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## Contents

List of Figures

List of Tables

List of Plates

1. Introduction

2. Study Sites

3. Methods

4. Results

4.1. Ballyteige drainage channels, Co. Wexford.

4.2. Kilmore Lake, Whiddy Island, Co. Cork.

4.3. An Loch Mór, Inis Oírr, Aran Islands, Co. Galway.

4.4. Loch Phort Chorrúch, Árainn, Aran Islands, Co. Galway.

4.5. Loch an Chara, Árainn, Aran Islands, Co. Galway.

4.6. Loch Fhada complex, Connemara, Co. Galway.

4.7. Loch an Aibhnín, Connemara, Co. Galway.

4.8. Loch Cara Fionnla, Connemara, Co. Galway.

4.9. Lough an tSaile, Connemara, Co. Galway.

4.10. Lough Athola, North Mannin Bay, Co. Galway.

4.11. Lough Bofin, Inishbofin, Co. Galway.

4.12. Maghery Lough, Co. Donegal.

4.13. Sally's Lough, Co. Donegal.

4.14. Kincas Lough, The Rosses, Co. Donegal.

4.15. Moorlagh, The Rosses, Co. Donegal.

4.16. Inch Lough, Lough Swilly, Co. Donegal.

5. Summary of the 16 sites selected for survey in 1998.

6. Summary of the 36 sites surveyed in 1996 and 1998.

7. Evaluation of the 36 sites surveyed in 1996 and 1998.

References

Acknowledgements

- List of figures
- Figure 2.1 Map of Ireland showing position of the 16 sites selected for survey of aquatic fauna, 1998.
- Figure 4.1.1 Section of O.S. 6" map showing area of Ballyteige drainage channels, Co. Wexford.
- Figure 4.1.2 Sketch map of Ballyteige drainage channels, Co. Wexford, showing sampling stations used for a survey of aquatic fauna, 1998
- Figure 4.2.1 Section of O.S. 6" map showing area of Kilmore Lake, Co. Cork.
- Figure 4.2.2 Sketch map of Kilmore Lake, Co. Cork, showing sampling stations used for a survey of aquatic fauna, 1998.
- Figure 4.3.1 Section of O.S. 6" map showing area of Loch Mór, Inis Oírr, Co. Galway.
- Figure 4.3.2 Sketch map of Loch Mór, Inis Oírr, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998
- Figure 4.4.1 Section of O.S. 6" map showing area of Loch Phort Churroch, Inis Mór, Co. Galway.
- Figure 4.4.2 Sketch map of Loch Phort Churroch, Inis Mór, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.
- Figure 4.5.1 Section of O.S. 6" map showing area of Loch an Chara, Inis Mór, Co. Galway.
- Figure 4.5.2 Sketch map of Loch an Chara, Inis Mór, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.
- Figure 4.6.1 Section of O.S. 6" map showing area of Loch Fhada, Connemara, Co. Galway.
- Figure 4.6.2 Sketch map of Loch Fhada, Connemara, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.
- Figure 4.7.1 Section of O.S. 6" map showing area of Loch an Aibhnín, Co. Galway.
- Figure 4.7.2 Sketch map of Loch an Aibhnín, Connemara, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.
- Figure 4.8.1 Section of O.S. 6" map showing area of Loch Cara Fionnla, Co. Galway.
- Figure 4.8.2 Sketch map of Loch Cara Fionnla, Connemara, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998
- Figure 4.9.1 Section of O.S. 6" map showing area of Loch an tSaile, Co. Galway.
- Figure 4.9.2 Sketch map of Loch Ahalia, Connemara, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.
- Figure 4.10.1 Section of O.S. 6" map showing area Loch Athola, Connemara, Co. Galway.
- Figure 4.10.2 Sketch map of Loch Athola, Connemara, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.
- Figure 4.11.1 Section of O.S. 6" map showing area of Lough Bofin, Inishbofin, Co. Galway.
- Figure 4.11.2 Sketch map of Lough Bofin, Inishbofin, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.
- Figure 4.12.1 Section of O.S. 6" map showing area of Maghery Lough, Co. Donegal.
- Figure 4.12.2 Sketch map of Maghery Lough, Co. Donegal, showing sampling stations used for a survey of aquatic fauna, 1998.
- Figure 4.13.1 Section of O.S. 6" map showing area of Sally's Lake, Co. Donegal.
- Figure 4.13.2 Sketch map of Sally's Lake, Co. Donegal, showing sampling stations used for a survey of aquatic fauna, 1998.
- Figure 4.14.1 Section of O.S. 6" map showing area of Kincas Lough, Co. Donegal.
- Figure 4.14.2 Sketch map of Kincas Lough, Co. Donegal, showing sampling stations used for a survey of aquatic fauna, 1998.
- Figure 4.15.1 Section of O.S. 6" map showing area of Moorlagh, Co. Donegal.
- Figure 4.15.2 Sketch map of Moorlagh, Co. Donegal, showing sampling stations used for a survey of aquatic fauna, 1998.
- Figure 4.16.1 Section of O.S. 6" map showing area of Inch Lough, Lough Swilly, Co. Donegal.
- Figure 4.16.2 Sketch map of Inch Lough, Lough Swilly, Co. Donegal, showing sampling stations used for a survey of aquatic fauna, 1998.
- Figure 6.1 Relative proportions of fauna in 8 salinity tolerance classes in 39 lagoons **(Type 1)**.
- Figure 6.2 Relative proportions of fauna in 8 salinity tolerance classes in 39 lagoons **(Type 2)**.
- Figure 6.3 Relative proportions of fauna in 8 salinity tolerance classes in 39 lagoons **(Type 3)**.
- Figure 6.4 Relative proportions of fauna in 8 salinity tolerance classes in 39 lagoons **(Type 4)**.
- Figure 6.5 Relative proportions of fauna in 8 salinity tolerance classes in 39 lagoons **(Type 5)**.
- Figure 6.6 Relative proportions of main taxonomic groups in 39 lagoons **(Type A)**.
- Figure 6.7 Relative proportions of main taxonomic groups in 39 lagoons **(Type B)**.
- Figure 6.8 Relative proportions of main taxonomic groups in 39 lagoons **(Type C)**.

Figure 6.9 Relative proportions of main taxonomic groups in 39 lagoons (Type D).  
 Figure 6.10 Relative proportions of main taxonomic groups in 39 lagoons (Type E).

List of Tables.

Table 1.1	List of lagoonal specialist fauna in Britain
Table 1.2	Proposed list of lagoonal specialist fauna in Ireland
Table 2.1	List of sites surveyed in 1998.
Table 4.1.1	Aquatic fauna recorded at stations in Ballyteige drainage channels, Co. Wexford. 1998.
Table 4.2.1	List of taxa recorded in Kilmore L., arranged in broad ecological categories.
Table 4.2.2	Aquatic fauna recorded at stations in Kilmore Lake, Co. Cork. 1998.
Table 4.3.1	Aquatic fauna recorded at stations in An Loch Mór, Inis Oírr, Co. Galway. 1998.
Table 4.3.2	Salinity data from L. Mór.
Table 4.4.1	Aquatic fauna recorded at stations in Loch Phort Chorrúch, Aráinn, Co. Galway. 1998.
Table 4.5.1	Aquatic fauna recorded at stations in Loch an Chara, Aráinn, Co. Galway. 1998.
Table 4.6.1	Aquatic fauna recorded at stations in the Loch Fhada complex, Co. Galway. 1998.
Table 4.7.1	List of taxa recorded in L. an Aibhnín arranged in broad ecological categories
Table 4.7.2	Aquatic fauna recorded at stations in Loch an Aibhnín, Co. Galway. 1998.
Table 4.8.1	Aquatic fauna recorded at stations in Loch Cara Fionnla, Co. Galway. 1998.
Table 4.8.2	Aquatic fauna recorded at stations in Kinvarra saltmarsh, Co. Galway. 1998.
Table 4.9.1	Aquatic fauna recorded at stations in Loch an tSaile, Co. Galway. 1998.
Table 4.9.2	Salinity data from L. an tSaile.
Table 4.10.1	List of taxa recorded in L. Athola, arranged in broad ecological categories.
Table 4.10.2	Aquatic fauna recorded at stations in Lough Athola, Co. Galway. 1998.
Table 4.11.1	Aquatic fauna recorded at stations in Lough Bofin, Co. Galway. 1998.
Table 4.12.1	Aquatic fauna recorded at stations in Maghery Lough, Co. Donegal. 1998.
Table 4.13.1	Aquatic fauna recorded at stations in Sally's Lough, Co. Donegal. 1998.
Table 4.14.1	Aquatic fauna recorded at stations in Kincas Lough, Co. Donegal. 1998.
Table 4.15.1	Aquatic fauna recorded at stations in Moorlagh, Co. Donegal. 1998.
Table 4.16.1	Aquatic fauna recorded at stations in Inch Lough, Co. Donegal. 1998.
Table 5.1.	Aquatic fauna recorded in the 16 sites selected for survey in 1998.
Table 6.1	List of taxa identified recorded in the 36 sites surveyed in 1996 and 1998.
Table 6.2	Numbers of taxa, lagoonal specialists and taxonomic groups recorded in 1996 and 1998.
Table 7.1	Summary of the 16 sites showing size of the lagoon and numbers of taxa, lagoonal specialists and rare species.
Table 7.2	Evaluation scores for the 36 sites based on fauna and faunal habitat.
Table 7.3	Ranking of the 36 sites for Score 1 and Score 2
Table 7.4	Conservation value of the 36 sites surveyed.

List of plates

Plate 4.1.1	View of Cull Lake (Sta.1), Ballyteige, Co. Wexford. 1998.
Plate 4.1.2	View looking north along sea wall towards pumping station. Ballyteige drainage channels, Co. Wexford. 1998.
Plate 4.1.3	View looking east along channel from pumping station (Sta. 2), Ballyteige drainage channels, Co. Wexford. 1998.
Plate 4.1.4	View of channel running parallel to dune system, (Sta. 3). Ballyteige drainage channels, Co. Wexford. 1998.
Plate 4.1.5	View of one of the gravel pits being excavated (Sta. 4), Ballyteige drainage channels, Co. Wexford. 1998.
Plate 4.1.6	View of channel running under the road bridge (Sta. 5). Ballyteige drainage channels, Co. Wexford. 1998.
Plate 4.2.1	View of barrier at low tide looking west, (Sta. 1,2). Kilmore Lake, Whiddy Island, Co. Cork. 1998.
Plate 4.2.2	View of inshore side of barrier at low tide looking east from Sta. 1. Kilmore Lake, Whiddy Island, Co. Cork. 1998.
Plate 4.2.3	View of lagoon looking north from above Sta. 4 towards Sta. 3. Kilmore Lake, Whiddy Island,, Co. Cork. 1998.
Plate 4.2.4	View of barrier at high tide looking south. Kilmore Lake, Whiddy Island,, Co. Cork. 1998.
Plate 4.3.1	View looking southwest towards Sta. 1. Loch an Mór, Inis Oírr, Co. Galway. 1998.
Plate 4.3.2	View looking west across Sta. 3 showing raft of <i>Enteromorpha</i> . Loch an Mór, Inis Oírr,

- Co. Galway. 1998.
- Plate 4.3.3 View of lagoon looking southwest across Sta. 4. Loch an Mór, Inis Oírr, Co. Galway. 1998.
- Plate 4.3.4 View of tidal pool, Sta. 5. Loch an Mór, Inis Oírr, Co. Galway. 1998.
- Plate 4.4.1 View looking south along the cobble barrier towards Sta. 1.  
Loch Phort Chorrúch, Árainn, Aran Islands, Co. Galway. 1998.
- Plate 4.4.2 View looking east across the lagoon from Sta. 1  
Loch Phort Chorrúch, Árainn, Aran Islands, Co. Galway. 1998.
- Plate 4.4.3 View of lagoon looking west over Sta. 4. (Sta. 1 top left).  
Loch Phort Chorrúch, Árainn, Aran Islands, Co. Galway. 1998.
- Plate 4.4.4 View looking southwest across Sta. 3.  
Loch Phort Chorrúch, Árainn, Aran Islands, Co. Galway. 1998.
- Plate 4.5.1 View looking north over Killeany Bay to Loch an Chara, Árainn, Aran Islands,  
Co. Galway. 1998.
- Plate 4.5.2 View looking along the north shore of the lagoon from Sta. 3. Loch an Chara, Árainn,  
Aran Islands, Co. Galway. 1998.
- Plate 4.5.3 View of tidal inlet at the eastern end of the lagoon near Sta. 1. Loch an Chara, Árainn,  
Aran Islands, Co. Galway. 1998.
- Plate 4.5.4 View looking along south shore of the lagoon from Sta. 6. Loch an Chara, Árainn,  
Aran Islands, Co. Galway. 1998.
- Plate 4.6.1 View from the road looking southwest over Sta. 1 Loch Fhada complex, Connemara,  
Co. Galway. 1998.
- Plate 4.6.2 View from the road looking northeast over Sta. 2. Loch Fhada complex, Connemara,  
Co. Galway. 1998.
- Plate 4.6.3 View looking south towards L. Aughagaddy, Sta. 3 Loch Fhada complex, Connemara,  
Co. Galway. 1998.
- Plate 4.6.4 View from the north end of L Fhada (Sta. 4). Loch Fhada complex, Connemara,  
Co. Galway. 1998.
- Plate 4.7.1 View looking south along the rapids to Sta. 1. Loch an Aibhnín, Connemara,  
Co. Galway. 1998.
- Plate 4.7.2 View looking north along the rapids to Camus Bay. Loch an Aibhnín, Connemara,  
Co. Galway. 1998.
- Plate 4.7.3 View looking west across the lagoon towards Sta. 1b. Loch an Aibhnín, Connemara,  
Co. Galway. 1998.
- Plate 4.7.4 View looking west across the lagoon from Sta. 3. Loch an Aibhnín, Connemara,  
Co. Galway. 1998.
- Plate 4.7.5 View overlooking the lagoon from the northwest. Loch an Aibhnín, Connemara,  
Co. Galway. 1998.
- Plate 4.8.1 View looking south across the loch from Sta. 2. Loch Cara Fionnla, Connemara,  
Co. Galway. 1998.
- Plate 4.8.2 Typical area of inflowing streams at south end of the loch (Sta.4 & 5). Loch Cara Fionnla,  
Connemara, Co. Galway. 1998.
- Plate 4.8.3 View looking north along eastern shore from Sta. 5 Loch Cara Fionnla, Connemara,  
Co. Galway. 1998.
- Plate 4.8.4 View of channel running north through Kinvarra saltmarsh. Loch Cara Fionnla, Connemara,  
Co. Galway. 1998.
- Plate 4.9.1 View looking north across Sta. 5. Loch an tSaile, Connemara, Co. Galway. 1998.
- Plate 4.9.2 View looking north to the inlet from the upper lake (Sta. 8b)  
Loch an tSaile, Connemara, Co. Galway. 1998.
- Plate 4.9.3 View of middle lake with salmon cage. Upper lake in distance.  
Loch an tSaile, Connemara, Co. Galway. 1998.
- Plate 4.9.4 View looking west from Sta. 10. Loch an tSaile, Connemara, Co. Galway. 1998.
- Plate 4.10.1 View looking west from Sta. 1 across the lough towards the inlet. Lough Athola,  
North Mannin Bay, Co. Galway, 1998.
- Plate 4.10.2 View of the eastern end of the lough where a small stream enters (Sta. 2). Lough Athola,  
North Mannin Bay, Co. Galway, 1998.
- Plate 4.10.3 View of the mosaic of peat islands at the outflow near Sta. 4. Lough Athola,  
North Mannin Bay, Co. Galway, 1998.
- Plate 4.11.1 View looking southwest along the cobble barrier to Sta. 1. Lough Bofin, Inishbofin,

- Co. Galway. 1998.
- Plate 4.11.2 View of northwest corner of the lagoon showing seepage through the barrier (Sta. 1). Lough Bofin, Inishbofin, Co. Galway. 1998.
- Plate 4.11.3. View of southwest area of the lagoon (Sta. 4). Lough Bofin, Inishbofin, Co. Galway. 1998.
- Plate 4.11.4. View looking northwest across the lagoon towards the barrier. Lough Bofin, Inishbofin, Co. Galway. 1998.
- Plate 4.12.1 View of the sluice at the northern end of the lough (Sta. 1). Maghery Lough, Co. Donegal. 1998.
- Plate 4.12.2 View of the lough, looking south from Sta. 1. Maghery Lough, Co. Donegal, 1998.
- Plate 4.12.3. View looking west across the lough from Sta. 2. Maghery Lough, Co. Donegal, 1998.
- Plate 4.12.4. View looking west from Sta. 3. Maghery Lough, Co. Donegal, 1998.
- Plate 4.13.1 View of eastern end of the lough ( Sta. 1). Sally's Lough , Co. Donegal. 1998.
- Plate 4.13.2 View of western end of the lough (Sta. 5). Sally's Lough , Co. Donegal. 1998.
- Plate 4.13.3. View looking west along the lagoon across Sta. 2. Sally's Lough , Co. Donegal. 1998.
- Plate 4.13.4. View of sluice at west end of the lough. Sally's Lough , Co. Donegal. 1998.
- Plate 4.13.5. View of bridge at west end of the lough. Sally's Lough , Co. Donegal. 1998.
- Plate 4.14.1 View of sluice on stream from Muuaghderg Lough. ( Sta. 1). Kincas Lough, The Rosses, Co. Donegal. 1998.
- Plate 4.14.2 View of eastern end of the lough (Sta. 2). Kincas Lough, The Rosses, Co. Donegal. 1998.
- Plate 4.14.3. View of southern end of the lough, overgrown with *Phragmites* (Sta. 3). Kincas Lough, The Rosses, Co. Donegal. 1998.
- Plate 4.14.4. View looking northeast across the lough. Kincas Lough, The Rosses, Co. Donegal. 1998.
- Plate 4.15.1 View of bridge and sluices at the north end of the lough. ( Sta. 1). Moorlagh, The Rosses, Co. Donegal. 1998.
- Plate 4.15.2 View looking southeast across the lough from the road. Moorlagh, The Rosses, Co. Donegal. 1998.
- Plate 4.15.3. View looking west across the lough (Sta. 4 in foreground, Sta. 3 in distance). Moorlagh, The Rosses, Co. Donegal. 1998.
- Plate 4.16.1 View of bridge and sluice on the embankment at the north end of the lough. ( Sta. 1). Inch Lough, Lough Swilly, Co. Donegal. 1998.
- Plate 4.16.2 View looking northeast along the shore of the lough from Sta. 1. Inch Lough, Lough Swilly, Co. Donegal. 1998.
- Plate 4.16.3 View from the embankment looking northeast across the lough ( Sta. 1). Inch Lough, Lough Swilly, Co. Donegal. 1998.
- Plate 4.16.4 View looking northwest across the embankment to Inch island. Inch Lough, Lough Swilly, Co. Donegal. 1998.
- Plate 4.16.5 View looking northwest across the central part of the lough. from Sta. 8. Inch Lough, Lough Swilly, Co. Donegal. 1998.
- Plate 4.16.6 View looking south across the lough from Sta.5. (showing rafts of *Enteromorpha*). Inch Lough, Lough Swilly, Co. Donegal. 1998.

## **Survey of aquatic fauna from coastal lagoons in Ireland, 1998.**

### **1. Introduction**

The Habitats Directive (92/43/EEC) identifies coastal lagoons as a priority for conservation. All member states are therefore obliged by European law to evaluate the lagoons within their national territories and protect those deemed worthy of conservation.

Until 1996 there was no existing comprehensive account of coastal lagoons in Ireland and they were not included in ongoing coastal surveys. Only a small proportion of those known had been described although some information was available for those of ornithological or geomorphological interest. During 1996 a survey was carried out on behalf of the National Parks and Wildlife Service and an inventory made of all known possible lagoons and saline lakes in the Republic. Most of these sites were visited during that year and 20 of the best, representative examples were selected for a more intensive survey. Results of this survey can be found in Healy et al. (1997a,b and c), Oliver and Healy (1998) Healy and Oliver (1998) Hatch and Healy (1998) and Good and Butler (1998).

However, during one short 6 month period it was not possible to visit all sites, due to constraints of time and accessibility, and a further survey was necessary in order to complete the inventory and be better informed as to which sites were the most important to protect and conserve.

Twenty sites were surveyed in 1996. The following records are the result of the complementary survey of 16 sites carried out on behalf of the NPWS during 1998, together with some miscellaneous records from the literature and personal communications. A combined list of the total 36 sites, ranked according to their scientific value is presented in the summary and evaluation. Further details of the 1998 survey carried out by other members of the survey team can be found in Healy (1999), Roden (1999) and Good (1999).

#### **Definition of a coastal lagoon.**

The following is taken largely from Volume I, Part I of this report. For more details see that section and Healy and Oliver (1998). There is no widely accepted definition of "lagoon". The term can have different meanings in different parts of the world and may refer to a variety of water bodies including inland saline lakes, tidal bays and freshwater ponds. A literature search using the term "lagoon" results in a high proportion of publications concerning ponds used for storage and treatment of industrial wastes. In Europe, the term is generally reserved for coastal saline lakes or enclosed bays.

The textbook definition of a lagoon is based on geomorphology and Barnes (1980) describes a lagoon as "a permanent body of shallow brackish or salt water, separated from an adjacent sea by a barrier of sand and/or shingle but which nevertheless exchanges water with the sea". Such systems are widespread on the east coasts of North and South America and in the Mediterranean. They have an intrinsic conservation value as endangered landforms and are particularly vulnerable to destruction due to storms, sea level rise, or human interference with coastal processes, but their biological communities are in no way unique or different from those in any other kind of enclosed brackish water.

The Interpretation Manual of the European Union Habitats Directive (Version EUR 12), based on the CORINE classification of habitats, defined lagoons as “expanses of shallow coastal salt water, of varying salinity or water volume, wholly or partially separated from the sea by sand banks or shingle, or, less frequently, by rocks. Salinity may vary from brackish water to hypersalinity depending on rainfall, evaporation and through the addition of fresh sea water from storms, temporary flooding by the sea in winter or tidal exchange. With or without vegetation from *Ruppia maritima*, *Potamogeton*, *Zostera* or *Chara* (CORINE 91: 23.21 or 23.22)”. The Manual allowed that “salt basins and salt ponds may also be considered as lagoons, providing that they had their origin on a transformed old natural lagoon or on a salt marsh, and are characterised by a minor impact from exploitation”. A revised version of the Manual (Version 15, Romao, 1996) following the accession of Sweden and Finland made further allowance for “flads” and “gloes”, considered to be Baltic varieties of lagoons.

A number of lagoon-like systems, some of which can be exceptionally rich in lagoonal species, appear to remain excluded by the above definition, notably silled lakes and artificial systems. The main aim of the Habitats Directive is to “contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora in the European territory of the Member States to which the Treaty applies”. This objective is most effectively achieved for lagoons by including in conservation programmes all types of water bodies where lagoonal conditions, species, and communities are found, whatever their origin or physical structure. A realisation of this need has brought about a shift in the definition and classification of lagoons by survey teams concerned with the selection and designation of SACs.

Surveys of lagoons on the coasts of England, Wales and parts of mainland Scotland (Barnes, 1989; Sheader and Sheader, 1989) distinguished two types of lagoons: 1) lagoons in the strict sense, with sedimentary barriers, and 2) saline ponds. The latter category included brackish waters with many different origins, including human activities, such as clay pits, salt marsh pools, and a variety of sluiced systems. A supplement to the Guidelines for selection of biological SSSIs was published (JNCC 1996) which provided a definition of saline lagoons in the following opening paragraph of its section dealing with lagoons: “Saline lagoons are areas of marine saline water where the concentration of salts is reduced by ground or surface freshwater input or concentrated by evaporation. Connection with the open sea is limited by sediment, shingle or rocky barriers, the degree of separation being used as a basis for the distinction of five physiographic types (based on Barnes (1988) and Sheader & Sheader (1989)). Freshwater input is usually from direct drainage from surrounding land or groundwater seepage. There is generally no major riverine input, or in cases where rivers drain into saline lagoonal systems, the lagoon basin is distinctly different from the physiographic features of an estuary. However, there are situations where the status of a location as a saline lake (as opposed to an estuary, an arm of the sea or an enclosed bay etc) will be unclear, and any dispute about whether a site constitutes a “saline lagoon” will be resolved by reference to a more detailed definition of saline lagoonal habitats held by country agency headquarters staff.” The five types recognised are as follows:

- 1) Isolated saline lagoons
- 2) Percolation saline lagoons
- 3) Sluiced saline lagoons
- 4) Silled saline lagoons
- 5) Saline lagoon inlets



The word "saline" was subsequently dropped and these five types have the added advantage of the word "lagoon" in the name of each category, making it clear that all are considered to be lagoons. This approach has been followed in classifying Irish lagoons.

For the purposes of this survey, "a lagoon is an enclosed or semi-enclosed body of brackish water with a salinity between 1 and 30 ppt, and one or more of the lagoonal specialist species listed in Britain. (Table 1.1). Where the salinity was <1ppt at the time of sampling, the widespread occurrence of brackishwater indicator species was taken as evidence of significant seawater influence, sufficient to identify the site as a lagoon. Similarly, the presence of a significant number of brackishwater indicator species, indicating substantial freshwater input for at least part of the time, allowed a system with full salinity to be accepted as a lagoon. Fully marine sites with no lagoonal specialist species were generally rejected unless they possessed the geomorphological features of a true lagoon and were believed to be in a marine phase due to recent damage to the barrier" (Healy, Vol. I, Part I).

This interpretation differs from that adopted by the UK where oligohaline lagoons have been largely ignored, while some wholly marine systems with no lagoonal specialist species have been identified as lagoons, particularly in Scotland (Covey et al., 1998; Thorpe, 1998)

**Four main categories of lagoon recognised in this survey:**

1) sedimentary lagoons - lie behind sedimentary barriers. Usually there is some landward percolation of seawater. The sea may also enter through a temporary or permanent inlet, or through an artificial structure.

2) rock lagoons - lie behind rock barriers and receive seawater by overtopping, through tidal inlets, or, in the case of karst, through underground rock fissures.

3) saline lake lagoons - have barriers or restricted entrances composed of peat, glacial till or material of mixed origin. Seawater enters through a tidal inlet which is of natural origin but usually modified and frequently sluiced. Many saline lakes are silled at the inlet and some are quite deep.

4) artificial lagoons - originated either by isolation of a sea bay or inlet behind a causeway, or by construction of a sea wall during land reclamation. Many date from the middle of the last century. Artificial lakes are sometimes created as reservoirs for fire-fighting purposes or as an amenity.

The intention was to include all brackish systems while allowing for strict adherence to the Habitats Directive definition should this become necessary in the event of a legal challenge to the designation of a given site. These categories are not biologically meaningful however, and have little value for formulating a strategy for conservation of lagoonal diversity.

**Lagoonal specialists**

"Lagoonal specialists" are distinctly more characteristic of lagoon-like habitats than of freshwater, estuarine or marine waters (Barnes, 1989). The category described as "species of blocked brackish waters" for *Ruppia* communities in The Netherlands, Finland and the Mediterranean (Verhoeven, 1980) is broadly equivalent. However, many of the listed species can also be found in saltmarsh pools, especially near the upper tidal limits where conditions are similar to those in lagoons and further information on the ecological requirements of these species is needed. Some of the species are rare or vulnerable in Europe, and in Britain several are protected by the Wildlife and Countryside Act (1981) (Bamber, 1997). Lists of lagoonal specialists vary according to the nature and geographic location of surveys and this has created some confusion (Oliver and Healy, 1998). The list compiled by Barnes (1989) comprises 33

faunal species, while that presented by Bamber (1997) for true lagoons in southern England, which contains two additional species, omits those not recorded and gives a total of only 21 faunal species. Table 1.1 is a list of the fauna regarded as lagoonal specialist species in Britain from Barnes (1989) with the addition of two species by Bamber (1997), omitting *Hediste diversicolor* included by Barnes in the original list.

Many of the species on this list are rare in Britain and one is presumed extinct. Many have never been recorded in Ireland and some, such as *Sigara concinna* appear to be less typically lagoonal in Ireland than in Britain. On the other hand, certain species appear to be typically lagoonal in Ireland though not recognised as such in Britain. For these reasons a provisional list for Ireland has been proposed (Table 1.2). In compiling this list for Ireland, the view has been taken that it is lagoonal habitats, wherever they occur, which are being characterised. Thus, brackish ditches, polder drainage channels, some upper salt marsh pools, sedimentary lagoons, rock lagoons, natural saline lake lagoons, and artificially impounded lagoons are all variants of a habitat defined by the presence of brackish water in the range 1-30ppt, a limited tidal exchange, and some shelter from strong currents and wave action, and it is these aspects of the habitat which determine the presence of lagoonal species and not the origins or topography of the systems.

Table 1.1 List of lagoonal specialist fauna in Britain.

<b>Cnidaria</b>	<i>Clavopsella navis</i>	(B)
	<i>Gonothyrea loveni</i>	
	<i>Edwardsia ivelli</i>	(p, nc, E?)
<b>Polychaeta</b>	<i>Nematostella vectensis</i>	(p)
	<i>Armandia cirrhosa</i>	(p)
	<i>Alkmaria romijni</i>	(p)
<b>Crustacea</b>	<i>Paramysis nouveli</i>	(B)
	<i>Idotea chelipes</i>	
	<i>Lekanesphaera hookeri</i>	
	<i>Corophium insidiosum</i>	
	<i>Gammarus chevreuxi</i>	
	<i>G. insensibilis</i>	(p)
	<i>Palaemonetes varians</i>	
<b>Insecta</b>	<i>Sigara concinna</i>	
	<i>S. selecta</i>	
	<i>S. stagnalis</i>	
	<i>Agabus conspersus</i>	(nc)
	<i>Berosus spinosus</i>	(nc)
	<i>Coelambus parallelogrammus</i>	(nc)
	<i>Dytiscus circumflexus</i>	(nc)
	<i>Enochrus bicolor</i>	
	<i>E. melanocephalus</i>	(nc)
	<i>E. halophilus</i>	
	<i>Haliphus apicalis</i>	(nc)
	<i>Ochthebius marinus</i>	(nc)
	<i>O. punctatus</i>	(nc)
<i>Paracymus aeneus</i>	(nc)	
<b>Mollusca</b>	<i>Hydrobia neglecta</i>	
	<i>H. ventrosa</i>	
	<i>Onoba aculeus</i>	
	<i>Littorina "tenebrosa" **</i>	
	<i>Cerastoderma glaucum</i>	
<b>Bryozoa</b>	<i>Tenellia adspersa</i>	(p, nc)
	<i>Conopeum seurati</i>	
	<i>Victorella pavidia</i>	(p)

(B) = species included by Bamber (1997); (E?) = now believed to be extinct; (nc) = not recorded in the NCC survey (Sheader and Sheader, 1989); (p) = rare and protected in the U.K.

\*\* = Barnes (1993) has demonstrated that this name is invalid, but is used for what appears to be a distinct species.

Table 1.2 Proposed list of lagoonal specialist fauna in Ireland

<b>Cnidaria</b>	<i>Gonothyrea loveni</i>	
	* <i>Cordylophora caspia</i>	
<b>Crustacea</b>	* <i>Neomysis integer</i>	
	<i>Idotea chelipes</i>	
	* <i>Jaera ischiosetosa</i>	?
	* <i>J. nordmanni</i>	?
	<i>Lekanesphaera hookeri</i>	
	* <i>Allomelita pellucida</i>	?
	<i>Gammarus chevreuxi</i>	
	* <i>Leptocheirus pilosus</i>	?
	<i>Palaemonetes varians</i>	
<b>Insecta</b>	* <i>Notonecta viridis</i>	
	* <i>Plea leachi</i>	
	<i>Sigara selecta</i>	
	<i>S. stagnalis</i>	
	<i>Agabus conspersus</i>	
	<i>Enochrus bicolor</i>	
	<i>E. halophilus</i>	
	<i>Haliphus apicalis</i>	
	<i>Ochthebius marinus</i>	
	<i>O. punctatus</i>	
<b>Mollusca</b>	<i>Hydrobia ventrosa</i>	
	<i>Littorina "tenebrosa" **</i>	
	<i>Onoba aculeus</i>	
	<i>Cerastoderma glaucum</i>	
<b>Bryozoa</b>	<i>Conopeum seurati</i>	
	<i>Victorella pavida</i>	

\* = species not on the British list

? = species of uncertain status requiring more information concerning ecological requirements.

\*\* = Barnes (1993) has demonstrated that this name is invalid, but is used for what appears to be a distinct species.

## 2. Study Sites

The main study was carried out in 16 lagoons (Table 2.1, Figure 2.1), selected from a total of 91 sites identified during 1996 and 1998.

Table 2.1 List of the 16 sites selected for survey in 1998.

Site name	OS ref	Lat/Long
1. Ballyteige drainage channels, Co. Wexford.	S955060	52° 12.0' N; 06° 37.0' W
2. Kilmore Lake, Whiddy Island, Co. Cork.	V958489	51° 40.8' N; 09° 30.2' W
3. An Loch Mór, Inis Oírr, Aran Islands, Co. Galway.	L989019	53° 03.5' N; 09° 30.4' W
4. Loch Phort Chorrúch, Árann, Co. Galway.	L857112	53° 08.2' N; 09° 42.5' W
5. Loch an Chara, Árann, Co. Galway.	L887099	53° 06.8' N; 09° 39.7' W
6. Loch Fhada complex, Connemara, Co. Galway.	L935303	53° 18.6' N; 09° 35.5' W
7. Loch an Aibhnín, Connemara, Co. Galway.	L947315	53° 19.5' N; 09° 34.5' W
8. Loch Cara Fionnla, Connemara, Co. Galway.	L963290	53° 18.0' N; 09° 33.0' W
9. Lough an tSaile, Connemara, Co. Galway.	L948386	53° 23.2' N; 09° 35.0' W
	L966393	53° 23.6' N; 09° 34.0' W
10. Lough Athola, North Mannin Bay, Co. Galway.	L626484	53° 28.0' N; 10° 04.2' W
11. Lough Bofin, Inishbofin, Co. Galway.	L525656	53° 37.1' N; 10° 14.1' W
12. Maghery Lough, Co. Donegal.	B723094	54° 55.7' N; 08° 25.7' W
13. Sally's Lough, Co. Donegal.	B718168	54° 59.7' N; 08° 26.5' W
14. Kincas Lough, The Rosses, Co. Donegal.	B752197	55° 01.5' N; 08° 23.0' W
15. Moorlagh, The Rosses, Co. Donegal.	B790187	55° 08.8' N; 08° 19.5' W
16. Inch Lough, Lough Swilly, Co. Donegal.	C352230	55° 03.0' N; 07° 27.0' W

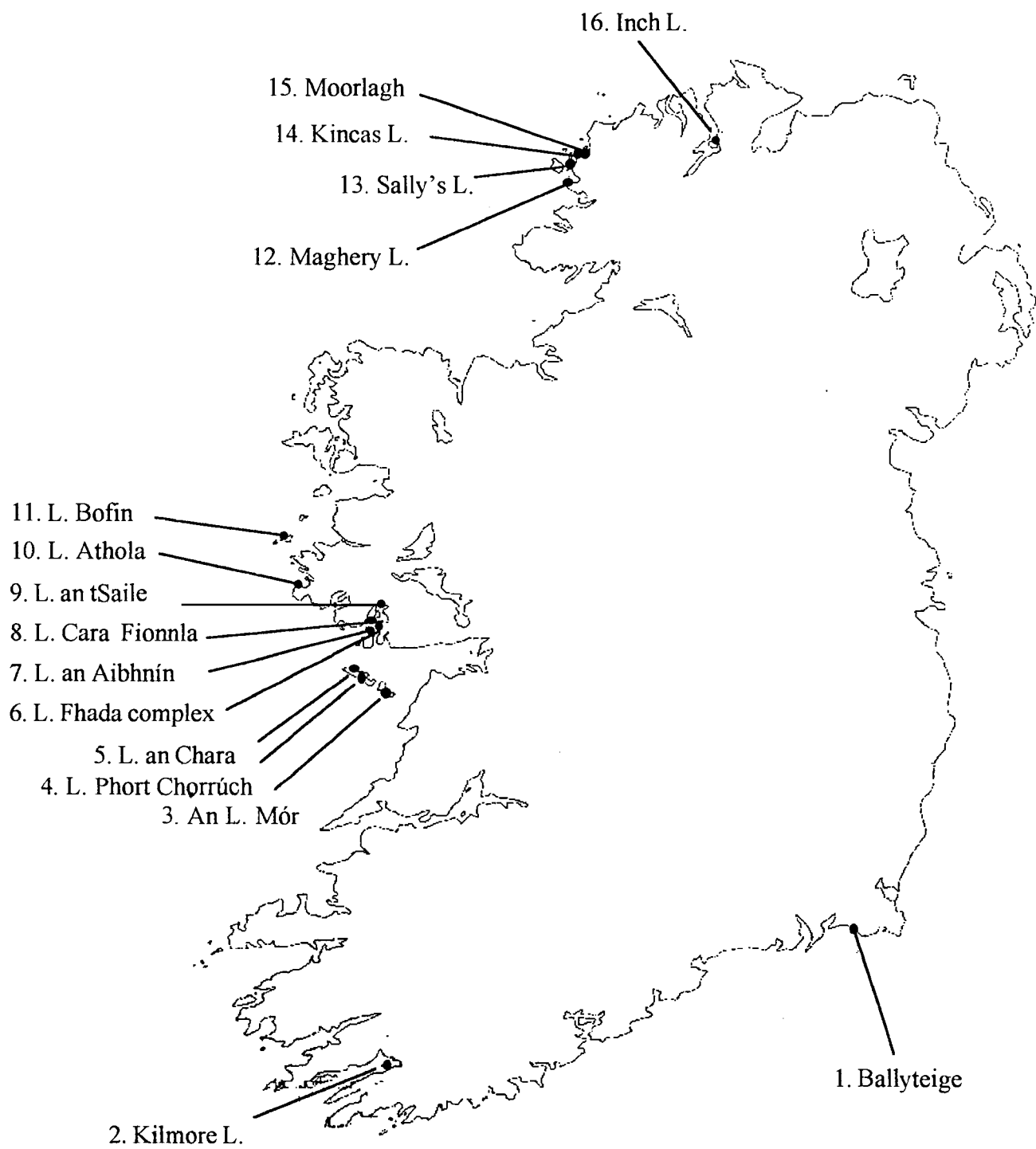


Figure 2.1. Location map of the sixteen sites surveyed for aquatic fauna, 1998.

### 3. Methods

A number of sampling stations were selected at each site to reflect the influences of substrate, vegetation, freshwater and tidal inflows. Positions of stations were determined using a GPS Personal Navigator (Global Positioning Satellite, Garmin GPS 45). Makers of the GPS claim accuracy of 10m although on occasions this degree of accuracy was not achieved, possibly due to poor satellite coverage. When there is doubt about the accuracy of the position of the sampling station, this is marked on the map with a question mark. Names and spellings used were taken from the Discovery Series 1:50,000 O.S. map and grid references for each site refer to the centre of the site. Names often differ on other maps and a full list of alternative names is given in the relevant sections of Vol. I, part 2 of this report. Sketch maps of each site were based on scanned sections of O.S. 6" map with an overlaid 1 km grid, updated when necessary using aerial photographs.

At each sampling station the depth of water and substrate type were recorded, salinity to a depth of up to 5m was measured using a conductivity meter (WTW LF330), and additional readings by other members of the survey team were made using a salinity refractometer (No. 1270, Chemlab, U.K., precision 1 ppt). Tidal exchange was estimated and a photographic record was made of the site whenever practical and local information sought concerning background and recent history.

Sampling at each station was mostly shore-based but additional samples were also collected by snorkelling and dredging with a grapnell from an inflatable dinghy. Faunal samples were collected by a combination of sweep-netting (0.5 mm. mesh), sieving of sediment (1 mm. mesh) and close inspection of stones and vegetation for one hour at each station. Perspex light-traps were left overnight at certain stations: These consisted of a perspex box (25x25x25 cm) containing a chemical light (Starlight). The boxes were constructed in the Zoology Dept. at U.C.D., according to the model described by Holmes and O'Connor (1988). Faunal samples were preserved in 70% alcohol and stored for subsequent sorting and identification. Examples of certain species ( E.g. Hydrobiids, Cnidarians) were kept alive to aid identification.

Fyke nets were used at certain stations when water depth allowed. Standard procedure was that followed by Moriarty (1975) and Poole (1994). The nets used are referred to as summer fyke nets and consist of two 3m traps, facing each other, joined by a 6m leader net, mesh size 16mm. The trap at each end consists of two chambers and a cod end with knot-to-knot mesh sizes of 16, 12 and 10 mm., respectively. Nets were generally placed at right angles to freshwater inflows or tidal inlets in order to trap fish swimming from either direction, although this was not always possible, due to either strong winds or tidal flows. Unless the water body was particularly small and the likelihood of trapping otters (*Lutra lutra*) was particularly high, nets were set in the evening, left overnight, and retrieved the following morning. A maximum of 4 nets was used on a maximum of two consecutive days in each lake. A small number of individuals were retained for identification purposes and some were damaged or killed as a result of trapping, but unless otherwise stated all individuals were returned alive, immediately following retrieval of the nets.

Nomenclature used in results for most of the marine fauna are those according to Hayward and Ryland (1995) and Howson and Picton (1997) when not listed in the former. Other nomenclature used are those according to Costello et al. , 1989 (Amphipoda), Savage, 1989 (Hemiptera), Anderson et al., 1997 (Coleoptera), Macan, 1977 (freshwater pulmonates).

Certain groups were identified or certain species verified by relevant specialists: Polychaeta (B. O'Connor), Isopoda (S. de Grave), Amphipoda (J. O'Brien), Mysidacea, Decapoda (D. McGrath), Hemiptera (B. Nelson, M. Speight), Ephemeroptera (M. Kelly-Quinn), Coleoptera (G. Foster, Balfour Brown Club) Mollusca (J. Nunn, S. Smith, E. Moorkens).

Tables showing species recorded at each station use an approximate abundance scale of present, occasional, common and abundant based on observations only. Records for indeterminate Ostracoda and Copepoda are only included if they are extremely abundant and obviously noticeable. Quantitative figures are given for light traps. Species are divided into broad ecological groups as follows:

1. **Marine:** more or less stenohaline, not known to be tolerant of reduced salinity.
2. **Marine/ polyhaline:** species of intertidal and estuarine habitats, known to have some tolerance to reduced salinity.
3. **Poly/mesohaline:** brackish species in the high salinity range 15-30ppt.
4. **Euryhaline:** species able to tolerate the full salinity range from 0-35ppt.
5. **Meso/oligohaline:** brackish species in the low salinity range of 0-15ppt.
6. **Oligohaline/limnetic:** freshwater species known to tolerate low salinities.
7. **Limnetic:** not known to tolerate saline conditions.



## 4. RESULTS

### 4.1 Ballyteige Drainage Channels

O.S. S955060      52° 12.0' N; 06° 37.0' W

#### Description

Ballyteige drainage channels are situated on the south coast of Wexford, 1 km to the west of Kilmore Quay (Fig 4.1.1). The drainage channels are artificial and were excavated to drain a lagoon and saltmarsh which were isolated behind an extensive dune system to the south and a sea wall to the west, constructed across the Cull Inlet in the mid 19th Century. Seawater enters by percolation through the dunes along the southern shore ( E.g. Sta. 3) and apparently by leakage of the sluice on the Cull at high tide. It is also possible that seawater enters from the tidal river that runs from Duncormick to Bridgetown. Freshwater enters from the river running from Bridgetown which can drain at low tide into the Cull but water levels are now controlled by additional pumping at the western end. The whole area floods rapidly at times of high rainfall or when the seawater pumps fail. Area of water about 5 ha., length of channels 3.2 km., maximum depth 3m.

#### Sources of Information

Carter and Orford, 1980; Orford and Carter, 1982; Ruz, 1989; Galvin, 1992.

#### Sampling Stations

The area was sampled on 14/7/98 and from 5-7/10/98

Five sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows. (Fig. 4.1.2). Fyke nets were not used at any stations due either to shallowness of water or strong tidal flows.

**Station 1** (S93746,06894) was located in the pool north of the Cull Inlet, known as the Cull Lake. This small lake measures 200m by 30m and was dug by farmers in the last 30 years. No streams enter this lake and there is no direct connection with the sea but seawater enters by percolation. Water depth was up to 1m. Salinity measured 0ppt (490mg/l) at the time of sampling but apparently is usually about 4ppt. (Healy et al., 1997b). The pool is highly eutrophic with deep organic silty sand and dense beds of aquatic and emergent vegetation Plate 4.1.1).

**Station 2** (S93772,06703) was located in the main channel east of the seawall and pumping station (Plate 4.1.2, 3). The channel is deep in this area (3-4m) with earth banks and cliffs of clayey soil topped with grassland along the levées. Substrate is sand, heavily scoured by currents, with occasional stones and soft silty sediments in sheltered areas along the banks. Salinity measured 28.4 ppt but undoubtedly varies from extremes of fresh and seawater influence.

**Station 3** (S93883,06019) was located along the channel which runs alongside and parallel to the dune system in an area where seawater "seeps" from the dune system into the drainage channel (Plate 4.1.4). The channel is very shallow at this point (up to 0.5m), salinity measured 18 - 31 ppt and substrate consisted of fine, anoxic, silty sand overlain with dense mats of aquatic vegetation.

**Station 4** (S94754,05631) was located in a gravel pit still being excavated and surrounded by agricultural land in the central area of the polderland (Plate 4.1.5). Substrate was gravel, salinity was close to fresh water (0-0.2ppt) and depth at this time was approximately 1m. The pit was only sampled briefly as work was in progress.

**Station 5** (S96785,06003) was located at the bridge where the main road passes over the main drainage channel at the eastern end. This bridge was taken as the eastern limit to the survey area but it is clear that there is considerable seawater influence much further inland. At this point depth was approximately 1-2m. Salinity measured 7.4 - 9.4 ppt at the surface and 26 - 27.7 ppt at 1m depth. Substrate was deep organic silt and the water highly eutrophic.

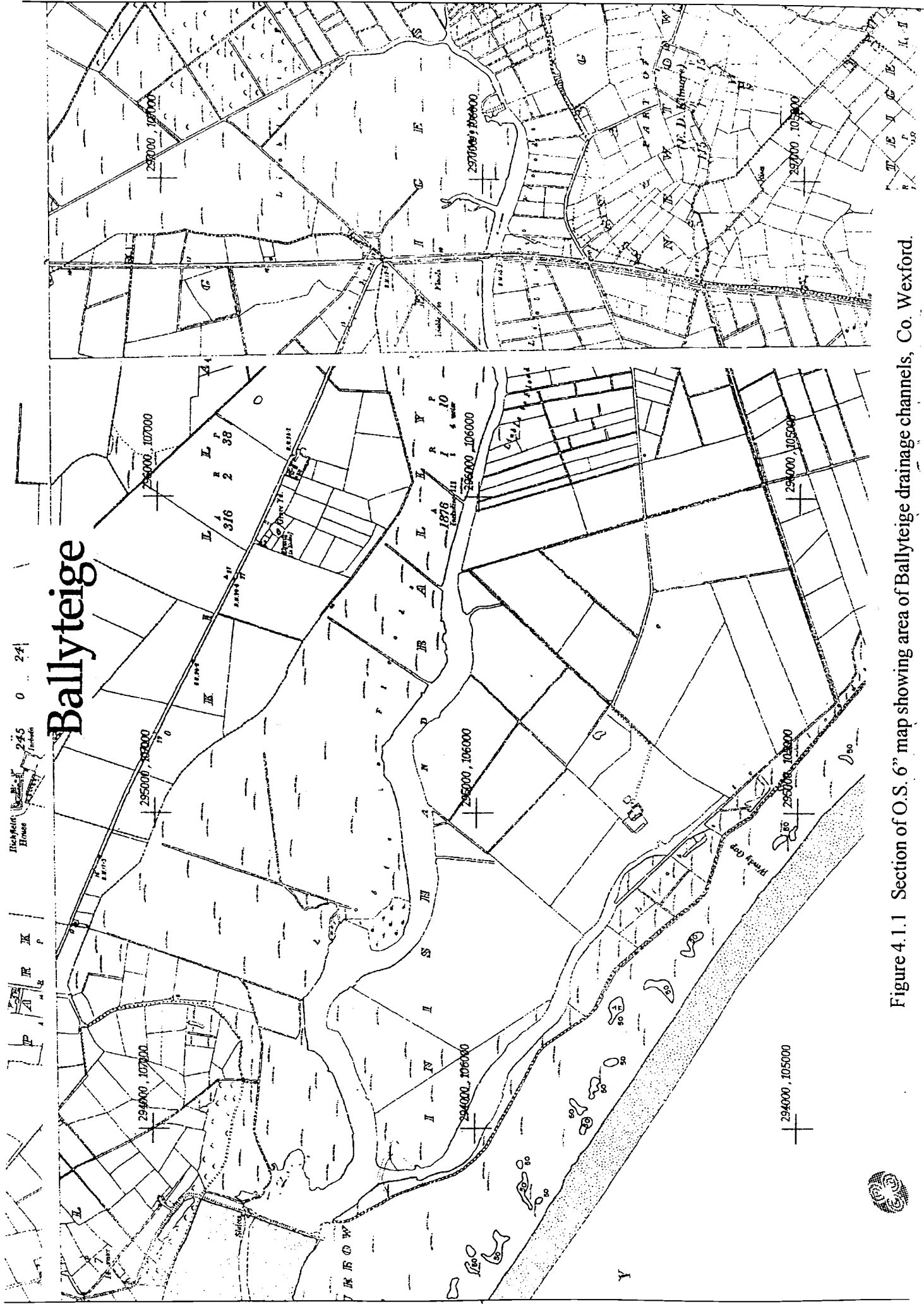


Figure 4.1.1 Section of O.S. 6" map showing area of Ballyteige drainage channels, Co. Wexford.

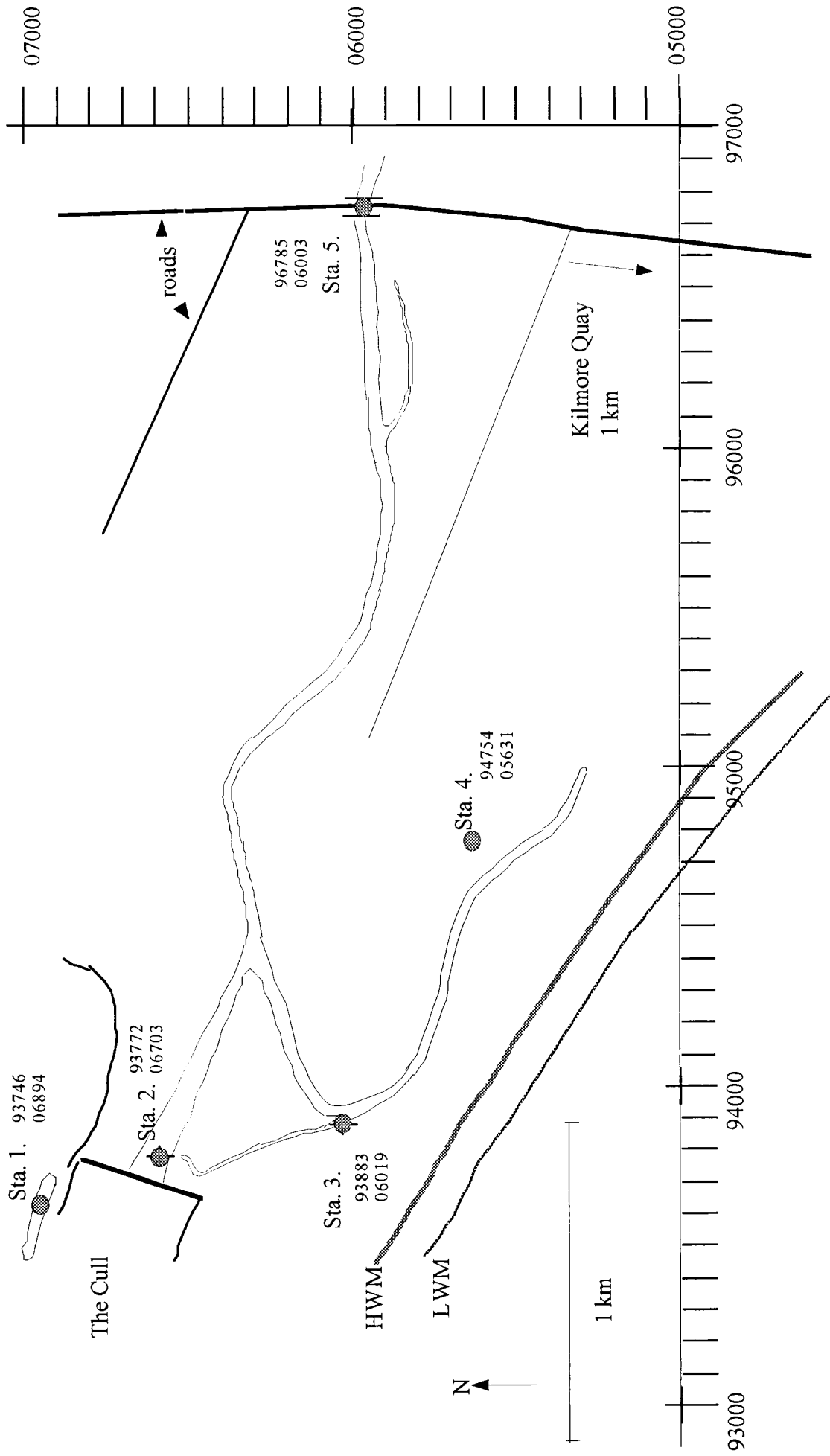


Figure 4.1.2. Sketch map of Ballyteige drainage channels, Co. Wexford, showing sampling stations used for a survey of aquatic fauna, 1998.

## Results

Table 4.1.1 shows the taxa recorded at each sampling station. The following is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes: (L\* = lagoonal specialist in Britain, L\*IR = proposed as lagoonal specialist in Ireland; \* = interesting or rare species. Species in brackets refer to previous records).

Marine	<i>Lineus ruber</i>	
	<i>Notomastus latericeus</i>	
	<i>Dexamine spinosa</i>	
Marine-polyhaline	<i>Arenicola marina</i>	
	<i>Capitella capitata</i>	
	<i>Tubificoides benedii</i>	
	<i>Heterochaeta costata</i>	
	<i>Crangon crangon</i>	
	<i>Palaemon ?longirostris</i>	
	<i>Praunus flexuosus</i>	
	<i>Amphipholis squamata</i>	
	<i>Corophium volutator</i>	
	<i>Melita palmata</i>	
	<i>Hydrobia ulvae</i>	
	<i>Littorina saxatili</i>	
	<i>Leptosynapta inhaerens</i>	
Poly-mesohaline	<i>Abra tenuis</i>	
	<i>Hydrobia ventrosa</i>	L*
	<i>Pomatoschistus microps</i>	
Euryhaline	<i>Hediste diversicolor</i>	
	<i>Neomysis integer</i>	L*IR
	<i>Lekanesphaera hookeri</i>	L*
	<i>Gammarus zaddachi</i>	
	<i>Carcinus maenas</i>	
	<i>Anguilla anguilla</i>	
	<i>Palaemonetes varians</i>	L*
	<i>Potamopyrgus antipodarum</i>	
	<i>Gasterosteus aculeatus</i>	
	* <i>Conopeum seurati</i>	L*
Meso-oligohaline	<i>Ischnura elegans</i>	
	<i>Sigara stagnalis</i>	L*
	*( <i>Agabus conspersus</i> )	L*
	* <i>Enochrus bicolor</i>	L*
	* <i>Notonecta viridis</i>	L*IR
	<i>Corixa panzeri</i>	
Oligohaline-limnetic	* <i>Plea leachi</i>	L*IR
	<i>Lymnaea peregra</i>	
	<i>Hippeutis complanata</i>	
	<i>Callicorixa praeusta</i>	
	<i>Notonecta glaucum</i>	
	<i>Sigara concinna</i>	L*
	<i>Hydrometra stagnorum</i>	
	( <i>Haliplus immaculatus</i> )	
	<i>Hygrotus inaequalis</i>	
	<i>Rhantus frontalis</i>	
	<i>Sigara lateralis</i>	
Limnetic	<i>Cloeon dipterum</i>	
	<i>Hesperocorixa sahlbergi</i>	
	<i>Helochares lividus</i>	
	<i>Laccophilus minutus</i>	
Uncertain	<i>Noterus clavicornis</i>	
	* <i>Rhantus suturalis</i>	
	( <i>Helophorus brevipalpis</i> )	
	* <i>Megasternum obscurum</i>	
	<i>Octhebius dilatatus</i>	

A total of 60 taxa were recorded in 1998 together with some additional records from 1996, of which 8 species are listed as lagoonal specialists in Britain (although one is a record from 1991) and a further 3 species are proposed as lagoonal specialists in Ireland.

The taxa recorded show a wide range of ecological groups from marine to limnetic reflecting the varied habitats of the area which ranged from very low to high salinities and from gravel to soft sandy substrates. This site really is a complex of lagoonal habitats.

*Conopeum seurati* has been recorded at 16 of the 36 sites surveyed, but is not listed in any review of Irish marine Bryozoa (Wyse Jackson, 1991). Either the species is under recorded or a truly lagoonal specialist.

*Notonecta viridis* and *Plealeachi* are not on the British list of lagoonal specialists but are both regarded as such in Ireland. Both species appear to be relatively uncommon and have only been recorded in Ireland in lagoonal habitats.

*Notonecta viridis* is recorded previously elsewhere on the south coast as common in Lady's Island L., Tacumshin L., and Kilkerran L. but also from the North Slob and as occasional in L. Donnell, Co. Clare (Oliver and Healy, 1998).

*Plealeachi* is known previously as *P. minutissima* from the Dingle Peninsula Co. Kerry (Halbert, 1935) and more recently from the same area by McCarthy and Walton (1980) and recorded elsewhere previously and during the 2 surveys only from this site (Galvin, 1992) and Tacumshin Lake (Oliver and Healy, 1998). Proposed lagoonal specialist for Ireland.

*Enochrus bicolor* was also recorded at L. Phort Chorrúch, L. an Chara and L. an Aibhnín during this survey, at 6 sites during the 1996 survey and also from Port na Curra, Inishmaan in 1998 and in samples collected at the North Slob in 1991. There are only 2 recent records from N. Ireland (Nelson *et al.*, 1998).

*Megasternum obscurum* was also recorded at L. an Chara during this survey and at Furnace L. (and L. an tSaile) during the 1996 survey but is otherwise described as rather rare in Ireland (Foster *et al.*, 1992).

*Rhantus suturalis* was recorded only from Ballyteige. Apparently a southern species which occurs in Ireland sporadically (Foster, 1985).

*Agabus conspersus* was identified from samples collected by Galvin in 1991. It was previously recorded in Lady's Island L. by Healy (1997). The species appears to have become rare and there are only two other recent Irish records: from a salt marsh in Co. Meath, and at Dundalk harbour, Co. Louth (Nelson *et al.*, 1997).

The community of *Amphipholis squamata*, *Leptosynapta inhaerens* and the dense population of annelids in the seepage area at Sta. 3 are of particular interest.

## Evaluation

The drainage channels at Ballyteige are already partly protected as a bird reserve but they also contain very interesting lagoonal habitats with several relatively rare species of aquatic fauna.

The area is totally artificial but are the remnants of a previously extensive lagoonal system lying behind a sedimentary barrier. One of the greatest interests in the area is the potential for restoration and creation of lagoonal habitats. Gravel pits are at present being excavated and, with careful planning, the creation of small lagoons of varying depths and salinities would be of great scientific interest and value.

The protection afforded to the area at present is mainly due to ornithological interest. Care should be taken that management takes into account the value of lagoonal habitats for invertebrate as well as vertebrate fauna.

See Evaluation (Section 7) for further details and ranking of the 36 sites.

Table 4.1.1 Aquatic fauna recorded in Ballyteige drainage channels, Wexford. 1998.

Taxa		Stations							
		1	2	L.T. 2	3	L.T. 3	4	5	L.T. 5
Nemertea	<i>Lineus ruber</i>				a				
Polychaeta	<i>Arenicola marina</i>				a				
	<i>Capitella capitata</i>				a				
	<i>Hediste diversicolor</i>		a		c				
	<i>Notomastus latericeus</i>				a				
Clitellata	<i>Lumbricillus sp.</i>				+				
	<i>Heterochaeta costata</i>				o				
	<i>Marionina sp.</i>				o				
	<i>Tubificoides benedii</i>				a				
Crustacea									
Ostracoda		a							
Copepoda		a							
Mysidacea	<i>Neomysis integer</i>		l						
	<i>Praunus flexuosus</i>							o	
Isopoda	<i>Lekanesphaera hookeri</i>		c	2				a	35
Amphipoda			+			1		a	1
	<i>Corophium volutator</i>		+						
	<i>Dexamine spinosa</i>		+						
	<i>Gammarus zaddachi</i>	+	a					+	1
	<i>Melita palmata</i>		+						
Decapoda	<i>Carcinus maenas</i>		+						
	<i>Crangon crangon</i>		o						
	<i>Palaemon ?longirostris</i>		l						
	<i>Palaemonetes varians</i>		o	1				o	
Acarina		c							
Insecta									
Ephemeroptera	<i>Cloeon dipterum</i>	l							
Odonata	<i>Ischnura elegans</i>	a	+	1			+		
Trichoptera	Leptoceridae indet.	o							
Heteroptera	<i>Callicorixa praeusta</i>	l							
	<i>Corixa panzeri</i>	a							
	<i>Gerris sp</i>	2							
	<i>Hesperocorixa sahlbergi</i>	o							
	<i>Hydrometra stagnorum</i>	3							
	<i>Notonecta glaucum</i>	o							
	<i>N. viridis</i>	c					o		
	<i>Plea leachi</i>	a							
	<i>Sigara concinna</i>	c							
	<i>S. lateralis</i>	l							
	<i>S. stagnalis</i>	a						c	c.40
L.T. = light trap. + = present, o = occasional, c = common, a = abundant.									

Table 4.1.1 cont. Aquatic fauna recorded in Ballyteige drainage channels, Wexford. 1998.

Taxa		1	2	L.T. 2	3	L.T. 3	4	5	L.T. 5
Coleoptera		9	2				2		
	<i>(Agabus conspersus)</i>	(c)							
	<i>Enochrus bicolor</i>	c							
	<i>(Haliphus immaculatus)</i>	(4)							
	<i>Helochaeres lividus</i>		2						
	<i>(Helophorus brevipalpis)</i>	(1)							
	<i>Hygrotus inaequalis</i>	2							
	<i>Laccophilus minutus</i>	4							
	<i>Megasternum obscurum</i>								
	<i>Noterus clavicornis</i>	2							
	<i>Ochthebius dilatatus</i>								
	<i>Rhantus frontalis</i>						1		
	<i>R. suturalis</i>						1		
Diptera	Chironomidae	a							
Mollusca									
Prosobranchia	<i>Hydrobia ulvae</i>		+	1					
	<i>H. ventrosa</i>		+						
	<i>Littorina saxatilis</i>		+						
	<i>Potamopyrgus antipodarum</i>	(a)	o					o	
Pulmonata	<i>Hippeutis complanata</i>	c							
	<i>Lymnaea peregra</i>	c					c		
Bivalvia	<i>Abra tenuis</i>	1			+				
Echinodermata	<i>Amphipholis squamata</i>				c	4			
	<i>Leptosynapta inhaerens</i>				c				
Bryozoa	<i>Conopeum seurati</i>		+						
Pisces	<i>Anguilla anguilla</i>				1				
	<i>Gasterosteus aculeatus</i>	c	a	25	c	6		a	113
	<i>Pomatoschistus microps</i>		a	12	a	3			
L.T. = light trap. + = present, o = occasional, c = common, a = abundant. ( ) = previous record									



Plate 4.1.1 View of Cull Lake (Sta. 1), Ballyteige, Co. Wexford. 1998.



Plate 4.1.2 View looking north along sea wall towards pumping station.  
Ballyteige drainage channels, Co. Wexford. 1998.





Plate 4.1.3 View looking east along channel from pumping station (Sta. 2), Ballyteige drainage channels, Co. Wexford. 1998.



Plate 4.1.4 View of channel running parallel to dune system, (Sta. 3). Ballyteige drainage channels, Co. Wexford. 1998.



Plate 4.1.5 View of one of the gravel pits being excavated (Sta. 4),  
Ballyteige drainage channels, Co. Wexford. 1998.



Plate 4.1.6 View of channel running under the road bridge (Sta. 5).  
Ballyteige drainage channels, Co. Wexford. 1998.

## 4.2 Kilmore Lake, Whiddy Island, Co. Cork

OS V958489 51° 40.8' N; 09° 30.2' W

### Description

Kilmore Lake is a natural sedimentary lagoon with a low cobble barrier.

The lagoon is situated on the west coast of Whiddy Island, Bantry Bay, approximately 2 km to the west of the harbour (Fig. 4.2.1). Seawater enters by percolation and by overflowing the low central part of the barrier, even on high water neap tides. The lagoon is small (c. 6 ha) and shallow (up to 3m) and with regular tidal flushing, salinity remains close to that of seawater, probably throughout the year, although 26 ppt was recorded near the barrier on 8/7/98 and salinity is always slightly lower at the northeast end where a small stream enters.

Most of the central part of the lake consists of fine, muddy sand sediments with very little fauna.

GPS readings did not seem to be very accurate for this site.

### Sources of Information

None ?

### Sampling stations

The area was sampled briefly on 8/7/98, from 24-25/7/98 and on 1/10/98.

Four sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows. (Fig. 4.2.2)

**Station 1** (V95669 48771) was located at the southern end of the lagoon inside the cobble barrier (Plate 4.2.1, 2 ). Water depth was up to 1m. Salinity measured 33ppt in July and October , 29 ppt on 30/8/98. Substrate consisted of cobbles with sand in sheltered crevices.

**Station 2** (V95737 48851) was located on the north shore of the lagoon. Salinity measured 32 ppt and substrate consisted of small pebbles and stones along the shoreline, giving way to fine muddy silt with scattered stones and rocks within a short distance from the water's edge. Depth 0-1m.

**Station 3** (V95941 49004) was located at the eastern end of the lagoon where a stream drains into the lagoon from the slightly higher freshwater lake. Salinity measured 28 ppt in this area in June and 32 ppt. in July. The beach and shoreline consisted of small cobbles and gravel with fine sediments and scattered rocks a short distance into the lagoon. Depth 0 - 1m. (Plate 4.2.3).

**Station 4** (V95916 48899) was located on the southern shore of the lagoon in slightly deeper water (up to 1.5 m) and with a hard rocky substrate. Salinity measured 32 ppt.

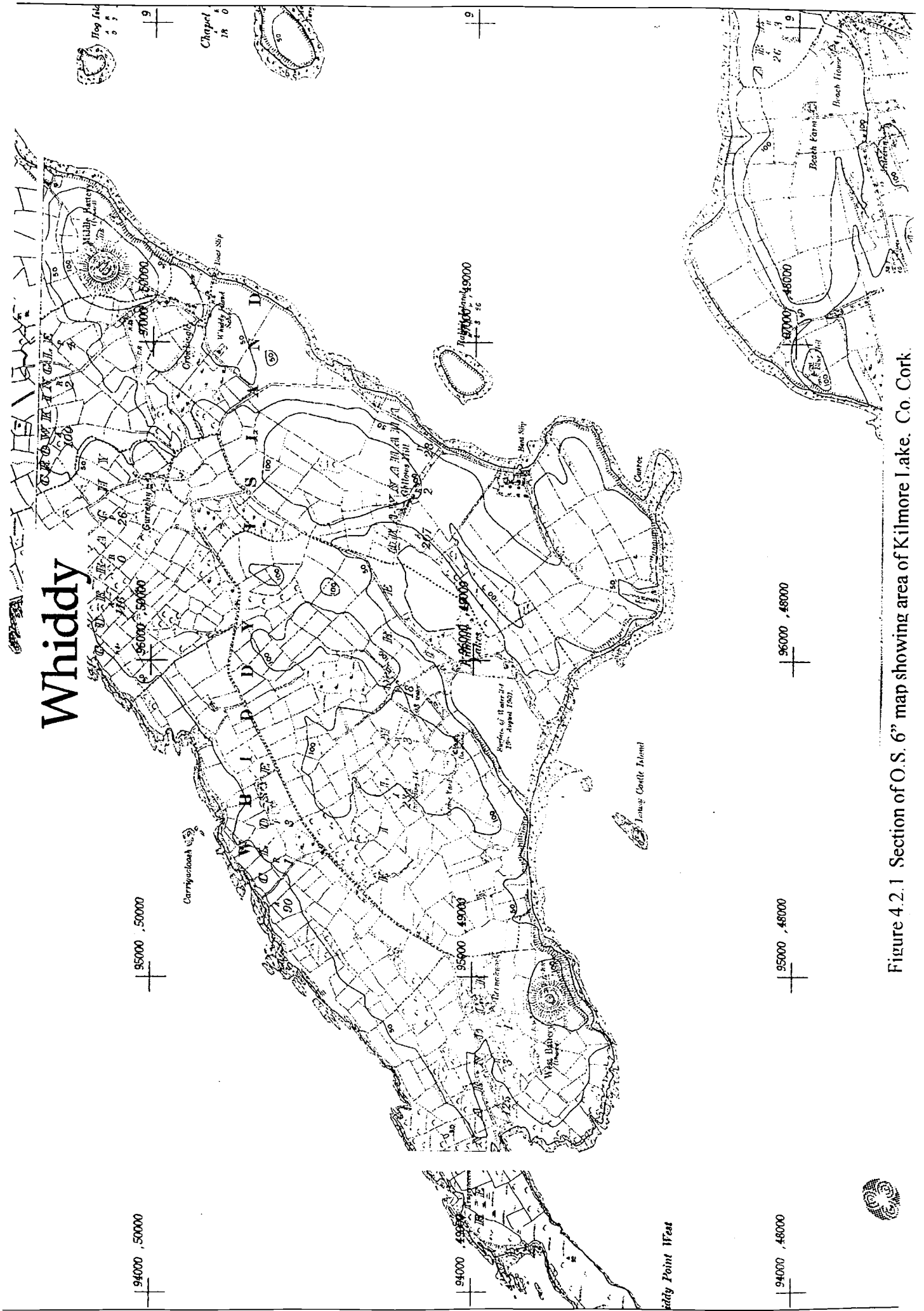


Figure 4.2.1 Section of O.S. 6" map showing area of Kilmore Lake, Co. Cork.

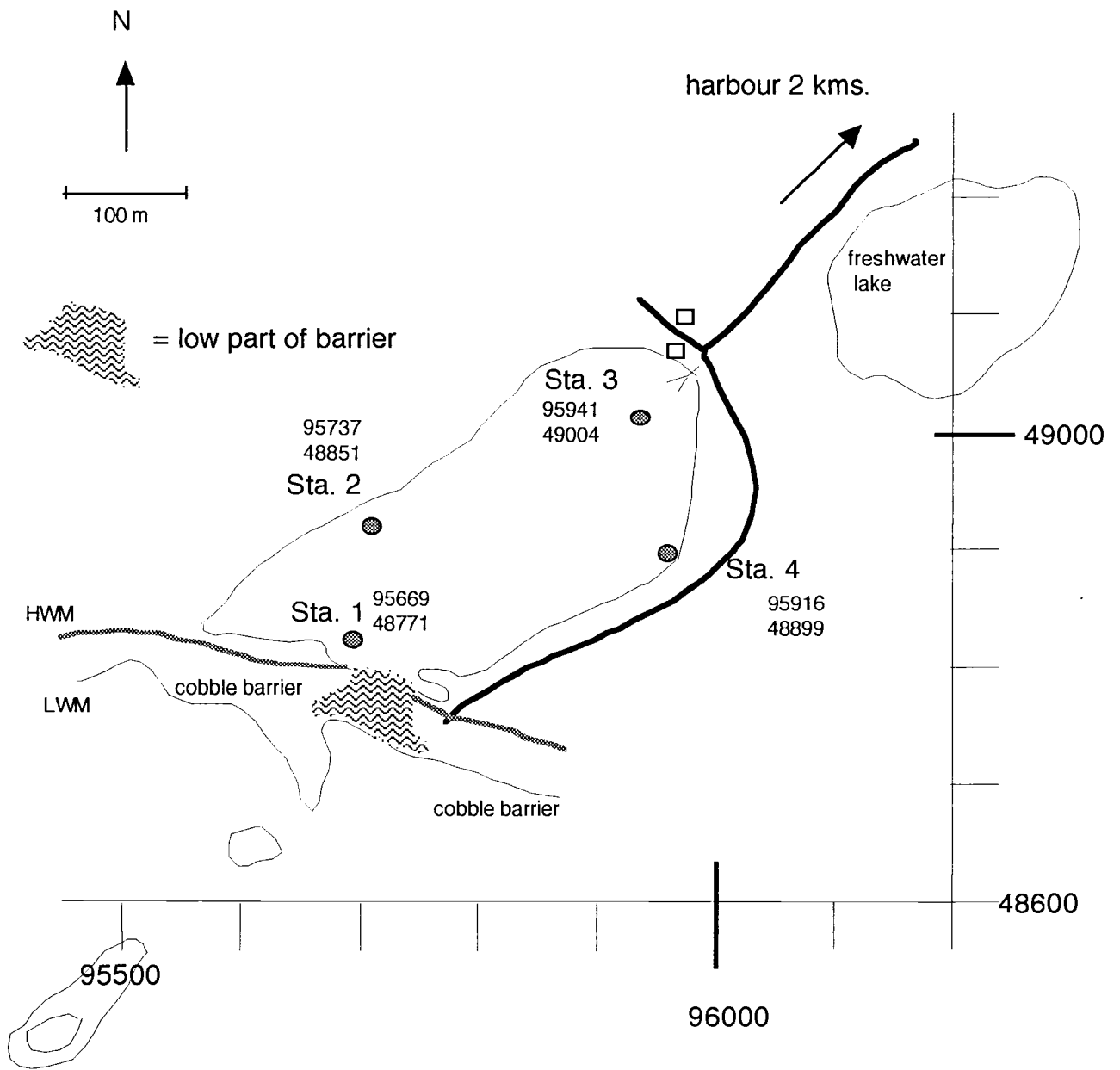


Figure 4.2.2 Sketch map of Kilmore Lake, Co. Cork, showing sampling stations used for a survey of aquatic fauna, 1998.

## Results

Table 4.7.1 is a list of taxa arranged in broad ecological categories based on salinity regimes. Table 4.7.2 shows the taxa recorded at each station.

A total of 113 taxa were recorded in the lagoon, of which 103 were identified to species. This is the highest species number of all the 36 sites surveyed. Some of these are interesting species but only one lagoonal specialist on the British list was recorded (*Cerastoderma glaucum*) and one possible from the proposed Irish list (*Jaera nordmanni*). The fauna is almost totally marine or marine/polyhaline in nature. The central part of the lagoon consists of soft, unstable sediments and the rich fauna is generally restricted to the area near the tidal inlet and a relatively narrow belt of shoreline. Several species are considered interesting or rare:

The tunicates *Phallusia mammillata* and *Styela clava* both have a very restricted range. The latter found only along the southern coast and the former apparently restricted to Bantry Bay.

*Jaera forsmanni* was previously recorded at Drongawn L. in the 1996 survey (Oliver and Healy, 1998) and during this survey at L. Fhada, L. an Aibhnín, Kinvarra saltmarsh (section 4.8) and L. Athola. The only other Irish record of the species located is for L. Hyne, Co. Cork, (De Grave and Holmes, 1998).

*Lembos longipes* was also recorded at L. an Aibhnín and possibly Sally's L. during this survey and at Drongawn L. and Furnace L. during the 1996 survey. There are only 3 previous records for Ireland (Costello *et al.* 1990).

*Cercyon littoralis* was previously recorded at Bridge L. and Mill L. (Oliver and Healy, 1998) and during this survey at L. an Aibhnín. *C. depressus* was only recorded on this site during the surveys. Both are driftline species with few recent records.

## Evaluation

Kilmore Lake is still a sedimentary lagoon in the geomorphological sense but the fauna is by no means lagoonal. According to local information the lake was fresh some 50 years ago but during construction of the oil terminal, the barrier was used as a road for heavy machinery and the sea has invaded the lake as a result.

The fauna of Bantry Bay is very rich and that of Kilmore Lake reflects this richness. The fauna are nearly all typical open coast marine species, indicative of the regular flushing of the lagoon.

It is quite likely that the lake formerly had a much more typical lagoonal community but it now appears to be in the 'dying stages' of its life as a lagoon and gradually becoming part of the open coast. It is possible that the lagoonal characteristics of the lake could be restored by rebuilding the barrier.

See Evaluation (Section 7) for further details and ranking of the 36 sites.

Table 4.2.1 List of species arranged in broad ecological categories based on the Venice system of salinity regimes (L\* = lagoonal specialist in Britain; L\*IR = proposed lagoonal specialist for Ireland; \* = interesting or rare species):

Marine	<i>Hymeniacion perleve</i>	<i>Tapes decussata</i>	
	<i>Leucoselenia botryoides</i>	<i>Asterias rubens</i>	
	<i>L. complicata</i>	<i>Paracentrotus lividus</i>	
	<i>Suberites ficus</i>	<i>Psammechinus miliaris</i>	
	<i>Anthopleura balli</i>	<i>Alcyonidium gelatinosum</i>	
	<i>Chrysaora hysoscella</i>	<i>Celleporella hyalina</i>	
	<i>Sagartiogeton undatus</i>	<i>Botryllus schlosseri</i>	
	<i>Sarcodictyon roseum</i>	* <i>Phallusia mammillata</i>	
	<i>Autolytus prolifer</i>	* <i>Styela clava</i>	
	<i>Eupolymnia nebulosa</i>	<i>Pollachius virens</i>	
	<i>Exogone hebes</i>	Marine/ polyhaline	<i>Halichondria panicea</i>
	<i>Harmothoe impar</i>		<i>Arenicola marina</i>
	<i>Myxicola infundibulum</i>		<i>Heterochaeta costata</i>
	<i>Nereis zonata</i>		<i>B. ?improvisus</i>
	<i>Perinereis cultrifera</i>		<i>Elminius modestus</i>
	<i>Platynereis dumerili</i>		<i>Semibalanus balanoides</i>
	<i>Polynoë scolopendrina</i>		* <i>Jaera forsmanni</i>
	<i>Polyophthalmus pictus</i>		<i>Corophium volutator</i>
	<i>Pomatoceros lamarecki</i>		<i>Melita palmata</i>
	<i>P. triqueter</i>		<i>Crangon crangon</i>
	<i>Sabella pavonina</i>		<i>Palaemon elegans</i>
	<i>Typosyllis hyalina</i>		<i>P. serratus</i>
	<i>Pedicellina hispida</i>		<i>Praunus flexuosus</i>
	<i>Ascidicola rosea</i>		<i>Lepidochitona cinereus</i>
	<i>Doropygus pulex</i>		<i>Bittium reticulatum</i>
	<i>Notodelphys allmani</i>		<i>Hydrobia ulvae</i>
	<i>Balanus balanus</i>		<i>Littorina littorea</i>
	<i>B. crenatus</i>		<i>L. saxatilis</i>
	<i>Verruca stroemia</i>		<i>Mytilus edulis</i>
	<i>Bodotria scorpioides</i>		<i>Patella vulgata</i>
	<i>Tanais dulongi</i>		<i>Rissostomia membranacea</i>
	<i>Mysidopsis gibbosa</i>		<i>Skeneopsis planorbis</i>
	<i>Siriella armata</i>		<i>Amphipholis squamata</i>
	<i>Idotea pelagica</i>		<i>Bowerbankia gracilis</i>
	<i>Limnoria quadripunctata</i>		<i>Cryptosula pallasiana</i>
	<i>Ampithoe ramondi</i>		<i>Ascidia mentula</i>
	* <i>Lembos ?longipes</i>		<i>Ascidiella aspersa</i>
	<i>Microprotopus maculatus</i>		<i>A. scabra</i>
	<i>Phtisica marina</i>		<i>Ciona intestinalis</i>
	<i>Cancer pagurus</i>		<i>Atherina presbyter</i>
	<i>Liocarcinus depurator</i>		<i>Ciliata mustela</i>
	<i>Pagurus bernhardus</i>		<i>Gobiosculus flavescens</i>
	<i>Porcellana platycheles</i>	Poly/mesohaline	<i>Cerastoderma glaucum</i> L*
	<i>Cerithiopsis tubercularis</i>		<i>Pomatoschistus microps</i>
	<i>Gibbula cineraria</i>		<i>Taurulus bubalis</i>
	<i>G. umbilicalis</i>	Euryhaline	<i>Jaera nordmanni</i> L*IR ?
	<i>Littorina obtusata</i>		<i>Gammarus duebeni</i>
	<i>Monodonta lineata</i>		<i>G. zaddachi</i>
	<i>Nucella lapillus</i>		<i>Carcinus maenas</i>
	<i>Anomia ephippium</i>		<i>Anguilla anguilla</i>
	<i>Chlamys varia</i>		<i>Mugilidae</i>
	<i>Hiatella arctica</i>		<i>Pleuronectes flesus</i>
	<i>Modiolarca tumida</i>	Strandline	* <i>Cercyon depressus</i>
	<i>Ostrea edulis</i>		* <i>C. littoralis</i>

Table 4.2.2. Aquatic fauna recorded in Kilmore Lake, Whiddy Island, Co. Cork. 1998.

Taxa		1	L.T. 1	2	L.T. 2	3	L.T. 3	4	L.T.4		
Porifera	<i>Halichondria panicea</i>					+					
	<i>Hymeniacidon perleve</i>	+									
	<i>Leucoselenia botryoides</i>	+									
	<i>L. complicata</i>	+									
	<i>Suberites ficus</i>			+							
Cnidaria	<i>Anthopleura ballii</i>	+		+		+		+			
	<i>Chrysaora hysoscella</i>	+									
	<i>Sagartiogeton undatus</i>			o							
	<i>Sarcodictyon roseum</i>	+									
Turbellaria	planarian indet	+									
Nemertea	indet.							+			
Annelida	Polychaeta	<i>Arenicola marina</i>	+		+						
		<i>Autolytus prolifer</i>					1		3		
		<i>Eupolymnia nebulosa</i>	+		+						
		<i>Exogone hebes</i>	+								
		<i>Harmothoë impar</i>	+		+						
		<i>Myxicola infundibulum</i>	+								
		<i>Nereis zonata</i>			+						
		<i>Perinereis cultrifera</i>			+						
		<i>Platynereis dumerili</i>	+		+	2		4	+	4	
		<i>Polynoë scolopendrina</i>	+		+						
		<i>Polyophthalmus pictus</i>	+	6	+	25	+	29	+	111	
		<i>Pomatoceros lamarcki</i>	+						+		
		<i>P. triqueter</i>	+					a	+		
		<i>Sabella pavonina</i>	1								
		<i>Spirorbidae indet.</i>	+								
		<i>Typosillis hyalina</i>	+								
		Oligochaeta	<i>Heterochaeta costata</i>	+							
			Tubificidae indet	+							
		Entoprocta	<i>Pedicellina hispida</i>	+							
		Crustacea		Ostracoda			+				
Copepoda	indet.					+		a			
	<i>Ascidicola rosea</i>			+		+		+		+	
<i>Caligus sp.</i>						2					
<i>Doropygus pulex</i>	+										
<i>Notodelphus allmani</i>	+										
Cirripedia	<i>Elminius modestus</i>			+		+		+		+	
	<i>Balanus balanus</i>			+		+				+	
	<i>B. crenatus</i>			+				+		+	
	<i>B. ?improvisus</i>							+			
	<i>Semibalanus balanoides</i>			+		+				+	
<i>Verruca stroemia</i>	+								+		
L.T. = light trap. + = present, o = occasional, c = common, a = abundant.											



Table 4.2.2. cont. Aquatic fauna recorded in Kilmore Lake, Whiddy Island, Co. Cork. 1998.

Taxa		Stations								
		1	L.T. 1	2	L.T. 2	3	L.T. 3	4	L.T.4	
Cumacea	<i>Bodotria scorpioides</i>				1				1	
Tanaidacea	<i>Tanais dulongi</i>				+			+		
Mysidacea	<i>Mysidopsis gibbosa</i>		4		11		2		2	
	<i>Praunus flexuosus</i>	o	10	o	9	c	2	+	2	
	<i>Siriella armata</i>			1						
Isopoda	<i>Idotea pelagica</i>				5					
	<i>Jaera forsmanni</i>			+		+				
	<i>J. nordmanni</i>			+		a				
	<i>Limnoria quadripunctata</i>						15		1	
Amphipoda	Amphipoda indet	+	30	+	250	+	c70	+	c70	
	<i>Ampithoe ramondi</i>		3						2	
	<i>Corophium volutator</i>	1								
	<i>Gammarus duebeni</i>	2								
	<i>G. zaddachi</i>	2	3	3	50	136	44	1	40	
	<i>Lembos ?longipes</i>		12				4		18	
	<i>Melita palmata</i>					1		10		
	<i>Microprotopus maculatus</i>	a	a	a	a	a	a	a	a	
	<i>Phtisica marina</i>			2	2		1			
	Decapoda	<i>Cancer pagurus</i>	1							
		<i>Carcinus maenas</i>	F=80		F=160					
<i>Crangon crangon</i>			2		6		1		1	
<i>Liocarcinus depurator</i>		F=2		+						
<i>Pagurus bernhardus</i>		+			+					
<i>Palaemon elegans</i>		+	4		1	a	+	+		
<i>Palaemon serratus</i>		+		+	1	a	1	+	2	
<i>Porcellana platycheles</i>		1								
Insecta										
Coleoptera	<i>Cercyon depressus</i>	2				4				
	<i>C. littoralis</i>					1				
Mollusca										
Polyplocophora	<i>Lepidochitona cinereus</i>	+		+						
Prosobranchia	<i>Bittium reticulatum</i>	1								
	<i>Cerithiopsis tubercularis</i>			1						
	<i>Gibbula cineraria</i>	+						+		
	<i>G. umbilicalis</i>	+						+		
	<i>Hydrobia ulvae</i>	+		+						
	<i>Littorina littorea</i>	+				c				
	<i>L. obtusata</i>	+								
	<i>L. saxatilis</i>	+		+		+				
	<i>Monodonta lineata</i>	+		+				+		
	<i>Nucella lapillus</i>	+								
<i>Patella vulgata</i>	+					o	+			

F = Fyke net; L.T. = light trap. + = present, o = occasional, c = common, a = abundant.

Table 4.2.2. cont. Aquatic fauna recorded in Kilmore Lake, Whiddy Island, Co. Cork. 1998.

Taxa	Stations								
	1	L.T. 1	2	L.T. 2	3	L.T. 3	4	L.T.4	
	<i>Rissoa parva</i>	+							
	<i>Rissostomia membranacea</i>	+							
	<i>Skeneopsis planorbis</i>	+							
Opisthobranchia	<i>Archidoris ?</i>	+						+	
Bivalvia	<i>Anomia ephippium</i>			+		+			
	<i>Cerastoderma glaucum</i>	+		+					
	<i>Chlamys varia</i>	+		+		+		+	
	<i>Hiatella arctica</i>	+		1					
	<i>Modiolarca tumida</i>	1							
	<i>Mytilus edulis</i>	+				+			
	<i>Ostrea edulis</i>			+				+	
	<i>Tapes decussata</i>	+		+		+			
Bryozoa	<i>Acyonidium gelatinosum</i>	+							
	<i>Bowerbankia gracilis</i>	+							
	<i>Celleporella hyalina</i>	+							
	<i>Cryptosula pallasiana</i>	+							
Echinodermata	<i>Amphipholis squamata</i>	+				+		+	
	<i>Asterias rubens</i>	+						+	
	<i>Paracentrotus lividus</i>	+						+	
	<i>Psammechinus miliaris</i>	+							
Tunicata	<i>Ascidia mentula</i>	+							
	<i>Ascidella aspersa</i>	+		+		+		+	
	<i>A. scabra</i>	+							
	<i>Botryllus schlosseri</i>	+						+	
	<i>Ciona intestinalis</i>	o							
	<i>Phallusia mammillata</i>	c		c				+	
	<i>Styela clava</i>	+		+					
Pisces	<i>Anguilla anguilla</i>			F=3					
	<i>Atherina presbyter</i>	o						o	
	<i>Ciliata mustela</i>			F=2					
	<i>Gobiosculus flavescens</i>	+							
	<i>Mugilidae indet.</i>	+		+					
	<i>Pleuronectes flesus</i>			+					
	<i>Pollachius virens</i>			F=2					
	<i>Pomatoschistus microps</i>	+	1	+		+		+	
	<i>Taurulus bubalis</i>	1							

F = Fyke net; L. T. = light trap. + = present, o = occasional, c = common, a = abundant.



Plate 4.2.1 View of barrier at low tide looking west, (Sta. 1,2).  
Kilmore Lake, Whiddy Island,, Co. Cork. 1998.



Plate 4.2.2 View of inshore side of barrier at low tide looking east from Sta. 1.  
Kilmore Lake, Whiddy Island,, Co. Cork. 1998.



Plate 4.2.3 View of lagoon looking north from above Sta. 4 towards Sta. 3.  
Kilmore Lake, Whiddy Island,, Co. Cork. 1998.



Plate 4.2.4 View of barrier at high tide looking south.  
Kilmore Lake, Whiddy Island,, Co. Cork. 1998.

### 4.3 An Loch Mór, Inis Oírr, Aran Islands, Co. Galway

OS L989019 53° 03.5` N; 09° 30.4` W

#### Description

An Loch Mór is situated in the northwest of Inis Oírr, approximately 1 km west of the harbour (Fig 4.3.1). The lake is a very deep (approx 25 m) rock lagoon with limestone cliffs along much of the shoreline. The main body of the lake has a uniform salinity of 5 ppt between 1 and 5 m depth with lower salinity water over parts of the surface (0-3 ppt). Seawater enters from a tidal pool to the northeast of the lake from which diluted seawater (up to 20ppt) runs into the lake through limestone fissures.

The lagoon is quite small (c. 7 ha) and has dense growths of aquatic vegetation, giving the appearance of eutrophication. Much of the shoreline and substrate of the shallow parts of the lake are limestone pavement and stones.

#### Sources of Information

Professor M. O'Connell of N.U.I.G. is currently conducting a major palaeo-ecological study of the lake's sediments.

#### Sampling stations

The area was sampled from 24-26/8/98.

Four sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows (Fig. 4.3.2).

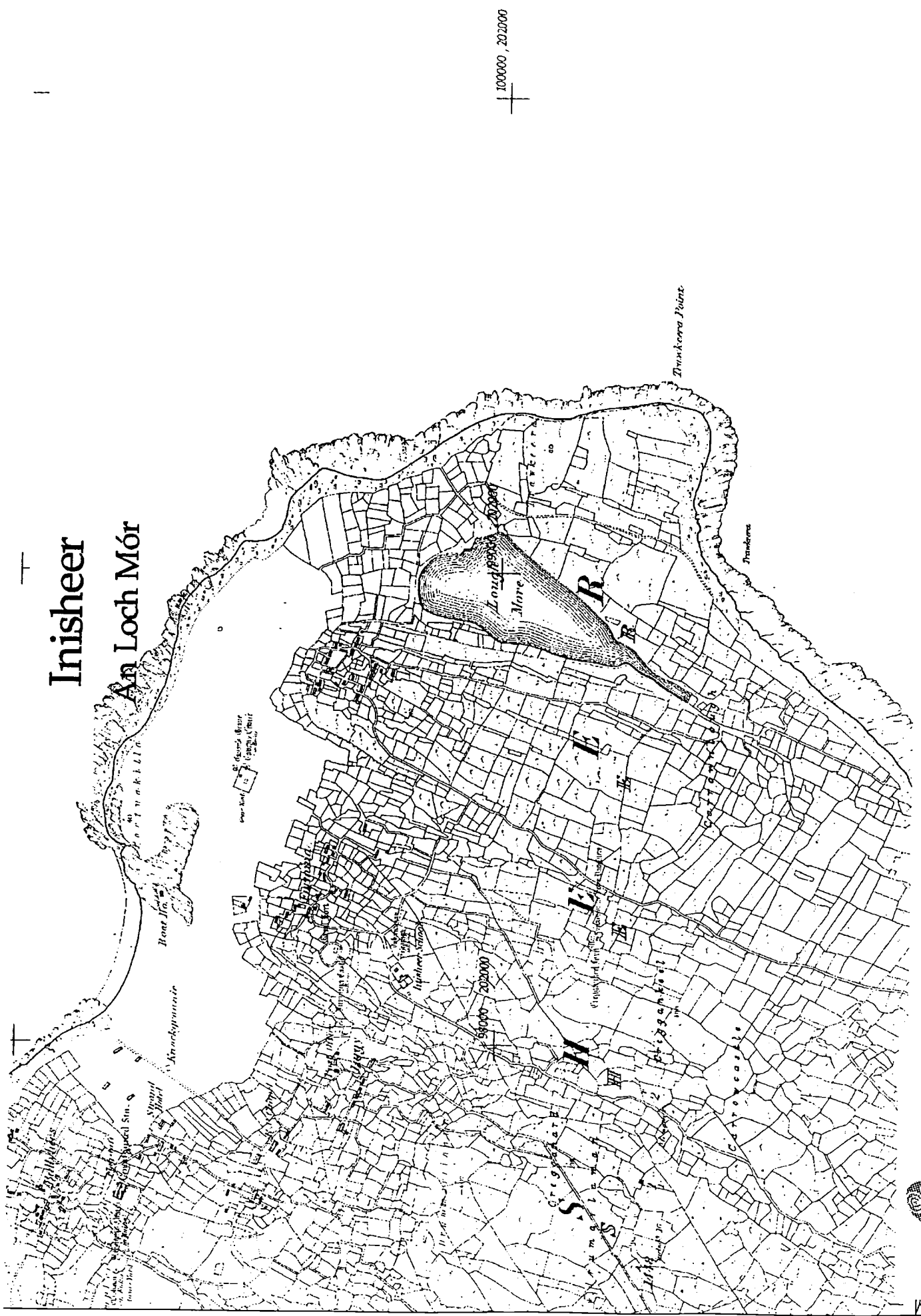
**Station 1** (L 98798 01688) was located at the southern end of the lake where freshwater enters from a reed bed (*Phragmites*). Much of the shoreline consisted of sheer limestone faces and substrate was limestone pavement and rocks with finer sediments in crevices and sheltered areas. Water depth was up to 1m. Salinity measured 0 - 2.5 ppt over much of the surface but up to 4.9 ppt at 0.5 m and deeper.

**Station 2** (L 98851 01911) was located on the west shore of the lagoon in a *Phragmites* swamp with dense growths of *Potamogeton* and rafts of *Enteromorpha* (Plate 4.3.1). Substrate consisted of limestone pavement and stones with finer sediments in grykes. Salinity measured 4.8 ppt and depth was up to 1m.

**Station 3** (L 98993 02173) was located at the north end of the lagoon under a limestone cliff. Most of this area was a limestone shelf in water about 1m deep with a dense growth of *Potamogeton* and rafts of *Enteromorpha* (Plate 4.3.2). Salinity measured 4.7 - 4.9 ppt.

**Station 4** (L 99104 01929?) was located in the northeast part of the lake (Plate 4.3.3) where diluted seawater enters from the tidal pool. Substrate consisted of limestone pavement, clints and grykes and loose stones. Depth varied from 0 - 1m and salinity measured 4.7 ppt over most of the area but up to 10 ppt in the grykes.

**Station 5** (position not recorded) was located in the tidal pool to the northeast of, and approximately 100m from, the lake (Plate 4.3.4). Substrate consisted of limestone rock and large boulders. Depth was up to 2 m and water level fluctuated about 1m over a tidal cycle. The pool was covered with *Enteromorpha* and salinity measured up to 20 ppt.



# Inisheer

## An Loch Mór

100000, 20:20000

Figure 4.3.1 Section of O.S. 6" map showing area of Loch Mór, Inis Oírr, Co. Galway.

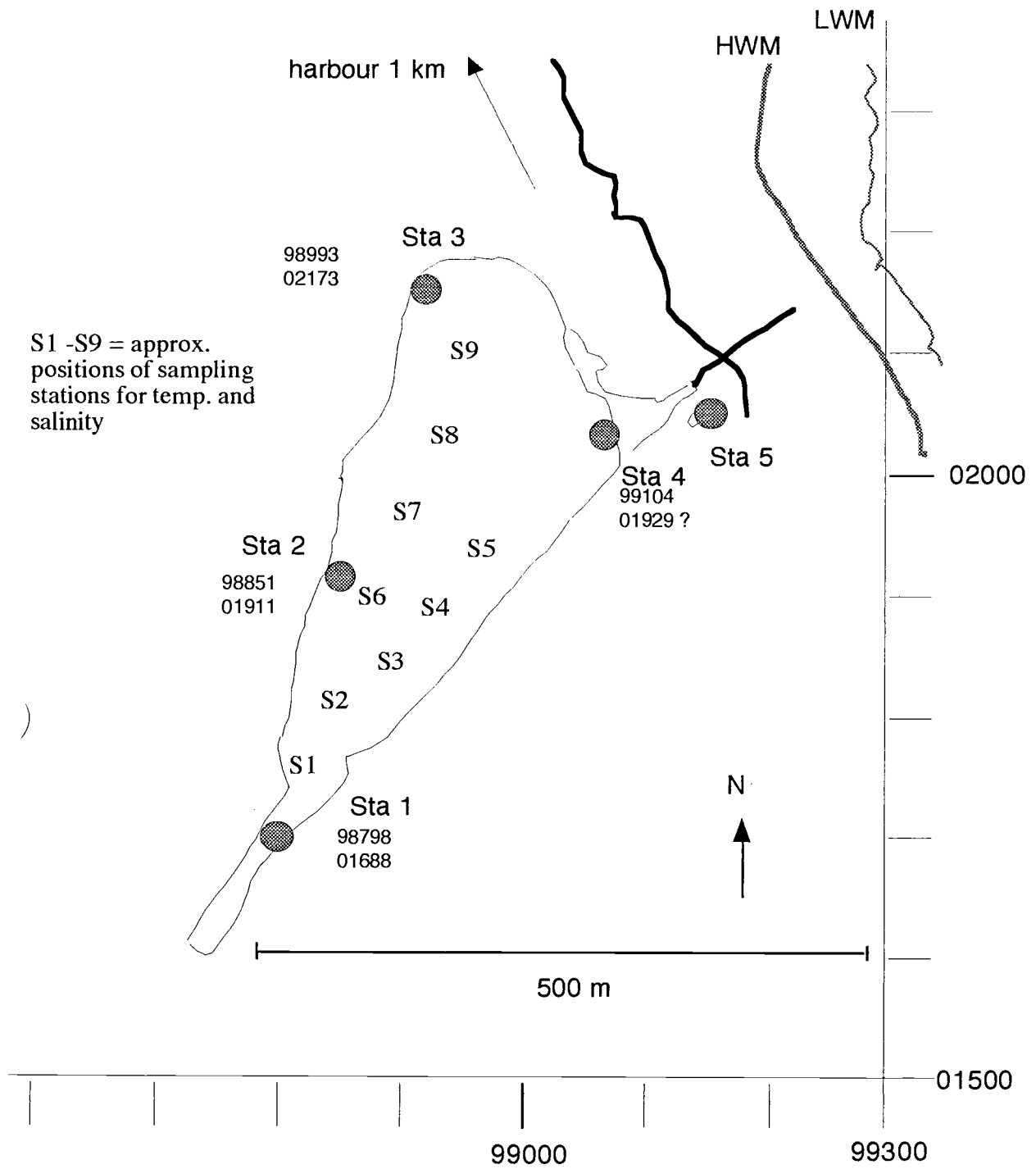


Figure 4.3.2 Sketch map of An Loch Mór, Inis Oírr, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.

## Results

### Fauna

Table 4.3.1 shows the total species list for each station. The following is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes (L\* = lagoonal specialist in Britain, L\*IR = proposed as lagoonal specialist in Ireland; \* = interesting or rare species).

Marine-polyhaline	<i>Lumbricillus sp.</i>	
	<i>Littorina saxatilis</i>	
Euryhaline	<i>Procerodes littoralis</i>	
	<i>Gammarus duebeni</i>	
	<i>Jaera nordmanni</i>	L*IR
	<i>Potamopyrgus antipodarum</i>	
	* <i>Conopeum seurati</i>	L*
	<i>Anguilla anguilla</i>	
Meso-oligohaline	<i>Ischnura elegans</i>	
Oligohaline-freshwater	<i>Corixa panzeri</i>	
	<i>Sigara concinna</i>	L*
	<i>Notonecta?glaucum.</i>	

Remarkably few taxa (15) were recorded in Loch Mór and only 10 identified to species. Two are regarded as lagoonal specialists in Britain, although one is of doubtful value as an indicator in Ireland. One (*J.nordmanni*) is a proposed specialist in Ireland. *Notonecta ?glaucum* was not positively identified but it is assumed that it is this species. Only one species is possibly of interest:

*Conopeum seurati* has been recorded at 16 of the 36 sites surveyed, but is not listed in any review of Irish marine Bryozoa (Wyse Jackson, 1991). Either the species is under recorded or a truly lagoonal specialist.

The fauna of the lagoon is remarkably poor despite the apparently stable and uniform conditions in the lagoon. Presumably this is due to the "island effect" and the problems of colonisation.

### Salinity

Table 4.3.2 shows salinity and temperature data to 5m depth. Positions of the sampling positions on the map are approximate, as GPS readings appear to be inaccurate at this site. The lagoon is very deep, up to approximately 25m measured with a plumbline. Water from 10m depth measured 10<sup>0</sup> C.

### Evaluation

The fauna is very poor, although some species are lagoonal specialists and one is potentially interesting. An interesting form of bacterial mat was found by the botanist (Roden, Vol.III). However, geomorphologically, the lake is unique and well deserving of protection.

See Evaluation(Section 7) for further information and ranking of the 36 sites,



Table 4.3.1. Aquatic fauna recorded at stations in An Loch Mór, Inis Oírr, Co. Galway. 1998

Taxa	Stations									
	1	L.T. 1	2	L.T. 2	3	L.T. 3	4	L.T. 4	5	
Turbellaria										
	<i>Procerodes littoralis</i>					c		a	140	
Annelida										
	<i>Lumbricillus sp.</i>									c
Crustacea										
Isopoda										
	<i>Jaera nordmanni</i>	c						c		c
Amphipoda		a	120	a	150	a	120	a	1000	c
	<i>Gammarus duebeni</i>	a	47	a	27		36	a	33	o
Insecta										
Odonata										
	<i>Ischnura elegans</i>			o	1					
Trichoptera	indet.								cases	
Heteroptera										
	<i>Corixa panzeri</i>	a	100	c	60	o	20	o	25	
	<i>Notonecta ?glaucum</i>	o		o	1			o		
	<i>Sigara concinna</i>			o	7			o	5	
Coleoptera	indet.								+	
Diptera	Chironomidae indet					o	4			
Mollusca	<i>Littorina saxatilis</i>									c
	<i>Potamopyrgus antipodarum</i>	c	1	a	700	c	30	c	21	
Bryozoa	<i>Conopeum seurati</i>							+		
Pisces	<i>Anguilla anguilla</i>							F = 3		

F = Fyke net; L.T. = light trap; + = present, o = occasional. c = common, a = abundant

Table 4.3.2 Salinity, temperature and maximum depth recordings from An Loch Mór, Inis Oirr, Co. Galway. 1998.

Sample point	OS position	Dmax	Depth	Salinity (ppt)	Temp. (C)
S1			surface	0.80	15.60
			01m	4.60	17.10
S2		6m	surface	3.90	18.10
			1m	4.60	17.50
			2m	5.00	17.20
			3m	5.00	17.20
			4m	5.10	17.00
			5m	5.30	16.40
S3	98939 1820	20 m	surface	4.60	18.70
			1m	4.80	18.70
			2m	4.80	17.10
			3m	5.00	17.10
			4m	5.10	17.00
			5m	5.20	16.70
S4	98964 1892	25m	surface	4.60	19.00
			1m	4.60	18.10
			2m	4.90	17.30
			3m	5.00	17.20
			4m	5.10	17.00
			5m	5.10	16.90
S5	99104 1904	25m	surface	4.80	19.20
			1m	4.80	19.10
			2m	4.90	17.80
			3m	5.00	17.20
			4m	5.10	17.00
			5m	5.20	16.80
S6	98951 1816	18m	surface	4.70	18.20
			1m	4.70	17.90
			2m	4.90	17.40
			3m	5.00	17.20
			4m	5.00	17.10
			5m	5.30	16.80
S7	98996 1942	15m	surface	4.60	18.80
			1m	4.70	18.30
			2m	4.90	17.50
			3m	5.00	17.30
			4m	5.00	17.10
			5m	5.20	16.90
S8	99104 1929	25m	surface	4.70	19.10
			1m	4.80	18.90
			2m	4.80	18.50
			3m	4.90	17.40
			4m	5.10	17.00
			5m	5.20	16.90
S9	99104 1929	3m	surface	4.70	19.10
			1m	4.70	19.00
			2m	4.90	18.70
			3m	4.90	18.50



Plate 4.3.1 View looking southwest towards Sta. 1.  
An Loch Mór, Inis Oírr, Co. Galway. 1998.



Plate 4.3.2 View looking west across Sta. 3 showing raft of *Enteromorpha*.  
An Loch Mór, Inis Oírr, Co. Galway. 1998.



Plate 4.3.3 View of lagoon looking southwest across Sta. 4.  
An Loch Mór, Inis Oírr, Co. Galway. 1998.



Plate 4.3.4 View of tidal pool, Sta. 5  
An Loch Mór, Inis Oírr, Co. Galway. 1998.

#### 4.4 Loch Phort Chorrúch, Árann, Aran Islands, Co. Galway

OS L857112 53° 08.2' N; 09° 42.5' W

##### Description

Loch Phort Chorrúch is a natural lagoon with a long, unbroken cobble barrier that may also receive seawater through underground fissures in the karstic limestone. The lagoon covers 4 ha and lies on the north coast of Inishmore, 2.5 km west of Kilronan (Fig 4.4.1). Seawater enters by percolation through the barrier, by overtopping the barrier during storms and possibly through underground fissures. The lagoon is shallow (aprox. 1m) and salinity was 0 - 4.5 ppt during the period of sampling. However, water levels were exceptionally high during the sampling period due to heavy rainfall the previous day and salinity may be higher under normal circumstances. The bed of the lake is basically limestone pavement with a thick deposit of fine muddy silt, especially in the western and southern parts of the lagoon. Reedbeds run along the inside of the barrier and also cover parts of the north and south shores; elsewhere the shoreline is fringed with wet grasslands, with limestone rocks and walls.

##### Sources of Information

None ?

##### Sampling stations

The area was sampled from 19- 20/8/98 on 23/8/98 and briefly in October 1998. Four sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows (Fig. 4.4.2).

**Station 1** (L 85580 11042) was located at the southwestern end of the lagoon (Plate 4.4.2) where seawater appears to percolate through the barrier and where freshwater also appears to enter the lake from a nearby spring. Substrate consisted of cobbles from the barrier with a thick layer of fine organic mud and patches of *Phragmites*. The sediment in this area was extremely fine and unstable and at least 1m deep. Water depth varied from 20-30 cm and salinity measured 2 ppt.

**Station 2** (L 85710 11251) was located on the northwest of the lagoon in a *Phragmites* swamp. Substrate consisted of limestone pavement and stones overlain with finer sediments. Salinity measured 4.5 ppt in this area and though no percolation through the barrier was visible it appears that this area is the most saline part of the lagoon. Depth was up to 0.5m.

**Station 3** (L 85896 11240) was located at the northeast end of the lagoon (Plate 4.4.4). Substrate was mostly of bare limestone pavement and grykes with emergent vegetation and wet grassland along the water's edge. Water was almost fresh in this area (0.6 ppt, suggesting freshwater seepage from surrounding land, and up to about 1m deep.

**Station 4** (L 85787 11070) was located on the eastern shore of the lake (Plate 4.4.3) and was very similar to Sta. 3. Substrate consisted of limestone pavement, grykes and loose stones. Depth varied from 0 - 1m and salinity measured 2.3 and 2.9 ppt on the 21/8/98 and 23/8/98, respectively.

# Inishmore

## Portcowrugh

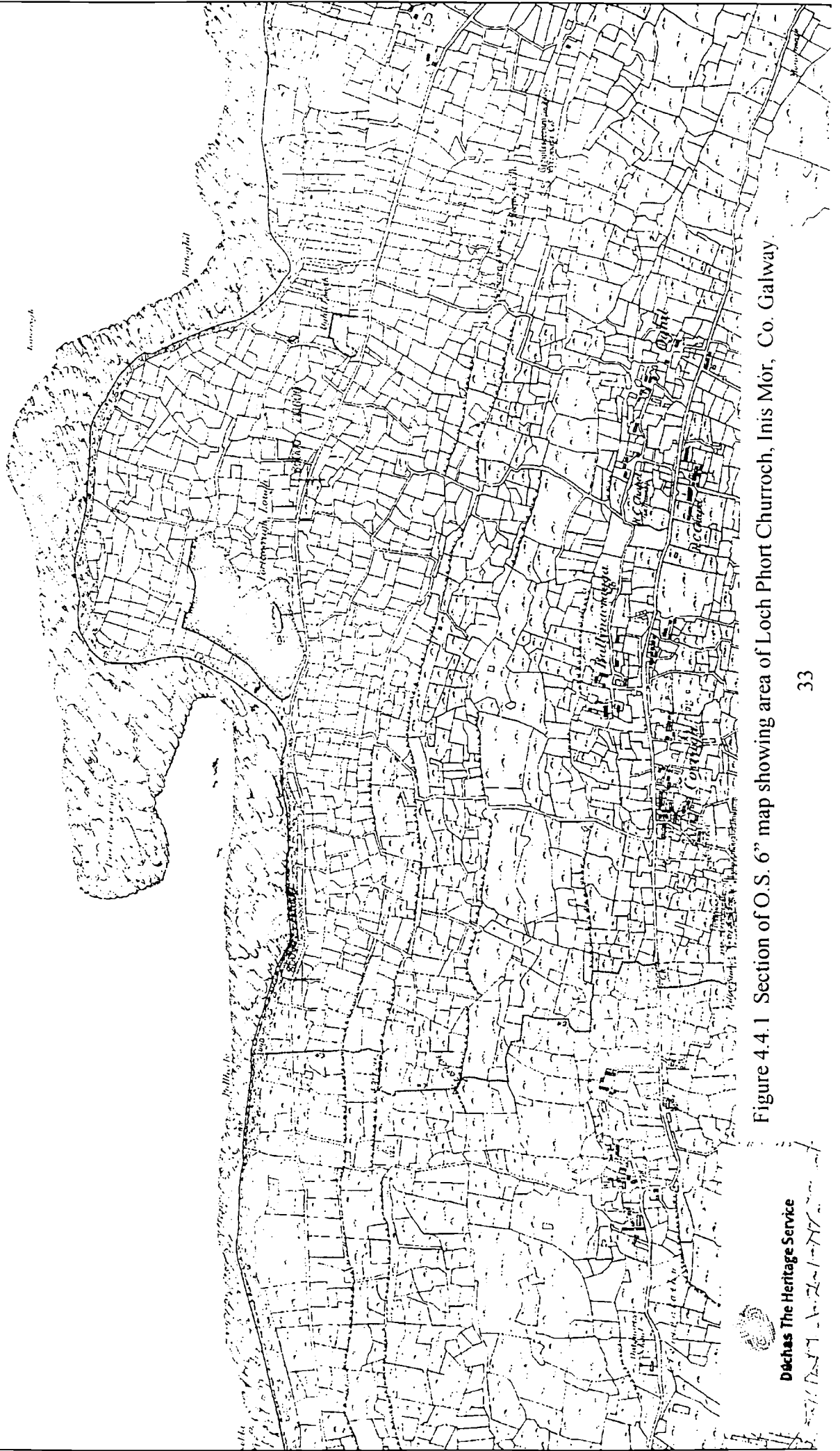


Figure 4.4.1 Section of O.S. 6" map showing area of Loch Phort Churroch, Inis Mór, Co. Galway.

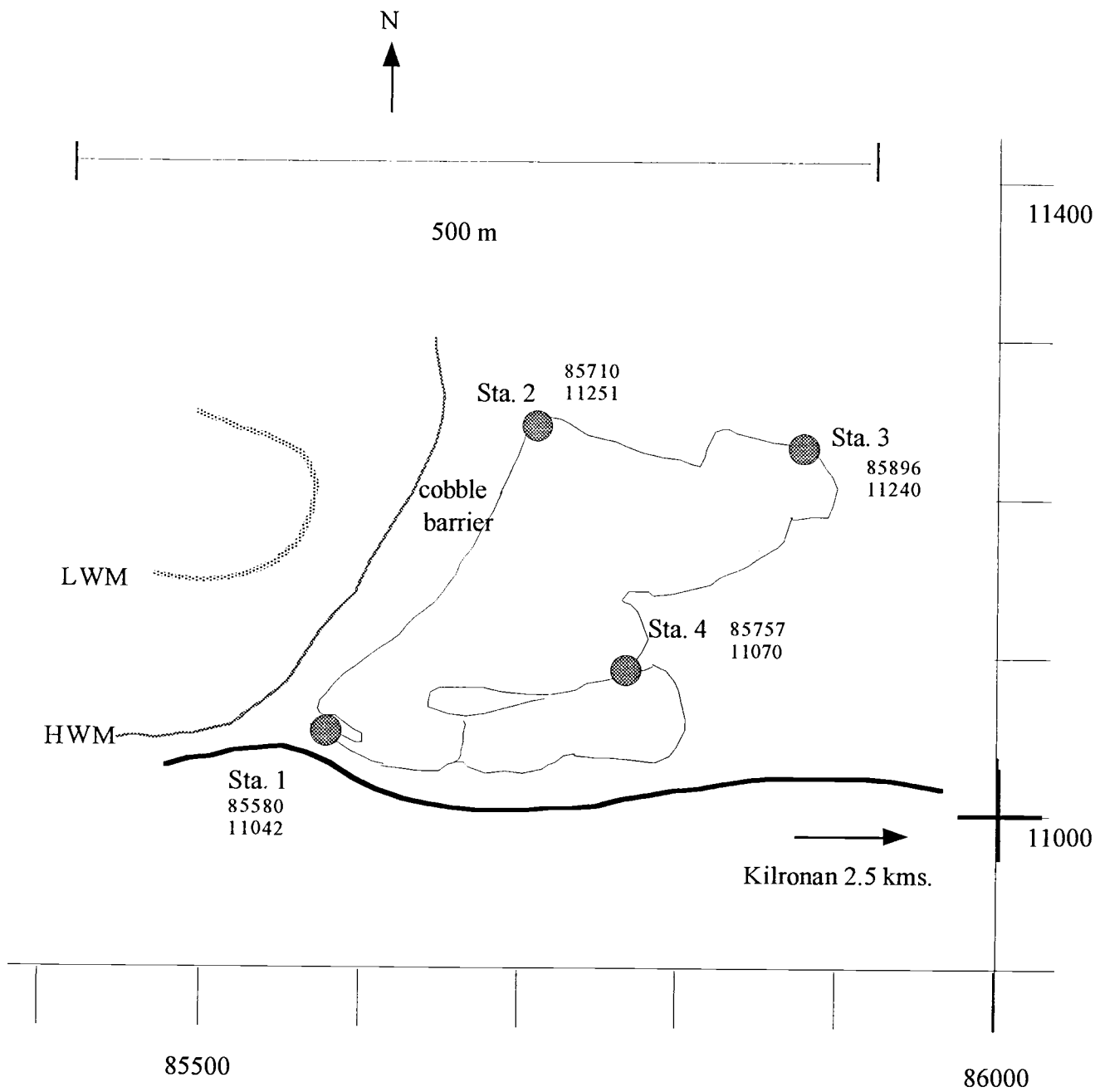


Figure 4.4.2 Sketch map of Loch Phort Chorrúch, Árainn, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.

## Results

Table 4.4.1 shows the total species list for each station. The following is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes (L\* = lagoonal specialist in Britain, L\*IR = proposed as lagoonal specialist in Ireland; \* = interesting or rare species).

### Marine-polyhaline

	<i>Gammarus locusta</i>	
Euryhaline	<i>Jaera nordmanni</i>	L*IR?
	<i>Procerodes littoralis</i>	
	<i>Gammarus duebeni</i>	
	<i>Potamopyrgus antipodarum</i>	
	* <i>Conopeum seurati</i>	L*
	<i>Gasterosteus aculeatus</i>	
	<i>Anguilla anguilla</i>	

### Meso-oligohaline

	<i>Ischnura elegans</i>	
	<i>Sigara stagnalis</i>	L*
	* <i>Enochrus bicolor</i>	L*
	<i>Ochthebius dilatatus</i>	

### Oligohaline-freshwater

*Corixa panzeri*

A total of 19 taxa were recorded, of which 3 species are regarded as lagoonal specialists in Britain and one additional species is a proposed lagoonal specialist in Ireland. The number of taxa is very low and would be even lower without the relatively high number of Dipteran groups. 2 species are of particular interest:

*Conopeum seurati* has been recorded at 16 of the 36 sites surveyed, but is not listed in any review of Irish marine Bryozoa (Wyse Jackson, 1991). Either the species is under recorded or a truly lagoonal specialist.

*Enochrus bicolor* was also recorded at L. an Chara and L. an Aibhnín during this survey, at 6 sites during the 1996 survey and also from Port na Curra, Inishmaan in 1998 and in samples collected at the North Slob in 1991. There are only 2 recent records from N. Ireland (Nelson *et al.*, 1998).

It is interesting to compare the fauna of this lagoon with the nearby lagoon, Loch an Chara (Section 4.5) which although not geomorphologically very interesting has a far richer fauna of both lagoonal and rare species. *Gasterosteus aculeatus* is extremely abundant at this site but does not occur in L. an Chara whereas on the other hand, *Palaemonetes varians* is extremely abundant in L. an Chara but does not occur at this site. It is difficult to imagine why both species have not colonised both lagoons. Possibly this is due to the fact that neither of these karstic lagoons have a direct communication with the sea.

## Evaluation

Loch Phort Chorrúch is an unusual lagoon, in that it appears to be a fine example of a sedimentary (percolation) lagoon with an impressive cobble barrier but it might also be classed as a rock lagoon, as it may receive seawater through underground fissures in the karstic limestone.

The fauna is disappointing and might be expected to be higher. It is possible that eutrophication and resulting anoxia limit the faunal richness. There are only 2 species of any interest and one of these is common in lagoonal habitats.

See Evaluation (Section 7) for further details and ranking of the 36 sites.







Plate 4.4.1 View looking south along the cobble barrier towards Sta. 1.  
Loch Phort Chorrúch, Árann, Aran Islands, Co. Galway. 1998.



Plate 4.4.2 View looking east across the lagoon from Sta. 1  
Loch Phort Chorrúch, Árann, Aran Islands, Co. Galway. 1998.



Plate 4.4.3 View of lagoon looking west over Sta. 4. (Sta. 1 top left).  
Loch Phort Chorrúch, Árann, Aran Islands, Co. Galway. 1998.



Plate 4.4.4 View looking southwest across Sta. 3.  
Loch Phort Chorrúch, Árann, Aran Islands, Co. Galway. 1998.

## 4.5 Loch an Chara, Árann, Aran Islands, Co. Galway

OS L887099

53° 06.8' N; 09° 39.7' W

### Description

Loch an Chara is difficult to classify as it is situated in karstic limestone and appears to receive seawater from a tidal spring rising from an underground fissure to the north of the lagoon, in which case it would be classed as a rock lagoon. However, it probably also receives seawater from an old mal-functioning sluice in the south and might also be classed as a saline lake lagoon. The lagoon is situated on the north coast of Inishmore, approximately 1 km north of Kilonan (Fig 4.5.1).

Open water covers an area of approximately 4 ha and appears to receive seawater from an underground fissure in the limestone bedrock at the north end of the lake and from a leaking sluice at the south end. According to Robinson (undated) the lake was open to the sea until the last century when land reclamation resulted in the present situation. Presumably before the road was built, water drained to the south and seawater was also able to enter freely from both directions. Attempts have been made to drain this water to the south through the sluice under the road. The lagoon is shallow (up to 1m) and salinity ranged from 6 to 20 ppt with an apparent increase from north to south. Substrate is basically limestone pavement overlain with sand and a thick layer of fine organic sediments in the central part of the lagoon. The shoreline is fringed with wet grasslands, with limestone rocks and walls.

### Sources of Information

Robinson (undated).

### Sampling stations

The area was sampled briefly in mid June 98, from 20-22/8/98 and again on 18/10/98. Six sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows (Fig. 4.5.2).

**Station 1** (L 88603 10029) was located at the north end of the lagoon near where seawater appears to enter the lake from a limestone fissure (Plate 4.5.3). Substrate consisted of soft organic mud under shallow water (0 - 0.5m), surrounded by emergent vegetation and limestone walls. Salinity measured 13.1 - 15.5 ppt on two consecutive days in August and 12 ppt in September.

**Station 2** (L 88704 10032) was located on the northeast shore of the lagoon. Substrate consisted of sand with finer muddy silt bordered by stone walls and grassland lagoon. Depth was up to 0.5m with dense beds of aquatic vegetation and salinity measured 12.9 - 14.5 ppt.

**Station 3** (L 88805 09944) was located on the northeast shore of the lagoon (Plate 4.5.2) to the south of Sta.2. Substrate was mostly of clean shell sand along the shore with deep finer sediments and dense beds of aquatic vegetation further into the lagoon and occasional stones. Depth 0 - 1m and salinity 13.5 -14.9 ppt on the surface, up to 20 ppt at 1m depth.

**Station 4** (L 88910 09830) was located at the southern end where the drainage channel from the sluice enters the lake. Substrate was muddy sand with deep mud in places and occasional stones. Shoreline composed of rough pasture, stone walls and low peat cliffs. Depth from 0 - 0.5m and salinity 14.5 - 15.3 ppt.

**Station 5** (L 8892 0980 ??) was located on the channel between the sluice and the lake. Water levels were very low at the time of sampling (0 - 30 cm) and substrate consisted of fine, soft sand and silt. Salinity was highest in this area (26 - 31 ppt).

# Inishmore

## L. Carra

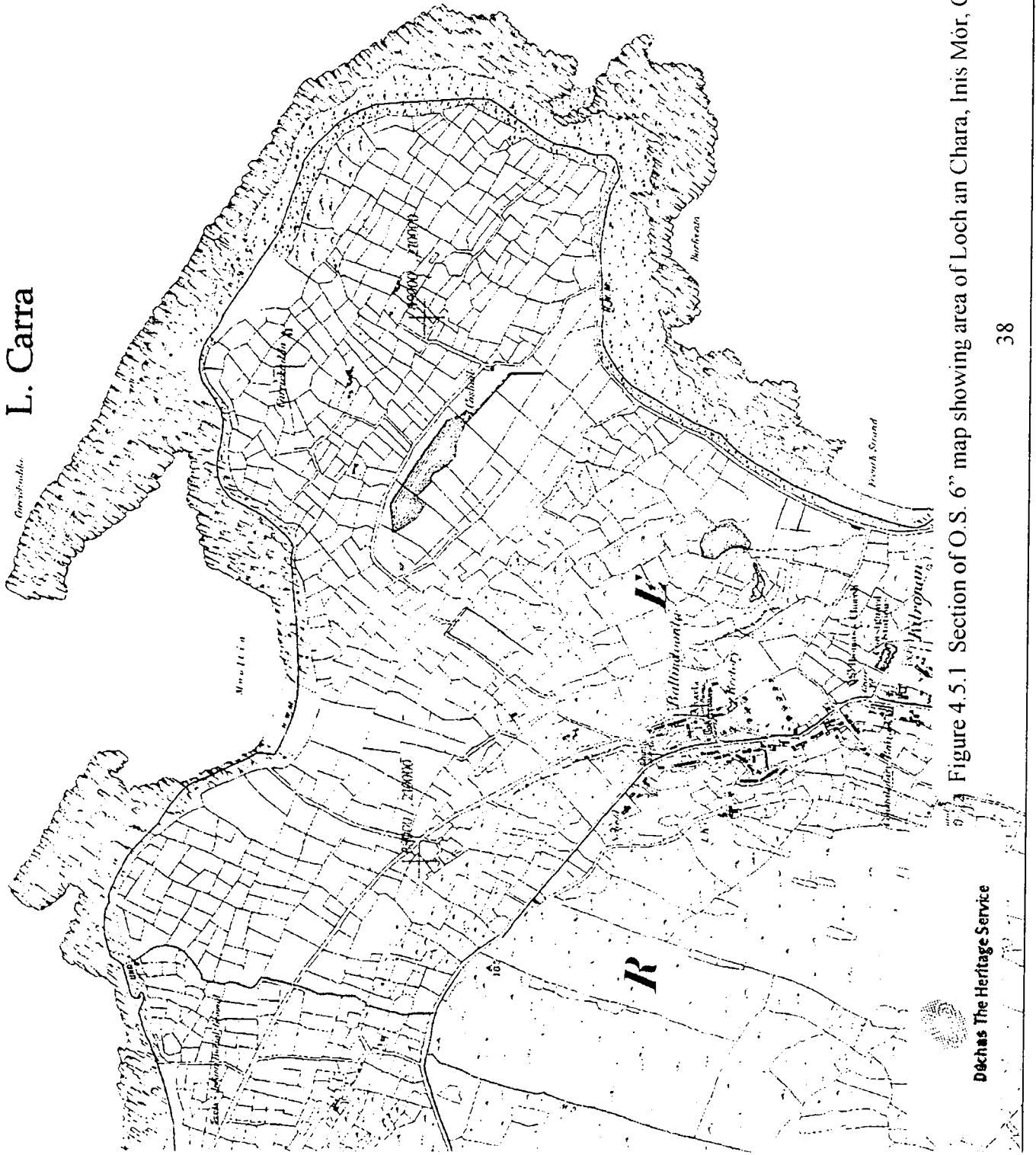


Figure 4.5.1 Section of O.S. 6" map showing area of Loch an Chara, Inis Mór, Co. Galway.

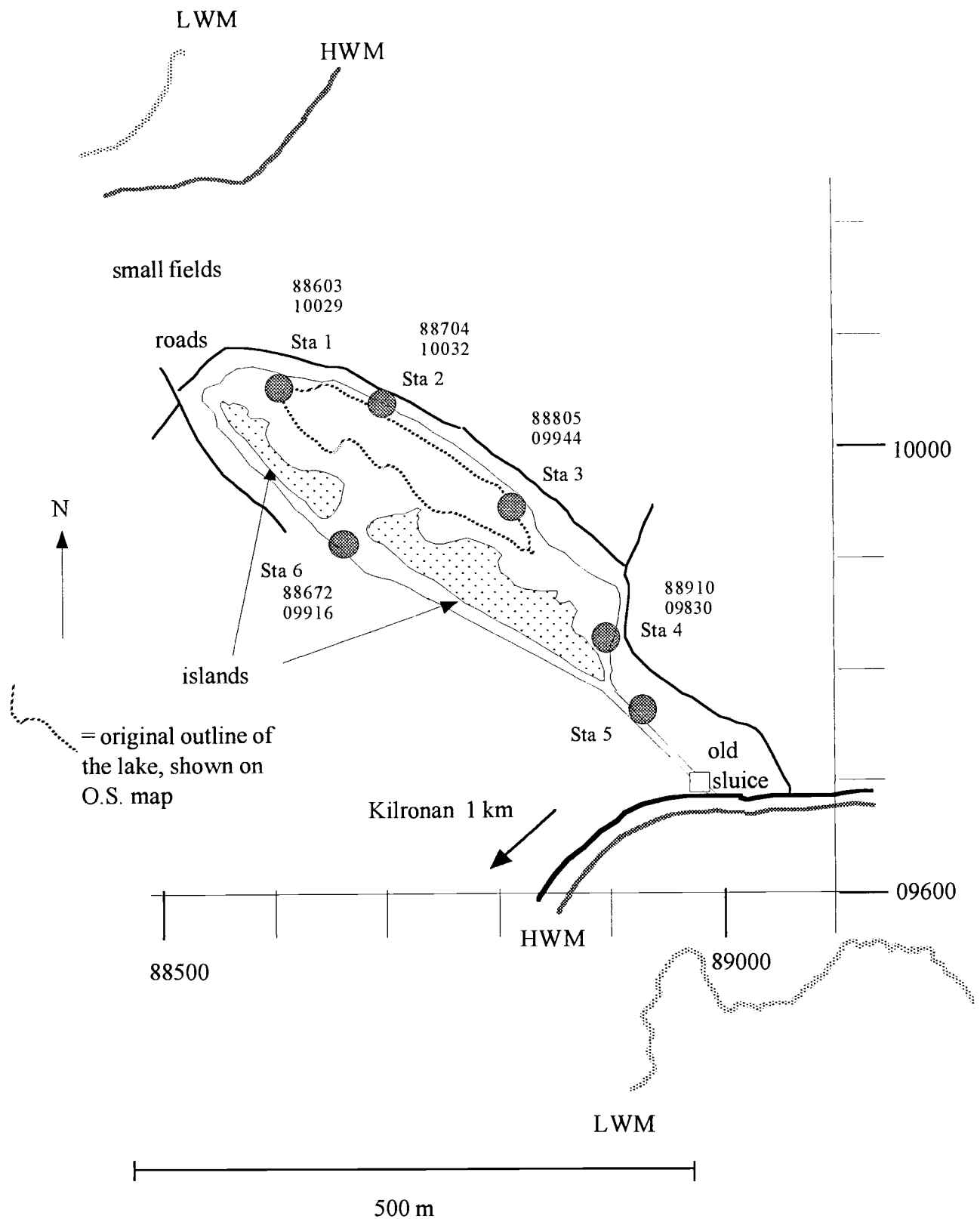


Figure 4.5.2 Sketch map of Loch an Chara, Árainn, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.

**Station 6** (L 88672 09916) was located on the western shore of the lake. A drainage channel runs to the southeast from this area, which is probably dry at times and is more of a flooded saltmarsh than a true part of the lake. Substrate consisted of fine soft mud and salinity was relatively low (11.2 ppt) suggesting seepage or overland flow from the fields to the west of the lake.

## Results

Table 4.5.1 shows the total species list for each station. The following is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes (L\* = lagoonal specialist in Britain, L\*IR = proposed as lagoonal specialist in Ireland; \* = interesting or rare species. Species in brackets refer to previous records).

Marine-polyhaline	Cirratulidae indet <i>Melita palmata</i> ( <i>Littorina saxatilis</i> )	
Poly-mesohaline	* <i>Jaera ischiosetosa</i> <i>Hydrobia ventrosa</i> * <i>Sigara selecta</i> * <i>Ochthebius punctatus</i>	L*IR L* L* L*
Euryhaline	<i>Hediste diversicolor</i> <i>Jaera nordmanni</i> <i>Gammarus duebeni</i> <i>Palaemonetes varians</i> <i>Potamoyrgus antipodarum</i> ( <i>Cerastoderma glaucum</i> ) <i>Anguilla anguilla</i>	L*IR ?   L*  (L*)
Meso-oligohaline	<i>Eurytemora</i> sp <i>Ochthebius dilatatus</i> <i>Sigara stagnalis</i> * <i>Enochrus bicolor</i>	  L* L*
Oligohaline/limnetic	<i>Corixa ?panzeri</i>	
Uncertain	<i>Cytherura gibba</i> * <i>Megasternum obscurum</i>	

A total of 22 taxa were recorded in Loch an Chara in 1998, of which 17 were identified to species; 6 of these are lagoonal specialists in Britain and 2 additional species are proposed lagoonal specialists for Ireland. *Littorina saxatilis* and *Cerastoderma glaucum* were not recorded alive during the sampling period but have been recorded in the recent past (M. O'Connell *pers comm*). *Cerastoderma glaucum* is an additional lagoonal specialist which probably occurs in the lagoon periodically, at least as spat, judging by the number of spat shells which presumably do not survive for many years. 5 species are interesting or rare:

*Sigara selecta* was abundant at this site and appears to be the second only Irish record. Previously recorded only from Ventry on the Dingle peninsula (McCarthy and Walton, 1980). This species is listed as a lagoonal specialist in Britain, where it tolerates higher salinities than *S. stagnalis* (Scudder, 1976). The previous record from Ventry was regarded by McCarthy and Walton as "difficult to explain since it has not previously been found at other brackish water sites recently investigated along the south coast". This record from the Aran islands is therefore of great interest and the large population of this rare lagoonal specialist at this site is very significant for conservation purposes.

*Jaera ischiosetosa* was also recorded at L. Athola, Maghera L., during this survey and at Moorlagh, L. Murree and Furnace L. in 1996. The only previous record appears to be for L. Hyne, Co. Cork (Goss Custard *et al.*, 1979).

*Enochrus bicolor* was also recorded at Ballytiege, L. Phort Chorrúch and L. an Aibhnín during this survey, at 6 sites during the 1996 survey and also from Port na Curra, Inishmaan in 1998 and in samples collected at the North Slob in 1991. There are very few other records for the country.

*Megasternum obscurum* was also recorded at Ballytiege during this survey and at Furnace L. (and L. an tSaile) during the 1996 survey but is otherwise described as rather rare in Ireland (Foster *et al.*, 1992).

*Ochthebius punctatus* was also recorded at Corragaun L., Farranamanagh L and Bridge L. during the 1996 survey. It is listed as a lagoonal specialist in Britain but not common. Since 1988, recorded at 7 brackish sites in Antrim and Down (Nelson *et al.*, 1998).

Several large corixid nymphs and females were assumed to be *C. panzeri*

### **Evaluation**

Although geomorphologically the site is not particularly striking, it is nevertheless an interesting type of karstic lagoon which appears to be rare in a European context.

It is interesting to compare the fauna of this lagoon with the nearby lagoon, Loch Phort Chorrúch (Section 4.4) which has a far less interesting fauna. *Gasterosteus aculeatus* is extremely abundant at that site but was not recorded in L. an Chara whereas on the other hand, *Palaemonetes varians* is extremely abundant in L. an Chara but does not occur at Phort Chorrúch. It is difficult to imagine why both species have not colonised both lagoons. Possibly this is due to the fact that neither of these karstic lagoons has a direct communication with the sea.

The species list is low but contains a large number of lagoonal specialists and 5 rare species. This site could easily be disregarded as of any significance based on morphology but is the best example of a lagoonal community in the Aran Islands and should be protected for this reason.

See Evaluation (Section 7) for further details and ranking of the 36 sites.



Table 4.5.1 Aquatic fauna recorded in Loch an Chara, Arainn, Co. Galway. 1998.

Taxa		Stations									
		1	L.T. 1	2	L.T. 2	3	L.T. 3	4	L.T. 4	5	6
Annelida	Cirratulidae indet.									1	
	<i>Hediste diversicolor</i>							o		o	
Crustacea											
Copepoda	<i>Eurytemora sp.</i>							+			
Ostracoda	<i>Cytherura gibba</i>							+			
Isopoda											
	<i>Jaera ischiosetosa</i>	1									
	<i>J. nordmanni</i>	c		+				c		+	
Amphipoda		+		+		+		o		o	o
	<i>Gammarus duebeni</i>										2
	<i>Melita palmata</i>			4				1		5	
Decapoda	<i>Palaemonetes varians</i>	a	200	a	250	c	55	c	130	+	
Insecta											
Trichoptera	(cases)					+		a			
Heteroptera	Corixidae sp.	+	21	+	550	+	6	+	3	+	+
	<i>Corixa ?panzeri</i>				4						
	<i>Gerris sp.</i>										+
	<i>Sigara selecta</i>	c	21	a	200	o	6	o		a	o
	<i>S. stagnalis</i>			o	3						
Coleoptera						o		o		o	
	<i>Enochrus bicolor</i>	1				1		2		1	
	<i>Megasternum obscurum</i>	3									
	<i>Ochthebius dilatatus</i>	1									
	<i>O. punctatus</i>									1	
Diptera	Chironomidae indet.	+		+		+		+		+	+
Mollusca											
Prosobranchia	Hydrobiidae	+		+		+		c		+	+
	<i>Hydrobia ventrosa</i>			+	7	+	3	+	2	+	+
	( <i>Littorina saxatilis</i> )									shells	
	<i>Potamopyrgus antipodarum</i>										
Bivalvia	( <i>Cerastoderma glaucum</i> )					shells					
Pisces	<i>Anguilla anguilla</i>									1	

L.T. = light trap; + = present, o = occasional. c = common, a = abundant, ( ) = previous record.



Plate 4.5.1 View looking north over Killeany Bay to Loch an Chara, Árainn, Aran Islands, Co. Galway. 1998.



Plate 4.5.2 View looking along the north shore of the lagoon from Sta. 3. Loch an Chara, Árainn, Aran Islands, Co. Galway. 1998.



Plate 4.5.3 View of tidal inlet at the eastern end of the lagoon near Sta. 1.  
Loch an Chara, Árann, Aran Islands, Co. Galway. 1998.



Plate 4.5.4 View looking along south shore of the lagoon from Sta. 6.  
Loch an Chara, Árann, Aran Islands, Co. Galway. 1998

## 4.6 Loch Fhada complex, Connemara, Co. Galway

OS L935303 53° 18.6' N; 09° 35.5' W

### Description

The Loch Fhada complex is a group of lakes to the north of the road from Costelloe, approximately 1 km east of Bealadangan (Fig 4.6.1). Seawater enters the lakes from high tides flooding through saltmarsh channels in the northwest to enter the smallest lakes which have no names on the O.S. maps (Sta. 1 & 2). From this area saline water flows to the northeast under the main road into Loch Fhada after dilution with lower salinity water flowing from L. Aughagaddy to the south. Water continues to flow north through L. Fhada and is further diluted from fresh water flowing from Loch Nafatha to the west. Eventually water flows from L. Fhada through a long narrow channel through saltmarsh vegetation into Loch an Aibhnín, which itself is brackish (see Section 4.7). It is possible that seawater also enters Loch Fhada from the north through L. an Aibhnín but the major input appears to be from the south. Environmental parameters vary throughout the complex and are described under the appropriate station numbers below. In general, the open water areas cover a total of 15 hectares and salinity during the sampling period ranged from 3 to 31.5 ppt with pronounced stratification in the deeper areas of water. According to local information the area in the southwest is subject to extreme tidal flooding.

### Sources of Information

None ?

### Sampling stations

The area was sampled briefly on 14/7/98, from 27-30/7/98 and again on 22/9/98 (Sta. 4). Five sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows (Fig. 4.6.2).

**Station 1** (L 92889 29906) was located at the small pool at the southwest (Plate 4.6.1). Seawater appeared to enter from flooding over the saltmarsh to the north and entered the pool at times of high water. The water in the pool was 3m deep and stagnant and is presumably only renewed from rainfall and overland flow and from periodic flooding with seawater. Substrate was mostly peat and soft organic silt and salinity varied from 12.4 ppt at the surface to 29.5 ppt at 3m depth. The pool was covered with a dense growth of *Chaetomorpha* and contained wrecks of cars and domestic refuse.

**Station 2** (L93177 30090) was located in the larger of the two small lakes in the southwest (Plate 4.6.2). Substrate consisted mostly of soft peat with coarse sand and gravel in places and scattered granite rocks. This pool appeared to receive the most saline water but was relatively shallow (up to 2.5 m) and also received freshwater from rainfall and runoff from surrounding land. Salinity at the time of sampling ranged from 18 to 22.9 ppt at the surface, and up to 31.5 at 2.5m depth. The loch was bordered by saltmarsh, rough grazing and granite rocks.

**Station 3** (L 93304 29905) was located in Loch an Ghadaí (Plate 4.6.3) in the southern part of the complex. Seawater flowed into this loch at times of high tides and storms from the channel which normally drains to the north, under the road towards L. Fhada. The loch was very shallow (mostly less than 1m) and what saline water flowed into the lake was very much diluted by the larger amount of freshwater that it received. At the time of sampling salinity measured 2.9 - 3.3 ppt but measured 6-10 ppt in June and is probably higher for most of the year. Substrate was mostly granite rocks, bedrock, coarse gravel with patches of fine sediments with

*Chaetomorpha* in sheltered areas. The Loch was bordered by granite rocks, bedrock, rough grazing and small areas of *Phragmites* reed bed.

**Station 4** (GPS not recorded) was located at the southwestern end of Loch Fhada.

Substrate consisted of rocks and gravelly sand with very little silt. The area was surrounded by moorland with granite rocks. Depth was 0-1m.

**Station 5** (L 94251 30834) was located at the southern end of Loch Fhada where it drains through a channel to L. an Aibhnín. The loch was deep in this area (up to 7m) with a narrow shoreline of granite rocks and bedrock, with patches of stony, coarse gravel and sand and small patches of *Phragmites* reed bed. Water in the loch was stratified with a noticeable halocline at 3m and a salinity and temperature gradient below this depth. In one area lower salinity water (15.5 ppt) was measured at 5m depth, as if diluted by an underground spring of freshwater.

Depth (m)	salinity (ppt)	temperature (°C)
0	7.6	17.9
1	7.7	17.6
2	7.7	17.6
3	20.4	16.8
4	23.9	15.0
5	25.1	12.5

# Lough Fhada

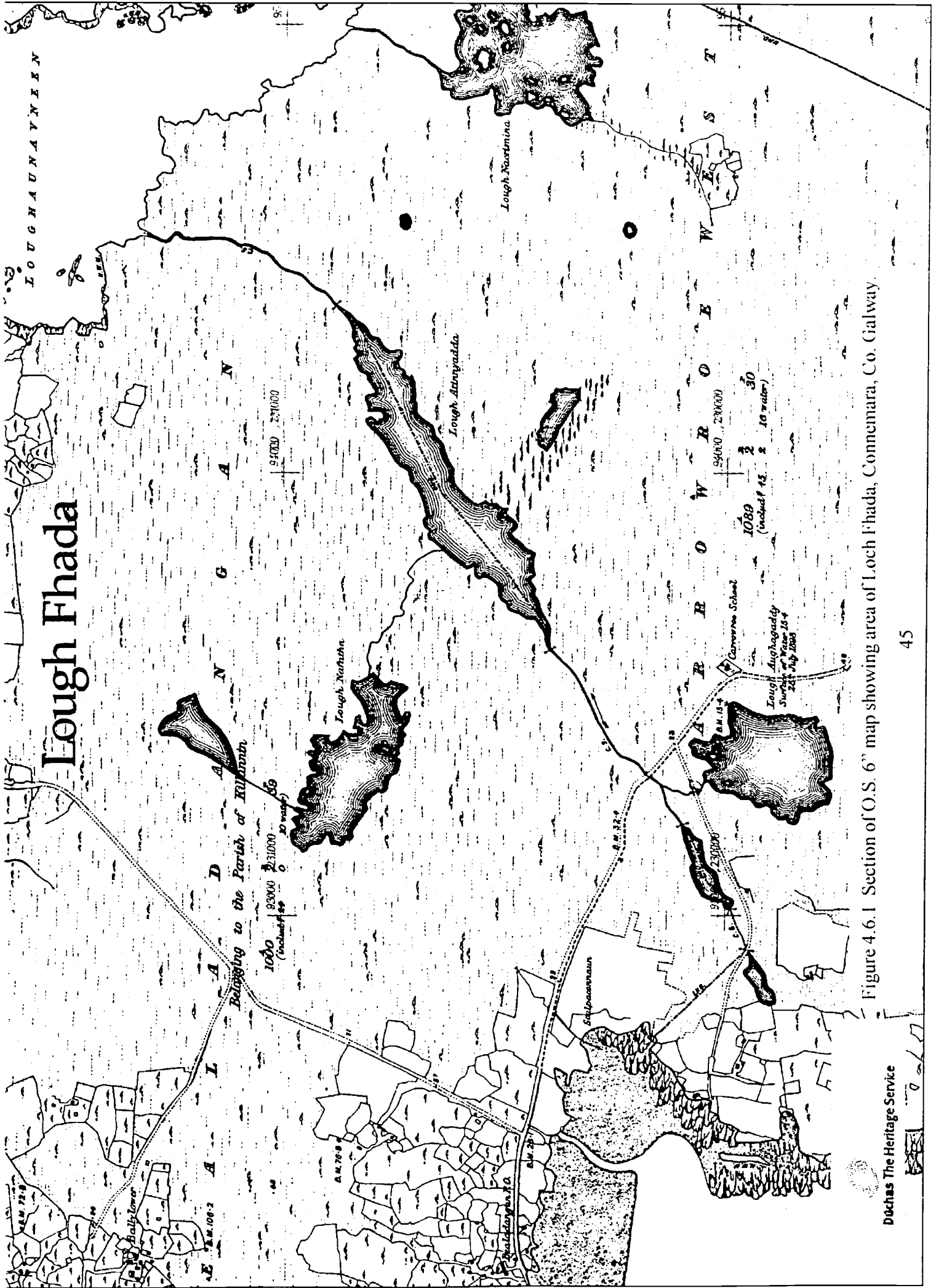


Figure 4.6.1 Section of O.S. 6" map showing area of Lough Fhada, Connemara, Co. Galway.

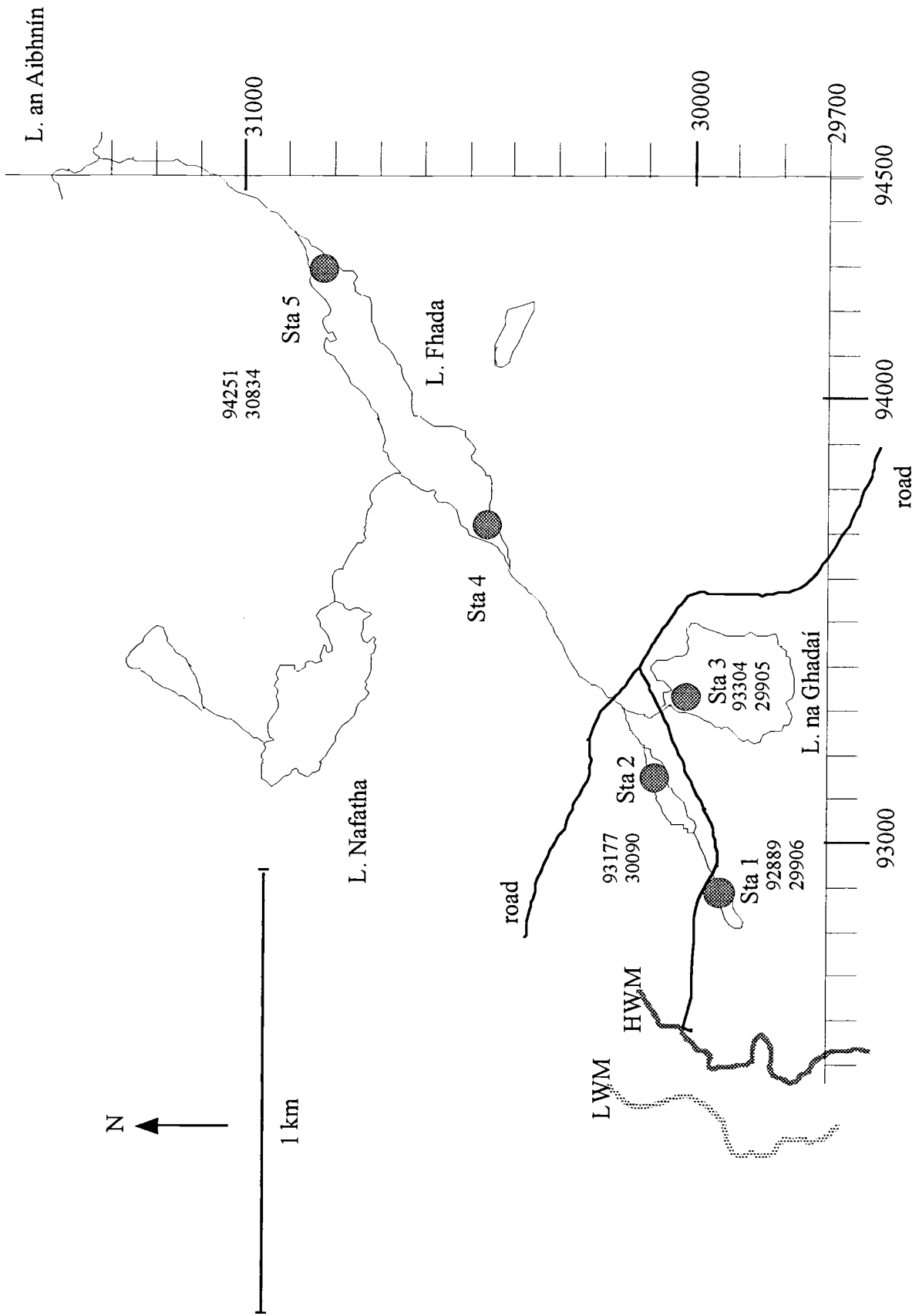


Figure 4.6.2 Sketch map of Loch Fhada complex, Connemara, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.

## Results

Table 4.6.1 shows the total species list for each station. The following is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes (L\* = lagoonal specialist in Britain, L\*IR = proposed as lagoonal specialist in Ireland; \* = interesting or rare species).

Marine	
	<i>Aurelia aurita</i>
Marine-polyhaline	
	<i>Clava multicornis</i>
	<i>Arenicola marina</i>
	* <i>Jaera forsmanni</i>
	<i>Corophium volutator</i>
	<i>Melita palmata</i>
	<i>Microdeutopus gryllotalpa</i>
	<i>Praunus flexuosus</i>
	<i>Hydrobia ulvae</i>
	<i>Mya arenaria</i>
	<i>Rissostomia membranacea</i>
	<i>Taurulus bubalis</i>
Poly-mesohaline	
	<i>Hydrobia ventrosa</i> L*
	* <i>Littorina "tenebrosa"</i> L*
	<i>Cerastoderma glaucum</i> L*
	Mugilidae
	<i>Pomatoschistus microps</i>
Euryhaline	
	<i>Hediste diversicolor</i>
	<i>Idotea chelipes</i> L*
	<i>J. nordmanni</i> L*IR ?
	<i>Lekanesphaera hookeri</i> L*
	<i>Gammarus zaddachi</i>
	<i>G. duebeni</i>
	<i>Carcinus maenas</i>
	<i>Palaemonetes varians</i> L*
	<i>Crangon crangon</i>
	<i>Neomysis integer</i> L*IR
	<i>Mytilus edulis</i>
	<i>Potamopyrgus antipodarum</i>
	* <i>Conopeum seurati</i> L*
	<i>Anguilla anguilla</i>
	<i>Gasterosteus aculeatus</i>
Meso-oligohaline	
	<i>Ischnura elegans</i>
	<i>Sigara stagnalis</i> L*
Uncertain	
	<i>Gerris sp.</i>
	Trichoptera

A total of 38 taxa were recorded, of which 8 are regarded as lagoonal specialists in Britain and 2 additional species are proposed lagoonal specialists in Ireland. 3 species are interesting or rare:

*Littorina "tenebrosa"* was also recorded during this survey at L. an Aibhnín and L. an tSaile and during the 1996 survey in Lettermullen Pool, L. Tanáí, L. Murree and from the North Slob. These are the only known sites in Ireland. The status of this taxon is still under dispute but



appears to be morphologically and ecologically distinct and is listed as a lagoonal specialist for Britain.

*Conopeum seurati* has been recorded at 16 of the 36 sites surveyed, but is not listed in any review of Irish marine Bryozoa (Wyse Jackson, 1991). Either the species is under recorded or a truly lagoonal specialist.

*Jaera forsmanni* was previously recorded at Drongawn L. in the 1996 survey (Oliver and Healy, 1998) and during this survey at Kilmore L., L. an Aibhnín, Kinvarra saltmarsh (section 4.8) and L. Athola. The only other Irish record of the species located is for L. Hyne, Co. Cork, (De Grave and Holmes, 1998).

The fauna of this complex is quite rich with a high proportion of lagoonal specialists reflecting the range of salinities and substrates available. Euryhaline and Marine/polyhaline species dominate the fauna with very few low salinity species present.

### **Evaluation**

Although individually the lagoonal habitats may not be too impressive, as a complex they comprise a wide range of salinity regimes and associated fauna. The species list is not particularly high but contains one of the highest numbers of lagoonal specialists in the country and 3 rare species; therefore worthy of protection.

See Evaluation (Section 7) for further details and ranking of the 36 sites.

Table 4.6.1 Aquatic fauna recorded at stations in the Loch Fhada complex, Connemara, Co. Galway. 1998.

Taxa	Stations											
	1	L.T. 1	2	L.T. 2	3	L.T. 3a	L.T.3b	4	5	L.T.5a	L.T.5b	
Cnidaria	<i>Aurelia aurita</i>											
	<i>Clava multicornis</i>											
Turbellaria	planarian indet.											
Annelida	<i>Arenicola marina</i>											
	<i>Hediste diversicolor</i>											
Crustacea												
Ostracoda												
Mysidacea	<i>Neomysis integer</i>											
	<i>Praunus flexuosus</i>											
Isopoda	<i>Idotea chelipes</i>											
	<i>Jaera forsmanni</i>											
	<i>J. nordmanni</i>											
	<i>Lekanesphaera hookeri</i>											
Amphipoda												
	<i>Corophium volutator</i>											
	<i>Gammarus duebeni</i>											
	<i>G. zaddachi</i>											
	<i>Melita palmata</i>											
	<i>Microdeutopus gryllotalpa</i>											
Decapoda	<i>Carcinus maenas</i>											
	<i>Crangon crangon</i>											
	<i>Palaemonetes varians</i>											
Insecta												
Odonata	<i>Ischnura elegans</i>											
Trichoptera												
Heteroptera	Corixidae											
	<i>Gerris sp.</i>											
	<i>Sigara stagnalis</i>											
Diptera	Chironomidae indet.											
Mollusca												
Prosobranchia	Hydrobidae											
	<i>Hydrobia ulvae</i>											
	<i>H. ventrosa</i>											
	<i>Littorina "tenebrosa"</i>											
	<i>Potamoperagus antipodarum</i>											
Bivalvia	<i>Rissostomia membranacea</i>											
	<i>Cerastoderma glaucum</i>											
	<i>Mya arenaria</i>											
	<i>Mytilus edulis</i>											
Bryozoa	<i>Conopeum seurati</i>											
Pisces	<i>Anguilla anguilla</i>											
	<i>Gasterosteus aculeatus</i>											
	Mugilidae											
	<i>Pomatoschistus microps</i>											
	<i>Taurulus bubalis</i>											
F = Fyke net, L. T. = light trap; + = present, o = occasional. c = common, a = abundant												

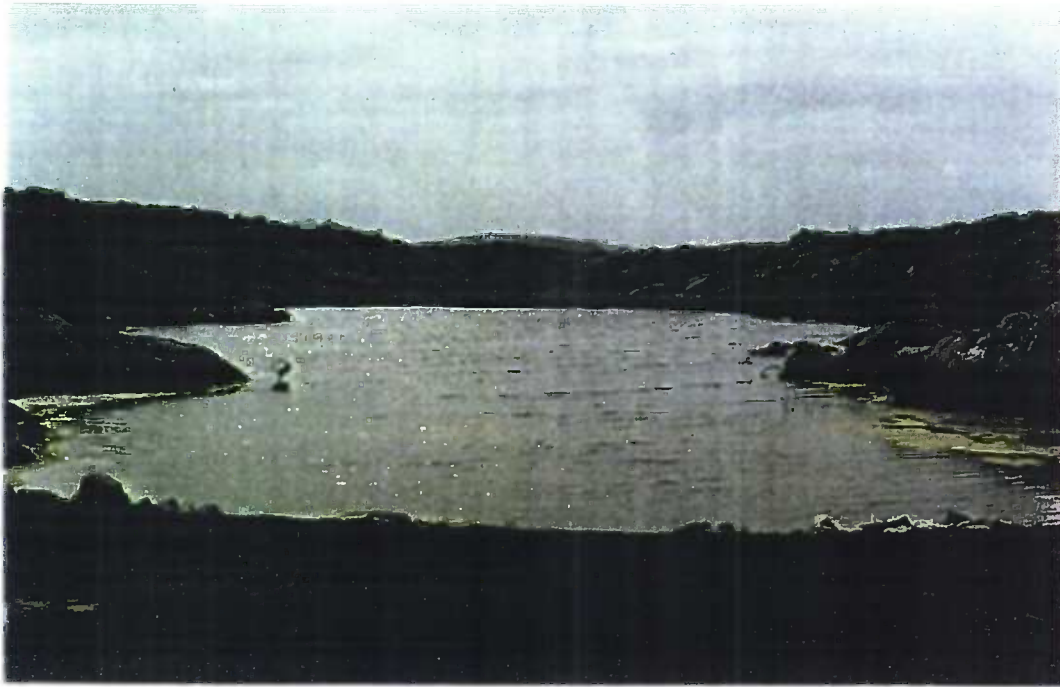


Plate 4.6.1 View from the road looking southwest over Sta. 1  
Loch Fhada complex, Connemara, Co. Galway. 1998.



Plate 4.6.2 View from the road looking northeast over Sta. 2.  
Loch Fhada complex, Connemara, Co. Galway. 1998.



Plate 4.6.3 View looking south towards L. Aughagaddy, Sta. 3  
Loch Fhada complex, Connemara, Co. Galway. 1998.



Plate 4.6.4 View from the north end of L Fhada (Sta. 4).  
Loch Fhada complex, Connemara, Co. Galway. 1998.

## 4.7 Loch an Aibhnín, Connemara, Co. Galway

OS L947315      53° 19.5' N; 09° 34.5' W

### Description

Loch an Aibhnín is a large (55 ha) saline lake lagoon on the south side of Camus Bay, 2 km to the northwest of Bealadangan (Fig 4.7.1). Seawater enters through narrow rapids from Camus Bay on spring tides and the lagoon receives diluted seawater from the L. Fhada complex (see Section 4.6) and from L. Tanaí (Oliver and Healy, 1998) and freshwater from a number of small streams and longterm seepage from surrounding peatland. The lagoon is uniformly shallow (c2m) apart from a deeper area near the outlet (3-4 m) and average salinity was 18 ppt on the surface and 25 ppt at 1m depth. Substrate is mostly peat, granite rocks and coarse sand and gravel with dense beds of *Ruppia* and *Zostera* where substrate allows. The lagoon is bordered by peat bog, granite rocks and bedrock and rough pasture.

### Sources of Information

None?

### Sampling stations

The area was sampled from 26-28/8/98 and 22-23/9/98

Eight sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows (Fig. 4.7.2).

**Station 1a** (L 94354 31890) was located at the north end of the lagoon inside the rapids which flow into Camus Bay (Plate 4.7.1). Substrate consisted of granite rocks and coarse sand with peat deposits in sheltered areas and crevices with dense growths of marine algae. The area was bordered by large granite rocks, moorland and rough grazing. Depth varied from 0 - 1.5 m and salinity measured 18.7ppt at the surface and 24.5ppt at 0.5m.

**Station 1b** (L94472 32077) was also located at the north end of the lagoon, very near Sta. 1a where a smaller inlet to the lagoon to the east of a small island has been partly blocked by a stone causeway. In general the environmental parameters were the same as those for 1a except that there was a larger area of shallow water with a coarse sand substrate.

**Station 2** (L 94849 31982) was located on the northwest shore of the lagoon about 300m from the rapids. Substrate consisted of soft peat with scattered granite stones. Depth varied from 0 - 1m. and salinity measured 24.5 ppt.. The area was bordered by moorland with peat cliffs and granite boulders.

**Station 3** (L 95044 31685) was located on the east shore of the lagoon where a small stream enters. Substrate consisted of soft peat with granite rocks and boulders. Depth varied from 0 - 1m and salinity measured 24.5 - 26.2 ppt. The area was bordered by moorland with peat cliffs and granite rocks.

**Station 4** (L 95055 31088) was located at the southeast end of the lagoon below a granite hill. Depth was slightly greater in this area (up to 2m) and salinity measured 24.5 - 26 ppt. Substrate consisted of peat with granite rocks and the area was bordered by moorland, granite rocks and patches of *Juncus*.

**Station 5** (L 94990 30825) was located at the southern end of the lagoon where the channel enters from L. Tanaí to the south. Depth was 0 - 1m and salinity measured 18 ppt on the surface and 25.6 ppt at 1m depth. Substrate consisted mostly of peat near the channel with rocks and coarse sand along the shore of the lagoon and in deeper water away from the channel. The area was bordered by moorland with peat cliffs and granite rocks.

**Station 6** (L 94798 31174) was located on the southwestern shore of the lagoon to the south of a stony headland between the inflow channels from L. Tanaí and L. Fhada. Depth was 0-1m and salinity measured 25.0 ppt. Substrate consisted of peat with rocks, coarse sand and

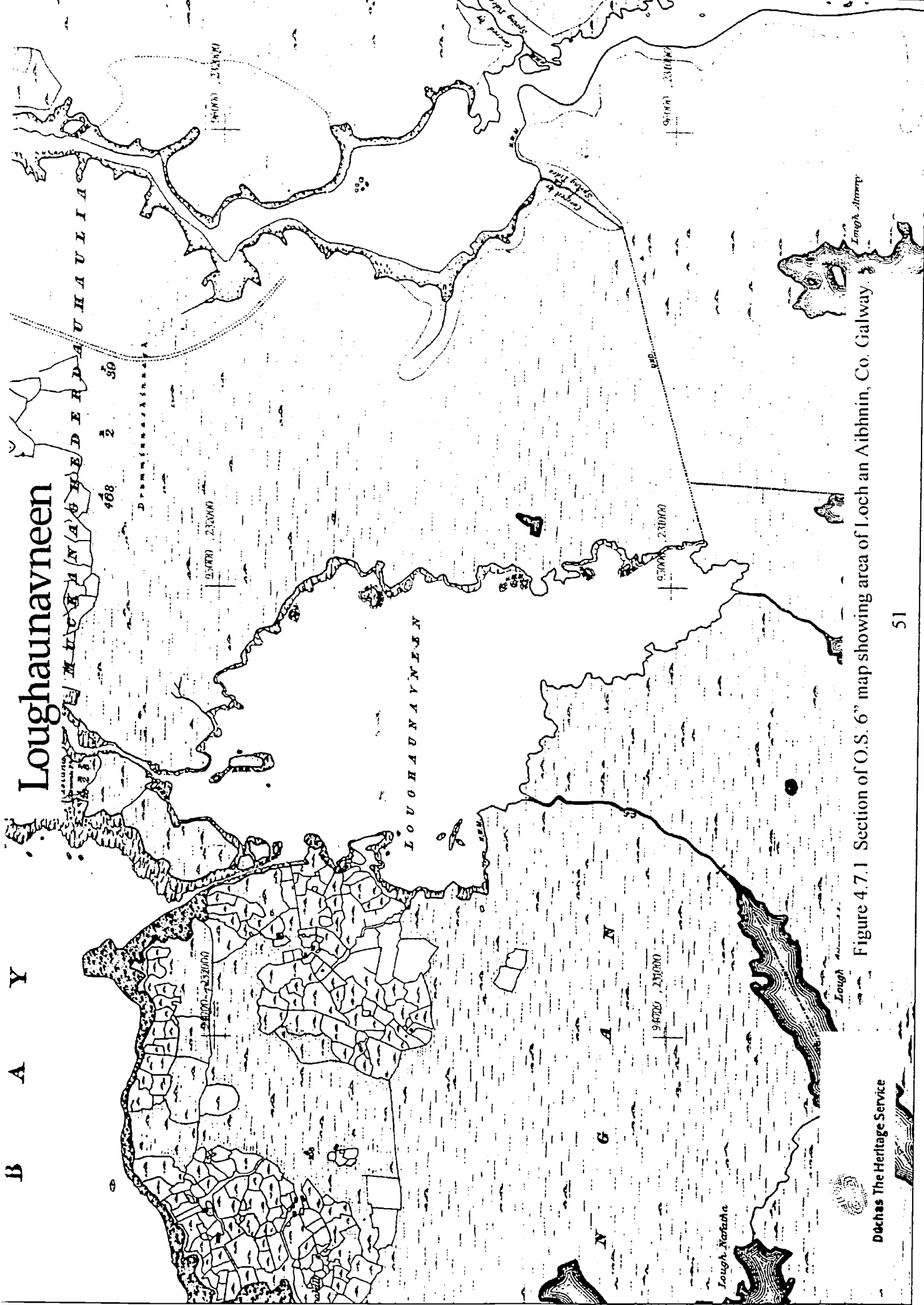


Figure 4.7.1 Section of O.S. 6" map showing area of Loch an Aibhinn, Co. Galway.

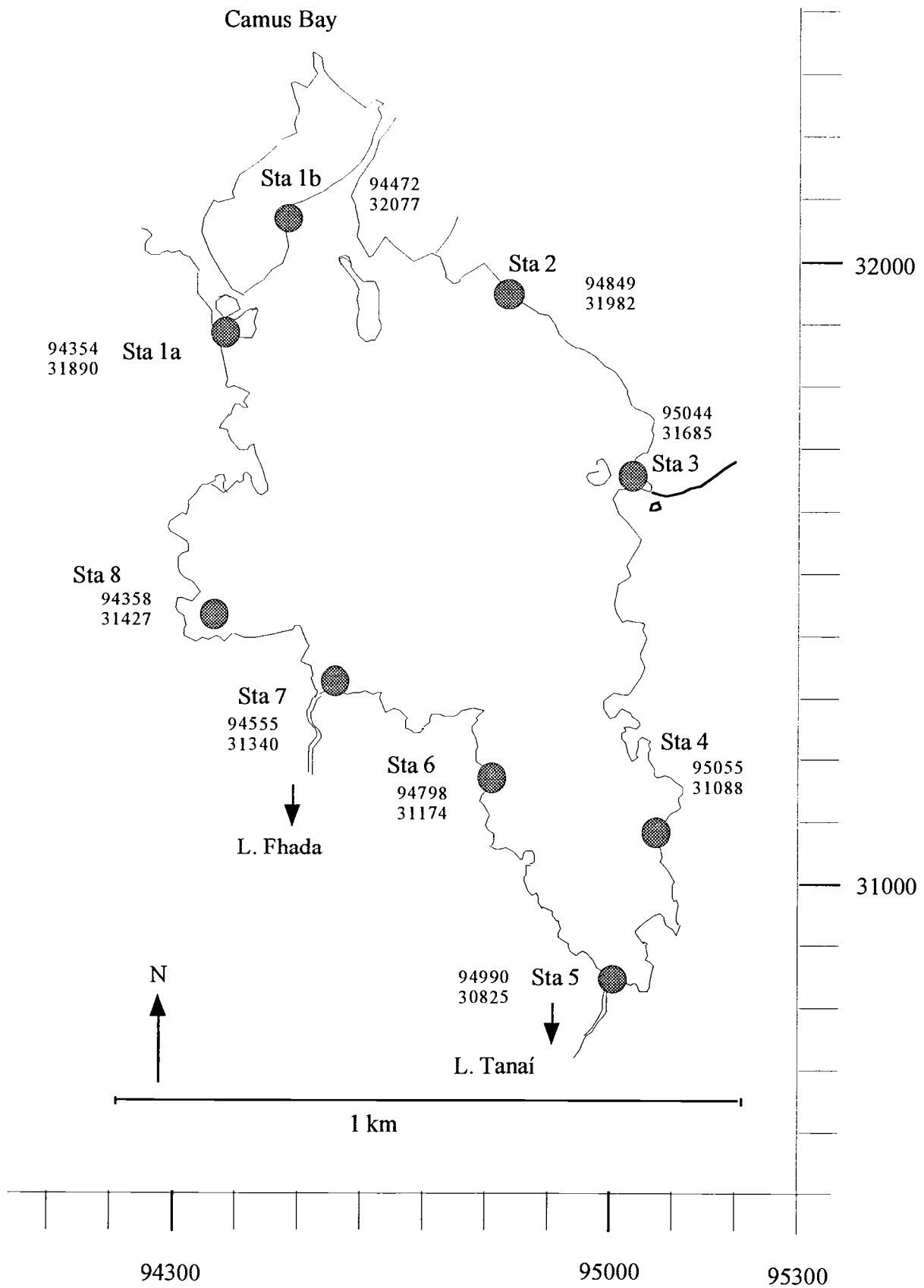


Figure 4.7.2 Sketch map of Loch an Aibhnín, Connemara, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.

finer silty sediments in sheltered areas. Fyke nets were used at this station but otherwise it was sampled only briefly.

**Station 7** (L 94555 31340) was located on the western shore of the lagoon where the channel from L. Fhada enters. Depth was 0 - 1m and salinity measured 20 - 25 ppt. Substrate consisted mostly of peat and peaty silt with occasional rocks.

**Station 8** (L 94358 31427) was located on the western shore of the lagoon in a large bay bordered by peat, saltmarsh and granite rocks. The area was relatively shallow (0-0.5 m) with a substrate of soft unconsolidated peat along the shore giving way to rocks further out into the lagoon. Much of the area was covered with a dense growth of filamentous algae.

## Results

Table 4.7.1 is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes. Table 4.7.2 shows the total species list for each station.

A total of 107 taxa were recorded, of which 9 are regarded as lagoonal specialists in Britain and one additional species is a proposed lagoonal specialist for Ireland. 7 species are interesting or rare:

*Gonothyrea loveni* is listed as a lagoonal specialist in Britain. Recorded at L. an Aibhnin in 1998. There is a record of its occurrence in the Belmullet Canal, Co. Mayo from material collected by P. Hayward in 1971 (B. Picton *pers comm.*) but there appear to be no other records of its occurrence in Ireland.

*Jaera forsmanni* was previously recorded at Drongawn L. in the 1996 survey (Oliver and Healy, 1998) and during this survey at Kilmore L., L Fhada, Kinvarra saltmarsh (section 4.8) and L. Athola. The only other Irish record of the species located is for L. Hyne, Co. Cork, (De Grave and Holmes, 1998).

*Lembos longipes* was also recorded at Kilmore L. and possibly Sally's L. during this survey and at Drongawn L. and Furnace L. during the 1996 survey. There are only 3 previous records for Ireland (Costello *et al.* 1990).

*Cercyon littoralis* was recorded at Bridge L. Mill L. and at Cross L., Mullet peninsula in 1996 and during this survey at this site and Kilmore L. A driftline species with few recent records

*Enochrus bicolor* was recorded at Ballytiege, L. Phort Chorrúch, and L. an Chara during this survey, at 6 sites during the 1996 survey and also from Port na Curra, Inishmaan in 1998 and in samples collected at the North Slob in 1991. There are only 2 recent records from N. Ireland (Nelson *et al.*, 1998).

*Littorina "tenebrosa"* was also recorded during this survey at L Fhada and L. an tSaile and during the 1996 survey in Lettermullen Pool, L. Tanaí, L. Murree and from the North Slob. These are the only known sites in Ireland. The status of this taxon is still under dispute but appears to be morphologically and ecologically distinct and is listed as a lagoonal specialist for Britain.

*Conopeum seurati* has been recorded at 16 of the 36 sites surveyed, but is not listed in any review of Irish marine Bryozoa (Wyse Jackson, 1991). Either the species is under recorded or a truly lagoonal specialist.

## Evaluation

Loch an Aibhnín is an extremely good example of a saline lake lagoon with a very rich fauna in the marine to euryhaline range, comprising a high number of lagoonal specialists and rare species. This site is extremely valuable and should be protected.

See Evaluation (Section 7) for further details and ranking of the 36 sites.



Table 4.7.1 List of taxa arranged in broad ecological categories based on salinity regimes (L\* = lagoonal specialist in Britain; L\*IR = proposed lagoonal specialist for Ireland; \* = interesting or rare species).

Marine			
	<i>Axinellidae</i> indet.	<i>Platynereis dumerili</i>	
	<i>Leucosolenia botryoides</i>	<i>Praunus flexuosus</i>	
	<i>L. complicata</i>	* <i>Jaera forsmani</i>	
	<i>Sycon ciliatum</i>	<i>Melita palmata</i>	
	<i>Anthopleura ballii</i>	<i>Crangon crangon</i>	
	<i>Aurelia aurita</i>	<i>Palaemon elegans</i>	
	<i>Lineus</i> spp.	<i>P. serratus</i>	
	<i>Circeis spirillum</i>	<i>Lepidochitona cinereus</i>	
	<i>Eumidia sanguinea</i>	<i>Gibbula cinereus</i>	
	<i>Eupolyornia nebulosa</i>	<i>Hydrobia ulvae</i>	
	<i>Flabelligera affinis</i>	<i>Littorina littorea</i>	
	<i>Harmothoe imbricata</i>	<i>L. saxatilis</i>	
	<i>Orbinia</i> sp.	<i>Patella vulgata</i>	
	<i>Polyopthalmus pictus</i>	<i>Rissostomia membranacea</i>	
	<i>Scoloplos armiger</i>	<i>Skeneopsis planorbis</i>	
	Spirorbidae sp 2	<i>Mya arenaria</i>	
	<i>Tanais dulongi</i>	<i>Mytilus edulis</i>	
	<i>Praunus ?inermis</i>	<i>Ostrea edulis</i>	
	<i>Limnoria lignorum</i>	<i>Bowerbankia gracilis</i>	
	<i>Ampithoe ramondi</i>	<i>Amphipholis squamata</i>	
	<i>Caprella acanthifera</i>	<i>Asciidiella aspersa</i>	
	<i>Dexamine spinosa</i>	<i>A. scabra</i>	
	* <i>Lembos longipes</i>	<i>Ciona intestinalis</i>	
	<i>Melita obtusata</i>	<i>Clavelina lepadiformis</i>	
	<i>Cancer pagurus</i>	<i>Crenilabrus melops</i>	
	<i>Liocarcinus depurator</i>	<i>Gobius niger</i>	
	<i>Gibbula umbilicalis</i>	Poly-mesohaline	
	<i>Littorina obtusata</i>	* <i>Gonothyraea loveni</i>	L*
	<i>Pusillina sarsi</i>	* <i>Enochrus bicolor</i>	L*
	<i>Akera bullata</i>	* <i>Littorina "tenebrosa"</i>	L*
	<i>Cadlina laevis</i>	<i>Onoba aculeus</i>	L*
	<i>Diodora graeca</i>	<i>Cerastoderma glaucum</i>	L*
	<i>Runcina coronata</i>	Mugilidae	
	<i>Scaphander lignarius</i>	<i>Pomatoschistus microps</i>	
	<i>Anomia ephippium</i>	Euryhaline	
	<i>Cerastoderma edule</i>	? <i>Procerodes littoralis</i>	
	<i>Chlamys varia</i>	<i>Neomysis integer</i>	L*IR
	<i>Hiatella arctica</i>	<i>Idotea chelipes</i>	L*
	<i>Modiolarca tumida</i>	<i>Lekanesphaera hooker</i>	L*
	<i>Modiolus modiolus</i>	<i>Gammarus duebeni</i>	
	<i>Monia patelliformis</i>	<i>Carcinus maenas</i>	
	<i>Musculus discors</i>	<i>Palaemonetes varians</i>	L*
	<i>Mysella bidentata</i>	* <i>Conopeum seurati</i>	L*
	<i>Paphia aurea</i>	<i>Anguilla anguilla</i>	
	<i>Amathia lendigera</i>	<i>Gasterosteus aculeatus</i>	
	<i>Callopora lineata</i>	<i>Pleuronectes flesus</i>	
	<i>Phaeostachys lineata</i>	Meso-oligohaline	
	<i>Polycarpa pomaria</i>	<i>Ochthebius dilatatus</i>	
	<i>Leptosynapta inhaerens</i>	<i>O. viridis</i>	
	<i>Botryllus schlosseri</i>	Strandline	
	<i>Botrylloides leachi</i>	* <i>Cercyon littoralis</i>	
Marine-polyhaline			
	<i>Halichondria panicea</i>		
	<i>Actinia equina</i>		
	<i>Anemonia viridis</i>		

Table 4.7.2 Aquatic fauna recorded at stations in Loch an Aibhín, Co. Galway, 1998.

Taxa	Stations																	
	1	L.T. 1	1B	2	L.T. 2	3	L.T. 3	4	L.T. 4	5	L.T. 5	6	L.T. 6	7	L.T. 7	8	L.T. 8	
Porfera																		
<i>Axinellidae</i> indet.	+																	
<i>Halichondria panicea</i>	+		+			+		+				+						
<i>Leucosolenia botryoides</i>	+											+						
<i>L. complicata</i>	+																	
<i>Suberites</i> sp.						+												
<i>Sycon ciliatum</i>	+									+		+						
Cnidaria	1																	
<i>Actinia equina</i>																		
<i>Anemonia viridis</i>	+					+												
<i>Aurelia aurita</i>	+																	
<i>Anthopleura ballii</i>	+					+		+				+						
<i>Gonothyrea loveni</i>	+					+		+						+				
Turbellaria	+																	
indet.																		
Nemertea	+					+						+						
<i>Lineus</i> sp.						+						+						+
Nem. sp. 1									+									
Nem. sp. 2									+									
Annelida																		
Polychaeta																		
<i>Circeis spirillum</i>	+																	
<i>Eumidea sanguinea</i>	+																	
<i>Eupolyornia nebulosa</i>	+																	
<i>Flabelligera affinis</i>	c									c								
<i>Harmothoe imbricata</i>	c									+								
Orbinidae indet.																		
<i>Platynereis dumerili</i>	+					1												
<i>Polyphthalamus pictus</i>	+	8																
<i>Scoloplos armiger</i>																		+
Spirorbidae indet.	+									+								
Tubificidae indet.																		
			1															

L. T. = light trap, + = present, o = occasional, c = common, a = abundant.

Table 4.7.2 cont. Aquatic fauna recorded at stations in Loch an Aibhinn, Co. Galway. 1998.

Taxa	1	L.T.1	1b	2	L.T.2	3	L.T.3	4	L.T.4	5	L.T.5	6	L.T.6	7	L.T.7	8	L.T.8
Sipuncula																	
Crustacea																	
Tanaidacea	+			+		a	a	a		+		+					
Mysidacea						o											
	c	10				a	35	c	23	a	59	a	89	a		a	400
									4						?		
Isopoda				+		+		o	3	o	5					a	9
	+		+	+		+		+									
										o				o	1	+	
									1								
Amphipoda	a		1			2				1				1			
	c	3	c	c	c	c	2	a	1	2		1		5			
	4																
	2																
			1	3										3			
			4											1			
	2					3		2									
Decapoda	1																
	F=6			F=9						F=7		F=3				+	
	o		o														
	1																
	o		o													+	
	o		o			+											
						+				o							
Insecta	+			+		+		+				+					
F = Fyke net; L. T. = light trap. + = present, o = occasional, c = common, a = abundant.																	

Table 4.7.2 cont. Aquatic fauna recorded at stations in Loch an Aibhnín, Co. Galway. 1998.

Taxa	1	L.T.1	1B	2	L.T.2	3	L.T.3	4	L.T.4	5	L.T.5	6	L.T.6	7	L.T.7	8	L.T.8
Coleoptera																	
<i>Cercyon littoralis</i>	6																
<i>Enochrus bicolor</i>	2																
<i>Ochthebius dilatatus</i>																1	
<i>O. viridis</i>																1	
Mollusca																	
Polyplacophora																	
<i>Lepidochitona cinereus</i>	+									+							
Prosobranchia																	
<i>Diodora graeca</i>	+									+							
<i>Gibbula cinerea</i>																	
<i>Gibbula umbilicalis</i>	+																
<i>Hydrobia ulvae</i>	0																
<i>Littorina littorea</i>																	
<i>L. obtusata</i>	+																
<i>L. saxatilis</i>	+									+							+
<i>L. "tenebrosa"</i>										+							
<i>Onoba aculeus</i>										0							0
<i>Patella vulgata</i>	+																
<i>Pusillina sarsi</i>	+																
<i>Rissostomia membranacea</i>	+																
<i>Skeneopsis planorbis</i>	+																
<i>Opisthobranchii Akera bullata</i>	+																
<i>Akera bullata</i>	+									+							0
<i>Cadlina laevis</i>	+																
<i>Runcina coronata</i>	+									+							+
<i>Scaphander lignarius</i>	+																
Bivalvia																	
<i>Anomia ephippium</i>	+																
<i>Cerastoderma glaucum</i>	+									+							+
<i>C. edule</i>																	
<i>Chlamys varia</i>	+																
<i>Hiattella arctica</i>	+																
indet.																	
										5							2

L.T. = light trap. + = present, 0 = occasional, c = common, a = abundant.

Table 4.7.2 cont. Aquatic fauna recorded at stations in Loch an Aibhinn, Co. Galway, 1998.

Taxa	Stations																
	1	L.T.1	1B	2	L.T.2	3	L.T.3	4	L.T.4	5	L.T.5	6	L.T.6	7	L.T.7	8	L.T.8
<i>Modiolarca tumida</i>	+																
<i>Modiolus modiolus</i>	1																
<i>Monia patelliformis</i>	+																
<i>Musculus discors</i>	c	c	c	c	c	c	c	c	c	c	c	c	c	c	c	a	
<i>Mya arenaria</i>																	
<i>Mysella bidentata</i>	+		+														
<i>Mytilus edulis</i>	+																
<i>Ostrea edulis</i>	+																
<i>Paphia aurea</i>			+														
<i>Amathia lendigera</i>	+		+														
<i>Bowerbankia gracilis</i>				+								+		+			
<i>Callopora lineata</i>	+		+	+				+			+	+		+		+	
<i>Conopeum seurati</i>	+																
<i>Phaeostachys spinifera</i>	+																
<i>Amphipholis squamata</i>	+					+						+		+			
<i>Leptosynapta inhaerens</i>				+		+								a			
<i>Asciella aspersa</i>	+										+			+			
<i>A. scabra</i>				+										+			
<i>Botryllus schlosseri</i>	+		+											+			
<i>Botrylloides leachi</i>	+																
<i>Ciona intestinalis</i>	+			+		+						+				+	
<i>Clavelina lepadiformis</i>	+			+		+						+					
? <i>Polycarpa pomaria</i>	+																
<i>Anguilla anguilla</i>	F=3			F=15							F=9						
<i>Cremilabrus melops</i>	F=2																
<i>Gasterosteus aculeatus</i>																	
<i>Gobius niger</i>	F=1																
Mugilidae																	
<i>Pleuronectes flesus</i>				F=1													
<i>Pomatoschistus microps</i>				+													

F = Fyke net; L. T. = light trap. + = present, o = occasional, c = common, a = abundant.



Plate 4.7.1 View looking south along the rapids to Sta. 1  
Loch an Aibhnín, Connemara, Co. Galway. 1998.



Plate 4.7.2 View looking north along the rapids to Camus Bay.  
Loch an Aibhnín, Connemara, Co. Galway. 1998.



Plate 4.7.3 View looking west across the lagoon towards Sta. 1b.  
Loch an Aibhnín, Connemara, Co. Galway. 1998.



Plate 4.7.4 View looking west across the lagoon from Sta. 3  
Loch an Aibhnín, Connemara, Co. Galway. 1998.

## 4.8 Loch Cara Fionnla, Connemara, Co. Galway

OS L963290      53° 18.0' N; 09° 33.0' W

### Description

Loch Cara Fionnla is a natural saline lake lagoon which drains into the south side of Camus Bay, through a long channel which runs through Kinvarra saltmarsh (Fig 4.8.1). The lagoon covers an area of 13.5 ha and lies beside the main road 11 km north of Costelloe. It is shallow (1-2m), and at the time of sampling, relatively fresh with a maximum salinity of 1.1 ppt at 2m depth in August and 1.9ppt in September and most of the surface water measuring 0-0.5 ppt although 3.5 was measured on 24/9/98. However, there are obviously extreme variations in salinity as 24 ppt was measured near the inflow in May 1997. Substrate is mostly granite rocks, coarse sand and gravel with peaty silts in sheltered areas. The lake is bordered by moorland, peat bog and granite rocks.

Cara na gCaorach lies to the north of Cara Fionnla surrounded by Kinvarra saltmarsh and is included with this site as it forms a gradation of the lagoonal habitat between the lagoon and the open sea of Camus Bay.

### Sources of Information

None ?

### Sampling stations

The area was sampled in 1996, briefly in June 98 and from 7-10/8/98 and on 9/9/98. Five sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows (Fig. 4.8.2).

**Station 1** (L 96137 29325) was located at the northwest end of the lagoon. Substrate consisted of granite rocks and stones, coarse gravel with peaty silt in sheltered areas. Water depth was 0-1m, the water was coloured peaty-brown and salinity measured 0.4 ppt at the surface and 1.4ppt at 1m depth. The area is bordered by low peat cliffs, saltmarsh, *Phragmites*, peat bog, moorland and granite rock.

**Station 2** (L 96384 29231) was located on the northeast shore of the loch, beside the main road and close to the inflow from Kinvarra saltmarsh (Plate 4.8.1). Substrate consisted of gravel, and sand with stones and rocks. Depth varied from 0 - 1.m and salinity measured 0.5 ppt in August but 3.5ppt was recorded on 24/9/98 and 24 ppt in May 1997. Patches of *Phragmites* bordered the loch in this area but it was mostly bordered by moorland and granite in the narrow strip between the road and the loch.

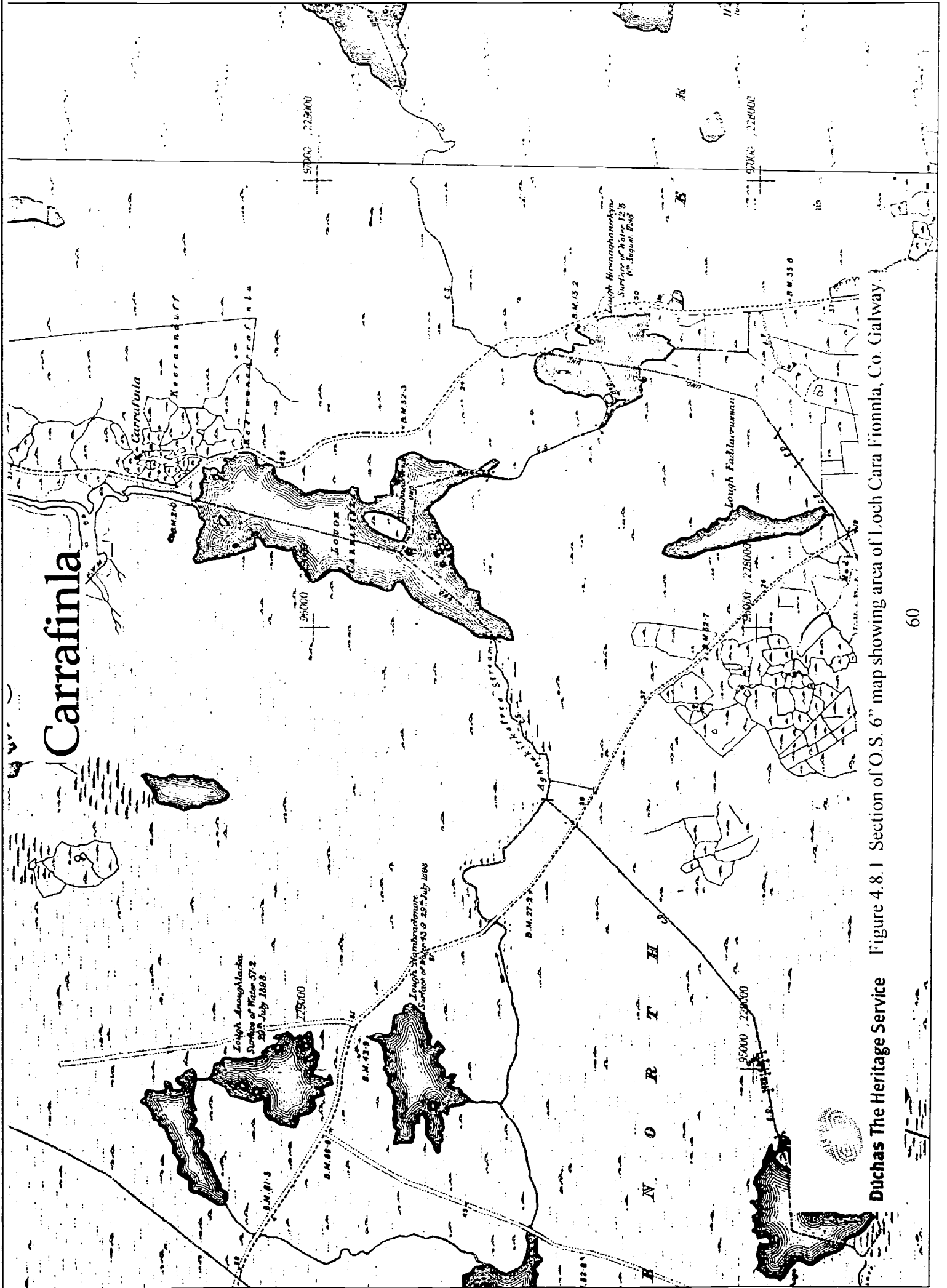
**Station 3** (L96153 29004) was located on the west shore of the loch. Depth varied from 0 - 1.3m and salinity measured 0.5ppt at the surface and 0.8ppt at 1.3 m. The area was bordered by moorland with peat cliffs and granite rocks.

**Station 4** (L 95995 28641) was located at the southwest end of the lagoon where a stream enters. Depth was 0 - 1.5m and salinity measured 0.6 - 1.3 ppt. Substrate consisted of soft peat with granite stones and the area was bordered by moorland, granite rocks and patches of *Juncus* and *Phragmites* (Plate 4.8.2).

**Station 5** (L 96363 28669) was located at the southeastern end of the loch where another stream enters. Depth was 0 -1.5m and salinity measured 0-0.6 ppt during the sampling period but 6 ppt in May 1997. The area was very similar to Sta. 4 but it appears that a greater volume of fresh water entered through this stream, salinity is lower and the *Phragmites* more extensive (Plates 4.8.2, 3).



# Carrafinla



Dúchas The Heritage Service Figure 4.8.1 Section of O.S. 6" map showing area of Loch Carrafinla, Co. Galway.

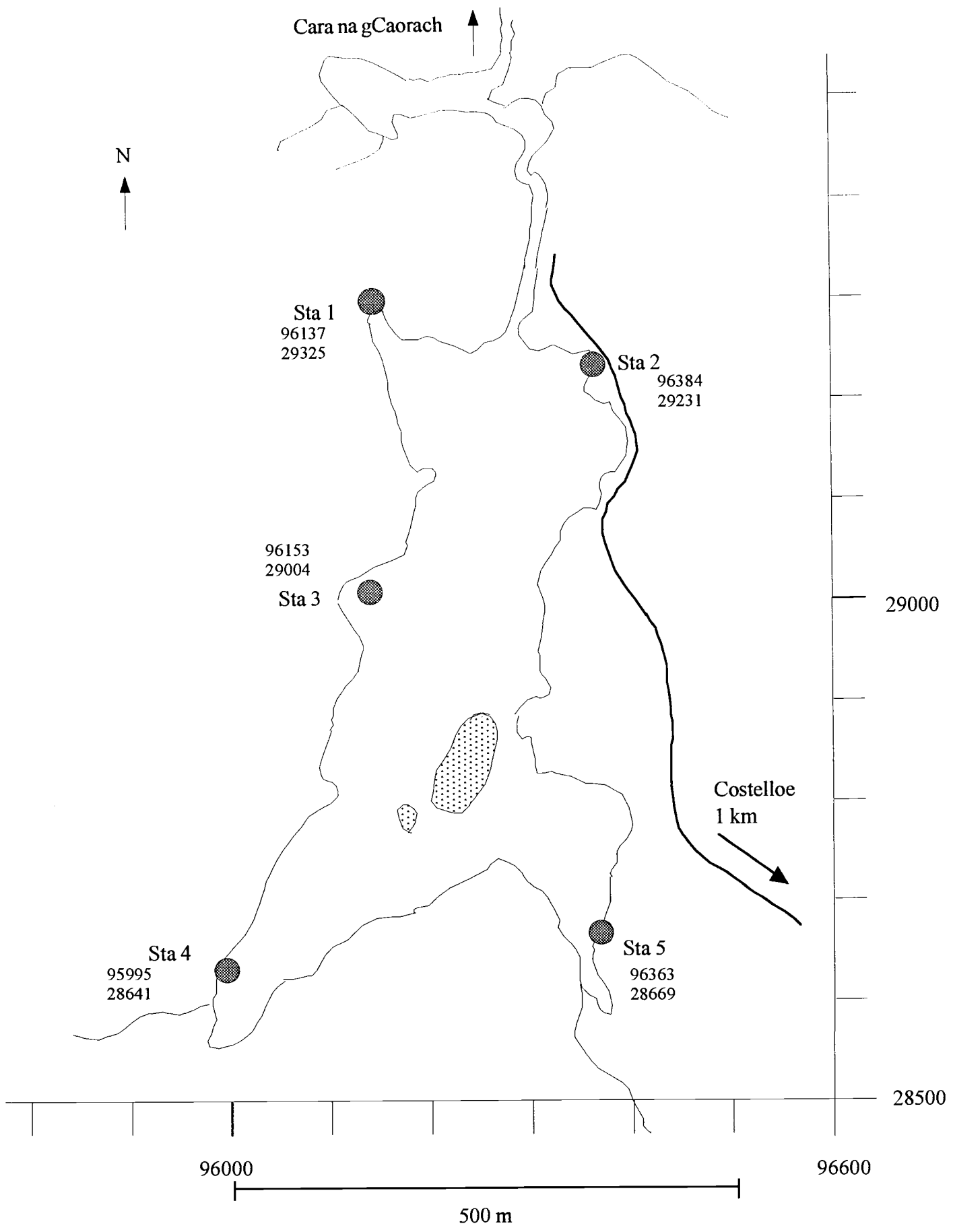


Figure 4.8.2. Sketch map of Loch Cara Fionnla, Connemara, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.

## Results

Table 4.8.1 shows the total species list for each station. The following is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes (L\* = lagoonal specialist in Britain, L\*IR = proposed as lagoonal specialist in Ireland; \* = interesting or rare species).

Marine-polyhaline	<i>Praunus flexuosus</i>	
Poly-mesohaline	<i>Chaetogammarus marinus</i>	
	<i>Corophium volutator</i>	
	<i>Pomatoschistus microps</i>	
Euryhaline	<i>Neomysis integer</i>	L* IR?
	<i>Jaera nordmanni</i>	L* IR?
	<i>Lekanesphaera hookeri</i>	L*
	<i>Gammarus duebeni</i>	
	<i>G. zaddachi</i>	
	<i>Palaemonetes varians</i>	L*
	<i>Potamopyrgus antipodarum</i>	
	* <i>Conopeum seurati</i>	L*
	<i>Anguilla anguilla</i>	
	<i>Gasterosteus aculeatus</i>	
	<i>Pleuronectes flesus</i>	
	<i>Salmo trutta</i>	
Meso-oligohaline	<i>Ischnura elegans</i>	
	<i>Hydrometra stagnorum</i>	
Oligohaline-freshwater	<i>Sympetra</i> sp.	
	<i>Corixa ?panzeri</i>	
	<i>Gerris lacustris</i>	
	<i>G. odontogaster</i>	
Uncertain	Trichoptera	

A total of 26 taxa were recorded, of which 20 were identified to species and 3 are regarded as lagoonal specialists in Britain and an additional 2 species are proposed lagoonal specialists in Ireland. Only one species is possibly interesting or rare:

*Conopeum seurati* has been recorded at 16 of the 36 sites surveyed, but is not listed in any review of Irish marine Bryozoa (Wyse Jackson, 1991). Either the species is under recorded or a truly lagoonal specialist.

The corixids were all large females and assumed to be *Corixa panzeri*.

A single specimen of *Sigara selecta* was found in a light-trap, but was assumed to be a contaminant from the previous site, L. an Chara. However, it is possible that this rare species does occur at this site.

### Evaluation

Loch Cara Fionnla is a saline lake lagoon in good natural condition. Relatively few species were recorded but several of these are lagoonal specialists. It is not a site of particularly high importance but a good example of its type in an area of scenic value.

See Evaluation (Section 7) for more details and ranking of the 36 sites.

Table 4.8.1 Aquatic fauna recorded at stations in Loch Cara Fionnla, Co. Galway. 1998.

Taxa		Stations										
		1	L.T. 1	2	L.T. 2	3	L.T. 3	4	L.T. 4	5	L.T. 5	
Crustacea	Mysidacea <i>Neomysis integer</i>	c	46	o	16	c	35	c	29	o	8	
	<i>Praunus flexuosus</i>	1										
Isopoda	<i>Jaera nordmanni</i>			+								
	<i>Lekanesphaera hookeri</i>	+	10	+	22	o	6					
Amphipoda		o	2	+	18	o	7			2	1	
	<i>Chaetogammarus marinus</i>			1								
	<i>Corophium volutator</i>			o	1							
	<i>Gammarus duebeni</i>	o	2		8		3				1	
	<i>G. zaddachi</i>			1								
Decapoda	<i>Palaemonetes varians</i>	o		+	2	o			1			
Insecta	Odonata Anisoptera indet.							1				
	<i>Ischnura elegans</i>			o						o		
	Trichoptera	+										
	Heteroptera	Corixidae indet.										
		<i>Corixa ?panzeri</i>	o	4							o	1
		<i>Gerris lacustris</i>			2		+					
		<i>G. odontogaster</i>					+				3	
		<i>Hydrometra stagnorum</i>	4						+			
	Coleoptera	larvae	1	1	o	1	o	3	2		0	
	Diptera	Culicidae indet.	+				+			4		
		Chironomidae indet.	+				+		+			
	Mollusca	<i>Potamopyrgus antipodarum</i>	a	120	c	85	a	150	o	3	c	95
Bryozoa	<i>Conopeum seurati</i>			+								
Pisces	<i>Anguilla anguilla</i>	F=6				F=5	1			F=4		
	<i>Gasterosteus aculeatus</i>	o		o	1			+				
	<i>Pleuronectes flesus</i>	F=2				F=1		F=1		F=4		
	<i>Pomatoschistus microps</i>	o	1					1				
	<i>Salmo trutta</i>	F=1										
F = Fyke net; L.T. = light trap; + = present, o = occasional. c = common, a = abundant												

## Cara na gCaorach

Cara na gCaorach lies between L. Cara Fionnla and Camus Bay and is included as it forms a continuum of lagoonal habitats between the two areas. Table 4.8.2 shows the total species list for three stations. The following is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes (L\* = lagoonal specialist in Britain, L\*IR = proposed as lagoonal specialist in Ireland; \* = interesting or rare species).

### Marine/polyhaline

*Arenicola Marina*  
 \**Jaera forsmanni*  
*Corophium volutator*  
*Praunus flexuosus*  
*Hyale* sp.  
*Hydrobia ulvae*  
*Crangon crangon*  
*Ascidia* sp.  
*Pomatoschistus microps*

### Euryhaline

<i>Hediste diversicolor</i>	
<i>Neomysis integer</i>	L*IR
<i>Idotea chelipes</i>	L*
<i>J. nordmanni</i>	L*IR
<i>Lekanesphaera hookeri</i>	L*
<i>Gammarus duebeni</i>	
<i>G. zaddachi</i>	
<i>Carcinus maenas</i>	
<i>Palaemonetes varians</i>	L*
<i>Potamopergeus antipodarum</i>	
* <i>Conopeum seurati</i>	L*
<i>Anguilla anguilla</i>	
<i>Pleuronectes flesus</i>	

### Meso/oligohaline

*Hydrometra stagnorum*

### Uncertain

<i>Notonecta</i> sp.	?
Chironomidae	
Culicidae	
<i>Anacaena lutescens</i>	
<i>Stictonectes lepidus</i>	

A total of 30 taxa were recorded, of which 4 are regarded as lagoonal specialists in Britain and an additional 2 species are proposed lagoonal specialists in Ireland. The fauna differs from Cara Fionnla in the slightly higher number of euryhaline and poly/mesohaline taxa, an additional lagoonal specialist and one rare marine/polyhaline species. It is quite possible that these additional species also occur in Cara Fionnla, at least periodically.

*Conopeum seurati* has been recorded at 16 of the 36 sites surveyed, but is not listed in any review of Irish marine Bryozoa (Wyse Jackson, 1991). Either the species is under recorded or a truly lagoonal specialist.

*Jaera forsmanni* was previously recorded at Drongawn L. in the 1996 survey (Oliver and Healy, 1998) and during this survey at Kilmore L., L. Fhada, L. an Aibhnin and L. Athola. The only other Irish record of the species located is for L. Hyne, Co. Cork, (De Grave and Holmes, 1998).

The notonectid was not positively identified but may well be *N. viridis* in view of the brackish nature of the site.

## **Evaluation**

Relatively few species were recorded but several of these are lagoonal specialists. It is not a site of particularly high importance but a good example of its type in an area of scenic value, with at least one rare species. In itself it is not of very high importance as a lagoonal habitat but should be regarded as an important gradation of a lagoonal habitat from Cara Fionnla to the open sea of Camus Bay.

See Evaluation (Section 7) for further details and ranking of the 36 sites.

Table 4.8.2 Aquatic fauna recorded at stations in Cara na gCaorach, Co. Galway. 1998.

Taxa		1	L.T.1	Stations		L.T.3
				2	3	
Polychaeta	<i>Arenicola marina</i>				+	
	<i>Hediste diversicolor</i>				+	
Crustacea						
Tanaidacea	<i>Tanais dulongi</i>			+		
Mysidacea	<i>Neomysis integer</i>					13
	<i>Praunus flexuosus</i>			+	+	8
Isopoda	<i>Idotea chelipes</i>	a				2
	<i>Jaera nordmanni</i>			o		
	<i>Jaera forsmanni</i>				a	
	<i>Lekanesphaera hookeri</i>	c		+		
Amphipoda					+	23
	<i>Corophium volutator</i>	7			a	13
	<i>Gammarus duebeni</i>		10			30
	<i>G. zaddachi</i>			20		
	<i>Hyale sp.</i>	1				
Decapoda	<i>Carcinus maenas</i>	F=1			+	
	<i>Crangon crangon</i>					2
	<i>Palaemonetes varians</i>	o		+	c	
Mollusca	<i>Hydrobia ulvae</i>				+	
	<i>Littorina saxatilis</i>				+	
	<i>Potamopyrgus antipodarum</i>	+		+	+	
Insecta						
Heteroptera	<i>Hydrometra stagnorum</i>	o				
	<i>Notonecta sp.</i>	1				
Coleoptera	<i>Stictonectes lepidus</i>	1				
	<i>Anacaena lutescens</i>	2				
Diptera	Chironomidae indet.	+			+	
	Culicidae indet.	+				
Bryozoa	<i>Conopeum seurati</i>			+		
Tunicata	<i>Ascidia sp.</i>				+	
Pisces	<i>Anguilla anguilla</i>	F=6,12				
	<i>Pleuronectes flesus</i>	F=3,12				
	<i>Pomatoschistus microps</i>			+	o	

F = Fyke net; L.T. = light trap; + = present, o = occasional. c = common, a = abundant



Plate 4.8.1 View looking south across the loch from Sta. 2  
Loch Cara Fionnla, Connemara, Co. Galway. 1998.



Plate 4.8.2 Area of inflowing streams at south end of the loch (Sta.4 & 5).  
Loch Cara Fionnla, Connemara, Co. Galway. 1998.



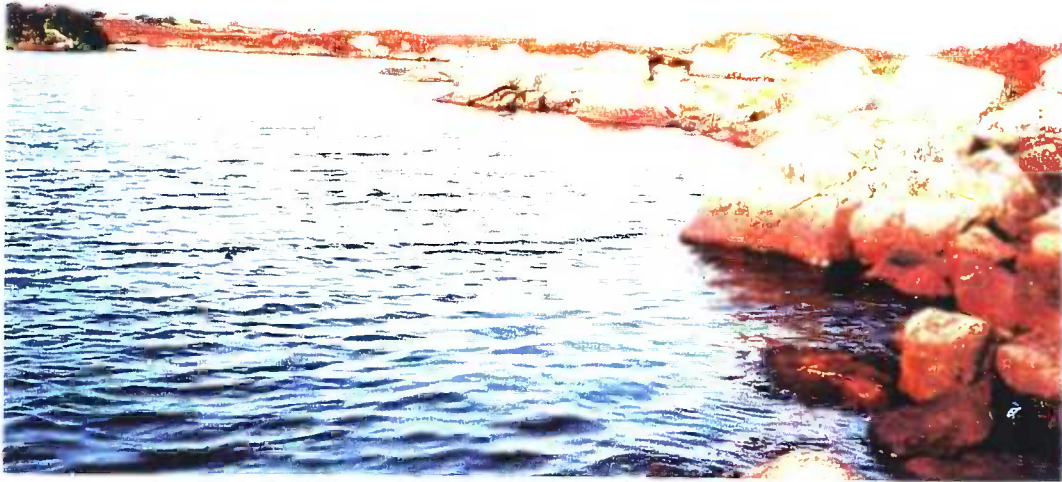


Plate 4.8.3 View looking north along eastern shore from Sta. 5  
Loch Cara Fionnla, Connemara, Co. Galway. 1998.



Plate 4.8.4 View of channel running north into Cara na gCaorach.  
Loch Cara Fionnla, Connemara, Co. Galway. 1998.

#### 4.9 Loch an tSaile, Connemara, Co. Galway

OS L948386      53° 23.2' N; 09° 35.0' W  
L966393      53° 23.6' N; 09° 34.0' W

##### Description

Loch an tSaile is a series of lakes with a natural outlet, somewhat modified by a road bridge and grill (apparently to prevent seals from entering the lakes) which are an important salmonid fishery. The lakes lie at the north end of Camus Bay, to the north of the R340, 1.5 km west of Screeb (Fig 4.9.1). There are in fact three large connecting lakes with several smaller embayments which almost form separate lakes in themselves. There is some confusion about the naming of the three lakes but in general the upper lake is referred to as Ahalia north and the lower two lakes together as Ahalia south. In an attempt to avoid confusion the three are referred to as upper, middle and lower in the report. The northern lake appears to remain fresh at all times and only the lower and middle lakes were included in the survey.

The two lower lakes are regarded as saline lake lagoons and together these cover an area of approximately 90 ha. Seawater enters from the south on all tides but the lakes also receive large volumes of freshwater from a large catchment area. The lower lake is relatively shallow (0-4m) and brackish throughout while the middle lake is deep (13 m) and permanently stratified with water below 3m, measuring 14ppt. Surrounding land is a combination of acid bog, moorland, rough grazing and granite rocks which is reflected in the substrate of the lake being granite rock, coarse sand and gravel and peaty silt in sheltered areas. The lower lake has dense growths of *Ruppia* in places, the middle is mostly deep and oligotrophic with steep banks and very few emergents but for the extreme east.

##### Sources of Information

None ?

##### Sampling stations

The area was sampled briefly in 1996, on 13/6/98, from 10-12/8/98 and 27-29/9/98. Eleven sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows (Fig. 4.9.2).

**Station 1** (L 94370 38563) was located at the west end of the lower lake. Substrate consisted of peaty mud bordered by emergent *Phragmites* and *Scirpus*. Depth was relatively shallow (0-1m), salinity 1.8 ppt at the surface, 3.6 at 1m, with dense growths of *Ruppia*.

**Station 2** (L 94632 38561) was located on the rocky south shore of the lower lake. The bank of the lake consisted of granite bedrock and large boulders which dropped steeply to 4m depth of peaty brown water. Substrate was soft peaty mud with dense growths of *Zostera*, *Ruppia* and *Chaetomorpha*. Salinity measured 1.5 ppt on the surface and 13.9 ppt at 4m. Beyond the granite banks, the area is bordered by moorland.

**Station 3** (L 94929? 38214?) was located in a small bay on the south shore of the lower lake. Substrate consisted mostly of granite bedrock with large boulders and coarse granite sand. Depth varies from 0 - 2m and salinity measured 1.5 - 7.5 ppt. The area was bordered by moorland, granite rocks and boulders.

**Station 4** (L 95165 38320) was located at the inlet to the lake. Depth was relatively shallow (0-2m) and salinity was surprisingly low at the time of sampling; (0ppt in July and September and 3.8 - 4.8 ppt in August) presumably due to the large volume of freshwater flowing through the lakes and diluting the tidal water in Camus Bay. Substrate consisted of bedrock, stones and coarse sand. The area was bordered by moorland and granite.

**Station 5** (L 95280 38438) was located in the bay at the east end of the lower lake. Depth was 0 -1m and salinity measured 3.5 ppt on the surface and 4.6 ppt at 1m depth. Substrate consisted mostly of granite boulders with coarse granite sand with patches of *Ruppia* and the area was bordered by moorland with peat cliffs and granite rocks (Plate 4.9.1).

**Station 6** (L 94924 38875) was located at the far end of the bay to the west of the channel connecting the lower and middle lakes. Depth was shallow (0 -1m) and salinity measured 1.4 -2.8 ppt. Substrate consisted of coarse granite sand and fine silt with some stones covered with *Ruppia* in most areas. The shoreline at the far end consisted of moorland with peat cliffs, granite and patches of *Juncus* and *Scirpus*.

**Station 7** (L 95047 39466) was located at the western end of the middle lake. Depth was 0 - 1m and salinity measured 0.6 -1.6 ppt. Substrate consisted mostly of granite sand and stones overlain with peaty silt. The area was bordered by moorland, granite, small peat islands with peat cliffs and patches of *Phragmites* and *Scirpus* along the shoreline. Patches of *Chara* were recorded in this area and despite the low salinity there were floating pieces of *Fucus* indicating the inflow of tidal water.

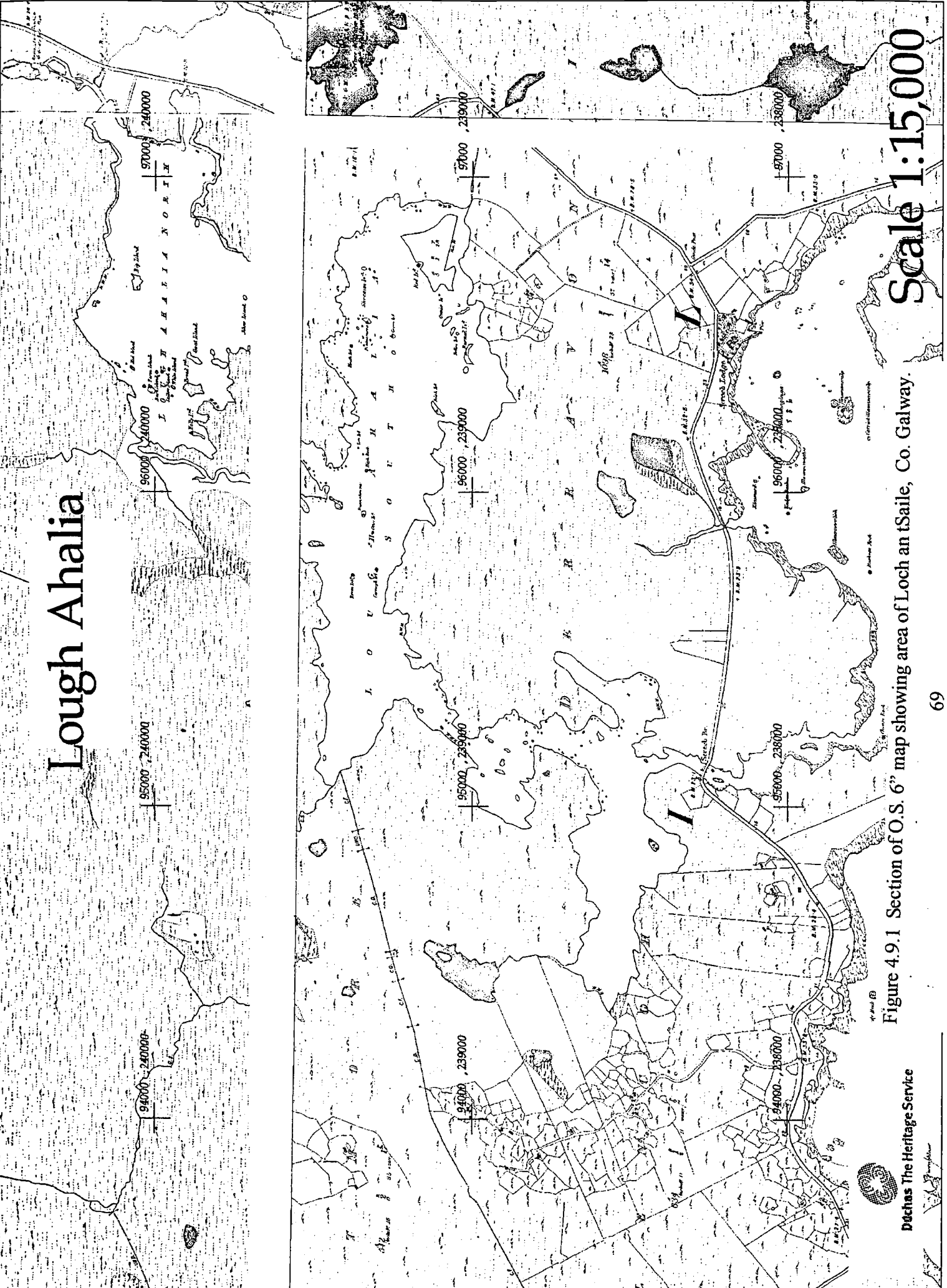
**Station 8** (L 95883 39092) was located in a bay containing a grading pen for smolts on the south shore of the middle lake, bordered by peat, saltmarsh and granite rocks. Depth measured up to 4m, with salinity almost fresh (0.2ppt) at the surface and for the upper 3-4 m and 10.3 ppt at the lowest 4m. Substrate was stones and coarse sand and gravel.

**Station 8b** (L 96022 39681) was located on the north shore of the lake in the channel which connects the middle and upper lakes. Depth measured up to 2m and water flowing from the upper lake was completely fresh (21 mg/l). Substrate was stones and coarse sand and gravel and the area was bordered by moorland with isolated rocks and *Phragmites* along the banks of the channel (Plate 4.9.2).

**Station 9** (L 96217 38955) was located midway along the south shore of the lake in a large bay. Depth measured up to 3-4m within 20m of the shore, salinity measured 0.2ppt at the surface, gradually rising to 1.3 at 4m depth. Substrate was granite stones and boulders with clean coarse sand and gravel. The area was bordered by moorland with isolated granite rocks and boulders.

**Station 10** (L96692 39088) was located on the eastern end of the middle lake near an island of *Phragmites*, *Juncus* and *Molinia*. Depth measured up to 0-1m and salinity measured 0ppt (206-340 mg/l) in August but 1ppt (2.3mS/cm) in September. Substrate was boulders with clean coarse sand and gravel over most of the area, with fine silty peat where small streams enter the lake. The area was bordered by moorland with isolated rocks, some improved pasture and patches of *Phragmites* (Plate 4.9.4).

# Lough Ahalia



Scale 1:15,000

Figure 4.9.1 Section of O.S. 6" map showing area of Loch an tSaile, Co. Galway.

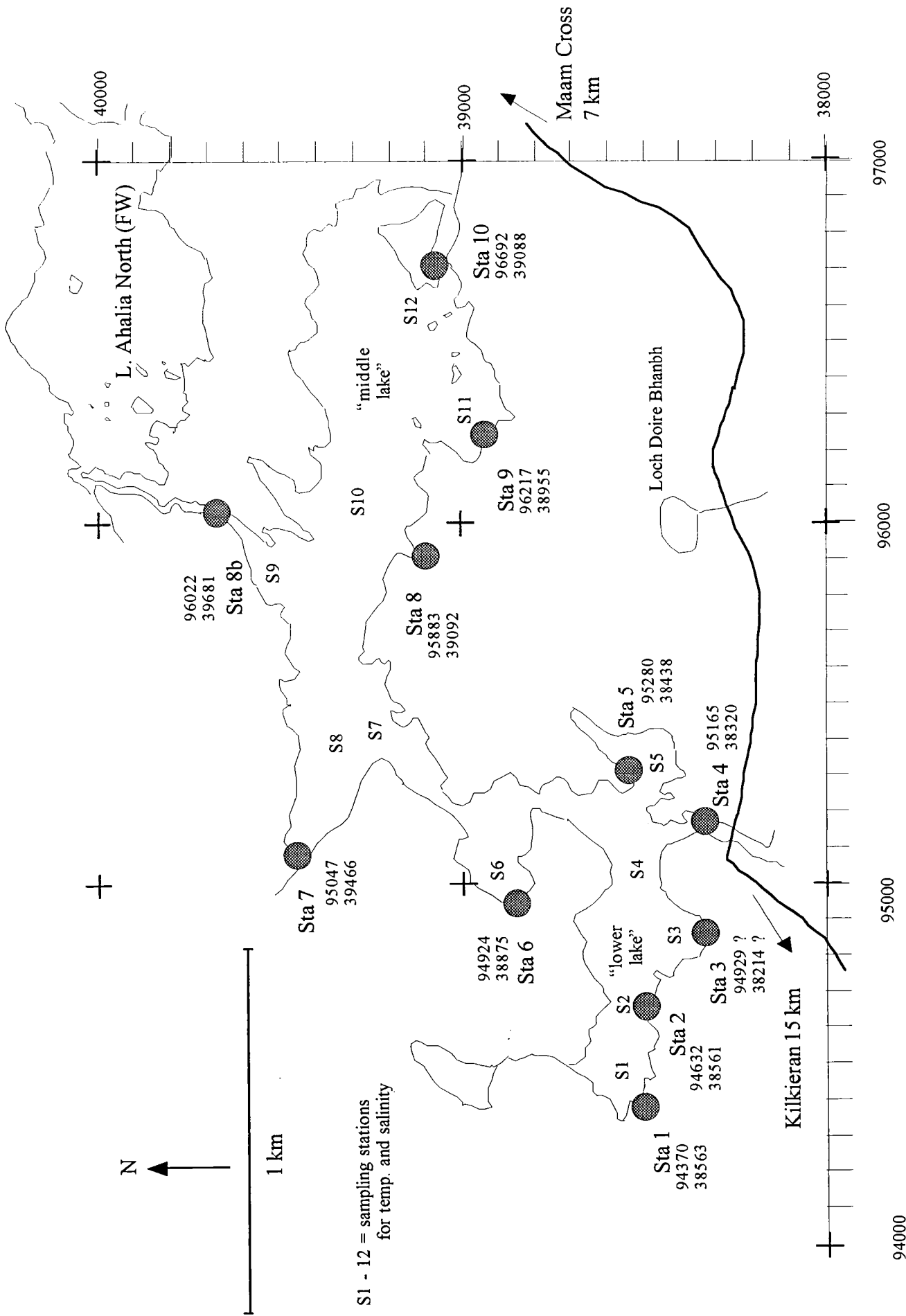


Figure 4.9.2 Sketch map of Loch an tSaille, Connemara, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.

## Results

### Fauna

Table 4.9.1 shows the total species list for each station. The following is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes (L\* = lagoonal specialist in Britain, L\*IR = proposed as lagoonal specialist in Ireland; \* = interesting or rare species. Species in brackets refer to previous records):

Marine	<i>Astropecten irregularis</i>	
Marine-polyhaline	<i>Halichondria panicea</i>	
	<i>Clava multicornis</i>	
	<i>Corophium volutator</i>	
	<i>Hydrobia ulvae</i>	
	<i>Mytilus edulis</i>	
Poly-mesohaline	Mugilidae	
	<i>Pomatoschistus microps</i>	
	* <i>Littorina "tenebrosa"</i>	L*
Euryhaline	? <i>Procerodes littoralis</i>	
	<i>Neomysis integer</i>	L*IR
	<i>Idotea chelipes</i>	L*
	<i>Jaera nordmanni</i>	L*IR ?
	<i>Lekanesphaera hookeri</i>	L*
	<i>Gammarus duebeni</i>	
	<i>G. zaddachi</i>	
	<i>Palaemonetes varians</i>	L*
	<i>Potamopyrgus antipodarum</i>	
	* <i>Conopeum seurati</i>	L*
	<i>Anguilla anguilla</i>	
	<i>Gasterosteus aculeatus</i>	
	<i>Salmo trutta</i>	
Meso-oligohaline	<i>Ischnura elegans</i>	
	<i>Gyrinus caspius</i>	
Oligohaline-freshwater	<i>Gyrinus substriatus</i>	
	<i>Haliphus rufficollis</i>	
Limnetic	Aeschnid indet.	
	<i>Chlorohydra viridis</i>	
	<i>Stylaria lacustris</i>	
	<i>Gerris lacustris</i>	
	<i>Hesperocorixa castanea</i>	
	<i>Sigara dorsalis</i>	
	<i>S. scotti</i>	
	<i>Velia sp.</i>	
Uncertain	<i>G. minutus</i>	
	<i>Nebrioporus depressus</i>	
	<i>Stictotarsus pustulatus</i>	
	*( <i>Megasternum obscurum</i> )	
	<i>Ephemeroptera indet.</i>	

A total of 43 taxa were recorded of which 5 are regarded as lagoonal specialists in Britain, 2 additional species are proposed lagoonal specialists in Ireland and 3 species are interesting or rare:

*Megasternum obscurum* was recorded at this site and at Furnace L., L. Murree and Corragau L. during the 1996 survey and at L. an Chara and Ballytiege during the 1998 survey, but is otherwise described as rather rare in Ireland (Foster *et al.*, 1992).

*Conopeum seurati* has been recorded at 16 of the 36 sites surveyed, but is not listed in any review of Irish marine Bryozoa (Wyse Jackson, 1991). Either the species is under recorded or a truly lagoonal specialist.

*Littorina "tenebrosa"* was also recorded during this survey at L. an Aibhnín and L. Fhada and during the 1996 survey in Lettermullen Pool, L. Tanaí, L. Murree and from the North Slob. These are the only known sites in Ireland. The status of this taxon is still under dispute but appears to be morphologically and ecologically distinct and is listed as a lagoonal specialist for Britain.

*Astropecten irregularis* was also found at Kincas L. but was found at surprisingly low salinity in L. an tSaile.

### Salinity

Table 4.9.2 shows salinity data from various sampling points in the lagoon (S1-S12, Fig. 4.9.2). Most of the lake is relatively shallow (0-2m) but up to 4m depth was measured at some points and a maximum depth of approximately 13m below the salmon cage (OS L96077 39227). Surface water varied from fresh at the eastern and northern parts of the middle lake up to 2.3 - 3.5ppt in sheltered bays (Sta 3, Sta 5, and Sta 6) but only 0.9ppt at the mouth of the inlet. The middle and lower lakes are stratified at about 2-3m depth. Salinity of water above this depth appears to depend on degree of exposure causing the surface water to mix and position in relation to inflowing fresh water. It is clear that during the sampling period large volumes of fresh water were flowing through the lakes but salinity increased to up to 5.1ppt at 1m depth at the western end of the middle lake (Sta 7) and most parts of the lower lake. At 2m depth in the lower lake salinity was 7.5 - 11.4ppt and up to 14.7ppt in the deepest parts at 4m (Sta 2).

### Evaluation

Loch an tSaile is a very good example of a large, stratified saline lake lagoon. The fauna is not particularly striking but represents a wide range of ecological groups reflecting the varied salinity regimes of the system. Many of the species are lagoonal specialists and at least two of the species are relatively rare. As a lagoonal system it is one of the most diverse in the country in terms of numbers of ecological categories.

See Evaluation (Section 7) for further details and ranking of the 36 sites.

(Note should also be made of the nearby pool, marked as Doire Bhanbh on the map. This pool is not connected to L. an tSaile but is a very interesting small lagoon with a large number of lagoonal specialists, including some not found in L. an tSaile. Any conservation efforts towards L. an tSaile should aim to include this pool)







Table 4.9.2 Salinity (ppt) at various stations and depths in L. an tSaile, Co. Galway. 1998.

depth (m)	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
0	1.8	1.5	2.5	1.7	3.5	1.4	0.5	1.2	0	0.2	0.2	0
1	3.6	3.4	2.3	1.7	4.6	2.8	0.5	1.3	0	0.2	0.2	1.00
2	4.1	11.4	4.8	11.3	-	-	0.7	1.5	-	0.2	0.2	-
3	-	-	7.5	14.1	-	-	-	7.9	-	10.2	0.2	-
4	-	13.9	-	14.7	-	-	-	8.7	-	10.3	0.7	-
5	-	-	-	-	-	-	-	-	-	12.2	1.3	-



Plate 4.9.1 View looking north across Sta. 5  
Loch an tSaile, Connemara, Co. Galway. 1998.



Plate 4.9.2 View looking north to the inlet from the upper lake (Sta. 8b).  
Loch an tSaile, Connemara, Co. Galway. 1998.



Plate 4.9.3 View of middle lake with salmon cage. Upper lake in distance.  
Loch an tSaile, Connemara, Co. Galway. 1998.



Plate 4.9.4 View looking west from Sta. 10.  
Loch an tSaile, Connemara, Co. Galway. 1998.

#### 4.10 Lough Athola, North Mannin Bay, Co. Galway

OS L626484 53° 28.0' N; 10° 04.2' W

##### Description

Lough Athola is a saline lake lagoon with a natural tidal inlet through creeks in salt marsh and peat superimposed on a rock barrier. The loch covers approximately 10 ha and is situated on the north shore of Mannin Bay, 4 km northwest of Ballinaboy (Fig 4.10.1). It is flooded by most tides but restricted by the narrow inlet. It is shallow (max 2-3m) and salinity is close to full seawater throughout; the lowest measured in August '98 was 33.7 ppt but 27 ppt was recorded at the western end in 1996 and 6 and 7 ppt close to a freshwater inflow in June and September (1998), respectively. Substrate is mostly rock and stones overlain in many areas by a thick layer of peaty silt and covered with a mats of *Chaetomorpha* or "tufty" *Cladophora battersii* (Roden, 1999).

##### Sources of Information

None ?

##### Sampling stations

The area was sampled in briefly in June 1996, on 29/6/98 and from 25-26//9/98.

Four sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows (Fig. 4.10.2).

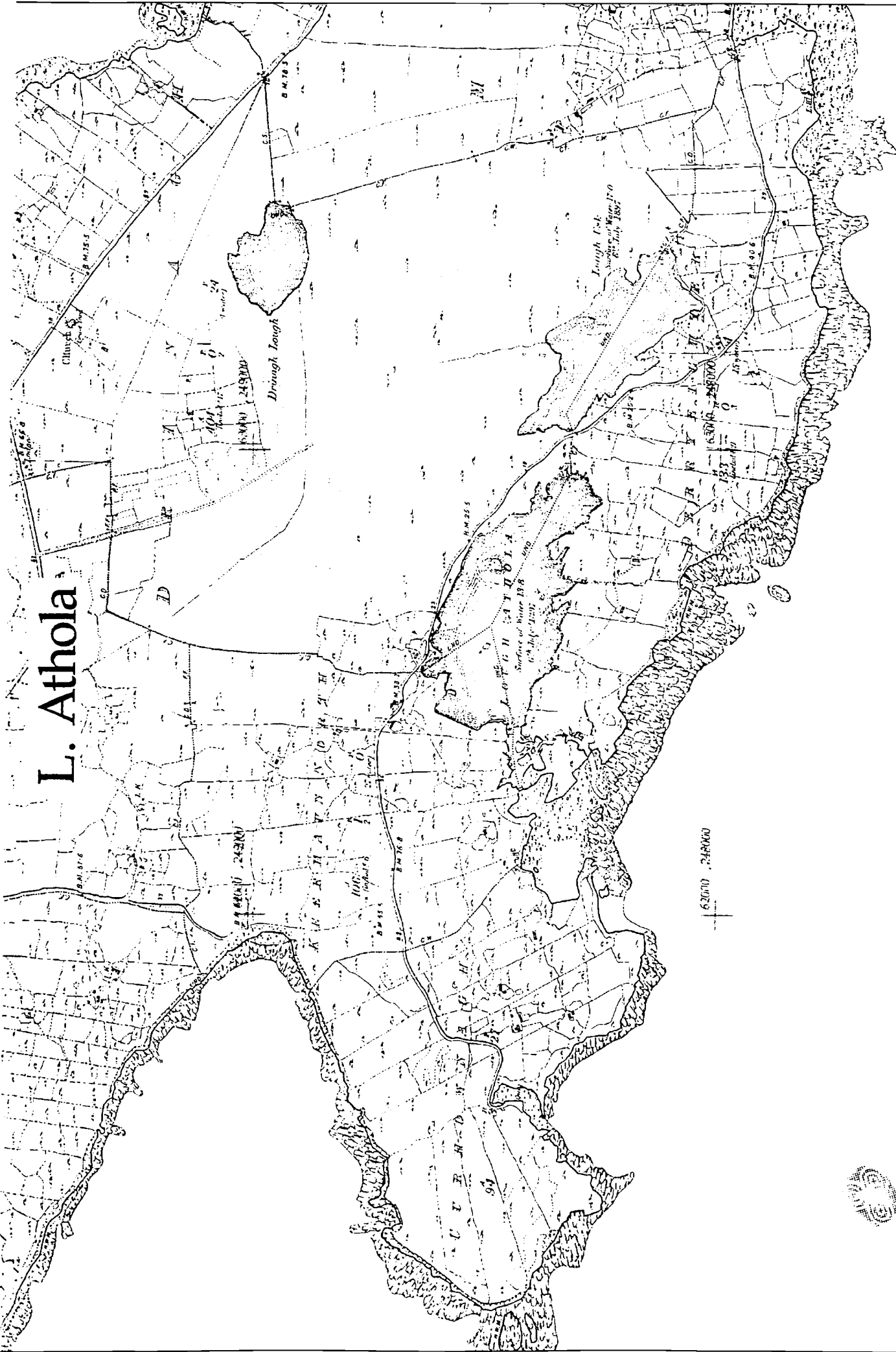
**Station 1** (L 62834 48487) was located on the north shore of the lough close to the main road (Plate 4.10.1). Water depth was up to 1m and salinity measured 34.1ppt. Substrate consisted of rock and stones with a thick layer of decomposing algae. The area was surrounded by moorland and rock.

**Station 2** (L 62887 48376) was located at the eastern end of the lough close to where a freshwater stream enters (Plate 4.10.2). Depth was up to 1m and salinity measured 33.9 ppt although 27 ppt was recorded in this area in 1996 and 6 and 7 ppt close to a freshwater in flow in June and September. Substrate consisted of rock, stones and coarse sand with peat islands and silty peat in sheltered areas. Further from the shore the substrate was mostly silty peat with a dense growth of algae. The area was bordered by low peat cliffs and grassland.

**Station 3** (L 62613 48312) was located on the south shore of the lough in an area where seawater appears to enter the lough during storms by overtopping the storm beach to the south. Depth was up to 1m and salinity measured 34.1 ppt. Substrate consisted of rock with small stones and gravel with a covering of "tufty" *Cladophora* at 1m depth.

**Station 4** (L 62402 48336) was located at the western end of the lough at the tidal inflow (Plate 4.10.3). Substrate was rock, stones, gravel and coarse sand. Depth was up to 1m and salinity measured 34.1 ppt. From this point the tidal channel meandered through peat islands and flowed over a rock sill.

# L. Athola



Dúchas The Heritage Service Figure 4.10.1 Section of O.S. 6" map showing area Loch Athola, Connemara, Co. Galway.



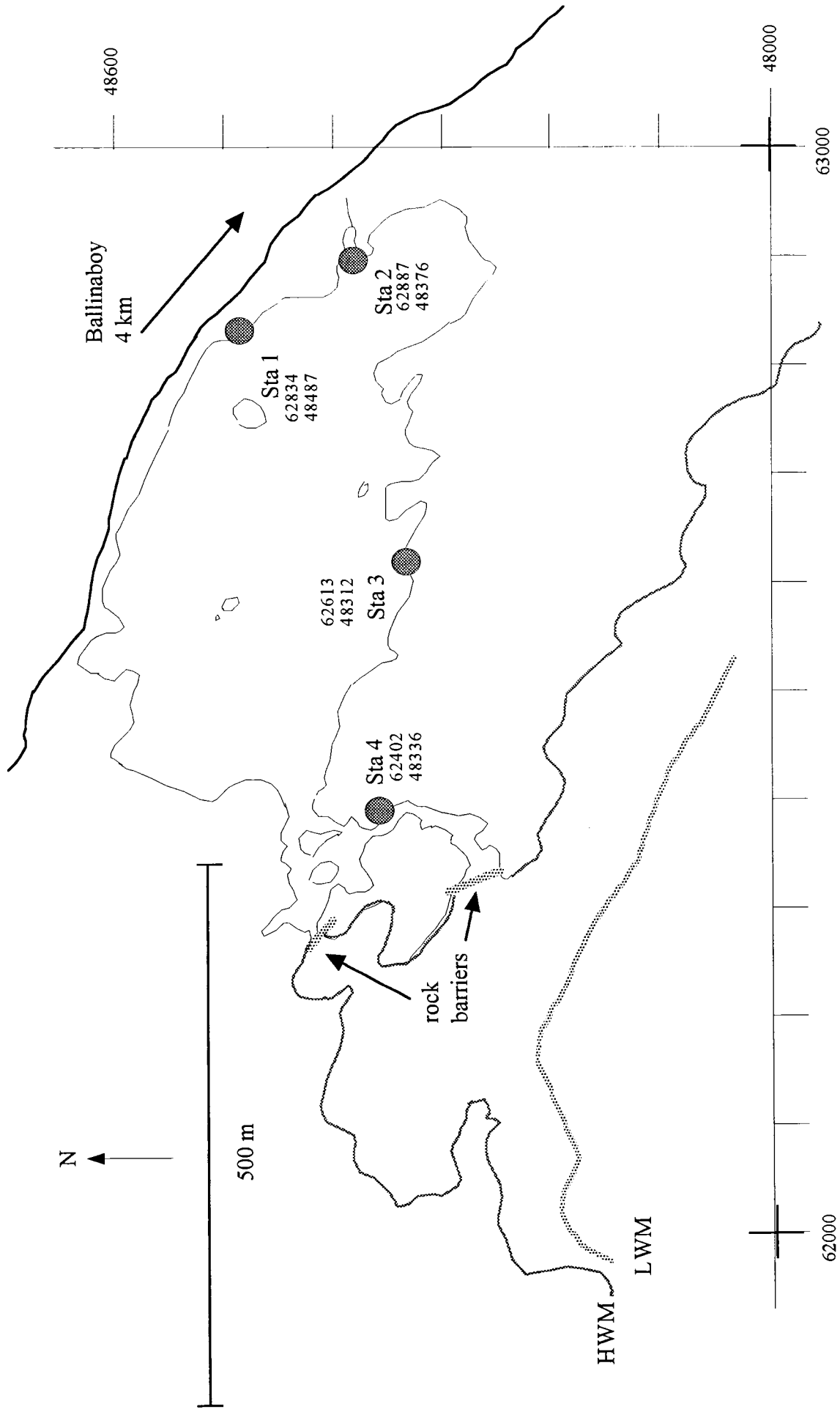


Figure 4.10.2 Sketch map of Loch Athola, Connemara, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.

## Results

Table 4.10.1 is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes, with additional species recorded during the Biomar Survey on 17/6/95. Table 4.10.2 shows the total species list for each station

A total of 93 taxa were recorded, of which 5 are regarded as lagoonal specialists in Britain, 2 are proposed as a lagoonal specialists for Ireland and 3 species are of particular importance:

*Jaera ischiosetosa* was also recorded at L.an Chara, and Maghery L. in 1998 and at Moorlagh, L. Murree and Furnace L. in 1996. The only previous record appears to be for L. Hyne. Co. Cork (Goss Custard *et al.*, 1979). This apparently rare crustacean is a proposed lagoonal specialist for Ireland.

*Conopeum seurati* has been recorded at 16 of the 36 sites surveyed, but is not listed in any review of Irish marine Bryozoa (Wyse Jackson, 1991). Either the species is under recorded or a truly lagoonal specialist.

*Leptocheirus pilosus* was recorded at this site and at Furnace L. in 1996. The only other known Irish localities are the south side of Wexford Harbour ( Costello *et al.*, 1989) and a brackish channel on the North Slob, Co. Wexford (Galvin, 1992). The only known sites are all brackish and this apparently rare crustacean is a proposed lagoonal specialist for Ireland.

## Evaluation

The fauna of Lough Athola is very rich but dominantly marine and marine/polyhaline, although 7 species are lagoonal specialists and 3 species appear to be rare in Ireland.

The lagoon is set in a natural area of great scenic interest and is a good example of its type, with a natural rock barrier with peat islands.

See Evaluation (Section 7) for further information and ranking of the 36 sites.



Table 4.10.1 List of species arranged in broad ecological categories based on the Venice system of salinity regimes (L\* = lagoonal specialist in Britain; L\*IR = proposed lagoonal specialist for Ireland; \* = interesting or rare species).

Marine		
<i>Clathrina coriacea</i>	<i>Anemonia viridis</i>	
<i>Leucoselenia botryoides</i>	<i>Arenicola marina</i>	
<i>Suberites</i> sp.	<i>Capitella capitata</i>	
<i>Sycon ciliatum</i>	<i>Tubificoides benedii</i>	
<i>Tergiops fugax</i>	<i>Noteropterus auritus</i>	
<i>Anthopleura ballii</i>	<i>Semibalanus balanoides</i>	
<i>Sagartia elegans</i>	<i>Praunus flexuosus</i>	
<i>Circeus spirillum</i>	<i>P. ?inermis</i>	
<i>Eteone picta</i>	<i>Jassa falcata</i>	
<i>Flabelligera affinis</i>	<i>Melita palmata</i>	
<i>Harmothoe imbricata</i>	<i>Palaemon elegans</i>	
<i>Odontosyllis gibba</i>	<i>P. serratus</i>	
<i>Perinereis cultrifera</i>	<i>Bittium reticulatum</i>	
<i>Platynereis dumerili</i>	<i>Hydrobia ulvae</i>	
<i>Polyophthalmus pictus</i>	<i>Littorina saxatilis</i>	
<i>Pomatoceros triqueter</i>	<i>L. littorea</i>	
<i>Serpula vermicularis</i>	<i>Ostrea edulis</i>	
<i>Spirorbids</i>	<i>Amphipholis squamata</i>	
<i>Sthenolais boa</i>	<i>Bowerbankia gracilis</i>	
<i>Typosyllis hyalina</i>	<i>Cryptosula pallasiana</i>	
<i>Chthamalus montagui</i>	<i>Gobius niger</i>	
<i>Tanais dulongi</i>	Poly-mesohaline	
<i>Mysidopsis gibbosa</i>	* <i>Jaera ischiosetosa</i>	L*IR ?
<i>Ampithoe ramondi</i>	* <i>Leptocheirus pilosus</i>	L*IR ?
<i>Dexamine spinosa</i>	<i>Onoba aculeus</i>	L*
<i>Erichthonius ?brasiliensis</i>	<i>Cerastoderma glaucum</i>	L*
Lysianissidae indet.	<i>Mytilus edulis</i>	
<i>Microdeutopus anomalus</i>	<i>Asciidiella aspersa</i>	
<i>Phtisica marina</i>	<i>A. scabra</i>	
<i>Cancer pagurus</i>	<i>Mugilidae</i>	
<i>Hippolyte ?varians</i>	Euryhaline	
<i>Palaemon ?adpersus</i>	<i>Idotea chelipes</i>	L*
<i>Lepidochitona cinereus</i>	<i>Gammarus zaddachi</i>	
<i>Gibbula cineraria</i>	<i>Carcinus maenas</i>	
<i>G. umbilicalis</i>	<i>Palaemonetes varians</i>	L*
<i>Patella vulgata</i>	* <i>Conopeum seurati</i>	L*
<i>Rissostomia membranacea</i>	<i>Anguilla anguilla</i>	
<i>Skeneopsis planorbis</i>	<i>Gasterosteus aculeus</i>	
<i>Anomia ephippium</i>	<i>Pomatoschistus microps</i>	
<i>Lasaea rubra</i>	Additional species recorded in the Biomar Survey:	
<i>Monia patelliformis</i>	<i>Polymastia mamillaris</i>	
<i>Modiolarca tumida</i>	<i>Hymeniacidon perleve</i>	
<i>Musculus discors</i>	<i>Dysidia gracilis</i>	
<i>Mysella bidentata</i>	<i>Sagartiogeton laceratus</i>	
<i>Tapes decussata</i>	<i>Scoloelepis foliosa</i>	
<i>Asterina gibbosa</i>	<i>Necora puber</i>	
<i>Ophiothrix fragilis</i>	<i>Eysia viridis</i>	
<i>Aetea truncata</i>	<i>Phoronis hippocrepa</i>	
<i>Amathia truncata</i>	<i>Marthasterias gracilis</i>	
<i>Ascidia mentula</i>	<i>Corella parallelogramma</i>	
<i>Botryllus schlosseri</i>	<i>Ascidia conchilega</i>	
<i>Clavelina lepadiformis</i>	<i>Botrylloides leachi</i>	
<i>Scrupocellaria reptans</i>	<i>Agonus cataphractus</i>	
Marine-polyhaline	<i>Pleuronectes platessa</i>	
<i>Halichondria panicea</i>		

Table 4.10.2 Aquatic fauna recorded at stations in Lough Athola, Co. Galway. 1998.

Taxa	Stations								
	1	L.T. 1	1b	2	L.T. 2	3	4	L.T.4	
Porifera									
	<i>Clathrina coriacea</i>						+		
	<i>Halichondria panicea</i>				+		+	+	
	<i>Leucoselenia botryoides</i>				+				
	<i>Suberites sp.</i>						+		
	<i>Sycon ciliatum</i>	+							
	<i>Tergiops fugax</i>						+		
Cnidaria	<i>Anemonia viridis</i>							+	
	<i>Anthopleura balli</i>	c			c		c	+	
	<i>Sagartia elegans</i>							+	
Turbellaria	planarian indet.							+	
Annelida	<i>Arenicola marina</i>							+	
	<i>Capitella capitata</i>			a					
	<i>Circeus spirillum</i>	+			+		a		
	<i>Eteone picta</i>							+	
	<i>Flabelligera affinis</i>						c		
	<i>Harmothoe imbricata</i>						+	+	
	<i>Odontosyllis gibba</i>				o				
	<i>Perinereis cultrifera</i>				+				
	<i>Platynereis dumerili</i>				+			a	
	<i>Polyopthalmus pictus</i>	+	1		a			+	5
	<i>Pomatoceros triqueter</i>						+	+	
	<i>Serpula vermicularis</i>							+	
	Spirorbidae indet.	+			+		+	+	
	<i>Stenolais boa</i>							+	
	<i>Typosyllis hyalina</i>							+	
	<i>Tubificoides benedii</i>	+		+					
Sipuncula	indet.						+		
Crustacea									
Copepoda	<i>Notopterophorus auritus</i>							+	
	indet.							+	
Cirripedia	<i>Chthamalus montagui</i>						+	+	
	<i>Semibalanus balanoides</i>	+					+		
Tanaidacea	<i>Tanais dulongi</i>				c		+	+	
Mysidacea	<i>Mysidopsis gibbosa</i>		3						1
	<i>Praunus flexuosus</i>	+	23		+	45	+	+	20
	<i>P. ?inermis</i>		2			5			10
Isopoda	<i>Idotea chelipes</i>	+							
	<i>Jaera ischiosetosa</i>						+		
L. T. = light trap; + = present, o = occasional, c = common, a = abundant.									

Table 4.10.2 cont. Aquatic fauna recorded at stations in Lough Athola, Co. Galway. 1998.

Taxa	Stations								
	1	L.T. 1	1b	2	L.T. 2	3	4	L.T. 4	
Amphipoda	+	+		+	1	+	+	8	
						1	11	1	
							3		
		1							
	17			1	1		1		
		1							
							16		
		1							
				12		2		5	
	1			10		4	1		
		7	2				+		
Decapoda							F=1		
	+			F=53		+	F=15		
		1							
	+			+	1	+	+		
				+		+	F=53		
				o	1				
Insecta									
	Chironomidae indet.	+				+	+		
Mollusca									
Polyplacophora	<i>Lepidochitona cinereus</i>					+	o		
Prosobranchia	<i>Bittium reticulatum</i>						+		
	<i>Gibbula cineraria</i>	+					+		
	<i>G. umbilicalis</i>						+		
	<i>Hydrobia ulvae</i>					+	+		
	<i>Littorina littorea</i>						+		
	<i>L. saxatilis</i>	+			+	o	c		
	<i>Onoba aculeus</i>			+			+		
	<i>Patella vulgata</i>	+					+		
	<i>Rissostomia membranacea</i>	+					+		
	<i>Skeneopsis planorbis</i>	+		c	+	+			
Bivalvia	<i>Anomia ehippium</i>						+		
	<i>Cerastoderma glaucum</i>	ad			+	+	ad		
	<i>Lasaea rubra</i>						+		
	<i>Monia patelliformis</i>						+		
	<i>Modiolarca tumida</i>						+		
	<i>Musculus discors</i>	+							
	? <i>Mysella bidentata</i>					+	+	1	
	<i>Mytilus edulis</i>	+			+	+	+		
	<i>Ostrea edulis</i>						+		
	<i>Tapes decussata</i>						+		
F = Fyke net, L.T. = light trap; + = present, o = occasional, c = common, a = abundant.									

Table 4.10.2 cont. Aquatic fauna recorded at stations in Lough Athola, Co. Galway. 1998.

Taxa		1	L.T. 1	Stations				4	L.T.4
				1b	2	L.T. 2	3		
Bryozoa	<i>Aetea truncata</i>						+	+	
	<i>Amathia lendigera</i>						+	+	
	<i>Bowerbankia gracilis</i>						+	+	
	<i>Conopeum seurati</i>				+				
	<i>Cryptosula pallasiana</i>						+	+	
	<i>Scrupocellaria reptans</i>						+	+	
Echinodermata	<i>Amphipholis squamata</i>	+			+		+	+	
	<i>Asterina gibbosa</i>							+	
	<i>Ophiothrix fragilis</i>							+	1
Tunicata	<i>Ascidia mentula</i>							+	
	<i>Ascidella aspersa</i>						+	+	
	<i>A. scabra</i>				+		+		
	<i>Botryllus schlosseri</i>						+		
	<i>Clavelina lepadiformis</i>			+					
	Pisces	<i>Anguilla anguilla</i>				F=2		+	F=3
<i>Gasterosteus aculeatus</i>		+			+	2			
<i>Gobius niger</i>					F=3			F=6	
<i>Pomatoschistus microps</i>		+					+	+	

F = Fyke net; L.T. = light trap; + = present, o = occasional, c = common, a = abundant.



Plate 4.10.1 View looking west from Sta. 1 across the lough towards the inlet. Lough Athola, North Mannin Bay, Co. Galway, 1998.



Plate 4.10.2 View of the eastern end of the lough (Sta. 2).  
Lough Athola, North Mannin Bay, Co. Galway, 1998.



Plate 4.10.3 View of the mosaic of peat islands at the outflow near Sta. 4  
Lough Athola, North Mannin Bay, Co. Galway, 1998.

#### 4.11 Lough Bofin, Inishbofin, Co. Galway

OS L525656      53° 37.1' N; 10° 14.1' W

##### Description

Lough Bofin is a natural sedimentary lagoon with a cobble barrier. The lagoon is situated on the north shore of the island of Inishbofin, approximately 2km to the west of the harbour (Fig 4.11.1). The barrier is high and seawater enters the lagoon by percolation and by overwash during storms. The lagoon is shallow (no deeper than 1.5m) and covers an area of approximately 8 ha. Although there is no direct connection with the sea, the volume of the lagoon is small and the amount of seawater that enters, either by percolation or overwashing can be relatively high. Several small streams enter the lagoon and large amounts of freshwater can also enter at times of high rainfall and it appears that the lagoon undergoes extreme variations in salinity. During the sampling period in August 1998, salinity measured 13-17 ppt from the landward end to the barrier. However, 32.3-33.1 ppt was recorded in August 1995, 23.5-27.6 ppt in April 1996 and 34-36 ppt in August 1996. The latter record indicates that the lagoon may become hypersaline away from the barrier. Substrate of the lagoon is rock, cobbles and shingle along most of the shoreline with a thick organic silt deposit covering most of the central area.

##### Sources of Information

P. King (*pers comm.*).

##### Sampling stations

The area was sampled from 5-7/8/98.

Four sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows (Fig. 4.11.2). Weather conditions were particularly bad during this period with heavy rainfall which undoubtedly affected salinity measurements and sampling efficiency.

**Station 1** (L52361 65630) was located at the northwest corner of the lagoon close to a seepage area through the cobble barrier. Water depth was up to 1m and salinity measured 16.0 - 17.5 ppt. Substrate consisted of cobbles and muddy gravel with occasional large stones giving way to finer sediments further from the shore. A dense growth of *Chaetomorpha* covered most of the substrate. The area was surrounded by the cobble barrier to the north, an eroding vertical edge of peat, and pasture with patches of *Phragmites* along the eastern shore (Plates 4.11.1, 2).

**Station 2** (L 52490 65730) was located at the foot of the hills on the northeastern shore of the lagoon. Depth ranged from 0 - 1m, and salinity measured 15-16 ppt. Surface water was running off in streams all along the eastern shore after 24 hours of heavy rain. Substrate consisted of bed rock (?schist) with large stones, flat stones and gravel and the area was bordered by a gently shelving edge with *Juncus* and rough grazing on the hillsides.

**Station 3** (L 52459 65503) was located midway along the western shore where a drainage ditch enters the lagoon. Depth varied from 0.7 - 1m along the edge and salinity measured 13.1 ppt. Substrate consisted of silty peat without rock or stones bordered by vertical banks of peat below damp pasture.

**Station 4** (L 52569 65335) was located at the southwestern end of the lagoon where streams enter from a freshwater marsh (Plate 4.11.3). Depth was up to 1m and salinity measured 4-7 ppt at the edge of the marsh and 17 ppt a short distance from the shore. Substrate was gravelly mud with flat stones and small isolated peat clumps giving way to deep silty mud.

Blairmont, Co. Wick  
**Inish Bofin**  
 Inish Bofin Bay

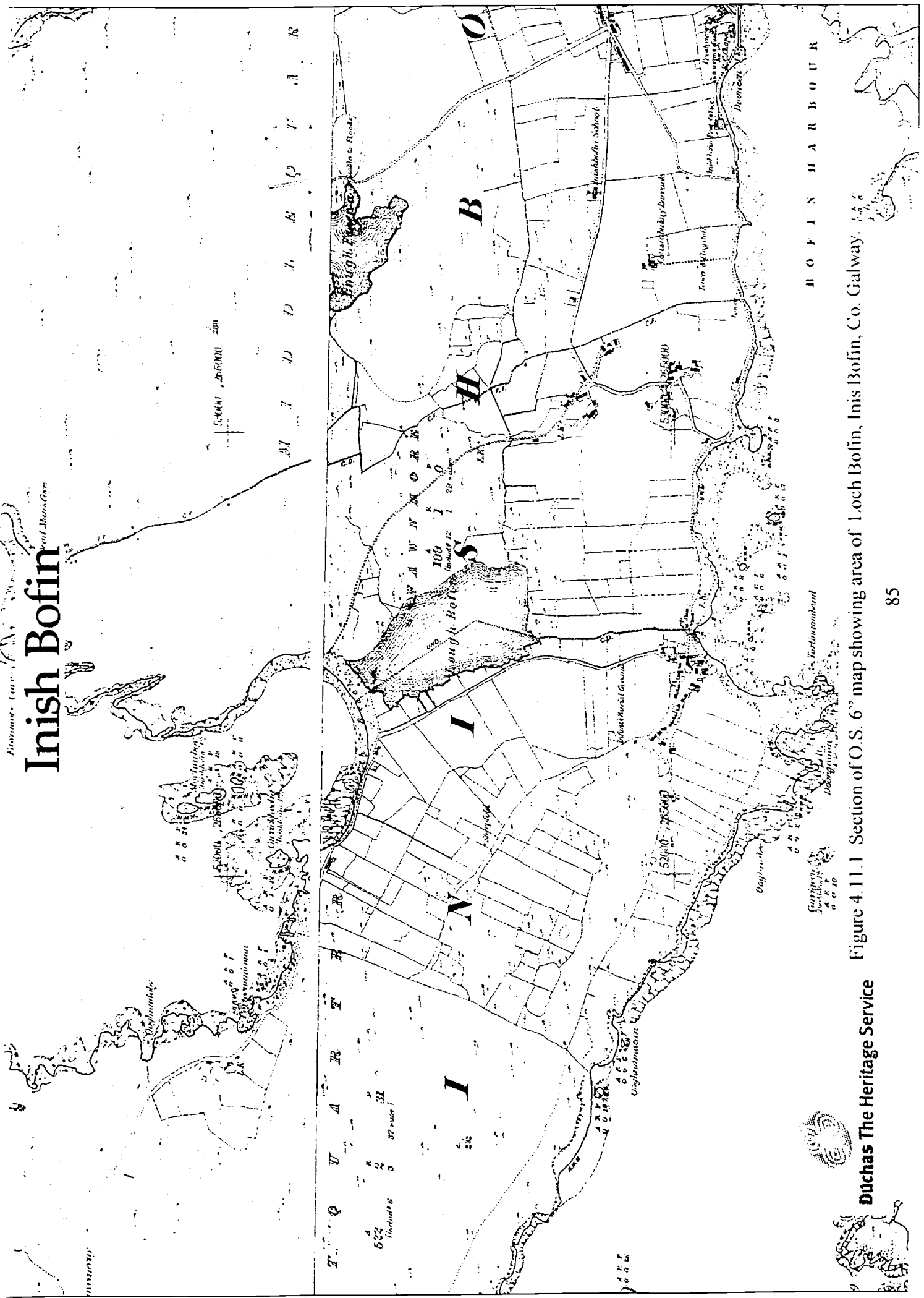


Figure 4.11.1 Section of O.S. 6" map showing area of Loch Bofin, Inis Bofin, Co. Galway.



**Duchas The Heritage Service**



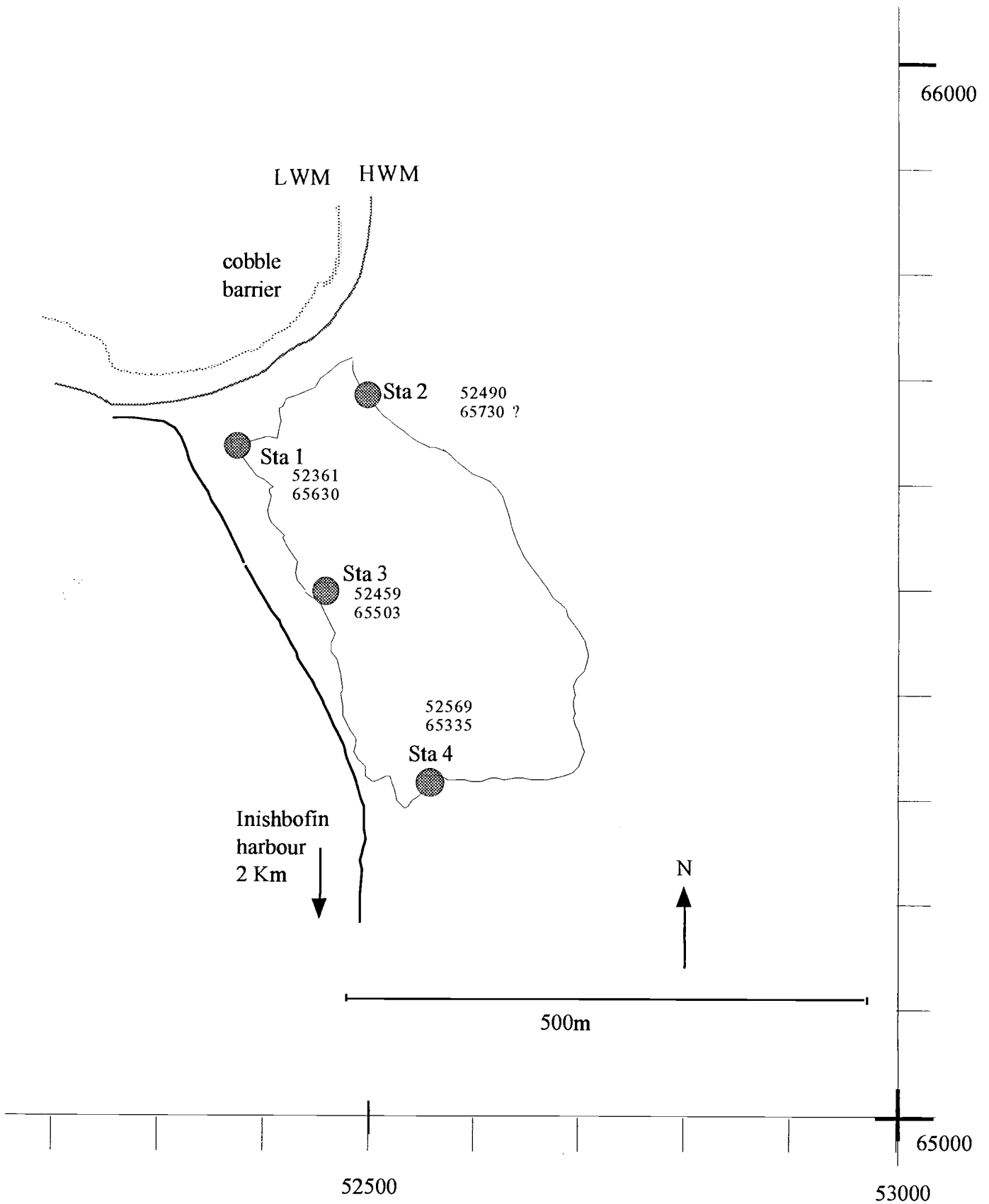


Figure 4.11.2 Sketch map of Loch Bofin, Inis Bofin, Co. Galway, showing sampling stations used for a survey of aquatic fauna, 1998.

## Results

Table 4.11.1 shows the total species list for each station. The following is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes (L\*IR = proposed as lagoonal specialist in Ireland).

### Marine-polyhaline

*Bowerbankia gracilis*

*Melita palmata*

### Euryhaline

*Procerodes littoralis*

*Hediste diversicolor*

*Jaera nordmanni* L\*IR?

*Gammarus duebeni*

*Anguilla anguilla*

*Gasterosteus aculeatus*

The fauna of this lagoon was extremely poor with only 10 taxa recorded, of which 8 were identified to species. One is a proposed lagoonal specialist in Ireland. None can be described as rare. The copepods were described as abundant in 1996 but were not identified. Surprisingly there were no Hydrobiids of any species found.

## Evaluation

Geomorphologically Lough Bofin is a fine example of a sedimentary lagoon with a high cobble barrier.

The fauna however is extremely impoverished, possibly due to extreme variations in salinity and periodic anoxia due to rotting algae. The lagoon could be referred to as what Hartog (1974) describes as a "shock system".

See Evaluation (Section 7) for further details and ranking of the 36 sites.

Table 4.11.1 Aquatic fauna recorded at stations in Lough Bofin, Inish Bofin, Co. Galway. 1998.

Taxa		Stations							
		1	L.T. 1	2	L.T. 2	3	L.T. 3	4	L.T. 4
Turbellaria	<i>Procerodes littoralis</i>	c		c					
Annelida	<i>Hediste diversicolor</i>	o				o		c	
Crustacea									
Copepoda	indet.	(a)		(a)		(a)		(a)	
Isopoda	<i>Jaera nordmanni</i>	c	7	c		8		6	2
Amphipoda		a	c250		c250	a	c1000	+	c500
	<i>Gammarus duebeni</i>	28	27	8	60	a	131	11	225
	<i>Melita palmata</i>	1							1
Insecta	Chironomidae indet.	+							
Bryozoa	<i>Bowerbankia gracilis</i>	+							
Pisces	<i>Anguilla anguilla</i>					F=5			
	<i>Gasterosteus aculeatus</i>	c	1	c	3	c		a	20

F = Fyke net; L.T. = light trap; + = present, o = occasional, c = common, a = abundant. ( ) = previous record



Plate 4.11.1 View looking southwest along the cobble barrier to Sta. 1, Lough Bofin, Inishbofin, Co. Galway. 1998.



Plate 4.11.2 View of northwest corner of the lagoon showing seepage through the barrier (Sta. 1). Lough Bofin, Inishbofin, Co. Galway. 1998.



Plate 4.11.3. View of southwest area of the lagoon (Sta. 4)  
Lough Bofin, Inishbofin, Co. Galway. 1998.



Plate 4.11.4. View looking northwest across the lagoon towards the barrier.  
Lough Bofin, Inishbofin, Co. Galway. 1998.

## 4.12 Maghery Lough, Co. Donegal.

OS B723094 54° 55.7' N; 08° 25.7' W

### Description

Maghery Lough is a saline lake lagoon with a modified, sluiced outlet. The lake covers approximately 19 ha and adjoins Maghery Bay, 5km to the west of Dungloe (Fig 4.12.1). Seawater enters the lake on most tides but the lake is surrounded by hills and wet grassland and marshes and several small streams flow into the lake in the southeast. The inlet is probably natural but has been modified by the building of a road bridge and addition of a wooden sluice flap, which was broken at the time of sampling. Depth is very shallow (up to 1.5 m) and salinity at the time of sampling was 34 ppt at the inlet and 29.5 ppt in the deepest parts of the lake but 23ppt over most of the surface and down to 15 ppt in the southeast. 22-4 ppt was measured in July. Substrate was rock, stones and coarse sand near the inlet, soft, sandy organic silt in sheltered areas and in parts of the centre, clean fine sand along parts of the western shore. A fringe of *Phragmites* was present along the southwest, south and southeast shores.

### Sources of Information

None ??

### Sampling stations

The area was sampled in June 1996, briefly on 29/6/98 and from 4 -5/9/98.

Five sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows (Fig. 4.12.2).

**Station 1** (B72232 09783) was located at the north end of the lake near the inlet (Plates 4.12.1,2). Depth varied from 0-1m and salinity measured 23.4 ppt. Substrate consisted of isolated rocks with coarse sand, gravel and stones and softer sediments in sheltered places. The area was bordered by moorland, granite rocks, boulders and stones.

**Station 2** (B 72450 09364) was located midway along the eastern shore where an island is connected to the shore by a line of stones (Plate 4.12.3). Substrate consisted of soft organic silt with coarse gravel and some stones. Large granite rocks and moorland lined the shore. Depth varied from 0-1m and salinity measured 23.8 ppt.

**Station 3** (B 72541 09208) was located in the southeast corner of the lake where small streams enter the lake through wet grassland and *Phragmites* swamp. Depth was slightly greater here (up to 1.5m) and salinity increased from 15 to 23 ppt away from the shore. Substrate was coarse sand with fine peaty silt (Plate 4.12.4).

**Station 4** (B 72036 09330) was located at the southwestern end of the lake in a shallow area bordered by *Phragmites*. Depth was less than 0.5 m and salinity measured 19 -23 ppt. Substrate consisted of soft peaty silt overlain with mats of decaying reed stems.

**Station 5** (B 72113 09317) was located in a small bay midway along the western shore. Depth was shallow (less than 0.5m) and salinity measured 23ppt. Substrate consisted of clean coarse shell sand and the area was bordered by *Phragmites*, improved grassland and metamorphosed bedrock.

# Maghery

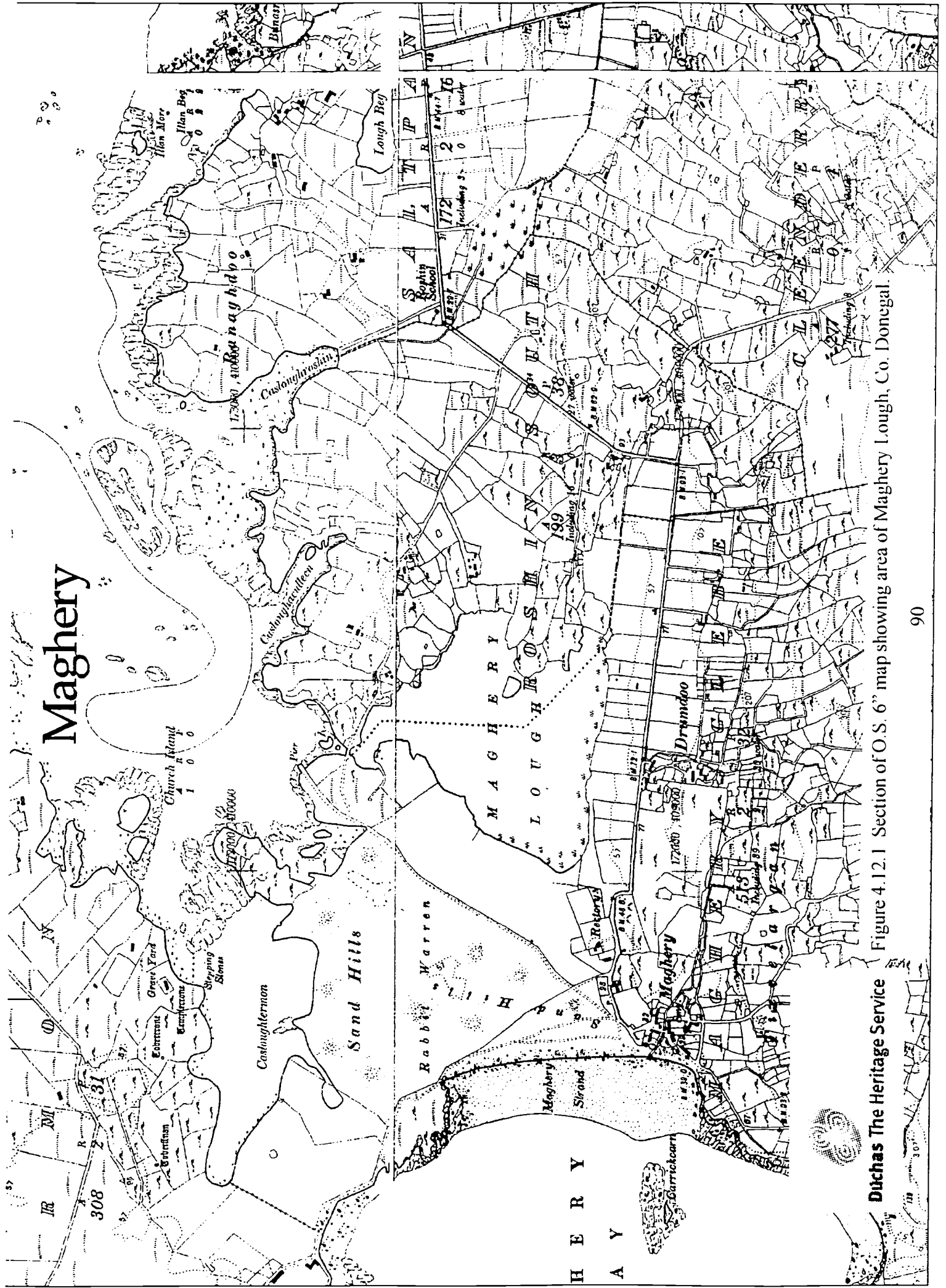


Figure 4.12.1 Section of O.S. 6" map showing area of Maghery Lough, Co. Donegal.

Dúchas The Heritage Service

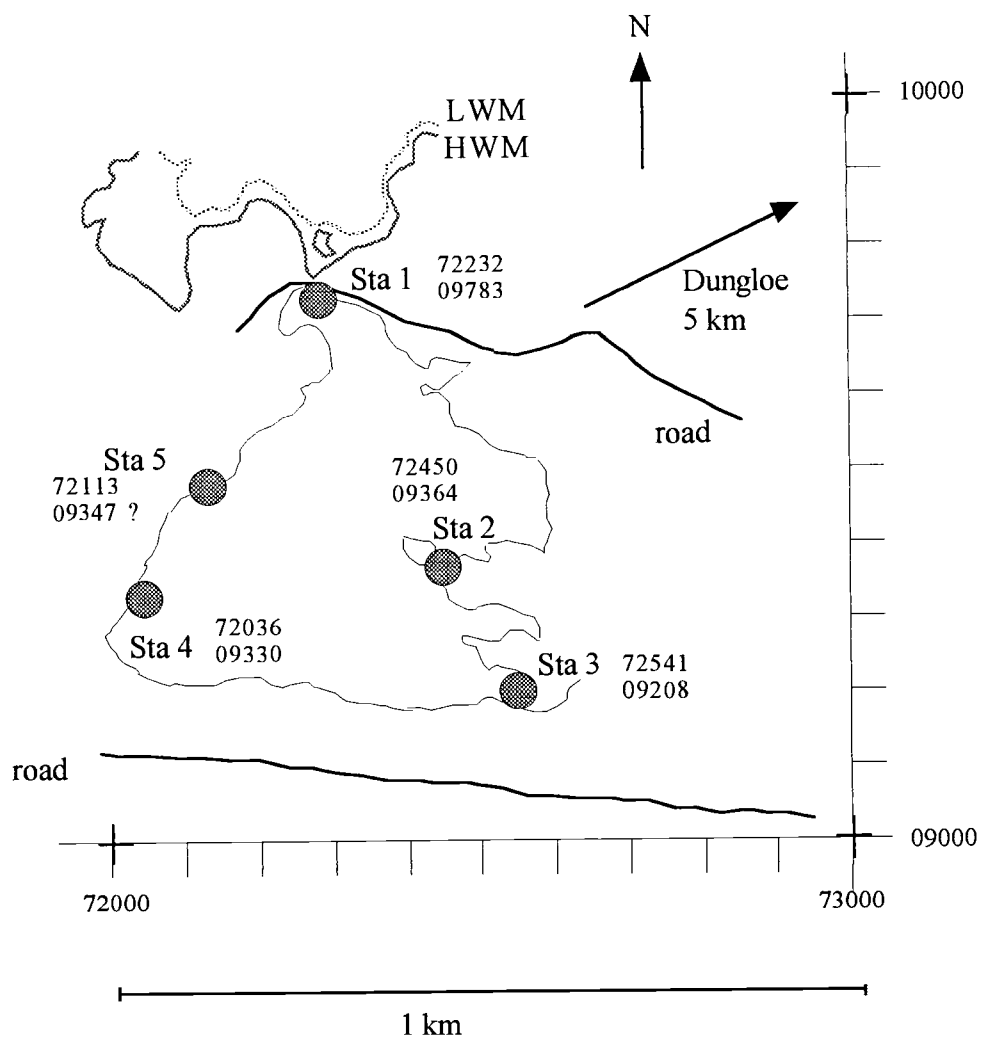


Figure 4.12.2 Sketch map of Maghery Lough, Co. Donegal, showing sampling stations used for a survey of aquatic fauna, 1998.



## Results

Table 4.12.1 shows the total species list for each station. The following is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes (L\* = lagoonal specialist in Britain, L\*IR = proposed as lagoonal specialist in Ireland; \* = interesting or rare species. Species in brackets refer to previous records):

### Marine

*Opercularella lacerata*

### Marine-polyhaline

*Arenicola marina*

*Semibalanus balanoides*

*Praunus flexuosus*

*Melita palmata*

*Crangon crangon*

*Palaemon elegans*

*P. serratus*

*Hydrobia ulvae*

*Littorina littorea*

(*L. saxatilis*) (1996)

*Mya arenaria*

*Taurulus bubalis*

### Poly-mesohaline

\**Jaera ischiosetosa*

L\*IR ?

*Corophium volutator*

*Cerastoderma glaucum*

L\*

*Mytilus edulis*

(*Pomatoschistus microps*) (1996)

### Euryhaline

*Hediste diversicolor*

*Neomysis integer*

L\*IR?

*Idotea chelipes*

L\*

*Jaera nordmanni*

L\*IR?

*Gammarus zaddachi*

*Carcinus maenas*

*Palaemonetes varians*

L\*

*Potamopyrgus antipodarum*

\**Conopeum seurati*

L\*

*Anguilla anguilla*

*Pleuronectes flesus*

*Gasterosteus aculeus*

### Oligohaline-limnetic

*Hydrometra stagnorum*

*Hydroporus memnonius*

### Limnetic

*Agabus bipustulatus*

*Helophorus brevipalpis*

A total of 32 taxa were recorded in 1998, of which 4 species are listed as lagoonal specialists in Britain and 3 are proposed as lagoonal specialists in Ireland. An additional 2 species were recorded in 1996 but not found alive during the 1998 survey. The thriving population of *Mya arenaria* was the most striking feature of this lagoon. Two interesting species were recorded:

*Jaera ischiosetosa* was also recorded at L.an Chara and L. Athola in 1998 and at Moorlagh, L. Murree and Furnace L. in 1996. The only previous record appears to be for L.

Hyne. Co. Cork (Goss Custard *et al.*, 1979). This apparently rare crustacean is a proposed lagoonal specialist for Ireland.

*Conopeum seurati* has been recorded at 16 of the 36 sites surveyed, but is not listed in any review of Irish marine Bryozoa ( Wyse Jackson, 1991). Either the species is under recorded or a truly lagoonal specialist.

### **Evaluation**

The fauna of the lagoon is mostly euryhaline and marine/polyhaline and not particularly rich. Only two species are possibly rare but several species are lagoonal specialists.

The lagoon is a good example of its type, relatively unspoilt despite the modified inlet, in an area of natural beauty.

See Evaluation (Section 7) for more details and ranking of the 36 sites.

Table 4.12.1 Aquatic fauna recorded at stations in Maghery Lough, Co. Donegal. 1998.

Taxa		Stations								
		1	L.T. 1	2	L.T. 2	3	L.T. 3	4	L.T. 4	5
Cnidaria	<i>Opercularella lacerata</i>	+								
Polychaeta	<i>Arenicola marina</i>	+								+
	<i>Hediste diversicolor</i>					c				
Crustacea										
Cirripedia	<i>Semibalanus balanoides</i>	(+)								
Mysidacea	<i>Neomysis integer</i>	c	7	c	2	o	1	c	16	
	<i>Praunus flexuosus</i>	o	1	o	1					
Isopoda	<i>Idotea chelipes</i>						1			
	<i>Jaera ischiosetosa</i>	1		c						
	<i>J. nordmanni</i>	+				+	5			
Amphipoda		+	+	a	+	+	+	+	+	+
	<i>Corophium volutator</i>	+				1				
	<i>Gammarus zaddachi</i>	123	34	136	6	34	34	59		52
	<i>Melita palmata</i>	1						1		
Decapoda	<i>Carcinus maenas</i>	F=126								
	<i>Crangon crangon</i>	a								
	<i>Palaemon elegans</i>	c	1				+			
	<i>P. serratus</i>	c	1							
	<i>Palaemonetes varians</i>	c								
Arachnida	Acarina indet.								1	
Insecta										
Heteroptera	(Corixidae indet.)							3		
	<i>Hydrometra stagnorum</i>					+				
Coleoptera	<i>Agabus bipustulatus</i>							1		
	<i>Helophorus brevipalpis</i>							1		
	<i>Hydroporus memnonius</i>							6		
Diptera	Chironomidae indet.	o		c		a		c		a
Mollusca										
Prosobranchia	<i>Hydrobia ulvae</i>	+								
	<i>Littorina littorea</i>	(+)		o						
	<i>L. saxatilis</i>	(+)								
	<i>Potamopyrgus antipodarum</i>	12				25		+		+
Bivalvia										
	<i>Cerastoderma glaucum</i>	o				shells				
	<i>Mya arenaria</i>	o		c		a		o		a
	<i>Mytilus edulis</i>	o								
Bryozoa	<i>Conopeum seurati</i>	+		+						
Pisces										
	<i>Anguilla anguilla</i>	F=2				F=7				
	<i>Gasterosteus aculeatus</i>	o		c	1	c		c	7	+
	<i>Pleuronectes flesus</i>	o		o						
	<i>Pomatoschistus microps</i>	(+)								
	<i>Taurulus bubalis</i>	F=2								



Plate 4.12.1 View of the sluice at the northern end of the lough (Sta. 1)  
Maghery Lough, Co. Donegal, 1998.



Plate 4.12.2 View of the lough, looking south from Sta. 1.  
Maghery Lough, Co. Donegal, 1998.



Plate 4.12.3 View looking west across the lough from Sta. 2.  
Maghery Lough, Co. Donegal, 1998.



Plate 4.12.4 View looking west from Sta. 3. Maghery Lough, Co. Donegal, 1998.

### 4.13 Sally's Lough, Co. Donegal.

OS B718168 54° 59.7' N; 08° 26.5' W

#### Description

Sally's Lough is an (artificial ?) saline lake lagoon with a narrow tidal inlet. The lake covers approximately 10 ha and lies 3 km to the north of Burtonport (Fig. 4.13.1). According to local information it was formerly a freshwater lake which became tidal following excavation of a channel to the sea. Seawater enters the lake on most tides but is diluted by rainfall running off the surrounding hills. Depth is up to 4 m in the centre of the lake and salinity at the time of sampling was close to that of seawater (29.5 -34.3 ppt) throughout the lough, although 28 ppt was recorded in June 1998. Substrate was granite rock, stones and coarse sand with a deep layer of fine organic silt in sheltered areas and in parts of the centre. The lough is bordered by granite hills and moorland, rough grazing and *Phragmites* at the western end.

#### Sources of Information

None ??

#### Sampling stations

The area was sampled briefly in June 1996, on 29/6/98 and from 5-7/9/98.

Five sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows (Fig. 4.13.2). GPS positions at this site appear to be inaccurate.

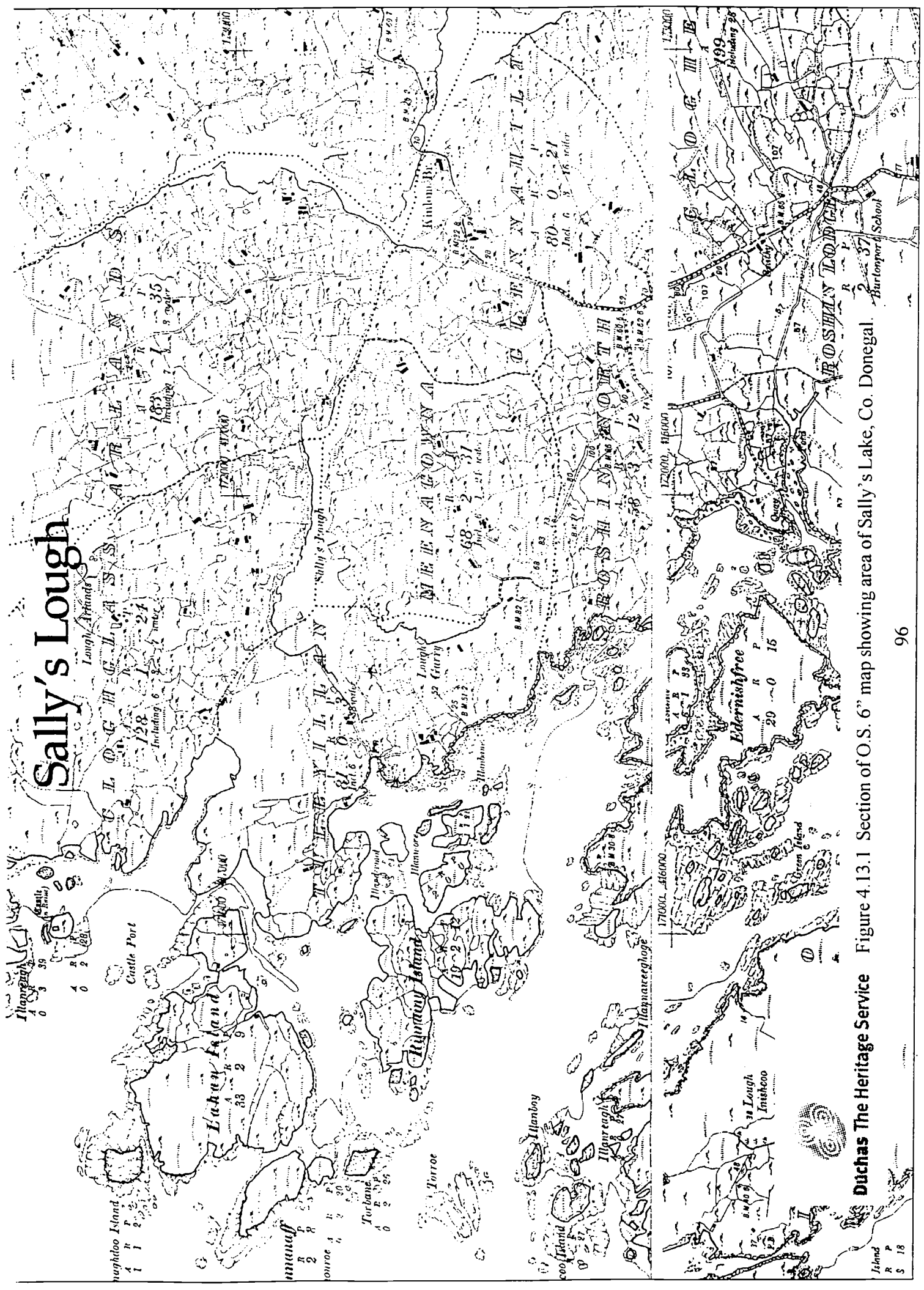
**Station 1** (B 72318 16688 ?) was located at the eastern end of the lake near the road (Plate 4.13.1). Depth varied from 0-1m and salinity measured 33.7 ppt. Substrate consisted of fine sand, coarse gravel and occasional stones overlain with peaty silt. The area was bordered by moorland, granite outcrops and rough grazing.

**Station 2** (B 72150 16550 ??) was located at the eastern end about 150 m from Sta 1. Depth varied from 0-1m and salinity measured 34 ppt. Substrate consisted of rock and stones along the shoreline with a deep layer of organic silt with decaying algae.

**Station 3** (B 72005 16729) was located in a small bay on the south shore of the lough. Depth was up to 1.5m and salinity measured 33.4 ppt. Substrate was granitic sand and gravel with rocks and stones with finer organic silt in sheltered places.

**Station 4** (B 71635 16754 ?) was located on the north shore of the widest part of the lough bordered by *Phragmites* and wet grassland. Depth was 0 - 0.5 m and salinity measured 29.5 - 31.5 ppt. Substrate consisted of fine organic silt and sand with coarse saltmarsh peat.

**Station 5** (B 71523 16697) was located at the western end of the lough close to the artificial channel at the mouth of the lough (Plate 4.13.2). Depth was 0.2 - 1m and salinity measured 33.5ppt. Substrate consisted of fine sand with organic silt. The area was bordered by wet grassland saltmarsh.



Duchas The Heritage Service Figure 4.13.1 Section of O.S. 6" map showing area of Sally's Lake, Co. Donegal.

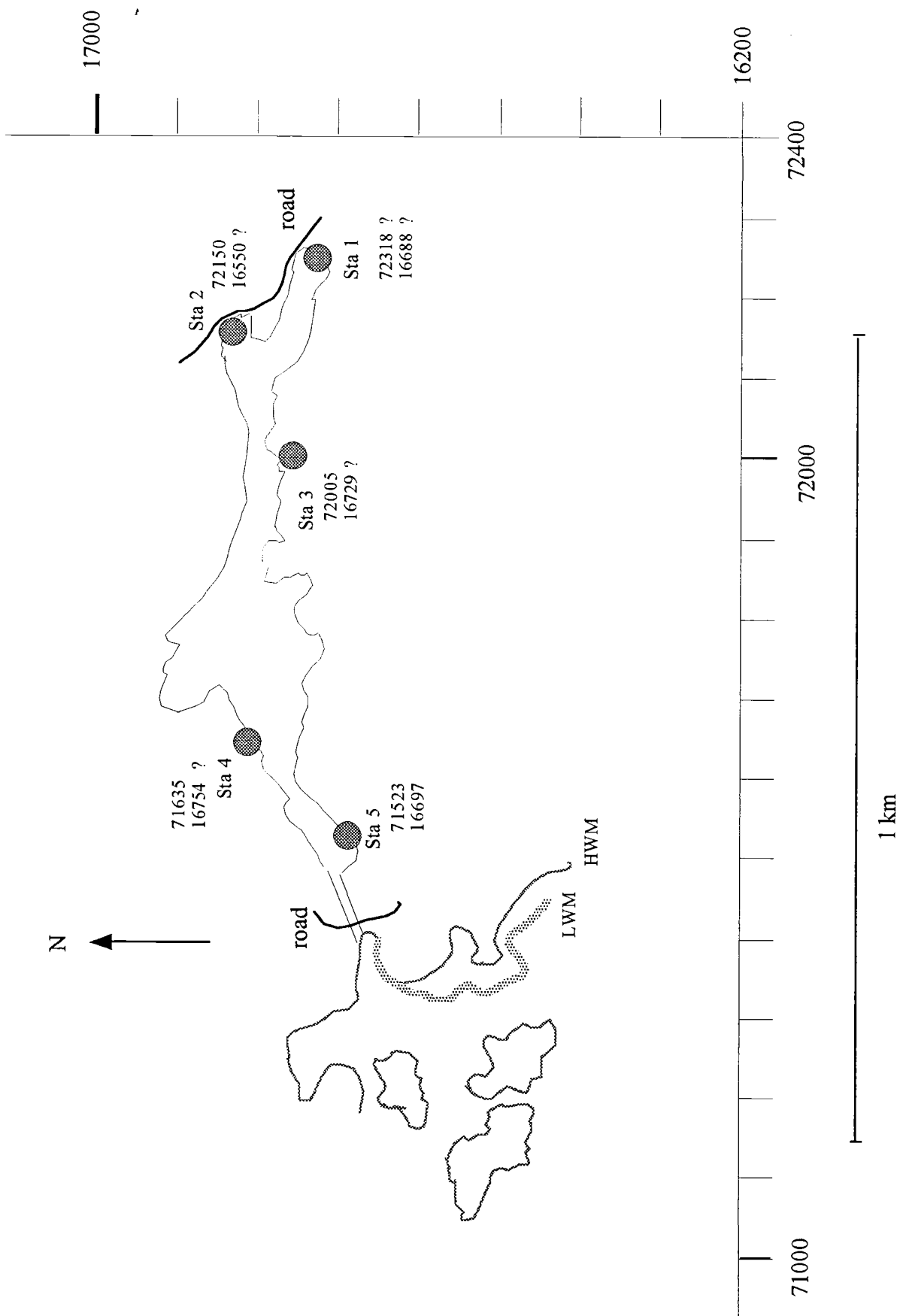


Figure 4.13.2 Sketch map of Sally's Lake, Co. Donegal, showing sampling stations used for a survey of aquatic fauna, 1998.



## Results

Table 4.13.1 shows the total species list for each station. The following is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes (L\* = lagoonal specialist in Britain):

### Marine

*Anthopleura ballii*  
*Lumbrinereis gracilis*  
*Platynereis dumerili*  
*Polyopthalmus pictus*  
*Pomatoceros* sp.  
*Scoloplos armiger*  
Spirorbidae indet.  
Sipunculidea indet.  
\**Ampithoe ramondi*  
*Dexamine spinosa*  
*Microdeutopus anomalous*  
\**Lembos longipes*  
*Cancer pagurus*  
*Asterias rubens*  
*Leptosynapta inhaerens*  
*Alcyonidium gelatinosum*  
*Clavelina lepadiformis*

### Marine-polyhaline

*Arenicola marina*  
*Corophium volutator*  
*Notodelphys* sp.  
*Praunus flexuosus*  
*Crangon crangon*  
*Palaemon elegans*  
*P. serratus*  
*Littorina saxatilis*  
*Rissoa parva*  
*Mytilus edulis*  
*Ostrea edulis*  
*Amphipholis squamata*  
*Bowerbankia gracilis*  
*Cryptosula pallasiana*  
*Asciidiella aspersa*  
*Gobius niger*

### Poly-mesohaline

*Onoba aculeus* L\*  
*Cerastoderma glaucum* L\*  
*Pomatoschistus microps*

### Euryhaline

*Idotea chelipes* L\*  
*Gammarus duebeni*  
*G. zaddachi*  
*Carcinus maenas*  
\**Conopeum seurati* L\*  
*Anguilla anguilla*  
*Gasterosteus aculeatus*  
Mugilidae indet.  
*Pleuronectes flesus*

A total of 49 taxa were recorded, of which 4 species are regarded as lagoonal specialists in Britain and 3 species are interesting or rare:

*Conopeum seurati* has been recorded at 16 of the 36 sites surveyed, but is not listed in any review of Irish marine Bryozoa (Wyse Jackson, 1991). Either the species is under recorded or a truly lagoonal specialist.

*Ampithoe ramondi* was recorded at Drongawn L. in 1996 and at Kilmore L., L. an Aibhnín, and L. Athola in 1998. According to Lincoln (1979) all records from Britain are in the southwest. The record from this site may be the most northerly record for the species.

*Lembos longipes* was also recorded at Kilmore L. and L. an Aibhnin during this survey and at Drongawn L. and Furnace L. during the 1996 survey. There are only 3 previous records for Ireland (Costello *et al.* 1990).

### **Evaluation**

The fauna of Sally's Lough is moderately rich but this is largely due to the marine influence. 4 species are listed as lagoonal specialists in Britain. Three species are possibly rare.

It seems that this lagoon is at least partly artificial and much of the central parts are covered in a deep layer of anoxic organic silt which supports very little fauna. Most of the species are marine or marine-polyhaline which presumably can enter or leave the lagoon quite freely depending on environmental conditions.

The lagoon is situated in an area of unspoilt natural beauty but the lagoon itself is not a particularly good example of its type.

See Evaluation (Section 7) for further details and ranking of the 36 sites.

Table 4.13.1 Aquatic fauna recorded at stations in Sally's Lough, Co. Donegal. 1998.

Taxa	Stations										
	1	L.T. 1	2	L.T. 2	mid	3	L.T.3	4	L.T.4	5	
Cnidaria	<i>Anthopleura ballii</i>	c		a		a	a		a		a
Nemertea	indet.					+					
Annelida	<i>Arenicola marina</i>						c				
	<i>Lumbrinereis gracilis</i>					a					
	<i>Platynereis dumerili</i>					c					
	<i>Polyophthalmus pictus</i>					c					
	<i>Pomatoceros sp.</i>										+
	<i>Scoloplos armiger</i>					a					
	Spirorbidae indet.								+		+
Sipuncula	indet.						+				
Crustacea											
Ostracoda											a
Copepoda	<i>Notodelphys sp.</i>			+					+		+
Mysidacea	<i>Praunus flexuosus</i>	a	15	a	78	c	c	35	c	37	c
Isopoda	<i>Idotea chelipes</i>	o					+				
	<i>Jaera sp.</i>	1	1								+
Amphipoda		o	2	o	1	a	c	2	a	1	9
	<i>Ampithoe ramondi</i>					c	+		1		
	<i>Corophium volutator</i>	o	1	a		o	1	1	c		1
	<i>Dexamine spinosa</i>						1		1		
	<i>Gammarus duebeni</i>			o	1			1	1		
	<i>G. zaddachi</i>								1		
	<i>Lembos longipes</i>								1		
	<i>Microdeutopus anomalous</i>		1	o		a	8		32	1	9
Decapoda	<i>Cancer pagurus</i>								F=1		
	<i>Carcinus maenas</i>	F=65		+		+	+		F=35		+
	<i>Crangon crangon</i>										c
	<i>Palaemon elegans</i>	+		+		+		+	+		+
	<i>P. serratus</i>			+					+		
Acarina	indet.										+
Insecta	Chironomidae indet.	+		+							
L. T. = light trap. F = Fyke net. + = present, o = occasional, c = common, a = abundant.											
continued....											

Table 4.13.1 cont. Aquatic fauna recorded at stations in Sally's Lough, Co. Donegal. 1998.

Taxa	Stations									
	1	L.T. 1	2	L.T. 2	mid	3	L.T.3	4	L.T.4	5
Mollusca										
Prosobranchia	<i>Littorina saxatilis</i>	l		+			+			
	<i>Onoba aculeus</i>	o					+	+		
	<i>Rissoa parva</i>	+		+		l	+	+		+
	<i>Skeneopsis planorbis</i>			shells				shells		
Bivalvia	<i>Cerastoderma glaucum</i>	spat		spat		spat	spat	spat		spat
	<i>Mya arenaria</i>	shells		shells		shells	shells	shells		shells
	<i>Mytilus edulis</i>							+		
	<i>Ostrea edulis</i>							+		
Bryozoa	<i>Alcyonidium gelatinosum</i>						+			
	<i>Bowerbankia gracilis</i>			+						
	<i>Conopeum seurati</i>			a						
	<i>Cryptosula pallasiana</i>	+					+			+
Echinoderma	<i>Amphipholis squamata</i>	c		c		c	c	c		c
	<i>Asterias rubens</i>									l
	<i>Leptosynapta inhaerens</i>			+		c		c		
Tunicata	<i>Asciidiella aspersa</i>	+		+			+	+		+
	<i>Clavelina lepadiformis</i>					+	+	+		+
Pisces	<i>Anguilla anguilla</i>	F=3		F=4			+		F=5	
	<i>Gasterosteus aculeatus</i>	+			3		o	2		
	<i>Gobius niger</i>	+							F=2	c
	<i>Pleuronectes flesus</i>			F=1						
	<i>Pomatoschistus microps</i>	+	10	+	5		+		+	c
L.T. = light trap; F = Fyke net; + = present, o = occasional, c = common, a = abundant.										

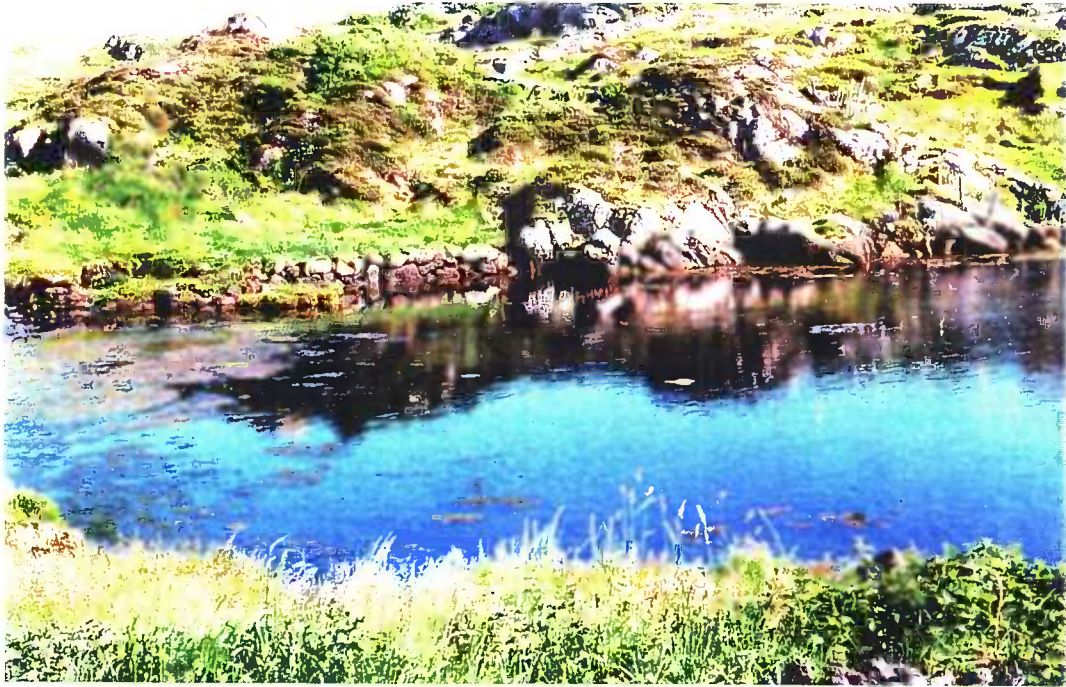


Plate 4.13.1 View of eastern end of the lough (Sta. 1). Sally's Lough , Co. Donegal.



Plate 4.13.2 View of western end of the lough (Sta. 5). Sally's Lough , Co. Donegal.



Plate 4.13.3. View looking west along the lagoon across Sta. 2. Sally's Lough, Co. Donegal. 1998.

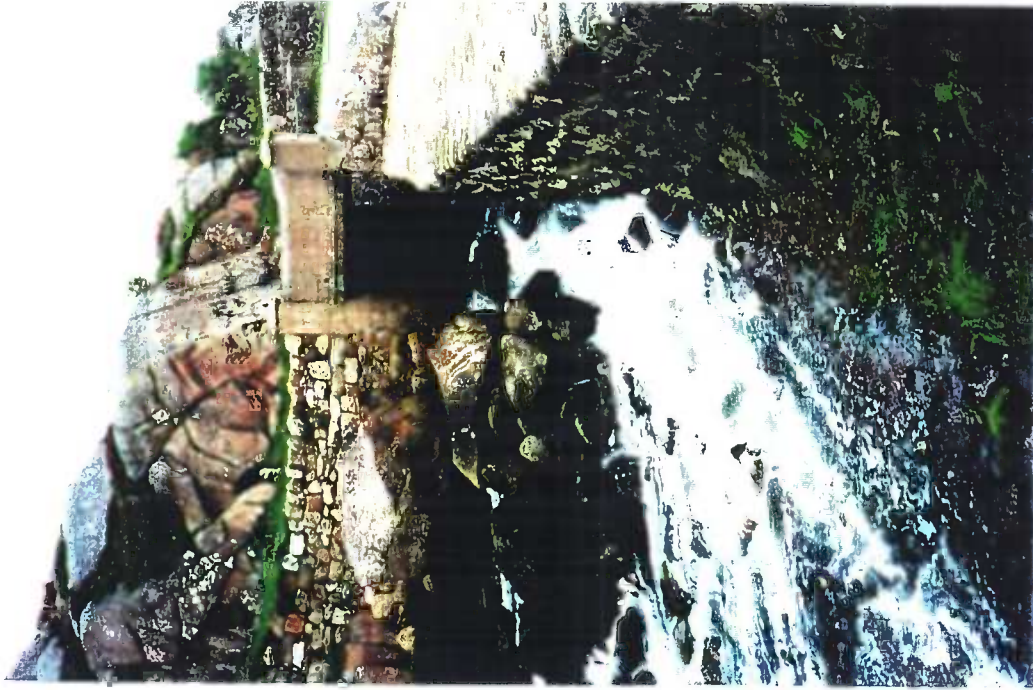


Plate 4.13.5. View of bridge at westend of the lough  
Sally's Lough , Co. Donegal. 1998.



Plate 4.13.4. View of sluice at west end of the lough.  
Sally's Lough , Co. Donegal. 1998.

#### 4.14 Kincas Lough, The Rosses, Co. Donegal.

OS B752197 55° 01.5' N; 08° 23.0' W

##### Description

Kincas Lough is a saline lake lagoon with an unsluiced artificial outlet.

The small lake (c. 6 ha) lies opposite Cruit Island, approximately 6 kms west of Annagary (Fig 4.14.1). According to local information, the channel from Lough Mullaghderg was deepened in order to relieve flooding. As a result, this raised water levels in Kincas Lough and the tidal inlet was deepened in order to lower these water levels. Seawater enters from the west on most tides but the lakes also receive large volumes of freshwater from small streams and the channel which drains from Lough Mullaghderg to the north. The lough is up to 5m deep and surface salinity varied from 5-10 ppt on 19/6/96 and 7.4 - 13.1 ppt in September 1998 but 32-33 ppt below 1m. Substrate is rock, granitic sand and gravel with deep layer of anoxic silt in central areas. The lagoon is surrounded by high granite hills and moorland. It is believed that effluent from the caravan site at L. Mullaghderg has caused pollution in the lagoon.

##### Sources of Information

None ?

##### Sampling stations

The area was sampled on 19/6/1996, briefly in 29/6/98 and from 7-8/9/98.

Four sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows (Fig. 4.14.2).

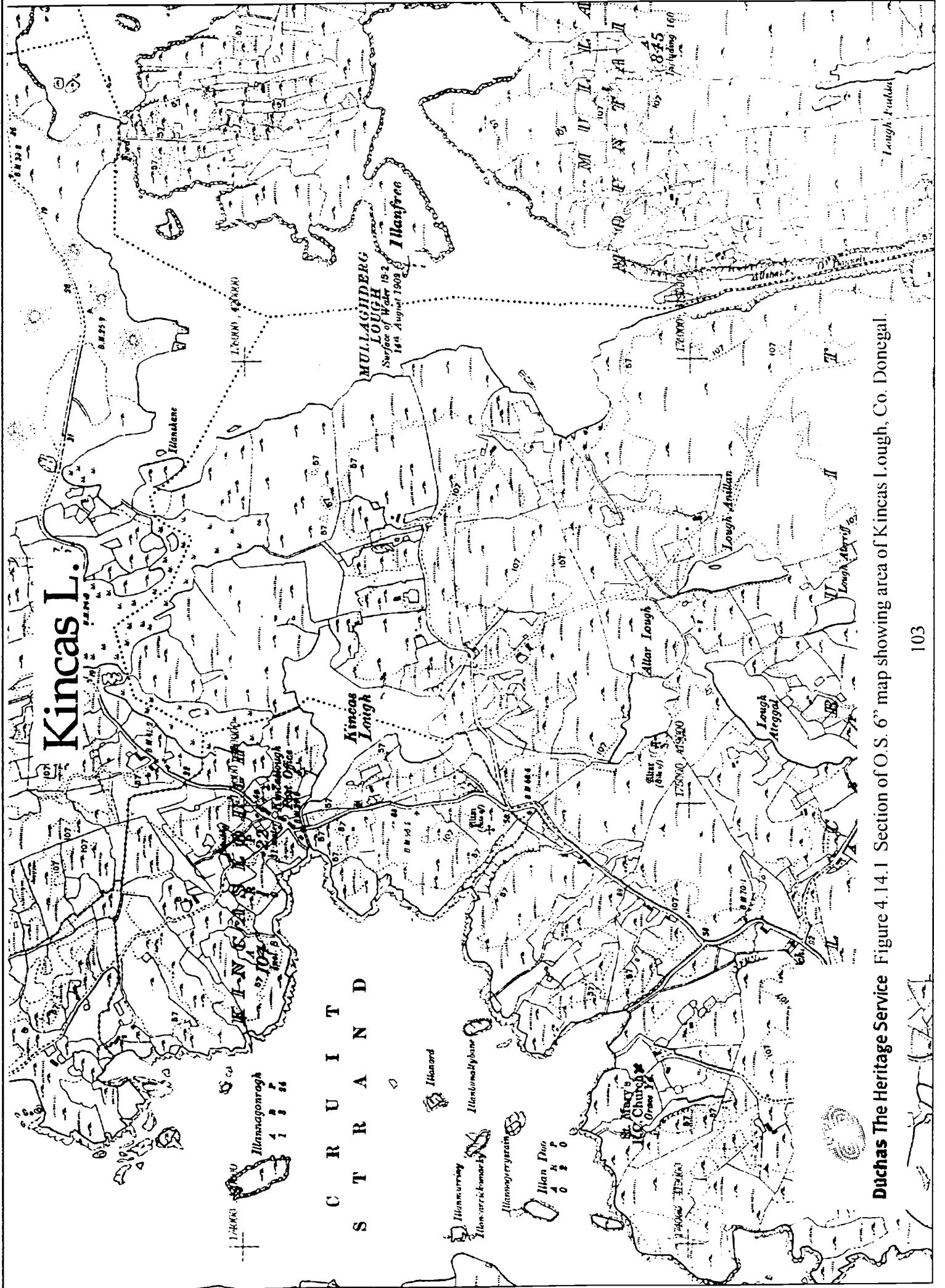
**Station 1** (B 75229 19885) was located at the north end of the lough near the inflow from Mullaghderg (Plate 4.14.1). Substrate consisted of gravel along the shoreline with scattered rocks and some stones. Depth was 0-1m and salinity 1.5 ppt at the inflow, 7.4 -8.6 along the shore and 29 ppt at 1m depth.

**Station 2** (B 75385 19820) was located at the eastern end of the lough (Plate 4.14.2). Depth was 0.2 - 1m and salinity measured 9.1 ppt on the surface and 29 ppt at 1m. Substrate was sand and gravel with some rocks and soft anoxic silt with *Chaetomorpha* at 1m depth. The area was bordered by moorland.

**Station 3** (B75278 19621) was located at the southern end of the lough bordered by *Phragmites* (Plate 4.14.3). Substrate consisted of fine, anoxic organic silt and clay with mats of reedbed rhizomes. Depth varied from 0.3 - 1m and salinity varied from 12.2 ppt at the surface to 30.9 ppt at 1m depth.

**Station 4** (B 75117 19805) was located at the edge of the reed bed at the northwest corner near the tidal inlet to the lough (Plate 4.14.4). Depth was 0.2 - 1m and salinity was 11.4 ppt at the surface and 27.5 ppt at 1m. Substrate consisted of *Phragmites* root mats.





# Kincas L.

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Dúchas The Heritage Service Figure 4.14.1 Section of O.S. 6" map showing area of Kincas Lough, Co. Donegal.

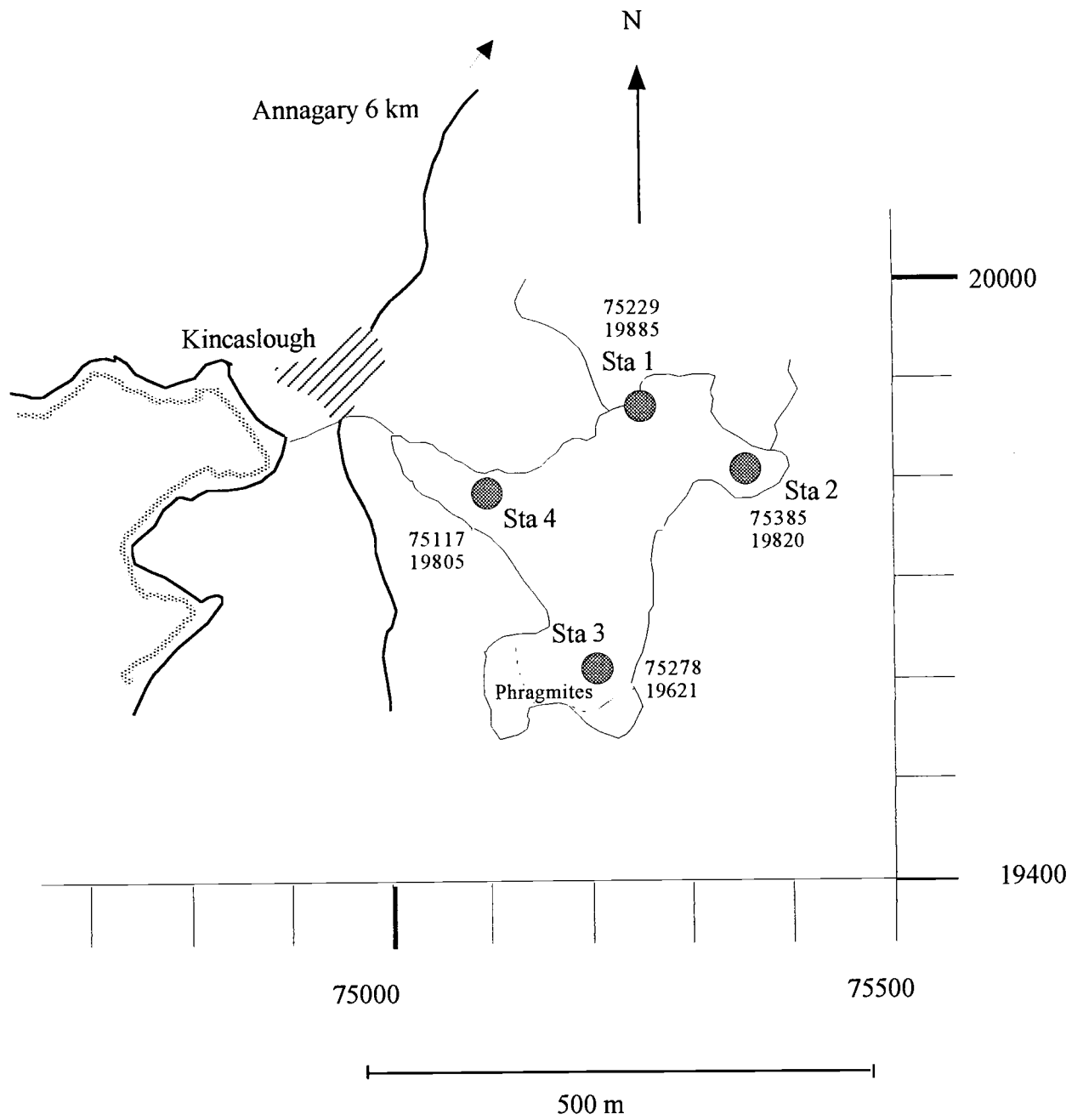


Figure 4.14.2 Sketch map of Kincaslough, Co. Donegal, showing sampling stations used for a survey of aquatic fauna, 1998.

## Results

Table 4.14.1 shows the total species list for each station. The following is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes (L\* = lagoonal specialist in Britain; L\*IR = proposed as lagoonal specialist in Ireland; \* = interesting or rare species).

### Marine

*Astropecten irregularis*

### Marine-polyhaline

*Fabricia stellaris*

*Crangon crangon*

*Hydrobia ulvae*

*Skeneopsis planorbis*

### Poly-mesohaline

*Pomatoschistus microps*

### Euryhaline

*Jaera nordmanni*

L\*IR?

*Neomysis integer*

L\*IR?

*Gammarus duebeni*

*Carcinus maenas*

*Palaemonetes varians*

L\*

*Potamopyrgus antipodarum*

\**Conopeum seurati*

L\*

*Anguilla anguilla*

*Gasterosteus aculeatus*

*Pleuronectes flesus*

### Meso-oligohaline

\**Cordylophora caspia*

L\*IR?

*Ischnura elegans*

*Gyrinus caspius*

### Oligohaline-limnetic

*Colymbetes fuscus*

### Limnetic

*Agabus sturmii*

*A. bipustulatus*

### Uncertain

*Limnephilidae indet.*

A total of 27 taxa were recorded, of which 2 species are listed as lagoonal specialists in Britain and 3 species are proposed as lagoonal specialists in Ireland. 2 species appear to be interesting:

*Cordylophora caspia* was also recorded at Inch L. during this survey, at Durnesh L. during the 1996 survey, at Rostellan, Co. Cork and Rinmore, Co. Galway during the Inventory and previously at Lady's Island L. (Healy *et al.*, 1982). According to Arndt (1984), the species "appears to be an excellent bio-indicator for eutrophic brackish water in the horohaline zone". It is a proposed lagoonal specialist for Ireland.

*Conopeum seurati* has been recorded at 16 of the 36 sites surveyed, but is not listed in any review of Irish marine Bryozoa (Wyse Jackson, 1991). Either the species is under recorded or a truly lagoonal specialist.

*Agabus sturmi* is also characteristic of eutrophic or mesotrophic waters. The hydrobiids were identified as *P. antipodarum* and *H. ulvae* although some live specimens showed pigmentation of the tentacles similar to that described for *H. neglecta*. All preserved specimens were identified as one of the former two species.

### **Evaluation**

It is possible that Kincas Lough was a freshwater lake before the channel to the sea was deepened. The lagoon is now stratified with almost fully saline water below 1m depth.

The fauna is not rich and is dominated by euryhaline and marine/polyhaline species, most of which are highly mobile and able to enter and leave the lagoon freely. At least 2 of the species appear to indicate eutrophic conditions.

The Hydrobiids would be worth further investigation, but otherwise the fauna is not particularly interesting, and at least two species are characteristic of eutrophic conditions.

The lagoon is situated in an area of scenic interest but the lagoon is not a particularly good example of its type.

See Evaluation ( Section 7) for further details and ranking of the 36 sites.

Table 4.14.1 Aquatic fauna recorded at stations in Kincas Lough, The Rosses, Co. Donegal. 1998.

Taxa		Stations							
		1	L.T. 1	2	L.T. 2	3	L.T. 3	4	L.T. 4
Cnidaria									
	<i>Cordylophora caspia</i>	+							
Nemertea	<i>Lineus sp.</i>					+			
Annelida	<i>Fabricia stellaris</i>				1				
Crustacea									
Ostracoda					c				
Mysidacea	<i>Neomysis integer</i>	0		o		o		o	1
Isopoda	<i>Jaera nordmanni</i>	c		+		o			
Amphipoda		+	2	+	3			+	
	<i>Gammarus duebeni</i>	19	2	4	2	6		34	
Decapoda	<i>Carcinus maenas</i>							F=15	
	<i>Crangon crangon</i>	+	1	+					5
	<i>Palaemonetes varians</i>	o		o					
Acarina	indet.				4				
Insecta									
Odonata	<i>Ischnura elegans</i>					2		+	
Trichoptera	Limnephilidae indet.					cases		+	
Coleoptera						+		+	
	<i>Agabus bipustulatus</i>					1			
	<i>A. sturmii</i>					1			
	<i>Colymbetes fuscus</i>					1			
	<i>Gyrinus caspius</i>			1					
Diptera	Chironomidae indet.			+	2	+	5	+	
Mollusca									
Prosobranchia	<i>Hydrobiidae</i>	o		c	10	a	35	a	
	<i>Hydrobia ulvae</i>					a		a	
	<i>Potamopyrgus antipodarum</i>	o		c					
	<i>Skeneopsis planorbis</i>	+							
Bivalvia	( <i>Cerastoderma glaucum</i> )	shells							
Bryozoa	<i>Conopeum seurati</i>			+					
Cnidaria	<i>Astropecten irregularis</i>					+			
Pisces	<i>Anguilla anguilla</i>							F=21	
	<i>Gasterosteus aculeatus</i>	o	1	+	2	+			
	<i>Pleuronectes flesus</i>	+						F=2	
	<i>Pomatoschistus microps</i>	+	6	+	52	+	3	+	9
L.T. = light trap; F = Fyke net; + = present, o = occasional, c = common, a = abundant.									



Plate 4.14.1 View of sluice on stream from Mullaghderg Lough. ( Sta. 1).  
Kincas Lough, The Rosses, Co. Donegal. 1998.



Plate 4.14.2 View of eastern end of the lough (Sta. 2).  
Kincas Lough, The Rosses, Co. Donegal. 1998.



Plate 4.14.3. View of southern end of the lough, overgrown with *Phragmites* (Sta. 3)  
Kincas Lough, The Rosses, Co. Donegal. 1998.



Plate 4.14.4. View looking northeast across the lough.  
Kincas Lough, The Rosses, Co. Donegal. 1998.

#### 4.15 Moorlagh, The Rosses, Co. Donegal.

OS B790187      55° 08.8' N; 08° 19.5' W

##### Description

Moorlagh is a saline lake lagoon with an artificial barrier formed by a causeway and road bridge with a natural outlet modified by sluices.

The small lake (c. 9.5 ha) lies 0.5 km south of Annagary (Fig 4.15.1). A causeway has been built across the outlet with 3 culverted channels each with a wooden sluice. Seawater enters from the north on most tides but large streams enter from the south. Depth is very shallow (less than 0.75m) and salinity probably varies considerably. In August salinity measured 0 ppt at the tidal inlet but up to 9-17 ppt in September and on spring tides is likely to be much higher. On the surface of the main body of the lake 7.3 - 9.7ppt was recorded, and up to 30.1ppt at 0.75m but 0.5 - 2ppt at the southern end of the lough. Substrate is granite rocks, stones, silty sand and gravel. The surrounding land is rocky heath with hills to the east.

##### Sources of Information

None ?

##### Sampling stations

The area was sampled in 1996, briefly in 29/6/98, and from 9 - 11 /9/98.

Five sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows (Fig. 4.15.2).

**Station 1** (B 78906 19056) was located at the north end of the lough near the tidal inlet (Plate 4.15.1). Substrate consisted of gravel in the channel with rocks and fine peaty sand and silt in sheltered areas. Depth was 0-0.5m and salinity measured 14.8 - 17 ppt at 11 am and 9ppt at 5pm on the same day.

**Station 2** (B 78934 18736) was located on the west shore of the lough about 250m from the tidal inlet. Depth varied from 0 - 0.75 m and salinity measured 7.3 -8.5 ppt. Substrate was gravel on the shore with sandy silt in deeper water with scattered rocks. The area was bordered by granite stones and moorland with peat cliffs and isolated peat clumps along the shoreline.

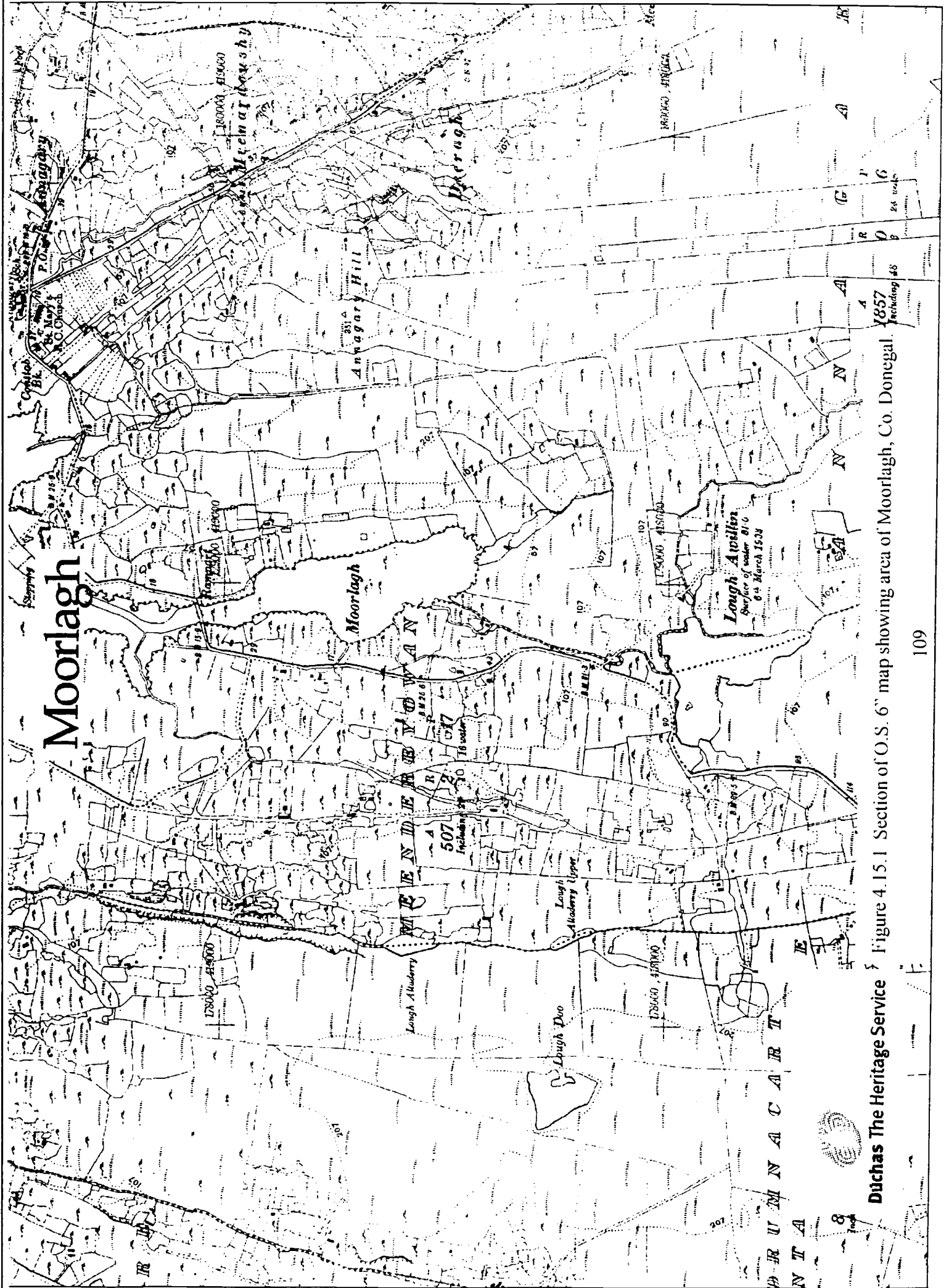
**Station 3** (B78870 18723) was located midway along the western shore in a small bay where a drainage channel enters (Plate 4.15.2, 3). Substrate consisted of soft peaty silt with occasional rocks and clay with mats of reedbed rhizomes covered with dense growths of *Potamogeton/Ruppia*. Depth varied from 0 - 0.75 m and salinity measured 9.7ppt at the surface and 18.5 ppt at 0.75m. The area was bordered by wet moorland with peat cliffs along the shoreline.

**Station 4** (B 79054 18710) was located midway along the eastern shore (Plate 4.15.2). Depth was very shallow (less than 30cm) and salinity measured 6.8 - 7.8ppt. Substrate consisted of gravel with peaty silt and the area was bordered by moorland, rock and stone walls. This was the most exposed shoreline to prevailing winds.

**Station 5** (B78925 18518) was located at the southern end of the lough where a small river enters. Depth was 0 -1m and salinity measured 0.5 - 2 ppt at the surface and 27 - 29ppt at 1m depth. Substrate consisted of peaty silt and the area was bordered by moorland and wet grassland with a small conifer plantation on one side.



# Moorlagh



Duchas The Heritage Service 5 Figure 4.15.1 Section of O.S. 6" map showing area of Moorlagh, Co. Donegal. Y857 (including #6)

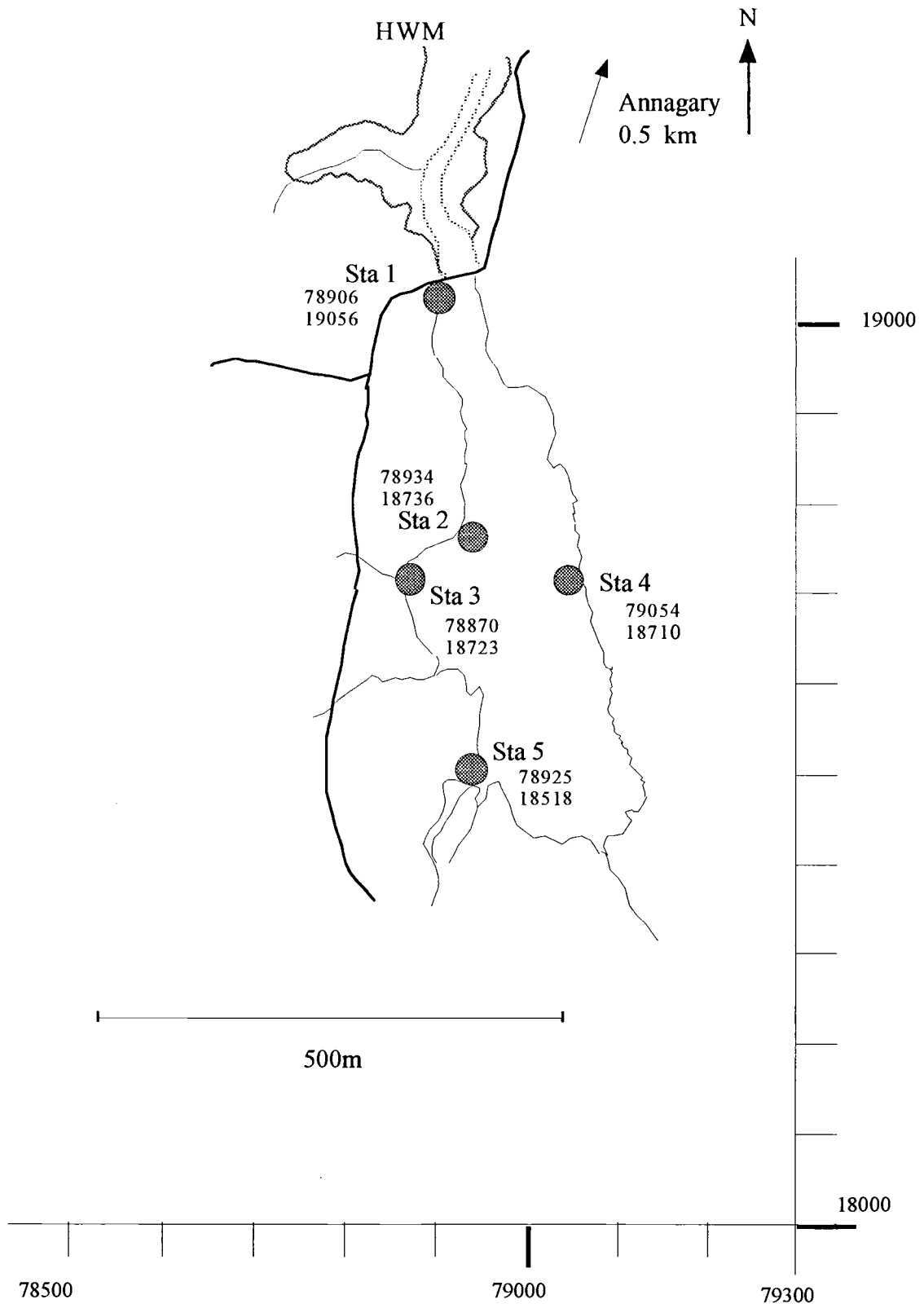


Figure 4.15. 2 Sketch map of Moorlagh, Co. Donegal, showing sampling stations used for a survey of aquatic fauna, 1998

## Results

Table 4.15.1 shows the total species list for each station. The following is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes (L\* = lagoonal specialist in Britain, L\*IR = proposed as lagoonal specialist in Ireland. Species in brackets refer to previous records):

### Marine

*Tetrastemma melanocephalum*

### Marine-polyhaline

*Praunus flexuosus*

*Melita palmata*

*Crangon crangon*

*Hydrobia ulvae*

*Skeneopsis planorbis*

### Poly-mesohaline

\*(*Jaera ischiosetosa*) (1996) L\*IR?

*H. ventrosa* L\*

*Pomatoschistus microps*

### Euryhaline

*J. nordmanni* L\*IR?

*Lekanesphaera hookeri* L\*

*Neomysis integer* L\*IR?

*Gammarus zaddachi*

*Carcinus maenas*

*Palaemonetes varians* L\*

*Potamopyrgus antipodarum*

*Anguilla anguilla*

*Pleuronectes flesus*

*Salmo trutta*

### Meso-oligohaline

*Ischnura elegans*

### Oligohaline-limnetic

*Hydrometra stagnorum*

*Haliphus rufficollis*

### Limnetic

*Gerris lacustris*

*Gyrinus substriatus*

*Helophorus brevipalpis*

Aeschnidae indet.

*Haliphus fulvus*

*H. lineolatus*

A total of 29 taxa were identified, of which 3 species are listed as lagoonal specialists in Britain and 3 are proposed lagoonal specialists in Ireland (1 of these was recorded only in 1996).

Only one species, which was only recorded in 1996, is considered to be rare and none are particularly abundant.

*Jaera ischiosetosa* was recorded at L.an Chara, L. Athola and Maghera L. in 1998 and at this site and L. Murree and Furnace L. in 1996. The only previous record appears to be for L. Hyne. Co. Cork (Goss Custard *et al.*, 1979).

The fauna is poor and dominated largely by euryhaline and marine/polyhaline species most of which are highly mobile and able to enter and leave fresh or seawater freely. The Coleopteran species may easily have been washed into the lagoon as a result of high rainfall and freshwater discharge from the streams.

## **Evaluation**

Very few species were recorded in Moorlagh and only one is considered to be rare, although several are lagoonal specialists.

The lagoon is very shallow and undoubtedly undergoes extreme variations in salinity and could be described as what Hartog (1974) refers to as a “shock system”, which could explain the paucity of resident species.

The lagoon is at least partly artificial and although it is set in an area of scenic value, the lagoon itself is not a particularly good example of its type based on fauna.

See Evaluation (Section 7) for further details and ranking of the 36 sites.





Plate 4.15.1 View of bridge and sluices at the north end of the lough. ( Sta. 1).  
Moorlagh, The Rosses, Co. Donegal. 1998.



Plate 4.15.2 View looking southeast across the lough from the road.  
Moorlagh, The Rosses, Co. Donegal. 1998.



Plate 4.15.3. View looking west across the lough (Sta. 3 in foreground, Sta. 4 in distance). Moorlagh, The Rosses, Co. Donegal 1998.

#### 4.16 Inch Lough, Lough Swilly, Co. Donegal.

OS C352230 55° 03.0' N; 07° 27.0' W

##### Description

Inch Lough is a large artificial saline lagoon with two artificial barriers and one sluiced outlet.

The lake is situated on the Inishowen Peninsula, between the mainland and Inch Island, approximately 12 km to the west of Derry (Plate 4.16.1). Open water covers an area of approximately 160 ha and was formed by construction of 2 barriers from the mainland to Inch island and a railway embankment along the eastern shore. There may have been an intention to reclaim this previously tidal area between the island and the mainland, but it is now flooded and water is pumped into it from the surrounding polderland. The lake is shallow throughout (less than 2m) and substrate consists of previously estuarine sediments of sand, gravel, and shells. Seawater presumably enters on the highest spring tides through gaps in the sluice flaps but also by percolation through the barrier. However, large volumes of freshwater enter from drainage ditches and by pumping from the polderland. Salinity is generally low (0 -2ppt) but up to 20ppt were measured along the southern causeway at 2m depth.

The polderland is now mostly part of one large 3,000 acre farm owned by the local creamery and managed by agreement between the NPWS and the creamery. The lake holds large numbers of waterfowl in the winter and is generally of great ornithological value.

##### Sources of Information

Mention of ornithological importance is made in Hutchinson (1986) and Sheppard (1993).

##### Sampling stations

The area was sampled in June 1996, briefly on 27/6/98, and from 11 - 15/9/98. Eight sampling stations were selected to reflect the influences of substrate, vegetation, freshwater and tidal inflows (Fig. 4.16.2).

**Station 1** (C33641 21938) was located at the south west end of the lough near the causeway and sluice (Plates 4.16.1-3). Depth was up to 2m and salinity increased from 1ppt on the surface to 13.8ppt at 1m and 21.2ppt at 2m depth. Substrate consisted mostly of stones, coarse sand and fine sediments in sheltered areas. The area was bordered by the stone embankment, overhanging bushes and patches of wet grassland.

**Station 2** (C3395 2265) was located at the north end of the southern embankment on the shoreline of Inch island. Water levels were particularly high (up to 1.5m) and substrate consisted partly of flooded wet grassland with gravel and stones in deeper water. Salinity measured 2 - 5ppt along the shore and up to 17.5ppt at 1.5m. The area was bordered by the stone embankment and patches of wet grassland.

**Station 3** (C33964 22584) was located on the south eastern shoreline of Inch island inside a small bay formed by a spit running to the southwest. Depth varied from 0 - 1.2m and salinity from 1.6 - 5.1ppt, respectively. Substrate consisted of flooded wet grassland and *Scirpus*, marine sediments with soft mud and some stones. at depth.

**Station 4** (C35088 22906) was located on the western shore of the central narrowest part of the lake where a track runs across a ford from the mainland to the island. Depth was up to 0.75m and salinity measured 0ppt (115 mg/l). As water levels were so high substrate was



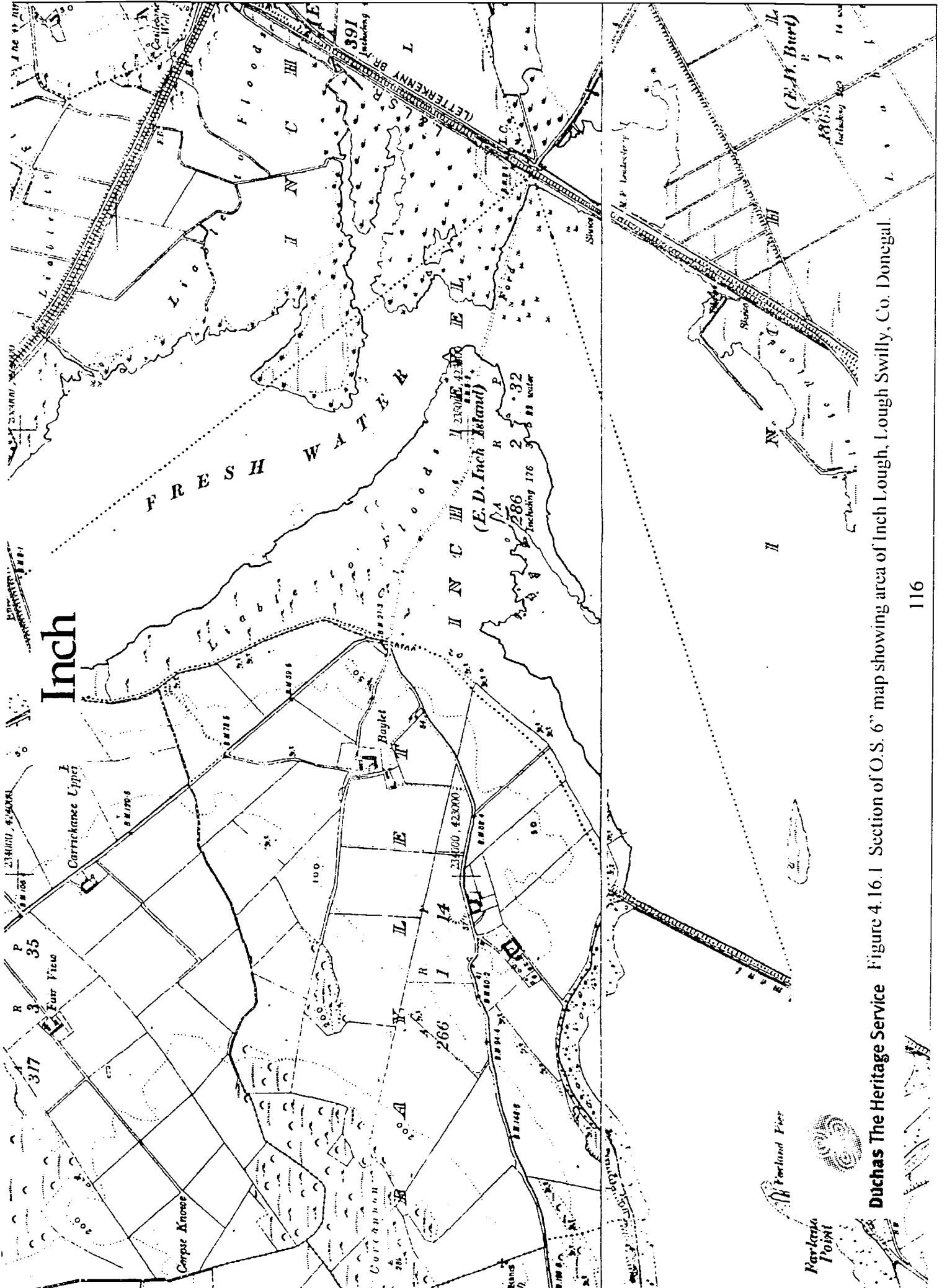
mostly flooded grassland at the time of sampling, but was seen to consist of stones along the ford and fine muddy sand on previous visits.

**Station 5** (C34479 23863) was located at the north west corner of the lake beside the northern embankment (Plate 4.16.6). Depth was up to 1m and salinity measured 0.1 - 0.2ppt (311 - 365mg/l). Substrate consisted of stones and fine silty sand. The area was bordered by the stone embankment, alder woodland and *Scirpus* along the shoreline with a floating mat of decaying green algae.

**Station 6** (C35015 23937) was located on the northeast shore of the lake. Depth was from 0.2 - 0.75m and salinity measured 0.3ppt (450mg/l). Substrate was presumably silty sand but covered with a thick layer of decaying algae. The area was bordered by alder woodland and *Scirpus* along the shoreline.

**Station 7** (C35405 23269) was located on the eastern shore of the lake where the river enters. Depth varied from 0.3 - 0.75m and salinity measured 0ppt (86mg/l). Substrate was mostly flooded grassland with softer sediments in the river channel. The area was bordered by *Scirpus*, *Juncus* and *Phragmites*.

**Station 8** (C35411 22805 ?) was located on the eastern shore of the lake just north of the pumping station (Plate 4.16.5). Depth was 0 - 1m. Salinity measured 0.1ppt (292 mg/l). Substrate was mostly flooded grassland, stones and soft silty mud. The area was bordered by flooded grassland and emergent vegetation.



# Inch

Duchas The Heritage Service Figure 4.16.1 Section of O.S. 6" map showing area of Inch Lough, Lough Swilly, Co. Donegal.

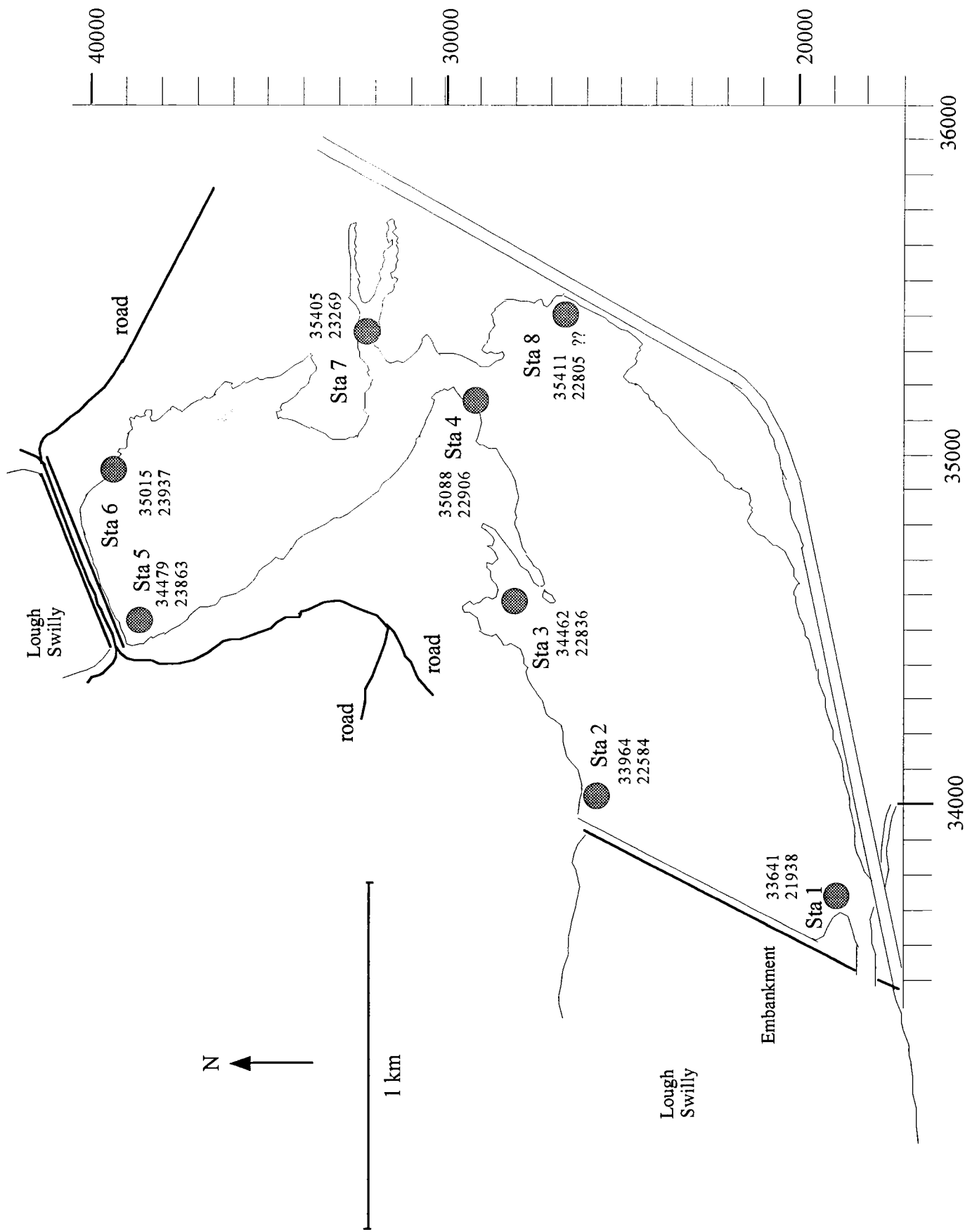


Figure 4.16.1 Sketch map of Inch Lough, Lough Swilly, Co. Donegal, showing sampling stations used for a survey of aquatic fauna, 1998.



Plate 4.16.1 View of bridge and sluice on the embankment at the north end of the lough. (Sta. 1). Inch Lough, Lough Swilly, Co. Donegal. 1998.



Plate 4.16.2 View looking northeast along the shore of the lough from Sta. 1. Inch Lough, Lough Swilly, Co. Donegal. 1998.



Plate 4.16.3 View from the embankment looking northeast across the lough ( Sta. 1).  
Inch Lough, Lough Swilly, Co. Donegal. 1998.



Plate 4.16.4 View looking northwest across the embankment to Inch island.  
Inch Lough, Lough Swilly, Co. Donegal. 1998.



Plate 4.16.5 View looking northwest across the central part of the lough. from Sta. 8. Inch Lough, Lough Swilly, Co. Donegal. 1998.



Plate 4.16.6 View looking south across the lough from Sta.5. (showing rafts of *Enteromorpha*) Inch Lough, Lough Swilly, Co. Donegal. 1998.

## Results

Table 4.16.1 shows the total species list for each station. The following is a list of species arranged in broad ecological categories based on the Venice system of salinity regimes (L\* = lagoonal specialist in Britain, L\*IR = proposed as lagoonal specialist in Ireland; \* = interesting or rare species. Species in brackets refer to previous records).

Marine-polyhaline	<i>Lumbricillus sp.</i>	
Poly-mesohaline	Tubificidae indet. <i>Corophium volutator</i> <i>Crangon crangon</i> <i>Pomatoschistus microps</i>	
Euryhaline	? <i>Procerodes littoralis</i> <i>Jaera nordmanni</i> <i>Lekanesphaera hookeri</i> <i>Neomysis integer</i> <i>Gammarus duebeni</i> <i>Carcinus maenas</i> <i>Palaemonetes varians</i> <i>Potamopyrgus antipodarum</i> * <i>Conopeum seurati</i> <i>Anguilla anguilla</i> <i>Gasterosteus aculeatus</i> <i>Pleuronectes flesus</i>	L*IR L* L*IR  L* L*
Meso-oligohaline	* <i>Cordylophora caspia</i> <i>Ischnura elegans</i> <i>Corixa panzeri</i> <i>Sigara stagnalis</i>	L*IR  L*
Oligohaline-limnetic	<i>Callicorixa praeusta</i> <i>Notonecta glaucum</i> <i>Sigara concinna</i> <i>Helophorus brevipalpis</i> <i>Laccobius biguttatus</i> <i>Noterus clavicornis</i> <i>Ochthebius dilatatus</i> <i>Lymnea peregra</i> <i>Rutilus rutilus</i> <i>Salmo trutta</i>	L*
Limnetic	<i>Hygrotus impressopunctatus</i> <i>H. inaequalis</i> * <i>H. novemlineatus</i> <i>Gerris odontogaster</i> <i>Sigara dorsalis</i> <i>S. scotti</i> <i>S. wollastoni</i> <i>Haliplus wehnckeii</i> <i>Anisus leucostoma</i> * <i>Aplexa hypnorum</i> <i>Limnaea palustris</i> <i>Oxyloma pfeifferi</i> <i>Physa fontinalis</i> <i>Vertigo antivertigo</i>	
Uncertain	<i>Cercyon convexiusculus</i> <i>Helophorus obscurus</i> <i>Propylea quattrodecimpunctata</i>	

A total of 53 taxa were recorded, of which 5 are listed as lagoonal specialists in Britain and an additional 3 species are proposed lagoonal specialists in Ireland. Four species appear to be of particular interest:

*Cordylophora caspia* was also recorded at Kincas L. during this survey, and at Durnesh L. during the 1996 survey, at Rostellan, Co. Cork and Rinmore, Co. Galway during the Inventory and previously at Lady's Island L. (Healy *et al.*, 1982). According to Arndt (1984) it "appears to be an excellent bio-indicator for eutrophic brackish water in the horohaline zone". It is a proposed lagoonal specialist for Ireland.

*Aplexa hypnorum* appears to be an uncommon species in the north of the country (Kerney, 1976).

*Hygrotus novemlineatus* appears to have declined in Northern Ireland, mirroring the trend in England (Nelson, 1997).

*Conopeum seurati* has been recorded at 16 of the 36 sites surveyed, but is not listed in any review of Irish marine Bryozoa (Wyse Jackson, 1991). Either the species is under recorded or a truly lagoonal specialist.

### **Evaluation**

Although totally artificial, Inch Lough is one of the largest lagoonal habitats in the country.

The species list is fairly extensive due to the abundance of oligohaline/limnetic species of Heteroptera and Coleoptera but many of the other species are euryhaline with several lagoonal specialists and interesting species.

The lake is protected as a bird reserve but should also be valued for its invertebrate fauna.

See Evaluation (Section 7) for more details and ranking of the 36 sites.





Table 4.16.1 cont. Aquatic fauna recorded at stations in Inch Lough, Lough Swilly, Co. Donegal. 1998.

Taxa	1	L.T.1	2	L.T.2	3	4	L.T.4	5	L.T.5	6	L.T.6	7	L.T.7	8	L.T.8
Coleoptera								1							
<i>Cercyon convexiusculus</i>								1							
<i>Haliplus wehmcke</i>								1				1			
<i>Helophorus brevivalpis</i>	1					2									
<i>H. minutus</i>														2	
<i>H. obscurus</i>						3				1					
<i>Hygrotus impressopunctatus</i>															2
<i>Hygrotus inaequalis</i>						1		3							
<i>H. novemlineatus</i>								1							
<i>Laccobius biguttatus</i>										3		1			
<i>Noterus clavicornis</i>								1							
<i>Ochthebius dilatatus</i>						10									
<i>Propylea quatuordecimpunctata</i>								1							
Diptera															
Chironomidae indet.															+
Ephyndriidae indet.															
Mollusca															
<i>Anisus leucostoma</i>								+							
<i>Aplexa hypnorum</i>															+
<i>Lymnaea palustris</i>										+					
<i>L. peregra</i>	+														+
<i>Oxyloma pfeifferi</i>															+
<i>Physa fontinalis</i>										o			2		
<i>Potamopyrgus antipodarum</i>	o														
<i>Vertigo antivertigo</i>	+														
<i>Conopeum seurati</i>	+														
Bryozoa															
<i>Anguilla anguilla</i>															
Pisces															
<i>Gasterosteus aculeatus</i>															
<i>Pleuronectes flesus</i>															
<i>Pomatoschistus microps</i>															
<i>Rutilus rutilus</i>															
<i>Salmo trutta</i>															

L.T. = light trap; F = Fyke net; + = present, o = occasional, c = common, a = abundant.

## 5. Summary of the 16 sites surveyed in 1998

Table 5.1 shows a total list of taxa recorded at each of the sites. For all sites combined a total number of 294 taxa were recorded and 255 of these were identified to species. The table only lists 284 of the taxa as 10 species of Insecta were added after the table was printed (See Table 6.1). The majority of this total was made up of 62 Crustacea, 50 Mollusca, 73 Insecta, 40 Annelida and 14 fish species. The number of taxa per site varied from only 10 at L. Bofin to 113 at Kilmore L. A higher total number was recorded at Whiddy, Aibhnín and Athola, partly reflecting the more marine nature of these three sites. The list of is quite different to that of the 1996 survey: For more details see Summary of the 36 sites, Section 6.

Several species are considered rare, possibly because lagoons were never surveyed before.

Table 5.1 Aquatic faunal taxa recorded for the 16 sites selected for survey, 1998.

Taxa		1. Ballyteige	2. Kilmore L.	3. An L. Mór	4. L. Phort Chorrúch	5. L. an Chara	6. L. Fhada complex	7. L. an Aibhinn	8. L. Cara Fionnla	9. L. an tSaile	10. L. Athola	11. L. Bofin	12. Maghery L.	13. Sally's L.	14. Kincas L.	15. Moorlagh	16. Inch L.
Porifera	Axinellidae indet.							+									
	<i>Clathrina coriacea</i>										+						
	<i>Halichondria panicea</i>		+					+		+	+						
	<i>Hymeniacidon perleve</i>		+														
	<i>Leucosolenia botryoides</i>		+					+			+						
	<i>L. complicata</i>		+					+									
	<i>Suberites ficus</i>		+														
	<i>Suberites sp.</i>							+			+						
	<i>Sycon ciliatum</i>							+			+						
	<i>Tergiops fugax</i>										+						
Cnidaria	<i>Actinia equina</i>							+									
	<i>Anemonia viridis</i>							+			+						
	<i>Aurelia aurita</i>						+	+									
	<i>Anthopleura ballii</i>		+					+			+			+			
	<i>Chlorohydra viridis</i>									+							
	<i>Chrysaora hysoscella</i>		+														
	<i>Clava multicornis</i>						+			+							
	<i>Cordylophora caspia</i>														+		+
	<i>Gonothyrea loveni</i>							+									
	<i>Opercularella lacerata</i>											+					
	<i>Sagartia elegans</i>										+						
	<i>Sagartiogeton undatus</i>		+														
	<i>Sarcodictyon roseum</i>		+														
Turbellaria	planarian indet.		+				+	+			+						
	<i>Procerodes littoralis</i>			+	+					+		+					?
Nemertea	<i>Lineus ruber</i>	+															
	<i>Lineus sp.</i>							+							+		
	<i>Nemertea sp.</i>		+					+						+			
	<i>Nemertea sp. 2</i>							+									
	<i>Tetrastemma melanocephalum</i>															+	
Annelida																	
Polychaeta	<i>Arenicola marina</i>	+	+				+				+		+	+			
	<i>Autolytus prolifer</i>		+														
	<i>Capitella capitata</i>	+									+						
	<i>Circeis spirillum</i>							+			+						
	Cirratulidae indet.					+											
	<i>Eteone picta</i>										+						
	<i>Eumidia sanguinea</i>							+									
	<i>Eupolyommia nebulosa</i>		+					+									
	<i>Exogone hebes</i>		+														

Table 5.1 cont. Aquatic faunal taxa recorded for the 16 sites selected for survey, 1998.

Taxa		1. Ballyteige	2. Kilmore L.	3. An L. Mór	4. L. Phort Chorrúch	5. L. an Chara	6. L. Fhada complex	7. L. an Aibhnín	8. L. Cara Fionnla	9. L. an tSaile	10. L. Athola	11. L. Bofin	12. Maghery L.	13. Sally's L.	14. Kincaas L.	15. Moorlagh	16. Inch L.
Polychaeta	<i>Fabricia stellaris</i>																
cont...	<i>Flabelligera affinis</i>							+			+				+		
	<i>Harmothoe imbricata</i>							+			+						
	<i>H. impar</i>		+														.
	<i>Hediste diversicolor</i>	+				+	+					+	+				
	<i>Lumbrinereis gracilis</i>													+			
	<i>Myxicola infundibulum</i>		+														
	<i>Nereis zonata</i>		+														
	<i>Notomastus latericeus</i>	+															
	<i>Odontosyllis gibba</i>										+						
	Orbinidae indet.							+									
	<i>Perinereis cultrifera</i>		+								+						
	<i>Platynereis dumerili</i>		+					+			+			+			
	<i>Polynoe scolopendrina</i>		+														
	<i>Polyophthalmus pictus</i>		+					+			+			+			
	<i>Pomatoceros lamarcki</i>		+														
	<i>P. triqueter</i>		+								+						
	<i>Pomatoceros sp.</i>													+			
	<i>Sabella pavonina</i>		+														
	<i>Scoloplos armiger</i>							+						+			
	<i>Serpula vermicularis</i>										+						
	Spirorbidae indet.		+					+			+			+			
	<i>Stenolais boa</i>										+						
	<i>Typosyllis hyalina</i>		+								+						
Oligochaeta	<i>Heterochaeta costata</i>	+	+														
	<i>Lumbricillus sp.</i>	+		+													+
	<i>Marionina sp.</i>	+															
	Naididae indet.									+							+
	<i>Stylaria lacustris</i>									+							
	<i>Tubificoides benedii</i>	+									+						
	Tubificidae indet.		+					+		+							+
Sipuncula	indet.							+			+			+			
Entoprocta	<i>Pedicellina hispida</i>		+														
Crustacea																	
Ostracoda	indet	+	+		+		+							+	+		
	<i>Cytherura gibba</i>					+											
Copepoda	indet	+									+	+					+
	<i>Ascidicola rosea</i>		+														
	<i>Caligus sp.</i>		+														
	<i>Doropygus pulex</i>		+														
	<i>Eurytemora sp.</i>					+											
	<i>Notopterophorus auritus</i>										+						
	<i>Notodelphys allmani</i>		+											+			

Table 5.1 cont. Aquatic faunal taxa recorded for the 16 sites selected for survey, 1998.

Taxa		1. Ballyteige	2. Kilmore L.	3. An L. Mór	4. L. Phort Chorrúch	5. L. an Chara	7. L. Fhada complex	8. L. an Aibhinn	6. L. Cara Fionnla	9. L. an tSaile	+0. L. Athola	11. L. Bofin	12. Maghery L.	13. Sally's L.	14. Kincaas L.	15. Moorlagh	16. Inch L.
Cirripedia	<i>Elminius modestus</i>		+														
	<i>Balanus balanus</i>		+														
	<i>B. crenatus</i>		+														
	<i>B. ?improvisus</i>		+														
	<i>Chthamalus montagui</i>										+						
	<i>Semibalanus balanoides</i>		+								+		(+)				
	<i>Verruca stroemia</i>		+														
Tanaidacea	<i>Tanais dulongi</i>		+					+			+						
Cumacea	<i>Bodotria scorpioides</i>		+														
Mysidacea	<i>Mysidopsis gibbosa</i>		+								+						
	<i>Neomysis integer</i>	+					+	+	+	+			+		+	+	+
	<i>Praunus flexuosus</i>	+	+				+	+	+		+		+	+		+	
	<i>P. ?inermis</i>							+			+						
	<i>Siriella armata</i>		+														
Isopoda	<i>Idotea chelipes</i>						+	+		+	+		+	+			
	<i>I. pelagica</i>		+														
	<i>Jaera forsmanni</i>		+				+	+									
	<i>J. ischiosetosa</i>					+					+		+			(+)	
	<i>J. nordmanni</i>		+	+	+	+	+		+	+		+	+		+	+	+
	<i>J. sp.</i>													+			
	<i>Lekanesphaera hookeri</i>	+					+	+	+	+						+	+
	<i>Limnoria lignorum</i>							+									
	<i>L. quadripunctata</i>		+														
	Amphipoda	<i>Ampithoe ramondi</i>		+					+			+			+		
<i>Caprella acanthifera</i>								+									
<i>Chaetogammarus marinus</i>									+								
<i>Corophium volutator</i>		+	+				+		+	+			+	+			+
<i>Dexamine spinosa</i>		+						+			+			+			
<i>Erichthonius ?brasiliensis</i>											+						
<i>Gammarus duebeni</i>			+	+	+	+	+	+	+	+		+		+	+		+
<i>Gammarus locusta</i>					+												
<i>Gammarus zaddachi</i>		+	+				+		+	+	+		+	+		+	
<i>Jassa falcata</i>											+						
<i>Lembos longipes</i>			?					+						+			
<i>Leptocheirus pilosus</i>											+						
<i>Lissiannassidae sp.</i>											+						
<i>Melita obtusata</i>								+									
<i>Melita palmata</i>		+	+			+	+	+		+	+	+	+			+	
<i>Melita sp.</i>										+							
<i>Microdeutopus anomalus</i>											+			+			
<i>M. gryllotalpa</i>						+											

Table 5.1 cont. Aquatic faunal taxa recorded for the 16 sites selected for survey, 1998.

Taxa		1. Ballyteige	2. Kilmore L.	3. An L. Mór	4. L. Phort Chorrúch	5. L. an Chára	7. L. Fhada complex	8. L. an Aibhnín	6. L. Cara Fionnla	9. L. an tSaile	+0. L. Athola	11. L. Bofn	12. Maghery L.	13. Sally's L.	14. Kincaas L.	15. Moorlagh	16. Inch L.
	<i>Microprotopus maculatus</i>		+														
	<i>Phisica marina</i>		+								+						
Decapoda	<i>Cancer pagurus</i>		+					+			+			+			
	<i>Carcinus maenas</i>	+	+				+	+			+		+	+	+	+	+
	<i>Crangon crangon</i>	+	+				+	+					+	+	+	+	+
	<i>Hippolyte ?varians</i>										+						
	<i>Liocarcinus depurator</i>		+					+									
	<i>Pagurus bernhardus</i>		+														
	<i>P. elegans</i>		+					+			+		+	+			
	<i>P. ?longirostris</i>	+															
	<i>P. serratus</i>		+					+			+		+	+			
	<i>Palaemonetes varians</i>	+				+	+	+	+	+	+		+		+	+	+
	<i>Porcelana platycheles</i>		+														
Arachnida																	
Acarina		+											+	+	+		
Insecta																	
Ephemeroptera	indet									+							
	<i>Cloeon dipterum</i>	+															
Odonata	Anisoptera indet.								+	+							+
	<i>Ischnura elegans</i>	+		+	+		+		+	+					+	+	+
Trichoptera																	
	cases only			+	+	+	+		+	+							
	Leptoceridae indet.	+															
	Limnephilidae indet.														+		
Heteroptera	Corixidae indet.												(+)				
	<i>Callicorixa praeusta</i>	+															+
	<i>C. wollastoni</i>																+
	<i>Corixa panzeri</i>	+		+	+	+			?								+
	<i>Gerris lacustris</i>								+	+							+
	<i>G. odontogaster</i>								+								+
	<i>Gerris sp.</i>	+				+	+										
	<i>Hesperocorixa sahlbergi</i>	+															
	<i>H. castanea</i>									+							
	<i>Hydrometra stagnorum</i>	+							+				+			+	
	<i>Notonecta glaucum</i>	+		+													+
	<i>N. viridis</i>	+															
	<i>Plea leachi</i>	+															
	<i>Sigara concinna</i>	+		+													+
	<i>S. dorsalis</i>									+							+
	<i>S. lateralis</i>	+															
	<i>S. scotti</i>									+							+
	<i>S. selecta</i>					+											

Table 5.1 cont. Aquatic faunal taxa recorded for the 16 sites selected for survey, 1998.

Taxa	1. Ballyteige	2. Kilmore L.	3. An L. Mór	4. L. Phort Chorrúch	5. L. an Chara	7. L. Fhada complex	8. L. an Aibhnín	6. L. Cara Fionnla	9. L. an tSaile	+0. L. Athola	11. L. Bofin	12. Maghery L.	13. Sally's L.	14. Kincas L.	15. Moorlough	16. Inch intake
<i>S. stagnalis</i>	+			+	+	+										+
<i>Velia</i> sp.									+							
Coleoptera larvae			+					+								
<i>Agabus conspersus</i>	(+)															
<i>A. bipustulatus</i>												+		+		
<i>A. sturmii</i>														+		
<i>Cercyon convexiusculus</i>																+
<i>C. depressus</i>		+														
<i>C. littoralis</i>		+					+									
<i>Colymbetes fuscus</i>														+		
<i>Enochrus bicolor</i>	+			+	+		+									
<i>Gyrinus caspius</i>									+					+		
<i>G. minutus</i>									+							
<i>G. substriatus</i>									+						+	
<i>Haliphus fulvus</i>															+	
<i>H. immaculatus</i>	(+)														+	
<i>H. lineolatus</i>															+	
<i>H. rufficollis</i>									+						+	
<i>H. wehnckeii</i>																+
<i>Helochaeres lividus</i>	+															
<i>Helophorus brevipalpis</i>	(+)										+					+
<i>H. flavipes</i>															+	
<i>H. minutus</i>																+
<i>H. obscurus</i>																+
<i>Hydroporus memnonius</i>											+					
<i>Hygrotus impressopunctatus</i>																+
<i>H. inaequalis</i>	+															+
<i>H. novemlineatus</i>																+
<i>Laccobius biguttatus</i>																+
<i>Laccophilus minutus</i>	+															
<i>Megasternum obscurum</i>	+				+				(+)							
<i>Nebrioporus depressus</i>									+							
<i>Noterus clavicornis</i>	+															+
<i>Ochthebius dilatatus</i>	+			+	+		+									+
<i>O. punctatus</i>					+											
<i>O. viridis</i>							+									
<i>Propylea quattuordecimpunctata</i>																+
<i>Rhantus frontalis</i>	+															
<i>R. suturalis</i>	+															
<i>Stictiotarsus 12-pustulatus</i>									+							



Table 5.1 cont. Aquatic faunal taxa recorded for the 16 sites selected for survey, 1998.

Taxa		+ Ballyteige	2. Kilmore L.	3. An L. Mór	4. L. Phort Chorrúch	5. L. an Chara	7. L. Fhada complex	8. L. an Aibhín	6. L. Cara Fionnla	9. L. an tSaile	+0. L. Athola	11. L. Bofin	12. Maghery L.	13. Sally's L.	14. Kincas L.	15. Moorlagh	16. Inch intake
Diptera	Chironomidae	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+
	Culicidae				+				+								
	Ephydriidae				+												+
	Syrphidae				+												
Mollusca																	
Polyplacophora	<i>Lepidochitona cinereus</i>		+					+			+						
Prosobranchia	<i>Diodora graeca</i>							+									
	<i>Bittium reticulatum</i>		+								+						
	<i>Cerithiopsis tubercularis</i>		+														
	<i>Gibbula cineraria</i>		+					+			+						
	<i>G. umbilicalis</i>		+					+			+						
	<i>Hydrobia ulvae</i>	+	+				+	+		+	+		+		+	+	
	<i>H. ventrosa</i>	+				+	+									+	
	<i>Littorina littorea</i>		+					+			+		+				
	<i>L. obtusata</i>		+					+									
	<i>L. saxatilis</i>	+	+	+		(+)		+			+		(+)	+			
	<i>L. "tenebrosa"</i>						+	+		+							
	<i>Monodonta lineata</i>		+														
	<i>Nucella lapillus</i>		+														
	<i>Onoba aculeus</i>							+			+			+			
	<i>Patella vulgata</i>		+					+			+						
	<i>Potamopyrgus antipodarum</i>	+		+	+	+	+		+	+			+		+	+	+
	<i>Pusillina sarsi</i>							+									
	<i>Rissoa parva</i>		+											+			
	<i>Rissostomia membranacea</i>		+				+	+			+						
	<i>Skeneopsis planorbis</i>		+					+			+			SH	+	+	
Pulmonata	<i>Anisus leucostoma</i>																+
	<i>Aplexa hypnorum</i>																+
	<i>Hippeutis complanata</i>	+															
	<i>Lymnaea palustris</i>																+
	<i>L. peregra</i>	+															+
	<i>Oxyloma pfeifferi</i>																+
	<i>Physa fontinalis</i>																+
	<i>Vertigo antivertigo</i>																+
Opisthobranchia	<i>Archidoris ??</i>		+														
	<i>Akera bullata</i>							+									
	<i>Cadlina laevis</i>							+									
	<i>Runcina coronata</i>							+									
	<i>Scaphander lignarius</i>							+									
Bivalvia	<i>Abra temuis</i>	+															
	<i>Anomia ehippium</i>		+					+			+						
	<i>Cerastoderma edule</i>							+									
	<i>C. glaucum</i>		+			(+)	+	+			+		+	+	SH		

Table 5.1 cont. Aquatic faunal taxa recorded for the 16 sites selected for survey, 1998.

Taxa		1. Ballyteige	2. Kilmore L.	3. An L. Mór	4. L. Phort Chorrúich	5. L. an Chara	7. L. Fhada complex	8. L. an Aibhinn	6. L. Cara Fionnla	9. L. an tSaile	+0. L. Athola	11. L. Bofin	12. Maghera L.	13. Sally's L.	14. Kincas L.	15. Moolagh	16. Inch L.
	<i>Chlamys varia</i>		+					+									
Bivalvia	<i>Hiatella arctica</i>		+					+									
cont.	<i>Lasaea rubra</i>										+						
	<i>Modiolarca tumida</i>		+					+			+						
	<i>Modiolus modiolus</i>							+									
	<i>Monia patelliformis</i>							+			+						
	<i>Musculus discors</i>							+			+						
	<i>Mya arenaria</i>						+	+					+	sh		+	
	<i>Mysella bidentata</i>							+			?						
	<i>Mytilus edulis</i>		+				+	+		+	+		+	+			
	<i>Ostrea edulis</i>		+					+			+			+			
	<i>Paphia aurea</i>							+									
	<i>Tapes decussata</i>		+								+						
Bryozoa	<i>Aetea truncata</i>										+						
	<i>Alcyonidium gelatinosum</i>		+											+			
	<i>Amathia lendigera</i>							+			+						
	<i>Bowerbankia gracilis</i>		+					+			+	+		+			
	<i>Callopora lineata</i>							+									
	<i>Celleporella hyalina</i>		+														
	<i>Conopeum seurati</i>	+		+	+		+	+	+	+	+		+	+	+		+
	<i>Cryptosula pallasiana</i>		+								+			+			
	<i>Phaeostachys lineata</i>							+									
	<i>Scrupocellaria reptans</i>										+						
Echinodermata	<i>Amphipholis squamata</i>	+	+					+			+			+			
	<i>Asterias rubens</i>		+											+			
	<i>Asterina gibbosa</i>										+						
	<i>Astropecten irregularis</i>									+					+		
	<i>Leptosynapta inhaerens</i>	+						+						+			
	<i>Ophiothrix fragilis</i>										+						
	<i>Paracentrotus lividus</i>		+														
	<i>Psammechinus miliaris</i>		+														
Tunicata	<i>Ascidia mentula</i>		+								+						
	<i>Ascidella aspersa</i>		+					+			+			+			
	<i>A. scabra</i>		+					+			+						
	<i>Botryllus schlosseri</i>		+					+			+						
	<i>Botrylloides leachi</i>							+									
	<i>Ciona intestinalis</i>		+					+									
	<i>Clavelina lepadiformis</i>							+			+			+			
	<i>Phallusia mammillata</i>		+														

Table 5.1 cont. Aquatic faunal taxa recorded for the 16 sites selected for survey, 1998.

Taxa	1. Ballyteige	2. Kilmore L.	3. An L. Mór	4. L. Phort Chorrúch	5. L. an Chara	7. L. Fhada complex	8. L. an Aibhnín	6. L. Cara Fionnla	9. L. an tSaile	+0. L. Athola	11. L. Bofin	12. Maghery L.	13. Sally's L.	14. Kincas L.	15. Moorlagh	16. Inch L.	
Tunicata							+										
cont..	<i>?Polycarpa pomaria</i>																
	<i>Styela clava</i>	+															
Pisces	<i>Anguilla anguilla</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
	<i>Atherina presbyter</i>		+														
	<i>Ciliata mustela</i>		+														
	<i>Crenilabrus melops</i>						+										
	<i>Gasterosteus aculeatus</i>	+			+	+	+	+	+	+	+	+	+	+	(+)	+	
	<i>Gobius niger</i>						+			+			+				
	<i>Gobiosculus flavescens</i>		+														
	<i>Mugilidae</i>		+			+	+		+								
	<i>Pleuronectes flesus</i>		+				+	+				+	+	+	+	+	
	<i>Pollachius virens</i>		+														
	<i>Pomatoschistus microps</i>	+	+			+	+	+	+	+		(+)	+	+	+	+	
	<i>Rutilus rutilus</i>															+	
	<i>Salmo trutta</i>							+	+						+	+	
	<i>Taurulus bubalis</i>		+			+						+					
	<i>Total No. of taxa</i>	60	113	15	19	22	38	107	26	43	93	10	32	49	27	29	53

## 6. Summary of the 36 sites.

Table 6.1 shows the list of species recorded in the 20 sites surveyed in 1996 and the 16 surveyed in 1998. Table 6.2 shows the relative numbers of species, lagoonal specialists and taxonomic groups recorded in the two surveys. Several species are rare and some appear to be first records for Ireland.

### Interesting or rare species.

*Cordylophora caspia* was recorded at Kincas L., and Inch L. during this survey, and at Inch L. and Durnesh L. during the 1996 survey, at Rostellan, Co. Cork and Rinmore, Co. Galway during the Inventory and previously at Lady's Island L. (Healy *et al.*, 1982). According to Arndt (1984), "appears to be an excellent bio-indicator for eutrophic brackish water in the horohaline zone". It is a proposed lagoonal specialist for Ireland.

*Gonothyrea loveni* is listed as a lagoonal specialist in Britain. Recorded at L. an Aibhnin in 1998. There is a record of its occurrence in the Belmullet Canal, Co. Mayo from material collected by P. Hayward in 1971 (B. Picton *pers comm.*) but there appear to be no other records of its occurrence in Ireland.

*Laomedea angulata* was recorded at Lettermullen Pool 1996. it is described as "known from the south coast of England southwards; status in Ireland unclear" (Hayward and Ryland, 1995). It is always found on *Zostera* and is probably under-recorded in Ireland.

*Jaera forsmanni* was previously recorded at Drongawn L. in the 1996 survey and during this survey at L. Fhada, L. an Aibhnín, Cara na gCaorach (section 4.8) Kilmore L. and L. Athola. The only other Irish record of the species located is for L. Hyne, Co. Cork (De Grave and Holmes 1998). Proposed lagoonal specialist for Ireland.

*Jaera ischioetosa* was recorded at L. an Chara, L. Athola and Maghery L. in 1998 and at Moorlagh, L. Murree and Furnace L. in 1996. The only previous record appears to be for L. Hyne. Co. Cork (Goss Custard *et al.*, 1979). Proposed lagoonal specialist for Ireland.

*Allomelita pellucida* was recorded at three sites in Cork and in Furnace L. in 1996. The only previous records are for L. Hyne and Glengarriff in Co. Cork and Furnace L. (Costello *et al.*, 1989). Proposed lagoonal specialist for Ireland.

*Ampithoe ramondi* was recorded at Drongawn L. in 1996 and at Kilmore L., L. an Aibhnín, L. Athola and Sally's L. in 1998. According to Lincoln (1979) all records from Britain are in the southwest. The record from Sally's L., Donegal may be the most northerly record for the species.

*Erichthonius difformis* was recorded in Drongawn L. in 1996. Up to, and including, the review of this genus (Myers and McGrath, 1984) there was only one positive record of this species in Ireland, at Kinsale, Co. Cork.

*Gammarus chevreuxi* was recorded as a single specimen in Aughinish L. and abundant in Durnesh L. in 1996. Recently confirmed as an Irish species by the record of a small population in the Douglas Estuary (De Grave and Myers, 1997). Previously recorded from "N. Ireland, rarely" by Spooner in the Plymouth Marine Fauna (1957) and subsequently from Ireland by Pinkster (1978), but confirmation of these records was described as desirable (Costello *et al.*, 1989). Regarded as a lagoonal specialist in Britain but only recorded in one lagoon during a recent survey (Smith and Laffoley, 1992).

*Lembos longipes* was recorded at Kilmore L, L. an Aibhnín and possibly Sally's L. during this survey and at Drongawn L. and Furnace L. during the 1996 survey. There are only 3 previous records for Ireland (Costello *et al.* 1990).

Table 6.1 List of taxa recorded in the 36 sites surveyed in 1996 and 1998.

( ) = previous records.

	1996	1998		1996	1998
<b>Porifera</b> Axinellidae indet.		+	<i>Polynoe scolopendrina</i>		+
<i>Clathrina coriacea</i>		+	<i>Polyophthalmus pictus</i>	+	+
<i>Halichondria panicea</i>	+	+	<i>Pomatoceros lamarecki</i>		+
<i>Hymeniacion perleve</i>		+	<i>P. triqueter</i>	+	+
<i>Leucosolenia botryoides</i>		+	<i>Sabella pavonina</i>		+
<i>L. complicata</i>		+	<i>Scoloplos armiger</i>		+
<i>Suberites ficus</i>		+	<i>Serpula vermicularis</i>		+
<i>Sycon ciliatum</i>		+	<i>Spirorbis rupestris</i>	+	
<i>Tergiops fugax</i>		+	Spirorbidae indet.	+	+
<b>Cnidaria</b> <i>Actinia equina</i>	+	+	<i>Stenolais boa</i>		+
<i>Anemonia viridis</i>	+	+	<i>Typosillis hyalina</i>		+
<i>Aurelia aurita</i>	+	+	Polychaeta indet.	+	
<i>Anthopleura ballii</i>	+	+	<b>Oligochaeta</b>		
<i>Chlorohydra viridis</i>		+	<i>Clitellio arenarius</i>	+	
<i>Chrysaora hysoscella</i>	+	+	<i>Heterochaeta costata</i>	+	+
<i>Clava multicornis</i>		+	<i>Lumbricillus sp.</i>		+
<i>Cordylophora caspia</i>	+	+	<i>Marionina sp.</i>		+
<i>Dynamena pumila</i>	+		Naididae indet.	+	+
<i>Gonothyrea loveni</i>		+	<i>Stylaria lacustris</i>		+
<i>Laomedea angulata</i>	+		<i>Tubificoides benedii</i>	+	+
<i>Opercularella lacerata</i>		+	<b>Hirudinea</b>	+	
<i>Sagartia elegans</i>		+	<b>Sipuncula indet</b>		+
<i>Sagartiogeton undatus</i>	+	+	<b>Entoprocta</b> <i>Pedicellina hispida</i>		+
<i>Sarcodictyon roseum</i>		+	<b>Crustacea</b>		
<b>Turbellaria</b> <i>Procerodes littoralis</i>		+	<b>Ostracoda</b> <i>Cytherura gibba</i>		+
indet.	+	+	indet.	+	+
<b>Nemertea</b> <i>Lineus ruber</i>		+	<b>Copepoda</b> <i>Ascidicola rosea</i>		+
sp. 1	+	+	<i>Caligus sp.</i>		+
sp. 2		+	<i>Doropygus pulex</i>		+
<i>Tetrastemma melanocephalum</i>		+	<i>Eurytemora sp.</i>		+
<b>Annelida</b>			<i>Notopterus auritus</i>		+
<b>Polychaeta</b>			<i>Notodelphys allmani</i>		+
<i>Amphitrite edwardsii</i>	+		indet.	+	+
<i>Arenicola marina</i>	+	+	<b>Cirripedia</b> <i>Elminius modestus</i>		+
<i>Autolytus prolifer</i>		+	<i>Balanus balanus</i>	+	+
<i>Capitella capitata</i>	+	+	<i>B.crenatus</i>		+
Cirratulidae indet.		+	<i>B. improvisus</i>	+	?
<i>Circeis spirillum</i>		+	<i>Chthamalus montagui</i>		+
<i>Eteone picta</i>		+	<i>Semibalanus balanoides</i>	+	+
<i>Eumidia sanguinea</i>		+	<i>Verruca stroemia</i>	+	+
<i>Eupolymnia nebulosa</i>		+	<b>Tanaidacea</b> <i>Tanais dulongi</i>	+	+
<i>Exogone hebes</i>		+	<b>Cumacea</b> <i>Bodotria scorpioides</i>		+
<i>Fabricia stellaris</i>		+	indet.	+	
<i>Flabelligera affinis</i>		+	<b>Mysidacea</b> <i>Hemimysis lamornae</i>	+	
<i>Harmothoe imbricata</i>		+	<i>Leptomysis lingvura</i>	+	
<i>H. impar</i>		+	<i>Mysidopsis gibbosa</i>	+	+
<i>Hediste diversicolor</i>	+	+	<i>Neomysis integer</i>	+	+
<i>Jamua pagenstecheri</i>	+		<i>Praunus flexuosus</i>	+	+
<i>Lepidodnotus squamatus</i>	+		<i>P. ?inermis</i>		+
<i>Lumbrineris gracilis</i>		+	<i>P. neglectus</i>	+	
<i>Myxicola infundibulum</i>		+	<i>Siriella armata</i>		+
<i>Nereis zonata</i>		+	<i>S. jaltensis</i>	+	
Nereidae indet.	+		<b>Isopoda</b> <i>Eurydice pulchra</i>	+	
<i>Notomastus latericeus</i>		+	<i>Idotea baltica</i>	+	
Orbinidae indet.		+	<i>I. chelipes</i>	+	+
<i>Perinereis cultrifera</i>		+	<i>I. pelagica</i>		+
<i>Platynereis dumerili</i>	+	+	<i>Jaera albifrons</i>	+	
			<i>J. forsmanni</i>	+	+

Table 6.1 cont. List of taxa recorded in the 36 sites surveyed in 1996 and 1998.

( ) = previous records.

	1996	1998		1996	1998
<i>J. ischiosetosa</i>	+	+	<i>Corixa panzeri</i>	+	+
<i>J. nordmanni</i>	+	+	<i>C. punctata</i>	+	
<i>Lekanesphaera hookeri</i>	+	+	<i>Cymatia bonndorffi</i>	+	
<i>Limnoria lignorum</i>		+	<i>Gerris lacustris</i>	+	+
<i>L. quadripunctata</i>		+	<i>G. odontogaster</i>	+	+
<b>Amphipoda</b> <i>Allomelita pellucida</i>	+		<i>G. thoracicus</i>	+	
<i>Ampithoe ramondi</i>	+	+	<i>Hesperocorixa castanea</i>		+
<i>Caprella acanthifera</i>	+	+	<i>H. linnaei</i>	+	
<i>Chaetogammarus marinus</i>	+	+	<i>H. sahlbergi</i>		+
<i>Corophium volutator</i>	+	+	<i>(Hydrometra gracilentata)</i>	+	
<i>Dexamine spinosa</i>	+	+	<i>H. stagnorum</i>	+	+
<i>Erichthonius ?brasiliensis</i>		+	<i>Nepa cinerea</i>	+	
<i>E. difformis</i>	+		<i>Notonecta glaucum</i>	+	+
<i>Gammarus chevreuxi</i>	+		<i>N. viridis</i>	+	+
<i>G. duebeni</i>	+	+	<i>Plea leachi</i>	+	+
<i>G. locusta</i>	+	+	<i>Sigara concinna</i>	+	+
<i>Gammarus zaddachi</i>	+	+	<i>S. dorsalis</i>	+	+
<i>Hyale sp.</i>	+		<i>S. falleni</i>	+	
<i>Jassa falcata</i>		+	<i>S. lateralis</i>		+
<i>Lembos longipes</i>	+	+	<i>S. scotti</i>		+
<i>Leptocheirus pilosus</i>	+	+	<i>S. selecta</i>		+
<i>Lissiannassidae</i>		+	<i>S. semistriata</i>	+	
<i>Melita obtusata</i>		+	<i>S. stagnalis</i>	+	+
<i>Melita palmata</i>	+	+	<i>Velia sp.</i>		+
<i>Microdeutopus anomalus</i>		+	<b>Coleoptera</b> <i>Agabus conspersus</i>	(+)	(+)
<i>M. gryllotalpa</i>		+	<i>A. bipustulatus</i>		+
<i>Microprotopus maculata</i>		+	<i>A. montanus</i>	+	
<i>Phtisica marina</i>		+	<i>A. nebulosus</i>	+	
<b>Decapoda</b> <i>Cancer pagurus</i>		+	<i>A. sturmii</i>		+
<i>Carcinus maenas</i>	+	+	<i>Anacaena globulus</i>	+	
<i>Crangon crangon</i>	+	+	<i>A. lutescens</i>	+	
<i>Hippolyte varians</i>	+	+	<i>Cercyon convexiusculus</i>		+
<i>Liocarcinus depurator</i>		+	<i>C. depressus</i>		+
<i>Macropodium rostrata</i>	+		<i>C. haemorhoidalis</i>	+	
<i>Pagurus bernhardus</i>	+	+	<i>C. littoralis</i>	+	+
<i>Palaemon elegans</i>	+	+	<i>C. marinus</i>	+	
<i>P. longirostris</i>	+	?	<i>C. melanocephalus</i>	+	
<i>P. serratus</i>	+	+	<i>C. sternalis</i>	+	
<i>Palaemonetes varians</i>	+	+	<i>C. ustulatus</i>	+	
<i>Porcellana platycheles</i>		+	<i>Chaetarthria seminulum</i>	+	
<i>Thoralus cranchii</i>	+		<i>Ceolostoma orbiculare</i>	+	
<b>Acarina indet.</b>	+	+	<i>Colymbetes fuscus</i>	+	+
<b>Pycnogonida indet.</b>		+	<i>Cymbiodyta marginella</i>	+	
<b>Ephemeroptera</b>			<i>Dryops luridus</i>	+	
<i>Cloeon dipterum</i>	+	+	<i>Elmis aenea</i>	+	
<i>C. simile</i>	+		<i>Enochrus bicolor</i>	+	+
<i>Procloeon bifidum</i>	+		<i>E. halophilus</i>	+	
<b>Odonata</b>			<i>E. testaceus</i>	+	
<i>Anisoptera indet.</i>		+	<i>Graptodytes granularis</i>	+	
<i>Ischnura elegans</i>	+	+	<i>Gyrinus aeratus</i>	+	
<b>Plecoptera indet.</b>	+		<i>G. caspius</i>	+	+
<b>Trichoptera indet.</b>	+	+	<i>G. minutus</i>		+
<i>Leptoceridae indet.</i>		+	<i>G. substriatus</i>		+
<i>Limnephilidae indet.</i>		+	<i>Haliphus confinis</i>	+	
<b>Heteroptera</b>			<i>H. flavicollis</i>	+	
<i>Arctocorisa germari</i>	+		<i>H. fulvus</i>	+	+
<i>Callicorixa praeusta</i>	+	+	<i>H. immaculatus</i>		(+)
<i>C. wollastoni</i>		+	<i>H. lineatocollis</i>	+	

Table 6.1 cont. List of taxa recorded in the 36 sites surveyed in 1996 and 1998.

( ) = previous records.

	1996	1998		1996	1998
<i>H. lineolatus</i>		+	<i>L. obtusata</i>	+	+
<i>H. ruficollis</i>	+	+	<i>L. saxatilis</i>	+	+
<i>H. wehmckeii</i>	+	+	<i>L. "tenebrosa"</i>	+	+
<i>Helochares lividus</i>		+	<i>Monodonta lineata</i>		+
<i>Helophorus aequalis</i>	+		<i>Nucella lapillus</i>	+	+
<i>Helophorus brevipalpis</i>	+	+	<i>Onoba aculeus</i>	+	+
<i>H. flavipes</i>		+	<i>O. semicostata</i>	+	
<i>H. fulgidicollis</i>	+		<i>Patella ulyssiponensis</i>	+	
<i>H. granularis</i>	+		<i>P. vulgata</i>	+	+
<i>H. minutus</i>		+	<i>Potamopyrgus antipodarum</i>	+	+
<i>H. obscurus</i>		+	<i>Pusillina sarsi</i>		+
<i>Hydrobius fuscipes</i>	+		<i>Rissoa inconspicua</i>	+	
<i>Hydroporus angustatus</i>	+		<i>R. parva</i>	+	+
<i>H. gyllenhalli</i>	+		<i>R. parva var. interrupta</i>	+	
<i>H. incognitus</i>	+		<i>Rissostomia membranacea</i>	+	+
<i>H. memnonius</i>	+	+	<i>Skeneopsis planorbis</i>	+	+
<i>H. palustris</i>	+		<b>Pulmonata</b> <i>Anisus leucostoma</i>	+	+
<i>H. planus</i>	+		<i>Aplexa hypnorum</i>	+	+
<i>H. pubescens</i>	+		<i>Hippeutis complanata</i>	+	+
<i>H. striola</i>	+		<i>Lymnaea palustris</i>	+	+
<i>H. umbrosus</i>	+		<i>L. peregra</i>	+	+
<i>Hygrotus impressopunctatus</i>	+	+	<i>Oxyloma pfeifferi</i>		+
<i>H. inaequalis</i>	+	+	<i>Physa fontinalis</i>		+
<i>H. novemlineatus</i>		+	<i>Planorbarius corneus</i>	+	
<i>Ilybius fuliginosus</i>	+		<i>Vertigo antivertigo</i>		+
<i>Laccobius biguttatus</i>	+	+	<b>Opisthobranchia</b>		
<i>L. minutus</i>	+		<i>Acanthodoris pilosa</i>	+	?
<i>Laccophilus minutus</i>	+	+	<i>Aeolidia papillosa</i>	+	
<i>Megasternum obscurum</i>	+	+	<i>Akera bullata</i>	+	+
<i>Nebrioporus depressus</i>	+	+	<i>Cadlina laevis</i>		+
<i>Noterus clavicornis</i>	+	+	<i>Elysia viridis</i>	+	
<i>Ochthebius auriculatus</i>	+		<i>Limapontia depressa</i>	+	
<i>O. dilatatus</i>	+	+	<i>Runcina coronata</i>		+
<i>O. marinus</i>	+		<i>Scaphander lignarius</i>	+	+
<i>O. punctatus</i>	+	+	<b>Bivalvia</b> <i>Abra tenuis</i>		+
<i>O. viridis</i>	+	+	<i>Abra sp.</i>	+	
<i>Phytobius quadrituberculata</i>	+		<i>Anomia ephippium</i>	+	+
<i>Propylea quattordecimpunctata</i>		+	<i>Cerastoderma edule</i>	+	+
<i>Rhantus frontalis</i>	+	+	<i>C. glaucum</i>	+	+
<i>R. suturalis</i>		+	<i>Chlamys varia</i>	+	+
<i>Stictiotarsus 12-pustulatus</i>		+	<i>Hiatella arctica</i>		+
<b>Diptera</b>			<i>Lasaea rubra</i>		+
Chironomidae indet.	+	+	<i>Modiolarca tumida</i>	+	+
Culicidae indet.	+	+	<i>Modiolus modiolus</i>		+
Ephydriidae indet.	+	+	<i>Monia patelliformis</i>		+
Syrphidae indet.	+	+	<i>Musculus discors</i>	+	+
<b>Mollusca</b>			<i>Mya arenaria</i>	+	+
<b>Polyplacophora</b> <i>Lepidochitona cinerea</i>	+	+	<i>Mysella bidentata</i>		+
<b>Prosobranchia</b>			<i>Mytilus edulis</i>	+	+
<i>Diodora graeca</i>		+	<i>Ostrea edulis</i>	+	+
<i>Bittium reticulatum</i>	+	+	<i>Paphia aurea</i>		+
<i>Cerithiopsis tubercularis</i>		+	<i>Parvicardium ovale</i>	+	
<i>Gibbula cineraria</i>		+	<i>Pisidium sp.</i>	+	
<i>G. umbilicalis</i>	+	+	<i>Sphaerium sp.</i>	+	
<i>Hinia incrassata</i>	+		<i>Tapes decussata</i>		+
<i>Hydrobia ulvae</i>	+	+	<i>Venerupis sp.</i>	+	
<i>H. ventrosa</i>	+	+	<b>Bryozoa</b> <i>Aetea truncata</i>		+
<i>Littorina littorea</i>	+	+	<i>Alcyonidium gelatinosum</i>	+	+

**Table 6.1 cont. List of taxa recorded in the 36 sites surveyed in 1996 and 1998.**

( ) = previous records.

	1996	1998		1996	1998
<i>Amathia lendigera</i>		+			
<i>Bowerbankia gracilis</i>	+	+	<i>Taurulus bubalis</i>	+	
<i>Callopora lineata</i>		+			
<i>Celleporella hyalina</i>		+			
<i>Conopeum seurati</i>	+	+	<b>Recent additions:</b>		
<i>Cryptosula pallassiana</i>	+	+	<b>Chironomidae</b>		
? <i>Fredericella sultana</i>	+		<i>Chironomus aprilinus</i>		+
<i>Phaeostachys lineata</i>		+	<i>C. ?cingulatus</i>		+
<i>Plumatella repens</i>	+		<i>C. salinarius</i>		+
<i>Scrupocellaria reptans</i>		+	<i>C. tentans</i>		+
<i>Walkeria uva</i>	+		<i>Glyptodentipes gripkoveni</i>		+
<b>Echinodermata</b>			<i>G. barbipes</i>		+
<i>Amphipholis squamata</i>	+	+	<i>Halocladius braunsi</i>		+
<i>Asterias rubens</i>	+	+	<i>H. variabilis</i>		+
<i>Asterina gibbosa</i>		+	<i>Procladius sp.</i>		+
<i>Astropecten irregularis</i>		+	( <i>Kiefferulus tendipediformis</i> )		+
<i>Leptosynapta inhaerens</i>		+	<b>Notonectidae</b>		
<i>Luidia ciliaris</i>	+		<i>Notonecta obliqua</i>		+
<i>Ophiothrix fragilis</i>		+			
<i>Paracentrotus lividus</i>	+	+			
<i>Psammechinus miliaris</i>		+			
<b>Tunicata</b>					
<i>Ascidia mentula</i>		+			
<i>Ascidella aspersa</i>	+	+			
<i>A. scabra</i>	+	+			
<i>Botryllus schlosseri</i>	+	+			
<i>Botrylloides leachi</i>		+			
<i>Ciona intestinalis</i>	+	+			
<i>Clavelina lepadiformis</i>	+	+			
<i>Dendrodoa grossularia</i>	+				
<i>Diplosoma listerianum</i>	+				
<i>Phallusia mammillata</i>	+				
? <i>Polycarpa pomaria</i>		+			
<i>Styela clava</i>		+			
<b>Pisces</b>					
<i>Anguilla anguilla</i>	+	+			
<i>Atherina presbyter</i>	+	+			
<i>Ciliata mustela</i>	+	+			
<i>Conger conger</i>	+				
<i>Crenilabrus melops</i>	+	+			
<i>Ctenolabrus rupestris</i>	+				
<i>Dicentrarchus labrax</i>	+				
<i>Gasterosteus aculeatus</i>	+	+			
<i>Gobius niger</i>	+	+			
<i>Gobiosculus flavescens</i>		+			
<i>Labrus bergylta</i>	+				
<i>Molva molva</i>	+				
<i>Mugilidae indet.</i>	+	+			
<i>Pleuronectes flesus</i>	+	+			
<i>Pollachius pollachius</i>	+				
<i>P. virens</i>		+			
<i>Pomatoschistus microps</i>	+	+			
<i>Pungitius pungitius</i>	+				
<i>Rutilus rutilus</i>	+				
<i>Salmo trutta</i>	+	+			
<i>Spinachia spinachia</i>	+				
<i>Sprattus sprattus</i>	+				
<i>Syngnathus acus</i>	+				
<i>S. typhle</i>	+				



*Leptocheirus pilosus* was recorded during the 1996 survey at Furnace L. and in the 1998 survey at L. Athola. The only other known Irish localities are the south side of Wexford Harbour (Costello *et al.*, 1989) and a brackish channel on the North Slob, Co. Wexford (Galvin, 1992) which are both brackish sites and this species is proposed as a lagoonal specialist in Ireland.

*Hydrometra gracilenta* was identified from specimens collected by Galvin in Kilkeran L. in 1991 and may be the first Irish record of this species.

*Notonecta viridis* was recorded on the south coast at Ballyteige, Lady's Island L., Tacumshin L., and Kilkeran L. but also from the North Slob and as occasional in L. Donnell, Co. Clare. A rare brackish water species in Ireland. According to Southwood and Leston (1959), it was recorded only for Wexford and North Kerry, but it has also been recorded in Lady's Island L. (Healy *et al.*, 1982) and in Lady's Island L. and the North Slob by Galvin (1992) and from the Dingle Peninsula by McCarthy and Walton (1980). Proposed lagoonal specialist for Ireland.

*Plealeachi* is known previously as *P. minutissima* from the Dingle Peninsula Co. Kerry (Halbert, 1935) and more recently from the same area by McCarthy and Walton (1980) and recorded elsewhere previously and during the 2 surveys only from Ballytiege (Galvin, 1992) and Tacumshin Lake (Oliver and Healy, 1998). Proposed lagoonal specialist for Ireland.

*Sigara selecta* was recorded as abundant in L. an Chara in 1998. Previously recorded only from Ventry on the Dingle peninsula (McCarthy and Walton, 1980). This species is listed as a lagoonal specialist in Britain, where it tolerates higher salinities than *S. stagnalis* (Scudder, 1976). The previous record from Ventry was regarded by McCarthy and Walton as "difficult to explain since it has not previously been found at other brackish water sites recently investigated along the south coast". This record from the Aran islands is therefore of great interest.

*Agabus conspersus* was identified from samples collected at Ballyteige and the North Slob by Galvin in 1991 and previously recorded in Lady's Island L. by Healy (1997). One specimen was recorded at Garretstown, Co. Cork during the Inventory in 1998. The species appears to have become rare and there are only two other recent Irish records: from a salt marsh in Co. Meath, and at Dundalk harbour, Co. Louth (Nelson *et al.*, 1997).

*Cercyon depressus* was only recorded on Kilmore L. during the surveys. A driftline species with few recent records.

*Cercyon littoralis* was recorded at Bridge L. Mill L. and at Cross L., Mullet peninsula in 1996 and during this survey at L. an Aibhnín and Kilmore L. A driftline species with few recent records.

*Cercyon sternalis* was recorded at Lady's Island L., Lissagriffin L., Tacumshin L. and L. Gill. There are only two other recent records: from L. Gash, Co. Clare and Portumna, Co. Galway (Owen, 1997).

*Enochrus bicolor* was recorded at Ballytiege, L. Phort Chorrúch, L. an Chara and L. an Aibhnín during this survey, at 6 sites during the 1996 survey and also from Port na Curra, Inishmaan in 1998 and in samples collected at the North Slob in 1991. There are only 2 recent records from N. Ireland (Nelson *et al.*, 1998).

*Enochrus halophilus* is listed as a lagoonal specialist in Britain and as Notable A in Hyman and Parsons (1992). Recorded at Tacumshin in 1996, from samples collected from L. Beg, Co. Cork in 1992 and previously in L. Murree by Pybus and Pybus (1980). There appear to be no other recent records.

*Helophorus fulgidicollis* was identified from samples collected at Kilkeran L. in 1996. A strictly brackish water species with recent records from only 2 sites in Co. Down (Nelson *et al.*, 1998).

*Hygrotus novemlineatus* appears to have declined in Northern Ireland, mirroring the trend in England (Nelson, 1997). It was found in this survey at Inch L.

*Megasternum obscurum* was recorded at Ballytiege and L. an Chara during this survey and at Furnace L., L. an tSaile, L. Murree and Corragaun L. during the 1996 survey but is otherwise described as rather rare in Ireland (Foster *et al.*, 1992).

*Ochthebius auriculatus* was recorded at Aughinish L. There are only 2 recent records from Northern Ireland. Previous records are all from the east coast (Nelson *et al.*, 1998).

*Ochthebius marinus* was identified from specimens collected from Tacumshin L. in 1996 and from samples collected from Lady's Island and Tacumshin in 1991. A lagoonal specialist regarded as scarce in Britain. Only recorded from one 10 km square in Ireland by Foster *et al.*, (1992). Four recent records from Co. Down (Nelson *et al.*, 1998).

*Ochthebius punctatus* was recorded at L. an Chara, Corragaun L., Farranamanagh L and Bridge L. during the survey. It is listed as a lagoonal specialist in Britain but not common. Since 1988, recorded at 7 brackish sites in Antrim and Down (Nelson *et al.*, 1998).

*Rhantus suturalis* was recorded only from Ballyteige. Apparently a southern species which occurs in Ireland sporadically (Foster, 1985).

*Littorina "tenebrosa"* was recorded during this survey at L. Fhada, L. an Aibhnín and L. an tSaile and during the previous survey in Lettermullen Pool, L. Tanaí, L. Murree and from the North Slob. These are the only known sites in Ireland. The status of this taxon is still under dispute but specimens appear to be morphologically and ecologically distinct and it is listed as a lagoonal specialist for Britain.

*Aplexa hypnorum* appears to be an uncommon species at least in the north of the country (Kerney, 1976). It was found at Roonah L. in 1996 and at Inch L. in the 1998 survey.

*Conopeum seurati* was recorded at 16 of the 36 sites surveyed, but is not listed in a recent review of Irish marine Bryozoa (Wyse Jackson, 1991). Either the species is under-recorded or a truly lagoonal specialist.

*Phallusia mammillata* was recorded in Kilmore Lake and is apparently restricted to Bantry Bay.

*Styela clava* was recorded in Kilmore L. The species has a restricted range and is apparently found only along the southern coast.

The records of *Ciona intestinalis* are interesting as they refer to bright red specimens which are not described in the literature but apparently typical of "reduced salinity peaty sites" (B. Picton *pers comm*).

*Syngnathus typhle* was recorded at L. Tanaí in 1996. Described as a "somewhat rare species" (Douglas 1989).

### **Additional records**

The additional records in Table 6.1 refer to identifications received too late to be included in the main text of the report. The chironomids are not believed to be rare but are interesting as several are typically brackish species and may be lagoonal specialists. The identifications and information concerning ecology was kindly supplied by D. Murray:

*Chironomus apralinus* is typical of brackish waters (Langton, 1991). Recorded at L. an tSaile, L. Cara Fionnla and Inch L..

*C. salinarius* is found in saline waters (Langton, 1991) under higher salinity conditions than other members of the genus (Lindeburg and Wiederholm, 1979). Recorded at L. an Aibhnín?, L. Fhada complex and Maghery L. during the survey and at Anillaun, Carrick Beg and Portna Carra, Inis Maan during the Inventory.

*Glyptodentipes barbipes* is common in brackish waters and can tolerate more saline conditions than other species in the genus. Recorded at Ballyteige.

*G. gripkoveni* is found in fresh and brackish stagnant waters. Recorded at Ballyteige.

*Kiefferulus tendipediformis* is "a southern species typical of fens and brackish waters" (Langton 1991). Previously recorded from Furnace L. (D. Murray, *pers comm.*)

*Halocladius braunsi* is described by Hirvenoja (1973) as a "stenotop thallassocolen" - a littoral species restricted to conditions of salinity between 8 and 40 ppt. Recorded at L. an Aibhnín, L. Phort Chorrúch and Maghery L.

*Notonecta obliqua* was recorded at Inch L. and at no other lagoon surveyed. This species appears to be the common notonectid in the Hebrides (Walton, 1942).

### Total number of taxa recorded

A total of 401 taxa were recorded during the two surveys, with 252 recorded at the 20 sites surveyed in 1996 and 294 at 16 sites in 1998. The total for 1996 differs from that stated by Oliver and Healy (1998) as several taxa such as *Ligia* and *Petrobius* were not included in this analysis as they are not considered to be truly aquatic, although the same could be argued for several of the Coleoptera species. Three other Insecta were also not included in this figure as they refer to previous records and were not actually collected during the survey. Several additional species have also been added as a result of further identifications after the 1996 report was printed (notably Coleoptera).

**Table 6.2 Total numbers of taxa, lagoonal specialists and taxonomic groups recorded at the 36 sites**

	Taxa	Lag. sp.	Insecta	Crustacea	Mollusca	Annelida	Pisces
1996	252	23	99	47	47	18	21
1998	294	21	73	62	50	40	14
Total	401	26	127	75	65	46	25

Not only the total numbers but the proportions in each taxonomic group also differed between surveys (Table 6.2). Far more annelid species were recorded in 1998 than in the previous survey. This may be partly explained by greater expertise in identification but also by the fact that sites with large areas of soft marine sediments were included (Kilmore L, L. Athola and Sally's L.). A higher number of Insecta were recorded in 1996 the relative numbers of Coleoptera and Diptera, and the actual species identified, are quite different. Fewer Coleoptera were recorded in 1998, possibly due to the higher incidence of rainfall, stronger winds and lower temperatures. On the other hand, the total number of Diptera was greater partly because for the first time a specialist identified many of the Chironomid specimens but also possibly because more pupal exuviae were collected due to a climatic difference in timing of emergence.

Many of the taxa recorded were records of single specimens or small colonies at only one site, but the difference in the lists between the two years is quite striking. Only 137 taxa out of the total 401 were recorded in both years (approx. 30%).

The number of taxa per site varied considerably from only 10 at L. Bofin to 113 at Kilmore L. Higher total numbers were recorded at Whiddy, Aibhnín and Athola, partly reflecting the more marine nature of these three sites, although relatively high numbers of species were also recorded at freshwater sites such as Lady's Island L., Tacumshin L. and Durnesh L.

There are many other differences in species composition between the two surveys reflecting the great range of variability within and between types of coastal lagoons. However, it is possible to classify types of lagoonal community to some extent in relation to salinity and the relative proportion of taxonomic groups. The following two sections and associated bar charts are an attempt to analyse briefly the results of the survey based on these two parameters.

#### **i) Faunal assemblages in relation to salinity**

In this analysis, only the number of species in each of the salinity tolerance/preference classes recognised in the site surveys, and one additional category, are considered and no attempt is made to single out indicator species.

##### Salinity Classes:

1. Euhaline, marine species - more or less stenohaline, not known to be tolerant of reduced salinity;
2. Euhaline-polyhaline species - marine species known to tolerate a degree of reduced salinity, including a number of common intertidal species;
3. Poly-mesohaline species - brackishwater species, characteristic of polyhaline waters and the upper mesohaline range, i.e. about 15-30 ppt;
4. Euryhaline species - brackishwater species with wide salinity tolerance, occurring throughout almost the full salinity range;
5. Meso-oligohaline species - brackishwater species characterising the middle to lower salinities, i.e. about 2-15 ppt;
6. Oligohaline-limnetic species - brackishwater species also extending into freshwaters;
7. Limnetic-brackish species - freshwater species known to tolerate low levels of salt; including species described as "coastal";
8. Limnetic species - species normally considered to be strictly inhabitants of freshwater.

While the majority of species could be classified with relative ease, a few were more difficult:

(a) Brackishwater species occurring over a wide salinity range but not as wide as euryhaline species were classified into Classes 3 or 5 according to their relative frequency in the upper or lower range.

(b) Marine species recorded in more than one brackish lagoon but not recorded in the literature as tolerating brackish conditions were put into Class 2.

(c) Freshwater species occurring in several oligohaline sites but not mentioned in the available literature as surviving in brackish water were placed in Class 7. While the occurrence of marine species in brackish waters is quite well documented, less information is available for freshwater species.

(d) Species for which a decision was particularly difficult are omitted.

L. Fhada and Ballyteige channels have been subdivided into their obviously different components. The charts are grouped into five lagoon types according to their profiles, although in some cases the placement is somewhat arbitrary. Obviously there are factors other than salinity that govern species occurrence, but some general trends emerge. Five main lagoon types

can be recognised based on the selected salinity classes. However, this is a broad generalisation and within each of the main types, sub-types can be recognised according to the predominant salinity regime

**Type 1.** (Fig. 6.1 a-h).

Lagoons with sea inlets, regular tidal flushing, and minor inflows of freshwater. Salinity high, fairly stable.

Fauna: Species rich (47-111 spp, + Ballyteige Sta 3), dominated by Class 1 species, especially near inlets, and/or Class 2. A good proportion are sessile spp (sponges, hydroids, anemones, serpulid polychaetes, bryozoans, tunicates and some infaunal species), indicating stable conditions. The presence of brackishwater species distinguishes these assemblages from those of the open coast. In the case of Kilmore L. the proportion of brackish species is low and this site is therefore atypical and the fauna basically not "lagoonal". The proportion is relatively high for L an Aibhnín where the salinity is somewhat lower.

The profile for Ballyteige Sta 3 differs from the others. This is not considered to be a typical lagoonal habitat because currents are strong.

**Type 2** (Fig 6.2a-h)

Lagoons with high salinity but narrow, long, or silled inlets that restrict tidal flow and a greater input of freshwater than in Type 1.

Fauna: Medium to low species richness (18-37 spp). Profiles of irregular shape with a low proportion of euhaline species, indicating either restricted access for colonists or salinity that is too low or fluctuates; those that occur are frequently transient pelagic species. Fauna dominated by classes 2 and 4 except for L. Tanaí which shows a greater marine influence (Fig 6.2 a)

**Type 3** (Fig. 6.3 a-i)

Colonists restricted or erratic but significant freshwater inflows.

Fauna: Medium species richness (15-37 spp). Profiles broad, including species from a wide range of salinity classes, but euryhaline (Class 4) species dominant, constituting at least 30-50% of total species number.

**Type 4** (Fig. 6.4 a-g)

Poor lagoons (for fauna), either stressed by rapid and extreme fluctuations in salinity ("shock systems") or with low habitat diversity.

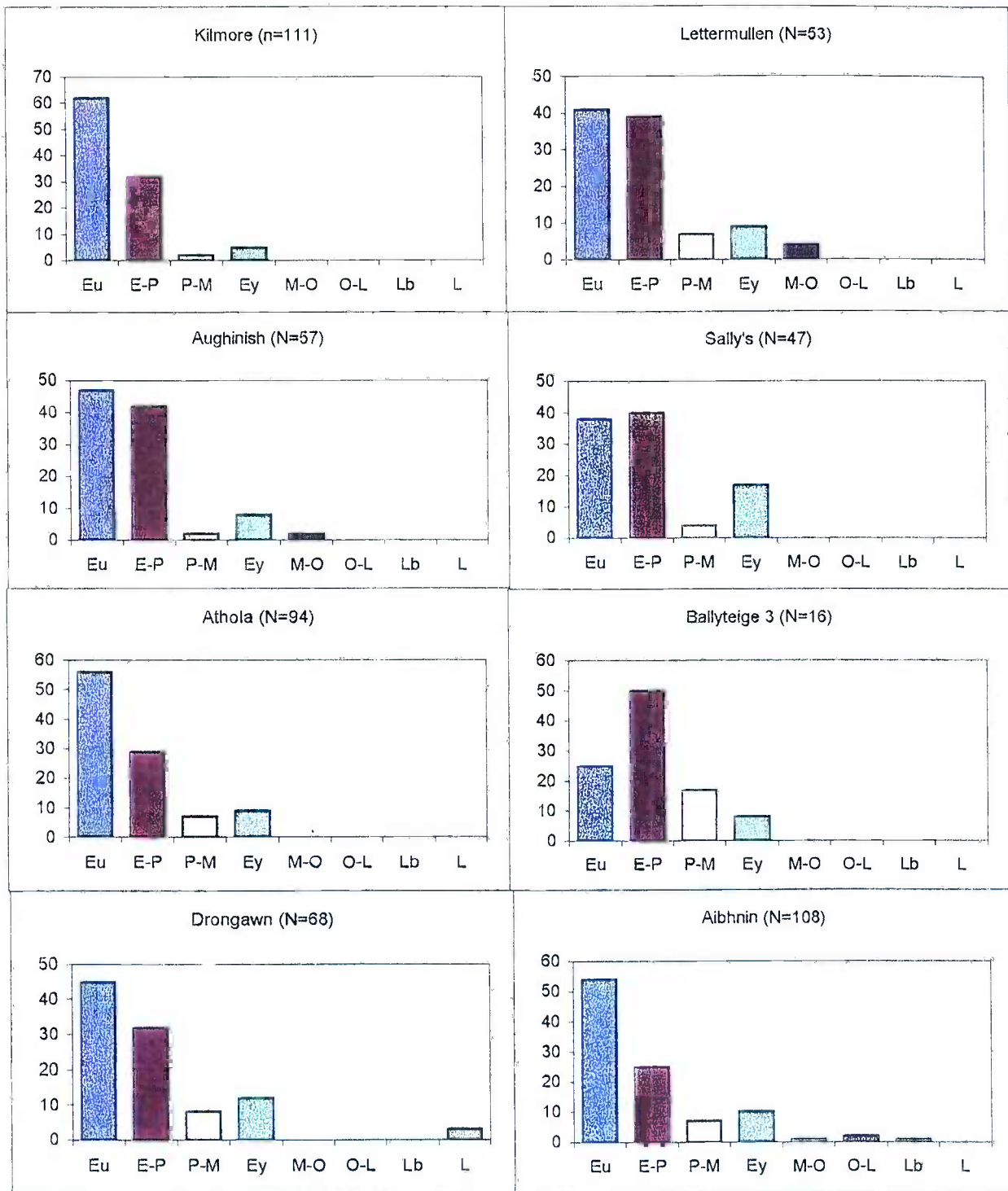
Fauna: Species poor (9-23 spp), euryhaline species (Class 4) comprising 35-75% of total species as in Type 3 but fewer classes present and freshwater species rare or absent. Three of the sites in this category are on islands for which opportunities for colonisation are reduced.

**Type 5** (Fig. 6.5 a-h)

Oligohaline lagoons with small influxes of seawater. Relatively stable conditions. Lagoons with salinity gradients and a diversity of habitats. Access for marine conditions of salinity.

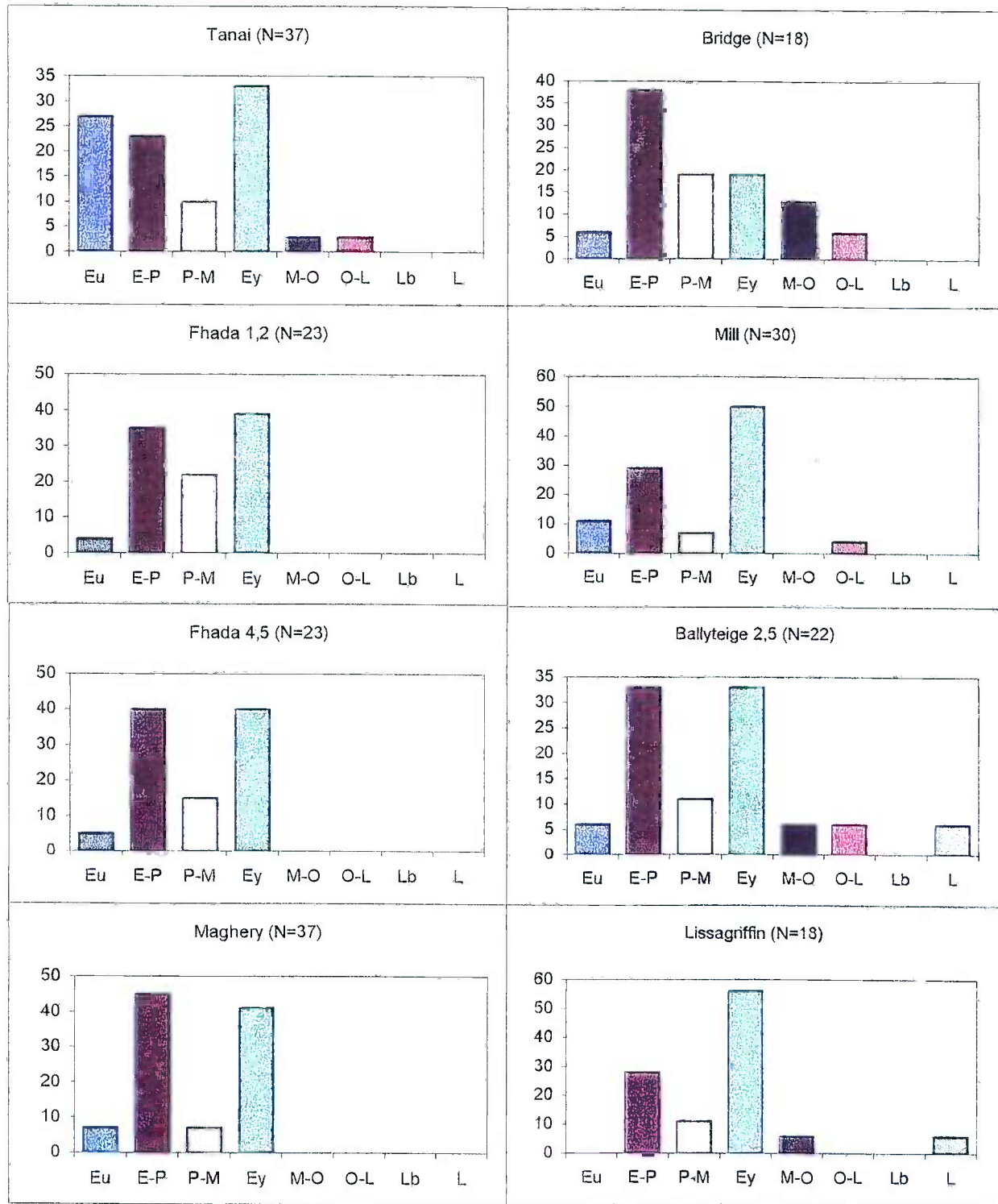
Fauna: Medium to high species richness (23-51 spp). Systems dominated by freshwater and oligohaline species (Classes 5-8), but usually with a significant proportion of euryhaline species distinguishing these sites from freshwater lakes. Two large sites (an tSaile and Tacumshin) have broad spectra and might be included in Type 2.

Fig. 6.1. Proportion of species in 8 salinity tolerance classes in 39 lagoons (Type 1).



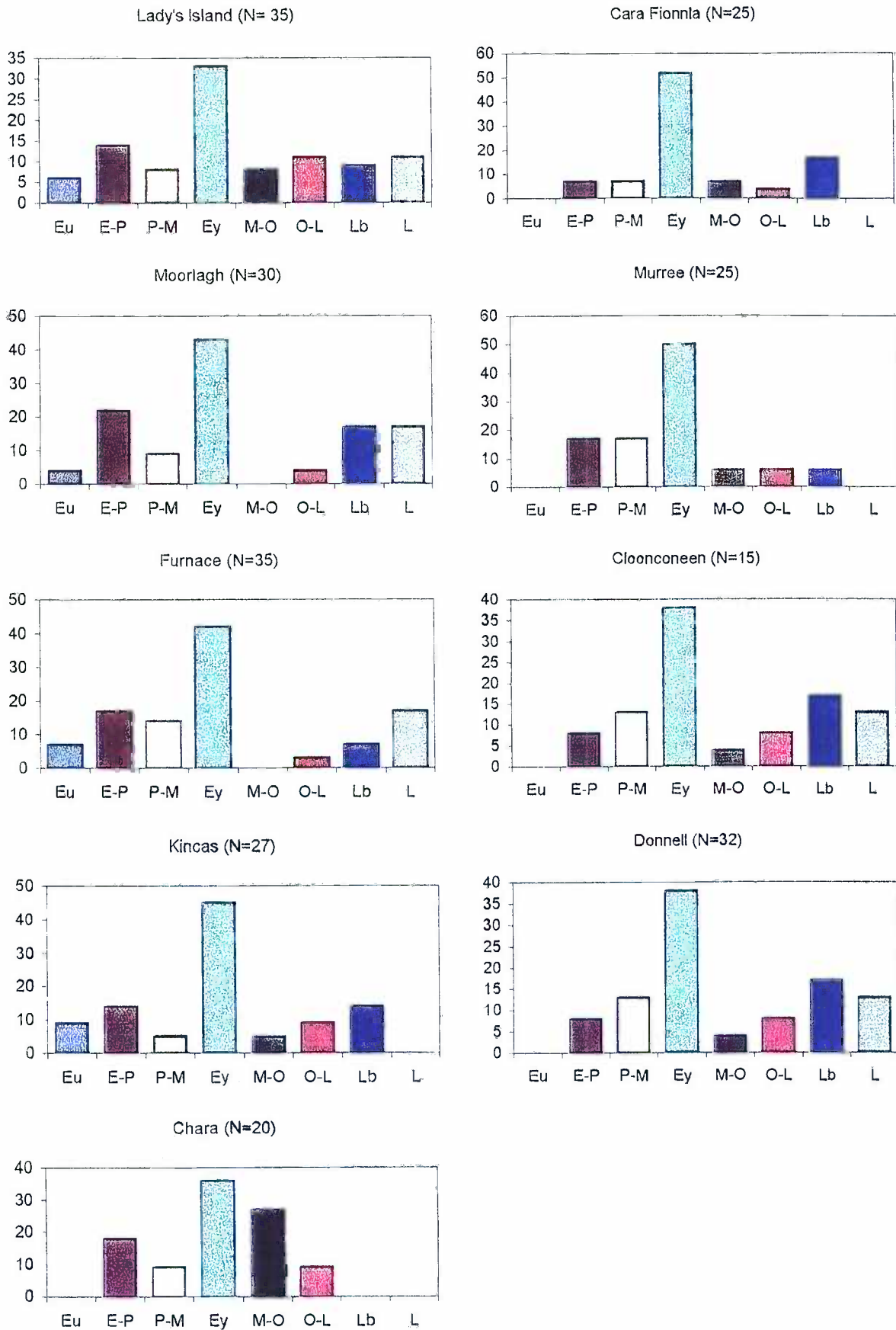
Eu - marine, euhaline; E-P = eu-polyhaline; P-M = poly-mesohaline; ey = euryhaline; M-O = meso-oligohaline; O-L = oligohaline-limnetic; Lb = limnetic-brackish; L = limnetic.

Fig. 6.2. Proportion of species in 8 salinity tolerance classes in 39 lagoons (Type 2).



Eu - marine, euhaline; E-P = eu-polyhaline; P-M = poly-mesohaline; ey = euryhaline; M-O = meso-oligohaline; O-L = oligohaline-limnetic; Lb = limnetic-brackish; L = limnetic.

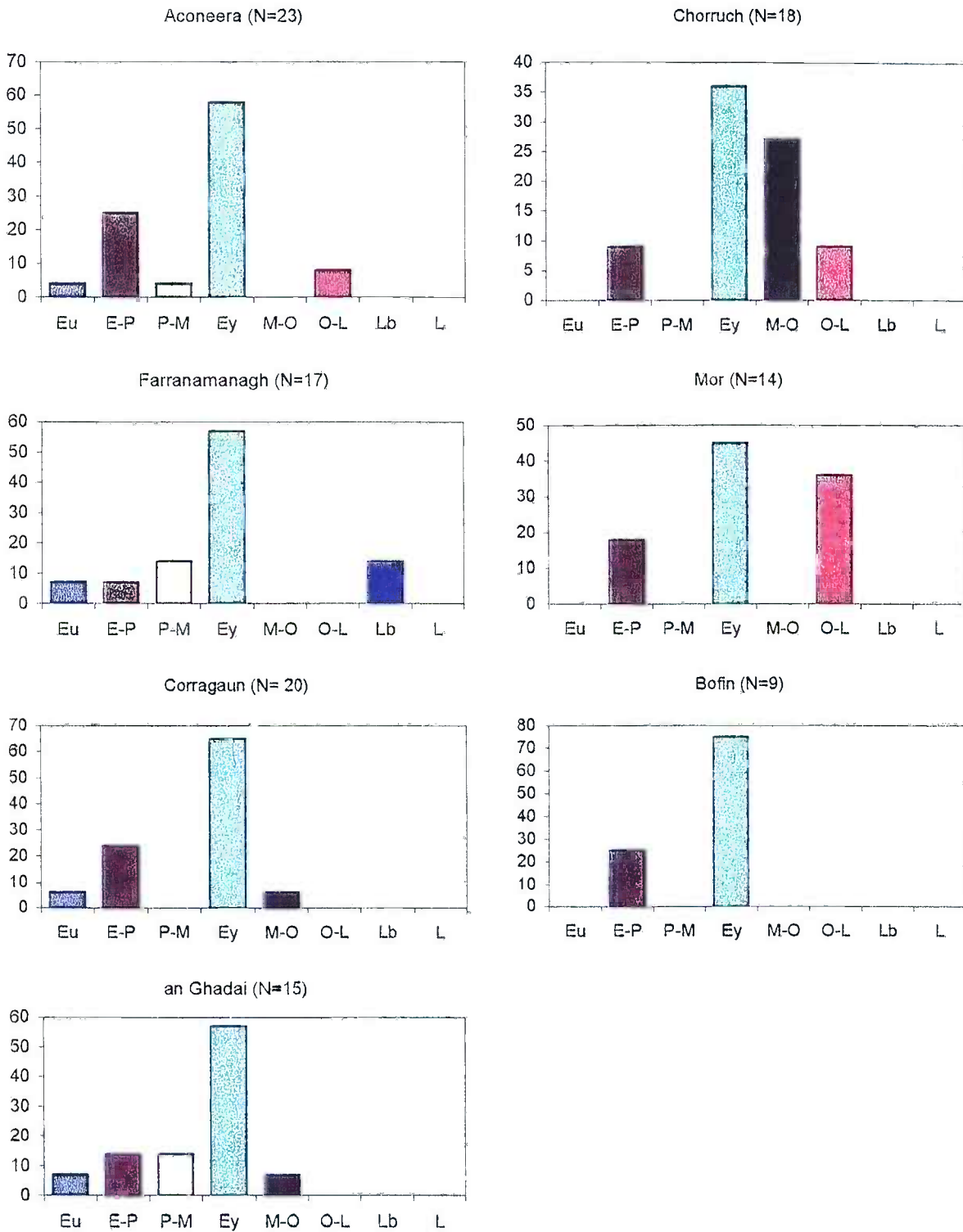
Fig. 6.3. Proportion of species in 8 salinity tolerance classes in 39 lagoons (Type 3).



Eu - marine, euhaline; E-P = eu-polyhaline; P-M = poly-mesohaline; Ey = euryhaline;  
M-O = meso-oligohaline; O-L = oligohaline-limnetic; Lb = limnetic-brackish; L = limnetic.

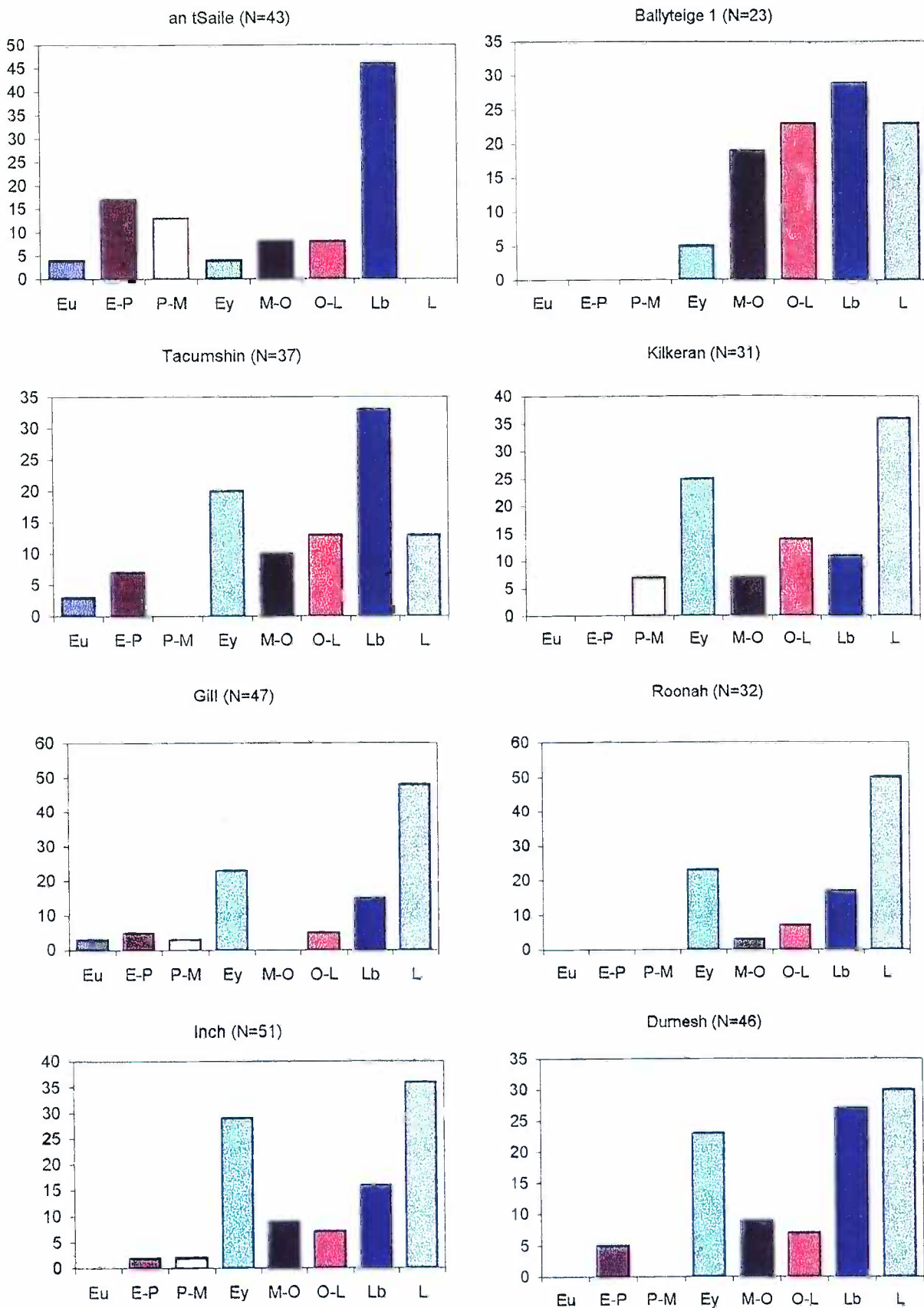


Fig. 6.4. Proportion of species in 8 salinity tolerance classes in 39 lagoons (Type 4).



Eu - marine, euhaline; E-P = eu-polyhaline; P-M = poly-mesohaline; Ey = euryhaline; M-O = meso-oligohaline; O-L = oligohaline-limnetic; Lb = limnetic-brackish; L = limnetic.

Fig. 6.5. Proportion of species in 8 salinity tolerance classes in 39 lagoons (Type 5).



Eu - marine, euhaline; E-P = eu-polyhaline; P-M = poly-mesohaline; Ey = euryhaline; M-O = meso-oligohaline; O-L = oligohaline-limnetic; Lb = limnetic-brackish; L = limnetic.

## ii ) Proportion of taxonomic groups

The proportion of the different taxonomic groups changes with salinity, e.g. insects replacing crustaceans as the salinity falls, but is also influenced by other factors such as substrate type, the nature and abundance of vegetation, ease of access for colonists etc. A great deal can be deduced about a given site by examining its taxonomic profile without identifying all taxa to species or knowledge of their salinity tolerances. It is sufficient to know how many species are in each group.

In Figures 6.6 -6.11 the proportion of species in each of the ten major groups is shown as bar charts. Characteristic profiles reflect combinations of environmental factors such as salinity, stability, presence of hard substrate, easy access from the sea, and habitat diversity (often related to lagoon size). As with the lagoon types based on salinity classes, five main types can be recognised and might be described as auto-correlated:

### Type A (Fig. 6.6 a-g)

Euhaline or polyhaline sites with tidal inlets, little freshwater entering, stable salinity conditions. Rocks present, at least near the inlet.

Fauna: Species-rich (51-111 spp), with a wide spectrum of groups, including sessile forms such as sponges, hydroids, anemones, serpulid polychaetes, barnacles, bryozoans, and tunicates, which are dependent on stable conditions. Annelids and molluscs well represented, two or more species of echinoderms.

This type corresponds to Type 1 based on salinity tolerance and the same lagoons are represented, except for Ballyteige Sta 3 which is regarded as Type D. at most sites.

### Type B (Fig. 6.7 a -h)

Lagoons with salinity gradients, frequently stratified due to both seawater and freshwater incursions, moderately stable. Usually with a diversity of habitats.

Fauna: Less diverse than Type A ( 23-43 spp). Tidal waters introduce transient pelagic or mobile benthic marine species (jellyfish, mysids, prawns, starfish, fish). A high proportion of crustaceans (at least 20%), and usually of molluscs. Two or more species of tunicates usually present indicating fairly stable conditions.

This type corresponds partly to Type 2 based on salinity tolerance.

### Type C (Fig 6.8 a -f)

Lagoons with fluctuating conditions ("shock systems"), freshwater and seawater influxes both important, but with a greater influence of seawater and strong tidal surges

Fauna: Low faunal diversity (9-30 spp). Crustaceans dominant (at least 40%), fish relatively important, molluscs and sessile forms poorly represented.

### Type D (Fig. 6.9 a -i)

Lagoons characterised by few opportunities for colonisation from the sea Except Moorlagh (Fig 6.8 h), conditions fairly stable, various salinity regimes. A poorly defined group. Fauna: Moderately diverse (15-38 spp). Two sub-types, one dominated by crustaceans, the other by crustaceans and insects, corresponding to different salinity regimes.

The atypical Ballyteige Sta 3 site is included here but is obviously a type on its own, dominated by annelids requiring appropriate substrates and oxygenated water. The high proportion of fish in Lady's Island may be due to recent breaching of the barrier that allowed entry of active pelagic species.

**Type E** (Fig 6.10 a -j)

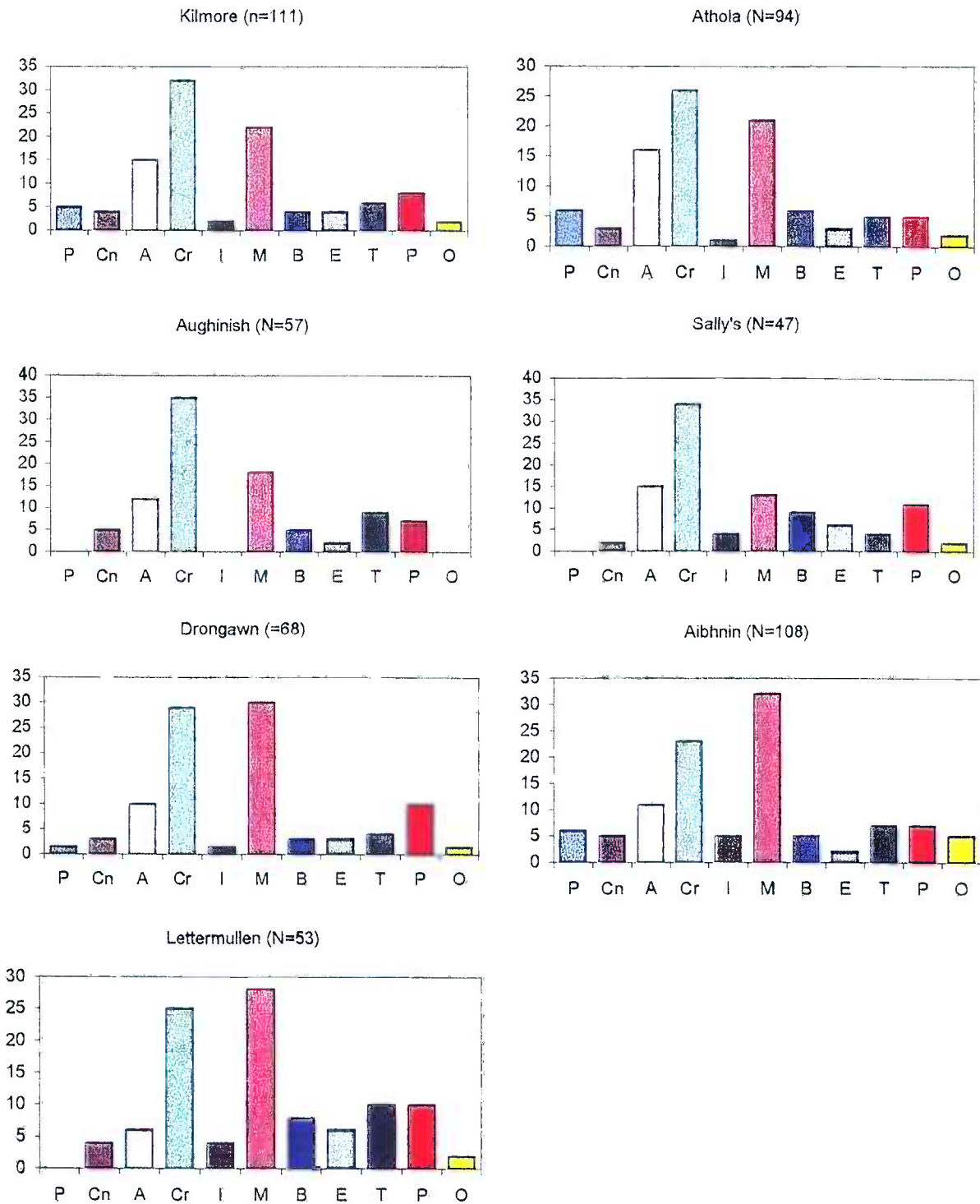
Oligohaline lagoons, marine influence limited, seawater flushed out. Stable.

Fauna: Moderately rich (13-53 spp), dominated by insects (45-80%).

This type corresponds to Type 5 based on salinity tolerance.

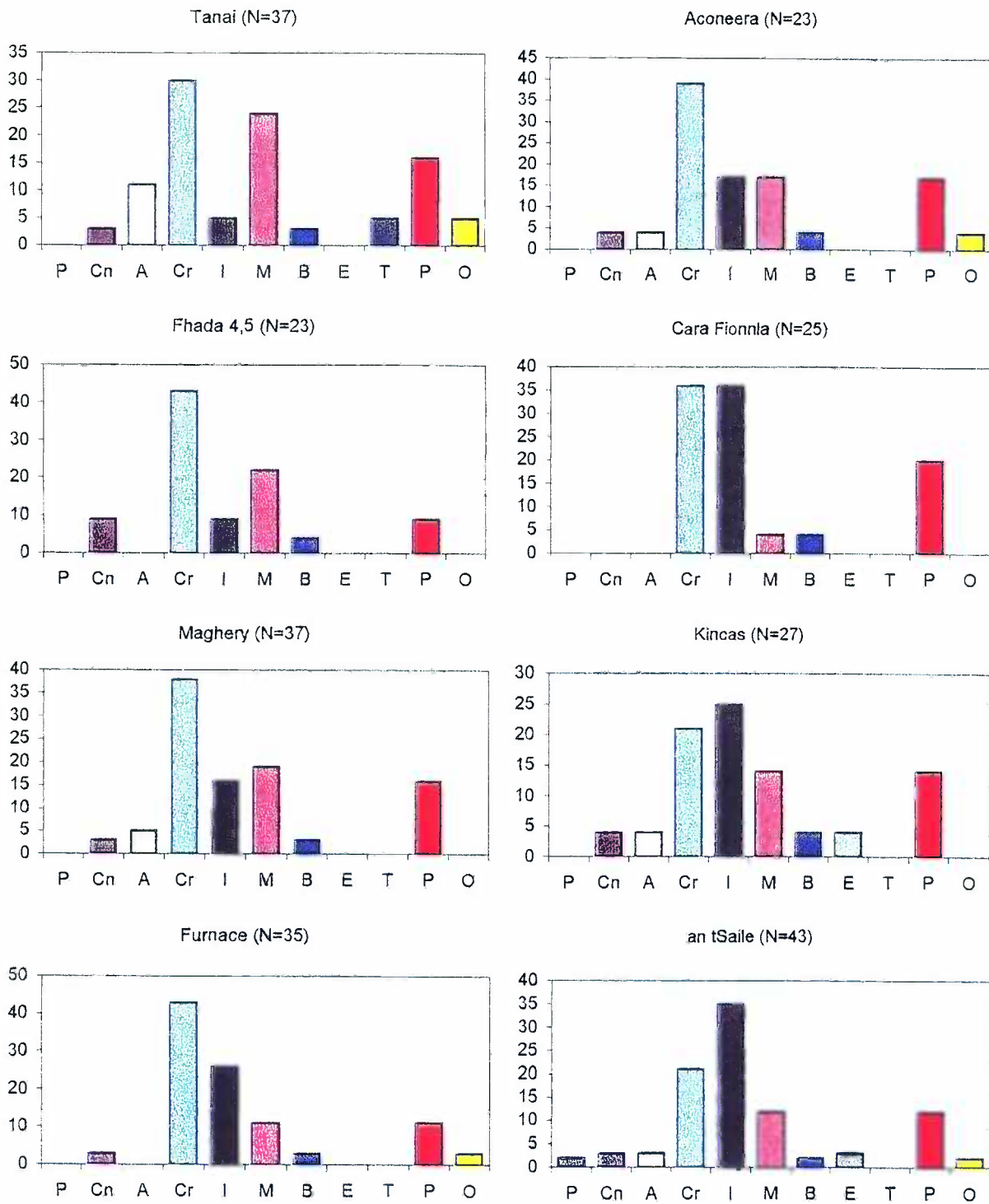
The types are not clearly defined but the groupings serve to demonstrate the type of information that taxonomic profiles can provide. Particularly useful is the presence of marine groups that indicate either stability or ease of colonisation. This type of information would be very suitable for computer analyses and the addition of parameters such as depth and substrate would greatly help to clarify differences in lagoon types.

Fig. 6.6 Proportional representation of the main taxonomic groups in 39 lagoons, based on number of species (Type A).



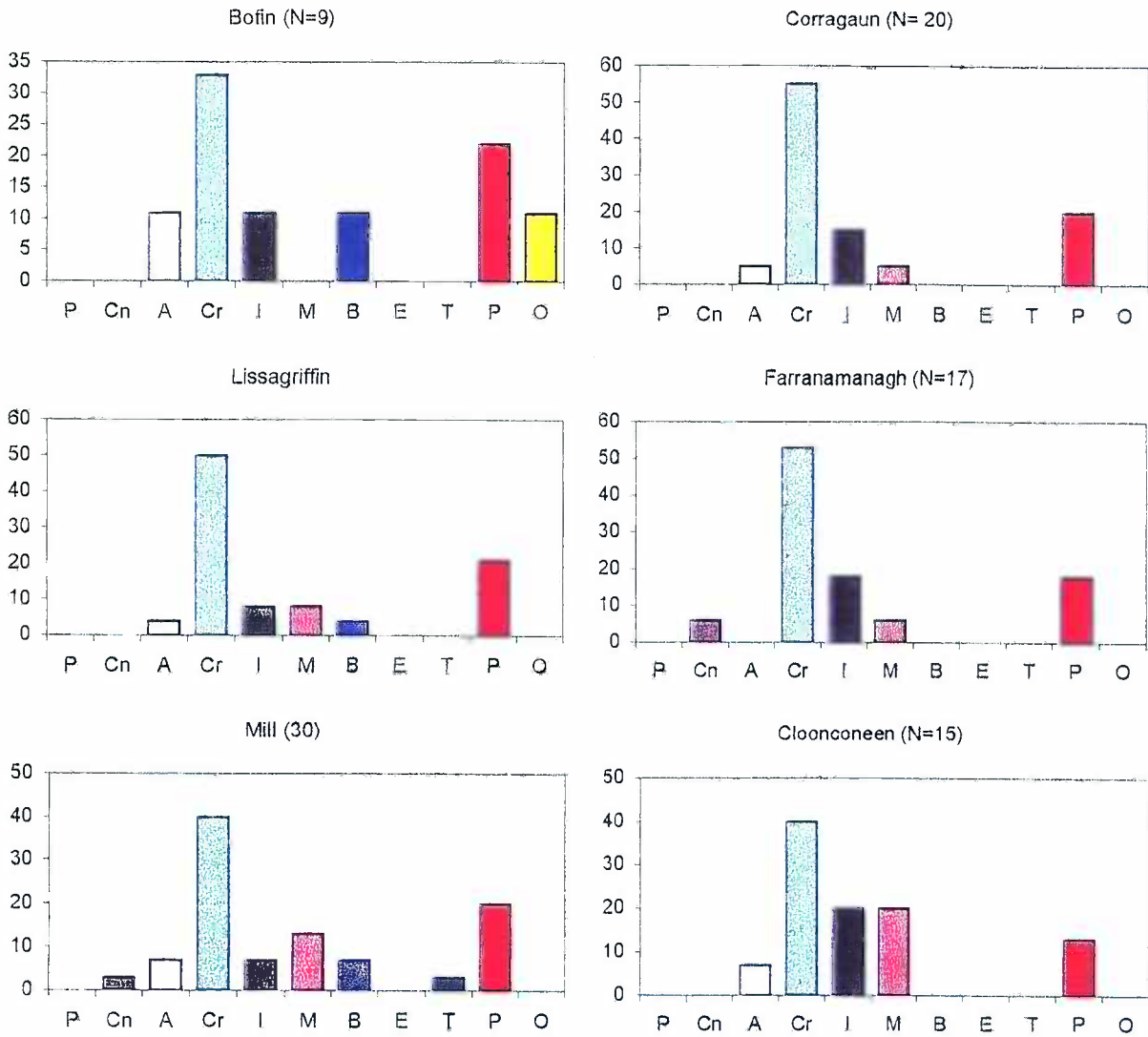
P = Porifera; Cn = Cnidaria; A = Annelida; Cr = Crustacea; I = Insecta; M = Mollusca;  
 B = Bryozoa; E = Echinodermata; T = Tunicata; P = Pisces; O = Others.

Fig. 6.7 Proportional representation of the main taxonomic groups in 39 lagoons, based on number of species (Type B).



P = Porifera; Cn = Cnidaria; A = Annelida; Cr = Crustacea; I = Insecta; M = Mollusca;  
 B = Bryozoa; E = Echinodermata; T = Tunicata; P = Pisces; O = Others.

Fig. 6.8 Proportional representation of the main taxonomic groups in 39 lagoons, based on number of species (Type C).



P = Porifera; Cn = Cnidaria; A = Annelida; Cr = Crustacea; I = Insecta; M = Mollusca;  
 B = Bryozoa; E = Echinodermata; T = Tunicata; P = Pisces; O = Others.

Fig 6.9 Proportional representation of the main taxonomic groups in 39 lagoons, based on number of species (Type D).

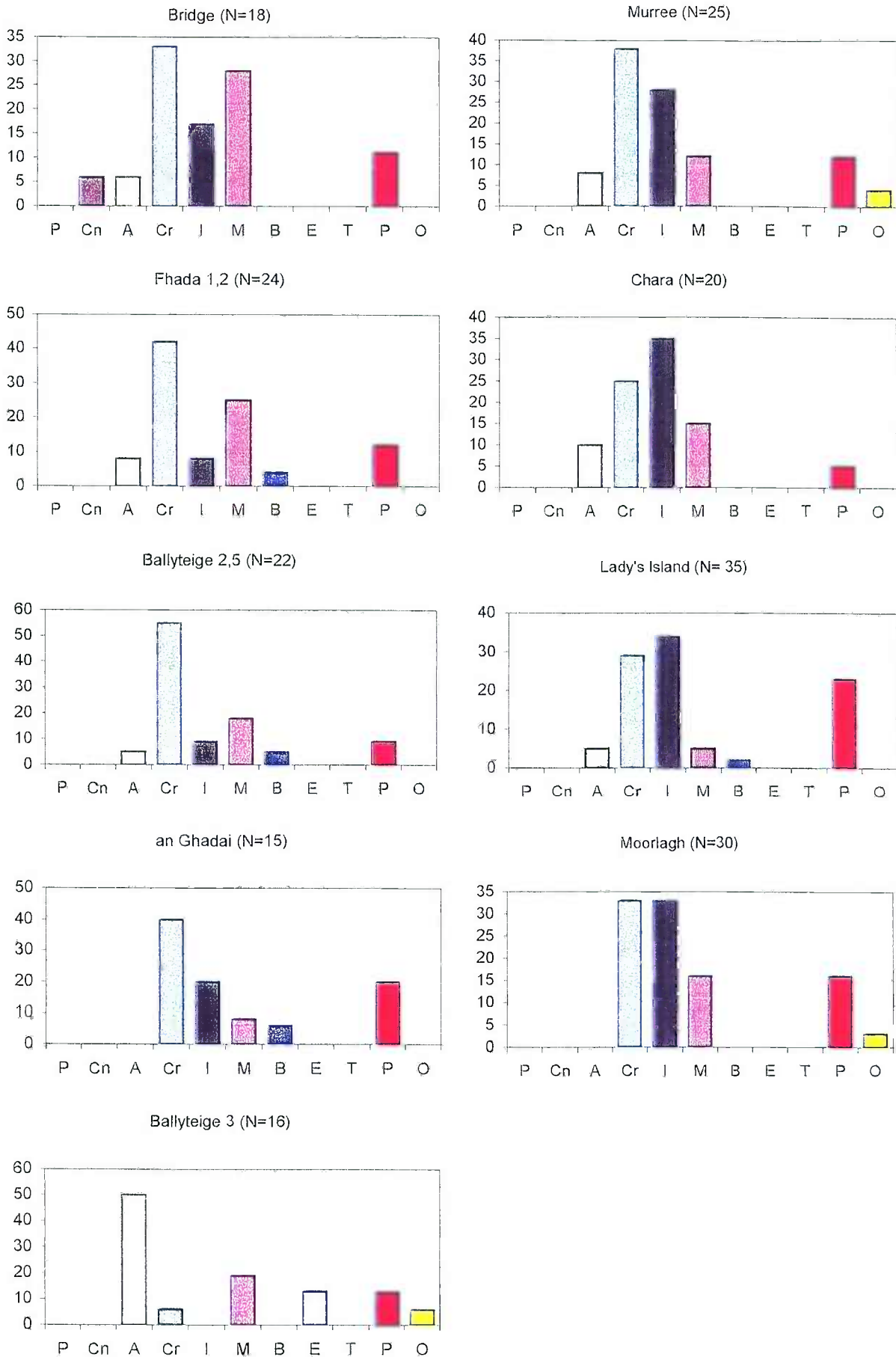
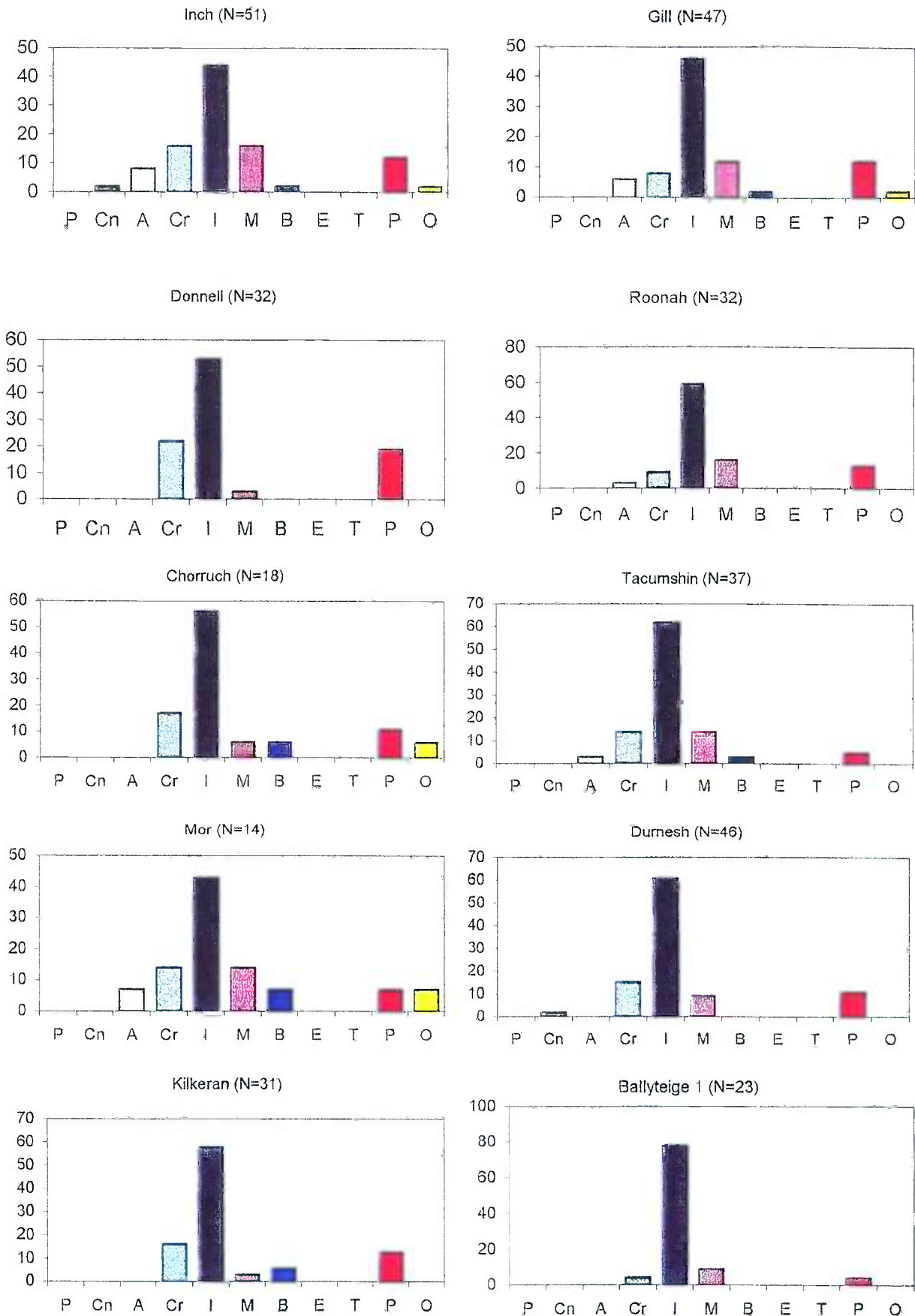




Fig. 6.10 Proportional representation of the main taxonomic groups in 39 lagoons, based on number of species (Type E).



P = Porifera; Cn = Cnidaria; A = Annelida; Cr = Crustacea; I = Insecta; M = Mollusca;  
 B = Bryozoa; E = Echinodermata; T = Tunicata; P = Pisces; O = Others.

## 7. Evaluation of the 36 sites surveyed in 1996 and 1998.

### Numerical evaluation scheme for aquatic fauna of lagoons.

This scheme aims to assess sites chiefly on the basis of lagoonal fauna i.e. their faunal richness in terms of total number of taxa recorded, specialist species, interesting or rare species, size of the lagoon and proportion of the lagoon that is regarded as "good habitat for fauna. The intention is to introduce an objective element into the evaluation process.

Two analyses are provided; the first dealing exclusively with fauna and the second with modifications added according to size and habitat quality. Geomorphology is not included in this analysis as the purpose of this part of the survey is to concentrate entirely on the faunal character and value of the lagoon. Vegetation and ecotonal coleoptera will be dealt with in the relevant volumes and summarised together with geomorphology in Volume 1.

The scores allotted to fauna are objectively based on numbers of species or taxa, although the list of lagoonal specialists both in Britain and Ireland and the rarity of many of the species involve some quite subjective assessments as information concerning ecology and occurrence is often incomplete. Estimates of diversity based on standard diversity indices are time-consuming and outside the scope of this project, and in any case would be of limited value without information on seasonal and annual variations in presence and abundance. Lagoonal conditions and populations are notoriously subject to unpredictable change although this may not be a feature of all lagoons. Typical causes are the tendency of some lagoonal species to produce summer blooms, mortalities due to sudden influxes of seawater or exceptionally high temperatures in shallow water, and random colonisations due to floods, storms or the malfunctioning of sluices.

The following criteria are used in order to rank the 36 sites surveyed:

#### 1) Faunal abundance

A maximum of 10 points based entirely on the total number of taxa recorded at each site.

Rating: 0-9 spp	1	60 -69 spp	6
10 -19 spp	2	70 -79 spp	7
20 -29 spp	3	80 -89 spp	8
30 -39 spp	4	90 -100 spp	9
40 -49 spp	5	>100 spp	10

#### 2) Number of lagoonal specialist fauna listed in Britain

Scored according to the number of lagoonal specialist species listed in Britain (Table 1.1) recorded at the site. Presence of high numbers of these species is believed to indicate lagoonal and relatively stable conditions and be a good predictor of survival of the lagoonal fauna in the long term. (8 is the maximum number recorded at any one site during the two surveys out of the 35 species listed).

#### 3) Number of lagoonal specialist fauna listed in Ireland

Scored according to the number of additional species proposed as lagoonal specialists in Ireland (Table 1.2) that are recorded at the site which are not listed in Britain. The list for Ireland includes most of those listed in Britain but some species on the British list either do not occur in Ireland or appear to differ in ecology such that they are not useful indicators of lagoonal conditions. Some additional species not listed in Britain are proposed as lagoonal specialists in Ireland but this list is still tentative and some species may prove to be less specialised to

lagoonal habitats than believed. (3 is the maximum number recorded at any one site during the two surveys).

#### 4) Interesting or rare fauna

Scored according to the number of species believed or known to be rare, although care must be taken with this score as populations may be ephemeral and information on most faunal groups in Ireland is insufficient for a reliable judgement on rarity to be made. For these reasons many of the species believed to be rare are referred to as "interesting". On the other hand, in some cases, species that are indeed rare may not have been recognised as such. (6 is the maximum number recorded at any one site during the two surveys)

#### 5) Faunal Diversity

Scored according to the number of ecological categories, based on salinity regimes from limnic to marine that are present at the site. In cases when only one species is present in a category it is ignored. (7 is the maximum number of categories recognised)

#### 6) Size of the lagoon

Scored according to the number of hectares of open water. Obviously, the size of a lagoon can vary considerably with fluctuations in water level and for this reason estimates of size can vary considerably in the literature. For this survey, estimates of size are based on a combination of information from O.S. maps, aerial photographs and field work. Large size generally implies stability and habitat diversity. (8 is the maximum number of points scored)

Rating:	< 1 ha	0	1-2	1
	3-5	2	6-20	4
	21-50	5	51-100	6
	>100	8		

#### 7) Quality of lagoonal habitat

Scored from 1 to 4 according to the percentage of lagoon which is considered to be rich habitat, regardless of type. For example, L. an Aibhnín would score 4 points as 100% of the lagoon is considered to be of "good" habitat for fauna, whereas L. Bofin and Kilmore L. only score 1 as 75% of these lagoons appears to be largely devoid of animal life.

**Analysis 1** is based on the first 5 criteria which relate directly to fauna and result in a value referred to as Score 1.

**Analysis 2** includes the first five criteria (Score 1) relating to fauna plus the final two criteria relating to size and habitat quality which give a combined score referred to as Score 2.

Table 7.1 shows a summary of the data on which the evaluation is based and Table 7.2 shows the scores given to each of the 36 sites for each of the 7 criteria listed above. Table 7.3 is a ranking of the 36 sites based on these scores. The following is a summary of the evaluation for each of the 36 sites surveyed:

Table 7.1 Summary of the 16 sites showing size of the lagoon and numbers of taxa, lagoonal specialists and rare species.

	size (ha)	Taxa	Lag. sp B	Lag sp. IR	rare sp	Diversity
1.1 Lady's Island L.	345	44	8	2	5	5
1.2 Tacumshin L.	430	45	7	3	5	3
1.3 Kilkeran L.	20	30	3	3	4	3
1.4 Lissagriffin L.	15	26	4	3	4	4
1.5 Farranamanagh L.	4	16	1	3	1	4
1.6 Drongawn L.	20	69	3	1	3	3
1.7 L. Gill	144	49	1	1	1	4
1.8 Cloonconeen Pool	7	15	6	1	1	4
1.9 L. Donnell	25	34	2	3	1	5
1.10 L. Murree	13	27	4	2	4	5
1.11 Aughinish Lagoon	8	57	1	0	2	3
1.12 Bridge L.	4	22	7	0	4	3
1.13 Lettermullen Pool	1	52	5	0	4	4
1.14 L. Tanáí	11	37	8	0	4	4
1.15 L. Aconeera	26	25	4	2	1	3
1.16 Mill L.	6	30	4	2	2	4
1.17 Corragaun L.	10	23	3	2	2	4
1.18 Roonah L.	55	35	1	1	1	3
1.19 Furnace L.	125	35	3	5	6	5
1.20 Durnesh L.	83	48	3	3	2	4
2.1 Ballyteige channels	5	60	8	3	6	7
2.2 Kilmore L.	6	113	1	1	6	4
2.3 L. Mór	7	15	2	1	1	4
2.4 L. Phort Chorrúch	4	19	3	1	2	3
2.5 L. an Chara	4	22	6	2	5	4
2.6 L. Fhada complex	15	38	8	2	3	5
2.7 L. an Aibhnín	55	107	9	1	7	5
2.8 L. Cara Fionnla	14	26	3	2	1	5
2.9 L. an tSaile	90	43	5	3	2	7
2.10 L. Athola	11	93	5	2	3	4
2.11 L. Bofin	8	10	0	1	0	4
2.12 Maghery L.	19	32	4	3	2	6
2.13 Sally's L.	5	49	4	0	3	4
2.14 Kincas L.	6	27	2	3	2	7
2.15 Moorlagh	10	29	3	3	0	7
2.16 Inch L.	160	53	5	3	4	5

Lag sp B = listed as lagoonal specialist in Britain; Lag sp IR = proposed as lagoonal specialist for Ireland; Diversity = number of ecological categories present, based on salinity regimes.

Table 7.2 Evaluation scores for the 36 sites based on fauna and faunal habitat.

	Categories							Score 1	Score 2
	Taxa	lag sp B	lag sp IR	rare spp.	Div	size	hab		
1.1 Lady's Island L.	4	8	2	5	5	8	3	24	35
1.2 Tacumshin L.	5	7	3	5	3	8	1	23	32
1.3 Kilkeran L.	3	3	3	4	3	4	3	16	23
1.4 Lissagriffin L.	3	4	3	4	4	4	1	18	23
1.5 Farranamanagh L.	2	1	3	1	4	2	4	11	17
1.6 Drongawn L.	7	3	1	3	3	4	3	17	24
1.7 L. Gill	5	1	1	1	4	8	4	12	24
1.8 Cloonconeen Pool	2	6	1	1	4	4	4	14	22
1.9 L. Donnell	3	2	3	1	5	5	3	14	22
1.10 L. Murree	3	4	2	4	5	4	3	18	25
1.11 Aughinish Lagoon	6	1	0	2	3	4	4	12	20
1.12 Bridge L.	2	7	0	4	3	2	3	16	21
1.13 Lettermullen Pool	5	5	0	4	4	0	4	18	22
1.14 L. Tanaí	4	8	0	4	4	4	4	20	28
1.15 L. Aconeera	3	4	2	1	3	5	3	13	21
1.16 Mill L.	3	4	2	2	4	4	3	15	22
1.17 Corragau L.	2	3	2	2	4	4	2	13	19
1.18 Roonah L.	4	1	1	1	3	6	2	10	18
1.19 Furnace L.	4	3	5	6	5	8	2	23	33
1.20 Durnesh L.	5	3	3	2	4	6	4	17	27
2.1 Ballyteige channels	6	8	3	6	7	2	3	30	35
2.2 Kilmore L.	10	1	1	6	4	4	1	22	27
2.3 L. Mór	2	2	1	1	4	4	1	10	15
2.4 L. Phort Chorrúch	2	3	1	2	3	2	3	11	16
2.5 L. an Chara	2	6	2	5	4	2	4	19	25
2.6 L. Fhada complex	4	8	2	3	5	4	4	22	30
2.7 L. an Aibhnín	10	9	1	7	5	6	4	32	42
2.8 L. Cara Fionnla	3	3	2	1	5	4	4	14	22
2.9 L. an tSaile	4	5	3	2	7	6	3	21	30
2.10 L. Athola	9	5	2	3	4	4	4	23	31
2.11 L. Bofin	1	0	1	0	2	4	2	4	10
2.12 Maghery L.	3	4	3	2	6	4	4	18	26
2.13 Sally's L.	5	4	0	3	4	2	3	16	21
2.14 Kincas L.	3	2	3	2	7	4	3	17	24
2.15 Moorlagh	3	3	3	0	7	4	4	16	24
2.16 Inch L.	5	5	3	4	5	8	4	22	34

Table 7.3 Ranking of the 36 sites for Score 1 and Score 2.

Score 1	Score 2
32 L. an Aibhnín	42 L. an Aibhnín
30 Ballyteige channels	35 Lady's Island L.
24 Lady's Island L.	35 Ballyteige channels
23 Tacumshin L.	34 Inch L.
23 L. Athola	33 Furnace L.
23 Furnace L.	32 Tacumshin L.
22 L. Fhada complex	31 L. Athola
22 Kilmore L.	30 L. Fhada complex
22 Inch L.	30 L. an tSaile
21 L. an tSaile	28 L. Tanaí
20 L. Tanaí	27 Kilmore L.
19 L. an Chara	27 Durnesh L.
18 Maghery L.	26 Maghery L.
18 Lissagriffin L.	25 L. Murree
18 Lettermullen Pool	25 L. an Chara
18 L. Murree	24 Moorlagh
17 Kincas L.	24 L. Gill
17 Durnesh L.	24 Kincas L.
17 Drongawn L.	24 Drongawn L.
16 Sally's L.	23 Lissagriffin L.
16 Moorlagh	23 Kilkeran L.
16 Kilkeran L.	22 Mill L.
16 Bridge L.	22 Lettermullen Pool
15 Mill L.	22 L. Donnell
14 L. Donnell	22 L. Cara Fionnla
14 L. Cara Fionnla	22 Cloonconeen Pool
14 Cloonconeen Pool	21 Sally's L.
13 L. Aconeera	21 L. Aconeera
13 Corragaun L.	21 Bridge L.
12 L. Gill	20 Aughinish Lagoon
12 Aughinish Lagoon	19 Corragaun L.
11 L. Phort Chorrúch	18 Roonah L.
11 Farranamanagh L.	17 Farranamanagh L.
10 Roonah L.	16 L. Phort Chorrúch
10 L. Mór	15 L. Mór
4 L. Bofin	10 L. Bofin

## 1. 1996 Survey

### 1.1 Lady's Island Lake, Co. Wexford.

Lady's Island Lake is a large (350 ha), **natural sedimentary lagoon** and one of the largest and, possibly, one of the best examples of a percolation lagoon in the whole of Europe.

The aquatic faunal community during stable periods comprises a characteristic assemblage of brackishwater species, a high proportion of which are specialist lagoonal species. A strong N-S salinity gradient and a wide range of substrate types explains the high level of species richness reported in this and other surveys. This is not always apparent, however, because the community undergoes wide fluctuations in species composition and abundance due to breaching.

The aquatic fauna was rich with 44 taxa recorded of which 10 are lagoonal specialists and 5 are interesting species.

Based on fauna alone the lagoon scores highly in both rankings due to the relatively high species number, large number of lagoonal specialists, wide range of ecological categories and size of the lagoon.

Interesting species:

*Notonecta viridis*

*Enochrus bicolor*

*Cercyon sternalis*

*Cymbiodyta marginella*

*Conopeum seurati*

Conclusion: Exceptional conservation value.

### 1.2 Tacumshin Lake, Co. Wexford.

Tacumshin Lake is a large (430 ha) **natural sedimentary lagoon** and one of the largest and best examples of a percolation lagoon in Ireland and Europe. However drainage attempts have greatly reduced the value of the site.

The aquatic fauna was rich with 45 taxa recorded of which 10 are lagoonal specialists and 5 are interesting species. The assemblage typifies a low salinity lagoon with a consistently high input of freshwater, and few opportunities for colonisation from the sea.

Based on fauna alone the lagoon scores highly in both rankings due to the relatively high species number, large number of lagoonal specialists and rare species. It rates highly for the size of the lagoon but this score is lowered by the fact that drainage has reduced the open water area considerably.

Interesting species:

*Notonecta viridis*

*Plealeachi*

*Cercyon sternalis*

*Enochrus halophilus*

*Octhebius marinus*

Conclusion: Exceptional conservation value.

### 1.3 Kilkeran Lake, Co. Cork.

Kilkeran Lake is a 20 ha **natural sedimentary lagoon** lying behind sand dunes with an artificial channel to the sea under a road bridge. It is a good example of its type but has suffered from eutrophication. It is probably the best example in the south west of Ireland of a lagoon with a sand/gravel barrier.

For such a small lake, the aquatic fauna appears to be diverse with 30 taxa recorded of which 6 are lagoonal specialists and 4 are interesting species.

Based on fauna alone the lagoon scores in the mid-range in both rankings due to the relatively low species number, low number of ecological categories and small size.

Interesting species:

*Hydrometra gracilenta* (possible first Irish record but awaiting confirmation)

*Notonecta viridis*

*Allomelita pellucida*

*Helophorus fulgidicollis* (possible first Irish record but awaiting confirmation)

Conclusion: The site only rates as of medium conservation value but this may be an underevaluation.

#### 1.4 Lissagriffin Lake, Co. Cork.

Lissagriffin Lake is a 15 ha **artificial lagoon** created by construction at the head of a tidal inlet. The lagoon lies behind sand dunes and it is possible that at one time in the past it was a sedimentary lagoon.

The aquatic fauna is moderately low with 26 taxa recorded but 7 are lagoonal specialists and 4 are interesting species.

Based on fauna it scores in the mid-range on the first analysis which is much higher than expected but this is due to the relatively high number of lagoonal specialists and interesting species. It scores lower on the second analysis due to small size and the relatively small area of 'good' habitat.

Interesting species:

*Allomelita pellucida*

*Cercyon sternalis*

*Enochrus bicolor*

*Ochthebius punctatus*

The fact that the lagoon is very shallow, presumably due to silting-up, and much of it is dry for parts of the tidal cycle lower the value of the site considerably.

Conclusion: Medium conservation value.

#### 1.5 Farranamanagh Lake, Co. Cork.

Farranamanagh Lake is a small (4 ha), **natural sedimentary lagoon** with a cobble barrier and natural inlet in an area of natural beauty.

The aquatic fauna is poor, with only 19 taxa recorded. However, 4 species are regarded as lagoonal specialists and 1 is an interesting species.

Based on fauna the lagoon is ranked low due to low species number and small size, but this is considered to be an under-evaluation, as the site is a very good example of a small sedimentary lagoon with a natural inlet in good condition and in an area of natural beauty.

Interesting species:

*Allomelita pellucida*

Conclusion: Medium conservation value.

#### 1.6 Drongawn Lough, Co. Kerry.

Drongawn Lough is a 12 ha silled, **saline lake lagoon** with a shallow highly constricted tidal inlet. The lagoon is in virtually pristine condition in an area of great natural beauty.

The aquatic fauna is rich, with 69 taxa recorded, of which 4 are lagoonal specialists and 3 are interesting species.

Based on fauna the lagoon is ranked in the upper mid-range of scores on the first analysis based on large species number but most of these are upper salinity range species and proportionately few are lagoonal specialists. In the second analysis it scores slightly lower due to its relatively small size and the fact that because it is so deep not all of the lagoon is considered to be "good" habitat for fauna.



Interesting species:

*Jaera forsmanni*

*Erichthonius difformis*

*Lembos longipes*

The fauna of the lagoon is probably under-recorded as the a diving survey would be required to do it justice. However, it still ranks quite highly and is an excellent example of a completely natural saline lake lagoon in an almost perfect state of preservation. As a lagoon, it is a very good example of its type, probably similar to the Scottish "obs".

Conclusion: High conservation value.

### 1.7 Lough Gill, Co. Kerry.

Lough Gill is a large (150 ha) **natural sedimentary lagoon** in a "classical position" (Guilcher and King, 1961), lying between two sedimentary barriers forming a tombolo.

The fauna is quite rich and diverse and lies in the Poly-mesohaline to limnic range. A total of 49 taxa were recorded, but although many of the species recorded are regarded as euryhaline, only two are lagoonal specialists. One species is of particular interest.

The predominance of freshwater species and the fact that neither of the lagoonal specialists was abundant casts some doubt upon the acceptance of the lake as a true lagoon based on the fauna alone. Salinity levels are controlled by management of the sluice and weir. Water analyses at UCD show the undeniable presence of seawater within the lagoon despite the fact that it is widely regarded as being completely fresh.

Interesting species:

*Cercyon sternalis*

Based on fauna the lagoon is ranked very low in the first analysis, as, despite the relative richness and diversity, there are very few lagoonal specialists or interesting species. In the second analysis it scores much higher due to large size and the fact that all of the lagoon is considered "good" habitat for fauna.

Conclusion: Medium conservation value.

However, whether or not the lake can be conserved as a lagoon depends on management and the persons responsible for management decisions.

### 1.8 Clooncneen Pool, Co. Clare.

Clooncneen Pool is a small (7 ha) **natural sedimentary lagoon** with a cobble barrier superimposed on peat.

The fauna of the lagoon is poor, with only 15 taxa recorded, but 7 of these are regarded as lagoonal specialists and one is an interesting species.

Interesting species:

*Enochrus bicolor*

Based on fauna the lagoon is ranked in the lower mid-range due to the very low number of taxa, only one interesting species and small size of the lagoon. This is considered to be an under-evaluation, however, as the pool is a very good example of an unusual type of lagoonal habitat in peat with a percolation barrier.

Conclusion: High conservation value.

### 1.9 Lough Donnell, Co. Clare.

Lough Donnell is a 25 ha **natural sedimentary lagoon** with a high cobble barrier and unsluiced artificial outlet pipe through which seawater can enter.

The fauna is relatively poor for the size of the lagoon with 34 taxa although it is moderately diverse with species in the range limnic to marine and 5 are lagoonal specialists, none are particularly abundant and only one is considered interesting.

Interesting species:

*Notonecta viridis*

Based on fauna Lough Donnell ranks in the lower mid-range due to the low number of taxa and interesting species recorded. It gains a slightly higher rank in the second analysis due to size of the lagoon, although it is very shallow and much of the bed of the lake is exposed at times, making it unsuitable for permanent residence to most fauna. The lagoon might be greatly improved if the outlet was sluiced and water levels allowed to remain higher as percolation through the barrier would maintain brackish conditions.

Conclusion: Low conservation value based on fauna.

### 1.10 Lough Murree, Co. Clare.

Lough Murree is a 13 ha **rock lagoon** in karstic limestone with no surface connection with the sea. The lake has formed in limestone bedrock on which a cobble barrier has been deposited on the coastal side of the lagoon.

The fauna is relatively poor, with only 27 taxa recorded. However, quite a wide range of ecological categories are present from poly-mesohaline to limnic, 6 species are lagoonal specialists, and 4 are considered interesting.

Interesting species:

*Jaera ischiosetosa*

*Enochrus bicolor*

*Littorina "tenebrosa"*

*Megasternum obscurum*

Records from the past indicate a less saline regime, at least periodically, with previous records of at least two other lagoonal specialists and a generally "healthier" community. The lake appears to suffer from eutrophication problems.

Based on fauna the lagoon ranks in the upper mid-range of scores due to the relatively high number of lagoonal specialists, rare species and diversity of ecological groups. Ranking in the second analysis is lowered slightly by the relatively small size of the lagoon and the fact that most of the central area is covered with a thick layer of anoxic mud.

The lagoon is an excellent example of a karstic rock lagoon despite the apparent deterioration of the site.

Conclusion: High conservation value.

### 1.11 Aughinish Lagoon, Co. Clare.

Aughinish Lagoon is a small (8.5 ha) **natural sedimentary lagoon** with a cobble barrier and a natural tidal inlet.

It is an unusual lagoon in that it is situated in karstic limestone and may receive seawater through underground fissures, as well as through the inlet and through or over the barrier but the fact that it becomes hypersaline suggests that water in the lagoon is isolated at least periodically.

The fauna is rich with 57 taxa recorded but almost entirely marine. Only one species is regarded as a lagoonal specialist, a rare species which occurred as one specimen only. This species plus one other are interesting.

Interesting species:

*Gammarus chevreuxi*

*Ochthebius auriculatus*

Based on fauna the lagoon ranks very low due to the lack of lagoonal specialists, rare species and general low diversity, despite the relative richness of the site. It is a very interesting lagoon geomorphologically and faunistically but as a representative site for lagoonal fauna it is not of any great value.

Conclusion: Medium conservation value, but not as a lagoon.

#### 1.12 Bridge Lough, Co. Galway.

Bridge Lough is a small (4 ha) **artificial saline lagoon** in karstic limestone formed by construction of a causeway carrying a road across a tidal inlet. The lagoon is very shallow and appears to suffer from eutrophication.

The fauna is relatively poor, with only 22 taxa recorded but 7 lagoonal specialists and 4 interesting species. Access to most of the lagoon was denied and the site may be under-recorded.

Interesting species:

*Cercyon littoralis*

*Enochrus bicolor*

*Ochthebius punctatus*

*Conopeum seurati*

Based on fauna the lagoon ranks in the lower mid-range of scores due to the high number of lagoonal specialists and interesting species, despite the low values for richness and diversity. In the second analysis it scores even lower due to the small size of the lagoon and the fact that much of the bed of the lagoon is covered with a thick layer of anoxic mud and not regarded as 'good' habitat for fauna.

Conclusion: Medium conservation value.

#### 1.13 Lettermullen Pool, Co. Galway.

Lettermullen Pool is a small (1 ha) **natural rock lagoon**. It could also be described as a large supra-littoral rock pool with a rock barrier and receiving seawater by occasional overwash at high spring tides.

The fauna is rich, with 52 taxa recorded in quite a wide range of ecological groups, with 5 lagoonal specialists and 4 interesting species. Two additional lagoonal specialists were recorded in July 1990 when salinity was slightly lower.

Interesting species:

*Laomedia angulata*

*Enochrus bicolor*

*Littorina "tenebrosa"*

*Conopeum seurati*

Based on fauna the lagoon ranks in the upper mid-range as a result of number of species, lagoonal specialists, rare species and diversity. The ranking is lowered in the second analysis due to its small size.

Although the lagoon is small, it is an excellent example of its type with a rich and interesting fauna.

Conclusion: High conservation value.

#### 1.14 Loch Tanaí, Co. Galway.

Loch Tanaí is an 11 ha **natural saline lake lagoon** formed in peat with a long, possibly artificial, tidal channel connecting it to L. an Aibhín and Camus Bay (See Site 2.7 in this section and Section 4.7).

The fauna is quite rich with 37 taxa recorded from the marine to euryhaline groups and including 8 lagoonal specialists and several rare or interesting species.

Interesting species:

*Enochrus bicolor*

*Littorina "tenebrosa"*

*Conopeum seurati*

*Syngnathus typhle*

Based on fauna the lagoon ranks in the top ten sites in the country due to faunal richness and diversity, number of lagoonal specialists and interesting species. In the second analysis it rates slightly lower due to its small size, although it actually forms part of a complex with several other Connemara sites.

The lagoon is an excellent example of a saline lake lagoon situated in peat with a rich and interesting fauna.

Conclusion: High conservation value.

### 1.15 Lough Aconeera, Co. Galway.

Lough Aconeera is a quite large (26 ha) silled, **natural saline lake lagoon** with a narrow tidal inlet under a road bridge. It is uncertain how natural this inlet is, as it is certainly modified by the bridge and the road along the south shore has been raised to avoid flooding.

The fauna is relatively poor with only 25 taxa but dominated by euryhaline species with 6 lagoonal specialists. Only one species is possibly rare.

Interesting species:

*Conopeum seurati*

Based on fauna the lagoon ranks low in the first analysis due to low species number, diversity and rarity of the species. In the second it ranks very slightly higher due to size but much of the deeper, central parts of the lake are not considered to be "good" habitat for fauna.

Conclusion: Low conservation value but this is considered an underevaluation.

### 1.16 Mill Lough, Co. Galway.

Mill Lough is a small (6 ha) **natural saline lake lagoon** with a narrow tidal inlet, modified to some extent by a road bridge. It is very much like a smaller version of L. Aconeera.

The fauna is moderately rich with 30 taxa recorded. The dominant group are euryhaline and 6 of the species are lagoonal specialists but there is a far greater marine element in this lagoon compared with L. Aconeera. Two species are considered interesting.

Interesting species:

*Conopeum seurati*

*Cercyon littoralis*

Based on fauna, the lagoon ranks in the lower mid-range in the first analysis and slightly higher in the second, despite its small size and the fact that only 75% of the lake is considered to be "good" habitat.

Conclusion: Medium conservation value.

### 1.17 Corragaun Lough, Co. Mayo.

Corragaun Lough is classified as a **natural sedimentary lagoon** with a completely natural tidal inlet. However, this stretch of coastline is subject to dynamic changes in sedimentation patterns, and the lagoon appears to have silted up and reduced in size and depth considerably. This is presumably due to sand from the coastal dunes being blown inshore but may also be partly due to siltation from the inflowing freshwater streams. The lagoon is now small and very shallow and separated from the sea by a longer, sinuous tidal channel.

The fauna is poor with only 23 taxa recorded, but 5 species are lagoonal specialists and 2 are interesting species.

Interesting species:

*Ochthebius punctatus*

*Megasternum obscurum*

Based on fauna, Corragaun ranks low in the first analysis, despite the number of lagoonal specialists and 2 interesting species, and even lower in the second due to small size and the fact that part of the bed of the lagoon either is exposed during neap tides or is covered with a thick, mobile layer of peaty, anoxic soft sediments.

Faunistically, the lagoon is not of very great interest but it is an interesting example of a type of sedimentary lagoon "in decline" and forms part of a dynamic complex of lagoon types on this part of the coast.

Conclusion: Low conservation value for fauna during survey but could easily change character and is an important part of a complex.

### 1.18 Roonah Lough, Co. Mayo.

Roonah Lough is a large (55 ha) **natural sedimentary lagoon** with a cobble barrier and apparently natural inlet, although this may partly be due to deliberate breaching and has certainly been "repositioned" recently.

The fauna is moderately rich with 35 taxa recorded and dominated by limnic and euryhaline species but with only 2 lagoonal specialists and 1 species of any apparent interest. Interesting species:

*Aplexa hypnorum*

Based on fauna, Roonah Lough ranks as one of the least valuable sites of the 36 surveyed, as despite the relatively high number of taxa, there are very few species typical of lagoons or of particular interest. The size of the lagoon does not help to improve this ranking.

Geomorphologically, the site is a good example of a sedimentary lagoon but faunistically it did not appear to be of any great interest during the survey. However, this stretch of coastline is subject to dynamic changes in sedimentation patterns, and it forms part of a complex of interesting lagoon types. It appears that, since the survey, a storm caused damage to the barrier and the lagoon has changed from being largely freshwater to much more tidal in character.

Conclusion: Low conservation value for fauna during survey but could easily change character and is an important part of a complex.

### 1.19 Furnace Lough, Co. Mayo.

Furnace Lough is a large (125 ha), and in places deep **saline lake lagoon** with two natural inlets either side of an island, modified with weirs.

The fauna is relatively rich with 35 taxa recorded, including 8 species regarded as lagoonal specialists and several interesting or rare species.

Interesting species:

*Allomelita pellucida*

*Jaera ischiosetosa*

*Lembos longipes*

*Leptocheirus pilosus*

*Megasternum obscurum*

*Conopeum seurati*

Based on fauna, the lagoon ranks highly based on faunal richness, diversity, number of lagoonal specialists and rare species. Many of the interesting species occurred in very low numbers, however and this may be an over-evaluation.

Lough Furnace is an excellent example of a large, stratified saline lake lagoon with a relatively rich and very interesting fauna.

Conclusion: High conservation value.

### 1.20 Durnesh Lough, Co. Donegal.

Durnesh Lough is a large ( 85 ha) **sedimentary lagoon** of an interesting type, in that the barrier is composed partly of drumlins and partly high sand dunes with the remnants of a cobble barrier in places. It is unclear how natural the lagoon is, as there is now an artificial channel and pipe running under the sand dunes and the brackish nature of the lagoon may be due entirely to the artificial outlet which allows a certain amount of seawater to enter. According to local information, the lagoon previously drained from an area further north and the channel was cut to alleviate flooding.

The fauna of the lagoon is rich, with 48 taxa recorded, largely due to the high number of limnic Coleoptera, but 6 of the species are lagoonal specialists and 2 are interesting. The most notable feature of the lagoon is the dense population of a rare amphipod.

Interesting species:

*Cordylophora caspia*

*Gammarus chevreuxi*

Based on fauna, the lagoon ranks in the mid-range on the first analysis due to richness and number of lagoonal specialists and the upper mid-range on the second due to large size and the fact that the entire lagoon is regarded as "good" habitat for fauna.

Conclusion: High conservation value.

### 1998 Survey

#### 2.1 Ballyteige drainage channels, Co. Wexford.

Ballyteige drainage channels are regarded as the remnants of a **sedimentary lagoon** for the purposes of this survey. The channels lie behind a sedimentary barrier, through which seawater percolates, in an area formerly occupied by an area of open water known as Ballyteige Lough, which was either a tidal inlet or true lagoon. The main channels, which have an open water area of approximately 5 ha, are artificial and were cut in order to drain the lough and a seawall was constructed to prevent seawater entering this previously tidal area. However, it now enters from a different direction.

Sampling stations represent a complex of lagoonal habitats as salinity varies considerably on different stretches of the channels.

Fauna of the area is surprisingly rich and diverse, with 62 taxa recorded from limnic to marine groups, and including an exceptional 11 lagoonal specialists, several interesting species and an interesting community of *Leptosynapta inhaerens* and *Amphipholis squamata*.

Interesting species:

*Notonecta viridis*

*Plea leachi*

*Enochrus bicolor*

*Megasternum obscurum*

*Rhantus suturalis*

*Conopeum seurati*

(*Agabus conspersus*) - collected in 1991.

Based on fauna, and despite its small area of water ( 5 ha), Ballyteige ranks as one of the top three lagoonal sites in the country due to faunal richness, diversity, number of lagoonal specialists and interesting species.

Although the site is largely artificial, it is undoubtedly of great value faunistically and has the added advantage of great potential for creation of artificial lagoons of different depths and salinities.

Conclusion: Exceptional conservation value.

## 2.2 Kilmore Lake, Co. Cork.

Kilmore Lake is a small (6 ha) **natural sedimentary lagoon** with a low cobble barrier. According to local information, the barrier was damaged at the time when the oil terminal was being constructed and the lagoon is now almost entirely marine.

The fauna of the lagoon is extremely rich, with the highest number of taxa recorded (113) out of all 36 sites surveyed and several interesting species. However, it is dominated almost entirely by marine or marine/polyhaline species, with very few euryhaline species and only 2 lagoonal specialists.

Interesting species:

*Jaera forsmanni*

*Lembos longipes*

*Cercyon depressus*

*C. littoralis*

*Phallusia mamillata*

*Styela clava*

Based on fauna, the lagoon ranks in the top ten sites of the country in the first analysis, due to the high number of taxa and interesting species. In the second analysis, it ranks lower due to small size and the fact that the fauna is largely restricted to a narrow peripheral belt and a larger area near the inlet. Much of the bed of the lagoon is covered with a thick layer of soft, mobile and anoxic sediments.

As a result of the faunal survey, Kilmore Lake has to be regarded as of high conservation value, despite the fact that it is not a good representative of a lagoonal community. The situation could possibly be improved by restoration of the barrier.

Conclusion: High conservation value, though possibly not as a lagoon.

## 2.3 Loch Mór, Co. Galway.

Loch Mór is an entirely natural **rock lagoon** situated in karstic limestone with no surface connection to the sea. It is a unique type of lagoon, very deep (approx. 25 m) with limestone escarpments along much of the shoreline.

The fauna is extremely poor with only 15 taxa recorded, 3 of which are regarded as lagoonal specialists and only one is of particular interest. Environmental conditions in the lagoon would appear to be relatively stable and the paucity of fauna may be due to an "island effect", compounded by the fact that there is no surface connection with the sea and no large amount of surface freshwater entering the lagoon to assist colonisation.

Interesting species:

*Conopeum seurati*.

Based on fauna, the lagoon ranks as the second lowest of the 36 sites surveyed. However, it is an exceptional example of what appears to be a unique type of coastal lagoon and the faunal ranking is a gross under-evaluation of the site.

Conclusion: Low conservation value based on fauna, but an excellent example of an apparently unique type of lagoon.

## 1.4 Loch Phort Chorrúch, Co. Galway.

#### 1.4 Loch Phort Chorrúch, Co. Galway.

Loch Phort Chorrúch is a small (4 ha) **rock lagoon/sedimentary lagoon** situated in karstic limestone, with a long, unbroken, cobble barrier. The lagoon is shallow and appears to suffer eutrophication, at least periodically.

The fauna of the lagoon is relatively poor, with only 19 taxa recorded, of which 4 species are lagoonal specialists and only 2 species are of particular interest.

Interesting species:

*Enochrus bicolor*

*Conopeum seurati*

Based on fauna, the lagoon ranks low due to the general paucity of fauna, lagoonal specialists and interesting species. Although the bed of the lagoon is basically limestone pavement, it is overlain in many areas by a thick layer of soft, mobile and anoxic sediment, a generally hostile environment to most fauna.

Although faunistically the lagoon is rated low, geomorphologically it is a good example of a combination rock/sedimentary lagoon.

Conclusion: Low conservation value based on fauna, but geomorphologically it is a good example of a sedimentary lagoon.

#### 2.5 Loch an Chara, Co. Galway.

Loch an Chara is a small (5 ha) **rock/saline lake lagoon** in karstic limestone. The formation of the lagoon is uncertain. Seawater appears to enter from a tidal spring at the north end and a malfunctioning sluice system at the south end. Historically, it seems that tidal water entered from the south but this is now blocked by a road and may therefore be partly artificial.

Faunistically, the lagoon is not rich as only 22 taxa were recorded, although it seems that at least 3 others occurred in the recent past, but 8 species are lagoonal specialists and 5 are rare species, most notably the extremely abundant corixid.

Interesting species:

*Jaera ischiosetosa*

*Sigara selecta*

*Enochrus bicolor*

*Ochthebius punctatus*

*Megasternum obscurum*

Based on fauna, the lagoon ranks in the top ten sites in the country in the first analysis. It ranks lower in the second analysis due to its small size.

Although the lagoon is not impressive geomorphologically, it is by far the best example of a lagoonal community in the Aran Islands and one of the best in the country.

Conclusion: High conservation value.

#### 2.6 Loch Fhada complex, Co. Galway.

The Loch Fhada complex comprises a series of **saline lake lagoons** of different sizes, depths and salinities with a total open-water area of approximately 15 ha.

The fauna of the whole complex is rich and diverse, with 38 taxa recorded from meso-oligohaline to marine groups, of which 10 species are lagoonal specialists and 3 are interesting species.

Interesting species:

*Jaera forsmani*

*Littorina "tenebrosa"*

*Conopeum seurati*



Based on fauna, the complex as a whole ranks as one of the top three sites in the country due to faunal richness, diversity and number of lagoonal specialists. It ranks slightly lower in the second analysis due to its relatively small size.

Conclusion: Exceptional conservation value.

### 2.7 Loch an Aibhnín, Co. Galway.

Loch an Aibhnín is a large (55 ha), shallow **saline lake lagoon** with a narrow, silled inlet. The lagoon lies in a sparsely populated area and is in an almost perfect state of preservation.

The fauna of the lagoon is extremely rich and diverse, with 107 taxa recorded, of which 10 are lagoonal specialists and 7 are interesting species.

Interesting species:

*Gonothyraea loveni*

*Jaera forsmani*

*Lembos longipes*

*Cercyon littoralis*

*Enochrus bicolor*

*Littorina "tenebrosa"*

*Conopeum seurati*

Based on fauna, the lagoon ranks as the highest of all sites surveyed. Not only is it rich and diverse, with a high number of lagoonal specialists and rare species, but it is a large site in almost completely natural condition.

Conclusion: Exceptional conservation value. Undoubtedly one of the best sites in the country.

### 2.8 Loch Cara Fionnla, Co. Galway.

Loch Cara Fionnla is a 13.5 ha **saline lake lagoon** with a narrow tidal inlet that runs through Cara na gCaorach and the Kinvarra saltmarsh to Camus Bay.

The fauna of the lagoon is relatively poor, with only 26 taxa recorded, of which 5 are lagoonal specialists but only one species appears to be of any great interest.

Interesting species:

*Conopeum seurati*

Based on fauna, the lagoon ranks in the lower mid-range as despite the low number of species, the community is quite diverse and "lagoonal" in that a large proportion of the species are either brackish or lagoonal specialists.

The lagoon is an interesting example of the type but faunistically not impressive. It does, however, form part of a complex with other lagoons in this part of Connemara and forms part of a continuum of lagoonal and estuarine habitat through Cara na gCaorach to Camus Bay.

Conclusion: Low conservation value.

### 2.9 Loch an tSaile, Co. Galway.

Loch an tSaile comprises a series of 2 **saline lake lagoons** and an upper freshwater lake which was not included in the survey. The lagoons are large, covering a total open-water area of approximately 90 ha, and receive tidal water through a narrow, silled inlet, modified to some extent by a road bridge.

The fauna of the lagoons is quite rich and very diverse, with 43 taxa recorded from limnic to marine groups, reflecting the wide range of salinity regimes within the lagoons. A total of 7 species are regarded as lagoonal specialists and at least 3 species are interesting:

Interesting species:

*Littorina "tenebrosa"*

*Conopeum seurati*

(*Megasternum obscurum* was recorded in 1996)

Based on fauna, the lagoon ranks in the top ten sites of the country due to faunal richness, diversity, number of lagoonal specialists and size.

Conclusion: High conservation value.

(N.B. Mention should also be made of the small pool to the south of the lagoon referred to as Doire Bhanbh, which although not connected to L. an tSaile, contains an interesting lagoonal fauna and should be included in any conservation efforts concerning L. an tSaile).

## 2.10 Lough Athola, Co. Galway.

Lough Athola is a 10 ha **saline lake lagoon** with a narrow, silled inlet which is of special interest as it runs through eroded peat.

The fauna of the lagoon is extremely rich with 93 taxa but mostly in the poly/mesohaline to marine range. 7 species are regarded as lagoonal specialists, however, and 3 species are considered of interest.

Interesting species:

*Jaera ischiosetosa*

*Leptocheirus pilosus*

*Conopeum seurati*

Based on fauna, the lagoon ranks high and one of the top ten in the country. This ranking is largely due to the number of marine species present. The fauna is similar in many respects to Kilmore L. except that more lagoonal specialists were recorded in L. Athola. Both sites appear to be more typical of the open coast and it may be that both sites are lagoons "in decline" through purely natural processes.

The lagoon is a good example of a saline lake lagoon, situated in peat and at the marine end of the range of salinity types.

Conclusion: High conservation value.

## 2.11 Lough Bofin, Co. Galway.

Lough Bofin is a small (8 ha) **natural sedimentary lagoon** with an impressive cobble barrier.

The fauna of the lagoon is extremely poor, with only 10 taxa recorded, only one species regarded as a lagoonal specialist, and none are considered rare or interesting. There is even some doubt about the one lagoonal specialist (*Jaera nordmanni*) as it is only a proposed specialist for Ireland, awaiting further information concerning ecological requirements.

Based on fauna, the lagoon ranks lowest of the 36 surveyed. The paucity of species is possibly due to either, or a combination of, the "island effect", extreme variations in salinity regime creating a "shock system" and perhaps periodic anoxia due to decaying algae washed into the lagoon during storms.

The lagoon is an excellent example of a sedimentary lagoon geomorphologically, but faunistically it is extremely poor.

Conclusion: Low conservation value.

## 2.12 Maghery Lough, Co. Donegal.

Maghery Lough is a 19 ha **saline lake lagoon** with a modified and (broken) sluiced outlet.

The fauna of the lagoon is moderately rich, with 33 taxa recorded from limnic to marine groups. Three additional species were recorded in 1996. A total of 7 species are regarded as lagoonal specialists and 2 are considered to be of interest.

Interesting species:

*Jaera ischiosetosa*

*Conopeum seurati*

Based on fauna, the lagoon ranks highly, in the upper mid-range due to the relatively high number of lagoonal specialists and ecological categories. None of the species are particularly abundant, apart from the thriving population of *Mya arenaria*, but the lagoon is a good example of its type with a diverse lagoonal community.

Conclusion: Medium conservation value.

### 2.13 Sally's Lough, Co. Donegal.

Sally's Lough is a 10 ha **saline lake lagoon** with a narrow inlet running through a small gorge in the rock. It is uncertain how natural this lagoon is, as according to local information, it was formerly a freshwater lake and the channel was cut through the rock to alleviate flooding and this caused the lake to become brackish.

The fauna is rich, with 49 taxa recorded, but mostly marine or marine-polyhaline. There is a significant brackish element to the fauna, however, and 4 of the species are regarded as lagoonal specialists. 3 species are considered to be of particular interest.

Interesting species:

*Ampithoe ramondi*

*Lembos longipes*

*Conopeum seurati*

Based on fauna, the lagoon ranks in the mid-range as, despite the relatively high number of taxa, overall diversity and number of lagoonal specialists is relatively low. In the second analysis it ranks even lower due to relatively small size and the fact that much of the central area is covered with a thick layer of anoxic soft sediment, which is not a "good" habitat for most fauna.

The lagoon in many respects is similar to Kilmore L. and L. Athola but with fewer marine species.

Conclusion: Medium conservation value.

### 2.14 Kincas Lough, Co. Donegal.

Kincas Lough is a small ( 6 ha) **saline lake lagoon** with an unsluiced artificial outlet. It is uncertain how natural the brackish nature of the lagoon is, as according to local information, the outlet was deepened to alleviate flooding and this allowed seawater to enter the formerly freshwater lake.

The fauna of the lake appears moderately rich, with 27 taxa recorded, of which 5 species are regarded as lagoonal specialists and 2 are interesting species. The lagoon appears to be highly "enriched" and at least two species are regarded as indicators of eutrophic conditions.

Interesting species:

*Cordylophora caspia*

*Conopeum seurati*

Based on fauna, the lagoon ranks surprisingly highly, in the mid-range due to the number of lagoonal specialists and the diversity of the fauna. Many of the fauna are recorded as single specimens, however, and this ranking may be an over-evaluation.

The lagoon is an example of a small saline lake with a brackish community but not generally considered very highly.

Conclusion: Medium conservation value based on fauna but this is considered to be an over-evaluation.

### 2.15 Moorlagh, Co. Donegal.

Moorlagh is a 10 ha **saline lake lagoon** with an artificial barrier formed by a causeway and road bridge and a natural outlet modified with sluices.

The fauna appears to be relatively rich, with 29 taxa recorded from limnic to marine groups, but most of the species were recorded from the extreme ends of the lagoon, either where a small river enters or at the tidal inlet. Fauna in the main body of the lagoon is much poorer and many of these species are highly mobile and able to enter and/or leave fresh or seawater freely. 6 of the species are regarded as lagoonal specialists but only one species is of interest and that was recorded previously in 1996 and not found during the present survey.

Interesting species:

*Jaera ischiosetosa* (1996)

Based on fauna, the lagoon ranks surprisingly highly, in the mid-range due to the number of lagoonal specialists and the diversity of the fauna. Many of the fauna recorded are not typical of the main body of the lagoon, however, which is much poorer. The lagoon appears to undergo extreme variations in salinity regime and there may be relatively few species that are permanent residents.

The lagoon is an example of a small, shallow saline lake lagoon and faunistically is not impressive.

Conclusion: Medium conservation value based on fauna but this is considered to be an over-evaluation.

### 2.16 Inch Lough, Co. Donegal.

Inch Lough is a large (160 ha) **artificial saline lagoon** created by impounding a tidal area between the mainland and Inch Island between two embankments.

The fauna is rich and diverse, with 53 taxa recorded from limnic to poly-mesohaline groups and including 8 lagoonal specialists and several interesting species.

Interesting species:

*Cordylophora caspia*

*Hygrotus novemlineatus*

*Aplexa hypnorum*

*Conopeum seurati*

Based on fauna, the lagoon ranks among the top three sites of the 36 surveyed due to faunal richness, diversity, number of lagoonal specialists and interesting species and finally size.

The lagoon is an excellent example of an artificial lagoon with a rich and varied fauna and a lagoonal community equivalent to a natural lagoon. Despite the fact that it is artificial, it is one of the very best lagoonal habitats for fauna in the country.

Conclusion: Exceptional conservation value.

In conclusion, Table 7.4 summarises the conservation value of the aquatic fauna of the sites surveyed with an emphasis on lagoonal communities and brackish water species.

**Table 7.4 Conservation value of the sites surveyed, based on lagoonal fauna**

<b>Exceptional</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>
Lady's Island L.	Drongawn L.	Kilkeran L.	L. Donnell
Tacumshin L.	Cloonconeen Pool	Lissagriffin L.	L. Aconeera
Ballyteige	L. Murree	Farranamanagh L.	Corragaun L.
L. Fhada complex	Lettermullen	L. Gill	Roonah L.
L. an Aibhnín	L. Tanaí	Aughinish L.	L. Mór
Inch L.	Furnace L.	Bridge L.	L. Phort Chorrúch
	Durnesh L.	Mill L.	L. Cara Fionnla
	Kilmore L.	Sally's L.	L. Bofin
	L. an Chara	Kincas L.	
	L. an tSaile	Moorlagh	
	L. Athola		

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