C.contraria* seemed to have specific requirements for very alkaline and oligotrophic water and was found in the S.E. Galway turloughs and at Lisduff. *C.virgata* was restricted to peaty sites, only one of which was strongly alkaline.

Coronopus squamaria A plant with rather a coastal distribution in Ireland it was somewhat unexpected adjacent to cattle ponds in turloughs. It was found at two sites in east Galway as well as Caherglassaun.

Chenopodium rubrum In the turlough habitat this is a late developing species that grows best in July and August on recently exposed mud. Earlier in the year it seems to grow on drier open sites where it flowers at a minute size. Before the pinkish flower heads develop it can be mistaken for *Atriplex patula* and may have been passed over at a few sites. It has a wide range in turloughs and is one of the most characteristic plants of the wet annual community.

Drepanocladus spp. No systematic recording of this genus was made as time did not permit the collection or determination of the species in every turlough. *D.revolvens* was clearly the most frequent species but substantial amounts of both *D.lycopodioides* and *D.aduncus* also occurred. The former seemed to be restricted to the more alkaline sites: *D.aduncus* was found over a greater range of habitat, including both Glenamaddy and Knockaunroe turloughs. *D.exannulatus* was found in Ballinturly only, while MacGowran (1985) records *D.uncinatus* from Caherglassaun Lough.

Eleocharis multicaulis This species is most characteristic of the highly calcareous turloughs of the eastern Burren where it is one of a series of oligotrophic plants. It grows also in Ballinturly turlough in Roscommon.

E.aicularis In turloughs this plant seems to have a variable period of growth which begins underwater and terminates rapidly if the plant is exposed. Its senescence occurred in early July in Garryland and in late August in Rahasane. It is most common in the less calcareous turloughs though MacGowran (1985) recorded it in Knockaunroe.

E.uniglumis This is normally a maritime species and has very few inland stations. It was found only in the Limerick turlough (Loughmore) which lies close to the Shannon estuary.

Ephemerum cohaerens This is a small annual moss which colonises open mud situations in the absence of higher plants. For this reason it seems to occur only in late-emptying turloughs close to sinkholes. It was found in two sites, Ballyglass in east Mayo and Lough Gash in south Clare. In both it was growing through a crust of calcium carbonate though the sites were not highly alkaline. At Ballyglass it occurred with *Pottia truncata* and a *Tortula* species. It has not been recognised as a turlough species before and its place in the Irish flora stems from a single record made in 1865 by Moore (1873) on the banks of the Shannon at Portumna.

Equisetum variegatum was found at one site, growing amongst limestone rocks at the edge of Caranavoodaun turlough. This ties in with its countrywide distribution which is based in the midlands.

Frangula alnus This species was found in four of the Burren turloughs only, growing on flat pavement with water at depth. It has a narrower range than *Rhamnus*, based lower in the turlough and sometimes with *Potentilla fruticosa*.

Galium uliginosum This *Galium* is not a widespread constituent of turlough vegetation unlike the ubiquitous *G.palustre* and occurs in strongly calcareous conditions with *Schoenus* or other sedges. It is present in Ballinturly, Glenamaddy and Doocastle.

Glyceria declinata The predominance of *G.fluitans* in the turloughs was remarkable. The other species were constantly looked for during the flowering period. *G.declinata* was only seen at a spring in Kiltullagh though MacGowran (1985) gives a record for Garryland.

G.plicata This species occurred marginally in two turloughs, once at the south end of Brierfield and again in a corner of Lough Aleenaun. MacGowran (1985) records it in Carran turlough. It occurred also in a pool adjacent to Caheravoostia but outside the turlough proper.

Groenlandia densa A species with a marked southern and south-eastern distribution in the country, *Groenlandia* grows in the ditch which crosses the Loughmore turlough in Limerick, close to other known stations by the Shannon.

Juncus bulbosus is the commonest member of that group of normally calcifuge species which grows in the most highly calcareous (and therefore oligotrophic) turloughs. It is spread throughout turlough country, occurring in twelve sites altogether.

Lemna gibba has a pronounced distribution in the eastern half of the country so its appearence in Rahasane and in Feacle turloughs is of some interest. The Feacle site was in a permanent pool at the western end and was a new vice-county record for Roscommon.

L.polyrhiza This species was found in two turloughs in Roscommon, Castleplunket and Rathnalulleagh which are 3.4km apart.

Limosella aquatica Perhaps the most specialist plant associated with turloughs, *Limosella* requires bare mud to be exposed fairly early in the season but to remain wet during the period of growth. The wetness may curtail the growth of *Polygonum* species which would otherwise take over the site. *Limosella* is particularly favoured by the fluctuating water levels of Caherglassaun Lough and it was found here, in the nearby Newtown/Coole turlough and at Peterswell.

Littorella uniflora This is a characteristic plant of the marly turloughs where the alkalinity creates an oligotrophic habitat. It avoids most calcareous parts of the country so this is an interesting facet of its ecology. It was recorded in at least ten turloughs from Longford to Mayo and Clare.

Lysimachia nummularia A species that occurred in relatively dry parts of two turloughs, one a natural looking setting at the edge of Greaghans, the other on the floor and recently cut ditch at Belclare. Here it may have been introduced and has certainly been spread by machinery.

Lythrum portula is probably the least expected of the turlough species favouring acidic rocks in the rest of the country. It grows only in Garryland and Caherglassaun along with *Limosella*, *Eleocharis acicularis* and *Callitriche* sp. and *Polygonum minus*. These turlough are fed with relatively acidic water from the Slieve Aughty mountains.

Myriophyllum verticillatum The number of old records of this species in Ireland suggest that it is declining in range, perhaps because of eutrophication of waterways. It was found in three turloughs, Belclare in the drainage ditch, Lough Nakill and Lough Croan in ditches cut in peat. These three records were the first to be made in each vice-county (N.E.Galway, East Mayo and Roscommon) since 1950.

Oenanthe aquatica This is such a widespread species in turloughs, occurring in about a third of all those visited, that it was a surprise that it was a new county record in both N.E.Galway and East Mayo.

O.fluviatile The species was only found once, in flowing water within Rahasane turlough where it is a first vice-county record for S.E.Galway.

Polygonum minus A species frequent in many of the Galway/Clare turloughs and also in Sligo but rare in most of Roscommon and Mayo.

Potamogeton friesii A small amount of this species was found growing with *Chara vulgaris* in a permanent pool at Slishmeen. The habitat was not highly calcareous.

P.pectinatus requires more permanent water than many others so its distribution in turloughs is limited by this fact, if not by others. It was found only in Rahasane, Caranavoodaun and Caherglassaun.

P.polygonifolius This is one of that special suite of oligotrophic species that grow in the calcareous conditions of some of the turloughs in the eastern Burren as well as in Ballinturly. Its presence in Killaturly Lough is related more to peat than to alkalinity.

P.pusillus *P.berchtoldii* is the pre-eminent pondweed from the shallow pools and ditches in turloughs and *P.pusillus* is relatively rare, as in other habitats. It was identified in four sites - Rahasane and Newtown/Coole, Lough Croan and Killaturly Lough.

Potentilla fruticosa A plant associated with lakeshores and turloughs in the Burren and near Lough Corrib, *P.fruticosa* was recorded at the edge of three turloughs in Clare, Carran, Castle Lough and Knockaunroe.

Ranunculus circinatus Like *Myriophyllum verticillatum* this seems to be a declining species in the country and one associated with the eastern half. Its occurrence in Rahasane turlough may therefore be of some interest. It is the first post-1950 record for S.E.Galway.

R.sceleratus This species again has a markedly eastern distribution with few if any stations on the western limestones, though it does occur on the coast. It was found once only in a turlough, at Rathbaun.

Rorippa islandica is a turlough plant **par excellence** and has hitherto been thought of as a rare species because of the lack of exploration of this habitat. Previously it was known from five turloughs in Clare/Galway as well as the (now destroyed) site at Renvyle. It was found on this survey in a total of thirteen sites which makes it still relatively rare but it is spread throughout the turlough range, except in Sligo. New county records were made in N.E.Galway, Roscommon and East Mayo. The species is characteristic of damp muddy sites kept open by late flooding or

by cattle trampling. It was found in flower from early July until mid-September so seems to have an opportunistic phenology.

R.sylvestris This species grows generally at a higher level in the turlough than the last and in closed vegetation. It seems to hybridize also with *R.amphibium* so that it is not always easy to separate. However it was found at four different sites, Rahasane which was a new vice-county record (H 15), Caherglassaun and the nearby Lough Aleenaun and Lough Nakill in East Mayo, similarly a new V.C. record.

Ricciocarpus natans This floating liverwort has a scattered distribution in the country and though not strictly a plant of the turloughs was found in a permanent pool in Attishane in Roscommon.

Salix triandra A few trees of this species occur at the edge of Lough Gash where they were presumably planted. It was not seen elsewhere and is rare away from the south-east.

Scirpus fluitans Because of its predilection for acid areas this plant is rare on the lowland western limestones. It does nevertheless find a place in some of the highly calcareous oligotrophic turloughs in Clare/Galway and at Balla (Mayo) as well as a smaller site in Sligo (Douglas *et al*, 1992).

Sparganium minimum This species grows in two of the peaty turloughs, in old cuttings and drains. Lough Nakill is a proper turlough, Killaturly Lough more of a lake/turlough hybrid.

Stellaria palustris Found in four of the more northern sites, this plant grows in widely different conditions of both level and soil belying its general rarity in the country. At Doocastle it is found in ditches, at Balla on the peaty surface, at Carrowkeel in the company of *Polygonum amphibium* and at Skealoughan amongst *Carex nigra* and *Phalaris*.

Thalictrum flavum This species is characteristic of the edge vegetation of several of the more southern turloughs where it is mixed with and sometimes concealed by *Filipendula*. It is widespread in the Burren area and extends to two sites in East Mayo (Lough Nakill & Ardkill) where it is a new vice-county record. It is found also at Loughmore in Limerick and the Loughans in Kilkenny which is near the centre of its national range.

Thelypteris palustris Found only at the wooded edge of Ballinderreen turlough where it was growing with vigour alongside *Lysimachia vulgaris* and *Filipendula*. This fern seems unaccountably rare in the habitat which is widely reproduced elsewhere.

Teucrium scordium Strongly calcareous turloughs seem to suit this species which was found in four sites within its known range in south-east Galway/Clare. It was noticeably tolerant to different periods of flooding and seems to be controlled more by grazing than physical factors.

Viola persicifolia The turlough violet was only found at a limited number of sites on this survey because it is so much more conspicuous at flowering time than later on when much of the work was done. It is recorded in nine separate turloughs, mostly in the eastern Burren but also at Rahasane and in Glenamaddy in Mayo.

Zannichellia palustris This species was looked for consistently in its shallow water habitat but was only seen in five turloughs spread from Mayo to Clare.

5. CLASSIFICATION & EVALUATION

When dealing with so many diverse sites it is necessary to classify them in some way in order to summarise the variation and pick out significant types that are repeated in different parts of the country. This is a pre-requisite of the evaluation process by which the turloughs with the greatest ecological interest are chosen for conservation. The objective is to choose sites that include the full range of variation of the habitat but also pick out the exceptional examples: in this case the turloughs that contain particularly striking features or extremes, or a concentration of rare species of plant or animal. To this end the rough physical classification (Table 2) was combined with details of vegetation diversity, rare plants and breeding waders to produce an evaluation (Table 5, p 45). The factors were scored to give a semi-objective scale of importance.

The following factors were included.

1. HYDROLOGY

   a) Dry or damp in overall terms.

   b) Significant aquatic communities, larger than cattle ponds

   c) Inflowing river: larger than ditches from adjacent land

   d) Apparent drainage: as shown by vegetation changes/ excavation

   e) Relative pH: assumed from visual examination

   f) Catchment size (see below)

2. OTHER PHYSICAL FEATURES

   a) Significant amounts of surface peat, marl or bare rock

   b) Naturalness: a lack of man-induced modification

3. BIOLOGICAL

   a) Number of vegetation types as defined above

   b) Presence of rare vegetation

c) Occurrence of rare plants (see note following)

d) Presence of wintering birds and/or breeding waders

5.1 Catchment Area

Catchment size (recorded in Table 1) was roughly estimated from the 1:126720 catchment maps drawn by the Hydrographical Section, OPW, for flow measurement. In a few cases use could be made of specific groundwater studies, for example Williams (1964) for the Fergus catchment and Coxon (1986) for part of the Robe.

In the absence of such studies catchment boundaries in limestone areas are often largely guesswork and cannot be interpreted too literally. For the purposes of measurement they were assumed to follow topographical highs where there was no other indication. The purpose of recording catchment areas was to draw attention to those turloughs that might be naturally oligotrophic, their water supply having had little area from which to pick up nutrients. Such turloughs will remain isolated from major river or groundwater pollution though they could still be susceptible to local sources. With a limited catchment area it will be possible to design and carry out a local groundwater management plan to maintain the turlough in an unenriched form.

In addition the ratio of catchment area to turlough area was established (Table 1) to identify any sites with peculiar hydrologies. A high ratio, i.e. a small turlough below a large catchment is likely to have a quick turnover of water, leading to a naturally eutrophic character. Turlough volume would of course be a better measure to use for this if it was available.

5.2 Scoring

Most physical factors were scored as present or absent (0/1) as they are used in a descriptive sense as an indication of habitat diversity. The variation is summed in the column 'physical diversity' in Table 5 which is made up of qualitative scores. The range of scores is 2-14.

The catchment ratio is included as three bands: below 10 (scored 5), 10-50 (3) and above 50 (1). This scoring is justified by the general decline in the number of naturally oligotrophic waterbodies in the country as well as the possibility of future conservation management.

Naturalness is scored on a 1-5 scale, 5 representing what appeared in the field as an untouched site except for being grazed.

Vegetation types are recorded as 1 for each one occurring. Rare vegetation is defined as that occupying 5% or less of the total area surveyed. The occurrence of a rare vegetation type is scored 2 for a type that covers 1% or less of the total area and 1 for one that covers 1-5%. The range of scores is 5-40.

Rare plants were scored individually to highlight interesting species and the total scores added up for each turlough. There are several types of rarity, which were established with the help of Curtis & McGough (1988), Scannell & Synnott (1987) and Perring & Walters (1990). A species may be restricted to turloughs and temporary waters and be rare therein (e.g. *Viola persicifolia, Limosella aquatica*). The more easily identified of these may also be protected by legislation (Flora Protection Order, 1987). Alternatively a plant may occur in a number of wetland habitats but be unusual in turloughs (e.g. *Potamogeton polygonifolius, Lythrum portula, Eleocharis multicaulis*). In this case its presence may be related to habitat conditions, especially extreme oligotrophy, or it may have a less obvious cause. *Carex aquatilis*, for instance, is almost absent in the limestone west midlands and *Chenopodium rubrum, Ranunculus sceleratus* and *Lemna gibba* are decidedly rare. It seems that the unexpected presence of these species should be recognised in the scoring process.

The system used is as follows. Protected species were given the score of 5, those also included in the Red Data book 4. A species occurring in 1-10 vice-counties, following Scannell and Synnott (1987), was scored 2 and in 11-25 vice-counties 1, while a new County record was given an additional point. Within the 61 sites examined a plant present in less than five turloughs was given 3, in six to ten turloughs 2 and in eleven to fifteen 1.

In order to identify a species that is relatively rare in the west midlands the various distribution maps (e.g. Perring & Walters, 1990, Jermy, Chater & David, 1982, Moore, 1986, Rich 1991) were examined. The area was defined by Ballina and Galway east to Athlone and from the Burren east to Lough Derg (4.9% of the whole country). A species that occurs in a lower proportion of 10km squares than this is rarer in the turlough country than would be expected. A difference of up to 10% was accorded one point while one greater than 10% was given two. Finally the total scores were halved so that species criteria would not dominate the physical and vegetational ones. The resulting scores for plant species ranged up to 35.

5.3 Conservation Value

A quantitative scoring system can only be a partial guide to the ecological and conservation importance of different sites as there are many factors that cannot be adequately measured or rated. A qualitative input involving intuition and experience may produce results that have a wider degree of acceptance than even the most

elaborate quantitative scheme. For this reason there are several points of difference between the scores shown in Table 5 and the final rating given in the list of sites in Table 6 (p 216). An explanation for these differences is usually given in the Evaluation section of the relevant site description.

6. SITE DESCRIPTIONS

The turloughs are listed roughly from north to south but keeping county groupings together. The numbers are shown on Figure 1. The equivalent numbers used by Coxon (1986) are included as Cx below the name of each site. If there is no obvious name for a site the nearest feature marked on the 1/2" map has been used, in line with general CORINE procedure.

Vegetation types are described by their numbers rather than names which may be found in Table 3 (p 14). A vegetation map is included for each site, derived from the 1:10560 O.S. sheets.

1. TURLOUGHMORE (Castleloye-Cx 84)	Grid Ref: G 5413
River System: Owenmore	6" sheet: Sligo 38
Catchment Area: 40 ha	Turlough Area: 25.7 ha
Altitude: 95m	Evaluation place: 54=

Topography: Turloughmore occupies a hollow in the drifty ridges north-east of Tobercurry. It is at the edge of a limestone area and glacial action has probably brought acidic material from the north-west. The basin consists of two parts separated by a slight ridge. In the eastern one the floor is undulating around a series of hollows which lead to a rock outcrop at the eastern end. The western basin has a flatter form with only a few collapse hollows in it. The turlough is bordered by bogland on part of the eastern side and elsewhere by fields of pasture.

Hydrology: There is no overground flow into the basin apart from a minor amount of seepage from the bog area during high rainfall. The swallow holes are situated around the edges of the eastern basin with a few on more central raised areas. In the western basin about four narrow holes occur in the floor. The floodwater appears to be only moderately calcareous.

The turlough probably drains quite fast because of the sand content in the substrate. There are certainly no long-lasting pool areas and the vegetation is dry in the summer. There is no evidence of drainage either within or at the edge of the basin.

Substrate: Sandy topsoil over sandy silt is characteristic (Coxon, 1986). There is some peat encroachment on the western and eastern

margins and a little peat enrichment of the soil profile in lower areas.

Land Use: The turlough is lightly grazed by cattle and horses and parts of the eastern half are largely untouched. The surrounding fields are farmed at low intensity and no silage was being made in 1990.

The land is divided by walls and does not seem to be held in commonage.

Vegetation: A feature of the vegetation of Turloughmore is the large area of 3B, the leached heathy community with *Nardus* and *Deschampsia cespitosa* mixed into *Carex panicea* and *C.hirta*. In this case there is much *Potentilla erecta* and a little *P.reptans* present with *Alchemilla* sp., *Dactylorhiza fuchsii* and, on the eastern side below the bog, *Achillea ptarmica, Euphrasia arctica* and *Juncus squarrosus*. Above it there is often a band of *Molinia, J.effusus, J.conglomeratus, Succisa* and *Anthoxanthum* (2D). The floor of both basins is predominantly a rather dry 6B, with *Carex hirta, C.nigra* and a little *C.disticha* plus *Festuca arundinacea, Phalaris, Rumex crispus* and *Senecio aquaticus*. The adjoining 6A which occupies a belt in the eastern half has very dense (and tall) *Phalaris, Mentha arvensis* and *Rumex acetosa*.

At the southern edge of the eastern basin patches of *Polygonum amphibium* occur around the swallow holes. The only other community present is some manured *Cynosurus* grassland at the extreme western corner.

Vegetation (ha as mapped)

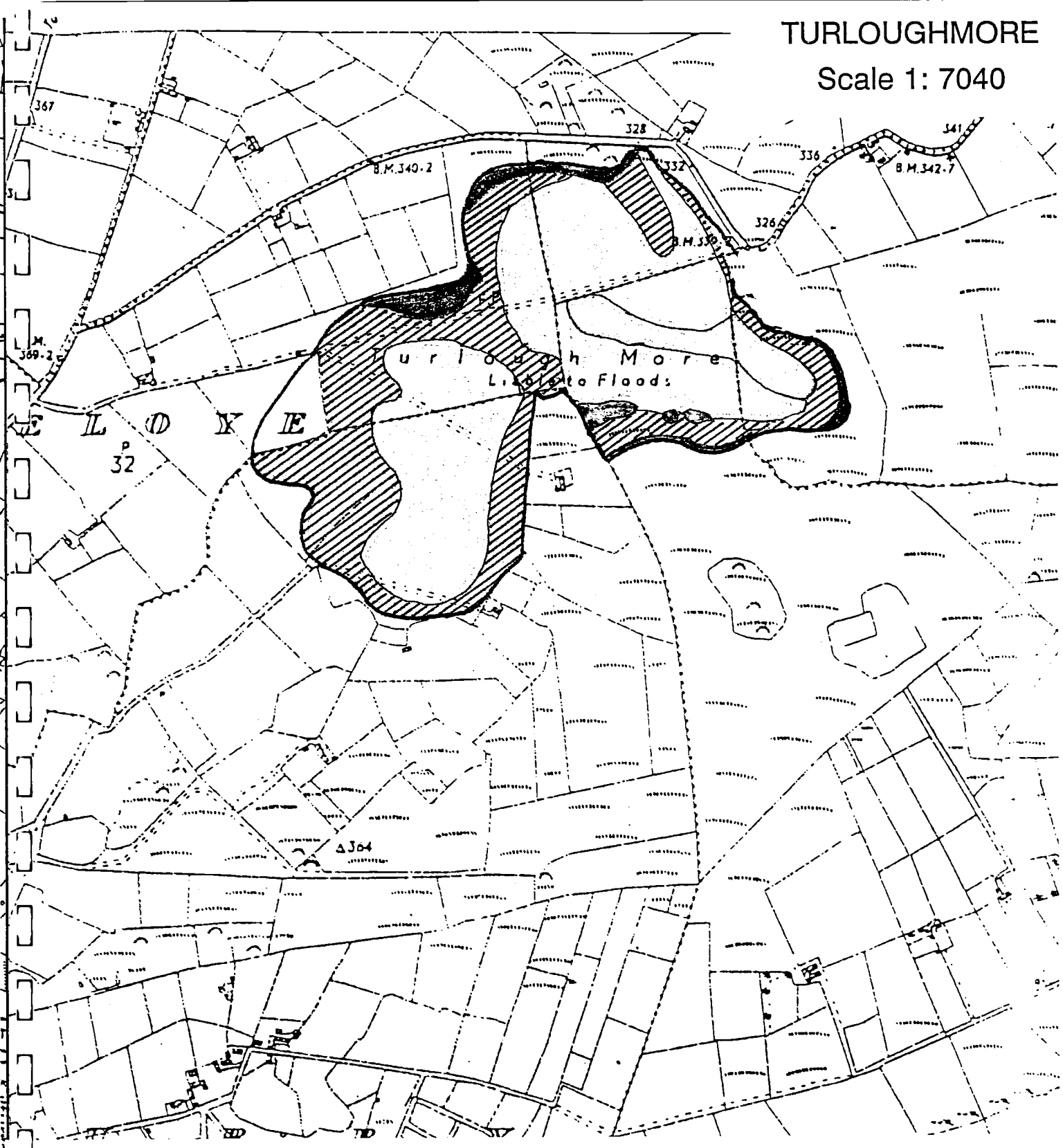
2A-	0.7	3B-	9.1	5A-		6D-		9A-		11B-	
2B-		3C-		5B-		7A-		9B-		12-	
2C-		3W-		5D-		7B-		9C-		Lake	
2D-	1.4	4B-		5E-		8A-	0.3	10A-			
2W-		4D-		6A-	1.5	8B-		10B-			
3A-		4W-		6B-	12.5	8C-		11A-			

Fauna: Four pairs of lapwing nested in this area (1988) and there are unlikely to be any other waders. In winter 30-40 lapwing occur with very small numbers of duck and c.6 whooper swan (Goodwillie *et al.*, in prep.).

Evaluation: Turloughmore has several points in its favour that give it a greater importance than its lowly score (22) would suggest. It is one of a rare type of turlough since it is naturally oligotrophic and also relatively low in alkalinity. In this it resembles Glenamaddy though it is much drier and has no inflowing stream. It is also unmodified by drainage and is not heavily grazed. It is the most northerly turlough in the country and is the best developed one in the NUTS north-west region (Corine) - Moylough is the only other example. Because of these facts, it is considered of national importance though its lack of diversity might be more reasonably accomodated in the regional category.

TURLOUGHMORE

Scale 1: 7040



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- Sedge heath
- 3C Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- 6A Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangu

2.DOOCASTLE [Cx 86]
River System: Owenmore
Catchment Area: 480 ha
Altitude: 67m

Grid Ref: G 5809
6" sheet: Mayo 52
Turlough Area: 38.2 ha
Evaluation place: 36=

Topography: Doocastle occurs on the county boundary of Mayo, south-east of Tobercurry. It lies in gently undulating fluvioglacial deposits with a NW - SE axis. There is no exposed rock within the basin except perhaps under the castle itself, and there are smooth slopes of drift on all sides. Any stones that occurred have been collected into walls and there are numerous dividing fences also. The floor is almost flat though there is a slight slope southwards resulting in the lowest levels being along the southern edge. The basin broadens from west to east and includes a circular rise in the centre. It narrows again at the castle before opening out again over damp fields with an uncertain southern boundary.

Hydrology: Most of the ditch system retains water throughout the summer. There are several dug out ponds in it as well as other hollows, particularly at the western end, that may act as swallow holes. One definite swallow hole occurs on the south side, 2 x 0.3m in size with stones at the base. The main pool is found just west of the castle.

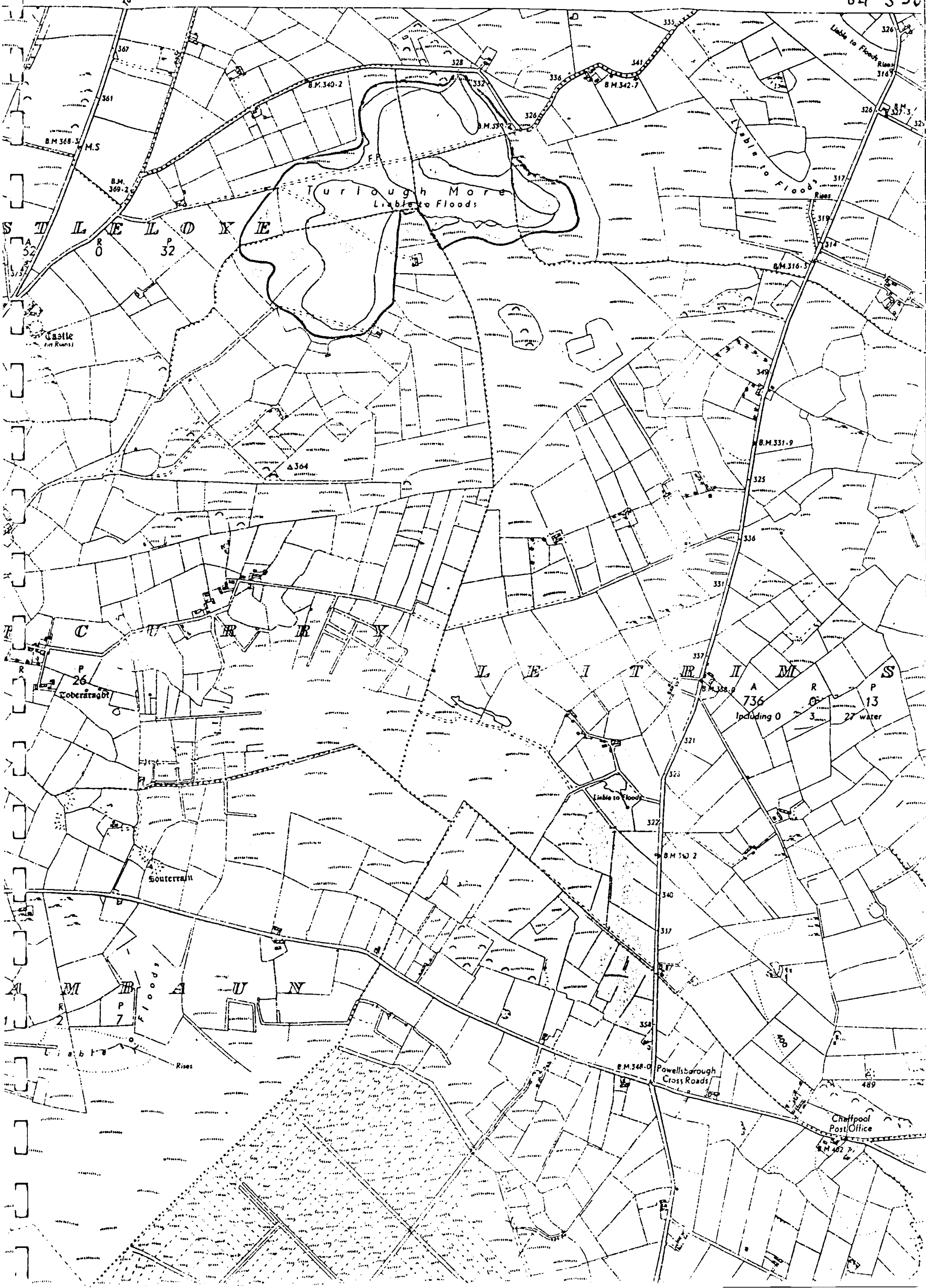
A small intermittant stream flows into the turlough from the east end but in the summer it soon sinks. Additional seepage comes from a willow bed on the southern edge of this basin. Floodwater seems moderately calcareous, more so than in the other turloughs of this area. There is no external drainage, only the internal ditches.

Substrate: The floor is basically covered by clay over sand. Coxon (1986) records 10cm of peaty soil over 20cm of organic clay over 5cm sand over 45cm grey plastic clay over silty sand. There is more peat accumulation in the south-east basin than elsewhere.

Land Use: The main basin of the turlough is heavily grazed by cattle and some sheep. East of the castle there are some cattle but hay is also mown along the SE edge. There is one farm in the surroundings but it does not seem to release any effluent into the basin. Silage is little made nearby.

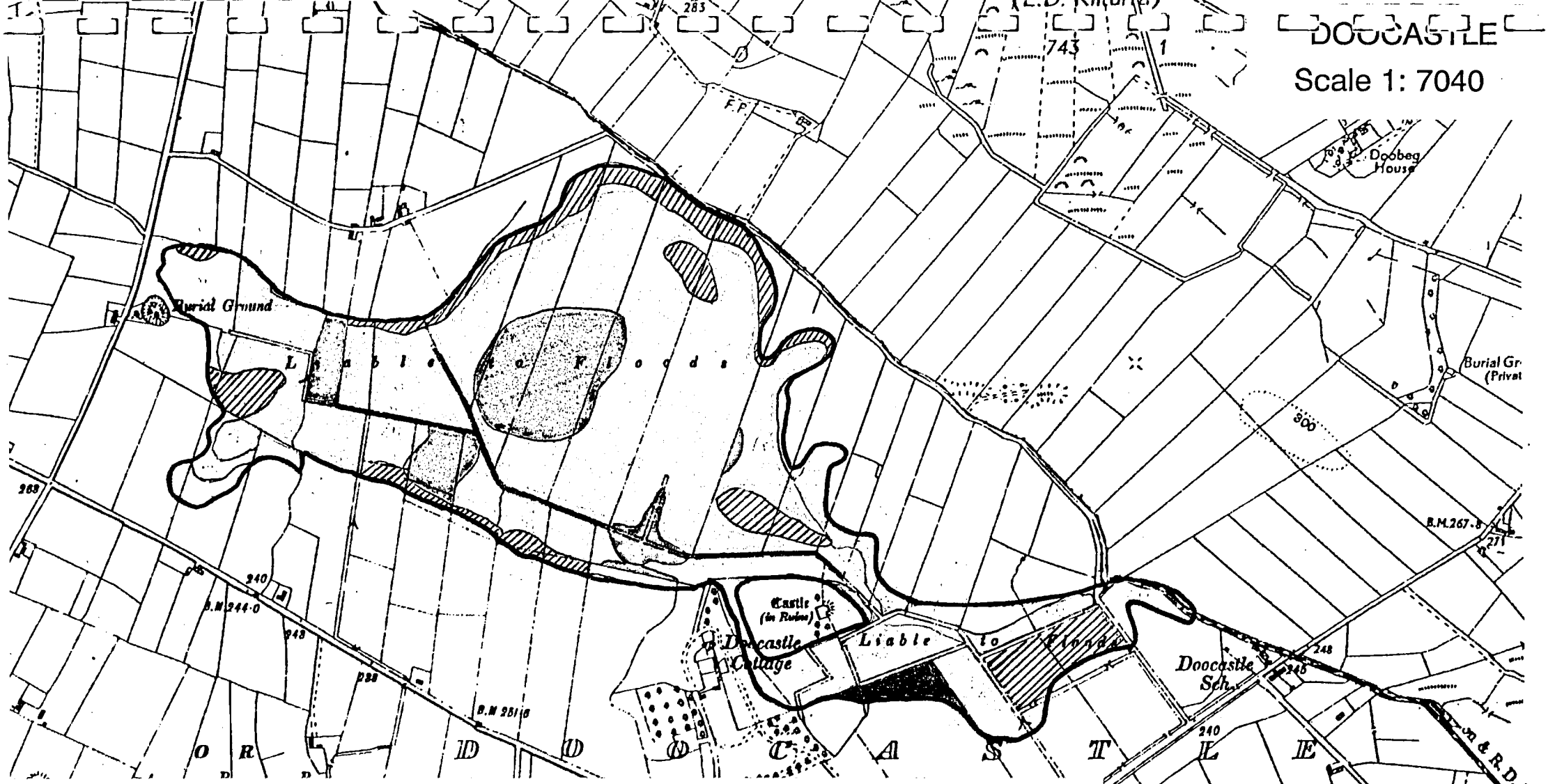
Vegetation: The wettest parts of the turlough are the ditches and two shallow ponds extending off them. *Equisetum fluviatile* occurs in the ditches with *Sparganium emersum, S.erectum, Alisma plantago-aquatica, Potamogeton natans, P.pusillus* and *P.crispus*. The pools have a 9A vegetation with *Polygonum hydropiper* and *P.minus* mixed with *Glyceria fluitans, Ranunculus trichophyllus, Apium inundatum* and *Rorippa palustris. Stellaria palustris* grows adjacent to some ditches at the western end.

84 S30


Turlough More
Liable to Floods
Castle (in Ruins)
Souterrain
Toberaraght
Liable to Floods
Powellsborough Cross Roads
Cheffpool Post Office
LEITRIM
CURRY
CASTLELOYE
AMBAUN
A 736 R 0 P 13
Including 0 3 27 water
R 0 P 32
P 26
R 2 P 7
Δ364
B.M.340·2
B.M.342·7
B.M.331·9
B.M.316·3
B.M.368·3
B.M.369·2
B.M.348·0
M.S
F.P.
Rises

DOOCASTLE

Scale 1: 7040



KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge	10E	Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)		Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb		Carex flava	8C	Cladium fen		Open water (12)
3B	Sedge heath	6A	Dry Carex nigra		Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)		Peaty Carex nigra	9C	Marl pond		Potentilla fruticosa / Frangula

The floor of the basin is generally covered by 6B including *Carex panicea, C.nigra, Phalaris, Hydrocotyle* and *Caltha. Potentilla palustris* and *Polygonum amphibium* occur in the wetter places. A ridge of higher ground extends into the centre from the south-west, culminating in a circular rise that is covered only by the higher floods. *Carex* species predominate on it, including *C.hostiana* and a little *C.pulicaris*. There is *Galium uliginosum* also, along with *Ctenidium molluscum* and *Eriophorum angustifolium*.

The rising land around the other edges of the basin has similar vegetation but a greater nutrient flow allows 3B or 3A to grow. In the former, *Deschampsia cespitosa, Nardus, Centaurea nigra* and some *Achillea ptarmica* are noticeable while the 3A has more *Phalaris* and *Filipendula, Carex hirta* and a little *C.disticha*. At the western end *Phleum, Euphrasia arctica* and *Festuca* spp. (with some *Polygonum amphibium*) give the vegetation a grassier look (2B) and are arranged in a zonation around a hollow in the SW corner.

East of the castle taller *Filipendula, Carex disticha* and *C.rostrata* fill the low-lying fields which turn peaty to the south with *Anthoxhanthum, Molinia* and *Deschampsia* and, in places, *Carex lepidocarpa* and *Parnassia. Leucojum aestivum* grows as a few clumps on the floor of this basin. Its eastern end culminates in a little stand of *Alnus glutinosa* and *Salix viminalis*.

Vegetation (ha as mapped)

2A-		3B-	5.1	5A-		6D-		9A-	0.9	11B-	
2B-	3.5	3C-		5B-		7A-		9B-		12-	
2C-	0.3	3W-		5D-	3.4	7B-		9C-		Lake	
2D-	0.6	4B-		5E-		8A-		10A-			
2W-		4D-		6A-		8B-	0.1	10B-			
3A-	5.5	4W-		6B-	18.6	8C-		11A-			

Fauna: Doocastle is quite rich in nesting birdlife with about 8prs lapwing and 2prs redshank, and sometimes coot, mallard and little grebe, depending on water levels. In winter a maximum of 551 is recorded in Goodwillie *et al.*, (in prep.), including 289 wigeon, 142 teal, 115 lapwing, 92 curlew and 73 golden plover. In addition about 10 whooper swans are regular.

Evaluation: Doocastle is the most northerly representative of the calcareous drift type of turlough in Galway/Roscommon and is of a different type than its nearest neighbours (Turloughmore & Moylough). It has a good diversity of vegetation including a relatively large amount of the Wet Carex nigra community (6B) and a nice example of Sedge Fen (5D) on a topographical rise. It has several rare species including the only records of *Galium uliginosum* and *Leucojum aestivum* in East Mayo (H26). The sizeable bird population is also of significant interest and contribute to an overall score of 33.5.

The turlough is undrained and though slightly modified by internal ditches and frequent subdivision it is considered of national value.

3. MOYLOUGH (Turloughmore-Cx 85)
River System: Moy
Catchment Area: 80 ha
Altitude: 76m

Grid Ref: G 5408
6" sheet: Sligo 38
Turlough Area: 19.5 ha
Evaluation place: 45

Topography: The turlough is situated south of the village in hummocky, fluvioglacial land. It is surrounded by irregular ridges, some of which have been quarried on a small scale. The turlough is made up of two basins separated by a grassy ridge with rock at depth through which water moves. The northern part of the main basin is the deepest; to the south-east and west the flooding extends over flat fields without a definite shoreline. The northern basin includes a shallow permanent lake at the head of a broad valley.

A few rocks show in the uneven floor of the basins but mostly they have been gathered into walls.

Hydrology: A perennial spring fills the lake in the northern basin and sustains a slight flow in the exit channel. There are no flows into the other basin though a pond occurs in the lowest part. Several swallow holes are scattered at different heights on the turlough floor. One is a collapse structure and is 1m deep.

Floodwaters would seem to be only slightly calcareous. The southern basin of the turlough is a dry one but there is no evidence of drainage. At its eastern end flooding may not be continuous in some years, the water occurring as shallow flashes

Substrate: Coxon (1986) records topsoil over silty clay over sand. There is a little peat accumulation in the northern basin.

Land Use: Cattle are grazed over the whole area but at quite a low density. Occasional gravel extraction takes place in a pit in the north centre of the main basin. There is some rubbish disposal too, especially a car in the northern basin.

Vegetation: The two parts of the site differ markedly in their vegetation owing to the presence of permanent water in the northern one. The lake here is an area of open water surrounded by beds of *Equisetum fluviatile* and *Carex rostrata* with much *Alisma plantago-aquatica* in the shallower parts. On the south side there is a fluctuating area of *Glyceria fluitans, Polygonum minus, P.hydropiper, Apium inundatum* and *Rorippa palustris* which gives

way landwards to *Carex nigra, Senecio aquaticus* and *Potentilla palustris*. This continues down the valley to the limit of flooding. At one point there is an animal trample with *Filaginella, Stellaria media* and the alga *Botrydium* spp. North of the lake a band of *Polygonum amphibium* occurs, together with *Carex vesicaria* and *C.nigra*. This is backed by tall *Phalaris* and *Filipendula*.

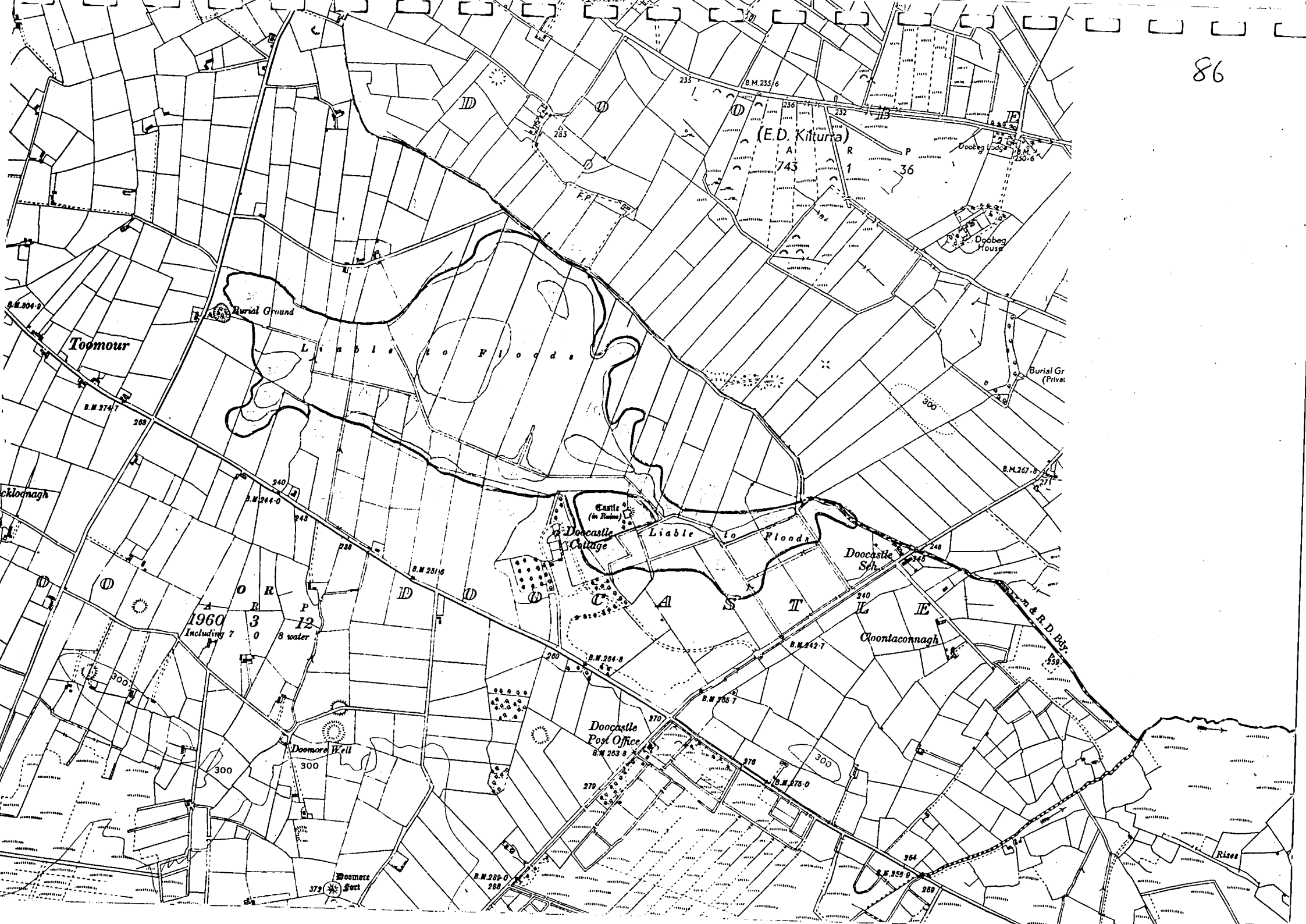
The main basin is dry because of its free-draining floor material and is mostly covered by pasture. 2B is important with *Rumex acetosa, Molinia* and *Rhinanthus* prominent in places. The western end has a richer community (2A) with *Cynosurus* and *Cerastium fontanum* as well as both *Senecio aquaticus* and *S.jacobaea*. A narrow fringe of limestone grassland on the north side overlooks the deepest section of the basin, filled with *Carex hirta, C.nigra, Potentilla anserina* and *Phalaris*. This runs into a pond full of *Agrostis stolonifera, Polygonum amphibium, Glyceria fluitans* and *Alisma plantago-aquatica*.

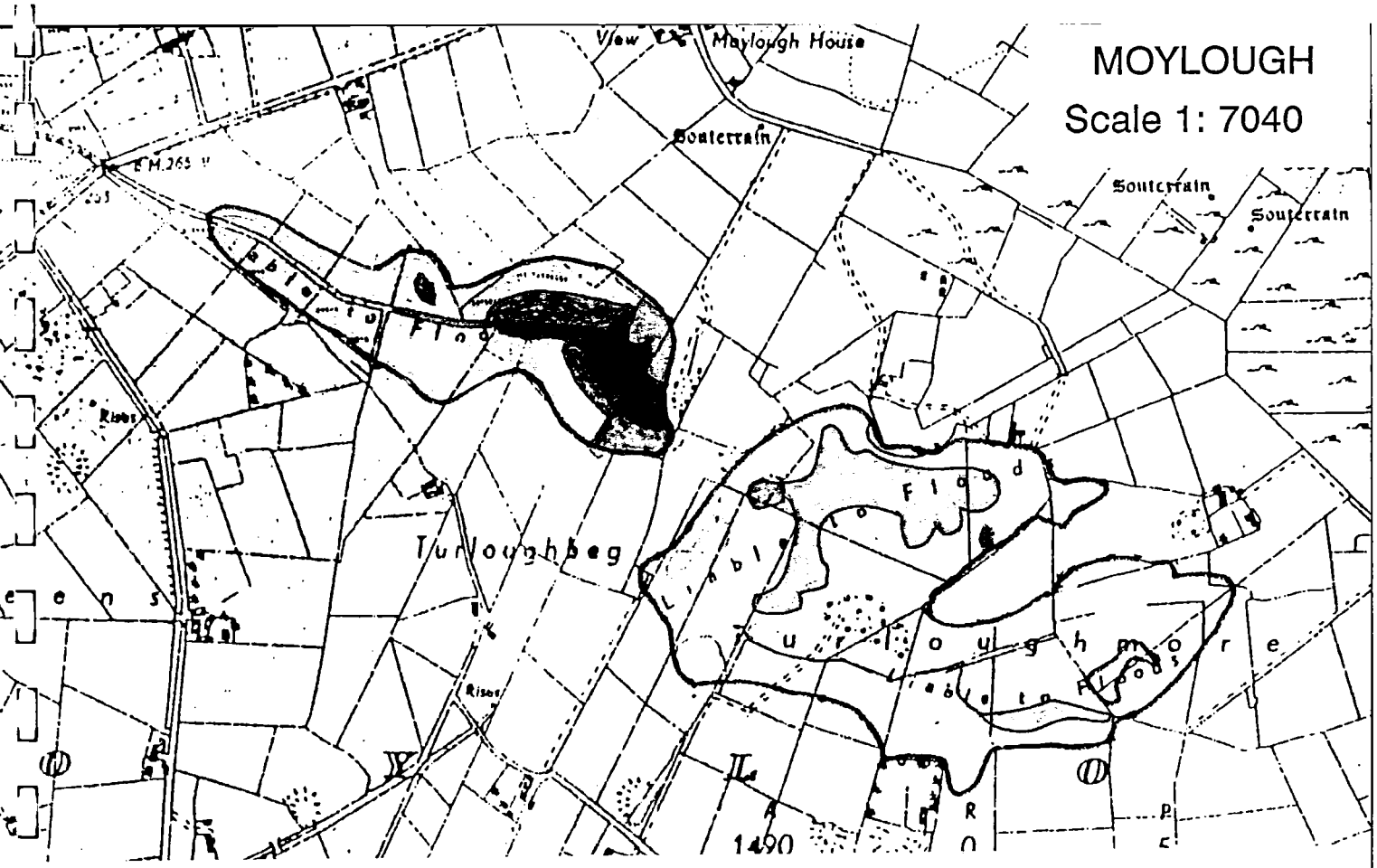
Vegetation (ha as mapped)

2A-	3.6	3B-		5A-	0.3	6D-		9A-	0.4	11B-	0.9
2B-	7.5	3C-		5B-		7A-		9B-		12-	
2C-	0.1	3W-		5D-		7B-		9C-		Lake	
2D-		4B-		5E-		8A-	0.5	10A-			
2W-		4D-		6A-	1.8	8B-	0.1	10B-			
3A-	0.6	4W-		6B-	3.8	8C-		11A-			

Fauna: One or two pairs of lapwing may nest in the north-western part of the area though probably not in the turlough itself. The site was visited too late to determine this. The lake also supports snipe and moorhen. There is no winter information but numbers are unlikely to be high.

Evaluation: The vegetation of Moylough has considerable diversity which gives it a higher score (28.5) than the somewhat similar Turloughmore nearby. None of the communities is particularly well-developed however though the north-western part has some interesting features. The turlough seems to have been affected by the Moy drainage and without significant bird numbers is less important than Turloughmore and Doocastle. On a four point scale it could be considered of local importance.

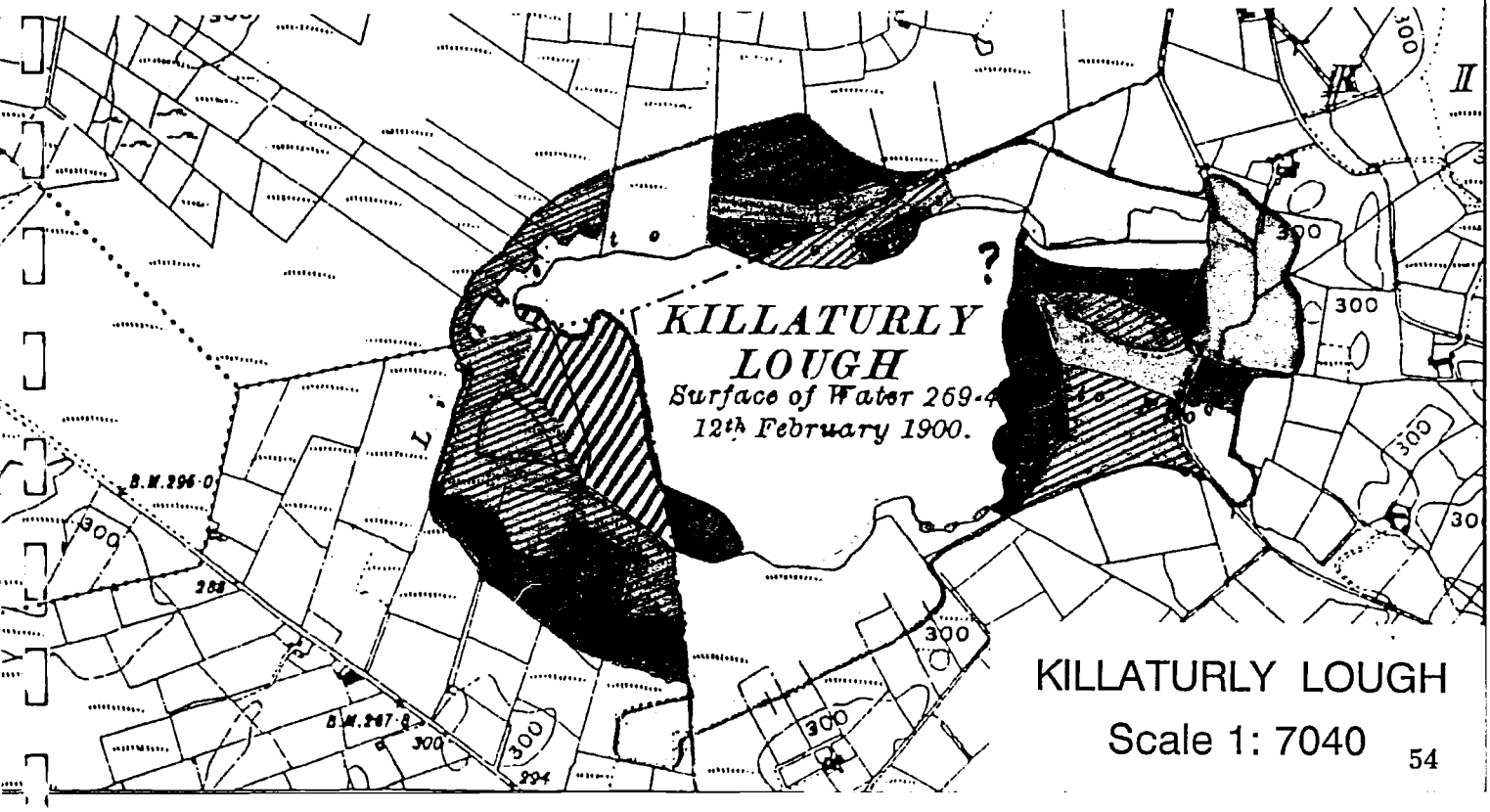

86
(E.D. Kiltura)
A 743 R 1 P 36
Doobeg Lodge
Doobeg House
Burial Ground
Toomour
Liable to Floods
Castle (in Ruins)
Doocastle Cottage
Liable to Floods
Doocastle Sch.
CASTLE
Cloontaconnagh
A 1960 Including 7 water R 3 0 P 12 8
Doomore Well
Doocastle Post Office
Doomore Fort
Rises
B.M.235·6
B.M.250·6
B.M.304·0
B.M.274·7
B.M.244·0
B.M.251·6
B.M.267·8
B.M.264·8
B.M.266·7
B.M.242·7
B.M.263·8
B.M.276·0
B.M.289·0
B.M.259·9



MOYLOUGH
Scale 1: 7040

KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 4A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- 8B Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula



KILLATURLY LOUGH
Scale 1: 7040

4.KILLATURLY LOUGH [Cx 83]
River System: Moy
Catchment Area: 560 ha
Altitude: 80m

Grid Ref: M 4198
6" sheet: Mayo 62
Turlough Area: 34.0 ha
Evaluation score: 13

<site map on previous page>

Topography: Killaturly Lough is a permanent lake set in a hollow between moraines and surrounded by much bog. Cutover peat surrounds the western and northern sides with fields on the east and south. The floor of the basin is generally flat as far as can be seen and the irregularities are due to peat cutting. There are some channels at the eastern end around the swallow hole.

Hydrology: The main water source for the basin seems to be a swallow hole at the eastern end and a stream which flows from the south-east. There are no active streams in the peat area but it holds a lot of water in cuttings and channels. The water appears calcareous though not strongly so.

There is no evidence of successful drainage although the exit stream in the north-east corner has been deepened.

Substrate: Peat is the predominant feature of the basin and a thickness of 1.5m occurs in places. There is likely to be marl below most of this: it is certainly exposed in the cuttings on the north-west side. Peaty clay over sand is recorded around the swallow hole by Coxon (1986).

Land Use: Peat cutting has ceased in practically all the area though a little may still be done on the north side. There are cattle on the south and east but only in low numbers. Wildfowl are shot on the lake.

Vegetation: The chief variation in the vegetation west and north of the lake is dependant on the amount and pattern of peat cutting done in the past. Where the peat has been largely removed as in the NW corner, thin shoots of *Phragmites* grow out of the marl with *Carex diandra, C.serotina* and *Schoenus, Campylium stellatum* and *Scorpidium* (8C). There is *Baldellia* and *Littorella* also, with a scatter of *Sparganium minimum*. Towards the SW this community merges into a denser reedbed of *Phragmites, Carex rostrata* and *Equisetum fluviatile* with a stand of *Typha latifolia* and a little *Lysimachia vulgaris* and *Lythrum salicaria*. Behind these areas at a higher level *Carex nigra, Molinia, Menyanthes, Potentilla palustris* (6D) cover a substantial area though peat cuttings in this bring in the pool flora of *Juncus bulbosus, Potamogeton polygonifolius* and *Carex diandra* with odd patches of *Sphagnum palustre* and *S.contortum*. Drier sites carry *Carex echinata, C.ovalis, Juncus conglomeratus* and, in places, a little *Polygonum amphibium* (2D).

A patch of similar vegetation based on level peat occurs at the opposite end of the lake but here it is unmodified by cutting.

Deschampsia cespitosa, Lythrum salicaria and *Lysimachia vulgaris* are much in evidence and there is a stand of rounded *Salix cinerea* trees. The occurrence of *Centaurea nigra* in the 2D community suggests that this peat is within the influence of flooding by lake water. There are stands of *Carex rostrata* and *Eleocharis palustris* in the lake with *Littorella* and *Potamogeton natans*.

The swallow hole area includes two holes and an intervening stream. *Polygonum minus, P.persicaria* and *P.hydropiper* are common in the channel and there is *Juncus bufonius* and *Filaginella* nearby. *Alisma plantago-aquatica, P.amphibium* and *Agrostis stolonifera* surround the muddy patches.

The lake flora includes *Potamogeton perfoliatus, P.pusillus* and *P.filiformis* which were washed up on the north side.

Vegetation (ha as mapped)

2A-		3B-		5A-		6D-	6.0	9A-	1.5	11B-	0.9
2B-	0.2	3C-		5B-		7A-		9B-		12-	0.7
2C-		3W-		5D-		7B-	0.8	9C-	0.5	Lake	10.3
2D-	4.7	4B-		5E-		8A-		10A-			
2W-		4D-		6A-		8B-		10B-			
3A-		4W-		6B-	10.4	8C-	1.5	11A-	1.3		

Fauna: Snipe and water rail nest in the area and there are likely to be mallard and probably teal also. In winter quite large flocks of wildfowl are present and there were already 60 in September. There are no specific counts published.

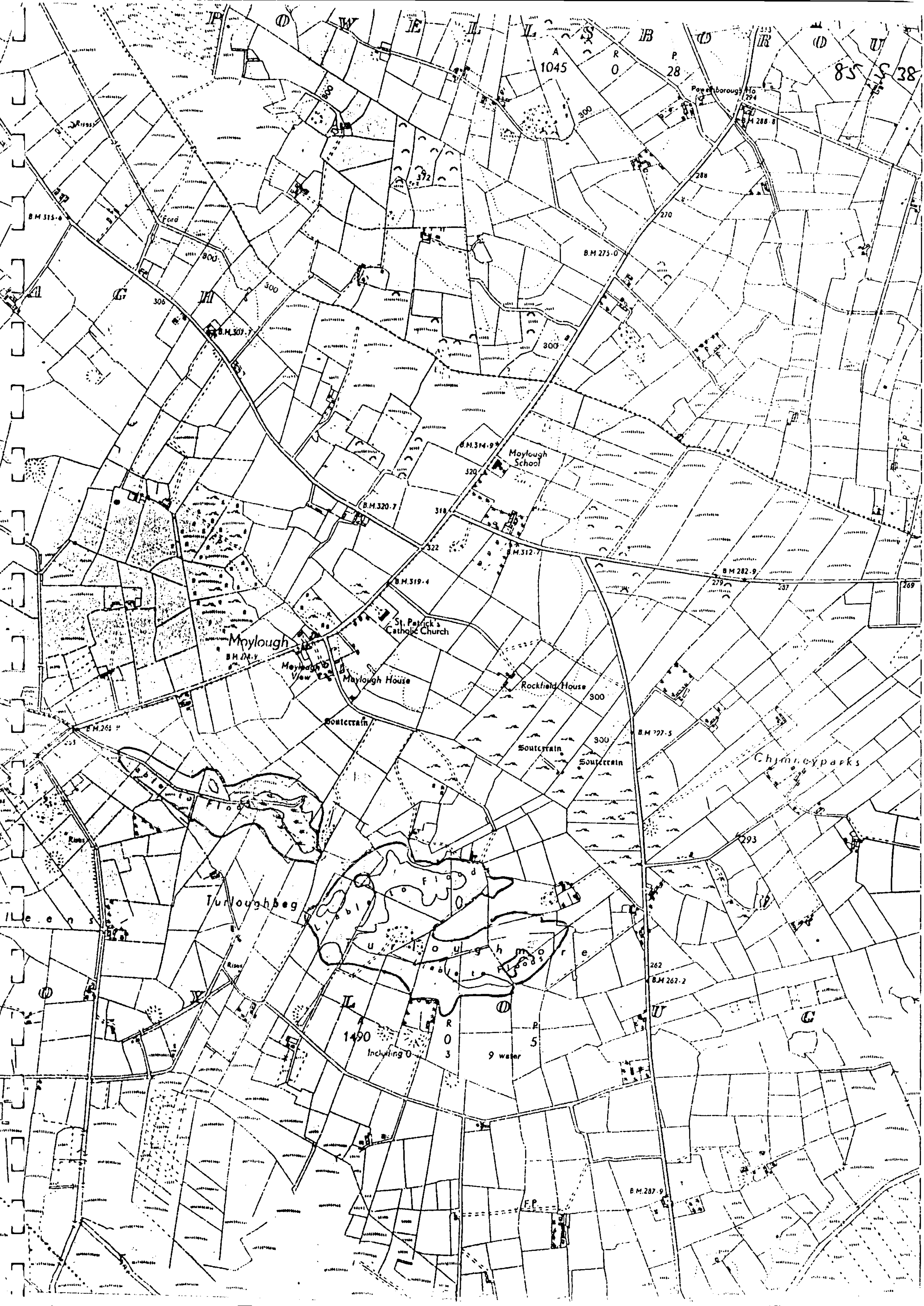
Evaluation: The site scores highly (52.5) in the evaluation process but this is largely due to the habitat and vegetation diversity around the permanent lake. The area of strictly turlough vegetation is quite small in the basin and it has few features to justify listing on this basis.

However the site must have value as a composite wetland and would seem at least of regional importance. In view of its hybrid nature - only similar to Levally Lough amongst the turloughs visited - this might even be national.

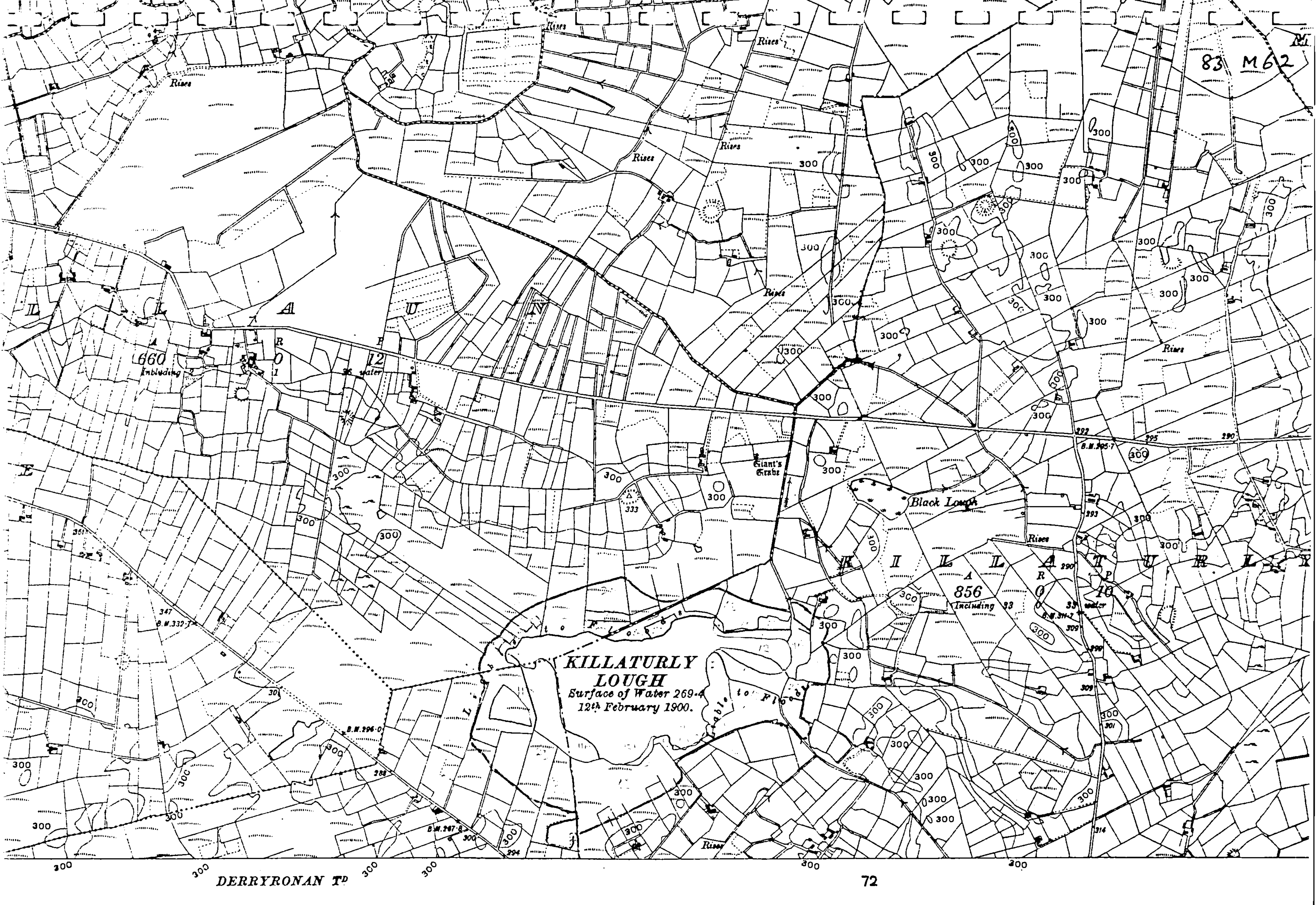
5. BALLA (Pollaghard - Cx 48)
River System: Manulla (Moy)
Catchment Area: 720 ha
Altitude: 39m

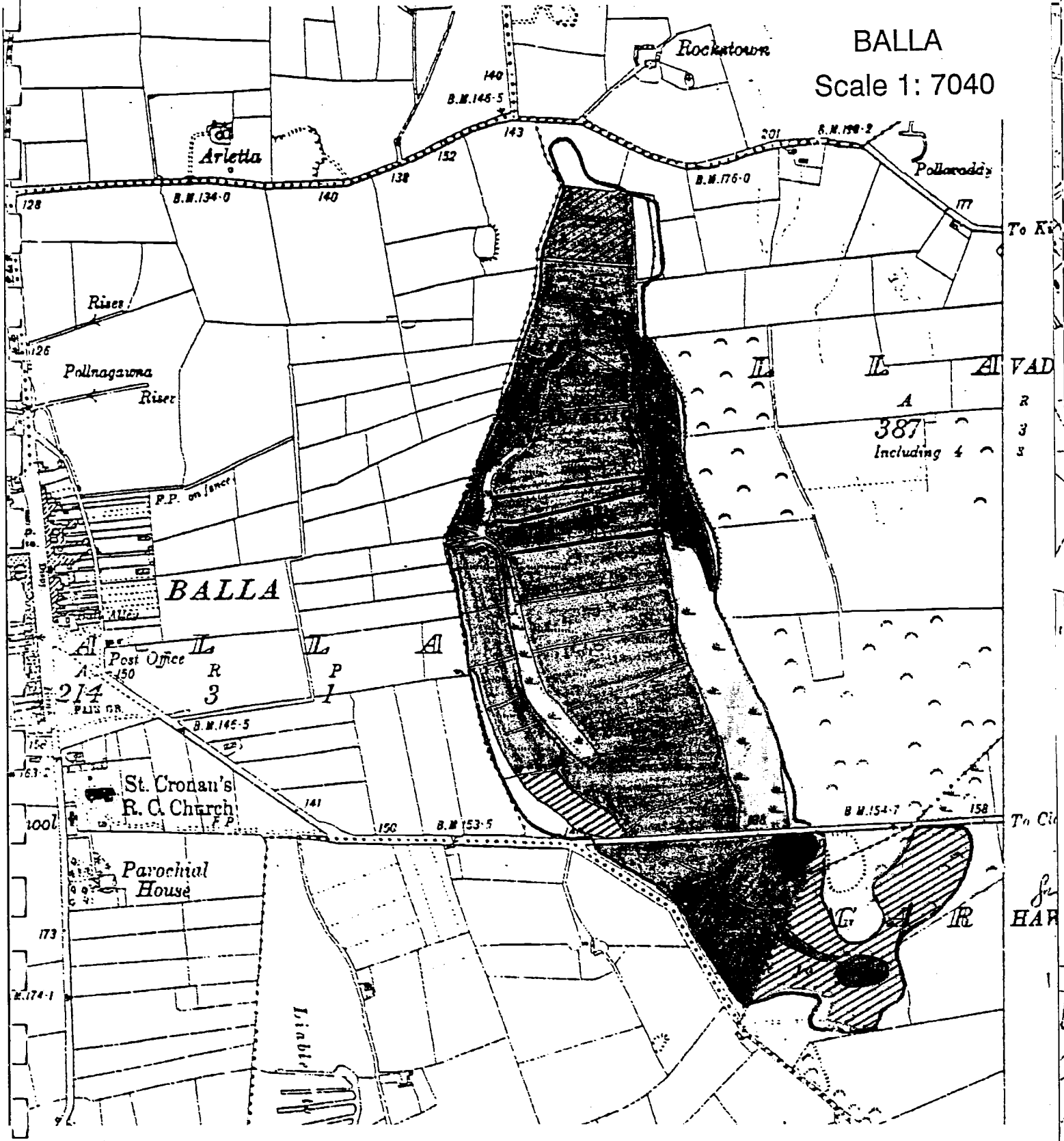
Grid Ref: M 2685
6" sheet: Mayo 90
Turlough Area: 35.0 ha
Evaluation place: 25

Topography: This turlough lies in a N - S hollow just east of the village. Its southern end is crossed by the main Claremorris to Castlebar road. Along each side of the basin are elongated drumlinoid ridges and the land rises more steeply on the east. The



85 C 38
POWELLSBOROUGH
A 1045 R 0 P 28
Powellsborough Ho
B.M. 288·8
B.M. 315·6
Ford
B.M. 301·7
B.M. 275·0
B.M. 314·9
Moylough School
B.M. 320·7
B.M. 312·7
B.M. 282·9
B.M. 319·4
St. Patrick's Catholic Church
Moylough
Moylough View
Moylough House
Rockfield House
Souterrain
Souterrain
Souterrain
Chimneyparks
Liable to Floods
Turloughbeg
Turloughmore
Liable to Floods
Rises
Rises
B.M. 262·2
B.M. 297·5
LOUGH
A 1490 R 0 3 P 5
Including 0
9 water
B.M. 287·9
F.P.


83 M62
KILLATURLY LOUGH
Surface of Water 269·4
12th February 1900.
Black Lough
Giant's Grave
KILLATURLY
856
Including 33
33 water
LAURO
660
Including 2
12
36 water
Rises
Liable to Floods
B.M. 295·7
B.M. 311·7
B.M. 332·7
B.M. 296·0
B.M. 297·8
333
DERRYRONAN Tᴰ



KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge	10B	Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)		Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb		Carex flava	8C	Cladium fen		Open water (12)
	Sedge heath		Dry Carex nigra		Temporary pond	2W	Dry woodland
	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)		Peaty Carex nigra	9C	Marl pond		Potentilla fruticosa / Frangula

floor is probably flat but it has become covered with a dome of peat except on the eastern side. South of the road there is a more varied topography with channels leading from depressions into the basin.

Hydrology: A large number of internal drainage ditches occur, running E - W through the peat dome and linking the swallow holes along the western edge with a temporary lake on the east. More permanent water exists in a ditch and pond in the southern limb which feeds under the road. Water would seem to rise mostly on the west side but also from the depression at the south end.

There is no evidence of external drainage.

Substrate: The main part of the basin has more than 1m of peat in the centre but this thins towards the edges to show the underlying drift. There is a build-up of marl currently happening in the south-eastern pond and some older layers are visible beneath the peat where the drains are newly cut. Across the road the substrate is a sandy till (Coxon, 1986) with some bedrock that may have been quarried.

Land Use: Most of the turlough is open to cattle but grazing does not seem intensive because of the prevailing vegetation. There is an intensive cattle unit on the hill at the north end (Rochestown). The upper part of the southern basin was ungrazed at the time of the visit.

Peat cutting ceased a long time ago but was probably last carried out along the western side of the pond area.

Vegetation: The peat dome has a uniform vegetation of scattered *Filipendula* and *Cirsium dissectum* among *Molinia, Carex panicea* and *C.hostiana* (5D). *Potentilla palustris* and *C.disticha* grow in the damper places and with *Lysimachia vulgaris, Menyanthes* and *Stellaria palustris* make up a distinct community (6D) at the northern end. Marginally, more typical turlough vegetation takes over as a noticeably grassy fringe. There is a substantial area of *Polygonum amphibium* in the northern half, sometimes mixed with *Carex vesicaria* and *C.nigra*. Southwards this gives way to an open stand of *Scirpus lacustris, C.rostrata* and *C.elata* in shallow water with *Littorella*, very dense *Potamogeton coloratus* and some *Scirpus fluitans* (9C). A small amount of 3B with *Nardus* and *Briza* occurs in the northern basin but this community is best developed at the south-east end. Here the rising water seems to come out of a limestone grassland area, flowing through a rim of tall *Deschampsia* and *Festuca arundinacea* to a depression lined with *Carex vesicaria, Agrostis stolonifera* and *Glyceria fluitans*. It flows through a wall into a patch of 8A and then is collected by a ditch which leads to the permanent pond with *Equisetum fluviatile*.

The oligotrophic community is repeated around the swallow holes but in a drier form with *Scirpus fluitans, Juncus bulbosus* and *Potentilla palustris* in the channels. Much *Sparganium emersum* and *Oenanthe aquatica* grow in the drainage ditches around here.

Vegetation (ha as mapped)

2A-		3B-	3.9	5A-		6D-		9A-	0.1	11B-	0.3
2B-	0.8	3C-		5B-		7A-	1.6	9B-		12-	
2C-	0.2	3W-		5D-	20.0	7B-		9C-	3.8	Lake	
2D-		4B-		5E-		8A-	3.2	10A-	0.3		
2W-		4D-		6A-		8B-		10B-			
3A-		4W-		6B-	0.4	8C-		11A-			

Fauna: The area attracts significant numbers of waders in winter and Sheppard (in prep.) records averages of golden plover 380, lapwing 190 and curlew 110. These birds would feed on the better fields nearby and not really in the turlough. Swans occur sometimes in winter.

It is likely that both snipe and lapwing nest here though the visit was too late in the season to determine this.

Evaluation: Balla is a distinctive turlough with a peat dome contained in an interesting topographical situation. It contains a good range of the more oligotrophic communities: the area of Sedge Fen (5D) is large and it is the only turlough where this vegetation type covers most of the ground (unusually with *Stellaria palustris*). The site is also the most northerly for the oligotrophic Marl Pond (9C) which contains *Juncus bulbosus* and *Scirpus fluitans*. This community occurs also at Coolcam and Fortwilliam to the east but is much more a feature of the Burren turloughs.

The ecology of Balla turlough illustrates a possible route of bog formation as peat build-up is taking the central dome above the level of frequent flooding. The aerial photographs suggest that this part is flooded for only a short time and perhaps not in every year. A winter visit in 1991 showed the floodwaters inundating the central dome but not covering the vegetation.

Because of these features Balla is considered of national importance, somewhat above the position its evaluation score (41) would suggest. It is also very accessible.

6. SLISHMEEN [Cx 47]
River System: Manulla/Lough Carra
Catchment Area: 360 ha
Altitude: 34m

Grid Ref: M 2279
6" sheet: Mayo 100
Turlough Area: 19.6 ha
Evaluation place: 48=

Topography: Slishmeen turlough occurs over the road from Ballyglass (46) and is a smaller, more even basin overlooked by some drift-covered fields on the north-east side. The landscape consists of elongated drumlinoid ridges (Coxon, 1986) which have

some bedrock core but are mostly glacial drift. The floor of the basin is flattish but some digging (of marl?) in the eastern half has created ridges and hollows in places. It descends to a pond in the west centre.

Hydrology: Though there is little evidence of physical drainage except for a small drain at the southern tip, the turlough must be affected by the largescale works at Ballyglass, 300m to the south. However because its floor slopes away from this exit, it retains a pond which lasts throughout the summer.

The floor is irregular from former digging as noted above and there is a pattern of old drainage ditches but no obvious swallow hole.

Substrate: The basic structure is till over bedrock with some peat around the pond and where the four walls meet nearby. The south-eastern half has deep marl deposits (over 80cm, Coxon, 1986) but there has been some soil development on top of them, indicating a previous dry phase.

Land Use: Cattle grazing is heavy at the NW end which is fenced off. The rest of the turlough may be commonage and carries both cattle and sheep. Marl extraction has now ceased but there is some dumping of rubbish in its place. There is no sign of peat cutting.

Vegetation: The turlough has a simple vegetation structure with a band of 2B, 2A or 3B around the upper limits of flooding. The 3B on the north-east side is infiltrated by calcareous water and contains *Linum, Parnassia, Euphrasia scottica* and *Alchemilla* sp. Below this level 6A occurs on the marl deposits of the eastern half, giving way to *Polygonum amphibium* communities at lower levels. In places the vegetation cover has been broken by trampling and patches of annuals take over, including *Polygonum persicaria, P.aviculare, Chenopodium rubrum* and *Stellaria media.* The wetter sites have a 10A cover with *Oenanthe aquatica, Rorippa amphibium* and some *P.amphibium.*

The pond is surrounded by a belt of *Scirpus lacustris, Equisetum fluviatile* and *Hippuris* leading into *Potamogeton crispus, P.natans* and a little *P.friesii.* Excessive trampling to its north-west has converted the natural 8A to a more open stand of *Oenanthe aquatica* and *Ranunculus trichophyllus* backed by docks, *Potentilla anserina* and *Polygonum persicaria.*

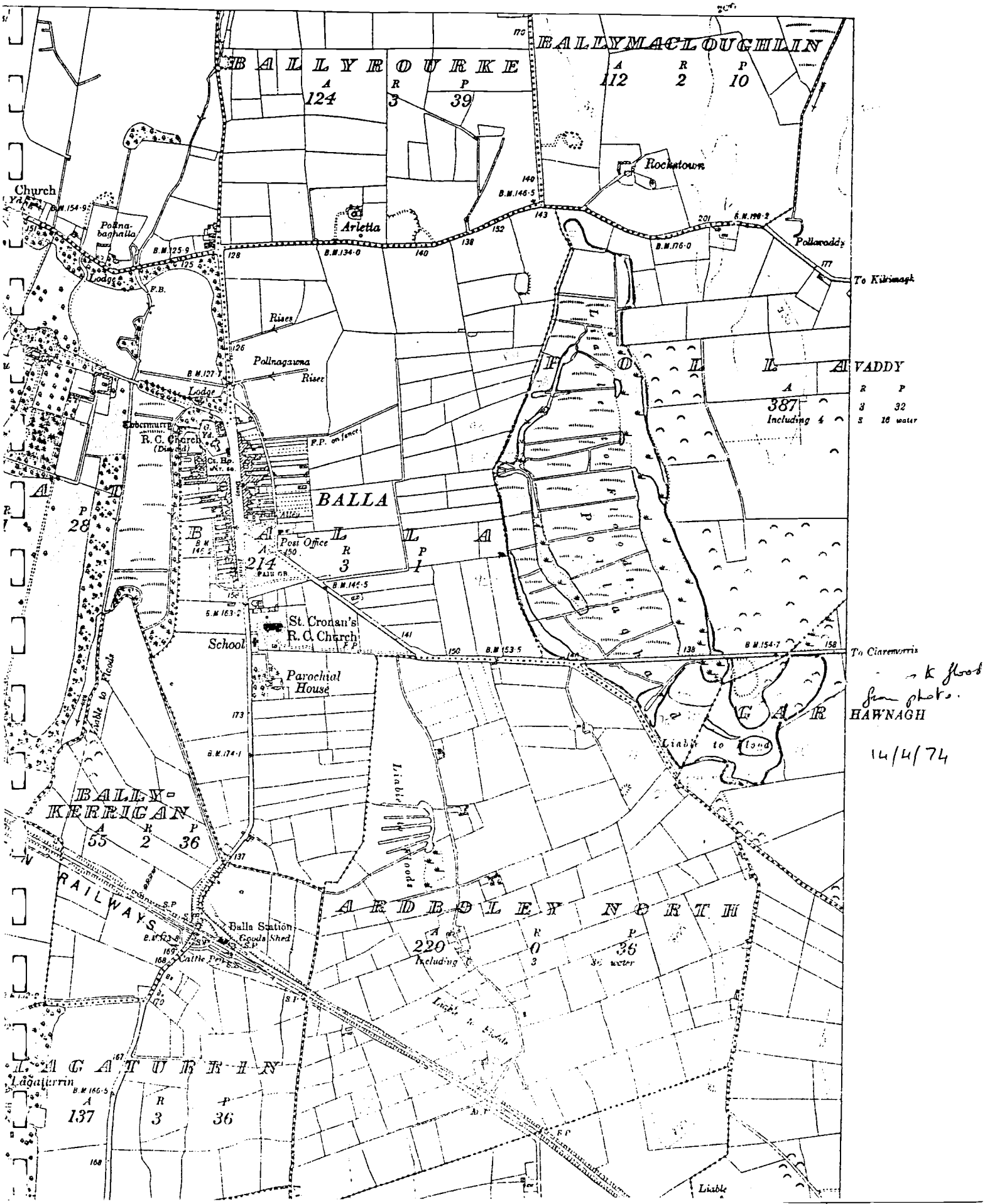
Vegetation (ha as mapped)

2A-	0.7	3B-	3.3	5A-	0.9	6D-		9A-		11B-	
2B-	4.2	3C-		5B-		7A-	0.8	9B-		12-	0.1
2C-		3W-		5D-		7B-		9C-		Lake	
2D-		4B-		5E-		8A-	2.4	10A-	1.3		
2W-		4D-		6A-	4.9	8B-	0.4	10B-			
3A-		4W-		6B-		8C-		11A-	0.3		

48

LEGAUN Td

MAYO SHEET 80.



→ K flood from photo.

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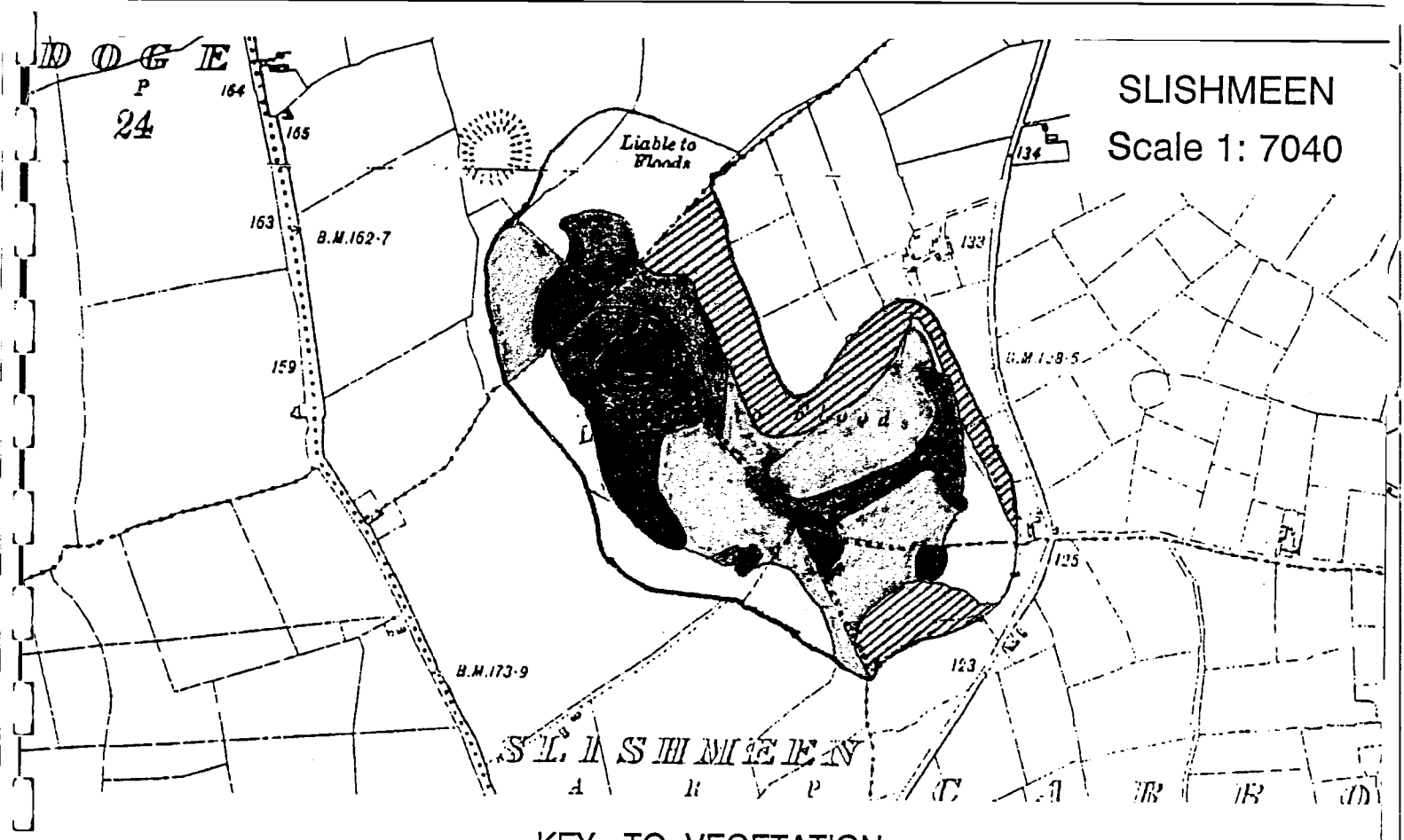
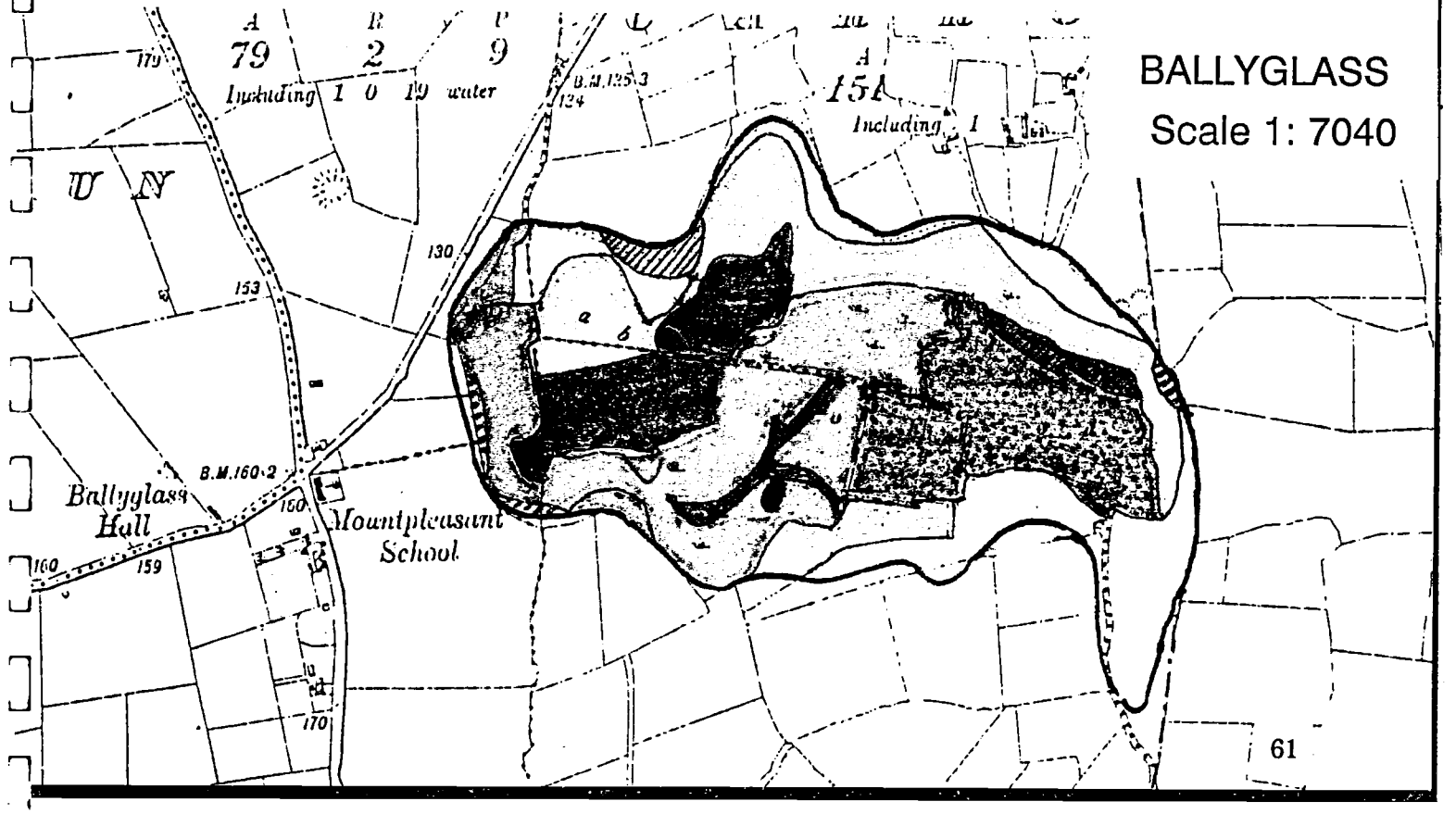


KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge		Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)		Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb		Carex flava	8C	Cladium fen		Open water (12)
3B	Sedge heath	6A	Dry Carex nigra	9A	Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)		Peaty Carex nigra	9C	Marl pond		Potentilla fruticosa / Frangula



Fauna: No data available. There was a flock of 40 curlew in the turlough in September.

Evaluation: Slishmeen has a reasonable level of diversity in its vegetation though without major features of interest, except for the presence of *Potamogeton friesii*. There is a good zonation of communities at the northern end but less variety than in the adjacent Ballyglass. Of the two turloughs, Slishmeen appears much less affected by drainage but its proximity to the works in Ballyglass makes a significant difference unlikely.

Overall it achieves a score of 24 which brings it into the bottom quarter of the league table. It may be thought of as locally important.

7. BALLYGLASS [Cx 46]
River System: Lough Carra
Catchment Area: 560 ha
Altitude: 33m

Grid Ref: M 2378
6" sheet: Mayo 100
Turlough Area: 25.9 ha
Evaluation place: 28=

<site map on previous page>

Topography: Ballyglass is one of a pair of turloughs lying 5km from Lough Carra towards Balla. It is orientated E - W in an oval basin surrounded by discontinuous ridges of drift and bedrock. At the eastern end a low valley takes the basin some way south. The floor is generally flat but occurs at two main levels, the lowest in the middle running SW towards the swallow hole.

Hydrology: This turlough has been drained as part of the Lough Carra drainage area. The swallow hole at the western end has been excavated and fenced and it is connected to a channel that runs along the length of the basin and thence southward to Ballyglass Lough. The turlough still floods however, though probably to a reduced extent.

There seems to be an input of polluted water rising into the central drain in the peat area.

Substrate: The western end of the turlough has a mineral soil over rock at about 80cm. Towards the centre this is replaced by a clayey silt which may be 700cm thick (Coxon, 1986). The silt is overlain by peat at the eastern end, at least in the lower part of the basin.

Land Use: A playing pitch is sited on the mineral soil at the western end but elsewhere the land is grazed by cattle or sheep (in the south). The peat area is not now cut though old traces remain.

Vegetation: The vegetation of the turlough is complex and it is also probably altering because of recent drainage. Basically the

lowest central part is of 6A which before drainage took water through low channels of 8A to the swallow hole. Earthmoving around the swallow hole has extended the amount of *Polygonum amphibium* while animal treading has also allowed good annual communities to develop, involving *Filaginella, Rorippa islandica* and *Chenopodium rubrum*. Close to the channel where the ground dries out for only a short period a community of annual mosses occurs involving *Tortula* cf *marginata, Pottia truncata, Pellia endiviifolia* and *Ephemerum cohaerens*.

The eastern end of the basin still has substantial areas of peat and this is covered by *Carex nigra, C.panicea* and *C.?demissa* as well as *Hydrocotyle*. Part of the northern side appears to have ridges marked on the surface every 10m. There are the remnants of cutting here too and *C.elata* and *C.nigra* cover the old banks and trenches.

These lower areas are surrounded by a ring of dryish 6B which grades into type 2 communities towards the edge. There is a relatively large area of 2A at the eastern end which may partly be due to drainage. At the western end there is much 5A on the bare land modified by the drainage machines with *Potentilla anserina, P.reptans, Polygonum amphibium, P.persicaria* and *Mentha aquatica*. In the NW corner is a playing field composed of *Carex panicea, Festuca pratensis* and *F.arundinacea* (2B). It is overlooked from the north by a slope of 3B, including *Linum catharticum* and *Parnassia*.

Vegetation (ha as mapped)

2A-	3.6	3B-	0.3	5A-	1.7	6D-		9A-		11B-	
2B-	0.8	3C-		5B-		7A-		9B-		12-	
2C-	0.6	3W-	0.1	5D-		7B-	0.4	9C-		Lake	
2D-		4B-		5E-	4.0	8A-	2.1	10A-			
2W-		4D-		6A-	5.4	8B-	1.1	10B-			
3A-		4W-		6B-	5.5	8C-		11A-			

Fauna: No ornithological information is published from this turlough. There were 60 golden plover there in mid-September.

Evaluation: The recent drainage of the turlough must have altered its vegetation significantly or at least begun a process of change that has yet to stabilise. It still contains a good variety of vegetation however, with twelve community types including Carex flava (5E) - one of only four examples.

In addition, a number of interesting plants occur giving the site a relatively high score (39) despite the recent drainage. Ballyglass is one of two sites for the moss *Ephemerum cohaerens* and is the most northerly location for *Rorippa islandica* yet found. It should therefore be considered of at least regional if not national importance.

8. CORBALLY [Cx 58]
River System: Scramogue (Shannon)
Catchment Area: 800 ha
Altitude: 61m

Grid Ref: M 8480
6" sheet: Roscommon 28
Turlough Area: 9.2 ha
Evaluation place: 56=

Topography: Corbally is one of the group of seven turloughs around Tulsk in central Roscommon. It covers a small site beside the main Strokestown road and is, for this reason, seen by many people. The road is built around the edge of the basin, 1-2m above flood level. The flat floor runs southward into beds of *Iris* and westwards to a more definite shore below a wall. There are three mounds on the floor, all presumably crannogs. Bedrock brings about small undulations in the surroundings but a thin drift cover is ubiquitous.

Hydrology: Ditches meander through most of the basin and all retained water in late June. They discharge at the eastern end of the turlough where there is a swallow hole. Water also rises into a ditch at the SW tip of the area. There is no evidence of external drainage.

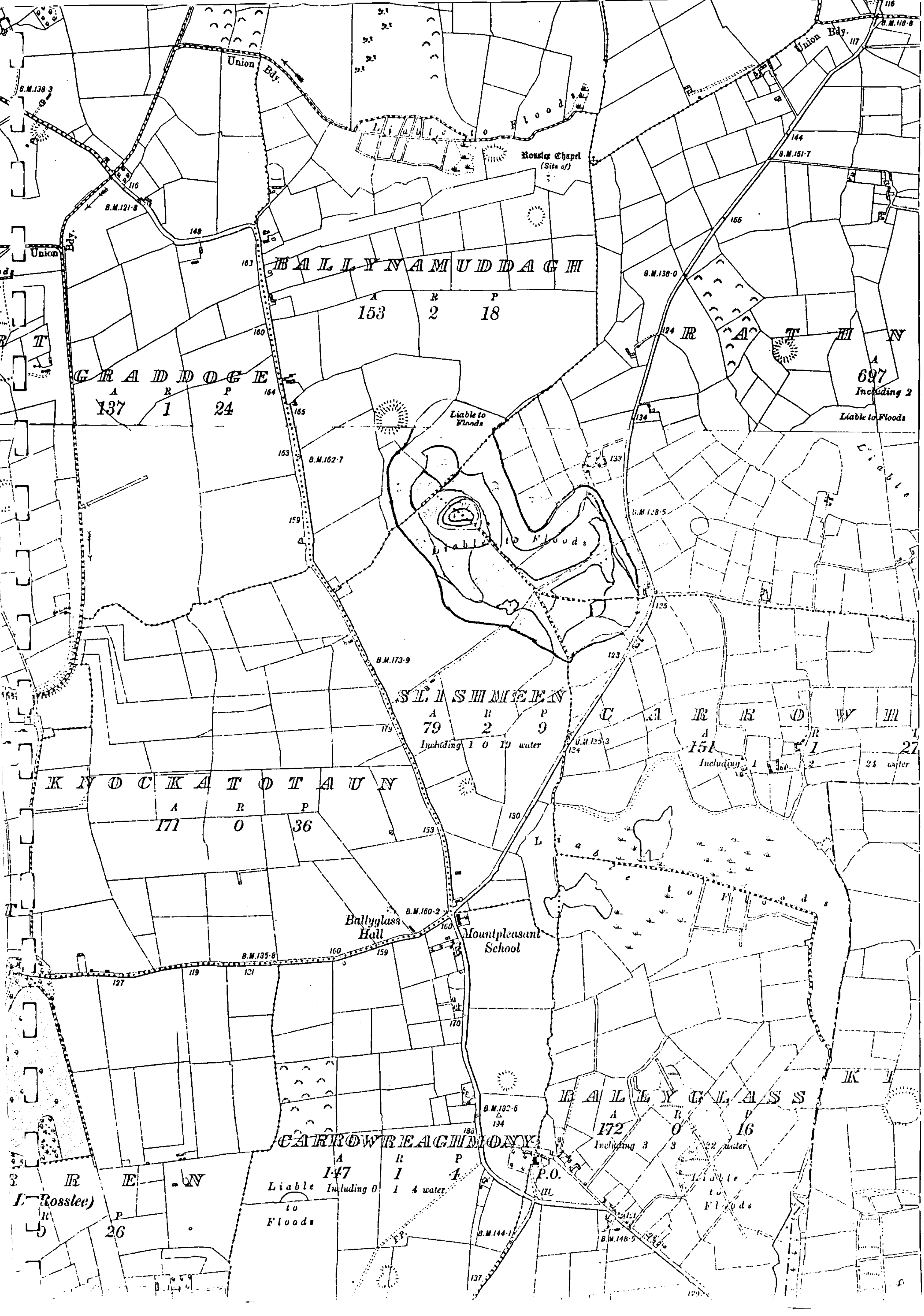
There was no lime deposit on the vegetation and the floodwater would appear to be relatively low in it.

Substrate: Coxon (1986) records up to 1m of well humified peat over till or bedrock, near the swallow hole. There is no obvious marl.

Land Use: The whole area is grazed by cattle which are generally confined by the ditches. All the surrounding land is under permanent pasture.

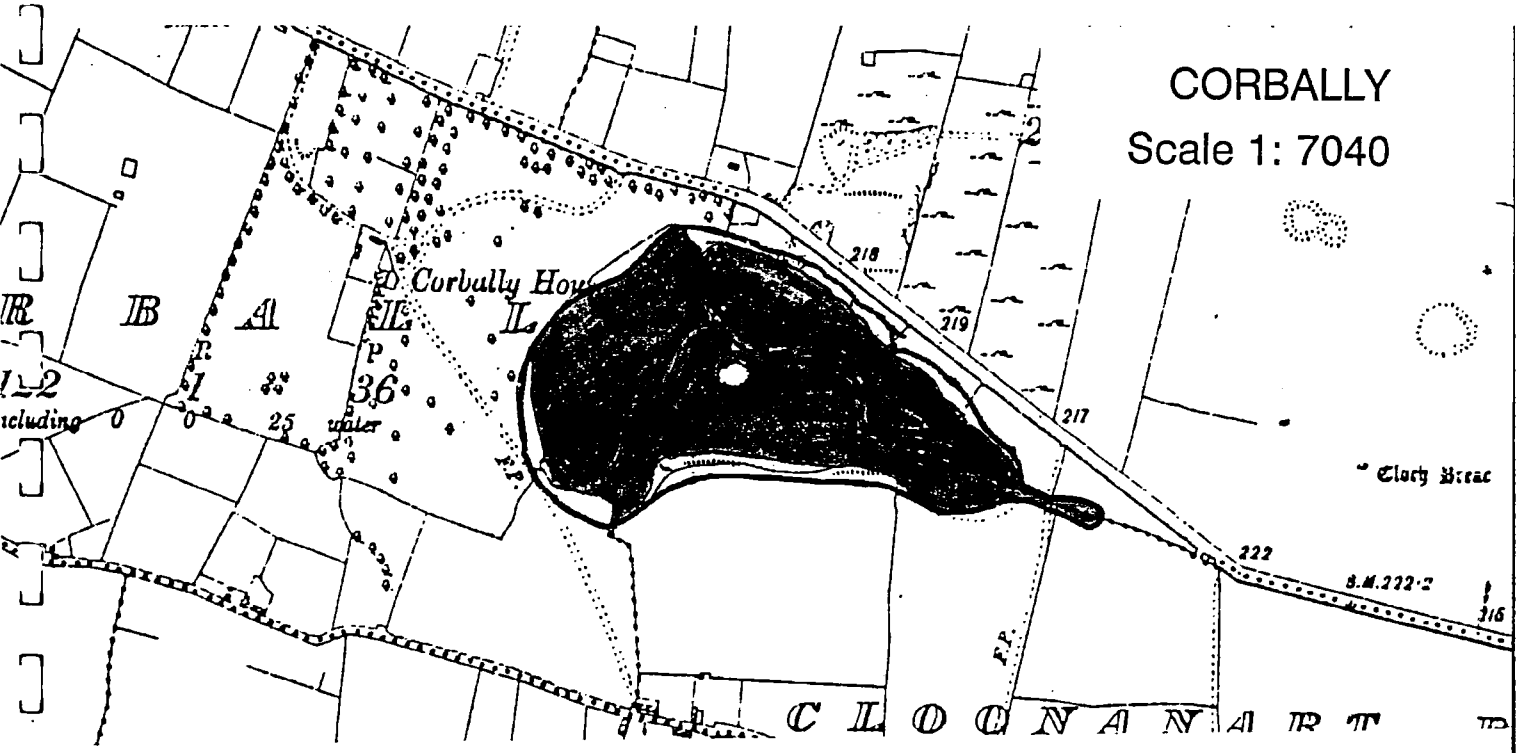
Vegetation: The vegetation is very uniform in this small area. On the floor there is much *Polygonum amphibium* which is mixed with *Eleocharis palustris*, *Hydrocotyle*, *Alopecurus geniculatus* and *Agrostis stolonifera*. North of the main ditch the ground is slightly wetter and *Glyceria fluitans*, *Menyanthes*, *Equisetum fluviatile* and *Rorippa palustris* take over as the associated species. The ditches contain a 9A community based on *Menyanthes*, *Ranunculus trichophyllus*, *Lemna* spp, *Alisma plantago-aquatica* and a little *Oenanthe aquatica*. *Lythrum salicaria* occurs, emphasising the peaty nature of the ground.

Around the edges of the basin there is often a belt of *Iris* with *Festuca arundinacea* and *Phalaris*. Alternatively where the soil is less peaty *Carex hirta*, *Phleum* and *Poa trivialis* become noticeable. The main crannog is scarcely flooded and is covered by *Festuca rubra*, *Lolium perenne* and *Veronica chamaedrys*.



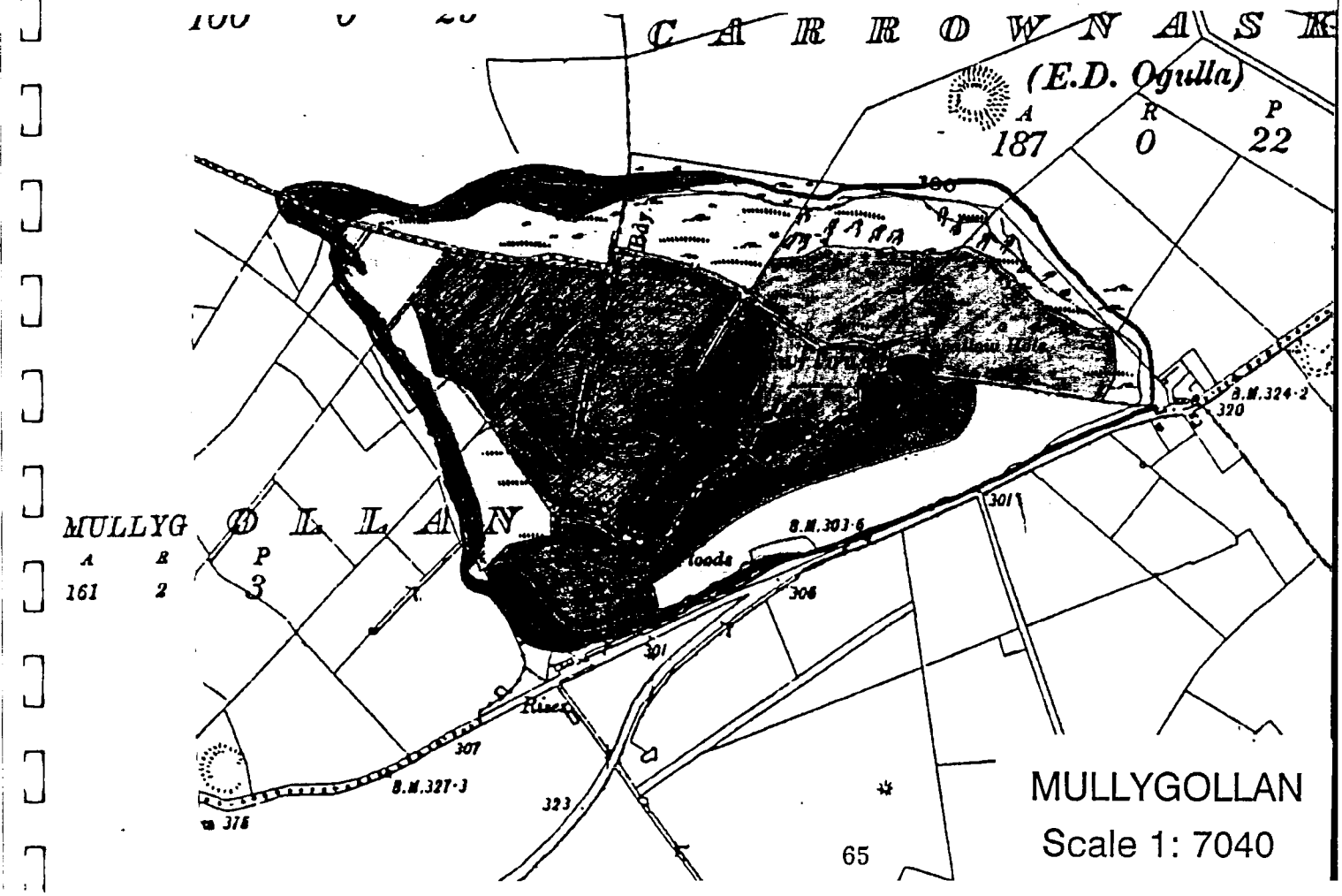
Union Bdy.
Union Bdy.
Union Bdy.
Liable to Floods
Rosslee Chapel (Site of)
BALLYNAMUDDAGH
A R P
153 2 18
GRADDOGE
A R P
137 1 24
RATHN
A
697
Including 2
Liable to Floods
Liable to Floods
Liable to Floods
SLISHMEEN
A R P
79 2 9
Including 1 0 19 water
CARROWM
A R
151 1
Including 1 2 24 water
KNOCKATOTAUN
A R P
171 0 36
Liable to Floods
Ballyglass Hall
Mountpleasant School
BALLYGLASS
A R P
172 0 16
Including 3 3 22 water
Liable to Floods
CARROWREAGHMONY
A R P
147 1 4
Including 0 1 4 water
Liable to Floods
P.O.
(Rosslee)
26


M 100
Surface of Water 91·7
31st March 1915.
SLISMEEAN
A R P
79 2 9
Including 1 0 19 water
KNOCKATOTAUN
A R P
171 0 36
CARROWHALL
A R P
151 1 27
Including 1 2 24 water
Mount Pleasant
MOUNTPLEASANT
A R P
197 2 12
Including 9 2 9 water
Ballyglass Hall
Mountpleasant School
KILGREEL
A R P
245 2 4
Including 2 0 16 water
BALLYGLASS
A R P
172 0 16
Including 3 3 22 water
CARROWREAGHMONY
A R P
147 1 4
Liable to Floods
Including 0 1 4 water
P.O.
BURRE
(E. D. Rosslev)
A R P
134 0 26
CARROWNAHATORE
A R P
35 0 2
Ballyglass
Ballyglass Bridge
BALLYGLASS LOUGH
Surface of Water 121·9
12th November 1900.
CARROWBRACK
A R P
96 2 26
PART OF DERRYPARK
CARROWLYSDOOEAUN



KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge		Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)	5D	Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb		Carex flava	8C	Cladium fen		Open water (12)
3B	Sedge heath		Dry Carex nigra		Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)		Peaty Carex nigra	9C	Marl pond		Potentilla fruticosa / Frangula



Vegetation (ha as mapped)

2A- 0.1	3B-	5A-	6D-	9A-	11B-
2B- 0.6	3C-	5B-	7A- 5.2	9B-	12-
2C-	3W-	5D-	7B-	9C-	Lake
2D-	4B-	5E-	8A- 2.3	10A-	
2W-	4D-	6A-	8B-	10B-	
3A- 0.7	4W-	6B-	8C-	11A-	

Fauna: There are no breeding waders in summer but the turlough is visited by substantial numbers of wildfowl in winter. They are mobile birds, moving between adjacent turloughs in response to water conditions and disturbance. They are descibed in detail under Castleplunket.

Evaluation: Corbally is a small and rather uniform turlough with vegetation types that are repeated on a larger scale in several other sites nearby. Its major biological feature is probably the wintering birdlife but this does not bring it above a low score (14).

The turlough contains two crannog sites and is also very accessible but it cannot be thought of as of more than local importance in a botanical sense.

9. MULLYGOLLAN [Cx 60]
River System: Scramogue (Shannon)
Catchment Area: 960 ha
Altitude: 88m

Grid Ref: M 8079
6" sheet: Roscommon 28
Turlough Area: 31.8 ha
Evaluation place: 20=

<site map on previous page>

Topography: Mullygollan turlough is about halfway between Castleplunket and Tulsk, beside the road. It is in a noticeable basin, bordered by a rock outcrop to the north and sloping, drift-covered fields to the south. At the west end it ends in a small stream valley. There is much loose rock strewn around the eastern half where the floor also has different levels. The centre and west is peat covered and flatter.

Hydrology: A considerable stream enters the basin at the west end and flows into a system of drains complicated by former peat cutting. Eventually the water reaches the east centre where there are several ponds and a swallow hole in a rock cleft. Other sinkholes with subsidence occur also in the eastern part.

There is no evidence of external drainage.

Substrate: The basin is lined with silty clay with bedrock only 30cm below in the SW part (Coxon,1986). Centrally there is peat which lies on a particularly sticky clay seen also around the ponds.

Land Use: Cattle are widespread but there is little overgrazing except near the swallow holes. The central wet part is not grazed since it is isolated by ditches. Some silage is cut in the surrounding area and there could be some effluent from a farm at the eastern end.

Peat cutting has ceased for many years.

Vegetation: The contrast of wet and dry areas in this turlough gives good diversity in the vegetation which consists of peaty communities in the centre and more traditional turlough vegetation around the edges. Tall sedges (*Carex vesicaria, C.aquatilis* and a little *C.rostrata*) cover the central wettest part and are surrounded by *C.nigra* with *Equisetum fluviatile, Potentilla palustris* and *Veronica scutellata* (6D). Closer to the swallow holes and streams *Polygonum amphibium* assumes importance, growing with *C.vesicaria* and *Phalaris* at the base of the sloping eastern edge. Outside this zone the damper ground is covered by 6B with *Carex nigra, Hydrocotyle* and scattered *P.amphibium*.

Around the swallow hole this community is infiltrated by abundant docks, *Rumex crispus, R.sanguineus* and *R.obtusifolius* (5A) while close to the rock outcrop and on the eastern edge of the basin *Potentilla reptans* enters the picture, with a little *Carex disticha* and *Geum rivale* in places. This gives way to *Achillea millifolia, Festuca rubra* and *Galium verum* (2C) between the rocks which form a small area of pavement. To the west a more heathy community comes in on the margin with *Anthoxanthum, Cirsium dissectum, Carex panicea* and *Dactylorhiza maculata*.

The pool areas are much used by cattle for drinking as the ditches are often too deep. The central permanent water with *Potamogeton natans* and *P.crispus* is surrounded by muddy ground full of *Eleocharis palustris, Ranunculus trichophyllus, Veronica catenata* and *Calliergon giganteum. Berula* also occurs.

Vegetation (ha as mapped)

2A-		3B-		5A-	5.0	6D-	5.9	9A-	0.1	11B-	
2B-		3C-		5B-	5.8	7A-	6.3	9B-		12-	0.2
2C-	0.7	3W-		5D-		7B-	0.8	9C-		Lake	
2D-	3.2	4B-		5E-		8A-	1.8	10A-			
2W-		4D-		6A-		8B-		10B-			
3A-		4W-		6B-	1.8	8C-		11A-			

Fauna: The wetness of the ground vegetation favours breeding waders and redshank, curlew, lapwing and snipe all nest. In winter the turlough supports part of the wildfowl and wader populations associated with Castleplunket (q.v.).

The area was examined by Bilton & Lott (1991) for its aquatic beetles.

Evaluation: Mullygollan is a turlough of extremes. It has a high physical and vegetational diversity which runs from bare limestone

to deep peat. It also has severe grazing pressure at one side (resulting in the greatest area of the Dry Weed community (5A) of any site) and a total absence of grazing in the centre because of permanent wetness. The build-up of peat in some ways resembles that at Balla though it is at an earlier stage and more frequently flooded.

Mullygollan is the only turlough with *Carex aquatilis* so may have unusual hydrological conditions: it is also one of the few with *Berula erecta*. Although it is much cut into by ditches, these are surface features which do not much influence water conditions. Bilton & Lott (1991) describe it as a drained turlough but it is not clear what evidence they had for this.

The site scores highly (44) because of its vegetation and birdlife, which includes four species of breeding wader. In 19th place it can be thought of as nationally important.

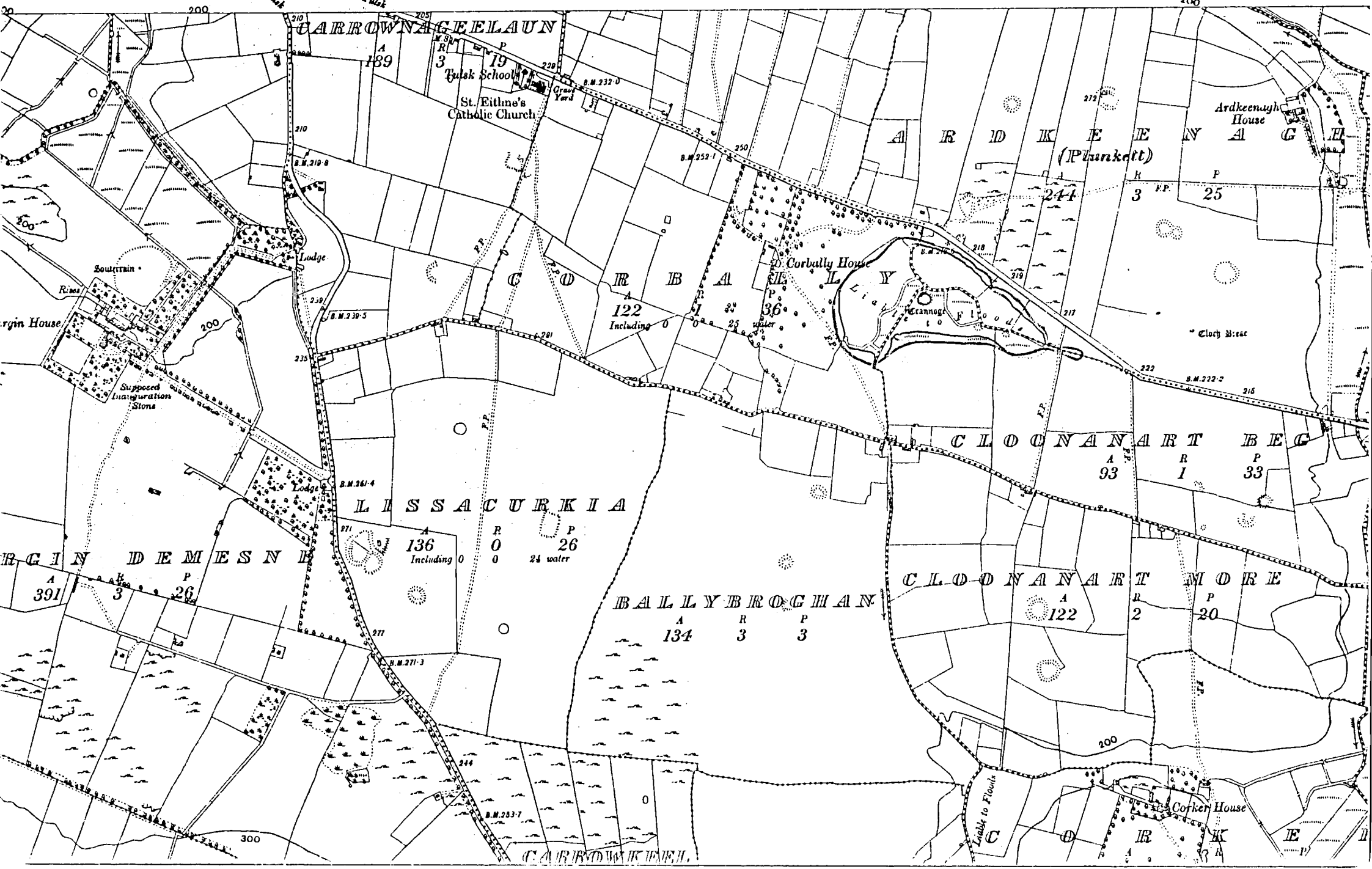
10. CASTLEPLUNKET [Cx 59]
River System: Smahraun (Suck)
Catchment Area: 80 ha
Altitude: 87m

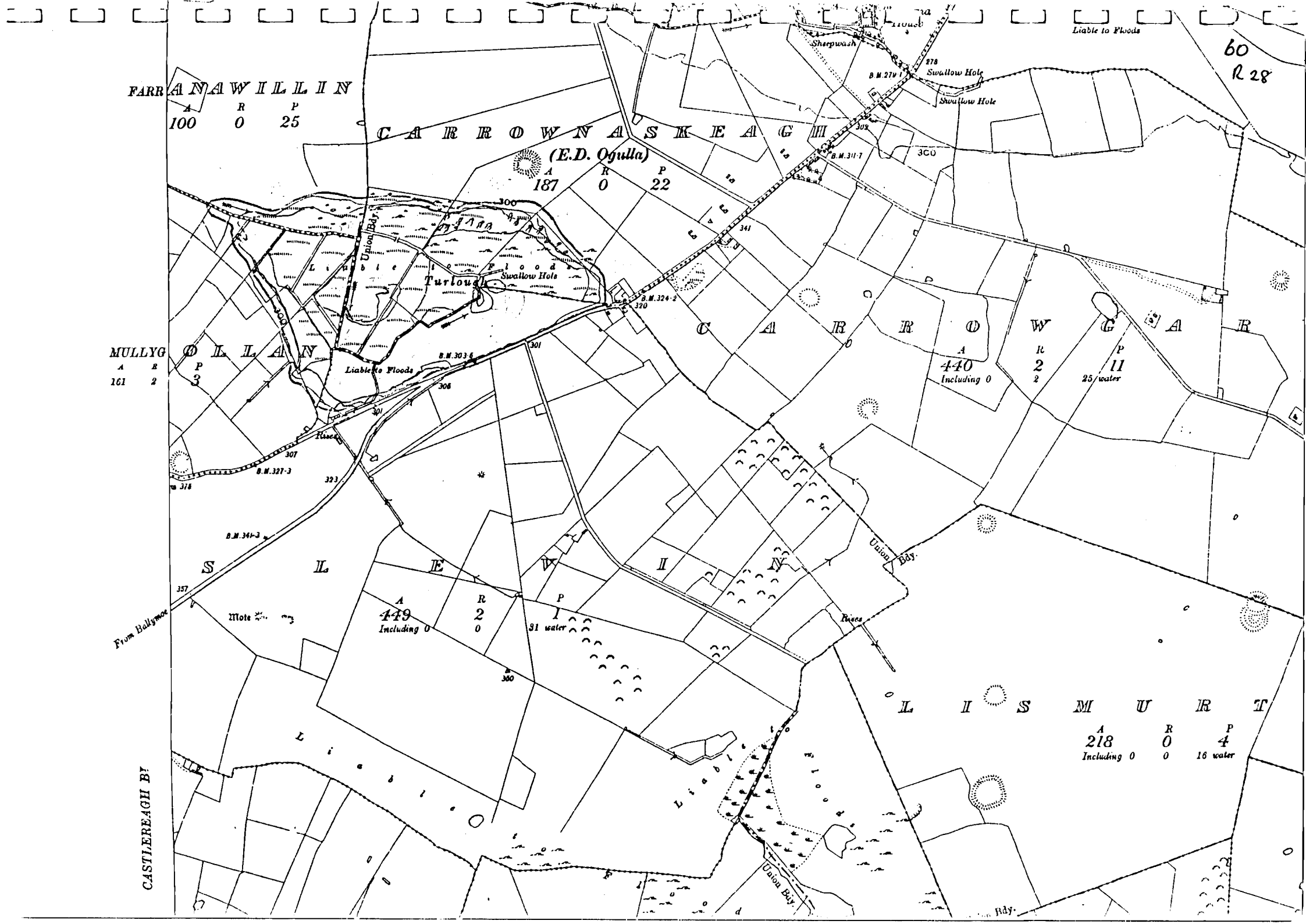
Grid Ref: M 7877
6" sheet: Roscommon 27
Turlough Area: 60.0 ha
Evaluation place: 38

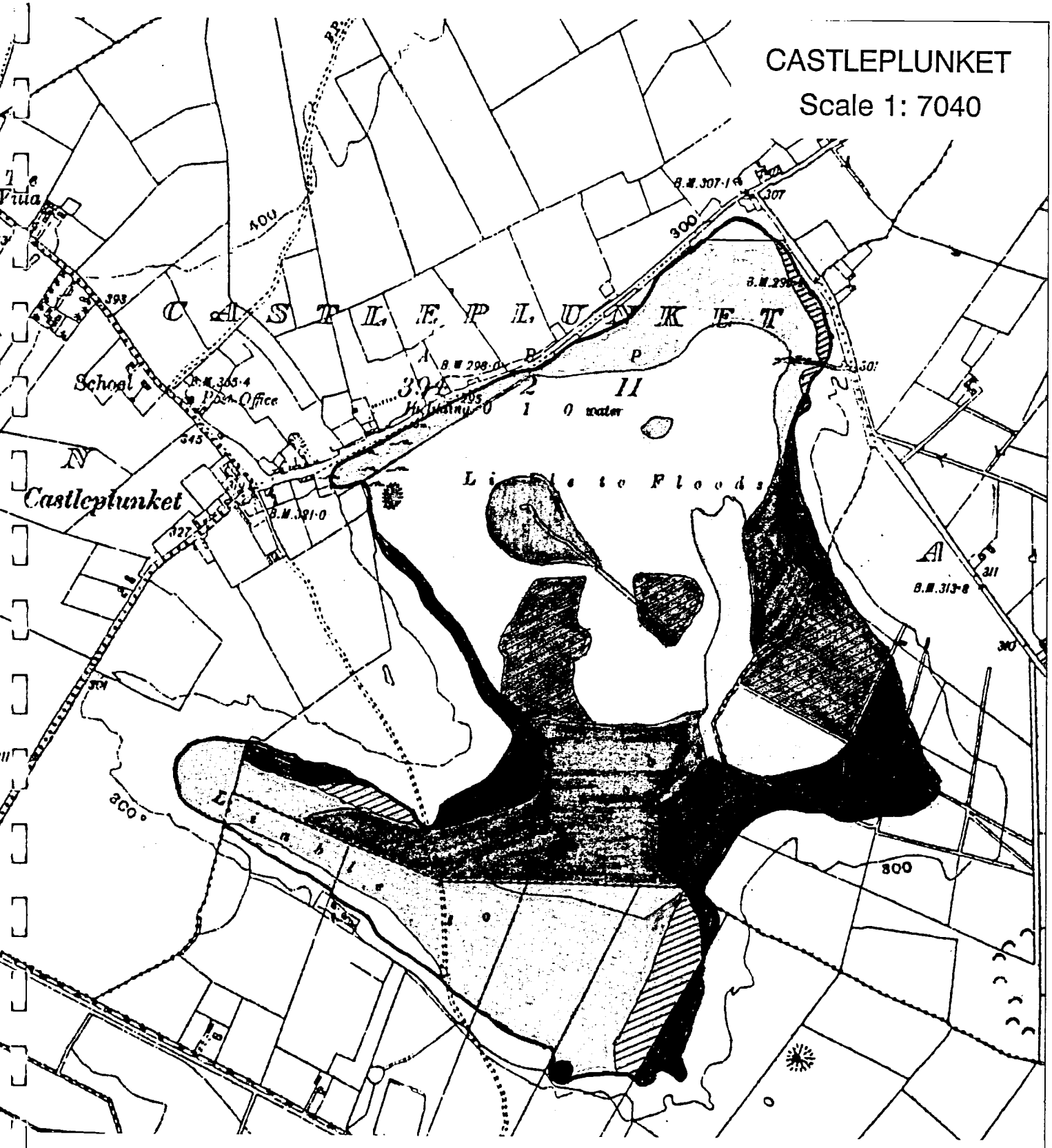
Description: The turlough lies as an arc east of the village and adjoining the Tulsk - Ballymoe road. It consists of two basins, the larger northern one separated by a slight ridge from the southern. The turlough runs into bogland on the east and into higher sloping ground on the south. The surroundings are drift-covered but there is a little outcropping rock along the NW side, under the road, as well as in a series of doline-like depressions (Coxon, 1986) nearby. There is a circular depression close to the town which seems like a quarry. The turlough floor is flat or, at the northern end, evenly sloping but has a few shallow depressions and channels in the centre.

Hydrology: A small stream enters the northern end of the basin and eventually disappears in the floor. There is, additionally, some inflow from the bogland on the east side. Permanent pools occur at the south-western tip, discharging east and at the very southern end, with no discharge. Most of the drainage of the northern basin occurs in the dolines mentioned with a long-standing pool also in the west centre. The lowest point of the southern basin is the central ditch but there are several small swallow holes at the SE end. There is no evidence of external drainage.

There was no lime deposition on foliage at the time of the visit but the pond at the SW corner is calcium-rich. The southern basin would seem to be more oligotrophic than the north though in a high flood they communicate together.


From Tulsk
From Tulsk
CARROWNAGEELAUN
A 189
R 3
P 19
Tulsk School
Grave Yard
St. Eithne's Catholic Church
B.M. 232·0
B.M. 219·8
B.M. 252·1
ARDKEENAGH (Plunkett)
A 244
R 3
P 25
Ardkeenagh House
Lodge
Southstrain
Rings
B.M. 239·5
CROBALLY
A 122
R 1
P 36
Including 0 0 25 water
Corbally House
Granuge
Flood
Liable to Floods
Cloch Bhreac
B.M. 222·2
Supposed Inauguration Stone
Lodge
B.M. 261·4
LISSACURKIA
A 136
R 0
P 26
Including 0 0 24 water
CLOONANART BEG
A 93
R 1
P 33
B.M. 271·3
BALLYBROGHAN
A 134
R 3
P 3
CLOONANART MORE
A 122
R 2
P 20
Corker House
CORKER
CARROWKEEL


60
R 28
FARR
ANAWILLIN
A R P
100 0 25
CAROWNASKEAGH
(E.D. Ogulla)
A R P
187 0 22
Liable to Floods
Swallow Hole
Turloughs
Sherpwash
Swallow Hole
Swallow Hole
Union Bdy.
MULLYGOLLAN
A R P
161 2 3
Liable to Floods
CARROWGARR
A R P
440 2 11
Including 0 2 25 water
SLEWIN
A R P
449 2 1
Including 0 0 31 water
LISMURT
A R P
218 0 4
Including 0 0 16 water
From Ballymoe
CASTLEREAGH BY
Union Bdy.
Union Bdy.
Union Bdy.



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 12W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula

Substrate: A peaty topsoil occurs over silt and sand (Coxon, 1986).

Land Use: Much of the turlough appears to be common land grazed by both cattle and sheep. Overgrazing is limited to the vicinity of the dolines and quarry. The southern and eastern parts of the turlough are divided by walls and, at the south end the fields are grazed more heavily and possibly occasionally fertilized. Quarrying has ceased.

Vegetation: The northern basin differs from the southern in two main ways. It has substantial amounts of *Iris* along the northern edge below a fringe of 3B and its floor is covered by 5B which is absent from the south. The *Iris* is mixed with *Carex disticha, C.hirta* and *Festuca arundinacea*. Small clearings within the stand have *Potentilla erecta, Bellis* and *Galium verum* also. Around the swallow holes the *Potentilla reptans* community contains much *Rumex obtusifolius* and *Stellaria media* with some *Phalaris, Potentilla anserina, P.reptans* and *Mentha aquatica* (5A). There is a similar *Rumex*-rich field under the roadside though with an unbroken vegetation cover.

The depth of peat increases on the eastern side. There is a band of 6B, two blocks of 6D (with *Potentilla palustris, Juncus articulatus* and scattered *Iris*) and some drier 5D. This passes eastwards into a rushy area with *J.effusus* and *J.conglomeratus* as well as *Deschampsia cespitosa, Lychnis* and *Anthoxanthum*. This 2D vegetation borders much of the SE edge of the turlough reappearing around the ridge on the opposite side that approaches from the town. In between the two the saddle of slightly raised ground is covered by mixed sedges, including *C.hostiana*. The southern half of the southern basin has 3A as in the north but there is little *Iris* in it and rather more *Phalaris, Geum rivale* and *Ophioglossum*. At the western end *Vicia cracca, Equisetum palustre* and *Valeriana officinalis* are prominent.

The pools in the southern basin differ from each other in that the western one has *Potamogeton crispus* and *P.berchtoldii* in it along with *Myriophyllum alterniflorum* while the eastern has *P.natans, Lemna polyrhiza, Callitriche obtusangula* and *Ranunculus aquatilis*.

Vegetation (ha as mapped)

2A-		3B-	1.7	5A-	1.8	6D-	5.2	9A-		11B-	
2B-	1.1	3C-		5B-	15.4	7A-		9B-		12-	
2C-		3W-		5D-	8.1	7B-		9C-		Lake	
2D-	8.4	4B-		5E-		8A-		10A-			
2W-		4D-		6A-		8B-		10B-			
3A-	14.6	4W-		6B-	2.9	8C-		11A-			

Fauna: Castleplunket is a well counted area partly because it is beside a road and has significant numbers of wintering birds. It shares them with other nearby turloughs but is the richest site on most occasions. Sheppard (in prep.) notes average peaks of 11 Bewick's swan, 13 whooper, 1258 wigeon, 261 teal, 58 mallard, 18

pintail, 17 shoveler, 84 pochard, 16 tufted duck, 703 golden plover, 785 lapwing and 109 curlew. In the breeding season there are both snipe and lapwing.

Some aquatic beetles were recorded from this turlough by Bilton & Lott (1991)

Evaluation: Castleplunket turlough has a contrasting northern and southern basin but rather large areas of uniform vegetation. Indeed it contains the greatest area of Tall Herb (3A) and the second largest area of Peat Grassland (2D) and Dry Weed (5A) of any site. It lacks rare plants except for two species in a permanent pool at the south end, *Lemna polyrhiza* and *Ranunculus aquatilis* - both recorded at only one other site. Overall its evaluation score (33) lies somewhat below the mid-point.

However the turlough is in totally undrained condition and is one of those right at the edge of a river catchment. Theoretically it should be an oligotrophic site but this may have been altered by the proximity of Castleplunket village. The abundance of *Iris* could be related to this enrichment as it is a notable feature of the turlough.

The wintering bird numbers are important on the site and its large size means that it acts as a refuge area for the mobile local populations. On a four point scale it may be considered of regional or possibly national value.

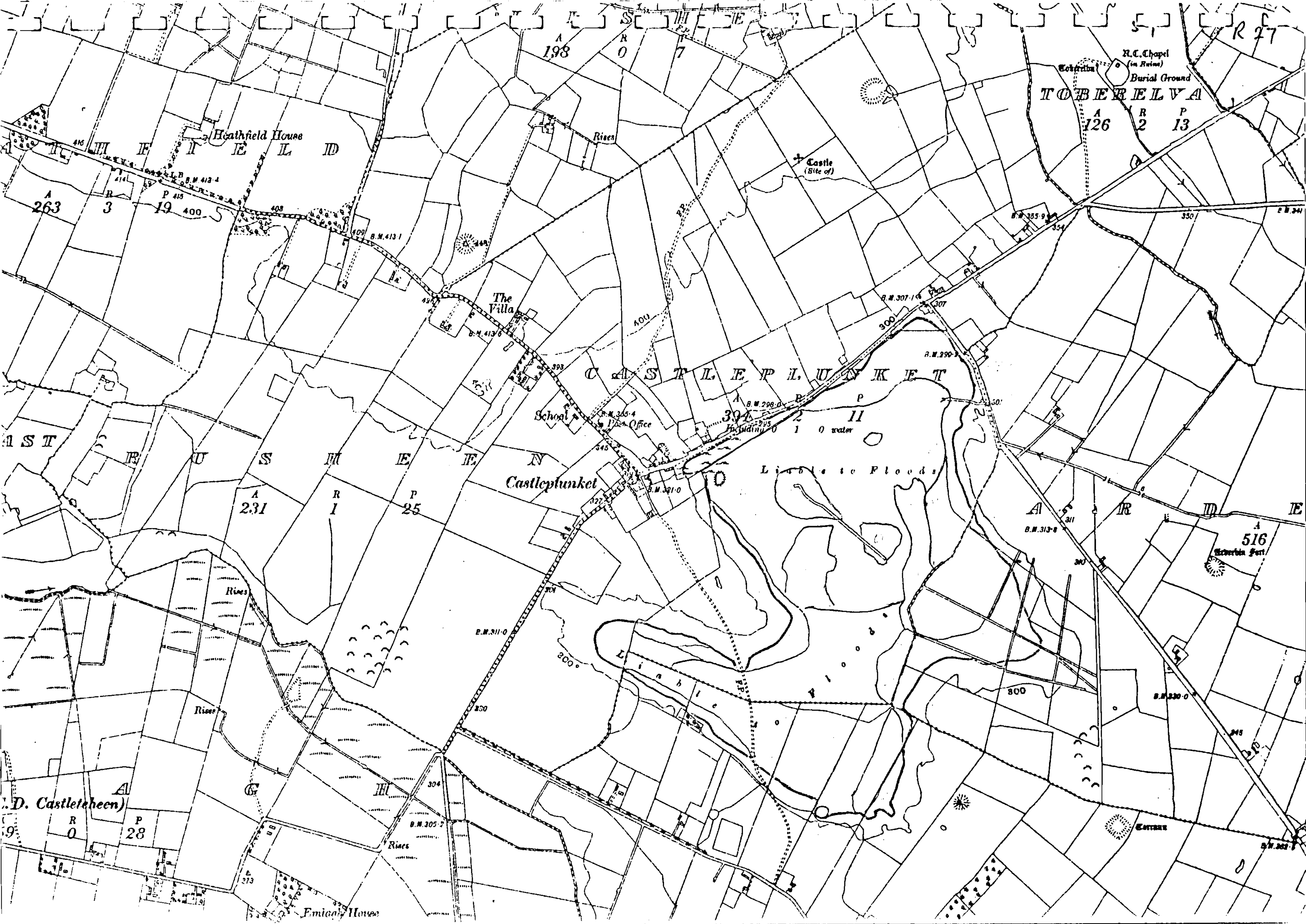
11. BRIERFIELD [Cx 61]
River System: Scramogue (Shannon)
Catchment Area: 640 ha
Altitude: 91m

Grid Ref: M 8177
6" sheet: Roscommon 28
Turlough Area: 52.9 ha
Evaluation place: 39

Topography: This turlough lies east of Castleplunket, about 4km away. It is surrounded by low drift ridges which rise most steeply on the northern and south-western sides. The basin has a V-shape, extending south-west and north-west. The south-western arm is peaty and therefore appears flat or slightly domed. The rest of the turlough floor is more uneven, the valley in the NW opening out into a hummocky zone around the swallow holes with shallow channels thereafter. There is little exposed rock except in the fields running down into the northern half. These have been walled and a wall also follows part of the ditch at the base.

In the northern half there are two crannogs which the drainage ditches skirt around.

Hydrology: Water enters the turlough in a stream from the NW and from a spring in the SW. There is additional seepage from the peaty areas on the eastern edge. In summer it is confined in


R 27
R.C. Chapel (in Ruins)
Burial Ground
TOBERELVA
A 126 R 2 P 13
A 198 R 0 P 7
Castle (Site of)
Rises
Heathfield House
HEATHFIELD
A 263 R 3 P 19
The Villa
School
Post Office
Castleplunket
CASTLEPLUNKET
A 394 R 2 P 11
Including 0 1 0 water
Liable to Floods
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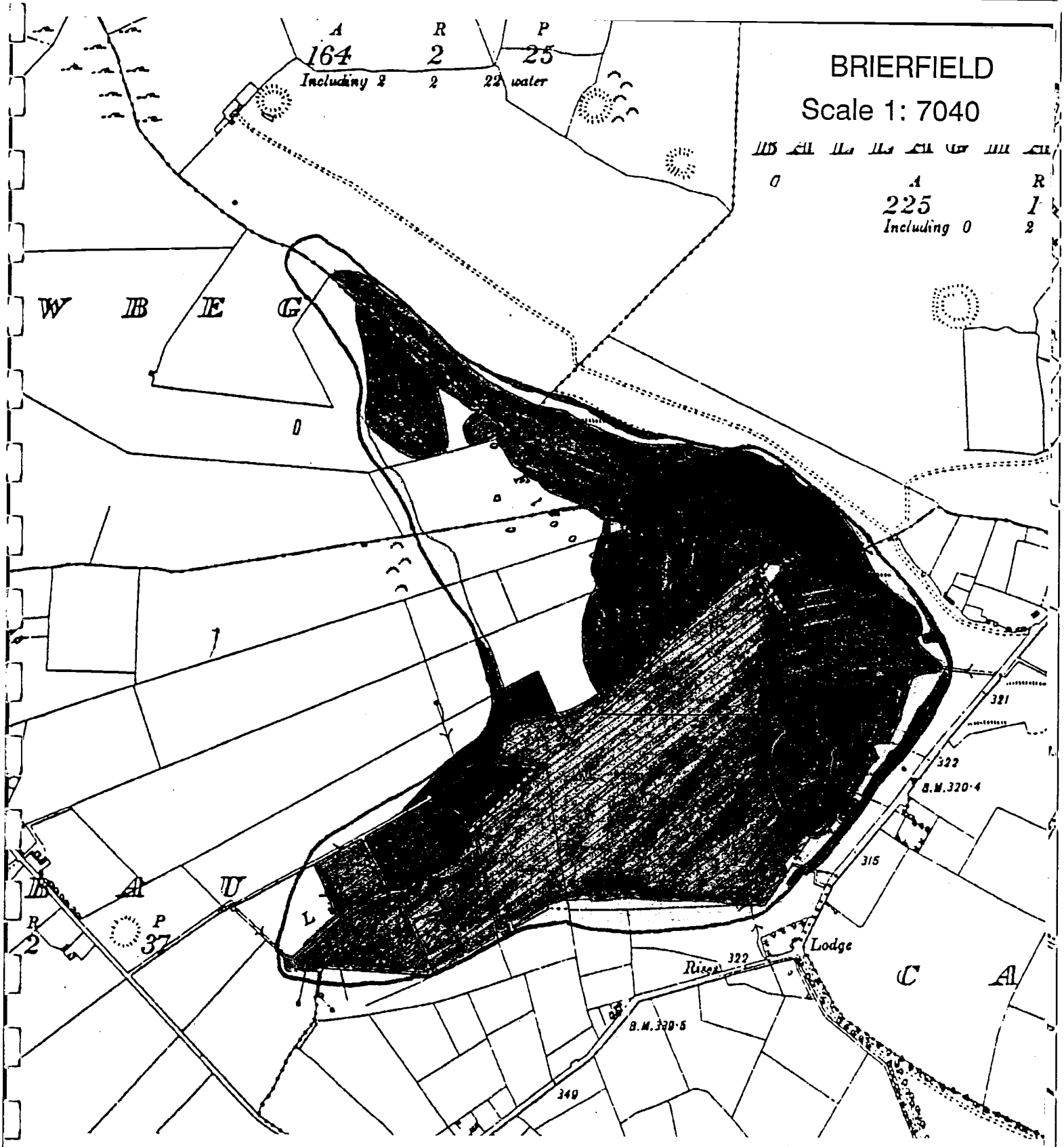
A 516
Cornaun
FURSMEEN
A 231 R 1 P 25
AGH
(D. Castleteheen)
R 0 P 28
Emiggy House



KEY TO VEGETATION

2A Lolium grassland	4D Schoenus fen	Polygonum amphibium (grassy)	Oenanthe aquatica (10A)
2B Poor grassland	5A Dry weed	Tall sedge	10B Ditch
2C Limestone grassland	5B P. reptans (sp. poor)	Polygonum amphibium	Reed bed (11A)
Peat grassland (2D)	Sedge fen	Wet annuals (8B)	Peaty pond (11B)
3A Tall herb	Carex flava	8C Cladium fen	Open water (12)
3B Sedge heath	Dry Carex nigra	Temporary pond	2W Dry woodland
3C Flooded pavement	6B Wet Carex nigra	Eleocharis acicularis	Rhamnus wood
4B Pot. reptans (sp. rich)	Peaty Carex nigra	9C Marl pond	Potentilla fruticosa / Frangula

drains which find their way to a series of swallow holes on the northern margin and in the east. The drains retain water for most of the year and there are two small pools in addition, a stone-built one close to the western crannog and a muddy one at the extreme SW end.

There is no evidence of external drainage.

Substrate: The south-western section of the turlough is filled with thick peat over marl. The peat floats as a scraw in places: it thins to the north and in the swallow hole area there is 10cm of silty peat over at least 80cm of buff marl (Coxon, 1986).

Land Use: The turlough is mostly ungrazed because of its wetness but there are cattle on the south and west sides. Peat cutting no longer takes place though it was extensive at one time.

Vegetation: The vegetation differs markedly in each arm of the basin. The SW is peat-filled and carries a large area of 6D - *Carex nigra* mixed with a little *C.rostrata* and locally *C.lasiocarpa*. The area is little flooded and there is a scatter of young *Salix cinerea* and *S.aurita* on it as well as *S.repens*. Occasional clumps of *Carex elata* occur with *Ranunculus lingua*, *Lythrum salicaria*, *Menyanthes* and *Equisetum fluviatile* also. The drains themselves have *Potamogeton berchtoldii*, *P.coloratus*, *Myriophyllum spicatum*, *Utricularia vulgaris* and a little *Oenanthe aquatica*. At the SW end a scraw of *Menyanthes*, *Carex rostrata* and *C.disticha* occurs and there is *Juncus subnodulosus* nearby. The flora of the pool includes *Iris*, *C.disticha*, *Filipendula* and *Glyceria plicata*. Somewhat similar vegetation occurs on inundated peat along the eastern margin of the basin; *C.nigra*, *Caltha* and *Senecio aquaticus* are mixed into *J.inflexus* and *Valeriana officinalis* (3A). Above this, the peaty influence is felt more and *Succisa*, *Eriophorum angustifolium* and *Cirsium dissectum* occur along with *Parnassia* and *Sagina nodosa*.

The rest of the turlough carries 8A on the lower ground with a few clumps of *Carex* cf *acuta* and a little *Ranunculus lingua*. As the swallow holes are approached *Hippuris* begins to occur in channels followed by sheets of *Rorippa amphibia* and *Oenanthe aquatica*. *Polygonum amphibium* remains abundant and there is a complex zonation of species which is totally ungrazed. Higher up on the sloping edge to the west is 5B vegetation yielding to pasture above. Above the swallow holes the abrupt slope has a trace of 5B also.

Vegetation (ha as mapped)

2A-		3B-		5A-		6D-	17.7	9A-		11B-	
2B-	2.4	3C-		5B-	6.5	7A-		9B-		12-	
2C-		3W-		5D-		7B-	1.3	9C-		Lake	
2D-	3.2	4B-	0.3	5E-		8A-	15.0	10A-	3.3		
2W-		4D-		6A-		8B-		10B-			
3A-	2.8	4W-		6B-		8C-		11A-			

Fauna: The site was visited too late in the season to find nesting waders but appears suitable for snipe, lapwing and curlew. Wintering birds include part of the Castleplunket population. Brierfield may be quite important for some species in view of its lack of disturbance.

Evaluation: Brierfield turlough has an especially good development of three types of vegetation - Oenanthe aquatica (10A) close to the swallow holes, surrounded by Polygonum amphibium (8A) to the east and west, and overlain by Peaty Carex nigra (6D) on the central southern area. The two latter communities cover exceptional areas: it is the largest stand of 6D anywhere while the area of 8A is only exceeded at Glenamaddy. The occurrence of trees on the peat is a unique feature of Brierfield which suggests an unusual flooding regime or perhaps only a lack of grazing animals. The absence of grazing pressure was one of the most notable contrasts between this site and those nearby.

The overall score (32) of the turlough is not high, reflecting the absence of rare plants, but its ecology gives Brierfield a significant level of interest, of at least regional value.

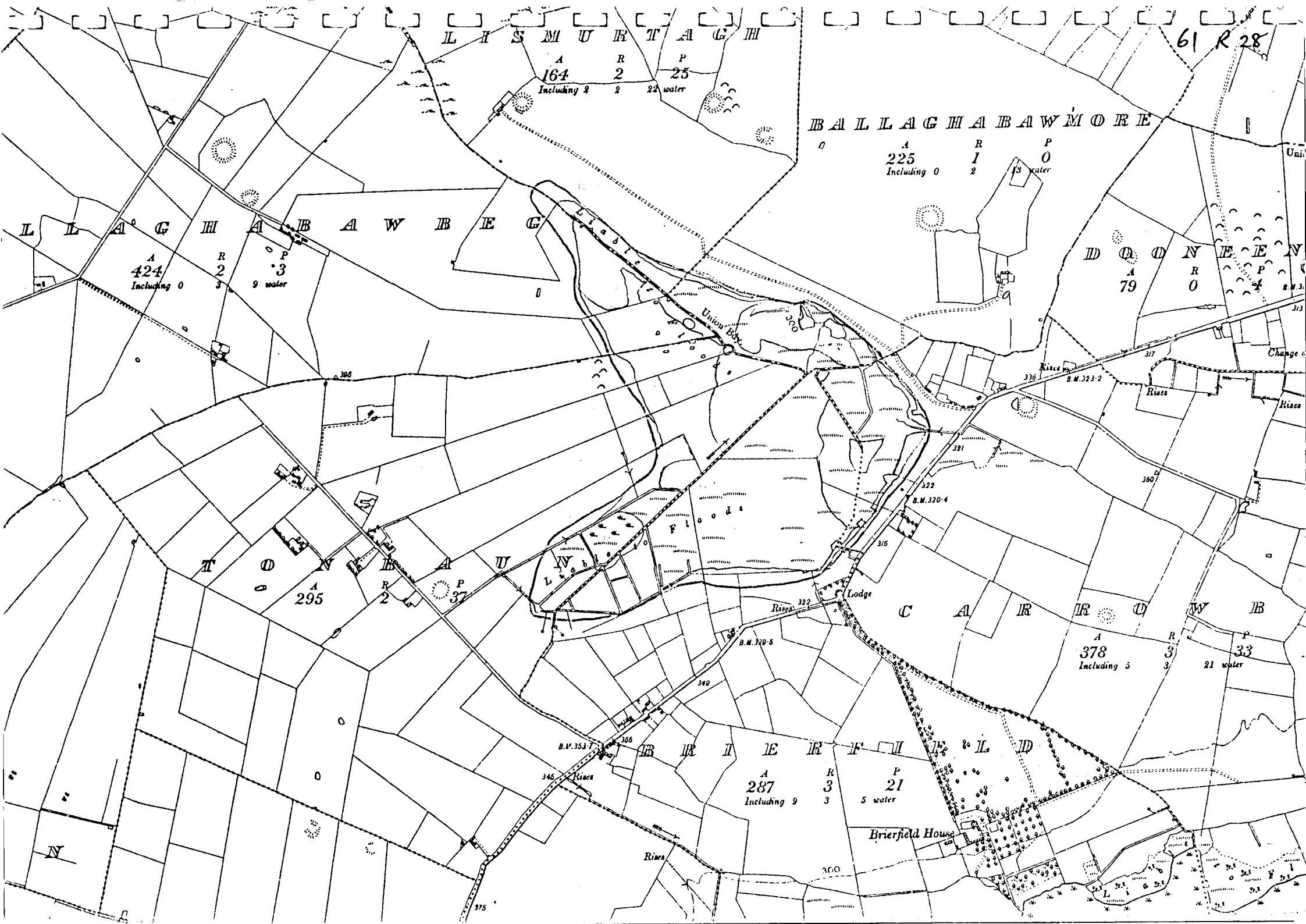
12. CARROWREAGH [Cx 62]
River System: Smahraun (Suck)
Catchment Area: 160 ha
Altitude: 85m

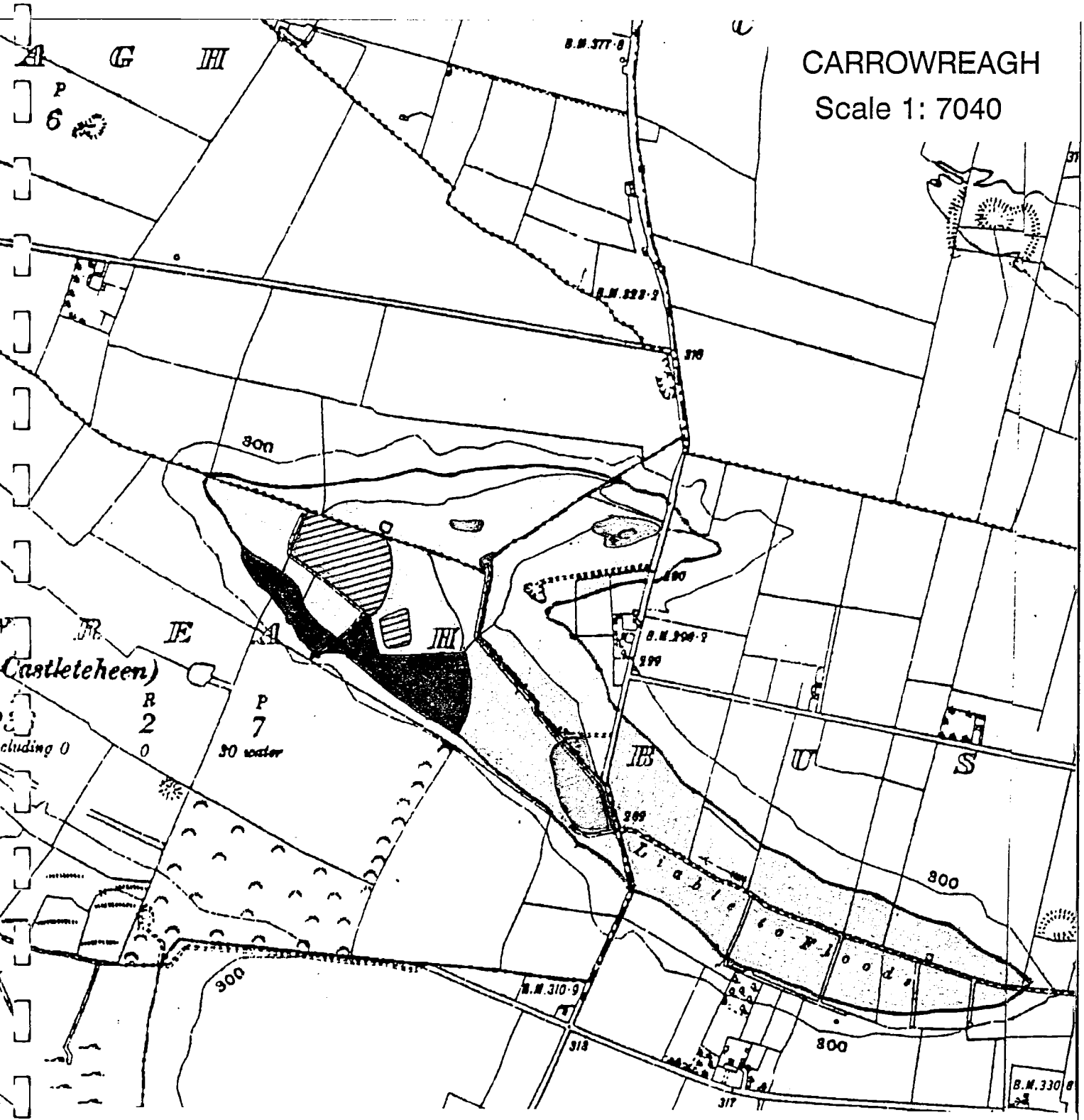
Grid Ref: M 7975
6" sheet: Roscommon 27
Turlough Area: 26.3 ha
Evaluation place: 48=

Topography: Carrowreagh is a long, narrow turlough south-east of Castleplunket. It lies in a NW - SE basin which is crossed by a road on a high causeway. The surrounding land is aligned similarly and consists of a number of low ridges and valleys. It is predominantly drift-covered but in the turlough itself the soils are thin in the central section. There is indeed a shallow quarry that is sometimes flooded. Elsewhere there have been enough rocks to furnish a network of walls but not to leave any on the ground.

Few parts of the floor are flat; there is a series of irregular hollows around the centre, formed by erosion and collapse while each of the three arms has a valley-like appearence with sloping sides.

Hydrology: A semi-permanent stream flows into the south-eastern end of the turlough and under the road before discharging through a grill into the central swallow hole. This is one of a number of holes that run westwards along the floor, with two at a higher level at the NW end. There is a small spring on the SW edge as marked on the map.


61 R 28
LISMURTAGH
A R P
164 2 25
Including 2 2 22 water
BALLAGHABAWMORE
A R P
225 1 0
Including 0 2 13 water
LLAGHABAWBEG
A R P
424 2 3
Including 0 3 9 water
DOONEEN
A R P
79 0 4
TONEABAW
A R P
295 2 37
CARROWB
A R P
378 3 33
Including 5 3 21 water
BRIERFIELD
A R P
287 3 21
Including 9 3 5 water
Brierfield House
Lodge
Union Box
Rises
Floods
B.M.323·2
B.M.320·4
B.M.320·6
B.M.353·1
N



KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge	10B	Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)		Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb		Carex flava	8C	Cladium fen		Open water (12)
3B	Sedge heath		Dry Carex nigra		Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)		Peaty Carex nigra	9C	Marl pond		Potentilla fruticosa / Frangula

There is no evidence of external drainage on the system though the main swallow hole has been opened up some time ago. The farm on the roadside discharges effluent into the nearby quarry.

Substrate: The soil is all till-based and there is no marl. There is peat in the surface layers, particularly on the south-west side, and it is likely to have been more widespread before the internal drainage.

Land Use: The turlough is closely grazed except for the most westerly field where there have been no animals recently. Cattle are predominant, exclusively so in the south-east. Silage is made in the large fields to the west with hay on the south and east.

Vegetation: Much of the south-eastern limb is covered by a mixture of *Iris* with *Festuca arundinacea, Carex disticha* and *Filipendula* (3A). In drier patches *Lolium* appears while there are holes with *Rumex crispus* and *Urtica dioica*. On the south-east side there is a significant peat influence with *Juncus articulatus, J.inflexus, Cirsium dissectum* and *Lychnis*. This depends on water percolating down from the land above and the nearby spring has *Ranunculus trichophyllus* and *Glyceria fluitans* as well as *Apium nodiflorum* and *Nasturtium officinale*.

In the western half of the basin there is the normal 6B on the floor including some *Carex disticha*, but slightly higher ground carries a more leached 3B, characterized by *Nardus, C.ovalis* and *Geum rivale*. To the north the slope is given over to *Potentilla reptans* (5B). In this there are patches of overgrazing in the depressions; *Polygonum persicaria, P.aviculare, Filaginella* and *Stellaria media* are common with a little *Rorippa palustris*. The north-east and west ends of the turlough bear limestone grassland vegetation but it appears very different because it is ungrazed in the west. Here *Festuca arundinacea* and *Filipendula* grow tall with *Centaurea nigra* and *Geum rivale*. These obscure the underlying *F.rubra, Plantago lanceolata* and *Trifolium repens*.

Vegetation (ha as mapped)

2A-		3B-	1.3	5A-	0.8	6D-	9A-	11B-
2B-	2.0	3C-		5B-	3.7	7A-	9B-	12-
2C-	3.4	3W-		5D-		7B-	9C-	Lake
2D-	1.8	4B-		5E-		8A-	10A-	
2W-		4D-		6A-		8B-	10B-	
3A-	11.3	4W-		6B-	1.9	8C-	11A-	

Fauna: Lapwing seem to nest within the turlough and curlew nearby, in the taller vegetation. In the winter the site is visited by some of the Castleplunket birds (q.v.) but its small size and narrowness limits their number.

Evaluation: The ungrazed Limestone Grassland (2C) at the western extremity is the most memorable feature of the turlough which otherwise has a range of common vegetation types and little physical diversity. In general the plant communities are fully

represented at other nearby sites. The Tall Herb (3A) cover in the southern arm is extensive and second only to Castleplunket.

Like this site Carrowreagh has a very small catchment area but is apparently eutrophic. Its 3A vegetation again has much *Iris* and it may not be insignificant that one or two major farms discharge effluent into the turlough. There is also a long-standing drainage channel which takes the inflowing water underground.

The low overall evaluation score of 24 seems justified and the site is not considered of more than local scientific interest.

13. RATHNALULLEAGH [Cx 63]	Grid Ref: M 7874
River System: Smaghraun (Suck)	6" sheet: Roscommon 34
Catchment Area: 960 ha	Turlough Area: 26.4 ha
Altitude: 80m	Evaluation place: 47

Topography: Rathnalulleagh is the central of the three turloughs on the bye-road from Castleplunket to Ballydooley. As in the other cases the basin follows the NW - SE trend of the local topography with a small extension off the northern edge. The ridges on each side are low and drumlinoid. Though crossed by an old footpath the tarred road now takes a bend around the turlough to avoid the eastern end. The floor of the basin is relatively flat but there are local changes in level of 1-2m. Two slight ridges cross the basin and carry further footpaths.

Hydrology: There is a drain at the south-eastern end of the basin where there are also two ponds. This formerly brought water into the basin from a spring and may still do so. Another spring occurs midway along the southern edge. Seven swallow holes are found in the SE part along the central wall with a series of shallow depressions further into the turlough. There is no effective drainage at present and no sign of the river shown on the half-inch map.

Substrate: The soil all seems to be derived directly from the till which fills the basin and there is no peat. Marl may occur in patches in the centre. There are some gravel deposits along the northern rim.

Land Use: Cattle and sheep occur at moderate density but there is no overgrazing. Silage is made in some of the surrounding fields and there is a clamp with wintering facilities overlooking the north-east corner. Some effluent enters here as it does also in the spring on the south side.

The road along the south side serves many more houses than are shown on the map. On the north side the dwellings are all derelict so that the roads crossing the basin are scarcely used.

Vegetation: The vegetation is strikingly uniform in this turlough, partly because the few fields run right across the basin and do not introduce different forms of management. Grassland (2B) covers almost the entire rim being influenced by limestone in the SE corner (2C), by peat at the eastern end (2D) and by richer soil in the west (2A). This gives way downwards to a 4B community with a small amount of *Potentilla reptans* mixed with *Filipendula, Calliergon cuspidatum, Poa pratensis* and *Carex nigra* along with *Geum rivale* and *Viola canina*. Depressions within this vegetation are dominated by the *Carex* again with *G.rivale* and *Rumex crispus*.

At the eastern end there is a patch of *Iris* with *Carex disticha, C.hirta, Phalaris* and *Apium nodiflorum*. The main pool here at the northern edge has *Potamogeton crispus* and *P.natans* as well as *Callitriche obtusangula, Lemna minor* and *L.polyrhiza*. Two other more temporary pools exist in the base of the turlough with a small amount of 9A vegetation - *Ranunculus trichophyllus, Glyceria fluitans* and *Veronica catenata*. *Rorippa palustris* and *Filaginella* grow on their margins. A further and larger annual patch is found in the narrow limb running NE from the main basin. It has abundant *Filaginella* with *Polygonum persicaria, P.hydropiper* and *Juncus bufonius*. It is subject to cattle trampling.

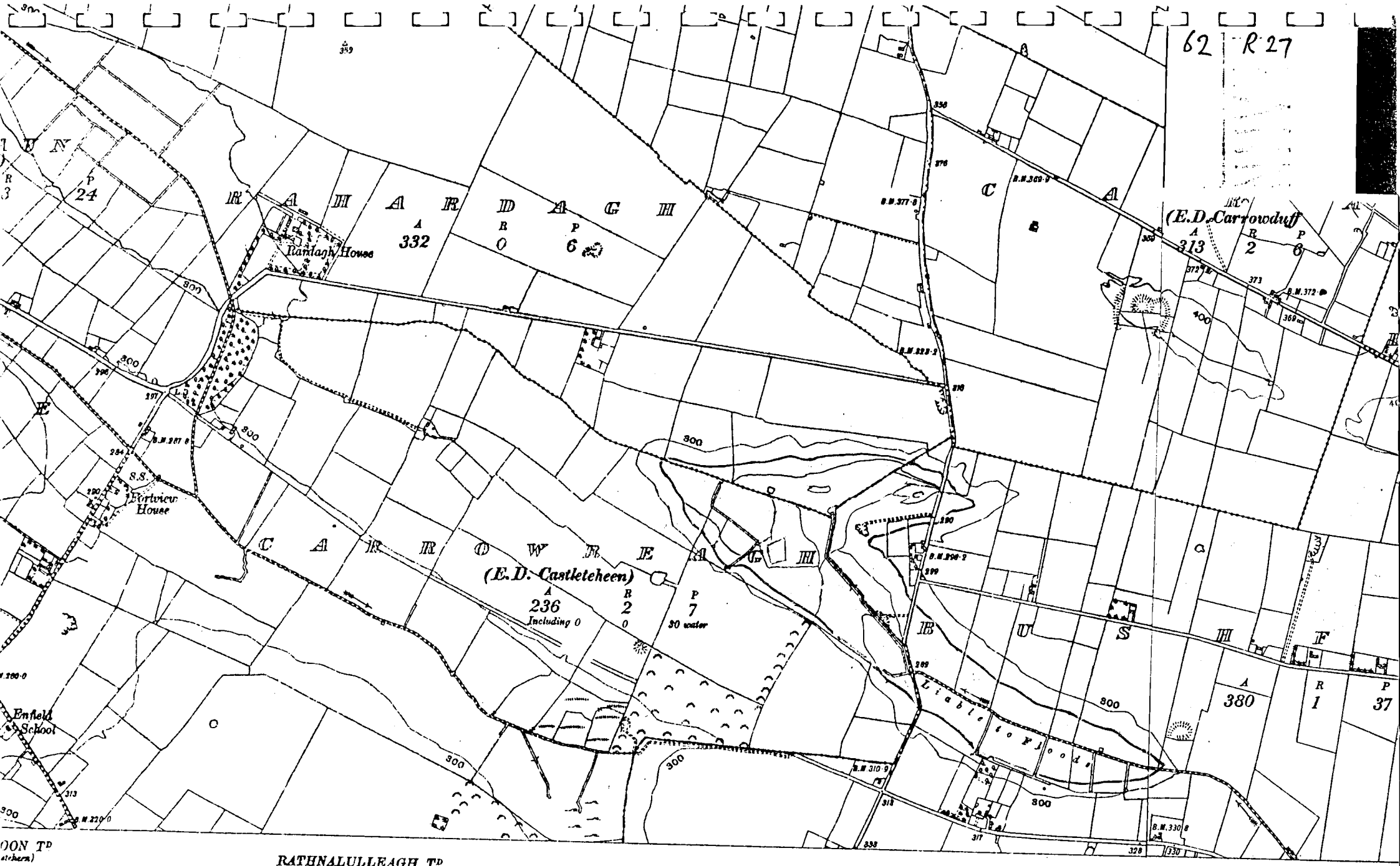
Vegetation (ha as mapped)

2A-	2.0	3B-		5A-	0.2	6D-		9A-	0.1	11B-	
2B-	6.8	3C-		5B-		7A-		9B-		12-	
2C-	0.2	3W-		5D-		7B-		9C-		Lake	
2D-	0.4	4B-	12.2	5E-		8A-		10A-			
2W-		4D-		6A-	4.2	8B-	0.3	10B-			
3A-	0.4	4W-		6B-		8C-		11A-			

Fauna: The turlough is too dry to harbour breeding waders and is also unlikely to be of great importance in winter because of the proximity of the houses. There is no specific data available.

Evaluation: Rathnalulleagh is a dry turlough but it has a considerable range of vegetation despite this. It is unusual in Roscommon for the prevalence of the Potentilla reptans (species-rich) community (4B) which in fact covers a larger area here than in any other site in the country, except for the similarly dry Belclare. The presence of abundant *Viola canina* (and possibly *V.persicifolia*) in this vegetation, as well as *Geum rivale* is notable. In addition it is one of two turloughs with *Lemna polyrhiza*.

This is one of the better dry turloughs in the group in central Roscommon though its score (26) brings it only just above Carrowreagh. It is considered of regional value because of its unmodified character.



10-61.

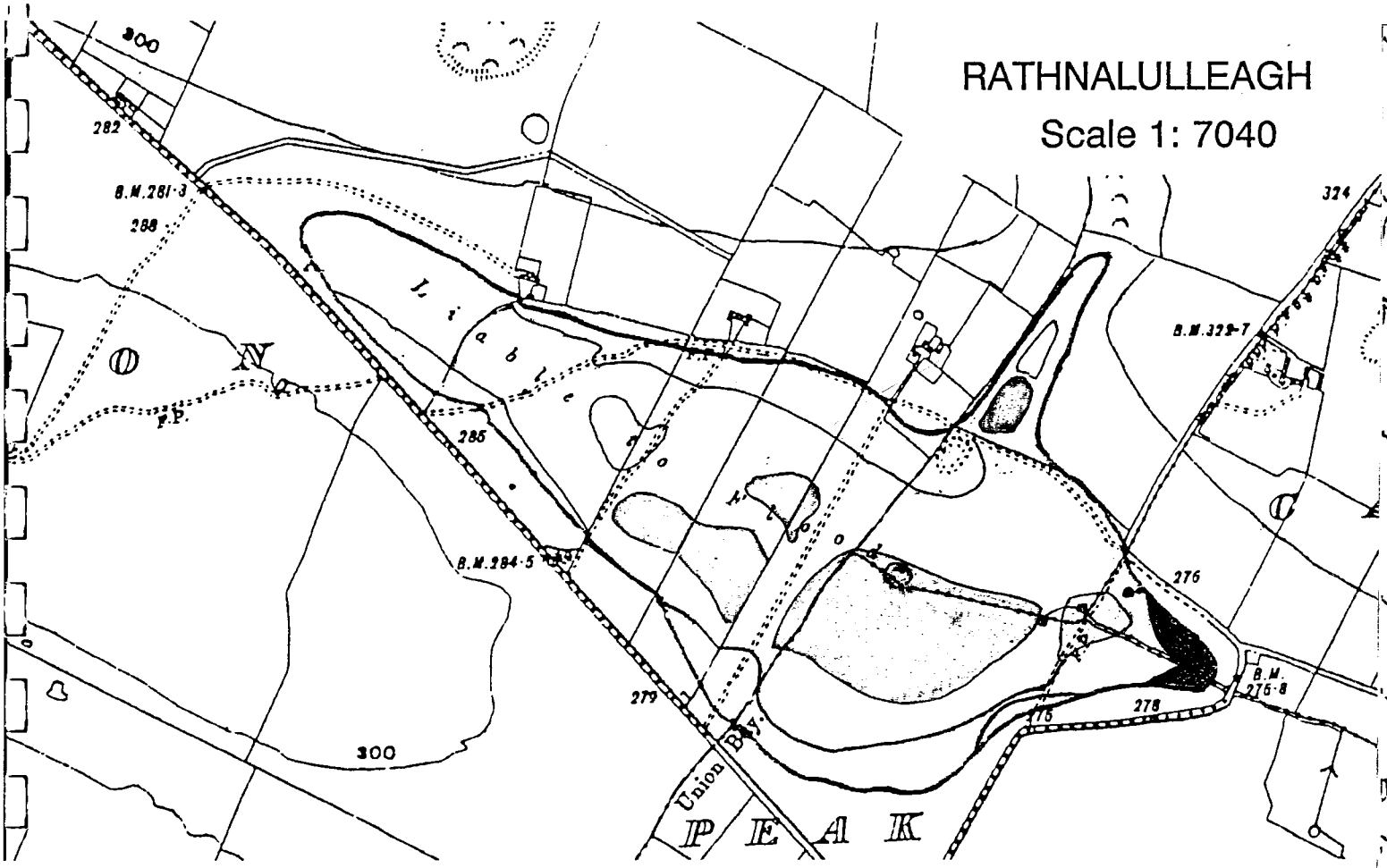
Price 10/- Net. Surveyed in 1837. Revised in 1923-4
Levelled in 1911-12. Levels partially r

Scale Six Inches to One Statute Mile or 880 Feet to One Inch

20 30 40 50 60 70 80 Chains
40 80 120 160 200 240 320 Perches 1 Mile
0 1000 2000 3000 4000

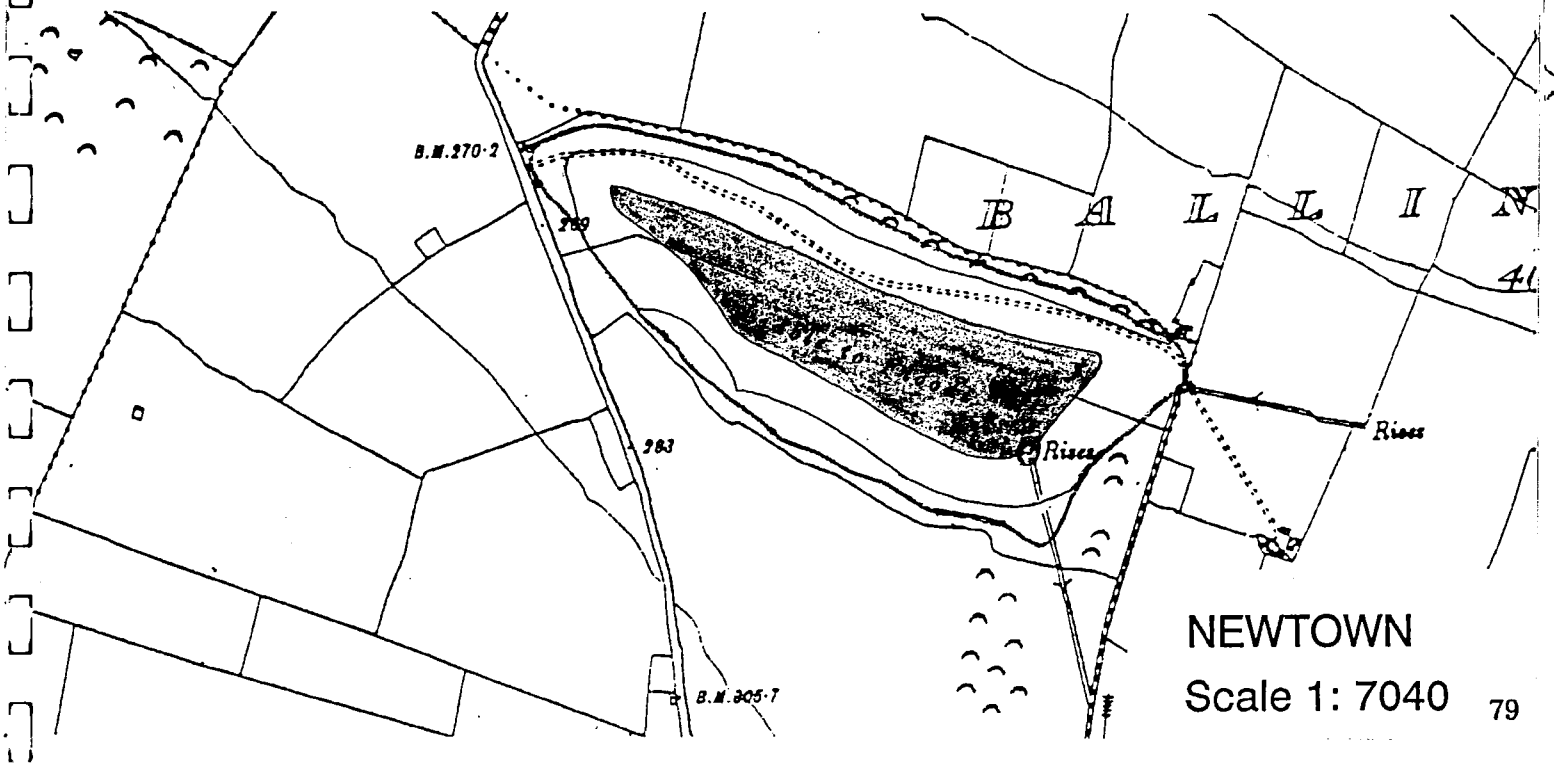
RATHNALULLEAGH

Scale 1: 7040



KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge		Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)		Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb		Carex flava	8C	Cladium fen		Open water (12)
3B	Sedge heath		Dry Carex nigra		Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)		Peaty Carex nigra	9C	Marl pond		Potentilla fruticosa / Frangula



NEWTOWN

Scale 1: 7040

14. NEWTOWN [Cx 64]
River System: Smaghraun (Suck)
Catchment Area: 480 ha
Altitude: 79m

Grid Ref: M 7873
6" sheet: Roscommon 34
Turlough Area: 12.4 ha
Evaluation place: 59

<site map on previous page>

Topography: Newtown turlough occupies a flat basin on the eastern side of the Ballydooley - Castleplunket road. Like Rathnalulleagh and Carrowreagh to its north it has a NW - SE alignment and has a simple linear outline. The land is drift-covered and there are no outcrops nearby. The turlough is divided by a fence on the south side and has a shallow central ditch.

Hydrology: The central drain runs close to the pond shown on the map and then leaves the basin in a south-easterly direction. There are old cuttings elsewhere around the eastern end but they seem to have little function. There are no obvious swallow holes but a small (2m) circular depression does occur.

Substrate: The lowest parts are based on lake silt (Coxon, 1986) with silty clay at higher levels.

Land Use: The turlough is grazed by cattle and horses to give a close even turf. There is one farm on the southern side but no sign of effluent from it.

Vegetation: The vegetation is a straighforward zonation of three communities - *Lolium* grassland at the top with a little *Potentilla reptans* and *Ranunculus acris*, followed by a damper grassland with *Iris*, *Filipendula* and *Carex hirta*. At the base a mixture of *Agrostis stolonifera*, *Alopecurus geniculatus*, *Carex hirta*, *Phalaris* and *Polygonum amphibium* extends out some 40m on both sides of the channel. A dried up and muddy pool in the SE corner has banks of *P.amphibium* around it with *Stellaria media* and *Phalaris* inside.

Vegetation (ha as mapped)

2A-	2.3	3B-		5A-	0.1	6D-		9A-		11B-	
2B-	5.8	3C-		5B-		7A-	4.4	9B-		12-	
2C-		3W-		5D-		7B-		9C-		Lake	
2D-		4B-		5E-		8A-		10A-			
2W-		4D-		6A-		8B-		10B-			
3A-		4W-		6B-		8C-		11A-			

Fauna: There were no breeding waders in 1990 because of the dryness of the ground and the lack of cover. Specific data on this site are not available in winter but small numbers of dabbling duck and swans could well occur at intervals from the Castleplunket flock.

Evaluation: Newtown is a dry uniform turlough with nothing except its uniformity (it has the lowest number of plant communities of any) to give it significant scientific interest.

It appears to hold water longer than the two preceeding ones (12 & 13) and has not been drained. It contains no rare plants and probably no birds and its low score (12) makes it of no more than local importance.

15. ATTISHANE (Tur Lough - Cx 49)
River System: Dalgan (Clare)
Catchment Area: 320 ha
Altitude: 78m

Grid Ref: M 5373
6" sheet: Roscommon 32
Turlough Area: 17.2 ha
Evaluation place: 50=

Topography: Attishane lies in a NE - SW valley on the border of Roscommon and Mayo, south of Ballyhaunis. On the north side the ridge rises eventually to 57m above the floor of the turlough while on the south the difference is of the order of 20m. The land is mostly drift covered; there are a few rock outcrops on the main ridge but none in the turlough itself. The floor is flat but rises slightly at each end. At the SW there are shallow channels and depressions in the vicinity of the swallow hole.

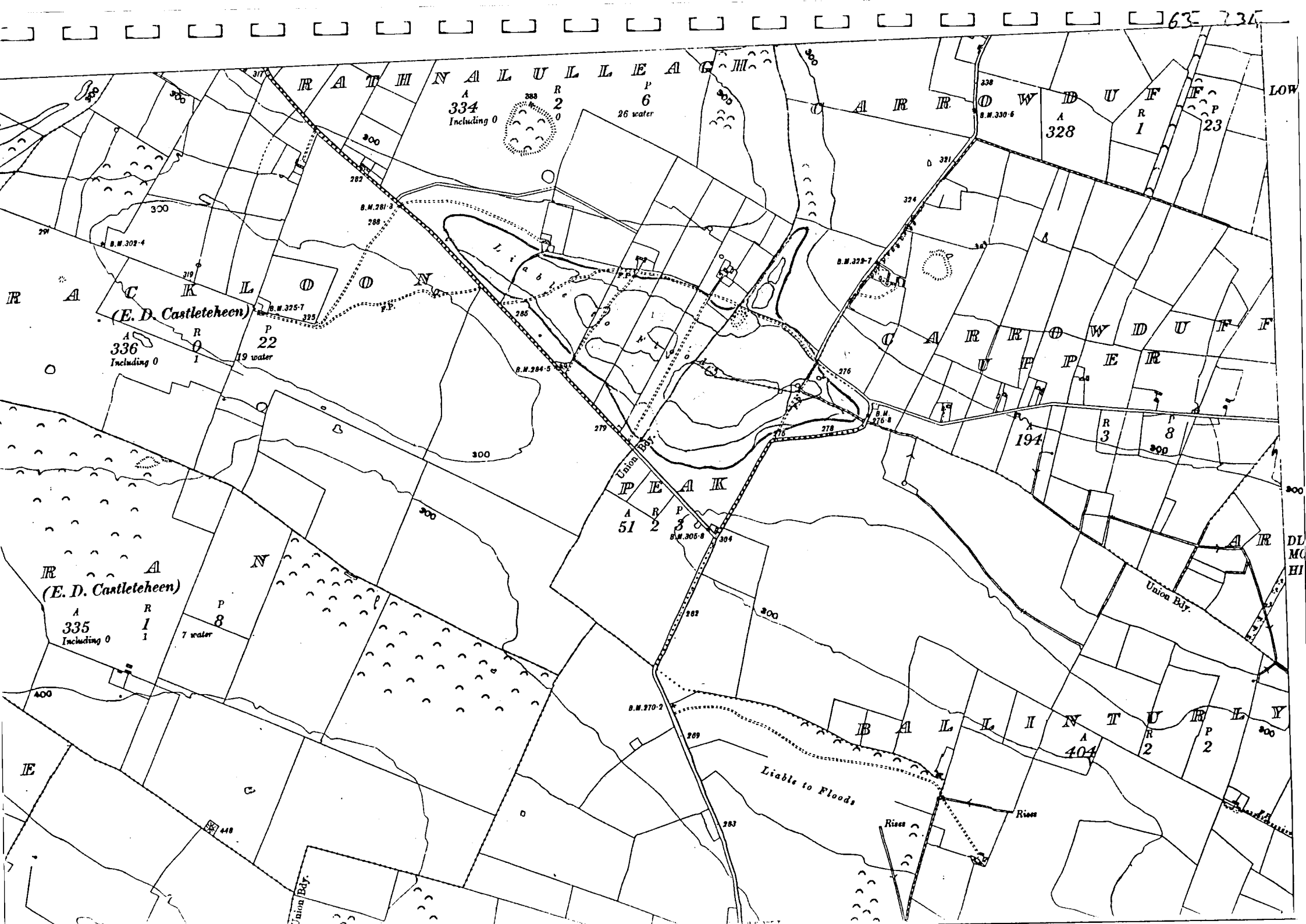
Hydrology: A stream enters the basin at the north-east end and formerly flowed across its floor to the swallow hole in the SW corner. Now, however, it has been embanked and diverted along the contours on the southern side, discharging out of the basin to the south. As well as this change there are a few drains bringing water in from a boggy area to the south and directing it towards the swallow hole. Within the turlough a shallow drain has been dug along the floor, on its north-western side. It seems that flooding is more restricted now than some years ago. The vegetation suggests that the south-western end in particular is drying out.

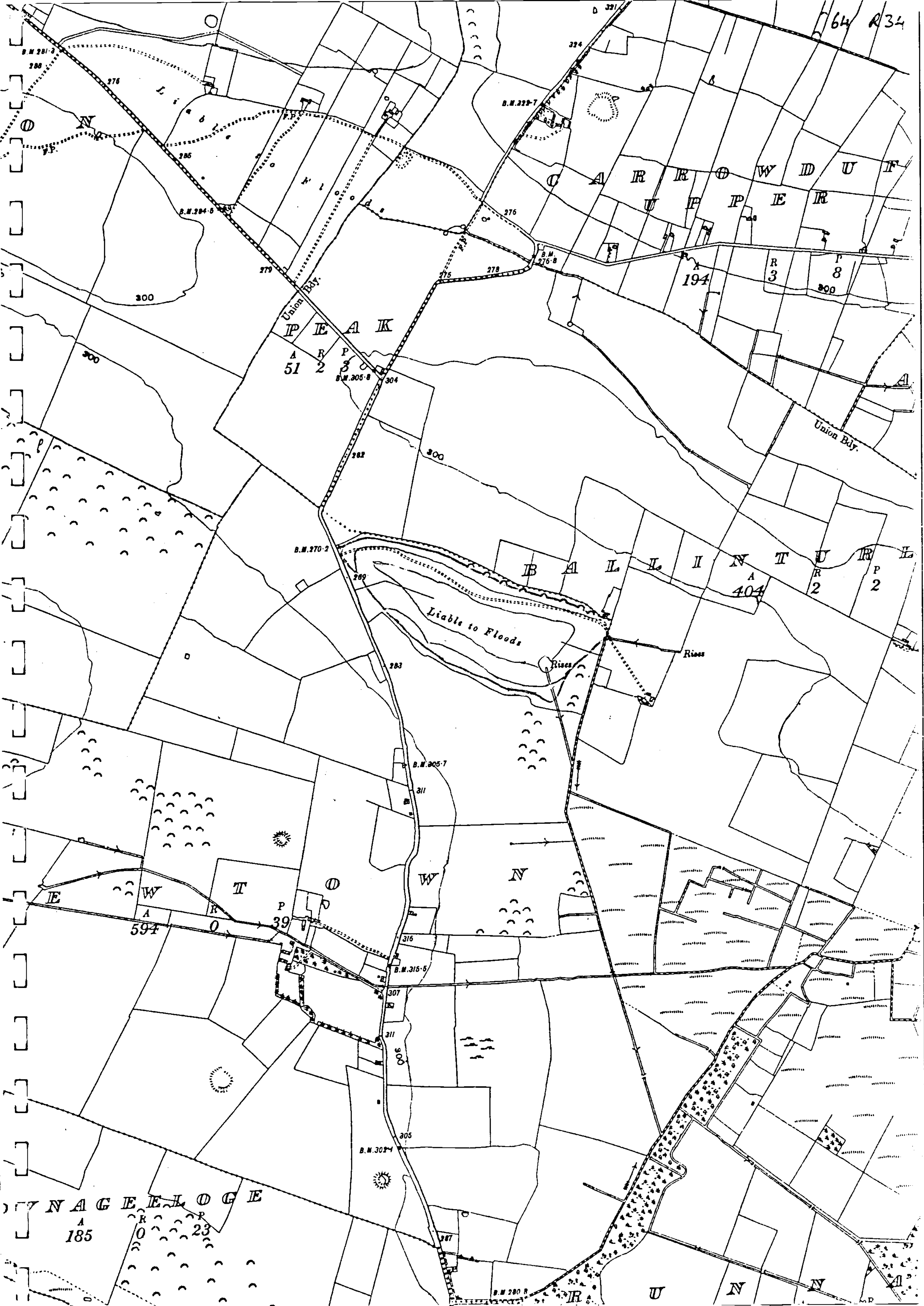
The swallow hole is a collapsed doline structure (Coxon,1986), about 2m deep and showing bedrock at the base. There is a permanent pond nearby and another some way to the NE. Between them a prominent earthwork, Lisheenahanragh, looks out over the basin.

Substrate: Sand and silty clay deposits cover the floor of the turlough with blue-grey clay at depth. In one core the rock occurred at 355cm (Coxon, 1986). There is no peat within the main basin though some approaches the southern end.

Land Use: Grazed by cattle throughout.

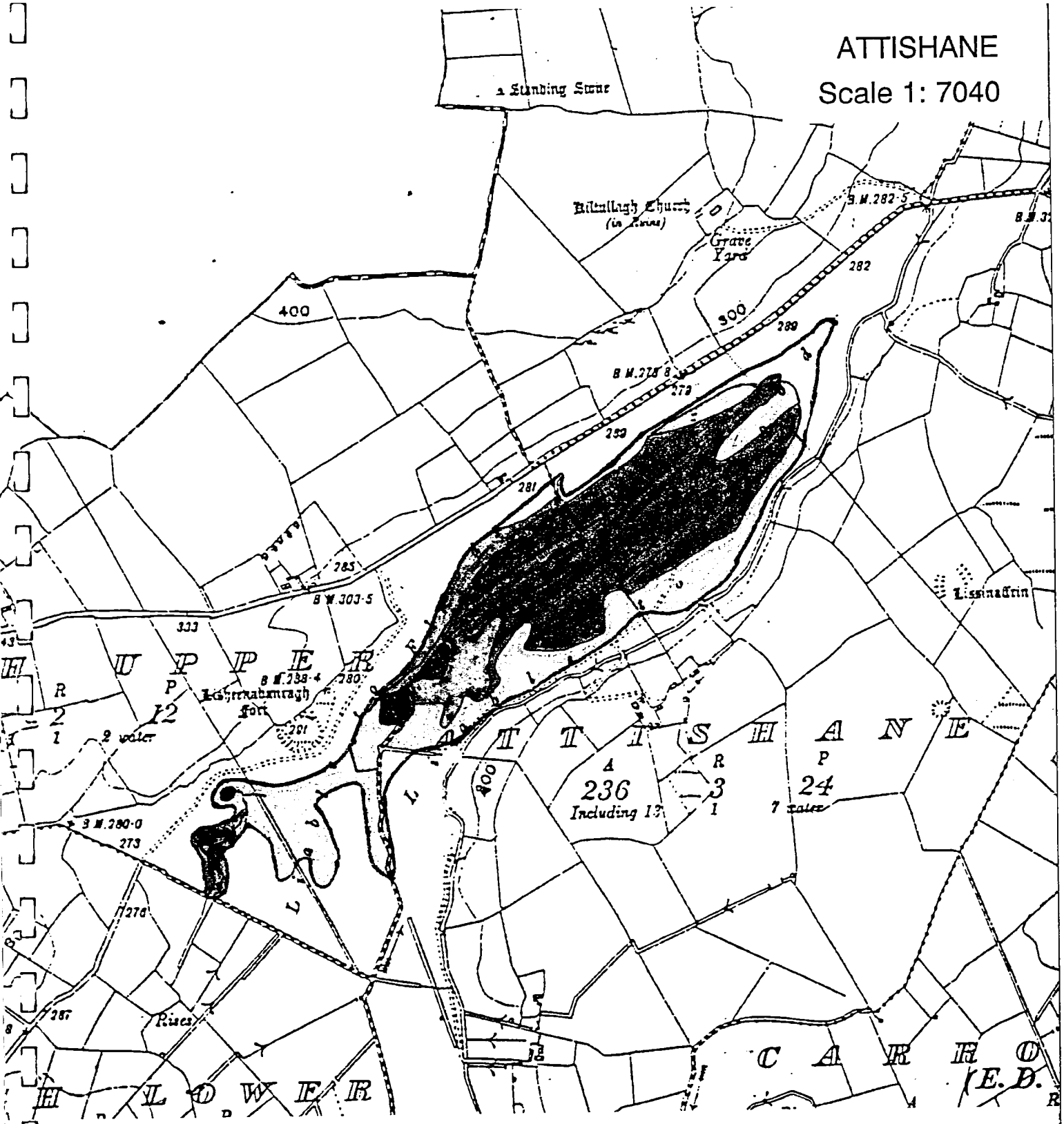
Vegetation: Attishane gives the impression of a grassy valley largely because of an extensive area of 7A in the main basin. This is composed of *Agrostis stolonifera* and a little *Glyceria fluitans* mixed with *Galium palustre*, *Polygonum amphibium*, *Eleocharis palustris* and *Myosotis scorpioides*. The drain cut into this area has *Oenanthe aquatica* and *Apium inundatum* with *Alopecurus*


RATHNALULLEA CH
A 334 Including 0
R 2 0
P 6 26 water
CARROWDUFF
A 328
R 1
P 23
CARROWDUFF UPPER
RACKLOON
(E. D. Castleteheen)
A 336 Including 0
R 0 1
P 22 19 water
RA N
(E. D. Castleteheen)
A 335 Including 0
R 1 1
P 8 7 water
PEAK
A 51
R 2
P 3
BALLINTURLY
A 404
R 2
P 2
194
R 3
P 8
Liable to Floods
Union Bdy.
B.M.302·4
B.M.325·7
B.M.281·3
B.M.284·5
B.M.329·7
B.M.330·6
B.M.276·8
B.M.305·8
B.M.270·2
448


64 R34
CARROWDUFF
UPPER
A 194 R 3 P 8
PEAK
A 51 R 2 P 3
Union Bdy.
Union Bdy.
BALLINTURL
A 404 R 2 P 2
Liable to Floods
Rises
Rises
A 594 R 0 P 39
NAGEELOGE
A 185 R 0 P 23
B.M. 270·2
B.M. 305·8
B.M. 305·7
B.M. 315·5
B.M. 302·1
B.M. 294·5
B.M. 276·8
300
300
300

ATTISHANE

Scale 1: 7040



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula

geniculatus, *Bidens cernua* and *Polygonum minus*. It is used by cattle for drinking and nearby are *Rorippa islandica*, *R.palustris* and *Polygonum arenastrum*.

The rest of the turlough seems to flood less frequently than this area and its vegetation is based on sedges. There is some ground dominated by 6A, *C.nigra* and *C.hirta* with scattered *Polygonum amphibium* while there is a larger area of these mixed with *C.panicea*, *Molinia*, *Potentilla erecta*, *Senecio aquaticus* and *Hydrocotyle* (6B). This runs into grassland at the edges with *Festuca arundinacea*, *Cynosurus*, *Rumex acetosa* and a little *Deschampsia* and *Molinia* (2B).

The ponds are distinct from each other. The westerly one is deeply sunken in a depression and consists of open water with *Ricciocarpus natans*, *Lemna minor* and *Sparganium emersum*. The eastern is more open, a scraw of *Equisetum fluviatile*, *Menyanthes* and *Hippuris* which may formerly have been wetter. The ditch running into it holds *Nasturtium officinale* and *Potamogeton berchtoldii*.

Vegetation (ha as mapped)

2A-		3B-		5A-		6D-		9A-	0.1	11B-	0.1
2B-	1.2	3C-		5B-		7A-	6.9	9B-		12-	
2C-		3W-		5D-		7B-		9C-		Lake	
2D-		4B-		5E-		8A-	0.3	10A-	0.1		
2W-		4D-		6A-	2.2	8B-		10B-			
3A-		4W-		6B-	6.0	8C-		11A-			

Fauna: The turlough seems too dry for breeding waders and there was nothing there when it was visited in mid-August. There is no winter information.

Evaluation: Drainage has had a considerable effect in this turlough, both the original diversion of the inflowing stream and the later cutting of trenches at the SW end. The vegetation has become rather uniform but the substantial area of Polygonum amphibium (grassy) 7A, is unusual. Several interesting plant species remain also and Attishane is one of only two stations in Roscommon for both *Rorippa islandica* and *Ricciocarpus natans*.

The turlough scores highly for rare species in its total of 23 but the drainage actions mean that it should only be considered of local interest as a habitat.

16. COOLCAM [Cx 51]
River System: Island (Suck)

Catchment Area: 960 ha
Altitude: 84m

Grid Ref: M 5871
6" sheet: Roscommon 32
Galway 1 & 6
Turlough Area: 67.1 ha
Evaluation place: 20=

Topography: Coolcam turlough lies in a complex area of eskers on the borders of Galway and Roscommon south of Ballinlough. The eskers are sinuous but have a general N - S direction and the basin has this orientation also. At its southern end, higher drift-covered land supervenes but in the north a continuation of the low land is covered by cutover bog. The turlough is made up of two parts, the shallow Coolcam Lough which dries out every summer is separated by a narrow esker from a more persistent, but nameless lake to the south-east. There are one or two other minor depressions in the south-east corner.

Hydrology: Coolcam Lough has no permanent inflow but the main basin takes water from the boggy area to the north and a smaller quantity from the south-west corner. There is one obvious swallow hole in the south-east which may have been deepened by hand but the water level was still too high in mid-August to see any others. The vegetation suggests that there may be an additional one in the SW corner.

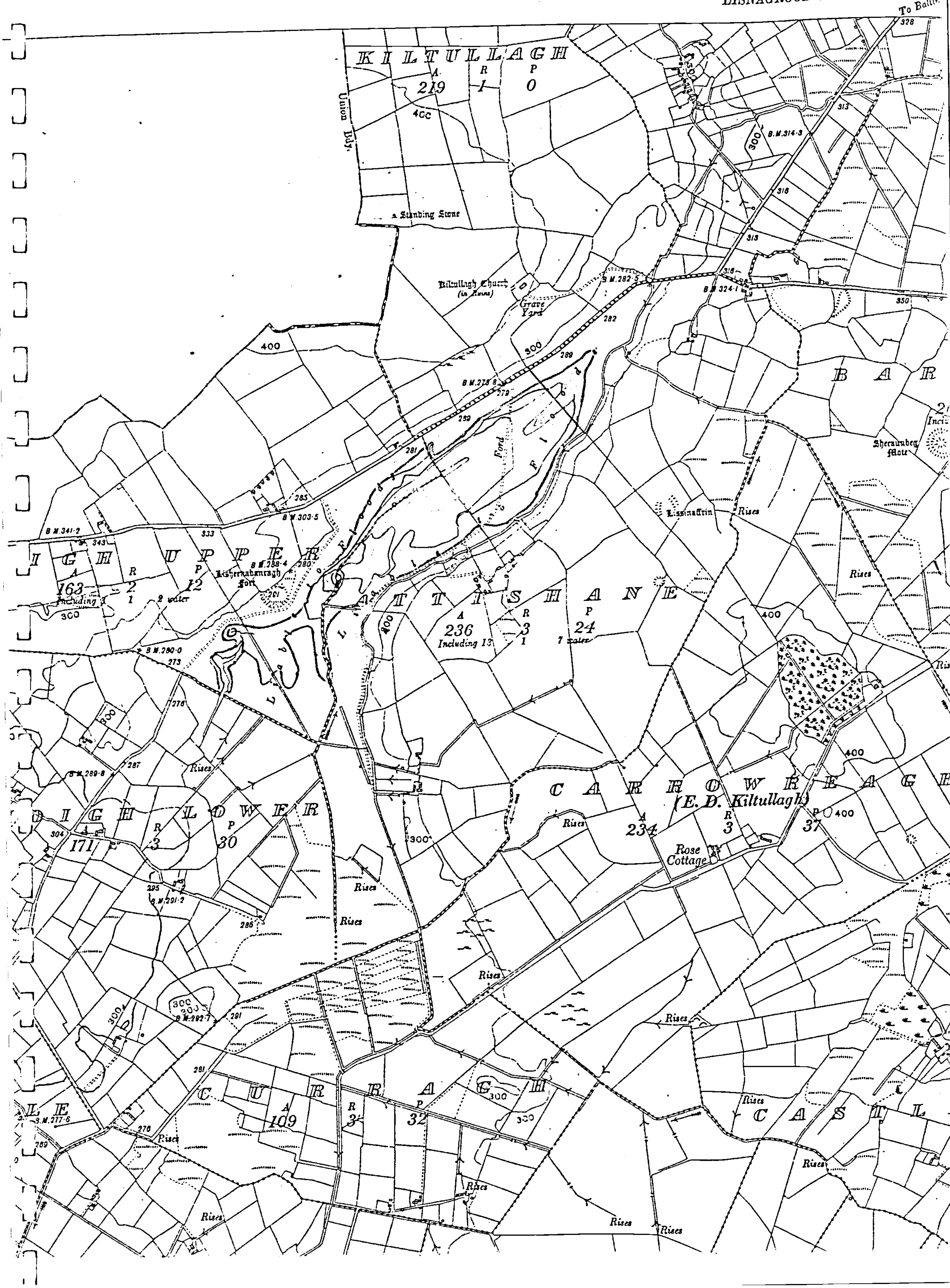
There is no evidence of drainage.

Substrate: Extensive marl deposits are found in the main basin but there is peat also on slight rises and around the edges. The eastern shore is mostly stony because of wave erosion. This is especially so along the esker marked with woodland on the map. Both basins seem to become peatier to the north. There are no cores available for description.

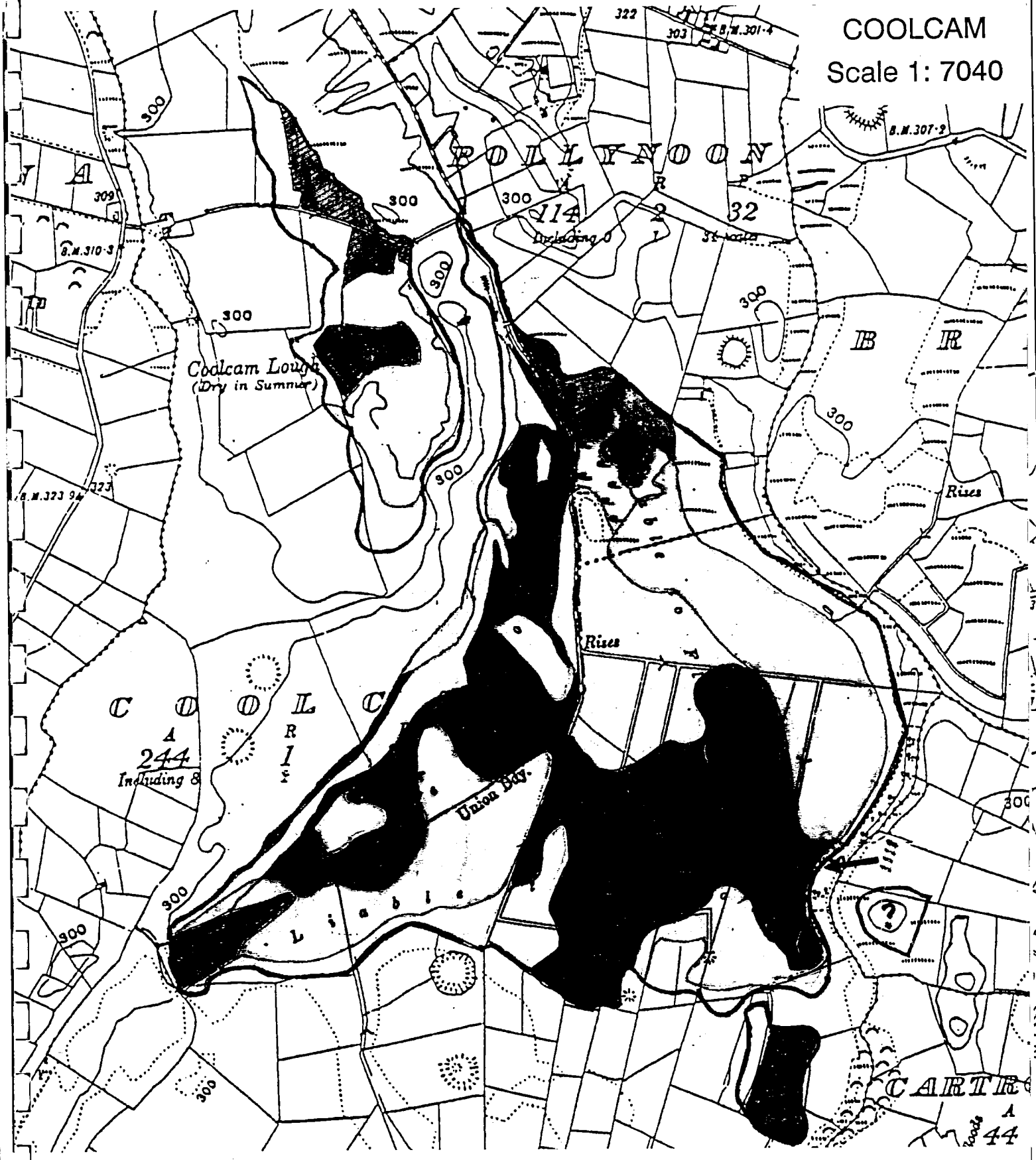
Land Use: Gravel pits exist on all sides though they have not yet affected any of the relevant eskers. The main pressure may come from the east where there is an extensive works. Otherwise the turlough is grazed by cattle where they can wade into it. There are sheep in the south-eastern corner. There are no major farms nearby and the agricultural impacts are minimal.

Vegetation: The description of vegetation in the main basin relies more heavily than usual on aerial photographs because it was impossible to reach on the ground. There is a central rise surrounded by large uniform areas of *Polygonum amphibium* mixed with *Oenanthe aquatica*, *Potamogeton gramineus* and *Sparganium emersum* (10A). Occasionally it occurs in pure stand as in the south-west corner. Certain sections of the lake seem more marly than others and here *Littorella* becomes common with *Baldellia*, *Myriophyllum spicatum*, *Scorpidium* and *P.gramineus* (9C). At the northern end a more permanent waterbody, perhaps the main source of water, supports a stand of *Cladium* and *Scirpus lacustris* with

49
R 32



LISNAGROOB Tp
To Ballin
KILTULLAGH
A R P
219 1 0
Union Bdy.
a Standing Stone
Kiltullagh Church (in Ruins)
Grave Yard
B A R
Sheranbeg Mote
Lissinaffrin
Rises
IGH UPPER
A R P
163 2 12
Including 1 2 water
Lisheenabanragh Fort
TTISHANE
A R P
236 3 24
Including 13 1 7 water
CARROWREAGH
(E.D. Kiltullagh)
A R P
234 3 37
Rose Cottage
OIGH LOWER
A R P
171 3 30
CURREAGH
A R P
109 3 32
CASTL
LE


COOLCAM
Scale 1: 7040
POLLYNOON
Coolcam Lough
(Dry in Summer)
Rises
Rises
Union Dgy.
CARTR
KEY TO VEGETATION
2A Lolium grassland
2B Poor grassland
2C Limestone grassland
Peat grassland (2D)
3A Tall herb
Sedge heath
Flooded pavement
4B Pot. reptans (sp. rich)
4D Schoenus fen
Dry weed
5B P. reptans (sp. poor)
Sedge fen
Carex flava
Dry Carex nigra
6B Wet Carex nigra
Peaty Carex nigra
Polygonum amphibium (grassy)
Tall sedge
Polygonum amphibium
Wet annuals (8B)
8C Cladium fen
Temporary pond
Eleocharis acicularis
9C Marl pond
Oenanthe aquatica (10A)
Ditch
Reed bed (11A)
Peaty pond (11B)
Open water (12)
2W Dry woodland
Rhamnus wood
Potentilla fruticosa / Frangula

abundant *Chara hispida*. Nearby on peaty ground there is much *Agrostis stolonifera, Equisetum fluviatile, Glyceria fluitans* and *Myosotis scorpioides* (9A).

The edges of the larger basin generally have the peaty 6B vegetation with *Juncus articulatus* and *Veronica scutellata* emphasizing this feature. To the west this grades into *Molinia* and *Cirsium dissectum* (2D) or the drier mixture of *Salix repens, Lysimachia vulgaris* and *Vicia cracca* (3A). Along the north-west shore the adjacent esker produces a steep slope into the turlough and animal treading introduces annual species into the 2B community. *Juncus bufonius, Filaginella, Sagina procumbens, Sonchus asper* and many others grow amongst the more traditional *Veronica serpyllifolia, Cerastium fontanum* and *Elymus repens*. *Potentilla x mixta* is also widespread.

On the opposite shore where there is erosion, *P.reptans* enters the community with *Molinia*. The closest approach of the esker in the south-east corner brings a wood of *Corylus, Crataegus* and *Quercus robur* to within range of the waves. *Rosa rubiginosa* and *Salix aurita* grow at the edge amongst flood debris. There is open esker too with *Calluna* and *Lathyrus montanus* and behind this, further small depressions filled generally with *Polygonum amphibium*.

The main basin terminates at the northern end in a cutover peaty area. An esker sinks gradually into it, its edges marked with a clear zonation of vegetation. To the west is the Coolcam Lough depression. This is a dry lake in summer with *P.amphibium, Glyceria fluitans* and *Eleocharis palustris* on its trampled bed. Around it there is a dense stand of dampish *Carex nigra* which turns peaty towards the north, bringing in ditches of *Carex rostrata, Menyanthes* and occasional *Phragmites* between banks with *C.lepidocarpa, Myrica* and *Parnassia*.

Vegetation (ha as mapped)

2A-		3B-		5A-		6D-	1.8	9A-	2.0	11B-	
2B-	3.2	3C-		5B-	0.8	7A-		9B-		12-	
2C-		3W-		5D-		7B-		9C-	14.8	Lake	
2D-	0.8	4B-	2.5	5E-		8A-	3.5	10A-	20.7		
2W-		4D-		6A-		8B-		10B-			
3A-	0.2	4W-		6B-	15.8	8C-	1.0	11A-			

Fauna: Substantial numbers of birds were on the site when visited in August including 16 herons, 30 mallard, 80 lapwing as well as smaller numbers of curlew, whimbrel and dunlin. Some of the lapwing and dunlin behaved as if they had bred in the area. There is no winter information.

Evaluation: Coolcam is an exceptional turlough, wet in this summer but obviously drying out sometimes. The landscape setting is very striking with wetland and eskers interdigitating in a way that is not easily seen on the map. The presence of the eskers brings about a pronounced zonation around the shore with a little natural woodland and dry grassland too.

The diversity in the vegetation as well as the physical habitat and birdlife makes this site score highly (44) though the absence of rare plants keeps it in 19th place in the overall list. It has by far the largest expanse of the Oenanthe aquatica community (10A) and also significant areas of the marly communities, Marl Pond (9C) and Cladium Fen (8C). This level of alkalinity distinguishes Coolcam from most of the nearby turloughs: only Levally Lough to the south resembles it.

The distictness and quality of the vegetation as well as the birdlife and the lack of human impact would seem to make Coolcam the most interesting of the turloughs in the north midlands and of international value.

17. CROAGHILL [Cx 52]
River System: Island (Suck)
Catchment Area: 400 ha
Altitude: 80m

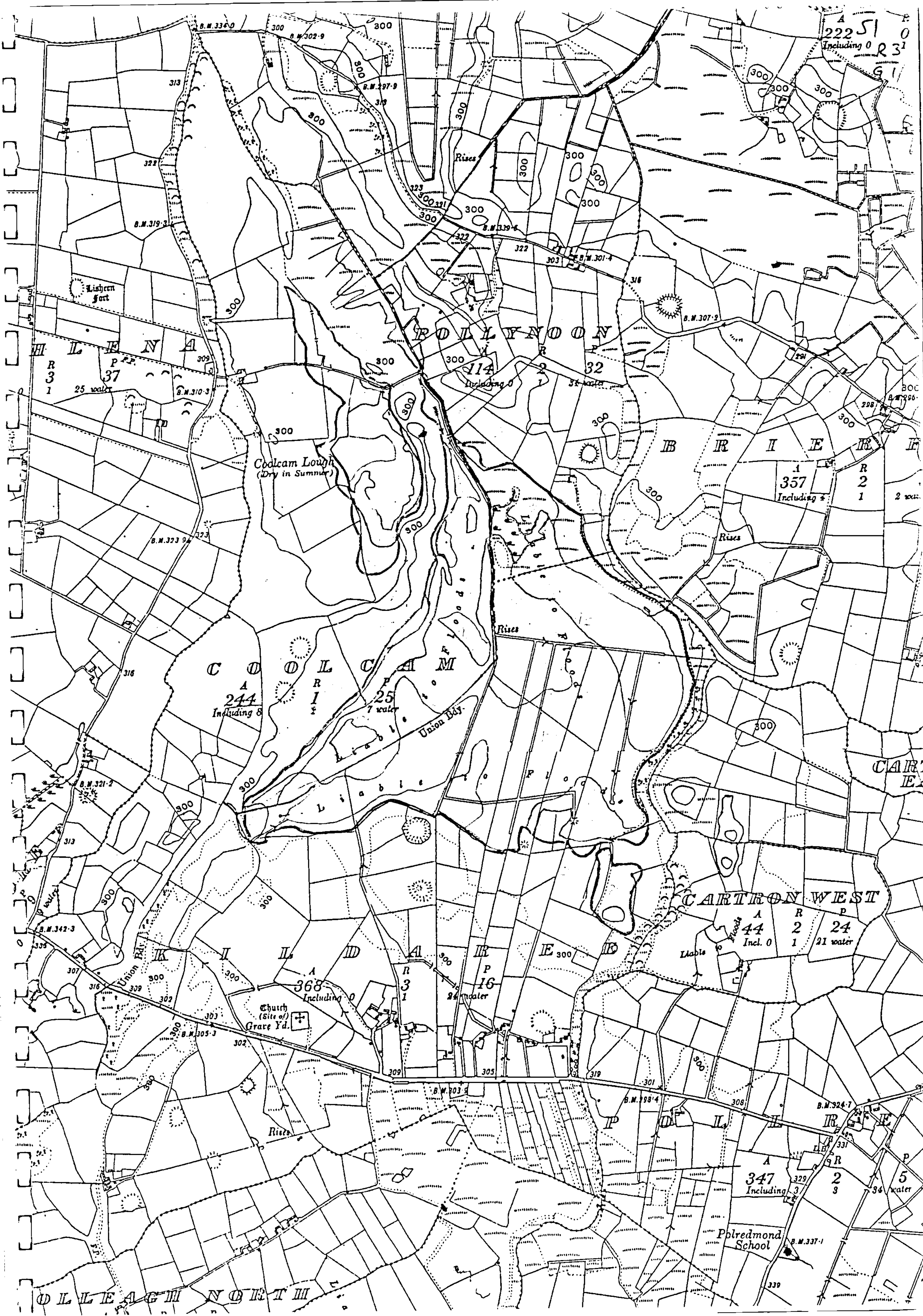
Grid Ref: M 6071
6" sheet: Galway 1 & 6
Turlough Area: 37.4 ha
Evaluation place: 16=

Topography: Croaghill is situated just to the east of Coolcam, close to the Dunmore - Ballymoe road. The topography is dominated by glacial deposits; there are eskers along some of the edges and drift slopes along the remainder. The turlough floor is undulating in the extreme, making it a difficult area in which to use the O.S. map. There are a series of semi-permanent pools especially in the northern half with intervening mounds and ridges. There is also a major central rise and a further pool in the SE part. The turlough is connected to two ponds in the NW by a narrow channel.

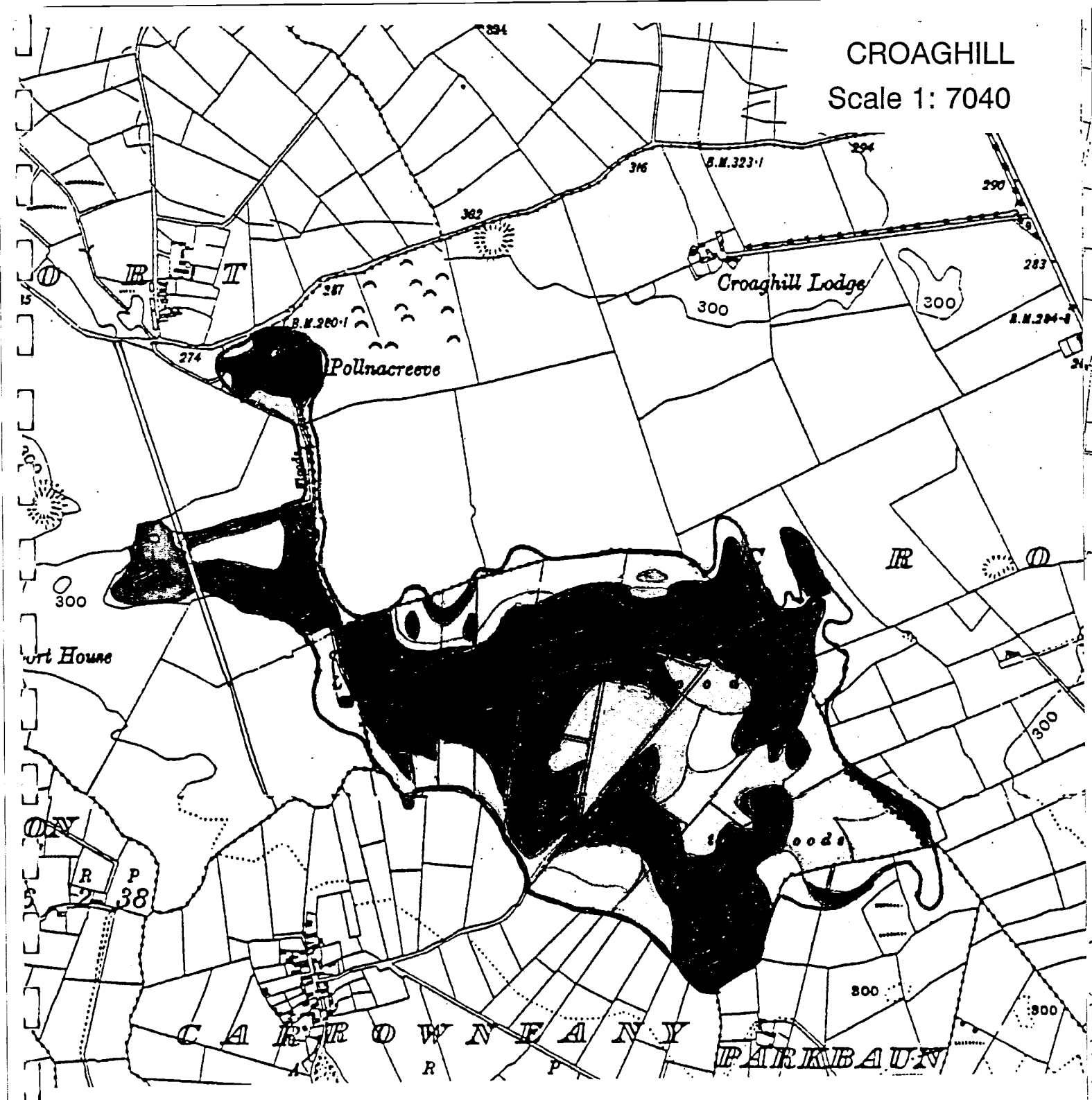
Hydrology: This is a wet turlough and it was still considerably flooded in July, when visited. Pollnacreeve is a permanent pond which discharges water by way of a channel and further pond to the NW corner of the main basin. Here there is also an old swallow hole (Coxon, 1986) at the edge. There are a number of depressions in the SE half which may also take water. The central part is crossed by field drains but there was no flowing water in them. External drainage is absent.

Substrate: Bottom areas normally have peat soils which in places may be 3m deep (Coxon,1986). Some floating peat occurs as a scraw in the main basin but there is little evidence of marl.

Land Use: The main basin is subject to rather little grazing because of its wetness and soft terrain and there were very few cattle except on the eastern and north-western fringes. One part of the north-east side had however been used for winterage. The surrounding land is used for hay, pasture and oats. There seem to be no farms discharging into the basin.



Lisheen Fort
Coolcam Lough (Dry in Summer)
POLLYNOON
A 114 R 2 P 32
Including 0 1 34 water
HELENA
R 3 P 37
1 25 water
BRIERF
A 357 R 2
Including 4 1 2 water
COOLCAM
A 244 R 1 P 25
Including 8 7 water
Liable to Floods
Union Bdy.
Rises
CARTRON WEST
A 44 R 2 P 24
Incl. 0 1 21 water
KILDARE
A 368 R 3 P 16
Including 0 1 24 water
Church (Site of)
Grave Yd.
Union Bdy.
POLREDMOND
A 347 R 2 P 5
Including 3 3 34 water
Polredmond School
OLLEAGH NORTH
B.M. 334·0
B.M. 302·9
B.M. 297·9
B.M. 319·3
B.M. 339·6
B.M. 301·4
B.M. 307·2
B.M. 310·3
B.M. 323·9
B.M. 321·2
B.M. 342·3
B.M. 305·3
B.M. 303·9
B.M. 298·4
B.M. 324·7
B.M. 337·1
A 222 R 3 P 0
Including 0



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- 6B Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- 6C Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula

Vegetation: Because of the undulations of the floor the vegetation has a complex pattern. In the main basin there are two low-lying sheets of water covered centrally by *Oenanthe aquatica*, *Polygonum amphibium* and *Eleocharis palustris*. At their edges the *P.amphibium* assumes dominance with *Apium inundatum*, *Potamogeton natans* and *Calliergon giganteum* and this in places grades into the wetter 6B community which contains *Juncus articulatus* and *Veronica scutellata*. The *Polygonum* community (8A) is repeated in the little hollows along the northern edge and in the more sizeable bays in the NE corner. It rises sometimes into an intervening belt of *Lysimachia vulgaris*, *Salix repens* and *Phalaris* and elsewhere directly into the *Potentilla reptans* community on well-drained peat. The central mound is seldom grazed and its vegetation includes *Carex hirta*, *Phalaris* and *Iris*.

The edges of the basin are mainly of grassland but in the NE corner a mixture of annual species have taken over, probably after animal treading. The 8B here contains *Brassica rapa*, *Polygonum persicaria*, *Mentha arvensis*, *Rumex* spp and the two *Rorippas*, *R.palustris* and *R.islandica*. In another example of this type in the SW corner, *Callitriche obtusangula* is established.

North-westwards the basin narrows and there is more 8A around a pond of *Equisetum fluviatile* and even a little 6A. The pond of Pollnacreeve has a more varied flora, including *Oenanthe aquatica* with *Carex disticha*, *Iris* and *Phalaris* around the edge.

Vegetation (ha as mapped)

2A-	0.5	3B-		5A-		6D-		9A-	0.1	11B-	1.8
2B-	1.8	3C-		5B-	4.1	7A-		9B-		12-	
2C-		3W-		5D-		7B-		9C-		Lake	
2D-	0.7	4B-	1.3	5E-		8A-	13.1	10A-	6.3		
2W-		4D-		6A-	0.5	8B-	0.5	10B-			
3A-	3.0	4W-		6B-	3.7	8C-		11A-			

Fauna: The turlough/lake seems to have many breeding birds and 15prs of black-headed gulls as well as snipe, redshank and lapwing were present. There were additionally flocks of 150 lapwing and 50 mallard, presumably post-breeding. There is no winter information.

Evaluation: Croaghill is one of the wettest peaty turloughs discovered and it has a great range of vegetation consistent with its variable topography. The northerly extension into Pollnacreeve brings in the Peaty Pond community (11B) which is not found in any of the adjacent turloughs. Croaghill also has a small area of Wet Annuals (8B) with *Rorippa islandica* and a relatively large stand of Polygonum amphibium (8A) for its size.
Its colony of nesting gulls is unusual and shows that the turlough is normally a late-emptying one.

The site comes in with a higher score (47) than Coolcam because of its rare species but is less remarkable in its physical setting and lack of human influence. It should probably be considered as of national value.

18. BALLINASTACK [Cx 54]
River System: Springfield (Suck)
Catchment Area: 300 ha
Altitude: 84m

Grid Ref: M 6565
6" sheet: Galway 6
Turlough Area: 24.9 ha
Evaluation place: 46

Description: Ballinastack turlough lies at the edge of an extensive cutover bog just north of Glenamaddy. The eastern boundary is indeterminate as it opens out into the large area of bog but there is a rim noticeable along the south and west and paticularly so around the swallow hole in the north-west corner. In this section the ground is hummocky, there are rounded outcrops of bedrock and deep channels leading into it. Elsewhere the floor is flat except for a slight ridge on the central line and the remains of turf banks in the eastern half.

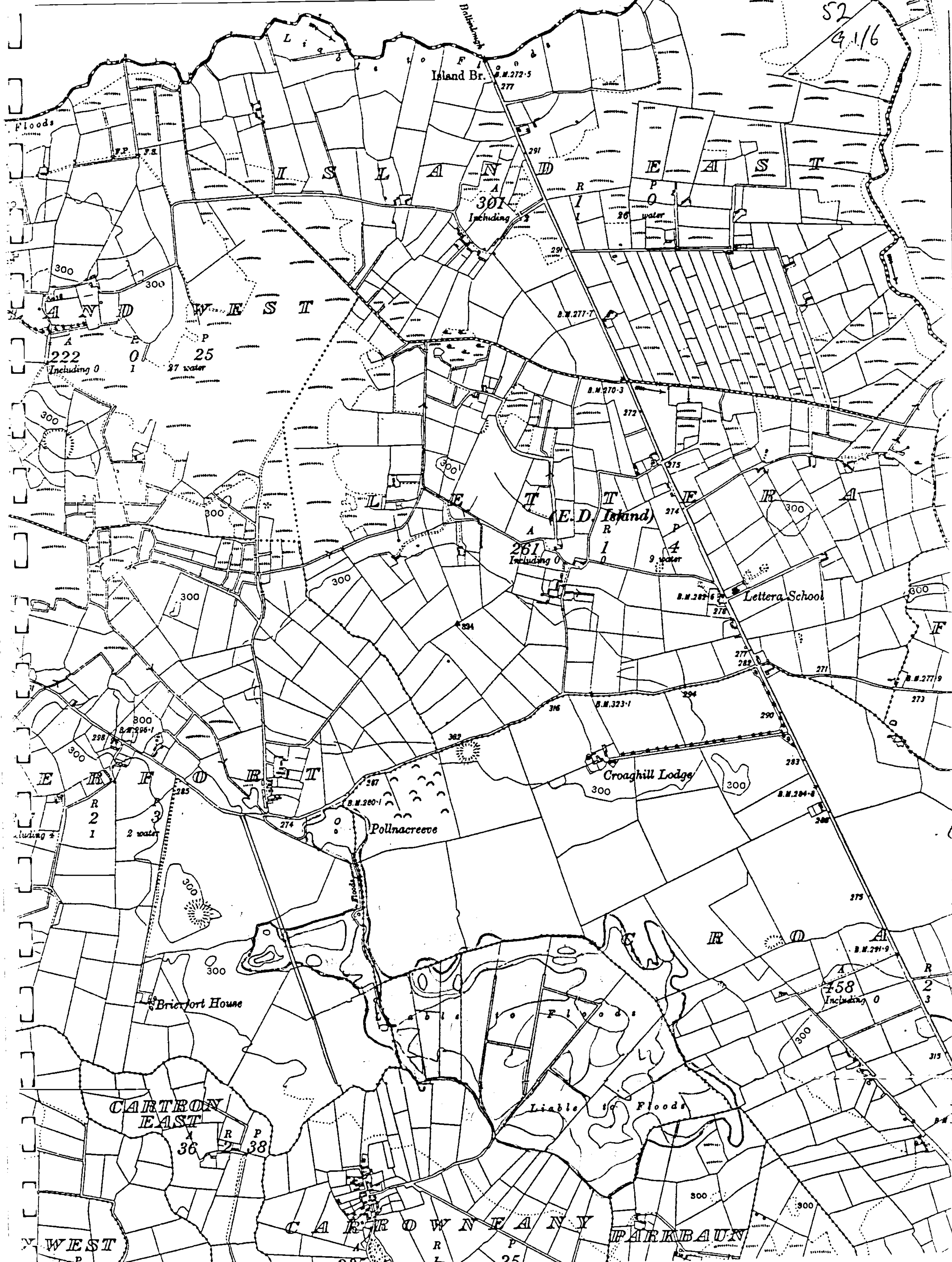
Hydrology: Two small streams enter from the south side of the basin and a ditch is dug from the eastern end. They all make their way to the swallow hole, as marked on the map, the south-western one breaking into a number of channels at first. A number of swallow holes exist in the floor of the stream channel, some filled with rounded boulders.

Substrate: The turlough is largely peat-based but in the north-west there is sandy silt. There is no evidence of marl.

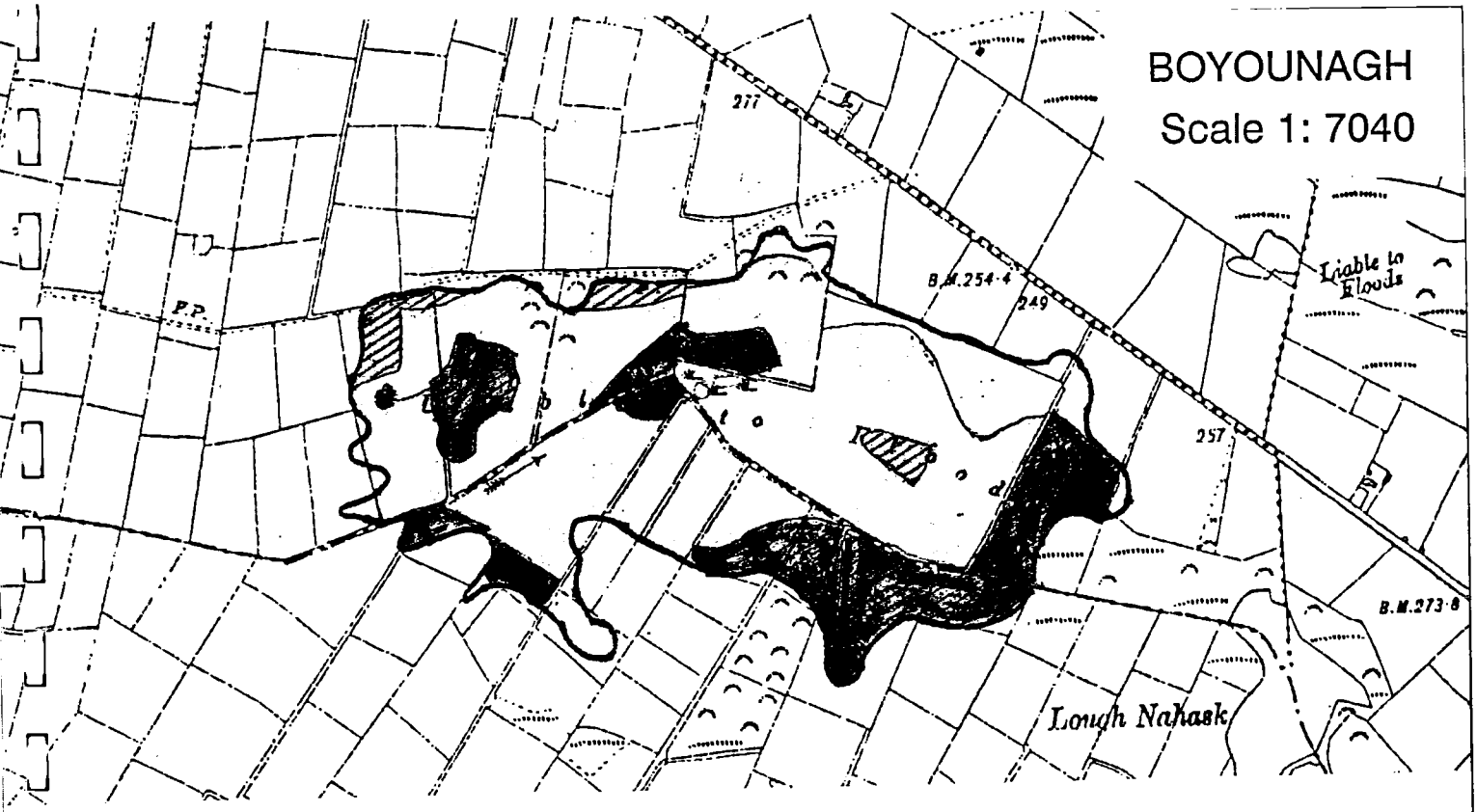
Land Use: Small numbers of cattle are present in the main basin but the lack of grazing is a notable feature. There is more grazing around the swallow hole with some resultant damage to the vegetation. There are no active turf banks in the area.

Vegetation: The vegetation gives the impression of being a sea of *Carex nigra* with drier areas of *Carex hostiana* (5D) around the edge, augmented by *Molinia, Myrica* and *Juncus effusus* (2D) at the eastern end. The *Carex* is ungrazed so stands to its full height, concealing an admixture of *C.rostrata* and *Equisetum fluviatile* in the wettest areas. These species also line the several branches of the stream which flows from the SW, with *Apium nodiflorum, A.inundatum, Utricularia* sp. and *Epilobium palustre*. In certain places they create a peaty 6D community with *Potentilla palustris* and *Menyanthes*.

South of the swallow hole there is a slight ridge marked with a zonation of 6D into 4B, with *Galium boreale, Viola canina* and *Climacium*. The swallow holes themselves have been largely trampled so that *Rumex* species are abundant along with *Polygonum persicaria, P.aviculare, Rorippa palustris* and *Plantago major*. Nearby is some poor pasture (2B) which is cut for silage in the most westerly field but not much fertilized. It includes some *Lolium* which becomes commoner to the east with *Bellis* etc on old cultivation ridges.

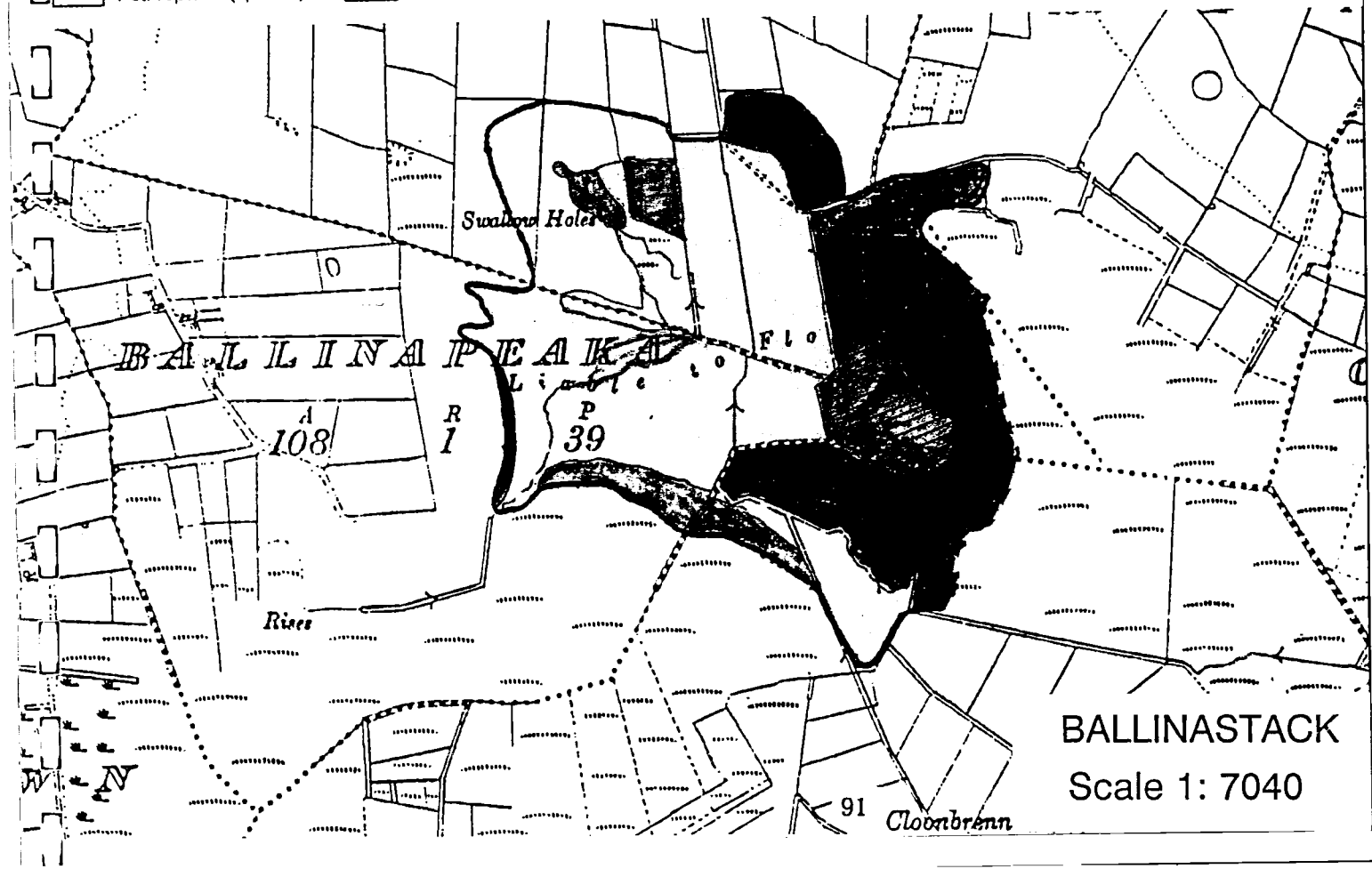


52
4116
Island Br.
Liable to Floods
Floods
I S L A N D E A S T
A 301 R 1 P 0
Including 1 26 water
A N D W E S T
A 222 R 0 P 25
Including 0 1 27 water
L E T T E R A
(E.D. Island)
A 261 R 1 P 4
Including 0 0 9 water
Lettera School
Croaghill Lodge
Pollnacreeve
E R F O R T
R 2 3
2 water
C R O A
A 458 R 2
Including 0 3
Brierfort House
Liable to Floods
CARTRON EAST
A 36 R 2 P 38
C A R R O W N E A N Y
PARKBAUN
WEST



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula



Vegetation (ha as mapped)

2A-	0.3	3B-		5A-	0.8	6D-	1.9	9A-		11B-	
2B-	2.3	3C-		5B-		7A-		9B-		12-	
2C-		3W-		5D-	2.1	7B-		9C-		Lake	
2D-	7.0	4B-	0.4	5E-		8A-		10A-			
2W-		4D-		6A-		8B-		10B-			
3A-		4W-		6B-	10.1	8C-		11A-			

Fauna: Snipe breed in the area but there were no other waders present when it was visited in June. Nor, in view of the oligotrophic nature of the vegetation, are there likely to be wintering populations of any size. The absence of disturbance, however, could favour snipe in winter.

Evaluation: This turlough is in an interesting ecological situation, adjacent both to a raised bog and a rocky swallow hole. It seems to be nearing the end of the progression whereby a turlough can become overgrown by peat despite seasonal flooding with calcareous water. This phenomenon is seen at its earlier stages in Balla, Brierfield and Mullygollan. At Ballinastack a nice transect exists from from cutover raised bog, through Peat Grassland (2D), Peaty Carex nigra (6D), Wet Carex nigra (6B) to Poor Grassland (2B) around the swallow hole.

The resulting vegetation does not have much diversity or any rare species so the turlough scores badly (27) on the general evaluation grounds. However it is in a natural, undrained state and only the north-west corner is subject to grazing by cattle. In fact the site contains the only substantial area of ungrazed Wet Carex nigra (6B) seen on the survey.

Ballinastack should be considered of regional importance in ecological terms.

19. BOYOUNAGH [Cx 53]
River System: Sinking (Clare)
Catchment Area: 400 ha
Altitude: 63m

Grid Ref: M 6063
6" sheet: Galway 18
Turlough Area: 21.2 ha
Evaluation place: 50=

<site map on previous page>

Description: The Boyounagh turlough fills a rectangular hollow below and south of the Dunmore - Glenammady road. The surrounding landscape is of rolling glacial hills but the floor is relatively flat except for a rise in the eastern half. The basin is confined by slopes on the north and part of the south but is more open to the west.

Hydrology: Water enters the basin from the eastern end by an excavated drain from Lough Nahask. This continues through to a central marshy pond where drainage has brought about some recent drying up. There is also input from the south-western corner and

from a spring on the south side. A swallow hole occurs high up on the northern side and at the west end, as marked on the map..

The floodwater would seem to be low in dissolved lime.

Substrate: Much of the turlough has a peat floor though this becomes sandy in the central pond and the south-west corner. The northern shore consists of well-drained glacial debris.

Land Use: Fairly low grazing pressure from cattle. The surrounding land use is low intensity but there could be some nutrient input from a farm on the south side. Peat cutting has occurred at the eastern end.

Vegetation: The turlough has a uniform vegetation cover with much 6B in the lowest area and 6D where there is a greater depth of wet peat. Here *Potentilla palustris* and a little *Viola palustris* occur. At the eastern end there are higher banks of cutover peat, occasionally flooded. A rise in the east centre carries the 3B community with *Climacium, V.canina, Ophioglossum* and some *Deschampsia cespitosa*. This is mirrored at the western end by former cultivation ridges now colonised by *Nardus, Carex panicea* and *Galium verum*. The northern shore is more steeply sloping and a good zonation of 2B above 4B above 6B is seen. At the south-western corner *Potamogeton amphibium* grows where water lies late, mixed with *Poa trivialis, Alopecurus geniculatus* etc.

The central marshy area which has been recently disturbed by excavation includes an area of *P.amphibium* but also a temporary pond with *Equisetum fluviatile* mixed into *Glyceria fluitans, Apium inundatum, Baldellia* and *Potamogeton natans*.

Vegetation (ha as mapped)

2A-	0.3	3B-	1.0	5A-		6D-	3.7	9A-	1.3	11B-	
2B-	0.5	3C-		5B-	0.8	7A-	0.5	9B-		12-	
2C-		3W-		5D-		7B-		9C-		Lake	
2D-	0.6	4B-		5E-		8A-	0.2	10A-			
2W-		4D-		6A-		8B-	0.2	10B-			
3A-		4W-		6B-	12.2	8C-		11A-			

Fauna: Snipe probably nest in this area but no other species was seen. There is no winter information.

Evaluation: Boyounagh has a varied vegetational cover for its size with patches of ten separate communities around its main floor of Wet Carex nigra (6B). The occurrence of old cultivation ridges in the Sedge Heath (3B) at the north-western end is an interesting feature comparable with the present influence of a farm in the south-east.

The turlough has been greatly modified by recent drainage connected with the Clare catchment and would seem not yet to have established an equilibrium between flooding and vegetation. This

and its lack of interesting plant species gives it a low evaluation score (23) and only local scientific interest.

20. GLENAMADDY [Cx 55]
River System: Shiven (Suck)
Catchment Area: 1365 ha
Altitude: 75m

Grid Ref: M 6461
6" sheet: Galway 18
Turlough Area: 177.5 ha
Evaluation place: 12

Topography: Glenamaddy is a vast turlough covering the junction of three valleys east of the town. The land about is flat or gently undulating with a ridge approaching the eastern side. Flat bogland stretches away to the south and south-east. The turlough is quite a deep one and the sides slope down to a flattish floor which is uncovered by water for a short season if at all. There is some wave erosion on the shores particularly those facing south and west.

Hydrology: As mentioned above three rivers flow into the depression, the largest from the Lough Lurgeen bog to the south-west. The others are smaller but seem perennial. The water accumulates as a long-persistent lake which made a visit to the turlough impossible during June and July. The main swallow hole is in the north-west corner, close to the road. There is a subsidiary one some way to the south-west of this which still receives the town effluent. A group of holes also occurs towards the town and these (Pollanargid) probably release water into the turlough.

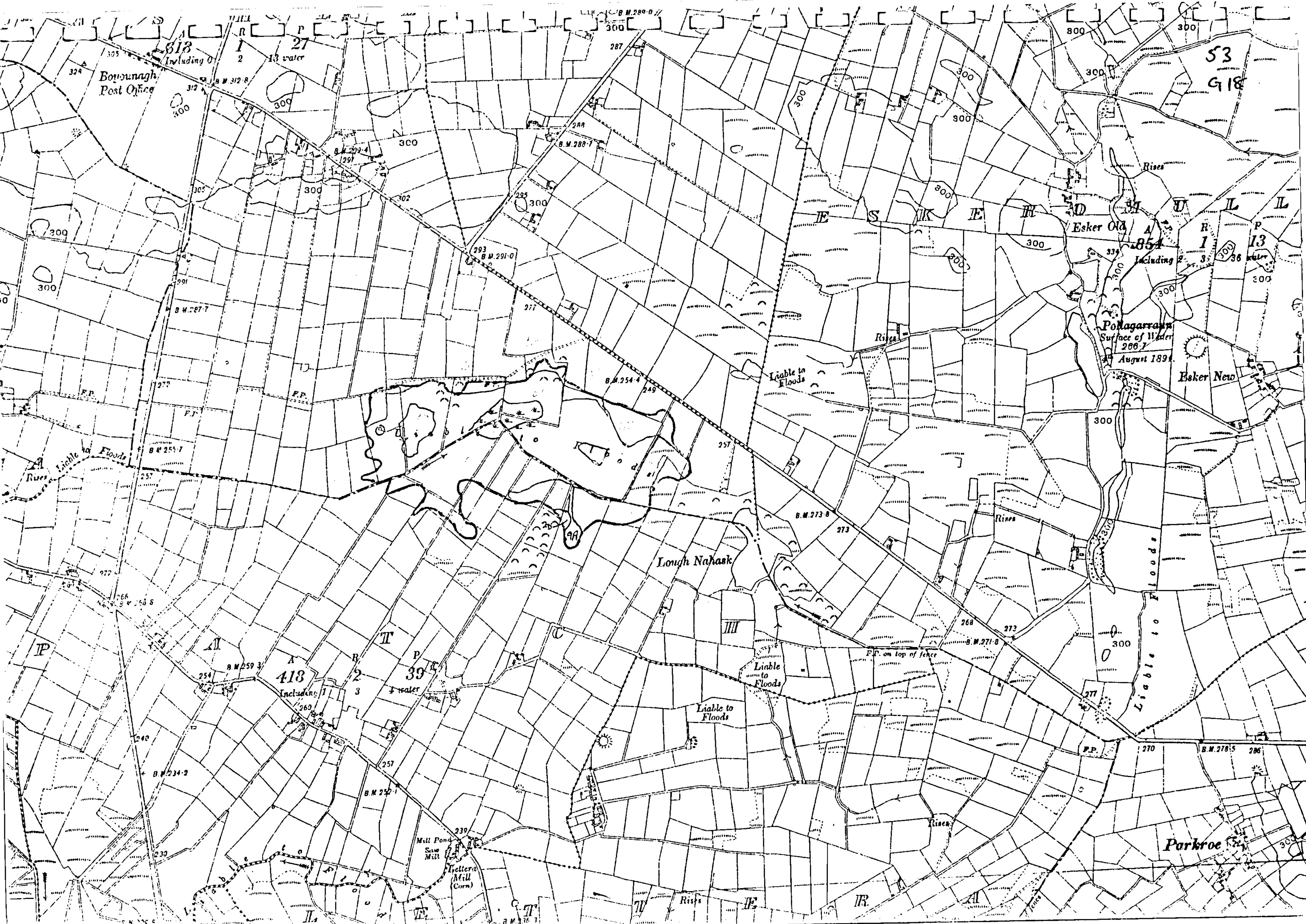
The incoming water seems to have little dissolved lime and from both easterly streams may in fact be neutral or acidic.

There is no sign of effective drainage.

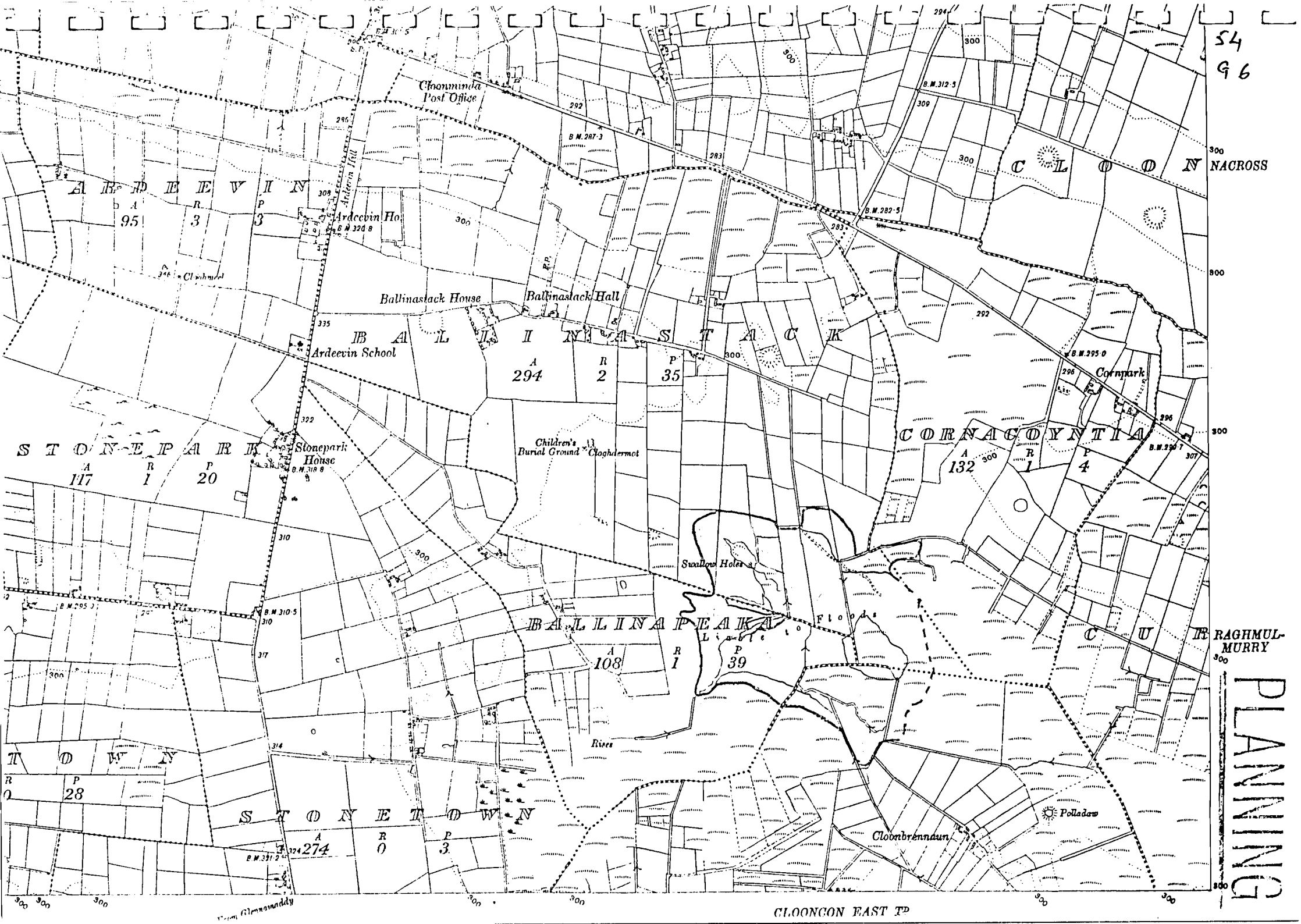
Substrate: The higher parts of the shore have large areas of bare sand with some stones eroded out of the local drift. There is shallow peat along the top level in some places, most extensive in the south-east and south. A section in the lower part of the basin (Coxon, 1986) comprised 80cm grey-brown silty clay over 10cm marl. The south-western limb also has peat at its lowest levels.

Land Use: The unenclosed parts of the turlough are grazed by cattle in apparent commonage. Elsewhere there are an additional few cattle, at the higher levels of the NE limb and lower down in the west. Peat cutting has taken place in the south-west part both on the turlough floor and, more recently, on the margins. Most of the fields forming the western edge are ridged for cultivation right down to the base.

Vegetation: For such a large area the vegetation of this turlough is amazingly homogeneous. It consists of two main communities. The basal one is a mixture of *Polygonum amphibium, Glyceria fluitans,*



53
G18
Boyounagh Post Office
Esker Old
Pollagarraun
Surface of Water 266·7
August 1894
Esker New
Liable to Floods
Lough Nahask
Rises
Mill Pond
Saw Mill
Parkroe


54
96
Cloonminda Post Office
ARDEEVIN
A 95 R 3 P 3
Ardeevin Ho
Ardeevin Hill
Ballinastack House
Ballinastack Hall
BALLINASTACK
Ardeevin School
A 294 R 2 P 35
Children's Burial Ground
Cloghdermot
Stonepark House
STONEPARK
A 117 R 1 P 20
CLOON
NACROSS
Cornpark
CORNACOYNTIA
A 132 R 1 P 4
Swallow Holes
BALLINAPEAKA
A 108 R 1 P 39
Lough
Flood
CUR
RAGHMUL-MURRY
River
TOWN
R 0 P 28
STONETOWN
A 274 R 0 P 3
Cloonbrenndaun
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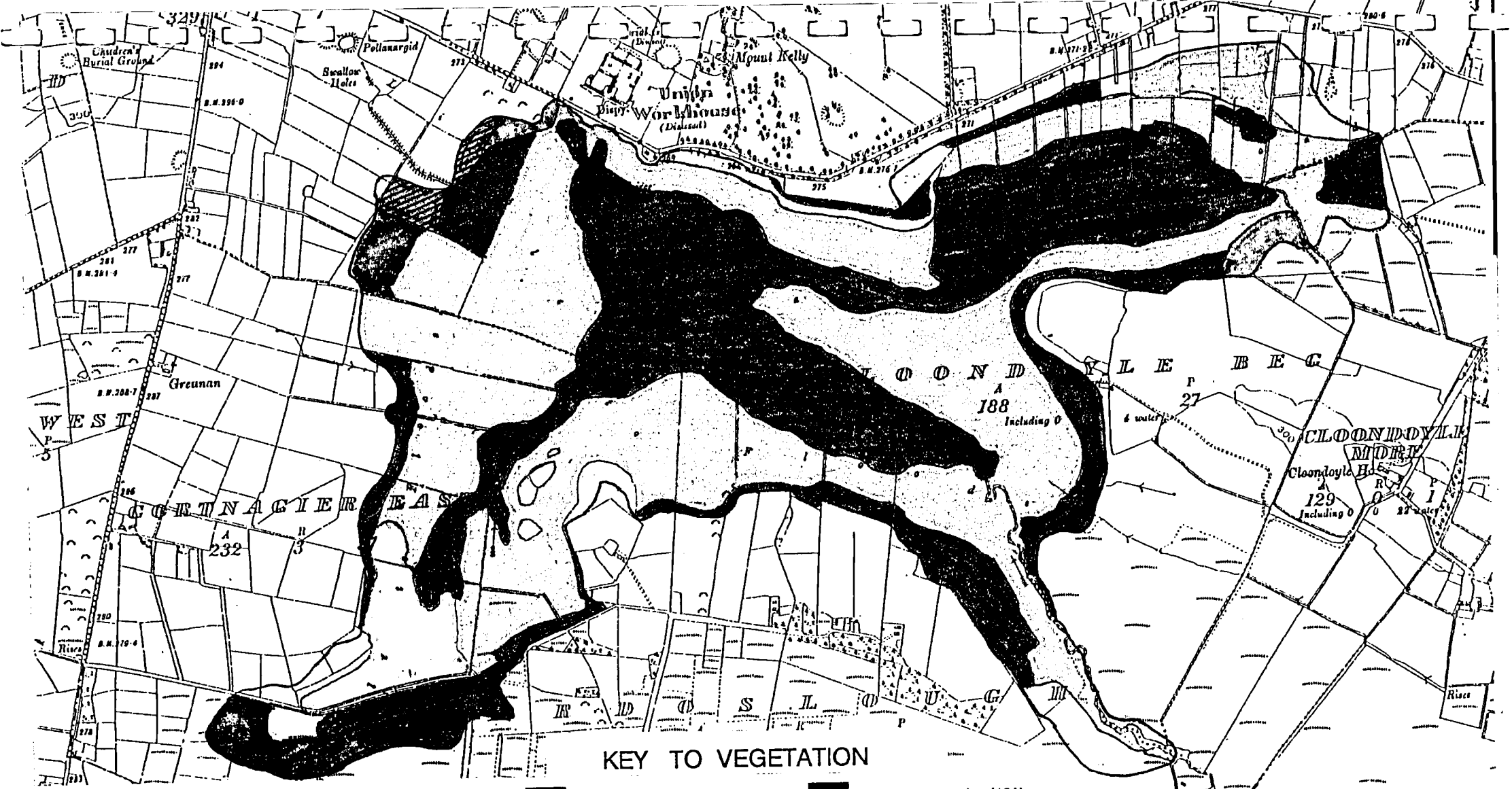
CLOONCON EAST TD
PLANNING



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- Sedge heath
- Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- Marl pond
- Oenanthe aquatica (10A)
- Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula

GLENAMADDY

Scale 1: 10560

Eleocharis palustris, *Littorella*, *Sparganium emersum* and occasional *Lysimachia vulgaris* with *Menyanthes* and *Potentilla palustris* in peatier places. At the south-western corner of the basin this changes into a type of 9C with *Potamogeton gramineus* and *Rorippa amphibium* but few of the other lime-tolerant species.

Above this lowest level the *Polygonum* becomes rarer and *Carex nigra*, *Senecio aquatica*, *Equisetum* x *littorale* and *Caltha* enter the picture (6B) with more abundant *Lysimachia* and *Sparganium* where water is ponded. The *Lysimachia* grows small and bushy and appears not to flower; it comes to resemble the *Myrica* and occasional *Salix repens* with which it grows. *Rumex crispus* occurs in some of the lower fields also as does *Veronica scutellata* in peaty sites. The shoreline is composed of a patchwork of other communities depending on the amount of peat and the management of the land. 2D is frequent, with *Myrica*, *Salix repens*, locally abundant *Viola persicifolia* (Ryan, pers.comm.) and scattered *Schoenus*. The *Schoenus* becomes most common in the south-east with *Cirsium dissectum*, *Succisa* and *Achillea ptarmica*. *Galium uliginosum* occurs in a patch of similar ground in the NE corner. Along the stony north shore the 4B community includes *Galium boreale*, *Molinia*, *Carex* cf *serotina*, *Salix repens* and *Leontodon taraxacoides* which is repeated as more basic *Molinia/Salix repens* on peat on the south shore. Some unmown *Festuca arundinacea*, *Carex nigra*, *Vicia cracca* and *Alopecurus geniculatus* (3A) is found at the NE, with abundant *Achillea ptamica* growing through it.

There are additional communities in the NW corner - a peaty site with *Carex nigra*, *Potentilla palustris* and *Equisetum palustre* (6D) and an area of trampled ground with *Filaginella*. A small area of 6A also occurs.

Vegetation (ha as mapped)

2A-		3B-		5A-		6D-	1.7	9A-		11B-	
2B-	2.2	3C-		5B-		7A-		9B-		12-	
2C-		3W-		5D-		7B-		9C-	4.7	Lake	
2D-	27.9	4B-	2.6	5E-		8A-	48.6	10A-			
2W-		4D-	4.2	6A-	1.8	8B-	1.7	10B-			
3A-	3.0	4W-		6B-	78.4	8C-		11A-			

Fauna: As a lake this area contains substantial numbers of birds in winter. Sheppard (in prep.) quotes averages of bewick swan 14, whooper 8, wigeon 472, teal 73, mallard 229, shoveler 15, pochard 20, golden plover 23, Lapwing 62, snipe 20, curlew 39 and redshank 15. The swan census of January 1986 recorded 16 whooper, 9 Bewick and 7 mute (Merne, pers. comm.) but 100 whooper have occurred on occasion (Silk, pers.comm.). In winter 70-80 white-fronted geese are regular.

By the time the turlough could be examined for its vegetation all breeding birds had left but redshank at least do nest (Silk, pers.comm.). It would appear suitable also for lapwing and dunlin in some years. In early summer the flocks of non-breeding mallard were notable (80-100), as were cormorants.

Evaluation: Glenamaddy is a very large turlough, coming third in size of those surveyed, after Rahasane and Coole/Newtown. It has extensive areas of uniform vegetation with the result that it contains the largest stands of Peat Grassland (2D), Wet Carex nigra (6B) and Polygonum amphibium (8A) of any site.

As mentioned above its nutritional conditions seem unusual, if not unique, and the plant communities are not strictly similar to any other site. The turlough is relatively poor in lime since one of the main inflows comes directly from a raised bog. However there is a small section of Marl Pond (9C) in the south-west which may have a separate connection to groundwater. The nutrient input from the town's sewage plant must also have some influence on the whole waterbody, most obviously on its deeper vegetation types which are generally still inundated during the early growing season. Such eutrophication would counteract the natural oligotrophy that must result from its relatively small catchment area. The enrichment effect may indeed promote a larger bird population than would otherwise occur.

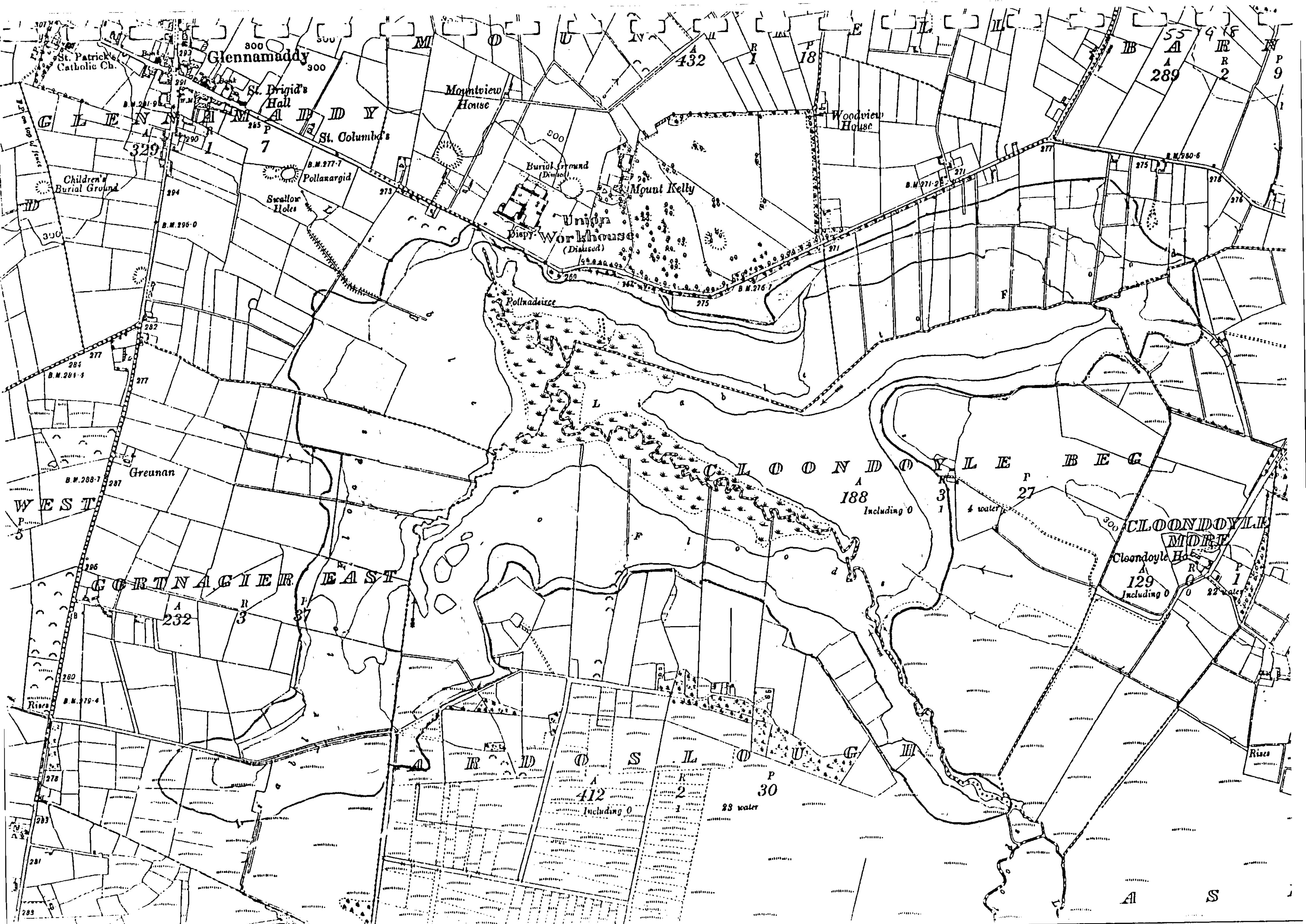
Glenamaddy achieves a score of 53 in the evaluation process and twelvth place in the overall scheme. This score comes from its pristine physical condition, its variety of vegetation and rare plants and its important wintering bird populations. It supports the ranking of the site as one of the most important outside the Galway Bay/Burren region and in view of the proximity of Lough Lurgeen bog the whole complex should be considered of international value.

21. KILKERRIN [Cx 56]
River System: Shiven (Suck)
Catchment Area: 240 ha
Altitude: 85m

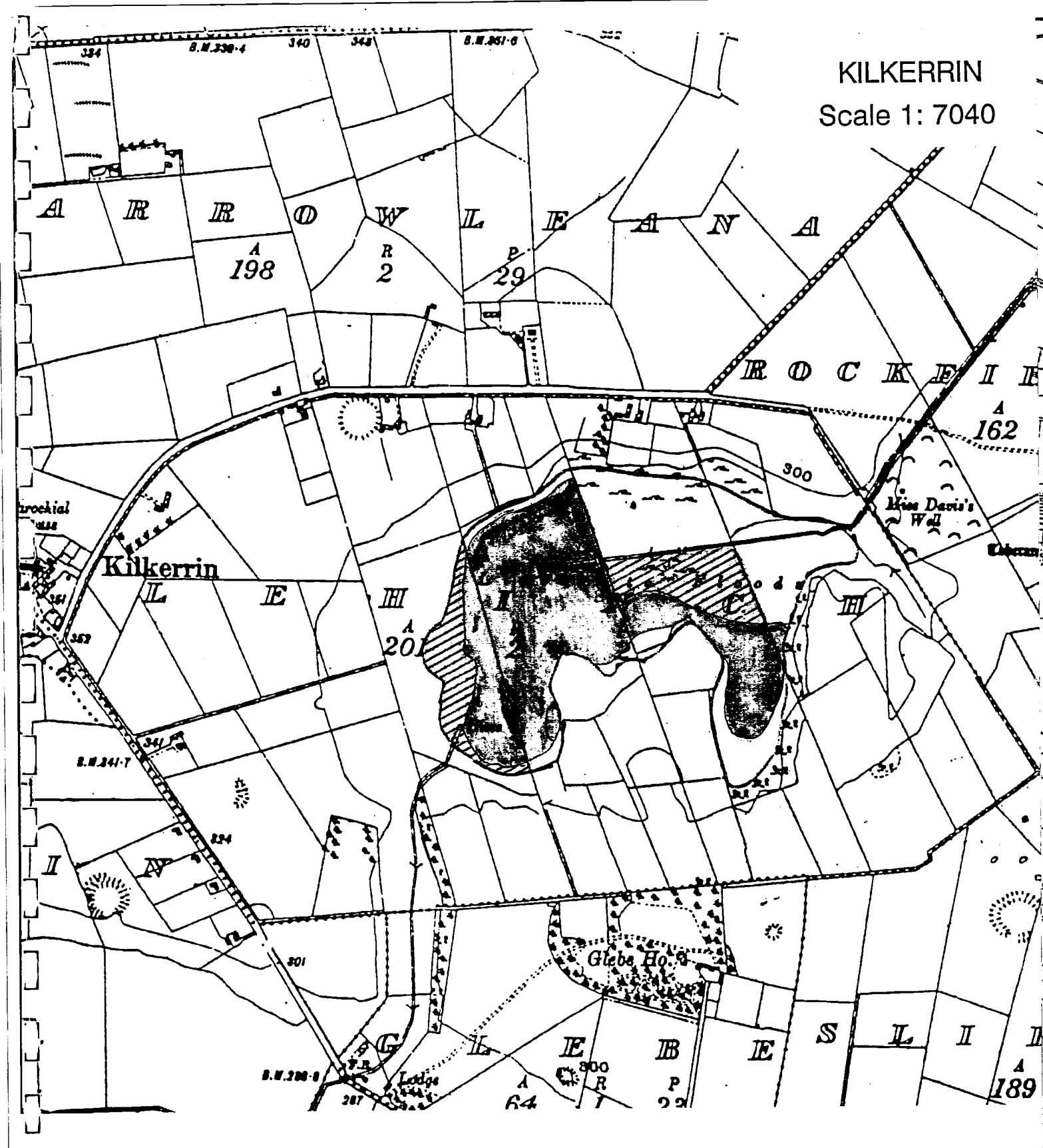
Grid Ref: M 6356
6" sheet: Galway 31
Turlough Area: 16.6 ha
Evaluation place: 56=

Description: Kilkerrin turlough occurs in a basin in rolling country about 6km south of Glenamaddy. It is crossed by a road from the north side which divides it roughly into two halves. Both parts extend southwards in a crescentic shape, the western one leading to a deep trench cut through bedrock. There is a little outcropping rock in the eastern half and some loose boulders in the west though there is a thin covere of drift on surrounding slopes. The turlough floor is uneven with hollows at several places in the western half. In the east there is a platform on which a small earthwork stands, crowned by trees and not flooded.

Hydrology: A small inflow occurs from Miss Davis's Well in the north-east corner which flows into a central ditch before disappearing. The main swallow hole occurs on the southern edge of the western half, below a cattle lot. Drainage has been attempted by the excavation of a deep (2m) trench through a ridge of rock at



Glennamaddy
St. Patrick's Catholic Ch.
St. Brigid's Hall
St. Columba's
GLENNAMADDY
Children's Burial Ground
Pollanargid
Swallow Holes
Mountview House
Burial Ground (Disused)
Mount Kelly
Union Workhouse (Disused)
Dispy.
Woodview House
Pollnadeirce
CLOONDOYLE BEG
CLOONDOYLE MORE
Cloondoyle Ho.
Greunan
WEST
GORTNAGIER EAST
ARDOSLOUGH
Including 0
4 water
23 water
Rises



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- Sedge heath
- Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula

the SW corner and it seems partly successful, limiting the duration of floods though not eliminating them.

Substrate: One section (Coxon, 1986) shows silt over marl over rock at 20cm but on the platform there is at least 90cm of marl. There is no development of peat and the turlough is now too dry to allow any further marl to form.

Land Use: The turlough is grazed by cattle and sheep and there is a farm at the south-west end which gives rise to some effluent. As mentioned above it is crossed by a road on a slight causeway. It appears that marl digging was carried out at one time.

Vegetation: This is a dry turlough with aquatic vegetation limited to the small stream entering from the east. The lowest points are found in the western half where the 6A community has been broken by treading to allow annuals to grow. The 8B here includes *Polygonum arenastrum, P.hydopiper, Filaginella* and *Chenopodium rubrum* as well as *P.amphibium* and *Rorippa amphibium* in the wettest places. The main community rises into 3B with some *Molinia* and *Deschampsia cespitosa* - this community is also found on the central section of the eastern half- and then into a rough grassland with much *Festuca arundinacea*. To the east and south the rocky slope is partially tree-covered and the shallower soil enriches the vegetation with *Lolium*.

Vegetation (ha as mapped)

2A- 2.4	3B- 2.7	5A- 0.1	6D-	9A-	11B-
2B- 3.1	3C-	5B-	7A-	9B-	12-
2C-	3W-	5D-	7B-	9C-	Lake
2D-	4B-	5E-	8A-	10A-	
2W-	4D-	6A- 8.0	8B- 0.2	10B-	
3A-	4W-	6B-	8C-	11A-	

Fauna: No dependant birds were seen during the visit and its small size probably prevents much use in the winter.

Evaluation: Kilkerrin turlough carries a uniform and rather dull vegetation whose communities are widely represented elsewhere. The most interesting features are the patches of Wet Annuals (8B) which bring in the typical *Chenopodium rubrum*. There is also a possible crannog.

The site has a very low evaluation score (14) which is further depressed by the long standing drainage at the south-western corner. It cannot be considered to have more than local interest.

22. LEVALLY LOUGH [Cx 50]
River System: Grange (Clare)
Catchment Area: 560 ha
Altitude: 63m

Grid Ref: M 5354
6" sheet: Galway 30
Turlough Area: 48.5 ha
Evaluation place: 16=

Topography: Levally Lough is a fluctuating lake situated 9km east of Tuam to the north of the Grange River. It is overlooked by a low rise on the north side with some esker or drift mound on the south. The land is flat at the eastern and western ends. As far as can be seen the floor of the lake is flat but peat growth in the centre with willows has produced a slight dome. The topography is more varied at the eastern end with channels and a deeper depression in the NE corner.

Hydrology: Much of the area is now a permanent lake as it was also when mapped in July 1912 and February 1925. The difference in water level between these two dates was 2.22m which would seem rather high for the flooding occurring today. The ground subject to inundation occurs on three sides of the lake but scarcely at all on the northern shore. An obvious swallow hole occurs in the NE corner in a large collapsed hollow of 10m diameter: a number of smaller ones surround it. An overground stream also enters the turlough in this corner.

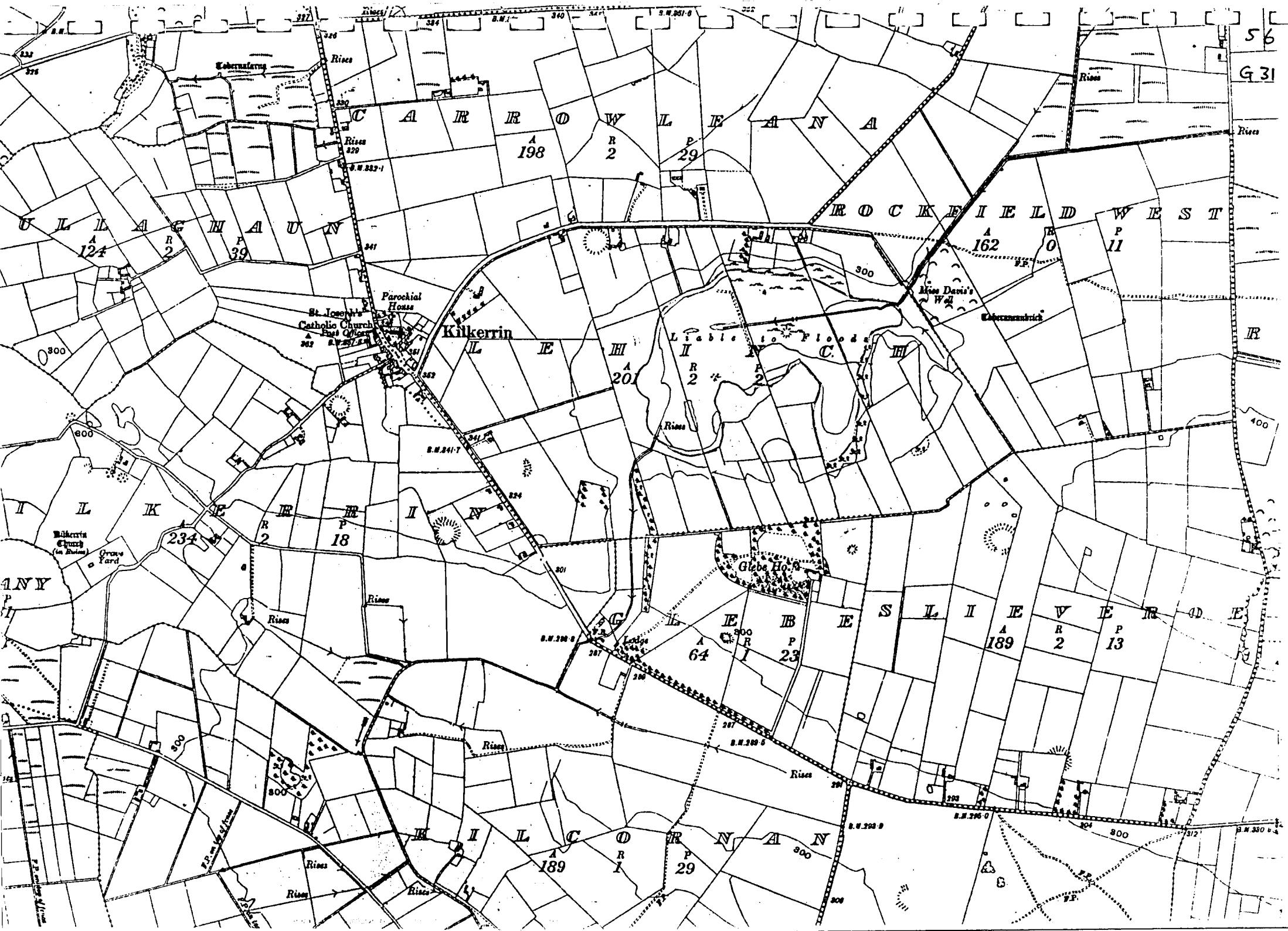
There is no evidence of drainage. Indeed the remains of *Schoenus* tussocks on the south shore, killed in their position of growth, suggests that a rise in average water levels has taken place in the recent past. The lake has not been dry for the past three years though the fenceline in the middle implies dryness at one time.

Substrate: The slopes of the basin consist of sand and gravel which gives way to marl on the lake bed. The marl varies from 25cm at the edge to more than 90cm further out (Coxon, 1986) where it is rich in organic matter and shells. The peat layer seems quite thin but has not been thoroughly investigated.

Land Use: There is some grazing on the margins of the turlough, most significant around the north-east corner. Elsewhere the soil and herbage is poorer.

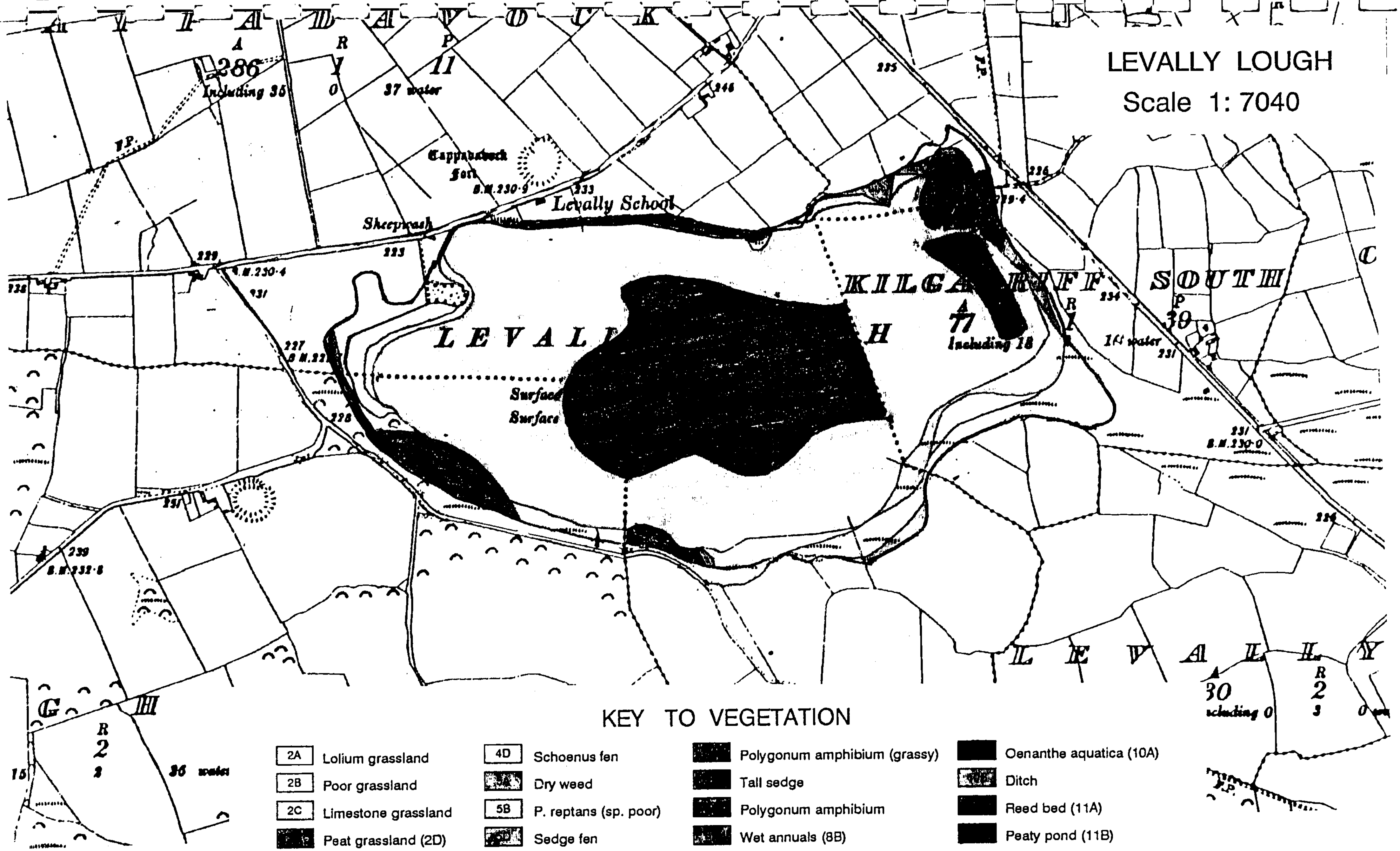
The lake is shot over for duck.

Vegetation: The vegetation was examined from the shore at the end of August when water levels were lower than in the previous months. The southern shore is itself peaty with slight headlands of 2D as well as stretches of *Schoenus* (4D) where the limey influence is stronger. *Salix repens* and *Molinia* are widespread with *Pinguicula vulgaris*, *Parnassia*, *Sagina nodosa*, *Ctenidium*, *Selaginella*, *Eleocharis quinqueflora* and *Epipactis palustris* at one place. An unusual hybrid *Veronica* also occurs, near to seepages of groundwater which also introduce *Apium nodiflorum*.


56
G 31
CARROWLEANA
A 198 R 2 P 29
ROCKFIELD WEST
A 162 R 0 P 11
ULLAGHAUN
A 124 R 2 P 39
Kilkerrin
LEHIN
A 201 R 2 P 2
Liable to Floods
ILKERRIN
A 234 R 2 P 18
GLEBE
A 64 R 1 P 23
GLEBESLIEVERE
A 189 R 2 P 13
KILCORNAN
A 189 R 1 P 29
Parochial House
St. Joseph's Catholic Church
Post Office
Kilkerrin Church (in Ruins)
Grave Yard
Glebe Ho.
Lodge
Miss Davis's Well
Risers

LEVALLY LOUGH

Scale 1: 7040



KEY TO VEGETATION

2A Lolium grassland	4D Schoenus fen	Polygonum amphibium (grassy)	Oenanthe aquatica (10A)
2B Poor grassland	Dry weed	Tall sedge	Ditch
2C Limestone grassland	5B P. reptans (sp. poor)	Polygonum amphibium	Reed bed (11A)
Peat grassland (2D)	Sedge fen	Wet annuals (8B)	Peaty pond (11B)
3A Tall herb	Carex flava	8C Cladium fen	Open water (12)
3B Sedge heath	Dry Carex nigra	Temporary pond	2W Dry woodland
3C Flooded pavement	6B Wet Carex nigra	Eleocharis acicularis	Rhamnus wood
4B Pot. reptans (sp. rich)	Peaty Carex nigra	8C Marl pond	Potentilla fruticosa / Frangula

At each end there is less moisture and 2B covers the ground, with some *Salix repens, Vicia cracca* and *Polygonum amphibium* at lower levels (4B). The vicinity of the swallow hole is marked by an increase of the already widespread *P.amphibium*, either in pure stand or mixed with grasses and *Potentilla anserina* (7A). The northern edge carries small areas of sedges mixed, in the drier sites, with *P.reptans* and *P.anglica*.

The main body of the lake appears to be a sheet of marl which is covered by 9C community with abundant *P.amphibium*. There is much *Chara curta* with some *C.virgata* and *C.pedunculata, Scorpidium, Potamogeton gramineus* and *Littorella* with *Alisma* and *Baldellia* also. At the eastern end there is *P.natans, P.berchtoldii, Myriophyllum spicatum* and *Calliergon giganteum*, perhaps in a less marly area. The centre of the lake has been invaded by *Phragmites, Scirpus lacustris* and *Menyanthes* with scattered *Salix cinerea*. The trees seem to be about 20years old though they could be dwarfed by the peculiar growing conditions. They have a straggly look with a tuft of leafy twigs at the top above few and mostly dead side branches.

Vegetation (ha as mapped)

2A-		3B-		5A-		6D-		9A-		11B-	
2B-	2.3	3C-		5B-	0.1	7A-	0.6	9B-		12-	0.9
2C-		3W-		5D-		7B-		9C-	27.1	Lake	
2D-	2.7	4B-	0.3	5E-		8A-	0.5	10A-			
2W-		4D-	2.2	6A-	0.4	8B-	0.2	10B-			
3A-		4W-		6B-	0.2	8C-		11A-	10.7		

Fauna: Levally Lough is a well known site for wildfowl in winter with a greater variety of species because of its permanence as a lake. Sheppard (in prep.) notes averages of wigeon 47, teal 58, mallard 28, pochard 61 and tufted duck 25, as well as golden plover 75, lapwing 91 and curlew 102. The summer birds include mallard, coot, moorhen, lapwing and black-headed gull.

Evaluation: Levally Lough is one of the wettest turloughs encountered and could be thought of as a fluctuating lake. Whatever classification is used it has very varied and rather unusual vegetation. It has the largest expanse of Marl Pond (9C) found at any site and also the largest Reedbed (11A) which occurs centrally with groups of willow bushes in it. There is a suggestion that water levels have risen recently, perhaps with the blockage of a swallow hole. If this is so the site would be unique in the turlough context but following a pattern preserved in the bottom sediments of many other basins.

Levally Lough scores highly (47) in the evaluation process and occupies sixteenth position overall. It has few rare plants actually in the turlough but substantial bird populations both in winter and summer. It may be considered as of national importance.

23. CARROWKEEL (Pollelamagur L. - Cx 44)
River System: Robe
Catchment Area: 560 ha
Altitude: 43m

Grid Ref: M 3069
6" sheet: Mayo 111
Turlough Area: 30.1 ha
Evaluation place: 22

Topography: This turlough lies between Ballinrobe and Claremorris, about 2km from the Robe river. It is contained in a linear basin which is orientated NE - SW in rolling land. There is a long-lasting lake, Poll Oilean-na-gCorr, in the narrow southern half which is about 0.5m deeper than the rest. A series of hollows occur at the northern end, one of which reaches bedrock. Otherwise the basin is drift-covered with few if any boulders still on the floor. A trench at the southern end is cut through 2-3m of till. The turlough is crossed by a causeway and bridge at the southern end.

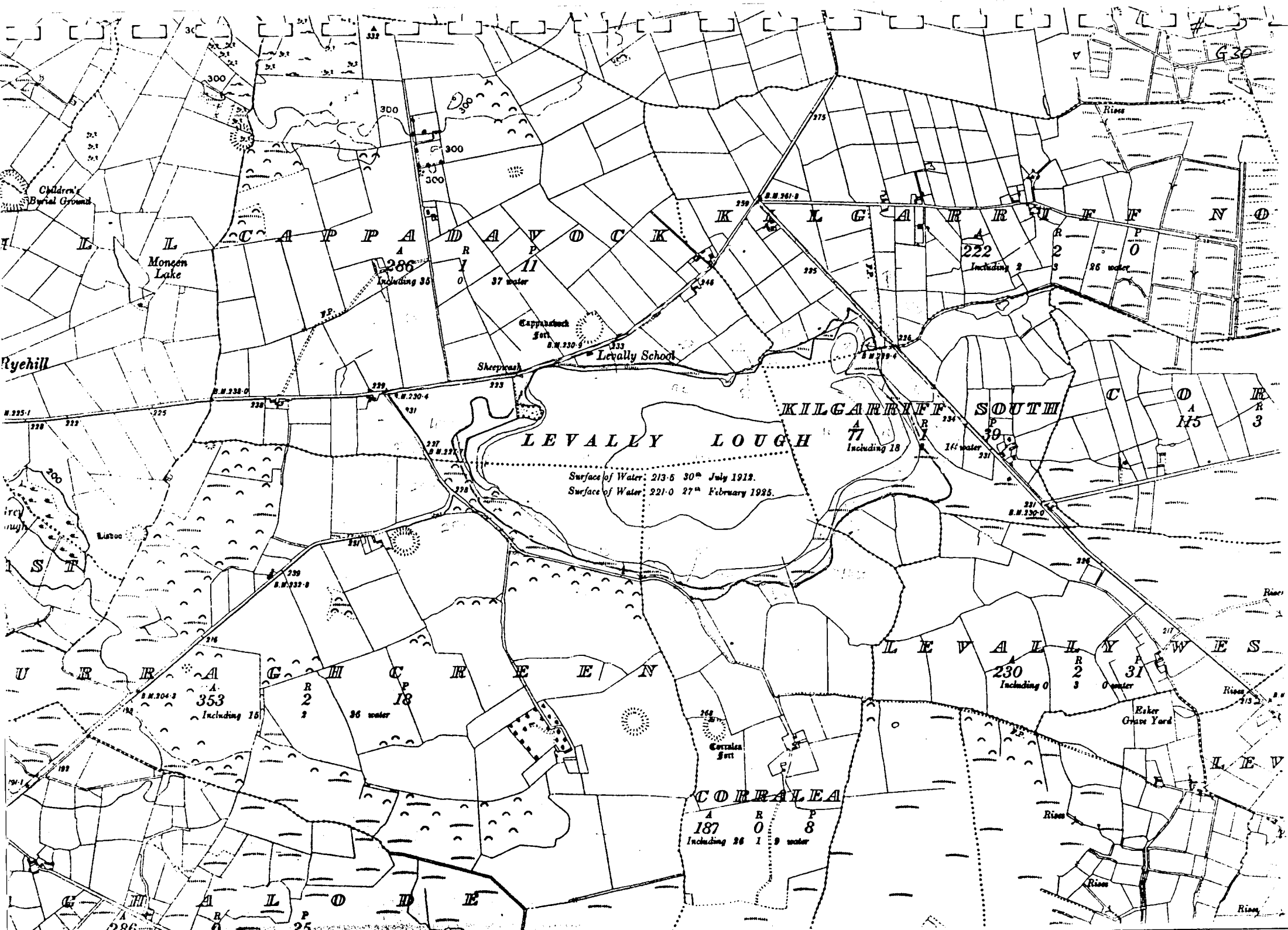
Hydrology: A drainage ditch extends throughout the length of the basin linking a pond under the farm yard (Purrauns House) with the lake and then running under the bridge to the SW. It has been extended through an undulating area (which may itself be porous) to a swallow hole outside the main turlough and beyond the reach of normal flooding.

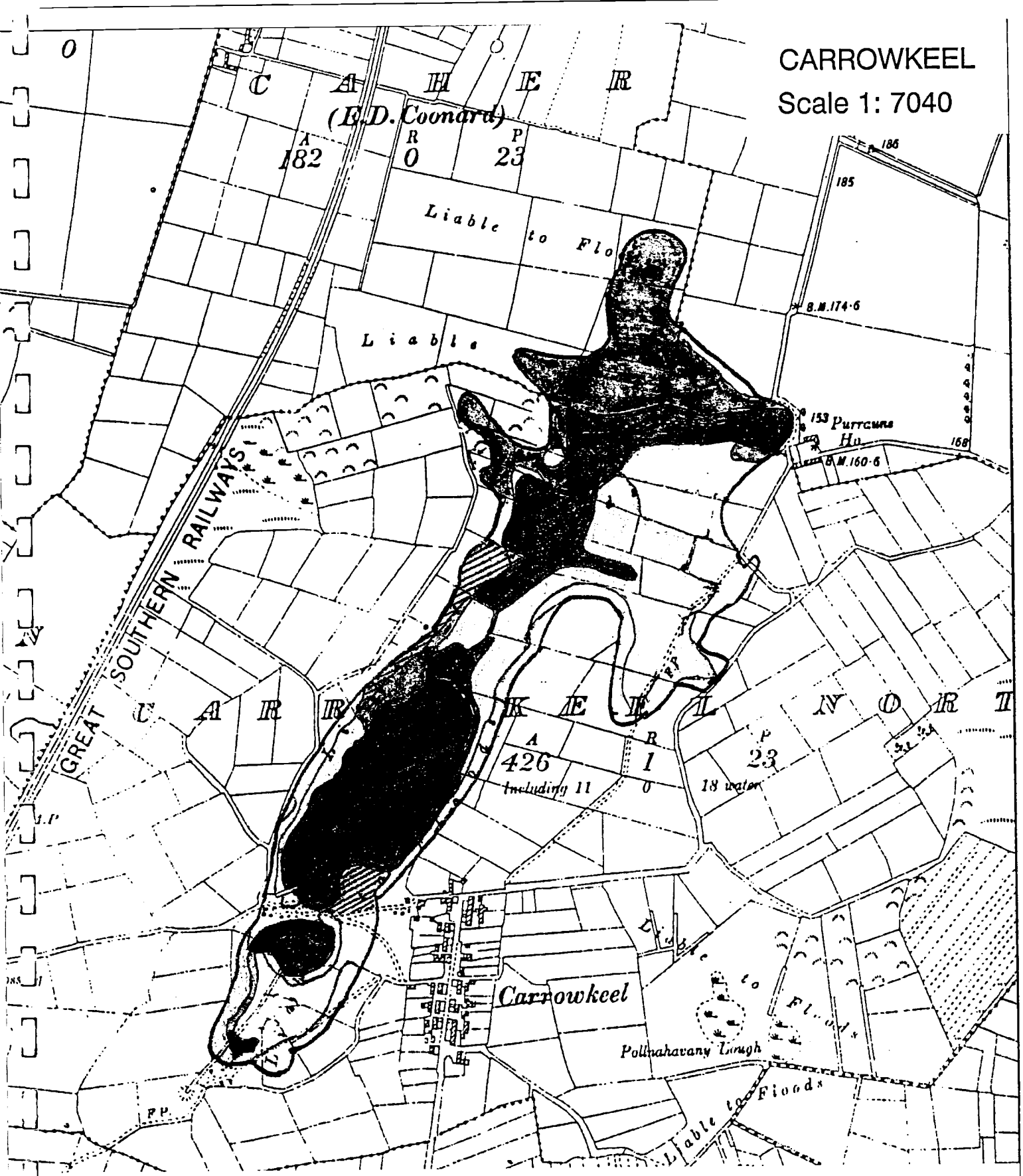
There is no sign of successful external drainage though some surplus water may be taken away at the SW end at certain times. The lime content of floodwater appears to be quite limited. There is likely to be some nutrient input from the farm at the north-eastern end and possibly from Carrowkeel village also.

Substrate: The lower land is covered by silty peat especially at the north-eastern end and in the lake where there is also a little superficial marl. Elsewhere there is usually more than 60cm sandy drift with clay at depth (Coxon, 1986).

Land Use: There is low grazing pressure through most of the area though some of the fields in the north-east are more closely grazed by sheep.

Vegetation: The lake consists of a stand of *Scirpus lacustris* with very abundant *Drepanocladus revolvens, Oenanthe aquatica, Polygonum amphibium, Equisetum fluviatile* and *Calliergon giganteum*. It is possible to walk through most of it and it is intermittently grazed. Areas of open water have *Ranunculus trichophyllus, Apium inundatum* and *Potamogeton natans*. Around the edges *P.amphibium* becomes dominant and it also covers much of the lower ground (as 8A) to the NE and SW. It runs into 6B on slightly drier ground with occasional oligotrophic stands of 5D or 3B. The 5D is most frequent at the northern end of the basin where there are a number of heathy fields (sometimes with old cultivation ridges) that are flooded sporadically by rain water. The groundwater influence seems small here, though there are a few isolated depressions which produce water sometimes but probably do not link up with the main basin.


LEVALLY LOUGH
Surface of Water: 213·6 30th July 1912.
Surface of Water: 221·0 27th February 1935.
CAPPADAVOCK
KILGARRIFF SOUTH
KILGARRIFF
LEVALLY WEST
CORRALEA
Levally School
Sheepwash
Cappadavock Fort
Corralea Fort
Esker Grave Yard
Children's Burial Ground
Moneen Lake
Ryehill
Listoo
Risers



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 12W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula

The turlough basin curves to the NE at the end into another waterbody consisiting partly of a scraw and partly of open water. The scraw is formed of *Glyceria fluitans*, *Equisetum fluviatile*, *Carex vesicaria*, *Menyanthes* and *Ranunculus lingua* with a distict section of *Eleocharis palustris*, *Sparganium emersum* and *Agrostis stolonifera* on which both *Alisma plantago-aquatica* and *A.lanceolatum* grow, in the company of *Oenanthe aquatica* and a little *Bidens tripartita*.

The south end of the basin is sprinkled with *Stellaria palustris* in several different communities, 5B, 6B and the 3A which occurs as a fringe on the western side. Higher up poor grassland of 2B type covers most ground though where slight ridges intrude it changes to 2C. In places also it has been managed and is modified into 2A.

Vegetation (ha as mapped)

2A-	1.0	3B-	1.5	5A-	0.1	6D-		9A-	+	11B-	
2B-	3.5	3C-		5B-		7A-	0.5	9B-		12-	
2C-	2.6	3W-		5D-	5.5	7B-		9C-		Lake	
2D-		4B-		5E-		8A-	4.9	10A-	0.2		
2W-		4D-		6A-	0.1	8B-		10B-			
3A-	0.4	4W-		6B-	5.3	8C-		11A-	4.6		

Fauna: Lapwing (at least 2prs) and snipe nest in the area with coot, little grebe and probably water rail in the reedbed. There is no winter data available.

Evaluation: Carrowkeel turlough for its size has one of the highest diversities of vegetation, partly because of the presence of permanent water. It offers an excellent series of communities which are obviousy linked to height and water quality. It also has a small area of scraw vegetation which is rare generally in turloughs.

The catchment is very small so the turlough would be expected to be oligotrophic. This is in fact the case at the northern end but it has a central more eutrophic band, perhaps linked to the presence of a farm at the north-east corner. The village of Carrowkeel could also be an enriching factor for the site.

The turlough scores quite highly (43) for its vegetation and rare plants and for its natural state. It is the most unusual in type of the group in north-west Galway and could be thought of as nationally important.

24. SCARDAUN [Cx 45]
River System: Robe
Catchment Area: 400 ha
Altitude: 46m

Grid Ref: M 3469
6" sheet: Mayo 111
Turlough Area: 18.3 ha
Evaluation place: 56=

Topography: Scardaun lies west of Ballindine in a shallow basin that runs NW - SE. The road terminates the western end of this depression and an esker, the east. On the south side the land rises into fields but on the north it is flatter and there is no break of slope as the ground runs into cutover bog. The floor is generally flat but small vegetation hummocks are characteristic, probably pronounced by poaching.

Hydrology: Two streams enter the turlough, from the SE end and from the bog to the north. Both have been cleaned out recently and run along the enlarged central ditch (with bridges) to a swallow hole at the NW end. The ditches have been deeply excavated, in places through 2m of till. The main swallow hole is now guarded with a grill set in concrete but there is another smaller one almost under the road in the bedrock.

The vegetation suggests that flooding is not prolonged in the turlough though the soil remains damp for much of the year. A spring exists on the south-west side where it creates a small scraw.

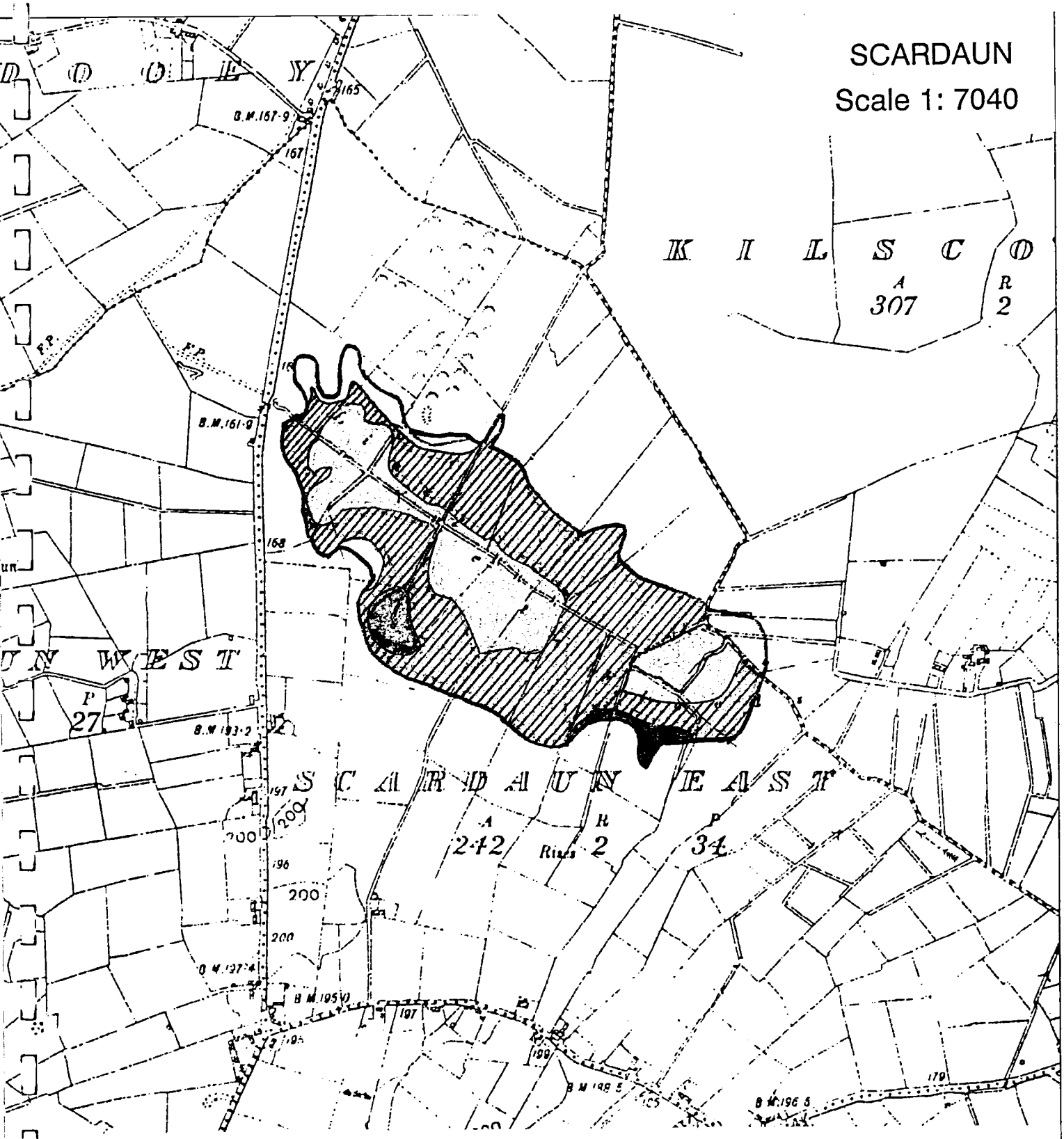
Substrate: Scardaun is a peaty turlough but the peat deposit is shallow and it does not seem to have been cutover. Coxon (1986) records 20-30cm peat over marl and then till, with bedrock at the western end. Deeper acid peat overlies till to the north of the basin.

Land Use: The land is used for cattle and although the quality of the herbage does not allow a high density of animals, they do exert significant pressure because of the soft soils. Most fields are divided by ditches, with walls on the margins. The surrounding land is poor quality rough grazing.

Vegetation: The vegetation is unusual in that it resembles that of an ill-drained pasture with few if any of the distictive turlough features. For example, *Potentilla anserina* is decidedly rare and *Fontinalis* absent while *Juncus effusus* and *Lychnis flos-cuculi* grow commonly in the central areas. The basal vegetation can be classified as 6B with *Senecio aquaticus, Carex disticha, J. effusus* and some *Deschampsia cespitosa*. Above this a type of 3B occurs with a hummocky mixture of *D.cespitosa, Filipendula ulmaria, Festuca rubra* and *Rumex acetosa*. Patches of *Iris* also occur while *Bellis, Leontodon autumnale* and even *Anagallis tenella* grow in between the hummocks (normally 35x20cm high).

This vegetation grades into rushy fields on the south side and cutaway bog to the north in a gradual way. Flooding does not


CAHER
(E.D. Coonard)
A 182 R 0 P 23
A 201 R 3 P 0
Gardenfield House
Liable to Floods
Purrauns Ho.
GREAT SOUTHERN RAILWAYS
CARROWKEEL NORTH
A 426 R 1 P 23
Including 11 0 18 water
Poll Oileán-na-gCorr
Surface of Water
144·8
3rd July 1895.
Carrowkeel
Pollnahavany Lough
Stepping Stones
CORRAC
A 569 R 1 P 12
Including 0 1 33 water
Ball Alley
A 261 R 1 P 4
Including 0 3 31 water
Level Crossing
Lehinch School
Lissatava Post Office
Purrauns
M.P.
F.P.



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- 5D Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- 6C Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- ZW Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula

extend to the base of the esker. On the south side there is an acidic patch of 2D and around the spring, a community of *Carex disticha, C. nigra* and *C.lepidocarpa* with *Briza, Parnassia* and *Equisetum palustre*. Some 2B occurs at the north-western end below rising land with gorse. Only here does the vegetation resemble a normal turlough.

Vegetation (ha as mapped)

2A-	0.4	3B-	10.8	5A-		6D-		9A-		11B-	
2B-	0.8	3C-		5B-		7A-		9B-		12-	
2C-		3W-		5D-	0.5	7B-		9C-		Lake	
2D-	0.4	4B-		5E-		8A-		10A-			
2W-		4D-		6A-		8B-		10B-			
3A-		4W-		6B-	5.2	8C-		11A-			

Fauna: The poor vegetation suggests that there is little feeding value for birds on the site and there are no records available. Snipe breed there in summer.

Evaluation: Scardaun has little diversity or interest in the vegetation which is apparently affected by recent drainage in the Robe catchment. It may be that the present hydrology does not allow turlough vegetation to persist and the plant species are readjusting to the new situation. At all events the Sedge Heath (3B) that is present is of an unusual tussocky type, more reminiscent of winter wet grassland.

The site has a low evaluation score (14) and is not considered of scientific interest.

25. KILGLASSAN [Cx 41]
River System: Robe
Catchment Area: 1280 ha
Altitude: 36m

Grid Ref: M 2864
6" sheet: Mayo 119
Turlough Area: 49.9 ha
Evaluation place: 32

Topography: Kilglassan turlough lies across a road from Caheravoostia though there is no aboveground connection between them. It has a long, narrow basin which runs NW - SE under a low ridge on the eastern side. The turlough has a northern and a southern basin and each slopes from south to north. They narrow close to the road that divides them on a causeway. The floors are generally flat though they have ditches and, in the southern one, a large amount of peat. This basin is slightly Y-shaped and it has low land in each of the arms. At the southern end there is a very lumpy area of drift which is presumably caused by subsidence over a swallow hole. The northern basin runs into a low limestone outcrop at the north end.

Hydrology: Kilglassan is a wet turlough and there are midline ditches in all sections that retain water throughout the year. In the northern part there is an obvious spring halfway up the west

side and similar features in the south probably occur under the peat. There is a swallow hole area among the rocks at the north end, also a deepened one at the north end of the southern section, one in the subsidence zone already mentioned and two possible ones at the base of the slope on the west side.

There is no evidence of external drainage.

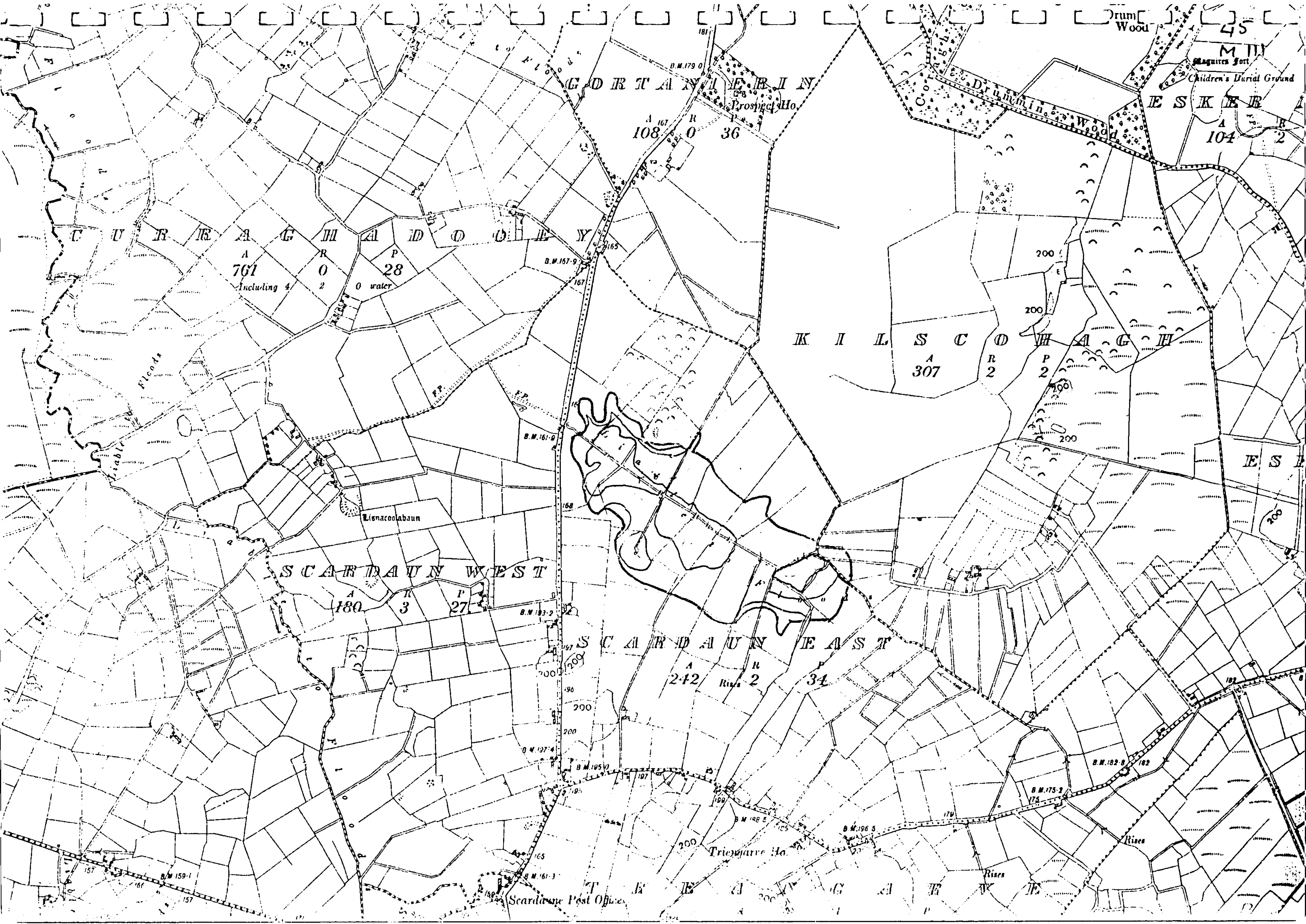
Substrate: The side slopes of this turlough are till covered but the base is obscured by peat. At the north end of the southern section Coxon (1986) records 2m peat over till. Towards the centre 90cm was found over 110cm pure marl over 25cm of impure marl over at least 140cm of silt/clay. There is a peat bank of 1.5m at one point in the southern half.

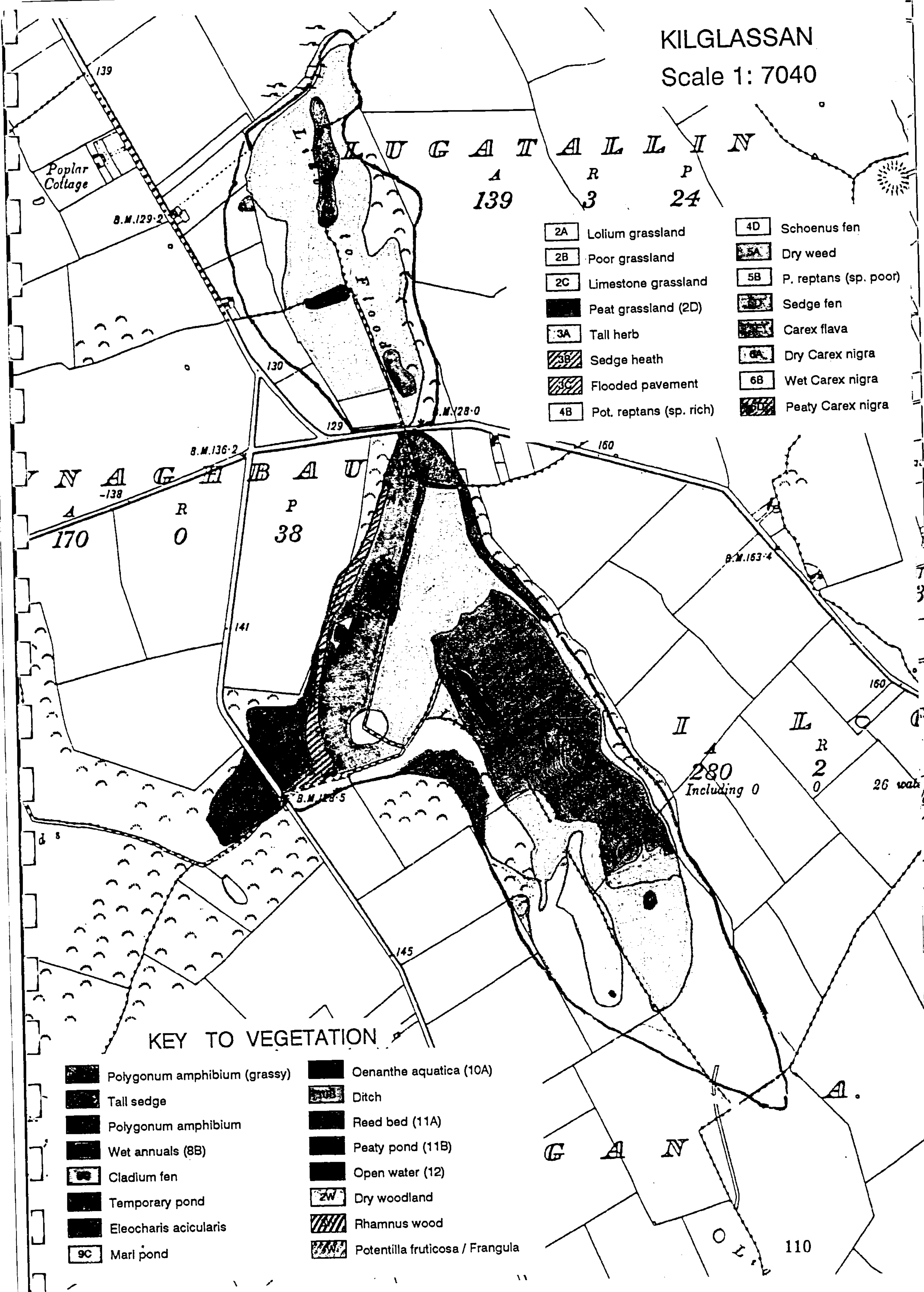
Land Use: Aside from peat cutting which was taking place about 20 years ago, the area is grazed by cattle with some sheep on the south-western side. The northern basin and the margins of the south support most animals. Land division is most often by ditches but the townland boundary in the south is marked by a bank.

Vegetation: The lowest land in the southern basin appears to be cutover peat and is now covered by 7A, a community with *Glyceria fluitans, Fontinalis, Polygonum amphibium* and *Carex vesicaria*. It contains two pools, one with *Oenanthe aquatica/Sparganium emersum*, the other with 9A. The surface rises, in a peat bank at the northern end, into 6B on peat where *Fontinalis, Hydrocotyle* and *Molinia* are the three most frequent plants. At the southern end there is an intermediate 3A community on the uneven ground with *Equisetum arvense, Phalaris* and *Carex hirta*. Above this level the peat becomes drier and 5B often takes over. This then grades into the peaty 2D or into 4B, rich in *Calliergon cuspidatum, Trifolium repens* and *Succisa* and with both *Galium boreale* and *G.verum*, as well as *Viola canina*.

The 2B community is characteristic of the westward projection of the basin at the top of the slope. It includes a little *Calluna* below gorse but where the slope begins *Nardus, Molinia* and *Carex panicea* take over to give 3B. The base of this arm is 6A, again with much *Molinia*. Water accumulates in a *Polygonum amphibium* stand here and at the north end, amidst abundant *Rorippa amphibium*.

The northern basin has a simpler vegetation pattern with grassland on the western side and a little 4B on the east. At the base two pool areas are found, the spring has 10B and the northern one 9A with *Juncus articulatus* and *Veronica scutellata*. Around the swallow hole near the rocks animal trampling gives rise to the normal weedy community of *Stellaria media, Polygonum persicaria, Potentilla anserina* and *Phalaris*.


45
M III
Drum Wood
Maguires Fort
Children's Burial Ground
ESKER
A 104 R 2
Drumminn Wood
GORTANIERIN
Prospect Ho.
A 108 R 0 P 36
CURRAGHADOOEY
A 761 R 0 P 28
Including 4 2 0 water
KILSCOHAGH
A 307 R 2 P 2
Floods
Lisnacoolabaun
SCARDAUN WEST
A 180 R 3 P 27
SCARDAUN EAST
A 242 R 2 P 34
Rises
Triennarre Ho.
Scardaune Post Office
ES


KILGLASSAN
Scale 1: 7040
Poplar Cottage
B.M.129·2
139
130
129
B.M.128·0
B.M.136·2
LUGATALLIN
A 139 R 3 P 24
-138
A 170 R 0 P 38
141
145
160
B.M.163·4
B.M.128·5
280
Including 0
2
26
110
2A Lolium grassland
2B Poor grassland
2C Limestone grassland
Peat grassland (2D)
3A Tall herb
3B Sedge heath
3C Flooded pavement
4B Pot. reptans (sp. rich)
4D Schoenus fen
5A Dry weed
5B P. reptans (sp. poor)
Sedge fen
Carex flava
6A Dry Carex nigra
6B Wet Carex nigra
6D Peaty Carex nigra
KEY TO VEGETATION
Polygonum amphibium (grassy)
Tall sedge
Polygonum amphibium
Wet annuals (8B)
Cladium fen
Temporary pond
Eleocharis acicularis
9C Marl pond
Oenanthe aquatica (10A)
10B Ditch
Reed bed (11A)
Peaty pond (11B)
Open water (12)
2W Dry woodland
Rhamnus wood
Potentilla fruticosa / Frangula

Vegetation (ha as mapped)

2A-	1.9	3B-	0.9	5A-	0.1	6D-		9A-	1.6	11B-	0.3
2B-	2.1	3C-		5B-	3.8	7A-	7.3	9B-		12-	
2C-		3W-		5D-		7B-		9C-		Lake	
2D-	3.6	4B-	6.7	5E-		8A-	0.1	10A-	0.4		
2W-		4D-		6A-	3.3	8B-		10B-			
3A-	0.5	4W-		6B-	16.5	8C-		11A-			

Fauna: The turlough is likely to be used occasionally by whooper swan but no winter counts are available. In summer it supports both breeding lapwing and snipe.

Evaluation: Kilglassan has a high level of diversity in its vegetation though not in its physiography. The diversity stems from the widespread occurrence of peat in the southern basin which brings in some of the less common communities like Peaty Pond (11B). There is also a large area of the grassy Polygonum amphibium (7A), the largest outside Rahasane.

No unusual plant species occur in the site which means that it scores (35) about halfway down the overall list. However it does have a certain value as an apparently undrained, peat-filled turlough despite its proximity to the Robe river. While the extent of cutting has modified a good part of the vegetation this in itself is a feature of the area, shown by the abundance of *Molinia* in the Wet Carex nigra (6B) community.

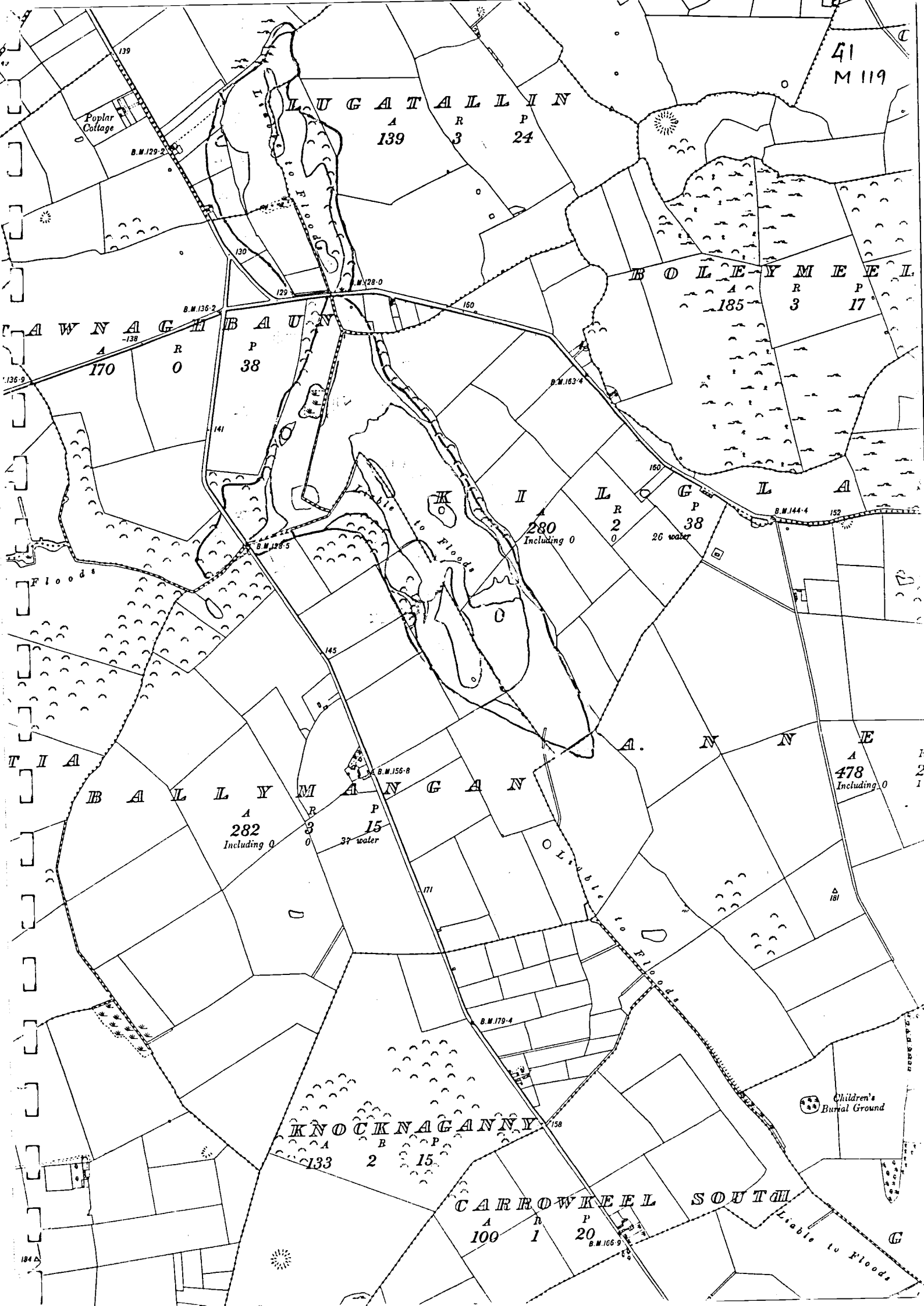
Kilglassan is considered of regional importance at this stage.

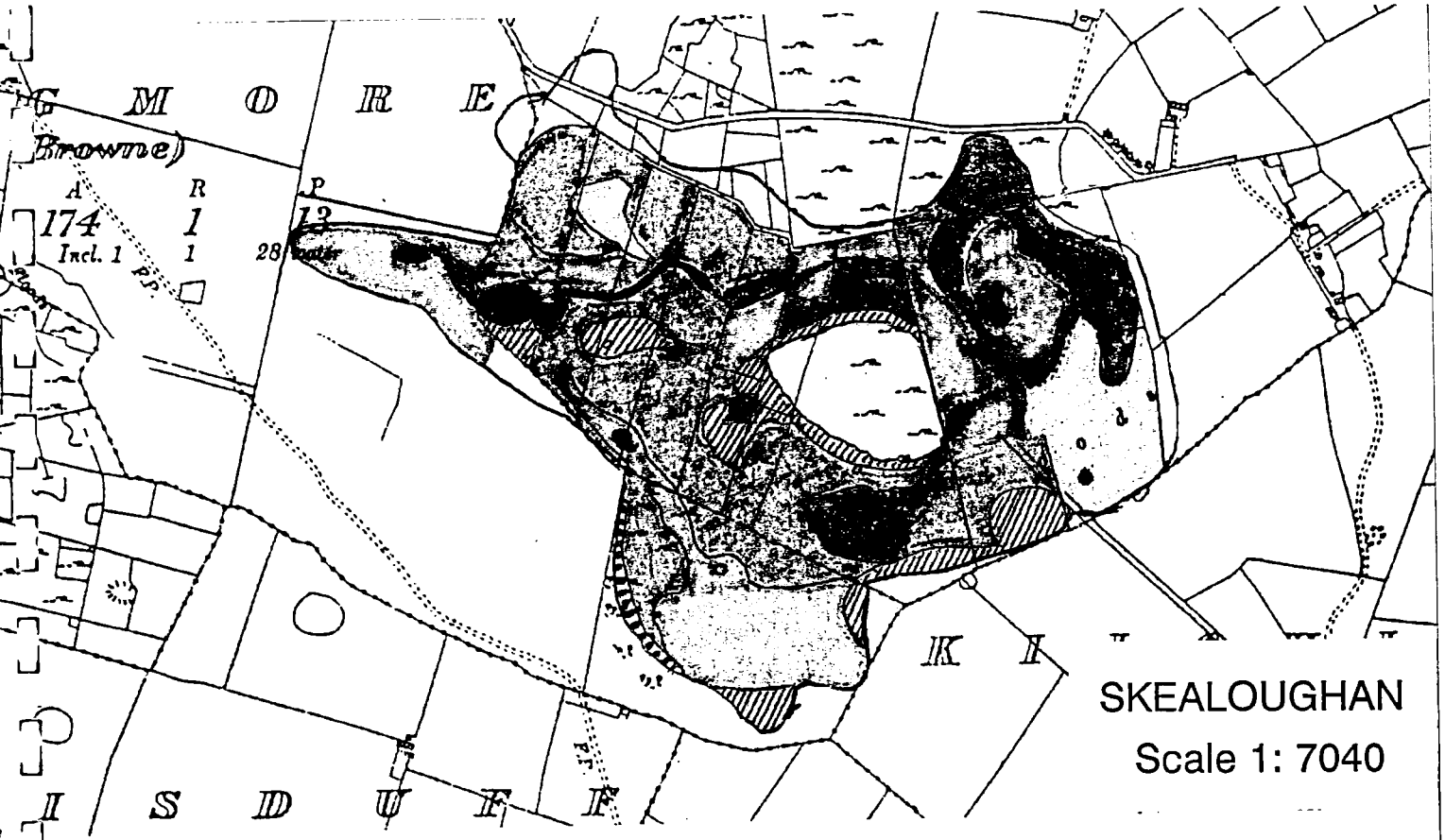
26. CAHERAVOOSTIA [Cx 39]
River System: Robe
Catchment Area: 1320 ha (incl. #25)
Altitude: 33m

Grid Ref: M 2665
6" sheet: Mayo 119
Turlough Area: 23.8 ha
Evaluation place: 40=

Topography: Caheravoostia follows a sinuous depression which lies just over 1km from the Robe River east of Ballinrobe. The floor of the basin is very flat and the surrounding topography gently rolling. There are two low points on the floor with a general slope from E - W. Higher heathy land around the minor road, which has a permanent spring-fed pond, drops into the central basin while the western end drops similarly away to the Ballinrobe road. There is a small extension of the turlough across this road.

Hydrology: A semi-permanent lake exists in the middle of the main basin associated with deep ditches and a considerable extent of wet floor. The main obvious swallow holes are in the north-west corner close to the road. There is a ditch here that may sometimes take water but it is largely blocked and there is no evidence of effective drainage.

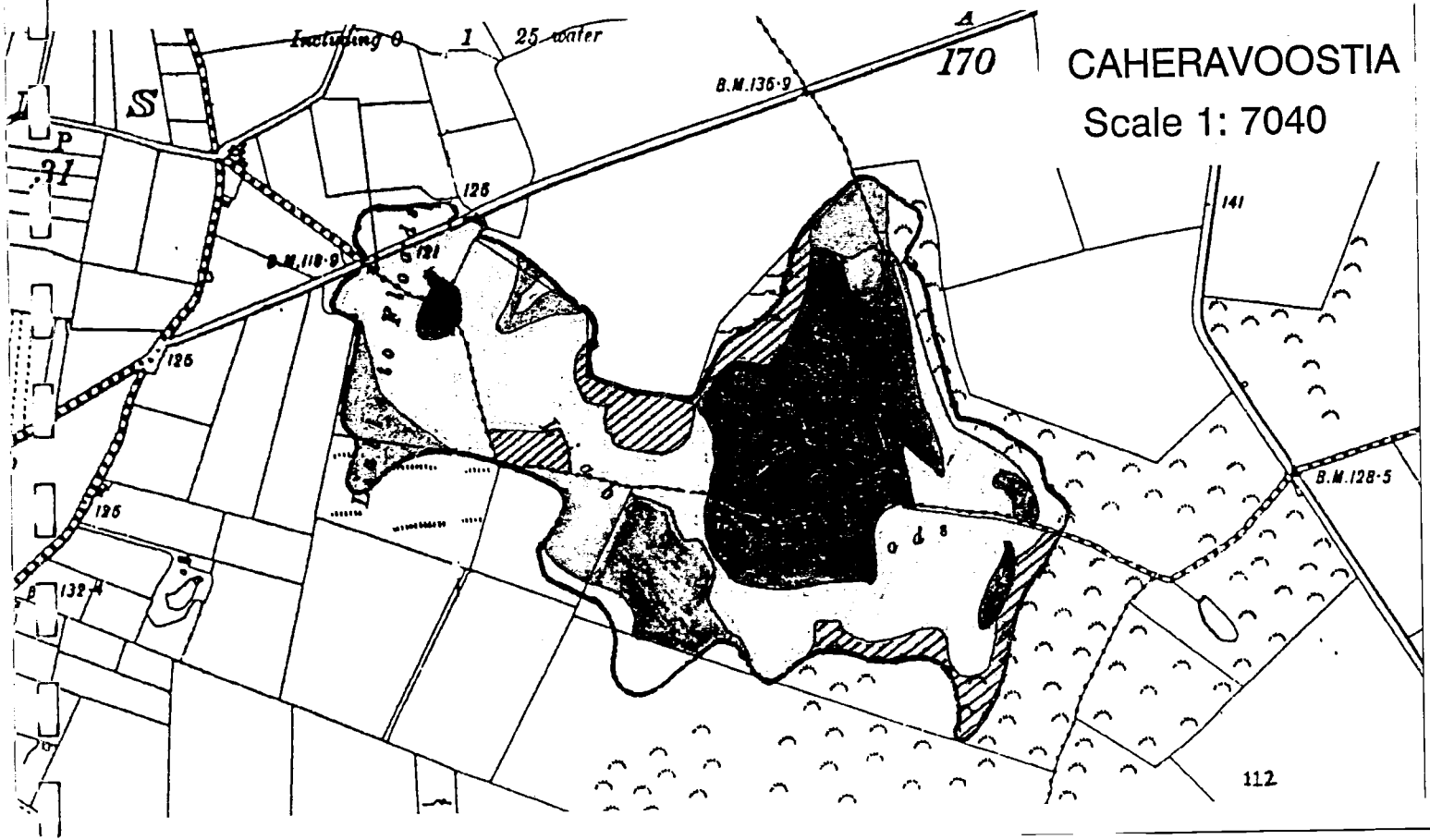

41
M 119
LUGATALLIN
A R P
139 3 24
Poplar Cottage
B.M.129·2
Liable to Floods
B.M.128·0
BOLEYMEEL
A R P
185 3 17
B.M.136·2
TAWNAGHBAUN
A R P
170 0 38
B.M.136·9
B.M.163·4
KILLGLA
A R P
280 2 38
Including 0 0 26 water
B.M.144·4
B.M.138·5
Floods
Liable to Floods
TIA
BALLYMANGAN
A R P
282 3 15
Including 0 0 37 water
B.M.156·8
ANNE
A
478
Including 0
Liable to Floods
B.M.179·4
KNOCKNAGANNY
A R P
133 2 15
CARROWKEEL SOUTH
A R P
100 1 20
B.M.166·9
Children's Burial Ground
Liable to Floods
139
130
129
160
141
145
171
158
184
181
152



SKEALOUGHAN
Scale 1: 7040

KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula



CAHERAVOOSTIA
Scale 1: 7040

The floodwaters seem relatively poor in lime judging by the lack of deposit on the vegetation.

Substrate: Significant amounts of peat have built up in the lower parts of the turlough but there is an input of silt also which prevents its expression in the vegetation. Coxon (1986) in one core records brown silty clay over fen peat over marl over peat over peaty marl over dark grey silt. The hydrological history therefore seems highly complex.

Land Use: Cattle are quite numerous in the turlough and there were a few sheep at the western end also at the time of the visit. Some dumping had occurred at the end of the northern limb. There appears to be little silage made or tillage in the area.

Vegetation: Wet communities cover much of the floor of the basin involving a very large amount of *Polygonum amphibium* around the lake and 6B in most other places. *Carex vesicaria* occurs in this vegetation with grazed *Phalaris* and there is some stunted *Oenanthe fistulosa* in the northern limb. The lake itself consists of a central patch of *Equisetum fluviatile, Menyanthes* and *Polygonum amphibium* surrounded by *Oenanthe aquatica, Apium inundatum* and *Sparganium emersum* (10A). This community is repeated in the depression at the NW end with large amounts of *Rorippa amphibium*.

Rising out of these damp areas there is a much trampled patch of 5A at the end of the northern limb with a little 6A. At the east end two further depressions lie below a fringe of 3B adjoining the *Ulex* above. This extends in patches around much of the turlough but on the south-west side it is generally the related, more sedgy 5D with *Carex hostiana*. Otherwise grassland communities occur (2A or B).

The pond outside the turlough proper at the east end contains a scraw of *Carex diandra* and *C.rostrata* with *Potentilla palustris, Sagina nodosa, Epilobium palustre* and both *Glyceria fluitans* and *G. declinata*.

Vegetation (ha as mapped)

2A-	0.7	3B-	3.3	5A-	0.5	6D-		9A-		11B-	0.5
2B-	1.2	3C-		5B-		7A-	0.3	9B-		12-	
2C-		3W-		5D-	2.3	7B-		9C-		Lake	
2D-		4B-		5E-		8A-	4.8	10A-	0.5		
2W-		4D-		6A-	0.8	8B-		10B-			
3A-		4W-		6B-	9.0	8C-		11A-			

Fauna: The wetness of the turlough floor encourages waders to breed and there were lapwing, snipe and redshank doing so in early July.

There is no other ornithological data available.

Evaluation: Caheravoostia is a uniform, wettish turlough with some peat development in its eastern half. There is a nice zonation of

vegetation with oligotrophic types around the margins becoming more eutrophic with depth. This culminates in an extensive patch of Polygonum amphibium (8A) surrounding a permanent waterbody where a number of waders nest.

Apart from this feature, the occurrence of *Oenanthe fistulosa* is of interest as it is rare everywhere west of the Shannon. It is not usually a turlough species and it occurs here presumably because of the wetness of the site. It brings the score (31) to a point somewhat below that of the adjacent Kilglassan and would make Caheravoostia of local importance on a four point scale.

27. GREAGHANS [Cx 42]
River System: Robe
Catchment Area: 240 ha
Altitude: 37m

Grid Ref: M 2963
6" sheet: Mayo 119
Turlough Area: 36.5 ha
Evaluation place: 20=

Topography: This is a very flat turlough, the most easterly of the group of five near Ballinrobe. It has an oval basin just discernible from the surrounding farmland and is overlooked by the Greaghans farm. The northern shore is slightly higher than the south and at one place there are belts of trees enclosing a narrow arm. There is a little loose rock here. Westwards the basin runs away into pastures without an obvious boundary.

There are minor undulations in the floor associated with pools and sinks.

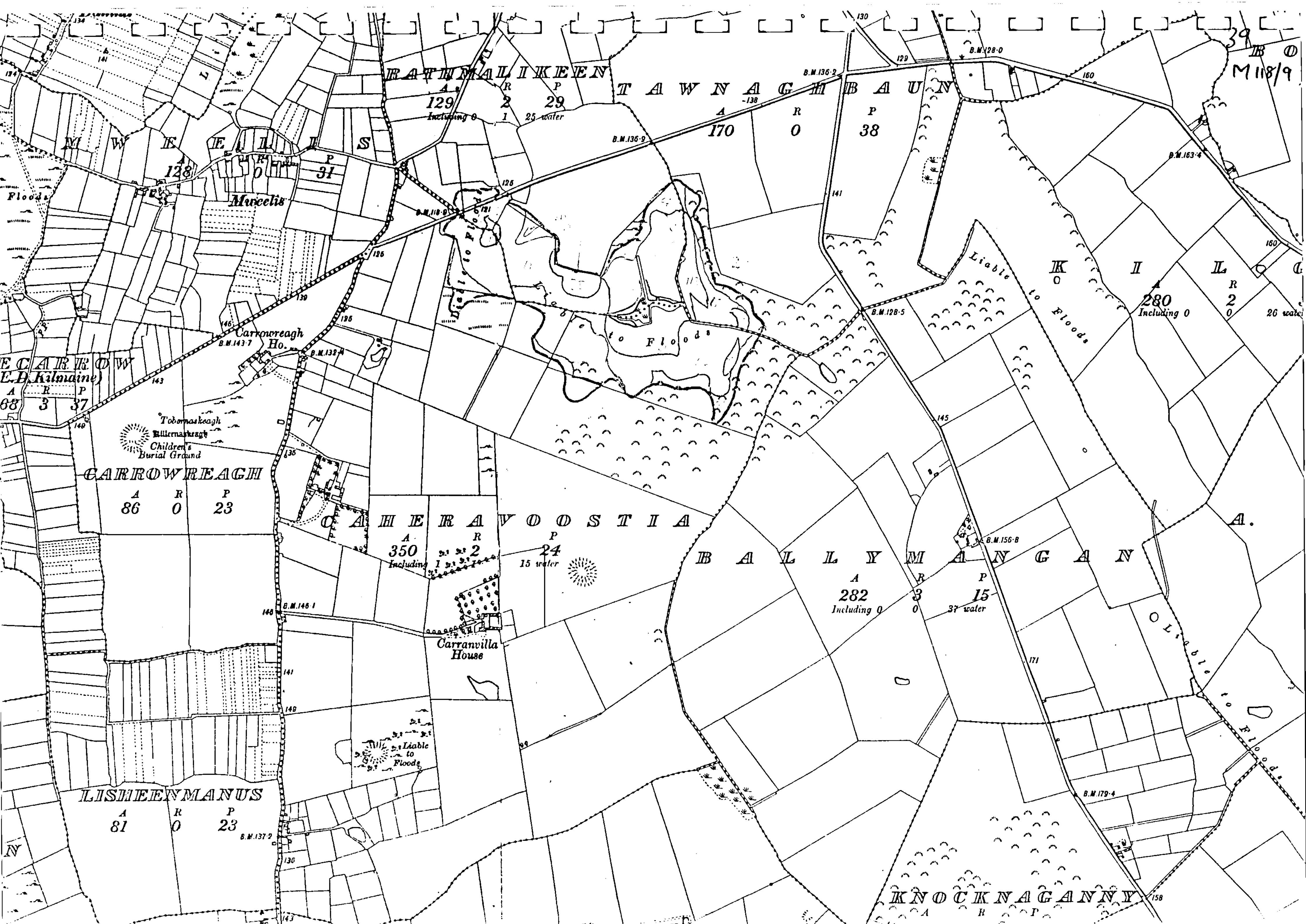
Hydrology: The northern edge of the basin is the deepest and the main swallow hole occurs by a wall near the farm. There are also some depressions on the SW side at the edge of the central marl (Coxon, 1986). Two streams enter the area, one in the north-east corner fills a pond before finding its way underground. The other at the south point was dry. There is also a ditch in the NW corner but this is shallow and it has little effect in taking water away. There is no other evidence of drainage.

There is significant nutrient input from the inflowing stream (which has sewage fungus) and from the two adjacent farms. The second farm is at the west end of the basin.

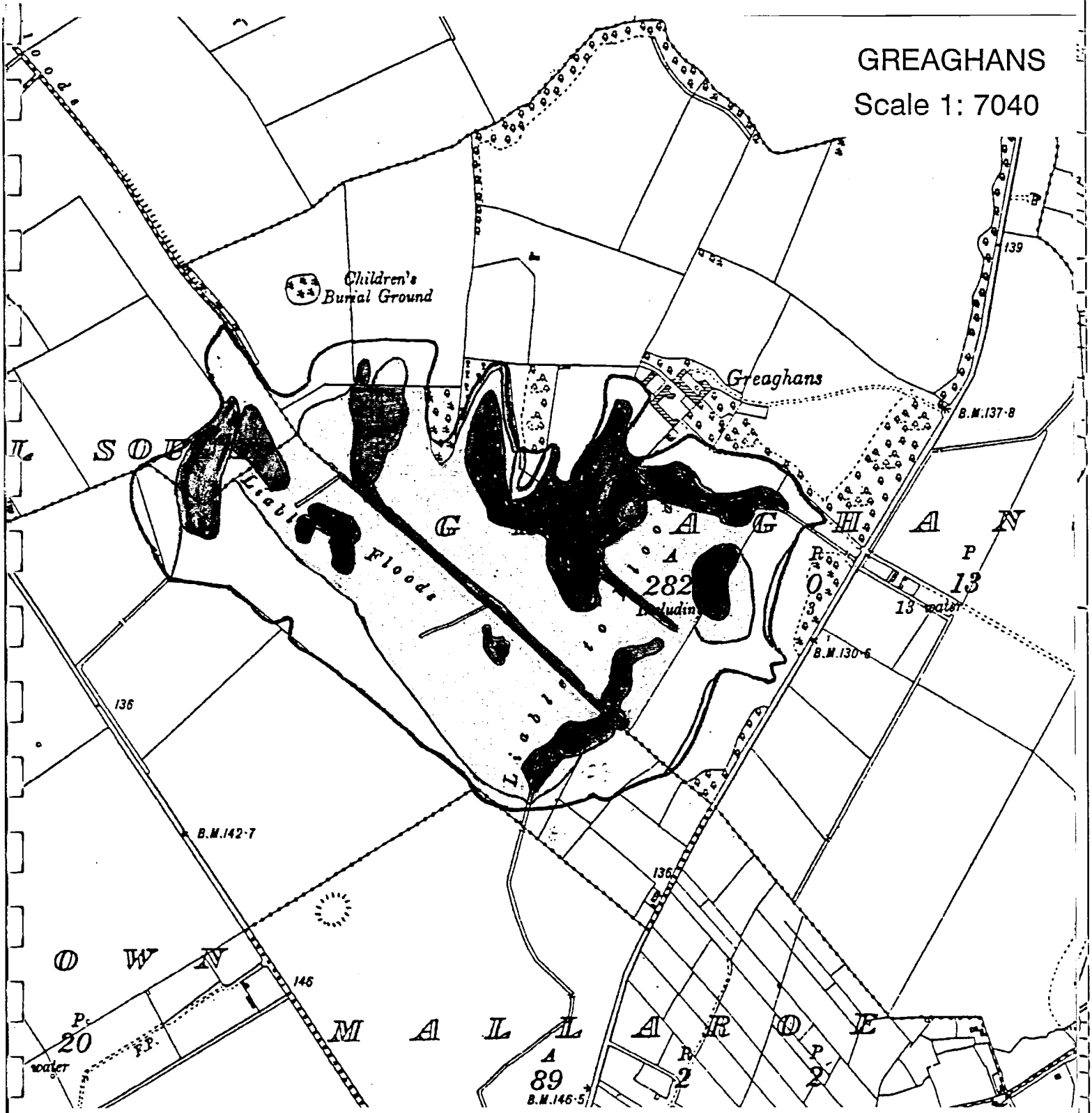
Substrate: The edges of the basin are till over bedrock but the flat centre is a sheet of marl representing a long standing ancient lake. Coxon (1986) notes about 450cm of marl above a metre or so of grey clay. The surface soil is slightly peaty.

Land Use: Cattle and a few sheep have free access to the turlough which appears to be owned by the two neighbouring farms. Grazing pressure is most severe at the western end falling off eastwards so that the vegetation beside the road is scarcely grazed at all. Walls occur around the fringes of the basin.


Carrowmore
Level Crossing
Liable to Floods
Rises
Lisheenmanus
A 81 R 0 P 23
A 86 R 0 P 23
Burial Ground
M 118
A 350
Lisavalley Lodge
A 87 R 2 P 9
Including 0 0 26 water
Liable to Floods
Level Crossing
Railways
Skealoghan
A 302 R 0 P 18
Castle (in Ruins)
Cregmore (Browne)
A 174 R 1 P 13
Incl. 1 1 28 water
Kilquire Lower
A 331 R 3 P 7
Cregmore (Lynch)
A 123 R 3 P 8
Including 0 2 6 water
Lisduff
A 66 R 1 P 14



39
M118/9
RATHMALIKEEN
A 129 R 2 P 29
Including 0 1 25 water
TAWNAGHBAUN
A 170 R 0 P 38
MWEELIS
A 128 R 0 P 31
Muccelis
Carrowreagh Ho.
Tobernaskeagh
Killernaskeagh
Children's Burial Ground
CARROWREAGH
A 86 R 0 P 23
ECARROW
E.D.Kilmaine
A 68 R 3 P 37
CAHERAVOOSTIA
A 350 R 2 P 24
Including 1 2 15 water
Carranvilla House
Liable to Floods
LISHEENMANUS
A 81 R 0 P 23
BALLYMANGAN
A 282 R 3 P 15
Including 0 0 37 water
KILLA
A 280 R 2
Including 0 0 26 water
KNOCKNAGANNY
B.M.136·2
B.M.136·9
B.M.118·9
B.M.143·7
B.M.133·4
B.M.146·1
B.M.137·2
B.M.128·0
B.M.128·5
B.M.163·4
B.M.156·8
B.M.179·4



KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge	10B	Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)		Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb		Carex flava	8C	Cladium fen		Open water (12)
	Sedge heath		Dry Carex nigra		Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)		Peaty Carex nigra	9C	Marl pond		Potentilla fruticosa / Frangula

Vegetation: There are two main communities on the floor of this large area. 6B occurs throughout the flatter regions giving way to 8A in the channels and lower sites where water collects near the swallow hole. At one enriched part of the western end the *Polygonum amphibium* shares dominance with grasses such as *Alopecurus geniculatus* and *Poa trivialis* and weeds *(Stellaria media* & *Rumex* spp.*)* creating 7A. In places these low-lying sites are trampled sufficiently to replace the perennial plants by annuals. These are commonest at the western end where there are relatively large areas of *Polygonum* species with *Rorippa islandica, Alopecurus geniculatus, Stellaria media, Ranunculus trichophyllus* etc.

There were two ponds present in early July with *Potamogeton crispus* and *P.natans, Sparganium emersum, Rorippa amphibium* and *Lemna trisulca.*

The margins of the basin are covered with grassland communities. There is a fringe of 2C at the eastern end and this leads downwards into a slightly leached 2B with *Potentilla erecta* and *Molinia* as well as *Phleum* and *Ranunculus acris.* The south-western edge is marked by more eutrophic fields with *Climacium* among the *Poa pratensis* and *Lolium.* Such pasture has been reseeded in the far NW corner. The indentations on the north shore represent low tree-covered spurs of *Fraxinus, Crataegus* and *Euonymus* above a narrow fringe of *Phalaris* and *Filipendula* with either *Potentilla reptans* or *Lysimachia nummularia* growing through it.

Vegetation (ha as mapped)

2A-	4.6	3B-		5A-		6D-		9A-		11B-	
2B-	6.0	3C-		5B-	0.2	7A-	1.0	9B-		12-	0.1
2C-	0.2	3W-	0.1	5D-		7B-		9C-		Lake	
2D-		4B-		5E-		8A-	7.0	10A-	0.1		
2W-		4D-		6A-		8B-	0.8	10B-			
3A-	0.2	4W-		6B-	15.8	8C-		11A-			

Fauna: Greaghans is noted for its swans in winter and 40 whoopers were there in January 1986 (Merne, pers. comm.). Counts of the wildfowl are not available but dabbling duck must occur in some numbers. Snipe would seem to nest there in summer.

Evaluation: This turlough has an interesting variety of plant communities in a rather uniform basin. This includes substantial amounts of Wet Annuals (8B) which is not widespread in Mayo and, unusually, no Sedge Heath (3B). There is also a clear zonation of vegetation with depth.

Its evaluation score (44) puts Greaghans in nineteenth place in the overall list. This is derived from its vegetation diversity and the presence of rare species, e.g. *Rorippa islandica* and *Lysimachia nummularia.* It also has a small catchment area but in nutritional terms this is concealed by the input of farm wastes from two separate sources. Its importance to wildfowl in winter

confirms the fact that the turlough should be considered as of regional importance.

28. SKEALOGHAN [Cx 38]
River System: Cross R./Lough Corrib
Catchment Area: 480 ha
Altitude: 35m

Grid Ref: M 2563
6" sheet: Mayo 118
Turlough Area: 28.0 ha
Evaluation place: 19

<site map on p 112>

Topography: Skealoghan is 5km from Ballinrobe, the nearest of a group of five turloughs that occupy hollows in rolling countryside. It lies in a complex basin with a central rocky rise and further limestone outcrops on the north and north-east sides. A lakeshore 'notch' is evident along parts of the margin. The eastern end consists of a series of interconnecting arms of standing water between flat peaty blocks where there has been peat cutting. In the north-west corner and the very south there are quite large, flat basins but elsewhere the ground in uneven.

Hydrology: Water flows from west to east in the basin, with two pools at the western end linked by a channel to the main waterbody. While parts of the channel dry out in most years, the other features retain permanent water. There is also a cattle pond dug at the eastern end.

A small swallow hole exists in the north-east, at the end of a curving channel and another similar one in the south-east. The largest ones however occupy the west end. They give rise to highly calcareous water.

No drainage attempts are apparent, either within or outside the site.

Substrate: Most of the turlough has a peaty soil which varies from 0-85cm thick and rests on calcareous sand (Coxon, 1986). There is some accumulation of marl in the ponds at the eastern end.

Land Use: The whole area is grazed by cattle and a few horses and the walls are generally broken down and easy to cross. Some fencing around the ponds limits access here. Peat cutting has ceased but its marks remain, particularly at the eastern end.

Little silage-making or tillage was seen in the vicinity.

Vegetation: The waterbody at the eastern end consists of winding channels filled with *Scirpus lacustris* (11A). At their edges *Equisetum fluviatile, Potamogeton natans, P. crispus* and *P.coloratus* grow with a little *Juncus bulbosus* and *Chara* sp. One of the channels discharges into an area of *Polygonum amphibium* but elsewhere they are surrounded by communities of types 5 & 6. 6A is frequent on the level peaty surface and 6B in the more low-lying south-east corner. 5D is of widespread occurrence throughout

the basin, on the mid-slopes around the central rise and at the western end. The NW corner contains an ungrazed stand with abundant *Dactylorhiza incarnata, Festuca rubra* and *Vicia cracca* and some *Plagiomnium elatum* in damp places. Occasionally *Carex flava (serotina?)* grows through the *C.hostiana*, perhaps where the peat is being recolonised afetr cutting (MacGowran, 1985).

3B occurs as a skirt around the central rise and also at the southern edge. *Nardus* is quite frequent in it and parts are enriched by *Stellaria palustris, Alchemilla filicaulis, Dactylorhiza fuchsii & maculata, Carex pilulifera* and *Euphrasia anglica*.

A fringe of woodland with *Rhamnus* occurs around the flat southern basin but in other places 2B or 2A is prevalent. At the western end *Carex nigra* seems to extend to the highest level of flooding above pools of *Scirpus lacustris, Menyanthes, Potentilla palustris, Myriophyllum alterniflorum* and occasional *Carex elata*.

Vegetation (ha as mapped)

2A-	0.5	3B-	2.7	5A-		6D-		9A-	0.4	11B-	0.5
2B-	1.3	3C-		5B-		7A-	0.7	9B-		12-	0.1
2C-		3W-	0.2	5D-	10.9	7B-		9C-	0.3	Lake	
2D-		4B-		5E-	0.7	8A-	0.9	10A-			
2W-		4D-		6A-	6.1	8B-		10B-			
3A-		4W-		6B-	2.1	8C-		11A-	1.7		

Fauna: Bird data is limited on this site but there is a record of 5 whooper swan in January 1986. In summer lapwing, snipe, mallard and water rail nest.

Evaluation: Skealoughan is a diverse site with much variation in topography and vegetation. For its area it has more plant communities than most other turloughs. Only Ardkill (Mayo), Lough Aleenaun and Lough Mannagh in Clare are comparable. Indeed it has some resemblance to a Burren turlough with the exposure of rock and marl with reedbeds at the eastern end. It is an oligotrophic site and little influenced by human activity.

It scores highly (45) in the evaluation scheme because of these features and the presence of a good selection of breeding waders. In addition it contains *Stellaria palustris* which only occurs in four northern turloughs.

Skealoughan can be thought of as regionally if not nationally important.

29. ARDKILL [Cx 40]
River System: Robe
Catchment Area: 40 ha
Altitude: c.36m

Grid Ref: M 2763
6" sheet: Mayo 119
Turlough Area: 16.0 ha
Evaluation place: 26=

Topography: Ardkill turlough occurs close to Greaghans and Caheravoostia but is rather different in character being set amongst low limestone knolls, with drift around the south and east. A spur of exposed pavement extends out from the northern edge and reappears again as a central island with low cliffs. Together with the SW shore they give the western end of the basin unusually steep slopes. To the east the turlough opens out somewhat, taking in some undulations but no further bare rock. There is much loose rock in the north-eastern part and it is built into several walls.

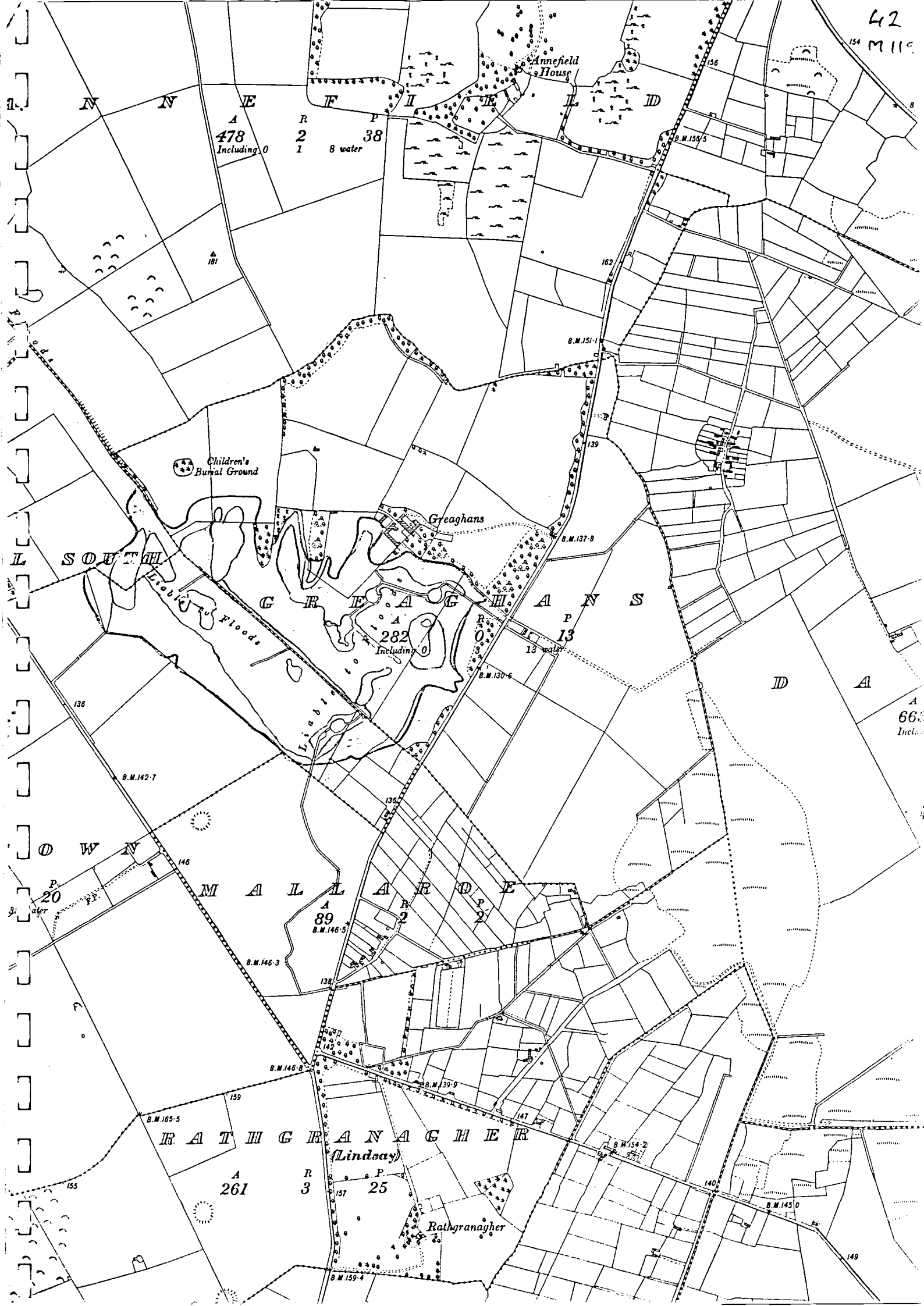
Hydrology: There is a long-lasting lake in the deepest, western end of the basin which is of the order of 6m below flood level. A shallower lake also occurs, seemingly perched at a higher level in the south-east. In the SW corner there is a swallow hole at the base of the slope and just above floor level. Water also rises at the edge of the northern rock outcrop as a spring. There is no aboveground inflow to the basin nor any sign of drainage.

Floodwaters appears to be well saturated with lime judging from the remains on the vegetation.

Substrate: Peat has accumulated in the lower-lying parts with marl where the water is more permanent. At the north-eastern end the peat is notably hummocky, perhaps indicating some subsidence. Coxon (1986) states that the flat areas are covered by dark brown peat, peat over marl or peat/marl with shells.

Land Use: The upper parts of the turlough are grazed consistently by sheep and cattle but the lower ground is too wet for much of the year. It is trampled however by cattle coming to drink. East of the site there is a newly-built farm with a huge silage operation which takes in the large fields seen on the map. This could influence the groundwater to a major extent, much more than the smaller farm at the SW corner.

Vegetation: The vegetation at Ardkill is highly diverse for such a small area because of the great range of water level and the occurrence of bare rock. At the topmost level there is a narrow fringe of limestone grassland around the outcrops with 2B on the drift soils to the south and east. The sloping ground below this generally has 3B with *Nardus* but no *Molinia*. A small, ungrazed field of 3A also occurs on the western edge where the zonation is particularly well displayed. Midslopes here contain *Potentilla reptans* either in 4B or 5B. At floor level 6B grows on the flatter areas but it is replaced at a certain frequency of flooding by 9A. This had been deeply probed by birds at the NE end at the time of


42
Annefield House
N N E F I E L D
A 478 Including 0
R 2 1
P 38 8 water
Children's Burial Ground
Greaghans
L SOUTH
Liable to Floods
G R E A G H A N S
A 282 Including 0
R 0
P 13 13 water
D A
Liable to
O W N
M A L L A R O E
A 89
R 2
P 2
P 20
F.P.
RATHGRANAGHER (Lindsay)
A 261
R 3
P 25
Rathgranagher
B.M.156·5
B.M.151·1
B.M.137·8
B.M.130·6
B.M.142·7
B.M.146·5
B.M.146·3
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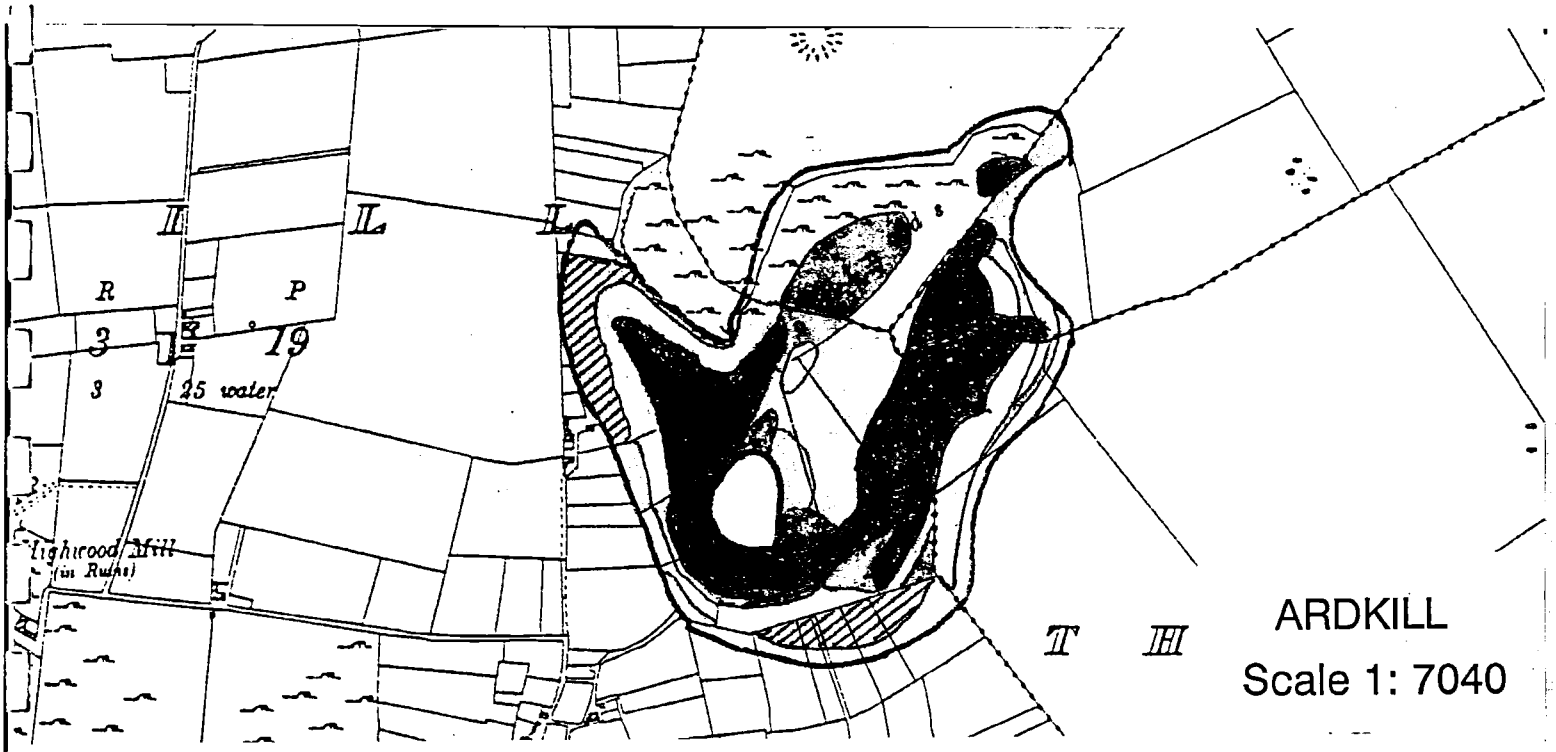
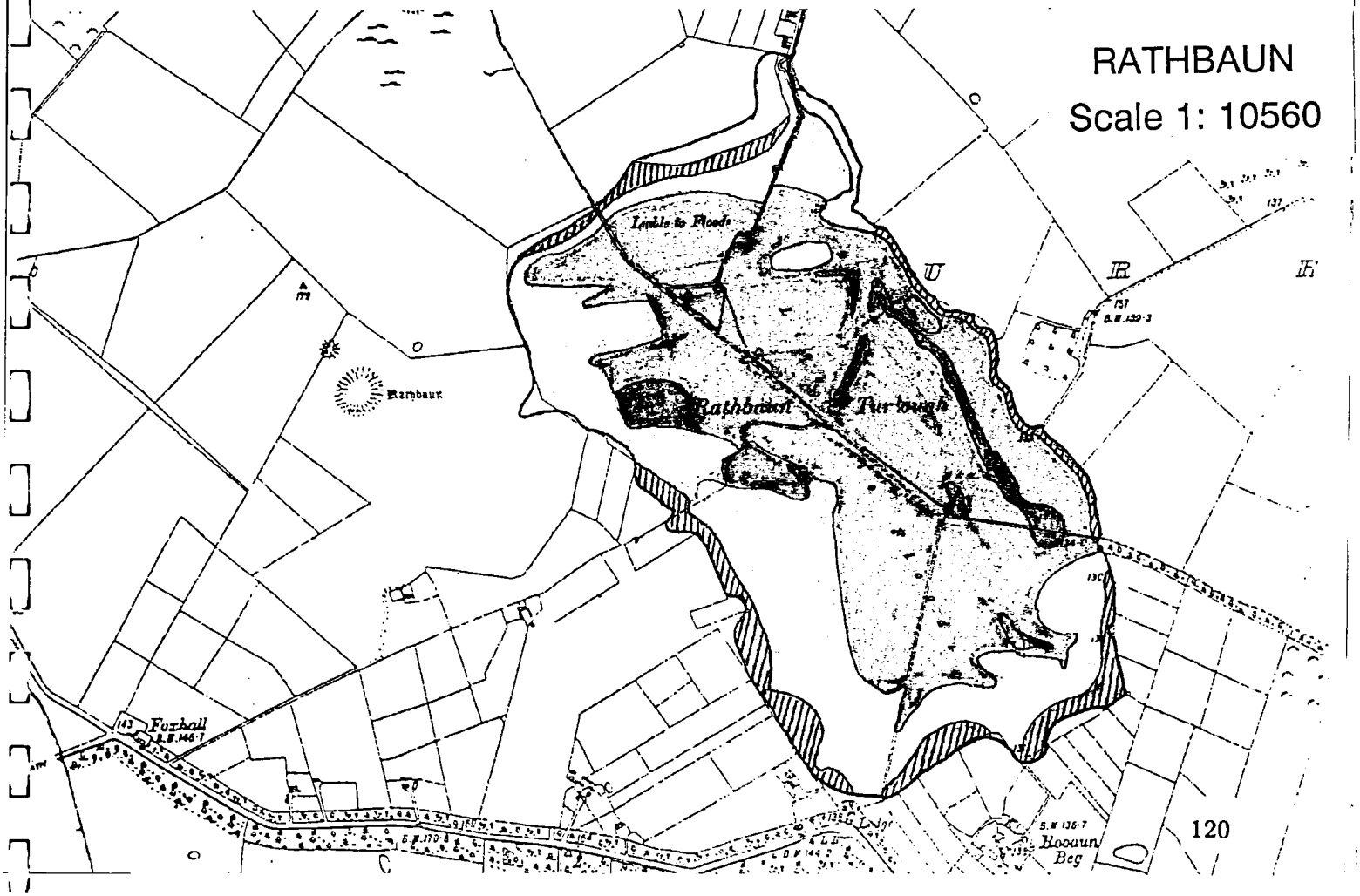
B.M.139·9
B.M.165·5
B.M.154·2
B.M.145·0
B.M.159·4



ARDKILL
Scale 1: 7040

KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge	10E	Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)	5D	Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb		Carex flava	8C	Cladium fen		Open water (12)
3B	Sedge heath	6A	Dry Carex nigra		Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)	6D	Peaty Carex nigra	9C	Marl pond		Potentilla fruticosa / Frangula



RATHBAUN
Scale 1: 10560

the visit. The main lake supports abundant *Polygonum amphibium* and *Rorippa amphibium* with floating stems at least 6m long. There is, unusually, no *Potamogeton natans*, only *P.berchtoldii*.

The central parts of the island are not flooded and contain scrub with *Rosa pimpinellifolia, Glechoma* etc. There is *Rubus caesius, Rhamnus, Thalictrum flavum* and *Rosa tomentosa* at the flood line and this grades eastwards into two patches of *Carex hostiana* (5D). Between them is a little 3A, with *Vicia cracca* and *Festuca arundinacea* before the ground drops away into a larger area of *C.nigra* mixed with *Lysimachia vulgaris* and *Caltha*. The shallower of the two lakes occurs along the south-east edge of the turlough. It is mostly grown over with *Polygonum amphibium, Scirpus lacustris* and *Equisetum fluviatile* and has a soft marly bed with abundant *Myriophyllum spicatum, Sparganium emersum* and *Lemna trisulca*. There is a small extension of this pond at the NE end where the ground is hummocky. The walls are draped with a spectacular abundance of *Fontinalis* and *Rorippa amphibium*.

Vegetation (ha as mapped)

2A-		3B-	1.3	5A-		6D-		9A-	1.0	11B-	
2B-	1.7	3C-		5B-	0.4	7A-		9B-		12-	1.7
2C-	0.2	3W-		5D-	0.3	7B-		9C-		Lake	
2D-		4B-	1.9	5E-		8A-	2.6	10A-			
2W-		4D-		6A-	0.4	8B-		10B-			
3A-	0.9	4W-		6B-	3.1	8C-		11A-	0.5		

Fauna: There were 14 mallard on the lake in early July and they may nest on the central island. In addition snipe, lapwing and common sandpiper probably breed. There is no winter data available.

Evaluation: Both in topography and vegetation this is a remarkable turlough. It would seem to have the largest fluctuation (8-10m) in water level of any site in the Mayo/Roscommon area though this could be exaggerated by its small size. This factor causes a large number of vegetation types to occur: with 13 types in an area of 16ha it is one of the most diverse in the country. A feature of the site is the narrow bands of plant communities around the southern end of the lake but there are also reedbeds and a large area of open water. The lateness at which this dries out in summer suggests that it could offer a suitable habitat to annual mosses such as *Ephemerum* and *Pottia*. The only unusual species recorded on this survey was *Thalictrum flavum* which has not been found elsewhere in H17.

Ardkill scores (41) in the mid range of the evaluation scheme because of its vegetative and physical features. It has a small catchment, one of the smallest of any turlough, but there are signs that it suffers enrichment from an intensive farm to the east. There is no suggestion of drainage however and this together with its unusual hydrology suggests that it should be considered of national importance.

30. RATHBAUN [Cx 43]
River System: Clare

Grid Ref: M 3561
6" sheet: Galway 15
Mayo 119

Catchment Area: 1245 ha
Altitude: 37m

Turlough Area: 66.9 ha
Evaluation place: 40=

<site mmap on previous page>

Topography: Rathbaun turlough occupies a well defined basin in low, rolling countryside halfway between Tuam and Ballinrobe. There is bedrock in the low bluffs on the eastern side and much loose rock has been dug out of the ditches in the north and west. There is a little natural rock lying about too, especially on the eastern side. The floor is distinctly undulating with flat channels along much of the eastern side and a much deeper one associated with the old lake and swallow hole on the west. The shape of the area is almost a rectangle with a slight extension along the valley at the north end.

Hydrology: A considerable river drains into the turlough from the country to the north as well as Altore Lough. It flows in a dug out channel, first south-west at about 1m below floor level, then south-east before escaping west (2-3m below this level) to a swallow hole beside a temporary lake. The drainage into the rock alters or has been altered from time to time so that abandoned channels and piles of excavated material occur around about. A ditch runs almost the length of the basin from the south-east, discharging into the same channel in the centre.

The turlough seems drier than it would naturally be because of drainage and there is little liklihood of peat forming today. Local knowledge is that it floods for five months in most years. The floodwaters appear moderately but not excessively limey.

Substrate: Coxon (1986) records upwards of 30cm of peat over a cosiderable thickness of marl, over drift.

Land Use: The turlough is divided on the western side but is commonage on the east (10.5 ha). All areas are grazed, the common land very heavily by sheep and cattle. The vegetation has broken down in the most frequented areas.

Vegetation: Rathbaun has a simple topography and the vegetation follows the contours in a fairly regular way. The topmost zone is mostly 3B with frequent *Nardus, Molinia, Climacium* and *Leontodon taraxacoides*. A little 2C is associated with the rock outcrops at the north end. As the slope lessens, 5B comes to dominate the vegetation, particularly on the shallower western side. Apart from drains the bottom community is 6A with a little *Polygonum amphibium* over peat. This vegetation suffers from sheep treading in the commonage, especially in the shallow channels and hollows that retain dampness the longest. Here there are extensive areas of annual communities with *Filaginella, Juncus bufonius,*

Chenopodium rubrum and four *Polygonum* species prominent *(P.persicaria, P.hydropiper, P.minus* and *P.aviculare)*. A drier sheep lie near at hand has *P.arenastrum* and *Rorippa palustris* while the lake bed contains abundant *R.islandica. Stellaria media* is ubiquitous, even among the *Carex nigra* vegetation on the floor.

The drains have aquatic vegetation that may sometimes dry out, including *Glyceria fluitans, Rorippa amphibium, Polygonum amphibium* and *Myriophyllum spicatum*. At the north end the flowing water contains *Sparganium emersum, Apium nodiflorum, Potamogeton crispus* and *Oenanthe fistulosa* (10B).

Vegetation (ha as mapped)

2A-	1.2	3B-	5.5	5A-	0.2	6D-		9A-	0.6	11B-	
2B-		3C-		5B-	20.2	7A-		9B-		12-	
2C-	0.9	3W-		5D-		7B-		9C-		Lake	
2D-		4B-		5E-		8A-	0.9	10A-			
2W-		4D-		6A-	34.8	8B-	2.3	10B-			
3A-		4W-		6B-		8C-		11A-			

Fauna: There are no ornithological records available from this site and it is certainly too dry and heavily grazed for breeding waders.

Evaluation: The size and general character of this turlough is worthy of note. It is a simple basin with an inflowing river and is therefore fairly unusual in type. However the swallow hole has been opened up and the river channel deepened so its hydrology must be considerably altered from its natural state. Because of its physical uniformity the site contains large areas of three plant communities: the largest stand of Dry Carex nigra (6A) of any turlough and the third largest of Potentilla reptans-species poor (5B) and Wet Annuals (8B). These latter areas contain both *Chenopodium rubrum* and *Rorippa islandica* so the rare plant input to the evaluation scheme pushes up its score to 31.

The turlough is too dry at the moment for full development of its vegetation but the nature of its (internal) drainage would make it possible for water levels to be raised and managed. It is therefore listed as of regional value.

31. SHRULE II (Lough Nakill - Cx 33)
River System: Black (L. Corrib)
Catchment Area: 522 ha
Altitude: 28m

Grid Ref: M 2654
6" sheet: Mayo 121, 122
Turlough Area: 104.1 ha
Evaluation place: 8

Topography: This site is called Shrule II to distinguish it from another site to the south of the town that has been drained. (Kill is one of the townlands at the eastern end). The turlough is orientated E - W in an extensive natural basin just north of

Shrule by the Kilmaine road. Slightly higher scrub-covered land rises on the north side but otherwise it is surrounded by gently undulating farmland. There is much peat development in the basin which consequently appears almost totally flat. It narrows at the western end, leading through to a more permanent lake beside the old Ballybackagh village.

A few rocks break through the surface around the edges of the turlough: there are two low outliers of limestone on the northern side which do not get covered by floodwater. Odd rocks are also sprinkled at the eastern end, a few of them much eroded by water and apparently in the positions they held in a former lake.

Some shallow channels exist along the south shore in the vicinity of swallow holes where the peat did not develop (or has been removed).

Hydrology: As mentioned above the turlough is in a natural hollow with no overground outflow. Three swallow holes occur along the southern shore. They have all been enlarged: the largest is now about 4m deep and 10m in diameter. They are fenced and channels have been cut into them - sometimes through rock. Water drains southwards to them but a median drain has also been cut in the peat and this runs through till into the western lake. Water in fact seems to flow in to the basin from the west but the flow may be reversed at times. At the eastern end there is a connection to the Black River which passes through rising land.

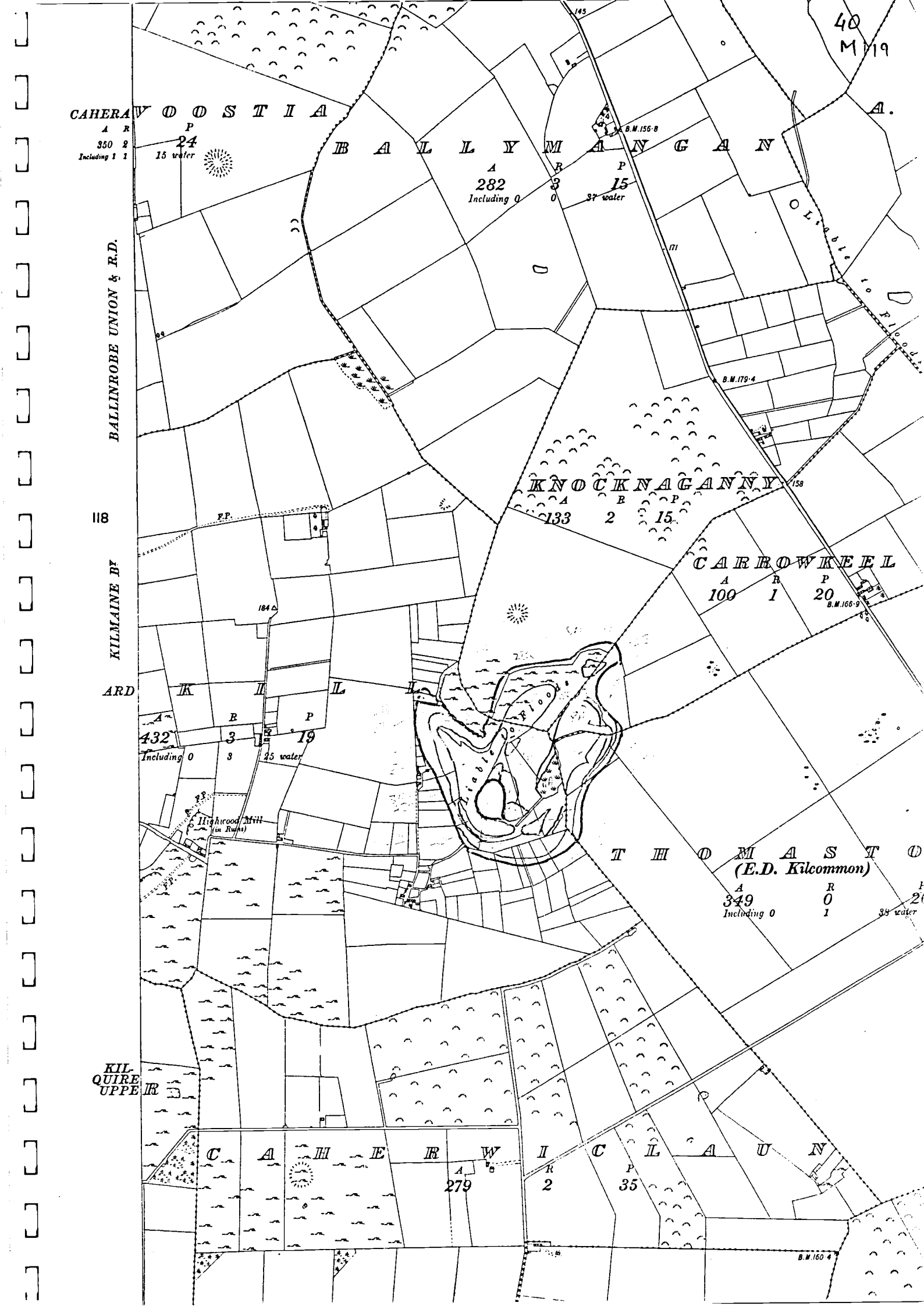
Although these drainage attempts have been made it appears that the turlough still floods regularly and has been little modified by them. The floodwaters apppear lime-rich.

Substrate: The greater part of the basin is covered by peat which has been partly cut away. A section in a site without peat showed 30cm marl with shells, then 40cm peaty marl, then 50cm humified peat and then an unknown thickness of pure marl (Coxon, 1986). Obviously the turlough has had a varied history of flooding and peat growth in the past. The southern edge is largely free of peat and around the swallow holes trenching has revealed about 2m of till.

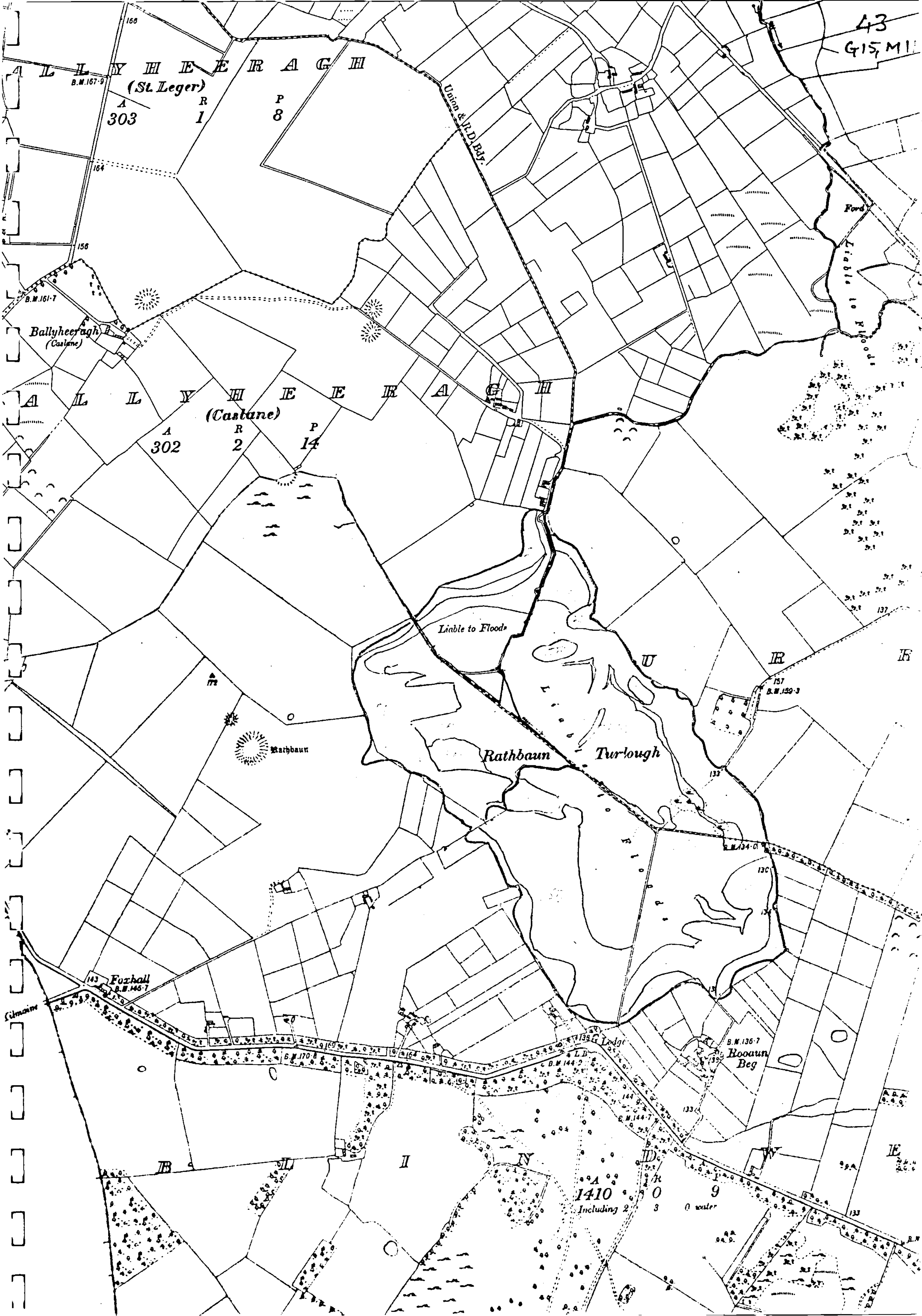
Land use: Most of the turlough is very lightly grazed because of the amount of peat but it is still divided into fields by ditches. Around the margins some of the peat has been reclaimed and is used by cattle. The southern side is similarly grazed and the cattle concentrate around the swallow holes.

Peat cutting does not now occur.

Vegetation: Alkaline peat covers the major part of the turlough and carries 4D in the drier parts. *Schoenus* and *Molinia* are dominant on this with *Carex lepidocarpa, Achillea ptarmica* and *Parnassia*. In one place on the south side this becomes so little flooded that it is replaced by 2D, *Briza* and *Juncus conglomeratus* growing amidst scattered *Schoenus*. Towards the centre the 4D soon


40
M 19
CAHERA
A R P
350 2 24
Including 1 1 15 water
WOOSTIA
BALLYMANGAN
A R P
282 3 15
Including 0 0 37 water
A.
B.M.156·8
B.M.179·4
158
KNOCKNAGANNY
A B P
133 2 15
CARROWKEEL
A R P
100 1 20
B.M.166·9
BALLINROBE UNION & R.D.
KILMAINE BY
118
ARD
KILL
A R P
432 3 19
Including 0 3 25 water
184
F.P.
Highwood Mill (in Ruins)
THOMASTO
(E.D. Kilcommon)
A R
349 0
Including 0 1
KIL-QUIRE UPPER
CAMEROW
A
279
ICLAUN
R P
2 35
B.M.160·4

43
G15, M11



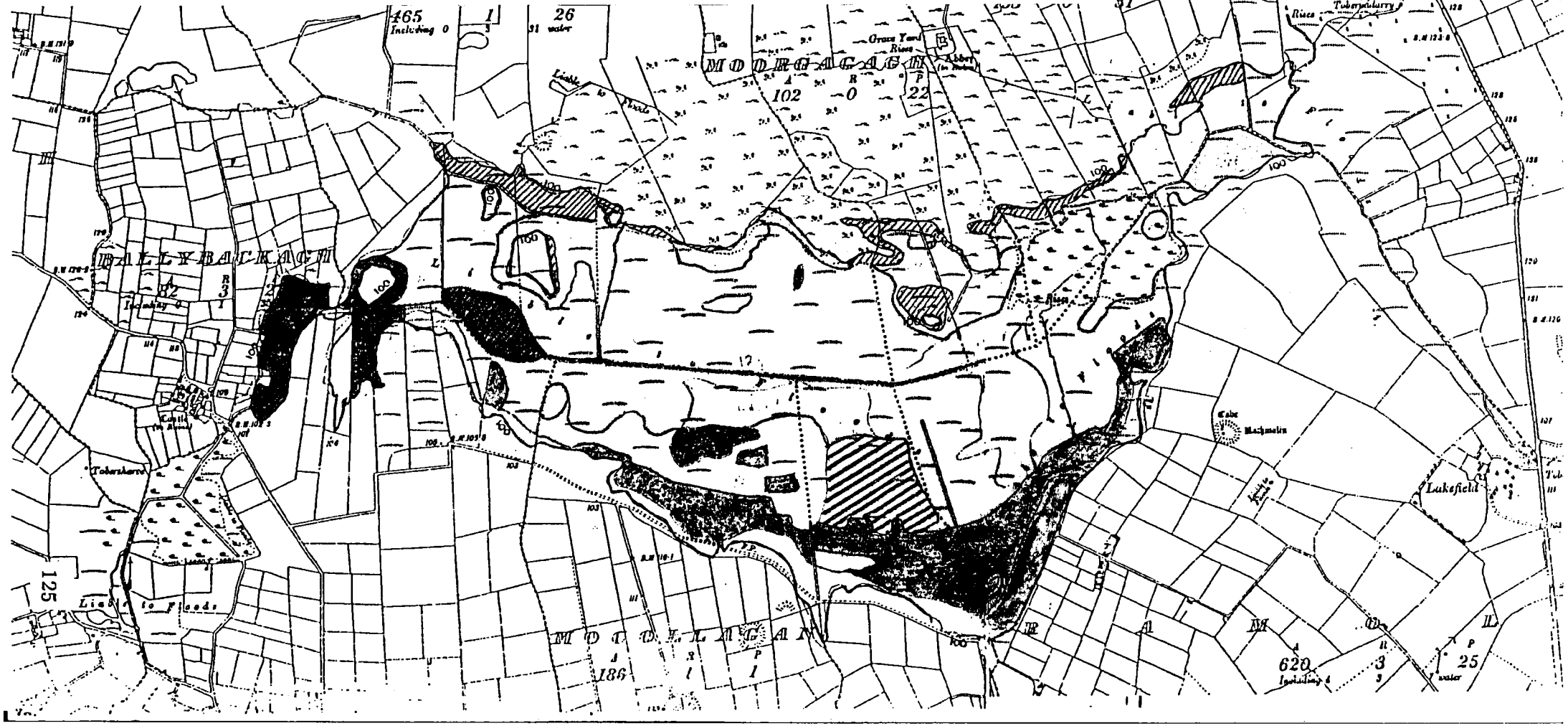
ALLYHEERAGH
(St. Leger)
A 303 R 1 P 8
Union & R.D. Bdy.
Ballyheeragh
(Caslane)
ALLYHEERAGH
(Caslane)
A 302 R 2 P 14
Rathbaun
Liable to Floods
Rathbaun Turlough
Ford
URR
Foxhall
Kilmaine
Lodge
Rooaun Beg
A 1410 R 0 P 9
Including 2 3 0 water

KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge		Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)	5D	Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb	5E	Carex flava	8C	Cladium fen		Open water (12)
3B	Sedge heath	6A	Dry Carex nigra		Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)	6C	Peaty Carex nigra	9C	Marl pond		Potentilla fruticosa / Frangula

SHRULE (L.NAKILL)

Scale 1: 10560



gives way to the wetter 8C which contains *Cladium* and the sedges, *Carex lasiocarpa, C.rostrata* and *C.elata. Cladium* forms an almost pure stand at the eastern end where marsh is marked on the O.S. map.

Ponds and ditches cut in the peat have quite a rich flora, including *Veronica anagallis-aquatica, Zannichellia, Utricularia vulgaris, Sparganium minimum* and *Myriophyllum verticillatum.* Water penetrating from the western end seems to outweigh the strong calcareous influence and creates a small patch of purer sedges, *Carex elata* and *C.lasiocarpa* with *Menyanthes* and *Caltha.*

The northern and southern edges of the basin are rather different in character. There is limestone on the north, exposed as a boulder beach below a bluff. *Schoenus, Galium boreale, Plantago maritima* and *Thalictrum flavum* grow here beside *Euonymus, Solanum dulcamara* and *Malus sylvestris.* More usually there is 3B with *Deschampsia, Potentilla erecta* and *Carex hostiana.* There are traces of 3A also which is well developed at the eastern end in a modified peaty field south of the stream. Here *Filipendula, Lysimachia vulgaris, Carex hirta* and *Vicia cracca* form a tall community.

The southern edge has a lesser thickness of peat but there is still sufficient for an expanse of 5E based on *Carex panicea, C.flava (serotina?), Hydrocotyle* and *Ranunculus flammula.* To the east *C.hostiana* becomes important (5D). Shorewards there are patches of *Polygonum amphibium* near the swallow holes with 5B behind. A green, lagg-like band at one point is filled with *Agrostis stolonifera, Baldellia, Veronica catenata & scutellata,* and a little *Potamogeton natans.*

The western end of the turlough is drier than elsewhere and areas of 2A and 2D occur. Through a narrow channel there is a *Phragmites* bed with *Scirpus lacustris* and *Juncus subnodulosus.*

Vegetation (ha as mapped)

2A-	1.4	3B-	4.7	5A-	0.1	6D-		9A-	0.3	11B-	
2B-	5.1	3C-	0.4	5B-	2.6	7A-		9B-		12-	0.8
2C-		3W-		5D-	3.9	7B-	17.5	9C-		Lake	
2D-		4B-		5E-	6.7	8A-	0.7	10A-			
2W-		4D-	20.2	6A-	1.9	8B-		10B-			
3A-	1.5	4W-		6B-	0.2	8C-	49.9	11A-	2.3		

Fauna: Both snipe and lapwing nest in the turlough and some mallard were also flushed from the central drain. There is no winter information available.

Evaluation: Shrule II is a large and very calcareous turlough with a high level of physical and vegetational diversity. It has 18 types of plant communities which is second (with Coole/ Newtown) only to Carran in Co. Clare. Fen vegetation is especially well developed with the largest extent of Cladium fen (8C) and of Schoenus fen (4D) in any site. There are also important stands of

Tall sedge (7B) and Carex flava (5E) - the last a community only found in four turloughs. The parallels with Carran are notable: both are oligotrophic, highly calcareous turloughs with extensive peat deposits and they share many vegetation types. Shrule does have a richer corner however, around the swallow hole in the south-east.

The site supports a good range of unusual plants, among them *Sparganium minimum, Utricularia vulgaris, Myriophyllum verticillatum* and *Rorippa sylvestris*. It also has a small catchment area and seems to be little modified by man though there is some superficial drainage. For all these reasons it achieves a high score (63) in evaluation which brings it into eighth place overall. This concurs with the general impression that it is a most important site which can be considered of international importance.

32. TURLOUGH O'GALL [Cx 27]
River System: Black (L. Corrib)
Catchment Area: 240 ha
Altitude: 28m

Grid Ref: M 3551
6" sheet: Galway 42
Turlough Area: 50.9 ha
Evaluation place: 26=

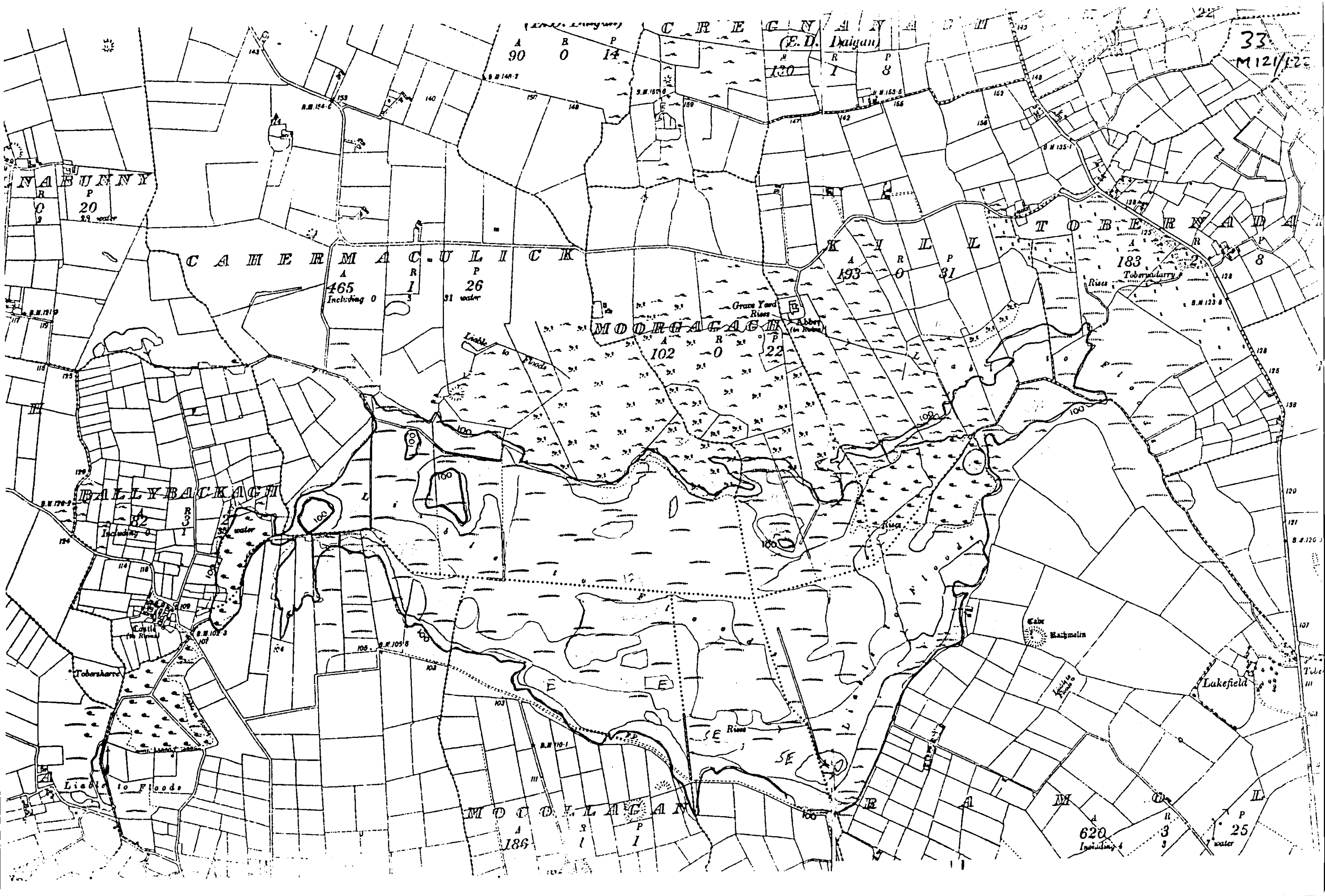
Topography: Turlough O'Gall lies between Shrule and Tuam about 3km west of Belclare. It is beside Mossfort House on the map so is sometimes known by this name. The surrounding countryside is very flat but the turlough can be viewed from the Knockmaa ridge to the south. The floor of the basin is uneven because of bedrock, especially in the eastern half. To the west there is a large expanse of level ground based on flat limestone which occasionally outcrops. The flat areas around the central lakes seem to have been partly dug out, perhaps as marl pits.

Hydrology: There were three areas of standing water at the time of the visit: a circular (natural?) pond under an outcrop in the centre of the northern edge, a cattle pond at the junction of three walls in the centre and a linear broad ditch just to the south-east. Flood water seems likely to enter from the northern pool and also at the base of the rocky slope that forms the NE side. A swallow hole occurs at the south-east end: there are three hollows caused by subsidence.

The turlough is a dry one and Coxon (1986) considers that the arterial drainage of the Clare river has curtailed flooding. The OPW maps suggest that it lies in the Black River catchment rather than in the Clare, receiving some of its water from the hills to the south.

Substrate: Quite deep marl deposits occur in the basin (90-150cm) and they are normally covered by 10cm of peaty soil.

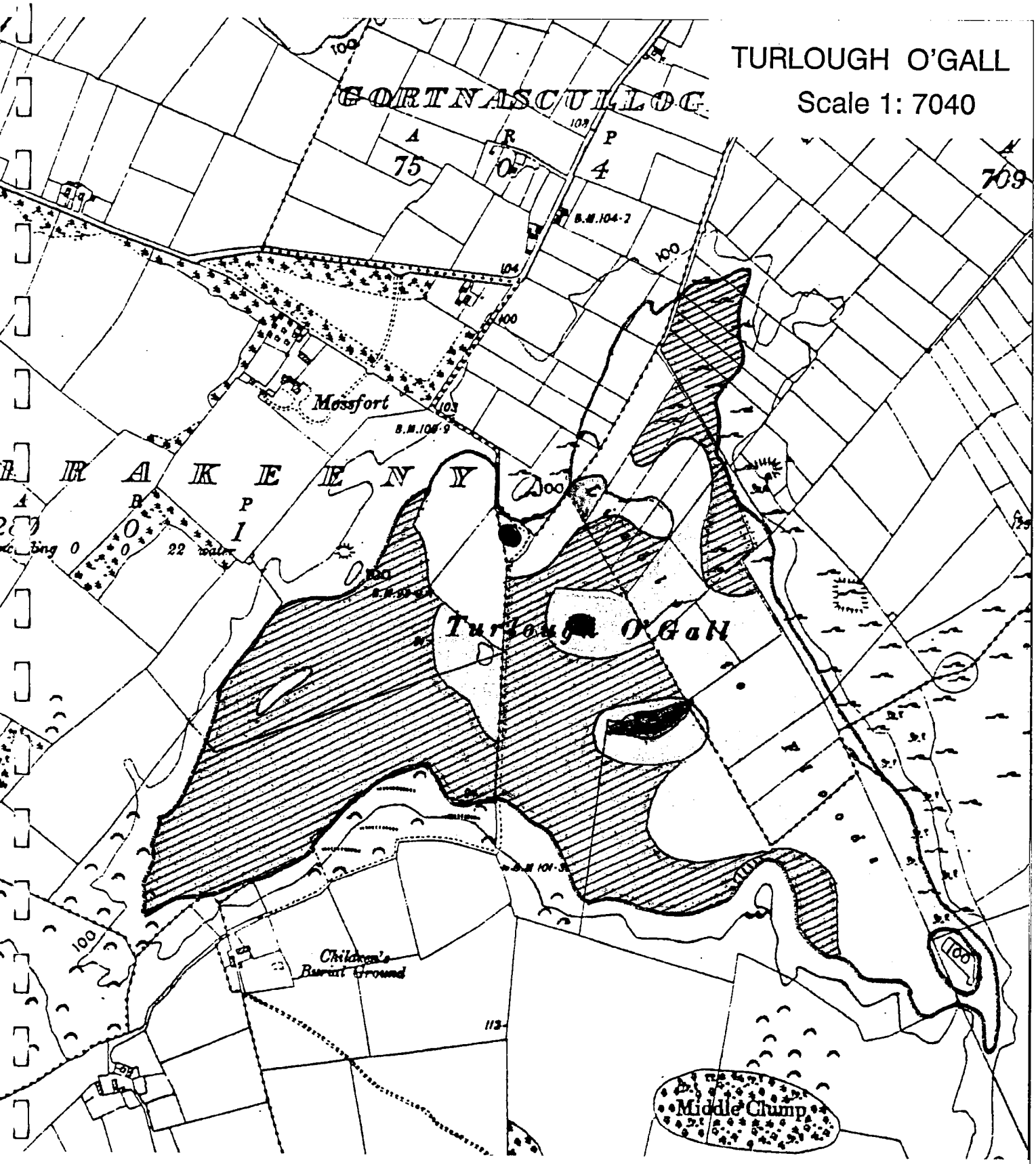
Land Use: Most of Turlough O'Gall consists of four large fields but the eastern end has a ladder-like appearence with numerous,



33
M121/122
CREGNANAGH
(E.D. Daigan)
CAHERMACULICK
MOORGAGAGH
KILL
TOBERNADA
Toberadarry
BALLYBACKAGH
NABUNNY
MOCOLLAGAN
RAMOL
Lakefield
Rathmolin
Tobersharre
Grave Yard
Abbey (in Ruins)
Castle (in Ruins)
Liable to Floods

TURLOUGH O'GALL

Scale 1: 7040



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- 4W Potentilla fruticosa / Frangula

walled divisions. These parts are subject to less grazing intensity than elsewhere and are more used by cattle. Sheep predominate in the rest of the area.

Vegetation: Apart from the vicinity of the ponds the southern half of the turlough has a simple vegetation structure with extensive areas of limestone grassland (2C) and its slightly leached counterpart (3B) in which *Nardus* is prominant. There is a little scrub invasion at the west end with scattered bushes of *Crataegus*. At the north end things become more complex as the vegetation adapts to more frequent changes of level. *Potentilla reptans* is thinly but widely spread and 4B occurs below the prevailing 3B. In the lower regions this runs into the pure 5B and in one field corner to 6A. Above it an unmanaged grassland contains *Deschampsia cespitosa, Molinia* and *Plantago maritima* amongst small bushes of *Salix repens* and *Rhamnus*. Such a community reappears in a more grazed form under the tree-covered slope on the eastern margin.

The three depressions on the floor of the turlough are ringed by 6B vegetation with a trace of *Polygonum amphibium*. The ponds themselves contain *Potamogeton natans* and *P. crispus*, with *Menyanthes, Alisma plantago-aquatica* and *Zannichellia* in the southern one. *Juncus bufonius, Veronica catenata* and *Triglochin palustre* occur in the surroundings with both *Polygonum aviculare* and *P.arenastrum*.

Vegetation (ha as mapped)

2A-		3B-	26.0	5A-		6D-		9A-	0.2	11B-	0.3
2B-	1.6	3C-	0.2	5B-	1.2	7A-		9B-		12-	0.1
2C-	12.5	3W-	0.1	5D-		7B-		9C-		Lake	
2D-		4B-	4.1	5E-		8A-		10A-			
2W-		4D-		6A-	0.2	8B-		10B-			
3A-		4W-		6B-	4.0	8C-		11A-			

Fauna: The dryish character of most of this area may prohibit its use by breeding waders but it seems likely that the turlough is used by some of the birds that are usually associated with Belclare. No data are available as yet.

The turlough was examined by Bilton & Lott (1991) for its aquatic beetles.

Evaluation: Turlough O'Gall is a dryish site without the ornithological interest of the adjacent Belclare. However it is distinct in vegetational terms by having very large areas of two 'upper' vegetation types, Sedge heath (3B) and Limestone grassland (2C) which are, respectively, the largest and the second largest stands in any turlough. Because of its rock outcrops and ponds it includes considerable diversity, albeit spread over a large area.

The turlough is situated close to the water divide between the Black River and the Clare. It thus has a small catchment but seems now not unduly oligotrophic. In former times marl deposition was

widespread but there is only a small amount going on currently in the southern pond.

The site achieves a score (41) that puts it just above the half-way point and a regional level of importance would seem appropriate. It is unmodified by any on-site drainage.

33. BELCLARE (Turloughnaroyey - Cx 28)
River System: Clare
Catchment Area: 280 ha
Altitude: 28m

Grid Ref: M 3850
6" sheet: Galway 43
Turlough Area: 98.8 ha
Evaluation place: 33=

Topography: This triangular turlough lies below the hill of Knockacarrigeen on which Belclare village is situated. On other sides the topography is flat with drift-covered fields of large size and an area of bog in the north-east. The floor of the basin is also flat but at two levels: a lower central area and a flat upper terrace 30-50cm above (Coxon, 1986). The southern arm of the area has a more undulating floor which scarcely shows this distinction.

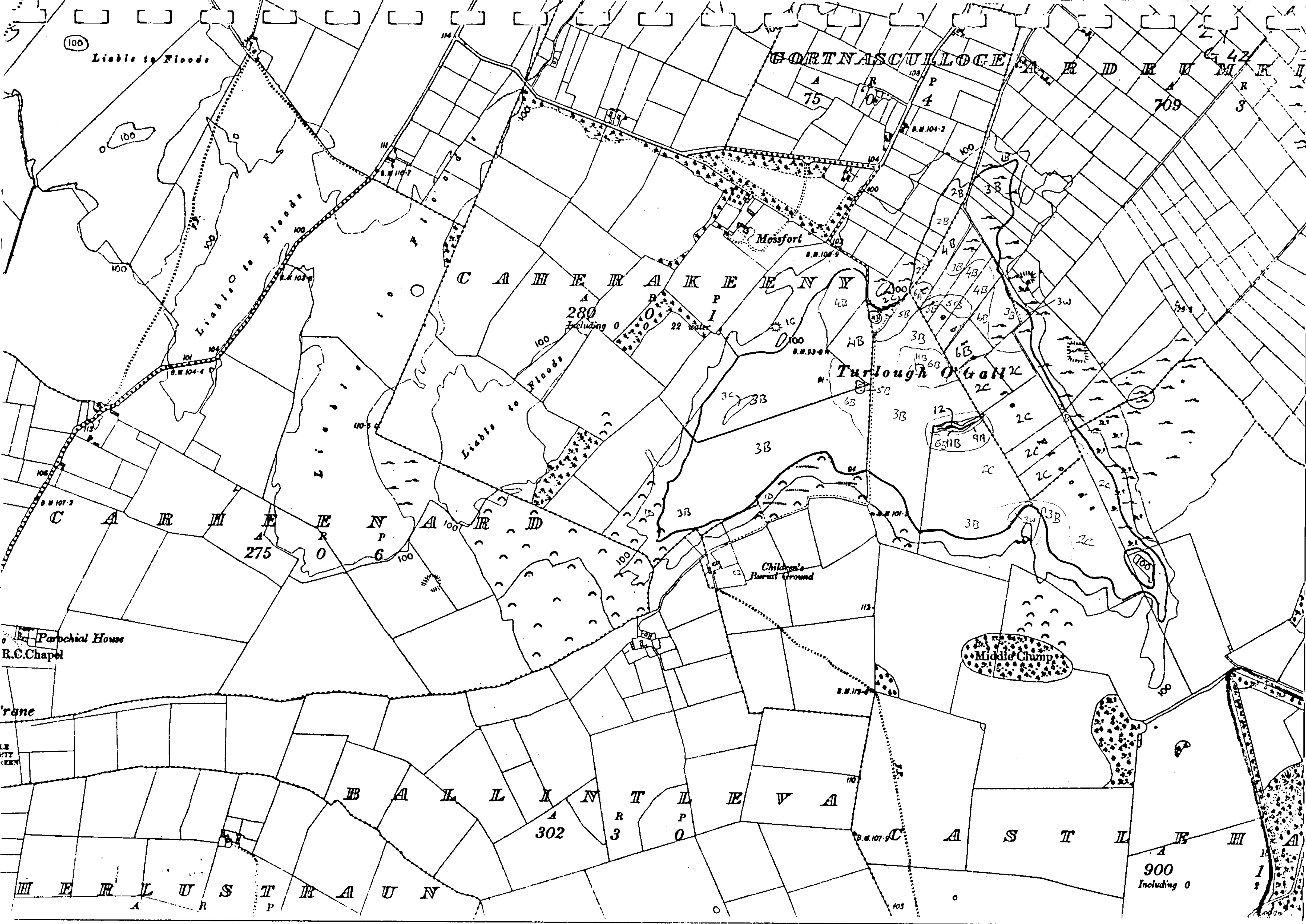
Hydrology: The turlough is completely dry in the summer months except for a seemingly natural stream which enters from the north-east and runs to a hole on the eastern side some way out from the edge. It is joined there by an artificial channel which begins in the south centre and flows around the eastern edge. This has been deepened within the last ten years. There is no external drainage in evidence though the proximity (1.3 km) of the turlough to the deepened Clare River makes it likely that it has been affected. Killower turlough which occupies a depression less than 1 km north of Belclare was drained in 1972-73 (D'Arcy, 1983).

Several holes occur at the south end of the basin also as well as near Thomastown House on the west side.

Substrate: In most sections a slightly peaty topsoil overlies marl on silty clay. There are few rocks except for those around the outcrops on the eastern side and at the southern tip (where they have been added to by dumping).

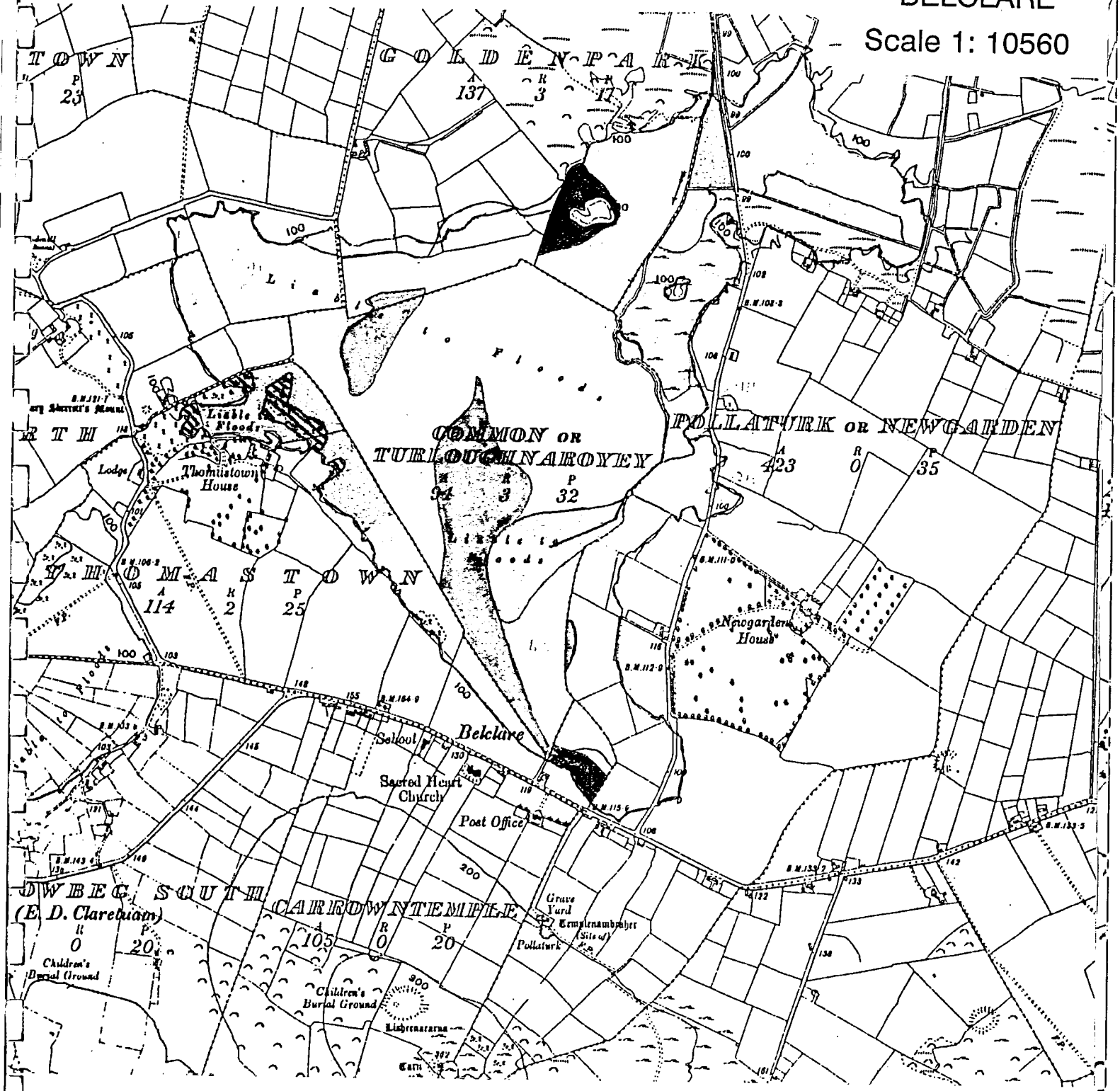
Land Use: The main central area is still commonage (15 owners) but the margins have been enclosed by walls. There are cattle and sheep on the common land but mainly cattle elsewhere. Some tillage, probably discing, has been carried out in the north-west corner where a field may also sometimes be mown for silage. There are abandoned peat cuttings in the NE section where, east of the road, it is mainly cutaway.

Vegetation: Since the turlough is a dry one without any standing water in the summer, except in the ditch, there is relatively


GORTNASCULLOGE
A 75 R 0 P 4
ARDRUMKI
A 709 R 3
Liable to Floods
Liable to Floods
Liable to Floods
Mossfort
CAHERAKEENY
A 280 R 0 P 1
Including 0
22 water
Turlough O'Gall
Children's Burial Ground
CARHEENARD
A 275 R 0 P 6
Parochial House
R.C.Chapel
Middle Chump
BALLINTLEVA
A 302 R 3 P 0
CASTLEH
A 900
Including 0
HERLUSTRAUN

BELCLARE

Scale 1: 10560



KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge	10B	Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)	5D	Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb		Carex flava	8C	Cladium fen		Open water (12)
	Sedge heath	6A	Dry Carex nigra	9A	Temporary pond	2W	Dry woodland
	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)		Peaty Carex nigra	9C	Marl pond		Potentilla fruticosa / Frangula

little diversity in the vegetation. However the peat influence in the north-east corner adjacent to exposed limestone rock does add some interest, as does the scrub on the western side.

The peat area mentioned consists of cutaway which is now covered by *Molinia, Myrica gale, Schoenus* and *Cirsium dissectum*, with *Equisetum palustre, Galium boreale* and *Parnassia*. East of the road there is about 10cm of peat over marl and here *Sagina nodosa* and *Triglochin palustre* are noticeable. The vegetation is modified centrally into 3A by fertilization and on the west side it grades into a higher zone with some *Calluna, Ulex europaeus, Juncus conglomeratus* and *Galium verum*. Towards the centre of the basin it terminates against a wall and is there replaced by 4B which stretches far into the turlough. This community in fact approaches 3B in places with *Carex hostiana, Molinia* etc, and rather little *Potentilla reptans*. The southern part of the area seems nutritionally richer as flood water moves south and then east into the ditch. Here there is 6A with 5B, the latter including *Lysimachia nummularia*. At the very southern end there is even some *Polygonum amphibium*.

The western edge includes 2A in the southern part which is closely grazed. A wall again divided this from tall-growing 3A, characterized by *Filipendula* and *Phalaris* with banks of *Galium boreale, Deschampsia cespitosus, Festuca arundinacea* and *Festuca rubra*. This tussocky cover is being colonized by *Rubus caesius, Viburnum, Rhamnus, Crataegus* and *Prunus spinosa* which grow out from a taller wood of *Crataegus, Fraxinus, Acer pseudoplatanus* and *Euonymus*. *Malus domestica* is established here.

The drainage ditch has an interesting flora in that *Myriophyllum verticillatum* grows in the water along with *Sparganium emersum* and *Apium inundatum* while *Lysimachia nummularia* covers parts of the bank.

Vegetation (ha as mapped)

2A-	24.5	3B-		5A-		6D-		9A-		11B-	
2B-	5.4	3C-		5B-	4.3	7A-		9B-		12-	
2C-	4.6	3W-	1.2	5D-		7B-		9C-		Lake	
2D-	1.4	4B-	32.5	5E-		8A-		10A-			
2W-		4D-	12.0	6A-	8.7	8B-		10B-			
3A-	4.8	4W-		6B-		8C-		11A-			

Fauna: Belclare is a noted bird site attracting wintering wildfowl and waders as well as birds on migration through Connaught. Sheppard (in prep.) quotes the following averages: wigeon 475, teal 165, mallard 52, lapwing 250, golden plover 58 (max. of 2000 noted by D'Arcy, 1983), curlew 208 and dunlin 20. It is also visited by the Galway lowland population of white-fronted geese which totals 100-150 (Noriss, pers.comm.)

There were no signs of breeding waders when the site was visited but lapwing are thought to nest.

Evaluation: Belclare turlough shows considerable diversity with a range of plant communities from the oligotrophic north-east corner to the eutrophic south-east. It also includes a scrubby ungrazed part. This means that its vegetation scores quite highly in the evaluation process, added to by the occurrence of two interesting plant species in a ditch. Because of its large size two of the vegetation types, Lolium grassland (2A) and Potentilla reptans-species rich (4B) have their largest stands here. The birdlife is also important at Belclare and includes white-fronted geese.

The site has a small catchment like Turlough O'Gall to the west. In this case, however, arterial drainage in the Clare River has affected the turlough though it still floods regularly. This detracts somewhat from its value and gives it an overall score of 34. However, it should still be considered of regional importance.

34. TURLOUGH MONAGHAN [Cx 22]
River System: Corrib
Catchment Area; 400 ha
Altitude: 27m

Grid Ref: M 3346
6" sheet: Galway 42
Turlough Area: 26.8 ha
Evaluation place: 43=

Topography: Turlough Monaghan is situated just to the north of Fearagha in the angle between two minor roads. It has a flat floor in most places apart from a rocky rise that projects from the south-west side. The north-east edge is marked by level beds of outcropping limestone which rise about 8m above the basin at the southern end.

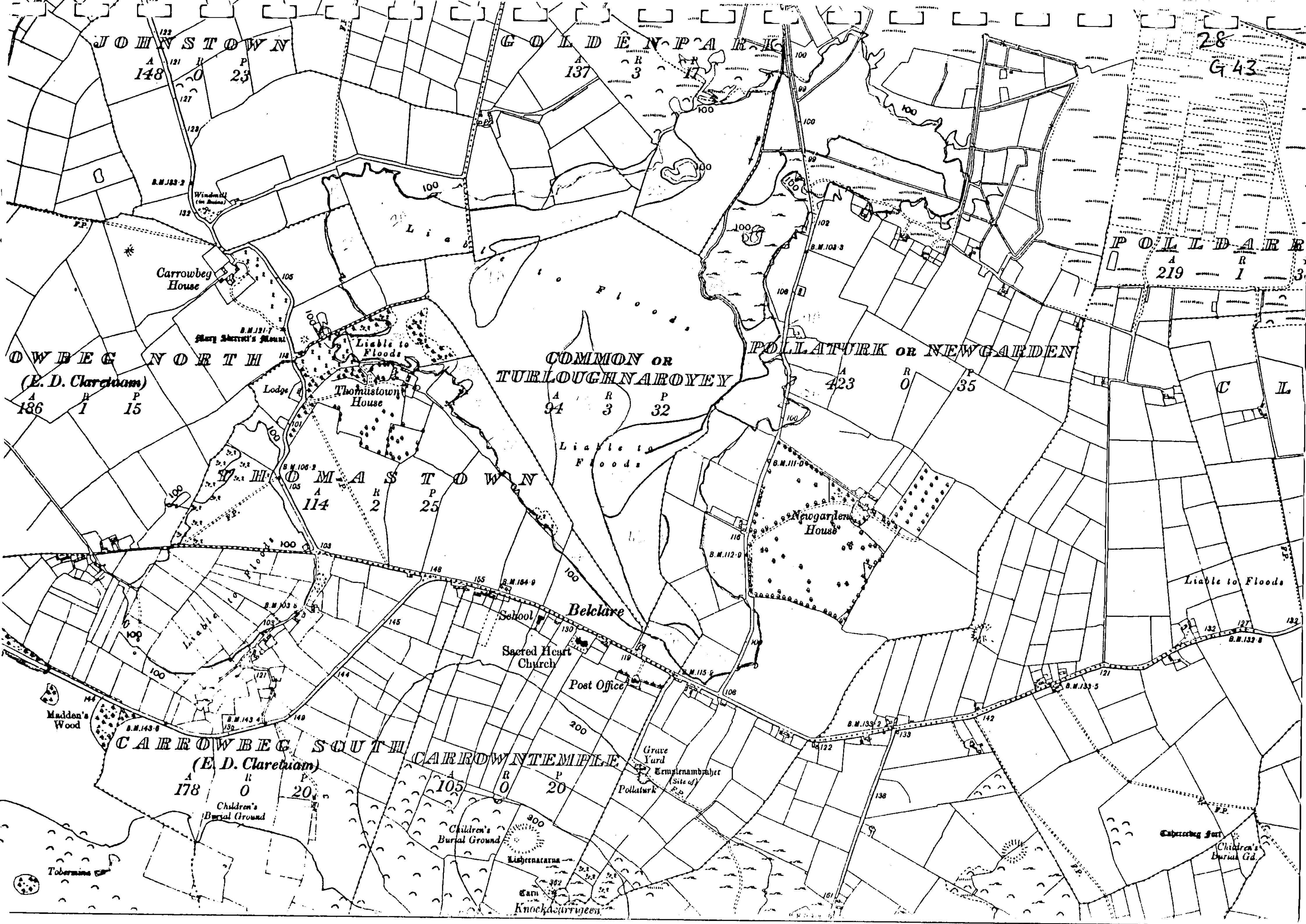
Hydrology: The turlough seems to flood regularly but is relatively shallow. Swallow holes are probably located at the break of slope in the limestone outcrop, most likely under trees in the NE corner. The two drinking pools are obviously excavated.

There is no drainage activity visible though Coxon (1986) suggests the turlough has been affected.

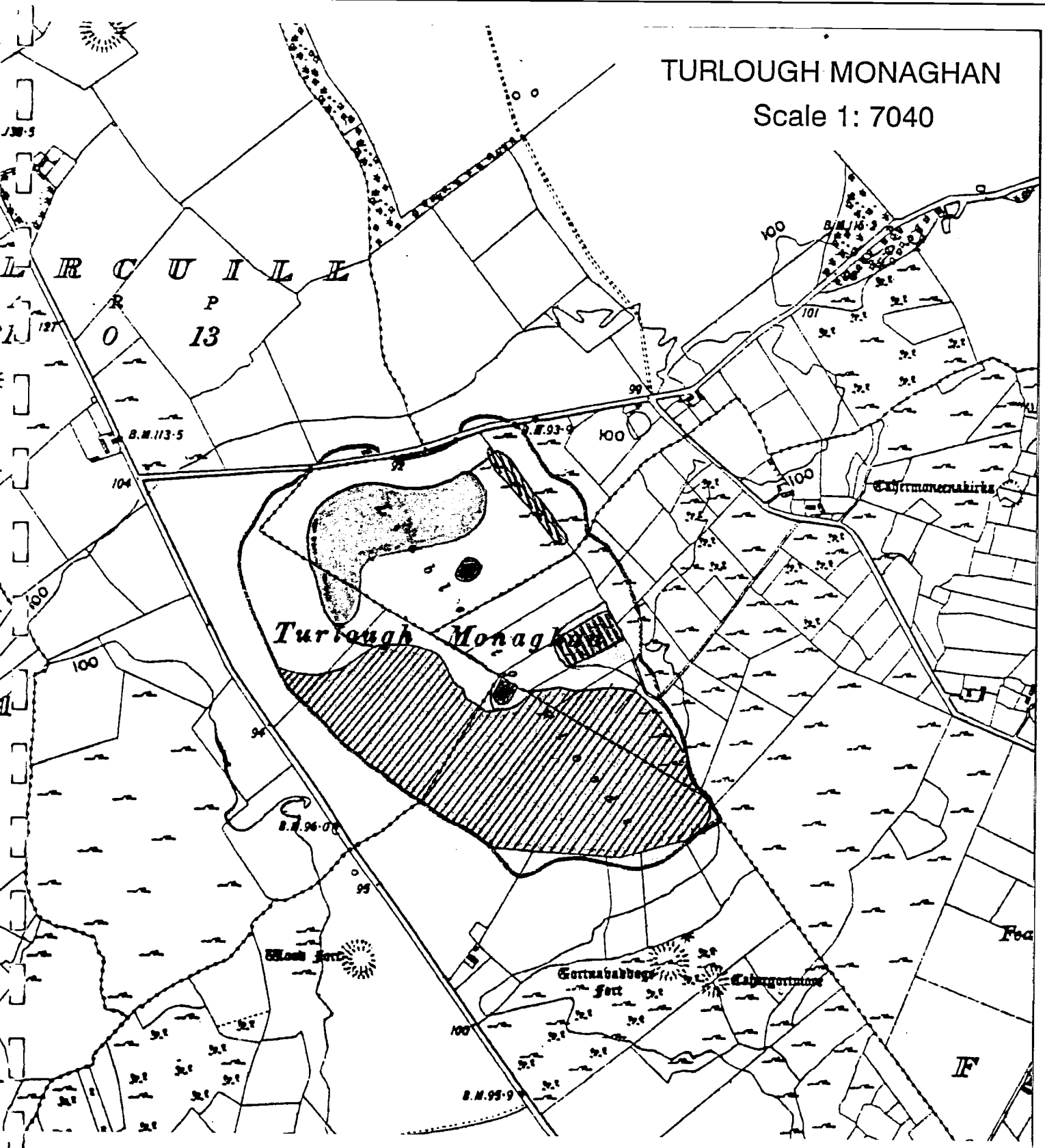
Substrate: Light brown/yellow silty soil covers most of the basin (Coxon, 1986) but there is carbonate deposition in the flattest, central section. This is more sandy than marly however. There is no evidence of peat.

Land Use: The turlough is grazed by cattle, sheep and horses. Ownership is multiple and the level of grazing very variable from field to field.

Vegetation: The two ponds in the lower parts of the floor resemble each other in having a central area of *Potamogeton natans* and *P.berchtoldii* surrounded by trampled 5A, with *Chamomilla* and *Coronopus squamatus*. Above this level, species-



28
G43
JOHNSTOWN
A 148 R 0 P 23
GOLDEN PARK
A 137 R 3 P 17
POLLDARR
A 219 R 1
POLLATURK OR NEWGARDEN
A 423 R 0 P 35
COMMON OR TURLOUGHNAROYEY
A 94 R 3 P 32
Liable to Floods
Windmill (in Ruins)
Carrowbeg House
Mary Sherrett's Mount
Thomastown House
Lodge
OWBEG NORTH
(E.D. Claretuam)
A 186 R 1 P 15
THOMASTOWN
A 114 R 2 P 25
Newgarden House
Belclare
School
Sacred Heart Church
Post Office
Grave Yard
Templenambraher (Site of)
Pollaturk
Madden's Wood
CARROWBEG SOUTH
(E.D. Claretuam)
A 178 R 0 P 20
Children's Burial Ground
CARROWNTEMPLE
A 105 R 0 P 20
Lisheenacarna
Cairn
Knockacarrigeen
Tobermina
Cahercorbeg Fort
Children's Burial Gd.



KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge	10B	Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)		Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb		Carex flava	8C	Cladium fen		Open water (12)
	Sedge heath		Dry Carex nigra		Temporary pond	2W	Dry woodland
	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)		Peaty Carex nigra	9C	Marl pond		Potentilla fruticosa / Frangula

rich *Potentilla reptans* (4B) is widespread, modified into 2B by grazing in several adjacent fields. A depression at the northern end carries 6A which changes to marginal communities as the land rises. A similar rise in the southern half is colonised by more heathy 3B vegetation almost to the edge of flooding. *Mentha arvensis* and *Molinia* are common in this vegetation and both *Euphrasia pseudokerneri* and *E.arctica* occur. The soils are thin here and rock breaks through in places. North of the main wall which bisects the turlough this community is ungrazed and the *Filipendula* grows tall and elegant.

A more definite outcrop on the eastern side bears some *Prunus spinosa* scrub centrally with 2C beside it. At the edge some of the pavement is flooded: *Rhinanthus, Rhamnus, Briza* and *Carex hostiana* are frequent with both *Leontodon hispidus* and *L.taraxacoides*. The 3W community reappears as a broad hedge in the north-east corner growing on rocks carpeted with *Cinclidotus*.

Vegetation (ha as mapped)

2A-	3.3	3B-	10.4	5A-		6D-		9A-		11B-	
2B-	4.8	3C-	0.1	5B-		7A-		9B-		12-	0.1
2C-	0.6	3W-	0.7	5D-		7B-		9C-		Lake	
2D-		4B-	4.0	5E-		8A-		10A-			
2W-		4D-		6A-	2.7	8B-	0.1	10B-			
3A-		4W-		6B-		8C-		11A-			

Fauna: A flock of lapwing was seen in July and it is likely that one or two pairs nest within the turlough. There is no published information about the birdlife in winter.

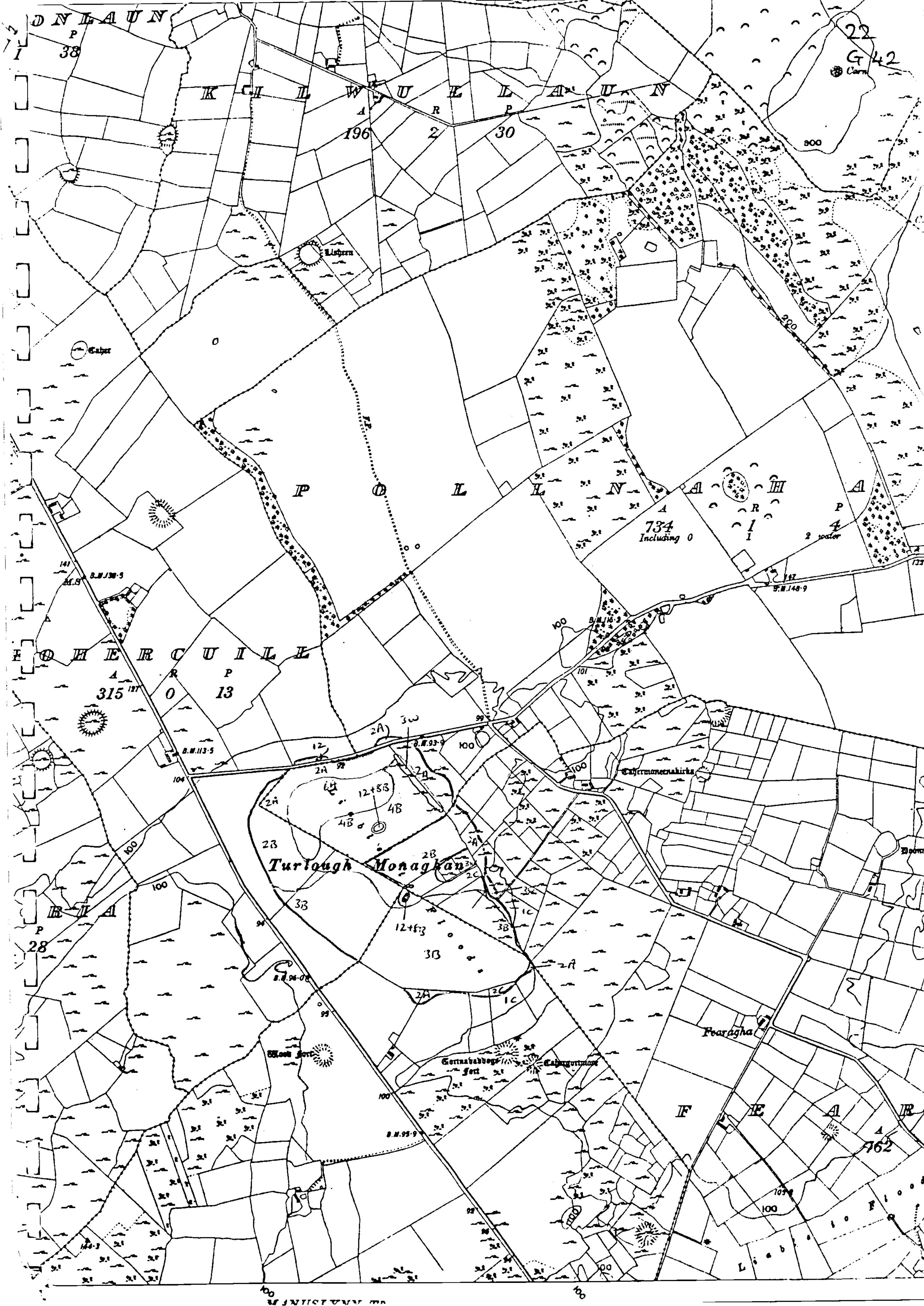
Evaluation: The turlough is basically a dry one with little physical variation except for the outcrops of bedrock. The vegetation however is quite diverse with ten community types in a small area. The vegetation is similar generally to Turlough O'Gall, the extent of Sedge heath (3B) perhaps indicating a short flooding season.

A low (29) overall evaluation score puts this turlough well into the lower half but it has a local value as a habitat example.

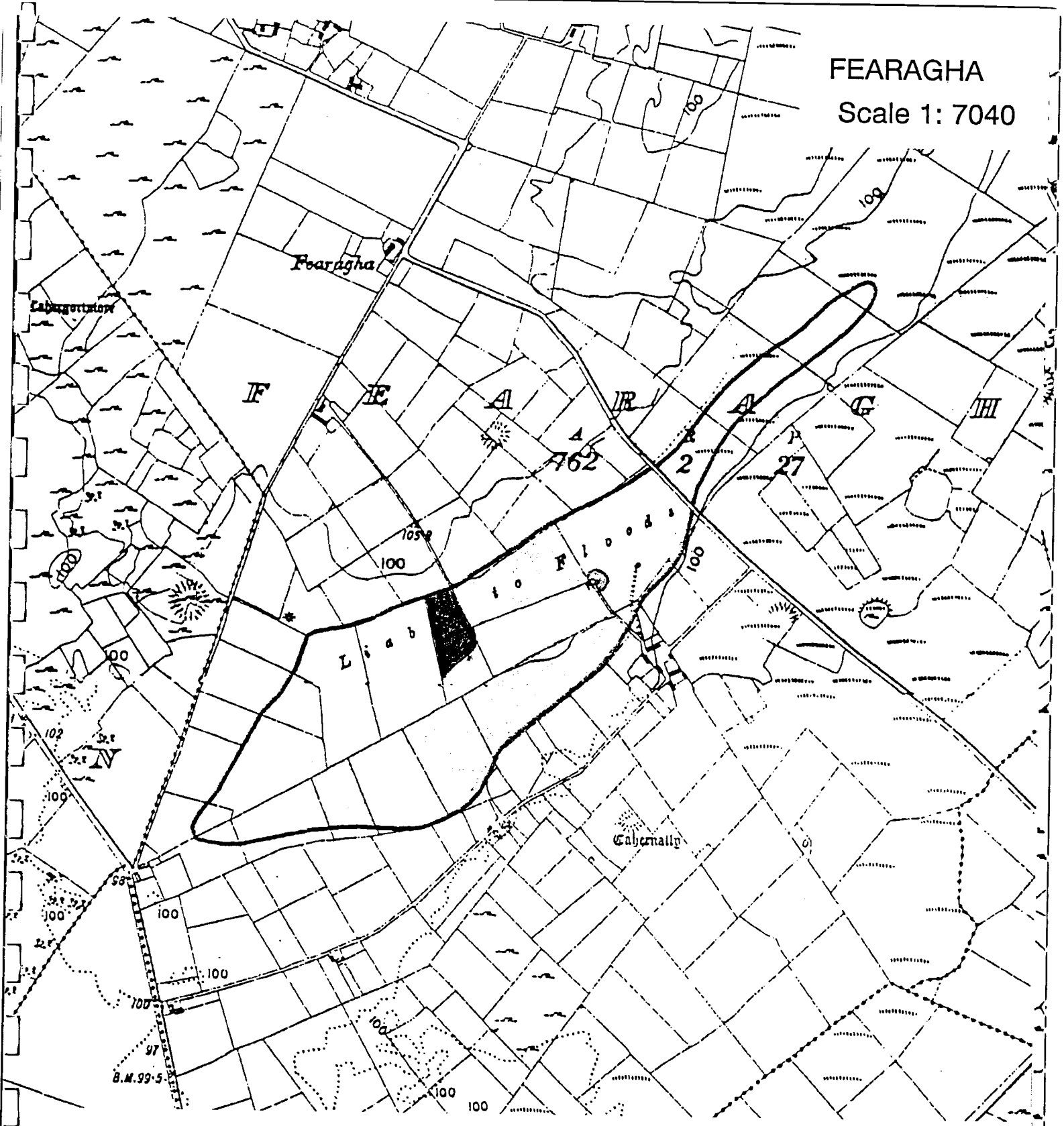
35. FEARAGHA [Cx 21]
River System: Corrib
Catchment Area: 480 ha
Altitude: 28m

Grid Ref: M 3445
6" sheet: Galway 42, 56
Turlough Area: 18.8 ha
Evaluation place: 61

Topography: Fearagha lies in an elongated depression east of Headford. It extends 1.2km on a NE - SW axis and is crossed by a road at right angles. Above the road it has a valley-like



DNLAUN
P
1 38
KILWULLAUN
A R P
196 2 30
22
G 42
Carn
300
Lishern
Caher
POLLNAHA
A R P
734 1 4
Including 0 1 2 water
B.M.148·9
B.M.116·3
B.M.138·5
M.S
141
FOHERCUILL
A R P
315 0 13
B.M.113·5
104
B.M.93·9
99
101
100
Cahermoneenakirka
Turlough Monaghan
12
2A
3W
2A
2A
4H
12+8B
4B
4B
2B
2B
2A
3W
2C
3B
1C
3B
12+f3
3B
3B
2A
2A
2C
1C
B.M.96·0
95
Moat Fort
Gortnabaddoge Fort
Cahergortmore
Fearagha
FEAR
A
762
100
105
Liable to Floods
RIA
P
28
B.M.95·9
144·3
100
MANUSLYNN TD



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot.,reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- 6D Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- 3W Potentilla fruticosa / Frangula

appearence but this gradually broadens out to the SW, running away into flattish fields at the end.

Hydrology: This turlough seems to have a peculiar flooding regime, perhaps flooding less now than in the past. The road is built up on a causeway several metres above what appears to be the present flood limits and many of the field boundaries have been invaded by trees (of about 35 years old). However it may have a very short flooding period as there remains a considerable amount of *Cinclidotus* on some walls.

There is a dug out (concreted) cattle pond at one point but no evidence of drainage on the site. A former well appears on the O.S. sheet.

Substrate: Coxon (1986) records more than 90cm of yellow-brown silt without stones or shell-fragments.

Land Use: The basin is subdivided into fields which are mostly grazed by cattle. At the western end silage may be cut occasionally: there is a farm here that makes it.

Vegetation: The presence of hedges throughout this turlough has already been noted. They consist of *Crataegus, Rhamnus, Prunus spinosa* and *Fraxinus*, the latter well grown and over 30 years old. The dryness that such trees indicate is carried over to the vegetation in the fields which is all type 2 communities, 2A at the eastern end, 2B in the west and 2C in the middle. This suggests shallower soils at this point. Some of the calcicole grassland has been converted to 2A, apparently by fertilization. A small patch of 2D occurs on the north-east side where leaching has not been counterbalanced by nutrient input and *Molinia* and *Succisa* have become frequent.

Vegetation (ha as mapped)

2A-	7.1	3B-	5A-	6D-	9A-	11B-
2B-	6.1	3C-	5B-	7A-	9B-	12-
2C-	4.9	3W-	5D-	7B-	9C-	Lake
2D-	0.6	4B-	5E-	8A-	10A-	
2W-		4D-	6A-	8B-	10B-	
3A-		4W-	6B-	8C-	11A-	

Fauna: No data exists but the site is most unlikely to support significant birdlife.

Evaluation: This turlough is now too dry to be of much ecological interest. It has very little diversity in physical or vegetational terms and seems to have been modified by drainage 30-40 years ago. It scores a total of 11 which puts it at the bottom of the evaluation list.

36. FORTWILLIAM [Cx 87]
River System: Lough Ree
Catchment Area: 320 ha
Altitude: 44m

Grid Ref: N 0263
6" sheet: Longford 21
Turlough Area: 44.0 ha
Evaluation place: 30=

Topography: Fortwilliam turlough is situauted close to the eastern shore of Lough Ree and 6km south of Lanesborough. The surrounding countryside is flat with a thin cover of drift - 50cm of such material covers the bedrock in an adjacent quarry. The floor of the oval basin is at two levels, a lower central area with several lakes and ponds and a higher surrounding level of till with scattered rocks extending north-westwards into flat fields and woodland.

Hydrology: There is little surface flow into the basin and swallow holes seem to lie mostly on the eastern and northern edges. The vegetation suggests that a pair of seepage areas may occur at the south end of the lake, linked by the reedbed. Coxon (1986) notes a line of depressions just beyond the south-west edge culminating in a huge excavated hole which is now refilled with stone. Despite this the turlough seems unaffected by drainage and standing water may persist throughout the summer in the reedbeds.

Floodwater would appear strongly calcareous.

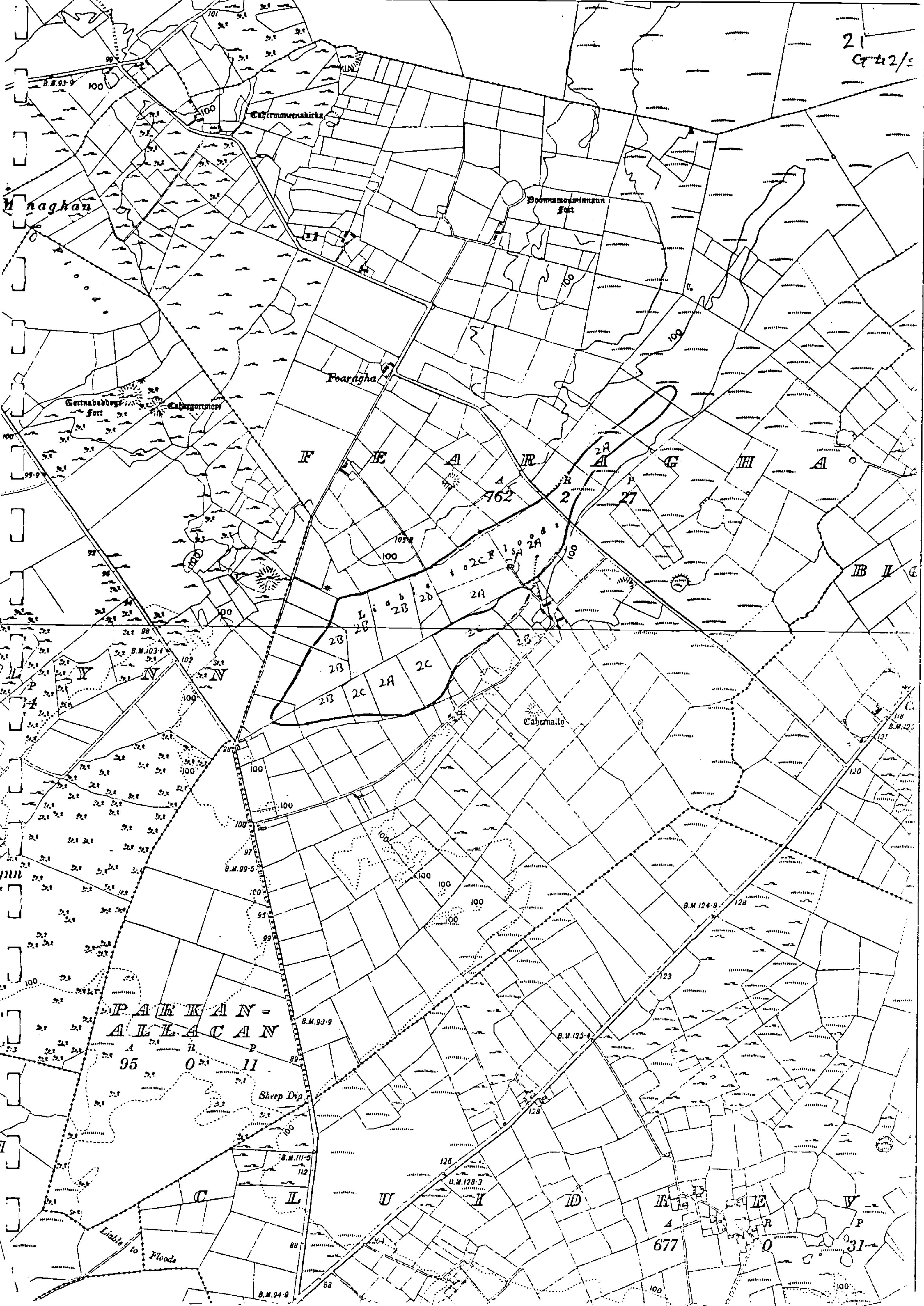
Substrate: The flat, lower areas have peat over marl or just marl but where the land rises this is replaced by sandy till.

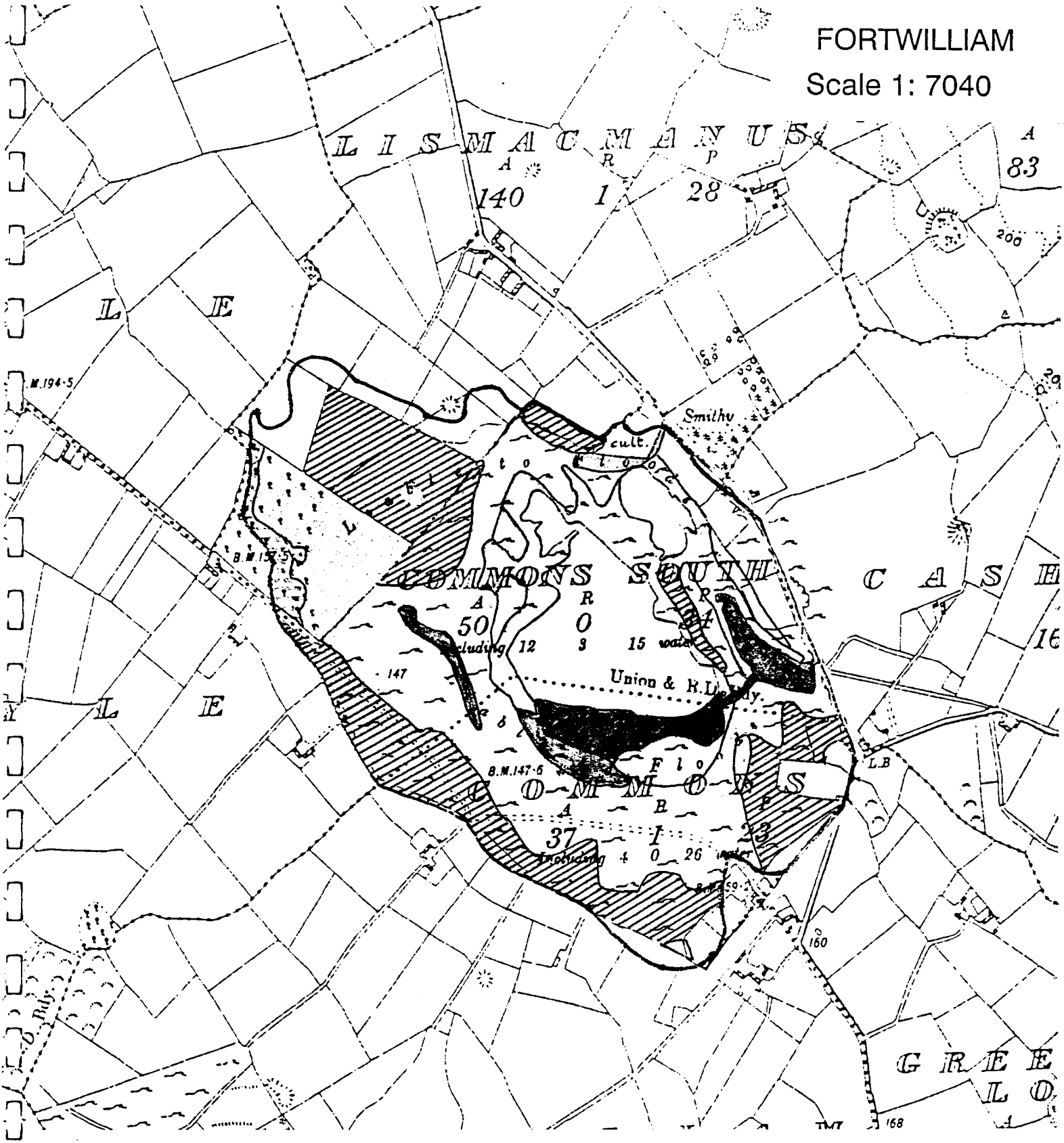
Land Use: The turlough is grazed by cattle and sheep though without significant damage to the vegetation. It seems to be held in common and, except at the NW end, is not divided.

Marl may have been dug here in the past.

Vegetation: The central marly area is primarily a stand of 9C with *Littorella, Potamogeton gramineus* and *P.natans* and *Scorpidium* in the wetter parts together with *Juncus articulatus, Baldellia, Samolus, Carex serotina* and *Drepanocladus lycopodioides*. At the south end this passes into *Scirpus lacustris* with *Hippuris* and *Ranunculus lingua* which lies in an apparent water track between two areas of *Polygonum amphibium*. The land rises mostly into *Carex nigra* and *Potentilla reptans* with a notable amount of *Ophioglossum* but in certain wetter places fragments of 6B exist.

The zonation continues with a broad band of 3B in the south and west. This has a calcareous nature with *Schoenus, Euphrasia micrantha*, and *Potentilla erecta* as well as *P.reptans* and *Achillea ptarmica*. In places it grows taller with *Filipendula, Festuca arundinacea, Agrimonia eupatorium, Vicia cracca* and *Lathyrus pratensis*. This 3A community is well developed at the north-western end, running into *Prunus spinosa* and *Crataegus* scrub. There is woodland adjacent, consisting of *Fraxinus* and *Sambucus*


21
Fearagha
F E A R A G H A
A 762 R 2 P 27
Liable to Floods
P A R K A N -
A L L A C A N
A 95 R 0 P 11
Sheep Dip
Cahernally
A 677 R 0 P 31
Liable to Floods
2A
2B
2C
B.M. 93·9
B.M. 103·1
B.M. 99·5
B.M. 93·9
B.M. 111·5
B.M. 128·3
B.M. 94·9
B.M. 124·8
B.M. 125·4



KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge	10B	Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)	8A	Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)	5D	Sedge fen	8B	Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb	5E	Carex flava	8C	Cladium fen		Open water (12)
3B	Sedge heath	6A	Dry Carex nigra	9A	Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra	9B	Eleocharis acicularis	3W	Rhamnus wood
4B	Pot. reptans (sp. rich)	6D	Peaty Carex nigra	9C	Marl pond	4W	Potentilla fruticosa / Frangula

nigra in addition to these species, with *Thamnobryum, Hedera* and *Glechoma* on the floor amongst the flood debris.

At the south end there is a small limestone outcrop with *Pimpinella minor* and *Campanula rotundifolia*, backed by pasture. Old fields to the east are filled by *Festuca arundinacea, Lotus corniculatus* and a little *Potentilla reptans*.

Vegetation (ha as mapped)

2A-	1.5	3B-	10.5	5A-	0.2	6D-		9A-		11B-	
2B-	2.1	3C-		5B-	12.0	7A-		9B-		12-	
2C-	0.1	3W-		5D-		7B-		9C-	8.7	Lake	
2D-		4B-	0.7	5E-		8A-	1.5	10A-		Till.	0.3
2W-	0.6	4D-		6A-		8B-		10B-			
3A-	2.6	4W-		6B-	1.4	8C-		11A-	1.3		

Fauna: Snipe and mallard nest in the area. There is no winter information.

Evaluation: Fortwilliam is the only extant large turlough in Co. Longford and one of only two east of the Shannon. It also has a varied vegetation which includes examples of thirteen separate communities. The areas of Sedge Heath (3B), Potentilla reptans-species-poor (5B) and Marl Pond (9C) are significant in a relatively small site and make it similar in some ways to the nearest turloughs in Roscommon, e.g. Lisduff and Ballinturly. Two points of difference however are the amount of Tall Herb (3A) and Dry Woodland (2W) at Fortwilliam. The latter is a community type that occurs in only four sites and presumably shows a wide fluctuation in water levels as well as a lack of grazing pressure.

The turlough achieves an evaluation score (38) that puts it in the mid-point of the scale and it should be considered of at least regional importance.

37. BALLINTURLY [Cx 65]
River System: Suck
Catchment Area: 160 ha
Altitude: 51m

Grid Ref: M 8460
6" sheet: Roscommon 41
Turlough Area: 130.4 ha
Evaluation place: 11

Topography: Ballinturly turlough is situated in a V-shaped basin just north of Athleague on the Roscommon road. It is a very large site stretching west for 2.5km from the road and opening out at the western end over some large fields. Bedrock is exposed in the NE end and has been quarried a little. Elsewhere the edges of the basin are frequently strewn with loose rocks, except for the western end. The turlough floor is predominantly flat but there is a line of depressions at the centre of the northern limb. In

general there is a fall to the west centre where there is a shallow lake.

Hydrology: The main flow into the basin is from the boggy area to the south-east and this flows eventually to the lake, joining with an intermittent flow from the south-west. A little standing water also occurs in the quarry area and in the series of depressions down the northern limb. Many of these act as swallow holes but the main one is at the end just where the basin opens out. Local opinion is that the water here rises and falls with the level of the Suck river, 2km to the west. Floodwaters seem to be moderately lime-rich.

There is no evidence of external drainage.

Substrate: The higher parts of the floor generally have 15-20cm of peaty soil over rock (Coxon,1986) while towards the west there is 80cm peat over marl. Peat is also present in the southern limb, both at its extremity and where the stream takes a bend to the south.

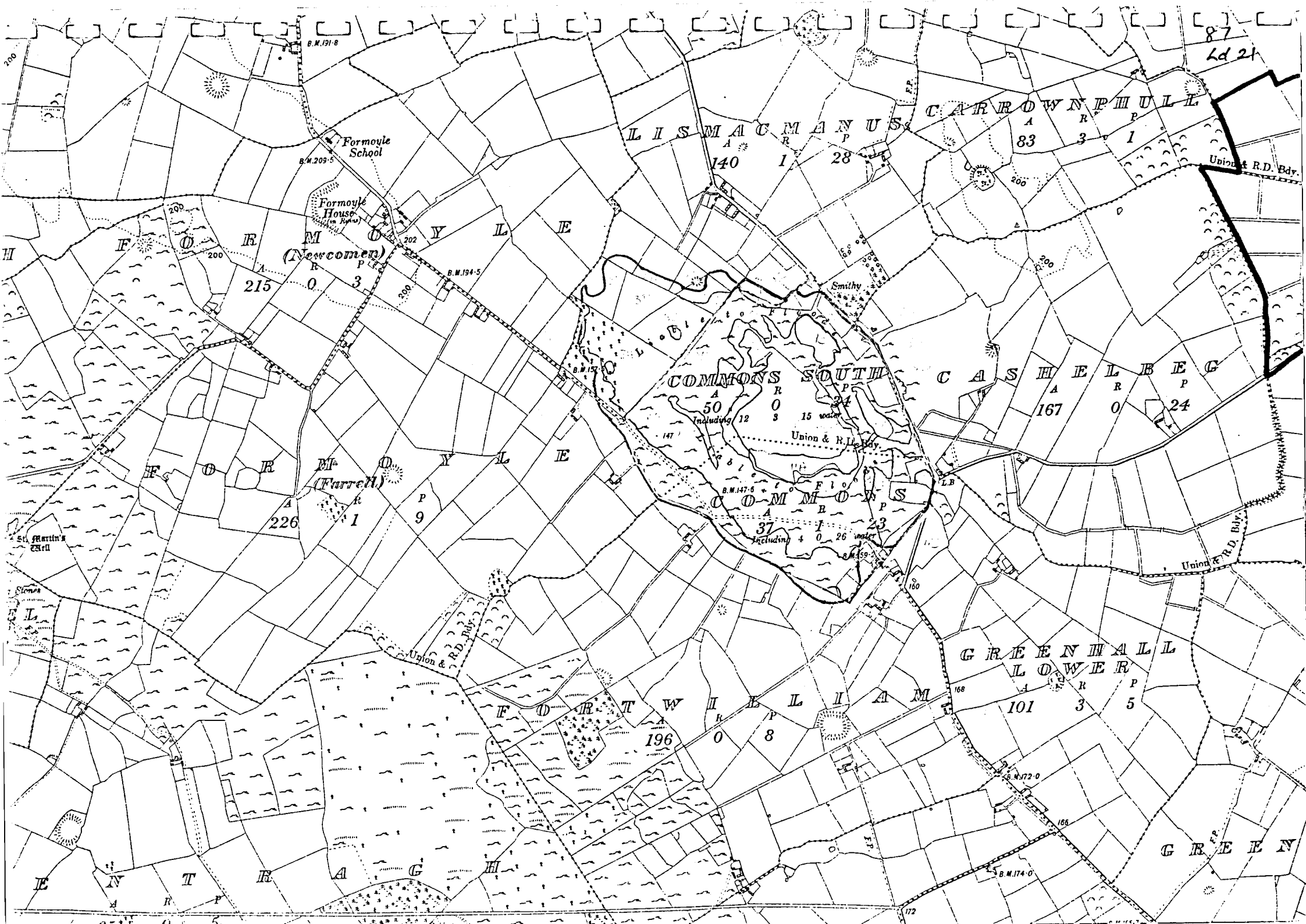
Land Use: The drier parts of the basin are grazed mainly by sheep with some cattle, but animals are largely absent from the vicinity of the lake. At the south-east end cattle have been poaching some of the peaty areas. There is a large cattle unit on the southern edge of the northern limb which may at times release effluent.

Peat cutting formerly took place in the south-east part but apparently not around the lake.

Vegetation: A multiplicity of vegetation types occurs in this turlough with its habitat variation from wet to dry and from peat to rock. The primary cover on the floor is 6B, a mixture of *Carex nigra* and *C.hirta* with *Hydrocotyle*, *Ranunculus repens*, *R.flammula* and a little *Drepanocladus exannulatus*. In peatier places there is a little *C.disticha* and *Deschampsia cespitosa* whereas where flooding occurs most frequently, *Myosotis scorpioides* and *Apium inundatum* are prominent. Depressions within this community, either in the central hollows or as marginal channels, are in most cases lined by *Polygonum amphibium* with *Eleocharis palustris* and *Phalaris*.

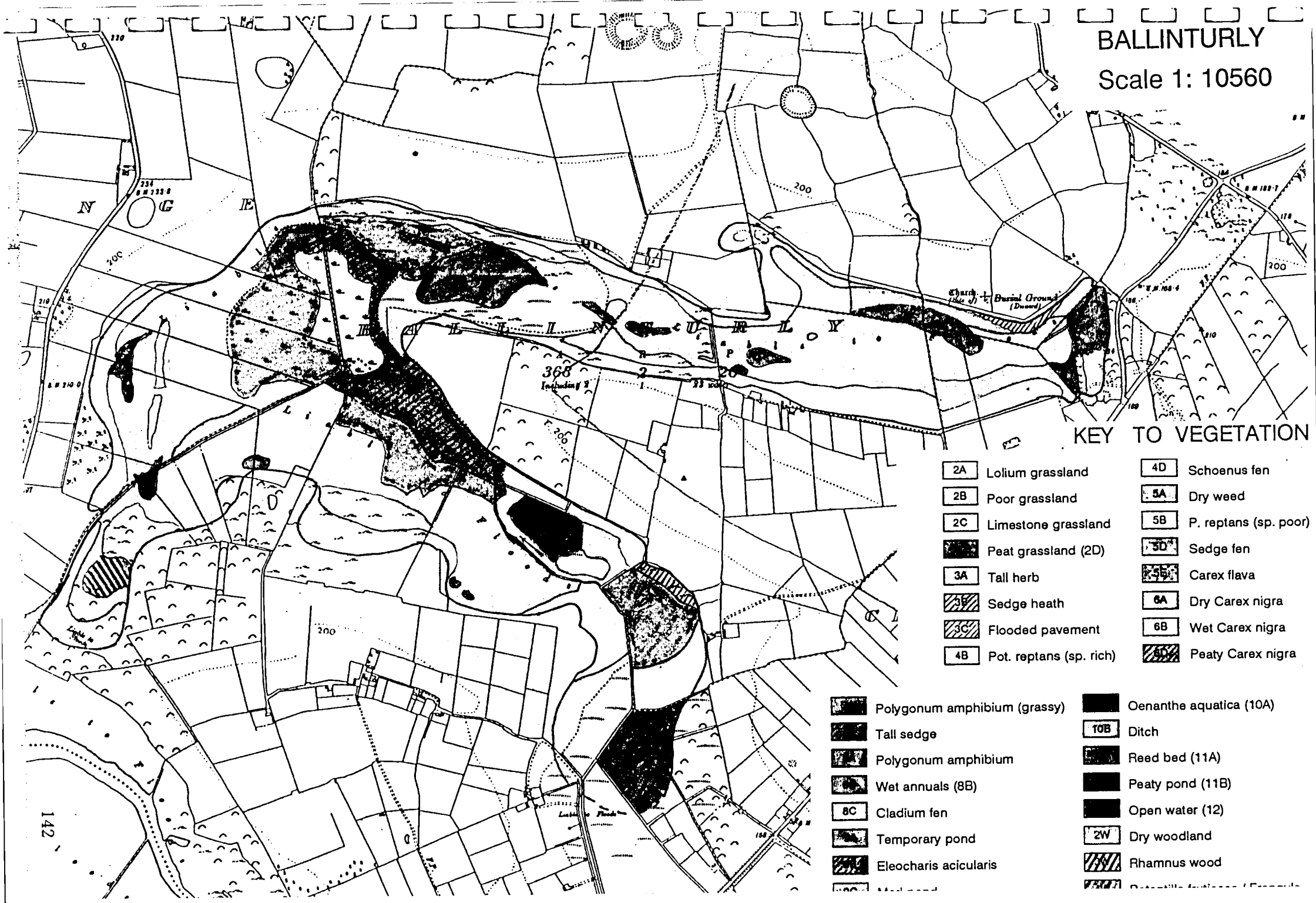
At its upper edge a purer *Carex nigra* stand occurs in the northern limb with damp grassland above. In the stonier parts there is a significant area of 4B with *Molinia* and *Potentilla reptans*. This changes to a tall stand of *Filipendula* and *Phalaris* with *Vicia cracca*, *Briza* and even *Rhinanthus* at the point of the dividing ridge.

The lake area consists centrally of open *Cladium* mixed with *Potamogeton coloratus*, *Baldellia*, *Samolus* and *Eleocharis multicaulis* on a marly surface. This is surrounded by extensive beds of *Carex elata*, *C.nigra* and *Scirpus lacustris* which continue south-eastwards and end in a stand of *C.lasiocarpa* with some *C.acuta* and a little *Phragmites*. On the south-west side the land


87
Ld 21
Formoyle School
Formoyle House
FORMOYLE (Newcomen)
A 215 R 0 P 3
FORMOYLE (Farrell)
A 226 R 1 P 9
LISMACMANUS
A 140 R 1 P 28
CARROWNPHULL
A 83 R 3 P 1
COMMONS SOUTH
A 50 R 0 P 24
Including 12 3 15 water
COMMONS
A 37 R 1 P 23
Including 4 0 26 water
CASHELBEG
A 167 R 0 P 24
FORTWILLIAM
A 196 R 0 P 8
GREENHALL LOWER
A 101 R 3 P 5
ENTRAGH
GREEN
Union & R.D. Bdy.
Union & R.D. Bdy.
Union & R.D. Bdy.
Union & R.D. Bdy.
Smithy
St. Martin's Well
Stones
B.M.191·8
B.M.209·5
B.M.194·5
B.M.147·6
B.M.172·0
B.M.174·0

105.60 km = 1 cm

100 = 9.469
200 = 18.939
300 = 28.41
400 = 37.88


BALLINTURLY
Scale 1: 10560
KEY TO VEGETATION
2A Lolium grassland
2B Poor grassland
2C Limestone grassland
Peat grassland (2D)
3A Tall herb
3B Sedge heath
3C Flooded pavement
4B Pot. reptans (sp. rich)
4D Schoenus fen
5A Dry weed
5B P. reptans (sp. poor)
5D Sedge fen
5E Carex flava
6A Dry Carex nigra
6B Wet Carex nigra
6D Peaty Carex nigra
Polygonum amphibium (grassy)
Tall sedge
Polygonum amphibium
Wet annuals (8B)
8C Cladium fen
Temporary pond
Eleocharis acicularis
Oenanthe aquatica (10A)
10B Ditch
Reed bed (11A)
Peaty pond (11B)
Open water (12)
2W Dry woodland
Rhamnus wood
142

rises (with peat) and then is covered by *Carex hostiana*, *C.lepidocarpa* and a little *Cirsium dissectum*. This community also occurs on the slight saddle that separates the SE tip of the turlough from the rest. Old peat cuttings in it that have reached the marl contain *Potamogeton polygonifolius*, *Scorpidium* and *Ctenidium* while on the nearby shore a narrow rocky fringe of 3B has *Climacium*, *Linum catharticum*, *Anagallis tenella* and *Galium uliginosum*. To the west a larger area of peat cutting is now occupied by an amalgam of communities grouped into 10A. *Oenanthe aquatica* and *Sparganium emersum* are noticeable but there is also some *Nuphar*, *Hippuris*, *Utricularia vulgaris* and *Myriophyllum spicatum*.

The south-east corner of the turlough is indistinct as there has been a build-up of peat over land that must formerly have been flooded. Today there is a large area of poached peat with *Carex disticha*, *Juncus effusus* and *Filipendula* and a smaller stand of cutover peat dominated by *Schoenus*, *Molinia* and *Cirsium dissectum*.

Woodland is present only in the south-west corner where *Crataegus* is scattered with a little *Rhamnus* on dry ground with frequent outcrops.

Vegetation (ha as mapped)

2A-	5.0	3B-	0.9	5A-		6D-		9A-	0.3	11B-	
2B-	14.1	3C-		5B-		7A-	0.4	9B-		12-	
2C-	2.1	3W-		5D-	21.5	7B-	6.7	9C-	3.5	Lake	
2D-		4B-	7.3	5E-		8A-	9.1	10A-	1.8		
2W-		4D-	1.1	6A-	2.7	8B-		10B-			
3A-	0.7	4W-		6B-	53.2	8C-		11A-			

Fauna: Lapwing and snipe nest in the area and it is also used by post-breeding flocks and on migration. In mid-July there were 120 lapwing.

Wintering birds are numerous and Sheppard (in prep.) gives the following averages: wigeon 899, teal 303, pintail 49, shoveler 24, tufted duck 18, lapwing 303, black-tailed godwit 210 and curlew 86.

Evaluation: Ballinturly is the fourth largest of the sites examined and the largest turlough in Roscommon. With 16 plant communities it has a good range of the upper and middle vegetation found in turloughs. It contains the largest area of Poor Grassland (2B) and the second largest of both Sedge fen (5D) and Wet Carex nigra (6B) of any site. In addition there is a little peat and some semi-permanent shallow water, with tall sedges including *Carex acuta* and *C.lasiocarpa*.

A special feature of the site is the presence of some of the group of species indicative of extreme oligotrophy, for example *Potamogeton polygonifolius* and *Eleocharis multicaulis*. This may be related to the fact that the turlough has a very small catchment despite its proximity to the Suck River. There seems to be no

significant input of nutrients from the river. There is very little internal drainage also and in general a lack of human impact, except that from grazing cattle.

All these factors, added to the physical diversity and bird populations, mean that Ballinturly scores highly (59) in the rating scheme. This puts it in eleventh place overall and it should be considered of international value.

38. LISDUFF [Cx 66]
River System: Suck
Catchment Area: 80 ha
Altitude : 49m

Grid Ref: M 8455
6" sheet: Roscommon 41, 44
Turlough Area: 54.1 ha
Evaluation place: 33=

Topography: Lisduff occurs just to the south of Athleague about 3km from the River Suck. It lies in a shallow basin amongst glacially-smoothed hills with occasional rock outcrops, as on the north-east margin. The main basin runs N - S but it has substantial arms in a NW and SE direction also. A road follows the eastern shore but it is little frequented.

Hydrology: The turlough is relatively wet in that a few central ponds persist into July, even in a dry year. Water enters overground from the north-west and there are hollows all along the eastern side which may act as additional sources. More definite swallow holes occur in the NE corner and in the middle of the southern end. There have been no drainage attempts, just the extension of the inflow to the centre in a ditch.

Floodwater is highly calcareous.

Substrate: The substrate is predominantly a grey soil over marl (Coxon, 1986) but there is significant peat build-up in the western half. It appears that this may have been removed from some of the eastern section.

Land Use: There is little subdivision of the basin except for a wall in the eastern half and the ditches already mentioned. The whole area is subject to very little grazing: a few cattle occur with some sheep on the east and west shores. The surrounding land is used for grazing and hay. Any silage is currently bagged (by a contractor living on the eastern margin).

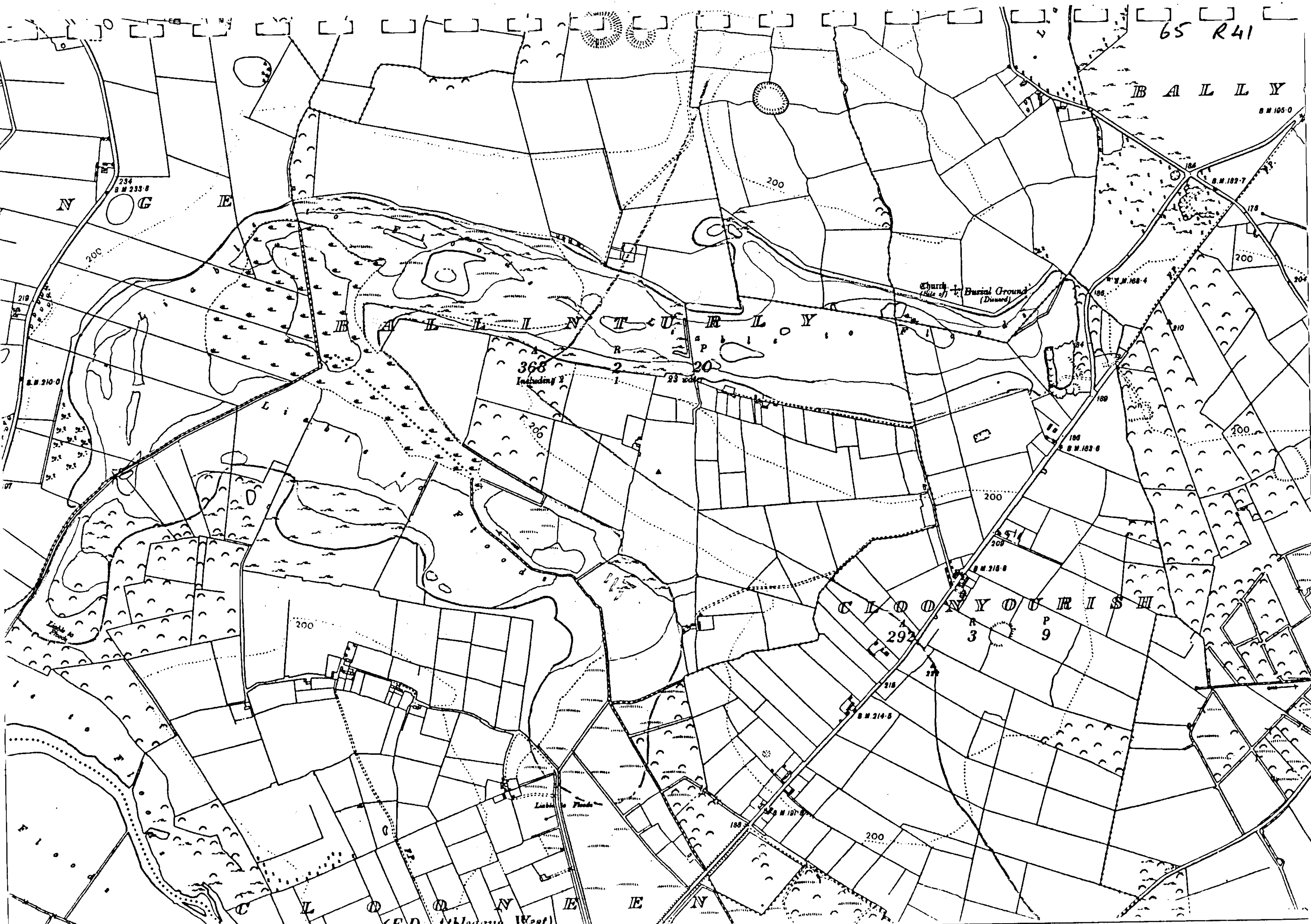
Peat cutting has occurred in the past and there are a few changes of level associated with it.

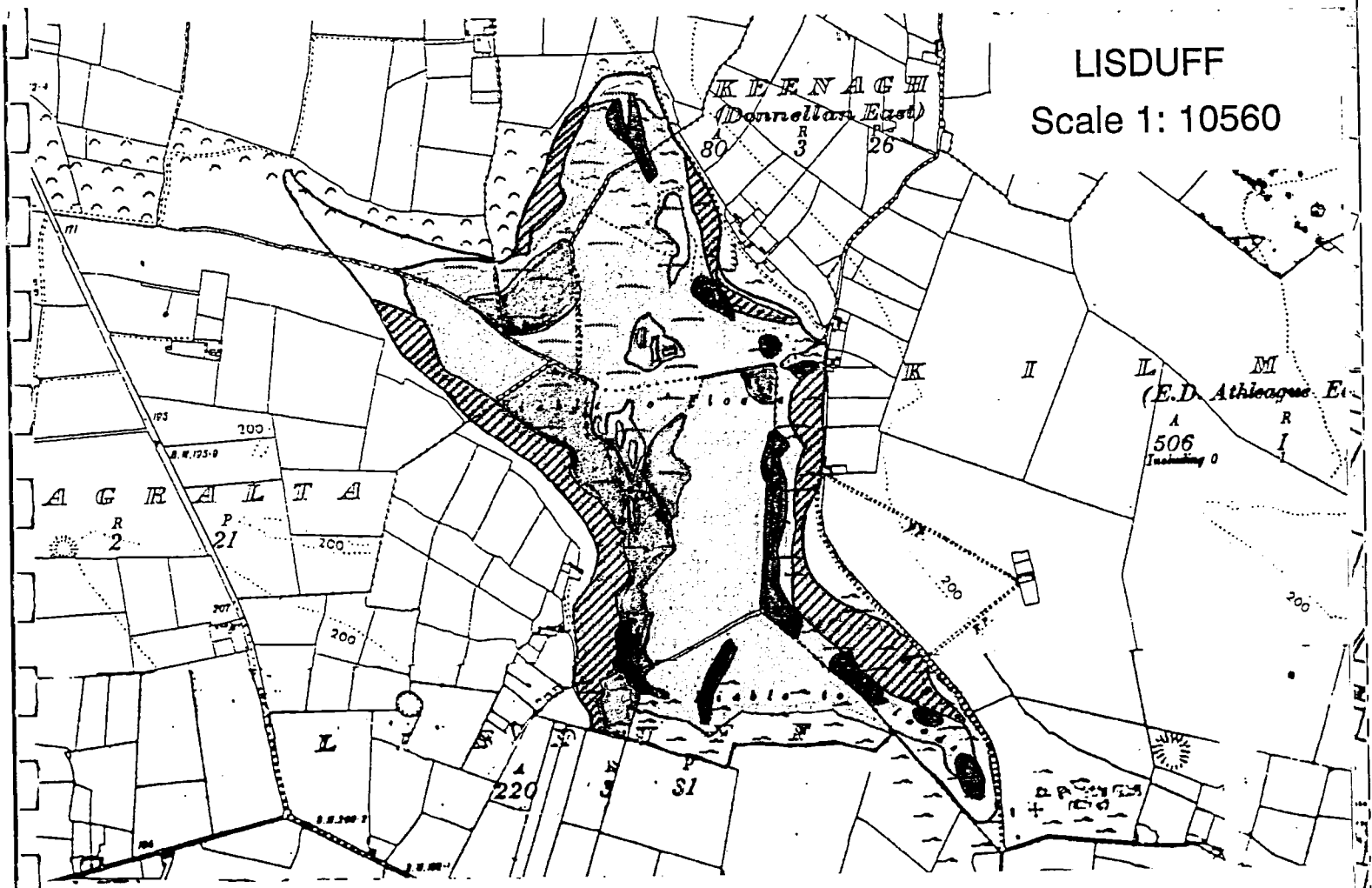
Vegetation: The vegetation is of oligotrophic type but strongly calcareous. All of it is dominated by sedges except for the hollows of *Polygonum amphibium* that occur in a line along the eastern edge. The central pools have a 9C community with

Littorella, Carex nigra, Scorpidium and *Juncus bulbosus* and at their edges give way to *C.nigra* and *C.panicea* with *J.articulatus*, some *Molinia* and *Eleocharis palustris*. This may represent cutover peat for a slight rise to the west brings in *C.hostiana, C.* cf *serotina* and *Eleocharis quinqueflora* (5E) along with much *C.panicea* and *Molinia*. As the ground rises further at the edge of the turlough 3B comes into its own with odd clumps of *Schoenus, Plantago maritima* and *Danthonia*.

The pattern is repeated around much of the basin except that grassland with much *Festuca arundinacea* is present at the southern end and in the NW corner. Close to a rock outcrop in the north-east the smaller scale limestone grassland (2C) occurs.

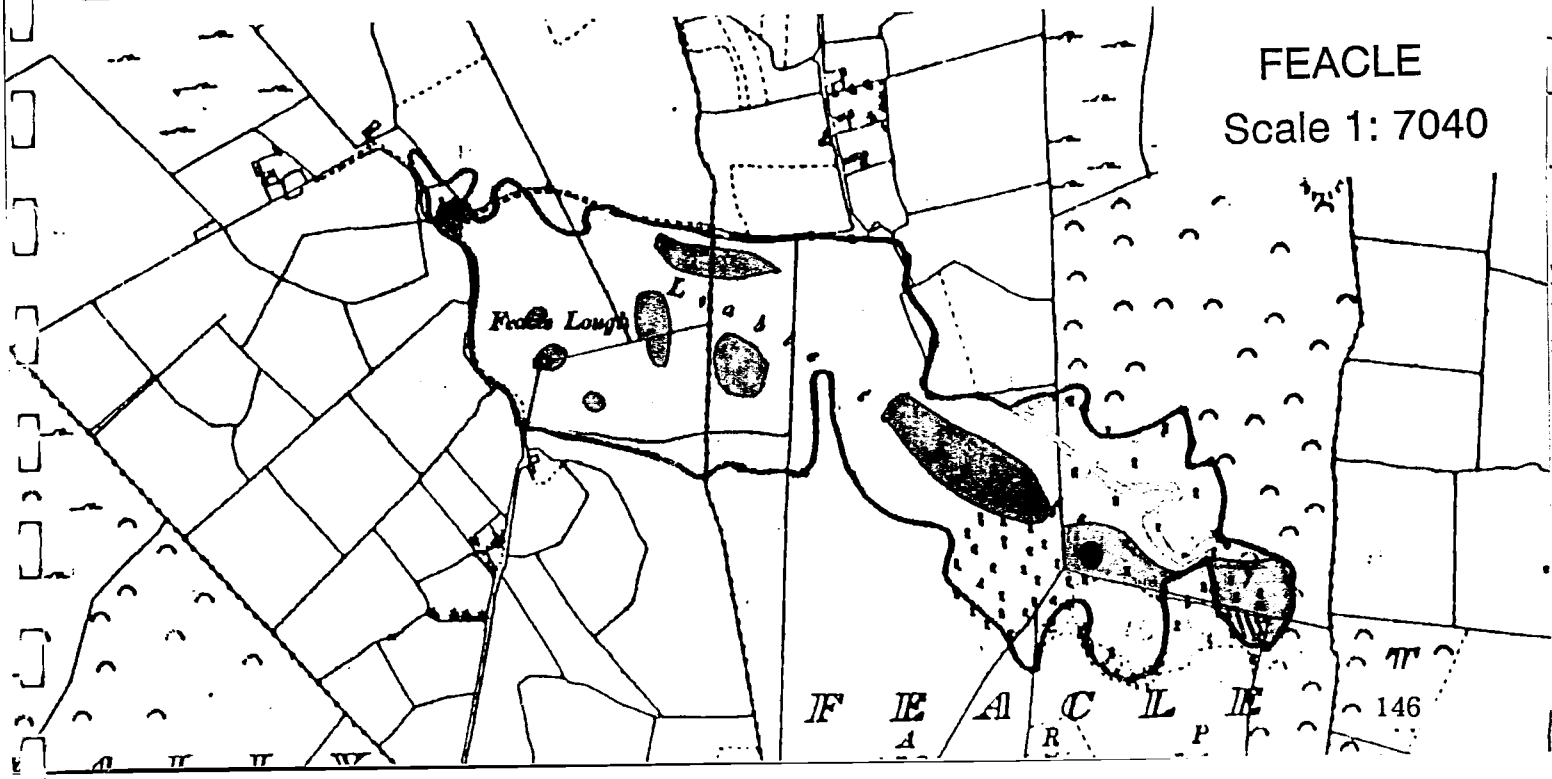
65 R41


BALLY
B.M. 105·0
B.M. 182·7
BALLINTURLY
A 368 R 2 P 20
Including 2 1 23 water
Church (Site of) Burial Ground (Disused)
CLOONYOURISH
A 292 R 3 P 9
B.M. 218·8
B.M. 214·5
B.M. 191·8
B.M. 183·6
B.M. 168·4
B.M. 210·0
B.M. 233·8
CLOONEEN
Liable to Floods
200



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- 6A Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula



Vegetation (ha as mapped)

2A-	0.6	3B-	8.6	5A-	0.5	6D-		9A-		11B-	
2B-	5.3	3C-		5B-		7A-		9B-		12-	
2C-	0.2	3W-		5D-	6.0	7B-		9C-	1.3	Lake	
2D-		4B-		5E-		8A-	3.0	10A-	0.3		
2W-		4D-		6A-	0.8	8B-		10B-			
3A-		4W-		6B-	26.9	8C-		11A-			

Fauna: The prevailing wetness allows a good wader population to nest and many snipe are present. In addition there were 3 prs dunlin and 1 pr redshank when the site was visited. Like the nearby Ballinturly the turlough attracts migrant birds and there was a whimbrel passing in mid-July.

In winter a surprising density of wildfowl occur. Sheppard (in prep.) notes wigeon 310, teal 97, mallard 67, pintail 5, pochard 119, golden plover 143, lapwing 250 and curlew 70. Bewick's swan also occur regularly (Silk, pers.comm.).

Evaluation: Lisduff is a highly oligotrophic site with limited physical diversity but a good range of vegetation which in places shows a nice zonation with depth. The juxtaposition of marl and peat is one of its more interesting features and could indicate some groundwater upwelling in the centre of the site. The turlough has a small catchment like Ballinturly and resembles this site in having a substantial area of the Wet Carex nigra (6B) community as well as Marl ponds (9C) spread through this. It contains *Juncus bulbosus* and *Eleocharis quinqueflora* as interesting species.

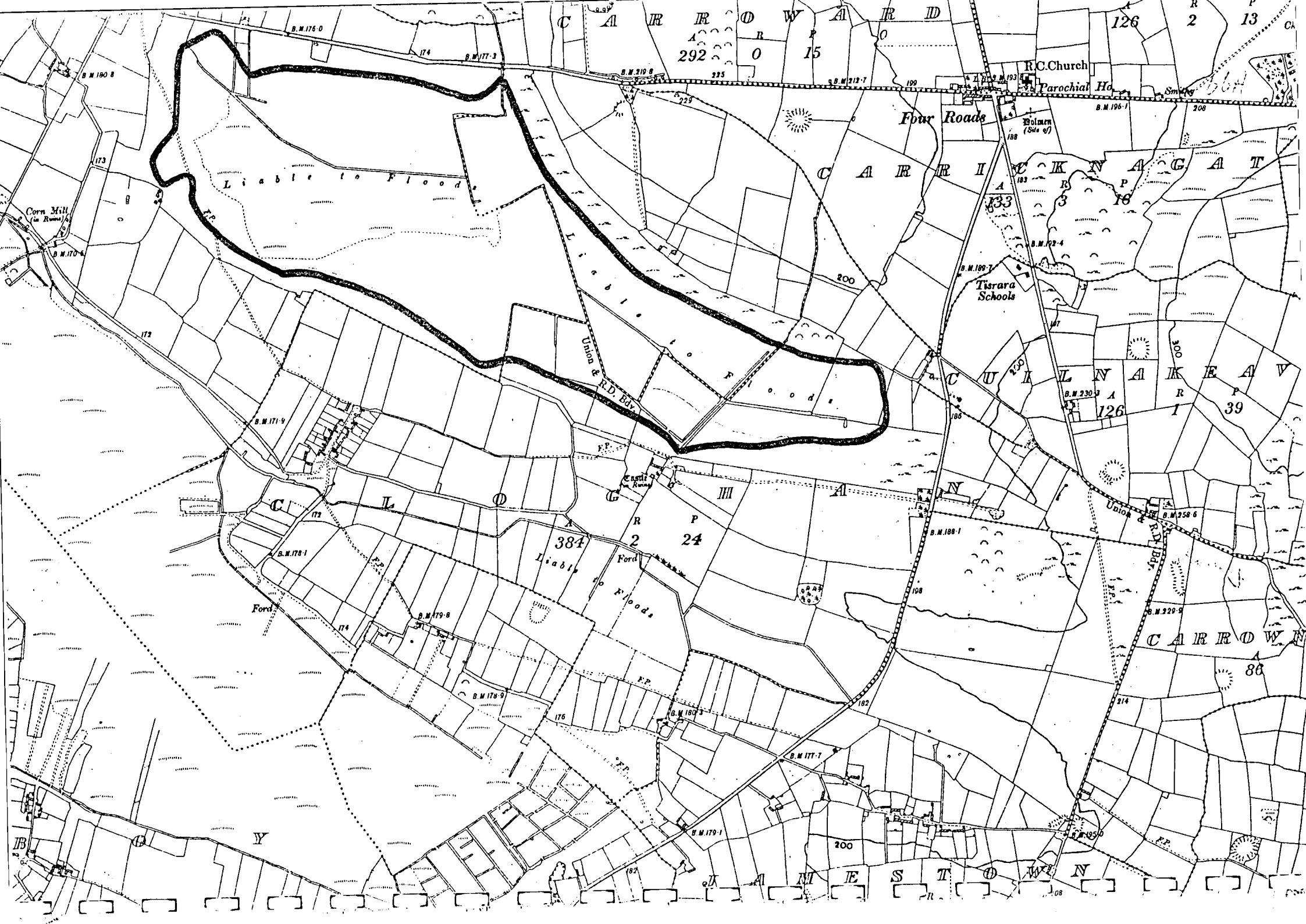
The site is totally undrained and relatively little grazed and is therefore in pristine condition. It also contains breeding dunlin and good wintering populations of birds. It scores 34 in the evaluation process giving it a position of 33rd in the 61 sites. It seems to be more valuable than this in ecological terms, however, and it is considered of national importance.

38A. FOUR ROADS (Cloonloughlin)
River System: Suck
Catchment Area: 460 ha
Altitude: 49m

Grid Ref: M 8451
6" sheet: Roscommon 44
Turlough Area: c.59.1 ha
Evaluation place - unknown

Description: This site has long been recognised as an area of ornithological interest and is protected as a Bird Sanctuary. The fact that it is a turlough was recognised in 1991 after fieldwork had finished. It is not included in Coxon's (1986) list although the 6" map does indicate that it is liable to floods.

The site was visited in the following spring for completeness sake. It lies in a very flat basin south-west of the village and is subject to less frequent flooding than the nearby Lisduff.


CARROWARD
292 A 0 R 15 P
126 A 2 R 13 P
R.C.Church
Parochial Ho.
Four Roads
Volunteer (Site of)
CARRICKNAGAT
133 A 3 R 16 P
Tisrara Schools
CULNAKEAV
126 A 1 R 39 P
CLOGHAN
384 A 2 R 24 P
Liable to Floods
Union & R.D. Bdy.
Corn Mill (in Ruins)
Castle (Ruins)
Ford
CARROWN
86 A
KAMESTOWN
B.M.176·0
B.M.177·3
B.M.219·8
B.M.219·7
B.M.193
B.M.196·1
B.M.180·8
B.M.170·4
B.M.171·9
B.M.178·1
B.M.179·8
B.M.179·9
B.M.180·3
B.M.177·7
B.M.179·1
B.M.195·0
B.M.192·4
B.M.189·7
B.M.230·3
B.M.188·1
B.M.258·6
B.M.229·9
F.P.
Union & R.D. Bdy.

Standing water remains longest at the western end where there was a narrow pond in April.

In vegetation terms it appears to be a eutrophic, grassy turlough surrounded by good grazing land. There is a small area of grazed *Schoenus* and *Carex panicea* in the north-west corner and large amounts of *C.nigra* below this. This seems likely to be be 6A in view of the apparent dryness of the site.

The site is used by large numbers of birds in winter. As with most turloughs numbers are highly variable. There are times when the whole Suck population of white-fronted geese (500) are there along with 2600 wildfowl and 8000 waders. At other times bird numbers are in hundreds. Averages and (peaks) from Sheppard (in prep.) and Silk (pers.comm.) include wigeon 1638, teal 1278, mallard 176 (500), shoveler 84 (400), pintail 46 (80), whooper swan (60), lapwing 1080 (2000) and golden plover 238 (6000).

The turlough also supports breeding lapwing, redshank and snipe.

Evaluation: An ornithological evaluation of this site would rate it as nationally important as it holds a sufficient proportion of the Irish population of white-fronted goose, wigeon, teal and shoveler.

A 6" map of the turlough is given overleaf with a boundary marked from the aerial photograph.

39. LOUGH CROAN [Cx 67]	Grid Ref: M 8849
River System: Cross (Shannon)	6" sheet: Roscommon 44,45,47,48
Catchment Area: 480 ha	Turlough Area: 106.9 ha
Altitude: 67m	Evaluation place: 5

Topography: Lough Croan is a linear wetland south of the Athlone to Mount Talbot road. The surrounding countryside is of very low relief and drift-covered. The basin is aligned NW - SE and overlooked from the north side by a number of houses. The floor has flat sections at each end overgrown with reeds and a more undulating middle part with a few high spots that are islands with a moderate flood level.

There is no exposed rock in the basin.

Hydrology: The turlough appears to be drier now than formerly; some of the marginal wetland plants are growing poorly and there is no evidence of flooding beside originally marginal fence lines. Flooding would still seem to be annual at the eastern end of the basin but very rare at the west. The Ordnance Survey maps mark the

site as a lake in 1968, nothing at all in 1983 and a marsh in 1987. However there is no evidence of external drainage.

Little overground water flows into it other than minor springs at the western end and a single one in the east. However there are several permanent waterbodies along the central line and at the SE end. A probable swallow hole occurs in an old well halfway along the northern side but this would not drain the whole area (Coxon, 1986).

Substrate: The floor deposits are peaty below the reedbeds (more than 90cm) and silty in the drier stretches. There is marl in the eastern lake though apparently rather impure.

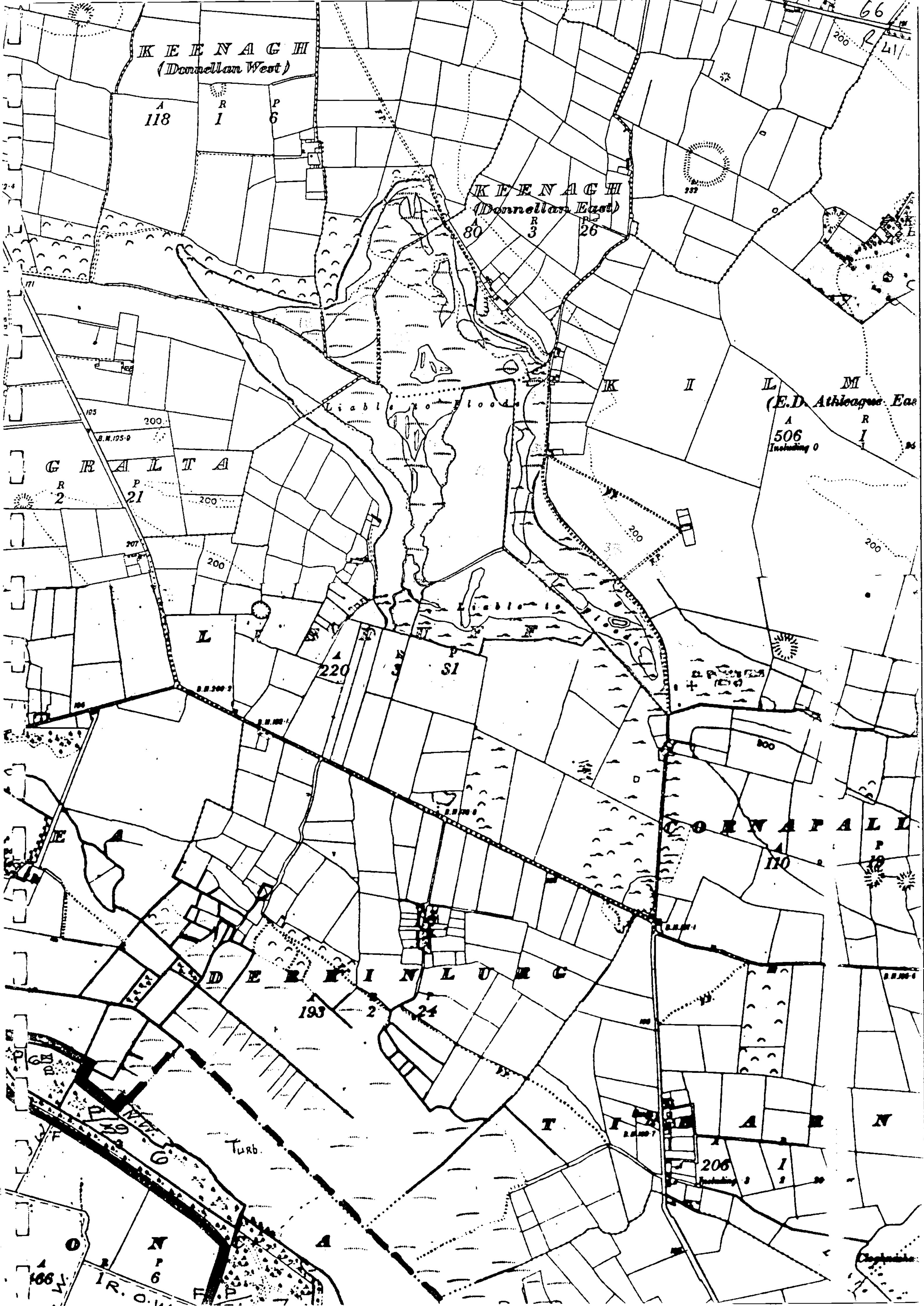
Land Use: Most of the area is open to grazing but the reedbeds are generally protected by ditches and the soft ground. At the time of the visit sheep were more frequent than cattle on the surrounding land. Silage is made by some of the nearby farms though there was no overt evidence of inflows. Seepage from the houses along the northern shore is likely.

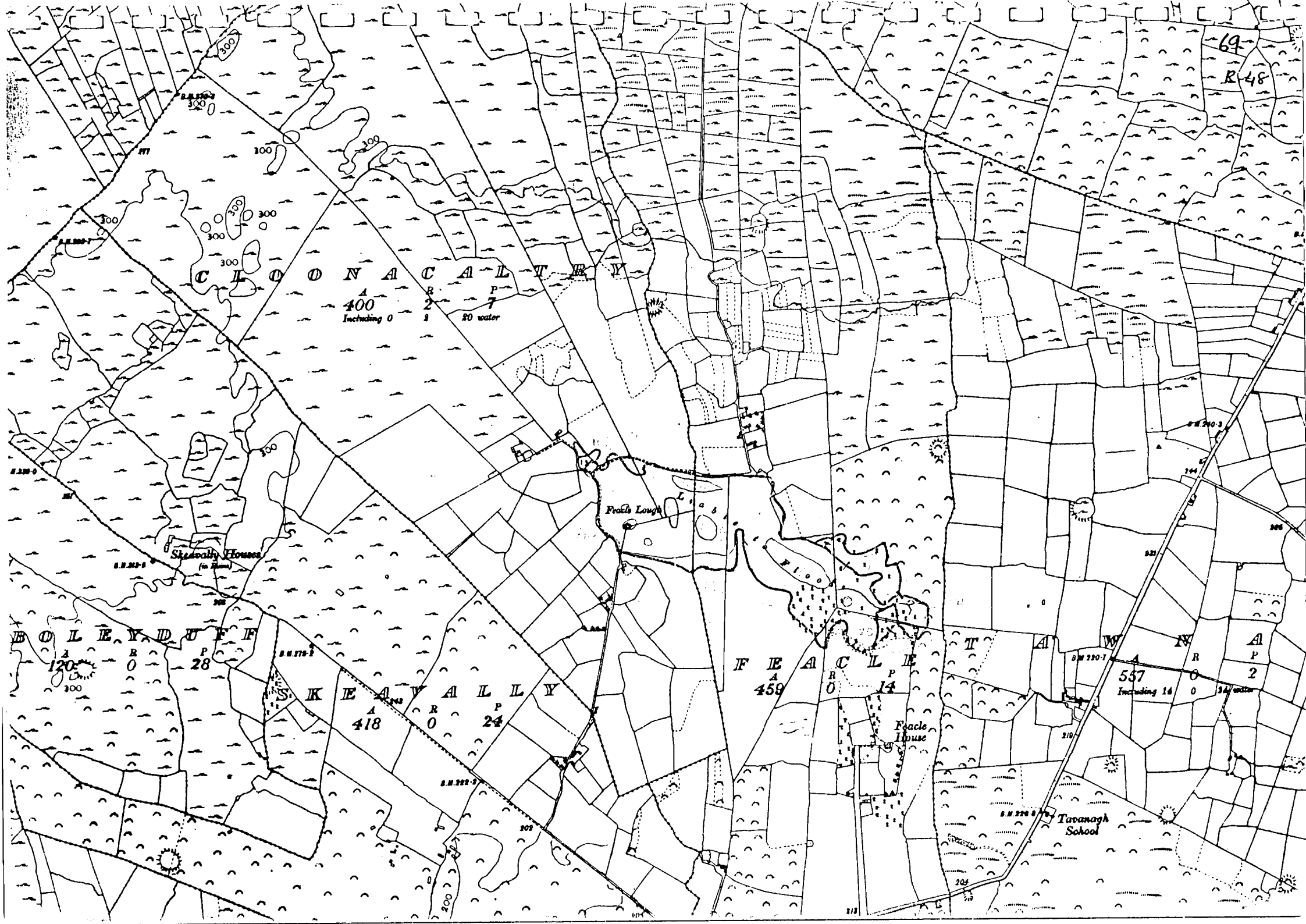
There is some evidence of former peat cutting at the western end.

Vegetation: The midline of the turlough is generally the wettest ground and there are beds of *Phragmites* with *Carex elata, C.rostrata* and *Equisetum fluviatile* in the centre of much of the western half. *Cicuta, Berula, Ranunculus lingua* and *Iris* are frequent and there are occasional clumps of *Salix cinerea*. The drains are filled by *Menyanthes*, sometimes producing a scraw, while *Potamogeton pusillus* and *Myriophyllum verticillatum* grow in the open water. At the eastern end a larger waterbody produces the same vegetation with substantial areas of *Scirpus lacustris, C.elata* and *Menyanthes*, pierced by *Sparganium erectum* and *Iris*. Shallow water ponds hereabouts are filled by 9A with *Glyceria fluitans, Veronica catenata, Oenanthe aquatica* and *Rorippa islandica* and *R.palustris*. On the southern side a distinct band of annual plants follows the edge of the sedges on the whitish mud. Here *R.islandica* comes into its own with *Filaginella, Chenopodium rubrum, Juncus bufonius* and a few trampled specimens of *Veronica scutellata* var *villosa*. There is also some *Amblystegium riparium* growing out of the vegetable debris over the mud.

Outside of these wet areas the bottom is covered by 6A or 6B. Both *Molinia, Deschampsia cespitosa* and *Equisetum palustre* emphasize the peat content of the soil which appears also on the 'islands'of 3B. In channels and hollows in the central area *Polygonum amphibium* becomes frequent, sometimes with *Apium inundatum* and *R.islandica*.

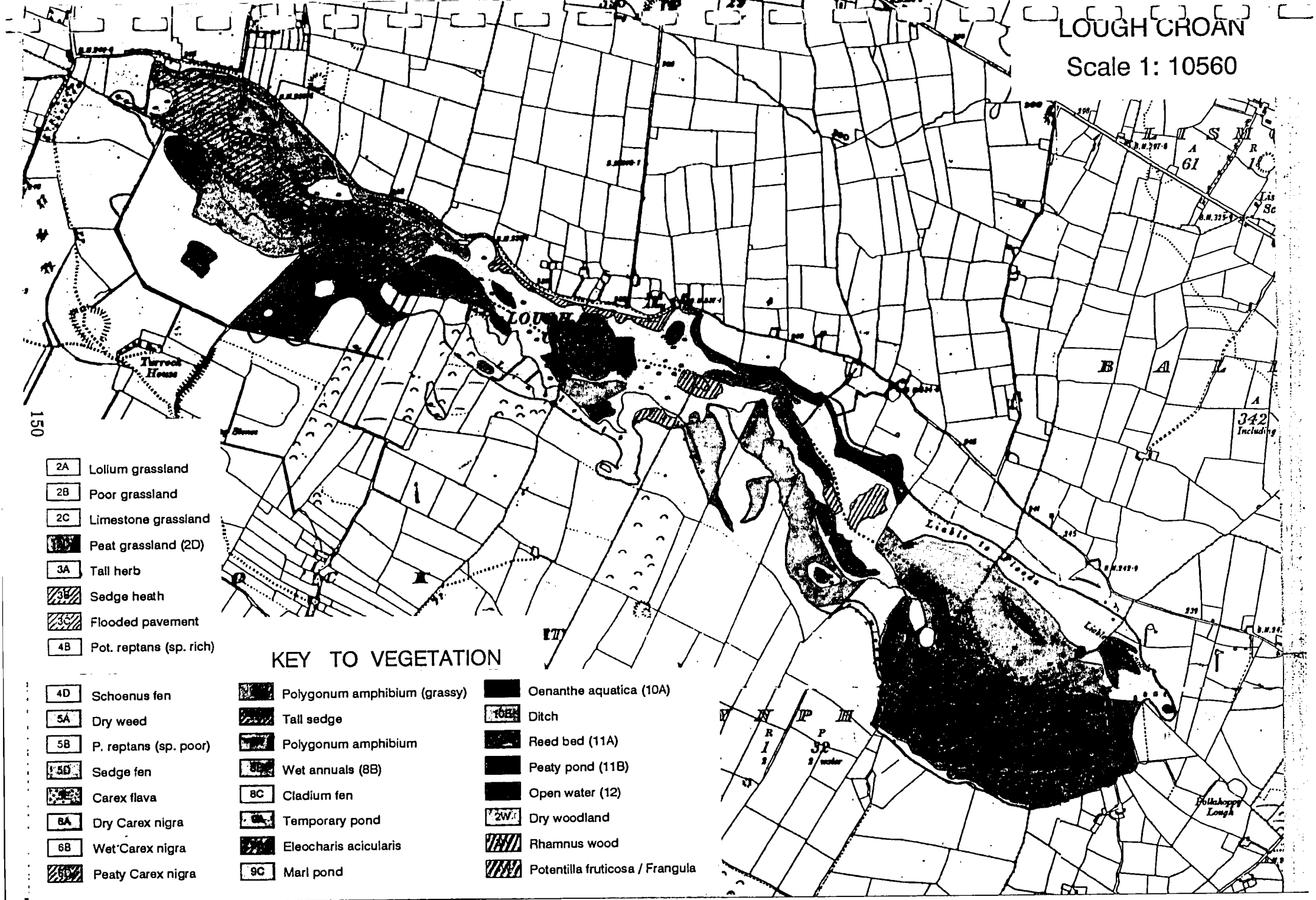
Peat is especially thick at the western end where *Juncus subnodulosus, Menyanthes, Pedicularis palustris* and *Equisetum fluviatile* are scattered through *Carex nigra, C.rostrata* and some *C.disticha*. There is also a patch of 5D with *Succisa*, a little *Schoenus* and unflowering *Carex lasiocarpa*. Southwards these give way to drier ground with *Deschampsia, Juncus conglomeratus* and


66
R 41
KEENAGH
(Donnellan West)
A 118 R 1 P 6
KEENAGH
(Donnellan East)
A 80 R 3 P 26
KILM
(E.D. Athleague East)
A 506 R 1
Including 0
Liable to Floods
GRALTA
R 2 P 21
200
Liable to Floods
L
A 220 P 31
CORNAPALL
A 110 P 12
DERRINLURG
A 193 R 2 P 24
Turb
T
A
ARN
A 206 R 1
Including
O
N
A
A 166 R 1 P 6
Cloghnaisha


69
R 48
C L O O N A C A L T E E Y
A 400 R 2 P 7
Including 0 1 20 water
Feacle Lough
F E A C L E
A 459 R 0 P 14
Feacle House
S K E A V A L L Y
A 418 R 0 P 24
B O L E Y D U F F
A 120 R 0 P 28
Skeavally Houses
T A W N A
A 557 R 0 P 2
Including 14 0 24 water
Tavanagh School

LOUGH CROAN

Scale 1: 10560



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- 5D Sedge fen
- Carex flava
- 6A Dry Carex nigra
- 6B Wet Carex nigra
- 6D Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula

Anthoxanthum (2D). Such a community is repeated along the northern shore of the basin and there is a tiny patch of 4D based on *Schoenus* at the eastern end. Calcareous seepage here allows *Selaginella* and *Anagallis tenella* to grow.

Elsewhere around the margins grassland is predominant, 2C at the southern end where the shore rises abruptly with stones, but elsewhere 2B or 2A. Occasional depressions are found on the southern side out of range of regular floods but with the same types of vegetation. Some of these have been filled or otherwise modified recently.

Vegetation (ha as mapped)

2A-	11.6	3B-	2.4	5A-		6D-	6.9	9A-	2.2	11B-	0.5
2B-	4.2	3C-		5B-		7A-	0.4	9B-		12-	
2C-	1.2	3W-		5D-	7.4	7B-	12.2	9C-		Lake	
2D-	7.9	4B-		5E-		8A-	3.3	10A-			
2W-		4D-	0.2	6A-	14.6	8B-	4.5	10B-			
3A-		4W-		6B-	18.1	8C-		11A-	8.9		

Fauna: Lough Croan is a well-known bird site and supports nesting snipe, curlew and lapwing as well as mallard, black-headed gull and mute swan. A single short-eared owl was also flushed out of the *Carex elata* at the eastern end.

In winter both wild swans are found and Sheppard (1991) records Bewicks at 18, whooper 7, wigeon 535, gadwall 10, teal 470, pintail 15, shoveler 140, coot 36, golden plover 120, lapwing 984 and curlew 77.

Evaluation: Lough Croan is the fifth largest site examined during the survey. It is an unusual wetland in that it contains both fen and turlough vegetation and it perhaps should be thought of as quite a small turlough contiguous with a large fen. The result of this complexity is that its vegetation is highly diverse with a total of 17 communities. The extent of the Reed bed (11A), Peaty *Carex nigra* (6D) and Tall sedge (7B) communities is notable and for the first two this forms their second largest stands in any site. Parts of all these types of vegetation are based on scraws suggesting that the site was a lake in the past, like Levally Lough (# 22).

The more strictly turlough vegetation includes a substantial area of Wet Annuals (8B) - again the second largest - at the south-east end. There is abundant *Rorippa islandica* and *Chenopodium rubrum* here and some *Veronica scutellata* var. *villosa* at its only Irish site. The rare plant species bring up the evaluation score of the site to 67 (5th place) and its small catchment is also relevant to this. However Lough Croan does show significant human impact. There is reclamation on the south side and probably nutrient input from houses on the north. No major drainage scheme is apparent but there is an over-riding impression from the vegetation that flooding has been reduced either in extent or frequency.

The overall size of the site, whether it is all a turlough or not, its birdlife and the rare plant communities and species would seem to make this site of national importance.

40. FEACLE [Cx 69]
River System: Cross (Shannon)
Catchment Area: 200 ha
Altitude: 63m

Grid Ref: M 9143
6" sheet: Roscommon 48
Turlough Area: 15.7 ha
Evaluation place: 42

<site map on p 146>

Topography: Feacle turlough lies about 12km west of Athlone in an uneven, glacial terrain of kame deposits. The basin runs roughly E - W but the edge is sinuous because of encroaching mounds. An esker-like feature projects from the southern side. The floor of the basin is similarly uneven with a number of discrete hollows: some at the western end show bedrock. Elsewhere there is loose rock at the edges and a number of walls.

Hydrology: A permanent pond exists across the road at the north-western end. There was no other water when the site was visited except in a well at the western end. This would seem to be the original swallow hole. There is no overground inflow to the turlough and it is a dry site in summer. Flooding to a depth of 3-4m is likely however.

There is no sign of drainage within or outside the basin.

Substrate: Coxon (1986) records a light brown soil over sandy silt over stones and rock. The sand is everywhere noticeable, even around the dried up cattle ponds.

Land Use: The turlough is largely grazed by sheep with a few cattle at the eastern end. There is no silage made locally and no obvious effluent to the basin. Some seepage from a house may enter the permanent pond.

Vegetation: The vegetation is extremely simple. All the lower hollows have *Polygonum amphibium* with some *Alopecurus geniculatus, Phalaris* and sometimes *Rorippa islandica*. Above this *Carex nigra* and *Potentilla reptans* occupy the western section and poor grassland (2B) the drier, eastern half. This spreads onto the esker on the south where there is a compact zonation. Animal treading at the eastern end has allowed a *Rumex crispus, R.obtusifoius, Potentilla anserina* mixture to grow on low land around a pond with *Polygonum* spp, *Ranunculus trichophyllus* and *Potamogeton crispus* within. *Capsella, Stellaria media* etc are frequent in this sandy ground. The south-east corner used to carry a significant amount of *Rhamnus* woodland around a hummocky limestone outcrop. This has largely been felled but a fragment persists.

The hedges at the western end have a high proportion of *Rhamnus* also and the roadside pond, connected to the turlough at times of high water is covered in dense *Amblystegium varium, Lemna minor, L.gibba* and *Myriophyllum spicatum* with *Filaginella* and *Rorippa islandica* around the edges.

Vegetation (ha as mapped)

2A-		3B-		5A-	0.8	6D-		9A-	+	11B-	0.1
2B-	7.5	3C-		5B-	5.3	7A-		9B-		12-	
2C-		3W-	0.1	5D-		7B-		9C-		Lake	
2D-		4B-		5E-		8A-	1.6	10A-			
2W-		4D-		6A-		8B-	+	10B-			
3A-		4W-		6B-		8C-		11A-			

Fauna: Lapwings probably nest in the turlough but no other species were seen. There is no winter information.

Evaluation: The value of this turlough is that it is at the dry end of the wet - dry gradient but seems to be unaffected by any artificial drainage. It is also unusual (like Coolcam) in being surrounded by gravelly deposits which may affect its hydrology. Its vegetation is limited in type but the zonation on the surrounding glacial hills is of some interest. It also contains two unusual plant species: *Lemna gibba* and *Rorippa islandica*.

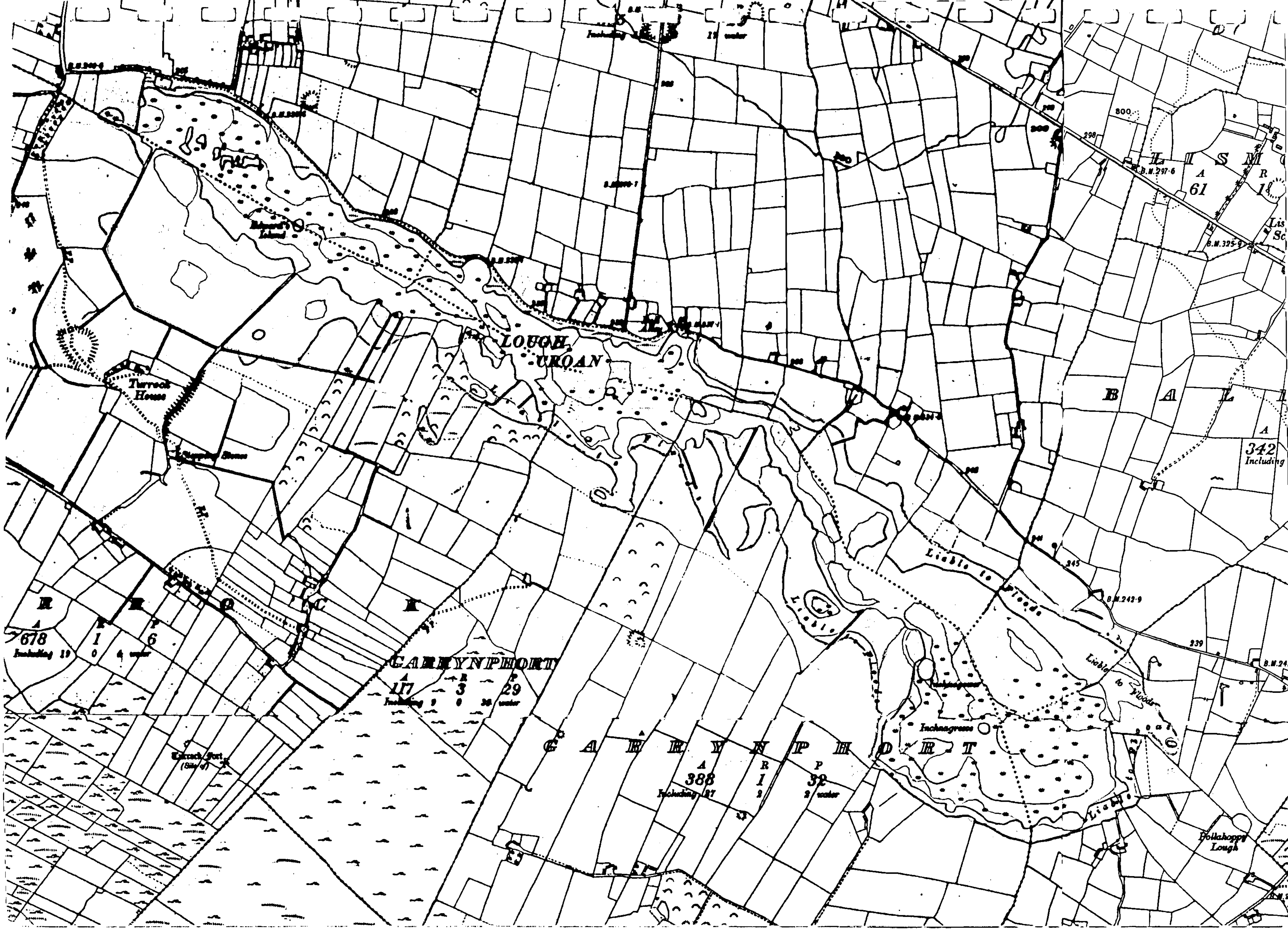
Its overall rating score (30) puts the turlough two-thirds way down the scale but its generally good condition would seem to qualify it as regionally important.

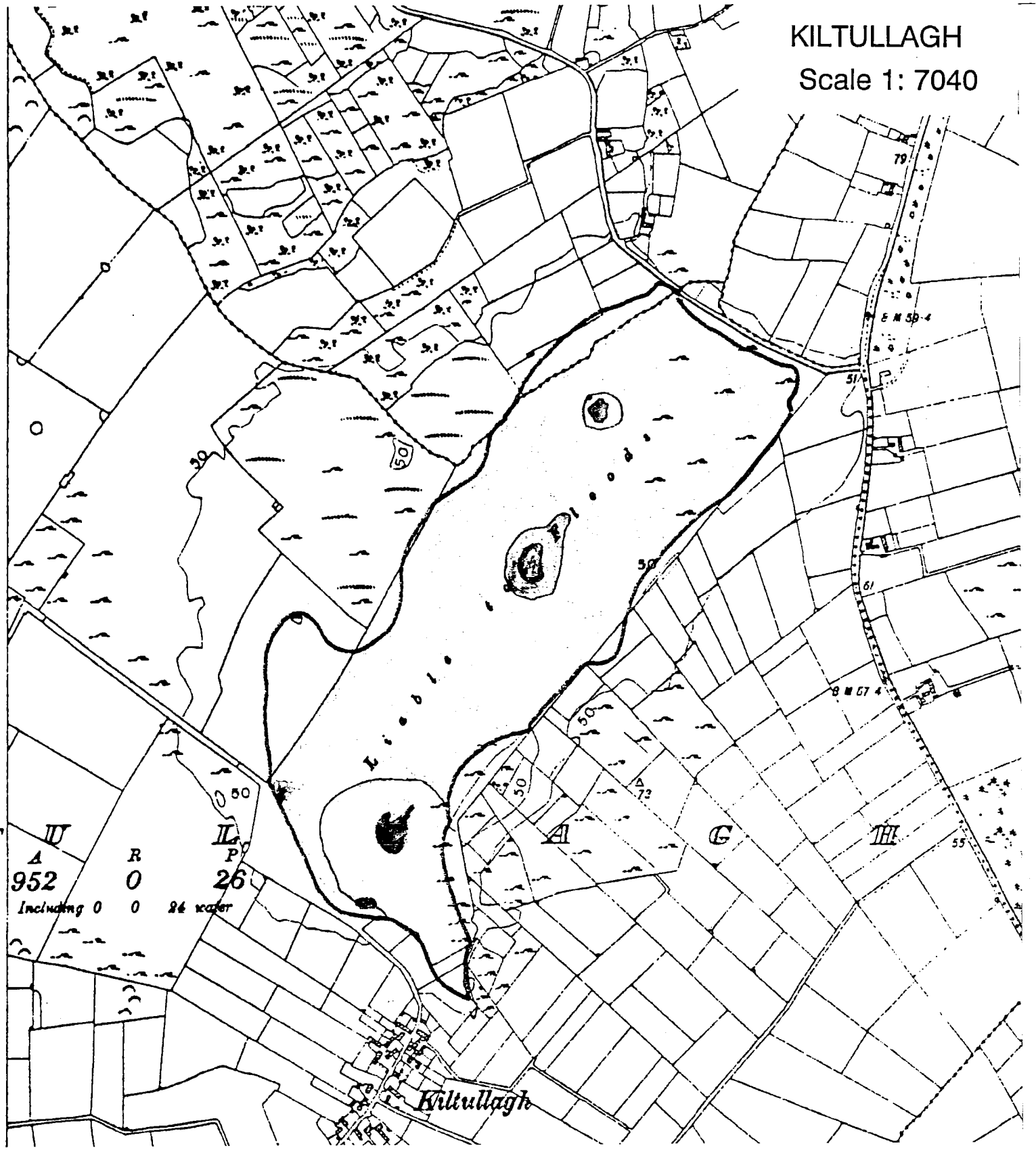
41. KILTULLAGH [Cx 18]
River System: Clare
Catchment Area: 200 ha
Altitude: 13m

Grid Ref: M 3730
6" sheet: Galway 83
Turlough Area: 28.9 ha
Evaluation place: 52

Topography: Kiltullagh lies close to Galway airport, north-east of the city. It is a flat linear basin running NE - SW up to the village and deepening at this southern end. A few boulders occur scattered along the edges but basically it appears as a flat grassy field. There has been some bulldozing of rocks in the western extension.

Hydrology: The turlough is a dry one which must empty more completely in the summer months than many others. There are three low-lying hollows which had recently been pools when the site was visited and there was a still active spring at the south-west end. Flooding had been extensive in early 1990 and there was debris across the roads at each end of the basin.


LOUGH UROAN
GARRYNPHORT
GARRYNPHORT
Turrock House
Edward's Island
Inchnagreese
Dollakoppy Lough
Turrock Fort (Site of)
Liable to Floods
Stepping Stones
A 388 R 1 P 32
Including 27 2 2 water
A 117 R 3 P 29
A 678 R 1 P 6
A 342 Including
A 61
B.M. 297·6
B.M. 325·9
B.M. 242·9
298
300
245
239



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot.'reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- 5D Sedge fen
- Carex flava
- 6A Dry Carex nigra
- 6B Wet Carex nigra
- 6D Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula

Coxon (1986) records a swallow hole at the north-east end, filled with rubbish, as well as two wells on the floor. These are no longer used.

There is no evidence of drainage though the area may have been affected by the arterial drainage of the Clare River.

Substrate: More than 50cm of stiff grey-brown, silty clay is noted by Coxon (1986).

Land Use: The area seems to be a common and is grazed closely by cattle and sheep.

Vegetation: The majority of the turlough is covered by a flowery pasture of 2C, on the 10th August bright with *Leontodon autumnale*, *Lotus* and *Potentilla erecta* and with *Euphrasia nemorosa*, *Prunella* and *Plantago maritima* at the edges. The fields on deeper soil have 2B but it is only around the three depressions that the vegetation is more varied. 5B covers much of this lower ground though in the centre, purer *Carex nigra* grows (6A). Two of the pools were dry with tiny *Ranunculus trichophyllus*, *Rorippa islandica* and *Filaginella* while a little shallow water in the other supported *Callitriche obtusangula*. The spring at the south end was partly grown over by *Glyceria declinata*.

Walls and rocks nearby bring in mosses such as *Rhynchostegiella tenella* as well as sheltering *Polygonum* species and *Stellaria media*.

Vegetation (ha as mapped)

2A-		3B-		5A-		6D-		9A-	0.1	11B-	
2B-	1.7	3C-		5B-	3.6	7A-		9B-		12-	
2C-	22.1	3W-		5D-		7B-		9C-		Lake	
2D-		4B-		5E-		8A-		10A-			
2W-		4D-		6A-	0.6	8B-	0.3	10B-			
3A-		4W-		6B-		8C-		11A-			

Fauna: There are unlikely to be breeding waders on this site but it is probably visited by local lapwing while it remains damp. There is no winter data available.

Evaluation: Kiltullagh is at the dry extreme of the sites visited and it is the only one with such a large proportion of the Limestone grassland (2C) community in its vegetation. Overall it has only six plant communities and, in addition, very limited physiographical diversity. However it does have a little floral interest in the occurrence of *Rorippa islandica* and *Glyceria declinata* - a grass not recorded in any other turlough. These bring up its evaluation score to 24 and its position to 52nd.

The turlough is in the catchment of the Clare River and may therefore be affected by the drainage scheme. This would explain the preponderance of a dry vegetation type and if true, further reduces the level of ecological interest in the site. However it

is possible that it is a natural phenomenon, in which case the site is quite unusual. Only Turlough O'Gall (and Rahasane) have comparable areas of this community.

It seems best to consider the site as of regional importance at this stage.

42. RAHASANE [Cx 1]
River System; Dunkellin
Catchment Area: 20070 ha
Altitude: 16m

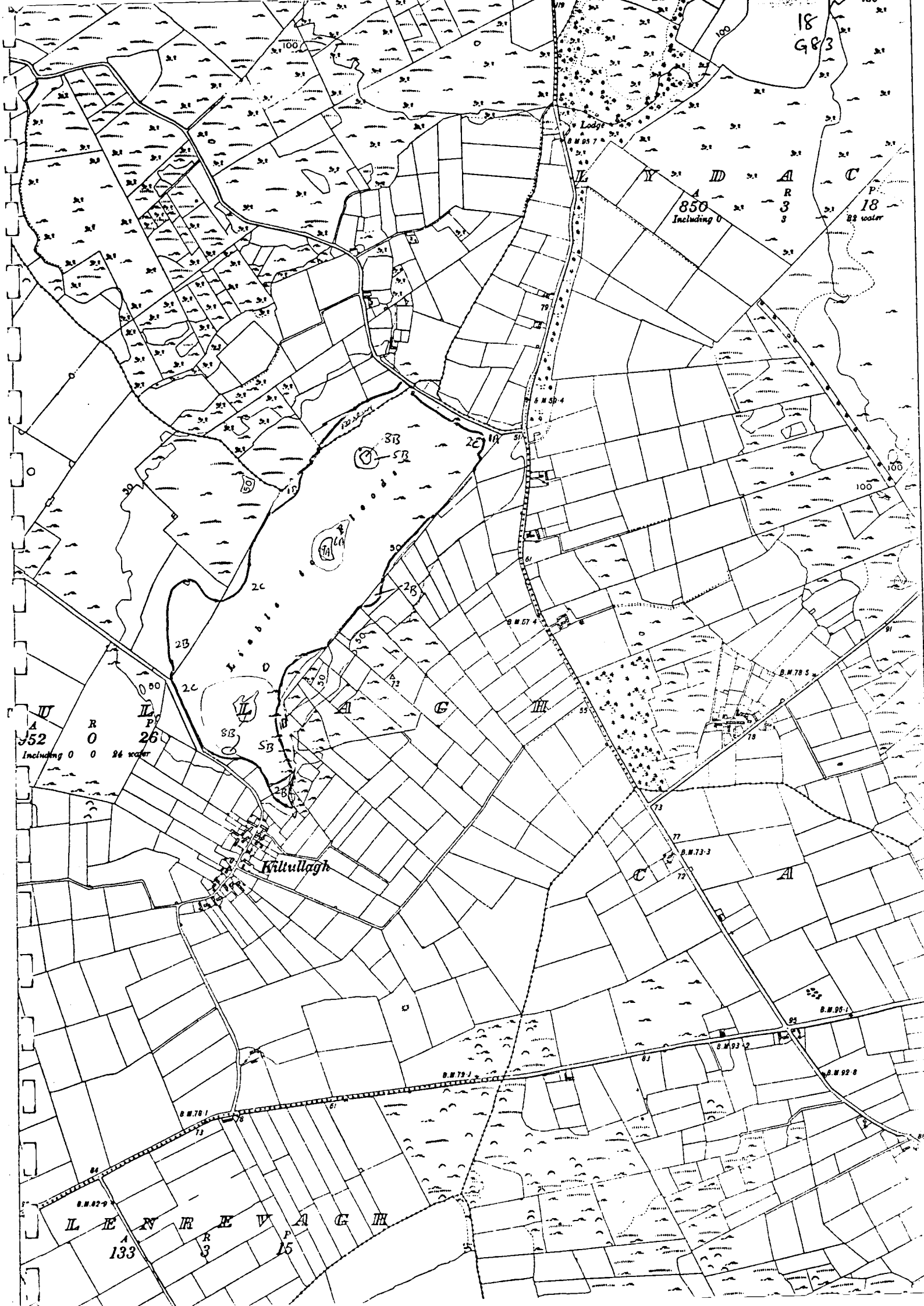
Grid Ref: M 4820
6" sheet: Galway 96,104
Turlough Area: 267.1 ha
Evaluation place: 2

Topography: Rahasane lies in gently undulating land west of Craughwell. It consists of three main parts: the large northern basin which takes the Dunkellin River westwards, the southern basin which is a drier, valley-like feature and the isolated, southern turlough, separated even at times of high water by a short channel. Mostly the edges rise gradually into the surrounding land but in places rocks mark a more sudden transition. The southern basin is an impressive topographic feature with high rocky sides above an undulating base, dotted with sheep and boulders. There is a lower hill on the south side of the main basin and again on the north-east near Shanbally Castle where wave-smoothed limestone is evident. The southern basin and parts of the eastern end of the main basin are distinguished by the presence of large rocks scattered over the floor but the major part of the turlough is stone-free, a very flat expanse of grass with occasional depressions and dry channels.

There is little division of the floor of the turlough except by waterways and the impression is of one gigantic field. Stone walls do occur in the southern basins and in the east of the main basin, all places where the floor still contains loose rock.

Hydrology: The turlough was formerly the natural sink of the Dunkellin River but now an artificial channel takes some of the water further downstream, at least in winter. The river follows the dug channel in the eastern end of the turlough but soon leaves it to flow around the edge of the northern basin in a broad sweep. It returns to the channel for a short distance in the west before breaking out again to flow into an active swallow hole system beside a scrub-covered pile of stones, perhaps an old crannog. The main swallow holes here are constantly changing but are anything up to 5m in diameter and 2-3m deep. There are minor collapses throughout this area and occasionally elsewhere in the turlough with two or three more permanent pools.

The northern side of the main basin remains wet throughout the year and in many places 10-15cm of water covers ground which from


18
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Kiltullagh
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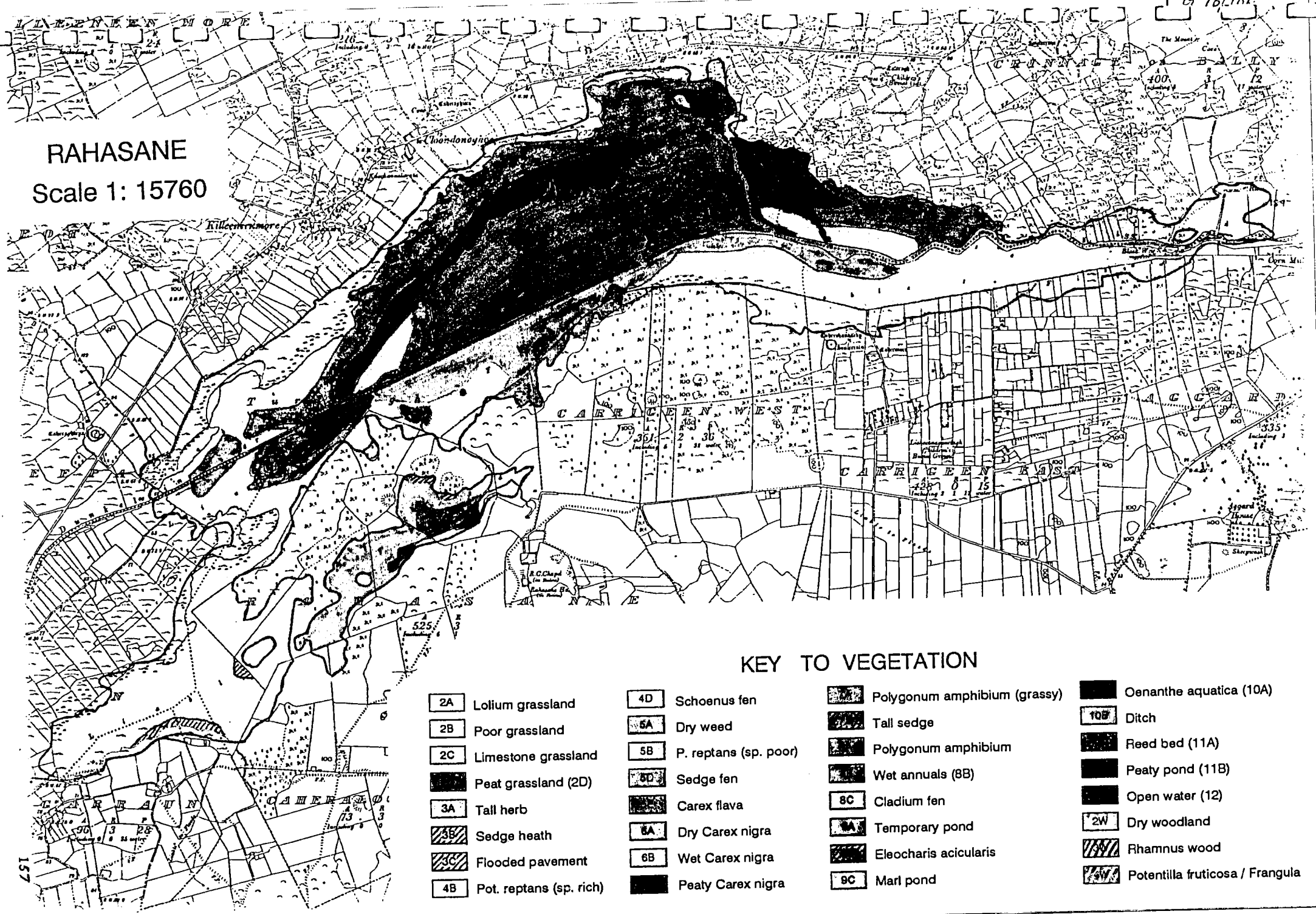

RAHASANE
Scale 1: 15760
KEY TO VEGETATION
2A Lolium grassland
2B Poor grassland
2C Limestone grassland
Peat grassland (2D)
3A Tall herb
3B Sedge heath
3C Flooded pavement
4B Pot. reptans (sp. rich)
4D Schoenus fen
5A Dry weed
5B P. reptans (sp. poor)
5D Sedge fen
Carex flava
6A Dry Carex nigra
6B Wet Carex nigra
Peaty Carex nigra
Polygonum amphibium (grassy)
Tall sedge
Polygonum amphibium
Wet annuals (8B)
8C Cladium fen
Temporary pond
Eleocharis acicularis
9C Marl pond
Oenanthe aquatica (10A)
10B Ditch
Reed bed (11A)
Peaty pond (11B)
Open water (12)
2W Dry woodland
Rhamnus wood
Potentilla fruticosa / Frangula

afar looks quite grassy. In 1990 the turlough was more flooded in August than in June or July.

There has been no successful drainage to date, the artificial river channel having little affect on the hydrology of the turlough.

Substrate: In most places there is silty clay with shell fragments up to or more than 3m in thickness (Coxon, 1986). It is well exposed around the swallow holes. Locally in the main basin there are signs of marl but peat is absent everywhere.

Land Use: The turlough is closely grazed by cattle, sheep and horses: indeed the shortness of most of the vegetation is one of its chief features. Sheep are largely confined to the southern basin and the northern shore but the other animals range everywhere. The artificial river channel is crossed by cattle in certain places where it is about 80cm deep. The southern turlough carried rather many cattle in 1990 which had turned the remaining water into muddy pools with scattered vegetation.

Vegetation: The vegetation of Rahasane divides into the dry and the wet rather more neatly than most others. In places with outcropping limestone the edge vegetation is predominantly 2C, though this breaks down to 5A on the north shore where trampling is intense and some animals are over-wintered. In a few places on the southern edge, leaching has gone far enough to allow 3B to grow as a fringe below the more calcicole community. Elsewhere there are stretches also of 2A and 2B on the flooded edges of agricultural fields. 5B occurs in very large expanses at both ends of the turlough. It covers practically all of the southern basin on the firm, sheep-grazed floor and extends also around the nearby edges of the main basin. At the eastern end it is found on the drier ground where the river follows its own channel.

In the central southern section as well as in the southern turlough *Potentilla reptans* disappears from the vegetation, perhaps because of slightly poorer drainage, leaving 6A which locally contains *Viola persicifolia*. The ground here is again very firm but the presence of low-growing *Eleocharis palustris* suggests that there is water not far below. This plant is most frequent in the shallow, winding channels that take the rising or retreating floods. Occasionally these lead into 8A, *Polygonum amphibium* benefitting from the accumulation of nutrients brought to such pools.

The wet communities are all associated with the river channels, both natural and artificial. Water escapes northwards just as the turlough broadens out below the site of Shanbally Castle and standing water persists all summer as a track south-westwards down to the swallow holes. The fully aquatic community here (11B) includes *Ranunculus circinatus* and *Potamogeton pectinatus* while the pool to the north-west has *P.pusillus* and *Eleocharis acicularis*. 9A adjoins on the north side of the river and contains a little *Rorippa sylvestris* close to the shoreline in rather

prostrate form. At each end of the main water track there are shallows which dry out occasionally and are covered with 10A with a little *Lemna gibba*, perhaps drifted in from the south. Between the two rivers, natural and artificial, is a broad island of splashy grass - *Polygonum amphibium* communities of both 7A and 8A which are consistently grazed by cattle. A few individual ponds are sunk in this and there is a muddy area also, with *Rorippa islandica*. 7A is repeated along the north shore east of Shanbally Castle while there are also some narrow fields with *Iris* (3A).

The main channel of the river has bands of 10B along each side, sometimes with a deeper central section of pondweeds (12). *Berula erecta*, *Apium nodiflorum* and *Polygonum amphibium* occur marginally and there is a little *Oenanthe fluviatilis*. *Rorippa islandica* grows in places along the edge and Lockhart (unpub.) records *Myriophyllum verticillatum* also.

Although there are areas of scrub, particularly on the southern and north-western shores, the actual area of flooded woodland is too small to be mapped. It is of 3W type with some *Rhamnus cathartica* and in Carrigeen West it leads into drier ash/hazel wood. Many of the trees have abundant epiphytes such as *Leskea polycarpa*, *Amblystegium riparium* and *Isopterygium elegans* as well as *Isothecium myosuroides* and *Thuidium tamariscinum*.

Vegetation (ha as mapped)

2A-	3.6	3B-	1.4	5A-	1.8	6D-		9A-	51.3	11B-	13.8
2B-	10.2	3C-		5B-	80.3	7A-	38.3	9B-		12-	1.9
2C-	22.5	3W-		5D-		7B-		9C-		Lake	
2D-		4B-		5E-		8A-	6.7	10A-	10.4		
2W-		4D-		6A-	25.0	8B-	0.1	10B-	3.4		
3A-	2.0	4W-		6B-	0.8	8C-		11A-			

Fauna: Rahasane is renowned for its wintering wildfowl populations (see below) but it also contains nesting waders in summer, including lapwing, redshank, snipe and dunlin. At least three singing males of the latter species were seen in June.

In winter Sheppard (in prep.) records averages and (peaks) as follows: whooper swan 179, mute swan 125, Bewick's swan 132, white-fronted goose 75, mallard 777, teal 3005, wigeon 7760, shoveler 498, pintail 102, pochard 356, tufted duck 381, coot 1289, lapwing 3995, golden plover 17,680, dunlin 3569 (5653), black-tailed godwit 170 and curlew 1205.

The southern turlough was the first place that the crustacean *Tanymastix stagnalis* was recorded in Ireland (Young, 1976). Some aquatic beetles were recorded by Bilton & Lott (1991).

Evaluation: As the largest turlough in the country with the largest numbers of birds and a very good variety of vegetation, albeit somewhat spaced out by the large dimensions involved, Rahasane is unquestionably of international value. It contains the largest stands of six separate vegetation types and the second

largest of three others. Of these Polygonum amphibium-grassy (7A), Temporary pond (9B) and Peaty pond (11B) stand out as by far the best examples of these communities. The rare plant species at Rahasane are numerous also. Most have been mentioned above but they include a number of waterplants (e.g. *Ranunculus circinatus, Potamogeton pusillus* and *Lemna gibba*) as well as the turlough specialities like *Viola persicifolia, Eleocharis acicularis* and *Rorippa islandica*.

Hydrologically the site has a huge catchment area and is now the only major turlough fed by a large limestone river. Turloughmore (780 ha) and Clonkeen (450 ha) were others, destroyed by the Clare arterial drainage (D'Arcy, 1983). Though superficially modified by the construction of an artificial channel, the flooding regime seems unaltered as the river deserts its channel to flood the eastern end of the basin and later to find a swallow hole.

The site comes second in the overall evaluation scheme - after Coole/Newtown with a score of 85.

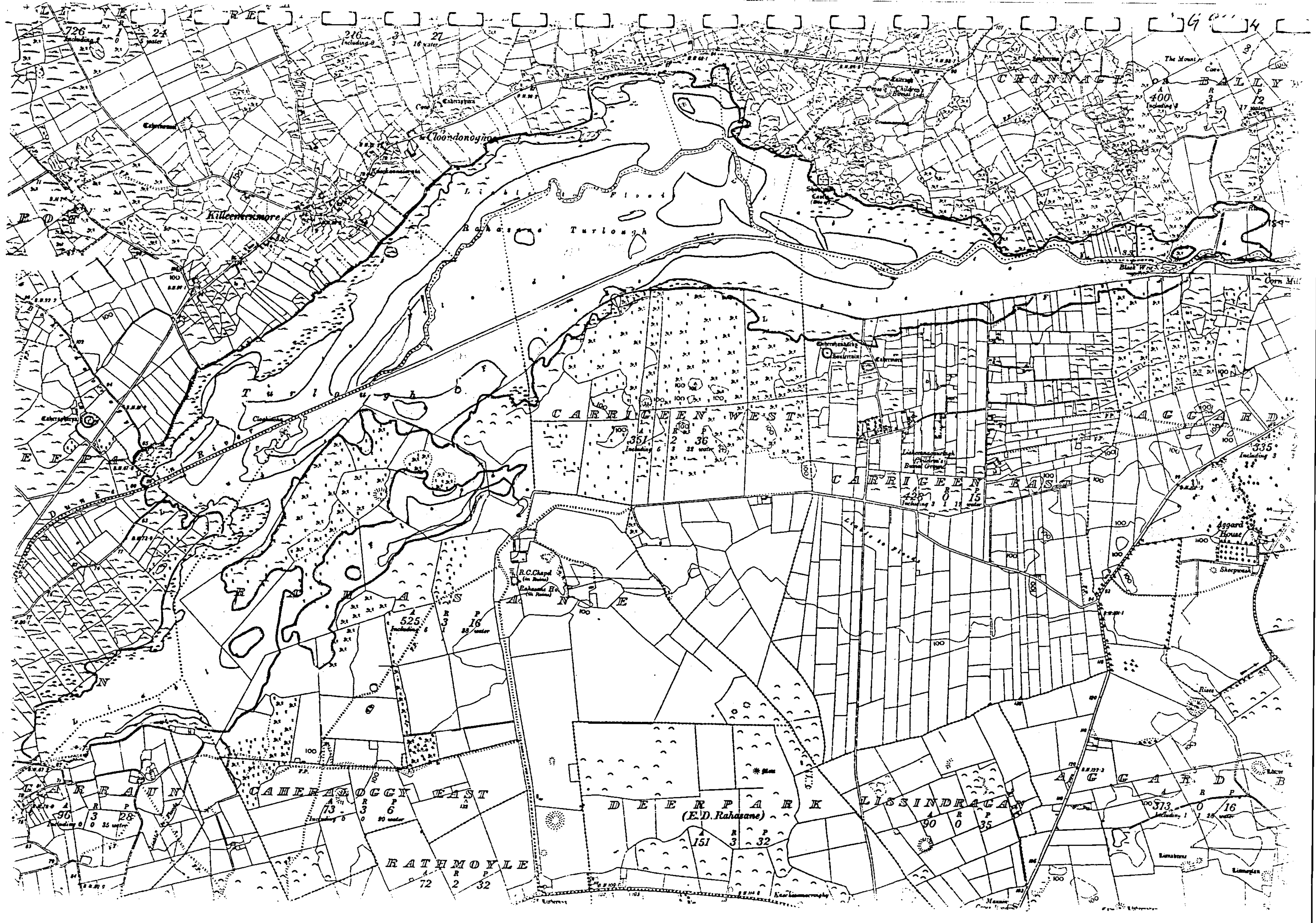
43. CARANAVOODAUN [Cx 9]	Grid Ref: M 4515
River System: Ballindereen/Galway Bay	6" sheet: Galway 103
Catchment Area: 480 ha	Turlough Area: 24.8 ha
Altitude: 26m	Evaluation place: 14

Topography: Caranavoodaun is set in undulating limestone land north of Ardrahan with areas of pavement, woods and fields nearby. The turlough lies in a hollow about 5m below the general level and the land rises more steeply on the northern edge than on the southern. The basin runs into scrub along most of the northern shore and into woodland on the east.

A wall system crosses the turlough from east to west, in part obscuring a line of low-lying pools which connect to a larger low area in the west. There is a slight rise in the centre with an area of flooded pavement close to the north shore. The eastern limit is marked by scattered rocks.

Hydrology: A permanent pool occurs at the centre of the basin with shallower arms which dry out occasionally, extending to its west and north. The inter-connections are by low ground, not specifically dug out ditches. A broad channel runs southwards from the pond to a swallow hole close to the southern edge while there is another hole at the western end. There is a small cattle pond dug in the angle on the south-western shore.

There are no drainage attempts visible and a good deal of shallow water persisted to at least mid-June in 1990.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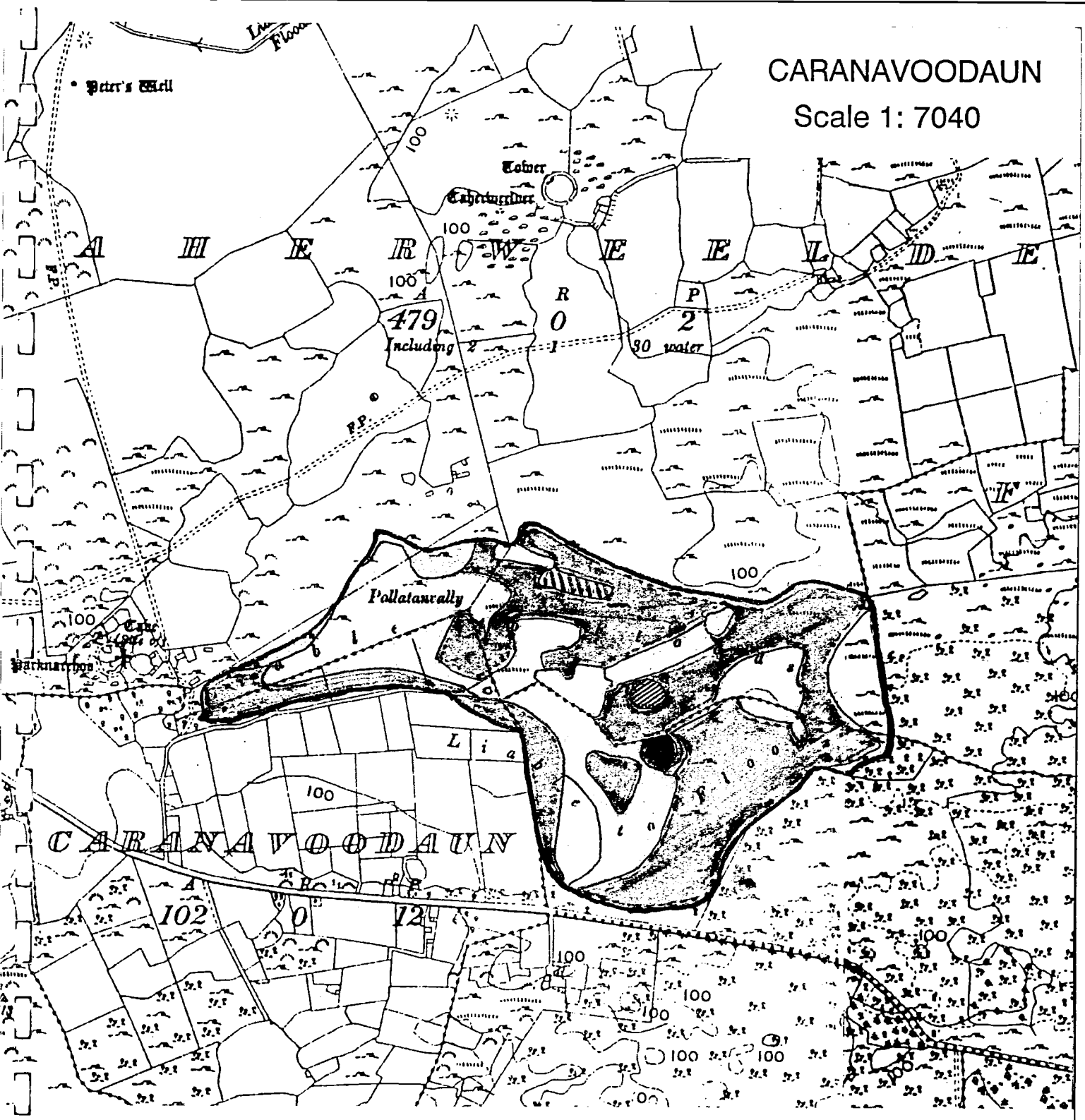
Turlough
CARRIGEEN WEST
CARRIGEEN EAST
AGGARD
Aggard House
Sheepwash
Corn Mill
Black Weir
Rises
R.C. Chapel (in Ruins)
Rahasane Ho. (in Ruins)
RAHASANE
DEERPARK
(E.D. Rahasane)
LISSINDRAGAN
CAHERALOGGY EAST
RATHMOYLE
GARRAUN
CRINNAGE
BALLY
The Mount
Dunkellin



KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge	10B	Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)	5D	Sedge fen	8B	Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb	5E	Carex flava	8C	Cladium fen		Open water (12)
3B	Sedge heath	6A	Dry Carex nigra	8A	Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)	6D	Peaty Carex nigra	9C	Marl pond	2W	Potentilla fruticosa / Frangula

Substrate: Silt and fine sand extend down to 90cm with the rock lying below this (Coxon, 1986). Some marl is accumulating at present in the ponds, especially at the eastern end where there is also shallow peat. There was much calcium carbonate encrusting the foliage early in the year.

Land Use: The lack of grazing is noticeable, probably caused by the relatively unpalatable sedge cover. A few cattle were confined to the fields at the western end and they would sometimes have had access to the whole turlough.

Vegetation: Caranavoodaun is a highly calcareous and rather oligotrophic turlough with the 5D community covering more than half of its area. There are two patches of 4D above it, the largest, at the eastern end is scattered with rocks and is flooded only occasionally. *Equisetum variegatum* grows sparsely through this area. The *Schoenus* gives way on the outside to an open scrub of *Rosa* spp., *Crataegus* and a little *Rhamnus*. To the south-east the woodland includes *Fraxinus* whose roots, with abundant *Thamnobryum*, are sometimes inundated. There is *Taxus* here too and both *Sorbus aria* and *S. hibernica*. The south-western shore is similarly marked by a band of scrub in which *Rhamnus* is conspicuous and tending to spread out onto the turlough floor. Trees of 3-4m in height were almost killed in the floods of February 1990 and were just managing to resprout from parts of the trunk by June.

Along the north-east shore the land rises from the 5D into a limestone heath with abundant *Juniperus* which was similarly killed by the high water. The north-west shore is slightly richer and there are small areas covered by *Phalaris* and *Carex hirta* (3A).

The low ground in the turlough holds 9C, still in June under 5-10cm of water. As one walks this area there is sometimes the crunch of *Littorella* underfoot with more frequent *Eleocharis palustris* and *Juncus bulbosus*. *Scirpus fluitans* forms a fine sward on shallow peat and there is a tangle of *Potamogeton gramineus, P.polygonifolius, P.coloratus* and *Baldellia* in the shrinking pool areas. The deepest pond has *P.natans*. The 9C community extends towards the swallow hole in the south, giving way to a small patch of 5B and ultimately to a few clumps of *Polygonum amphibium* beside the sink.

Limestone pavement breaks through the turlough floor in the north centre supporting 4W above the shallow watertable. The prostrate shoots of *Frangula* and *Rubus caesius* mix with more upright *Rosa canina* and *R.pimpinellifolia*. *Cladium, Carex elata* and *Festuca arundinacea* grow in the cracks while a few stunted trees of *Fraxinus* and *Prunus spinosa* stand over the whitened rocks.

Vegetation (ha as mapped)

2A-		3B-	0.2	5A-		6D-		9A-	0.1	11B-	
2B-		3C-		5B-	0.7	7A-		9B-		12-	0.1
2C-		3W-		5D-	13.8	7B-		9C-	7.8	Lake	
2D-		4B-		5E-		8A-		10A-			
2W-		4D-	1.0	6A-	+	8B-		10B-			
3A-	0.6	4W-	0.2	6B-		8C-		11A-			

Fauna: The area is too small and oligotrophic to attract much birdlife but a few mallard and teal probably visit in winter. Four mallard were present in June and could nest in the surrounding cover. There were no waders.

Evaluation: Caranavoodaun is at the extreme oligotrophic end of the variation in turlough type and has a corrispondingly small catchment. It has a limited number of vegetation types but these include relatively large areas of Sedge fen (5D) and Marl pond (9C). The latter support the suite of oligotrophic species, *Potamogeton polygonifolius*, *Eleogiton fluitans* and *Juncus bulbosus*. It is also the only turlough in which *Equisetum variegatum* was found.

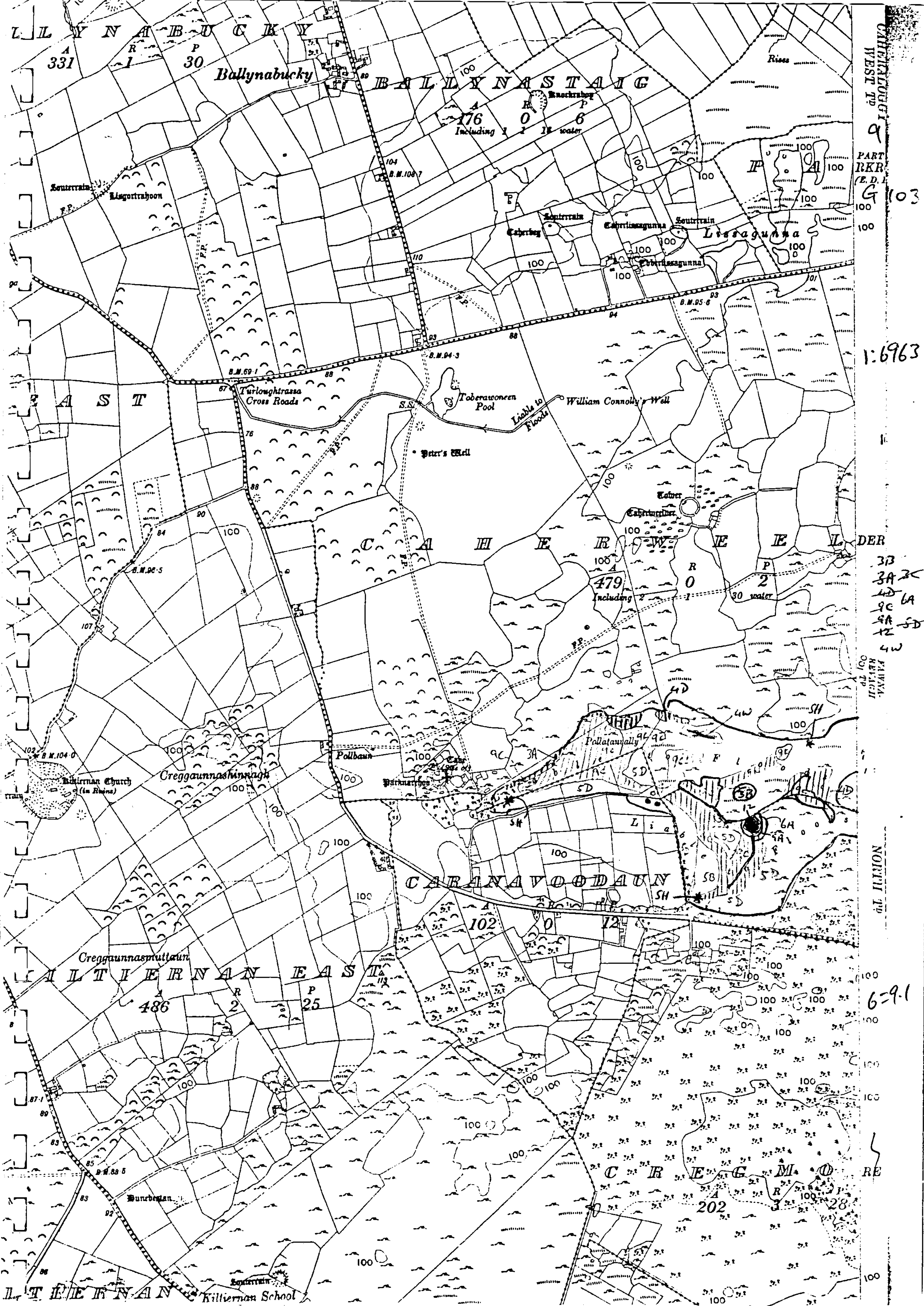
The site scores highly from its pristine undrained state, its rare plants and vegetation and lies in 14th place in the overall scheme. It thus is at least of regional value.

44. BALLINDERREEN [Cx 11]
River System: Ballindereen/Galway Bay
Catchment Area: 320 ha
Altitude: 15m

Grid Ref: M 4015
6" sheet: Galway 103
Turlough Area: 47.2 ha
Evaluation place: 3

Topography: This turlough is situated east of the village of the same name, in the angle of two approach roads. It lies in flat limestone pavement for the most part so that its outline is most irregular depending on minor differences in the outcropping rocks. It is crossed by a laneway on a slight rise and is thus divided into two. The northern basin drops gradually to the north-west with rocks leading into two linear shallow pools. At the north-west corner an even depression created by subsidence takes the floor level below 15m for the only time. There are peaty fields in the south-west corner.

The southern basin is larger and again covered by surface rock in many places. There is a semi-permanent pool at the eastern end where the flood waters partially surround some higher land. To the south the turlough narrows through scrub before opening out again into a rather different, peaty basin with some small ponds sheltered by the trees of Creglucas.



BALLYNABUCKY
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Ballynabucky
BALLYNASTAIG
Knockrahoy
A 176 R 0 P 6
Including 1 1 16 water
Souterrain
Lisgortrahoon
Caherbeg
Souterrain
Caherlissagunna
Souterrain
Lissagunna
Toberlissagunna
B.M.108·7
B.M.95·6
B.M.94·3
B.M.69·1
Turloughtrassa Cross Roads
Toberawoneen Pool
Liable to Floods
William Connolly's Well
Peter's Well
EAST
Tower
Caherturrilner
CAHERWEELDER
A 479 R 0 P 2
Including 2 1 30 water
B.M.96·5
B.M.104·0
Killiernan Church (in Ruins)
Creggaunnashinnagh
Pollbaun
Parknatrahoo
Pollatauvally
CARANAVOODAUN
A 102 R 0 P 12
Creggaunnasmuttaun
KILTIERNAN EAST
A 486 R 2 P 25
CREGMORE
A 202 R 3 P 28
B.M.88·5
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Killiernan School
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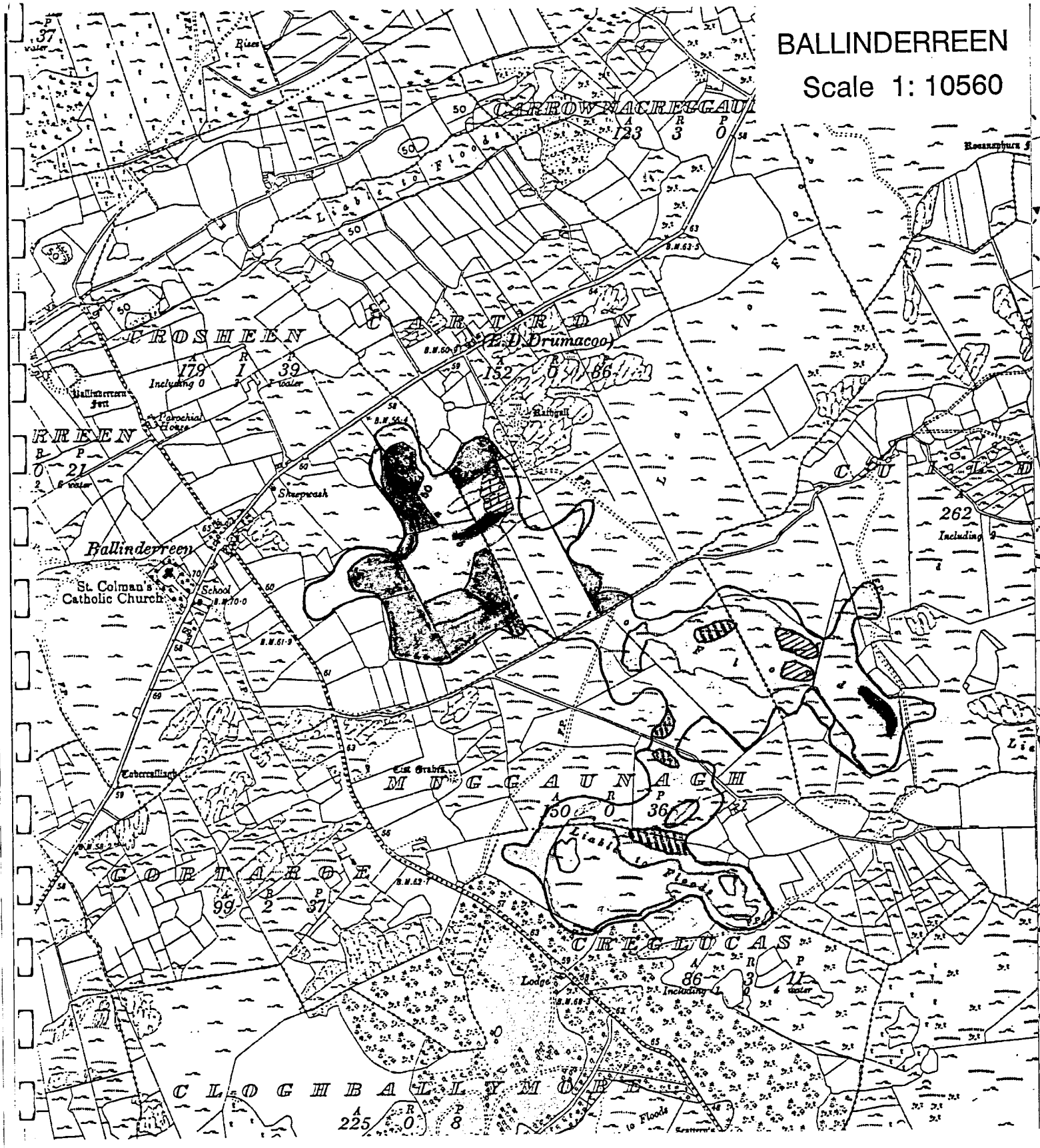
BALLINDERREEN

Scale 1: 10560



KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge	10B	Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)	5D	Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb		Carex flava	8C	Cladium fen		Open water (12)
3B	Sedge heath	6A	Dry Carex nigra		Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra	9B	Eleocharis acicularis	4W	Rhamnus wood
4B	Pot. reptans (sp. rich)	6D	Peaty Carex nigra	9C	Marl pond		Potentilla fruticosa / Frangula

Aquatic beetle records for two pools at Coole Lough are included by Bilton & Lott (1991).

Evaluation: Coole/Newtown is the most diverse turlough encountered for both its physiography and vegetation. It is also the largest site with a total area of almost 300ha. Though its vegetation is varied its has extensive stands of certain communities: those of Dry woodland (2W), Rhamnus wood (3W), Sedge fen (5D) and, at Coole L., Eleocharis acicularis (9B) are the largest to occur anywhere while the Potentilla reptans- species poor (5B) is the second largest. The woodland between Coole Lough and Newtown which floods in most if not all years is a remarkable feature, as is the muddy lakeshore of Coole which does not recur in any other site. The turlough has much interesting vegetation adjacent to it, including limestone heath with *Juniperus*, *Calluna*, *Sesleria* and *Filipendula vulgaris*.

The vegetation includes an abundance of rare plants and the site scores highly (100) in this aspect also. As well as those distinctive ephemeral species like *Limosella*, *Lythrum portula* and *Eleocharis acicularis* that occur also downstream in the two preceding sites, Newtown has *Potamogeton pusillus* and *Zannichellia* in standing water.

All these factors, taken with the unusual hydrology and birdlfie make Newtown unquestionably of international value. It comes first also in the evaluation process ahead of Rahasane and Carran.

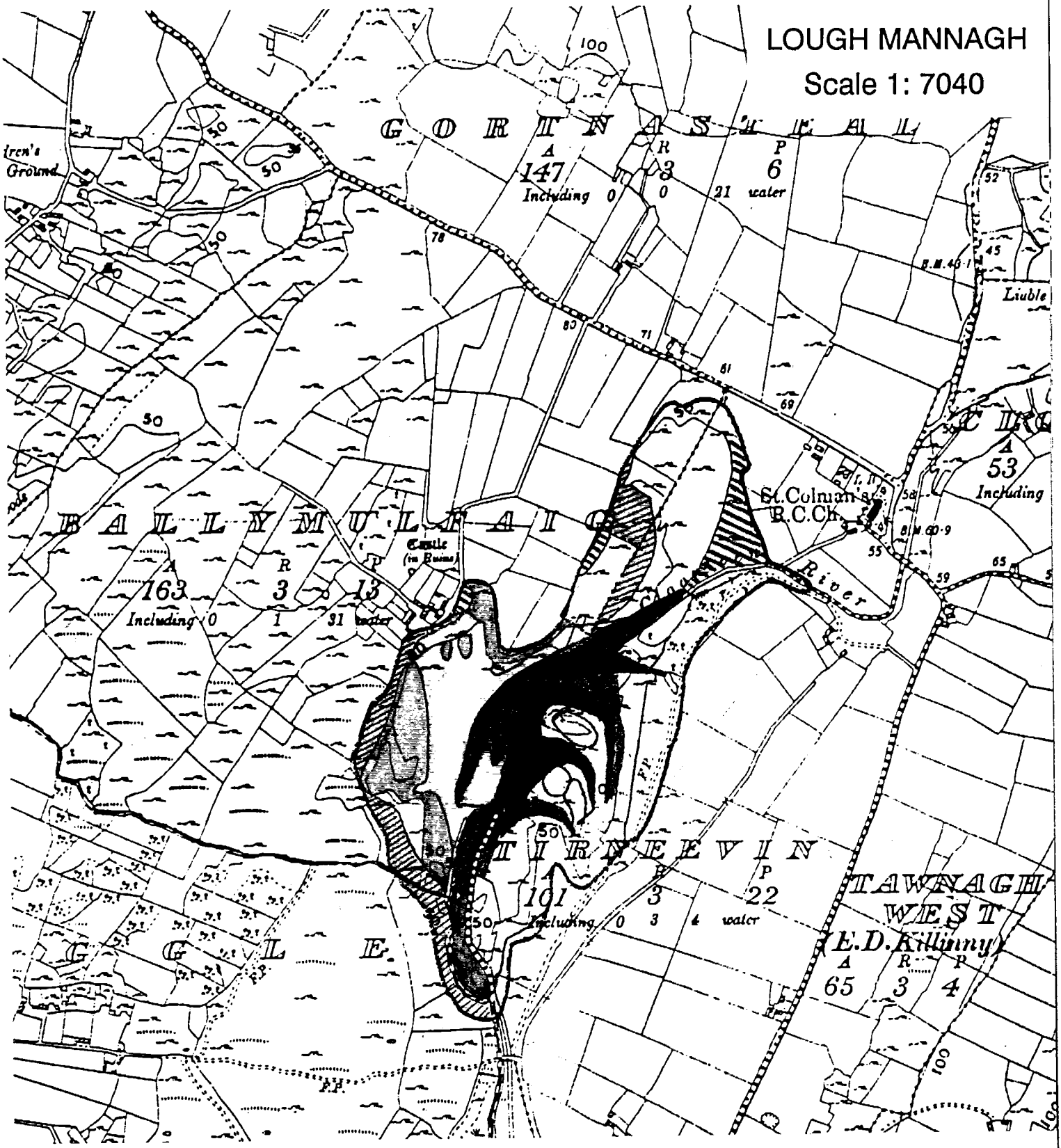
50. LOUGH MANNAGH [Cx 16] Grid Ref: M 4001
(Tirneevin townland, not Tirneevin turlough)
River System: Gort 6" sheet: Galway 122
Catchment Area: 3140 ha Turlough Area: 23.4 ha
Altitude: 14m Evaluation place: 9

Topography: This turlough lies south-west of the Tirneevin junction on the border of Galway and Clare. The land is generally undulating hereabouts though it is close to the much steeper slopes of Hawkhill Lough (Praeger's Tirneevin turlough). The basin of Lough Mannagh is elongated NE - SW and consists of a narrow limb in the north with an uneven floor. To the south it opens out into a broader area with a flat floor at a slightly lower level. The eastern side of the turlough is marked by a number of channels which lead to swallow holes between low ridges. Limestone is exposed around much of the margin though there is also some shallow drift.

Hydrology: A small river enters the turlough at the south end from the marshes around Kilmacduagh and it curves to the east before dividing to discharge into four or five swallow holes. A rock channel was cut in the 19th century, allowing surplus water to

LOUGH MANNAGH

Scale 1: 7040



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula

escape north-eastwards as the Cloonteen River which itself soon sinks into Hawkhill Lough. This measure presumably retards the onset of flooding in Lough Mannagh but since it is at a higher level than the swallow holes, it can have little other influence.

Williams (1964) suggests that this turlough is on the main drainage line from Lough Bunny north-eastwards to Kinvara which gives it a large catchment area.

Substrate: The northern limb is floored by a shallow drift soil over rock but elsewhere the wetter conditions have caused considerable accumulation of peat over a peaty marl (Coxon,1986) The swallow holes are in most cases filled with rounded boulders which may have been washed out of the local drift or dumped in by man. The whole of the eastern side is scattered with large angular boulders, particularly in the northern half.

Land Use: The turlough is little grazed because of its uneven floor and reed beds but there are cattle at the northern end and around most of the edges. The northern limb is partly divided by walls but elsewhere the area is open. The river channel acts as a barrier to animals.

There is evidence of peat-cutting in the southern part but it is now discontinued.

Vegetation: Lough Mannagh has a complex mixture of vegetation types because of the inflowing river. The river enters through a dry, peaty area (5D) before reaching the main stand of emergent vegetation. This consists of sedges *(Carex acuta, C.elata)*, *Cladium* and *Juncus subnodulosus* which give way northwards to a *Phragmites/Scirpus lacustris* stand with *Hippuris* and *Ranunculus lingua*. As such the community penetrates most of the channels to the swallow holes though there are additional species here, for example *Eleocharis palustris* and *Polygonum amphibium*. An old record for *Limosella aquatica* (1894) also exists (Wildlife Service Database). The overflow from the stream reaches into the western side of the basin, creating a large patch of 9C with *E.multicaulis* and *Scirpus fluitans* and a smaller stand of *Carex lasiocarpa, C.lepidocarpa, Schoenus* and thin *Phragmites. Myrica* grows on the peat here in one or two tufts.

The margins bear more traditional types of turlough vegetation, 2A and 5B on the eastern side, the latter with a considerable amount of *Teucrium scordium* in it. There is a belt of woodland at the NE end with *Rhamnus, Rubus caesius* and, at the edge, *Polygonum amphibium*.

The western edge normally carries a band of 3B above 6A but there is a little 2C associated with a limestone outcrop where *Frangula* also occurs. This edge experiences more animal trampling than elsewhere and there is quite a weed patch below the farm yard.

Vegetation (ha as mapped)

2A-	1.8	3B-	2.1	5A-	0.4	6D-		9A-		11B-	
2B-		3C-	0.3	5B-	7.4	7A-		9B-		12-	
2C-	0.5	3W-	0.9	5D-	0.5	7B-	0.6	9C-	2.2	Lake	
2D-		4B-	0.3	5E-		8A-	0.3	10A-			
2W-		4D-		6A-	1.7	8B-		10B-			
3A-		4W-	0.1	6B-	0.2	8C-	0.3	11A-	3.4		

Fauna: No data available though the site is suitable for nesting snipe and possibly water rail.

Evaluation: Lough Mannagh is a highly diverse site with as much physical and vegetational variation as Carran and Coole/Newtown turloughs but in a tiny area by comparison. On an area basis it has the second highest diversity of any site after Ardkill in Mayo.

The turlough has a large but oligotrophic catchment area extending from Lough Bunny and Castle Lough. It thus cannot be as oligotrophic as Castle Lough itself or Knockaunroe and the thickish reedbeds with *Ranunculus lingua* and *Juncus subnodulosus* indicate this fact. However there is a sizeable area of marl deposition in which *Eleocharis multicaulis* and *Scirpus fluitans* grow as well as some Cladium fen (8C) and *Myrica*. These juxtapositions add to the ecological interest of the area and with rare species like *Teucrium scordium* give it a high score (59) in the evaluation process.

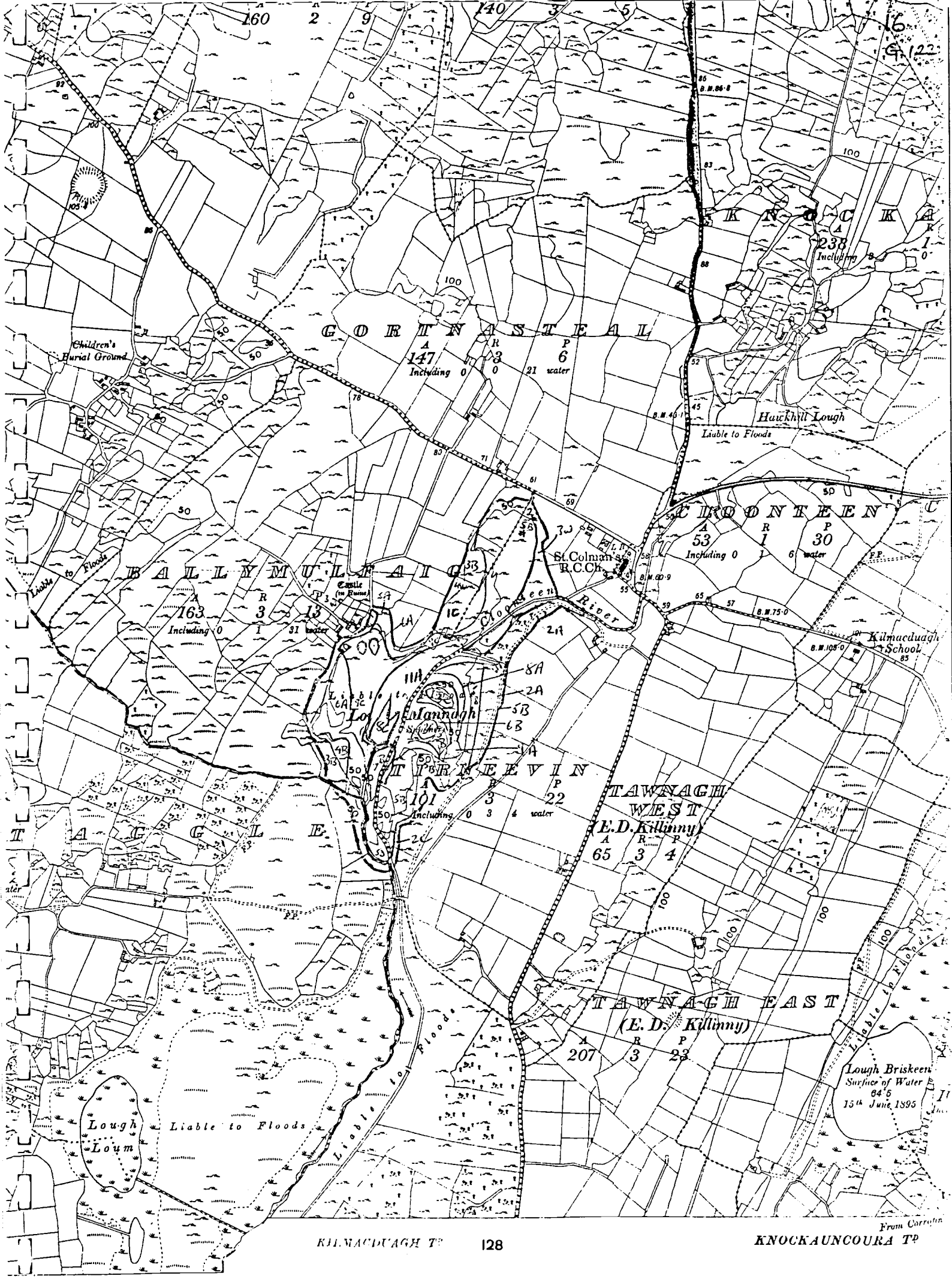
The site deserves to be thought of as nationally important though it has sometimes been overshadowed by the proximity of Newtown/Coole and the smaller Hawkhill site. This rating is given despite the long-standing drainage channels which seem to have little effect.

51. TERMON LOUGH [Cx 17]
River System: Fergus
Catchment Area: 640 ha
Altitude: 23m

Grid Ref: R 4197
6" sheet: Galway 128
Turlough Area: 38.2 ha
Evaluation place: 24

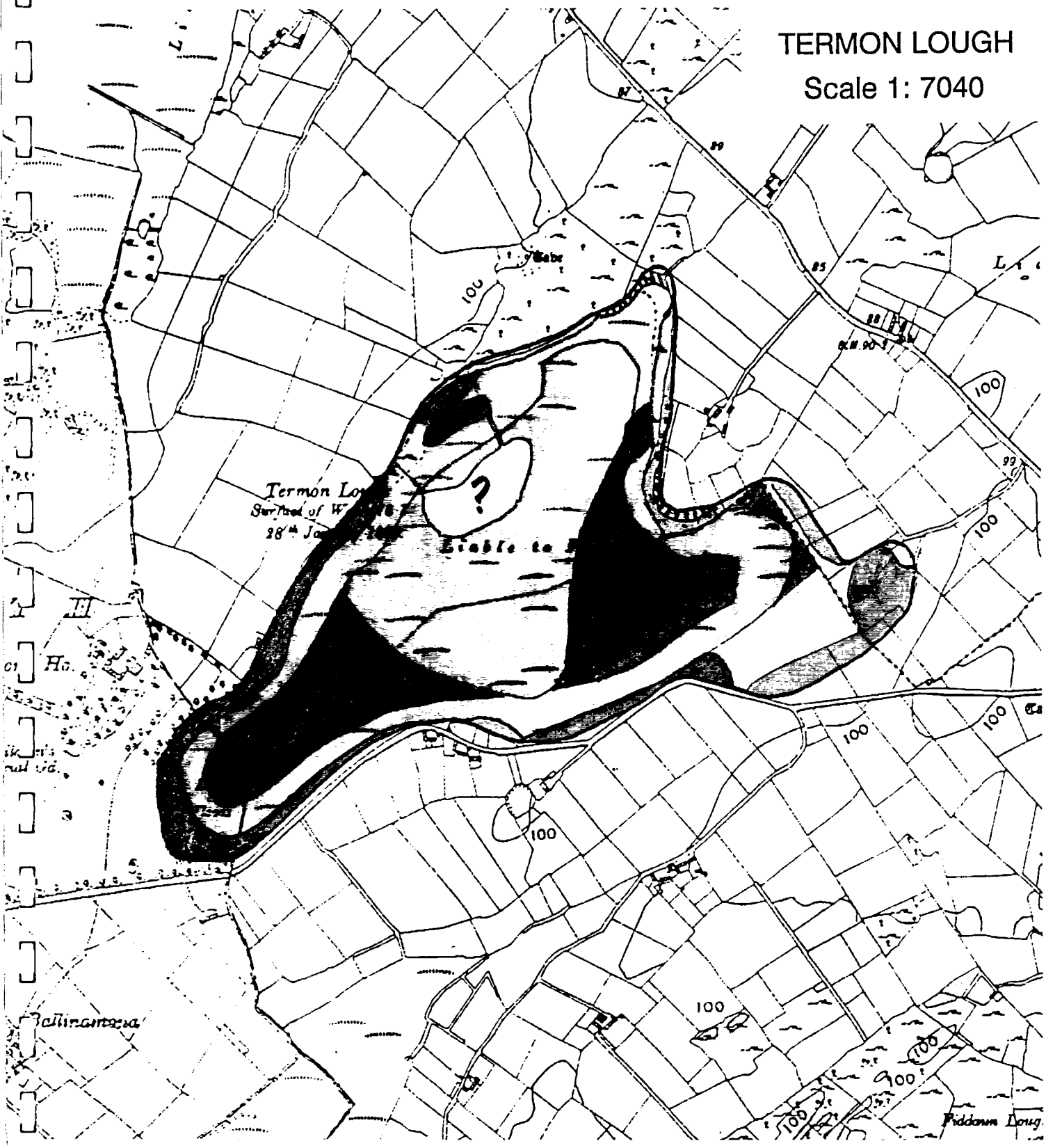
Topography: This is a flat turlough east of Lough Bunny with low, drift-covered slopes on all sides except the north where there is a limestone outcrop. A higher spur also adjoins the basin in the north-east. The area narrows at the opposite end and runs into an estate woodland.

Hydrology: Termon Lough dries out so seldom (i.e. not every year) that it seems more like a shallow calcareous lake. However it carries turlough plant communities, at least in part. There is no surface inflow to the basin but it is surrounded by higher land on



the Director General at the Ordnance Survey Office, Phœnix Park, Dublin, 1922.

The Altitudes are given in Feet above the Low Water of Spring Tides in Dublin Bay, which is 21 Feet below a mark on the base of Poolbeg L



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- Sedge heath
- Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula

three sides which may yield the necessary groundwater. The lime content is high and there was considerable deposit on the vegetation.

There is a swallow hole at the south-western end into which a channel has been dug, but no sign of successful drainage.

The presence of the dividing wall suggests that in former times this turlough was probably drier. Certainly the O.S. maps note the vegetation as rough grazing rather than the marsh it is today.

Substrate: Coxon (1986) records more than a metre of brown, peaty marl with *Phragmites* root fibres and abundant shells.

Land Use: The site is occasionally visited by cattle when the water level is low. It is divided by a NE - SW wall. It is shot over in winter.

Vegetation: The central part of the turlough is taken over with *Cladium, Scirpus lacustris, Phragmites* and *Carex elata* growing in a dense bed, probably a scraw. Around the edge the tall species decline and 9C takes over with a few beds of *Polygonum amphibium.* This marginal vegetation contains abundant *Potamogeton gramineus,* with *Juncus bulbosus* and *Eleocharis multicaulis* and grades landwards into stony tufts of *Carex serotina* and *Molinia.* At the western end there are slightly richer conditions and 9A occurs with *Apium inundatum,*
E.palustris and *Sparganium emersum.*

The edges of the basin elsewhere bear a narrow band of drier communities, a little 5D along the south and both 6A and 6B at the eastern end where the turlough opens out. There are traces of 3A also with *Phalaris, Lysimachia vulgaris* and some *Thalictrum flavum.*

Vegetation (ha as mapped)

2A-		3B-		5A-		6D-		9A-	2.5	11B-	
2B-	0.1	3C-	0.3	5B-		7A-		9B-		12-	1.1
2C-		3W-	+	5D-	1.4	7B-	5.1	9C-	10.1	Lake	
2D-		4B-		5E-		8A-	0.9	10A-			
2W-		4D-		6A-	1.5	8B-		10B-			
3A-	0.7	4W-		6B-	2.0	8C-	4.9	11A-	7.4		

Fauna: Snipe and water rail would nest in some years if there was an early drop in water level but in 1990 there seemed to be only coot and mallard.

Evaluation: Termon Lough is an unusual turlough because of its extreme wetness and might be considered a hybrid turlough/lake somewhat like Levally Lough. It shows little physical variation but its vegetation is well developed with comparatively large stands of Cladium fen (8C) and Reed bed (11A). Although it is situated quite near the head of the Castlelodge catchment it is the most eutrophic of the eastern Burren turloughs. This is

probably due to being surrounded by drift-covered land rather than bare limestone.

The evaluation process gives Termon Lough a reasonable score (43) and therefore a position of 23rd. Its vegetation and hydrology are the interesting features: there are few rare plants or birds. However the site is at least of regional importance.

52. TURLOUGHNAGULLAUN [Cx 76]
River System: 'Bealaclugga'
Catchment Area: 640 ha
Altitude: 20m

Grid Ref: M 2804
6" sheet: Clare 6
Turlough Area: 20.4 ha
Evaluation place: 30=

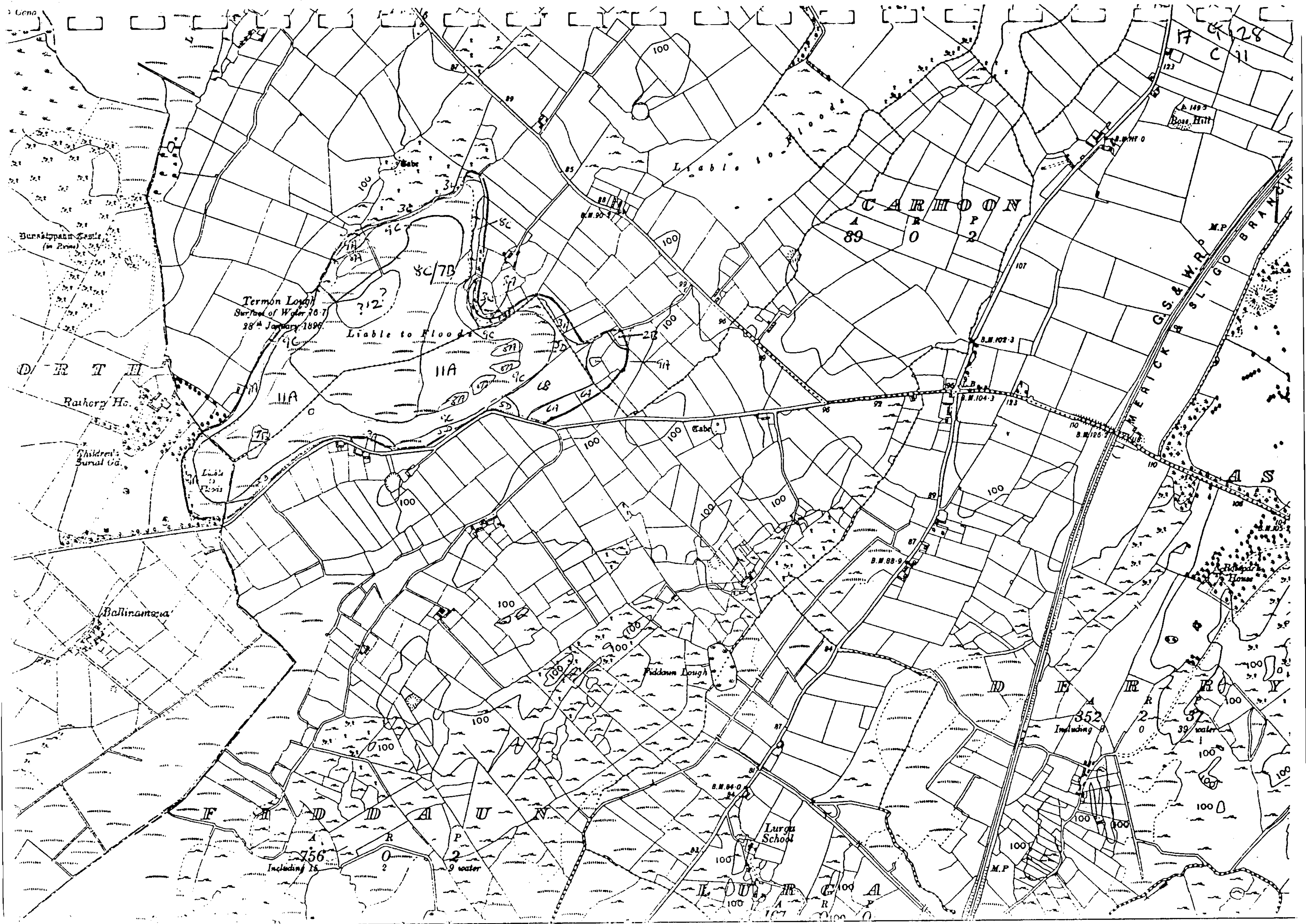
Topography: Turloughnagullaun is situated at the head of a valley in the eastern Burren, 6km south of Burren village. The turlough is divided into two basins by the Deelin Beg road which crosses on a high bridge. Most of the land is drift-covered but there is some exposed rock around the southern edge of the main basin and on the higher land above. This basin is deeply sunk in the surroundings with a line of depressions of varying depths separated and surrounded by stone-covered slopes. The edges of the basin are woodland on most sides with pavement at the north end. The eastern basin is a complete contrast. It is much more open and made up of fields and shallow channels. There are few if any rocks on this side.

Hydrology: The western basin floods deeply, up to 4-5m, and receives water from a number of swallow holes near the boundary slopes on the southern and western sides. There are additional groundwater connections at the base of some of the hollows though not the central one. Surplus water flows east to fill the other basin where there are no obvious swallow holes. A ditch here contains a small spring however.

There is no drainage except for a dry channel running from the SE corner of the eastern basin.

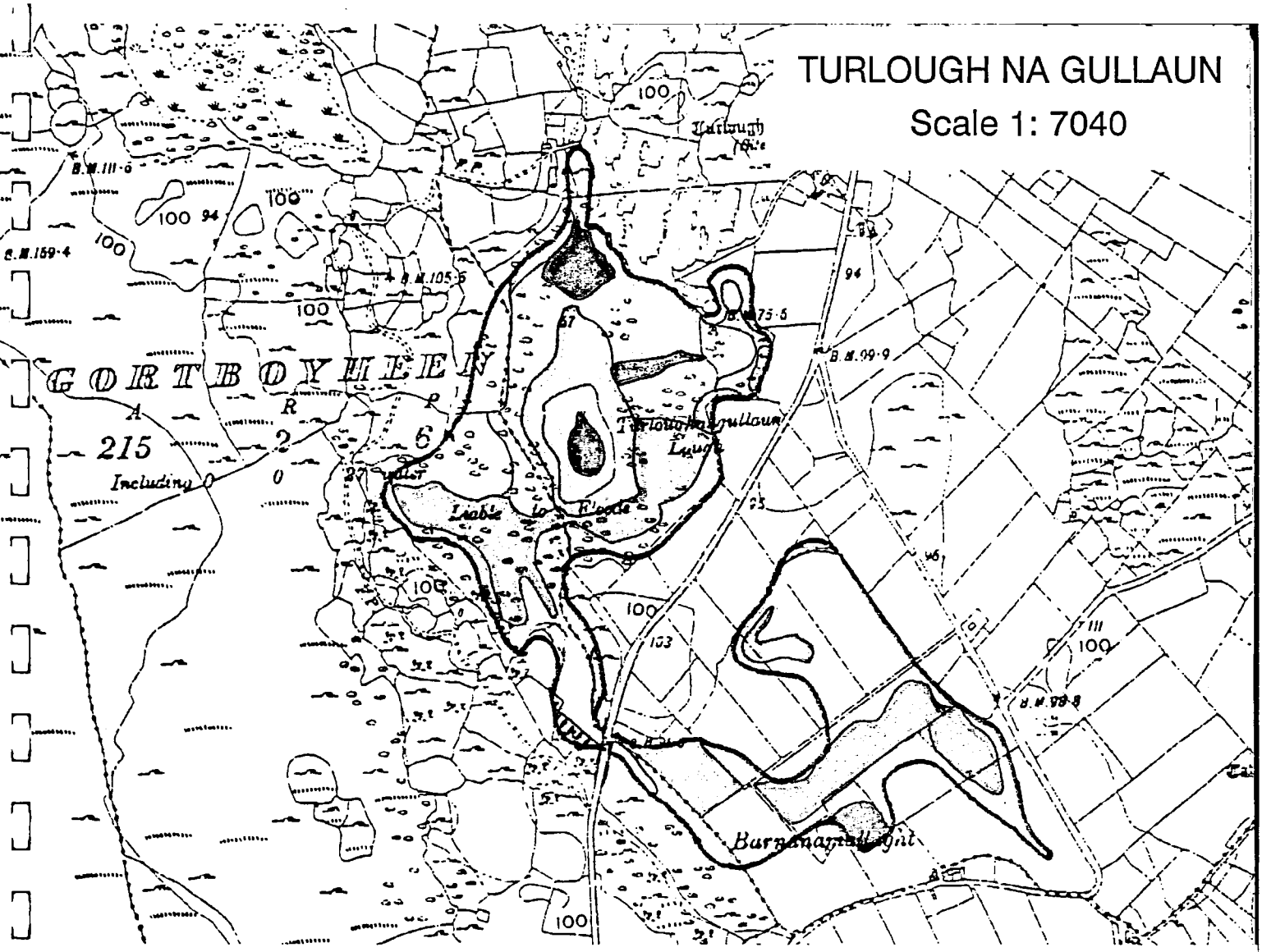
Substrate: The main depression is lined with more than 1m of pale, yellow-grey marl (Coxon, 1986) but this peters out at the slopes and in the minor hollows where clay occurs. The slopes are in some cases sandy and there are skeletal gravels at one point. There is a little peat accumulation in the eastern basin, as a humus-enriched soil layer.

Land Use: Cattle are grazed in both halves of the turlough with some slight overuse in the SE end. A wall divides the main basin along a townland boundary. Some hay making is carried out in the fields around the eastern basin but there is no silage made (1990).


17 C/28
C 11
Boss Hill
CARROON
A 89
R 0
P 2
Liable to Floods
Termon Lough
Surface of Water 76.7
28th January 1896
Liable to Floods
8C/7B
11A
11A
DERRYCASS
A 352
R 2
P 37
Including 8 ... 39 water
Fiddaun Lough
Lurga School
FIDDAUN
A 756
R 0
P 2
Including 15 ... 9 water
LURGA
Rathory Ho.
Children's Burial Gd.
Ballinamona
Burntkippam Castle (in Ruins)
LIMERICK G.S.&W.R. SLIGO BRANCH
Tober
Liable to Floods
Rathcore House

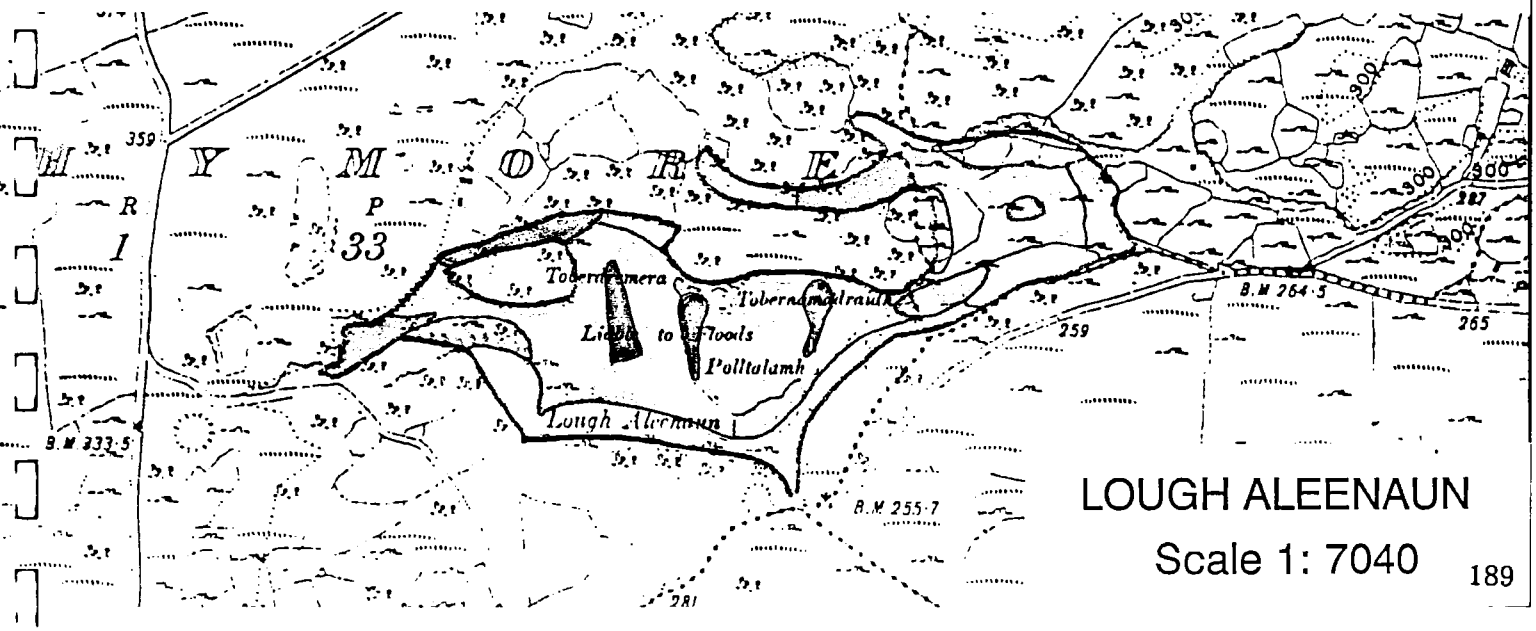
TURLOUGH NA GULLAUN

Scale 1: 7040



KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge	10B	Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)	5D	Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb		Carex flava	8C	Cladium fen		Open water (12)
3B	Sedge heath	6A	Dry Carex nigra	8A	Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)	6D	Peaty Carex nigra	9C	Marl pond		Potentilla fruticosa / Frangula



LOUGH ALEENAUN

Scale 1: 7040

Vegetation: The undulating nature of the floor in the main basin means that the vegetation pattern appears more complex than it is. The central marly depression is lined by 6B, with rather frequent though short *Eleocharis palustris*. It surrounds a patch of *Polygonum* spp and *Potentilla anserina* growing in the trampled ground. A channel leads into this central zone from the little bay in the NE corner. It is lined by *Polygonum amphibium* and *Carex nigra*, as is a larger hollow in the north. Other hollows are covered by 6A and its boundaries show the lie of the contours in the basin.

The sloping, stony sides are generally dominated by 5B, *Carex panicea*, *C.nigra* and *Potentilla reptans*. Often at the top of the slopes the *P.reptans* becomes less common and *Molinia*, *Succisa*, *Ophioglossum* and *Viola canina* with *V.persicifolia* enter the community. On the SW and NW edges there is taller vegetation with *Phalaris*, *Vicia cracca*, *Geum rivale* and *Thalictrum flavum* (3A). This merges into a scrub of *Rosa canina*, *Rhamnus* and *Fraxinus* which in the north-east corner has largely been killed back by the abnormal floods of February 1990. *Mercurialis perennis* occurs in woodland at the NW corner but does not get flooded.

The eastern basin consists of flattish fields filled with 6A in the lower parts and 4B above. There is much *Filipendula* in this with *Mentha arvensis*, *Viola canina*, *Festuca arundinacea* and *Juncus articulatus*. To the south there is purer grassland with abundant *Elymus repens*, *Plantago major* and *Rumex* spp.

Vegetation (ha as mapped)

2A-		3B-		5A-	0.2	6D-		9A-		11B-
2B-	0.6	3C-		5B-	4.7	7A-		9B-		12-
2C-	0.4	3W-	0.1	5D-		7B-		9C-		Lake
2D-		4B-	5.7	5E-		8A-	0.6	10A-		
2W-	0.1	4D-		6A-	5.4	8B-	0.2	10B-		
3A-	0.4	4W-		6B-	1.9	8C-		11A-		

Fauna: The turlough seems too small and confined for nesting lapwing and none were seen. There is no winter information.

There are records of molluscs from this site in Donaldson et al. (1979).

Evaluation: Turloughnagullaun is a diverse turlough in topography and vegetation and is notably unmodified (except for a wall). It is relatively eutrophic despite occurring in the hilly Burren and has rather unusual vegetation for this area. Similar stands of Dry Carex nigra (6B), Potentilla reptans-species rich (4B) and Polygonum amphibium (8A) are not found in nearby sites.

The turlough contains two plants of interest, *Viola persicifolia* and *Thalictrum flavum* while *Mercurialis perennis* grows close by. It achieves a score (38) which puts it halfway down the evaluation list and is considered of regional importance. Visually, however, it is a striking site.

53. TURLOUGHMORE (Burren) [Cx 71]
River System: Fergus
Catchment Area: 161 ha
Altitude: 30m

Grid Ref: M 3500
6" sheet: Clare 10
Turlough Area: 21.7 ha
Evaluation place: 53=

Topography: Although it lies at the edge of the upland Burren, south of Tulla, Turloughmore is surrounded by soil-covered ridges rather than limestone pavement. At the extreme south-western end there is a little flooded pavement while in the centre some bedrock breaks through the surface. Otherwise the basin is filled by glacial drift and smooth except for some loose rock around the edges. In places, especially in the northern half, the rocks have been bulldozed to the edge. The floor is undulating in character with distinct hollows in the centre and at each end. The undulations seem related to the underlying rock in most cases.

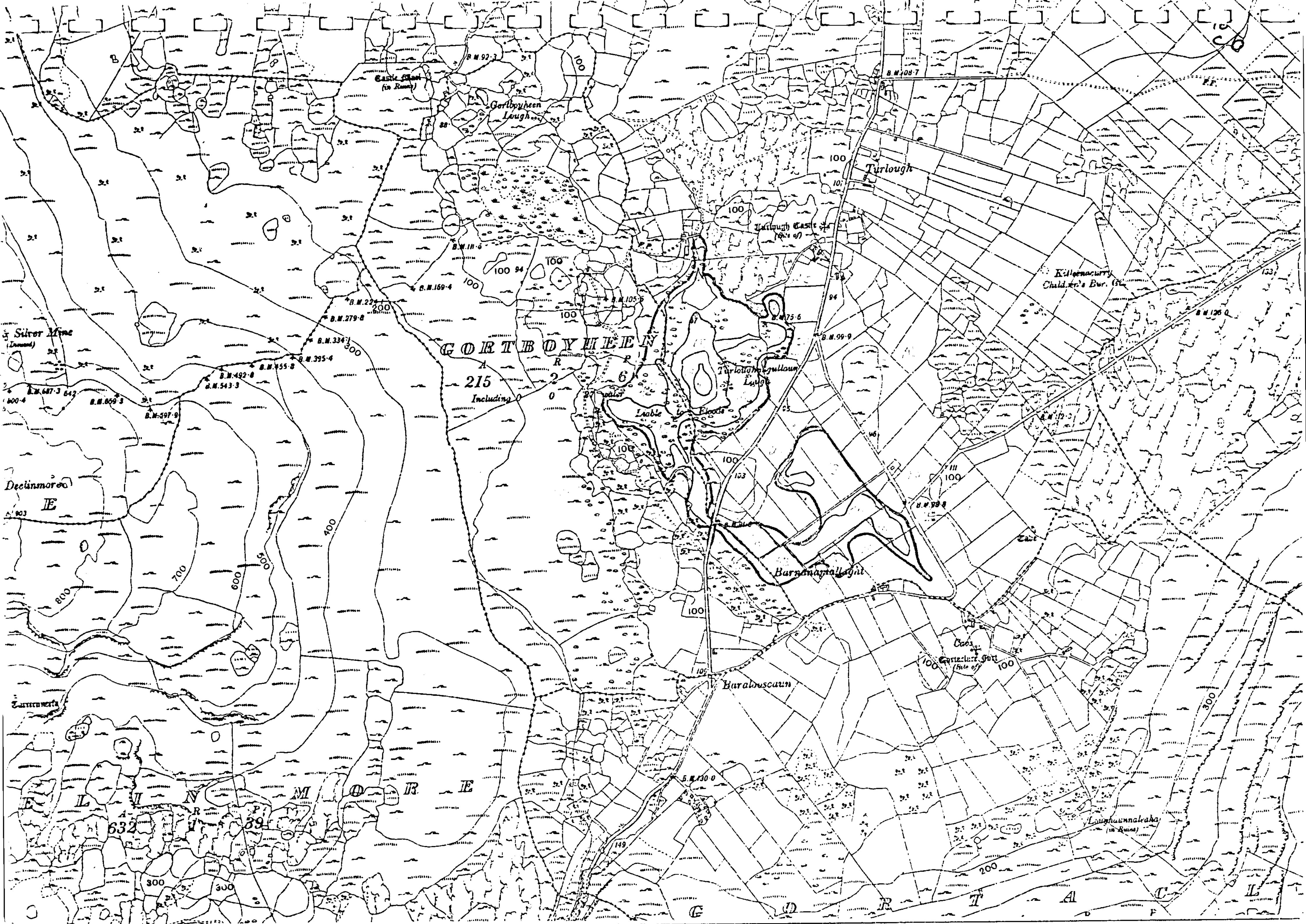
Hydrology: The turlough is a dry one without any standing water or permanent inflow. There are five small depressions along the eastern side which may act as swallow holes. There is no sign of drainage.

Substrate: Coxon (1986) records silt over rock and there is a little peaty silt at the north-eastern end.

Land Use: The basin is divided from side to side by a number of walls but is grazed fairly uniformly by sheep and a few cattle. Cows were being strip grazed in the NE corner when the site was visited and there could be some fertilization here. One of the adjacent fields is cut for silage and there is a large clamp in a farm on the west side. There is no obvious effluent track from it.

Vegetation: Grassland communities predominate in the turlough, generally richer in the southern half than the north. The northern ones are 2B with a scatter of *Carex panicea, C.hirta* and *Festuca arundinacea* mixed into *Agrostis stolonifera*. The 2A in the south has more *Lolium* and *Poa* spp with fewer *Carices*. However in both cases the depressions are filled with *C.nigra* with abundant *Potentilla anserina* and *Ranunculus repens* which colour them yellow in mid-June.

At the southern tip of the basin a rough, ungrazed patch of grass runs into limestone pavement which has water at depth but is also flooded occasionally. *Rhamnus* is widespread here with *C.flacca, Hypericum tetrapterum* and *Leontodon hispidus*. *Sesleria* and *Koeleria* grow on the rocks along with *Trifolium dubium, Erysimum cheirianthoides* and *Euphorbia exigua*. Further patches of *Rhamnus* and *Crataegus* occupy the thin soils just north of centre (where *Filipendula vulgaris* occurs on the floodline), and as a hedge along the marked road in the north-east.


Turlough
Turlough Castle (Site of)
Killeenacurry Children's Bur. Gd.
Gortboyheen Lough
Castle Mael (in Ruins)
GORTBOYHEEN
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215 2 6
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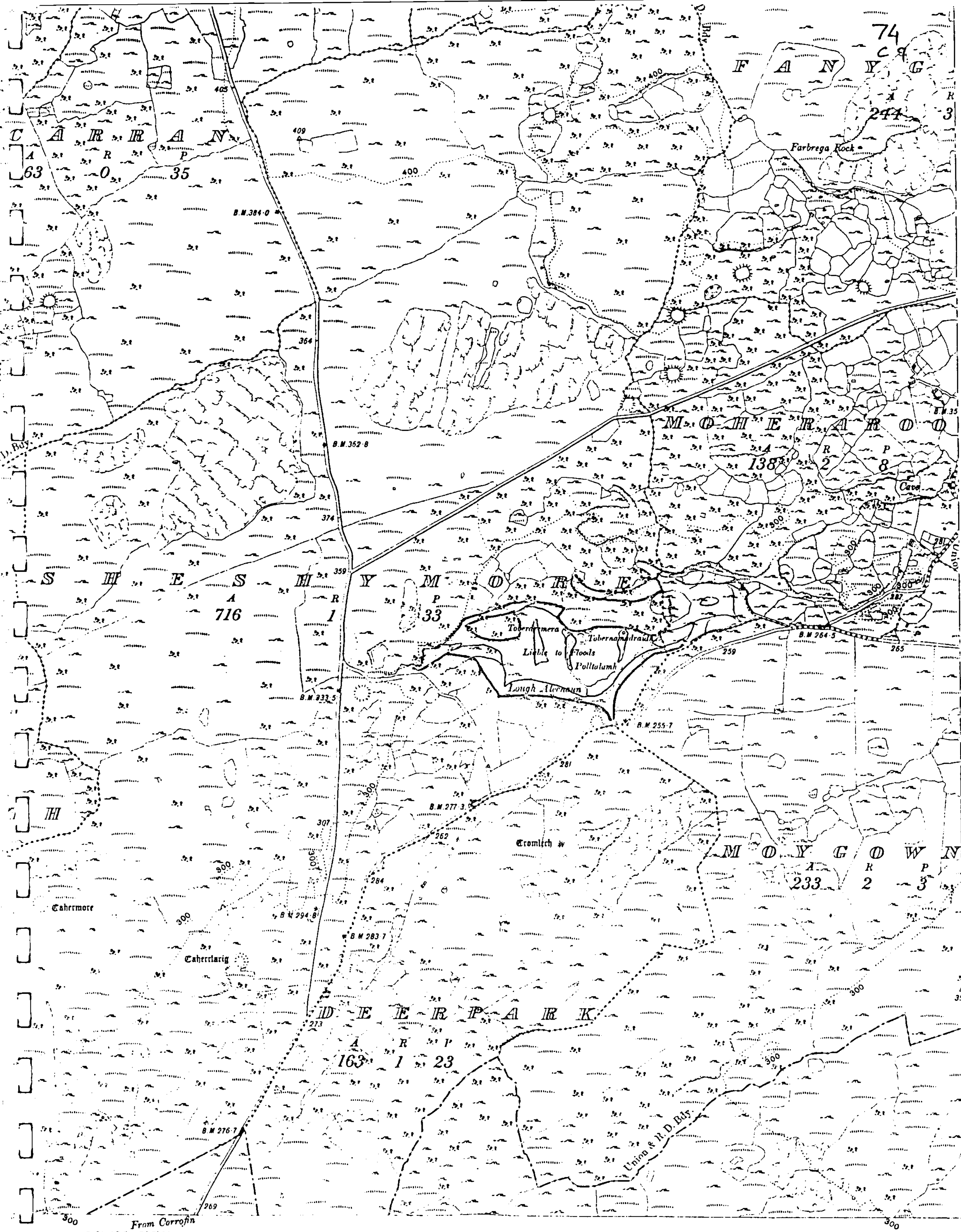


LEAMANEH NORTH T^D
INCHIQUIN B^Y

CAHERFADDA T^D
INCHIQUIN B^Y

Scale _ Six Inches to One Statute Mile or 880 Feet to One Inch = 1:10,560.

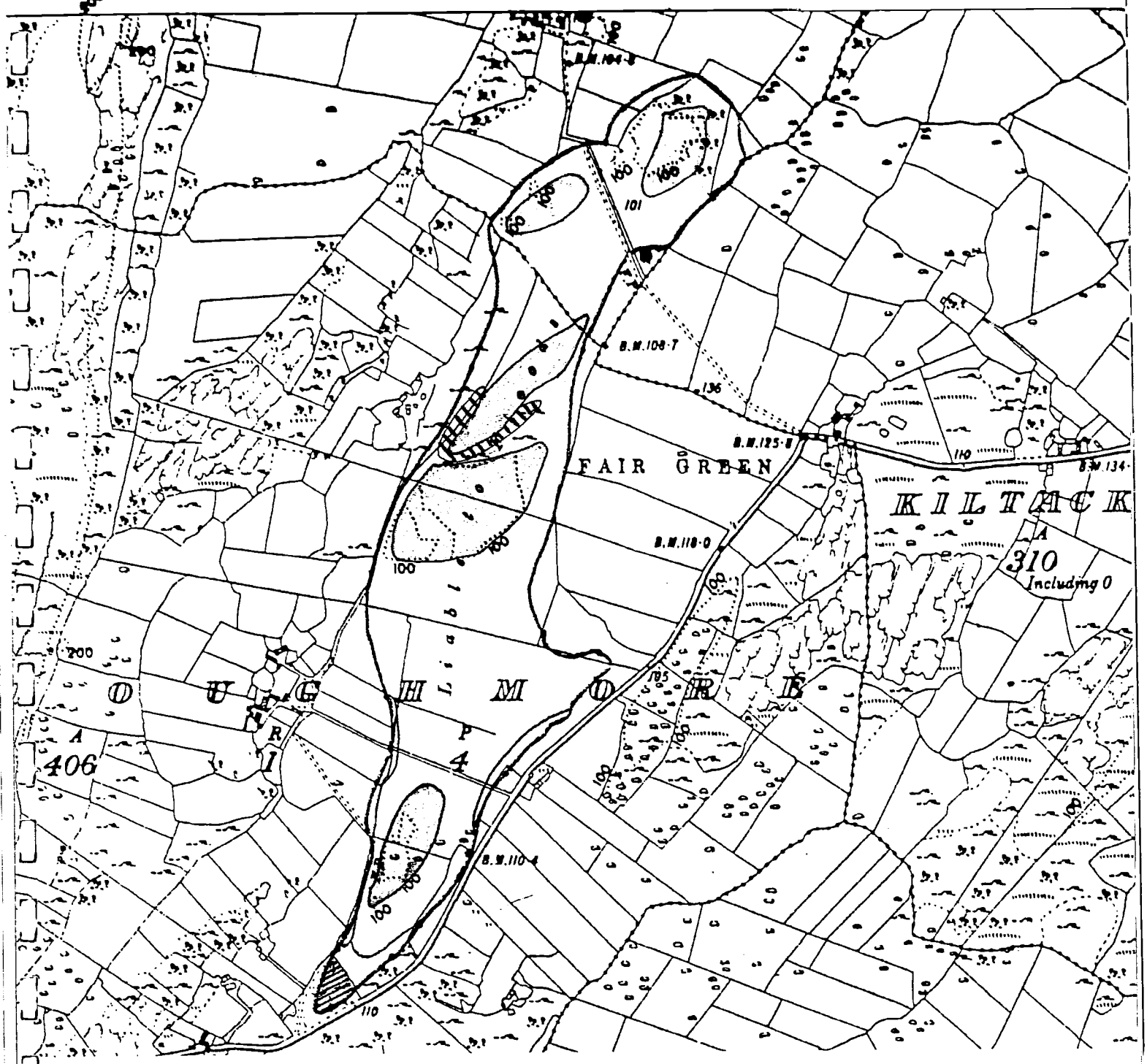
7-60.

Price 10

10 20 30 40 50 60 70 80 Chains } 1 Mile
40 80 120 160 200 240 280 320 Perches
1000 2000 3000 4000 5000 5280 Feet

TURLOUGHMORE

Scale 1: 7040



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- Sedge heath
- Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula

Vegetation (ha as mapped)

2A-	8.3	3B-		5A-		6D-		9A-		11B-	
2B-	6.9	3C-	0.2	5B-		7A-		9B-		12-	
2C-	0.5	3W-	+	5D-		7B-		9C-		Lake	
2D-		4B-		5E-		8A-		10A-			
2W-		4D-		6A-	7.8	8B-		10B-			
3A-		4W-		6B-		8C-		11A-			

Fauna: The dryness prevents waders from breeding in summer and none were seen. There is no winter information.

Evaluation: This is a dry turlough without much interest in its physiography or vegetation. It includes six plant communities, the most interesting of which is the Flooded pavement (3C) which in this case has two interesting weed species, *Erysimum cheirianthoides* and *Euphorbia exigua*.

The evaluation process gives this site a low score (22) even with its small catchment and it cannot be considered of more than local interest.

54. CARRAN [Cx 75]
River System: Fergus
Catchment Area: 1600 ha
Altitude: 110m

Grid Ref: R 2999
6" sheet: Clare 10
Turlough Area: 90.3 ha
Evaluation place: 4

Topography: Carran turlough occurs in the high Burren just below the village of the same name. It occupies an immense polje, a collapsed canyon dissolved out by the partially underground river which flows south to Kilnaboy. The NE - SW depression is about 2.6km long and is divided into two section by a central rise crossed by the Glencolumkille road. The base of the turlough has some areas of pavement and loose rock but these are mostly covered by peat. The edges rise as bare rock in a series of ridges and scarps that are especially pronounced on the south-eastern side. The land is not so high on the opposite side of the basin though it is still rocky in the north. South of the bridge however the ground flattens out; there is a subsidiary lake, Poulmoneen, and fields approach the turlough which broadens considerably. The fields here are covered by stony drift which is otherwise rare in the basin.

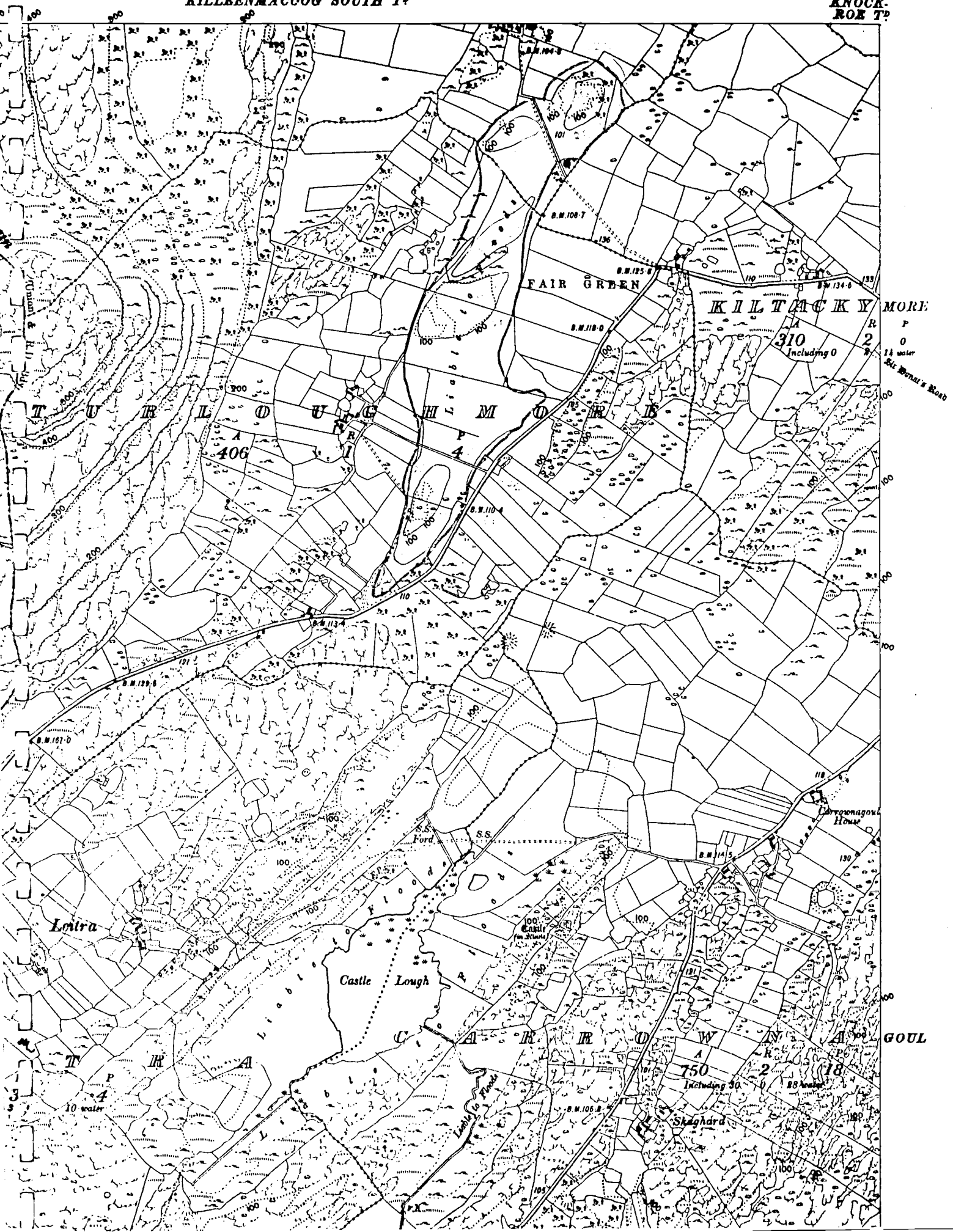
Hydrology: Water in general moves from north to south in the turlough. A small stream enters at the NE end and is lost in an extensive area of swamp and bog which retains water throughout the year. Patches of open water occur mostly on the western side with ponds sometimes beside the marginal bedrock. The water disappears near the bridge but reappears on the south side in a rocky channel which then winds through similar peaty areas with many cuts and pools in it. The channel becomes more definite at the southern end

71
C10

CLARE. SHEET 10.

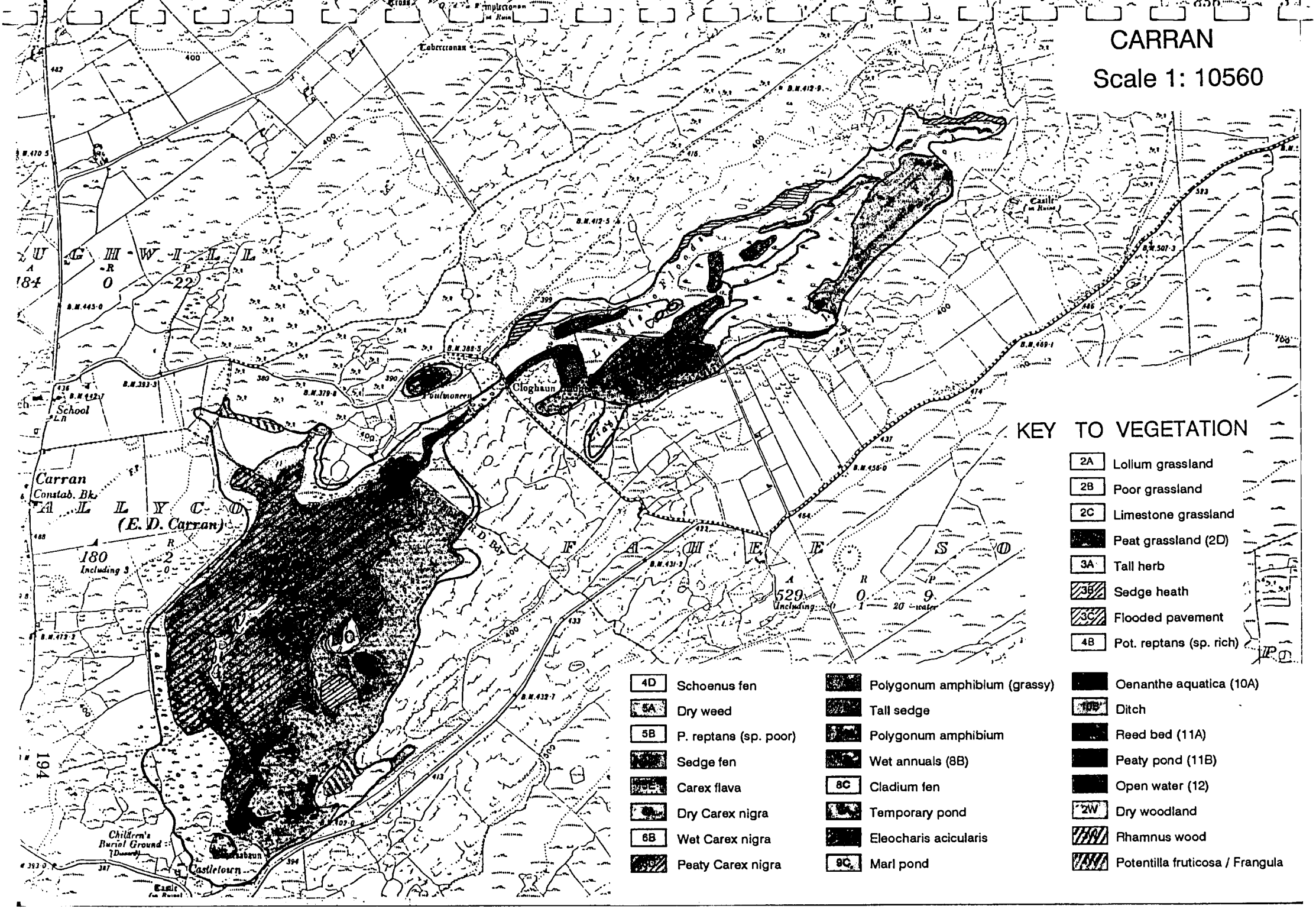
KILLEENMACOOG SOUTH Tp

KNOCK-ROE Tp



CARRAN

Scale 1: 10560



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula

before disappearing below Cahersabaun. Another flowing water source occurs SW of Poulmoneen but seepage must occur all around the basin from clefts in the rock. Poulmoneen itself occupies an even depression without aboveground inflow or outflow. The floodwater is highly calcareous and, at the north end, crystal clear.

There has been no attempt at drainage.

Substrate: The basin is entirely covered by peat though this thins out on the south-western shores. It has been much cut but a substantial thickness remains in most of the central regions. Some marl has accumulated on and beside this in the wetter ponds. Beneath the peat a grey clay of 1-4m in thickness overlies gravel on the bedrock (MacGowran, 1978).

Land Use: Cattle occur in large, free-ranging herds that are concentrated in the south where most of the farms are. The herds are separated by the central wettest area. There are also some sheep and horses but though some of the edges are closely grazed there is no evidence of overgrazing. Trackways have been built out to communicate with some of the reedbeds but little other management has been done except for the digging of a few drinking ponds.

Vegetation: The northern basin is more oligotrophic than the southern and its vegetation is made up of a large area of *Schoenus*, with *Carex hostiana, Cirsium dissectum* and *Dactylorhiza incarnata*. At higher levels at the north-east end the *Schoenus* dies out and is replaced by *C.panicea* (5D) while lower down the basin *Carex rostrata* and *C.nigra* with some *C.elata* form a large stand extending out in wetter conditions. Pools within this have *Menyanthes, Equisetum fluviatile* and a little *Potamogeton natans* and *Utricularia neglecta*. A number of natural linear pools occur down the centre of the basin. One or two have thin *Phragmites* beds in them with *Nymphaea* and a little *Sparganium minimum* but the more frequent community is 9C with *Baldellia, Scorpidium* and *Carex rostrata* growing on marl.

The spring that enters the basin at its northern point winds through marly sand with *Apium nodiflorum* beside an area of flooded pavement containing *C.hostiana, Deschampsia cespitosa, Briza, Gentiana* and occasional *Calluna* and *Gymnadenia*. Similar outcrops along the western side bring in *Antennaria* and *Sedum acre*, both in floodable positions.

The western end of this basin is marked by a peaty band below a rocky promontory. With some groundwater influence *Juncus subnodulosus, Anagallis tenella, Eleocharis quinqueflora, Pedicularis palustris* and *Parnassia* join with *Molinia, Carex echinata, Narthecium, Sphagnum contortum, Cinclidium stygium* and *Eriophorum angustifolium*. These give rise to a complex mixture of vegetation, put into the 2D category.

Poulmoneen is an oval depression based on a central pool with *Menyanthes*, surrounded by a zone of *Carex vesicaria* and *C.nigra* and augmented at the rear by *Phalaris, Deschampsia, Caltha* and *Valeriana officinalis*. The nearby channel connecting the two parts of the turlough has somewhat similar vegetation with much *Festuca arundinacea* and *Filipendula*.

The southern basin is larger than the north and in most places has lower sides. Centrally it is dominated by a large stand of *Carex rostrata, C.nigra* and *C.lepidocarpa*? set with numerous small pools of *Equisetum fluviatile, Menyanthes* and sometimes *Scirpus lacustris* and *C.elata*. Occasionally there is *Nymphaea, Phragmites* and *Alisma plantago-aquatica* while *Scorpidium* is frequent everywhere. Marly pools occur on the course of the Castletown river with *Juncus articulatus, J.bulbosus* and *Baldellia* as well as more *Nymphaea* and *Potamogeton natans*. To the east there is a slight rise to an area of *Carex panicea/ C.flava* with *Juncus articulatus, Hydrocotyle* and *Mentha aquatica* with much *Drepanocladus revolvens* (5E). Where drift occurs round the basin or seepage water enters thewre is the slightly more eutrophic 6B. A few areas of pavement are also found with *Galium boreale* and *Sedum acre* or a scrub of *Frangula, Rhamnus* and *Potentilla fruticosa* (4W).

Another patch of taller woodland occurs in an extension on the NW side. Here an ungrazed stand of *Fraxinus, Crataegus* and *Rhamnus* occurs on pavement behind a wall amongst tall *Phalaris, Deschampsia, Vicia cracca* and *Rubus caesius*. Animal treading nearby brings in some of the only annual communities seen in the whole turlough while a temporary pond supports *Glyceria fluitans* and *Myosotis scorpioides*.

Vegetation (ha as mapped)

2A-	0.3	3B-		5A-	0.4	6D-		9A-	0.7	11B-	2.3
2B-	1.6	3C-	1.0	5B-		7A-		9B-		12-	1.2
2C-	1.5	3W-	0.4	5D-	4.3	7B-	26.1	9C-	2.2	Lake	
2D-	1.1	4B-		5E-	16.2	8A-		10A-			
2W-		4D-	12.3	6A-		8B-	0.1	10B-	+		
3A-	0.5	4W-	0.5	6B-	16.3	8C-		11A-	1.1		

Fauna: Mallard, curlew and lapwing seem to nest in the turlough which includes large areas of undisturbed cover. In winter relatively small numbers of duck occur: Sheppard (in prep.) records averages of 12 whooper swan, 128 wigeon and 129 teal but the north Clare flock of white-fronted geese (30-50) also visits.

Evaluation: Carran turlough is unusual in many ways. It is second highest turlough in the country (c.110m), after the Loughans in Kilkenny, it is set among limestone hills rather than lowland and it is almost all peat-covered. It has the highest vegetational diversity of any site (20 community types) and three of them occur here in their largest stands. These are Flooded pavement (3C), Carex flava (5E) and Tall sedge (7B) while there is also a large area of Peaty pond (11B).

It is not a strongly oligotrophic site, having a medium-sized catchment to the north and west. However the amount of peat brings in such plants as *Nymphaea alba* (its only turlough site), *Sparganium minimum* and *Utricularia neglecta*. Otherwise its rare plants are few and it is chiefly because of its diversity that it achieves third place in the overall evaluation.

It is considered of international importance.

55. CASTLE LOUGH [Cx 72]
River System: Fergus
Catchment Area: 800 ha
Altitude: 22m

Grid Ref: R 3598
6" sheet: Clare 10
Turlough Area: 35.4 ha
Evaluation place: 10

Topography: Castle Lough occurs on the eastern edge of the Burren about 3km north-east of Mullagh More. It is a permanent lake surrounded by a much larger turlough which penetrates the low ridges of limestone pavement along low NE - SW depressions. The pavement is flat on the eastern side of the lake but more undulating on the west so that there is a distinct cut-off here below a small scarp. The north-east end of the basin is marked by low, drift-covered fields.

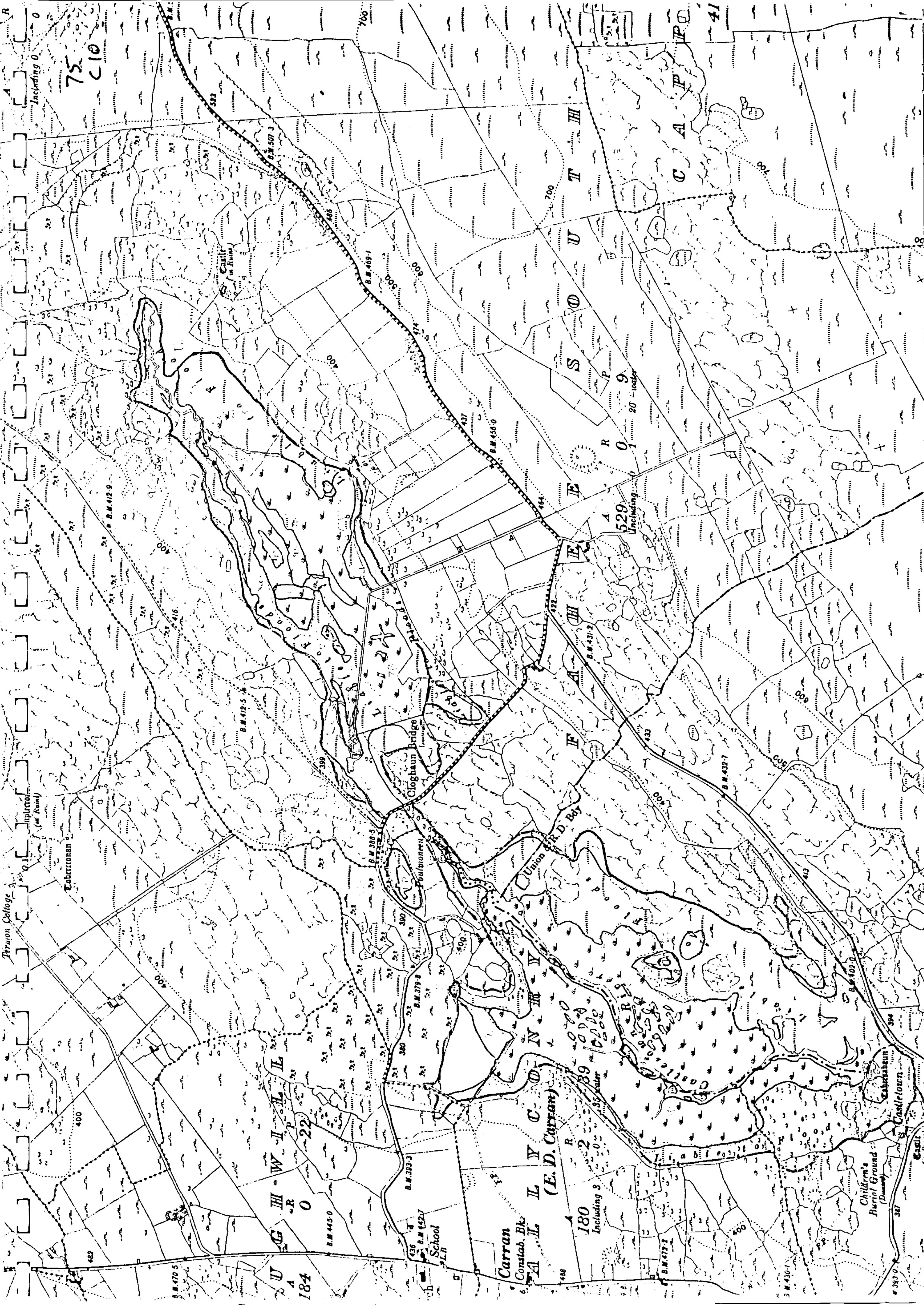
Hydrology: The lake is fed by streams from the SW, NE and SE. These issue from the pavement in most cases and seem almost permanent. Their low gradient anyway keeps them flooded for a long period. The lake itself is surrounded by a vertical shore of about 30cm so it has this fluctuation in the summer. Its bed appears seldom exposed. There is no major swallow hole except for a widened joint in the pavement on the east side adjacent to a line of collapse holes in the peat. In the north-western arm there is another depression which produces water at times.

There is no evidence of successful external drainage though trenches have been excavated in the rock at the south-west end. Floodwater appears highly calcareous.

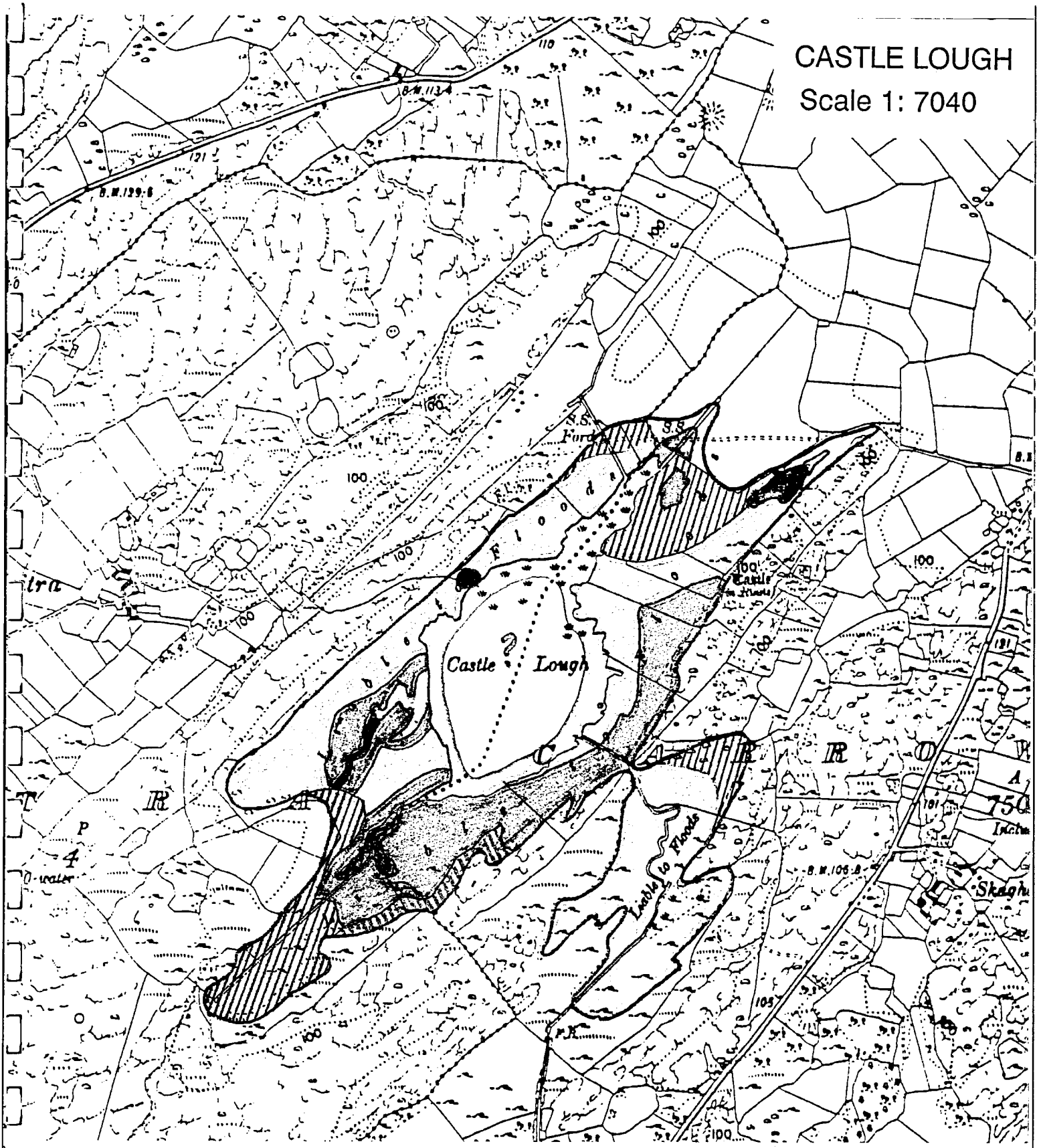
Substrate: The lake seems to be based on marl while around it there is peat over marl. The marl layer does not seem to extend to the edges of the present basin (Coxon, 1986).

Land Use: A few cattle occur in the fields east of the lake and also in the smaller south-eastern basin. Most of the turlough is grazed very little however. There is no intensive farming nearby.

Vegetation: Castle Lough is a sedgey turlough, oligotrophic and highly calcareous. Most of its vegetation consists of 3B, 5D and 6B, except near the lake where more aquatic communities take over. The 3B occurs as a rim around the shallower parts. It is a heathy



75
C10
Cloghaun Bridge
Poulmoneen
Union & R.D. Bdy
(E.D. Carran)
Carran
Constab. Bk.
School
Castletown
Children's Burial Ground (Disused)
Castle (in Ruins)



KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge	10B	Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)	8A	Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)		Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb		Carex flava	8C	Cladium fen		Open water (12)
3B	Sedge heath		Dry Carex nigra		Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)		Peaty Carex nigra	9C	Marl pond	4W	Potentilla fruticosa / Frangula

community of *Carex flacca, C.pulicaris* and *C.pilulifera, Briza, Plantago maritima* and *Danthonia. Dactylorhiza fuchsii* and *D.maculata* occur along with *Platanthera bifolia, Gymnadenia* and *Equisetum palustre*. There is often a little *Calluna* and *Juniperus* on land that is only occasionally flooded.

Towards the south-western end the flat, edging rocks have *Potentilla fruticosa* and *Frangula* and occasional shoots of *Cladium*. Below this community *Carex panicea, C.nigra* and *C.hostiana* (5D) take over, covering the most peaty part of the turlough south-east of the lake. *Schoenus* occurs as scattered tufts with a little *Eriophorum angustifolium* and *Cirsium dissectum*. At one point an obvious water rise is surrounded by rings of *Ranunculus repens* and *R.acris*, then *Poa pratensis, Lolium, Rumex sanguineus* and *Plantago lanceolata* - an alien selection of plants in a sea of *Carices*. The 6B community is found in slightly wetter areas where there is more nutrient input from flooding. *Carex nigra, Potentilla anserina, Eleocharis palustris* with some *Caltha* and *Senecio aquaticus* grow here, sometimes enriched by *Triglochin palustre* or *Equisetum fluviatile* where there is moving water and by *Littorella* in marly places. *Teucrium scordium* occurs locally.

The inflowing streams add interest with *Phragmites, Carex elata* and *C.cf acuta* around the southern one and *Scirpus lacustris* and *Menyanthes* in the northern. The smaller stream flowing through the SE basin also has *S.lacustris, Hippuris, Myriophyllum spicatum* and *Potamogeton natans*. As the lake is approached the marl is exposed and the flora includes *Juncus bulbosus, Baldellia, Littorella* and *P.gramineus* with small amounts of *Eleocharis multicaulis* and *Scirpus fluitans*. The lake itself seems fairly sterile in its extreme alkalinity. Thin stands of *P.gramineus* grow with drifting algal balls.

The influence of drift at the north-east end changes the vegetation somewhat. There is some grassland and small temporary ponds with *Ranunculus trichophyllus* and *Veronica catenata*. At the extreme north-east a more permanent pool with *P.natans* is surrounded by *Sparganium erectum, Eleocharis palustris* etc. It grades into a poached and peaty area with *Nasturtium officinale, Veronica beccabunga* and *Alopecurus geniculatus*.

Vegetation (ha as mapped)

2A-	0.3	3B-	4.9	5A-		6D-		9A-	0.4	11B-	0.9
2B-	0.3	3C-		5B-		7A-		9B-		12-	0.2
2C-		3W-		5D-	7.0	7B-	0.3	9C-	3.8	Lake	4.1
2D-		4B-		5E-		8A-		10A-			
2W-		4D-		6A-		8B-		10B-	+		
3A-		4W-	0.6	6B-	13.5	8C-		11A-	0.1		

Fauna: Snipe and redshank nest in this area but there is little winter data available. It is unlikely to hold many duck apart from pochard or tufted duck but it is visited by the north Clare flock of (c.40) white-fronted geese (Norriss, pers.comm.)

Evaluation: Castle Lough is a good example of an oligotrophic lake and turlough which is little affected by man. It has a high level of diversity in physical terms, rather less so in its vegetation. However there is a good zonation of communities on all sides corrisponding to the depth of the basin and its nutrition. The amount of Potentilla fruticosa/Frangula (4W) is notable as is the purity of the marl lake. Its oligotrophy is shown by the occurrence of *Eleocharis multicaulis*, *Scirpus fluitans* and *Juncus bulbosus*.

The site scores highly (60) because of its variety and the rare plants which include *Teucrium scordium* as well as those mentioned above. It has significant scientific value which, including the lake as an additional habitat, could be considered to be of national value.

56. LOUGH ALEENAUN [Cx 74]
River System: Fergus
Catchment Area: 480 ha
Altitude: 68m

Grid Ref: R 2595
6" sheet: Clare 9
Turlough Area: 10.7 ha
Evaluation place: 33=

<site map on p 189>

Topography: Lough Aleenaun occurs in the foothills of the Burren just off the Ballyvaughan - Kilnaboy road. It consists of a notable hollow in the bedrock, formed presumably by collapse. The surroundings are generally scrub-covered pavement but on the south side there are a few sloping fields with drift. The northern edge of the turlough is marked by a 4m cliff in a ridge of rock. The basin extends away from this as level ground to the south where it is crossed by a semi-circular stream. To the east there is a linear extension curving its way through the overhanging scrub. In this section there has been much bulldozing of rocks so that the natural disposition of the ground is altered. There is a little untouched limestone pavement in the south-east however.

Hydrology: MacGowran (1985) states that the flooding and emptying of this turlough are frequent and rapid. There is a spring and sink at opposite ends of the northern cliff and the linking stream was still active in late-June. Water also seems to be produced by a hole under rocks in the eastern section.

There is no evidence of drainage.

Substrate: The central level area of the main basin is covered by impure marl which becomes clayey round the edges. Marl seems likely to occur in the eastern basin also. Amongst the trees to the north the clay is much exposed by poaching. There is no real peat but the surface layers are enriched by humus in the central (stream) area.

Land Use: The western basin and northern arms are heavily used by cattle with resultant damage to the vegetation. In the east, sheep are prevalent and the turf more intact. As mentioned this area has been modified by rock clearance.

There is no silage made or stored in the vicinity as far as is known.

Vegetation: The floor of the turlough is covered predominantly with 6B, i.e. abundant *Agrostis stolonifera* and *Calliergon cuspidatum* with frequent *Eleocharis palustris* and a scatter of *Caltha, Phalaris* and *Rumex crispus*. In places this is trampled, favouring *Rumex obtusifolius* and *R.conglomeratus, Polygonum persicaria* and, in scrubby areas, *Filipendula, Valeriana officinalis, Angelica* and *Apium nodiflorum*. At the north-western edge a similar but grassier community occurs (7A) with abundant *A.stolonifera* and *Glyceria fluitans* and a little *G.plicata*. In the west centre the trampled marl is rich in *Polygonum* species, including *P.minus*.

The stream leading out of and into the cliff includes two static ponds and a flowing section. The ponds have *Apium inundatum, Ranunculus trichophyllus, Rorippa amphibium, Zannichellia palustris, Callitriche obtusangula* and *Glyceria fluitans* while *Rorippa palustris* and *R.sylvestris* grow at the edges. MacGowran (1985) recorded *R.islandica* during his work and also a little *Eleocharis acicularis*.

The land rises smoothly around the southern side of the basin into a *Lolium* grassland with *Elymus repens* and a little *Carex disticha* and *C.hirta*. At the eastern end there is a herb-rich limestone grassland with *Achillea, Bellis* etc. while a small section of flooded pavement carries *Sedum acre* amidst festoons of *Cinclidotis*.

Vegetation (ha as mapped)

2A-	1.6	3B-		5A-	1.0	6D-		9A-	0.3	11B-	
2B-	0.7	3C-	0.1	5B-		7A-	0.3	9B-		12-	
2C-	0.3	3W-		5D-		7B-		9C-		Lake	
2D-		4B-		5E-		8A-		10A-			
2W-	+	4D-		6A-		8B-	0.2	10B-			
3A-		4W-		6B-	5.7	8C-		11A-			

Fauna: No waders nest in the turlough but it may be visited occasionally by flocks of curlew and lapwing in autumn. There is no winter information to hand.

Some records of molluscs are listed by Donaldson et al. (1979).

Evaluation: Overall this is now a rather dull turlough where the natural vegetation has been much altered by overgrazing and rock clearance. However it contains quite a varied vegetation for its small size and visually has a nice cliff and disappearing river. One of the reasons it is well known is that it has been visited by

many botanists in the past because of its location and has a large recorded flora. The special species are *Eleocharis acicularis*, *Rorippa islandica* and *R.sylvestris* and these do something to bring its place in the evaluation table to 33rd position.

It is not considered of more than local scientific interest.

57. KNOCKAUNROE [Cx 73]
River System: Fergus
Catchment Area: 350 ha
Altitude: 28m

Grid Ref: R 3194
6" sheet: Clare 17
Turlough Area: 42.5 ha
Evaluation place: 7

Topography: Knockaunroe turlough is situated in the flat limestone pavement south-west of Mullagh More. It lies in a narrow depression that opens out towards the east. The northern end is surrounded and crossed by ridges of bare rock, trending NE - SW. To the west and south there is a thin cover of soil on the rock and the turlough breaks through a low ridge to fill a subsidiary basin. There is some loose rock about, all in its original position. Another subsidiary basin occurs at the eastern end where the turlough continues east of the road. This section was not mapped during the field visit so has been put on the vegetation map as an outline.

Hydrology: Water stays late in the basin and there is usually a reasonably large lake in the northern half into June. The depth of water is related to the amount of former peat cutting so that blocky islands of peat stand up within and around the lake and isolated pools occur in otherwise dry areas. The lake persists longest in the south centre.

The turlough is totally dependant on groundwater and there is no inflow into the basin. Swallow holes occur particularly on the northern shore as enlarged cracks in the pavement. There is some fine sculpturing of the rock on parts of the shore. The water is highly calcareous. A single measurement in late July (RPS, 1992) gave a pH of 7.5 and an alkalinity of 140 mg/l calcium carbonate. Reynolds (1982) records the winter conductivity at 83-158 µmhos cm -1 and 177-240 in June-September whilst RPS obtained a more extreme result of 325 because of low water levels.

Substrate: It seems likely that the northern basin was once entirely filled with peat. Cutting has brought the underlying marl to light in many places and also allowed marl to reform on the lowered peat surface. The peat is 1m thick where it remains intact (MacGowran, 1985). The southern basin seems less peaty with a broad band of marl down the middle. Here again it may cover the old peat surface - which is suggested by the O.S. map.

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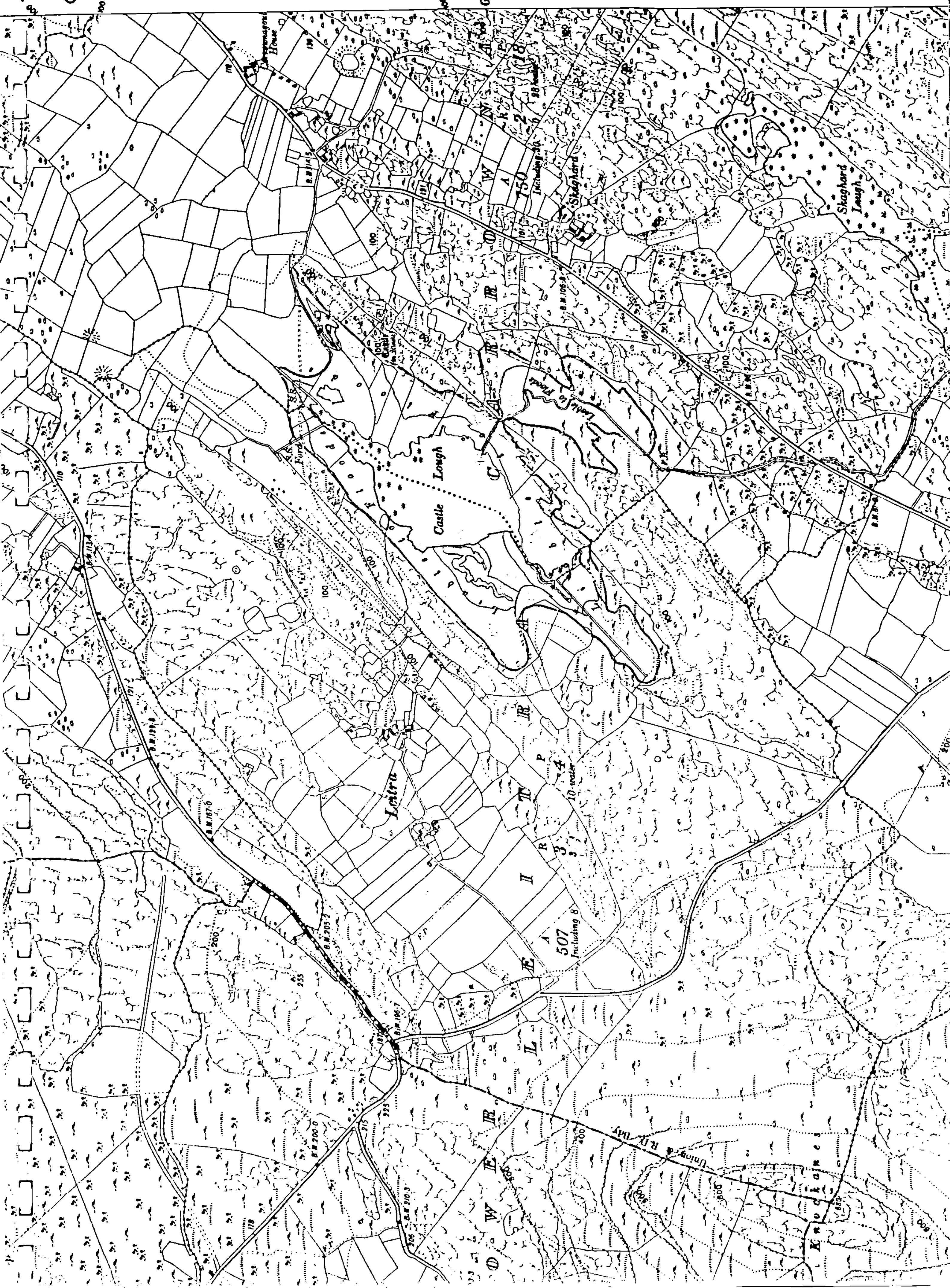
C10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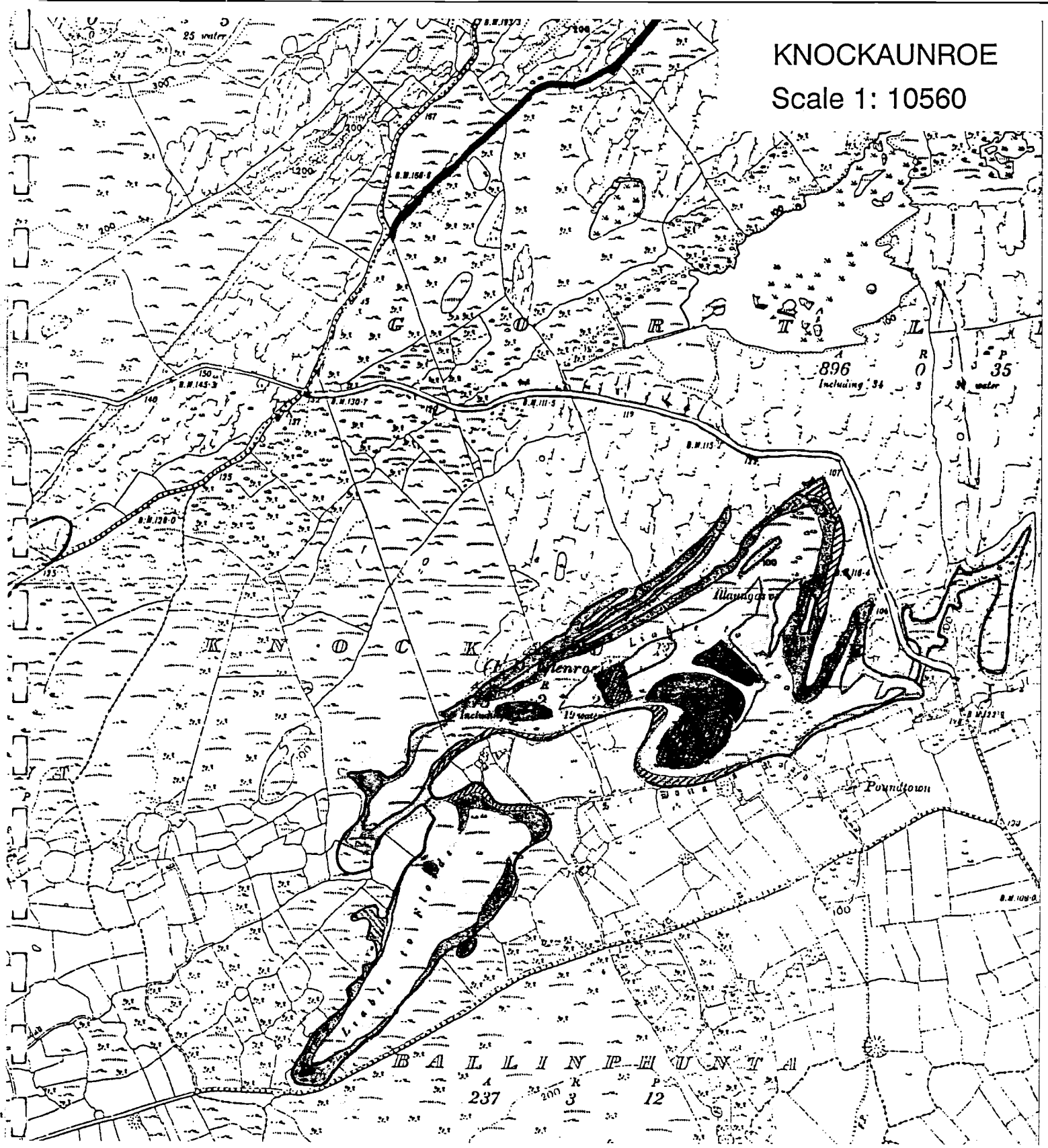


KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen	7A	Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed	7B	Tall sedge	10B	Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)	8A	Polygonum amphibium	11A	Reed bed (11A)
2D	Peat grassland (2D)	5D	Sedge fen	8B	Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb	5E	Carex flava	8C	Cladium fen		Open water (12)
3B	Sedge heath	6A	Dry Carex nigra	9A	Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra	9B	Eleocharis acicularis	3W	Rhamnus wood
4B	Pot. reptans (sp. rich)	6D	Peaty Carex nigra	9C	Marl pond	4W	Potentilla fruticosa / Frangula

Land Use: There is little grazing of the unpalatable herbage though the basin is open to cattle from most sides. There is one field at the south-west end of the northern basin.

Peat cutting has long ceased.

Vegetation: The predominant community at Knockaunroe is that of a seasonal marl lake (9C) which consists of *Littorella, Juncus articulatus, J.bulbosus, Baldellia, Eleocharis multicaulis* and *Carex lepidocarpa,* along with several *Chara* species, including *C.hispida.* MacGowran (1985) records *Eleocharis acicularis* in addition.

All around the more permanent water there is much *Potamogeton gramineus* and there is also *P.polygonifolius, Myriophyllum alterniflorum* and *Scirpus fluitans,* showing the oligotrophy of such highly calcareous water. On the southern shore *Teucrium scordium* penetrates into this community from the rocky edge of the turlough. In the centre of the lake blocks of peat stand out, covered by *Schoenus, Molinia, Cirsium dissectum* and *Carex panicea.* There is much *C.elata* also. It is scattered on the lake bed but forms more compact stands in the centre and south, mixed with *Phragmites, Scirpus lacustris* and a little *C.acuta.* An area of *Cladium* occurs beside the *Schoenus* peat. The peat cutting in the central area causes a haphazard arrangement of communities as small patches of *Cladium, Potamogeton natans* or *Phragmites* may occur in pools in the midst of dry vegetation. In one peat cutting both *Utricularia minor* and *U.intermedia* are found while *Potamogeton lucens* grows in another pool.

In much of the northern basin the lake community rises into *Carex hostiana, C.panicea* and *C.nigra* (5D) with *C.lepidocarpa, Succisa* and occasional *Taraxacum 'palustria'* and *C.dioica.* Bare rock slopes down into this peat, bringing with it *Potentilla fruticosa, Galium boreale, Salix repens, Rhamnus* and *Frangula.* At each end of the northern basin different communities occur. There is a patch of 6B at the eastern end where water movement to or from the turloughs across the road may increase the nutritional status. At the western end the soil becomes more silty and 6A surrounds the lake, giving way behind to a field of *Molinia, Agrostis stolonifera* and *Calliergon cuspidatum* with frequent *Viola canina* (4B). In much of the central area a narrow fringe of 3B occurs high up on the shore: at one place in this there is an abundance of *V.persicifolia.*

The southern basin repeats the pattern of central 9C surrounded by peat. There are even greater amounts of *Chara* spp. which in late June formed drying white sheets like some salt lake. The edging stands of *Carex panicea* have little *C.hostiana* but more *C.flava (*cf *serotina)* and *Scorpidium* than in the main basin. They are therefore distinguished as 5E. On each side of this basin there are round depressions that are filled with *Polygonum amphibium.* These are probably swallow holes of sorts. There is also a small extension on the western side which contains abundant

Potentilla fruticosa and *Salix repens*, mixed with *Molinia* and *Carex hostiana*.

Vegetation (ha as mapped)

2A-		3B-	1.3	5A-		6D-		9A-		11B-	
2B-		3C-	0.6	5B-		7A-		9B-		12-	
2C-		3W-		5D-	8.8	7B-	1.7	9C-	20.9	Lake	
2D-		4B-	0.4	5E-		8A-	0.1	10A-			
2W-		4D-	2.9	6A-	1.6	8B-		10B-			
3A-		4W-	0.3	6B-	0.9	8C-	0.5	11A-	2.5		

Fauna: Redshank, lapwing and common sandpiper nest around the turlough, the latter requiring the lake water in which to feed. In winter they are relatively few birds though some diving duck occur. There are no counts published.

Some records of aquatic invertebrates are included in Reynolds (1982) while a few water beetles are listed by Bilton & Lott (1991).

Evaluation: This is an oligotrophic turlough **par excellence** with many interesting features in its flora and vegetation. It is physically diverse with rock outcrops, a dry end and some semi-permanent water. The vegetation types are strongly biassed to the highly calcareous and the site contains more Marl pond (9C) for its size than any other. Peat is also widespread and its partial cutting has been the only human influence on the turlough in the past.

The oligotrophy of the habitat consistent with its very small catchment, is shown by the presence of the most complete range of that 'calcifuge' element which is so distinctive of highly calcareous turloughs throughout the country, i.e. *Potamogeton polygonifolius, Eleocharis multicaulis, Scirpus fluitans, Myriophyllum alterniflorum* and *Juncus bulbosus*. Knockaunroe is the only turlough in which *Utricularia minor* and *U.intermedia* were found and it also contains most of the Burren specialities, for example *Frangula, Potentilla fruticosa, Viola persicifolia* and *Teucrium scordium*.

The site scores highly (64) in the evaluation process which puts it in seventh place overall. It is therefore considered of international importance.

58. LOUGH GASH [Cx 77]
River System: Fergus/Shannon
Catchment Area: 482 ha
Altitude: 14m

Grid Ref: R 3968
6" sheet: Clare 51
Turlough Area: 21.9 ha
Evaluation place: 18

Topography: Lough Gash occurs in the low landscape west of Newmarket-on-Fergus. From the east it is overlooked by a housing estate while on the west side there are large pastures with scattered trees. The turlough has a very flat basin, slightly raised in the middle and in one place crowned with an island (Monument). The southern limb is more sloping with a channel leading from the south end. Channels meander across the centre also, from east to west. The shores rise as a stony slope on the west side with apparent bedrock in a few places.

Hydrology: The water rises mainly from the rocks at the south end but there are two overground flows also: one in the nearby ditch and the other a stream on the east side. This latter is diverted through the town's sewage works. The largest sink hole is situated on the west side about halfway down but in summeer the stream disappears at random into the muddy bottom.

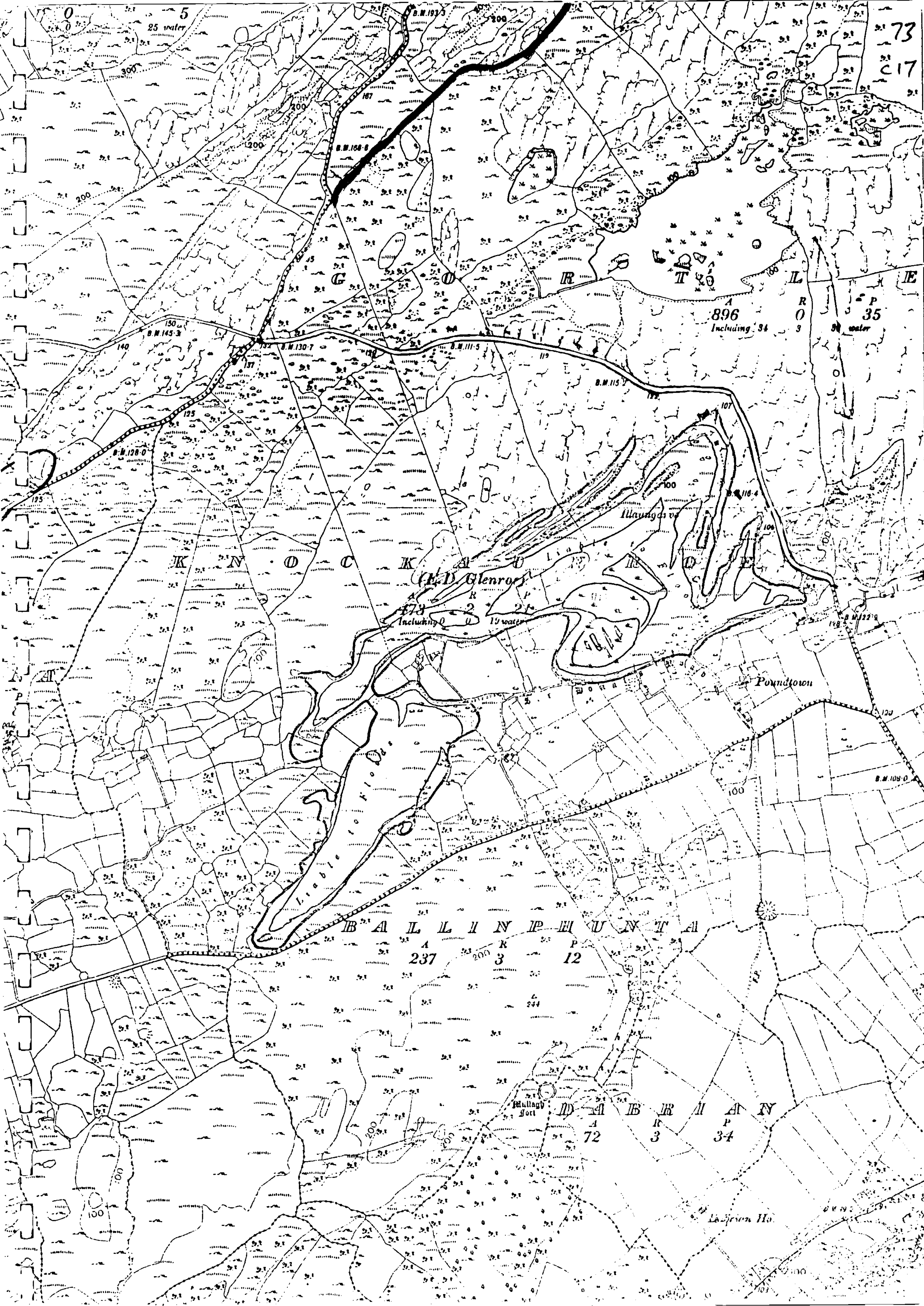
An excavated channel leaves the turlough on the west side near the swallow hole but it does not have much drainage effect. In 1990 the turlough dried out first in August, having had a depth of 2-3m until then.

Substrate: The base is covered by peaty marl of 1m thick or more. It was still too soft to walk on in some places on 12th September.

Land Use: The basin is used as a discharge for the sewage works but is too wet for any grazing. Some wildfowl are shot in winter.

Vegetation: Because of its late draining the whole turlough supports distinctive communities containing many annual species. The central zone is covered by an open vegetation of *Chenopodium rubrum, Polygonum minus, Rorippa islandica, Bidens tripartitus* and *Juncus bufonius* with some *Oenanthe aquatica*. The annual moss *Ephemerum cohaerens* occurs here on open mud.

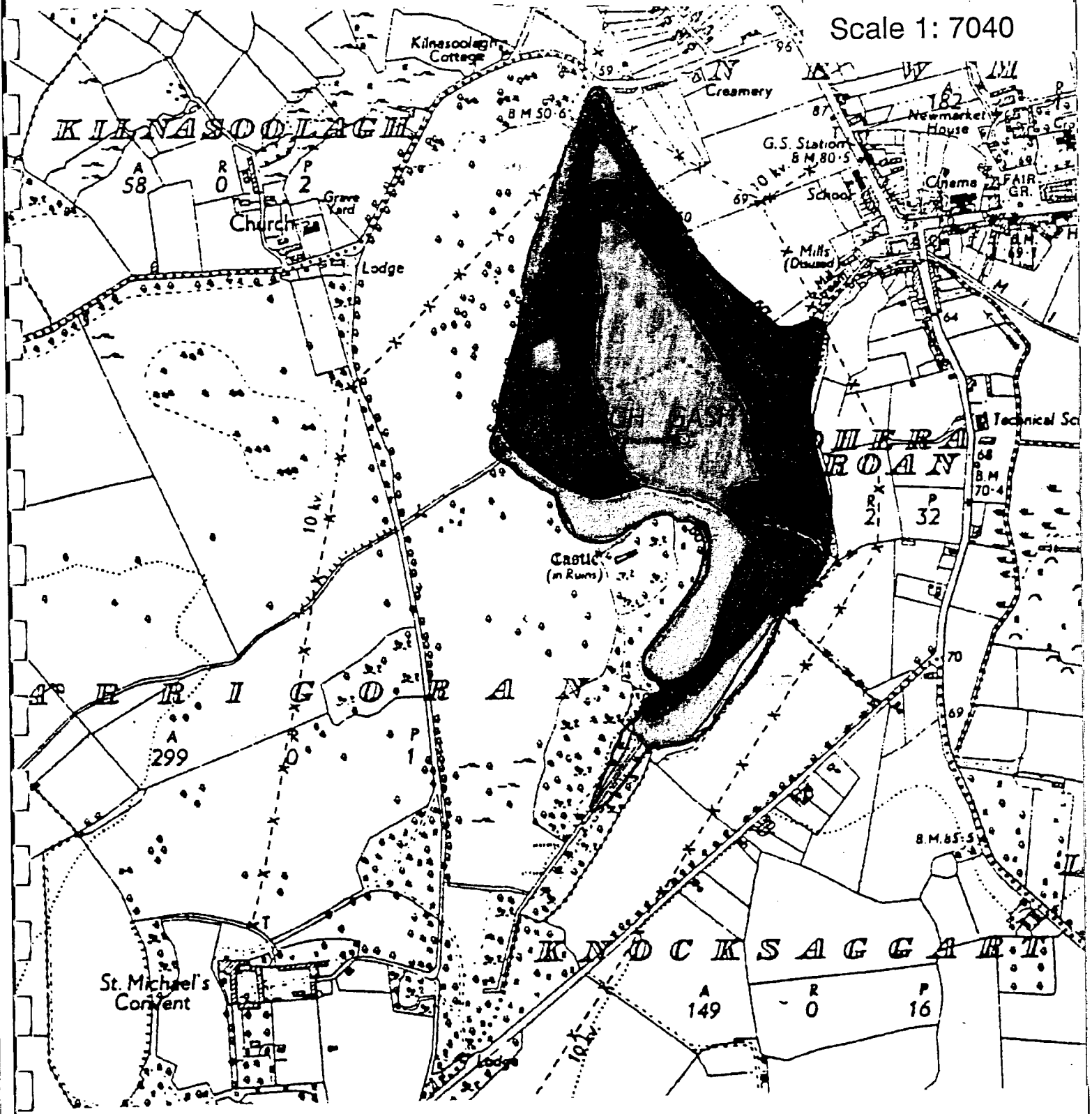
On the slightly higher ground around the centre, the *Oenanthe* dominates with *Rorippa amphibium, Ranunculus trichophyllus, Veronica catenata, B.tripartitus* and some *Polygonum amphibium*. There is a sea of waving herbs 60cm high, untouched by grazing animals. At their bases *R.islandica* remains common. Parts of the shore especially at the southern end have a grassier community with *Glyceria fluitans, Agrostis stolonifera* and *Alopecurus geniculatus* as well as scattered *Sparganium emersum*. This leads out into a narrow fringe of *Carex hirta, Potentilla anserina* and *P.reptans* at one place.



73
C17
25 water
A R P
896 0 35
Including 34
(E.D. Glenroe)
Poundtown
Liable to Floods
B A L L I N P H U N T A
A R P
237 3 12
Mullagh Fort
A R P
72 3 34

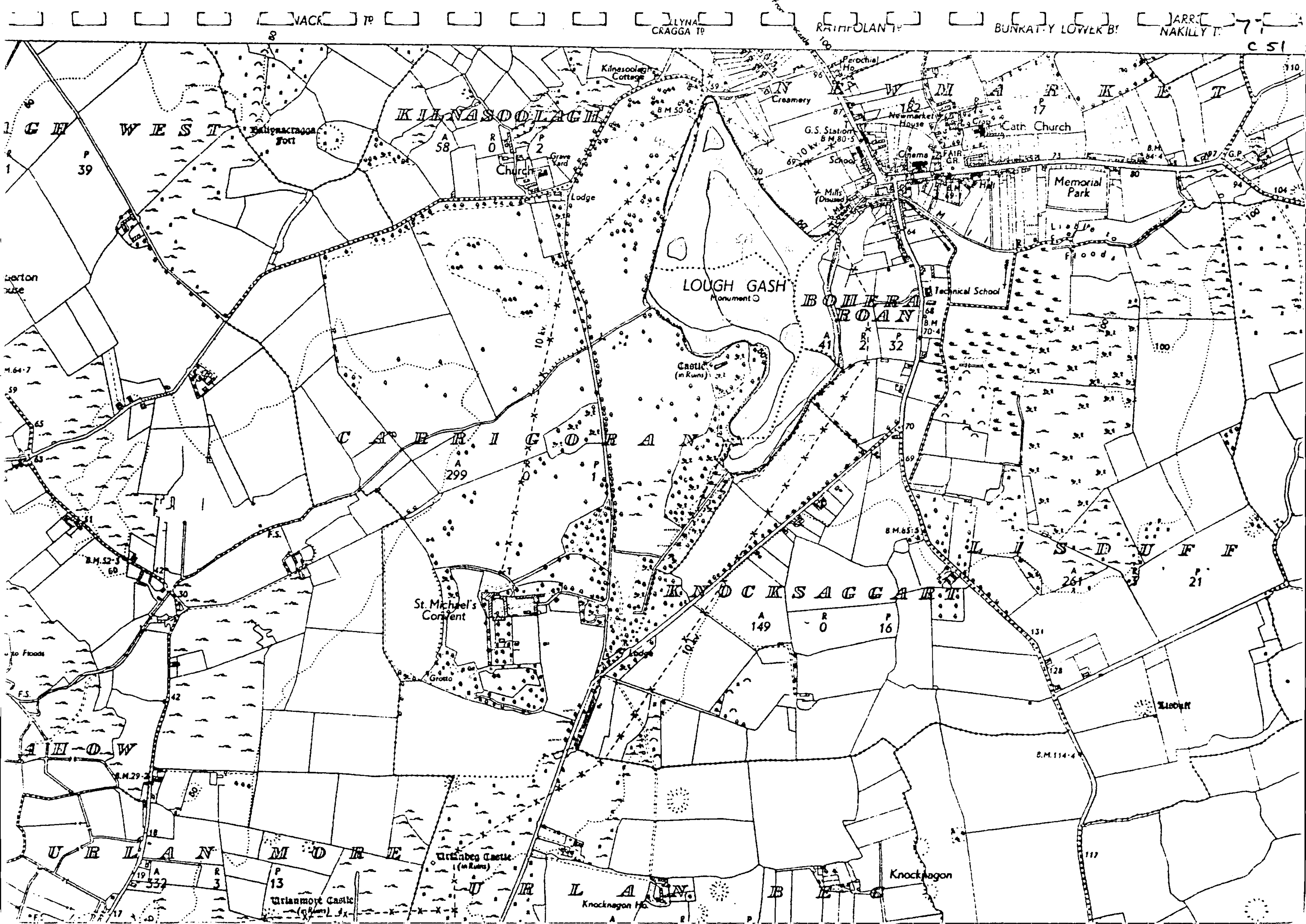
LOUGH GASH

Scale 1: 7040



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- 3B Sedge heath
- 3C Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry.weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula



C 51
LOUGH GASH
Monument
Castle (in Ruins)
Memorial Park
Technical School
Cath. Church
Creamery
G.S. Station
Newmarket House
Cinema
School
Mills (Disused)
Perochial Ho.
Kilnasoolagh Cottage
Church
Grave Yard
Lodge
St. Michael's Convent
Grotto
Knocknagon
Knocknagon Ho.
Urlanbeg Castle (in Ruins)
Urlanmore Castle (in Ruins)
Lisduff
KILNASOOLAGH
WEST
CARRIGORAN
BOHERAROAN
KNOCKSAGGART
LISDUFF
URLANMORE
NEWMARKET

The streams introduce a different flora into this mix. That from the sewage works brings *Apium nodiflorum, Phalaris, Iris* and *Bidens cernua* (and *Lycopersicum*) while at the southern end a marshy area has *Salix cinerea, S.viminalis, Nasturtium officinale* and *Carex* cf *acutiformis*, with *Cornus sericea* planted along the margins.

Vegetation (ha as mapped)

2A-		3B-		5A-		6D-		9A-	3.7	11B-	
2B-		3C-		5B-		7A-		9B-		12-	
2C-		3W-		5D-		7B-		9C-		Lake	
2D-		4B-	0.2	5E-		8A-		10A-	11.9		
2W-		4D-		6A-		8B-	5.8	10B-			
3A-	0.2	4W-		6B-		8C-		11A-			

Fauna: The area supports nesting snipe, mute swan, moorhen and mallard and from the numbers of broods seen in late May could be quite important. It is too wet for other wader species. There is no winter information available.

Some records of aquatic beetles are included in Bilton & Lott (1991).

Evaluation: Lough Gash is at one of the extremes of habitat conditions since it retains water into August in even a dry year. It also has a very flat profile so that vertical zonation is reduced. There are only three main vegetation types found and these consist almost entirely of annual plants. By far the largest area of Wet annuals (8B) occurs at this site as well as the second largest of both Temporary pond (9A) and Oenanthe aquatica (10A).

Lough Gash is the only site with such a vegetation and the presence within it of such well-adapted species as *Rorippa islandica, Chenopodium rubrum* and *Ephemerum cohaerens* brings up its overall score (46) to put it in 18th position overall. It contains more *Rorippa islandica* than all other sites put together and also has a unique amount of *Bidens tripartita*.

It is considered of at least national value and could achieve international value if the vegetation were to persist without nutrient input.

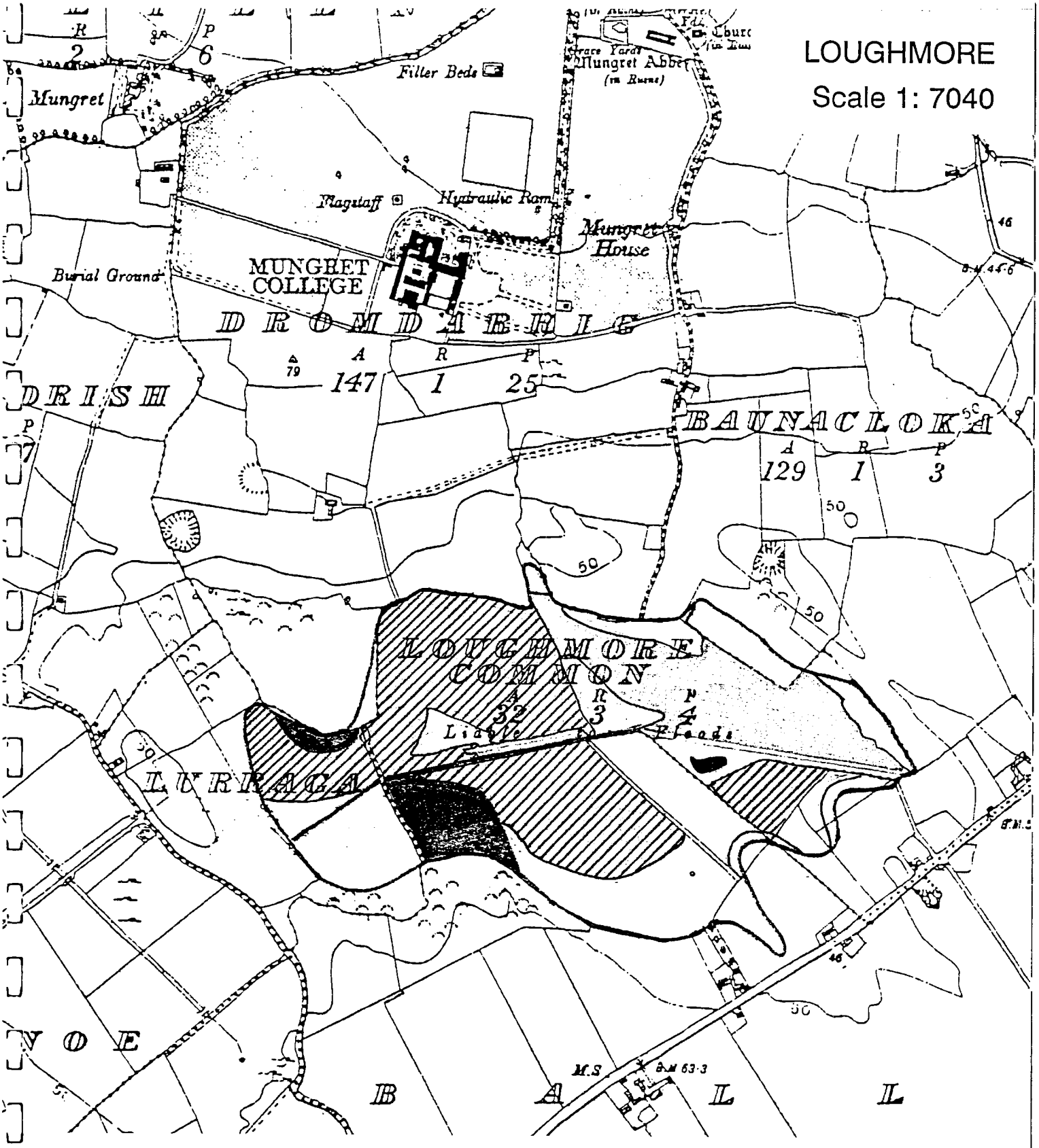
59. LOUGHMORE COMMONS [Cx 79]
River System: Shannon
Catchment Area: 480 ha
Altitude: 12m

Grid Ref: R 5453
6" sheet: Limerick 13
Turlough Area: 30.0 ha
Evaluation place: 43=

Topography: Loughmore is a shallow turlough set in the flat land south of the Mungret Cement works near Limerick. The basin is

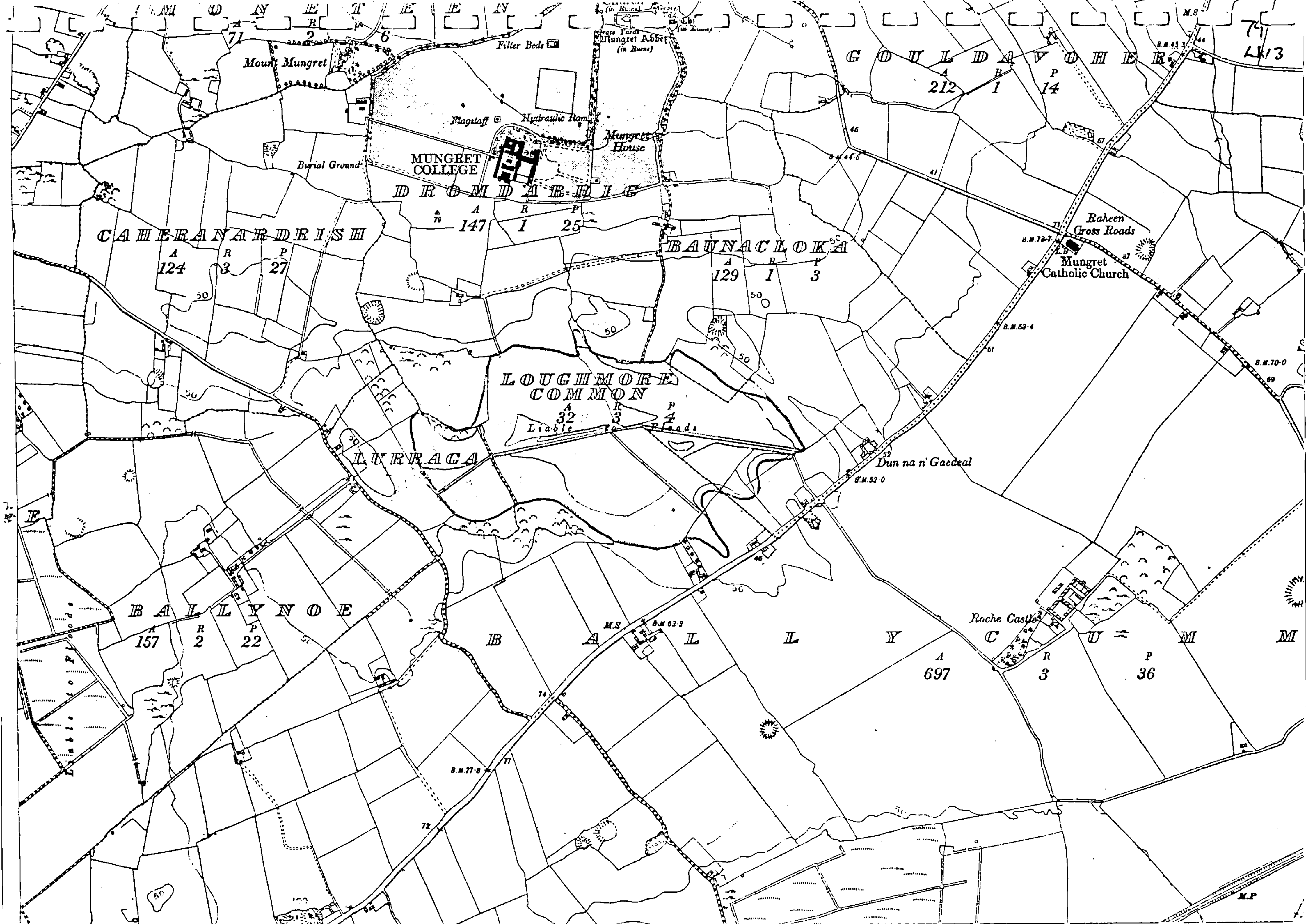
LOUGHMORE

Scale 1: 7040



KEY TO VEGETATION

- 2A Lolium grassland
- 2B Poor grassland
- 2C Limestone grassland
- Peat grassland (2D)
- 3A Tall herb
- Sedge heath
- Flooded pavement
- 4B Pot. reptans (sp. rich)
- 4D Schoenus fen
- 5A Dry weed
- 5B P. reptans (sp. poor)
- Sedge fen
- Carex flava
- 6A Dry Carex nigra
- 6B Wet Carex nigra
- Peaty Carex nigra
- Polygonum amphibium (grassy)
- Tall sedge
- Polygonum amphibium
- Wet annuals (8B)
- 8C Cladium fen
- Temporary pond
- Eleocharis acicularis
- 9C Marl pond
- Oenanthe aquatica (10A)
- 10B Ditch
- Reed bed (11A)
- Peaty pond (11B)
- Open water (12)
- 2W Dry woodland
- Rhamnus wood
- Potentilla fruticosa / Frangula


Mount Mungret
Filter Beds
Grave Yard
Mungret Abbey
(in Ruins)
Flagstaff
Hydraulic Ram
Mungret House
MUNGRET COLLEGE
Burial Ground
DROMDARRIG
CAHERANARDRISH
BAUNACLOKA
GOULDAVOHER
Raheen Cross Roads
Mungret Catholic Church
LOUGHMORE COMMON
Liable to Floods
LURRAGA
Dun na n' Gaedeal
BALLYNOE
BALLYCUMMIN
Roche Castle
A 212 R 1 P 14
A 147 R 1 P 25
A 124 R 3 P 27
A 129 R 1 P 3
A 32 R 3 P 4
A 157 R 2 P 22
A 697 R 3 P 36
B.M. 79·7
B.M. 68·4
B.M. 70·0
B.M. 52·0
B.M. 63·3
B.M. 77·8
B.M. 44·6

elongated in an E - W directin with sinuous margins especially on the south side. Some rocks show through at the north-eastern end but the turlough and the land around are mostly covered by glacial drift. The floor is flat but is crossed by a raised aquaduct which is fenced on both sides.

Hydrology: The turlough is a dry one fed probably from a swallow hole at the NE end. It seems that water from the stream which is now taken westwards over the turlough floor in a raised ditch may have once reached the basin. It does so no longer, however, though there appears to be enough groundwater present for limited flooding (less than 50cm). Shallow ditches run across the floor separating the fields. There is also a toe drain along each side of the central embankment.

The presence of saltmarsh plants in this turlough suggests that their may be a slight salt influence in the floodwater. On the other hand it could be because of its physical proximity to the Shannon Estuary.

Substrate: Up to 30cm of grey lake clay occurs on the floor of the basin (Coxon, 1986). There is also some surface accumulation of peat particularly at the western end away from the swallow hole.

Land Use: A few cattle are present in the fields along the southern edge but much of the common appears to be ungrazed at present. It is used for training greyhounds and for occasional shooting.

Vegetation: There is an extensive area of dryish peaty communities in the western half. Mostly it can be included in 3B though it has more abundant *Deschampsia cespitosa* than elsewhere along with *Equisetum palustre* and some *Dactylorhiza incarnata, Pulicaria* and *Lysimachia vulgaris*. There is some calcareous influence and *Campylium stellatum* occurs in the ground layer. Higher patches (2D) to the south and north have *Molinia, Carex hostiana* and *Briza*. A little 6B is found around drains and natural hollows. Here the flora normal for this vegetation is augmented by *Oenanthe lachenalii* and *Eleocharis uniglumis* as well as *Equisetum fluviatile, Polygonum amphibium* and *Juncus subnodulosus*. To the east more typical 6A takes over, running up to the swallow hole area where there are some flat rocks.

Limestone grassland occupies a fringe of ground around parts of the eastern shore passing to wet grassland along the southern side. This is also peaty and *Deschampsia, Festuca arundinacea* and *Juncus inflexus* are prominent as well as some *Lysimachia vulgaris, Lotus uliginosus* and *Iris*. In the SE centre a patch of 3B stands above a slightly enriched or differently managed community based on *Filipendula* with *Polygonum amphibium* and *Mentha aquatica*. A pond is situated here with *Equisetum fluviatile, Sparganium erectum, Oenanthe lachenalii, Nasturtium officinale* and *Potamogeton natans*.

The main aquatic communities occupy the raised ditch and toe drains to each side. The ditch is lined by *Typha latifolia, Scirpus lacustris* and *S.maritimus* with some *Carex riparia* and *Groenlandia densa* at the western end. *Thalictrum flavum* grows on the bank. Below this the toe drains have *Baldellia, Alisma plantago-aquatica, Eleocharis uniglumis* and *Scorpidium.*

Vegetation (ha as mapped)

2A-		3B-	11.3	5A-		6D-		9A-		11B-	
2B-	6.3	3C-		5B-		7A-		9B-		12-	
2C-	1.6	3W-		5D-		7B-		9C-		Lake	
2D-	1.8	4B-	2.0	5E-		8A-		10A-			
2W-		4D-		6A-	4.6	8B-		10B-			
3A-		4W-		6B-	1.2	8C-		11A-			

Fauna: Snipe nest in the area and occur also in winter when there are numbers of lapwing, golden plover and curlew.

Evaluation: Although drier than formerly and largely disfigured by the embanked aqueduct that runs down the middle, Loughmore Commons retain significant ecological interest. It has little in the way of diversity but its peat content and proximity to the sea gives it decidedly unusual plant communities not strictly comparable to any other site. It thus scores relatively highly for its rare plants though overall it comes in at 43rd place.

The unusual species include *Eleocharis uniglumis, Oenanthe lachenalii* and *Lotus uliginosus* and this is the only site for any of them. In addition the drain contains *Groenlandia densa*. The area is considered of regional interest.

60. LISKEENAN [Cx 81]
River System: Shannon/Lough Derg
Catchment Area: 240 ha
Altitude: 61m

Grid Ref: R 9799
6" sheet: Tipperary 7,8
Turlough Area: 26.0 ha
Evaluation place: 55

Topography: This site is situated east of Lough Derg near Carrigahorig. It occupies a shallow basin adjacent to a raised bog, now largely cutover. Drift-covered fields surround it on three sides with bog on the east. There is no exposed rock and the surface is very flat.

Hydrology: The central and southern reedbeds remain quite wet throughout the year as the bog area produces water continually. There was a former inflow at the NW corner also though now this has been diverted to a major drainage channel which drains the western end of the basin. The main swallow hole is in this area

but does not look active today. The vegetation suggests that a recent reduction in flooding has taken place.

Substrate: Peat over marl is the normal pattern except for a fringe of clay soils at the western end.

Land Use: The southern and western sides of the basin are grazed by cattle but few venture out into the central area. They are limited by the wetness of some places and the unpalatibility of the *Schoenus* vegetation. Peat cutting was formerly widespread and appears to have worked eastwards into the edge of the turlough.

Vegetation: The major part of the area is covered by *Schoenus* fen with some *Cladium, Carex lepidocarpa, Molinia* and *Dactylorhiza incarnata* (some 1m high). In the wetter central places *Cladium* is more frequent growing with *Phragmites, Juncus subnodulosus* and *Carex rostrata*. There is some *Menyanthes* and *Epilobium palustre* in the south-east corner. As old peat banks appear there is some colonisation by *Myrica, Anthoxanthum, Briza* and *Rumex acetosa* (2D) before the high bog is reached. This is repeated on the SW side though here a *Carex* fringe with *Veronica scutellata* and *Hydrocotyle* is more common below the surrounding pastures.

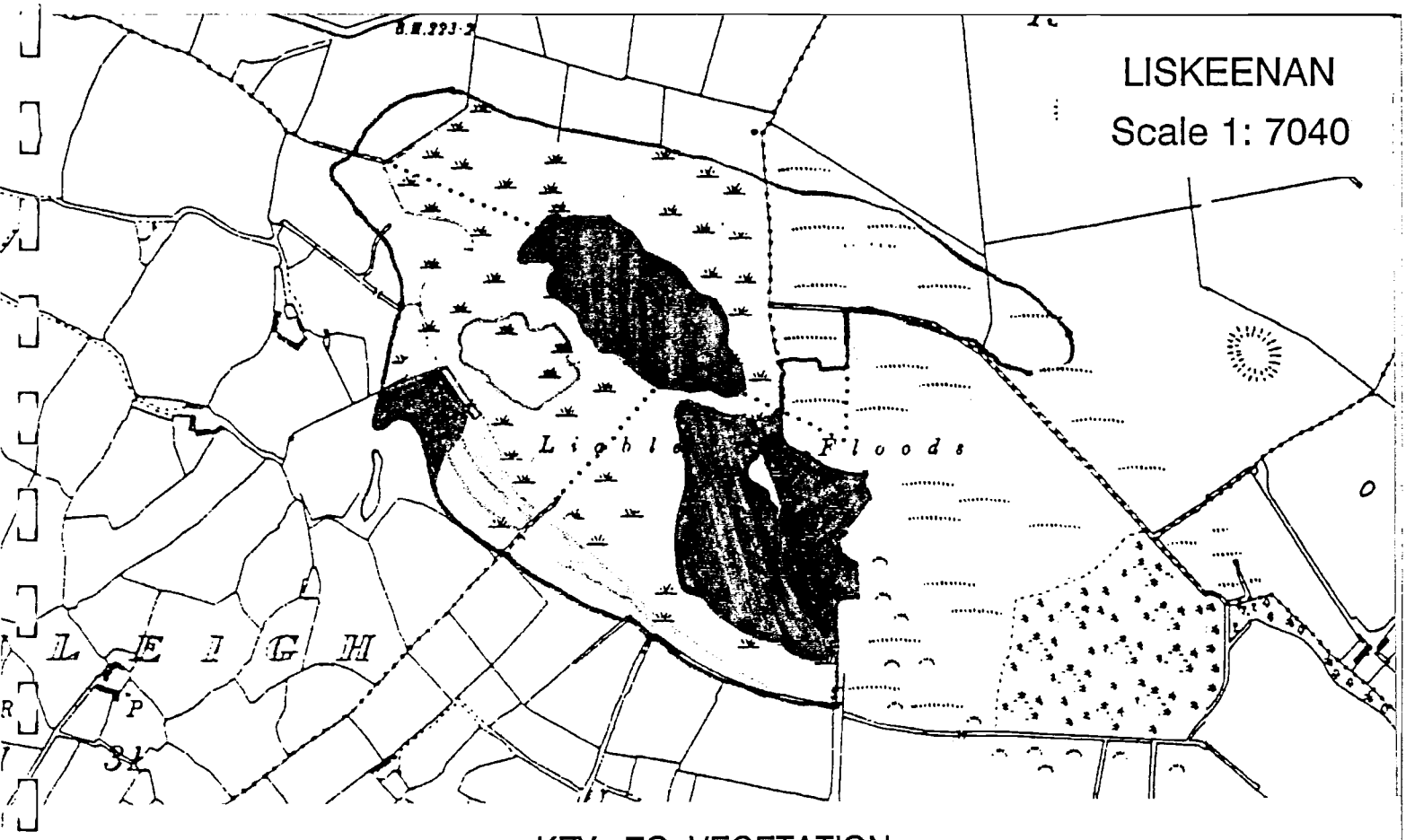
Vegetation (ha as mapped)

2A-	2.4	3B-		5A-		6D-		9A-		11B-	
2B-		3C-		5B-		7A-		9B-		12-	
2C-		3W-		5D-		7B-		9C-		Lake	
2D-	2.1	4B-		5E-		8A-		10A-			
2W-		4D-	14.5	6A-	0.3	8B-		11A-	5.0		
3A-		4W-		6B-	0.9	8C-	0.9	11B-			

Fauna: The area is a good breeding site for snipe and probably lapwing though only a flock of ten of the latter species was seen in mid-June.

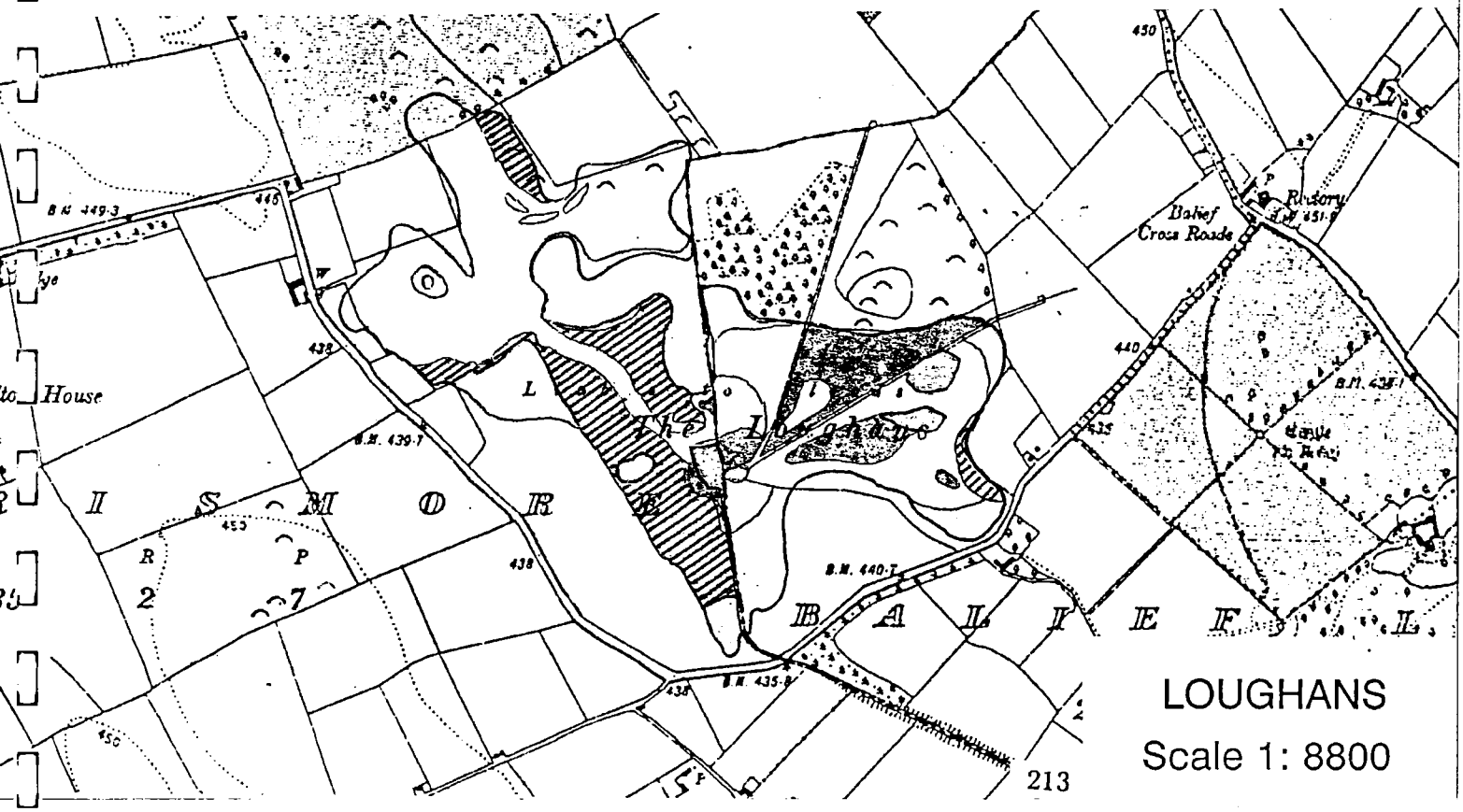
There is no winter information.

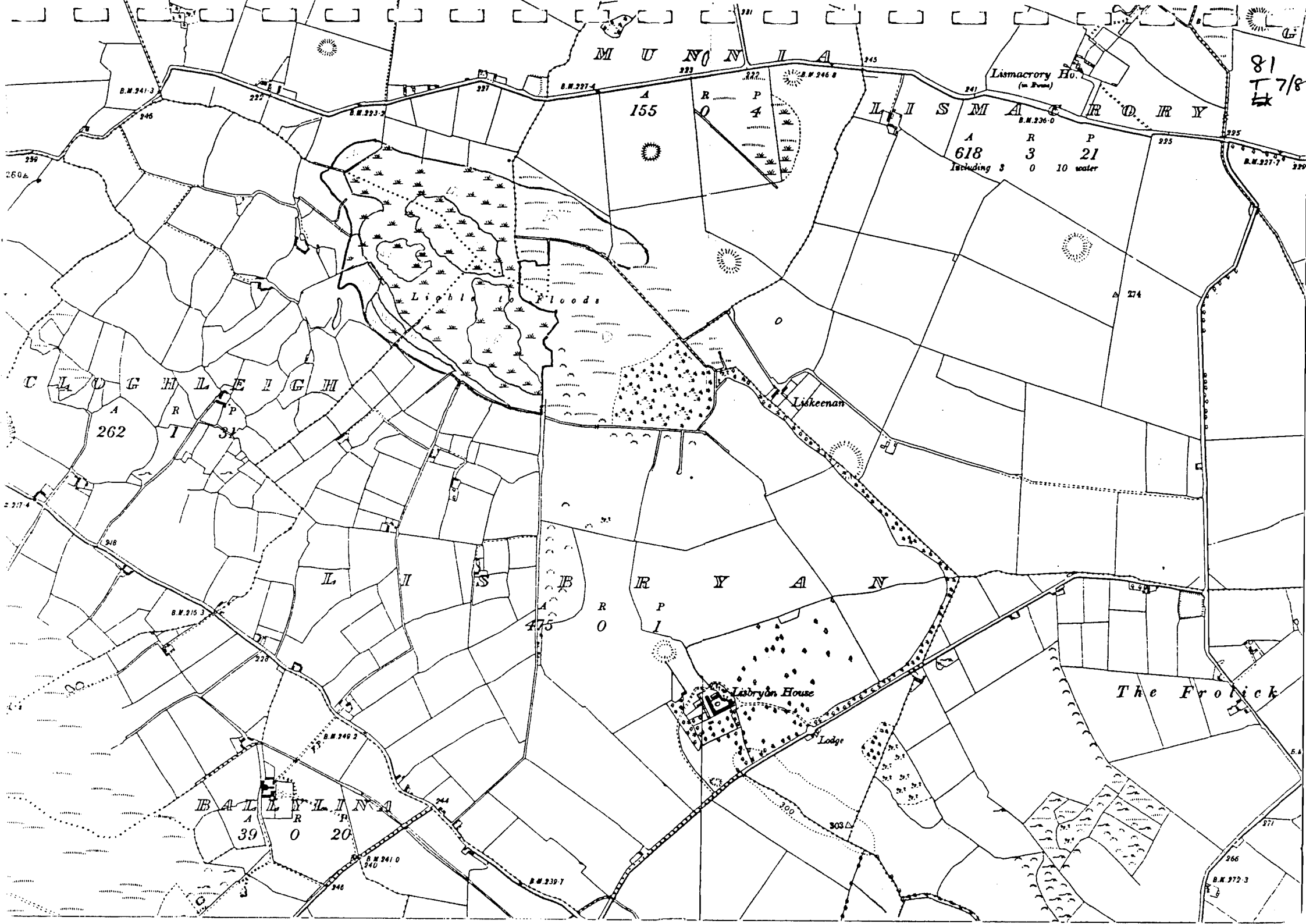
Evaluation: Liskeenan is today scarcely a turlough because of the local drainage. It is a limestone fen with a bit of extra flooding in winter and is not considered of scientific interest in the turlough context.



KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge	10B	Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)		Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb		Carex flava	8C	Cladium fen		Open water (12)
3B	Sedge heath	6A	Dry Carex nigra		Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)		Peaty Carex nigra	9C	Marl pond		Potentilla fruticosa / Frangula




M U N N I A
L I S M A C R O R Y
A R P
618 3 21
Including 3 0 10 water
Lismacrory Ho.
(in Ruins)
A R P
155 0 4
C L O G H L E I G H
A R P
262 1 31
L I S B R Y A N
A R P
475 0 1
Liable to Floods
Liskeenan
Labryan House
Lodge
The Frolick
B A L L Y L I N A
A R P
39 0 20
81
T 7/8

61. LOUGHANS [Cx 89]
River System: Goul (Nore)
Catchment Area: 560 ha
Altitude: 129m

Grid Ref: S 3164
6" sheet: Kilkenny 12
Turlough Area: 21.7 ha
Evaluation place: 29=

<site map on previous page>

Topography: The Loughans is situated east of Urlingford in flat land below the escarpment of the Slieve Ardagh Hills. The basin is slightly undulating with banks and hummocks of glacial drift around which the water rises. It has a level floor for the most part but at the southern tip a very uneven field suggests that there may be some active subsidence going on. There are three or four other subsidence hollows. One at the north-west end is now dry, possibly replaced in function by the nearby swallow hole, but the others, at the eastern end, contain ponds. There is no exposed rock except at the northern end beside a wall.

Hydrology: This turlough was at first excluded from the survey as Coxon (1986) states that it has suffered significant drainage. However local knowledge is that it continues to flood for long periods each year despite a drain cut into the southern end and an excavated swallow hole in the north-west. In summer it retains a permanent central pond and there are several subsidiary wet hollows at the eastern end. Apart from the swallow hole mentioned above there is evidence of water movement at hedges on the western side, at the northern tip and, especially, at the eastern extremity where a channel exists. The inflow water seems moderately calcareous.

Substrate: Much of the basin is lined by marl deposits and the excavation reveals an average of about 0.6m white marl over stony drift. However in one place there is a cone of blocky marl of 4m depth, probably indicating local susidence. Although drift is in evidence around the turlough there are now no boulders within the basin. There are some stone walls around the edge however. Peat is largely absent though the vegetation indicates a slight accumulation in the south-eastern end.

Land Use: All the basin is grazed by cattle with the exception of the extreme southern end and the fields on the south-west side. Here part is grazed as an enclosed field and part cut for hay. The Borrismore half of the turlough appears to be one land holding without walls or fences.

Vegetation: The standing water in this turlough is shallow with a muddy floor in which *Potamogeton natans, Ranunculus aquatilis* and *R.trichophyllus* are the main species. Around its edges, *Polygonum amphibium* (7A) becomes important, extending away along the few ditches and to other low-lying areas with *Agrostis stolonifera, Alopecurus geniculatus, Carex nigra* and *Myosotis scorpioides*. A band of this community connects with several ponds at the eastern end where *Glyceria fluitans, Veronica scutellata, V.catenata* and

Ranunculus flammula form a scraw with *Apium inundatum, Potamogeton natans, Ranunculus trichophyllus* and *Sparganium emersum* (9A).

Outside these pool areas the predominant community on the turlough floor is 4B, a mixture of *Potentilla reptans, Carex nigra* and *Juncus articulatus* with various 'upper' species like *Deschampsia, Carex hirta, C.disticha, Molinia* and even *Ranunculus acris*. This shows a tendancy to acidify at the higher levels so is generally surrounded by a sedge heath (3B) in which *Succisa, Potentilla erecta, Carex flacca* and locally *Cirsium dissectum* are prominant. Where obvious drift banks are flooded, as in the north-western section, a small zone of Limestone grassland (2C) occurs and this is easily modified into 2B by enrichment from fertilizers or grazing cattle. The northern end of the turlough is more uniform than the south having only a single dry depression filled by *Carex nigra* with *Potentilla reptans* (5B).

At the southern end of the area a small lumpy field behind a cottage is covered by a tangle of *Molinia, Filipendula, Thalictrum flavum, Rubus caesius* and *Deschampsia* with *Succisa, Briza media* and *Carex flacca* on the high points and locally some *Trifolium medium* and *Epipactis palustris*.

Vegetation (ha as mapped)

2A- 0.9	3B- 4.7	5A-	6D-	9A- 0.8	11B-
2B- 1.9	3C-	5B- 0.9	7A- 2.4	9B-	12-
2C- 0.5	3W-	5D-	7B-	9C-	Lake
2D-	4B- 8.8	5E-	8A-	10A-	
2W-	4D-	6A-	8B- 0.2	11A-	
3A- 0.5	4W-	6B-	8C-	11B-	

Fauna: The Loughans supports breeding lapwing (2-3 prs) in most years, with snipe and occasionally mallard.

In winter, average and (peak) counts by Comerford (pers.comm.) have shown bird numbers to be teal 17(36), mute swan 9(17), whooper swan 8(17), bewick's swan 6(16), lapwing 111(317), golden plover 109(603) and curlew 32(89).

Evaluation: The Loughans is the only large turlough in the south-east of the country and it is also the highest one anywhere, some 19m above Carran in the Burren. It has limited physical variation but a fairly diverse vegetation for its size. This includes standing water, extensive damp areas and a good transition to drift deposits (which support *Orchis morio*). There is a large amount of Potentilla reptans-species rich (4B), in fact the third largest in any turlough.

The evaluation system puts this turlough in 29th place overall but in view of the lack of any other sites in the NUTS south-east region it should be considered of national importance. It is the only site in Kilkenny for *Chenopodium rubrum* and one of few for *Trifolium medium* and *Thalictrum flavum*. Its bird population is also locally important because of the lack of similar habitat.

DONAGHMORE LOWER Tᴾ
URLINGFORD
SEVENSISTE
A 225
R 3
P 39
BALIEF
A 251
Ardanerna Church (in Ruins)
Lodge
Wilton House
RRISMORE
A 1085
R 2
P 7
The Loughans
Balief Cross Roads
Rectory
BALIEF
A 227
R 1
P 31
RIDGE
A 185
R 1
P 34
Spring
Belle Vue

215

x 120%

1 : 8800

4's

1 cm² = 0.7744 ha

ha

✓ ~~1.8~~ 1.9 2B 8

✓ 4.6 ~~3.7~~ 7 3B ~~18~~ 24

✓ 0.45 2C 1.5

0.89 5B 3.4 4

✓ 0.89 2A 3

2.84 7A 10

112 ✓ 8.8 4B 40

0.5 3A 2

0.2 8B 0.7

0.7 9A 3

17.7 ha

~~24.8~~ total

21.7

TABLE 6. SUMMARY OF TURLOUGHS OF ECOLOGICAL VALUE
(in approximate order of importance)

International	National	Regional	Local
NEWTOWN/COOLE	LOUGH GASH	CARANAVOODAUN	CAHERAVOOSTIA
RAHASANE	CASTLE LOUGH	SKEALOUGHAN	LOUGH ALEENAUN
CARRAN	LOUGH MANNAGH	BALLYGLASS	CARROWREAGH
CAHERGLASSAUN	CROAGHILL	CASTLEPLUNKET	TURLOUGHMORE (Clare)
KNOCKAUNROE	LEVALLY LOUGH	BRIERFIELD	KILTIERNAN
SHRULE II	*LOUGH CROAN	FORTWILLIAM	ATTISHANE
BALLINTURLY	ARDKILL	TURLOUGHNAGULLAUN	TURLOUGH MONAGHAN
BALLINDERREEN	BALLA	GREAGHANS	CORBALLY
GLENAMADDY	LISDUFF	TURLOUGH O'GALL	SLISHMEEN
COOLCAM	MULLYGOLLAN	KILGLASSAN	MOYLOUGH
GARRYLAND	DOOCASTLE	*KILLATURLY L.	NEWTOWN (Roscommon)
PETERSWELL	CARROWKEEL	BELCLARE	BOYOUNAGH
	LOUGHANS	TERMON LOUGH	KILKERRIN
	TURLOUGHMORE (Sligo)	BALLINASTACK	
		RATHBAUN	
		FEACLE	
		LOUGHMORE	
		RATHNALULLEAGH	
		KILTULLAGH	

Unlisted

SCARDAUN
FEARAGHA
LISKEENAN

Notes: Four Roads (Cloonloughlin) was not examined botanically so is not included in this table.
*Lough Croan and Killaturly Lough do not fit easily into the turlough category but are sites of interest nevertheless.

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APPENDIX 1.

Characteristic species used to identify vegetation types.

2A. Cynosurus cristatus, Lolium perenne, Poa spp., Trifolium repens, Bellis perennis, Ranunculus acris, Cirsium arvense, Veronica serpyllifolia, Elymus repens

2B. Carex hirta, Phleum pratense, Festuca arundinacea, Deschampsia cespitosa, Prunella vulgaris, Ranunculus acris, Elymus repens

2C. Festuca rubra, Achillea millefolia, Galium verum, Leontodon taraxacoides, Carex flacca, Cerastium fontanum, Dactylis glomerata

2D. Molinia caerulea, Potentilla erecta, Succisa pratensis, Juncus effusus, J.conglomeratus, Cirsium dissectum

2W. Fraxinus excelsior, Quercus robur, Alnus glutinosa, Salix cinerea, Rhamnus catharticus

3A. Phalaris arundinacea, Filipendula ulmaria, Festuca arundinacea, Vicia cracca, Lysimachia vulgaris, Thalictrum flavum, Iris pseudacorus

3B. Deschampsia cespitosa, Molinia caerulea, Carex panicea, C.hostiana, Danthonia decumbens, Nardus stricta, Plantago maritima, Festuca arundinacea

3C. Molinia caerulea, Carex hostiana, Rhinanthus minor, Carex flacca, Centaurea nigra, Briza media

3W. Prunus spinosa, Rhamnus catharticus, Crataegus monogyna, Filipendula ulmaria

4B. Filipendula ulmaria, Carex flacca, C.panicea, Lotus corniculatus, Galium boreale, Salix repens, Potentilla reptans, Viola canina

4D. Schoenus nigricans, Molinia caerulea, Achillea ptarmica, Cirsium dissectum, Parnassia palustris

4W. Potentilla fruticosa, Frangula alnus, Rubus caesius, Solanum dulcamara, Polygonum amphibium

5A. Rumex obtusifolius, R.crispus, Potentilla anserina, P.reptans, Carex hirta, Polygonum aviculare, P.amphibium, Rorippa palustris

5B. Potentilla reptans, Carex nigra, C.flacca, Trifolium repens, Lotus corniculatus, Rumex crispus, Filipendula ulmaria, Viola persicifolia

5D. Carex hostiana, C.panicea, Succisa pratensis, Potentilla erecta, Molinia caerulea, Briza media, Schoenus nigricans

5E. Carex 'flava', C.panicea, C.nigra, Calliergon giganteum, Hydrocotyle vulgaris

6A. Carex nigra, Agrostis stolonifera, Potentilla anserina, Plantago lanceolata, Rumex crispus, Phalaris arundinacea

6B. Carex nigra, Senecio aquaticus, Caltha palustris, Eleocharis palustris, Hydrocotyle vulgaris, Myosotis scorpioides, Juncus articulatus, Phalaris arundinacea

6D. Carex nigra, Potentilla palustris, Menyanthes trifoliata, Juncus articulatus

7A. Agrostis stolonifera, Potentilla anserina, Polygonum amphibium, Ranunculus repens, Galium palustre, Leontodon autumnale

7B. Carex elata, C.acuta, C.rostrata, C.vesicaria

8A. Polygonum amphibium, Agrostis stolonifera, Myosotis scorpioides, Eleocharis palustris

8B. Polygonum persicaria, Rorippa islandica, R.amphibia, Eleocharis palustris, Agrostis stolonifera, Galium palustre

8C. Cladium mariscus, Carex lasiocarpa, C.serotina

9A. Glyceria fluitans, Agrostis stolonifera, Ranunculus trichophyllus, Myosotis scorpioides, Rorippa amphibia, Apium inundatum, Eleocharis palustris, Polygonum hydropiper, P.minus

9B. Eleocharis acicularis, Lythrum portula, Limosella aquatica

9C. Juncus articulatus, J.bulbosus, Baldellia ranunculoides, Eleocharis multicaulis, Littorella uniflora, Potamogeton coloratus, P.gramineus, Carex lepidocarpa, Scirpus fluitans

10A. Oenanthe aquatica, Sparganium emersum, Rorippa amphibia

10B. Berula erecta, Nasturtium officinale, Apium nodiflorum

11A. Phragmites australis, Scirpus lacustris, Sparganium erectum, Ranunculus lingua, Juncus subnodulosus

11B. Equisetum fluviatile, Sparganium erectum, Alisma plantago-aquatica, Menyanthes trifoliata, Hippuris vulgaris, Lemna spp., Carex rostrata

12. Potamogeton natans, P.crispus, P.berchtoldii, Myriophyllum spicatum, Nuphar lutea

APPENDIX 2.

Species presence in the vegetation types

2A Lolium grassland	%	2B Poor grassland	%
Lolium perenne	75	Festuca arundinacea	56
Festuca rubra	47	Carex hirta	54
Trifolium repens	41	Phleum pratense	42
Bellis perennis	34	Filipendula ulmaria	34
Cirsium arvense	29	Potentilla anserina	32
Poa pratensis	29	Elymus repens	31
Potentilla anserina	27	Rumex crispus	30
Cynosurus cristatus	26	Lolium perenne	28
Agrostis stolonifera	23	Trifolium repens	24
Leontodon autumnale	23	Rumex acetosa	23
Ranunculus acris	23	Festuca rubra	23
Rumex acetosa	23	Leontodon autumnale	21
Rumex crispus	23	Ranunculus acris	20
Phleum pratense	18	Deschampsia cespitosa	19
Cerastium fontanum	16	Agrostis stolonifera	17
Elymus repens	16	Ranunculus repens	15
Plantago lanceolata	15	Lotus corniculatus	14
Prunella vulgaris	15	Senecio aquaticus	12
Ranunculus repens	15	Carex panicea	12
Lotus corniculatus	14	Plantago lanceolata	11
Taraxacum officinale	12	Galium palustre	11
Carex hirta	11	Alopecurus geniculatus	10
Galium palustre	11	Bellis perennis	10
Potentilla reptans	10	Potentilla erecta	10
Odontites verna	10	Carex nigra	10
Achillea millefolium	10	Stellaria media	10
		Taraxacum officinale	10
(Calliergon cuspidatum	5)		
		(Poa trivialis	8)
		(Calliergon cuspidatum	8)
TOTAL LISTS	73	TOTAL LISTS	117
TOTAL SPECIES	104	TOTAL SPECIES	120

2C Limestone grassland	%	2D Peat grassland	%
Festuca rubra	81	Cirsium dissectum	47
Galium verum	46	Molinia caerulea	46
Bellis perennis	40	Carex panicea	38
Achillea millefolium	35	Succisa pratensis	31
Carex flacca	35	Juncus conglomeratus	31
Lotus corniculatus	33	Carex nigra	28
Lolium perenne	31	Filipendula ulmaria	28
Trifolium repens	27	Juncus effusus	28
Centaurea nigra	25	Anthoxanthum odoratum	20
Prunella vulgaris	25	Potentilla erecta	19
Carex panicea	21	Carex hostiana	19
Leontodon taraxacoides	21	Senecio aquaticus	19
Festuca arundinacea	21	Ranunculus acris	17
Cynosurus cristatus	19	Deschampsia cespitosa	16
Leontodon autumnale	19	Festuca rubra	16
Ranunculus acris	19	Hydrocotyle vulgaris	14
Rumex acetosa	19	Lychnis flos-cuculi	14
Agrostis stolonifera	15	Myrica gale	10
Filipendula ulmaria	15	Calliergon cuspidatum	10
Plantago lanceolata	15		
Potentilla erecta	15		
Carex hirta	13		
Carex nigra	13		
Galium palustre	13		
Potentilla anserina	13		
Succisa pratensis	13		
Pimpinella saxifraga	10		
(Taraxacum officinale	8)		
TOTAL LISTS	48	TOTAL LISTS	57
TOTAL SPECIES	96	TOTAL SPECIES	105

3A Tall Herb	%
Phalaris arundinacea	59
Filipendula ulmaria	55
Carex hirta	40
Vicia cracca	40
Potentilla anserina	39
Festuca arundinacea	32
Carex nigra	22
Agrostis stolonifera	18
Iris pseudacorus	17
Lysimachia vulgaris	15
Carex disticha	14
Polygonum amphibium	12
Rumex crispus	12
Festuca rubra	11
Mentha aquatica	11
Potentilla reptans	11
Senecio aquaticus	11
TOTAL LISTS	64
TOTAL SPECIES	120

2W Dry Wood	%
Fraxinus excelsior	89
Crataegus monogyna	56
Quercus robur	44
Salix cinerea	44
Filipendula ulmaria	34
Corylus avellana	22
Glechoma hederacea	22
Rhamnus catharticus	22
Salix aurita	22
Stellaria media	22
Viola riviniana	22
TOTAL LISTS	9
TOTAL SPECIES	34

3B Sedge Heath	%
Festuca rubra	44
Carex panicea	40
Deschampsia cespitosa	38
Potentilla erecta	38
Succisa pratensis	37
Molinia caerulea	36
Carex flacca	33
Lotus corniculatus	32
Filipendula ulmaria	31
Danthonia decumbens	29
Festuca arundinacea	27
Nardus stricta	25
Carex hostiana	24
Leontodon autumnale	23
Plantago maritima	21
Cirsium dissectum	20
Potentilla anserina	16
Prunella vulgaris	15
Carex nigra	14
Carex pulicaris	14
Galium verum	14
Agrostis stolonifera	13
Leontodon taraxacoides	13
Ranunculus acris	13
Trifolium repens	13
Juncus articulatus	13
Plantago lanceolata	13
Potentilla reptans	11
Lolium perenne	11
Anthoxanthum odoratum	11
Calliergon cuspidatum	11
Briza media	10
Carex hirta	10
Climacium dendroides	10
Hydrocotyle vulgaris	10
Senecio aquaticus	10
Bellis perennis	10
Parnassia palustris	10
TOTAL LISTS	71
TOTAL SPECIES	133

3C. Flooded pavement	%
Rhamnus catharticus	38
Carex flacca	25
Sedum acre	25
Briza media	19
Calluna vulgaris	19
Carex hostiana	19
Carex nigra	19
Cladium mariscus	19
Filipendula ulmaria	19
Galium boreale	19
Leontodon hispidus	19
Lotus corniculatus	19
Potentilla anserina	19
Prunella vulgaris	19
Rubus caesius	19
Succisa pratensis	19
Thalictrum flavum	13
Thymus praecox	13
Schoenus nigricans	13
Senecio aquaticus	13
Sagina nodosa	13
Antennaria dioica	13
Carex elata	13
Crataegus monogyna	13
Euphorbia exigua	13
Frangula alnus	13
Galium verum	13
Molinia caerulea	13
Plantago lanceolata	13
Plantago maritima	13
Potentilla fruticosa	13
Rosa canina	13
Vicia cracca	13
TOTAL LISTS	16
TOTAL SPECIES	87

4B Potentilla reptans-(species-rich)	%
Potentilla reptans	45
Filipendula ulmaria	43
Potentilla anserina	43
Galium boreale	36
Carex hirta	32
Molinia caerulea	31
Carex panicea	28
Leontodon autumnale	28
Potentilla erecta	27
Lotus corniculatus	23
Salix repens	23
Agrostis stolonifera	22
Viola canina	22
Carex nigra	22
Galium verum	20
Ranunculus repens	19
Festuca rubra	18
Galium palustre	18
Calliergon cuspidatum	16
Climacium dendroides	16
Deschampsia cespitosa	16
Plantago lanceolata	16
Festuca arundinacea	14
Juncus articulatus	14
Mentha aquatica	14
Phalaris arundinacea	14
Trifolium repens	14
Rumex acetosa	13
Ophioglossum vulgatum	12
TOTAL LISTS	56
TOTAL SPECIES	79

3W Rhamnus Wood	%
Crataegus monogyna	87
Rhamnus cathartica	83
Prunus spinosa	65
Fraxinus excelsior	39
Rubus caesius	17
Filipendula ulmaria	17
Euonymus europaeus	13
Glechoma hederacea	13
Viburnum opulus	13
TOTAL LISTS	23
TOTAL SPECIES	52

4W Frangula Wood	%
Frangula alnus	67
Rhamnus cathartica	33
Potentilla fruticosa	33
Rubus caesius	33
Molinia caerulea	22
Deschampsia cespitosa	22
Festuca arundinacea	22
Galium boreale	22
Crataegus monogyna	22
TOTAL LISTS	9
TOTAL SPECIES	27

4D Schoenus Fen	%
Schoenus nigricans	86
Molinia caerulea	55
Cirsium dissectum	50
Carex hostiana	27
Parnassia palustris	18
Dactylorhiza incarnata	18
Carex nigra	18
Carex lepidocarpa	18
Filipendula ulmaria	18
Achillea ptarmica	14
Anagallis tenella	14
Carex panicea	14
Hydrocotyle vulgaris	14
Linum catharticum	14
Myrica gale	14
Pinguicula vulgaris	14
Salix repens	14
Scorpidium scorpioides	14
TOTAL LISTS	22
TOTAL SPECIES	55

5A Dry Annuals	%
Stellaria media	45
Potentilla anserina	43
Rumex crispus	38
Polygonum amphibium	34
Polygonum aviculare	32
Polygonum persicaria	32
Carex hirta	26
Potentilla reptans	26
Rumex obtusifolius	26
Phalaris arundinacea	21
Agrostis stolonifera	19
Rorippa palustris	19
Plantago major	17
Chamomilla suaveolens	17
Ranunculus repens	13
Myosotis scorpioides	13
Atriplex patula	11
Poa annua	11
Rumex conglomeratus	11
TOTAL LISTS	47
TOTAL SPECIES	60

5B Potentilla reptans (species-poor)	%
Potentilla reptans	94
Carex nigra	50
Phalaris arundinacea	38
Potentilla anserina	38
Filipendula ulmaria	28
Ranunculus repens	19
Leontodon autumnale	19
Mentha aquatica	19
Lotus corniculatus	19
Viola canina	19
Agrostis stolonifera	16
Carex hirta	16
Geum rivale	13
Hydrocotyle vulgaris	13
Potentilla erecta	13
TOTAL LISTS	32
TOTAL SPECIES	61

5D Sedge Fen	%
Carex hostiana	76
Carex panicea	64
Carex nigra	47
Cirsium dissectum	40
Molinia caerulea	38
Succisa pratensis	33
Potentilla erecta	29
Hydrocotyle vulgaris	22
Carex flava agg.	18
Filipendula ulmaria	18
Juncus articulatus	18
Schoenus nigricans	18
Plantago maritima	16
Carex lepidocarpa	16
Lotus corniculatus	13
Mentha aquatica	13
Potentilla anserina	13
Ranunculus flammula	13
Carex flacca	11
Taraxacum Sect. palustris	11
(Plantago lanceolata	9)
TOTAL LISTS	45
TOTAL SPECIES	83

5E Cutover Carex nigra	%
Carex flava agg.	100
Carex panicea	100
Carex nigra	80
Hydrocotyle vulgaris	80
Caltha palustris	40
Drepanocladus revolvens	40
Mentha aquatica	40
Potentilla anserina	40
Ranunculus flammula	40
Agrostis stolonifera	20
Calliergon cuspidatum	20
TOTAL LISTS	5
TOTAL SPECIES	25

6A Dry Carex nigra	%
Carex nigra	93
Potentilla anserina	55
Carex hirta	46
Phalaris arundinacea	34
Rumex crispus	30
Filipendula ulmaria	27
Mentha aquatica	27
Galium palustre	25
Agrostis stolonifera	25
Ranunculus repens	25
Myosotis scorpioides	16
Leontodon autumnale	14
Polygonum amphibium	11
Potentilla erecta	11
(Calliergon cuspidatum	6)
TOTAL LISTS	50
TOTAL SPECIES	63

6B Wet Carex nigra	%
Carex nigra	86
Eleocharis palustris	41
Potentilla anserina	35
Senecio aquaticus	34
Caltha palustris	33
Hydrocotyle vulgaris	28
Galium palustre	24
Juncus articulatus	23
Ranunculus flammula	22
Mentha aquatica	21
Phalaris arundinacea	19
Carex panicea	17
Ranunculus repens	17
Filipendula ulmaria	17
Agrostis stolonifera	14
Myosotis scorpioides	12
Glyceria fluitans	12
Carex hirta	10
Molinia caerulea	10
TOTAL LISTS	105
TOTAL SPECIES	95

6D Peaty Carex nigra	%
Carex nigra	68
Potentilla palustris	55
Caltha palustris	45
Carex rostrata	41
Filipendula ulmaria	41
Menyanthes trifoliata	41
Equisetum fluviatile	32
Agrostis stolonifera	18
Equisetum palustre	18
Hydrocotyle vulgaris	18
Lysimachia vulgaris	18
Lythrum salicaria	18
Mentha aquatica	18
Potentilla anserina	18
Salix aurita	18
Senecio aquaticus	18
TOTAL LISTS	23
TOTAL SPECIES	62

7B Tall Sedge	%
Carex rostrata	44
Menyanthes trifoliata	39
Carex elata	35
Carex nigra	35
Carex vesicaria	22
Eleocharis palustris	22
Phragmites australis	13
Phalaris arundinacea	13
Filipendula ulmaria	13
Caltha palustris	13
Carex aquatilis	13
TOTAL LISTS	23
TOTAL SPECIES	43

7A Polygonum amphibium-grassy	%
Polygonum amphibium	67
Agrostis stolonifera	61
Potentilla anserina	44
Galium palustre	38
Phalaris arundinacea	35
Eleocharis palustris	32
Myosotis scorpioides	32
Mentha aquatica	30
Rumex crispus	27
Alopecurus geniculatus	21
Carex nigra	21
Glyceria fluitans	18
Ranunculus flammula	18
Carex hirta	15
Ranunculus repens	15
Poa spp.	12
Carex vesicaria	11
(Calliergon cuspidatum	9)
TOTAL LISTS	35
TOTAL SPECIES	57

8A Polygonum amphibium	%
Polygonum amphibium	97
Eleocharis palustris	57
Glyceria fluitans	40
Carex nigra	30
Apium inundatum	24
Galium palustre	22
Mentha aquatica	19
Potentilla anserina	18
Myosotis scorpioides	16
Agrostis stolonifera	16
Phalaris arundinacea	13
Rorippa amphibia	10
Calliergon giganteum	10
(Fontinalis antipyretica	6)
TOTAL LISTS	67
TOTAL SPECIES	61

8C Cladium Fen	%
Cladium mariscus	56
Schoenus nigricans	56
Carex rostrata	33
Carex nigra	22
Carex elata	22
Campylium stellatum	22
Juncus articulatus	22
Phragmites australis	22
Scirpus lacustris	22
Scorpidium scorpioides	20
TOTAL LISTS	9
TOTAL SPECIES	36

8B Wet Annuals	%
Polygonum persicaria	56
Polygonum aviculare	40
Filaginella uliginosa	37
Stellaria media	35
Rorippa islandica	31
Rorippa palustris	25
Polygonum hydropiper	23
Potentilla anserina	19
Chenopodium rubrum	19
Juncus bufonius	17
Polygonum amphibium	17
Polygonum arenastrum	17
Polygonum minus	17
Ranunculus trichophyllus	17
Rumex crispus	15
Rorippa amphibia	14
Alopecurus geniculatus	12
Poa annua	12
Myosotis scorpioides	12
Chamomilla suaveolens	12
Apium inundatum	10
Atriplex patula	10
Capsella bursa-pastoris	10
Veronica catenata	10
TOTAL LISTS	51
TOTAL SPECIES	67

9A Temporary Pond	%
Apium inundatum	50
Glyceria fluitans	49
Eleocharis palustris	40
Myosotis scorpioides	34
Veronica catenata	32
Ranunculus trichophyllus	28
Polygonum amphibium	28
Agrostis stolonifera	25
Rorippa amphibia	18
Galium palustre	16
Polygonum minus	16
Mentha aquatica	13
Potentilla anserina	13
Potamogeton natans	13
Rorippa palustris	13
Veronica scutellata	10
Alisma plantago-aquatica	10
TOTAL LISTS	68
TOTAL SPECIES	73

9B Eleocharis acicularis	%
Eleocharis acicularis	86
Limosella aquatica	57
Eleocharis palustris	57
Polygonum minus	57
Rorippa amphibia	43
Littorella uniflora	43
Agrostis stolonifera	29
Carex vesicaria	29
Callitriche stagnalis	29
Glyceria fluitans	29
Galium palustre	29
Fontinalis antipyretica	29
Juncus bufonius	29
Lythrum portula	29
Polygonum hydropiper	29
Ranunculus trichophyllus	29
Potentilla anserina	29
Rorippa islandica	29
TOTAL LISTS	7
TOTAL SPECIES	27

9C Marl Pond	%
Juncus bulbosus	45
Baldellia ranunculoides	41
Littorella uniflora	36
Eleocharis palustris	32
Mentha aquatica	32
Carex nigra	30
Scorpidium scorpioides	29
Juncus articulatus	26
Apium inundatum	26
Potamogeton gramineus	25
Ranunculus flammula	23
Samolus valerandi	19
Galium palustre	19
Eleocharis multicaulis	15
Potentilla anserina	15
Hydrocotyle vulgaris	15
Chara spp	14
Carex lepidocarpa	12
Polygonum amphibium	12
Potamogeton natans	12
Scirpus fluitans	12
Ranunculus repens	12
Potamogeton polygonifolius	10
Potamogeton coloratus	10
(Agrostis stolonifera	8)
TOTAL LISTS	73
TOTAL SPECIES	76

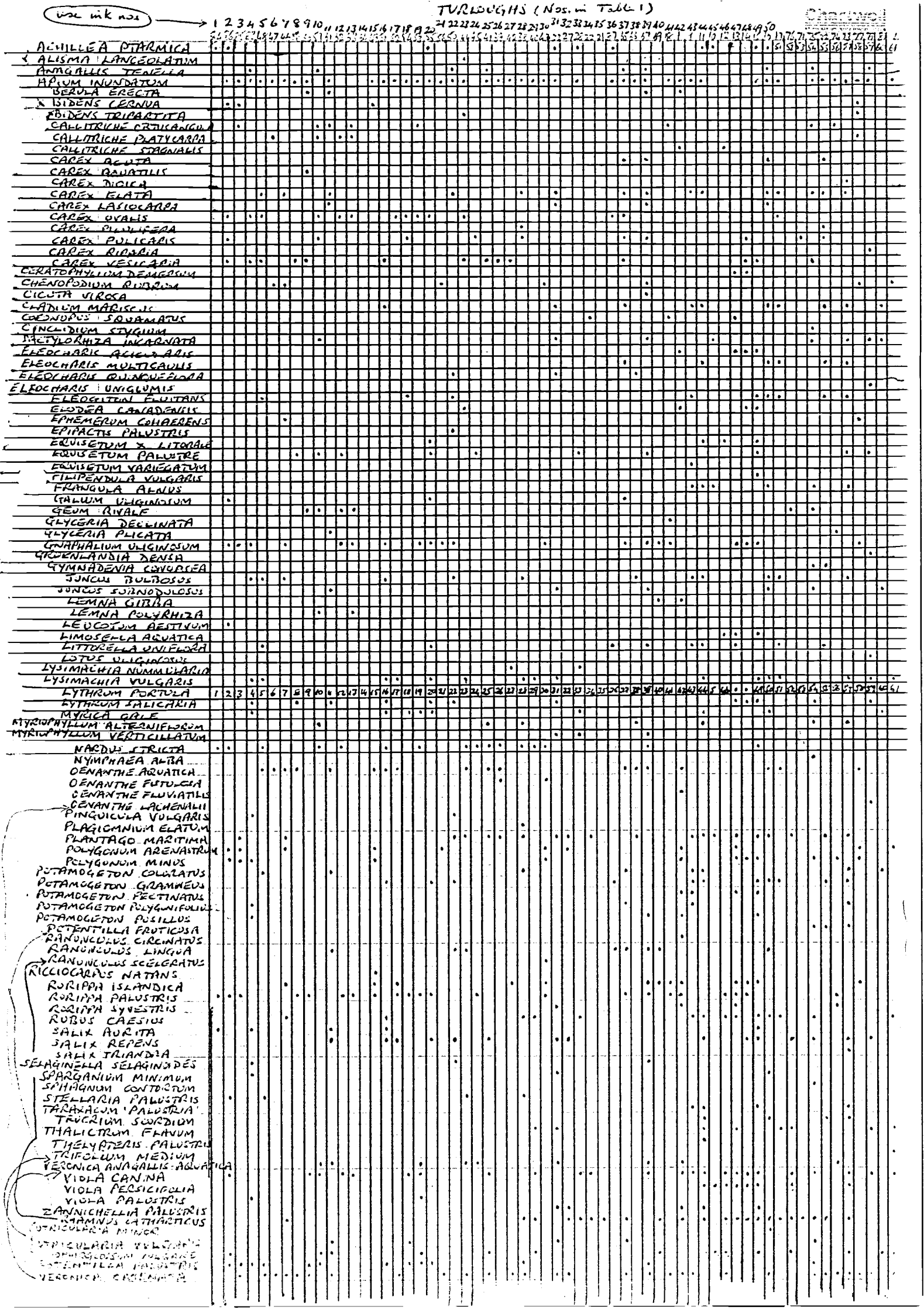
10A Oenanthe aquatica	%
Oenanthe aquatica	85
Sparganium emersum	52
Polygonum amphibium	44
Rorippa amphibia	41
Glyceria fluitans	33
Alisma plantago-aquatica	30
Ranunculus trichophyllus	30
Eleocharis palustris	30
Veronica catenata	19
Potamogeton natans	19
Galium palustre	19
Calliergon giganteum	19
Apium inundatum	19
Equisetum fluviatile	19
Nasturtium officinale	11
Hippuris vulgaris	11
Potamogeton crispus	11
Mentha aquatica	11
(Fontinalis antipyretica	7)
TOTAL LISTS	27
TOTAL SPECIES	52

10B Ditch	%
Apium nodiflorum	68
Nasturtium officinale	42
Glyceria fluitans	42
Myosotis scorpioides	32
Polygonum amphibium	21
Alisma plantago-aquatica	21
Veronica beccabunga	16
Sparganium erectum	16
Sparganium emersum	16
Ranunculus trichophyllus	16
Polygonum persicaria	16
Berula erecta	16
Alopecurus geniculatus	11
Apium inundatum	11
Bidens tripartita	11
Calliergon cuspidatum	11
Callitriche platycarpa	11
Eleocharis palustris	11
Epilobium palustre	11
Galium palustre	11
Hippuris vulgaris	11
Hydrocotyle vulgaris	11
Juncus bufonius	11
Phalaris arundinacea	11
Rorippa amphibia	11
Senecio aquaticus	11
Salix viminalis	11
Veronica anagallis-aquatica	11
TOTAL LISTS	19
TOTAL SPECIES	58

11A Reedbed	%
Scirpus lacustris	77
Phragmites australis	45
Menyanthes trifoliata	36
Equisetum fluviatile	32
Mentha aquatica	26
Potamogeton natans	26
Carex rostrata	19
Glyceria fluitans	16
Hippuris vulgaris	16
Hydrocotyle vulgaris	16
Oenanthe aquatica	16
Rorippa amphibia	16
Ranunculus lingua	16
Polygonum amphibium	16
Sparganium erectum	13
Lemna trisulca	13
Eleocharis palustris	13
Alisma plantago-aquatica	13
Calliergon giganteum	10
Cladium mariscus	10
Carex elata	10
Fontinalis antipyretica	10
Galium palustre	10
Iris pseudacorus	10
Drepanocladus revolvens	10
TOTAL LISTS	30
TOTAL SPECIES	64

11B Peaty Pond	%
Equisetum fluviatile	53
Menyanthes trifoliata	38
Alisma plantago-aquatica	33
Potamogeton natans	31
Sparganium emersum	29
Polygonum amphibium	27
Lemna minor	27
Carex rostrata	22
Sparganium erectum	22
Glyceria fluitans	18
Hippuris vulgaris	18
Veronica catenata	16
Lemna trisulca	13
Callitriche obtusangula	11
Oenanthe aquatica	11
Scirpus lacustris	11
TOTAL LISTS	45
TOTAL SPECIES	70

12 Open Water	%
Potamogeton berchtoldii	46
Potamogeton natans	43
Potamogeton crispus	38
Polygonum amphibium	19
Chara spp.	16
Eleocharis palustris	16
Lemna minor	16
Elodea canadensis	16
Glyceria fluitans	16
Myriophyllum spicatum	14
Alisma plantago-aquatica	11
Hippuris vulgaris	11
Potamogeton pectinatus	11
Sparganium emersum	11
TOTAL LISTS	37
TOTAL SPECIES	48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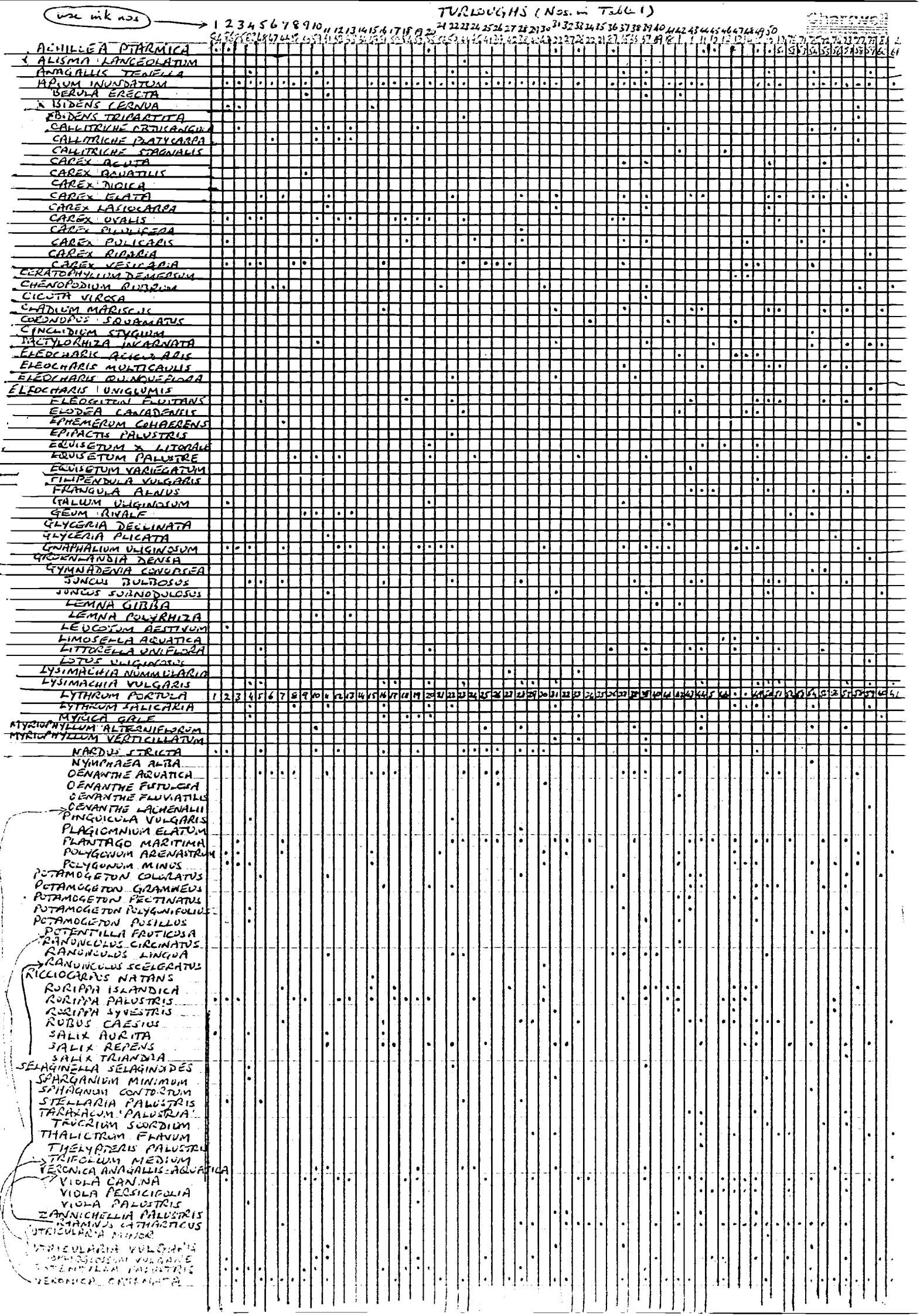
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UTRICULARIA VULGARIS
OXYCOCCUS PALUSTRIS
SCHEUCHZERIA PALUSTRIS
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UTRICULARIA MINOR
UTRICULARIA VULGARIS
[illegible]
[illegible]
VERONICA [illegible]

NEWTOWN / COOLE

Scale 1: 16250

KEY TO VEGETATION

2A	Lolium grassland	4D	Schoenus fen		Polygonum amphibium (grassy)		Oenanthe aquatica (10A)
2B	Poor grassland	5A	Dry weed		Tall sedge	10B	Ditch
2C	Limestone grassland	5B	P. reptans (sp. poor)		Polygonum amphibium		Reed bed (11A)
	Peat grassland (2D)		Sedge fen		Wet annuals (8B)		Peaty pond (11B)
3A	Tall herb		Carex flava	8C	Cladium fen		Open water (12)
3B	Sedge heath	6A	Dry Carex nigra		Temporary pond	2W	Dry woodland
3C	Flooded pavement	6B	Wet Carex nigra		Eleocharis acicularis		Rhamnus wood
4B	Pot. reptans (sp. rich)		Peaty Carex nigra	8G	Marl pond		Potentilla fruticosa / Frangula

	NAME	PHYSICAL DIVERSITY	NATURALNESS	CATCHMENT AREA	RECENT DRAINAGE	VEGETATION NO.	TYPES RARITY	RARE PLANTS	BIRDS WINTER	BIRDS SUMMER	SCORE (RANK)
1.	Turloughmore	4	5	5		6	1	–	–	1	22 (54=)
2.	Doocastle	2	3	3		9	6	6.5	2	2	33.5 (37=)
3.	Moylough	4	2	5	-2	11	7	1.5	–	–	28.5 (46)
4.	Killaturly L.	10	3	3		11	11	11.5	2	1	52.5 (13)
5.	Balla	6	3	3		11	7	7	2	2	41 (24)
6.	Slishmeen	4	2	3	-5	11	7	2	–	–	24 (49=)
7.	Ballyglass	4	1	3	-5	12	6	7	–	1	39 (28=)
8.	Corbally	2	2	1		5	2	1	1	1	14 (57=)
9.	Mullygollan	10	3	3		11	8	4	1	4	44 (19=)
10.	Castleplunket	6	3	5		9	3	2	3	2	33 (39)
11.	Brierfield	6	4	3		9	6	–	1	3	32 (40)
12.	Carrowreagh	4	2	5		8	3	–	1	1	24 (49=)
13.	Rathnalulleagh	2	2	3		10	7	2	–	–	26 (48)
14.	Newtown	2	2	3		4	1	–	–	–	12 (60)
15.	Attishane	2	1	3	-5	8	5	9	–	–	23 (51=)
16.	Coolcam	8	5	3		12	8	3	2	3	44 (19=)
17.	Croaghill	8	3	3		13	9	5	2	4	47 (17=)
18.	Ballinastack	6	4	3		8	3	2	–	1	27 (47)
19.	Boyounagh	6	1	3	-5	11	6	–	–	1	23 (51=)
20.	Glenamaddy	6	4	5		11	8	8.5	3	3	53 (12)
21.	Kilkerrin	2	1	3	-2	6	2	2	–	0	14 (57=)
22.	Levally L.	8	3	3		13	10	2	2	5	47 (16=)
23.	Carrowkeel	4	4	3		13	6	7	1	5	43 (22)
24.	Scardaun	6	2	3	-5	6	1	–	–	1	14 (57=)
25.	Kilglassan	4	2	3		15	8	1	–	2	35 (33)
26.	Caheravoostia	4	3	1		11	4	3.5	1	3	30.5 (41=)
27.	Greaghans	4	3	5		12	9	9	1	1	44 (19=)
28.	Skealoughan	6	4	3		15	10	2	1	4	45 (18)
29.	Ardkill	6	4	5		13	7	1.5	–	4	40.5 (25=)
30.	Rathbaun	4	2	3	-5	9	4	13.6	–	–	30 (41=)
31.	Shrule II	10	3	5		18	11	12	1	3	63 (8)
32.	Turlough O'Gall	6	4	5		12	10	2.5	1	–	40.5 (25=)
33.	Belclare	6	2	5	-5	10	6	6	3	1	34 (34=)
34.	Turlough Monaghan	4	2	3	-2	10	9	2	–	1	29 (44=)
35.	Fearagha	2	2	3	-2	4	2	–	–	–	11 (61)
36.	Fortwilliam	6	4	5		13	7	2	–	2	38 (30=)
37.	Ballinturly	10	5	5		16	9	9	3	2	59 (11)
38.	Lisduff	6	5	5		11	3	–	1	3	34 (34=)
39.	Lough Croan	6	3	5	-2	17	12	18	3	5	67 (5)
40.	Feacle	2	4	3		6	6	7.5	–	1	29.5 (43)
41.	Kiltullagh	2	3	5	-5	6	4	8.5	–	–	23.5 (51=)
42.	Rahasane	10	4	1		17	13	27.5	3	4	85 (2)
43.	Caranavoodaun	8	5	5		9	10	14	–	1	52 (14)
44.	Ballinderreen	12	5	5		14	11	21	2	2	72 (3)
45.	Kiltiernan	2	2	3	-2	10	8	8.5	1	1	33 (37=)
46.	Peterswell	8	4	1		10	7	9	–	–	39 (28=)
47.	Caherglassaun	6	4	1		12	10	31	1	1	66 (6)
48.	Garryland	6	4	1		11	11	18	–	–	51 (15)
49.	Newtown/Coole	14	5	1		20	18	35	3	4	100 (1)
50.	Lough Mannagh	12	3	3		17	11	12.5	–	2	60.5 (9)
51.	Termon Lough	4	4	3		13	11	5.5	–	2	42.5 (23)
52.	Turloughnagullaun	4	5	3		12	8	6	–	–	38 (30=)
53.	Turloughmore	4	3	5		6	4	–	–	–	22 (54)
54.	Carran	12	4	3		20	20	7	1	3	70 (4)
55.	Castle Lough	10	5	3		12	12	15	1	2	60 (10)
56.	Lough Aleenaun	4	2	3		9	9	7	–	–	34 (34=)
57.	Knockaunroe	10	4	5		13	10	17.5	1	3	63.5 (7)
58.	Lough Gash	4	4	3		5	6	12	2	4	40 (27)
59.	Loughmore	4	2	3	-2	7	3	11	–	1	29 (44=)
60.	Liskeenan	6	1	5	-5	7	4	–	–	2	20 (56)
61.	Loughans	4	3	3		10	5	10	1	2	38 (30=)

Table 5 Numerical Evaluation of Turloughs