CONSERVATION AND AMENITY
ADVISORY SERVICE

A REPORT ON AREAS OF SCIENTIFIC INTEREST IN COUNTY WATERFORD

R. Young
An Foras Forbartha
June, 1972

The National Institute for Physical Planning and Construction Research

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This Report is based on information in the files of the Conservation and Amenity Section, An Foras Forbartha; on published literature and on observations made in the field during the period March - May 1972. It is a provisional document, subject to further research.

Dr. A. Flegg, Geological Survey of Ireland, supplied details of geological sites included in this report and his help is gratefully acknowledged.

CONTENTS

SECTION A

PREFACE

In the present day, Ireland can still justifiably be called 'The Green Isle'. In comparison with most countries in the western world, a very high percentage of the country is still 'natural', unspoilt countryside, untouched by industry, urbanization and often, even by modern farming techniques.

It is unrealistic to think that this situation will continue indefinitely. If the national economy is to improve, many areas of our countryside must be taken over by industrial and urban development and traditional farming methods must be 'modernised'. These trends have already become manifest and can be expected to continue over the coming years.

Fortunately, it is now realised that unspoilt countryside is itself a valuable asset to the community. It is generally appreciated that in the peace and quiet and scenic beauty of such countryside, many people find relaxation and recreation - this is surely the basis of the Irish tourist industry. In addition to such amenity values however, many parts of the countryside are of scientific importance, either because of their research potential or their educational value.

The essence of conservation is planning, in which these intrinsic values of the countryside are weighed against the needs of agricultural improvement and industrial and urban expansion. Its aims are, firstly to ensure that as far as possible the areas of countryside that will be 'lost' to development are those of least value from the points of view of amenity and scientific interest, and secondly, to ensure that development does not pollute or in any way clash with the intrinsic values of the surrounding countryside beyond a degree that is absolutely essential. Thus development can proceed without unnecessary impoverishment of our rich heritage of beautiful and scientifically important areas.

The responsibility for conservation in Ireland lies largely with the County Councils in the preparation and implementation of County Development Plans

However, if County Development Plans are to be based on the principles of conservation outlined above, it is clearly essential that adequate data on areas of scientific interest should be supplied to the County Councils because, whilst such a characteristic of an area as scenic beauty is readily apparent to the discerning eye, the scientific values of a site are often hidden from all but the specialist.

It is the aim of the Conservation and Amenity Advisory Service, An Foras Forbartha, to provide this information in a series of reports, each of which will deal with the areas of scientific interest within a single county.

SECTION B

VULNERABILITY OF AREAS OF SCIENTIFIC INTEREST

Areas of scientific interest can be damaged in many ways. They can, for example, be completely and rapidly destroyed by scrub or tree clearance, by turf cutting or by arterial drainage, or they can suffer insidiously through pollution, fertilisation, grazing or overuse for recreations.

Of these various instances the first poses the greatest threat because of the rapidity with which it can occur. In the absence of a fine large enough to be a sure deterrent, co-operation to maintain the county's deciduous woodlands at all levels of landowner, forester and the general public must be actively sought. It may not be sufficient merely to put a Tree Preservation Order on an area which would lose its value immediately the trees are felled. The voluntary organisations have a role to play in this acting as observers throughout the county.

Turf cutting on a small, private scale presents little threat to the countries' boglands in comparison with the activities of Bord na Mona. A representative series of Irish bogs should certainly be left untouched by commercial exploitation.

Drainage schemes of all kinds can have serious effects on wetland sites. Marshes, fens and bogs may dry out, lake levels may fall and the dredging of rivers results in the steepening of their banks and an increased rate of water flow. All these changes can result in the disappearance of particular communities or species.

The effects of pollution are most often encountered in aquatic sites, which are particularly vulnerable because the incoming material cannot be localised. but is transported throughout the water body. Toxic chemicals can obviously

have disasterous effects on aquatic communities but equally serious effects can be produced by sewage if sufficient quantities pass into the water. Such influx of sewage causes the nutrient levels of lakes to rise with consequent effects on the aquatic communities and water quality. A sign of this rise in nutrient levels, known as eutrophication, is the production of algal scums or 'blooms' on the water surface in warm weather.

Several farming operations are potentially destructive, apart from straight-forward pollution by silage effluent or intensive livestock units. Excessive fertilization produces run-off of nutrients, especially nitrates and these are particularly bad for nutrient-poor ecosystems such as acid lakes and bogs. Introducing such run-off into any natural community will change the species composition.

Grazing has a similar effect. It can select out of the vegetation those species that are most resistant to constant cutting and/or those that are unpalatable, and therefore not grazed, and allow them to multiply at the expense of others. This reduces the diversity of the flora and often also its interest. Light grazing is seldom detrimental except that it prevents the natural colonisation of grassland by shrubs and trees, but as it is intensified such changes as those mentioned above occur and in extreme cases the vegetation may not be able to persist at all. Eskers and sand dunes are particularly vulnerable as their dry soils do not allow a fast recovery growth by grazed plants.

The last influence to be mentioned is recreation, the effects of which are most obvious today on sand dune systems. Heavy recreational use of dunes results in destruction of the vegetation which stabilises the dunes and serious erosion can result. The destructive effects of flower or plant collecting should perhaps also be mentioned. Opening up of areas with a rare noticeable plant may damage that species, but in general enough individuals escape notice so that it persists from year to year.

SECTION C

INTRODUCTION TO AREAS OF SCIENTIFIC INTEREST IN CO. WATERFORD

A study of the first Development Plan for County Waterford, 22 September, 1967, is extremely encouraging to the conservationist. It is quite clear that the Waterford County Council is well aware of the need to protect areas of general amenity, scenic beauty and historical or scientific interest. Few areas of scientific interest were actually scheduled for protection however, because of the paucity of information on such areas that was then available.

This report contains details of thirty-one areas of scientific importance within the county and it is hoped that it will enable the County Council to take any action necessary to preserve the scientific interest of these sites. Where areas are already known to be threatened and their preservation is considered to be justifiable, specific recommendations are made for their protection. An indication is also given as to the degree of urgency necessary if protective action is to be effective. As will be seen, only five areas have been assigned "A" priority and great urgency is required if these are to be effectively protected.

A definite statement of intent is really required with regard to areas of scientific interest. They should certainly be listed as such in the Development Plan: areas within which the first priority is to maintain or improve the scientific values. Many of the disagreements that have arisen in the past stemmed basically from a lack of knowledge. The developer did not know that his chosen site had any scientific interest and his imagination and self-assurance did not allow any graceful retreat from his stand. This could be largely avoided if the areas of scientific interest were widely publicised. Such firm action by the Council might elicit a response from the public in greater awareness of the environment. A developer would be inclined to work more closely with the planning authorities rather than against them. Where permission has to be refused for a certain development, it should be qualified by suggestion of an alternative course of action.

As a first step the landowners should, in almost all instances, be told of the importance of their land. They should be advised that their present form of land use is that most suited to the maintenance of such interest if this is so; if not, recommendations of slightly varying stocking densities, etc. should be passed on.

As developments occur and as scientific knowledge increases, the importance and priority of the areas will change. Continual reassessment is required to monitor such changes. If a particular site loses its value through pollution or physical disturbance, the others of its type will immediately become more important in the regional context. Likewise, if a new and particularly interesting organism is found in an unlisted site, one of the existing ones may be deleted after comparison. Priority for a site's protection may also vary as developments in its vicinity are proposed or begun. As the countryside becomes more intensively used for agriculture, housing, industry and recreation however, action will probably be needed to preserve all sites in their present condition.

SECTION D

RATING OF AREAS OF SCIENTIFIC IMPORTANCE

This is a measure of the relative importance of areas of scientific importance.

The importance of each area is indicated in terms of the following categories:

International Importance

1. Only area of its type in Europe.
2. One of the few such localities in Europe.
3. One of a natural series in Europe.
4. Recognised international importance.
5. Specialised educational importance.

National Importance

1. Only area of its type in Ireland.
2. One of a few such localities in Ireland.
3. One of a natural series in Ireland.
4. Recognised national importance.
5. General or specialised educational importance.

Regional Importance

1. Only area of its type in province.
2. One of a few localities in Ireland.
3. One of a natural series in region.
4. Fine example of its kind.
5. General or specialised educational importance.

Local Importance

1. Only area of its type in county.
2. One of a few localities in province.
3. Fine example of its kind.
4. General educational importance.

PRIORITY OF AREAS OF SCIENTIFIC INTEREST

This is a measure of the relative urgency necessary for protection of the areas of scientific importance.

Each site is given a priority rating of A, B or C.

The rating of any area is based on a combination of the following criteria:-

a) the importance of the area

b) the vulnerability of the area

c) the nature and imminence of any threats to the area.

Area	page no	Grid Ref.	Rating	Priority	Interest
Coumshingaun corrie and lake	15	S. 32, 11	National	A	Geomorphological: Geological: Botanical: Zoological. Probably Ireland's finest corrie. The acidic lake is suspected of holding char stocks and the high cliffs around it have an interesting flora.
Coast from Tramore to Stradbally	17	X.372,966 -S.577,006	National	C	Geological. Taken as a whole this section is probably the finest section of volcanics and associated rocks in Ireland.
Quarry near Dunhill	19	S.507,007	National	C	Geological. A small quarry face in which can be seen five beds of acid tuff, each grading from lapilli tuff at the base to fine tuff at the top.
Dungarvan harbour	21	X. 27, 91	National	A	Ornithological: Ecological: Botanical. An important wintering area for Brent Geese, for ducks and for waders.
Tramore	23	S. 61, 01	National	A	Ecological: Botanical: Ornithological. The back strand is an important wintering area for Brent geese, for ducks and for waders. Several rare plants occur on the sand dunes of the Burrow.

Area	page no	Grid Ref.	Rating	Priority	Interest
Woodlands in the Nire Valley	26	S.208,130 & S.247,140	National	A	Ecological: Botanical. A series of woodlands showing various stages in development towards the oak-dominated climax.
Kilsheelan Lake	31	S.268,231	National	C	Ecological: Zoological. The only lake in the country known to have breeding stocks of carp.
Danes Island	32	X.417,977	Regional	C	Geological. Bronze age copper mines.
Ardmore lead mine	33	X.199,773	Regional	C	Geological. An early Irish lead mine, probably dating from the 7th 9th century.
Bunmahon sand dunes	34	X.435,987	Regional	A	Ecological: Botanical. A small area of dunes, almost destroyed by sand and gravel extraction, on which grow an interesting flora with an abundance of several uncommon species.
Woods at Portlaw	36	S. 45, 15	Regional	C	Ecological. An area of fine, mature oakwood.
Woods near Lismore	39	R.995,003 & S.044,008	Regional	C	Ecological. Stands of birch and oak.

Area	page no.	Grid Ref.	Rating	Priority	Interest
Fennor Bog	41	S.531,015	Regional	C	Ecological: Botanical. An area with an interesting variety of plants and wetland communities.
Islandtarnsey fen	43	S.553,012	Regional	C	Ecological: Botanical. An example of the Phragmites fens peculiar to this part of Ireland.
Belle Lake	46	S.664,046	Regional	C	Ecological: Botanical. Lowland lake, probably rich, with a large area of reedswamp at the south end. One of the few substantial areas of freshwater in the south-east.
Carrickavantry reservoir	48	S.548,023	Regional	C	Botanical: Ecological. The west shore has an extraordinary assemblage of plants that are rare in County Waterford and the south-east.
Cliffs on Helvick Head	50	X. 31, 88	Regional	C	Ornithological. Important for nesting seabirds.
Cliffs at Dunmore East	51	S. 69, 00	Regional	B	Ornithological. A nesting area for Kittiwakes.
Sgilloge Loughs	52	S.296,114	Local	C	Botanical. A rich bryophyte flora.

Area	page no.	Grid Ref.	Rating	Priority	Interest
Coolfin marshes	53	S. 48, 14	Regional	C	Ornithological. The wintering area of the only remaining flock of Greylag geese in Munster.
Newtown Cove	54	X.568,993	Local	C	Botanical. A damp wooded gulley in which there are large numbers of plants of an alien annual, Limnanthes douglasii.
Ballyeelinan	56	X.212,807	Local	C	Ecological: Botanical. A small wooded valley running down to the sea. There is an old record of a very rare plant occurring in the valley.
Ballymacart	57	X.253,815	Local	C	Ecological. A small wooded valley very similar to Ballyeelinan.
Woods near Stradbally	58	X.35/6,97	Local	C	Ecological. Mixed woodlands dominated by oak and beech but containing some conifers.
Woods north of Youghal	60	Around X.085,825	Local	C	Ecological. Some fine stands of deciduous woodlands with very few conifers mixed in.
Woods near Glenpatrick Bridge	62	S.292,200	Local	C	Ecological. Two small areas of deciduous woodland in an area of conifer plantations.

Area	page no	Grid Ref.	Rating	Priority	Interest
River valley north of Annestown	64	S.500,000	Local	C	Ecological: Botanical. The flat vailey bottom has an interesting variety of plant communities.
Castlecraddock Bog	65	S.491,022	Local	C	Ecological. An area of marsh, fen and swamp.
Lissaviron bog	66	S.488,010	Local	C	Ecological. Very near to Castlecraddock bog but with different plant communities.
Kilbarry bog	67	S.589,103	Local	B	Ecological: Botanical. An area of fen, swamp and open water which, because of its proximity to Waterford, has great potential as an area for teaching field biology.
Ballinlough	68	S.448,035	Local	C	Ecological. A very attractive small shallow lake with interesting plant communities and almost certainly an abundance of animal life.

SECTION F

DETAILED REPORTS AND MAPS OF EACH OF THE AREAS OF SCIENTIFIC INTEREST

Each report is written under the following sub-headings:-

- Name of Area
- Acreage
- Grid Reference
- Scientific Interest
- Rating
- Priority
- Description of Area
- Evaluation
- Threats to the area
- Recommendations

In the descriptions the abundance of the species may be indicated according to the following scale:-

a	-	abundant
c	-	common
f	-	frequent
o	-	occasional
r	-	rare
l	-	locally (as a prefix)

Botanical nomenclature follows that of "Flora of the British Isles" Clapham, Tutin and Warburg. Second Edition, 1962.

Name of area	COUMSHINGAUN CORRIE AND LAKE
Acreage	c 605 acres
Grid reference	S. 32. 11
Scientific interest	Geomorphological : Geological : Botanical : Zoological
Rating	National importance
Priority	A

Description of Area

The area of interest, including the corrie itself and the complex of fine moraines below it, is shown on Map I.

The back wall of the east-facing corrie is exceptionally high, 1,326 feet above the level of the lake, the rock being Coumshingaun conglomerate capped by Comeragh sandstone. The lake is a good example of an acid high-level lake and is suspected of holding char stocks. The whole area is of botanical interest. The cliffs surrounding the corrie, particularly on the wetter north-facing side, have a rich bryophyte flora and in places are festooned with St. Patrick's cabbage (Saxifraga spathularis), a species rare so far east. (See Fig. I). The moraine complex, through which the lake drains, has an interesting acid heath flora dominated by fescue and bent grasses (Festuca spp. and Agrostis spp.) bilberry (Vaccinium myrtilus) heather (Calluna vulgaris) and furze (Ulex europaeus). By the stream there is a rich bryophyte flora. Another feature of the moraine area is the abundance of large boulders whose surfaces provide a substrate for many epilithic lichens and mosses and beneath and between which are many damp, shady crevices in which ferns and a variety of bryophytes flourish.

Evaluation

This is probably the finest corrie in Ireland, certainly the finest in the Comeraghs and, along with the moraine complex below it is an area of exceptional geomorphological interest. The geological, botanical and

zoological interests of the area contribute to it being rated as an area of undoubted national scientific importance.

The area is also very important as a tourist attraction and a teaching area.

Threats to the area

It has been proposed that the corrie should be the site of a pumped-storage, electricity generating scheme.

Recommendations

Development of the corrie as a pumped-storage site should only be allowed if it can be shown that the corrie is far and away the best site in the region for this purpose. Other corries in the Comeraghs should be thoroughly investigated as possible alternative sites. If the corrie must be developed then very strict control must be exercised over the development, in order to minimise interference with the scientific, educational and amenity values of the area.

In the event of the possible development becoming a reality it is recommended that a comprehensive series of conditions should be drawn up,aimed at controlling the development within acceptable limits. Such conditions might include - no unnecessary disturbance of moraines, no overhead pylons, invisible upper lake, hidden roads etc. The advice of the Geolcgical Survey and of the Conservation and Amenity Advisory Service, An Foras Forbartha, should be sought when drawing up these conditions.

Name of area	COAST FROM TRAMORE TO STRADBALLY
Grid reference	X 372, 966 S. 577, 006
Scientific interest	Geological
Rating	National importance
Priority	C

LISTED AS ECOLOGICAL IN ASI INDEX 1989

Description of area

The area of interest, shown on Map 2, is a very beautiful stretch of coastline, mainly of high, steep cliffs but broken by many small, unspoilt coves and beaches.

The rocks of this coastline are volcanic and intrusive, intermingled with sedimentary deposits. The stratigraphy is not always clear but there is an abundance of geological features - tuffs, lavas, pillow lavas, intrusive pillows, ashfalls, ignimbrites, volcanic vents and necks, a variety of dykes, etc.

Sites of particular interest occur at Newtown Cove, Garrarus Strand, Knockane Strand, Stage Cove East, Bunmahon Head and Ballydowane Bay. The detailed geology of these sites, with the exception of Newtown Cove, and the general geology of the whole coastline is described in the Excursion Guide to Coastal Area of County Waterford, Tramore to Strabally, prepared by Dr. Stillman, T.C.D. and Dr. Schiener, U.C.D. (See Appendix I).

Other publications dealing with the geology of this area are :-

Reed. F.R.C., 1899. The lower palaeozoic bedded rocks of Co. Waterford. Quarterly Journal of the Geological Society of London. Vol. 55, p. 718-772.

Reed. F.R.C., 1900. The igneous rocks of the coast of Co. Waterford. Quarterly Journal of the Geological Society of London. Vol. 56, p. 637-693.

Evaluation

Taken as a whole this stretch of coastline is almost certainly the finest section of volcanic and associated rocks in the country. It is regularly visited by University parties and is an area in which active geological research is being carried out.

The coastline also has great amenity value.

Threats to the area

Small areas could be damaged by building etc.

Large scale interference with the scientific values of this coastline is unlikely as the County Council is well aware of the amenity values of the area and many parts of it are listed in the County Development Plan, Sept. 22nd, 1967, as areas to be protected from undesirable development.

Recommendations

There should be careful control of development in this area, in order to preserve its great scientific interest and amenity value. Certainly adverse development should be prevented in the areas of particular interest mentioned above.

Additional protection could be given to this area by a Special Amenity Area Order under Section 42, Local Government (Planning and Development) Act, 1963. This Order could be drawn up in draft form by the Conservation and Amenity Advisory Service, An Foras Forbartha.

Name of area	QUARRY NEAR DUNHILL
Acreage	c 1 acre
Grid reference	S. 507, 007
Scientific interest	Geological
Rating	National importance
Priority	C

Description of area

The area of interest, a very small disused quarry with interesting bedded tuffs visible in the back wall, is shown on Map 3.

Five beds of acid tuff can be seen, each grading from coarse lapilli tuff at the base to fine tuff at the top. There are also blocks and bombs of pumice embedded in the upper parts of the beds with impaction structures beneath them. The texture of the tuffs and the form of shards and pumice fragments are excellently preserved.

A detailed account of the geology of the quarry can be found in -

Stillman. C.J. Ordovician ash-fall tuffs from Co. Waterford, Scientific Proceedings of the Royal Dublin Society. A. Vol. 4. No. 7., p 89-101

Evaluation

The quarry is significant in the interpretation of the Ordovician volcanics of Ireland and Britain.

Threats to the area

Further quarrying would destroy the exposures but this appears to be an unlikely development.

The main threat to the exposures is probably from geologists as the hammering of fragments from the face would quickly destroy its value.

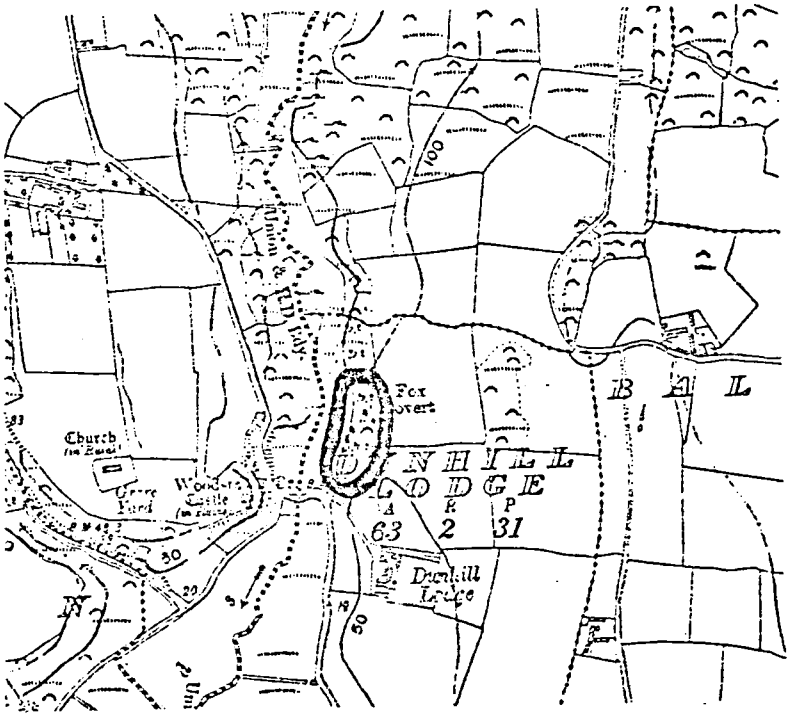
Recommendation

Any development in this small area should be prevented.

A small inconspicuous notice could be erected alongside the tuff exposures, explaining their significance and the need to refrain from hammering at the face.

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 3

Scale: 6 Inches to 1 Mile



Name of area	DUNGARVAN HARBOUR
Acreage	c 3200 acres
Grid reference	X 27, 91
Scientific interest	Ornithological : Ecological : Botanical
Rating	National importance
Priority	A

Description of area

The area of interest is shown on Map 4. It includes large areas of intertidal mud and sand and the Cunnigar sand spit.

The intertidal areas have little vegetation on them except for two large beds of eel grasses (Zostera spp.), one west of the Cunnigar spit and the other on Whitehouse Bank. Recently however, clumps of cord-grass (Spartina townsendii) have appeared on the shore close to the main Dungarvan-Youghal road just south of the town. They may be recognised as more or less circular patches of a very stiff grass. These areas of mud and sand are an important wintering area for ducks, waders and Brent geese, the latter feeding exclusively on the Zostera beds.

The Cunnigar spit is interesting ecologically and botanically. It may be roughly divided into four distinct areas - shingle bank, saltmarsh, unstable dunes and dune grassland. Uncommon species noted on the spit were :-

Juncus acutus	(sharp rush)	(See Fig. 2)
Myosotis ramosissima	(early forget-me-not)	(See Fig. 3)

Evaluation

This is the most important area for bird life in Co. Waterford and part of it has been listed as a potential National Wildfowl Refuge by the Irish Wildbird Conservancy.

The ecological and botanical interest of the area contribute to it being rated as an area of national importance.

Threats to the area

Land reclamation or other development within the area would obviously be deleterious to its ornithological interest.

Another serious and more imminent threat exists however, that of the spread of cord-grass (Spartina townsendii). Spartina can spread very quickly and given suitable conditions could colonise a large proportion of the harbour in as little as ten years. Dense stands of this grass create conditions unsuitable for bird populations and thus the spread of the grass would be a serious blow to the ornithological interest of the area.

The spread of the grass would also be deleterious to the scenic beauty of the area, seriously affecting some of the views referred to on p.22 and p. 23 of the County Development Plan, Sept. 22nd, 1967.

Recommendations

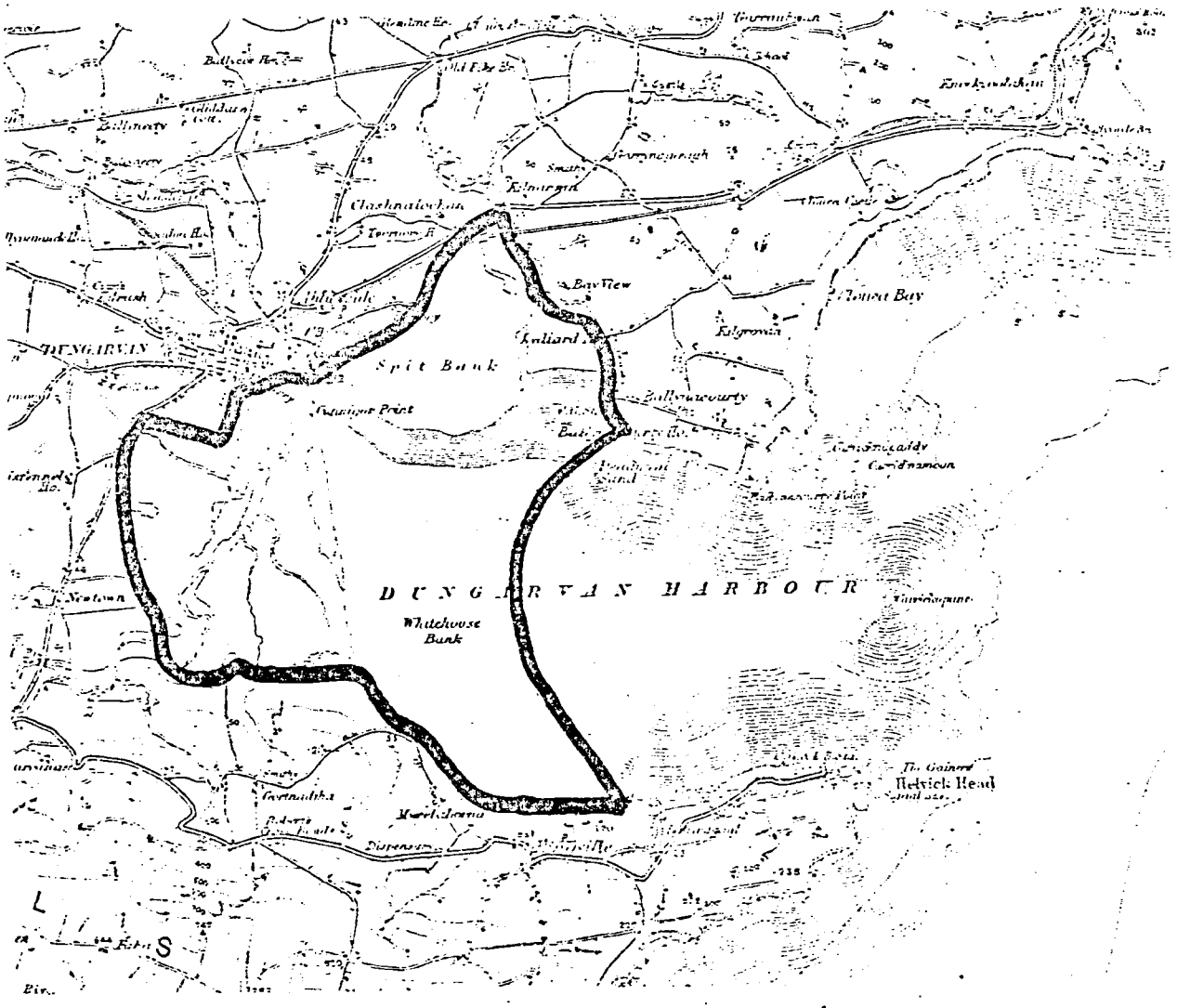
Land reclamation or other development within the area should be prevented.

Immediate steps should be taken to erradicate Spartina in the area. A combination of digging out and treatment with weedkiller would probably be most effective. Detailed recommendations could be made by the Conservation and Amenity Advisory Service, An Foras Forbartha.

The intention of the County Council to safeguard the ornithological interest of the area has in fact already been stated (p. 24 of the County Development Plan, Sept. 22nd, 1967).

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 4

Scale: 1 Inch to 1 Mile



Name of area	TRAMORE
Acreage	c 1675 acres
Grid reference	S. 61, 01
Scientific interest	Ecological : Botanical : Ornithological
Rating	National importance
Priority	A

Description of area

The area of interest is shown on Map 5.

The southern boundary of the area is formed by a well-developed spit, which has an area of high, unstable dunes on its eastern half, the Rabbit Warren Hills, and dune grassland and shingle bank vegetation, with salt marsh on its northside, nearer to the town.

North of the spit is a large area of intertidal mud and sand. The western part of this area was at one time reclaimed land lying behind an embankment but nowadays the embankment is broken through and the sea once again floods the land at high tides. A similar embankment protects land to the north of the area.

The spit has long been known as an area with rare and interesting plants. Praeger in 'The Botanist in Ireland' listed :-

Asparagus officinalis	(asparagus)	(See Fig. 4)
Brachypodium pinnatum	(tor grass)	(See Fig. 5)
Cuscuta epithymum	(dodder)	(See Fig. 6)

None of these were noted when the area was visited in May 1972. The spit certainly has an interesting variety of plant communities however and, in addition, an abundance of snails and insects. Beetles were

particularly conspicuous, especially a species of Timarcha (bloody-nosed beetles) of which dozens of adults and very large numbers of larvae were noted.

The intertidal areas are an important wintering area for ducks, waders and brent geese, which feed on the Back Strand.

It is noticeable that there are many clumps of cord-grass (Spartina townsendii) around the margins of the Back Strand, presumably originating from the reflooded area west of the embankment, which is dominated by a Spartina sward.

Evaluation

The Back Strand is a category 'A' wintering area for ducks, waders and Brent geese. This, together with the great ecological and botanical interest of the area results in this area being of national importance.

Threats to the area

Land reclamation or other development in the Back Strand area would be deleterious to the ornithological interest of the area and, as at Dungarvan, the potential spread of Spartina also represents a serious and imminent threat.

Parts of the spit, particularly the Rabbit Warren Hills, are threatened by erosion. This is the result of recreational pressure in the area, as excessive trampling leads to destruction of the vegetation along paths etc. and the blowing away of exposed sand.

Recommendations

Land reclamation or other development in the Back Strand area should be prevented.

Immediate steps should be taken to eliminate Spartina from the Back Strand.

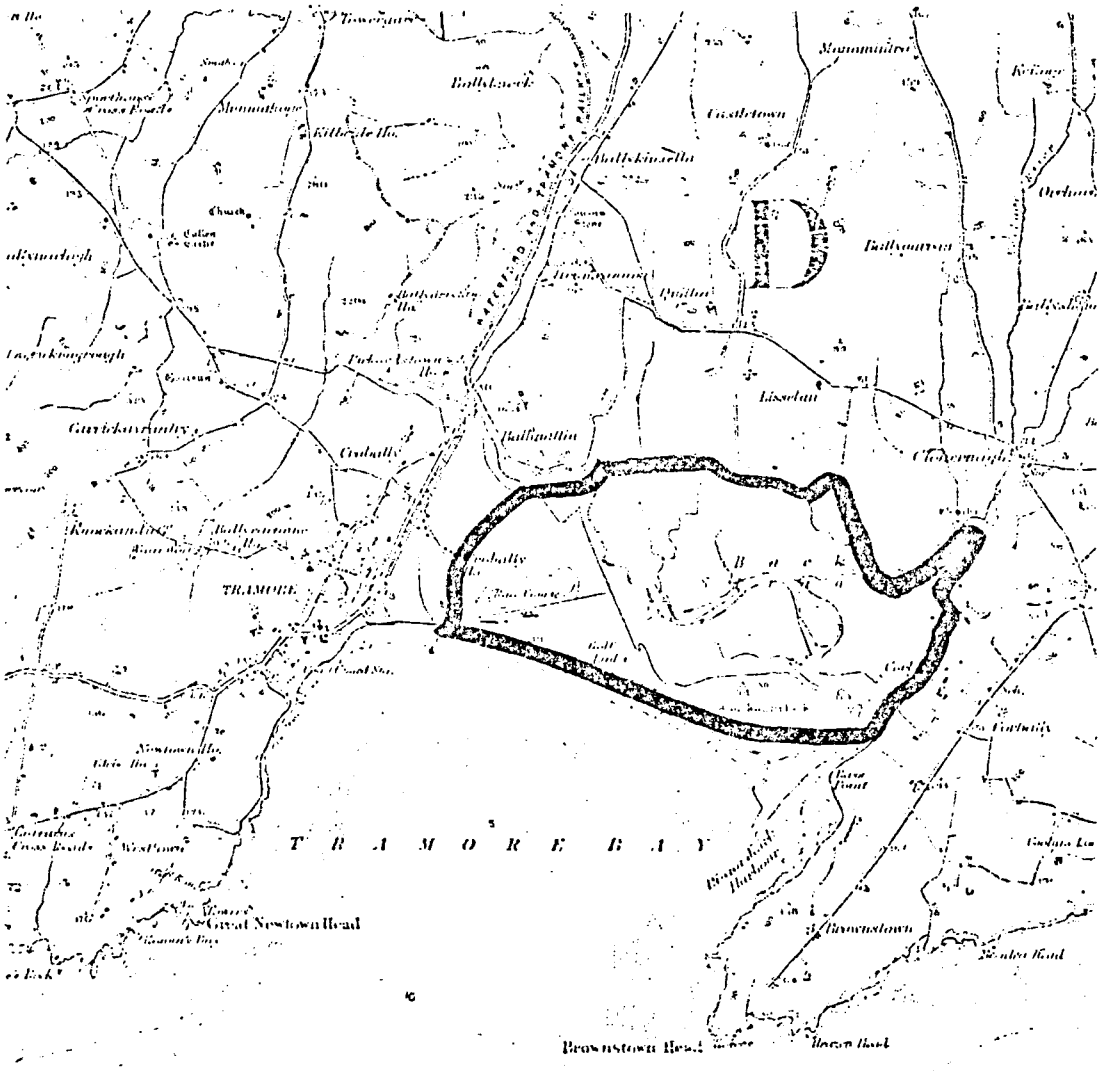
Immediate consideration should be given to the problem of erosion on Tramore Burrow, particularly in the Rabbit Warren Hills. The erosion of such dunes can be checked by a combination of replanting, brushwood fence erection and temporary exclusion of the public from small, selected areas. If nothing is done to check the erosion in its initial stages the problem will become worse and worse and the amenity value of the area will decrease rapidly.

The Conservation and Amenity Advisory Service, An Foras Forbartha, could advise on the exact procedures to be adopted for eradication of the Spartina and stabilisation of the dunes.

The intention of the County Council to safeguard the ornithological interest of the Back Strand has already been stated (p. 24, County Development Plan, Sept. 22nd, 1967).

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 5

Scale: 1 Inch to 1 Mile



Name of area	WOODLANDS IN THE NIRE VALLEY
Acreage	c 260 acres
Grid reference	S. 208, 130 and S. 247, 140
Scientific interest	Ecological : Botanical
Rating	National importance
Priority	A

Description of area

The areas of interest are shown on Map 6. They are mainly areas of deciduous woodland but some areas of rough land with furze (Ulex europaeus) and birch (Betula spp.) scrub are included.

A comparison of the distribution of deciduous woodlands shown on the Ordnance Survey 6" to 1 mile maps, Sheets 5 and 6 (Revised 1923) with the present situation shows that there have been marked changes within the valley over the last 50 years. This is the result of two factors :-

a) There has been extensive forestry planting. Coniferous woodlands now occupy many acres that were previously bog and heath and have also replaced the two large, formerly deciduous woodlands, Lacka Wood and Turraphuca Wood.

b) Many areas that were rough heath land in 1923 have since been invaded by birch and are now at various stages of development towards climax oakwood.

Another feature of the deciduous woodland areas, not obvious from the above comparison, is that some areas shown as deciduous woodland in 1923 have since been felled but have been reinvaded by birch and oak and thus a secondary succession towards climax oakwood is occurring.

The great ecological interest of these areas lies in the fact that here can be found areas of mature climax oakwood and many stages in the succession towards such a climax, both from open heath and from felled oakwood.

A typical patch of mature oakwood, marked ★ on Map 6, has the following structure :-

high canopy	-	Quercus spp.	(oak)	a
		Betula spp.	(birch)	f
low canopy	-	Ilex aquifolium	(holly)	f
		Corylus avellana	(hazel)	r
		Sorbus aucuparia	(rowan)	r
field layer	-	Vaccinium myrtilus	(bilberry)	a
		Luzula sylvatica	(great woodrush)	c
ground zone	-	a rich bryophyte flora in which the following mosses were conspicuous:-		

Dicranum majus
Dicranum scoparium
Plagiothecium undulatum
Polytrichum formosum
Rhytidiadelphus loreus
Rhytidiadelphus triquetrus
Sphagnum spp.
Thuidium tamariscinum

There was also a rich bryophyte flora on the tree trunks with the liverwort Frullania tamarisci and the following mosses all conspicuous :-

Dicranum scoparium
Isothecium myosuroides
Mnium hornum
Thuidium tamariscinum
Ulota crispa

In developing woodlands, in areas shown as rough land on Map 6 or in areas of secondary woodland, birch is much common and a typical canopy structure is:-

Betula spp.	(birch)	c
Sorbus aucuparia	(rowan)	f
Corylus avellana	(hazel)	o
Ilex aquifolium	(holly)	o
Quercus spp.	(oak)	o

There are also differences in the field layer and ground zone flora.

Along the roadside boundaries of these woodlands (and also along the riverbank) are conspicuous yellow green tussocks of the Irish Spurge (Euphorbia hyberna), growing here at the extreme eastern limits of its range. (See Fig. 7).

Evaluation

The great ecological interest of these areas of deciduous scrub and woodland, in which stages in both primary and secondary successions towards climax oakwood can be seen, results in their being of national importance.

The occurrence of Euphorbia hyberna on their margins contributes to this high rating.

Apart from its scientific interest the Nire Valley is an area of great scenic beauty, which has become very popular with tourists in recent years.

The deciduous woodlands of the valley are an important feature of the scenery, providing as they do subtle variations of colour and 'texture' within their boundaries and also contrast with surrounding farmland and coniferous plantations. In short, they provide variety in the scenery.

Threats to the area

The most common threat to deciduous woodlands is clearance. Here in the Nire Valley clearance of deciduous woodland or scrub might be carried out for either of two reasons :-

a) In order to provide additional farmland. This is being done in the area marked  on Map 6, where scrub is being bulldozed away.

b) In order to provide additional space for forestry plantations. Another threat from forestry could be underplanting of deciduous woodlands with conifers.

Further development of forestry within this valley must also be a matter of concern from the amenity and tourism viewpoint. It must immediately be said that hitherto the conifer planting has not been on the basis of 'block monoculture' and the mixing together of larch and evergreen conifers and the preservation of small patches of deciduous trees has produced woodlands that are scenically attractive when viewed from elsewhere in the valley. The main threat of forestry to the amenity value of the valley would seem to be that, where planting occurs along the roadsides, the developing trees might cut off pleasant views of the distant countryside. This threat is already evident in some parts of the valley.

Recommendations

In view of the great amenity value of this valley it is recommended that the

whole Nire catchment be declared an Area of Special Amenity, under Section 42, Local Government (Planning and Development) Act, 1963. Such an order however would have no effect in controlling forestry planting or scrub or woodland clearance for agricultural purposes, the two most likely causes of change within the valley. (See Section 4, Subsection (1) (a) Local Government (Planning and Development) Act, 1963.

It is therefore also recommended that :-

(a) The cooperation of the Department of Lands, Forestry Division, should be sought in maintaining the scenic beauty of this valley.

(b) The deciduous woodlands, important from both the amenity and scientific viewpoints, should be protected by a Tree Preservation Order under Section 45, Local Government (Planning and Development) Act, 1963.

Both the Special Amenity Area Order and the Tree Preservation Order could be drawn up in draft form by the Conservation and Amenity Advisory Service, An Foras Forbartha.

Name of area	KILSHEELAN LAKE
Acreage	c 13 acres
Grid reference	S. 268, 231
Scientific interest	Ecological : Zoological
Rating	National Importance
Priority	C

Description of area

The area of interest, a small lake surrounded by a fringe of trees, is shown on Map 7.

The lake is of interest because it is the only lake in the country known to hold breeding stocks of carp. This is indicative of exceptionally high summer temperatures and this is probably also reflected in its invertebrate populations.

Botanically, the lake appears uninteresting, with little emergent or floating vegetation. The nature and extent of any submerged vegetation could not be assessed however, owing to the extremely muddy water.

Several waterside birds were seen on arrival and the area may have some ornithological interest. Three herons, three waterhens and a pair of coot were noted.

Evaluation

The lake is of national importance purely because it is the only lake in the country known to hold breeding stocks of carp.

Threats to the area

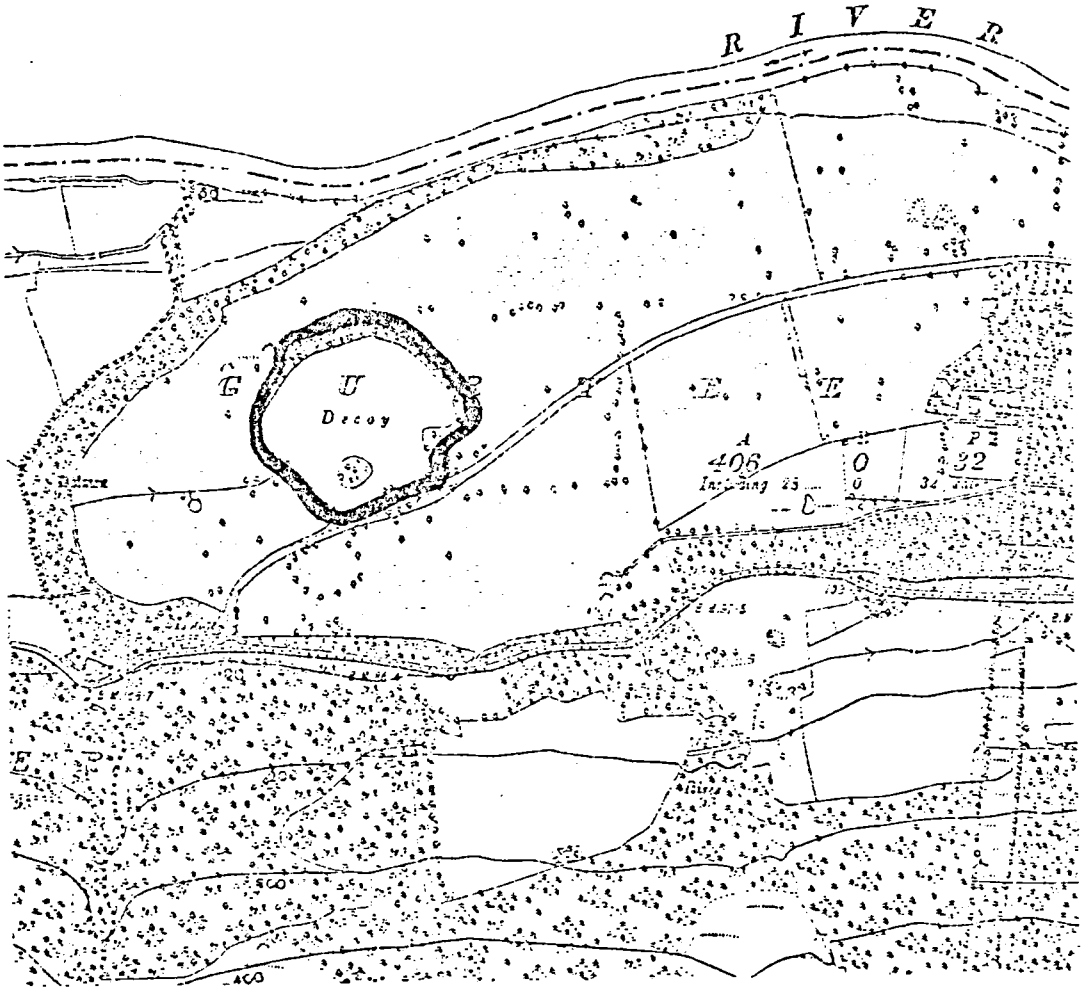
None known of

Recommendations

Any development affecting the lake should be prevented.

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 7

Scale: 6 Inches to 1 Mile



Name of area	DANES ISLAND
Acreage	c 5 acres
Grid reference	X. 417, 977
Scientific interest	Geological
Rating	Regional importance
Priority	C

Description of area

The area of interest is shown on Map 8.

In the rock of the mainland cliffs and of Danes Island itself are a number (c 12) of bronze age copper mines. Typically, these consist of short horizontal tunnels or addits.

The isthmus connecting Danes Island to the mainland has eroded to a sharp edge and it is difficult to descend to some of the mines.

Evaluation

The concentration of these mines within the area results in this site being of regional importance.

Threats to the area

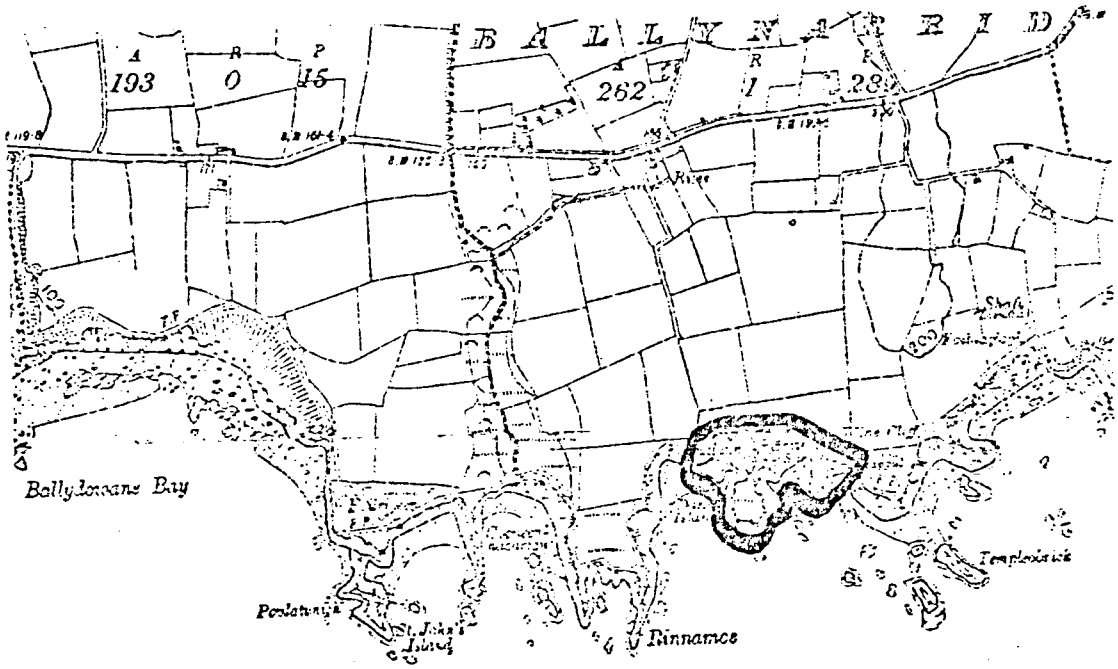
None known of.

Recommendation

Development in this area should be prevented.

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 8

Scale: 6 Inches to 1 Mile



Name of area	ARDMORE LEAD MINE
Acreage	c 1 acre
Grid reference	X. 199, 773
Scientific interest	Geological
Rating	Regional importance
Priority	C

Description of area

Within the area outlined on Map 9 is a single addit with it's opening on the cliff-face.

The addit, three or four feet in diameter, is at first straight, running 10 or 15 metres or so in an easterly direction, before bending to the right. It was not explored.

Evaluation

The mine represents an early attempt at mining lead in Ireland, probably dating from the 7th, 8th or 9th century, and is of regional importance.

Threats to the area

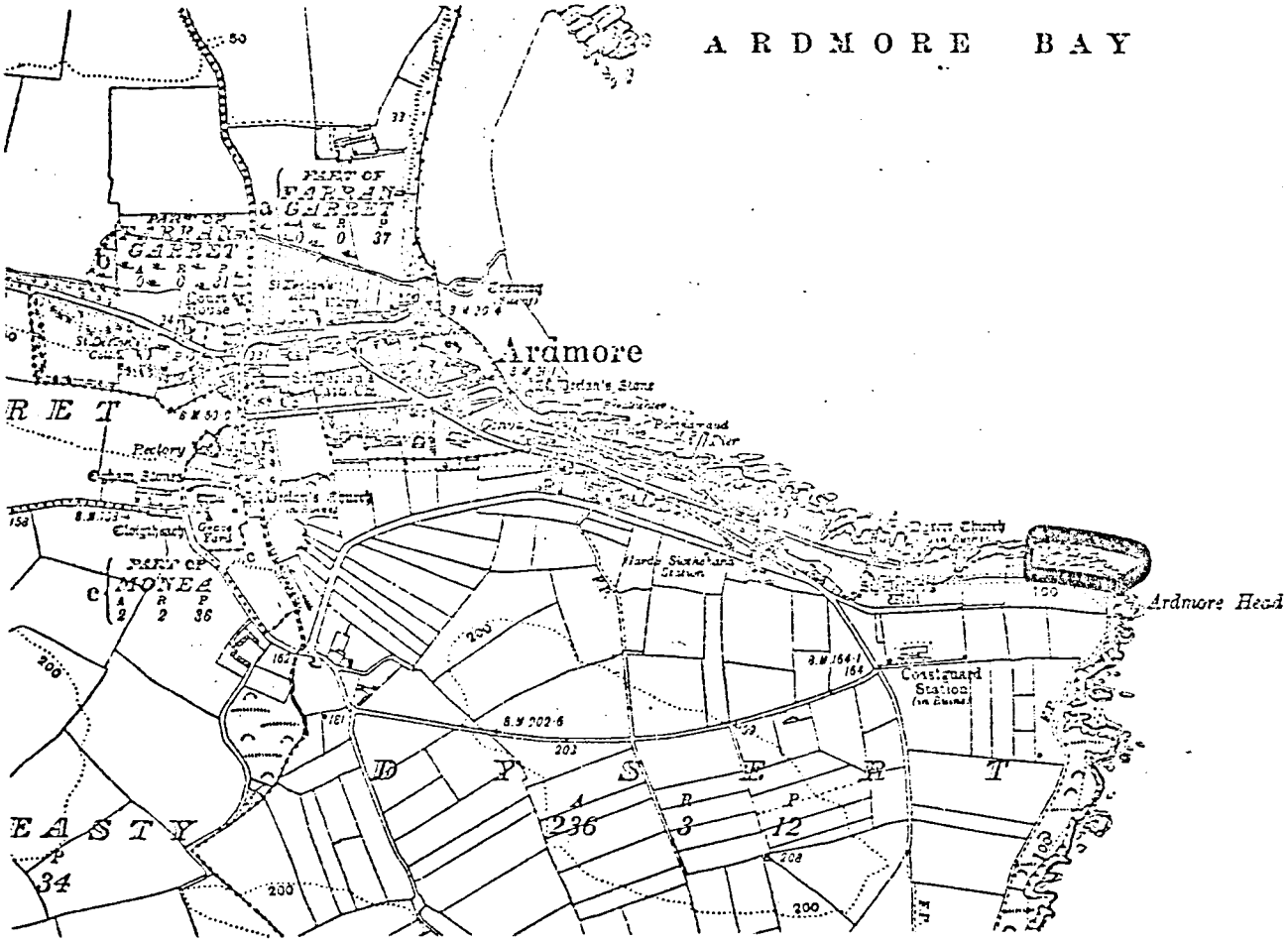
None known of.

Recommendation

Development in this area should be prevented.

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 9

Scale: 6 Inches to 1 Mile



Name of area	BUNMAHON SAND DUNES
Acreage	c 30 acres
Grid reference	X. 435, 987
Scientific interest	Ecological : Botanical
Rating	Regional importance
Priority	A

Description of area

The area of interest is shown on Map 10.

The sand dunes have been removed from most of this area by commercial sand and gravel extraction. Some dunes still remain along the southern boundary of the area however, though a part of these has been 'scalped' by bulldozing away the surface soil and vegetation to expose the dark sand beneath.

When the area was visited in May 1972 there was no evidence of recent work having been done and it may well be that the extraction of sand and gravel has ceased. It does appear however that there has been some recent dumping of builders' rubbie by the track leading from the road into the working area.

Both the remaining dunes and the old 'worked-out' areas are of ecological and botanical interest. Rare or uncommon species noted in the latter areas were :-

Lamium amplexicaule	(hen bit)	(See Fig. 8)
Lupinus arboreus	(tree lupin)	(See Fig. 9)
Lycium sp.	(Duke of Argyll's tea plant)	(See Fig. 10)
Trifolium medium	(zig zag clover)	(See Fig. 11)

The dunes hold an interesting collection of not particularly rare but nonetheless uncommon species, including very large numbers of Autumn lady's tresses (Spiranthes spiralis) (See Fig. 12).

Evaluation

The area is of regional scientific importance because of the interesting collection of plants growing in it and the variety of ecological conditions produced by the sand and gravel extraction.

Threats to the area

Further sand and gravel extraction would soon destroy the remaining dunes and seriously lower the scientific value of the area.
Dumping of refuse in the area also constitutes a threat.

Recommendations

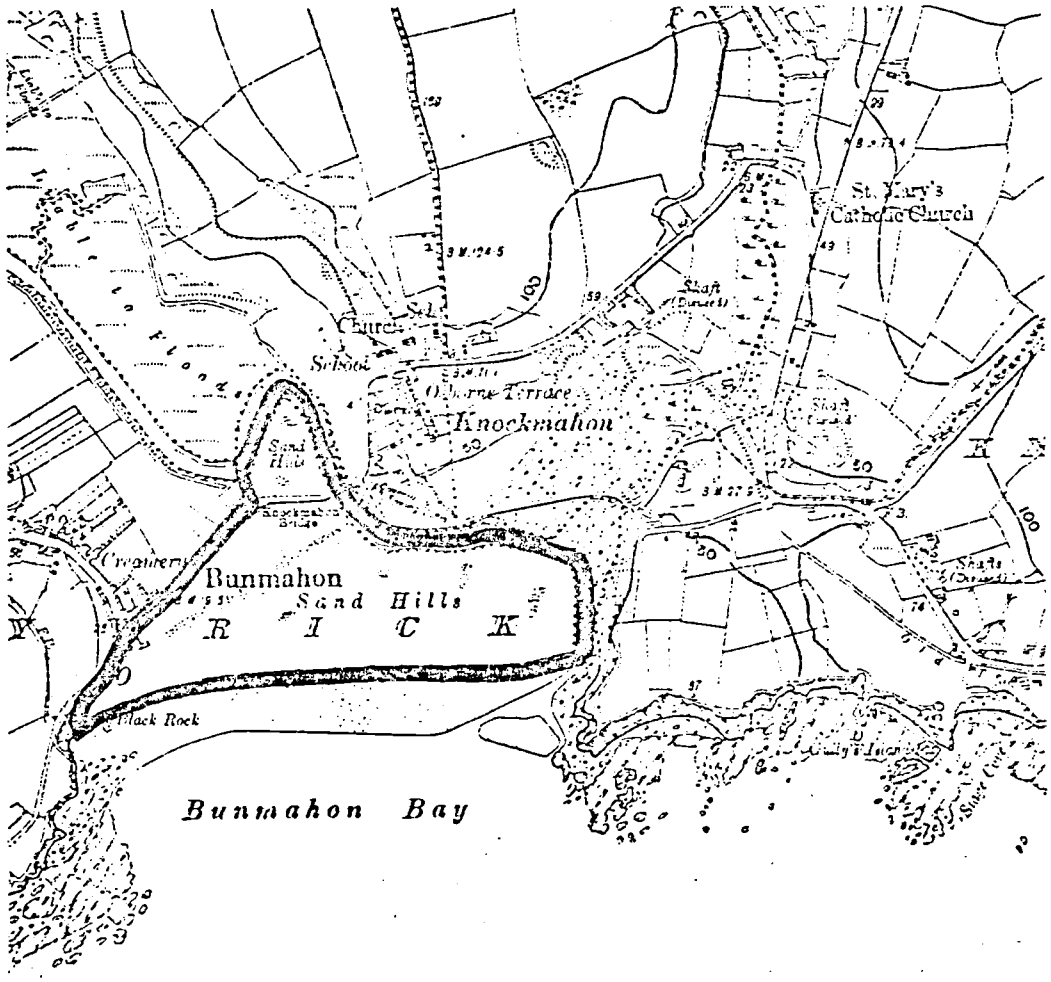
Further extraction of sand and gravel from the area should be prevented.

Dumping within the area should be prevented.

From the purely scientific viewpoint the area would be of greatest interest if it were left untouched after cessation of sand and gravel extraction, hence preserving the wide range of habitats existing at present. However, it is appreciated that the old 'worked-out' areas are scenically unattractive and that the needs of amenity might require that they be landscaped. If this is done, it is recommended that the small part of this area north of the T 63 road be preserved in its present condition.

MAP SHOWING AREA OF SCIENTIFIC INTEREST —10

Scale: 6 Inches to 1 Mile



Name of area	WOODS AT PORTLAW
Acreage	c 375 acres
Grid reference	S. 45, 15
Scientific interest	Ecological
Rating	Regional importance
Priority	C

Description of area

The area of interest is shown on Map 11.

Most of this area is fine, mature oak woodland. One area examined, probably fairly typical, had the following structure.

high canopy	-	Quercus spp.	(oak)	c
low canopy	-	Ilex aquifolium	(holly)	c
		Rhododendron ponticum	(rhododendron)	lc
		Quercus spp.	(oak)	f
		Abies sp.	(fir)	o
		Fagus sylvatica	(beech)	o
		Sorbus aucuparia	(rowan)	o
Herbs	-	Luzula sylvatica	(great woodrush)	c
		Vaccinium myrtilus	(bilberry)	c
		Lonicera periclymenum	(honeysuckle)	f
		Blechnum spicant	(hard fern)	o
		Calluna vulgaris	(heather)	o
		Hedera helix	(ivy)	o
		Oxalis acetosella	(wood sorrel)	o
		Pteridium aquilinum	(bracken)	o
		Rubus fruticosus	(bramble)	o

There was also an abundance of bryophytes on the ground and the lower trunks of the trees.

An interesting feature of this area of woodland was the fact that the oak appears to be regenerating freely - seedlings, saplings and regenerating stumps were all frequently noted. This may be indicative of a low grazing pressure, a possibility also indicated by the lush growth of the herbs, Vaccinium for example reaching a height of 5 feet.

A less pleasing feature is the invasion of the alien shrub Rhododendron ponticum which can radically change oakwood communities by virtue of the dense shade it casts.

Elsewhere in the woods a wet area was noted dominated by large willows (Salix sp.). Here there was no low canopy, but a dense field layer of bramble (Rubus fruticosus) with occasional patches of ivy (Hedera helix). The ivy was more conspicuous growing up the tree trunks, which also had a dense cover of lichens, including Usnea sp., Parmelia caperata, Evernia sp. and several crustose species.

The road through the area is lined by high, unbroken stone walls making entry into the woods very difficult.

Evaluation

The woods are of regional importance as an example of mature oakwood, with typical associated species, in which regeneration is occurring.

These woodlands also have treat scenic value, forming an extremely attractive backdrop to the town of Portlaw.

Threats to the Area

Clearance is an obvious threat. The spread of Rhododendron through the woods would reduce their scientific value.

Recommendation

The trees could be protected by a Tree Preservation Order, under Section 45, Local Government (Planning and Development) Act, 1963, but it would probably be better to seek the co-operation of the landowner in maintaining this area as deciduous woodland.

Name of area	WOODS NEAR LISMORE
Acreage	c 600 acres
Grid reference	R. 995, 003 and S. 044, 008
Scientific interest	Ecological
Rating	Regional importance
Priority	C

Description of area

There are large areas of woodland in the Blackwater valley around Cappoquin and Lismore. Many of them are mixed woodlands, with many conifers amongst the deciduous trees, and others are owned by the Department of Lands, Forestry Division, and presumably will ultimately be replaced by conifer plantations. The areas of scientific interest shown on Map 12 are areas of almost exclusively deciduous woodland not immediately threatened by forestry. Within these areas are some fine stands of mature oak woodland such as that marked ★ on Map 12. This has the following structure:-

high canopy	Quercus spp.	(oak)	c
low canopy	Corylus avellana	(hazel)	f
	Ilex aquifolium	(holly)	f
	Hedera helix	(ivy)	f (epiphytic on tree trunks
herbs	Luzula sylvatica	(great woodrush)	a

Elsewhere, particularly in the Glenmore Valley, birch is locally dominant in the woodlands.

Evaluation

The areas are of regional importance as examples of well-developed birch and oak woodlands with typical associated species.

Threats to the area

Clearance represents the only obvious threat although some parts are being invaded by rhododendron (Rhododendron ponticum) and cherry laurel (Prunus laurocerasus) which could reduce their scientific value.

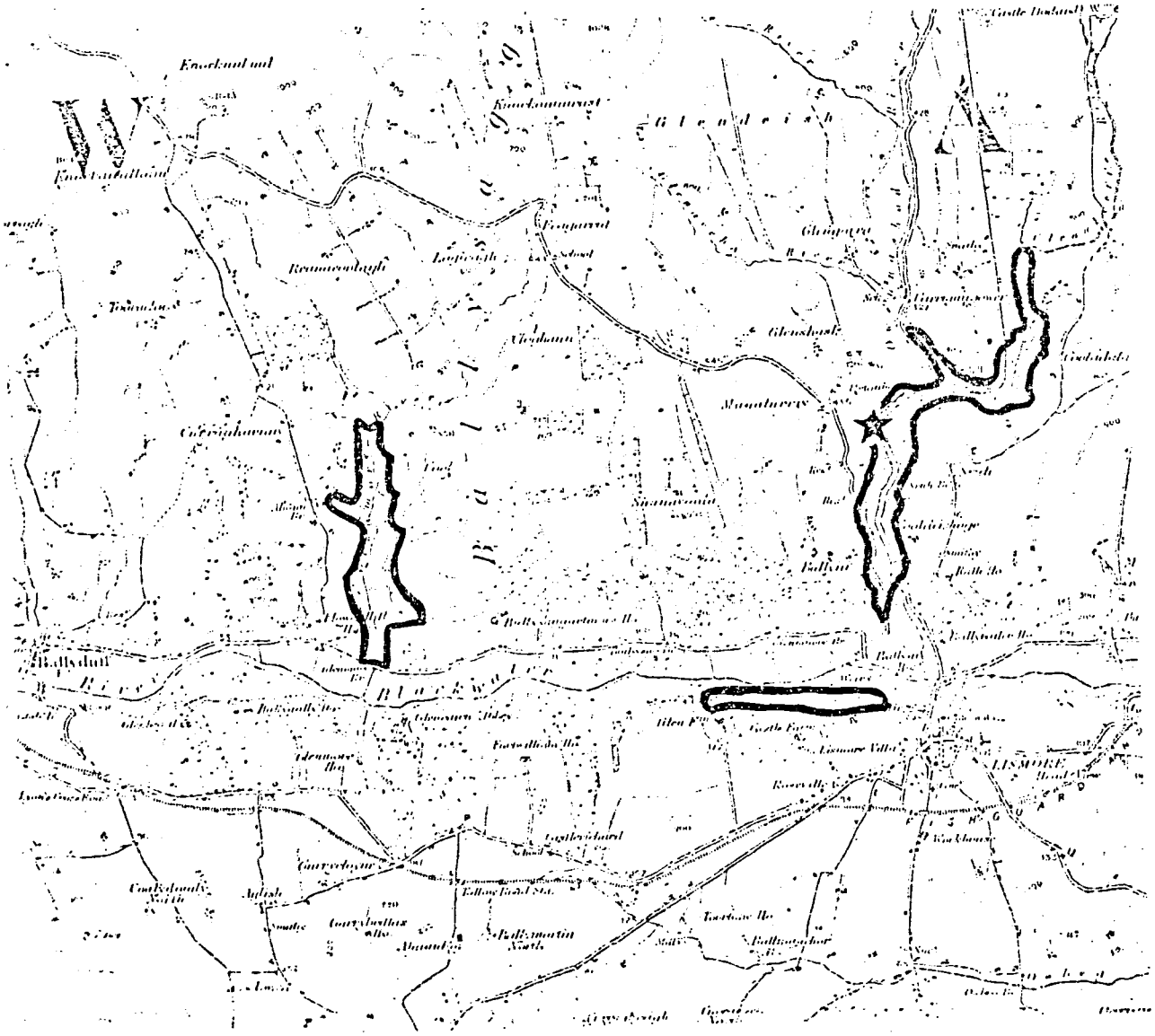
Recommendation

Development in the valley should be controlled so as to prevent any unnecessary destruction of these woodlands.

Small and particularly interesting areas of the woodlands could be protected by a Tree Preservation Order, under Section 45, Local Government (Planning and Development) Act, 1963. This could be drawn up in draft form by the Conservation and Amenity Advisory Service, An Foras Forbartha.

MAP SHOWING AREA OF SCIENTIFIC INTEREST —12

Scale: 1 Inch to 1 Mile



Name of area	FENNOR BOG
Acreage	c 30 acres
Grid reference	S. 531, 015
Scientific interest	Ecological
Rating	Regional importance
Priority	C

Description of area

The area of interest is shown on Map 13. It is an area containing a variety of swamp, fen and bog communities.

The wettest patches are dominated by bogbean (Menyanthes trifoliata) water horsetail (Equisetum fluviatile) and bog pond weed (Potamogeton polygonifolius).

In slightly drier places these species become less common and the dominant species is the moss, Aulacomnium palustre, with cotton grass (Eriophorum angustifolium), marsh bedstraw (Galium palustre) and the sedge Carex rostrata all frequent. In addition the bog St. John's wort (Hypericum elodes) is very common, a local species in Ireland and Britain (See Fig.13).

Other areas are dominated by the conspicuous tussocks of panicled sedge (Carex paniculata) or by reed (Phragmites communis) and willow and alder bushes are frequent in some areas.

Evaluation

The variety of wetland plant communities found in this area and the abundance of Hypericum elodes results in it being of regional importance.

Threats to the area

No imminent threats are known of, though drainage, dumping or

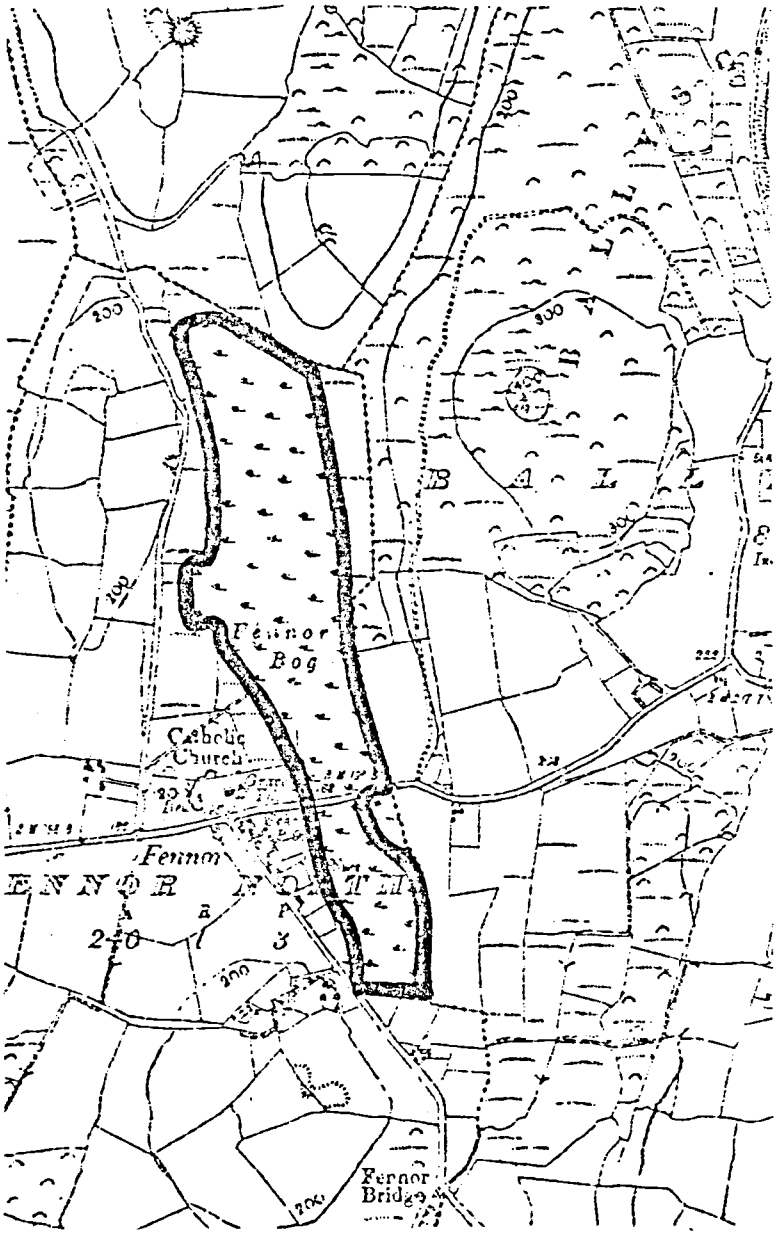
eutrophication caused by septic tank effluent could all be threats in the future.

Recommendation

Any development plans affecting this area should take into account the scientific value of the bog.

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 13

Scale: 6 Inches to 1 Mile



Name of area	ISLANDTARNSEY FEN
Acreage	c 45 acres
Grid reference	S. 553, 012
Scientific interest	Ecological : Botanical
Rating	Regional importance
Priority	C

Description of area

The area of interest is shown on Map 14.

The area can be considered in two parts :-
South of the dotted line on Map 14 is dense reed swamp of Phragmites communis. Amongst the dense reeds were noted :-

Agrostos stolonifera	(fiorin)	f, lc
Cardamine pratensis	(lady's smock)	f
Equisetum fluviatile	(water horsetail)	f
Filipendula ulmaria	(meadow sweet)	f
Galium palustre	(marsh bedstraw)	f
Angelica sylvestris	(wild angelica)	o
Athyrium felix-femina	(lady fern)	o
Juncus effusus	(soft rush)	o
Lemna minor	(duckweed)	o
Lythrum salicaria	(purple loosestrife)	o
Potentilla palustris	(marsh cinquefoil)	o
Rubus fruticosus	(bramble)	o
Salix cinerea ssp atrocinerea	(common sallow)	o
Urtica dioica	(nettle)	o
Myosotis sp.	(forget-me-not)	r

North of the dotted line Phragmites is very sparse and the area of marsh is dominated by fiorin (Agrostis stolonifera), bottle sedge (Carex rostrata)

and cotton grass (Eriophorum angustifolium). Also recorded were :-

Galium palustre	(marsh bedstraw)	c
Cardamine pratensis	(lady's smock)	f
Equisetum fluviatile	(water horsetail)	f
Filipendula ulmaria	(meadow sweet)	f
Juncus acutiflorus	(sharp-flowered rush)	f
Menyanthes trifoliata	(bogbean)	f
Hydrocotyle vulgaris	(marsh pennywort)	o
Juncus effusus	(soft rush)	o
Lythrum salicaria	(purple loosestrife)	o
Mentha aquatica	(water mint)	o
Myrica gale*	(bog myrtle)	o
Osmunda regalis	(royal fern)	o
Pedicularis palustris	(red-rattle)	o
Ranunculus flammula	(lesser spearwort)	o
Salix cinerea ssp. atrocinerea	(common sallow)	o

* rare in S.E. Ireland (See Fig. 25)

Evaluation

This area is rated as being of regional importance because of the variation within it and the interesting assemblage of flowering plants that it contains.

It is also desirable that in this region at least one area of Phragmites fen, peculiar to and characteristic of this part of Ireland, should be preserved intact and this area, which contains such a fen, is chosen with this in mind.

Threats to the area

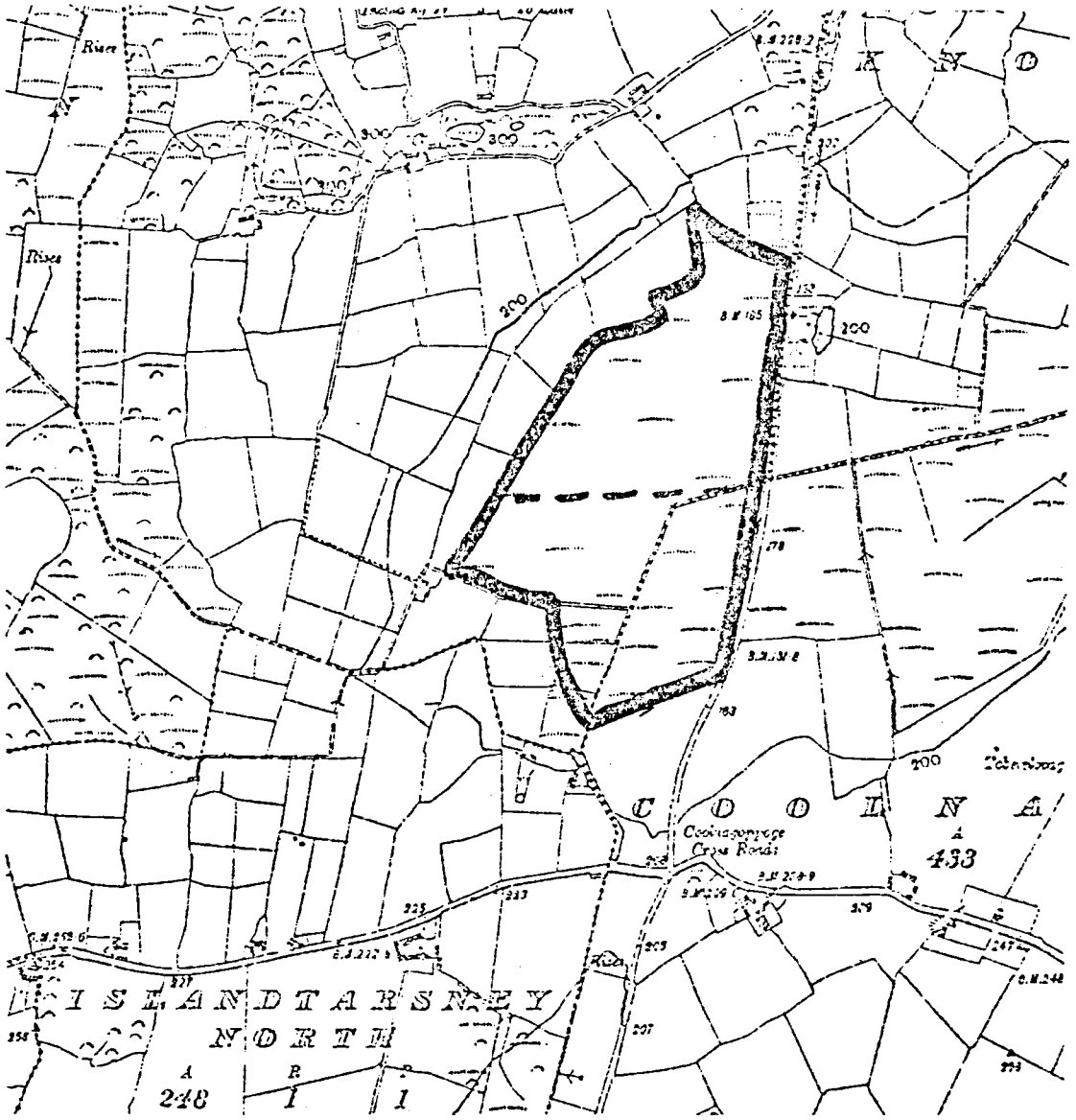
No imminent threats are known of. As in the case of Fennor bog, drainage, dumping and eutrophication could be future threats.

Recommendation

Any development plans affecting this area should take into account its scientific interest.

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 14

Scale: 6 Inches to 1 Mile



Name of area	BELLE LAKE
Acreage	c 110 acres
Grid reference	S. 664, 046
Scientific interest	Ecological : Botanical
Rating	Regional importance
Priority	C

Description of area

The area of interest is shown on Map 15.

This is a large attractive lake with a large area of Phragmites reedswamp at its south end. Growing in this reedswamp are seen :-

Phragmites communis	(reed)	a
Equisetum fluviatile	(water horsetail)	f
Galium palustre	(marsh bedstraw)	f
Salix cinerea ssp atrocinerea	(common sallow)	o

This reedswamp extends as a thick marginal band up most of the west side of the lake but on the east side there is only a thin marginal band of:-

Equisetum fluviatile	(water horsetail)	lc
Potamogeton natans	(broad-leaved pondweed)	lc
Typha angustifolia	(lesser reedmace)	lc
Schoenoplectus lacustris	(bulrush)	o

Typha angustifolia is rare in Ireland and is of particular interest (See Fig. 14).

The lake bottom close to the shore on the east side of the lake is soft and muddy with few stones but examination of the few stones that could be found indicated that the lake is rich in invertebrates. Invertebrate groups noted were Turbellaria (flatworms), Hirudinea (leeches), Amphipoda (fresh water shrimps, Gammarus sp.) Trichoptera (caddis larvae, both

epilithic tube and mobile case forms) and Gastropoda (spire snails).

Evaluation

This is one of the few substantial areas of fresh water in the south east of Ireland and, as such, is of regional importance.

Threats to the area

No imminent threats are known of.

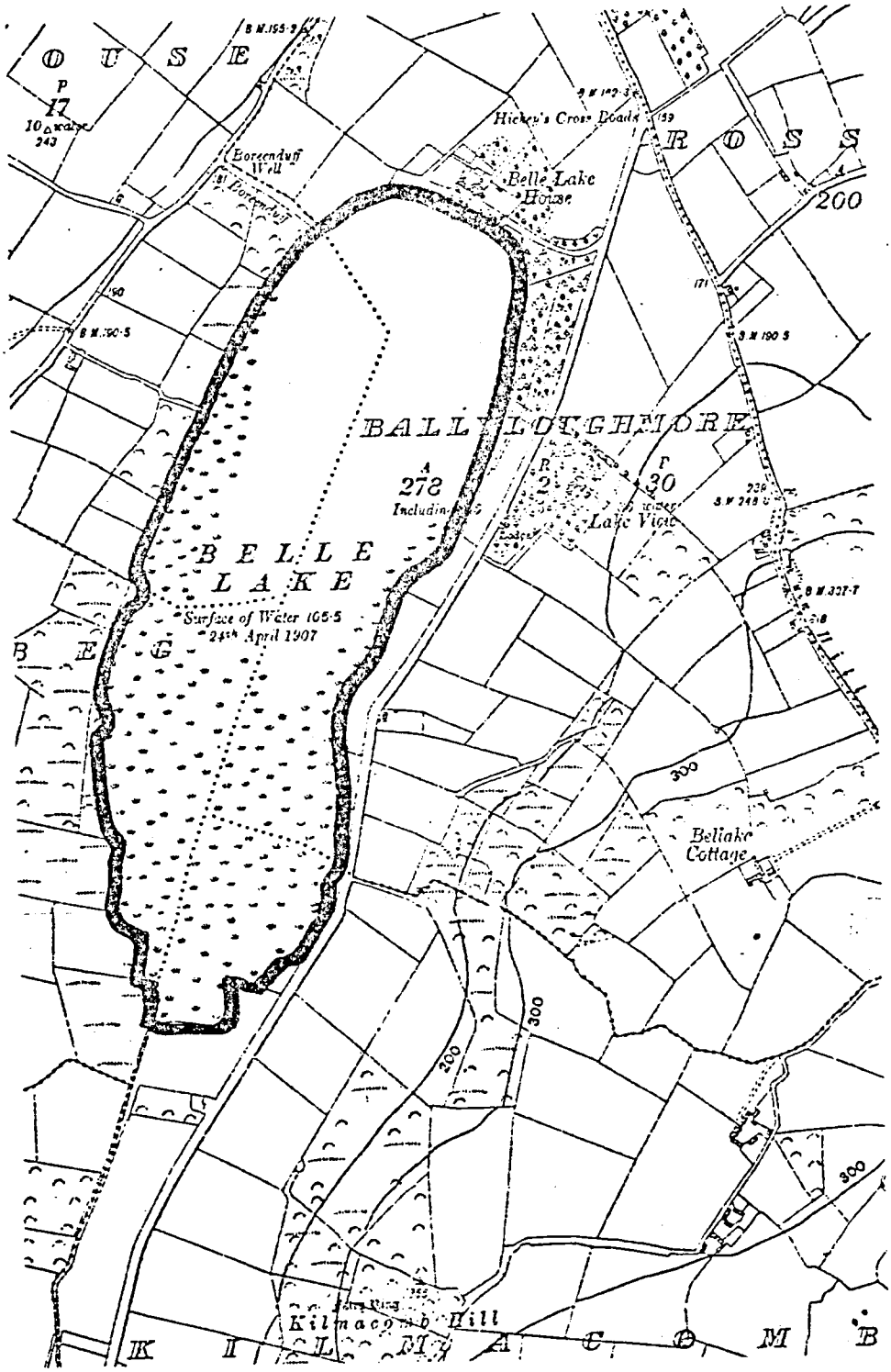
Excessive housing or industrial development or establishment of intensive farming units in surrounding areas could lead to pollution or eutrophication of the lake.

Recommendation

Any development plans affecting this area should take into account its scientific interest.

MAP SHOWING AREA OF SCIENTIFIC INTEREST —15

Scale: 6 Inches to 1 Mile



Name of area	CARRICKAVANTRY RESERVOIR
Acreage	c 30 acres
Grid reference	S. 548, 023
Scientific interest	Botanical : Ecological
Rating	Regional importance
Priority	C

Description of area

The area of interest is shown on Map 16.

This is a beautiful lake fringed by farmland to the south and east and forestry plantations on the west.

The west shores of the reservoir have an extraordinarily interesting collection of plants for many of which this is their only station in the east of the county or the county as a whole. The significance of the site can be gauged from the following list of plants recorded there, together with notes on their distribution elsewhere in the county :-

Ranunculus trichophyllus	('water buttercup') - the only record for the county
Hypericum elodes	(marsh St. John's wort) - rare in the county
Utricularia vulgaris	(bladderwort) - rare in the county
Littorella uniflora	(shoreweed) - rare in the county
Baldellia ranunculoides	(lesser water-plantain) - only county record
Potamogeton perfoliatus	(perfoliate pondweed) - one of three county records
Potamogeton berchtoldii	(small pondweed) - one of three county records

Potamogeton obtusifolius	(grassy pondweed) - only county record
Sparganium emersum	(unbranched bur-reed) - only county record
Sparganium minimum	(small bur-reed) - only recent county record
Eleogiton fluitans	(floating scirpus) - only recent record for west of county

The above data is taken from Ferguson. I.K. Notes on the Flora of Co. Waterford. Irish Naturalists Journal. Vol. 16, Part 4, pp. 94 - 97 (See also Figs. 13 and 15 - 24).

Evaluation

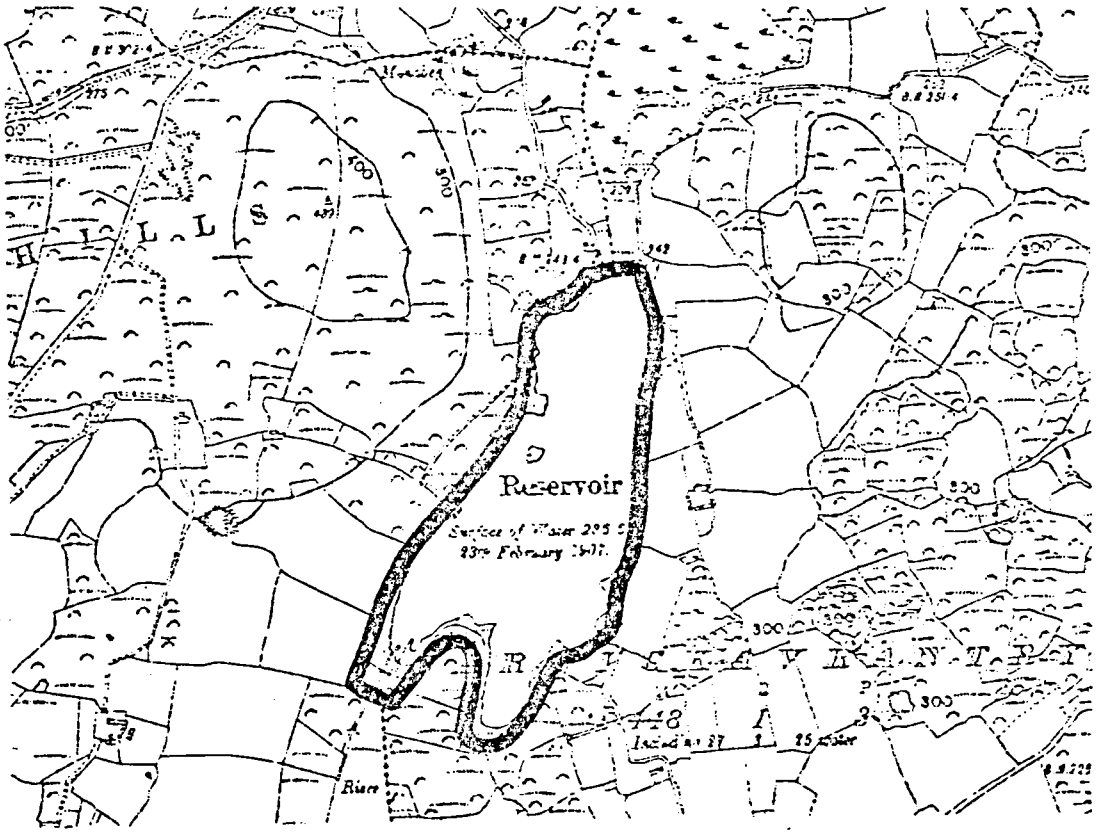
The extraordinary interest of the flora of the west shore results in the reservoir being of regional scientific importance.

Threats to the area

In view of the fact that this is a reservoir no threats appear likely.

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 16

Scale: 6 Inches to 1 Mile



Name of area	CLIFFS ON HELVICK HEAD
Grid reference	X. 31, 88
Scientific interest	Ornithological
Rating	Regional importance
Priority	C

Description of area

The area of interest is shown provisionally on Map 17.

These high, fairly remote cliffs are of interest because of nesting seabirds. Further data is awaited on the exact areas used by nesting birds and on the species of birds that nest here. It is hoped that this information will be obtained in due course from the organisers of 'Operation Seafarer'. a survey of seabird colonies in Ireland and Britain.

Evaluation

This is a well known locality for nesting seabirds and is provisionally rated as being of regional importance.

Threats to the area

No imminent threats are known of.

Development of this stretch of coastline and subsequent disturbance of nesting birds would appear to be the only possible threat.

Recommendation

Development in this area should be prevented.

Again this area is already scheduled for protection in the County Development Plan, Sept. 22nd, 1967.

Name of area	CLIFFS AT DUNMORE EAST
Grid reference	S. 69, 00
Scientific interest	Ornithological
Rating	Regional importance
Priority	B

Description of the area

The area of scientific interest is shown provisionally on Map 18.

The area is of interest because it contains a large, scattered nesting colony of kittiwakes.

The limits of the nesting area will be more accurately mapped when further information on the area is obtained from the organisers of 'Operation Seafarer'.

Evaluation

This colony is of regional interest mainly because it can be so easily seen by people on the quay.

Threats to the area

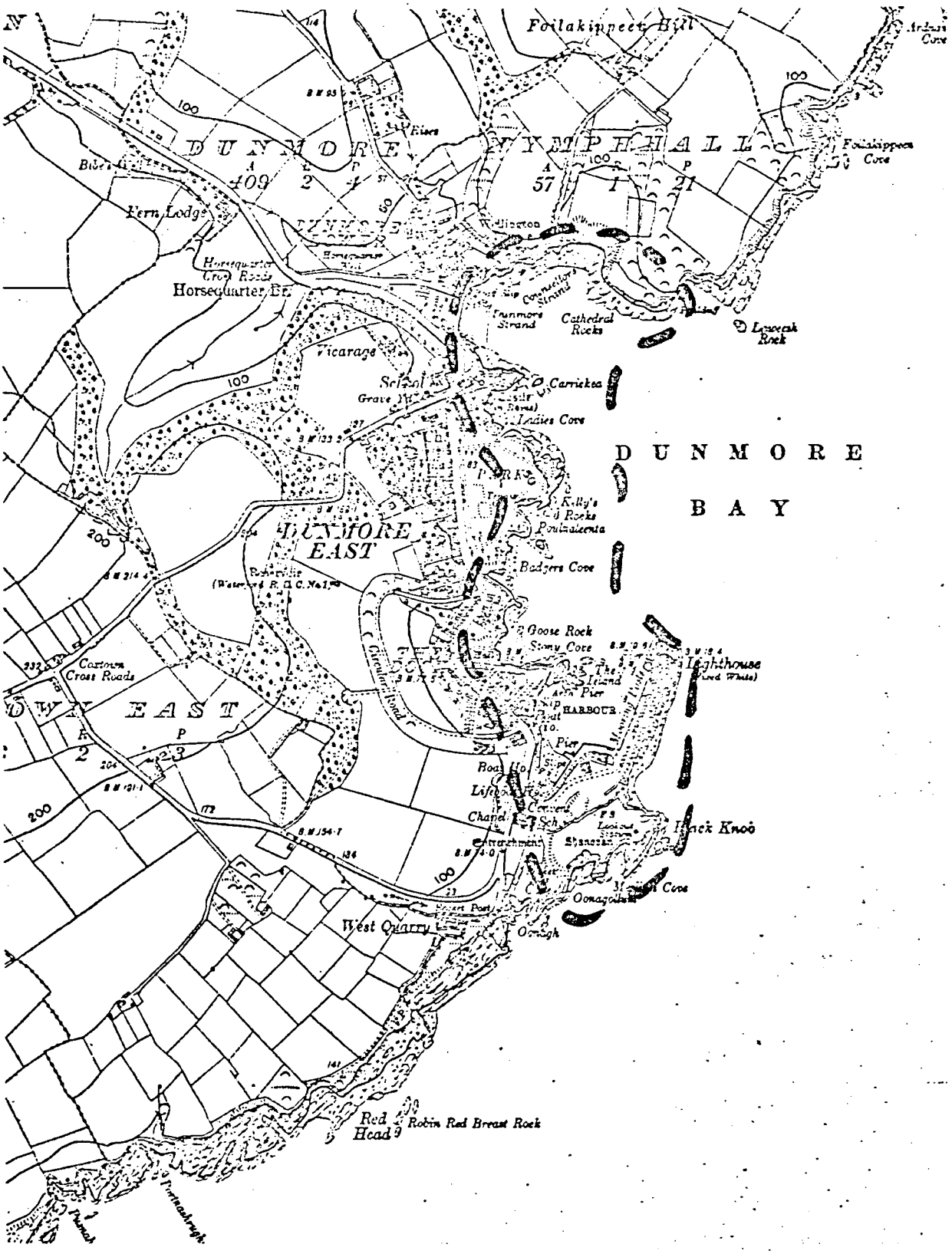
Because of its accessibility disturbance of the colony is always likely. The colony might also be physically threatened by the harbour developments.

Recommendations

During any development of this area, disturbance of the colony should be avoided as far as possible.

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 18

Scale: 6 Inches to 1 Mile



Name of area	SGILLOGE LOUGHS
Acreage	c 220 acres
Grid reference	S.296,114
Scientific interest	Botanical
Rating	Local importance
Priority	C

Description of the Area

The area of interest is shown on Map 19. It was not visited during the periods of fieldwork preparatory to this report.

The cliffs and moorland surrounding the loughs are of bryological interest. They were visited by the British Bryological Society during a field meeting in 1966 and the following new county records were made:-

Anthelia julacea	)	
Lepidozia trichoclados	)	liverworts
Cephaloziellia pearsonii	)	
Radula lindbergii	)	
Bryum riparium	-	a moss

Evaluation

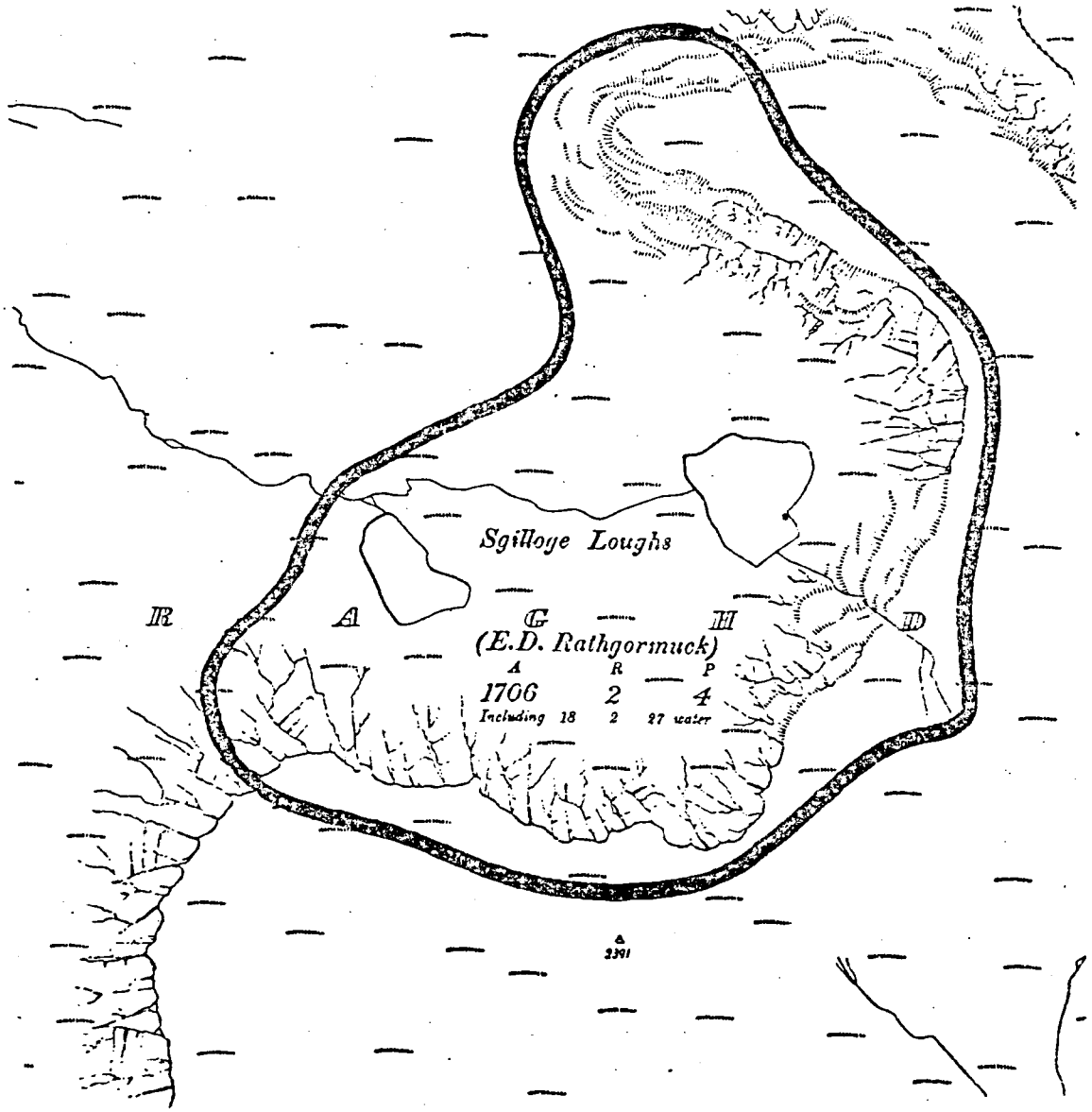
The typical high level bryophyte flora and the locally rare species found here result in this area being of local scientific interest.

Threats to the Area

None likely.

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 19

Scale: 6 Inches to 1 Mile



Name of area	COOLFIN MARSHES
Acreage	c 335 acres
Grid reference	S. 48, 14
Scientific interest	Ornithological
Rating	Regional importance
Priority	C

Description of area

The area of interest is shown on Map 20.

This is an area of wet fields separated by drainage ditches. Two or three of the fields are frequented each winter by Munster's only remaining flock of Greylag geese.

Evaluation

The fact that some of the fields are used by the overwintering Greylag geese results in the area being of regional importance.

Threats to the area

Improving the drainage of the area could render the fields unattractive to the geese.

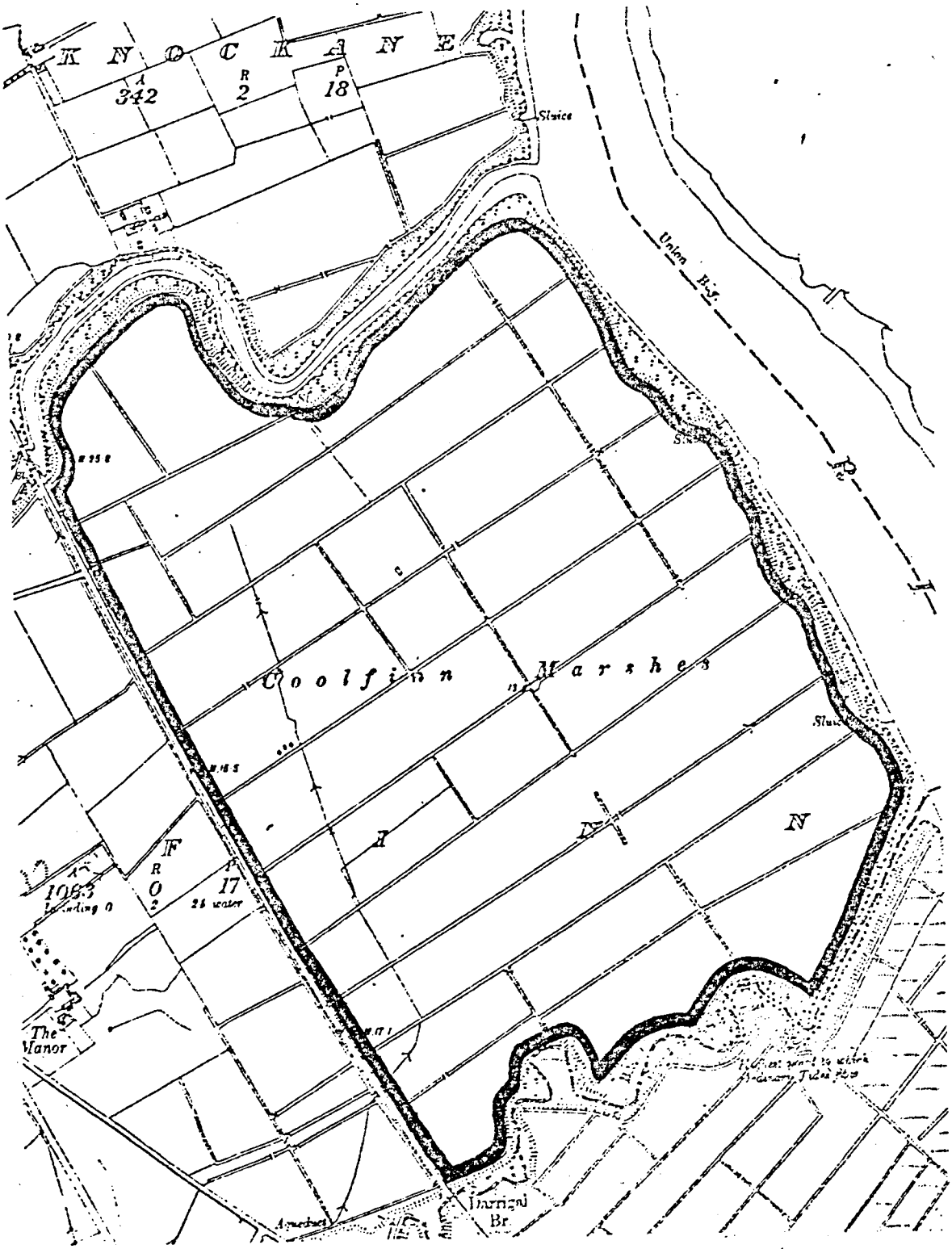
This, or any other development in the area, is unlikely however as the marshes are scheduled for protection in the County Development Plan, Sept. 22nd, 1967.

Recommendation

Further drainage or other development in this area should be prevented.

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 20

Scale: 6 Inches to 1 Mile



Name of area	NEWTOWN COVE
Acreage	c 8 acres
Grid reference	X. 568, 993
Scientific interest	Botanical
Rating	Local importance
Priority	C

Description of area

The area of interest, a small, damp, wooded valley cut by a stream, is shown on Map 21.

The botanical interest of the area lies mainly in the occurrence there of the North American annual plant Limnanthes douglasii.

The Limnanthes occurs in two places on the south side of the river, both being partially bare, clay banks, artifically created by the building of two bridges across the river and the creation of paths leading from them, which zigzag up the north-facing slope. Close to the bridge furthest from the sea 40 plants were counted, growing in areas of bare soil on a steep bank which was also being colonised by many plants from the surrounding woodland. Further down the valley, close to the second bridge and in a similar habitat, 49 plants were counted.

Field maple (Acer campestre) is also naturalised in this area. Its only recorded station in Ireland.

Evaluation

As already stated the botanical interest of this area lies in the presence of the alien annual, Limnanthes. Although the plant is often reported as a casual garden escape it has never, as far as is known, been

Limnanthes douglasii R. Br - Poached egg flower (Limnanthaceae).
A hardy annual from California with yellow + white flowers.

reported to be naturalised in Ireland. Within this valley however there are many naturally occurring areas with open vegetation, very similar to the habitats now occupied by this species e.g. the steep banks of the stream, and Limnanthes might well colonise these and become naturalised here.

The status of this colony will be of great interest over the coming years.

The occurrence of the species here is an interesting problem in itself as the nearest garden is a considerable distance away from the area in which the plant occurs.

Threats to the area

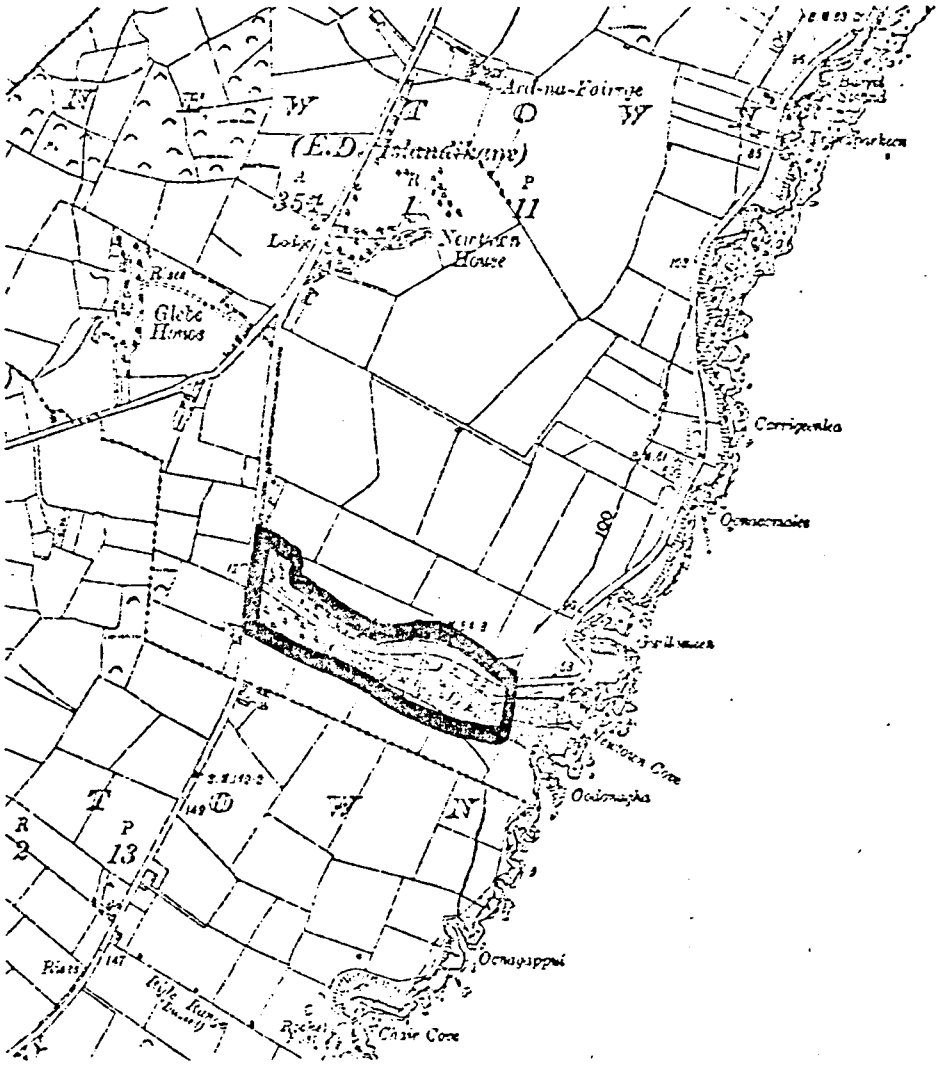
No threats to the area are known of, nor are any likely to develop in view of the amenity value of the area.

Recommendation

Any development plans affecting this area should take into account its scientific and amenity value.

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 21

Scale: 6 Inches to 1 Mile



Name of area	BALLYEELINAN
Acreage	c 50 acres
Grid reference	X. 212, 807
Scientific interest	Ecological : Botanical
Rating	Local importance
Priority	C

Description of area

The area of interest, a small, steep-sided, wooded valley running down to the sea, is shown on Map 22. There is an old record of a very rare plant occurring in the valley.

Evaluation

In view of their coastal position the woodlands in the valley are of general ecological interest. The possibility of the rare plant still occurring here is also of interest. The area is thus of local importance.

Threats to the Area

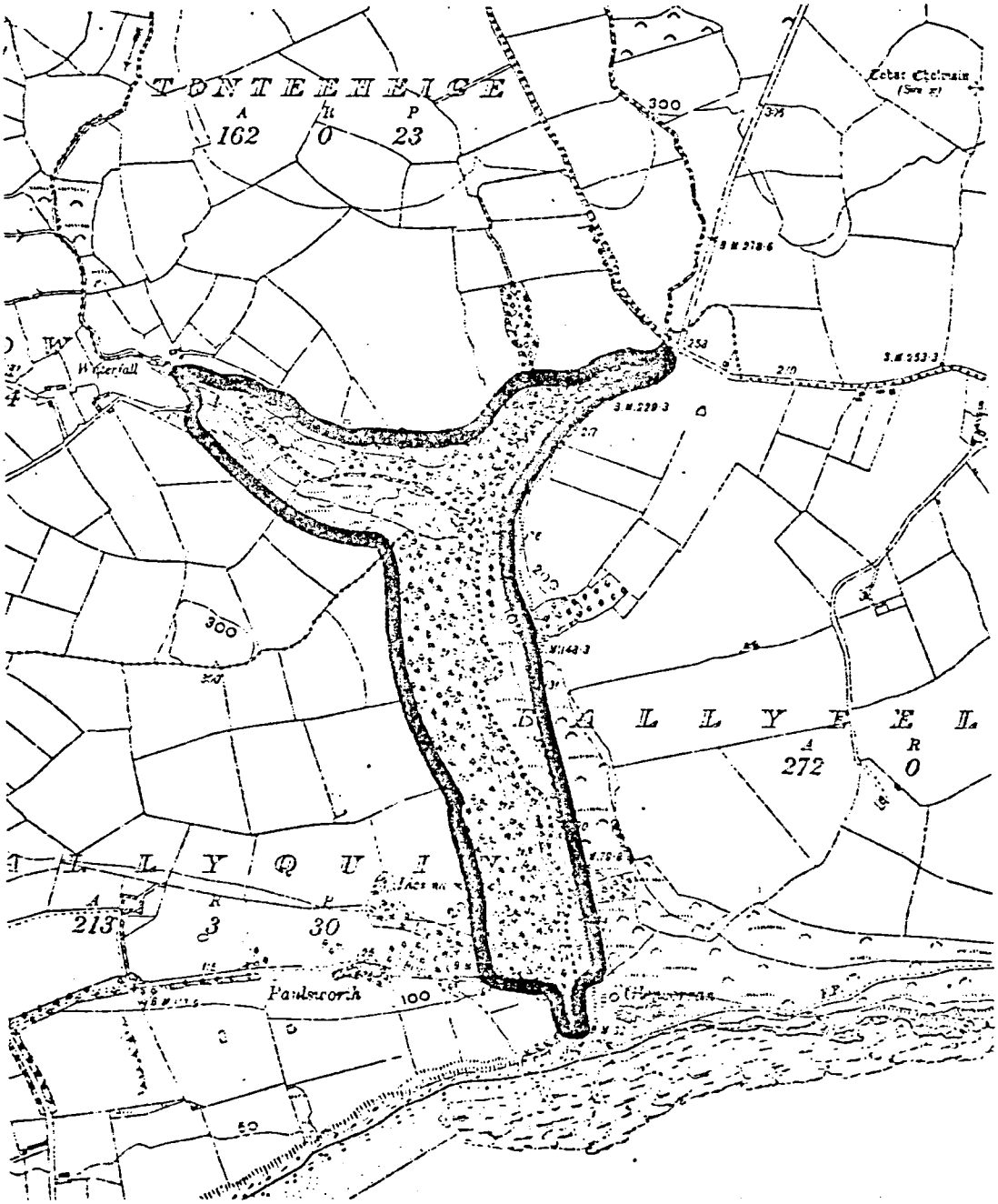
No imminent threats are known of, though clearance may well be proposed in the future.

Recommendations

Any development plans affecting this area should take into account its scientific interest.

MAP SHOWING AREA OF SCIENTIFIC INTEREST – 22

Scale: 6 Inches to 1 Mile



Name of area	BALLYMACART
Acreage	c 25 acres
Grid reference	X. 253, 815
Scientific interest	Ecological
Rating	Local importance
Priority	C

Description of area

The area of interest is shown on Map 23.

Again this is a small wooded valley, very similar to Ballyeelinan. The deciduous woodlands are a mixture of ash (Fraxinus excelsior), elm (Ulmus sp.), elder (Sambucus nigra), hawthorn (Crataegus monogyna), oak (Quercus sp.) and sycamore (Acer pseudoplatanus).

Evaluation

As with Ballyeelinan the woodlands are of general ecological interest and are thus of local importance.

Threats to the area

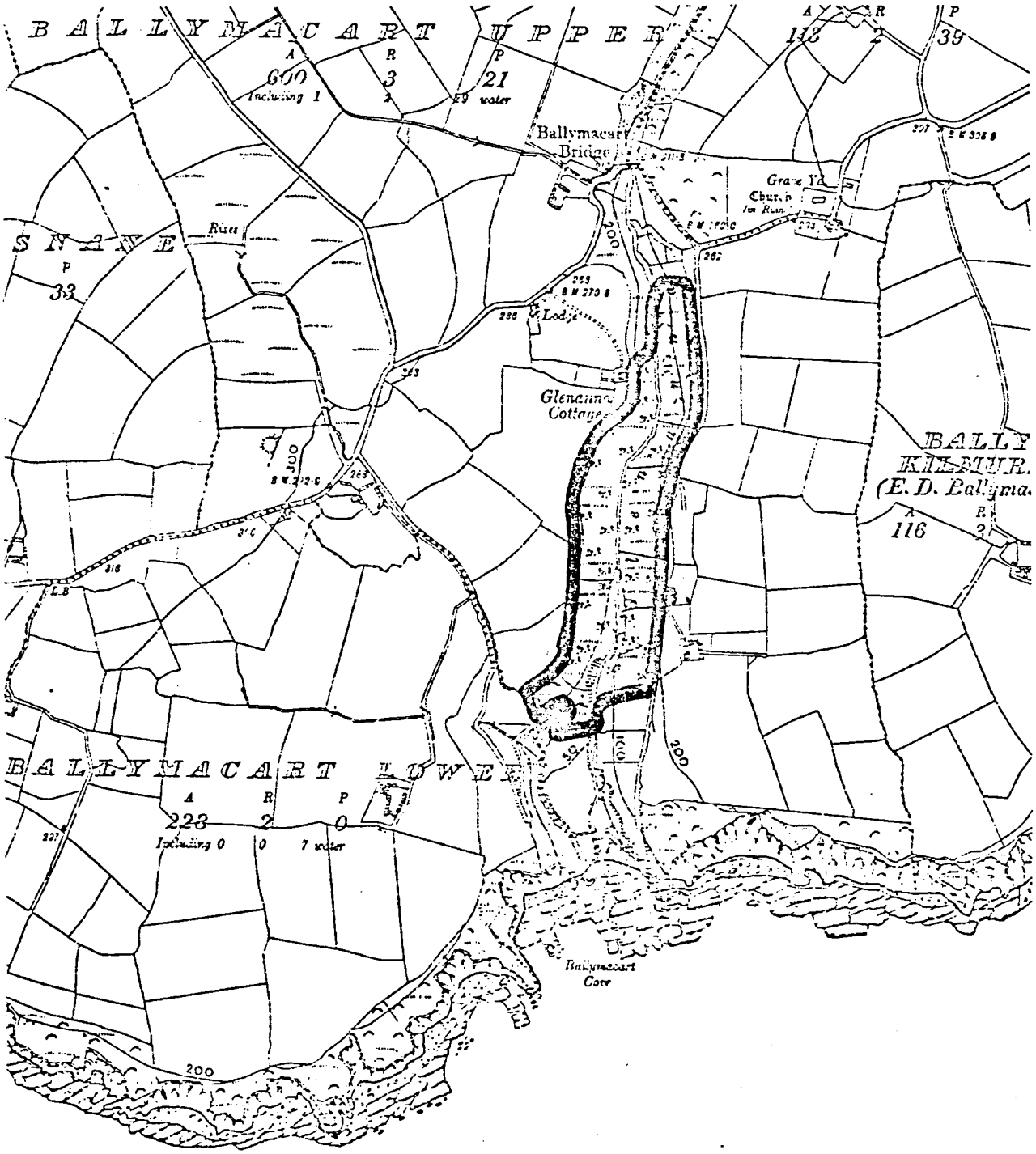
No imminent threats are known of.

Recommendation

Any development plans affecting this area should take into account its scientific interest.

MAP SHOWING AREA OF SCIENTIFIC INTEREST –23

Scale: 6 Inches to 1 Mile



Name of area	WOODS NEAR STRABALLY
Acreage	c 170 acres
Grid reference	X. 35 and 36, 97
Scientific interest	Ecological
Rating	Local importance
Priority	C

Description of area

The areas of interest are shown on Map 24.

The areas are mainly mature woodlands dominated by oak (Quercus spp.) and beech (Fagus sylvatica) but containing occasional conifers and other deciduous trees e.g. birch (Betula spp.) and sycamore (Acer pseudoplatanus). Some areas are also being invaded by cherry laurel (Prunus laurocerasus).

A particularly interesting area is the east-facing slope of Strabally Cove, which appears to have undergone natural colonisation by trees. The resulting area of woodland is completely different from the other woodlands nearby and has the following structure :-

high canopy	-	Fraxinus excelsior	(ash)	c
		Acer pseudo platanus	(sycamore)	c
low canopy	-	Ilex aquifolium	(holly)	f
herbs	-	Endymion non-scriptus	(bluebell)	c
		Hedera helix	(ivy)	f
		Polystichum setiferum	(soft shield-fern)	f
		Lonicera periclymenum	(honeysuckle)	f
		Dryopteris dilatata	(broad buckler fern)	o

Evaluation

These deciduous woodlands are certainly of ecological interest, but when compared with other areas of deciduous woodland in the county they can only be rated as of local importance.

Threats to the area

No imminent threats are known of, but the woodlands may be threatened by clearance in the future.

Extensive spread of the alien shrub Prunus laurocerasus, cherry laurel, could reduce the scientific value of the woodlands.

Recommendation

The co-operation of the landowner should be sought in maintaining these areas as deciduous woodland.

Glendine + Ardsallagh Woods

Name of area	WOODS NORTH OF YOUGHAL
Acreage	c 335 acres
Grid reference	Around X. 085, 825
Scientific interest	Ecological : Botanical
Rating	Local importance
Priority	C

Description of area

The areas of interest shown on Map 25 are mainly mature deciduous woodland containing very few conifers. (In the surrounding woodlands conifers are much commoner).

Within these areas are some fine stands of mature oak woodland. Some in the Glendine valley are easily accessible and have the following structure :-

high canopy	-	Quercus sp.	(oak)	c
low canopy	-	Ilex aquifolium	(holly)	c
herbs	-	Vaccinium myrtilus	(bilberry)	c
		Blechnum spicant	(hard fern)	f
		Dryopteris dilatata	(broad buckler fern)	f
		Lonicera periclymenum	(honeysuckle)	f

Other areas are dominated by beech (Fagus sylvatica).

Evaluation

When compared with other areas of deciduous woodland in the county these particular areas can only be rated as being of local importance.

Threats to the area

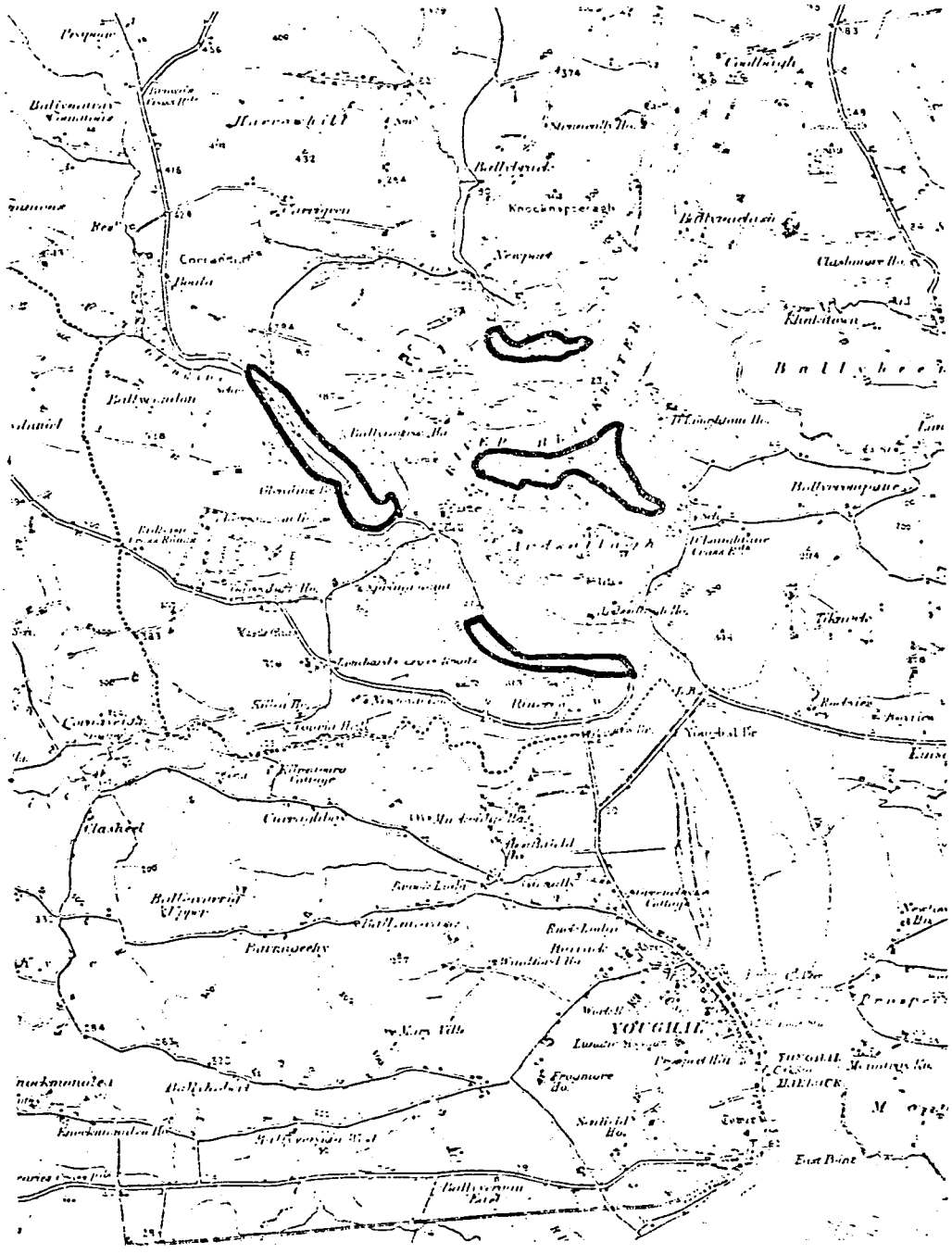
No imminent threats are known of, but the woodlands may be threatened by clearance in the future.

Recommendation

The co-operation of the landowner should be sought in maintaining these areas as deciduous woodland.

MAP SHOWING AREA OF SCIENTIFIC INTEREST —25

Scale: 1 Inch to 1 Mile



Name of Area	WOODS NEAR GLENPATRICK BRIDGE
Acreage	c 22 acres
Grid Reference	S. 292,200
Scientific Interest	Ecological
Rating	Local Importance
Priority	C

Description of Area

The areas of interest, deciduous woodlands surrounded by conifer plantations, are shown on Map 26.

The southern area is a patch of mature relict oakwood on a steep slope, which is very wet in one area where water drains down from above. The wood has the following structure:-

high canopy -	Quercus sp	(oak)	c
	Fraxinus excelsior	(ash)	o
	Sorbus aucuparia	(rowan)	o
low canopy -	Corylus avellana	(hazel)	c
	Ilex aquifolium	(holly)	f
herbs - (dryer areas)	Luzula sylvatica	(great woodrush)	a
	Dryopteris dilatata	(broad buckler fern)	f
	Rubus fruticosus	(bramble)	f
	Blechnum spicant	(hard fern)	o
	Hedera helix	(ivy)	o
	Oxalis acetosella	(wood sorrel)	o
(wet areas)	Chrysosplenium oppostifoloim	(golden saxifrage)	c,la
	Oenanthe crocata	(water dropwort)	f,lc
	Athyrium felix-femina	(lady fern)	f

The more northerly area is a young beech plantation. A typical area within it had the following structure:-

high canopy -	Fagus sylvatica	(beech)	c
low canopy -	absent		
herbs -	Endymion non-scriptus	(bluebell)	l.c.
	Dryopteris borreri	(male fern)	f

Along the roadside bordering the area and in the woodland edge were noted oak (Quercus spp), hazel (Corylus avellana), cherry laurel (Prunus laurocerasus), bilberry (Vaccinium myrtilus), broad buckler fern (Dryopteris dilatata) and honeysuckle (Lonicera periclymenum).

Evaluation

The patch of oakwood is significant in that it has a different floral composition from the oakwoods described elsewhere in this report. In view of its small size however it is only rated as locally important.

The beech wood is of general ecological interest.

Threats to the Area

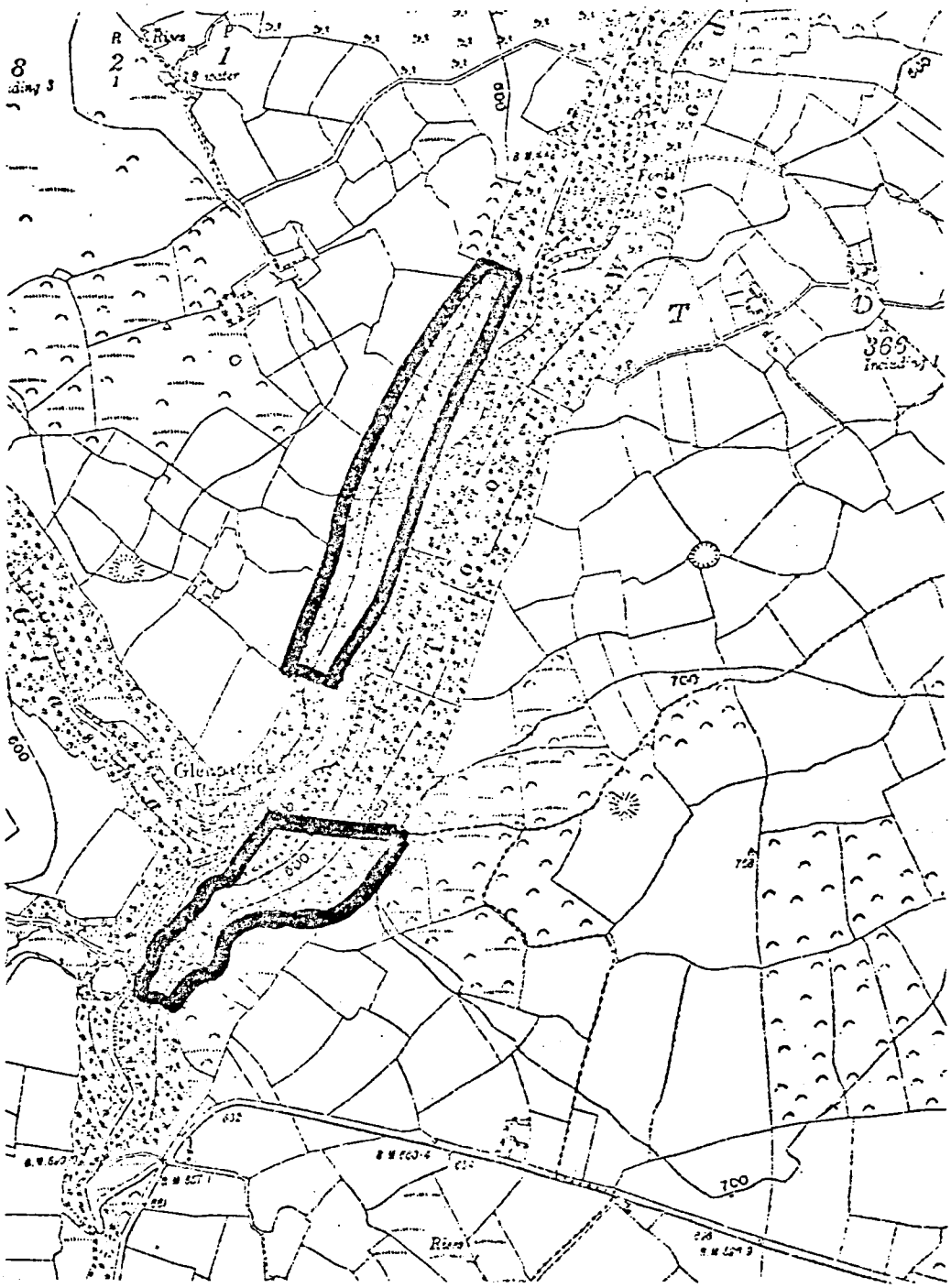
Both these areas of woodland are owned by the Department of Lands, Forestry Division, and it would appear that they are safe from any immediate threat. The beech wood may be cut for timber when it matures.

Recommendation

No action should be taken regarding these woodlands.

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 26

Scale: 6 Inches to 1 Mile



Name of Area	RIVER VALLEY NORTH OF ANNESTOWN
Acreage	c 95 acres
Grid Reference	S.500,000
Scientific Interest	Ecological: Botanical
Rating	Local Importance
Priority	C

Description of Area

The area of interest is shown on Map 27.

Within this area there is an interesting variety of marsh, fen and swamp communities. Of particular note is a large area of fen carr, dominated by common sallow (Salix cinerea ssp atrocinerea).

Within the whole area the following species of interest are recorded:

Hypericum elodes	(marsh St. John's wort)	(See Fig. 1
Myrica gale	(bog myrtle)	(See Fig. 2
Rumex hydrolapathum	(great waterdock)	(See Fig. 2
Utricularia vulgaris	(bladderwort)	(See Fig. 1
Carex riparia	(great pond-sedge)	(See Fig. 2

The area is probably also of some ornithological interest.

Evaluation

The variety of communities within this area and the uncommon plants occurring here result in it being of local importance.

Threats to the Area

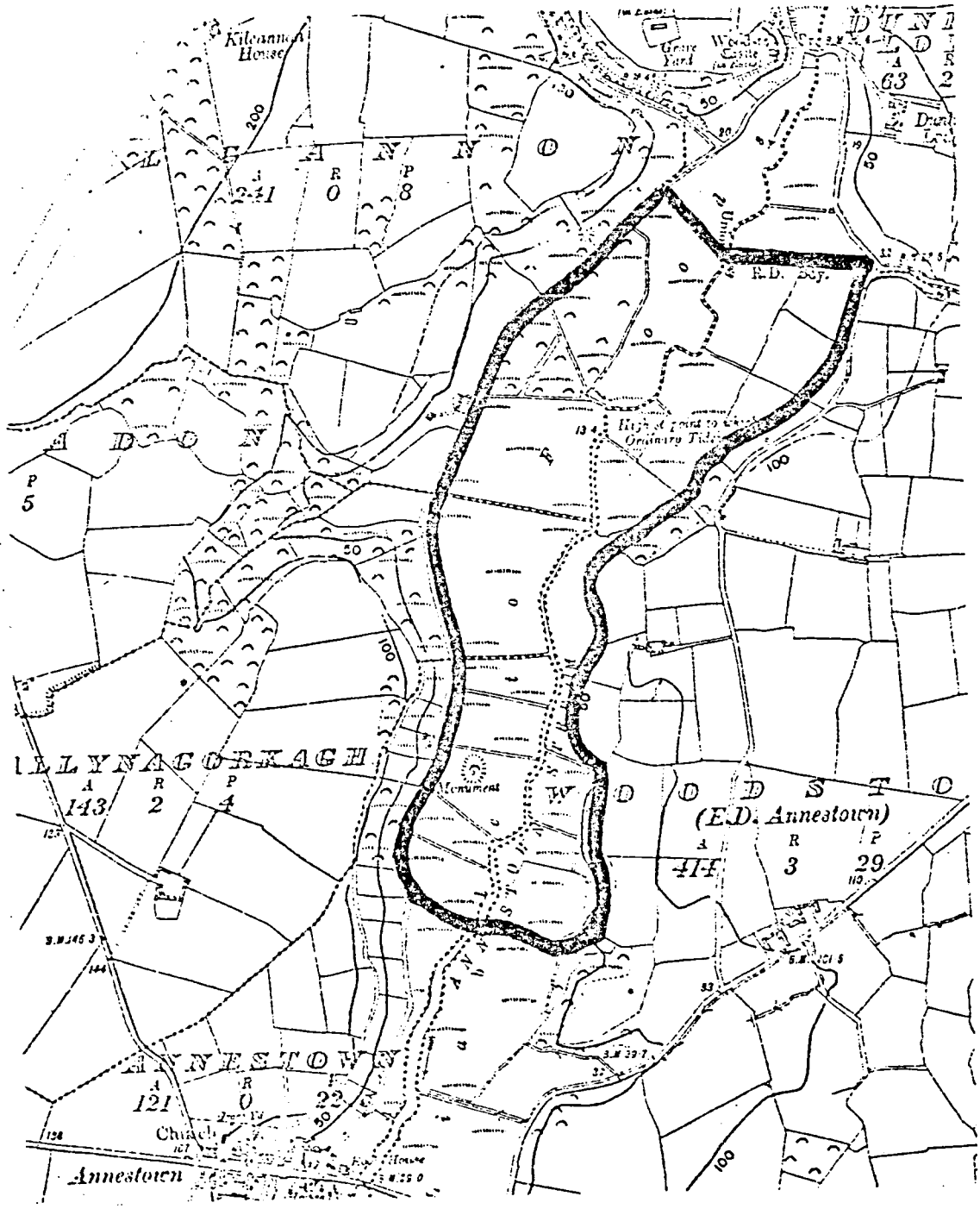
No imminent threats are known of, but drainage, dumping or development may all become threats in the future.

Recommendation

Any development plans affecting this area should take into account its scientific interest.

MAP SHOWING AREA OF SCIENTIFIC INTEREST —27

Scale: 6 Inches to 1 Mile



Name of Area	CASTLECRADDOCK BOG
Acreage	c 55 acres
Grid Reference	S.491,022
Scientific Interest	Ecological
Rating	Local Importance
Priority	C

Description of Area

The area of interest is shown on Map 28.

This is an area of marsh, fen and swamp.

In the wetter areas of the 'bog' on the east side two distinct communities were noted, one of almost pure stands of panicled sedge (Carex paniculata), the other with meadowsweet (Filipendula ulmaria), water horsetail (Equisetum fluviatile) and a species of grass (? Poa sp)as co-dominants.

Other areas are dominated by reedmace (Typha latifolia), and nettle (Urtica dioica) is common in places.

Evaluation

There are several such small 'bogs' in the county and as no two are exactly alike they are all of local ecological interest. This 'bog' has been chosen as a good example of such an area for the purposes of this report.

Threats to the Area

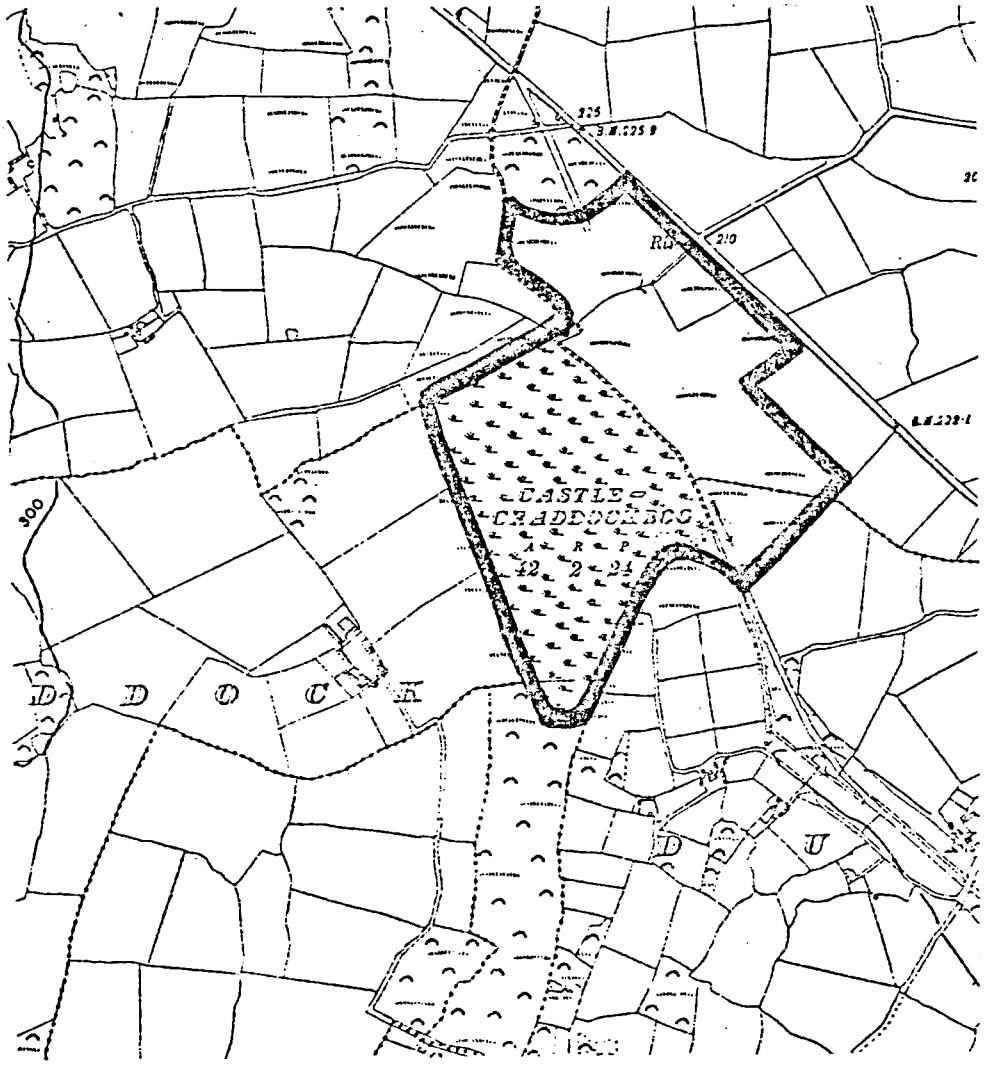
No imminent threats are known of, but drainage, dumping or development may become threats in the future.

Recommendation

Any development plans affecting this area should take into account its scientific interest.

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 28

Scale: 6 Inches to 1 Mile



Name of Area	LISSAVIRON BOG
Acreage	c 55 acres
Grid Reference	S.488,010
Scientific Interest	Ecological
Rating	Local Importance
Priority	C

Description of Area

The area of interest is shown on Map 29.

An area of swamp, fen and developing bog very close to Castlecraddock bog, but completely different from it. There is, for instance, very little Carex paniculata here and much of the area is dominated by bottle sedge (Carex rostrata). There are also areas very similar to the wetter parts of Fennor bog (See p.41) dominated by bogbean (Menyanthes trifoliata) bog pond weed (Potamogeton polygonifolius) etc.

Evaluation

As for Castlecraddock bog

Threats to the area

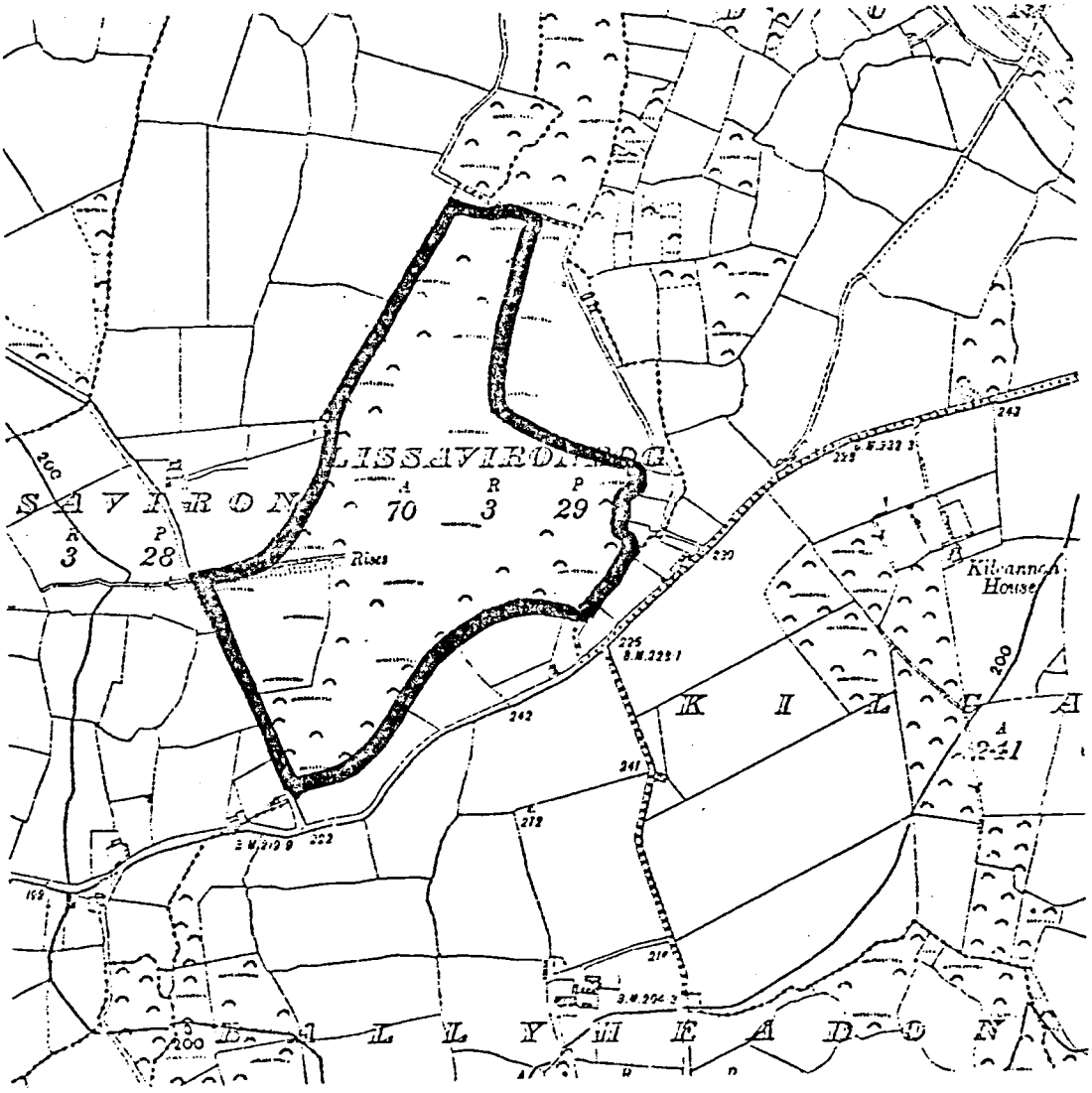
As for Castlecraddock bog

Recommendation

As for Castlecraddock bog

MAP SHOWING AREA OF SCIENTIFIC INTEREST —29

Scale: 6 Inches to 1 Mile



Name of Area	KILBARRY BOG
Acreage	c 115 acres
Grid Reference	S.598,103
Scientific Interest	Ecological: Botanical
Rating	Local
Priority	B

Description of Area

The area of interest is shown on Map 30.

This is a large area of swamp and fen with some small, apparently fairly deep pools of open water. The majority of the area is dominated by reed, (Phragmites communis) but there are some extensive areas with a shorter vegetation at the north end, dominated by a sedge (Carex ? rostrata).

Praeger in 'The Botanist in Ireland' records the rare summer snowflake, (Leucojum aestivum) as growing on the bog. It has not been seen recently. (See Fig. 28).

Evaluation

As for Castlecraddock Bog.

This area also has obvious educational potential. Because of its proximity to Waterford city it could be used as a site for field studies of wetland and aquatic plants and animals.

Threats to the Area

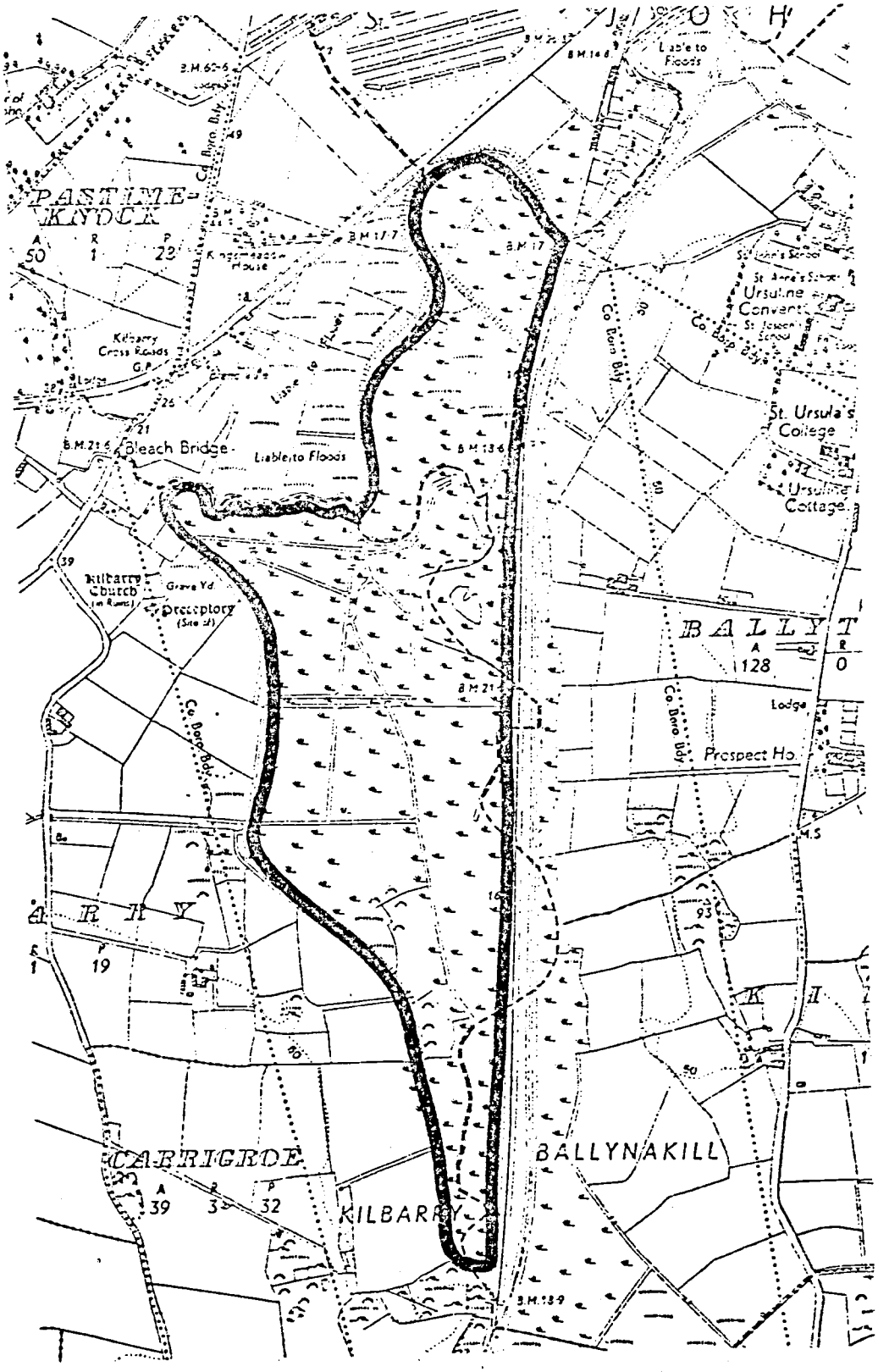
The bog is currently being filled in by a large dump.

Recommendations

A small selected area at the north end of the bog should not be filled in and should be preserved with a view to its possible use as an educational area.

MAP SHOWING AREA OF SCIENTIFIC INTEREST — 30

Scale: 6 Inches to 1 Mile



Name of Area	BALLINLOUGH
Acreage	c 42 acres
Grid Reference	S. 448,035
Scientific Interest	Ecological
Rating	Local Importance
Priority	C

Description of Area

The area of interest is shown on Map 31.

The small, attractive lake appears to be very shallow over most of its area. The indications are that it is highly eutrophic and contains abundant invertebrate populations.

It is surrounded by a more or less continuous reedswamp in which reed (Phragmites communis), reedmace (Typha latifolia), bottle sedge (Carex rostrata) and water horsetail (Equisetum fluviatile) are all locally dominant. Further out from the shore and covering most of the lake's area are floating beds of water crowfoot or buttercup (Ranunculus aquatilis).

Turning over stones at the water's edge revealed a rich and varied invertebrate fauna. Flat worms (Turbellaria), leeches (Hirudinea), ramshorn snails (Gastropoda) and the freshwater hog-louse, Asellus aquaticus (Isopoda) were all common.

Evaluation

This small eutrophic lake is certainly of local scientific importance and, in a part of Ireland where lakes are not common, it may well be that a rating of 'regional importance' could be justified.

Threats to the Area

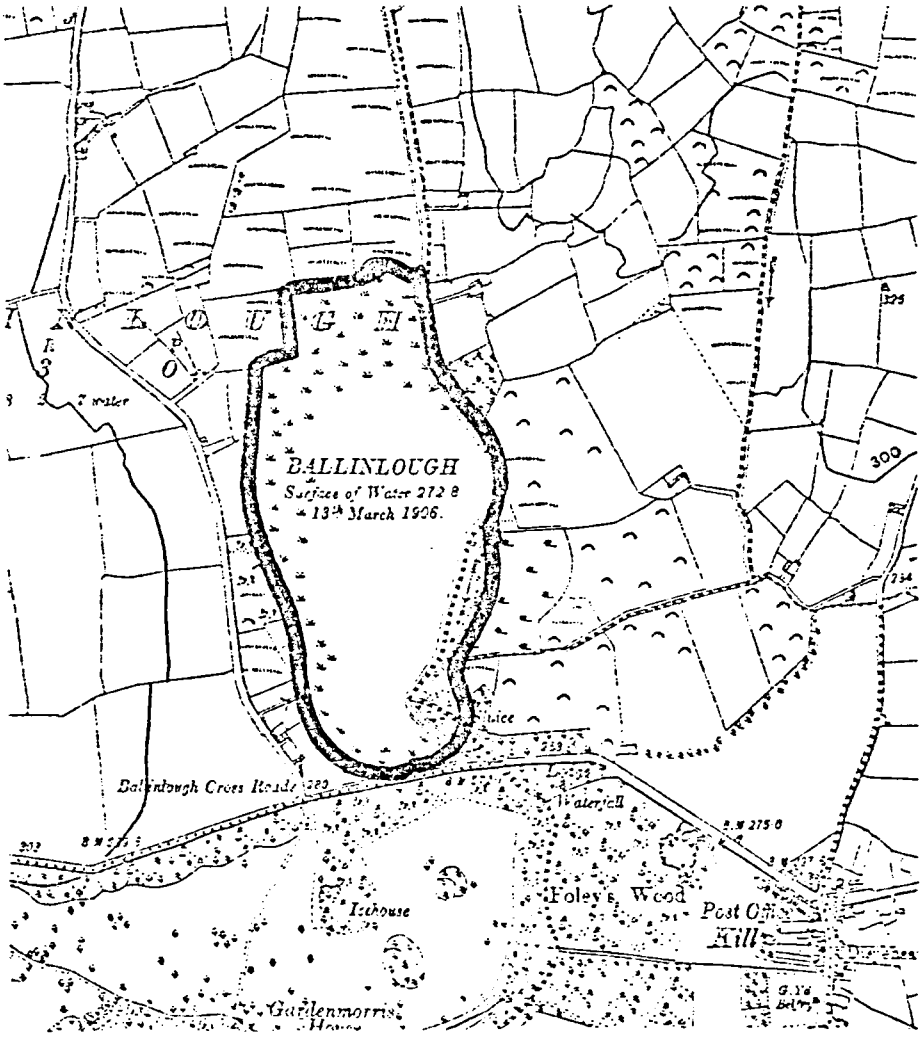
None known of.

Recommendation

Any development plans affecting this area should take into account its scientific interest.

MAP SHOWING AREA OF SCIENTIFIC INTEREST —31

Scale: 6 Inches to 1 Mile



RECOMMENDED ACTION FOR EACH AREA OF SCIENTIFIC INTEREST

	General planning control	Special Amenity Area Order	Tree Preservation Order	Other recommendations	Priority
Coumshingaun corrie and lake	*			Investigation of other corries in the Comeraghs as possible alternative sites for a pumped-storage scheme	A
Coast from Tramore to Stradbally	*	Possibly			C
Quarry near Dunhill	*			Erection of small inconspicuous information notice in the quarry	C
Dungarvan Harbour	*			Eradication of Spartina within the area	A
Tramore				Eradication of Spartina within the area. Control of erosion in the Rabbit Warren Hills	A
Woodlands in the Nire Valley		*	*	Co-operation with Dept. of Lands Forestry Division	A
Kilsheelan Lake	*				C
Danes Island	*				C
Ardmore lead mine	*				C
Bunmahon sand dunes	*				A

	General planning control	Special Amenity Area Order	Tree Preservation Order	Other recommendations	Priority
Woods at Portlaw			possibly	Co-operation with landowner	C
Woods near Lismore	*		*		C
Fennor bog	*				C
Islandtarnsey fen	*				C
Belle Lake	*				C
Carrickavantry reservoir	*				C
Cliffs on Helvick Head	*				B
Cliffs at Dunmore East	*				C
Sgilloge Loughs	*				C
Coolfin marshes	*				C
Newtown Cove	*				C
Ballyeelinan	*				C
Ballymacart	*			Co-operation with landowner	C
Woods near Stradbally	*				

	General planning control	Special Amenity Area Order	Tree Preservation Order		Priority
Woods north of Youghal	*			Co-operation with landowner	C
Woods near Glenpatrick Bridge					C
River valley north of Annestown	*				C
Castlecraddock bog	*				C
Lissaviron bog	*				C
Kilbarry bog	*			Preservation of a small part of the bog as a teaching area should be considered	B
Ballinlough	*				C

APPENDIX 1

EXCURSION GUIDE TO COASTAL AREA OF COUNTY WATERFORD

TRAMORE TO STRADBALLY

Prepared jointly by Dr. Stillman, T.C.D. and Dr. Schiener, U.C.D.

GENERALISED STRATIGRAPHIC COLUMN

Old Red Sandstone		Red-bed sequence of conglomerates coarse and fine sandstones Basal conglomerate in places contains locally derived Caradocian debris
		----------unconformity
	equivalent to Carrigaghaha Series (F.C. Reed, 1899)	Acid Ash-flow sheets (?Ignibrites) Acid tuffs interbedded with silts and mudstones Andesitic tuffs and black mudstones Occasional tuff beds in sedimentary sequence Laminates - distal turbidites, and mudstones
	Tramore Limestone Series	Dunabrattin Limestone Series
		----------?unconformity
? Arenig	Tramore Slates	Not seen west of Tramore Bay

WATERFORD VOLCANICS - MODE OF OCCURRENCE

(Caradocian)

A) Syndepositional

1) Basic and Intermediate

Submarine			Subaerial	Intermediate & Deep Intrusions
centres of eruption		flows with no discernable focus		
shallow intrusions into wet sediment		extensive tuff (hyaloclastic) & agglomerate beds, & mud-flow breccias		gabbro bosses
agglomerate	breccia necks	pillow lavas (shallow intrusives)		

2) Acid

Submarine			Subaerial	Intermediate & Deep Intrusions
centres of eruption		flows with no discernable focus	ash-flow tuffs rhyolite (ignibrites) lava ash-fall tuffs flows (?shallow water)	flow-banded rhyolite & quartz-feldspar porphyry dykes, sills (feeders).
breccia necks	plugs containing sedimentary fragments	ash-flow tuffs agglomerates & polymict tuffs down-slope lava flows		

B) Post-Depositional

(possibly Hercynian)

dolerite dykes and sills
intrusive gas-breccia zones

OUTLINE OF GEOLOGY

At Tramore unfossiliferous Tramore Slates underlie the Tramore Limestone Series. The status of the break between is uncertain, there is a structural discontinuity and possibly a stratigraphic one also. The slates have been ascribed to the Ashgill, on no very good evidence, by earlier workers. The Limestones yield a good fauna of brachiopods and trilobites and have been subdivided into three stages by Reed (1899). Lithologically similar calcareous beds are seen at Dunabrattin Head, with a similar fauna. Above these are developed laminites, probably representing distal turbidites and mudstones. These sediments are well exposed on Knockane and Moarageeha strands.

Tuff horizons appear some distance above the limestones, probably at different horizons at different localities along the section. The frequency of tuff beds increases upwards and the pyroclastics are joined by basaltic and andesitic 'lavas'; these often show pillowed tops, which are apparently intrusive into the overlying bedded strata and it is postulated that they represent shallow intrusions emplaced laterally into waterlogged and unconsolidated sediment

or tuff. The validity of this supposition is borne out by abundant evidence of small sheet intrusions breaking up and sinking into the underlying sediments. The whole of this phase of volcanicity is submarine.

Still higher in the sequence, acid tuffs appear interbedded with the sediment; these are submarine still, but ash-fall tuffs, such as those at Dunhill Castle, indicate that in some locations the water is very shallow, and, in the western part of the area near Bunmahon, extensive sheets of rhyolitic tuff appear to be ignimbrites, indicating emergence of a land mass - probably of one or more volcanic islands. These sheets transgress across marine sediments and volcanics, but are involved in the Caledonide deformation which affects all the Ordovician strata.

Piercing the sediments and tuffs (though not the ignimbrites, so far as has yet been detected) are intrusive vents, which sometimes include masses of sediment in a form which suggests that they were emplaced whilst the sediment was unconsolidated. There are also rhyolite feeder dykes and rhyolite and quartz-porphyry sheet intrusions, as well as some large, gabbroic intrusions. The igneous history ends with the emplacement of a series of dolerite dykes which are not affected by the Caledonide deformation and appear to be related to faults of presumed Hercynian age. Gas intrusion-breccias are localised along some of these faults.

A noteworthy feature is the presence of two outliers of Red-beds, presumed to be of Old Red Sandstone age, which are lithologically very similar to the basal beds of the Old Red Sandstone as seen at Ballyvoyle Head, at the western end of this coastal section. The red-beds lie unconformably on the Caradocian succession, reddening the underlying strata and in some places possessing a basal conglomerate with locally derived fragments of Ordovician rocks. Both outliers are fault-bounded.

ITINERARY

Route from Tramore westwards, along T63, with deviations off to the named localities.

Follow T63 westwards from Tramore for approximately $\frac{1}{2}$ mile, then fork left towards Garrarus. An Caher Bridge (X548 993) turn left down road marked Garrarus Strand.

Locality 1 — Garrarus Strand (X551 982) - observe a volcanic centre, possibly the roots to a vent. Descend by path to beach; see coarse volcanic breccias, note dips. West of beach entrance see abundant intrusions which were emplaced in wet sediment. At east end of strand, proceed round headland to small cove, where a large number of dykes are concentrated. These may well be feeders to an eruptive vent; the dyke density here is much greater than usual. There are also abundant and irregular masses of black shale caught up in intrusive bodies.

Return to T63 via Garrarus Crossroads and pass through Fennor; continue westwards for approximately 1 mile, then turn off right to Dunhill Castle.

Locality 2 — Dunhill Castle Quarry (S 507 007)

The quarry is situated on the east bank of Annestown Stream, about 45 yds north of Woodstown House Bridge.

PLEASE DO NOT HAMMER THE QUARRY FACE

In this quarry the Dunhill Castle Tuffs may be seen; 5 beds of acid tuff are visible, each grading from lapilli tuff at the base to fine tuff at the top. The tuffs are poorly sorted, even the coarsest contains more than 50% fine ash (less than $\frac{1}{2}$ mm); there is a complex repetition of grading which, with the poor sorting, the lithologies of the particles and the indistinct mixed passage from one grade unit to another within the individual beds, suggests that each bed of tuff is the product of a number of successive ash falls, the sorting being carried out in the vertically erupted ash column. The fine tops to the beds have sorting and bedding features which suggest that the tuffs fell into water and when the pyroclastic showers ceased for a time, the finer material settled and the tops of the beds were re-worked. A further obvious feature is the scatter of blocks of collapsed pumice and rhyolite which are concentrated in the fine tops. Note the impaction structures below the lithic blocks. The presence of the pumice

blocks can be explained if the tuffs were deposited in sufficient depth of water to delay the arrival of the pumice till the bulk of the lapilli had settled. The rhyolite blocks are presumably the precursors of subsequent eruption but the impact structures developed in unconsolidated tuff prove the time interval to be short. Microscopic examination shows moulding and welding of shards in the lapilli tuff and the lapilli are mainly of dark, chloritic, compressed pumice or of highly vesiculated pale rhyolite.

Return to T63 and continue through Annestown to Dunabrattin Head.

Locality 3 Knockane Strand (X477 984)

Walk down to Boat Strand Harbour, then follow the shore line north-east along Knockane Strand.

On Dunabrattin Head are calcareous rocks equated with the Tramore Limestones. The northern-most outcrop is seen immediately south of the harbour. At Boat Strand and Knockane Strand examine the laminites and mudstones. These were placed by Reed (1899) below the calcareous beds, but critical examination of the outcrops along the southern edge of the harbour suggest an anticlinal closure such that the argillaceous beds are in fact equivalent to the Carrigaghalia Series, overlying the limestones. The argillaceous beds belong to a turbidite and laminite facies and comprise black slates and laminated siltstones all showing a great deal of contemporaneous disturbance; intraformational slate conglomerates and breccias are formed in the black slates and ball and pillow structures, convolution and a variety of bottom structures in the laminated siltstones.

Occasional seismite structures are found. Caledonian structures with tight, sometimes overturned folds and considerable thrusting, are seen and a good cleavage is developed in the slate.

At the eastern end of the strand are a variety of intrusions and in Morageeha Strand (some 700 yds further on) are 'lavas' and tuffs interbedded with the sediments.

Return to the road and continue towards Bunmahon. At (X442985) the road takes a sharp right-hand turn just before descending into Knockmahon, leave the vehicle and walk down to the shore along a cliff path past the old Knockmahon mine engine house, to the east of Stage Cove.

Locality 4 — Stage Cove East (X447 984)

Descend a headland of amygdaloidal andesite cut by intrusions of quartz-feldspar porphyry and massive diorite. This sequence is faulted with much shattering against sediments to the east, and the fault place is very heavily mineralised with dominant chalcopyrite and pyrite; the wall rocks are considerably altered. This constituted one of the principal mineral lodes mined extensively in the 19th Century. The sediments are siltstones with calcareous bands containing a shelly fauna not unlike that of Dunabrattin Head; they are underlain by amygdaloidal andesites, seen on the foreshore, and overlain by acid volcanics.

To the east the sediments are downfaulted to beach level and the whole cliff is made up of a massive columnar-jointed rhyolite sheet. This is believed to be an ash-flow sheet and evidence of a sillar base may be seen if the shingle beach is excavated. This sheet overlies the succession of interbedded sediments and andesites, and forms the majority of inland outcrops here.

Return to the road and follow T63 through Bunmahon. At the west end of the village the road swings sharply to the right and a cliff track climbs up to the left. Follow this track on foot for approx. 600 yds.

Locality 5 — Bunmahon Head (X428 982) (see locality map 5)

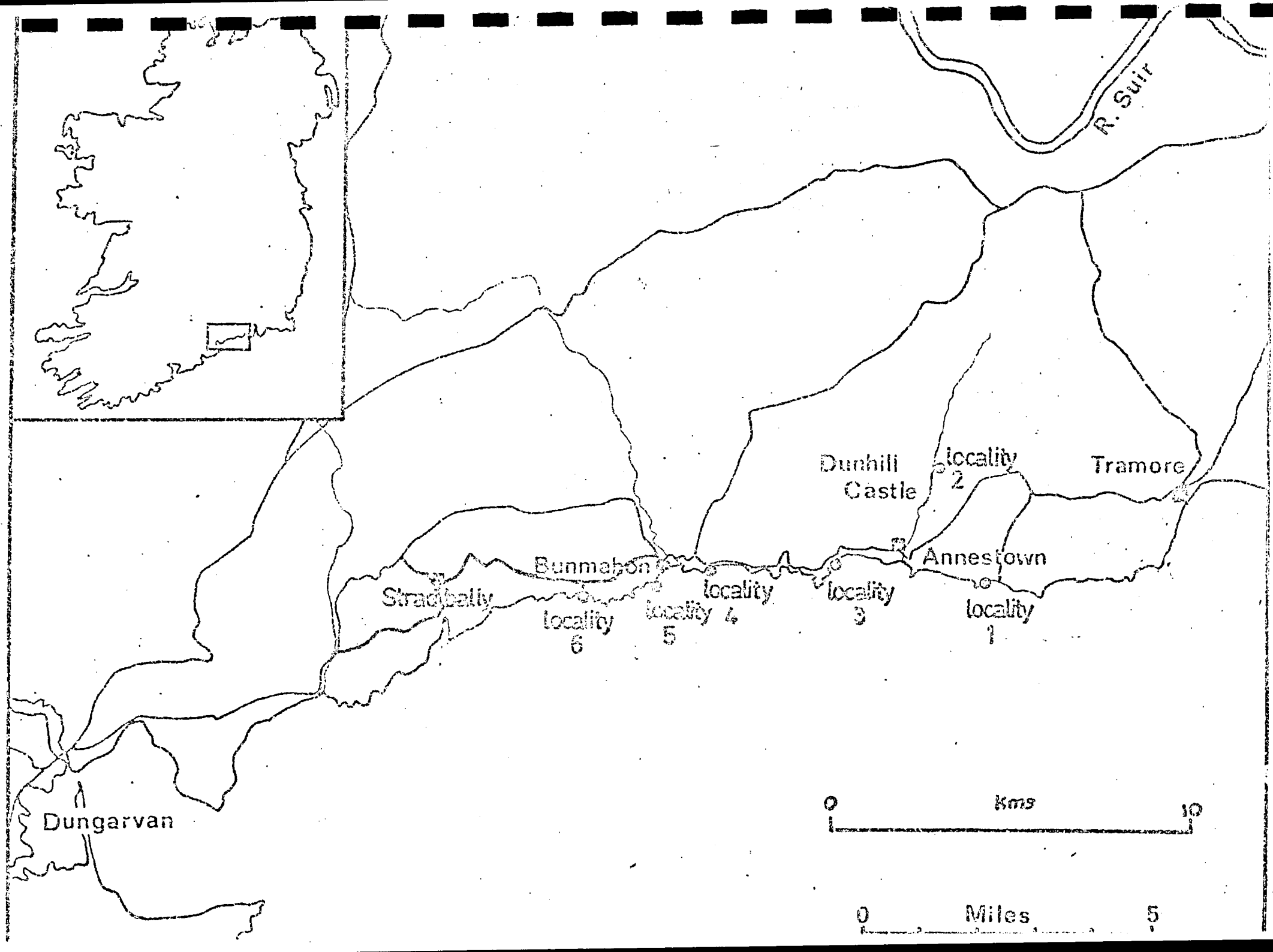
Bunmahon Head itself is composed of almost vertical red-bed facies conglomerates and coarse and fine sandstones, of presumed Old Red Sandstone age, which show many interesting bedding features, sole markings, etc. The base is marked by an angular unconformity with underlying andesitic lavas, pillow breccias and tuffs which form a wave-cut platform on the south-east of the Head. Reddening of the volcanics is seen for some feet from the contact. The red beds are

terminated landwards by a NE/SW fault inclined at approx. 45° to the south, which develops an extensive breccia zone. West of the Head, in Trawnamoe strand is seen a succession of andesitic tuffs intruded by a shallow intrusive or 'lava' with a well defined pillowed top, which forms a marker horizon for some distance to the west. The succession dips northward into an inclined fault plane which is probably a continuation of the fault which terminates the red beds, and to the west is associated with an intrusive gas breccia. A quartz-feldspar porphyry intrudes the andesites but is probably truncated by the inclined fault.

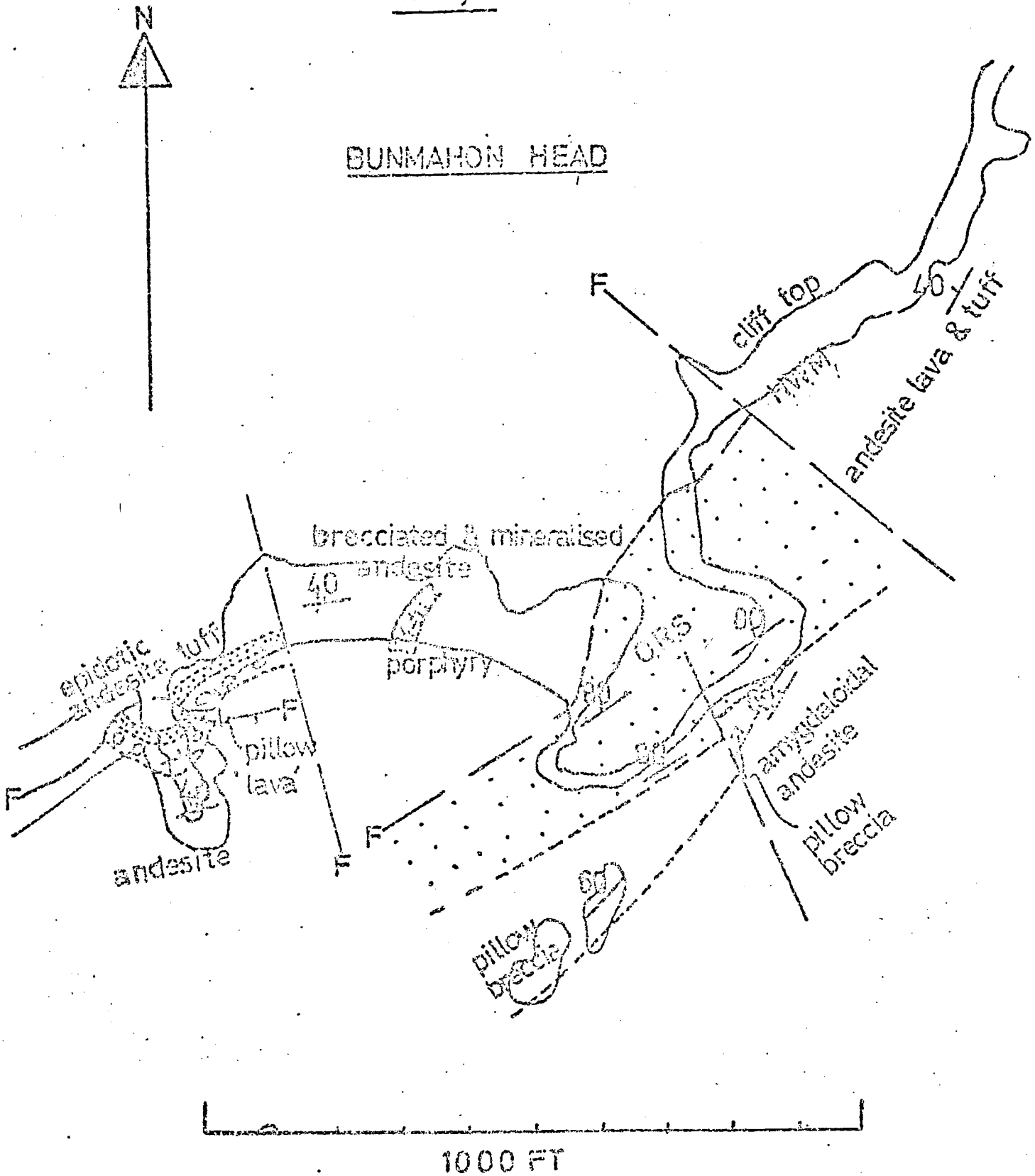
Return to Bunmahon, follow the main road (T63) for approx. 100 yds then fork left to follow the coast road to Stradbally. Approximately 2 miles further on follow sign post to Ballydowane Bay, down access road to the left, as far as the car park.

Locality 6 — Ballydowane Bay (X408 978) (see locality map 6)

Red beds of presumed Old Red Sandstone age occupy most of the northern side of the bay; in the east they dip steeply northward or are vertical, and unconformably overlie pillowed and brecciated andesites and tuffs. The contact and basal conglomerate can be seen in the NE corner of the beach. 200 yds to the SE, a fault brings back the red-beds, again dipping vertically. West of the beach entrance the red beds dip much less steeply to the NE, and in the foreshore the unconformity can be seen again but here the underlying beds are thin-bedded heavily epidotised tuffaceous and calcareous sediments. The western limit of the red-beds is a major north-south fault to the west of which is seen a succession of pillow lavas, overlain by bedded tuffs and agglomerates which pass up to the thin-bedded epidotised sediments. It is possible that the pillowed sequence may be correlated with that of Bunmahon, in which case the calcareous sediments are probably higher in the sequence than the Tramore Limestones.


R. Suir
Dunhill Castle
locality 2
Tramore
Annestown
Bunmahon
Stradbally
locality 6
locality 5
locality 4
locality 3
locality 1
Dungarvan
0 Kms 10
0 Miles 5

Locality 5


N
BUNMAHON HEAD
F
cliff top
40
andesite lava & tuff
brecciated & mineralised andesite
40
epidotic andesite tuff
porphyry
F
pillow lava
andesite
F
F
amygdaloidal andesite
pillow breccia
pillow breccia
1000 FT

APPENDIX 2

FIGURES 1 - 26

Fig. 1 Distribution of Saxifraga spathularis in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

Each symbol on the map records the presence of this species in a 10-kilometre square of the Ordnance Survey National Grid, which was extended to cover Ireland for the purpose of this survey.

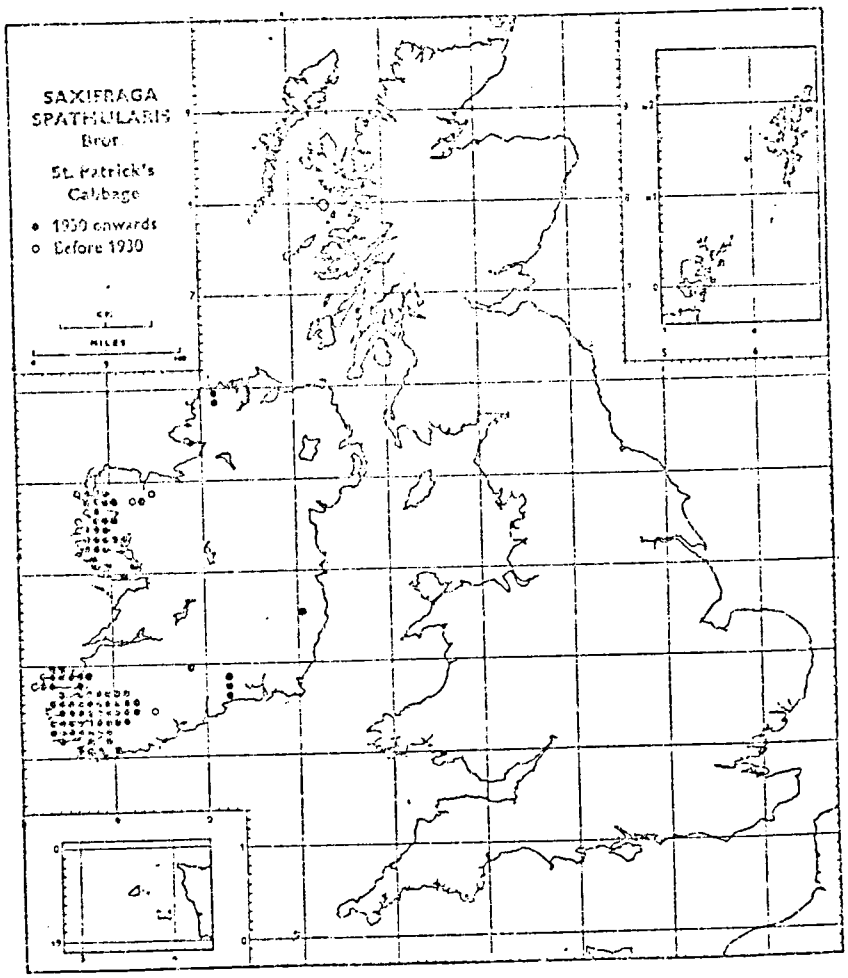


Fig. 2 Distribution of Juncus acutus in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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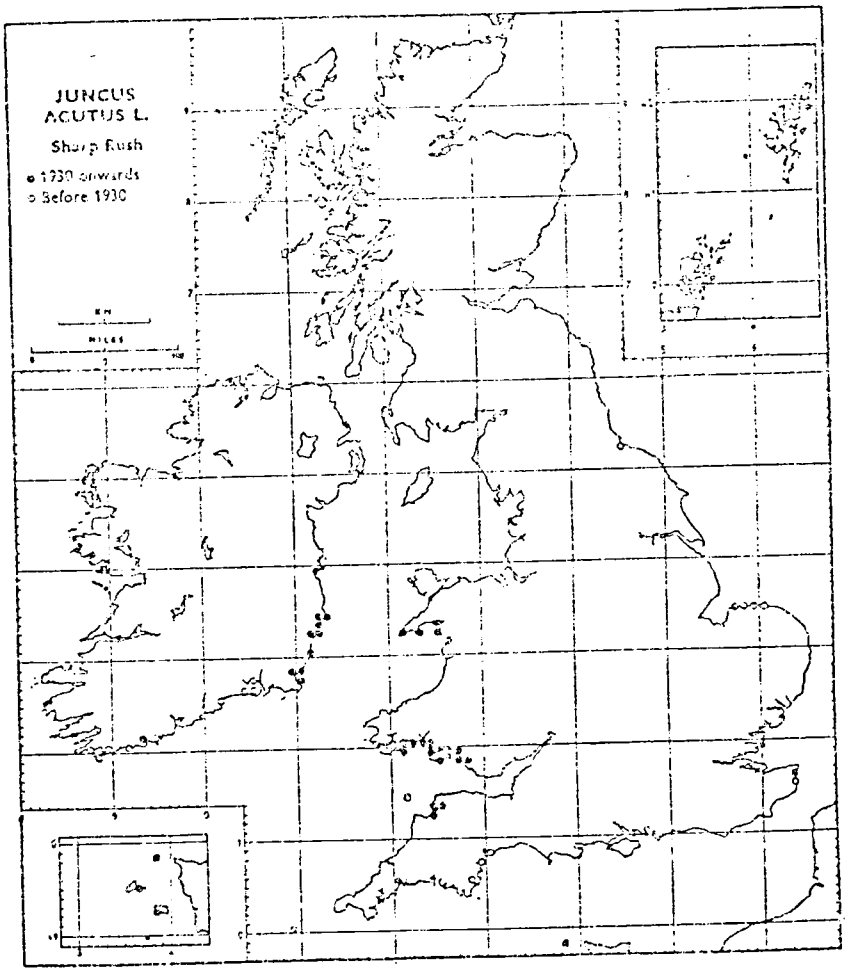

Fig. 3 Distribution of Myosotis ramosissima in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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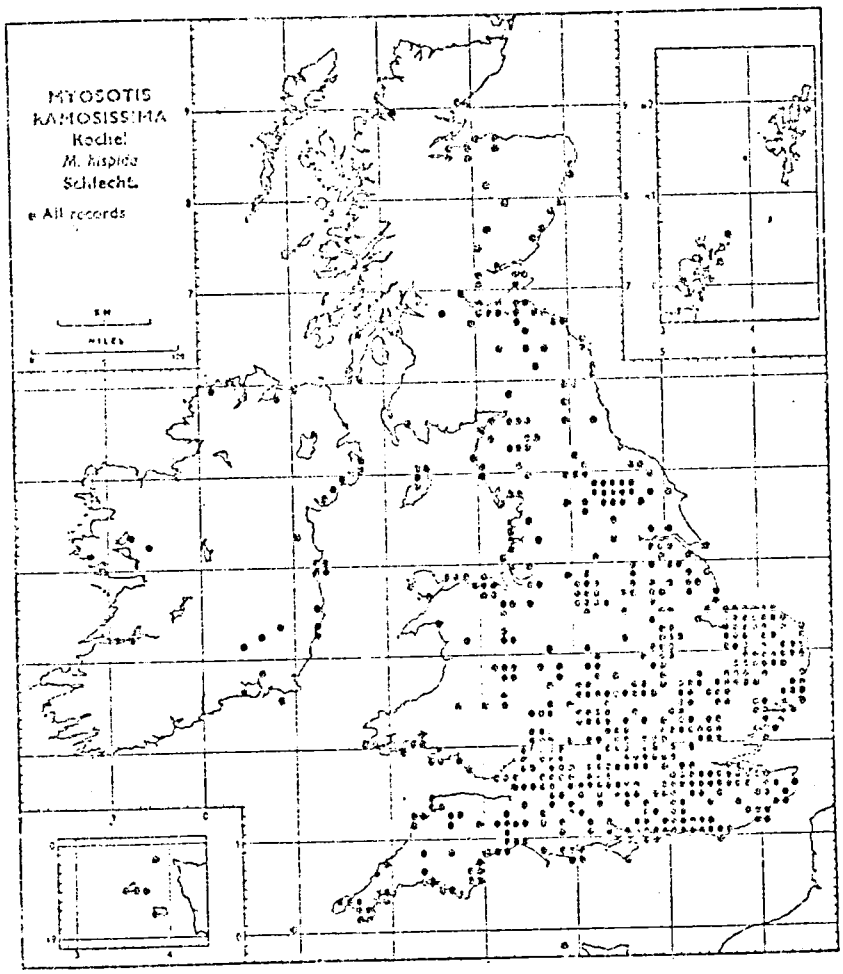

Fig. 4 Distribution of Asparagus officinalis in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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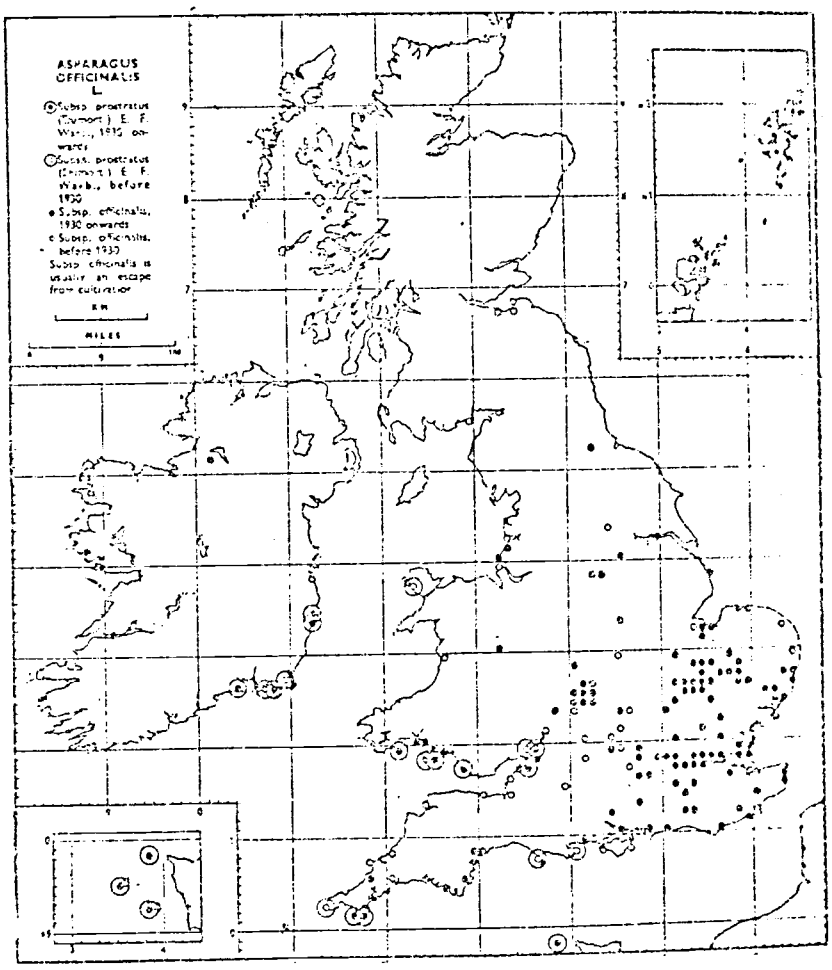

Fig. 5 Distribution of Brachypodium pinnatum in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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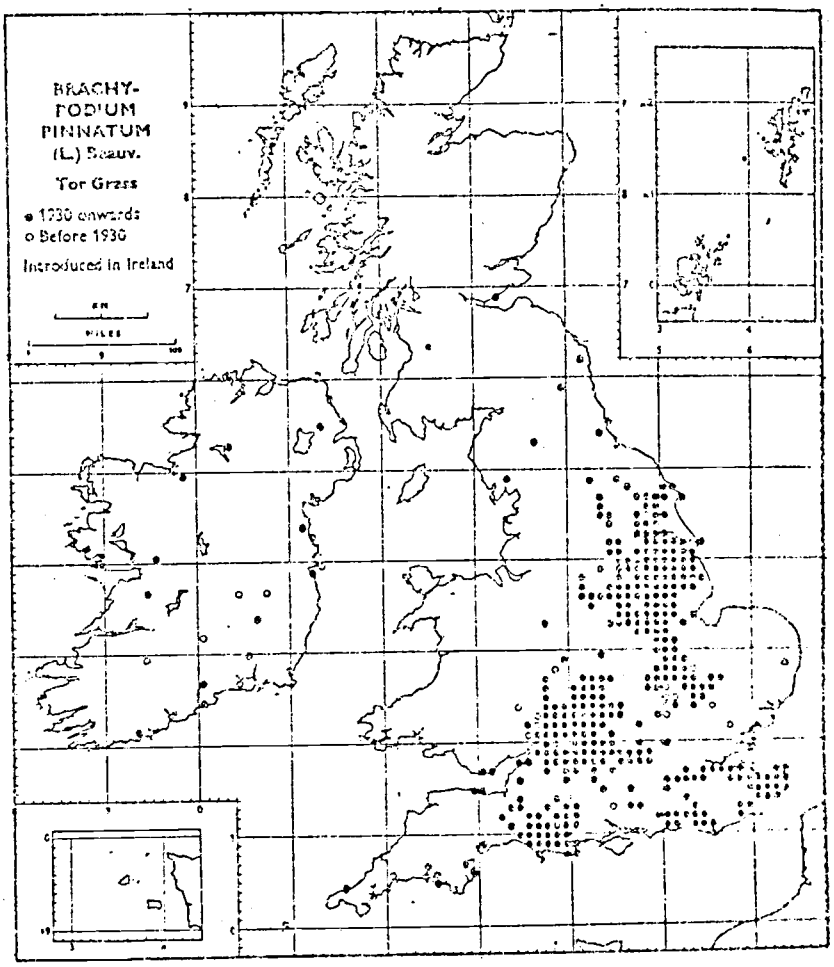

Fig. 6 Distribution of Cuscuta epithymum in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

Each symbol on the map records the presence of this species in a 10-kilometre square of the Ordnance Survey National Grid, which was extended to cover Ireland for the purpose of this survey.

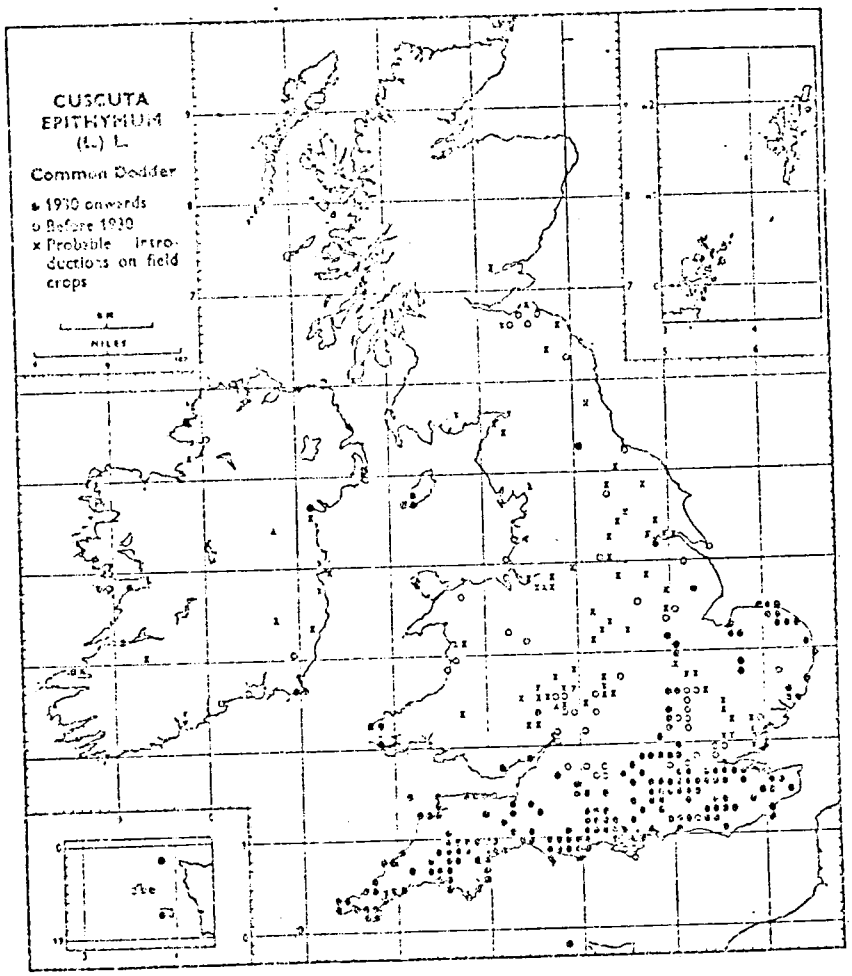

Fig. 7 Distribution of Euphorbia hyberna in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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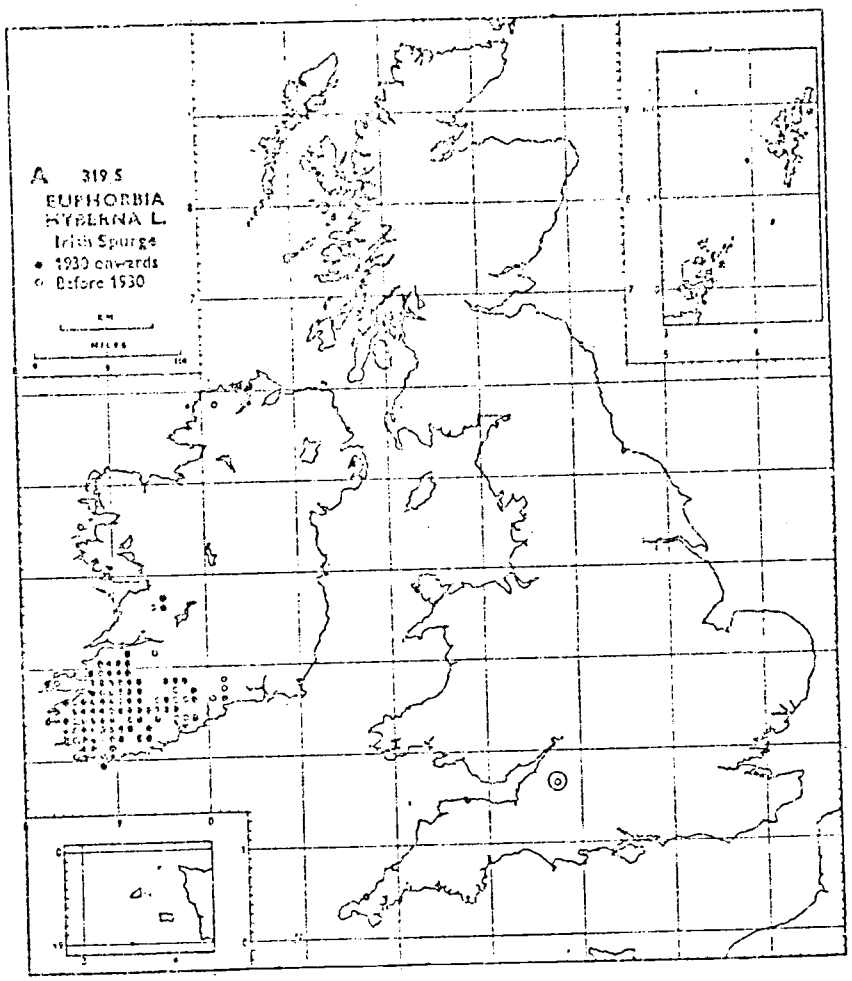

Fig. 8 Distribution of Lamium amplexicaule in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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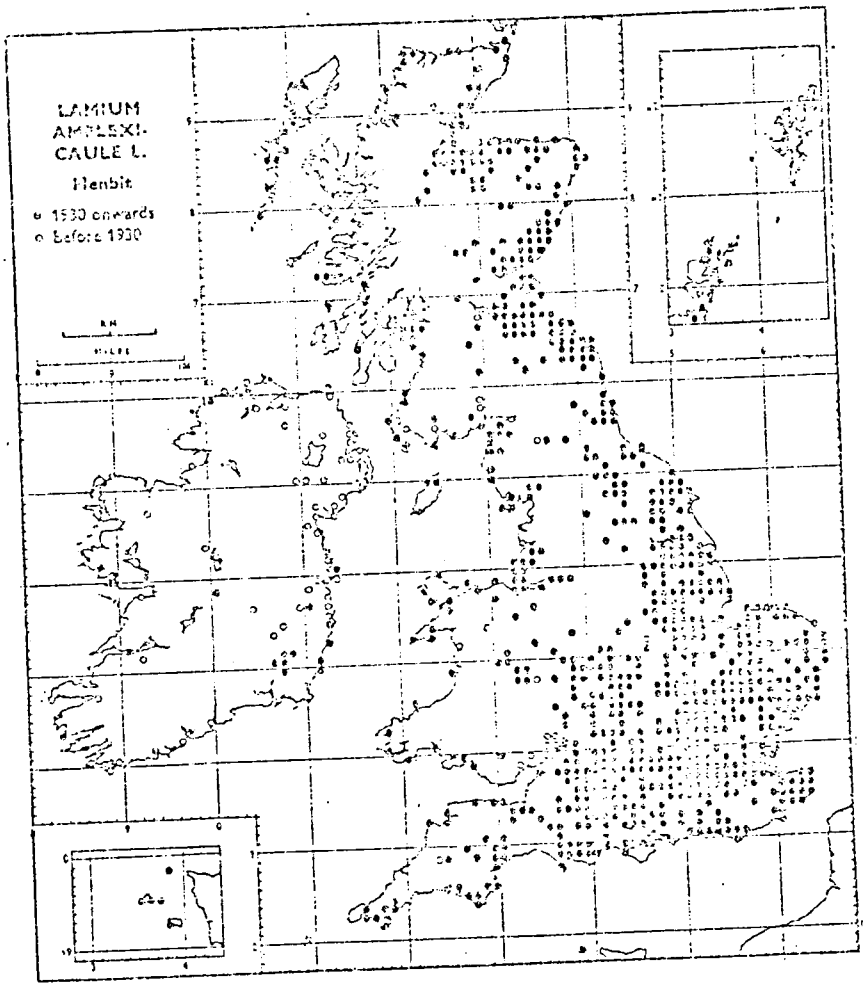

Fig. 9 Distribution of Lupinus arboreus in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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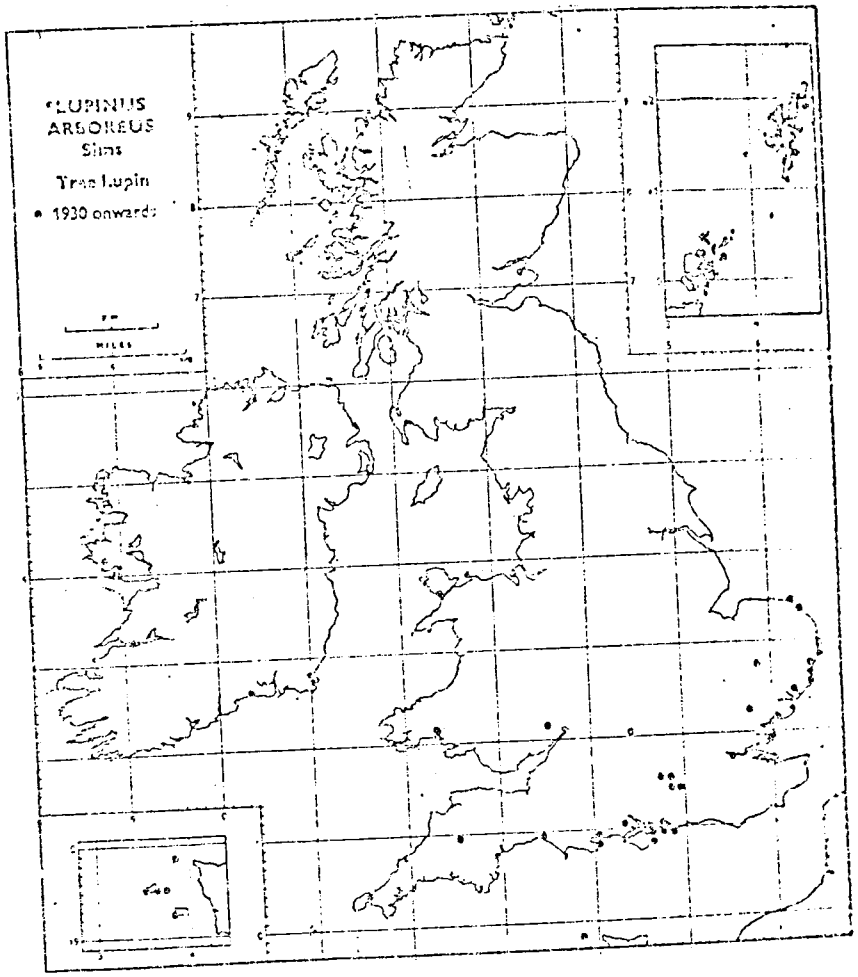

Fig. 10 Distribution of Lycium spp. in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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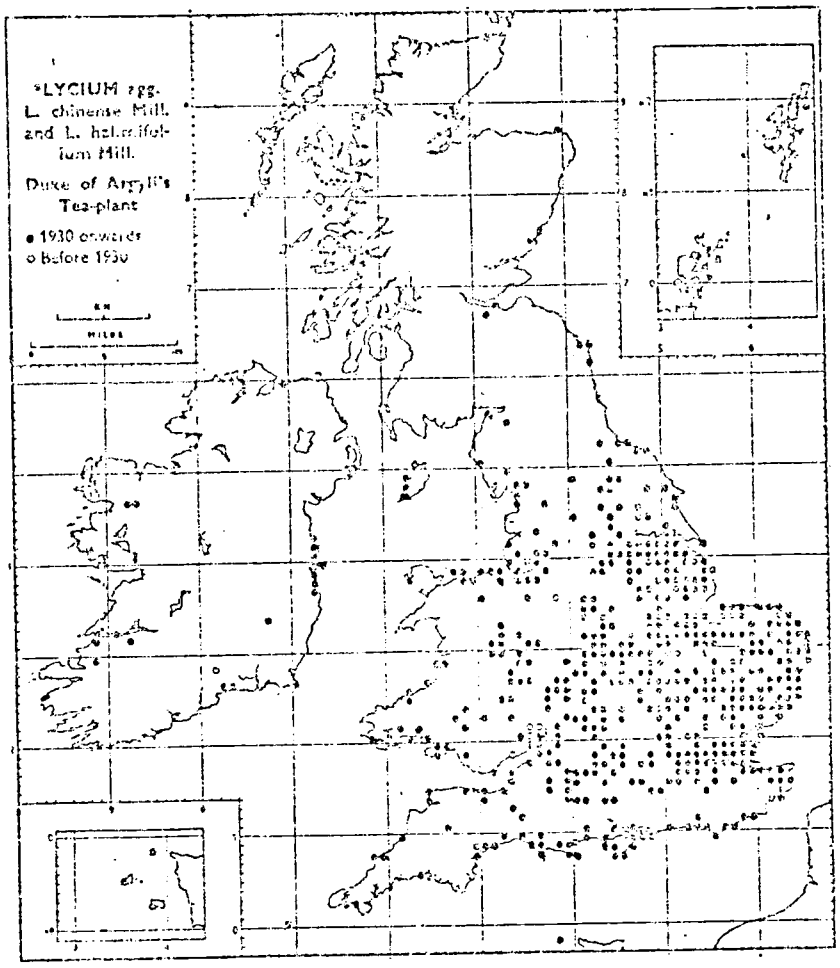

Fig. 11 Distribution of Trifolium medium in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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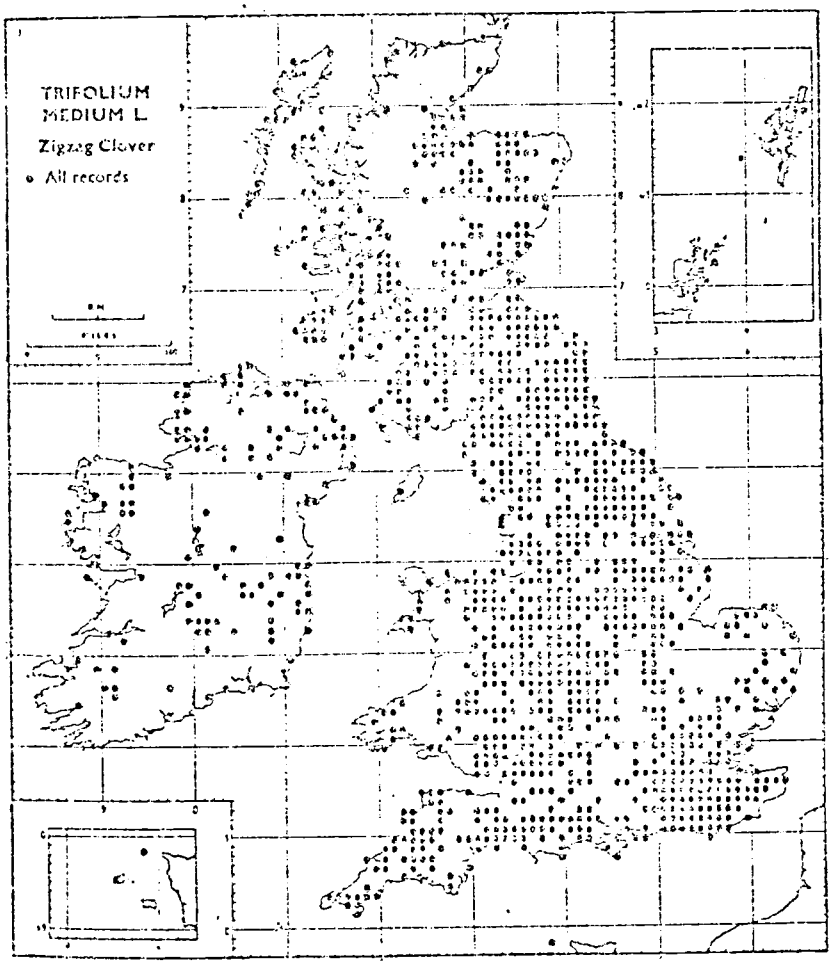

Fig. 12 Distribution of Spiranthes spiralis in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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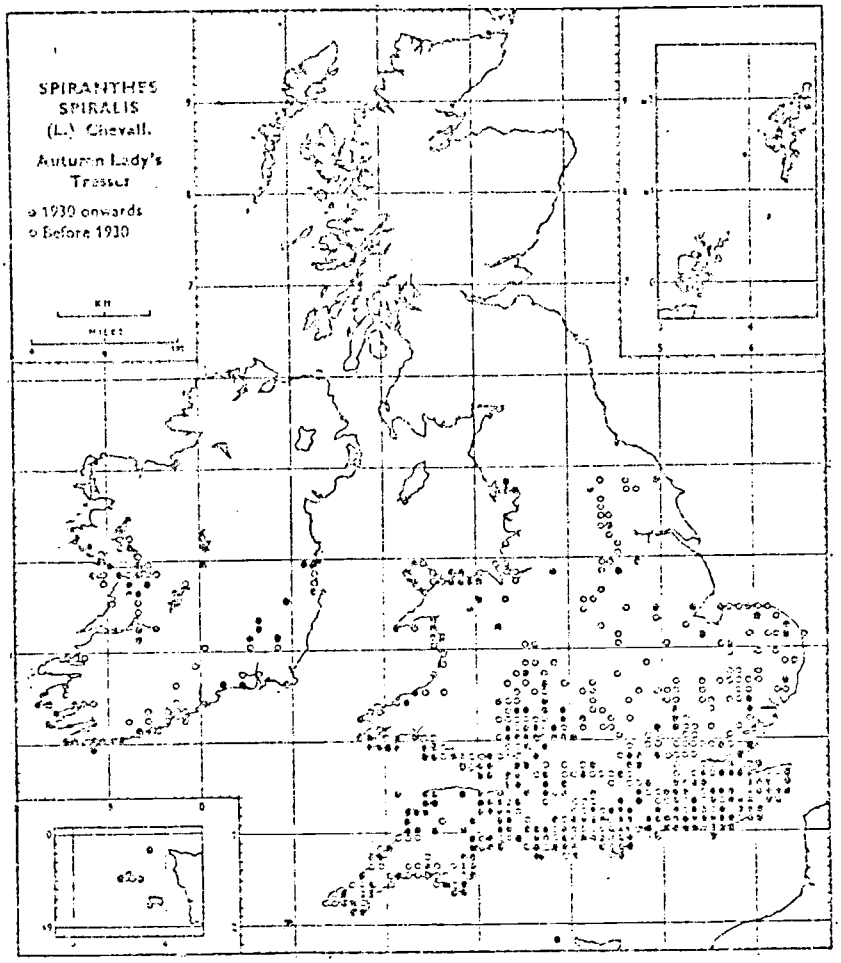

Fig. 13 Distribution of Hypericum elodes in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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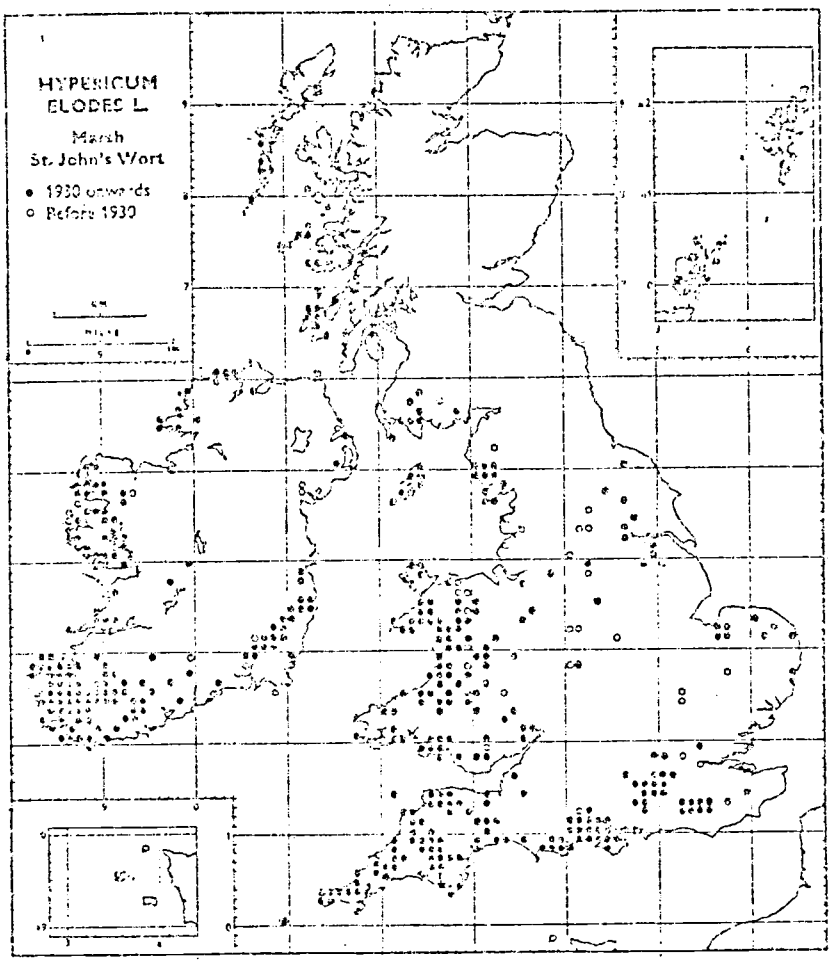

Fig. 14 Distribution of Typha angustifolia in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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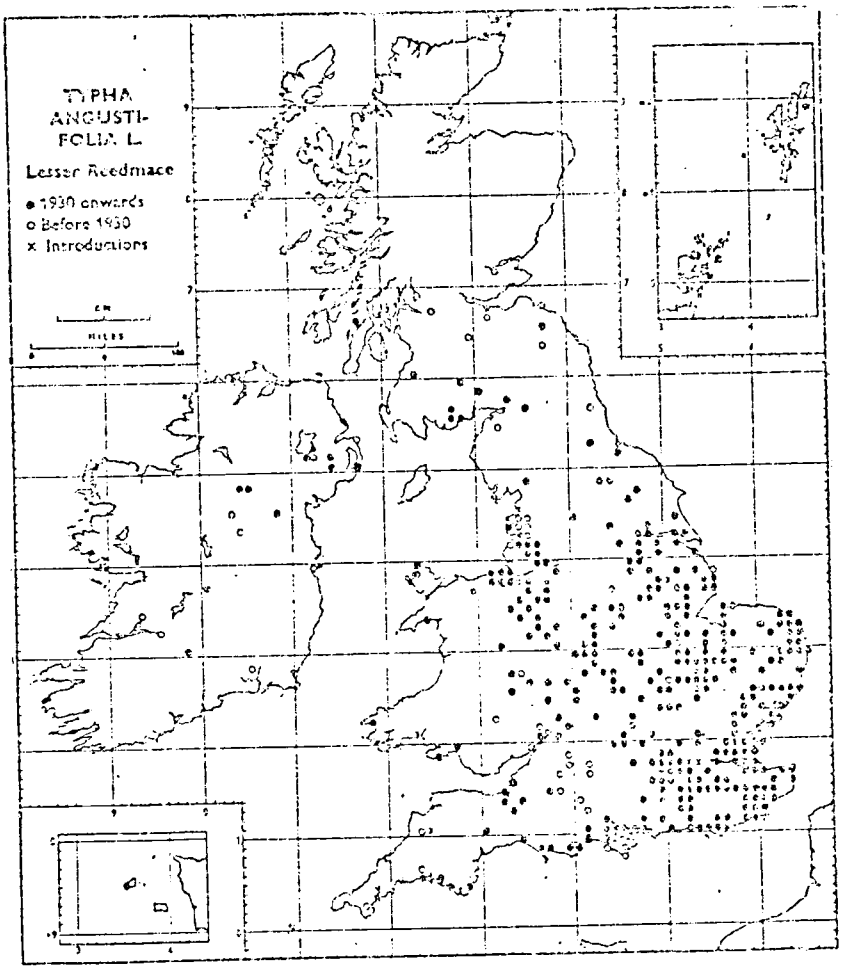

Fig. 15 Distribution of Ranunculus trichophyllus in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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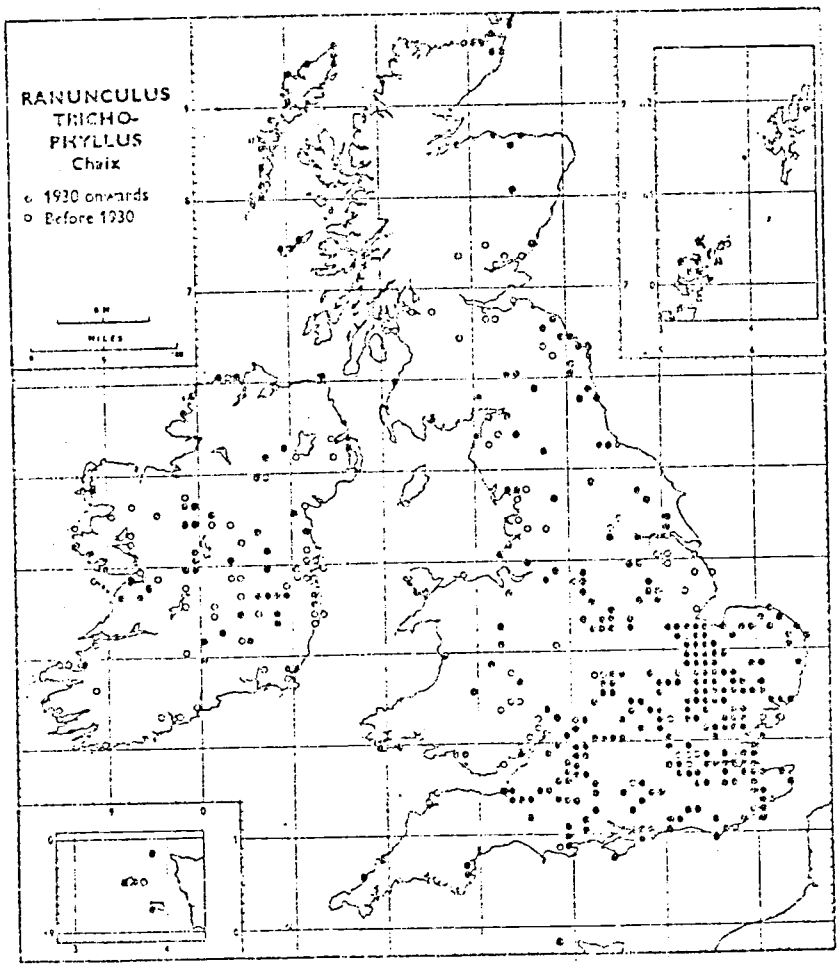

Fig. 16 Distribution of Utricularia vulgaris in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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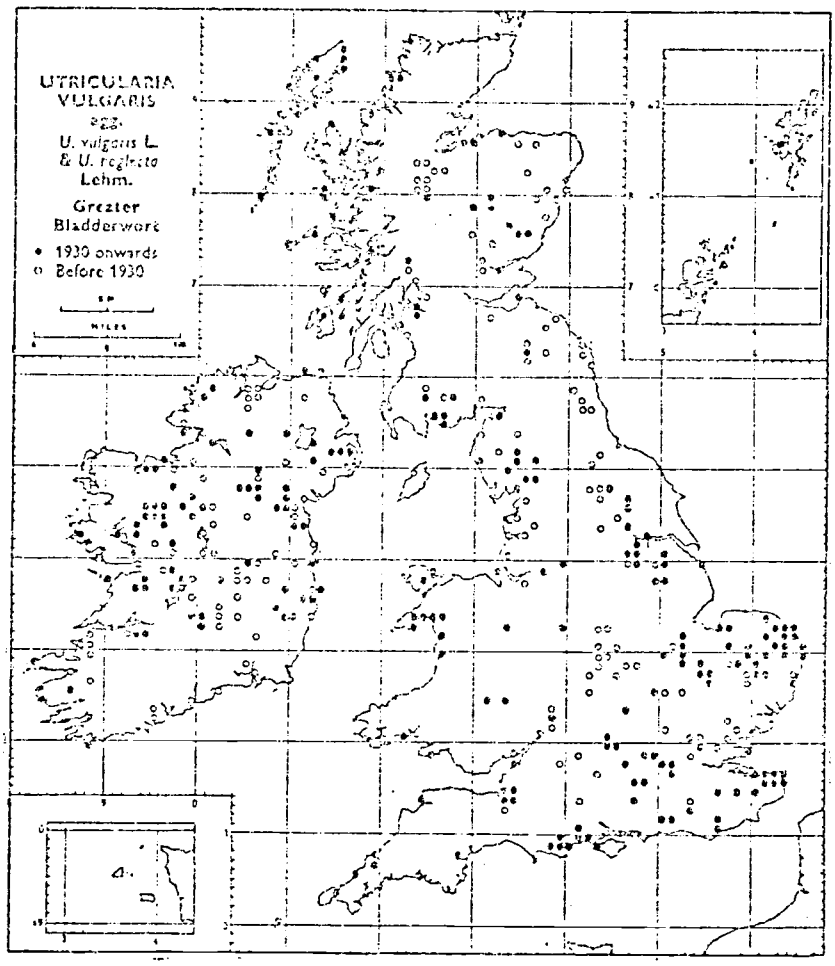

Fig. 17 Distribution of Littorella uniflora in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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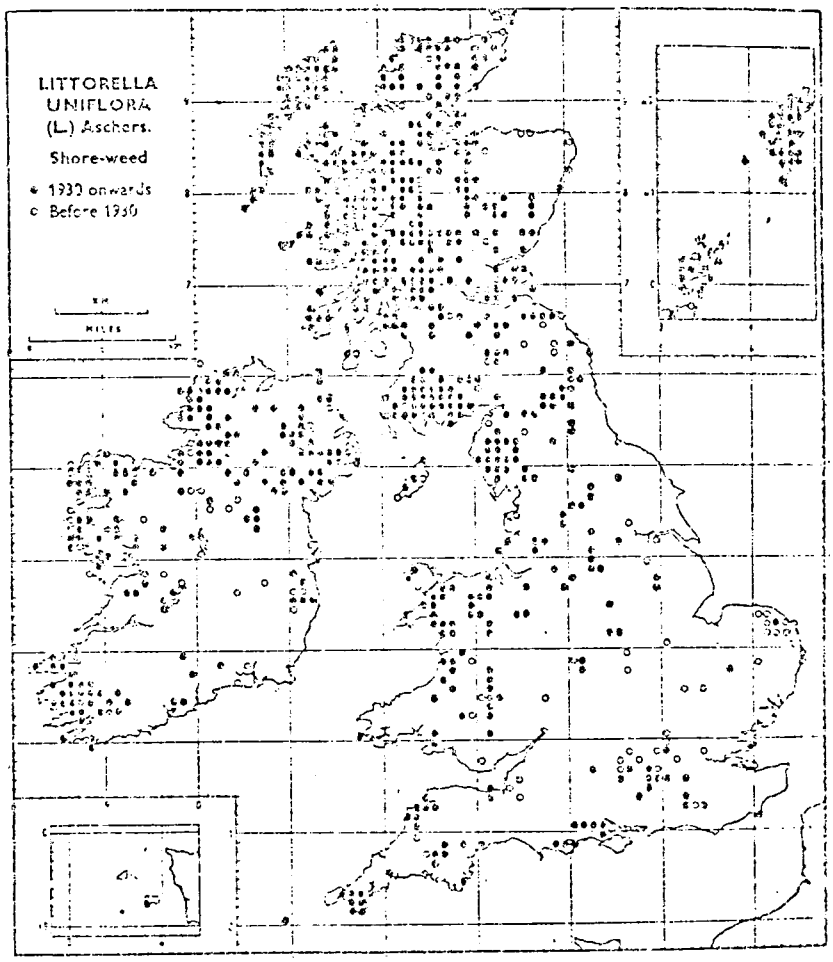

Fig. 18 Distribution of Baldellia ranunculoides in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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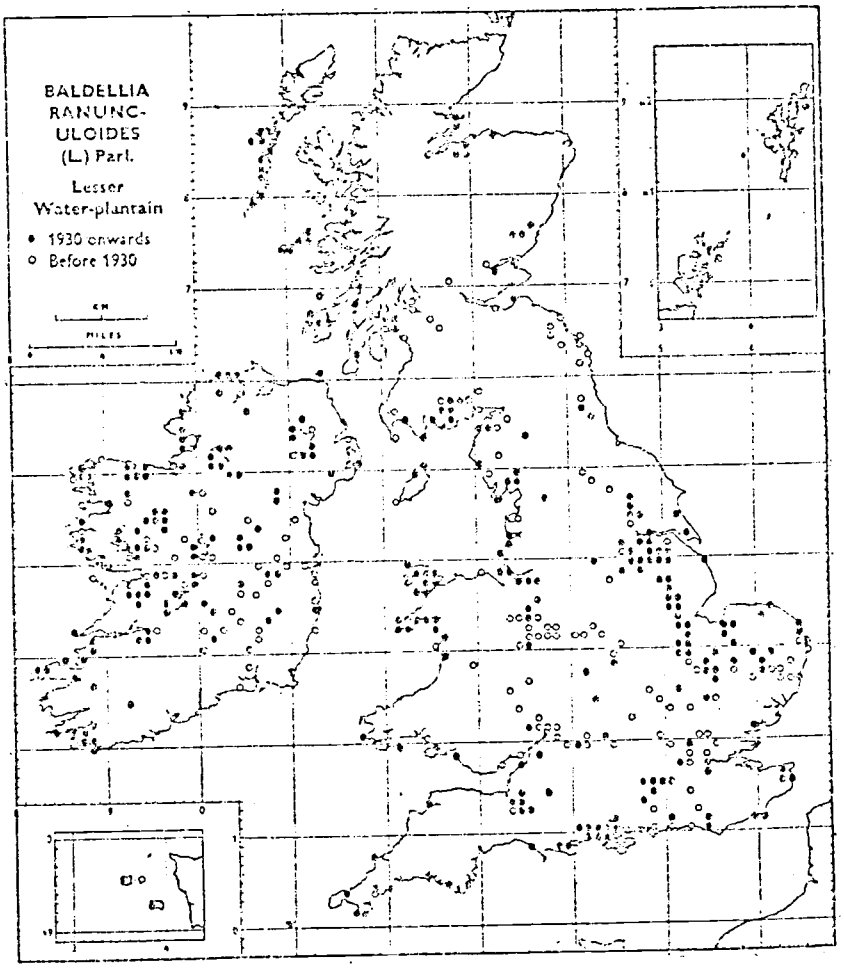

Fig. 19 Distribution of Potamogeton perfoliatus in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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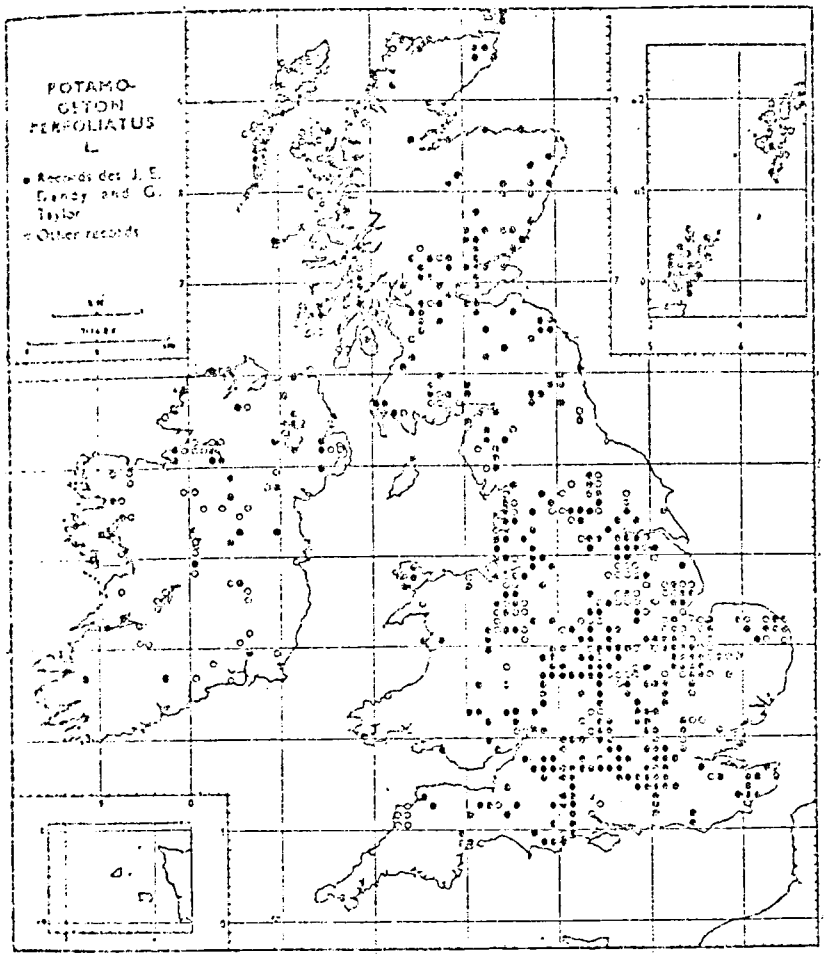

Fig. 20 Distribution of Potamogeton berchtoldii in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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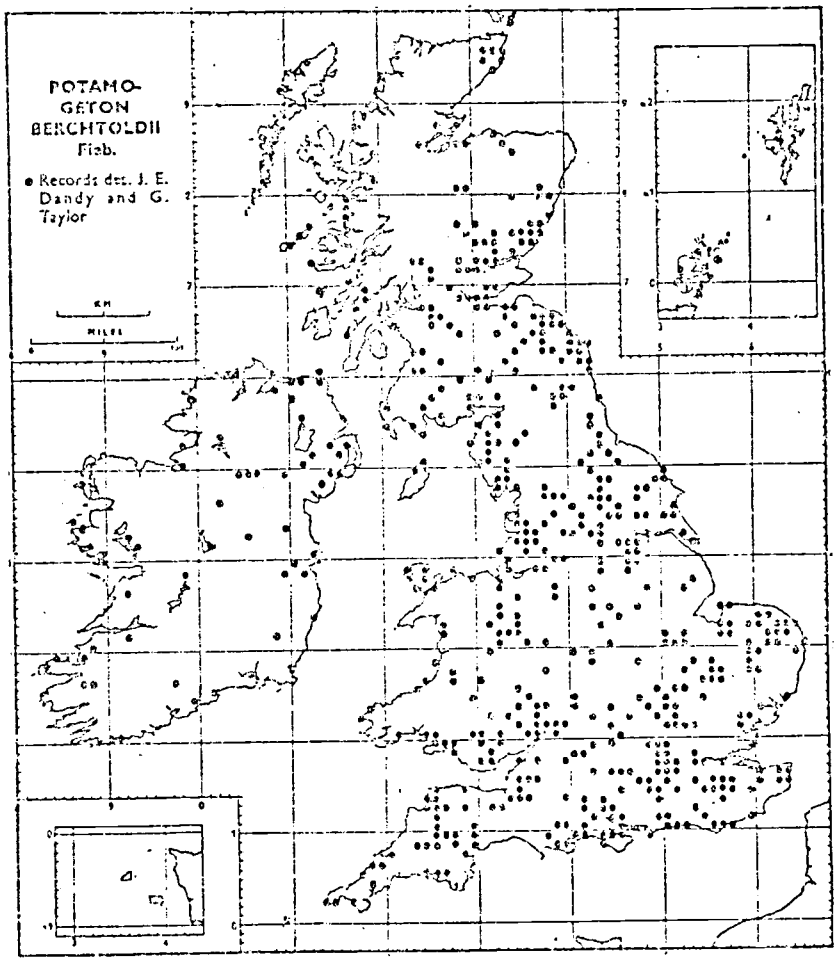

Fig. 21 Distribution of Potamogeton obtusifolius in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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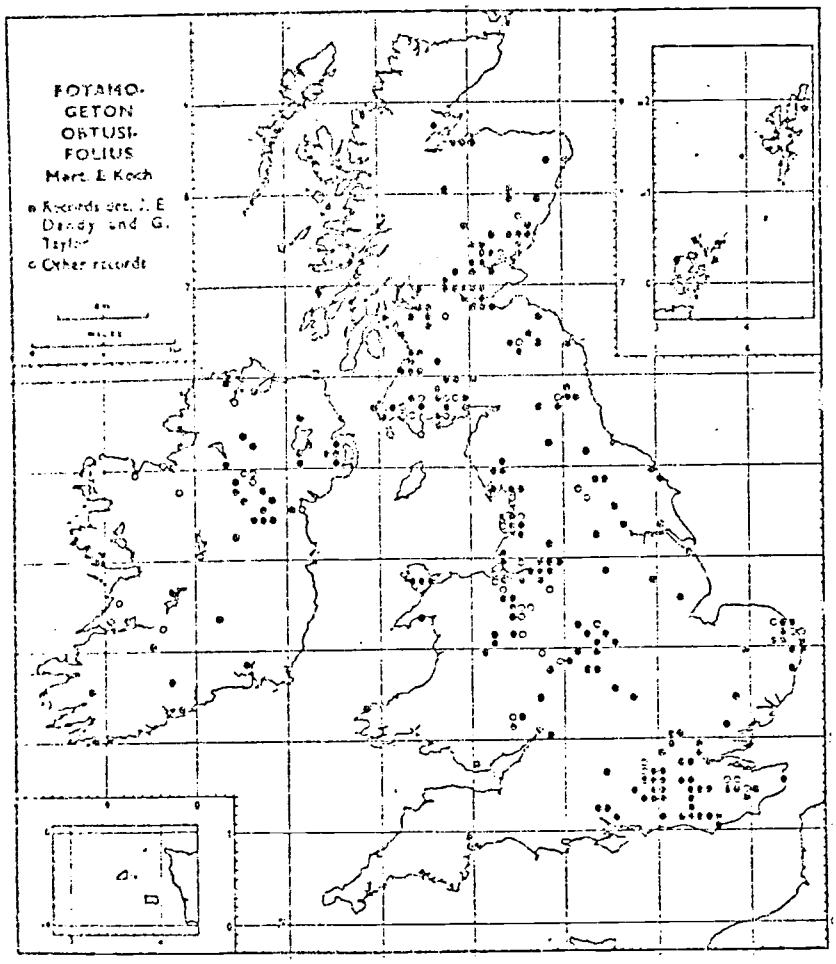

Fig. 22 Distribution of Sparganium emersum in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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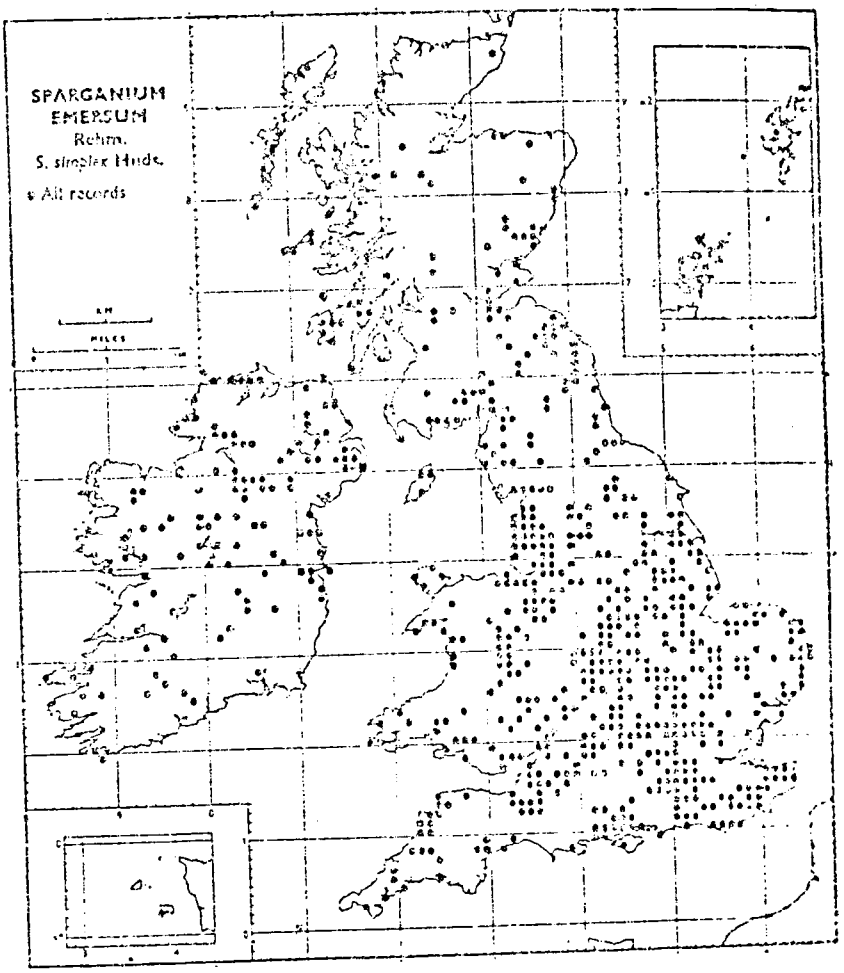

Fig. 23 Distribution of Sparganium minimum in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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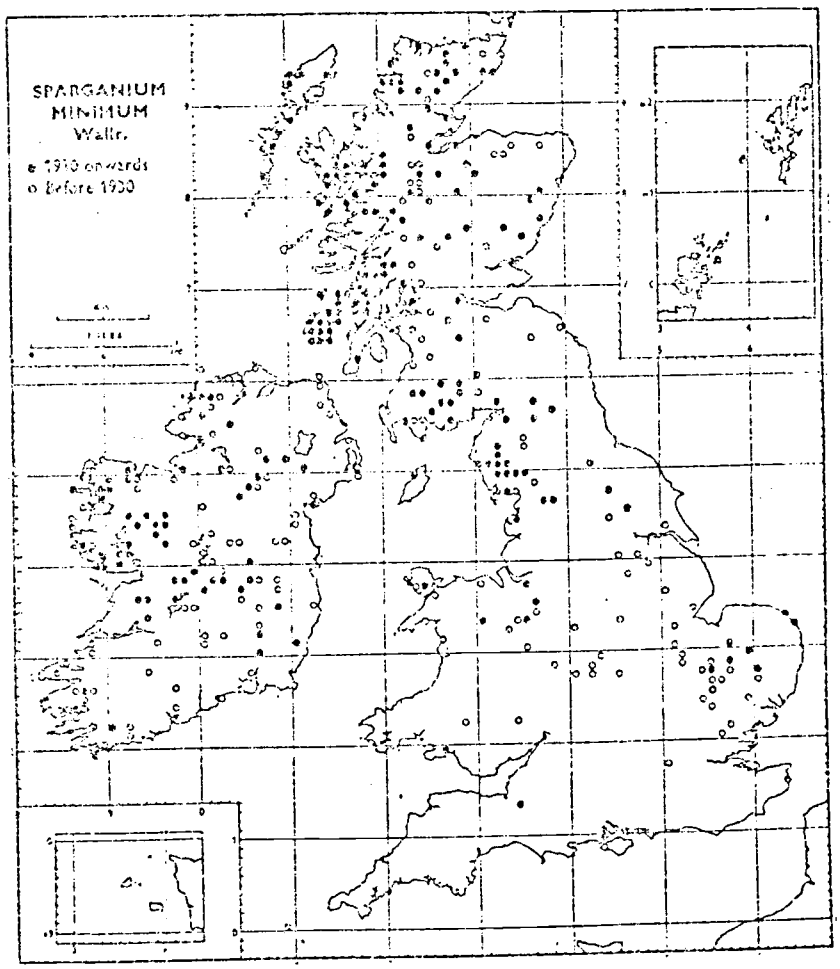

Fig. 24 Distribution of Eleogiton fluitans in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

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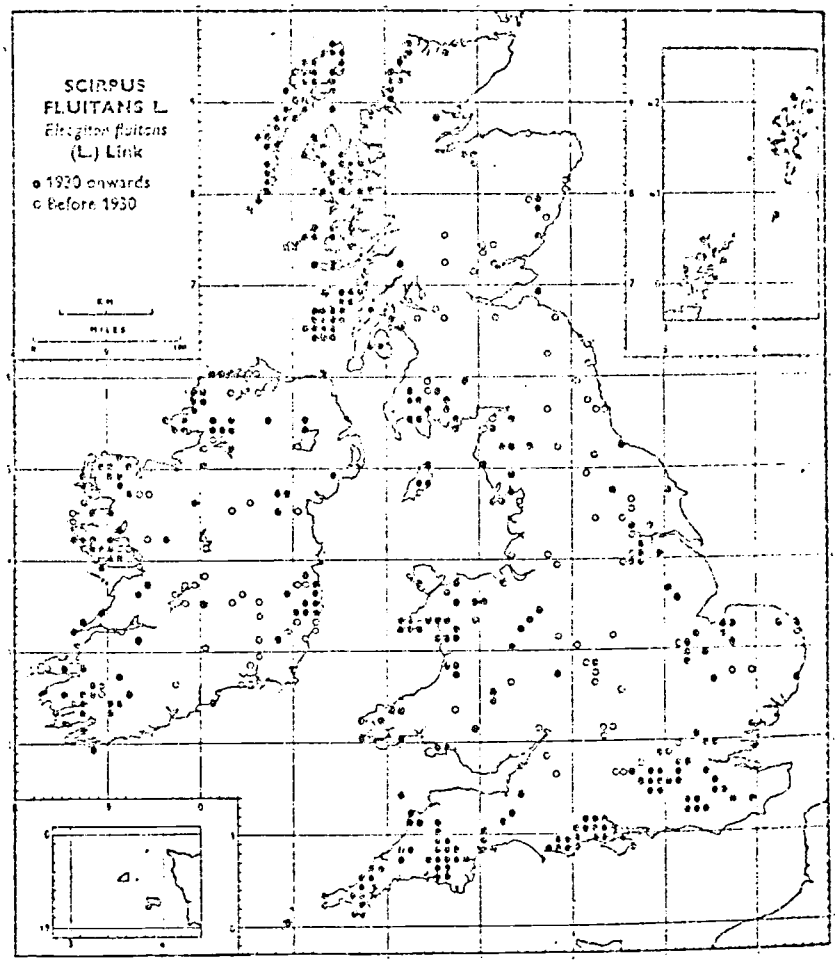


Fig. 25 Distribution of Myrica gale in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

Each symbol on the map records the presence of this species in a 10-kilometre square of the Ordnance Survey National Grid, which was extended to cover Ireland for the purpose of this survey.

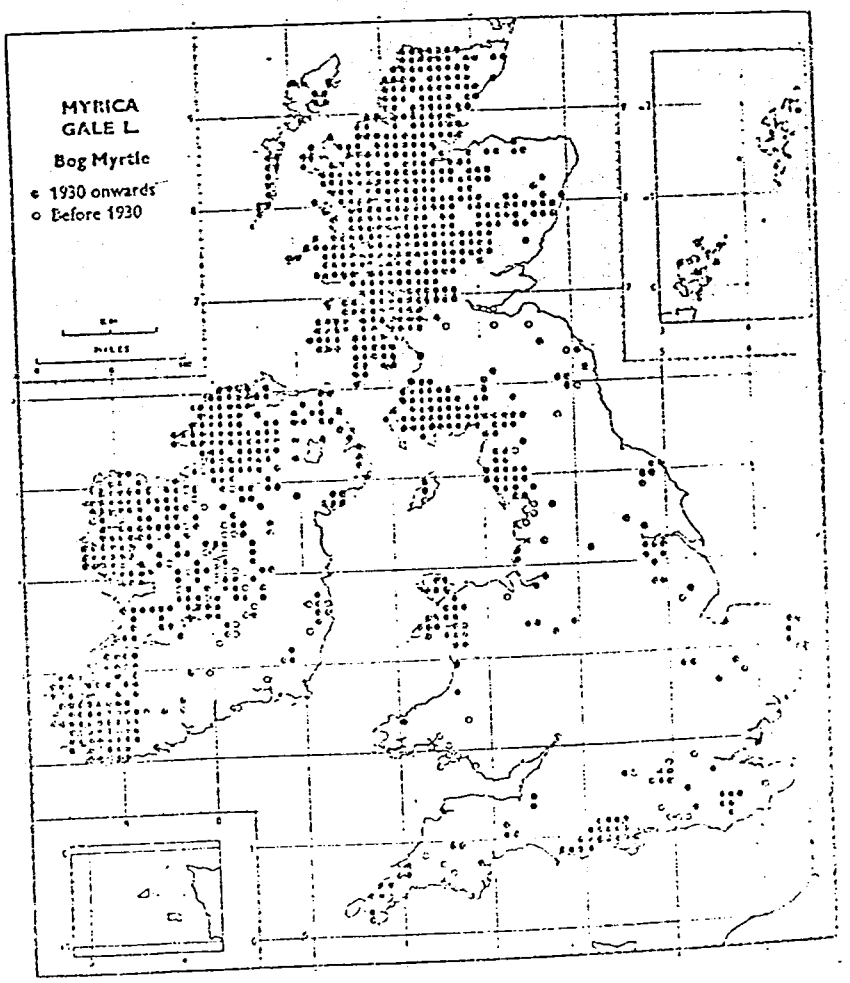


Fig. 26 Distribution of Rumex hydrolapathum in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

Each symbol on the map records the presence of this species in a 10-kilometre square of the Ordnance Survey National Grid, which was extended to cover Ireland for the purpose of this survey.

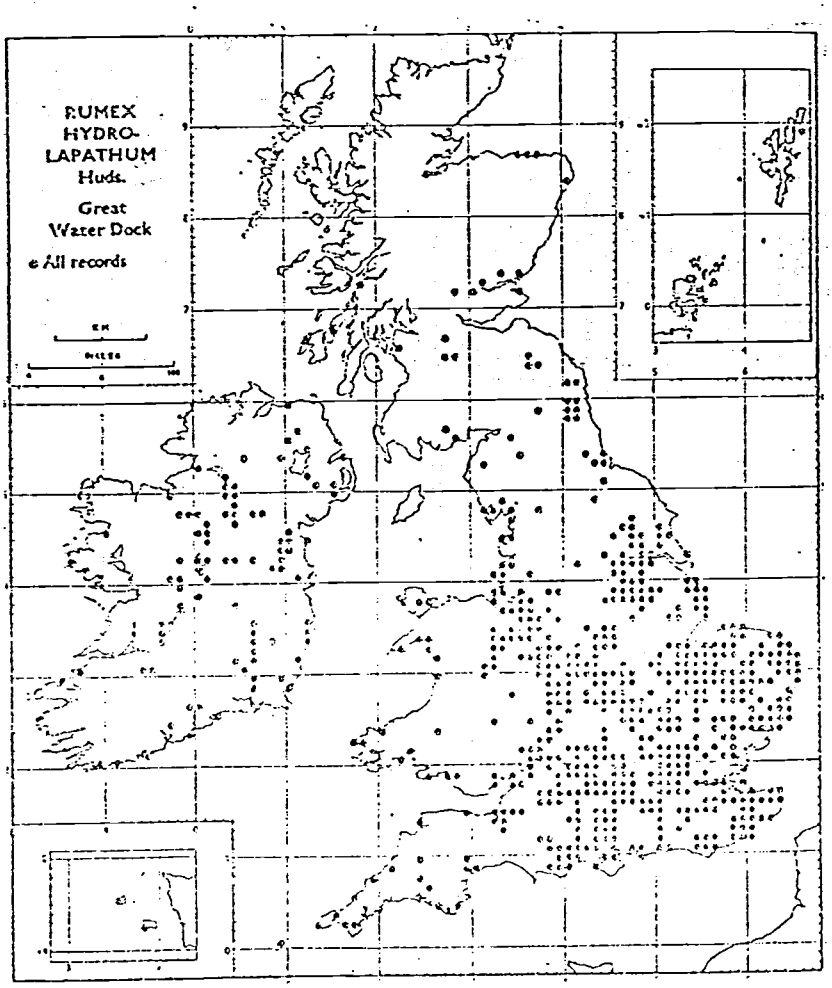


Fig. 27 Distribution of Carex riparia in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

Each symbol on the map records the presence of this species in a 10-kilometre square of the Ordnance Survey National Grid, which was extended to cover Ireland for the purpose of this survey.

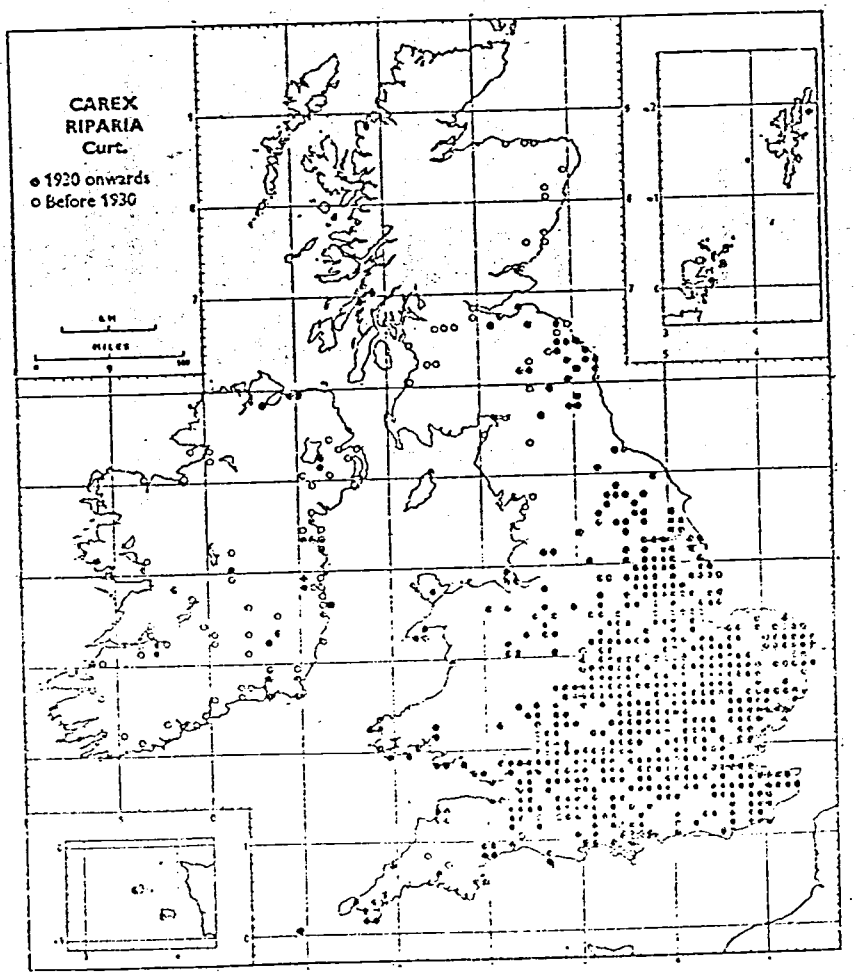
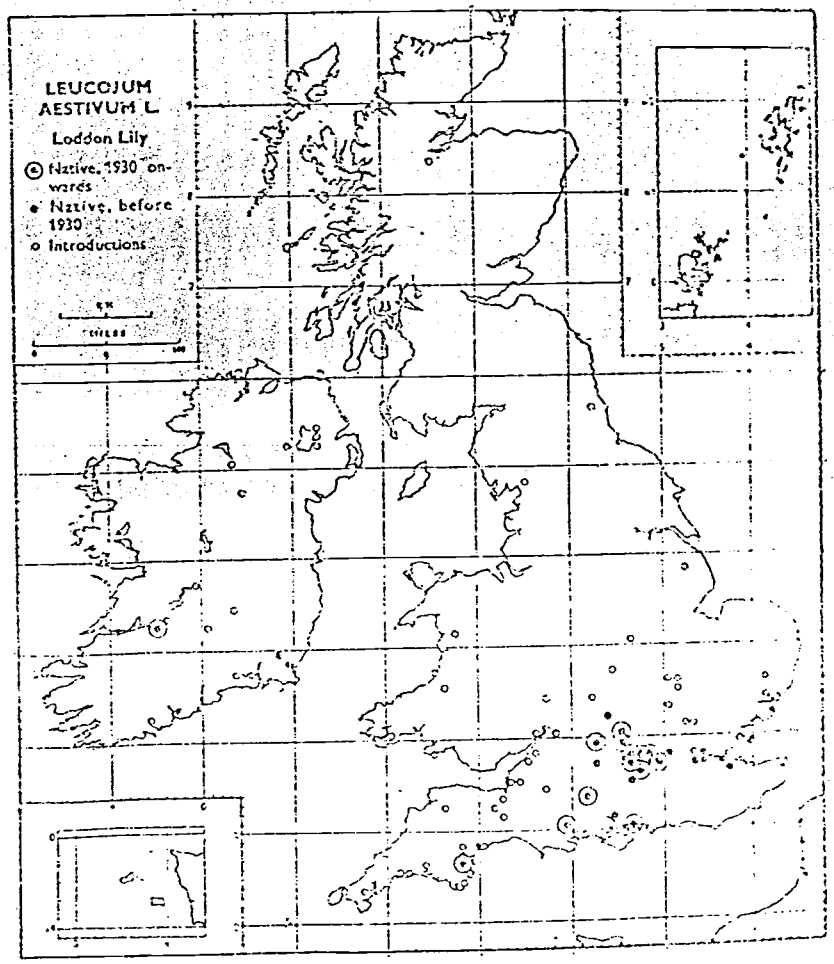
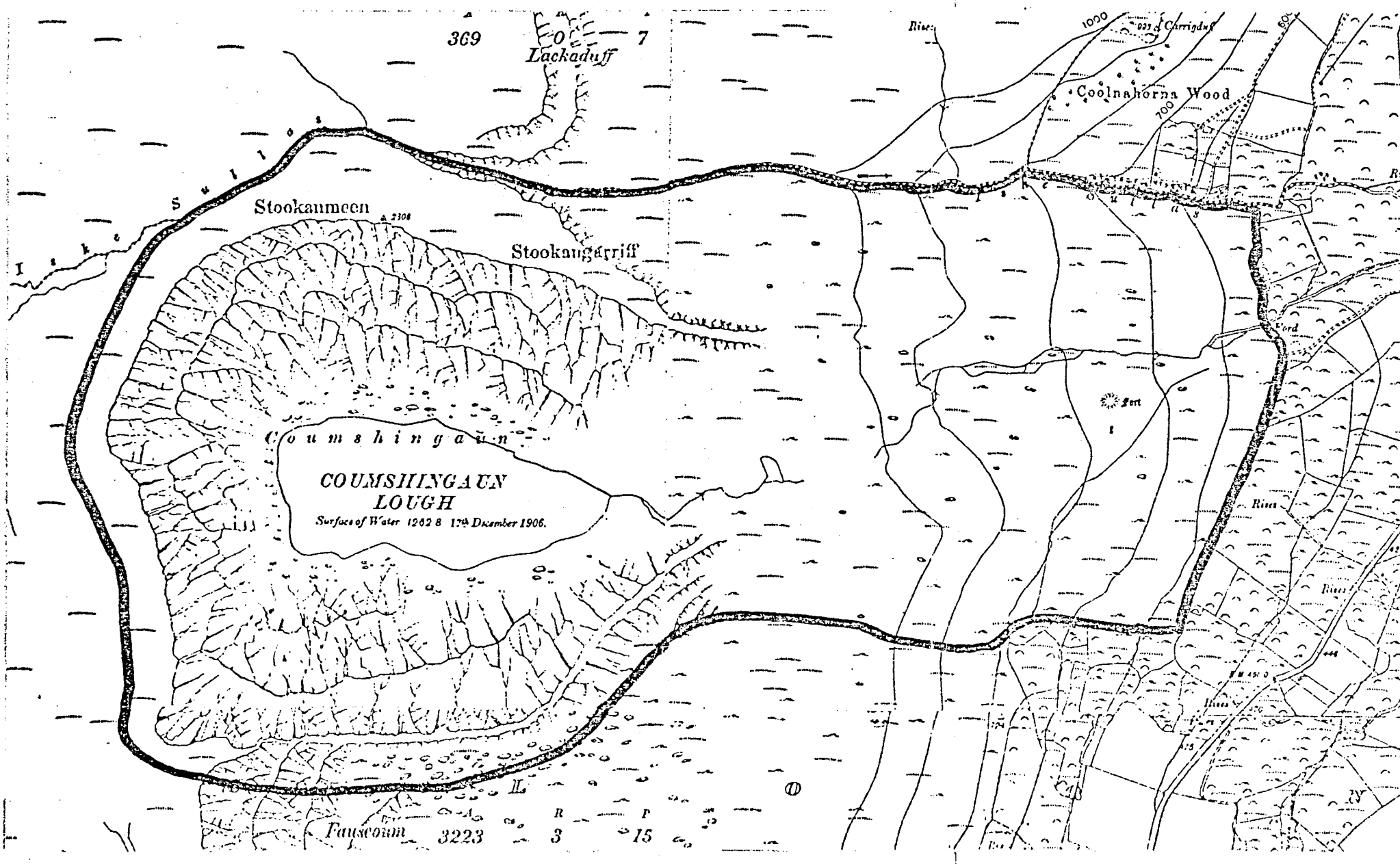


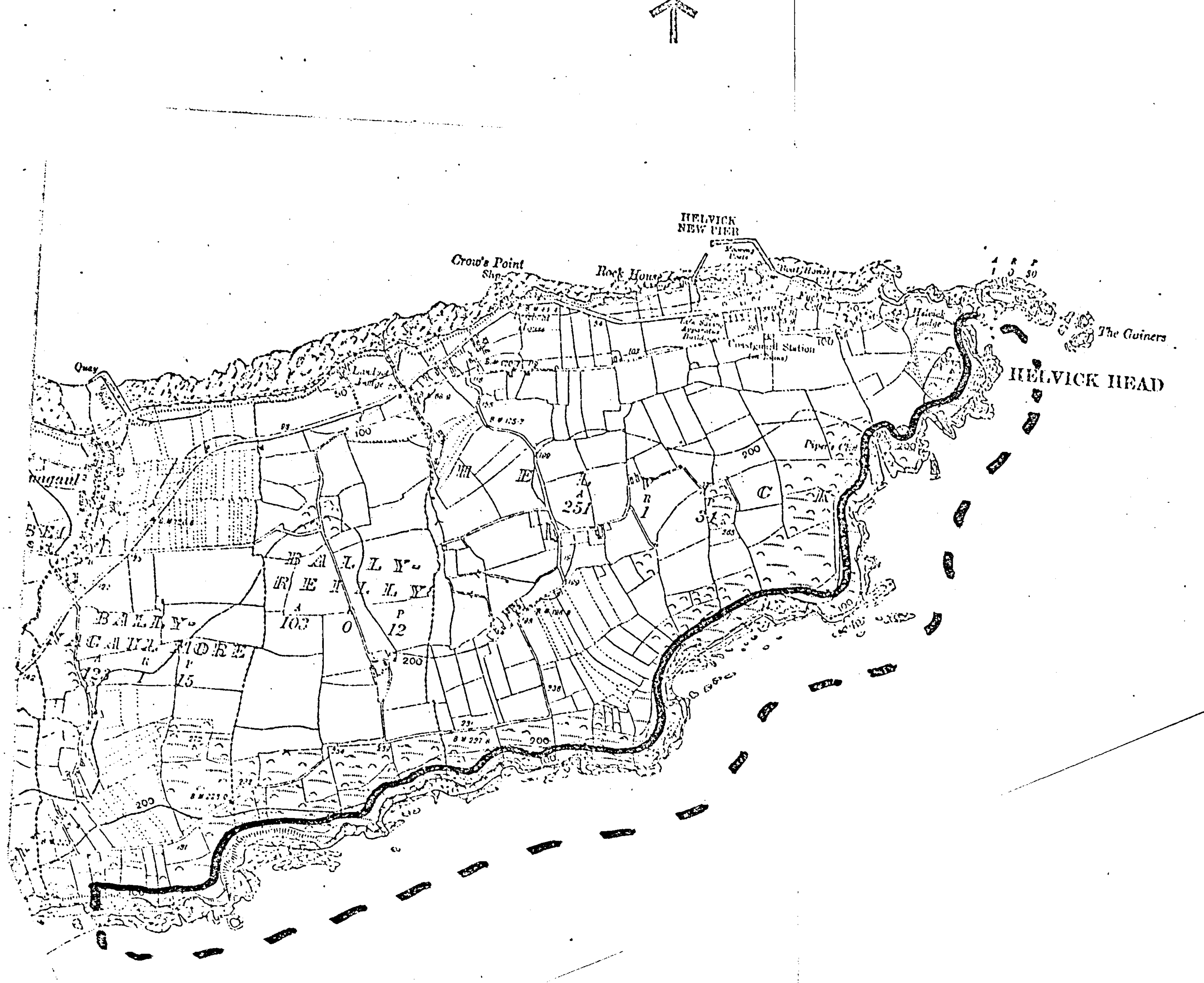
Fig. 28 Distribution of Leucojum aestivum in Britain and Ireland

Taken from "Atlas of the British Flora", prepared by the Botanical Society of the British Isles.

Each symbol on the map records the presence of this species in a 10-kilometre square of the Ordnance Survey National Grid, which was extended to cover Ireland for the purpose of this survey.



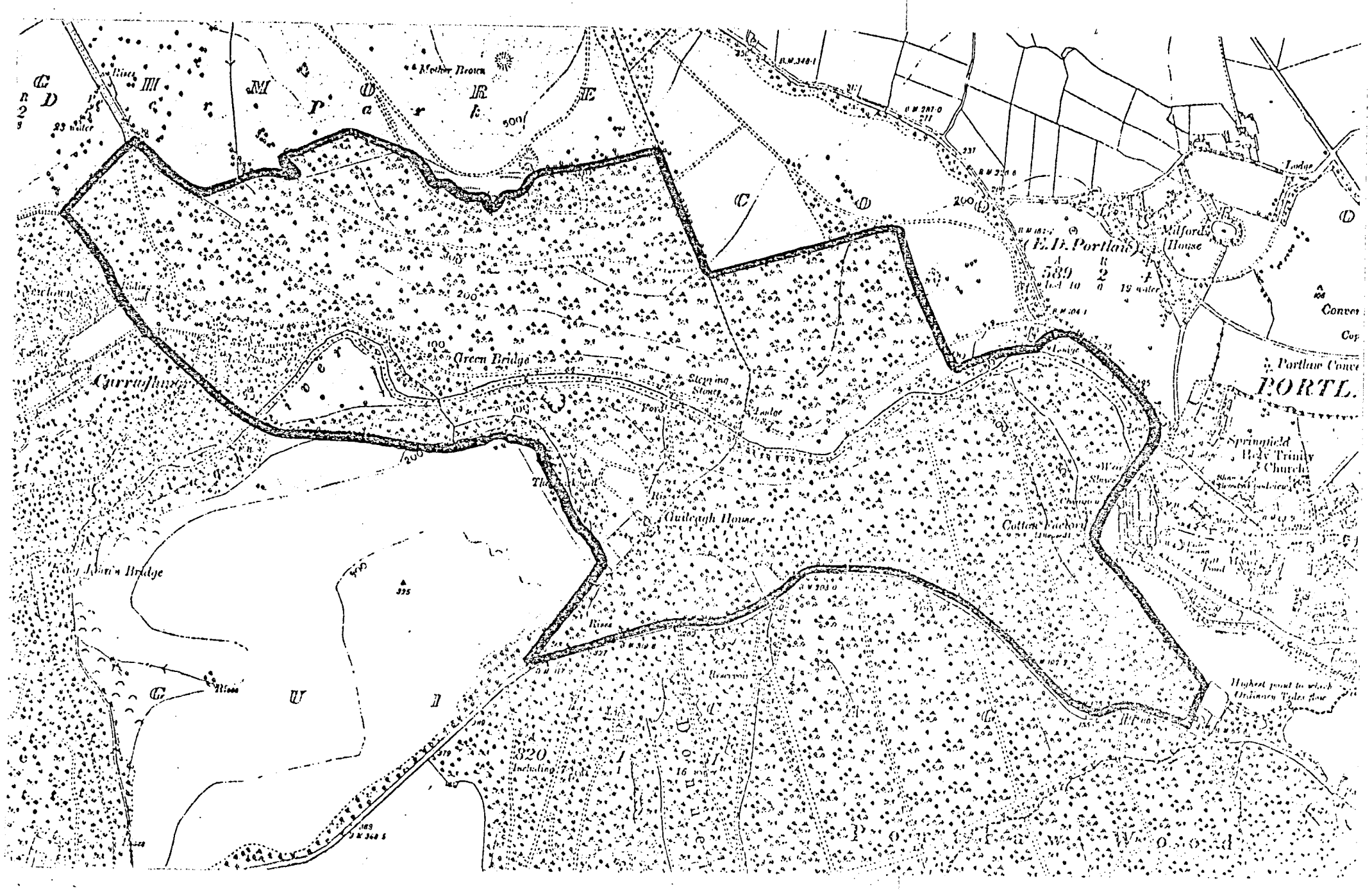

369
Lackaduff
7
Coolnahorna Wood
Stookanmeen
Stookangarriff
Coumshingaun
COUMSHINGAUN
LOUGH
Surface of Water 1262 8 17th December 1906.
Fauscoum
3223
3
15

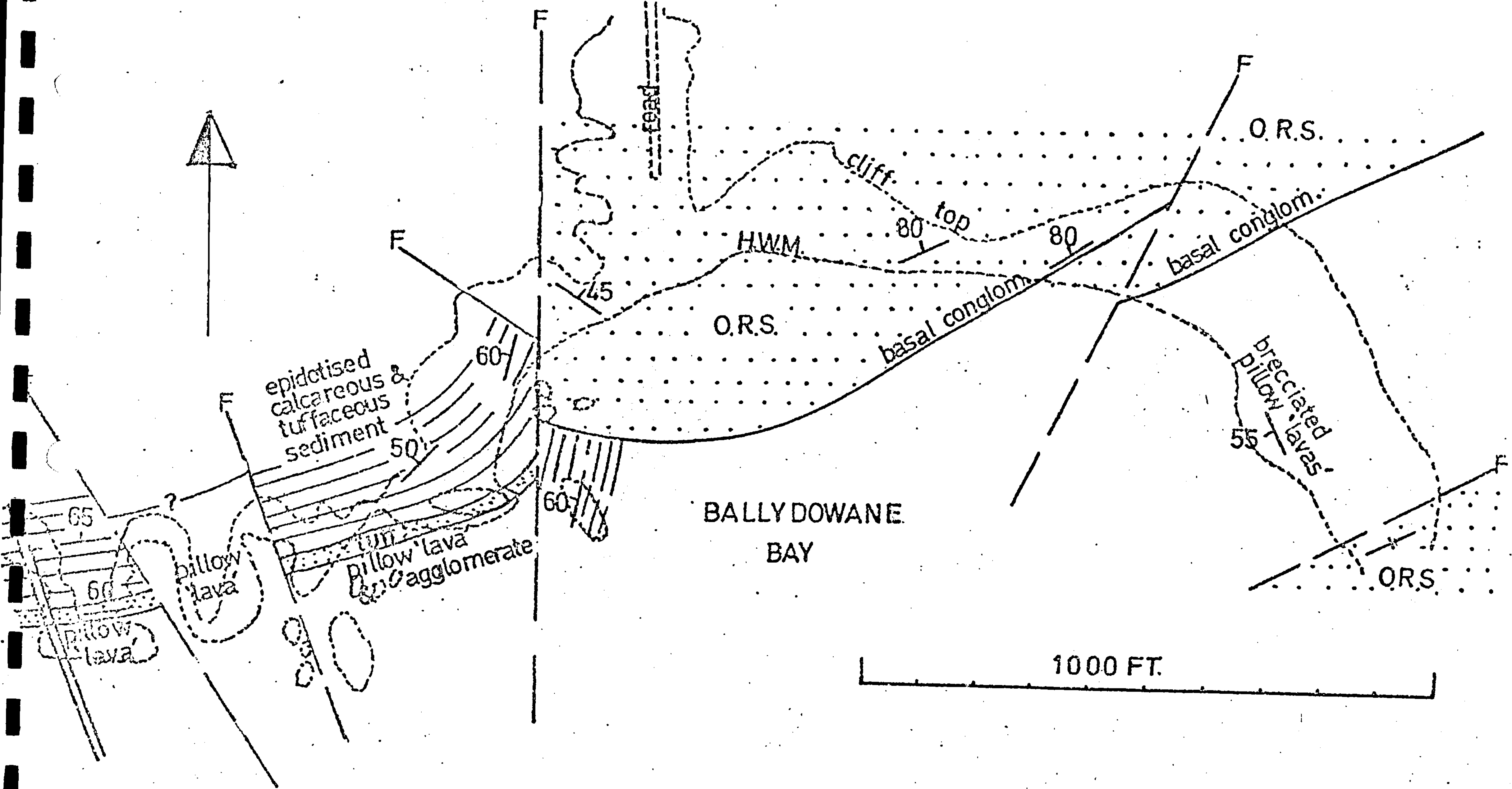


HELVICK NEW PIER
Crow's Point
Rock House
Quay
Coastguard Station
The Guiners
HELVICK HEAD
BALLY-REILLY
BALLY-CAHILLMORE

MAP SHOWING AREA OF SCIENTIFIC INTEREST —11

Scale: 6 Inches to 1 Mile

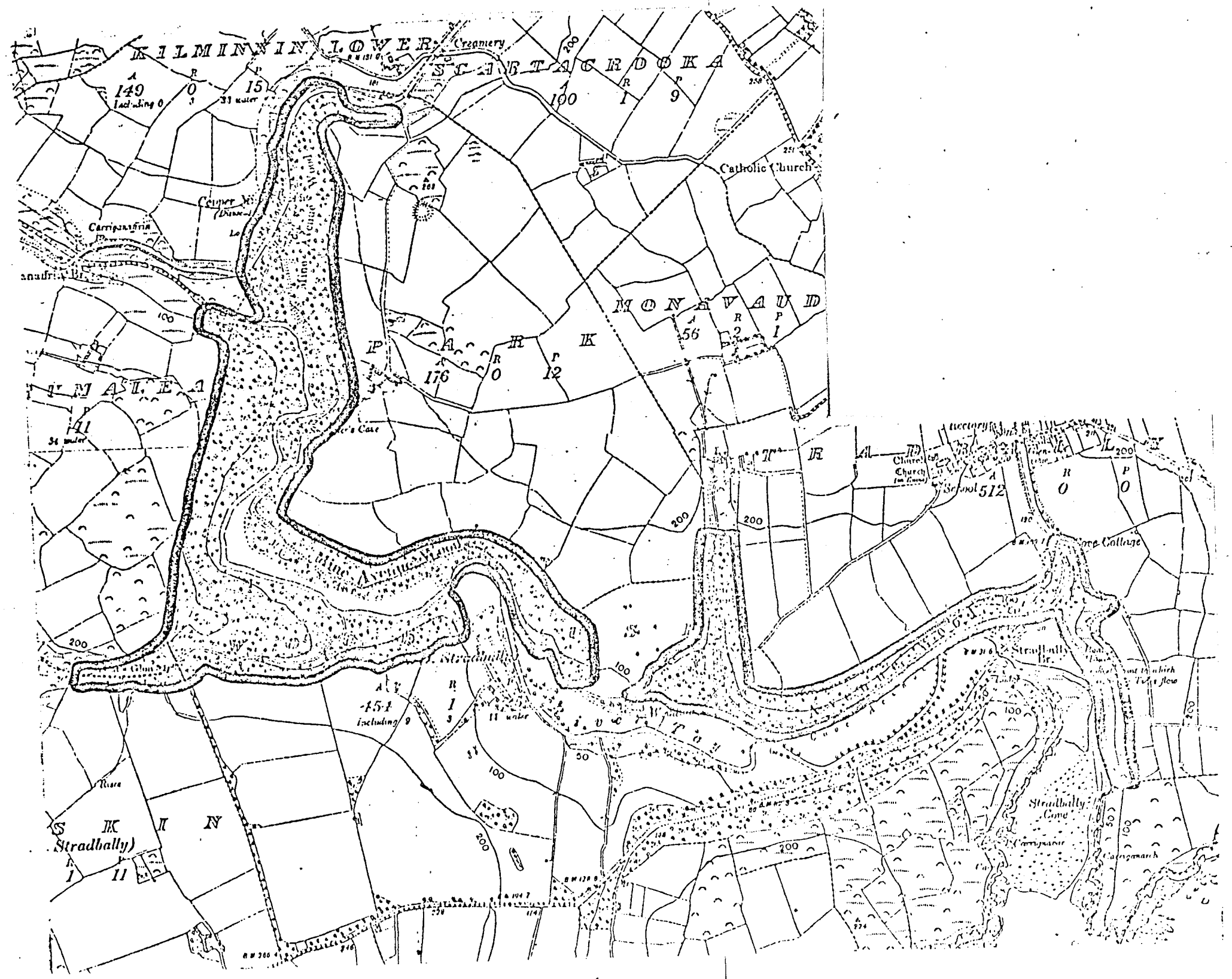



F
road
O.R.S.
cliff top
80
80
HWM.
45
O.R.S.
basal conglom.
basal conglom.
brecciated pillow lavas
55
epidotised calcareous & tuffaceous sediment
60
50
60
65
60
?
pillow lava
pillow lava
tuff
pillow lava & agglomerate
BALLYDOWANE BAY
O.R.S.
1000 FT.

locality 6

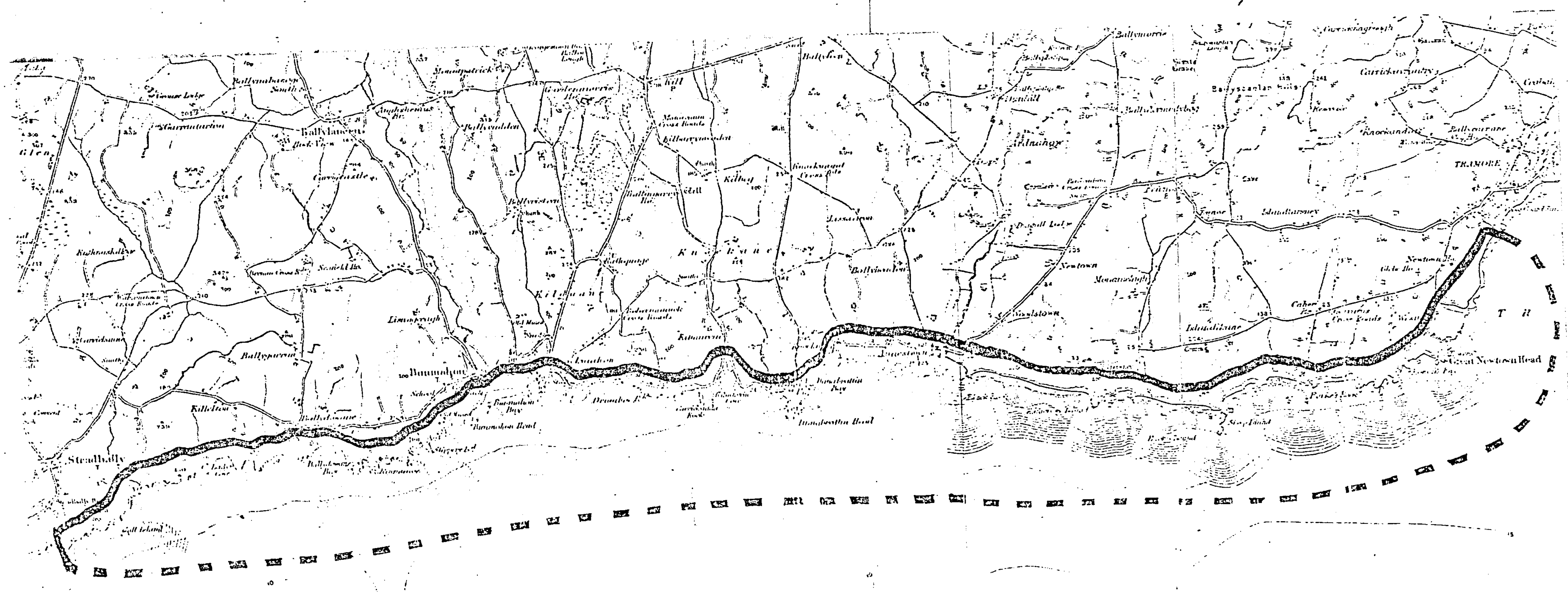
MAP SHOWING AREA OF SCIENTIFIC INTEREST —24

Scale: 6 Inches to 1 Mile



MAP SHOWING AREA OF SCIENTIFIC INTEREST — 2

Scale: 1 Inch to 1 Mile



MAP SHOWING AREA OF SCIENTIFIC INTEREST — 6

Scale: 6 Inches to 1 Mile