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COMMITTEE FOR IRELAND, 1996-1997
BOTANICAL SOCIETY OF THE BRITISH ISLES

In line with the Rules, one new committee member was elected at the Annual General Meeting held in Trinity College, Dublin on 28 September, 1996 (Office Bearers were subsequently elected at the first Committee Meeting). The Committee is now:

Miss Ann B. Carter, Chair (retiring October, 1997)
Mr Paul Hackney, Secretary (retiring October, 1997)
Miss Fiona MacGowan (retiring October, 1997)
Dr John Conaghan (retiring October, 1997)
Dr Michael Wyse-Jackson (retiring October, 1998)
Dr E.C. Mhic Daeid (retiring October, 1998)
Miss Sharon Parr (retiring October, 1999)

The following are also members of the Committee:

Dr David W. Nash, B.S.B.I. Council Representative
Mr Paul Corbett, Department of the Environment (N.I.) Representative
Dr Colman O'Criodain, Office of Public Works, Republic of Ireland
Mr Alan G. Hill, Field Meetings Secretary, co-opted October, 1995
Dr Brian S. Rushton, Editor *Irish Botanical News*, co-opted October, 1995
Dr Declan Doogue, Atlas Co-ordinator, co-opted October, 1995
Dr John J. Early, Treasurer for the Atlas Project in the Republic of Ireland, co-opted October, 1995
Mr Shaun Wolfe-Murphy, co-opted October, 1996

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All species names and common names in *Irish Botanical News* follow those in Stace, C.A. (1991). *New Flora of the British Isles*. Cambridge University Press, Cambridge.

The cover illustration shows *Salix herbacea* (Dwarf Willow), recently relocated on Mangerton North in Co. Kerry by Toby Hodd. Taken from Fritch, W.H. & Smith, W.G. (1908). *Illustrations of the British flora*. Lovell Reeve & Co., Ltd., London.

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EDITORIAL

I was recently invited to give a talk to a local natural history society and over the telephone I gave them the title “The threat of aliens”. There was a few seconds pause before the rather strained voice said: “Yes! That’ll be nice”. I’m sure that they thought I was going to talk about an episode of the X-Files!

But in preparing the talk I did begin to muse on the threat that aliens pose and, indeed, whether we should be concerned. I was reminded of Gwynn Ellis who in the very first *Irish Botanical News* (1991) suggested that we should keep an Alien Register “whereby details of newly discovered aliens which appear to be becoming established and may spread, can be sent to a central point” and their spread monitored. This seemed an eminently sensible idea and was further explored in a later paper by Gwynn in *The common ground of wild and cultivated plants* (edited by A.R. Perry & R.O. Ellis, 1994): “... it is vitally important that the changes to our climate and any associated changes in our vegetation are fully and completely documented” and “it is therefore proposed that an Alien Study Group be inaugurated and an Alien Register set up to monitor the spread of aliens in the British Isles, and, it is hoped, to find solutions to some of the very real problems that this spread may cause”.

With the development and release of Genetically Modified Organisms (GMOs), the concept of an “alien” takes on a whole new meaning - and the recent case of soya bean suggests that it could become a legal minefield. For many years we have accepted the “release” of cultivars (when we record *Lolium perenne* (Perennial Rye-grass) what exactly are we recording?) but somehow GMOs go beyond this. As botanists, we need to monitor developments in this field closely and, if necessary, voice our objections.

Have a good field season,

Dr Brian S. Rushton, Editor, *Irish Botanical News*

DEVELOPMENTS IN COMPUTING THE FLORA OF FERMANAGH

R.S. Forbes

Institute of Continuing Education, Queen's University, Belfast, BT7 1NN

In the year since I last wrote about this project for *Irish Botanical News* 6, we have added a further 26,000 plant records to our RECORDER Database. Robert Northridge has written a separate note in this issue of some of the most notable plant finds in what has largely been an exercise to even out or standardize the level of detail in our coverage of the county. The additional records really only tidy up the data for the more common species, but we feel that this is a worthwhile aim, and it will enable us to be more certain of the validity of any statistical comparisons we might make from our database, and improve the map accuracy.

I want in this note to describe a major advance on the computing side of the project, which is facilitating the writing of *The Flora of Fermanagh*. On an extremely memorable day last February, Dr Bernard Picton (from the Ulster Museum but currently working at Trinity College, Dublin on the BioMar Project), visited my home accompanied by Dr Damian McFerran from CEDaR (the Centre for Environmental Data and Recording), based at the Ulster Museum. During a marathon computing session lasting about nine nonstop hours, Bernard set up a new Data Reporting Window for us in RECORDER, along lines Robert and I had designed to enable us to extract information for *The Flora*.

The new Window created by Bernard is an enormous improvement over the existing RECORDER Local Species Window, in that when a species is designated, it sets up a template with appropriate 'prompts' or sections into which the Local Species Account can be written, *and* it automatically searches the database and completes parts of the Window with information on:

- a. the first record;
- b. the number of records for the species in the Database;
- c. the number of (tetrad) squares (pre- and post-1975); and
- d. the percentage of tetrads for which the species is recorded (see Fig. 1).

Fermanagh Flora			
Species number	2311	Phytogeographic status	Northern Montane
<i>Pseudorchis albida</i> (L.) A. & D. Loeve		GB Status	Unknown
Small-white Orchid			Orchidaceae
Local common name			
Local status	RDB K (Ireland)		
Habitat	Well-drained upland pastures, heaths, screes.		
Distribution	Mainly in the western uplands		
First record	Scott, Dr R. 1806		Mackay, W.T. (1806)
Co. Fermanagh			
Months recorded	Mid-May to mid-July	Abundance	rare
Declining elsewhere, this orchid is holding its ground remarkably well in upland areas of Fermanagh, the modern distribution being wider than that known pre-1975. The 1976 Atlas showed it in three 10 Km squares, and it Threats	Current agricultural practices, and in particular the funding of Environmentally Sensitive Areas by government, would seem to Literature source		
Hackney, P. (Ed.) & Beesley, S., Harron, J. & Lambert, D. (1992)			
Number of records	35	Percent squares	2.50%
No. of squares - pre 1975 : 8		post 1975 : 8	
<Browse> <Options> <Softkeys> <Save> 2311 NL 3			

FIGURE 1. Screen dump from RECORDER showing the basic structure and information content of the new Local Species Account Window as in use for the Fermanagh Flora project. The sample species used in this, and subsequent Figures in this paper, is *Pseudorchis albida* (Small-white Orchid).

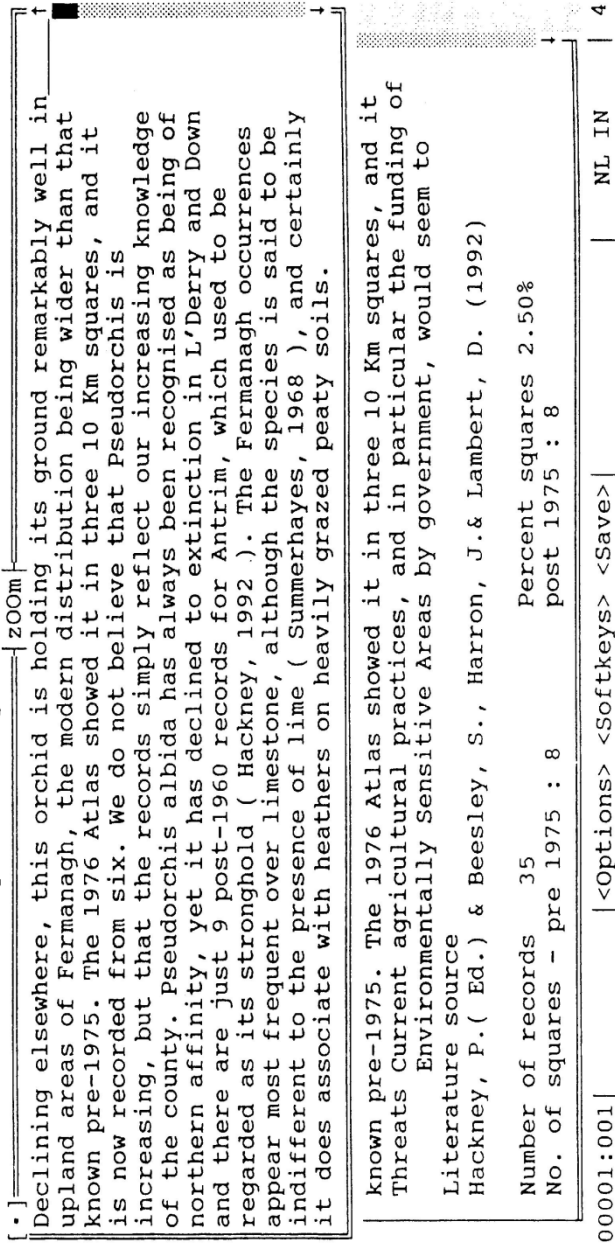


FIGURE 2. Screen dump from RECORDER which shows the free text field giving the species account in the Local Species Account Window. As with other free text fields in the window, only two lines are usually visible, but it can readily be seen in full by using the zoom option in RECORDER (Key F3).

Figs 1-6 are unedited screen dump print-outs generated with this new window, and I believe they give a clear indication of the usefulness of this new facility. Robert and I are extremely indebted to Bernard for his kindness and willingness in setting up this very useful Report Window, which, if suitably modified or customised for the individual, could greatly assist many other biological recorders.

The major text fields for the species are open-ended (i.e. free-text), and normally only display two or three lines in the Window because of limited screen space. It is possible to see the full text field simply by zooming on it, using the F3 key, and I have again included an example from our *Pseudorchis albida* (Small-white Orchid) window (Fig. 2). Fields of this nature are Habitat, Distribution, Species Account (for which the prompt is not labelled) and Threats.

The Window is equipped with Pop-Up lists for the fields covering Phytogeographic Status, Local Status and Abundance from which choice is made for inclusion in the species account being generated, and additional information can be sought from RECORDER Tables (i.e. files) related to the RECORDS TABLE, using a 'Softkey' approach (selected by using F6). The Screen print-out in Fig. 3 shows the Custom Application Softkeys that are available by this manoeuvre, which present eight possible options you can use to consult, edit, or generate print-out, which may assist analysis of your existing species data. An example is the Phenology option, which performs an analysis of the record dates of your species, and automatically draws histograms which you can elect to be on a weekly, fortnightly or monthly basis (see example screen in Fig. 4).

The Softkeys options also allow you to, for example, view the list of Records held for a particular species (Fig. 5), and to Edit or add details of relevant literature to the appropriate LITERATURE TABLE (Fig. 6).

Structurally the new Window for Local Species Accounts writes to a new RECORDER Table called SP_ACCOUNTS which is stored in a separate Directory on the hard drive, in our case named VCFLORA. At present the new Window is rather slow at generating the automatic input, which it does before it allows the cursor to come up enabling you to begin writing into the Window. Even with a 486 processor running at 99 MHz and a 1.6 Gb hard disk (a smaller hard disk previously slowed

Custom Application Softkeys		ntane
Key	Function	
1 SF1	Edit CODES table	
2 SF2	Edit STATUS.REGION table	
3 SF3	Edit LITERATURE table	
4 SF4	List records of this species	06)
5 SF5	Distribution map	
6>SF6	Phenology	kably well in
7 SF7	Count grid squares	er than that
8 SF8	Print a report including records	res, and it
of Environmentally Sensitive Areas by government, would seem to		e funding
Literature source		
Hackney, P.(Ed.) & Beesley, S., Harron, J.& Lambert, D. (1992)		
Number of records	35	Percent squares 2.50%
No. of squares - pre 1975 :	8	post 1975 : 8
Single Select row by pressing [Return] or enter row number		NL
		4

FIGURE 3. Screen dump from RECORDER showing the list of Custom Application Softkeys accessible when using Key F6.

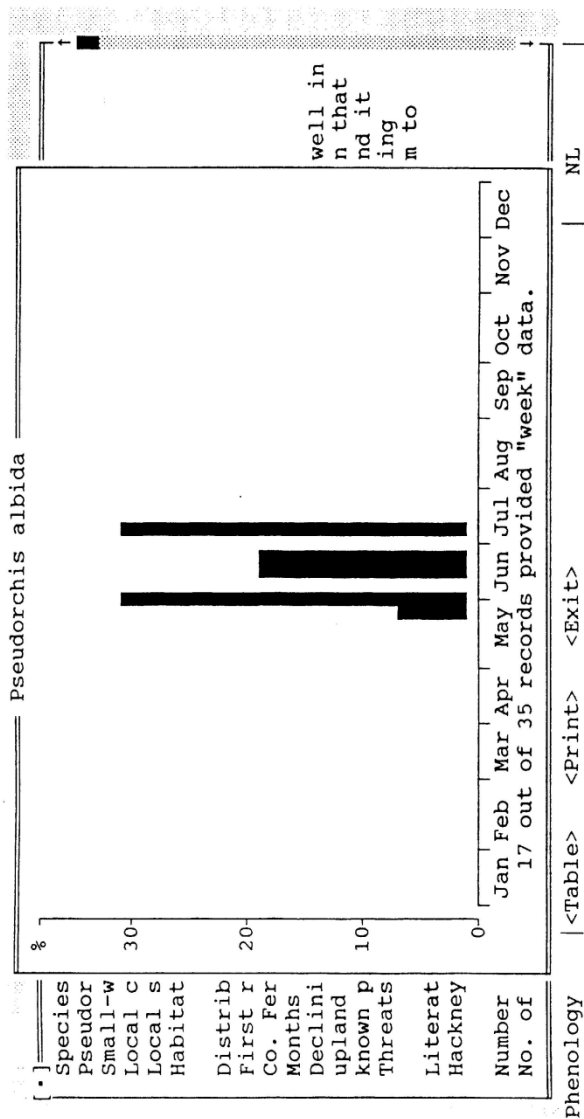


FIGURE 4. Screen dump from RECORDER showing the Phenology report selected from the list of available Custom Application Softkeys (see Fig. 3).

Records for Pseudorchis albida				
	Code	Locality	Source	Date
1	325884	Fermanagh, Co. Fermanagh	Scott, Dr R.	1806
2	324221	Scree below E. range of	Barrington, Mr R.M. Det.	1884
3	324220	Topped Mountain, or Mully	1957 FLORA Det.	1957 FLOR 1946
4	324223	S. of Knockmore, near Gar	1957 FLORA Det.	1957 FLOR 1946
5	324222	Moorland above Marble Arc	1957 FLORA Det.	1957 FLOR 1947
6	324224	Carran Lough, N. of Boho	1957 FLORA Det.	1957 FLOR 1947
7	324225	Peaty ground by Derrygonn	1957 FLORA Det.	1957 FLOR 1947
8	324226	Scree slope above Doagh L	1957 FLORA Det.	1957 FLOR 1947
9	324227	Monawilkin Lough	1957 FLORA Det.	1957 FLOR 1947
10	324228	Callow (or Carrick) Hil	1957 FLORA Det.	1957 FLOR 1947
11	324229	Cliffs of Magho	1957 FLORA Det.	1957 FLOR 1947
12	324230	Scarps around Tullynasrah	1957 FLORA Det.	1957 FLOR 1951
13	157008	Hill, West of Knockmore	Farrell, Ms L. Det. Farre	01 JUL 1969
14	106355	Tullynanny Lough	Scannell, Miss M.J.P. Det	10 JUN 1978
15	158682	Mullaghmore, Black River	Northridge, Mr R.H. Det.	JUL 1978
16	158681	Belmore Quarry	Northridge, Mr R.H. Det.	JUL 1979
17	158683	Gortmacconnell Rock	Northridge, Mr R.H. Det.	06 JUN 1981
<div> <div>Multi</div> <div> <div>Select or cancel rows by pressing [Return] [F9]-Save</div> <div>OK >< None ></div> </div> </div>				
				NL

FIGURE 5. Screen dump from RECORDER showing the Pop-up list of Records for this species selected from the available Custom Application Softkeys (see Fig. 3)

Browse Softkeys Relations Print Main Menu

[.]=[.] Document entry

Spe	Number	512	Keywords
pse			
Sma	Authors(s)		
Loc	Hackney, P. (Ed.)		
Loc	Beesley, S., Harron, J. & Lambert, D.		
Hab	Year of publication or production	1992	
Dis	References text		
Fir	Stewart & Corry's Flora of the North-East of		
Co.	Ireland, 3rd Edition, Institute of Irish Studies,		
Mon	The Queen's University of Belfast		
Dec			
upl			
kno			
Thr	Type Book		
Lit	Location		
Hac	Date added/changed	24 NOV 1996 Updated by RF	
Number of records		35	Percent squares 2.50%
No. of squares - pre 1975 : 8			post 1975 : 8

001/002 | <Browse> | <Softkeys> <Save> | 512 | NL | 4

FIGURE 6. Screen dump from RECORDER showing the Document Entry Window which can be accessed and edited from the Literature Table through selection from the available Custom Application Softkeys (see Fig. 3).

things greatly), it still can take three minutes or more of processing before you get access to edit or add to the Window. Furthermore, the Window does the full processing of the data *every time* you go to a particular species account, even if the particular account has already been written up, and you merely want to read, or edit it slightly. Bernard Picton is working at this problem as I write this article, and I am sure that a modification will very soon be made, so that the program compares the date of the SP_ACCOUNT with when the RECORD Table was most recently updated, to ascertain whether or not a recalculation of the species data is necessary.

Robert Northridge and I have also requested Bernard Picton to modify the Window so that if a species has 20 or fewer Records, they will be automatically listed in the Window in a new field, giving details for each of Site Name, Grid Reference, Date and Recorder's Name.

When the RECORDER SP_ACCOUNTS have been written, they can be written to an ASCII text file using the options available under the database's REPORTS from the Main Menu and choosing (in our case), FERMANAGH FLORA. Again, this process needs a little more adjustment as RECORDER is currently extremely slow at writing the text file, apparently because it recalculates the data for every species all over again. However, once the text file is available, it can be picked up, formatted and edited by a standard word processor such as Word for Windows and combined with a species map (transferred using additional software specifically designed to convert data from RECORDER's 'PLOTS' mapping to a 'Windows'-compatible format (DMPW, i.e. Alan Morton's DMAP for Windows)).

Hey Presto! You have your camera-ready copy for publication! This is NOT an instant Flora writer (since you do still have to write into the Window), but it is an enormously helpful tool enabling efficient access to your data, and assisting you in writing your account.

Joking aside, there are plans afoot to transfer RECORDER away from the current AREV (Advanced Revelation) to another software database or 'platform', which will allow easier co-ordination and transfer between Windows packages. This is a situation greatly to be desired, and we should not have too long to wait before Utopia arrives.

ORTHILIA SECUNDA REFOUND (YET AGAIN!) IN CO. ANTRIM (v.c. H39)

R.H. and Hannah Northridge
9 Coole Drive, Enniskillen, BT74 6BS

Orthilia secunda (Serrated Wintergreen) was found in Co. Antrim in the 1830s by Dr Moore, was not seen again in the county until 1910, and has not been seen since the 1920s.

Dr D. Moore found the plant in Co. Antrim, at Sallagh Braes, Glenarm and at Agnew's Hill near Larne. He also describes finding the plant in Co. Derry in 1835: "On the bank which faces the north of the Agivey River, generally called Errigal Banks, above Garvagh, Derry, between the lint mill and Errigal Bridge, found in considerable quantity".

In *Irish Naturalist* XIX: 227, 1910, is described Stelfox's discovery, on 13 August 1910, of the plant "occurring quite sparingly, in two or three places on the cliffs, not on the Sallagh Braes proper, but on the northern face of Knock Dhu, closely associated with *Dryas octopetala* [Mountain Avens] and *Epilobium angustifolium* [*Chamerion angustifolium*, Rosebay Willowherb]. The plants seen were mostly in fruit".

In 1920, in Co. Antrim, Praeger & Stelfox found the plant "growing luxuriantly on the south bank (and very sparingly on the north bank) in a gorge on the Cranny Burn a little above the point where it is joined by the Pollan Burn. Here, sheltered by a birch and a Mountain Ash, it was flowering abundantly" (*Irish Naturalist* XXIX: 100, 1920).

On 11 April 1996, Paul Hackney, Ralph Forbes and the authors, set out to investigate this site which Praeger had described so exactly. We walked to the spot, just below the waterfall, and found the species on the south bank, exactly as described above.

There were about 25 rosettes of *Orthilia secunda*, none showing any sign of having flowered in 1995. Associated species were: *Blechnum spicant* (Hard-fern), *Dryopteris filix-mas* (Male-fern), *Calluna vulgaris* (Heather), *Erica cinerea* (Bell Heather), *Festuca rubra* (Red Fescue), *Galium saxatile* (Heath Bedstraw), *Hypericum pulchrum* (Slender St John's-wort), *Jasione montana* (Sheep's-bit), *Lathyrus linifolius* (Bitter-

vetch), *Luzula sylvatica* (Great Wood-rush), *Oxalis acetosella* (Woodsorrel), *Primula vulgaris* (Primrose), *Vaccinium myrtillus* (Bilberry) and *Viola riviniana* (Common Dog-violet). We did not find the plant on the north bank. The grid reference of the place is D/255.178.

We then proceeded to Knock Dhu to try to refind Stelfox's plants, but abandoned our search early due to mist coming down over the hill.

Orthilia secunda occurs in 15 1-km x 1-km squares in the Lough Navar Forest region in Co. Fermanagh (v.c. H33), has not been seen in Co. Derry (v.c. H40) since 1835, was last seen in Co. Antrim (v.c. H39) on Knock Dhu sometime prior to 1938, and is extinct in Co. Offaly (v.c. H18).

We would be sure that this N.I. Schedule 8 species could, with careful searching, be refound in some of its old sites and possibly in some new ones in Co. Antrim. All the Fermanagh sites, and the site described by us above, are north facing scarps. The leaves are very distinctive, looking rather like fleshy violet leaves and, being winter-green, can profitably be looked for in winter when other vegetation has died back.

NOTES ON SOME PLANTS FOUND IN THE KILLARNEY NATIONAL PARK DURING THE SUMMER OF 1996

T. Hodd

Coolies, Muckcross, Killarney

During the summer of 1996, Matt Hood, Daithi O'Corrain and myself have been completing some plant survey work in the Killarney National Park and here I have summarised some of our more significant findings. Locations are shown in Fig. 1 (except for sites associated with *Neottia nidus-avis* (Bird's-nest Orchid)).

1. The discovery of the only known recent colony of *Botrychium lunaria* (Moon wort) in v.c. H2, North Kerry after 27 years Scully (1916) records this unusual fern from three places around the Killarney Lakes in the early part of this century. He found it on Brown Island, by the Aghadoe Boat House and by Doo Lough on the Muckcross

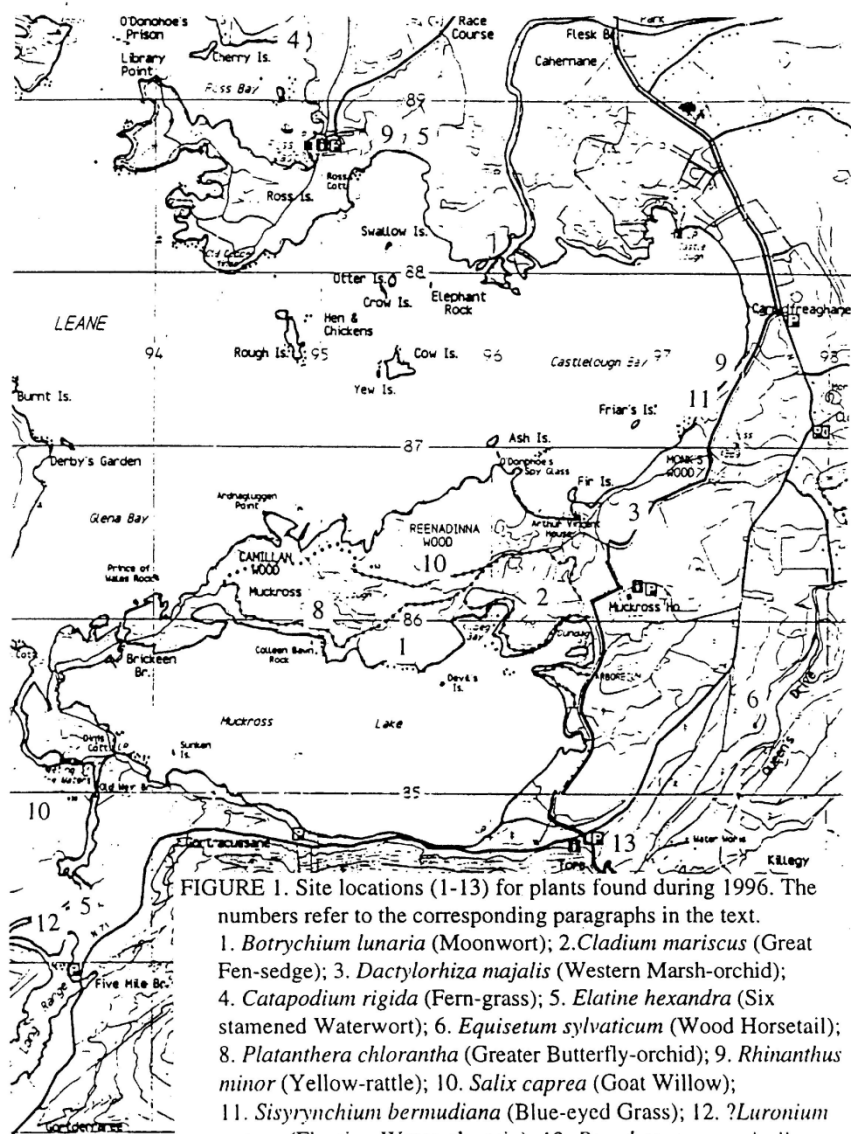


FIGURE 1. Site locations (1-13) for plants found during 1996. The numbers refer to the corresponding paragraphs in the text.
 1. *Botrychium lunaria* (Moonwort); 2. *Cladium mariscus* (Great Fen-sedge); 3. *Dactylorhiza majalis* (Western Marsh-orchid); 4. *Catapodium rigida* (Fern-grass); 5. *Elatine hexandra* (Six stamened Waterwort); 6. *Equisetum sylvaticum* (Wood Horsetail); 8. *Platanthera chlorantha* (Greater Butterfly-orchid); 9. *Rhinanthus minor* (Yellow-rattle); 10. *Salix caprea* (Goat Willow); 11. *Sisyrinchium bermudiana* (Blue-eyed Grass); 12. ?*Luronium natans* (Floating Water-plantain); 13. *Pseudotsuga menziesii* (Douglas Fir). The grid is of 1-km squares.

peninsula. It was not seen again in the Killarney area until 1969 when Olivia Goodwillie found it beside a path in woodland between Doo Lough and Muckross Lake. She showed it to Dr Daniel Kelly that year and there the matter rested; as far as I know, no one, not even Dr Kelly, has seen it since. This may be because Moonwort does not sporulate in the same place each year and when it does emerge it is only visible for about 70 days or even less (i.e. only between June and September). The rest of the year it lives completely underground obtaining its nutrition from fungi as they break down leaf litter.

On 12 July 1996 Daithi O’Corrain and Matt Hood took me down a track from the south eastern end of Doo Lough which leads down to Muckross Lake just east of the Victoria Point. They wanted to show me their new finds of *Neottia nidus-avis* (Bird’s-nest Orchid) and extra large specimens of Ash, Alder and Goat Willow. We were just admiring a fine stand of Bird’s-nest Orchids when I spotted a tiny fern, with half-moon shaped leaves like *Cardamine pratensis* (Cuckooflower). It was only 20 cm high so I knelt down beside it and saw that it was Moonwort. It had a weird projecting frond bearing yellow spore cases almost like half-opened yellow flowers. It was all on its own in the very deep shade of an oak tree, just 1 m from the Bird’s-nest Orchid. This was not the sort of habitat I would have expected Moonwort to be in - it is normally a plant of open grassland or mountain ledges. We thoroughly searched the whole area and managed to find a further seven sporing fronds of the fern in an area a little under 70 m x 20 m. This must be one of the rarest plants in all Kerry. I know of one other recent record of Moonwort in Kerry and that is on the Connor Pass on the Dingle Peninsula. Exhaustive searching for it on Brown Island has failed to relocate it there.

2. Flowering of *Cladium mariscus*

The Great Fen-sedge did not flower in 1995 but in 1996 it was fully in flower by the Muckross House spring. Perhaps it needs a hot summer the previous year before the flowering heads can form.

3. Sorting out the Marsh-orchids in Killarney

Last year, because the *Dactylorhiza* orchids look so similar even when in flower, I sought assistance from Dr Tom Curtis. For identification he needs fresh flowers and when I sent them to him at his Dublin office in the National Parks and Wildlife Service last June, 1995 he was away on

holiday. By the time he came back the flowers were no use for identification!

So, in June this year, I again sent him flowers and leaves of various Marsh-orchids and I was thrilled to receive some identifications from him at the end of the month. From his identifications I have realised that three species of Marsh-orchids are quite common in the Killarney National Park. *Dactylorhiza fuchsii* (Common Spotted-orchid) occurs in shaded sites commonly on limestone rocks and on copper bearing rocks both on the Muckcross Peninsula and Ross Island. *Dactylorhiza maculata* (Heath Spotted-orchid) also occurs on base rich soil but it is equally at home on acid soils and it is common in the Upper Lake and wetland areas of the mountainous parts of the Park. *Dactylorhiza majalis* (Western Marsh-orchid) is found like the Common Spotted-orchid on base rich soils but it grows more in the open than the Common Spotted-orchid. This June I found fine stands of the Western Marsh-orchid near the treatment plant in Monks Wood and near the Muckcross House springs on the edge of the Kilbeg Wood.

4. A new species of grass for the Killarney National Park

This is *Catapodium rigida*, the Fern-grass. This tiny, 6 cm high, grass was found growing on top of a 3 m high wall around Killarney House near the Golden Gates. In 1914 Scully recorded the Fern-grass on walls near the railway line in Killarney.

5. Two new locations for *Elatine hexandra* (Six-stamened Waterwort)

This summer, during July, I found this tiny and rare water plant in the Killarney National Park for the first time. It was growing abundantly on mud in Lough Leane beside the Bunrower Marshes and in the Long Range, below the Eagles Nest.

6. A fourth colony of *Equisetum sylvaticum* (Wood Horsetail) found in the Killarney National Park

In June 1996 a tiny colony of this rare and graceful horsetail was found beside the turlough on the Queen's Drive.

7. *Neottia nidus-avis* (Bird's-nest Orchid)

With the late spring in 1996, the Bird's-nest Orchid was still in full

flower in mid-July. It proved even more widespread than expected apart from being very numerous:

- a. at the Governor's Rock and Copper Mines area of Ross Island it was found abundantly;
- b. in the Blue Pool or Clogheereen Wood;
- c. in the Acres Wood (between the Muckross Traditional Farms and the main Killarney/Kenmare Road);
- d. on the west side of the Muckross main entrance drive;
- e. in Monks Wood especially near the Lovers Walk;
- f. in Reenadinna Wood North;
- g. in the oak/ash wood (Reenadinna South) between the Doo Lough and Victoria Point on the Muckross Lake; and
- h. along the Friars Walk.

Additionally, two small clumps were found on Brown Island, Lough Leane.

8. The distribution of *Platanthera chlorantha* (Greater Butterfly-orchid) in the Killarney National Park

Last year's Greater Butterfly-orchid, at the east end of Doo Lough, did not re-emerge but the large colony of twelve plants on the Miner's Paddock did come up again and no less than 14 separate plants were counted.

9. Two new locations where *Rhinanthus minor* (Yellow-rattle) occurs in abundance

Until this year the only area in the Park where I had found Yellow-rattle in quantity was the Miner's Paddock. But in late June and early July 1996 I found it in quantity in two new areas:

- a. on the Muckross Abbey shore beside the *Sisyrinchium bemudiana* (Blue-eyed Grass); and
- b. in great profusion on the Bunrower Marshes.

It is an annual and old fashioned methods of hay making, which involved turning the hay repeatedly, led to the seeds falling out of the fruits on to the soil. Unfortunately modern hay making in which the hay is wrapped into large round bales does not involve much turning and so the seeds are incorporated into the bales rather than shed on to the ground. Because it only comes each year through seed propagation, this lovely plant is rapidly becoming extinct in Kerry.

10. Three new sites for *Salix caprea* (Goat Willow)

Three new Goat Willow trees have been found. One in Reenadinna Wood North, one at Glaishin na Marbh near Shehy Mountain and one between Doo Lough and the shores of the Muckcross Lake (Reenadinna Wood South). This last record is most notable as it is of a truly large and erect specimen, some 18 m high with a girth of 1.3 m.

11. A large colony of *Sisyrinchium bermudiana* (Blue-eyed Grass) just 800 m from the Muckcross House

Three new colonies of Blue-eyed Grass have been found by us this summer. Two were on the Upper Lake shore, one near the mouth of the River Doogarry and one near Duck Island. More notably we found a large colony on the Muckcross Abbey shore of Lough Leane. It is flourishing and we counted over 50 flowers in about ten clumps in late June 1996. As far as I can establish this is the only colony of Blue-eyed Grass still found on the shores of Lough Leane although R.W. Scully found it in several places around Lough Leane back in the last century. (Scully found it at the mouth of the River Flesk but surveys of that area in 1994, 1995 and 1996 have failed to refind Blue-eyed Grass there.)

12. A frustrating search for *Luronium natans* (Floating Water-plantain)

In Scully (1916) there are some records of Floating Water-plantain in the Killarney Lakes which he discounts. R.L. Praeger (1934) does not even list the Floating Water-plantain as a native plant of Ireland. Rich *et al.* (1995) described large populations of native Floating Water-plantain recently found in Ireland in two lakes in Connemara. I wrote to the principal author of the paper, Tim Rich, and he sent me living specimens of the Irish plants and photocopies of two herbarium specimens of this species that were taken from the Killarney Lakes in 1875 and 1885 and subsequently rejected by R.W. Scully in his *Flora of County Kerry* (1916). The 1885 material certainly looks like the new material while the 1875 specimen looks more like a creeping variety of Lesser Water-plantain (*Baldellia ranunculoides*).

Then early in July 1996 I found a 'Floating Water-plantain' in the Long Range beside the Eagles Nest. It seemed to have some of the characteristics of the true *Luronium natans* and some of the characteristics of the *Baldellia ranunculoides*. I have sent a living sample of it to Tim Rich and we must await a response from him. But as yet I do not think I have managed to refind the elusive *Luronium natans*!

13. Sixteen new tree distribution surveys and 14 height and girth measurements of selected trees now completed

Matt Hodd and Daithi O’Corrain have added a further 16 tree distribution surveys to last year’s 19 tree surveys. These surveys were carried out in new areas and were mainly of oak woods on acid soils. The surveys were in the following areas:

- a. the west end of Muckcross Peninsula;
- b. the upland woods of Eagles Nest, Glaishin na Marbh and Glena;
and
- c. Derrycunihy Woods.

In addition about 14 large individual trees were selectively photographed and had their girths and heights measured. Most notable was the Douglas Fir (*Pseudotsuga menziesii*) in the Torc Ravine which has now reached over 50 m in height.

14. The Herbarium of the Killarney National Park

Daithi O’Corrain and Matt Hodd have made great strides in collecting a good flowering specimen of every species found in the Killarney National Park. They have now pressed and fully labelled about 200 out of the 500+ vascular plant species recorded in the Park.

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IN SEARCH OF ALPINE PLANTS ON THE NORTHERN SLOPES OF MANGERTON MOUNTAIN, SOUTH KERRY (v.c. H1)

T. Hodd

Coolies, Muckross, Killarney, Co. Kerry

INTRODUCTION

The Mangerton Mountain of Killarney, South Kerry (v.c. H1) has the largest mass of land over 600 m above sea level in Ireland. The Mountain covers an enormous 75 km² area of completely uninhabited upland. The whole area is of national importance to wildlife as it includes the main range for the Red Deer and many rare alpine plants. But even though half of the area falls within the Killarney National Park with the remainder designated as a Natural Heritage Area, it has been little studied from the botanical point of view.

The northern slopes of Mangerton which I surveyed are just outside the Park and their lower slopes are clothed with fine stands of 1 m high heathers which have not been completely burnt for some years. These slopes consequently form a very rich habitat for wild animals and plants.

The main purpose of this survey was to see if two alpine plants, *Lycopodium clavatum* (Stag's-horn Clubmoss) and *Salix herbacea* (Dwarf Willow), which had been recorded a hundred years ago by Kerry's foremost botanist, Reginald W. Scully (1858-1935) could be relocated. Scully found the two plants on an unnamed summit of Mangerton Mountain whose altitude he records as 2568 feet [770 m] in his book, the *Flora of County Kerry* (Scully 1916). Examination of the 1892, 6 inch map showed a nameless peak of this height. It is this peak which J.C. Coleman has named as Mangerton North in his book, the *Mountains of Killarney* (Coleman 1990).

The two records were as follows:

1. Scully (1916) recorded a plant known as *Lycopodium clavatum* as occurring plentifully in mossy and heather grown spots on this summit in 1888 and 1901. I know of no records of this rare clubmoss in Co. Kerry since that date (Jermy *et al.* 1978; Perring & Walters 1976; Scannell & Synnott 1987).
2. Scully (1916) also recorded the alpine willow known as Dwarf

Willow (*Salix herbacea*) as “near the point marked on the map 2568 feet [770 m] north of the Punch Bowl”. In the *Atlas of the British flora* it is only recorded after 1930 in two localities in Co. Kerry, on Mount Brandon, Dingle and the MacGillycuddy Reeks (Perring & Walters 1976). However while this willow may not actually be so rare on the mountain tops of Kerry it is easily overlooked being only 5-8 cm high with leaves superficially like the much commoner *Vaccinium myrtillus* (Bilberry).

Despite numerous walks on the mountains of Killarney between 1989 and 1996 I had never seen either the Stag’s-horn Clubmoss or the Dwarf Willow, but I had not had Scully’s notes to guide me until this particular day. The various places mentioned in the text are shown in Fig. 1.

THE SURVEY

I reached the start of the main walkway up Mangerton on the north side about 120 m above sea level at around 9.30 a.m. The early morning weather forecast had been for a weak ridge of high pressure, and westerly winds up to 40 km an hour, but by midday the forecast was for an Atlantic storm of high winds and rain so time was not on my side.

As I followed the course of the River Finoulagh which drains the northern flanks of Mangerton and flows on down into the River Flesk, I spotted some clumps of yellowing *Oreopteris limbosperma* (Lemon-scented Fern) well rooted into the fast-flowing river bed. At around 150 m I passed some hummocky clumps of *Sphagnum* which had sported the dainty blue flowers of the rare *Wahlenbergia hederacea* (Ivy-leaved Bellflower) earlier in the year. After about 0.5 km I reached a small metal gate in a boundary wall and hidden ditch which crisscrosses the hill, following the 180 m contour for 1 km on either side of the path. Just near here is the site of the Battle of Toreencormick (it took place in 1282!) and from this point I looked down on to Killarney and the townlands of Coolies and Gortagullane. From here, using binoculars, I could see the four new archaeological sites that Matt Hodd and I had found early in September, 1996. These were two standing stones and two bronze age cooking sites (fulachta fiadhs), which the map shows are all sited along a narrow 1 km long corridor. I wondered, “Was there any connection between them or were they occupied during different times in prehistory?”. Only an excavation of the sites could begin to tell

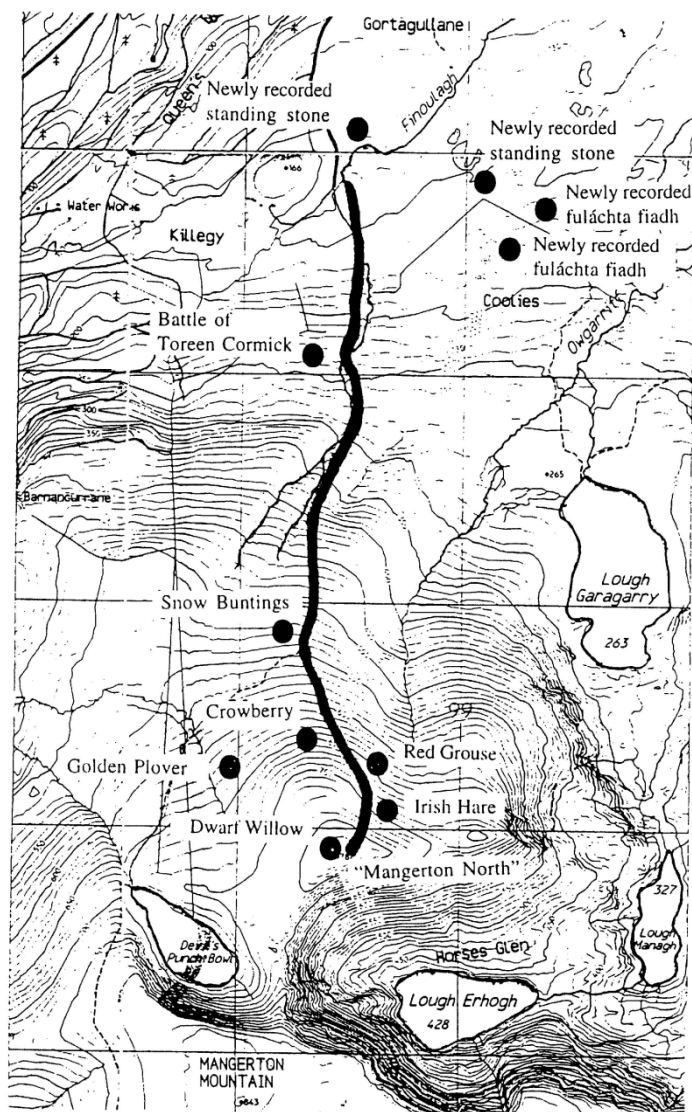


FIGURE 1. Location of some of the points of interest on Mangerton Mountain, Co. Kerry (v.c. 1). The grid is of 1-km squares. Route followed: —

us, and then only if artefacts were found that could be radio-carbon dated.

I climbed higher and soon reached around 450 m above sea level. Suddenly I heard some musical trilling notes as I spotted some sparrow sized birds flying away from me. First a couple took off and then a further dozen judging by their musical calls and the large amount of white on their upper wings and bodies indicated they were Snow Buntings (*Plectrophenax nivalis*). This was the first time I had seen these rare winter visitors inland in Co. Kerry.

Soon after seeing the Snow Buntings I reached a point where the pathway veers to the right towards the outfall of the Devils Punch Bowl, so I strode out straight on, heading through short (c. 30 cm) heather for the summit of the gentle rounded hill known as Mangerton North. As I climbed I noticed many shiny evergreen leaves, broader and longer than heather leaves but otherwise similar. They were the leaves of Crowberry (*Empetrum nigrum*), a local mountain loving plant whose black berries are, according to Scully (1916), a favourite of the Red Grouse (*Lagopus lagopus scoticus*) - and I did not have to wait long after that to see one! At about 600 m altitude, the deep rapid alarm call of “kok kok kok” alerted me to a Grouse as it flew low over the heather to escape me. This was the first time I had seen one so close to the main pathway to Mangerton but the fact he was on his own, shows just how rare this sociable bird has become.

More thrills were to follow when a huge Irish Hare (*Lepus hibernicus*), twice as big as a rabbit, bounded out from the heather just near the summit of Mangerton North. It was very nervous and was a couple of hundred metres from me. His dark coat, very white tail, and very long legs all stood out as he raced away from me. Then, at about 700 m, three more Snow Buntings flew up - I presume they were different from the others. They were in a much more typical habitat for inland Snow Buntings - stony scree and very dwarf montane heath.

Until now there had been little wind, but then as I reached the summit, the wind hit me with such force that it seemed to suck my breath away. Head down I began my search for Scully's 100 year old records of Stag's-horn Clubmoss and Dwarf Willow. Dark clouds raced towards me from the Reeks and a thick curtain of rain began to threaten. In no

time I found a Clubmoss but it was too erect to be the Stag's-horn Clubmoss and was the much commoner Fir Clubmoss (*Huperzia selago*). Here on the summit the heather was nearly gone and the vegetation was only a few cm high, mainly mosses and dwarfed grasses.

I looked for a summit cairn but there was none, only a 1 m wide and 0.5 m high pile of medium sized stones, marking the highest point. Now on my hands and knees (thank heavens for light weight leggings) I searched through the stones. "Eureka!" I exclaimed "The Dwarf Willow". In between the stones was a 60 cm square patch of almost leafless willow with its tiny rounded leaves all gone bar a couple of crucial, partially shrivelled ones. I hunted all over the summit but I could find no more and no Stag's-horn Clubmoss either. Scully reported that the Clubmoss was gathered by Kerry shepherds for making fire lighters from the spore bearing stems - perhaps that it is why it may be extinct now!

Within fifteen minutes of reaching the summit, it began to rain and I had to abandon my plant search as the clouds rolled around me, but there was still one more bit of excitement to come as I descended Mangerton North heading for the main Mangerton pathway. At around 600 m I heard the plaintive whistle of the Golden Plover (*Pluvialis apricaria*) as a flock of eleven of these winter visitors to the Kerry mountain bogs took off, not 50 m from me. There are always a few Golden Plovers on the north side of Mangerton in the winter but these were the first I had seen this year. By 12.30 a.m. I was back to my starting point at the foot of Mangerton after a most rewarding and exciting three hour long walk.

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SOME NON-NATIVE AQUATIC PLANTS IN THE LOWER RIVER LAGAN

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Elodea canadensis (Canadian Waterweed) and *E. nuttallii* (Nuttall's Waterweed)

The Lagan is a notable site in the history of the spread of *E. canadensis* in the British Isles. It was one of the first water bodies in which the species became naturalised after its arrival in the British Isles, probably through Belfast port, some time before 1836. Since then it has spread very widely in Northern Ireland as elsewhere in the British Isles.

An extensive survey of lakes commissioned by the Department of the Environment (Northern Ireland) (DoE(NI)) and conducted between 1988 and 1991, recorded *E. canadensis* from over 300 lakes at altitudes of up to 245 m. It is now a characteristic species of most lowland lakes and rivers here. During the course of the lake survey, much narrow-leaved *Elodea* material was collected from lakes, but none was confirmed to be *E. nuttallii*.

The first record for *E. nuttallii* in the River Lagan was made by Chris Preston in 1987, only a few years after its first discovery in Ireland from Lough Neagh. A survey of the Lagan between Lisburn and Belfast, also commissioned by the DoE(NI), conducted in 1996, revealed that *E. nuttallii* was by far the most abundant of the two species, having displaced *E. canadensis* from most parts of the river, and at the few stations where they co-occurred, almost always out-producing it. It has also spread to at least one nearby pond. Simpson (1990) has recorded similar displacements from England.

E. canadensis was found to be abundant and *E. nuttallii* absent at Mazetown, some 5 km upstream of Lisburn, during the River Corridor Survey work commissioned by the Department of Agriculture (Northern

Ireland) in 1996.

Nymphoides peltata (Fringed Water-I iJ y)

Hackney (1992) records this species as having been formerly introduced and naturalised in the River Lagan and Canal in several places, but not having been seen since 1950. Two small vegetative patches were found under Moore's Bridge (J/262.629) in south Lisburn during the 1996 DoE(NI) survey. There is access to the towpath at this point from the Hillsborough road running over the bridge, which makes this seem a likely point for deliberate introduction. *Nymphoides peltata* is not readily available from most garden centres.

Azolla filiculoides (Water Fern)

In late 1995, the surface of the River Lagan, at least in Belfast as far as Shaw's Bridge, became completely covered with floating vegetation so abundant that it could be seen afterwards in drifts washed up along the coast. This turned out to be mainly *Lemna gibba* (Fat Duckweed), *Spirodela polyrhiza* (Greater Duckweed) and *Azolla filiculoides* which was constant although somewhat patchy. During the course of the 1996 DoE(NI) Lagan survey, whilst *L. gibba* and *S. polyrhiza* were frequent, only two stations for *Azolla* were recorded: a few fronds from a stagnant canal section near the point at which the M1 motorway crosses the river, and similarly a few fronds from a stagnant ditch in the very south of Sir Thomas and Lady Dixon Park.

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ACER NEGUNDO L. (ASHLEAF MAPLE) AND URBAN PLANTING IN CORK CITY

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A letter written to the *Irish Times* in October 1936 was reproduced in a recent issue of that newspaper. The extract reported that “Cork has found a benefactor. His name is not known. His portrait is not published ... This mystery man has sent £500 to the City Manager for the planting of trees along the streets of Cork, the gift has been accepted and soon lime-trees and sycamores will be planted to beautify the walks where fashion flaunts and poets pace.”

The donation must have been used to plant the South Mall, the Grand Parade and Parnell Place - thoroughfares which today are lined with mature trees dating probably to the mid 1930s. On the South Mall I have noted *Tilia x vulgaris* (Lime), *T. platyphyllos* (Large-leafed Lime) and *T. tomentosa* (Silver-lime) flanking the street on both sides.

In Parnell Place some years ago I observed a medium sized tree with sycamore-type fruits and a strange leaf. I identified them as *Acer negundo* (Ashleaf Maple or Box Elder). Other plantings on this street included a hawthorn, with red flowers, probably *Crataegus laevigata* cv. ‘Paul’s new double scarlet’. Trees planted on pavements were out-of-reach and therefore it was difficult to check correct identification.

Acer negundo is a native of N.E. America, from Ontario to Florida. The flowers are dioecious and the leaves are compound, hence the common name. Gilbert Carter (1936) added to his description “in this country often deformed”. A Canadian work remarks “the only maple with compound leaves”.

The variegated form is the var. most frequently planted. The species is not known to be naturalised. On Wellington Road, Dublin there are four trees, one a well-grown male tree which produces flowers before the leaves emerge.

Acer negundo is not a pretty tree in its foliage, its branching nor in its

autumn colouring but it seems to tolerate urban conditions well.

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AN INTERESTING COPY OF SCULLY'S *FLORA OF COUNTY KERRY*

Nora McMillan

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I possess the late A.W. Stelfox's copy of R.W. Scully's *Flora of County Kerry* (1916) which has quite an interesting history. It was given in the first instance to R.A. Phillips of Cork but, having already ordered a copy, he passed this one on to Stelfox. With the book (given to me by Stelfox's son in memory of his father) came the letter from Phillips to Stelfox and also a letter of 16 June 1934 from Scully to Stelfox with lists of Kerry desiderata and careful directions to "good" places to visit. A few ms. annotations by Stelfox are given below:

"*Primula officinalis* (cowslip). V. abundant in fields about Cloghane A.W.S. 1.6.1946".

Sibthorpia europaea (Cornish Moneywort). "Plentiful in two places at ca. 1200 and 2200 ft. alt. at Owenafeana below Lough Duff. A.W.S. 1.6.1946".

Pinguicula grandiflora (Large-flowered Butterwort). "In full flower, about Connor Pass and on Brandon in Sept. 1910. A.W.S."

Stelfox also added the following comment upon Ley's record of *Thalictrum alpinum* (Alpine Meadow-rue). "Ley did not say he got this on Brandon Mt. but 'on the Brandon range of mountains' which may be a very different thing. A.W.S." and again "Augustin Ley's record of *Thalictrum alp.* on Brandon, SK. reads as follows (Journal of Botany

25, p. 274. 1887) ‘I found this plant in the Brandon range of mountains on rocks facing east, at an altitude of about 2000 ft. in August this year.’ [Not much of it & only in one spot but no clue as to exact location. A.W.S.]”.

The volume also yielded two small loose slips in a different hand, initialled “J.P.B.” [Brunker]. These ran thus:

“III. *Epilobium pedunculare* [Rockery Willowherb]. All over the [illegible]. E. of the Glenbeigh [?] Mountain. J.P.B.”

“*Spiranthes spiralis* Koch [Autumn Lady’s-tresses]. Sparingly near the headland in Rossbehy Creek which meets the western side of the Caragh R. estuary ‘51. J.P.B.”

HART’S *FLORA OF DONEGAL*

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In my possession is A.W. Stelfox’s copy of the *Flora of Donegal* by H.C. Hart (1898). To this, Stelfox has added, in his hand, a few ms. notes that may be of interest to readers of *Irish Botanical News*.

Page 259, *Cladium mariscus* (Great Fen-sedge). “Around Kill L. North S.E. of Dunfanaghy. A.W.S. 10.6.55”.

Page 260, *Carex teretiscula* [*C. diandra*] (Lesser Tussock-sedge). “Clonenny L. Still abundant here on 10.6.55”.

Page 261, *Carex paniculata* (Greater Tussock-sedge). “Clonenny L. Still there 10.6.55. A.W.S.” Hart says “By the small lake near Dunfanaghy, with *C. teretiscula*” and Stelfox has added “= Clonenny L.”

Page 263, *Carex stricta* [*C. elata*] (Tufted-sedge). “No trace of *stricta* in this locality [i.e. Clonenny Lough, N.McM.] on 10.6.55 though *paniculata* and *teretiscula* still abundant A.W.S.”

Page 265, *Carex limosa* (Bog-sedge). “At S.E. corner of Kill L. North S.E. of Dunfanaghy 10.6.55. A.W.S.”

Page 283, *Hymenophyllum tunbrigense* (Tunbridge Filmy-fern). "Above Sessiagh Lough 10.6.55. A.W.S."

Page 286, *Asplenium viride* [*A. trichomanes-ramosum*] (Green Spleenwort). "I. Bulbin Mt. A.W.S. June 1955".

Page 291, *Osmunda regalis* (Royal Fern). "Three plants on roadside between Linenhead [?] and the end of the Gap of Mamore A.W.S. 27.6.55".

GIANTS IN THE PLANT KINGDOM

M. O'Sullivan

Knockavota, Milltown, Co. Kerry

I would imagine that 1995 was an exceptional year for vigorous growth in plants and casual observation of a variety of species led me to measure the most prominent specimens of them from stem-base to apex. For the record here are the tallest, though in all instances there were quite a few specimens not far behind!

<i>Sonchus asper</i> (Prickly Sow-thistle)	267 cm
<i>Urtica dioica</i> (Common Nettle)	254 cm
<i>Digitalis purpurea</i> (Foxglove)	218 cm
<i>Cirsium palustre</i> (Marsh Thistle)	211 cm
<i>Dactylis glomerata</i> (Cock's-foot)	193 cm
<i>Senecio jacobaea</i> (Common Ragwort)	188 cm
<i>Rumex sanguineus</i> (Wood Dock)	135 cm
<i>Luzula sylvatica</i> (Great Wood-rush)	89 cm

Even allowing for the fact that most of these species are shade-loving and will grow to a maximum height in that situation, I am nevertheless convinced that exceptionally favourable weather conditions were prime factors in the production of such fine specimens. Check them out in 1997!

A REPORT ON THE FLORA OF CORK (v.cc. H3-H5), 1996

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The most notable feature of recording in 1996 was the range of rare inter-specific hybrids encountered, of which one is new to science, a second is new to Britain and Ireland, while three additional hybrids are new to the Irish flora.

In February, *Sedum dasyphyllum* (Thick-leaved Stonecrop) was found on three mortared-sandstone walls at Blairs Hill, Sunday's Well, Cork City (H4, W/66.72). It cohabits here with *S. acre* (Biting Stonecrop). The species would seem to be long-naturalized in this area.

Finds made between March and May included *Arum italicum* subsp. *italicum* (Italian Lords-and-Ladies) from the northern bank of the River Lee below Sunday's Well (H4, W/66.71); *Anemone apennina* (Blue Anemone) from woodland beneath Kilnap railway viaduct on the Old Mallow Road (H4, W/66.74); and *Symphytum tuberosum* (Tuberous Comfrey) well established in hedgebanks near Blackrock Convent (H4, W/71.71), here in its second Mid Cork site.

Hybrid Bluebell, i.e. *Hyacinthoides non-scripta* (Blue-bell) x *H. hispanica* (Spanish Bluebell), is now known to be widespread and locally common about Cork City but as yet I have failed to find convincing material of *H. hispanica*, and I strongly suspect that most of the British and Irish records for this species are erroneous.

In May I also rechecked my 1990 Blackrock (H4, W/71 .70) site for the sedge hybrid *Carex x emmae* (*C. divulsa* (Grey Sedge) x *C. remota* (Remote Sedge)). Five tussocks of this exceedingly rare European hybrid were refound.

On 8 June, Kilcolman Fen, near Doneraile (H5, R/5.1) - a National Wildfowl Refuge - was visited. It is very evident that major changes in species-distribution patterns have taken place here since the sluice came into operation in November 1992. Doubtless the much higher winter/spring water levels are facilitating the dispersal of propagules throughout the fen basin. As a consequence, the present Warden,

Andrew Shaw, has found many new stations for formerly very localised species. A case in point is *Rumex maritimus* (Golden Dock) which he has recorded as two large pond-side populations at the SW/SE margins of the fen. Yet in the previous 125 years (1870-1995) this nationally-rare dock was confined to the northern, turlough-type lough fronting the Bird Observatory.

Chenopodium rubrum (Red Goosefoot) has similarly spread from the lough to the southern ponds, while I have recently found it in two other pond sites north of Killavullen (H5, R/6.0).

15-16 June was earmarked for a BSBI (Irish Branch) weekend outing to Lough Allua on the River Lee (H3, W/1.6 & W/2.6) and to Gurtavehy Lough in the Caherbarnagh Mountains west of Millstreet (H3, W/2.8), respectively. Prior to the meeting, I visited the eastern end of Lough Allua adjacent to Inchageela Village on 1 June (accompanied by Michael Troy) in order to familiarize myself with the terrain. This trip resulted in the fortuitous rediscovery of *Viola lactea* (Pale Dog-violet) and *V. canina* (Heath Dog-violet) from the general area where they were first recorded by R.A. Phillips on 4 June 1900 (see: *Irish Naturalist* 9: 244), *V. lactea* then being new to the Irish flora.

I intend to carry out further work on the distribution and frequency of both species here (including their various hybrids) in 1997.

In July, on-going work on the current Cork distribution and frequency of the nationally-rare *Geranium purpureum* (Little-Robin) turned up some new sites, while the outlier Glanmire hedgebank population (H5, W/7.7) made a spectacular display this year - a very pleasant surprise. Moreover, against all expectations, the species continues to persist in the neighbourhood of former sites which have been destroyed by house-building developments in recent years. While *G. purpureum* is still only known from two hectads about Cork City (H4 & H5, W/6.7 & W/7.7), within this area it now boasts some 23 distinct stations in eight 1-km squares!

A particularly rewarding discovery in the Blackrock area of the city, (H4, W/72.71) was that of two plants of the F₂ hybrid *G. robertianum* (Herb Robert) x *G. purpureum*. This largely fruit-sterile hybrid is new to science.

In August, the rare maritime grass hybrid, *Elytrigia atherica* (Sea Couch) x *E. repens* (Common Couch) was found in a further Cork Harbour site. It grew abundantly on saltmarsh embankments in Douglas Creek, adjacent to the Douglas Tennis Club (H4, W/70.70).

Two further August hybrid finds are of special note:

1. *Myosotis scorpioides* (Water Forget-me-not) x *M. laxa* (Tufted Forget-me-not) was added to the Irish flora from the Gearagh (H3, W/3.7) west of Macroom. It is quite frequent on the southern side of the defunct Dunmanway road-crossing here. This forget-me-not hybrid is probably widespread in Ireland, but has just been overlooked to-date.
2. The very rare European sedge hybrid, *Carex divulsa* (Grey Sedge) x *C. muricata* (Prickly Sedge) was confirmed from Maglin Crossroads, near Ballincollig (H4, W/59.68), where I first observed it in November 1995. This is its second 1-km site in this hectad.

On-going *Rosa* work continues to prove very productive. The most gratifying result was the addition of *Rosa agrestis* (Small-leaved Sweetbriar) to the Cork flora at long last, from hedgebanks on the Doneraile-Killavullen road (H5, R/6.0). This East Cork site for *R. agrestis* bridges the gap between my recent Limerick (H8) and Waterford (H6) stations for the species. Indeed the Dungarvan locality is the most southern for *R. agrestis* in Ireland.

The Doneraile-Killavullen roadway is possibly unique in Britain and Ireland in possessing four Sweetbriar taxa namely: *R. agrestis*, *R. rubiginosa* (Sweetbriar), *R. micrantha* (Small-flowered Sweet-briar) and *R. micrantha* x *R. rubiginosa*.

Other *Rosa* finds included: *R. micrantha* x *R. rubiginosa* from the Blackrock Amenity Walkway, near the Atlantic Pond, Cork City (H4 W/70.71); *R. canina* (Dog Rose) x *R. caesia* subsp. *glauca* (Glaucous Dog-rose) from my third West Cork site near Macroom (H3, W/3.7); *R. sherardii* (Sherard's Downy-rose) x *R. tomentosa* (Harsh Downy-rose) also from the above Macroom site; and *R. canina* x *R. micrantha* from the Knockraha area of East Cork (H5. W/7.7), this latter hybrid being new to the Irish flora.

September continued the run of hybrid rarities. A pollen-/fruit-fertile

form of *Stachys palustris* (Marsh Woundwort) x *S. sylvatica* (Hedge Woundwort) (*S. x ambigua*) was found in the Lee Fields (inundation meadows) Cork City (H4, W/6.7). This seems to be a unique Irish/British plant as the F₁ hybrid is known to be highly pollen-/fruit-sterile. I hope to grow-on further plants from the seeds of this hybrid.

Additionally, F₂ plants of *Veronica anagallis-aquatica* (Blue Water-Speedwell) x *V. catenata* (Pink Water-Speedwell) (*V. x lackschewitzii*) were recorded from the confluence of the rivers Blackwater and Awbeg, near Castletownroche (H5, R/6.0). This pollen-/fruit-fertile hybrid is new to the Irish flora, though the pollen-/fruit-sterile F₁ hybrid is widespread (if largely under-recorded) in Ireland.

A visit to the sole Irish site for *Carex depauperata* (Starved Wood-Sedge) on 14 September proved anything but encouraging, as the 20 tussocks seen here in August 1989 had now dwindled to just seven plants, of which only four produced fruiting culms. All of the clumps are clearly dying out, and it remains to be seen if a fresh crop of seedlings will continue the line here, as has consistently happened in the past during my period of observations (i.e. 1973-1996). *C. depauperata* leads a will-o'-the-wisp existence in its East Cork limestone woodland habitat, and such erratic appearance/disappearance would seem to be an intrinsic part of its autecology throughout its Irish/British (?and European) range.

Lastly, the hybrid knotweed, *Fallopia japonica* (Japanese Knotweed) x *F. sachalinensis* (Giant Knotweed) (*F. x bohémica*) was confirmed as occurring at Little Island (H5, W/7.7), East Cork in late September. This station is additional to the very small list of Irish sites given by Bailey *et al.* (1996).

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THE FLORA OF CORK (v.cc. H3-H5) IN 1996

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In the 1996 season visits were made to Cork county to observe and record the flora. Urban areas of Cork City were also noted.

Cork is the largest Irish county embracing just over 7,500 km². The geological formation of the uplands is largely of Old Red Sandstone, the synclines are of limestone and in H4 and H5 there are few lakes and few peat bogs. The coastline is long and, in parts, difficult to explore.

In June a scheduled meeting of the Regional Branch of BSBI was held in Macroom-Millstreet led by Tony O'Mahony. Near the town we were shown *Veronica crista-galli* (Crested Field-speedwell) and *Carex muricata* (Prickly Sedge). The causeway area of the Gearagh was botanized and *Elatine hexandra* (Six-stamened Waterwort) was found in some plenty at the furthest point from the main road. From Millstreet the cliffs over Gortavehy lake were explored and plants of interest were noted including *Asplenium trichomanes-ramosum* (Green Spleenwort), *Cystopteris fragilis* (Brittle Bladder-fern), *Huperzia selago* (Fir Clubmoss), *Carex pallescens* (Pale Sedge), *Pinguicula grandiflora* (Large-flowered Butterwort) and frequent *Saxifraga spathularis* (St Patrick's-cabbage). The meeting was notable for the sight of *Viola lactea* (Pale Dog-violet) recently rediscovered by the leader in the station originally reported by R.A. Phillips. The weather was excellent. Toby and Rory Hodd took note of the butterflies.

In urban Cork, *Erigeron karvinskianus* (Mexican Fleabane) was collected from a high limestone wall in the Blackrock area. *Hirschfeldia incana* (Hoary Mustard) was collected from the grassed margin of the Bus Depot parking in Parnell Place, apparently new to H4.

Late in the season a visit was made to the Castlemartyr area (V/9.7). The station for *Origanum vulgare* (Wild Marjoram) west of Lady's Bridge was checked. Some 12-15 plants were noted in one spot on an earthen bank. I sought *Rubia peregrina* (Wild Madder) but it was not found on this occasion. Walter Wade (c. 1760-1825) remarked regarding this species "*Rubia peregrina* (bastard madder) which perhaps may answer

the purposes of the more costly madder or *Rubia tinctoria*". It was recorded in the early Floras and has been collected in recent times from near East Ferry and on the approach road to Cobh.

Grid square V/9.6 was worked, again late in the season, from Cloyne to Ballycotton and about Shanagarry. Further large boulders have been deposited in areas of Ballycotton Bay to stem erosion. Some species not noted in the region in the 1962 *Atlas* were found to be not uncommon including *Carex otrubae* (False Fox-sedge), *C. divulsa* (Grey Sedge), *Aira praecox* (Early Hair-grass), *A. caryophyllea* (Silver Hair-grass), *Vulpia bromoides* (Squirrel-tail Fescue) and others. *Carex punctata* (Dotted Sedge) was reported by R.A. Phillips from west of Ballycotton. A brief search did not reveal it and there is little suitable ground for the species near Ballycotton itself. *Diplotaxis muralis* (Annual Wall-rocket) was found on shattered rock (preliminary to house building) west of the village of Ballycotton. Plants resembling *Rumex crispus* subsp. *littoreus* (Curled Dock) were noted near Ardnahinch but were not collected for checking. *Raphanus raphanistrum* subsp. *maritimus* (Sea Radish) occurs frequently on a stretch of the Bay. *Picris echioides* (Bristly Oxtongue) occurs on sandy ground and on roadsides near Monagurra. South of Cloyne *Chicorium intybus* (Chicory) was found in fair quantity about the margin of a field after crop clearance.

Visiting botanists also provided information from their work. Ian McNeill (Co. Tyrone) worked about Kinsale, Garrylucas Marsh, Glengariff and Castletownbere. He reported an unusual *Hypericum* from the Bandon estuary. I suggested it might be *H. pseudohenryi* (Irish Tutsan). Later a report said it had been determined by N.K.B. Robson as *H. hircinum* (Stinking Tutsan). The latter species is known about Glanmire and East Ferry. Also reported was a possible hybrid of *Rumex crispus* (Curled Dock) with *R. hydrolapathum* (Water Dock), which may be new to the flora-list, but it is not known if specimens were collected for determination. *Avena strigosa* (Bristle Oat) was found near Garrylucas Marsh. It is listed in O'Sullivan *et al.* (1996) as one of the species in the Irish Plant Genetic Resources Seedbank.

R.P. Bowman of Southampton botanized about Barley Cove and Galley Cove, reporting *Orchis morio* (Green-winged Orchid) and *Anthyllis vulneraria* subsp. *lapponica* (Kidney Vetch). He also worked about Mizen Head, Lough Ine and sent lists of his finds.

I express thanks to Ian McNeill and to R.P. Bowman for their cooperation.

The writer also worked in other counties - Co. Clare, v.c. H9 (the Burren), N. Tipperary, v.c. H10 (Monaincha Bog), Co. Kildare, H19 (canal) and Westmeath, v.c. H23. The *Flora* of H23 was initiated by the Irish Regional Branch of the BSBI under a sub-committee of Con Breen (Vice-county Recorder), T.G.F. Curtis and M.J.P. Scannell. There was no scheduled meeting in 1996.

REFERENCE

O'Sullivan, A., Martin, J., Curtis, T.G.F. & Waldren, S. (1996). Conserving native Irish plant species by collecting and storing their seeds. *Irish Botanical News* **6**: 5-11.

REPORT FOR CO. LIMERICK (v.c. H8), 1996

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In 1996, fieldwork for *Atlas 2000* was concentrated in hectads in north Co. Limerick, and the more interesting sites and representative plants in those hectads are described below.

At Loghill (R/1.4), a field with adjacent saltmarsh beside the White River had many plants of *Dipsacus fullonum* (Wild Teasel) and *Brassica nigra* (Black Mustard), both quite common in this area, as well as *Linum bienne* (Pale Flax), previously found here in 1902. In the same square, many weedy species, including *Raphanus raphanistrum* subsp. *raphanistrum* (Wild Radish) and *Spergula arvensis* (Corn Spurrey) grew on dumped soil near Glin, and on higher ground south of Glin *Osmunda regalis* (Royal Fern) was found with common bog plants.

A BSBI field meeting recorded in a fen at Ballyvogue (R/3.5) east of Askeaton in 1974. That fen has since been drained and degraded, but another fen about 1 km north of Ballyvogue is intact and contains many of the same species such as *Cladium mariscus* (Great Fen-sedge),

Potamogeton coloratus (Fen Pond weed), *Baldellia ranunculoides* (Lesser Water-plantain) and *Menyanthes trifoliata* (Bogbean). Other species seen were *Eleogiton fluitans* (Floating Club-rush), *Apium inundatum* (Lesser Marshwort) and *Sparganium natans* (Least Burreed), and the surrounding limestone grassland was equally rich in species.

Two good sites in R/4.5 were at Bleach Lough and Ferry Bridge. At the north end of Bleach Lough, in quite a small area of lake, lake edge, grassland and a rocky knoll, over 170 species were recorded in mid-August in two hours. Undoubtedly, visits earlier in the year would add to the total. In the lake, with its marl substrate, there were five species of *Potamogeton* - *P. berchtoldii* (Small Pondweed), *P. crispus* (Curled Pondweed), *P. natans* (Broad-leaved Pondweed), *P. gramineus* (Various-leaved Pondweed) and *P. pectinatus* (Fennel Pondweed). The highly calcareous water is a less usual habitat for the latter two species (Preston 1995). *Parnassia palustris* (Grass-of-Parnassus), *Juncus subnodulosus* (Blunt-flowered Rush), *Carex viridula* subsp. *brachyrrhyncha* (Yellow-sedge) and subsp. *viridula* occurred at the lake edge, *Cirsium dissectum* (Meadow Thistle) and *Schoenus nigricans* (Black Bog-rush) were in nearby marshy ground, and *Melica uniflora* (Wood Melick) was on the rocky knoll.

At Ferry Bridge (R/4.5), two protected species, *Schoenoplectus triqueter* (Triangular Club-rush) and *Hordeum secalinum* (Meadow Barley) grew within metres of each other. *S. triqueter* was accompanied by *Aster tripolium* (Sea Aster) and *Rumex crispus* subsp. *uliginosus* (Curled Dock) on the mud in the tidal creek. On the banks two large sedges, *Carex riparia* (Greater Pond-sedge) and *C. acutiformis* (Lesser Pond-sedge), were common, and *Trifolium fragiferum* (Strawberry Clover) grew near the abundant *Hordeum secalinum*. *T. fragiferum* and *H. secalinum* are also known to occur together by the Shannon estuary at another site in R/4.5 and at one in R/3.5. In a damp field near Ferry Bridge, plants which initially looked like *Persicaria hydropiper* (Water-pepper), on closer examination were found to lack glands (also no peppery taste!). Using Stace (1991) these plants had all the characters to make them *P. laxiflora* (Tasteless Water-pepper). As *Polygonum mite* (= *Persicaria laxiflora*), there are old records for it near Limerick city which is in the adjoining square.

Despite industrial works close by, Ballinacurra Creek (R/5.5), on the outskirts of Limerick city, remains of great interest botanically. *Schoenoplectus triqueter*, first found in Limerick in 1899, grows along the creek, and *Leucojum aestivum* (Summer Snowflake) flourishes among *Phragmites australis* (Common Reed) on tidal mud. A shallow ditch, with swans, inside the embankment on the west side of the creek contained abundant *Zannichellia palustris* (Horned Pondweed) and *Potamogeton pectinatus* (Fennel Pondweed). A satisfying find in the same ditch was *Hydrocharis morsus-ranae* (Frogbit). It is not listed for Co. Limerick in Scannell & Synnott (1987), but there is a record for it at Primrose Bank in a paper by a member of the Limerick Field Club (Fogerty 1898). The paper had included so many totally wrong records (Praeger wrote scathingly about this paper) that all the records in it were regarded as being unreliable. However, Primrose Bank was in the same area as Ballinacurra Creek, and it is likely that the *Hydrocharis* record, was correct. Another satisfying up-date of an earlier record was to find *Typha angustifolia* (Lesser Bulrush): it was growing with *T. latifolia* (Bulrush), and the hybrid should be looked for as it has been recorded across the Shannon in Co. Clare (Brady & Rich 1992).

The 1974 BSBI field meeting visited Ballinacurra Creek as well as Loughmore Turlough in the same square. Since that time, much of Loughmore has been drained and planted with broadleaved trees. In a ditch along one side of the plantation there were still some small plants of the protected species *Groenlandia densa* (Opposite-leaved Pondweed); a few years ago this species was quite common in the Abbey River in Limerick city.

In early September, Michael Quirke of Murroe showed me an unusual site in the Slieve Felim Mountains which he had found during the summer. It was a small piece of fen, dominated by *Phragmites*, on a slope with *Molinia caerulea* (Purple Moor-grass) at about 350 m. Whereas the *Molinia* slope was poor in species, the *Phragmites* site had an interesting variety of approximately 35 species including *Carex limosa* (Bog-sedge), *Cirsium dissectum* (Meadow Thistle), *Vaccinium oxycoccos* (Cranberry), *Triglochin palustre* (Marsh Arrowgrass), *Coeloglossum viride* (Frog Orchid), *Menyanthes trifoliata*, *Potentilla palustris* (Marsh Cinquefoil) and *Empetrum nigrum* (Crowberry).

A productive BSBI field meeting in August to Lough Gur (R/6.4),

Knockdere (R/6.3), Askeaton (R/3.5), Barrigone, Aughinish Island and Foynes Port (R/2.5) will be reported on in *BSBI News*.

There are 36 hectads or substantial parts of hectads in Co. Limerick. Four of these were surveyed for the Monitoring Scheme, four more meet the 1996 quota of about 300 species per hectad, and 13 have fewer than 50 species recorded in them (including several zeros!), so much field work remains to be done in the county between now and 1999.

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REPORT ON THE FLORA OF FERMANAGH (v.c. H33), 1996

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Ralph Forbes and I have, during the last season, spent time visiting the tetrads with less than 100 species recorded from them and there now remain about 40, out of the 525 tetrads in Fermanagh, which require further recording next season. If our experience is anything to go by, it should be possible to find at least 150 species in all but the most species poor upland tetrads. The richest tetrads should have between 350 and 400 species.

Since most of the tetrads we visited had not been visited before, simply because they consisted mostly of uninteresting habitats, it is not

surprising that we have not had a vintage year for exciting finds! However, some interesting species did turn up and some are detailed below:

Lathraea squamaria (Toothwort) was found on a riverbank near Kesh.
Equisetum x trachyodon (Mackay's Horsetail) on Inishkeeragh, west of Boa Island.

Equisetum hyemale (Rough Horsetail) by stream in Muckenagh townland near Garrison.

Neottia nidus-avis (Bird's-nest Orchid) in a wood beside Nutfield Estate near Brookeborough (see Fig. 1).

Neotinea maculata (Dense-flowered Orchid) 16 flowering spikes on Knockninny. Raymond Piper pointed out that these were of the pink flowered variety, but the pinkish hues are only obvious when the plant is viewed through a lens.

Centaurea cyanus (Cornflower). A plant was found in flower on a newly seeded lawn in a housing development on the outskirts of Enniskillen. Had it grown from seed introduced with the grass or had it grown from seed long dormant in the imported topsoil spread in front of the newly erected dwelling? The species is considered extinct in Ireland by Curtis & McGough (1988).

Saxifraga tridactylites (Rue-leaved Saxifrage) with only one previous Fermanagh record, turned up twice, once on Gortmaconnell Rock on the marlbank Scenic Loop, and again on a limestone outcrop at Natural Bridge near Garrison. Perhaps the very dry spell early in the summer encouraged this plant.

Trichomanes speciosum (Killarney Fern). The gametophyte of this fern was found in two places in Derryvahan townland.

Orthilia secunda (Serrated Wintergreen). The known range of this species was extended to the south-west by its discovery in two new tetrads to the west of the Correl Glen.

Pyrola media (Intermediate Wintergreen). A nice stand of about half a dozen plants of this species was found to the west of the Correl Glen. It usually occurs as isolated plants.

REFERENCE

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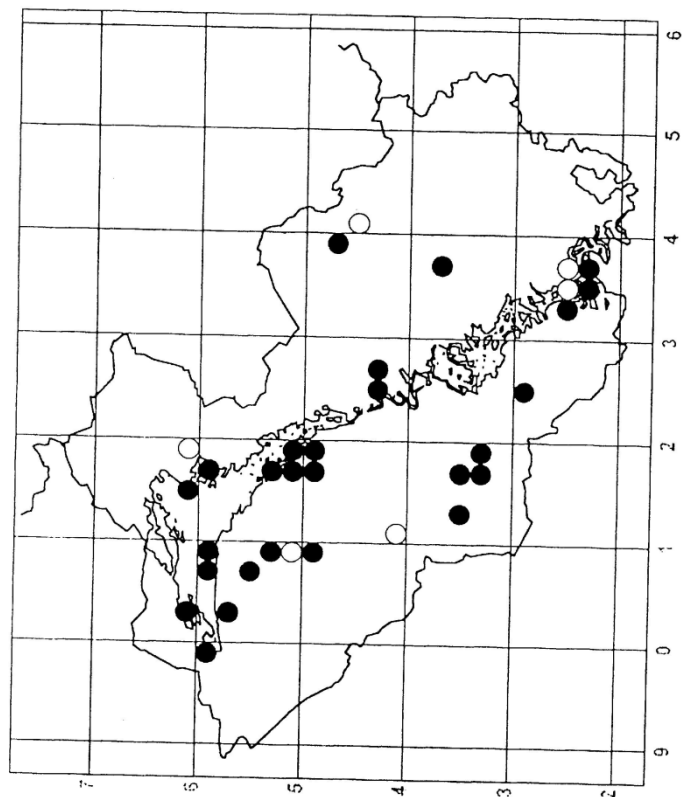


FIGURE 1. The distribution of *Neottia nidus-avis* (Bird's-nest Orchid) in Co. Fermanagh. Open circles are pre-1975 records and closed circles are records dated 1975 or later.

B.S.B.I. FIELD MEETINGS IN IRELAND, 1996

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The first meeting of the season was in May to S.E. Galway (v.c. H15) where we met at Ardrahan Cross Roads and visited woodland areas including Coolgarry where we deliberated long and hard over plants which might not have been *Viola persicifolia* (Fen Violet) or were they *V. canina* (Heath Dog-violet) or maybe a hybrid?

In June we visited the v.cc. of West and Mid Cork (v.cc. H3 and H4). We started in Macroom and after a car procession through the town, where we temporarily lost some members, we visited the Geeragh where the River Lee is dammed to form a large reservoir. Unfortunately, the water level was high and most of the interesting flora was submerged. Near Inchigeela we were shown the site of *Viola lactea* (Pale Dog-violet) and also found a magnificent stand of *Briza maxima* (Greater Quaking-grass). On the Sunday we were near Mill Street and on the north-facing cliffs above Lough Gurtavehy we found *Listera cordata* (Lesser Twayblade), *Cystopteris fragilis* (Brittle Bladder-fern), *Phegopteris connectilis* (Beech Fern) and both *Saxifraga spathularis* (St Patrick's-cabbage) and its hybrid with *S. hirsuta* (Kidney Saxifrage), *S. x polita*. *Juncus conglomeratus* (Compact Rush) x *J. effusus* (Soft-rush), a rare hybrid, grows besides the lake which also contains *Lobelia dortmanna* (Water Lobelia).

Also in June there was an extra field trip to Westmeath (v.c. H23) where recording for the *Atlas 2000* scheme and the on-going *Flora* of the county was carried out.

At the end of June we were in Cavan (v.c. H30) where we concentrated on the lakes in the Belturbet area. On this meeting we were privileged to have Chris Preston, the *Potamogeton* expert on hand to sort out this under-recorded genus and we found 13 species in all, four of which were new v.c. records. Among other aquatic plants found were *Stratiotes aloides* (Water-soldier), only the second v.c. record, *Hydrocharis morsus-ranae* (Frogbit), *Stellaria palustris* (Marsh Stitchwort) and many others.

In mid-July North Tipperary (v.c. H10) was the venue for a field meeting based at Roscrea. There is a very productive area beside the railway line near Cloughjordan and here we found *Carlina vulgaris* (Carlina Thistle), *Geranium sanguineum* (Bloody Crane's-bill) and *Ophrys apifera* (Bee Orchid). Beside a lake in the area we found *Sparganium natans* (Least Bur-reed) and in some woodland *Pyrola minor* (Common Wintergreen). There was also *Luzula*, possibly *L. pilosa* (Hairy Wood-rush).

At the end of July we visited an area of limestone pavement near Moycullen in West Galway (v.c. H16). This is possibly the best limestone pavement area outside the Burren and had all the usual plants. In a nearby boggy area were excellent sporing specimens of *Pilularia globulifera* (Pillwort) and also *Vicia orobus* (Wood Bitter-vetch) was discovered.

In August we were north of the border at Torr Head and Glenariff in Co. Antrim (v.c. H39) where several species of *Hieracium* (Hawkweeds) were seen under the cliffs of Torr Head along with *Saxifraga aizoides* and *S. hypnoides* (Yellow Saxifrage and Mossy Saxifrage). In Glenariff a few stands of *Phegopteris connectilis* (Beech Fern) and also *Hymenophyllum wilsonii* (Wilson's Filmy-fern) were found in the Glen.

At the end of August, in driving rain, we assembled at Lough Gur in Co. Limerick (v.c. H8) and saw fine examples of *Rumex hydrolapathum* (Water Dock) and *R. maritimus* (Golden Dock). At Foynes Port on the River Shannon we investigated the aliens in the port area among which were *Descurainea sophia* (Flixweed), *Setaria viridis* (Green Bristle-grass), *Malva pusilla* (Small Mallow), *Amaranthus retroflexus* (Common Amaranth) and *Erucastrum gallicum* (Hairy Rocket). At Barrigone Roundstone we saw *Blackstonia perfoliata* (Yellow-wort) and *Persicaria amplexicaulis* (Red Bistort), a rare member of the bistort family, was found growing by the roadside.

A Field and Workshop Meeting arranged for Laois and Co. Kildare (v.cc. H14 and H19) was a complete washout and nobody except the leader Declan Doogue turned up. But his own field meeting based in Kilcullen was a profitable affair with *Chamaemelum nobile* (Chamomile), *Blackstonia perfoliata* (Yellow-wort), *Clinopodium*

acinos (Basil Thyme), *Carduus acanthoides* (Wetted Thistle) and *Origanum vulgare* (Wild Marjoram) either in flower or in fruit.

1996 was my first year as Field Meetings Secretary and I was able to attend all but one of the regular meetings and I would like to thank all the v.c. recorders for giving up their time to lead meetings and to all those members who participated. The attendance varied from fair to good apart from the Kildare/Laois meeting, but I would urge members to attend if they can because after all they are arranged for you and are enjoyable and informative and I have certainly learnt a lot this year. Indeed beginners in field identification of plants are most welcome at all our meetings - there is never any shortage of more experienced members prepared to help the beginner.

I have arranged a full programme for 1997 and details are enclosed with this issue of *Irish Botanical News* and I look forward to seeing as many members as possible - if you were not able to attend this year, see what you missed!

SPECIES DISPERSAL AND LAND USE PROCESSES

The 1997 Annual Conference of the International Association for Landscape Ecology (UK) is to be held at the University of Ulster, Coleraine, Northern Ireland, 9-12 September 1997.

Session themes:

1. Dispersal and spatial scale
2. Species distribution and land use processes
 - arable and pastoral landscapes
 - uplands
 - forests and woodlands
3. Large-scale distribution patterns and GIS
4. Insect dispersal in altered landscapes
5. Habitat creation and species dispersal

Recent and current land uses are now major determinants of species distribution. Lowland landscapes are strongly influenced by agriculture, industry and urban development. Most rural areas now contain only

small, isolated remnants of semi-natural habitat within large blocks of intensively managed crops and grassland. Upland landscapes have also been radically changed. Their vegetation mosaics have been much modified by land use processes associated with livestock rearing, plantation forestry, recreation, tourism and peat extraction.

In some cases, species dispersal may be directly associated with specific human activities. This is illustrated by the spread of plant species across agricultural land on farm machinery and in animal manures. Land use processes also influence species dispersal and colonisation indirectly by their impact on dispersal agents and patch characteristics. Hedges, for example, act as reservoirs of biodiversity in lowland farmland and as potential corridors for species movement through the landscape, but as a result of recent changes in hedgerow management, their abundance and quality have declined markedly.

Landscape ecology focuses on the spatial arrangement of landscape elements, and on the ecological and cultural mechanisms that drive ecological change at the landscape scale. An important component of landscape ecology is the dispersal of organisms within and between habitat patches. Species distribution patterns and dispersal processes, and their relationship to land use, are the subject of this conference. Its purpose is to bring together ecologists, planners and land managers to develop applications of landscape ecology which may contribute to the sustainable management of contemporary and future landscapes.

For further information, please contact the organiser:

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ERRATUM

A mistake crept into the paper by Maura Scannell in *Irish Botanical News* **6**: 26-27. The des Abbayes (1951) reference in the paper should read:

des Abbayes, H. ed. (1971). *Flore et végétation du Massif Armoricain*. Presses Universitaires de Bretagne, Saint-Brieuc.