NPWS

Connemara Bog Complex SAC
(site code: 2034)

Conservation objectives supporting document-
Coastal lagoons

Version 1
October 2015

Contents

1. Introduction

1.1 Connemara Bog Complex SAC

Connemara Bog Complex SAC is a large site encompassing the majority of the south Connemara lowlands in Co. Galway. The site supports a wide range of habitats, including extensive tracts of western blanket bog, which form the core interest. It is also designated for one coastal and one marine habitat listed on Annex I of the Habitats Directive.

"Coastal lagoons" (habitat code 1150) is a priority habitat in Annex I of the Habitats Directive. A coastal lagoon is a lake or pond that is fully or partially separated from the sea by a permeable barrier that can be entirely natural such as shingle, or can be an artificial embankment. Salinity varies depending on such factors such as freshwater inputs and barrier permeability. Lagoons support unique assemblages of flora and fauna, particularly invertebrates. In Ireland, coastal lagoons are considered to be in bad conservation status due to issues such as drainage and water pollution (NPWS, 2013).

Three lagoons are listed for this SAC by Oliver (2007). The table below gives the conservation status assessment of these lagoons as outlined in that report. A fourth lagoon, Ardbear Salt Lake, is a deep, natural saline lake which functions as a lagoon and is included in Healy et al., (1998).

Code[1]	Name	County	Conservation Assessment
IL061	Loch Doire Bhanbh	Galway	Favourable
IL062	Loch an tSáile	Galway	Favourable
IL063	Loch Conaortha	Galway	Favourable
	Ardbear Salt Lake	Galway	

[1] Codes are those used in Oliver, 2007.

See map in Appendix 1 and Appendix 2 for accounts of each site (from Oliver, 2007 and Healy et al., 1998).

1.2 Conservation objectives

A site-specific conservation objective aims to define the favourable conservation condition of a habitat or species at site level. The maintenance of habitats and species within sites at favourable condition will contribute to the maintenance of favourable conservation status of those habitats and species at a national level.

Conservation objectives are defined using attributes and targets that are based on parameters as set out in the Habitats Directive for defining favourable status, namely area, range, and structure and functions.

Provisional reference conditions for Irish lagoons are proposed by Roden and Oliver (2013). Reference conditions aim to define ecological status prior to human impacts (i.e. "natural" conditions). The targets for the water quality attributes given below are based on reference values given by Roden and Oliver (2013).

Attributes and targets may change/become more refined as further information becomes available.

2. Area

The target for habitat area is: stable or increasing, subject to natural processes. Favourable reference area for the mapped lagoons is 151.4ha- see table below.

Code[1]	Name	Area (Ha)
IL061	Loch Doire Bhanbh	1.3[2]
IL062	Loch an tSáile	89.5[2]
IL063	Loch Conaortha	24.1[2]
	Ardbear Salt Lake	36.5[3]
	Total	**151.4**

[1] Codes are those used in Oliver, 2007.

[2] Areas are calculated from spatial data derived from Oliver (2007).

[3] Area derived using the same methodology as above

3. Range

The known distribution of lagoon habitat in Connemara Bog Complex SAC is shown in Appendix 1.

The target for the habitat distribution attribute is: no decline, subject to natural processes.

4. Structure and functions

Structure and functions relates to the physical components of a habitat ("structure") and the ecological processes that drive it ("functions"). For lagoons these include attributes such as salinity, hydrology and various water quality attributes.

4.1 Salinity regime

Lagoons can vary considerably in salinity both within and between sites depending on the volume and timing of inflowing and outflowing fresh and seawater. Salinity is probably the most important variable in the classification of lagoon types (Roden and Oliver, 2013).

The target for the salinity regime attribute is: median annual salinity and temporal variation within natural range.

The salinity in Loch Doire Bhanbh ranges from 20-25 psu. Loch an tSáile lagoon consists of two connected lakes; seawater enters from the south on all tides and large volumes of freshwater enter from the large catchment area. The southern lake is relatively shallow (0-4m) and brackish throughout while the northern lake is deep (13m) and permanently stratified with water below 3m measuring 14 psu. Salinities within Loch Conaortha range from 10-13 psu. Salinity in Ardbear Salt Lake ranges from 16-35 psu with low salinities generally confined to the eastern shores where a few streams enter the lake. However in periods of intense rainfall, this can lead to a strong halocline at depths of approximately 2m. The lake is shallow over most of its area with an average depth of between 4 and 6m; a deep depression (27m) occurs on the southern side of the lake towards the inlet to the sea (Leahy, 1991).

Using information from Oliver (2007), Healy, et al. (1998) and Leahy (1991), the following table gives the salinity class for each lagoon listed. See Roden and Oliver (2013) for further information on salinity classes and Appendix 2 for individual lagoon reports.

Code	Name	Salinity
IL061	Loch Doire Bhanbh	Polyhaline
IL062	Loch an tSáile	Oligohaline/Mesohaline
IL063	Loch Conaortha	Mesohaline
	Ardbear Salt Lake	Polyhaline

4.2 Hydrological regime

Fluctuations in water depth are a natural feature of lagoon hydrology. However, if water levels fluctuate beyond their natural values due to issues such as drainage, the condition of the habitat can deteriorate.

The target for hydrological regime is: annual water level fluctuations and minima within natural ranges.

The northern lake within Loch an tSáile is deep (13m). Ardbear Salt Lake is relatively shallow (4-6m) over most of its area, as are the remaining lagoons identified within Connemara Bog Complex SAC ($\underline{<}$ 5m). Thus even small changes in their water depth can cause significant losses in habitat area. Further information is required to investigate historic fluctuations to enable more specific targets to be set. See Appendix 2 for individual site reports.

4.3 Barrier: connectivity between lagoon and sea

The morphology of the barrier between a lagoon and sea determines how it functions ecologically. Changes to the barrier can be due to natural processes such as storms, but they can also be modified through human intervention. Active management is sometimes necessary, particularly if the lagoon is artificial.

The target for the attribute barriers: connectivity between lagoon and sea is: appropriate hydrological connections between lagoons and sea, including where necessary, appropriate management.

The four lagoons listed for the site have varying barrier types, which is summarised in the following table (after Oliver, 2007 and Healy et al., 1998). See also site accounts in Appendix 2.

Code	Name	Barrier Type
IL061	Loch Doire Bhanbh	Salt marsh lagoon
IL062	Loch an tSáile	Rock/peat barrier
IL063	Loch Conaortha	Rock/peat barrier
	Ardbear Salt Lake	Rock barrier

4.4 Water quality- Chlorophyll a

This attribute indicates the level of phytoplankton in the water column. Roden and Oliver (2013) make the assumption that, for shallow lagoons in “natural” condition, primary productivity is

dominated by the benthos rather than the plankton. Phytoplankton tends to increase in density in response to increasing nutrient levels. Excessive shading from phytoplankton can reduce submergent macrophyte colonisation of the littoral zone of lagoons.

The target for the attribute water quality- Chlorophyll a is: annual median chlorophyll a within natural ranges and less than 5µg/L. Target based on Roden and Oliver (2013).

4.5 Water quality- Molybdate reactive phosphorus (MRP)

The target for the attribute water quality- Molybdate Reactive Phosphorus (MRP) is: annual median MRP within natural ranges and less than 0.1mg/L. The target is based on Roden and Oliver (2013).

This limit is required to ensure that excessive shading from phytoplankton does not reduce submergent colonisation of the littoral zone.

4.6 Water quality- Dissolved inorganic nitrogen (DIN)

The target for the attribute water quality- Dissolved Inorganic Nitrogen (DIN) is: annual median DIN within natural ranges and less than 0.15mg/L. The target is based on Roden and Oliver (2013).

As for phosphorus, the limit for set nitrogen is to ensure that excessive shading from phytoplankton does not reduce submergent colonisation.

4.7 Depth of macrophyte colonisation

The lagoons within the Connemara Bog Complex SAC have largely been identified as shallow, generally less than (≤5m) and Ardbear Salt Lake (4-6m over most of its area); the exception is the middle lake at Loch an tSáile which is 15m deep. Thus, it is anticipated that macrophytes extend down to the full depth in Loch Doire and Loch Conaortha. In Loch an tSáile macrophytes would be expected to extend to 4m depth; thereafter the dark water colour prohibits growth. The target for the attribute depth of macrophyte colonisation is: macrophyte colonisation to maximum depth of lagoons in Loch Doire and Loch Conaortha and to 4m in Loch an tSáile. In Ardbear the maximum depth of macrophyte is expected to be approximately 12m.

4.8 Typical plant species

As lagoon specialist species do not easily recolonise, their presence is one of the indicators of long term continuity of quality.

The target for the attribute typical plant species is: maintain number and extent of listed lagoonal specialists, subject to natural variation.

The plant species recorded in three of the lagoons are summarised in Oliver (2007). Species considered to be lagoonal specialists include *Chaetomorpha linum*, *Lamprothamnium papulosum*, *Chara baltica* and *Ruppia* spp. Plant species for Ardbear Salt Lake are recorded in Healy et al. (1998) and MERC (2012), the latter noting the presence of the lagoonal specialist *Ruppia maritima*. See Appendix 2 for individual site reports.

4.9 Typical animal species

Some invertebrate species are regarded as lagoonal specialists and their presence can indicate long term quality. As species found within each lagoon can vary considerably, depending on other attributes such as salinity, the target is based on site-specific species lists.

The target for the attribute typical animal species is: maintain listed lagoon specialists, subject to natural variation.

The species recorded per site are summarised in Oliver (2007). The lagoonal specialists recorded within these lagoons are, the isopods *Idotea chelipes, Jaera nordmanni* and *Lekanesphaera hookeri*, the decapod *Palaemonetes varians*, the gastropods *Hydrobia ventrosa* and *Littorina "tenebrosa"*, the bivalve *Cerastoderma glaucum*, the bryozoan *Conopeum seurati* and the water beetle *Megasternum obscurum*. For Ardbear Salt Lake the lagoonal specialist *Palaemonetes varians* was recorded and the bivalve *Cerastoderma glaucum* had previously been described for this lagoon. See Appendix 2 for site reports.

4.10 Negative indicator species

Negative indicator species include non-native alien species as well as those that are not typical of the habitat. For example, accelerated encroachment by reedbeds can be caused by low salinity, shallow water and elevated nutrient levels.

The target for the attribute negative indicator species is: negative indicator species absent or under control.

5. References

Healy, B., Oliver, G.A., Hatch, P. & Good, J.A. (1998). Survey of Irish coastal lagoons. 1996 and 1998.. Report to the National Parks and Wildlife Service, Dublin.

Leahy, Y. (1991). Polychaete studies on the west coast of Ireland I. Benthic characterisation of the Dunkellin estuary with particular reference to the Polychaeta II. Aspects of the biology and ecology of the serpulid *Serpula vermicularis* Linnaeus from Ardbear Salt Lake. Unpublished Ph.D. thesis, National University of Ireland, Galway

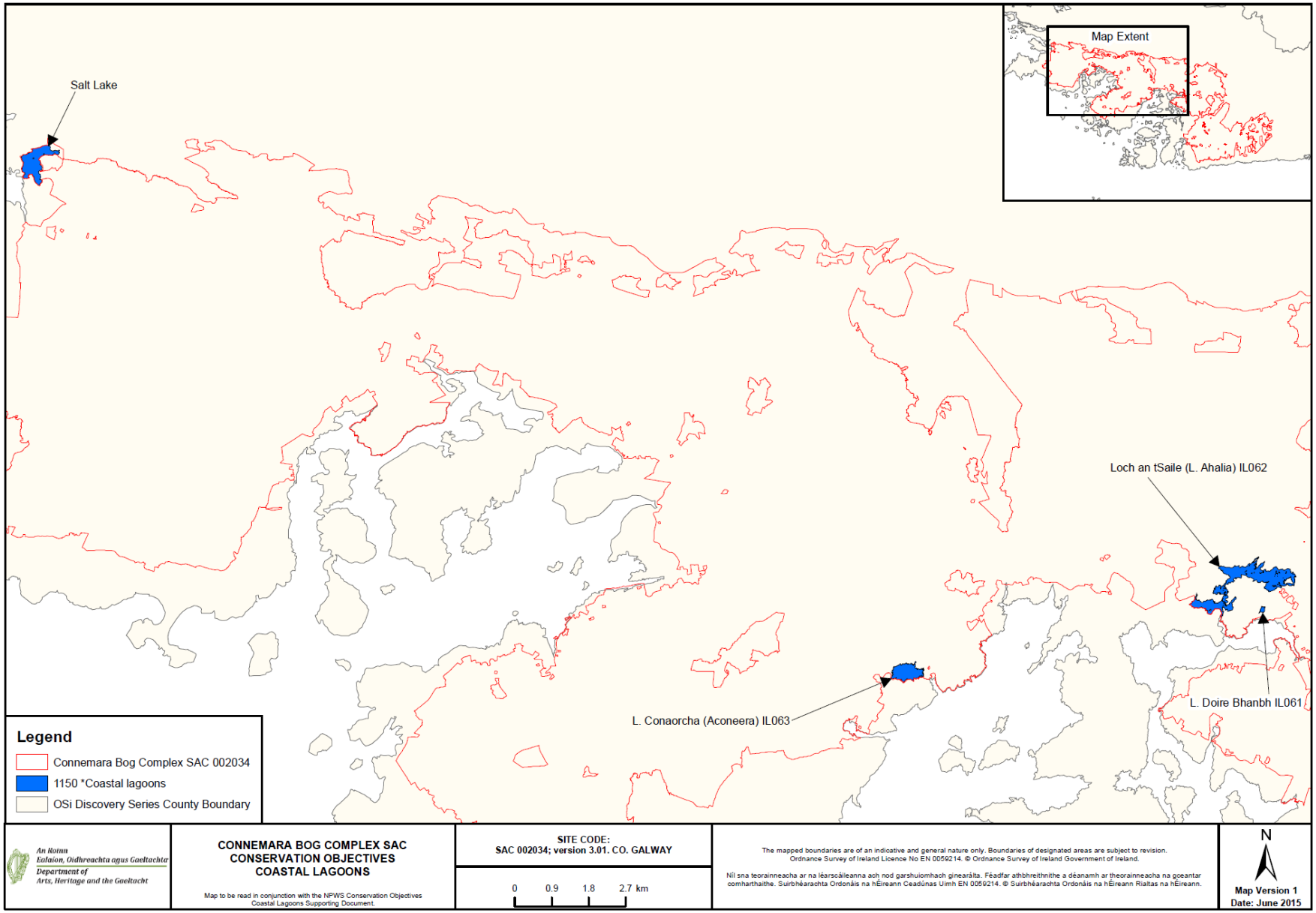
MERC (2012). Subtidal reef survey of Salt Lake, Connemara Bog Complex. Carried out by MERC on behalf of the Marine Institute in partnership with National Parks and Wildlife Service, Department of Environment, Heritage and Local Government.

NPWS (2013) The status of EU protected habitats and species in Ireland. Unpublished report, NPWS. Department of Arts, Heritage and the Gaeltacht, Dublin.

Oliver, G. (2007) Inventory of Irish coastal lagoons (version 2). Unpublished report to the National Parks and Wildlife Service.

Roden, C.M. and Oliver, G. (2013) Monitoring and assessment of Irish lagoons for the purpose of the EU Water framework Directive. Unpublished report to the Environmental Protection Agency.

Appendix 1 Lagoon distribution map



Appendix 2 Site reports

The following are site accounts from Oliver (2007)

Code[1]	Name
IL061	Loch Doire Bhanbh
IL062	Loch an tSáile
IL063	Loch Conaortha

[1] Codes are those used in Oliver, 2007.

4.61 **Loch Doire Bhanbh, County Galway** O.S. L 961 384
O.S. Discovery Sheet 45

Conservation Designation: Connemara Bog complex SAC 002034, pNHA 002034

General description:

A very small (1ha), relatively shallow (3m) **natural "saltmarsh" lagoon**, situated on the northern shore of Camus Bay, 15km northeast of Kilkieran, Co. Galway. Ranging in salinity at the time of sampling (10/08/2002) from 20-25psu.

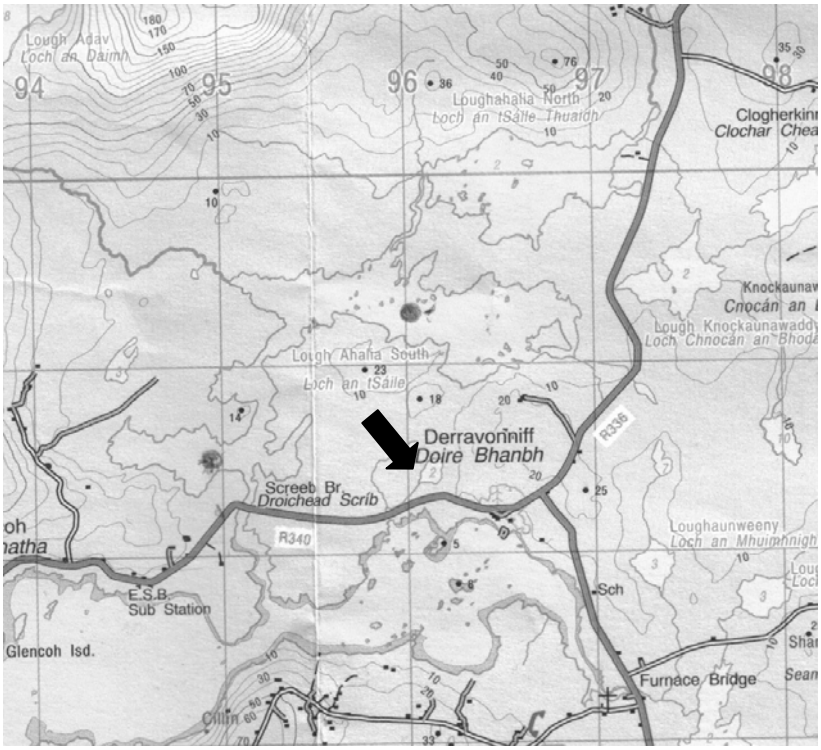


Figure 61.1 Location map of L. Doire Bhanbh.

L. Doire Bhanbh was surveyed in 2002 as part of a PhD study and used in a biological classification of Irish coastal lagoons (Oliver 2005). Four stations were selected for the sampling of aquatic fauna and flora (Figure 61.2 Table 61.1)

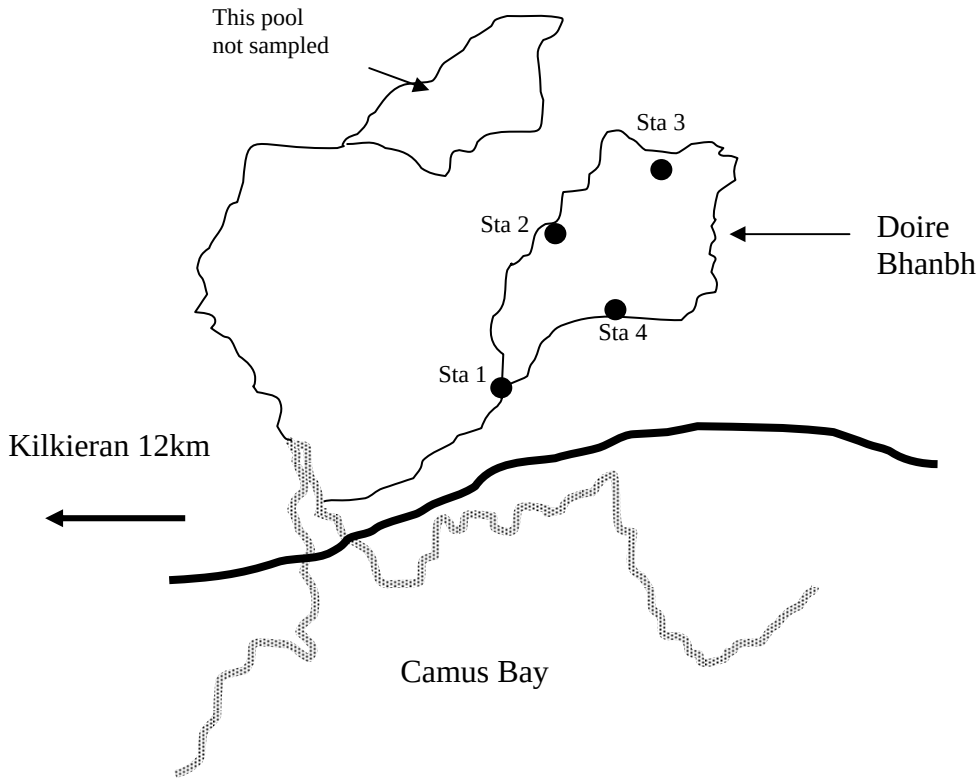


Figure 61.2 Sampling stations used at Doire Bhanbh on 10/08/2002.

Flora

Only 9 floral taxa were recorded at Doire Bhanbh (Table 62.1), but three of these are lagoonal specialists, one of which is a rare charophyte. Two other species (*Zostera marina*, *Fucus ceranoides*) are not particularly rare but are only found in relatively few lagoons.

Table 62.1 Percentage cover of vegetation in Doire Bhanbh on 10/08/02 with salinity, depth of water and type of substratum. Species in bold text are "lagoonal specialists" or rare species.

		Station 1	Station 2	Station 3	Station 4
Salinity(psu)		25	25	22	20
Depth(cm)		300	100	100	100
Substratum		sand	soft peat	sand, rock	soft peat
Percentage cover:					
Chlorophyta	***Chaetomorpha linum***	10	90	30	30
	Cladophora sp.	10	2	1	20
	Enteromorpha	0	0	1	0
	Fucus ceranoides	10	5	30	5
Charophyta	***Lamprothamnion papulosum***	0	2	0	2
Angiosperms	*Potamogeton pectinatus*	0	5	5	5
	***Ruppia* sp.**	5	5	5	30
	Phragmites australis	5	5	10	5
	Zostera marina	20	0	0	0

Lamprothamnion papulosum was known from only three sites in Ireland before 1996 (Hatch and Healy 1998). As a result of the surveys it was relocated at two of these sites (Lady's Island L., Co. Wexford, L. Murree, Co. Clare), but not at Tacumshin L., Co. Wexford. It is also now known from a total of 14 lagoon sites, most of which are clustered in Connemara, but there are also new records from the North Slob, Co. Wexford, L. Bofin, Co. Galway and Maghery, Co. Donegal. This species is listed in the Red Data Book for Britain and Ireland (Stewart and Church 1992). Although recorded from the Baltic to the Mediterranean and Black Sea and also South Africa, it is believed to be declining in Europe. There are only five recent records from the south of England, but there are 12 important sites in the Outer Hebrides (Bamber et al. 2001b). These Irish locations are very important in European terms, and it is especially encouraging to have found new sites.

Chaetomorpha linum. There is some doubt about the taxonomic status of the unattached lagoonal form of this species, and it was recorded by Hatch and Healy (1998) as *C. mediterranea*. It is a common, characteristic alga of semi-isolated Irish lagoons, recorded at 49 of the 87 (56.3%) lagoons surveyed.

***Ruppia* spp.** are the most characteristic aquatic plant taxa of Irish coastal lagoons. The species are hard to distinguish when not flowering, and remain uncertain at some sites, but *Ruppia* of one species or the other (*R. maritima, R. maritima var brevirostris, R. cirrhosa*) was found at 62 of the 87 lagoons (71.3%) surveyed, and is one of the most useful indicators of coastal lagoon status.

The *Ruppia* in Doire Bhanbh was not identified specifically, but is assumed to be ***R. maritima,*** which appears to be the more common of the species and was found at 41 of the lagoons surveyed (47%). ***R. cirrhosa*** is believed to tolerate higher salinities than the former species and to be less common, but neither of these statements is clearly supported in Irish lagoons and the two species were often found growing together. *Ruppia cirrhosa* was only identified at 23 lagoons (26%), but species was not determined at 12 sites. ***R. maritima* var *brevirostris*** was only positively identified at two sites (Ballyteige, Co. Wexford and Inch L., Co. Donegal).

Fucus ceranoides was recorded at 18 of the higher salinity lagoons, on all parts of the coastline.

Doire Bhanbh is very small but the vegetation is very interesting, and dominated by lagoonal specialist species, one of which is a rare charophyte, *Lamprothamnium papulosum*. Based on aquatic vegetation the site is rated as of **high conservation value.**

Fauna

Only 17 faunal taxa were recorded in Doire Bhanbh when sampled on 10/08/02 (Table 61.2), but six of them are lagoonal specialists. Most of these "specialists" are relatively common in lagoonal habitats, but one (*Littorina tenebrosa*) is rare in Ireland.

Idotea chelipes is a common, lagoonal, isopod crustacean, often found in association with the lagoonal form of *Chaetomorpha linum.* Found at 23 of the 87 (26.4%) lagoons surveyed, mostly at relatively high salinity.

Lekanesphaera hookeri is a common lagoonal isopod crustacean, found at 37 of the 87 lagoons surveyed (42.5%).

Hydrobia ventrosa. Gastropod mollusc commonly found in brackish lagoons and ditches and generally not on the open coast. Recorded at 18 of the 87 (20.7%) lagoons surveyed up to 2006.

Littorina "tenebrosa" Gastropod mollusc recorded on the North Slob and in a brackish pool close to L. Murree, Co. Clare and at seven lagoons in Co. Galway. These are the only known sites in Ireland. The status of this taxon is still uncertain but specimens appear to be morphologically and ecologically distinct from *L. saxatilis.*

Cerastoderma glaucum Bivalve mollusc. A common lagoonal specialist found at 30 of the 87 lagoons (34.5%) surveyed.

Conopeum seurati Bryozoan recorded at 49 of the 87 lagoons surveyed (56.3%), but is not listed in a recent review of Irish marine Bryozoa (Wyse Jackson 1991). Either the species is under-recorded or is truly a lagoonal specialist.

Relatively few faunal taxa were recorded in Doire Bhanbh, but a large proportion of these are lagoonal specialists, and one of these is rare. Based on aquatic fauna, the site is rated as of **high conservation value**.

Table 61.2 Faunal taxa recorded at stations in Doire Bhanbh on 10/08/02.
SWm = mean of 3x 30 second sweeps, Sedm = mean of 3 x 0.005m^2 diameter sediment cores, L.T. = Light trap, **Ab** = overall abundance of all sampling methods, including visual searches. r = rare, o = occasional, c = common, a = abundant. Species in bold text are lagoonal specialists or rare species.

		Sta 1			**Sta 2**			**Sta 3**				**Sta 4**		
		SWm	L.T.	**Ab**	Sedm	L.T.	**Ab**	SWm	Sedm	L.T.	**Ab**	SWm	L.T.	**Ab**
Annelida	*Nereis diversicolor*				0.3		**r**		0.7		**o**			
Nemertea	indet											0.3		**o**
Crustacea														
Isopoda	***Idotea chelipes***	1.3	1	**o**		16	**o**	4.0		7.0	**c**	3.3	12	**c**
	Lekanesphaera hookeri	27.0	7	**c**		56	**c**	19.3		48.0	**c**	6.7	3	**c**
	Tanais dulongi	0.3		**r**										
Mysid	*Praunus flexuosus*	3.0	4	**o**		235	**c**	1.7		3.0	**o**	11.7	19	**c**
Amphipoda	indet	7.7	1	**c**		1	**r**	5.7	1.0	7.0	**c**	4.0		**c**
	Corophium volutator					6	**o**		0.7	21.0	**o**	0.7		**o**
	Gammarus salinus	3.0		**c**										
	Gammarus zaddachi	0.3		**r**		1	**r**	2.7		4.0	**c**	1.3		**o**
	Melita palmata	3.7	1	**c**				0.3		2.0	**o**	0.7		**o**
Insecta														
Diptera	Chironomidae	0.7		**o**	1.0		**o**	5.7	0.3		**c**	7.0		**c**
Mollusca														
Gastropoda	***Hydrobia ventrosa***	2.0	1	**o**				11.7	2.7	11.0	**c**	12.0	13	**c**
	Littorina" tenebrosa"	21.3		**c**		3	**a**	93.0		15.0	**c**	69.7	4	**c**
Bivalvia	***Cerastoderma glaucum***								1.0		**o**	1.7		**o**
	Mytilus edulis	0.7		**o**								0.3		**r**
Bryozoa	***Conopeum seurati***			**o**			**o**				**o**			
Pisces	*Gasterosteus aculeatus*	0.3	2	**o**		1	**r**	1.7		12.0	**o**	5.3	1	**c**

Summary

Doire Bhanbh is a very small natural "saltmarsh" lagoon, with a low number of both floral and faunal taxa recorded, but a high proportion of lagoonal specialists (3 floral, 6 faunal), at least two of which, the charophyte ***Lamprothamnium papulosum*** and the mollusc ***Littorina "tenebrosa"*** are rare, both in Ireland and Europe. Although small and geomorphologically not very interesting, both aquatic fauna and flora are of high conservation value. Overall conservation value is therefore rated as high.

Overall Conservation Value = High

Conservation Status Assessment (from Oliver 2007)	
Impacts	Natural eutrophication in small lagoon but significant tidal flushing. Accumulation of organic material.
Conservation Status	Favourable

Further Information

Listed as a lagoon by Healy *et al.* 1997, and Healy 2003. Surveyed in 2002/2003 as part of a PhD study (Oliver 2005) and used in a biological classification of Irish coastal lagoons and in the Conservation Status Assessment (Oliver 2007).

References:

Bamber, R.N, Gilliland, P.M. & Shardlow, M.E.A. 2001b. *Saline lagoons: a guide to their management and creation* (interim version). ISBN 1 85716573 X. Peterborough, English Nature.

Hatch, P. & Healy, B. 1998. Aquatic vegetation of Irish coastal lagoons. *Bulletin of the Irish Biogeographical Society*. **21:** 2-21.

Healy, B. 2003. Coastal Lagoons. In: *Wetlands of Ireland.* R. Otte (ed). Chapter 4. University College Dublin Press. Dublin. 44-78.

Healy, B., Oliver, G.A., Hatch, P. & Good, J.A. 1997. *Coastal lagoons in the Republic of Ireland. Vol. 3. Inventory of lagoons and saline lakes.* Report to the National Parks and Wildlife Service, Dublin.

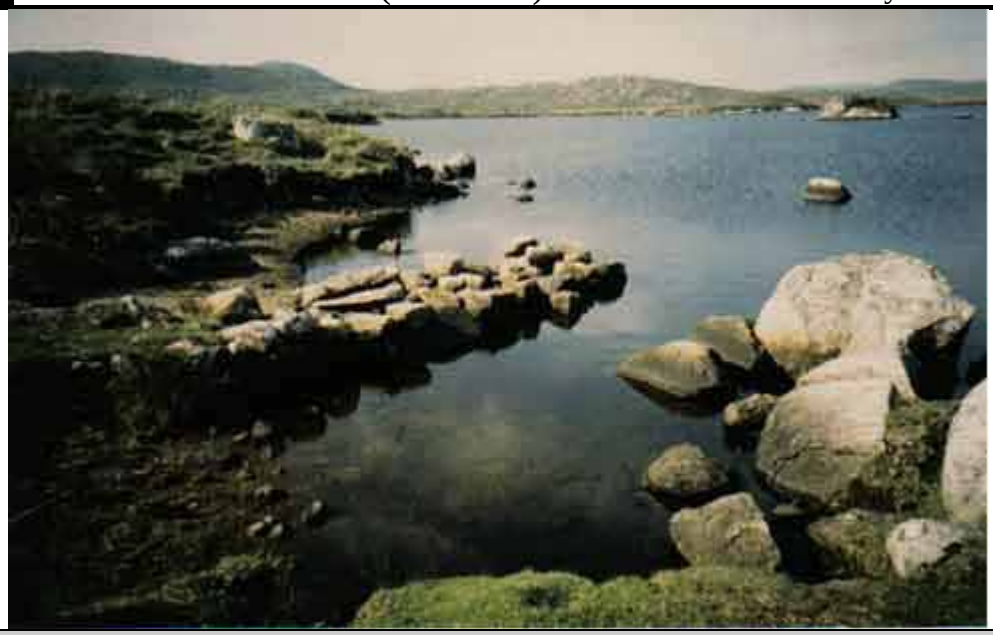
Oliver, G.A. 2005. *Seasonal changes and Biological Classification of Irish Coastal Lagoons.* PhD Thesis. U.C.D., Dublin. Available on www.irishlagoons.com

Oliver, G.A. 2007. *Conservation status report: Coastal Lagoons (1150).* Unpublished report to the National Parks and Wildlife Service, Dublin.

Stewart, N.F. & Church, J.M. 1992. *Red Data Books of Britain and Ireland. Charophytes.* Joint Nature Conservation Committee and Office of Public Works, Dublin.

Wyse Jackson, P.N. 1991. Distribution of Irish marine Bryozoa, together with biographical notes relating to the chief researchers in the group. *Bulletin of the Irish Biogeographical Society*. **14:** 129-18.

4.62 **Loch an tSaile, County Galway** O.S. L 954 390
(L. Ahalia) O.S. Discovery Sheet 45



Conservation Designation: Connemara Bog complex SAC 002034, pNHA 002034

General description:

Loch an tSaile is one a series of lakes with a natural outlet, at the north end of Camus Bay, 1.5 km west of Screeb. There are three large connected lakes with several smaller embayments which almost form separate lakes in themselves. The two lower lakes are regarded as **rock/peat lagoons** and together these cover an area of approximately 90ha. 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 (13m) and permanently stratified with water below 3m measuring 14psu.

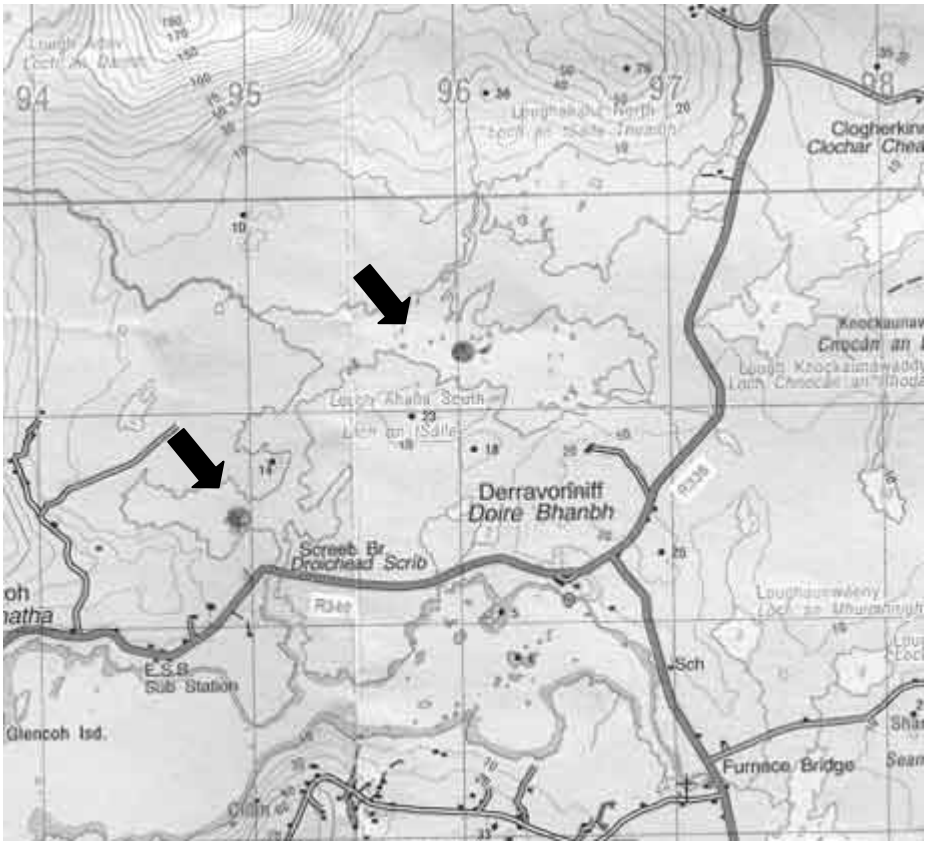


Figure 62.1 Location of map of L. an tSaile (L.Ahalia).

Listed as a lagoon by Healy *et al.* 1997. Surveyed in 1998 for vegetation (Roden 1999), aquatic fauna (Oliver 1999) and ecotonal coleoptera (Good 1998, Good & Butler 2000). Results of these surveys are summarised by Healy (1999a,b; 2003). Included in a biological classification of Irish coastal lagoons (Oliver 2005) and in the Conservation Status Assessment (Oliver 2007).

Flora

The vegetation of L. an tSaile was surveyed in 1998 by C. Roden. The following is taken mostly from Roden (1999):

Underwater observations

This lagoon consists of several partially separated basins. Two types of water can be distinguished, with a stratified upper freshwater layer up to 4m deep in the upper basin but much shallower in the lower basin, and a lower more saline layer. The less saline layer is very clear while the more saline layer is cloudy, possibly due to algal growth.

All the basins have a similar structure, with rocky steeply shelving sides descending to a flat muddy floor. The eastern part of the lower basin is very shallow and is covered by a ***Potamogeton pectinatus/Ruppia*** sp. mixture. In the upper basin much of the lagoon is covered by the characteristic spherical balls of ***Cladophora aegagropila***. However, part of this basin is very deep (unreachable using a snorkel) and probably is covered only by mud. The remaining basins are only metres deep but the dark colour of the water seems to inhibit plant growth. In the lower basin a sparse population of ***Zostera*** occurs with some ***Chaetomorpha linum***, while *P. pectinatus* is common in the middle basin.

The sloping sides of the upper basin are very unusual. Close to the surface a sparse flora of freshwater plants including *Littorella uniflora, Myriophyllum alternifolium* and *Potamogeton polygonifolius* grow amongst granite boulders and gravel. In places a green blanket of drift *Oedogonium* and freshwater filamentous algae cover the granite rock. However, as one descends this flora is replaced by a band of ***Ruppia cirrhosa***, which in turn is replaced (in places) by specimens of ***Fucus ceranoides*** and dead mussel shells. Elsewhere the *Ruppia* extends into the *C. aegagropila* zone.

In the other basins a brackish flora extends from the surface downwards. *Enteromorpha* and *F. ceranoides* occur on bare rock while *Ruppia* sp. occur in mud and gravel. *C. linum* forms a distinct band at the base of the rocky sloping sides.

Results

The great depth of the site (>14m) and the strong salinity gradient result in a wide range of vegetation communities:

1. Charophyte communities in shallow water less than 1.0m. Four different species occur depending on salinity.

   Chara virgata occurs in the upper and middle basin often in association with *Littorella uniflora.*

   Chara aspera occurs in the middle basin and the eastern arm of the lower basin.

   Chara baltica and ***Lamprothamnium papulosum*** are confined to the lower basin.

2. The surface 3m of the upper basin contains a freshwater community of *Myriophyllum alterniflorum, Potamogeton polygonifolius* and *C. virgata.*
3. A band of ***Ruppia* sp.** grows below this zone. The saline nature of this community is shown by dead *Mytilus* and *Cerastoderma* shells.
4. Mud and sand areas are covered by drifting balls of ***Cladophora aegagropila***.
5. The small middle basin contains *Ruppia/Potamogeton pectinatus* communities with some ***Chaetomorpha linum***.
6. The western arm of the lower basin is the most saline area. Rocky shores are covered by ***Fucus ceranoides***, *Cladophora rupestris* and *Enteromorpha* sp.

7. At 1-2m depth, *F. serratus* and *F. vesiculosus* occur. At greater depths dense mounds of *C. linum* are found.
8. Soft sediments support *Ruppia* sp. and at greater depths, ***Zostera marina*** and *Ruppia* with some *C. linum*.
9. The eastern arm is shallow with a dense growth of *P. pectinatus, Ruppia* sp., *L. papulosum* and *C. linum*.
10. The channel which links the four basins is 2-4m deep. The floor is largely bare mud with occasional large boulders. A sparse growth of *Zostera marina, Ruppia* sp., *P. pectinatus* and *C. linum* occurs.

Six of the species recorded are lagoonal specialists, and two of these are rare charophytes (***C. baltica, L. papulosum***). One other species of chlorophyte algae (***Cladophora aegagropila*****)** appears to be a rare species:

Chara ?baltica. Recent records from 3 lagoons. This species was first reported by Hatch & Healy (1998) in L. Aconeera, identified as *C. baltica* by Jim Ryan and confirmed by Mr. Nick Stewart. However, recently Stewart wrote to C. Roden expressing reservations about his identification. The population was resampled and depending on one's interpretation of the cortex it keys out as either *Chara baltica* or *Chara aspera*, using standard works. Another related lagoonal taxon, known from Brittany and southern Europe is *C. gallioides* which is larger than *C. aspera* and has larger reproductive organs and lacks bulbils. It has not been possible to obtain fertile material which would help in identification, from L. Aconeera and the species remains to be verified.

(Roden (1999) recorded *C. baltica* in L. an tSaile in 1998, which is apparently the same species as the *Chara* in L. Aconeera, and similarly remains to be verified).

Another charophyte found in Ballyconneely L. since 1998 easily keys out as *Chara baltica* on the basis of size (>60cm), spines single or in pairs, large reproductive organs and long uncorticated branchlet end cells, as well as slight encrustation. However this identification has not been confirmed by an expert in the group and Schubert and Blindlow (2004) note differences between the form of *Chara baltica* found in the Baltic Sea and all other European populations identified as this species.

Lamprothamnium papulosum was known from only three sites in Ireland before 1996 (Hatch and Healy 1998). As a result of the surveys it was relocated at two of these sites (Lady's Island L., Co. Wexford, L. Murree, Co. Clare), but not at Tacumshin L., Co. Wexford. It is also now known from a total of 14 lagoon sites, most of which are clustered in Connemara, but there are also new records from the North Slob, Co. Wexford, L. Bofin, Co. Galway and Maghery, Co. Donegal. This species is listed in the Red Data Book for Britain and Ireland (Stewart and Church 1992). Although recorded from the Baltic to the Mediterranean and Black Sea and also South Africa, it is believed to be declining in Europe. There are only five recent records from the south of England, but there are 12 important sites in the Outer Hebrides (Bamber *et al*. 2001). These Irish locations are very important in European terms, and it is especially encouraging to have found new sites.

Chaetomorpha linum. There is some doubt about the taxonomic status of the unattached lagoonal form of this species, and it was recorded by Hatch and Healy (1998) as *C. mediterranea*. It is a common, characteristic alga of semi-isolated Irish lagoons, recorded at 49 of the 87 (56.3%) lagoons surveyed.

Cladophora aegagropila is a rare species recorded only in L. an tSaile during the lagoon surveys (confirmed by Prof. Van den Hoek). Roden (1999) lists this species as a lagoonal specialist but it is also found in freshwater. Status as a lagoonal species remains uncertain at the moment.

***Ruppia* spp.** are the most characteristic aquatic plant taxa of Irish coastal lagoons. The species are hard to distinguish when not flowering, and remain uncertain at some sites, but *Ruppia* of one species or the other (*R. maritima, R. maritima var brevirostris, R.*

cirrhosa) was found at 62 of the 87 lagoons (71.3%) surveyed, and is one of the most useful indicators of coastal lagoon status. ***Ruppia maritima*** appears to be the more common of the species and was found at 41 of the lagoons surveyed (47%). ***Ruppia cirrhosa*** is believed to tolerate higher salinities than the former species and to be less common, but neither of these statements is clearly supported in Irish lagoons and the two species were often found growing together. *Ruppia cirrhosa* was only identified at 23 lagoons (26%), but species was not determined at 12 sites. ***Ruppia maritima* var *brevirostris*** was only positively identified at two sites (Ballyteige, Co. Wexford and Inch L., Co. Donegal).

Summary

The aquatic flora of L. an tSaile is rich with a total of 26 floral taxa recorded in 1998, of which six species are lagoonal specialists. Two of these are rare charophytes (***C. baltica, L. papulosum***) and one other species of chlorophyte algae (***Cladophora aegagropila*)** appears to be a rare species in Europe. Based on aquatic flora, this site is regarded as of **high conservation value.**

Fauna

Eleven stations were selected for sampling aquatic fauna in 1998 (Figure 62.2, Table 62.1, Oliver 1999)

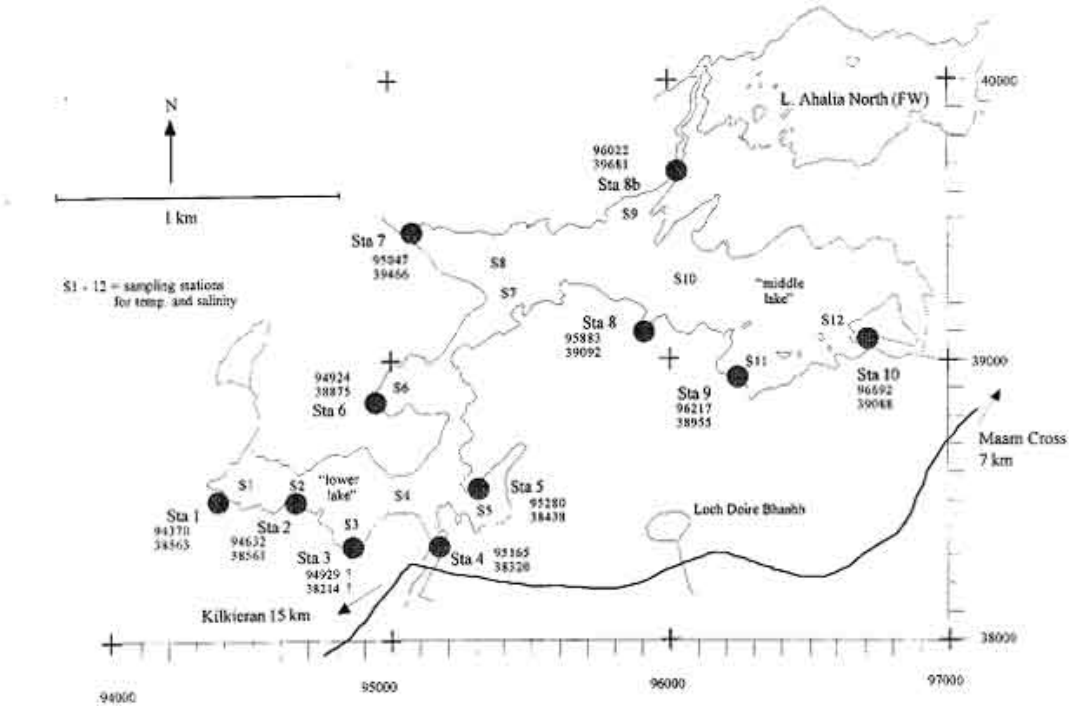


Figure 62.2 Sampling stations used at Loch an tSaile.

A total of 43 faunal taxa were recorded in L. an tSaile in 1998 (Table 62.2), of which 5 species are regarded as lagoonal specialists in Britain, one other species is a proposed specialists for Ireland, and three species appear to be rare:

Idotea chelipes is a common, lagoonal, isopod crustacean, often found in association with the lagoonal form of *Chaetomorpha linum.* Found at 23 of the 87 (26.4%) lagoons surveyed, mostly at relatively high salinity.

Jaera nordmanni. Isopod crustacean recorded at 24 of the 87 lagoons surveyed (27.6%) and may occur at others where it was not recorded due to the fact that only adult males are easily identified. This species may occur in freshwater, as in L. Errol, Cape Clear, Co. Cork. Described in England (Barnes 1994, Hayward and Ryland 1995) as occurring in

streams flowing down the shoreline, on south and west coasts only. All records in Ireland are from West Cork to Donegal. Proposed as a lagoonal specialist for Ireland by Oliver and Healy (1998).

Lekanesphaera hookeri is a common lagoonal isopod crustacean, found at 37 of the 87 lagoons surveyed (42.5%).

Palaemonetes varians Decapod crustacean listed as a lagoonal specialist in the U.K. by Barnes (1989) and Bamber (1997), but apparently is no longer regarded as such. Although found in estuaries, this species appears to be far more characteristic of lagoons in Ireland, found in 64 of the 87 lagoons surveyed (73.6%) and may require a lagoonal environment for reproduction. Therefore, it remains on the proposed list of lagoonal specialists for Ireland.

Littorina "tenebrosa" Gastropod mollusc recorded on the North Slob, Co. Wexford, and in a brackish pool close to L. Murree, Co. Clare and at seven lagoons in Co. Galway. These are the only known sites in Ireland. The status of this taxon is still uncertain but specimens appear to be morphologically and ecologically distinct from *L. saxatilis.*

Conopeum seurati Bryozoan recorded at 49 of the 87 lagoons surveyed (56.3%), but is not listed in a recent review of Irish marine Bryozoa (Wyse Jackson 1991). Either the species is under-recorded or is truly a lagoonal specialist.

Megasternum obscurum Water-beetle recorded at Ballyteige, Co. Wexford, L. an Chara and L. an tSaile, Co. Galway and at Furnace L., Co. Mayo, but is otherwise described as rather rare in Ireland (Foster *et al.* 1992*).*

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

Table 62.1 Positions of stations used for sampling aquatic fauna in L. an tSaile on 10-12/8/98 and 27-29/9/98, with salinity, depth of water and type of substratum.

	Sta 1	Sta 2	Sta 3	Sta 4	Sta 5	Sta 6	Sta 7	Sta 8	Sta 8b	Sta 9	Sta 10
GPS position	L 94370 38563	L 94632 38561	L 94929 38214?	L 95165 38320	L 95280 38338	L 94924 38875	L 95047 39466	L 95883 39092	L 96022 39681	L 96217 38955	L 96692 39088
Salinity at surface(psu)	1.8	1.5	1.5	3.8	3.5	1.4	0.6	0.2	0	0.2	0
Salinity at depth(psu)	3.6	13.9	7.5	4.8	4.6	2.8	1.6	10.3	0	1.3	1.0
Depth (cm)	0-100	0-400	0-200	0-200	0-100	0-100	0-100	0-400	0-200	0-400	0-100
Substratum	Peaty mud	Soft peaty mud	Granite bedrock, large boulders, coarse sand	Bedrock, stones, coarse sand	Granite boulders, coarse sand	Stones, granite sand, silt.	Stones, granite sand, peat	Stones, gravel, coarse sand.	Stones, gravel, coarse sand	Boulders, stones, gravel, coarse sand	Boulders, stones, gravel, coarse sand

The aquatic fauna of L. an tSaile is rich with 43 taxa recorded in 1998, of which six species are lagoonal specialists, and two are rare species. Based on aquatic fauna, the site is regarded as of **high conservation value**.

Ecotonal coleoptera

Eleven species of carabid and eighteen species of staphylinid were recorded in L. an tSaile in 1998 (Good 1999, Good & Butler 2000). One species, ***Stenus lustrator*** is an indicator species, but based on ecotonal coleoptera the site was rated as of **low conservation value**.

Summary

Loch an tSaile is a large (90ha) lagoon, of a type which is rare in a European context, but characteristic of parts of the west coast of Ireland, especially in Connemara, referred to as **rock/peat lagoons** with restricted tidal influence due to the presence of a "barrier" of bedrock and peat. Flora and fauna are rich, with a total of 26 floral taxa recorded in 1998, of which six species are lagoonal specialists. Two of these are rare charophytes (***C. baltica, L. papulosum***) and one other species of chlorophyte algae (***Cladophora aegagropila*)** appear to be a rare species in Europe. The fauna is equally rich with 43 taxa recorded, of which six species are lagoonal specialists, and two are rare species. The site is ranked as one of the six most important lagoons in the country and regarded as of **exceptional conservation value**.

Overall Conservation Value = Exceptional

Conservation Status Assessment (from Oliver 2007)	
Impacts	Salmonid cages, but significant flushing. Leisure fishing. Cattle poaching in some areas.
Conservation Status	Favourable

Further Information

Listed as a lagoon by Healy *et al.* 1997. Surveyed in 1998 for vegetation (Roden 1999), aquatic fauna (Oliver 1999) and ecotonal coleoptera (Good 1998, Good & Butler 2000). Results of these surveys are summarised by Healy (1999a,b; 2003). Included in a biological classification of Irish coastal lagoons (Oliver 2005) and in the Conservation Status Assessment (Oliver 2007).

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Table 62.2 Aquatic fauna recorded at stations in Loch an tSaile, Co. Galway. 1998.

L.T. = light trap; + = present, o = occasional. c = common, a = abundant. Species in bold text are lagoonal specialists or rare species.

		Sampling Stations																	
Taxa		1	L.T. 1	2	L.T. 2	3	L.T.3	4	L.T. 4	5	L.T. 5	6	L.T. 6	7	L.T. 7	8a	8b	9	L.T.9	10
Porifera	*Halichondria panicea*					+														
Cnidaria	*Chlorohydra viridis*																+	+		
	Clava multicornis			+		+														
Turbellaria	*Procerodes littoralis*													+						
Annelida	Naididae indet.					+														
	Stylaria lacustris																+			
	Tubificidae indet.																			+
Crustacea																				
Mysidacea	*Neomysis integer*	c	8	+	5							+	5	+	4					4
Isopoda	*Idotea chelipes*			o	2					+	+									
	Lekanesphaera hookeri	+	22	a	56	+	50					+		o		o		o	5	1
	Jaera nordmanni							a				+		+				+	1	c
Amphipoda		+	100	+	20	c	c100		10		10	+	20	1	5			+	3	
	Corophium volutator	a	12	+	2			+	2	+	1	+	1		1					
	Gammarus duebeni				1				2											
	G. zaddachi	7	1	4	13	11	63	14	2		7	6	18	1	4				3	
	Melita sp.								1											
Decapoda	***Palaemonetes varians***	+	1					+	1											
Insecta																				
Ephemeroptera																	+			
Odonata	Aeschnidae indet.													1						1
	Ischnura elegans											+	1	+						+
Trichoptera												+								
Heteroptera	Corixidae indet.											2		8		4	3			1
	Hesperocorixa castanea																			1
	Sigara dorsalis													1						
	S. scotti													3						
	Gerris lacustris													o		o				o
	Velia sp.																			1

Table 62.2 continued. Aquatic fauna recorded at stations in Loch an tSaile, Co. Galway. 1998.
L.T. = light trap; + = present, o = occasional. c = common, a = abundant, F = Fyke Net. Species in bold text are lagoonal specialists or rare species.

		Sampling Stations																	
Taxa		1	L.T. 1	2	L.T. 2	3	L.T.3	4	L.T. 4	5	L.T. 5	6	L.T. 6	7	L.T. 7	8a	8b	9	L.T.9	10
Coleoptera												+		12	1					10
	Gyrinus caspius											5		4						
	G. minutus													1						
	G. substriatus													1						
	Haliplus rufficollis											1		5						5
	(Megasternum obscurum)						1													
	Nebrioporus depressus													1						2
	Stictotarsus 12-pustulatus																		2	
Diptera	Chironomidae indet.	c		o				c				o		o			+			+
Mollusca	Hydrobiidae indet.	+		+	45							+				+	+			
Prosobranchia	*Hydrobia ulvae*	1		c		+		+												
	H. ventrosa			+		+		+												
	Littorina "tenebrosa"			1		+		+												
	Potamopyrgus antipodarum	a		o				c				c		+		c	+	+		c
Bivalvia	*Mytilus edulis*			+				+												
Echinodermata	*Astropecten irregularis*			+		+		+												
Bryozoa	*Conopeum seurati*			+				+												+
Pisces	*Anguilla anguilla*	F=15				F=1								+				F=8		
	Gasterosteus aculeatus	+	5			+	2	+		+				+			+	+	2	+
	Mugilidae					F=1														+
	Pomatoschistus microps		5					+		+		+		+				+	1	
	Salmo trutta																			+

4.63 **Loch Conaortha, County Galway** O.S. L 875 369
(Lough Aconeera) O.S. Discovery Sheet 44

Conservation Designation: Connemara Bog complex SAC 002034, pNHA 002034

General description:

Lough Aconeera is a moderate sized (26ha) lagoon up to 5m deep in the central parts, situated on the northern shore of Kilkieran Bay, western Connemara, 6 km north of Kilkieran. It is a type of lagoon, rare in a European context, but characteristic of parts of the west coast of Ireland, especially in Connemara, which are permanent and brackish, with restricted tidal influence due to the presence of a "barrier" of granite rocks and peat referred to as a **"rock/peat" lagoon**. This lagoon lies at the base of a mountain range, Cnoc Mordáin, which rises to 354 m within 1 km of the lake.

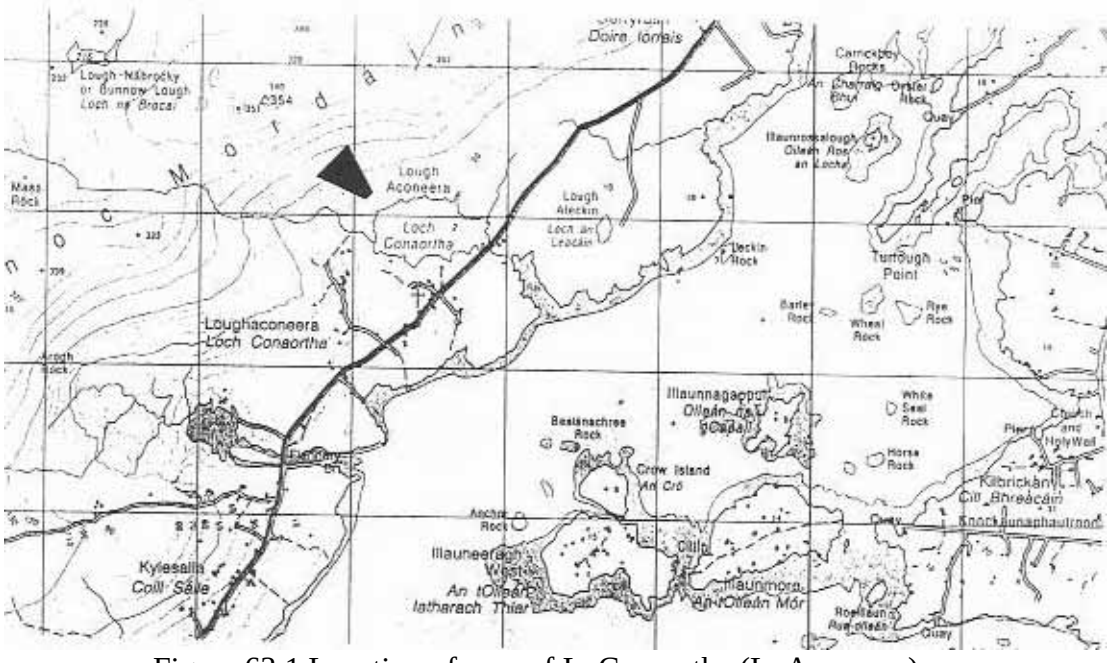

Figure 63.1 Location of map of L. Conaortha (L. Aconeera).

Lough Aconeera was surveyed for aquatic fauna in 1996 (Healy & Oliver 1996, Oliver & Healy 1998) and ecotonal coleoptera (Good 1996, Good & Butler 1998). Vegetation was surveyed in 1996 by P. Hatch (Hatch 1996, Hatch & Healy 1998) and again by C. Roden briefly in 1998 and more intensively in 2003 (Roden 2004). Results of these surveys are summarised by Healy *et al*. (1997a,b, c), Healy & Oliver (1998) and Healy (1999a,b, 2003).

Flora

Taken from Hatch (1996):

Ruppia cirrhosa and *Potamogeton pectinatus* grew in dense mixed and single species beds at the western end to a depth of about 2.5 metres and within 10 m of the shore around most of the site with *P. pectinatus* particularly dense in sheltered bays.

Chara baltica was frequent around the site and was particularly abundant near a freshwater inflow.

Some *Fucus* was present near the tidal inlet. Marginal vegetation was poorly developed and consisted of *Juncus maritimus* dominated saltmarsh vegetation with *Schoenoplectus lacustris* ssp *tabernaemontani* in small occasional stands and *Phragmites* in dense beds near freshwater inflows.

Taken from Roden (2004):

The water in this lake is visibly stratified at a depth of about 4m. Water clarity is moderate to good. The deepest point reached was about 6m. Here a muddy floor with outcropping rock had empty shells of *Mytilus edulis*, *Mya arenaria* and *Cerastoderma glaucum* on the surface. Rare plants of *Chondrus crispus* grew on rock. Along the thermocline occasional *Aurelia aurita* were seen, these specimens were larger than those found in Loch Fhada. At about the level of the thermocouple dense stands of ***Chaetomorpha linum*** were found on rock and sand. The upper part of the lake floor consisted of very large glacial boulders (like Loch a tSáile) resting on bedrock, mud or sand. A band of *Ruppia (cirrhosa?*) occurred above the *C. linum* at about 2-3m. Extremely dense stands of *Potamogeton pectinatus* were found near the shore. Above this zone at 1m ***Chara baltica***, ***Ruppia maritima*** and *P. pectinatus* were seen.

Four of the above species are lagoonal specialists and one is a very rare charophyte. The charophytes are a difficult group to identify and there are certain taxonomic difficulties. The following information concerning ***C. baltica*** is taken from Roden (2004).

Chara ?baltica. Recent records from 3 lagoons. This species was first reported by Hatch & Healy (1998) in L. Aconeera, identified as *C. baltica* by Jim Ryan and confirmed by Mr. Nick Stewart. However, recently Stewart wrote to C. Roden expressing reservations about his identification. The population was resampled and depending on one's interpretation of the cortex it keys out as either *Chara baltica* or *Chara aspera*, using standard works. Another related lagoonal taxon, known from Brittany and southern Europe is *C. gallioides* which is larger than *C. aspera* and has larger reproductive organs and lacks bulbils. It has not been possible to obtain fertile material which would help in identification, from L. Aconeera and the species remains to be verified. (Roden (1999) recorded *C. baltica* in L. an tSaile in 1998, which is apparently the same species as the *Chara* in L. Aconeera, and similarly remains to be verified).

Another charophyte found in Ballyconneely L. since 1998 easily keys out as *Chara baltica* on the basis of size (>60cm), spines single or in pairs, large reproductive organs and long uncorticated branchlet end cells, as well as slight encrustation. However this identification has not been confirmed by an expert in the group and Schubert and Blindlow (2004) note differences between the form of *Chara baltica* found in the Baltic Sea and all other European populations identified as this species.

Chaetomorpha linum. There is some doubt about the taxonomic status of the unattached lagoonal form of this species, and it was recorded by Hatch and Healy (1998) as *C. mediterranea*. It is a common, characteristic alga of semi-isolated Irish lagoons, recorded at 49 of the 87 (56.3%) lagoons surveyed.

Ruppia* spp.** are the most characteristic aquatic plant taxa of Irish coastal lagoons. The species are hard to distinguish when not flowering, and remain uncertain at some sites, but *Ruppia* of one species or the other (*R. maritima, R. maritima var brevirostris, R. cirrhosa*) was found at 62 of the 87 lagoons (71.3%) surveyed, and is one of the most useful indicators of coastal lagoon status. ***R. maritima appears to be the more common of the species and was found at 41 of the lagoons surveyed (47%). ***R. cirrhosa*** is believed to tolerate higher salinities than the former species and to be less common, but neither of these statements is clearly supported in Irish lagoons and the two species were often found growing together. *Ruppia cirrhosa* was only identified at 23 lagoons (26%), but species was not determined at 12 sites. ***Ruppia maritima* var *brevirostris*** was only positively identified at two sites (Ballyteige, Co. Wexford and Inch L., Co. Donegal).

The site was rated as of **exceptional conservation value** based on the presence of four lagoonal specialists including the rare charophyte, *Chara baltica.*

Fauna

Five stations were selected for faunal sampling in L. Aconeera in 1996 (Figure 63.2, Table 63.1)

Table 63.1 Positions of faunal sampling stations in L. Aconeera, 5-6/9/96, with salinity, depth of water and type of substratum.

	Sta A	Sta B	Sta C	Sta D	Sta E
GPS position	L 8787 3683	L 8716 3683	L 8718 3700	L 8728 3692	L 8769 3714
Salinity(psu)	13	13	10	12	12
Depth of water(cm)	0-60	0-60	0-30	0-120	0-120
Substratum	Granite bedrock, stones, gravel, coarse sand	Small cobbles, coarse granite sand	Coarse granite sand	Bedrock, soft organic mud	Coarse sand, organic silt

Among 22 taxa identified, 20 were identified to species. Four species are lagoonal specialists in Britain and one species (*J. nordmanni*) is proposed as a lagoonal specialist for Ireland, but all of these species are relatively common in lagoonal habitats in Ireland.

Jaera nordmanni. Isopod crustacean recorded at 24 of the 87 lagoons surveyed (27.6%) and may occur at others where it was not recorded due to the fact that only adult males are easily identified. This species may occur in freshwater, as in L. Errol, Cape Clear, Co. Cork. Described in England (Barnes 1994, Hayward and Ryland 1995) as occurring in streams flowing down the shoreline, on south and west coasts only. All records in Ireland are from West Cork to Donegal. Proposed as a lagoonal specialist for Ireland by Oliver and Healy (1998).

Lekanesphaera hookeri is a common lagoonal isopod crustacean, found at 37 of the 87 lagoons surveyed (42.5%).

Palaemonetes varians Decapod crustacean listed as a lagoonal specialist in the U.K. by Barnes (1989) and Bamber (1997), but apparently is no longer regarded as such. Although found in estuaries, this species appears to be far more characteristic of lagoons in Ireland, found in 64 of the 87 lagoons surveyed (73.6%) and may require a lagoonal

environment for reproduction. Therefore, it remains on the proposed list of lagoonal specialists for Ireland.

Cerastoderma glaucum Bivalve mollusc. A common lagoonal specialist found at 30 of the 87 lagoons (34.5%) surveyed.

Conopeum seurati Bryozoan recorded at 49 of the 87 lagoons surveyed (56.3%), but is not listed in a recent review of Irish marine Bryozoa (Wyse Jackson 1991). Either the species is under-recorded or is truly a lagoonal specialist.

In spite of the high proportion of rocky substrate, burrowing species were well represented e.g. *Arenicola marina, Corophium arenarium, Mya arenaria and Cerastoderma glaucum. Gammarus* (2 spp.) were particularly abundant.

The species composition is characteristic of middle to low salinity waters not subject to frequent colonisation from the sea but the absence of limnic species indicates that there is always a significant marine influence and that there are no permanent freshwater inflows of significance.

None of the recorded species can be described as rare in Ireland.
Based on aquatic fauna, the site can be rated as of **moderate conservation value** only.

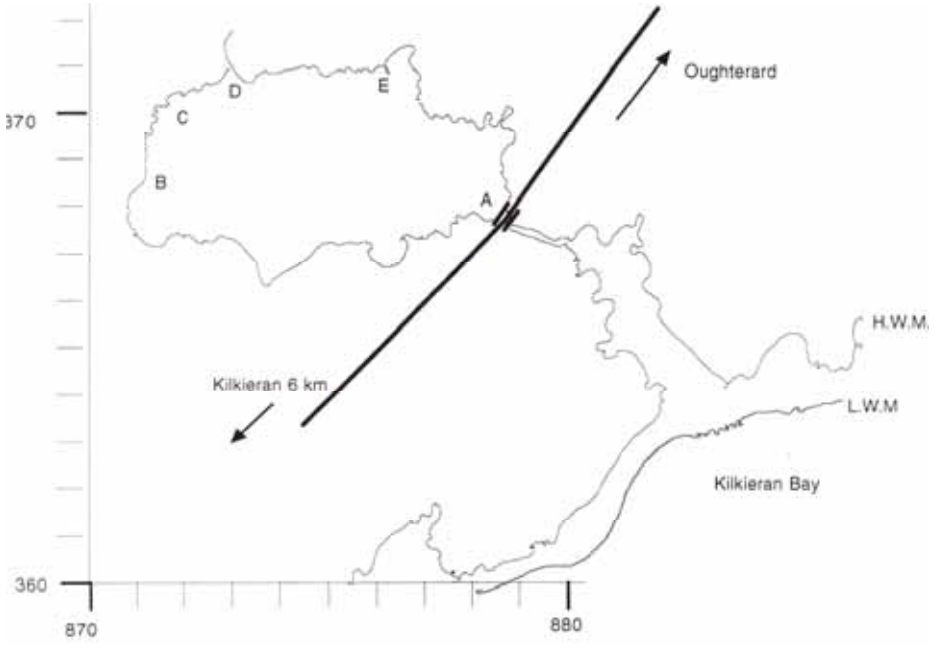

Figure 63.2 Sampling stations used at L. Conaorcha (L. Aconeera), 5-6/9/96.

Ecotonal coleoptera

Thirteen species of staphylinid and nine species of carabid beetles were recorded in L. Aconeera in 1996 (Good 1996, Good & Butler 1998). One species (***Agonum nigrum***) is an indicator species, which occurs on the shores of standing waters (fresh and brackish) and bogs, but the presence of only one indicator species is insufficient to indicate well-developed habitat. Based on ecotonal coleoptera the site was rated as of **low conservation value**.

Table 63.2 Aquatic Fauna Recorded in Lough Aconeera. June and September, 1996.

L.T. = light-trap ( ) = records from June. + = present; o = occasional; c = common; a = abundant, F = Fyke net. Species in bold text are lagoonal specialists or rare species.

		Sampling Stations								
		A	L.T.A	B	C	L.T.C	D	L.T.D	E	L.T.E
Turbellaria		(+)		+					+	
Annelida	*Arenicola marina*			+	+					
Crustacea										
Mysidacea	*Neomysis integer*	a	250	+	a	200	c	200	a	800
Isopoda	*Idotea sp.*	+	1							
	Jaera nordmanni	+	+			+				
	Lekanesphaera hookeri	a	150	+	c	100	a	250	c	50
Amphipoda	*Corophium volutator*	+								
	Gammarus duebeni	+		+	+	+	+		+	+
	G. zaddachi	+	+	+		+	+			
Decapoda	*Carcinus maenas*	+			F, 1				F, 2	
	Palaemonetes varians	(+)							+	1
Insecta										
Ephemeroptera		(+)								
Odonata	*Ischnura elegans*	+			+				+	4
Trichoptera	(cases)						+			
Coleoptera	*Gyrinus caspius*	(+)								
Diptera	Chironomidae	+		+	+		+			
Mollusca										
Prosobranchia	*Potamopyrgus antipodarum*	+		+	+		+		+	
Bivalvia	***Cerastoderma glaucum***				a					
	Mya arenaria	+			+		+			
	Mytilus edulis			+						
Bryozoa	***Conopeum seurati***	+		+					+	
Teleostei	*Anguilla anguilla*		F, 2						F, 7	
	Gasterosteus aculeatus	c	1	c	c	3	c	3	c	26
	Platichthys flesus	F, 5								
	Pomatoschistus microps	c	1	c	c	4	c	6	c	7

Summary

Lough Aconeera is a good example of a large, natural **"rock/peat" lagoon** with a natural tida and a substrate comprising a large proportion of bedrock. The aquatic fauna was typical of a l in the middle to low salinity range and included five lagoonal specialists. The aquatic vegetat was well developed with four lagoonal specialists and remarkable chiefly for the presence of rare lagoonal specialist charophyte ***Chara baltica***. Only indicator species of ecotonal Coleopt was recorded, but the stands of *Juncus maritimus* in which the species occurred were small ar staphylinid numbers were low.

Botanically, the lake is rated as of exceptional conservation value for the presence of *Chara b* but in other respects its rating is only moderate to low. Overall value is therefore rated as high mainly to the presence of *C. baltica.*

Overall Conservation Value = High

Conservation Status Assessment (from Oliver 2007)	
Impacts	No major impacts.
Conservation Status	Favourable

Further Information

Loch Aconeera was surveyed for aquatic fauna in 1996 (Healy & Oliver 1996, Oliver & Healy 1998) and ecotonal coleoptera (Good 1996, Good & Butler 1998). Vegetation was surveyed in 1996 by P. Hatch (Hatch 1996, Hatch & Healy 1998) and again by C. Roden briefly in 1998 and more intensively in 2003 (Roden 2004). Results of these surveys are summarised by Healy *et al*. (1997a,b, c), Healy & Oliver (1998) and Healy (1999a,b, 2003). Included in a biological classification of Irish coastal lagoons (Oliver 2005) and in the Conservation Status Assessment (Oliver 2007).

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