NPWS

Kilkieran Bay and Islands SAC
(site code 2111)

Conservation objectives supporting document-
Lagoons

Version 1
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Contents

1. Introduction

1.1 Kilkieran Bay and Islands SAC

Kilkieran Bay and Islands SAC (site code 002111) is located north of Galway Bay and extends from Keeraun Point, south of Carraroe, westwards to Mace Head, west of Carna. The site contains a large area of open marine water, many islands and rocky islets, and the coastline is much indented with a series of bays, channels and inlets. A number of streams, lakes and lagoons drain into the bays. The bedrock of the site is igneous, composed of granite, felsite and other intrusive rocks rich in silica.

The site is selected for eight habitats listed in Annex I of the Habitats Directive and three species in Annex II.

"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).

This SAC is extremely important for the number and quality of lagoons that it encompasses and is considered to be the best site in the country for this habitat. 11 lagoons/lagoon groups are listed by Oliver (2007). They are concentrated on the eastern side of the site, with at least several being inter-connected. See map in Appendix 1 and Appendix 2 for accounts of each site (from Oliver, 2007). The table below gives the conservation status assessment of each lagoon as outlined in that report. Unusually, most are described as being in favourable condition. Lettermullen Pool is a particularly good example of a rock lagoon lying on granite. Loch an Aibhnín was selected by Roden and Oliver (2013) as one of the "reference" lagoons to help define natural conditions for lagoons in Ireland (see conservation objectives section below).

Code[1]	Name	County	Conservation Assessment
IL053	Lettermullen Pool	Galway	Favourable
IL054	Loch Fhada upper pools	Galway	Unfavourable- inadequate
IL055	Loch an Ghadaí	Galway	Favourable
IL056	Loch Fhada	Galway	Favourable
IL057	Loch Tanaí	Galway	Favourable
IL058	Loch an Aibhnín	Galway	Favourable
IL059	Loch Cara Fionnla	Galway	Favourable
IL060	Cara na gCaorach	Galway	Favourable
IL064	Loch an Mhuilinn	Galway	Favourable
IL065	Lough Ateesky	Galway	Unfavourable- inadequate
IL066	Lough an Chaorain	Galway	Favourable

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

It should also be noted that Lough an tSáile (Lough Ahalia) (IL062) has a connection to the sea at Camus Bay (at the north western end of the SAC), while the lagoon itself is within Connemara Bog

Complex SAC (002034). This large lagoon is described as being of exceptional conservation value in Oliver (2007).

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 115.9ha- see table below.

Code[1]	**Name**	**Area (Ha)** [2]
IL053	Lettermullen Pool	0.6
IL054	Loch Fhada upper pools	1.1
IL055	Loch an Ghadaí	5.2
IL056	Loch Fhada	8.1
IL057	Loch Tanaí	9.4
IL058	Loch an Aibhnín	53.9
IL059	Loch Cara Fionnla	13.7
IL060	Cara na gCaorach	22.5
IL064	Loch an Mhuilinn	5.4
IL065	Lough Ateesky	1.4
IL066	Lough an Chaorain	1.5
	Total	**122.8**

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

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

3. Range

The known distribution of lagoon habitat in Kilkieran Bay and Islands SAC is shown in Appendix 1. There may be other lagoons in the site that have not yet been mapped by NPWS.

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 majority of the lagoons in the SAC can be classed as high salinity (poly- to euhaline), although several appear to be low (oligo- to mesohaline). Using information from Oliver (2007), the following table gives provisional salinity classes 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
IL053	Lettermullen Pool	Polyhaline
IL054	Loch Fhada upper pools	Polyhaline
IL055	Loch an Ghadaí	Oligohaline
IL056	Loch Fhada	Polyhaline
IL057	Loch Tanaí	Polyhaline
IL058	Loch an Aibhnín	Polyhaline
IL059	Loch Cara Fionnla	Mesohaline
IL060	Cara na gCaorach	Mesohaline
IL064	Loch an Mhuilinn	Polyhaline
IL065	Lough Ateesky	Euhaline
IL066	Lough an Chaorain	Mesohaline

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.

Lagoons that are 2m or less in depth can be regarded as shallow and in such cases, even small changes in water depth can cause significant losses in habitat area. In Kilkieran Bay and Islands SAC, there are number of lagoons that have recorded depths of 2m or less. These include Loch an Ghadaí, Loch Tanaí, Cara na gCaorach and Lough Ateesky. 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 11 lagoons listed for the site are described as having either "rock/peat" or "saltmarsh" barrier types, which is summarised in the following table (after Oliver, 2007). See also site accounts in Appendix 2.

Code	Name	Barrier Type
IL053	Lettermullen Pool	Rock/peat
IL054	Loch Fhada upper pools	Saltmarsh
IL055	Loch an Ghadaí	Rock/peat
IL056	Loch Fhada	Rock/peat
IL057	Loch Tanaí	Rock/peat
IL058	Loch an Aibhnín	Rock/peat
IL059	Loch Cara Fionnla	Rock/peat
IL060	Cara na gCaorach	Rock/peat
IL064	Loch an Mhuilinn	Rock/peat
IL065	Lough Ateesky	Saltmarsh
IL066	Lough an Chaorain	Rock/peat

"Rock/peat" lagoons are similar to the Scottish "obs" and are a particularly unusual lagoon type in a European context. There are a small number of "saltmarsh" lagoons in Ireland and these are very much like very large permanent saltmarsh pools (Oliver, 2007).

4.4 Water quality- Chlorophyll a

This attribute indicates the level of phytoplankton in the water column. Roden and Oliver (2010) 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

Roden and Oliver (2013) give a reference value of 2m for depth of macrophyte sward. Thus, for the shallow lagoons within Kilkieran Bay and Islands SAC, it is expected that macrophytes would extend down to their full depths.

The target for the attribute depth of macrophyte colonisation is: macrophyte colonisation to at least 2m depth.

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 each lagoon is summarised in Oliver (2007). Species considered to be lagoonal specialists include the rare charophyte *Lamprothamnium papulosum* as well as *Ruppia* spp. and *Chaetomorpha linum*. 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 lagoon are summarised in Oliver (2007). 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.

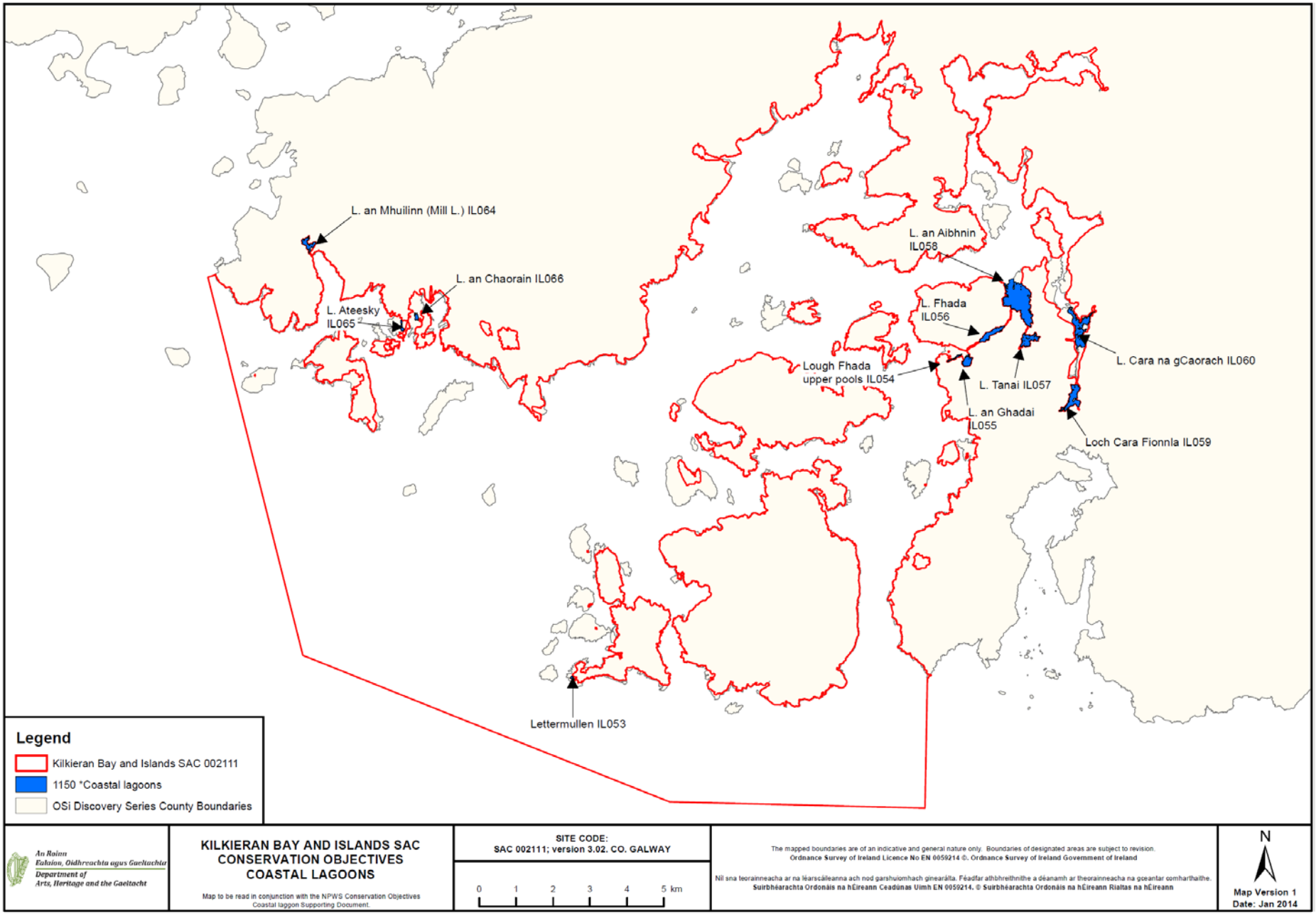
5. References

NPWS (2013) The status of EU protected habitats and species in Ireland. Habitat assessments volume 2. Version 1.1. Unpublished report, National Parks and Wildlife Service. Department of Arts, Heritage and the Gaeltacht, Dublin.

Roden, C.M. and Oliver, G.A. (2013) Monitoring and assessment of Irish lagoons for the purpose of the EU Water Framework Directive, 2009-2011. Unpublished report to the Environmental Protection Agency.

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

Appendix 1 Lagoon distribution map



Appendix 2 Site reports

The following are site accounts from Oliver (2007)

Code[1]	Name
IL053	Lettermullen Pool
IL054	Loch Fhada upper pools
IL055	Loch an Ghadaí
IL056	Loch Fhada
IL057	Loch Tanaí
IL058	Loch an Aibhnín
IL059	Loch Cara Fionnla
IL060	Cara na gCaorach
IL064	Loch an Mhuilinn
IL065	Lough Ateesky
IL066	Lough an Chaorain

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

4.53 **Lettermullen Galway** O.S. L 827 213
O.S. Discovery Sheet 44

Conservation Designation: Kilkieran Bay and Islands SAC 002111

General description:

Lettermullen Pool is a very small (<0.5ha) **rock lagoon** on the western shore of Lettermullen Island in western Connemara. Six islands have to be crossed by bridges and causeways to reach Lettermullen. Golam Head is the final island in this group which lies 500 metres west of Lettermullen. The pool is usually regarded as a large rock pool into which a freshwater spring runs and seawater enters on spring tides and during storms. It can just as easily be regarded as a small coastal lagoon with a rock barrier. Salinity is generally high, even hypersaline, and measured 34-37psu at the time of sampling in September 1996.

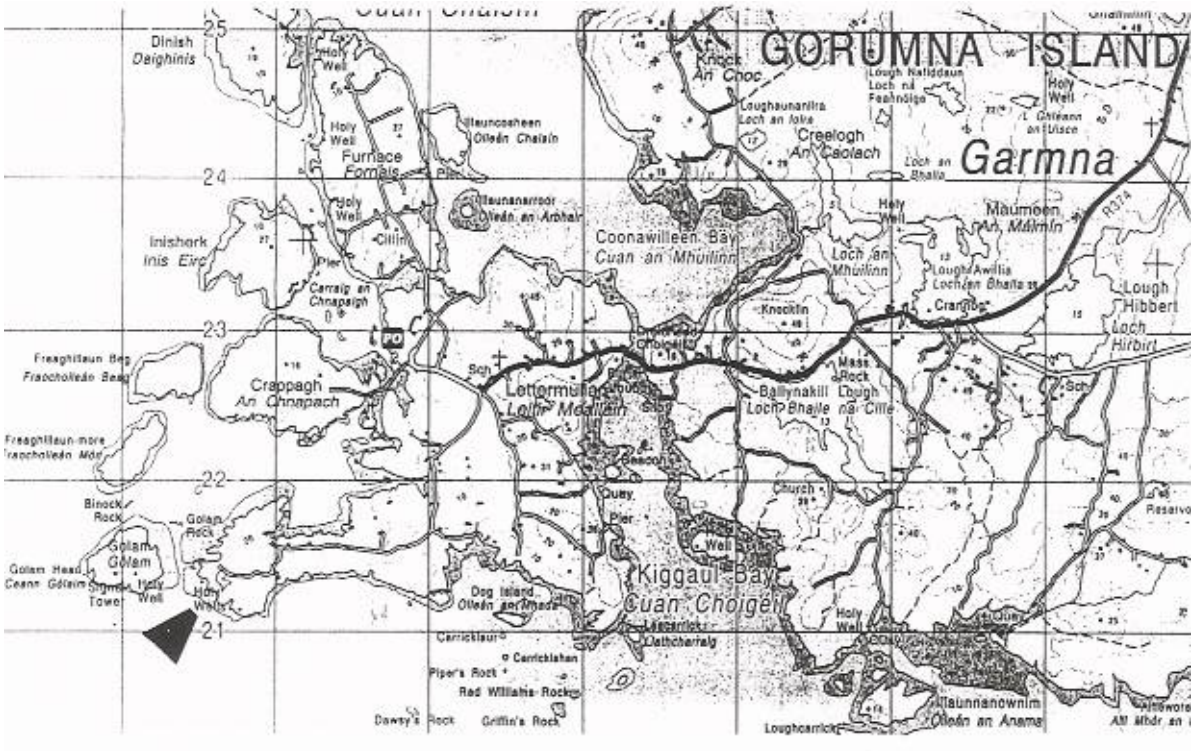


Figure 53.1 Location of map of Lettermullen.

Lettermullen pool was surveyed in 1996 for vegetation (Hatch 1996, Hatch & Healy 1998), aquatic fauna (Healy & Oliver 1996, Oliver & Healy 1998). Results of these surveys are summarised by Healy *et al*. (1997a,b,c), Healy & Oliver (1998) and Healy (1999, 2003). The vegetation was surveyed again in September 2003 by C. Roden (Roden 2004), when sublittoral observations were made.

Stations used for faunal sampling are not necessarily the same as those used for vegetation or ecotonal coleoptera.

Flora

The vegetation of Lettermullen pool was surveyed by P. Hatch in 1996 (Hatch 1996, Hatch & Healy 1998). The presence of marine algae could be expected at such a site and several species are found here. *Corallina officinalis* is abundant. *Chondrus crispus*, *Lomentaria clavellosa*, *Codium tomentosum* and *Polysiphonia elongata* all occur at varying degrees of frequency.

Zostera marina could also be expected and is abundant here. Particularly interesting is the occurrence of these marine species with abundant ***Ruppia cirrhosa*** and with ***Lamprothamnium papulosum***, a rare charophyte for which this is a new site. Both of the latter two species are lagoonal specialists. *Lamprothamnium* was known from only three Irish sites before this survey took place. Its presence at Lettermullen is alone reason enough to regard the site as valuable. This plant is very locally abundant in shallow areas close to the northern shore and was also found in deeper water (>1m) by grapnel survey from the southern and western shores. The distribution of species is also interesting in that a distinct zonation occurs along the steeper, rocky shores with algal species forming a 1-2m wide belt below the shore with a dense mixed *Ruppia* and *Zostera* bed beyond.

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. 2001b). These Irish locations are very important in European terms, and it is especially encouraging to have found new sites.

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. ***R. cirrhosa*** was only identified at 23 lagoons (26%), but species was not determined at 12 sites.

When surveyed by Roden in 2003, he described a dense vegetation of ***R. cirrhosa*** with ***Z. marina*** in the northern part and bare mud with some ***C. linum*** at 2-3m depth. The vascular plant vegetation was ascribed to the Zostera/Ruppia/Lamprothamnium unit although Lamprothamnium was not recorded in 2003. Seaweed communities are well developed including a community dominated by ***Gigartina acicularis*** and ***Pterocladiella***, hitherto only recorded from Loch Athola.

Lettermullen Pool is a good representative of an isolated (i.e. having no permanent connection to the sea) highly saline **rock/peat lagoon**. Species composition and shore zonation are interesting, species diversity and abundance are high and a rare charophyte occurs here. The marine algal community is of great interest, only recorded from this site and Loch Athola in Ireland, and not recorded from Scotland. Based on vegetation, this lagoon is rated as of **high conservation value**.

Fauna

Four stations were selected for faunal sampling in Lettermullen Pool in 1996 (Figure 53.2, Table 53.1) (Healy & Oliver 1996, Oliver & Healy 1998). Among 52 taxa recorded (Table 53.2), 48 are identified to species; including five species (*Idotea chelipes, Enochrus bicolor, Littorina "tenebrosa", Cerastoderma glaucum* and *Conopeum seurati*) which are listed as lagoonal specialists.

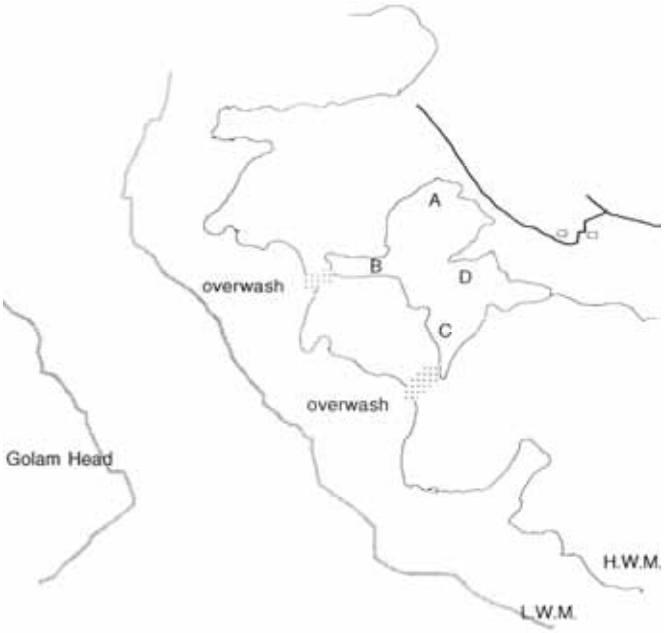


Figure 53.2 Sampling stations used at Lettermullen.

Table 53.1 Positions of sampling stations in Lettermullen Pool 25-26/8/06, with salinity, depth of water and type of substratum.

	Sta A	Sta B	Sta C	Sta D
GPS position	L 8261 2142			
Salinity(psu)	37	35	35	35
Depth(cm)	0-100	0-100	0-400	0-100
	Cobbles, stones, gravel, soft organic mud	Rock, gravel, coarse sand	Bedrock, cobbles, pockets of coarse sand	Organic mud, fine silt/sand

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.

Enochrus bicolor Water-beetle recorded at 12 lagoons of the 87 surveyed, from the southern half of the country from Co. Wicklow to Connemara including the Aran Islands. There are only two recent records from N. Ireland (Nelson *et al.* 1998).

Table 53.2 Aquatic Fauna Recorded at Lettermullen Pool, Co. Galway. June and September, 1996.( ) = records from June. + = present; o = occasional; c = common; a = abundant; F = fyke net; L.T. = light-trap. Species in bold text are lagoonal specialists.

Fauna		Sampling Stations							
		A	L.T.A	B	L.T.B	C	L.T.C	D	L.T.D
Cnidaria	*Aurelia aurita*	(+)							
	Laomedea angulata	+		+		+		+	
Nemertea	Nemertea sp. 1	+							
	Nemertea sp. 2			+					
Annelida	*Arenicola marina*	+		+					
	Hediste diversicolor			?					
	Janua pagenstecheri			+					
	Spirorbidae indet.	+		+		+		+	
	Tubificoides benedii			+					
Crustacea									
Copepoda							+		
Cirripedia	*Balanus improvisus*	+							
Cumacean	indet.								1
Mysidacea	*Praunus flexuosus*	c	75	c	11	c	2	c	50
	Siriella jaltensis						1		
Isopoda	*Idotea baltica*	+	+						
	Idotea chelipes	a	11	a				o	
Amphipoda	*Dexamine spinosa*	+	+	+					
	Melita palmata	+	+						
Tanaidacea	*Tanais dulongi*							+	
Decapoda	*Carcinus maenas*	+		+		+		+	
	Palaemon elegans	o							
Insecta									
Coleoptera	***Enochrus bicolor***	+							
Diptera	Chironomidae	+		+					
Mollusca									
Polyplacophora	*Lepidochitona cinerea*					+		+	
Prosobranchia	*Bittium reticulatum*	+							
	Gibbula umbilicalis			+					
	Hinia incrassata			+					
	Littorina littorea			+					
	Littotina "tenebrosa"	a		+				c	+
	Nucella lapillus					+		1	
	Patella vulgata			+		+			
	Rissoa membranacea	c		a				c	
	Skeneopsis planorbis	o		c					
Opisthobranchia	*Elysia viridis*							+	
Bivalvia	***Cerastoderma glaucum***	c		o		o		c	
	Mytilus edulis	o							
Bryozoa	*Alcyonidium mamillatum*	+							
	Conopeum seurati			+		+			
	Bowerbankia gracilis	+							
	Walkeria uva	+							
Echinodermata	*Amphipholis squamata*					+			
	Luidia ciliaris					c			
	Paracentrotus lividus					1			
Tunicata	*Ascidiella aspersa*	+							
	A. scabra	+				+			
	A. ?virginiata								
	Botryllus schlosseri	+				+			
	Clavelina lepadiformis	+		+		+		+	
Teleostei	*Conger conger*	F, 1							
	Ctenolabrus rupestris			F, 1					
	Gasterosteus aculeatus	+	1	+	4	+		o	
	Molva molva			F, 1					
	Pollachius pollachius	F, 1		F, 2					

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.

Most species were distributed throughout the pool but some which are common intertidally in the area (*Patella vulgata, Littorina littorea, Nucella lapillus, Paracentrotus lividus, Luidia ciliata*) were restricted to the seaward stations, and some herbivores and euryhaline species (*Balanus improvisus, Idotea chelipes, Elysia viridis, Enochrus bicolor)* were found only at the landward stations which may receive more freshwater, or in *Zostera* beds. The pool contains a mixed flora of marine algae, *Zostera* and charophytes, and both hard and soft substrates, providing a wide range of habitats for fauna in a small area. An interesting hydroid (*Laomedia angulata*) was recorded. Specimens of Conger, Ling and Pollach were recorded in Fyke nets.

Ecotonal coleoptera

This site was investigated for ecotonal coleoptera in 1996, but it was decided that there was insufficient habitat to allow comparative sampling, and that based on this animal group, the site was of **no conservation value**.

Summary

Lettermullen Pool has high conservation value as a type of lagoon, 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. The aquatic fauna is rich and distinctly marine, but there is also a significant element of brackish species, including five lagoonal specialists one of which, ***Littorina "tenebrosa"***, is currently being investigated. Floral species composition and shore zonation are interesting, species diversity and abundance are high and a rare charophyte, ***Lamprothamnium papulosum*** was recorded. The marine algal community is of great interest, only recorded from this site and Loch Athola in Ireland, and not recorded from Scotland. Overall, the pool is rated as of **high conservation value.**

Overall Conservation Value = High

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

Further Information

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

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Nelson, B., Foster, G., Weyl, R. & Anderson, R. 1998. The distribution of aquatic Coleoptera in Northern Ireland. Part 2: Families Hydraenidae, Helophoridae, Hydrochidae, Hydrophilidae, Elmidae and Dryopidae. *Bulletin of the Irish Biogeographical Society* .**22**: 128-193.
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4.54 **Loch Fhada upper pools (2) Galway** O.S. L 930 300
O.S. Discovery Sheet 45

Conservation Designation: Kilkieran Bay and Islands SAC 002111

General description:

Loch Fhada upper pools are two of a group of lagoons (including L. Fhada itself and L. an Ghadaí), approximately 1 km east of Bealadangan which were included previously as part of the Lough Fhada complex Seawater enters these pools occasionally from high tides flooding through saltmarsh channels in the northwest which flows to the northeast into Loch Fhada then into Loch an Aibhnín. It is possible that seawater also enters the pools from Loch Fhada. The western pool (Sta 1) is very small (<0.5ha), approx. 3m deep, largely stagnant with a salinity of 12.4-29.5 psu., the eastern pool (Sta 2) is slightly larger (0.5ha) but shallower, more like a saltmarsh pool, with a salinity of 18-31.5psu during the sampling period.

Figure 54.1 Location of map of Loch Fhada upper pools.

Loch Fhada upper pools were surveyed in 1998 as part of the Loch Fhada complex, for vegetation (Roden 1999) and aquatic fauna (Oliver 1999). Results of these surveys are summarised by Healy (1999a,b; 2003).

Stations used for faunal sampling are not necessarily the same as those used for vegetation or ecotonal coleoptera.

Flora

Loch Fhada upper pools were surveyed in 1998 by C. Roden and included in the group of lagoons referred to as the Loch Fhada complex (Roden 1999).

Only two floral species were recorded in these pools. The western pool (Sta 1) contained domestic refuse and an abandoned car and was otherwise totally dominated by ***Chaetomorpha linum***. The western pool (Sta 2) was mostly bare mud with patches of *Chaetomorpha* and ***Ruppia* sp**. Both of these taxa are regarded as lagoonal specialists.

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.

The ***Ruppia*** was not specifically identified as flowering plants are needed for certain identification, but is assumed to be *R. maritima*, which is a common lagoonal plant

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. *R. cirrhosa* was only identified at 23 lagoons (26%), but species was not determined at 12 sites, but is assumed to be *R. maritima*, which is also a common lagoonal plant.

Based on aquatic vegetation, the site is regarded as of **moderate conservation value**.

Fauna

A total of 24 faunal taxa were recorded at Loch Fhada upper pools (Table 54.2), of which 21 were identified to species. Seven of these taxa are regarded as lagoonal specialists and one (*Jaera forsmani*) is an apparently rare species:

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%).

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.

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.

Jaera forsmani Isopod crustacean recorded at Raffeen and Kilmore L. (Co Cork), Drongawn L. (Kerry) and at L. Fhada, L. Fhada upper pools, and L. an Aibhnín (Connemara). The only other Irish record of the species located is for L. Hyne, Co. Cork (De Grave and Holmes 1998).

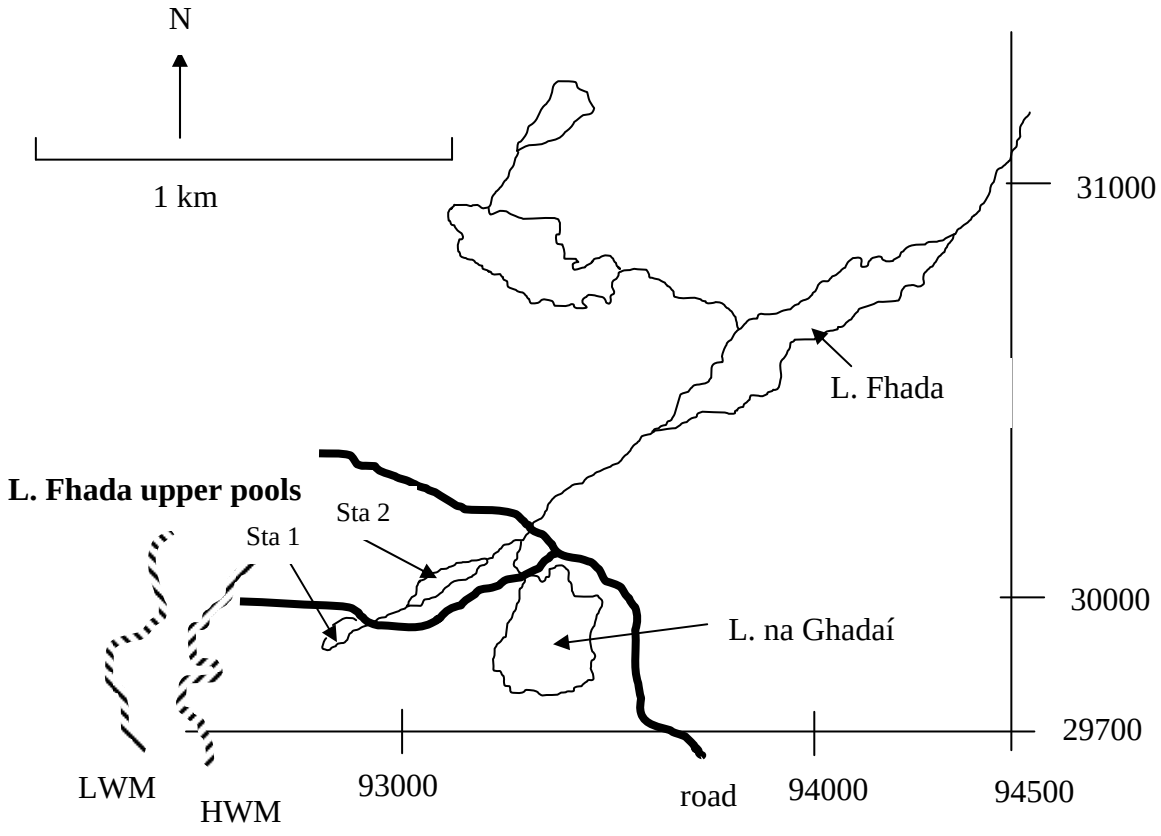

Figure 54.2 Sketch map showing faunal sampling stations in Loch Fhada upper pools.

Table 54.1 Positions of sampling stations in Lough Fhada upper pools, with sampling date, salinity and depth of water, type of substratum and percent cover of vegetation, and bare ground. Species in bold text are "lagoonal specialist" species.

	Sta 1	Sta 2
GPS position	L 92889 29906	L 93177 30090
Sampling date	27/7/98	27/7/98
Salinity (psu) at surface	12.4	18-22.9
Salinity (psu) at depth	29.5	31.5
Depth (cm)	0-300	0-250
Substratum	peat, soft anoxic silt	peat, soft mud, gravel, scattered rocks
Percentage cover		
Chaetomorpha linum	90	20
***Ruppia* sp.**		10
Bare mud		65
Rock		5
Domestic refuse	10	

Table 54.2 Faunal taxa recorded at stations in Loch Fhada upper pools on 27/7/98. L.T. = Light trap, + = present, o = occasional, c = common, a = abundant. Species in bold text are lagoonal specialists or rare species.

			Sta 1		**Sta 2**	
			search	L.T.	search	L.T.
Annelida						
	Polychaeta	*Arenicola marina*			**+**	
		Nereis diversicolor			**o**	
Crustacea						
	Mysidacea	*Praunus flexuosus*	**o**	2	**a**	77
	Isopoda	***Idotea chelipes***	**c**	6	**+**	27
		Jaera forsmani	**o**		**+**	
		Lekanesphaera hookeri			**c**	10
	Amphipoda	*Corophium volutator*			**o**	
		Gammarus zaddachi			**c**	
		Melita palmata	**5**			
		Microdeutopus gryllotalpa		17		2
	Decapoda	*Carcinus maenas*	**c**		**o**	
		Crangon crangon				1
		Palaemonetes varians			**o**	
Insecta						
	Heteroptera	*Gerris* sp.	**+**			
	Diptera	Chironomidae indet.	**+**			
Mollusca						
	Gastropoda	*Hydrobia ulvae*	**c**		**a**	71
		Hydrobia ventrosa	**c**			
		Littorina tenebrosa	**c**			
	Bivalvia	***Cerastoderma glaucum***	**a**		**spat**	
		Mytilus edulis			**o**	
Bryozoa		***Conopeum seurati***	**+**		**+**	
Pisces		*Gasterosteus aculeatus*		1		1
		Mugilidae indet.			**+**	
		Pomatoschistus microps			**c**	

Due to the high number of lagoonal specialists, two of which are rare species, based on aquatic fauna the site is regarded as of **high conservation value**.

Summary

Loch Fhada upper pools are two small lagoons with a relatively high number of lagoonal specialist species (2 floral, 7 faunal), of which two species (*Littorina "tenebrosa"*, *Jaera forsmani*) have been recorded at only a few sites in Ireland previously. The western pool in particular is dominated by typical lagoonal species with dense growths of ***Chaetomorpha linum*** and high numbers of ***Idotea chelipes, Hydrobia ventrosa*** and ***Littorina "tenebrosa".***

Overall Conservation Value = High

Conservation Status Assessment (from Oliver 2007)	
Impacts	Moderate eutrophication from decaying algae in small pool, otherwise adequately flushed by tides. Accumulation of organic material. Urbanisation. Dumping. Silting up.
Conservation Status	Unfavourable-Inadequate

Further Information

Listed as a lagoon by Healy *et al.* 1997. Surveyed in 1998 as part of the Lough Fhada complex for vegetation (Roden 1999) and aquatic fauna (Oliver 1999). 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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4.57 **L. Tanaí Galway** O.S. L 950 305
O.S. Discovery Sheet 45

Conservation Designation: Kilkieran Bay and Islands SAC 002111

General description:

Loch Tanaí is situated in western Connemara, 5 km north of Costelloe and 6 km south of Camus. The lagoon is a medium sized (12ha), shallow (1m) and lies in an area of lowland peat, connected to Loch an Aibhnín (Section 4.58) by a narrow channel. A good example of a type of lagoon, 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. Salinity probably varies considerably, and ranged from 11-34psu at the time of sampling (22-24/8/96). Very little appears to be known about any aspect of the functioning of brackish lagoons situated in acid peat bogs.

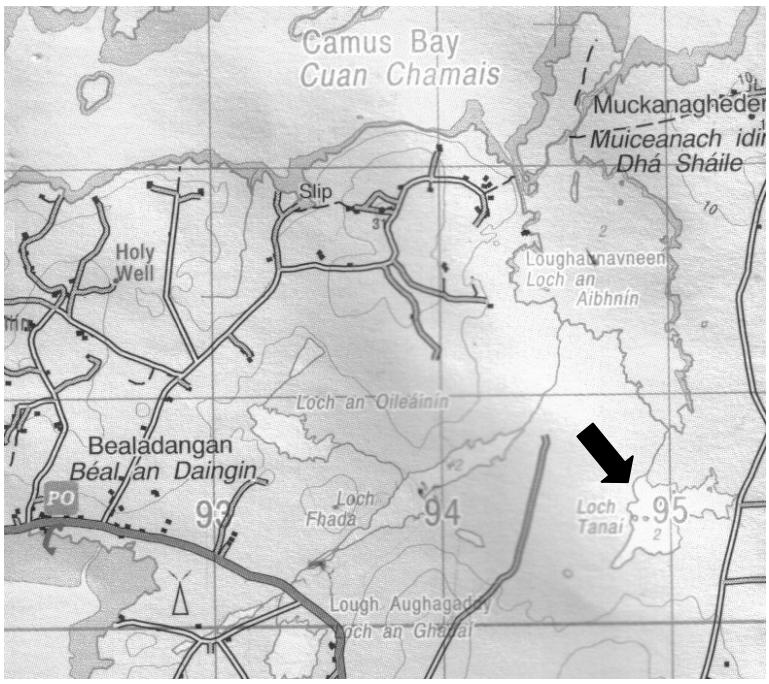

Figure 57.1 Location of map of L. Tanaí.

Loch Tanaí was surveyed in 1996 for vegetation (Hatch 1996, Hatch & Healy 1998), aquatic fauna (Healy & Oliver 1996, Oliver & Healy 1998) and ecotonal coleoptera (Good 1996, Good & Butler 1998). Results of these surveys are summarised by Healy *et al*. (1997a,b,c), Healy & Oliver (1998) and Healy (1999, 2003).

Stations used for faunal sampling are not necessarily the same as those used for vegetation or ecotonal coleoptera.

Flora

The vegetation of L. Tanaí was surveyed by P. Hatch in 1996 (Hatch 1996, Hatch & Healy 1998). Species distribution reflected a high degree of spatial variation in salinity. Fucoid algae were abundant and well distributed around the shore. ***Phyllophora pseudo- ceranoides*** also occurred here. *Ruppia* and ***Zostera marina*** were abundant around much of the site in dense, often mixed stands. It is considered notable that both ***Ruppia maritima*** and ***R. cirrhosa*** occur here.

The rare charophyte ***Lamprothamnium papulosum*** was more or less frequent around most of the shore and abundant in places, often growing amongst *Ruppia* beds. Its presence here is reason enough in itself to regard this site as valuable.

A distinct zonation of algal and higher plant species occurred along the rockier shores with dense *Ruppia* and *Zostera* beds, frequently with *Lamprothamnium*, lying beyond a narrow belt of fucoids.

Marginal vegetation was restricted due to the rocky, steep-sided nature of much of the site. No emergent species occurred here. The dominant marginal community is species-poor salt tolerant vegetation dominated by *Juncus maritimus.*

Three of these species are lagoonal specialists:

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.

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.

Loch Tanaí is a good representative of a highly saline lagoon with a permanent connection to the sea. Species composition and shore zonation are interesting, frequency and abundance of most species were high and *Lamprothamnium* was abundant. Three lagoonal specialists were recorded including both species of ***Ruppia*** and the rare charophyte ***Lamprothamnion papulosum***. For these reasons the site is regarded as of **high conservation value** as a coastal lagoon.

Fauna

Five stations were selected for faunal sampling in 1996 (Figure 57.2, Table 57.1) (Healy & Oliver 1996, Oliver & Healy 1998).

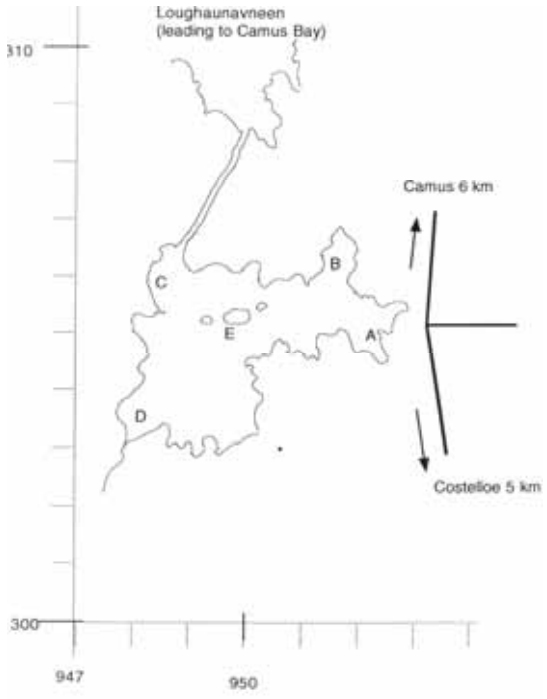

Figure 57.2 Sampling stations used at L. Tanaí.

Table 57.1 Positions of sampling stations in L. Tanaí, 22-24/8/96, with salinity, depth of water and type of substratum.

	Sta A	Sta B	Sta C	Sta D	Sta E
GPS position	L 9521 3057	L 9515 3057	L 9492 3061	L 9488 3036	L 9498 3052
Salinity(psu)	32-34	11	28-32	14-27	34
Depth(cm)	0-60	0-15	0-100	0-100	0-100
Substratum	Fine silt, peat, occasional stones	Soft, unconsolidated peat	Soft, unconsolidated peat	Soft, unconsolidated peat	Granite rocks and boulders. Coarse sand, silt.

A total of 36 faunal taxa were recorded in 1996 (Table 57.2), of which six species are lagoonal specialists:

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%).

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.

Table 57.2 Aquatic Fauna Recorded at Loch Tanaí. June and August 1996.
+ = present; o = occasional; c = common; a = abundant; F = fyke net; L.T. = light-trap.
Species in bold text are lagoonal specialists.

		Sampling Stations									
		A	L.T.A	B	L.T.B	C	L.T.C	D	L.T.D	E	L.T.E
Cnidaria	*Aurelia aurita*	+								+	
Nemertea	Nemertea	+									
Annelida	*Arenicola marina*	o		a							
	Hediste diversicolor			+		+	1			+	
	Polychaeta indet.	+									
	Tubificidae indet.	+									
Crustacea											
Mysidacea	*Praunus flexuosus*	a	>100	a		a	100	a	>100	a	c100
Isopoda	***Lekanesphaera hookeri***	+	4	+				+	+	3	
	Idotea chelipes	+		+		+		+		+	1
Amphipoda	*Caprella acanthifera*					+					
	Corophium volutator			+				+			
	Dexamine spinosa										+
	Melita palmata	+						+		+	
Decapoda	*Carcinus maenas*	+						F, 1			
	Palaemonetes varians	o	3								
Arachnida	Hydracarina						1				
Insecta											
Coleoptera	***Enochrus bicolor***			+							
Diptera	Chironomidae	+						+			
Mollusca											
Prosobranchia	*Hydrobia ulvae*	+						+			
	Hydrobia ventrosa	+		+				+			
	Littorina saxatilis	+				+		+	12	+	1
	Rissoa membranacea	+				c		+		+	
Opisthobranchia	*Akera bullata*	c	6			+		+		+	
Bivalvia	***Cerastoderma glaucum***	a				o		+		+	
	Musculus discors	+				+				+	
	Mytilus edulis	+				+		+		+	
Bryozoa	***Conopeum seurati***	+				+				+	
Tunicata	*Ascidiella scabra*	+				+				+	
	Clavelina lepadiformis	+				+		+		+	
Teleostei	*Anguilla anguilla*							F,			
	Gasterosteus aculeatus	o	2			o	2	o	3		
	Mugilidae	a	1								
	Platichthys flesus	F,									
	Syngnathus typhle					1					

Enochrus bicolor Water-beetle recorded at 12 lagoons of the 87 surveyed, from the southern half of the country from Co. Wicklow to Connemara including the Aran Islands. There are only two recent records from N. Ireland (Nelson *et al.* 1998).

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.

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 soft substrate, much of which was unconsolidated peat, burrowing forms were relatively well represented throughout the lake and were not more abundant or diverse at stations with more sand or silt. The most abundant species at all stations was *Praunus flexuosus. Cerastoderma glaucum* was represented by both adults and juveniles. Faunistically, the lake is a good example of a lagoon with salinity in the middle to upper range. A wide range of ecological types of invertebrate was represented and there were some unusual species present, e.g. *Akera bullata* and *Syngnathus typhle*, but no rare species were recorded. Loch Tanaí, and the other similar lakes in the area, appear to be unknown to marine biologists and their communities have not, therefore, been investigated. The habitat is unusual for brackish species.

Ecotonal coleoptera

Seventeen species of staphylinid and three species of carabid beetles were recorded in 1996 by Good & Butler (1998), of which two species were indicator species (*Philonthus fumarius, Stenus opticus*). Both species appear to be very local in Ireland. The former occurs in marshes and muddy freshwater shores and especially in coastal marshes in Britain. The latter is restricted to marshes, Alder carr, and bogs, occurring in *Sphagnum* and *Carex.* Based on ecotonal coleoptera, L. Tanaí is described as of **significant conservation value**, which refers to the fact that the site is worth conserving in terms of their ecotonal coleoptera.

Summary

Loch Tanaí is a type of lagoon, 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. and is valued as moderate/high for its geomorphology because the type is rare in the European context. A wide range of ecological types of aquatic fauna are represented, with 7 lagoonal specialists. Species composition and shore zonation of the vegetation are interesting, frequency and abundance of most species are high and the rare charophyte ***Lamprothamnium papulosum*** was abundant. Three lagoonal specialist plants were recorded with both ***R. maritima*** and ***R. cirrhosa***. The presence of two indicator species of ecotonal Coleoptera, plus a majority of staphylinid species associated with bogs and wetlands, indicates ecologically well-developed habitats. This peat/lagoon ecotonal habitat may be unique to Atlantic coasts. Overall, Loch Tanaí is regarded as of high conservation value.

Overall Conservation Value = High

Conservation Status Assessment (from Oliver 2007)	
Impacts	No significant impacts. Dumping in small area near the road.
Conservation Status	Favourable

Further Information

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

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4.55 **Loch an Ghadaí, County Galway** O.S. L 933 299
O.S. Discovery Sheet 45

Conservation Designation: Kilkieran Bay and Islands SAC 002111

General description:

Loch an Ghadaí is one of a group of lagoons, approximately 1 km east of Bealadangan which includes L. Fhada upper pools and Loch Fhada, which were included previously as part of the Lough Fhada complex. Seawater enters these pools occasionally from high tides flooding through saltmarsh channels in the northwest which flows to the northeast into Loch Fhada, then into Loch an Aibhnín. It is possible that seawater also enters from Loch Fhada on flood tides. This is the lowest salinity lagoon of the group, measuring 2.9-3.3psu at the time of sampling, but 6-10psu in June 1998 and probably gets considerably higher at times. The lagoon is shallow (mostly <1m) with a bed of granite and coarse sand with luxuriant growths of *Ruppia, Chaetomorpha* and *Lamprothamnium*.

Location map of Loch an Ghadaí.

Loch an Ghadaí was surveyed in 1998 as part of the Loch Fhada complex, for vegetation (Roden 1999) and aquatic fauna (Oliver 1999). Results of these surveys are summarised by Healy (1999a,b; 2003).

Stations used for faunal sampling are not necessarily the same as those used for vegetation.

Flora

The vegetation of Loch an Ghadaí was surveyed in 1998 by C. Roden (1999).

This is a very shallow lake with very large areas of flat outcropping granite bedrock. The entire lake bottom is covered by vegetation. ***Ruppia* sp**. and ***Lamprothamnium papulosum*** form a dense sward in the centre while flat slabs of granite are covered with ***Chaetomorpha linum*** and ***Cladophora liniformis***.

Cladophora liniformis has not previously been recorded in Ireland.

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*** was not specifically identified as flowering plants are needed for certain identification, but is assumed to be ***Ruppia maritima*** which 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.

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. 2001b). These Irish locations are very important in European terms, and it is especially encouraging to have found new sites.

Four of the above species are lagoonal specialists, one of which is a rare charophyte. Based on aquatic vegetation, the site is regarded as of **high conservation value**.

Fauna

A total of 20 faunal taxa were recorded in Loch an Ghadaí, of which 18 were identified to species. Six of these taxa are regarded as lagoonal specialists:

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. Described in northwest Europe (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%).

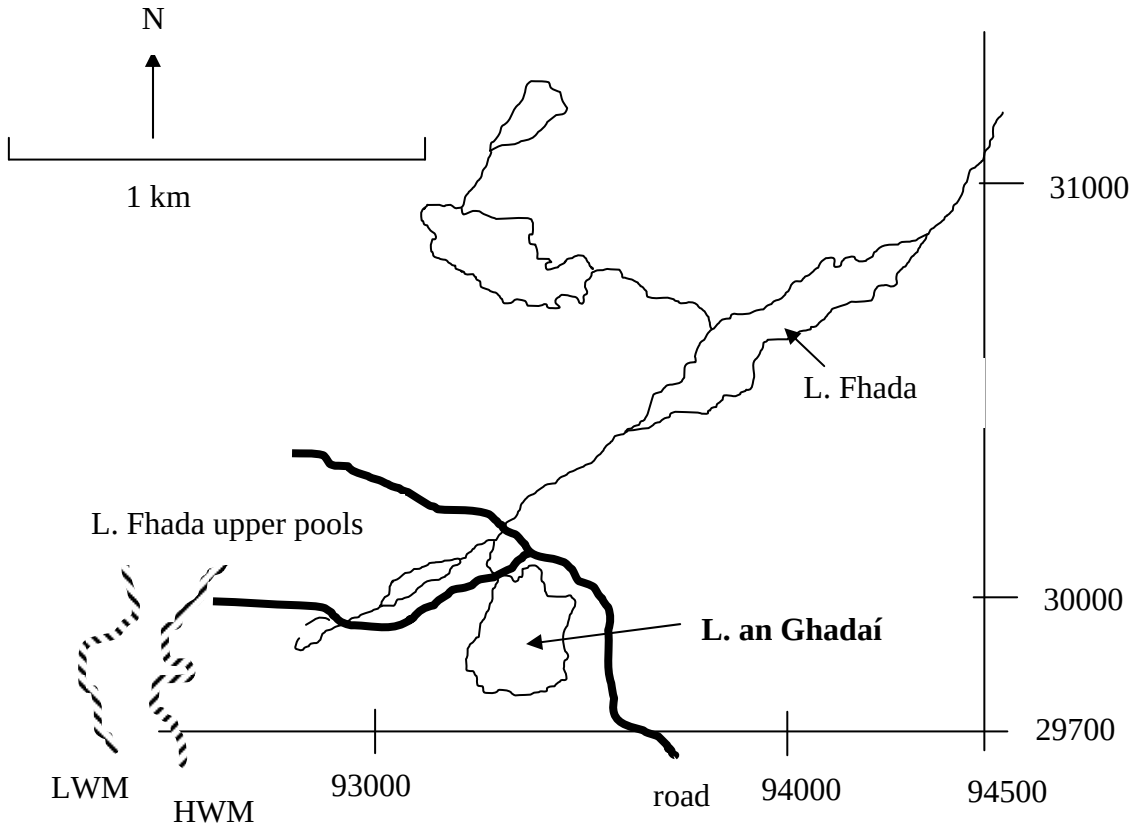

Figure 55.2 Sketch map showing sampling area in Loch an Ghadaí

Table 55.1 Positions of faunal sampling stations Loch an Ghadaí with sampling date, salinity and depth of water and type of substratum.

	Sta 1
Sampling date	27-28/7/98
GPS position	L 93304 29905
Salinity(psu)	2.9-3.3 (6-10 in June 1998)
Depth	0-200
Substratum	Granite bedrock and rocks, coarse sand. Small patches of finer sediments

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.

Sigara stagnalis Hemipteran insect (water-boatman). A common lagoonal specialist found at 36 of the 87 (41.4%) lagoons surveyed.

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.

Eels were recorded in fyke nets, as was (surprisingly) one specimen of *Taurulus bubalis*, a marine fish common on rocky shores, indicating the obvious incursion of marine water. None of the other faunal species appear to be of particularly high conservation interest.

Faunal taxa recorded at stations in Loch Fhada upper pools on 27/7/98.
L.T. = Light trap, + = present, o = occasional, c = common, a = abundant, F = Fyke net.
Species in bold text are lagoonal specialists.

			Sta 1		
			search	L.T.	L.T.2
Crustacea					
	Ostracoda	indet.	**a**		
	Mysidacea	*Neomysis integer*	**+**		
		Praunus flexuosus	**a**	**450**	**30**
	Isopoda	***Jaera nordmani***	**+**	**4**	**1**
		Lekanesphaera hookeri	**a**	**45**	**30**
	Amphipoda	*Corophium volutator*			**2**
		Gammarus duebeni		**2**	
		Gammarus zaddachi	**o**	**18**	**4**
	Decapoda	***Palaemonetes varians***	**o**	**3**	
Insecta	Odonata	*Ischnura elegans*	**r**		
	Heteroptera	***Sigara stagnalis***	**o**		
Mollusca					
	Gastropoda	*Potamopyrgus antipodarum*	**a**		
	Bivalvia	***Cerastoderma glaucum***	**spat**		
		Mytilus edulis	**o**		
Bryozoa		***Conopeum seurati***	**o**		
Pisces		*Anguilla anguilla*	**F = 6**		
		Gasterosteus aculeatus	**o**	**11**	
		Mugilidae indet.	**o**		
		Pomatoschistus microps		**1**	
		Taurulus bubalis	**F = 1**		

Summary

Loch an Ghadaí is a small (5ha) 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. Based on aquatic vegetation, the site is regarded as of **high conservation value** as four species are lagoonal specialists, one of which is a rare charophyte, ***Lamprothamnium papulosum***. The aquatic fauna is not rich but six species are lagoonal specialists. The lagoon is of an unusual type in Europe and the biota comprises a large proportion of lagoonal specialists including a rare charophyte. Overall conservation is regarded as high.

Overall Conservation Value = High

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

Further Information

Listed as a lagoon by Healy *et al.* 1997. Surveyed in 1998 for vegetation (Roden 1999) and aquatic fauna (Oliver 1999). 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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4.56 **Loch Fhada, County Galway** O.S. L 939 305
O.S. Discovery Sheet 45

Conservation Designation: Kilkieran Bay and Islands SAC 002111

General description:

Loch Fhada is one of a group of lagoons approximately 1 km east of Bealadangan, which were included previously as part of the Lough Fhada complex. Seawater enters these lagoons occasionally from high tides flooding through saltmarsh channels in the northwest which then flows into Loch an Aibhnín. It is possible that seawater also enters the pools from Loch an Aibhnín on flood tides. Loch Fhada is a small (10ha) **rock/peat lagoon**. Depth is up to 7m and the water was stratified at the time of sampling with a noticeable halocline at 3m and a salinity and temperature gradient below this depth. In one area, lower salinity water (15.5psu) was recorded at 5m depth, as if diluted by an underground spring of freshwater.

Figure 56.1 Location of map of Loch Fhada.

Loch Fhada was 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).

Stations used for faunal sampling are not necessarily the same as those used for vegetation or ecotonal coleoptera.

Flora

The vegetation of Loch Fhada was surveyed by C. Roden in 1998 (Roden 1999).

A total of 18 floral taxa were recorded in Loch Fhada, of which 15 were identified to species. Four of these taxa are regarded as lagoonal specialists. Most notable about this lagoon is the presence of both species of ***Ruppia***, the abundance of the rare charophyte, ***Lamprothamnium papulosum*** and the dense mats of Chaetomorpha ***linum*** and the two rare *Cladophora* species (*C. liniformis, C. vagabunda*).

Flora recorded in Loch Fhada by Roden (1999):
Chaetomorpha linum
Cladophora liniformis
Cladophora vagabunda
Enteromorpha sp.
Chondrus crispus
Hildenbrandia sp.
Phyllophora pseudoceranoides
Polysiphonia macrocarpa
Polysiphonia nigrescens
Fucus vesiculosus
Chara aspera
Lamprothamnion papulosum
Cladium mariscus
Eleocharis sp.
Juncus maritimus
Ruppia maritima
Ruppia cirrhosa
Schoenoplectus tabernaemontana

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. 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 liniformis was recorded in Loch Fhada (and L. an Ghadaí). Not previously recorded in Ireland.

Cladophora vagabunda was recorded at 10 sites from Galway to Donegal.

With four lagoonal specialists, one of which is a rare charophyte (***L. papulosum***) and two rare *Cladophora* species, based on aquatic vegetation, Loch Fhada is regarded as of **high conservation value**.

Fauna

Two stations were selected by Oliver (1999) for faunal sampling in 1998 (Figure 56.2, Table 56.1).

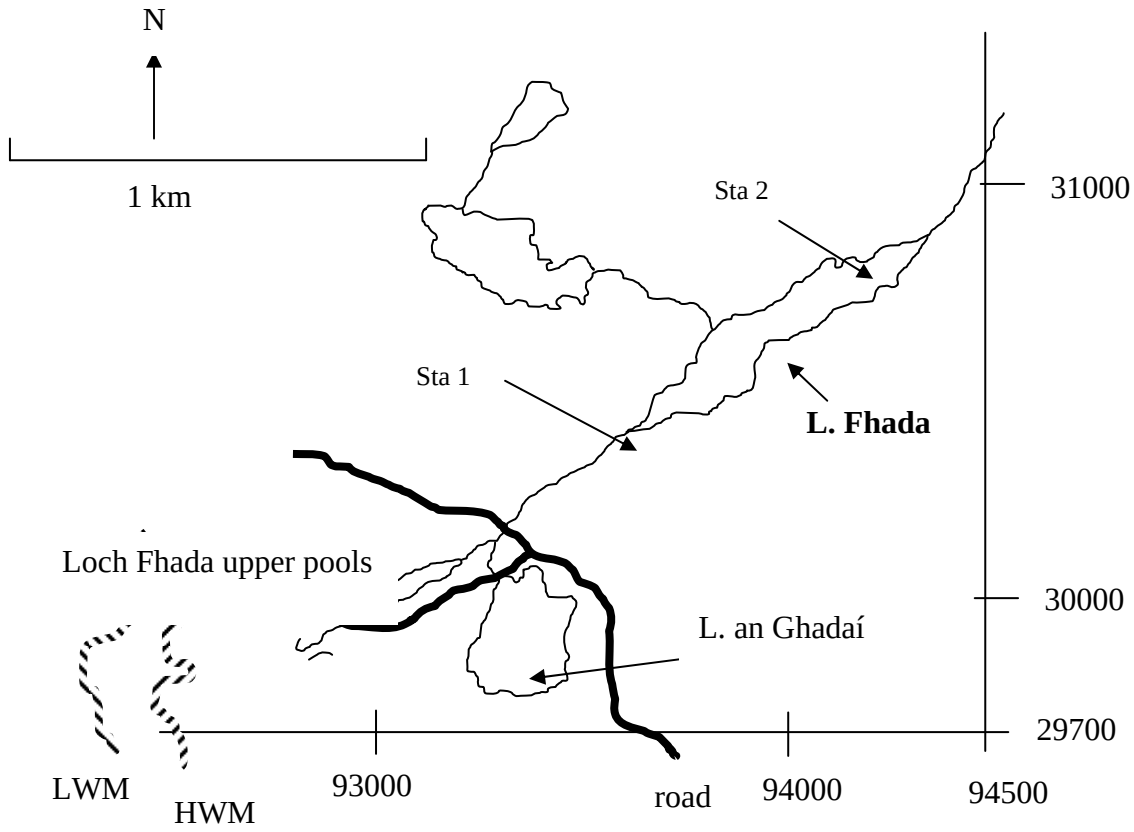

Figure 56.2 Sketch map showing faunal sampling stations used in Loch Fhada on 30/7/98 and 22/9/98.

Table 56.1 Positions of faunal sampling stations in Loch Fhada, with sampling date, salinity, depth of water and type of substratum.

	Sta 1	Sta 2
Sampling date	29-30/7/98	21-22/9/98
GPS position	L 937 304	L 94251 30834
Salinity(psu)	25	7-6-25.1
Temperature(C)	17	17.9-12.5
Depth(cm)	0-100	0-700
Substratum	Rocks, gravely sand	Granite rocks, bedrock. Muddy bottom at depth

Table 56.2 Aquatic fauna recorded at stations in Loch Fhada, Co. Galway. 1998. F = Fyke net; L.T. = light trap; + = present, o = occasional. c = common, a = abundant. Species in bold text are lagoonal specialists and rare species.

Taxa		Sampling stations			
		1	2	L.T.2a	L.T.2b
Turbellaria	planarian indet.		o		
Cnidaria	*Aurelia aurita*		c		
	Clava multicornis	o			
Crustacea					
Mysidacea	*Neomysis integer*	o	o		
	Praunus flexuosus	o	c	53	38
Isopoda	***Idotea chelipes***	o	+	6	2
	Jaera forsmani	o			
	Jaera nordmanni	o	o		
	Lekanesphaera hookeri	a	a	120	38
Amphipoda		a	a	54	
	Corophium volutator	1			
	G. zaddachi	28	77	25	
	Melita palmata		2		
Insecta					
	Gerris sp.		+		
Diptera	Chironomidae indet.		+		
Mollusca					
Prosobranchia	Hydrobiidae		+		6
	Littorina"tenebrosa"	o			1
	Rissostomia membranacea	o			
Bivalvia	***Cerastoderma glaucum***	spat			
	Mya arenaria	c	+		
	Mytilus edulis	+	+		
Bryozoa	***Conopeum seurati***	+	+		
Pisces	*Anguilla anguilla*		F=1		
	Gasterosteus aculeatus	o	o		2
	Pomatoschistus microps	o	o		

A total of 23 faunal taxa were recorded (Table 56.2), of which 20 were identified to species. Seven of these taxa are regarded as lagoonal specialists and two 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 forsmani was recorded at Raffeen and Kilmore L. (Co. Cork), Drongawn L. (Kerry), Aibhnín, L. Fhada and L. Fhada upper pools (Connemara). The only previous record for this, probably under-recorded species was for L. Hyne, Co. Cork in De Grave and Holmes (1998).

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%).

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*.

***Rissoa membranacea* var.** Gastropod mollusc recorded at eleven of the 87 lagoons surveyed on the west coast from Co. Cork to Co. Galway and also at Castle Espie, Co. Down. These records refer to a 'lagoonal' variety of the species, proposed as a lagoonal specialist for Ireland by Oliver and Healy (1998).

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.

The halocline was marked by a "dwarf" *Aurelia aurita* (1-2cm), which seemed to keep position along the discontinuity.

The fauna is not rich but includes a large proportion of lagoonal specialists (7 species). Based on aquatic fauna, the site is regarded as of **moderate conservation value**.

Ecotonal coleoptera

Two species of carabid and nine species of staphylinid beetles were recorded at Loch Fhada in 1998 (Good 1999, Good & Butler 2000), one of which (*Stenus lustrator*) is regarded as an indicator species, but based on ecotonal coleoptera, the site is regarded as of **low conservation value**.

Summary
A total of 18 floral and 23 faunal taxa were recorded in Loch Fhada, of which 12 were lagoonal specialists (7 faunal, 4 floral). Most notable about this lagoon is the presence of both species of *Ruppia*, the abundance of the rare charophyte, *Lamprothamnium papulosum* and the dense mats of Chaetomorpha *linum* and the two rare *Cladophora* species. The fauna is comprised of a high proportion of lagoonal specialists and at least two apparently rare species (*J. forsmani, L. "tenebrosa"*).
Overall Conservation Value = High

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

Further Information
Listed as a lagoon by Healy *et al.* 1997. Surveyed in 1998 as part of the Loch Fhada complex 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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4.58 **Loch an Aibhnín, County Galway** O.S. L 947 315
O.S. Discovery Sheet 45

Conservation Designation: Kilkieran Bay and Islands SAC 002111

General description:

Loch an Aibhnín is a large (55 ha), natural **rock/peat lagoon** on the south side of Camus Bay, 2 km to the northwest of Bealadangan. Seawater enters through narrow rapids from Camus Bay on spring tides and the lagoon receives diluted seawater from L. Fhada (Code No. IL056) and from L. Tanaí (Code No. IL057), and freshwater from a number of small streams and long-term 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 18psu on the surface and 25 psu 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.

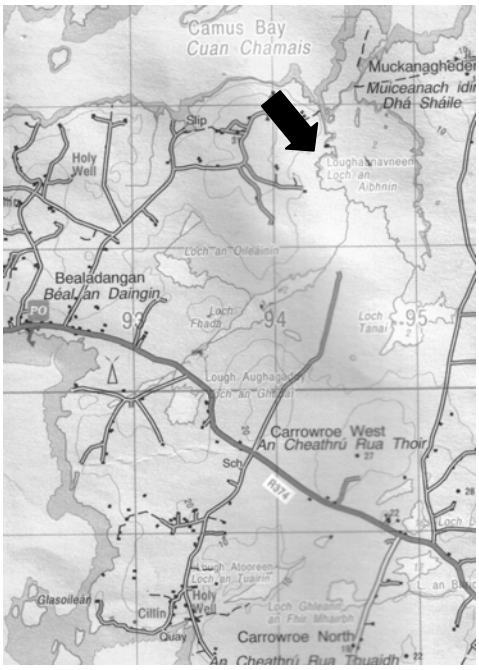

Figure 58.1 Location of map of Loch an Aibhnín.

Loch an Aibhnín was 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).

Stations used for faunal sampling are not necessarily the same as those used for vegetation or ecotonal coleoptera.

Flora

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

Results

This large high salinity lagoon contains several vegetation types. Soft sediment communities include:

(1) Peripheral vegetation in shallow water (<1m) includes ***Ruppia* sp.** along with a small form of Zostera ***marina***, *Fucus vesiculosus* and dense epiphytic Ectocarpaceae.
(2) Stands of ***Ruppia cirrhosa*** with or without ***Lamprothamnium papulosum*** occur in the southern part of the lagoon. This community grades into a *Zostera marina/Ruppia cirrhosa* community with rare *L. papulosum.*
(3) The centre of the lagoon is occupied by a *Zostera marina* community with occasional ***Spermathocnus paradoxus***.
(4) In slightly deeper water (3m) on the eastern side, a large area of bare mud occurs.
(5) Exposed rocks support several algal communities. In shallower water *Furcellaria lumbricalis* and ***Chyllocladia verticillata*** occur on sloping rock. This community is close to OB23/OB24 of Covey & Thorpe (1994). Horizontal rocks are covered by coils ***Chaetomorpha linum*** with attached *Chondrus crispus,* crustose non-calcareous red algae and ***Phyllophora pseudoceranoides***.
(6) At greater depths on mud, loose lying *Gracilaria gracilis* and other species occur.
(7) In a deep hole near the rock sill inlet, *Phyllophora crispa, Coccotylus truncata* and other species occur.

The phytoplankton consists of brackish water dinoflagellates.

Interesting species

Both species of *Ruppia* occur (***R. cirrhosa, R. maritima***) as well as ***Lamprothamnium papulosum***. The ***Zostera marina*** which grows close to the shore is very small and could be mistaken for *Z. angustifolia*. Several unusual or local algae were recorded. ***Codium vermillaria*** is known from Cork, Clare and Antrim. One plant of ***Cladophora coelothrix*** was found, which is rarely recorded from Ireland (Burrows 1991). ***Coccotylus truncates*** is mainly found in the North of Ireland and Scotland. ***Chondria capillaris*** is rare in the south and west of Ireland.

An impressive total of 62 floral taxa were recorded at L. an Aibhnín. Four of these species, the two *Ruppias* (***R. cirrhosa, R. maritima***), a rare charophyte ***Lamprothamnium papulosum***, and the green alga ***Chaetomorpha linum***, are lagoonal specialists:

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.* 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.

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.

The vegetation of L. an Aibhnín is extremely rich, with a total of 62 taxa recorded, including four lagoonal specialists, one of which is a rare charophyte, and at least five rare or local algal species. This site has the best and most extensive development of the *Zostera/Ruppia/Lamprothamnium* community encountered in the lagoon surveys carried out from 1996-2006. Botanically it is regarded of **high conservation value**.

Fauna

Eight stations were selected for faunal sampling of this large lagoon in 1998 (Oliver 1998, Healy 1999) (Table 58.1, Figure 58.2).

Table 58.1 Positions of sampling stations in Loch an Aibhnín, 26-28/8/98 and 22-23/9/98, with salinity, depth of water and type of substratum.

	Sta 1a	Sta 1b	Sta 2	Sta 3	Sta 4	Sta 5	Sta 6	Sta 7	Sta 8
GPS position	L 94354 31890	L 94472 31982	L 94849 31982	L 95044 31685	L 95055 31088	L 94990 30825	L 94798 31174	L 94555 31340	L 94358 31427
Salinity(psu)	18.7 -24.5	1 8 - 2 5	2 4 . 5	24.5-26.2	24.5-26.0	18.0-25.6	2 5	2 0 - 2 5	1 8 - 2 4
Depth(cm)	0-150	0-100	0-100	0-100	0-200	0-100	0-100	0-100	0-50
Substratum	Granite rocks, coarse sand, peat	Granite rocks, coarse sand, peat	Soft peat, scattered granite rocks	Soft peat, scattered granite rocks	Peat, scattered granite rocks, boulders	Peat, rocks, coarse sand	Peat, rocks, coarse sand, silt	Peat, peaty silt, scattered rocks	Soft peat, scattered rocks

An impressive total of 107 faunal taxa were recorded in L. an Aibhnín in 1998, of which 10 species are lagoonal specialists and three others are apparently rare species:

Gonothyraea loveni. Hydroid listed as a lagoonal specialist in Britain by Downie (1996) and JNCC (1996). Recorded only at L. an Aibhnín and an unconfirmed record from Rossalia, Co. Clare. 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 other than a record (as *G. hyalina*) in Co. Louth by Duerden (1894).

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%).

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.

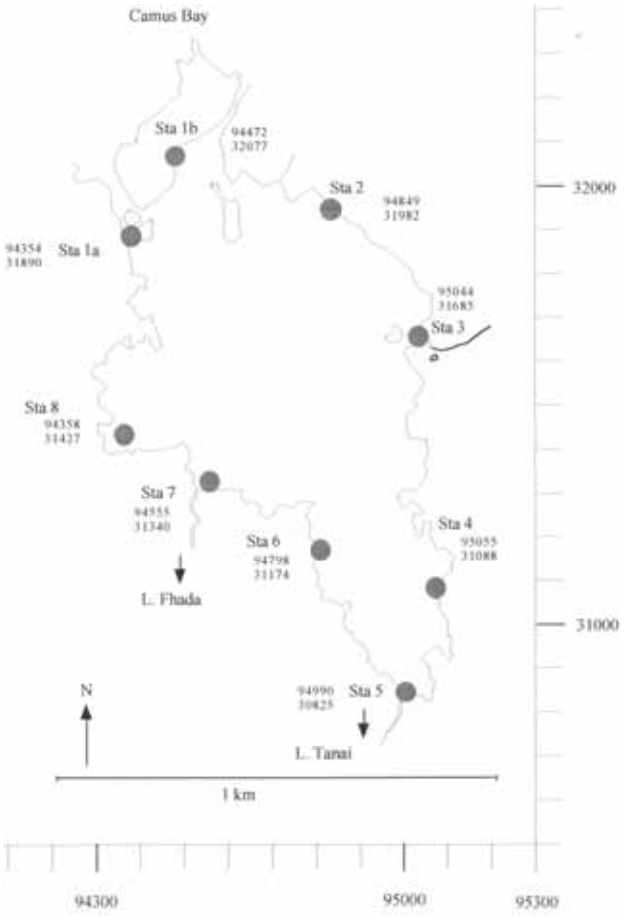

Figure 58.2 Sampling stations used at Loch an Aibhnín.

Enochrus bicolor Water-beetle recorded at 12 lagoons of the 87 surveyed, from the southern half of the country from Co. Wicklow to Connemara including the Aran Islands. There are only two recent records from N. Ireland (Nelson *et al.* 1998).

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.*

***Rissoa membranacea* var.** Gastropod mollusc recorded at eleven of the 87 lagoons surveyed on the west coast from Co. Cork to Co. Galway and also at Castle Espie, Co. Down. These records refer to a 'lagoonal' variety of the species, proposed as a lagoonal specialist for Ireland by Oliver and Healy (1998).

Onoba aculeus Gastropod mollusc recorded at Greenore Golf course, Co. Louth, Lettermullen Pool, L. an Aibhnín, and L. Athola, Co. Galway and Sally's Lake, Co. Donegal, and recently (unconfirmed) from L. Dearg in the Aran islands.

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.

Other species which are not lagoonal specialists but appear to be rare in Ireland:

Jaera forsmani was recorded at Raffeen and Kilmore L. (Co. Cork), Drongawn L. (Kerry), Aibhnín, L. Fhada and L. Fhada upper pools (Connemara). The only previous record for this, probably under-recorded species was for L. Hyne, Co. Cork in De Grave and Holmes (1998).

Lembos longipes Amphipod crustacean recorded at 5 sites on the west coast (Kilmore L, Co. Cork, Drongawn L., Co. Kerry, L. an Aibhnín, Co. Galway, Furnace L., Co. Mayo and Sally's Lough, Co. Donegal). There are only three previous records for Ireland (Costello *et al.* 1989).

Cercyon littoralis was recorded at Bridge L. and Mill L. in 1996 (Oliver and Healy, 1998) and at L. an Aibhnín and Kilmore Lake in 1998. Driftline species with few recent records.

Based on aquatic fauna, Loch an Aibhnín is one of the most important lagoons in the country, with 107 taxa recorded, of which 10 species are lagoonal specialists and at least 3 other species appear to be rare in Ireland. This lagoon is therefore rated as of **exceptional conservation value**, based on aquatic fauna.

Ecotonal coleoptera

In total, two species of carabid and 9 species of staphylinid beetles were recorded in 1998 by (Good 1999, Good & Butler 2000), none of which are indicator species. The site was therefore rated as of **low conservation value**.

Summary
Loch an Aibhnín is one of the best examples in the country of an unusual type of lagoon, 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. The vegetation is extremely rich, with a total of 62 taxa recorded, including four lagoonal specialists, one of which is a rare charophyte, and at least five rare or local algal species. This site has the best and most extensive development of the *Zostera/Ruppia/Lamprothamnium* community encountered in the lagoon surveys carried out from 1996-2006. Faunistically, it is one of the most important lagoons in the country, with 107 taxa recorded, of which 10 species are lagoonal specialists and at least 3 other species appear to be rare in Ireland. This lagoon is therefore rated as of **exceptional conservation value**, based on geomorphology, and aquatic fauna and flora.
Overall Conservation Value = Exceptional

Conservation Status Assessment (from Oliver 2007)	
Impacts	No significant impacts. Natural eutrophication in parts.
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). Sampled seasonally and included in a biological classification of Irish coastal lagoons (Oliver 2005) and in the Conservation Status Assessment (Oliver 2007).

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Table 58.2 Aquatic fauna recorded at stations in Loch an Aibhnín, Co. Galway. 1998.
L.T. = light trap. + = present, o = occasional, c = common, a = abundant. Species in bold text are lagoonal specialists or rare species.

Taxa		Sampling 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
Porifera	Axinellidae indet.	+																
	Halichondria panicea	+		+			+		+				+					
	Leucosolenia botryoides	+											+					
	L. complicata	+																
	Suberites sp						+											
	Sycon ciliatum	+									+		+					
Cnidaria	*Actinia equina*	1																
	Anemonia viridis	+			+													
	Aurelia aurita	+																
	Anthopleura ballii	+			+		+		+		+		+					
	Gonothyraea loveni	+		+			+		+		+				+			
Turbellaria	*? Procerodes littoralis*																	
Nemertea	*Lineus sp.*	+			+		+				+		+		+		+	
	Nem. sp.1								+									
	Nem. sp 2								+									
Annelida																		
Polychaeta	*Circeis spirillum*	1																
	Eumidea sanguinea	+																
	Eupolymnia nebulosa	+																
	Flabelligera affinis	c		c							a							
	Harmothöe imbricata	c		+														
	Orbinia sp.				1													
	Polyophthalmus pictus	+	8								+				+			
	Platynereis dumerili	+		+	+													
	Scoloplos armiger																+	
	Spirorbidae indet.	+		+	+		+		+		+		+		+			
Oligochaeta	Tubificidae			1														

Table 58.2 Cont…Aquatic fauna recorded at stations in Loch an Aibhnín, Co. Galway. 1998.
L.T. = light trap. + = present, o = occasional, c = common, a = abundant. Species in bold text are lagoonal specialists or rare species.

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	***Cercyon littoralis***	6																
	Enochrus bicolor	2																
	Ochthebius dilatatus																1	
	O. viridis																1	
Mollusca										5		2						
Polyplacophora	*Lepidochitona cinereus*	+									+							
Prosobranchia	*Diodora graeca*	+																
	Gibbula cinerea			+							+							
	Gibbula umbilicalis	+		+														
	Hydrobia ulvae	o			+													
	Littorina littorea			+														
	L. obtusata	+																
	L. saxatilis	+		+													+	
	Littorina "tenebrosa"				+		+		+		+							
	Onoba aculeus				o		o				+		+		+		o	
	Patella vulgata	+																
	Pusillina sarsi	+																
	Rissostomia membranacea	+			+		+		+		+		+		+			
	Skeneopsis planorbis	+			+				+		+				+		+	
Opisthobranchia	*Akera bullata*	+		+	o		+		+								o	
	Cadlina laevis	+																
	Runcina coronata	+		+	1				+								+	
	Scaphander lignarius	+					+				c		o		+			
Bivalvia	*Anomia ephippium*	+																
	Cerastoderma glaucum	+		+	+		+		+		+		+		+		+	
	C. edule						+											
	Chlamys varia	+																
	Hiatella arctica	+																

Table 58.2 Cont…Aquatic fauna recorded at stations in Loch an Aibhnín, Co. Galway. 1998.
L.T. = light trap. + = present, o = occasional, c = common, a = abundant. Species in bold text are lagoonal specialists or rare species.

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
	Modiolarca tumida	+																
	Modiolus modiolus	1																
	Monia patelliformis	+																
	Musculus discors	c		c	c		c		c		c		c				a	
	Mya arenaria						+											
	Mysella bidentata	+		+														
	Mytilus edulis	+																
	Ostrea edulis	+																
	Paphia aurea			+														
Bryozoa	*Amathia lendigera*	+		+														
	Bowerbankia gracilis				+						+		+		+			
	Conopeum seurati	+															+	
	Callopora lineata	+		+	+		+		+		+		+		+		+	
	Phaeostachys spinifera	+																
Echinodermata	*Amphipholis squamata*	+					+						+		+			
	Leptosynapta inhaerens				+		+				+				a			
Tunicata	*Ascidiella aspera*	+													+			
	A. scabra				+										+			
	Ciona intestinalis	+			+		+		+		+		+				+	
	Clavelina lepadiformis	+			+		+				+		+					
	Botryllus schlosseri	+		+											+			
	Botrylloides leachi	+																
	? Polycarpa pomaria	+																
Pisces	*Anguilla anguilla*	F=3			F=15						F=9		F=5					
	Crenilabrus melops	F=2											F=1					
	Gasterosteus aculeatus						+		0	1						1		
	Gobius niger	F = 1																
	Mugilidae						+											
	Pleuronectes flesus				F=1													
	Pomatoschistus microps				+		+		+									

4.59	**Loch Cara Fionnla, County Galway** O.S. L 963 290 (L. Carafinla) O.S. Discovery Sheet 45

Conservation Designation: Kilkieran Bay and Islands SAC 002111

General description:

Loch Cara Fionnla is a medium sized (13.5ha), shallow (1-2m) natural **rock/peat lagoon** which drains into the south side of Camus Bay, through a long channel which runs through Kinvarra saltmarsh. At the time of sampling salinity was low, measuring 1.1 –3.5 psu but 24psu was recorded 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.

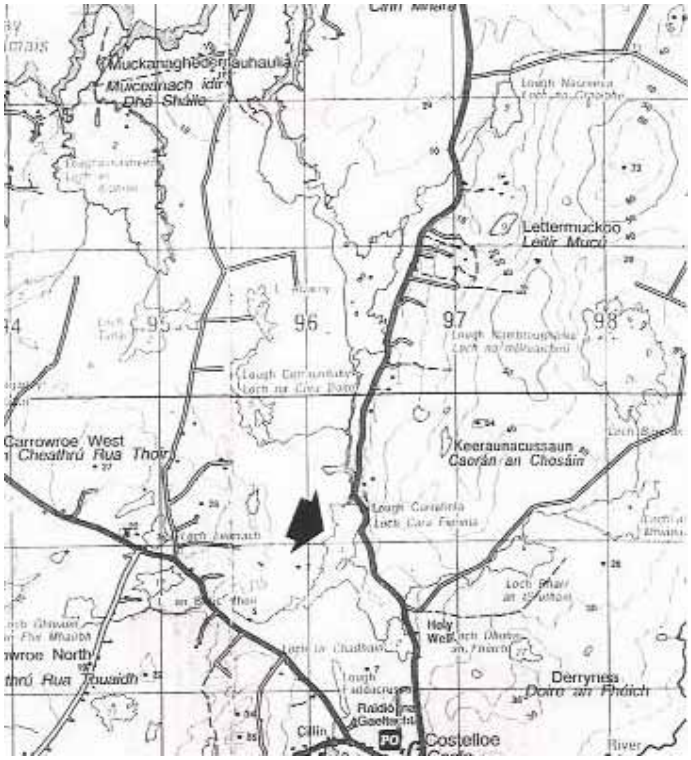

Figure 58.1 Location of map of Loch Cara Fionnla.

Loch Cara Fionnla was 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).

Stations used for faunal sampling are not necessarily the same as those used for vegetation or ecotonal coleoptera.

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Flora

The vegetation of Carafinla was surveyed in 1998 by Roden (1999).

Visibility was poor on the three occasions the lagoon was surveyed in 1998, suggesting peat-stained freshwater runoff from surrounding moorland. The bed of the lagoon has a flat bottom of fine peaty mud, with occasional granite boulders protruding, and vegetation is very sparse. The rocky sides support dense stands of ***Potamogeton pectinatus*** and ***Fucus ceranoides***.

Small areas of *Chara aspera* were found at the southern end of the lake. The greater part of the lagoon supported communities of ***Ruppia* sp.** and *P. pectinatus.* ***Lamprothamnium papulosum*** occurred only in the centre of the lagoon growing sparsely on bare mud or with *Ruppia sp.* at a depth of 1-2m.

Relatively few floral taxa were recorded in Carafinla, but two of these are lagoonal specialists and one (*L. papulosum*) is a rare charophyte:

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.

The *Lamprothamnium* in Carafinla is growing in an unusual habitat, in low salinity water (1-2psu) and at depth. Possibly salinity is normally higher than during the sampling period at this depth.

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 Carafinla 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%). ***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. *R. cirrhosa* was only identified at 23 lagoons (26%), but species was not determined at 12 sites.

Botanically, Carafinla is rated as of **high conservation value**, simply due to the presence of the rare charophyte, *L. papulosum*.

Fauna

Five sampling stations were selected for faunal sampling in 1998 (Figure 59.2, Table 59.1) (Oliver 1999).

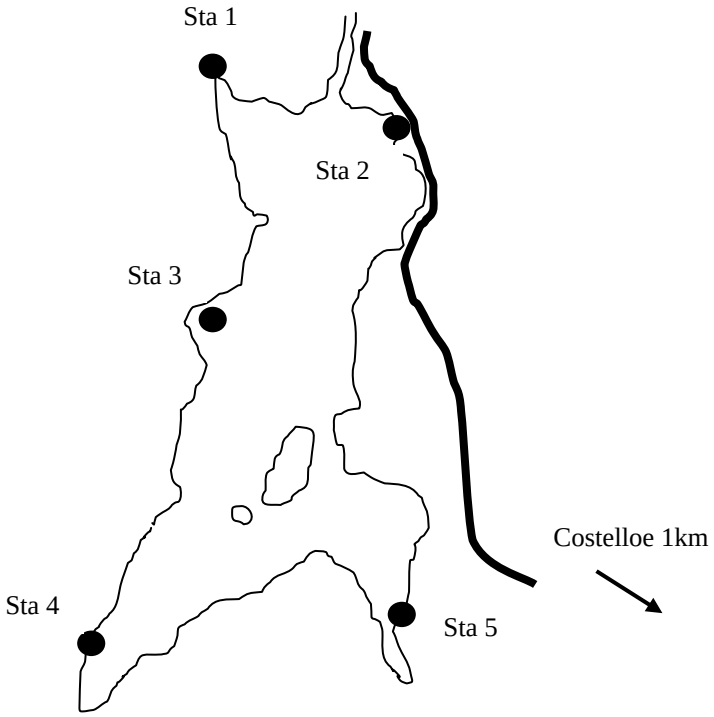

Figure 58.2 Sketch map showing sampling stations used at Loch Cara Fionnla, 7-10/8/98 and 9/9/08.

Table 59.1 Positions of faunal sampling stations in Carafinla, 7-10/8/98 and 9/9/08, with salinity, depth of water and type of substratum.

	Sta 1	Sta 2	Sta 3	Sta 4	Sta 5
GPS position	L 96137 29325	L 96384 29231	L 96153 29004	L 95995 28641	L 96363 28669
Salinity(psu0	0-4-1.4	0.5-3.5	0.5-0.8	0.6-1.3	0-0.6
Depth(cm)	0-100	0-100	0-130	0-150	0-150
Substratum	Granite rocks, stones, gravel, peaty silt	Rocks, stones, gravel, sand	Soft peat, granite stones	Soft peat, granite stones	Soft peat, granite stones

A total of 26 faunal taxa were recorded in Carafinla in 1998, most of which are common low salinity or estuarine animals, but three species are regarded as lagoonal specialists in Britain and one other is a proposed lagoonal specialist for 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.

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.

Table 59.2 Aquatic fauna recorded at stations in Loch Cara Fionnla, Co. Galway. 1998. F = Fyke net; L.T. = light trap; + = present, o = occasional. c = common, a = abundant. Species in bold text are lagoonal specialists.

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

The fauna of Carafinla is relatively poor, but includes four lagoonal specialists. Based on aquatic fauna the site is regarded as of moderate **conservation value**.

Ecotonal coleoptera

Three species of carabid and fourteen species of staphylinid beetles were recorded in 1998 by Good & Butler (2000, Healy 1999a, b), one of which is an indicator species (***Stenus lustrator***). Previous to the lagoon surveys there were only three records for this species in Ireland, but was found at eight lagoons in 1996 and 1998. This beetle appears to be characteristic of lagoons and saline lakes with well developed peat shore habitat. Despite the presence of this species, based on ecotonal coleoptera Carafinla is rated as of **low conservation value**.

Summary

Relatively few species were recorded in Carafinla, but several of these are lagoonal specialists (2 floral, 4 faunal), two of which are rare. The main feature of conservation value is the presence of the rare charophyte ***Lamprothamnium papulosum.*** For this reason alone, the site is rated as of **high conservation value**. Otherwise, it is not a site of particularly high importance but a good example of a type of lagoon, 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. Overall conservation value is therefore rated as high.

Overall Conservation Value = High

Conservation Status Assessment (from Oliver 2007)	
Impacts	No significant impacts.
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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4.60 **Cara na gCaorach, County Galway** O.S. L 964 305
O.S. Discovery Sheet 45

Conservation Designation: Kinvarra Saltmarsh SAC 002111, pNHA 002075

General description:

Cara na gCaorach is not named on the 1;50,000 OS map, but is the name used by Robinson (1997?) for a large (30ha), mostly shallow (1-2m) natural **rock/peat lagoon** 2.5km south of Kinvarra, Co. Galway, which drains into the south side of Camus Bay, through a long channel which runs through Kinvarra saltmarsh. Salinity probably varies considerably and ranged from 0.9-13.9 psu but 24psu at the time of sampling (15-16/10/06). Substrate is mostly soft peaty silts with outcrops of granite bedrock and rocks. The lagoon is bordered by moorland, peat bog and granite rocks.

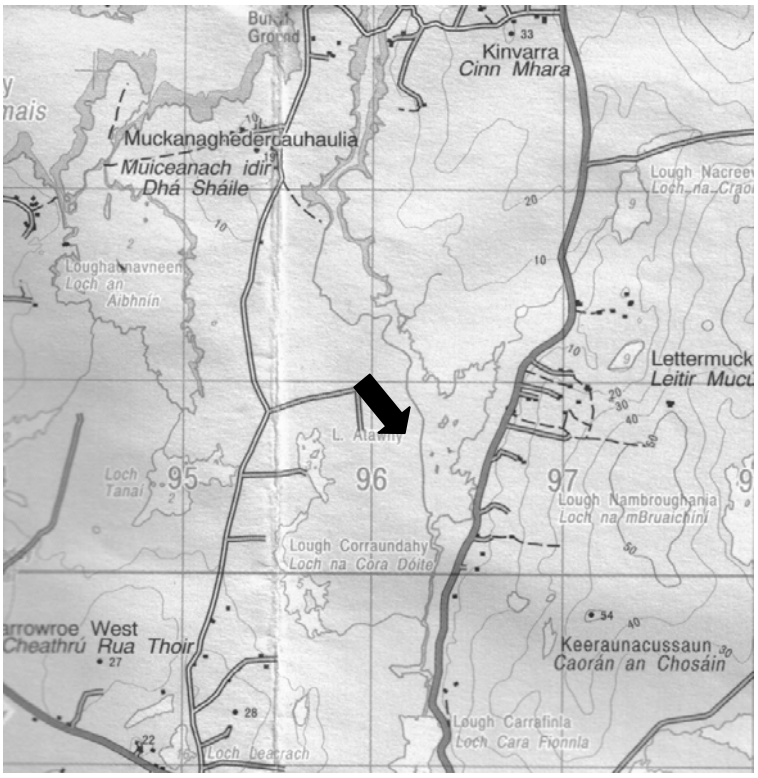

Figure 60.1 Location map of L. Cara na gCaorach.

L. Cara na gCaorach was surveyed on 15-16/10/06 for aquatic fauna and flora. Six stations were selected for sampling at this time (Figure 60.2, Table 60.1)

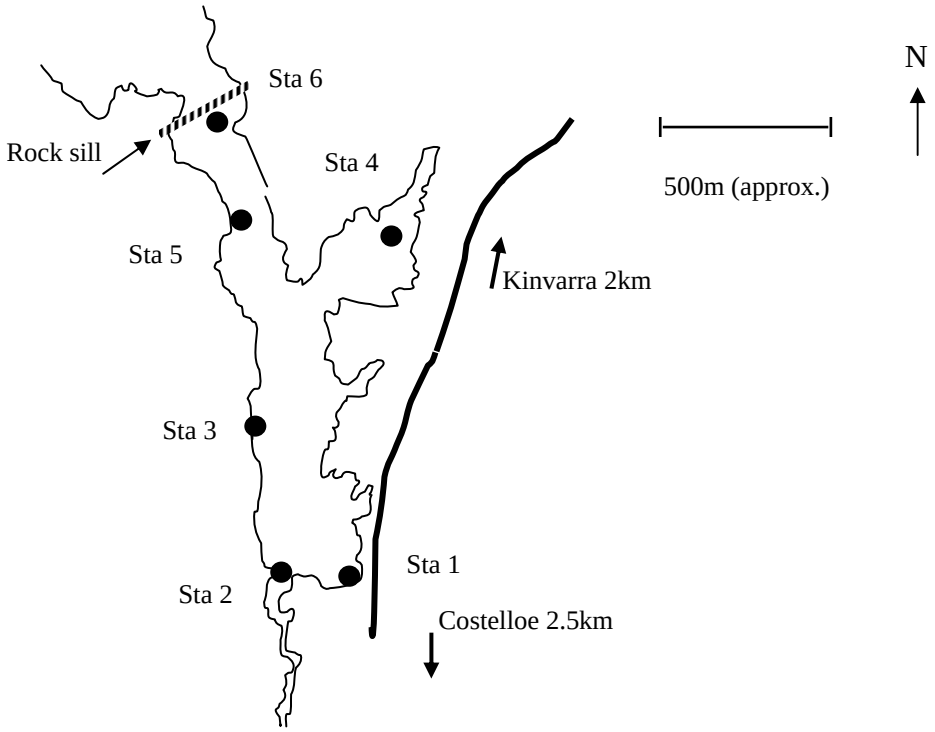

Figure 60.2 Sketch map of sampling stations used in Cara na gCaorach, 15-16/10/06

Flora

The vegetation of Cara na gCaorach was surveyed by C. Roden in 1998 (Roden 1999, Healy 1999a, b) and by Oliver in 2006. The following is a summary of both years. A total of 15 floral taxa were recorded at Cara na gCaorach (Table 60.1), three of which are regarded as lagoonal specialists. Two species are rare:

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. 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.

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%).

Zostera angustifolia was recorded only from this site and the North Slob during the lagoon surveys.

Table 60.1 Positions of sampling stations in Cara na gCaorach, with sampling date, hydrological variables (salinity, temperature and depth of water) type of substratum and percent cover of vegetation, bare ground and rotting vegetation. Species in bold text are lagoonal specialists or rare species. + = species present

Name of site	Cara na gCaorach					
Date of survey	15/10/2006	15/10/2006	15/10/2006	15/10/2006	16/10/2006	16/10/2006
	Sta 1	Sta 2	Sta 3	Sta 4	Sta 5	Sta 6
GPS position	L 96524 30318	L 96306 30255	L 96282 30737	L 96578 31052	L 96237 31166	L 96142 31347
Salinity (psu) at surface	9.1	3.6	3.8	0.9	4.9	5.1
Salinity at depth		13.9		7.1	5.3	
Temperature at surface	20	13.2	12.0	11.4	13.0	13.1
Temperature at depth		13.8		12.1	12.9	
Depth (cm)	0-40	0-200	0-0.5	0-100	0-200	0-50
Substratum	peaty mud, stones	peaty mud, stones	peaty mud, stones	peaty mud, stones	peaty mud, bedrock	peaty mud, bedrock
Percentage cover						
Algae						
Chlorophyceae						
Chaetomorpha linum	**50**	**80**	**60**	**50**	**20**	
Cladophora sp.	**40**	**30**	**20**	**20**	**30**	
Cladophora rupestris					+	+
Enteromorpha sp.	+	+	+	+		
Phaeophyceae						
Ascophyllum nodosum	+	+	+	+		**5**
Fucus ?ceranoides		**5**	+	+	**?**	**?**
Fucus serratus				drift		**60**
Fucus vesiculosus					**10**	**10**
Pelvetia canaliculata						**5**
Rhodophyceae						
Ceramium sp.						+
Gracilaria verrucosa					+	+
Polysiphonia sp.						+
Charophyceae indet.						
Lamprothamnion papulosum	+	+	+	+		
Angiosperms						
Ruppia maritima	**20**	**20**	**80**	**50**	**10**	
Zostera angustifolia	**?**	**?**	**?**	**?**		
Bare mud	**10**		**10**		**30**	
Stones	**30**	+	+	+	**40**	**30**

This is a large site with four lagoonal specialist plants, one of which is rare in Ireland (*L. papulosum*). Based on this vegetation, Cara na gCaorach is regarded as of **high conservation value** as a coastal lagoon.

Fauna

The fauna of Cara na gCaorach is not particularly rich, which is quite characteristic of many lagoons. Only 28 faunal taxa were recorded in 2006 (Table 60.2), but five species are lagoonal specialists and two additional species appear to be 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%).

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.

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.

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.

Jaera ischiosetosa Isopod crustacean recorded at 12 sites from West Cork to Donegal. The only previous record appears to be for L. Hyne. Co. Cork (Goss Custard *et al.* 1979).

?Heterotanais oerstedi Tanaid crustacean only recorded in Cara na gCaorach during the lagoon surveys. Apparently occurs throughout northwestern Europe. Little is known about its biology or range, doubtless because of its small size, but its distribution does genuinely appear to be patchy (Barnes 1994).

Table 60.2 Aquatic fauna recorded at Cara na gCaorach, Co. Galway. 15-16/10/06. L.T. = light trap, + = present, o = occasional. c = common, a = abundant, F = Fyke net; Species in bold text are lagoonal specialist or rare species.

			Sta 1	Sta 2	Sta 3	Sta 4	Sta 5	Sta 6
Protozoa	Foraminifera	indet.		o		o	o	
Nematoda		indet.					o	
Annelida	Polychaeta	Spionid indet.			r	r		
	Oligochaeta	Tubificidae indet.			o		o	
Crustacea	Ostracoda	indet.		o		o		
	Copepoda	*Harpacticoida* indet.	o	o	r	o	o	o
	Tanaidacea	***?Heterotanais oerstedti***	c	c	o	c	c	c
	Mysidacea	*Neomysis integer*	o	r	o	o	o	
		Praunus flexuosus			r		c	c
	Isopoda	***Idotea chelipes***	o	r	o	o	c	o
		Jaera ischiosetosa	c	c	o	o	o	a
		Lekanesphaera hookeri	a	o	o	c	c	c
	Amphipoda	*Corophium volutator*		o	c	o	o	
		Gammarus ?zaddachi	o	c	o	o	o	a
		Microdeutopus sp.		r				
	Decapoda	*Carcinus maenas*					o	o
		Crangon crangon	r					
		Palaemonetes varians	c	o	a	o	o	o
Acarina		indet.	r					
Insecta	Diptera	Chironomidae indet.	o	o	c	c	c	o
Mollusca	Gastropoda	*Hydrobia ulvae*	c	c		o	o	o
		Hydrobia ventrosa		o	r		o	o
		Potamopyrgus antipodarum	c	c	o	c	o	o
	Bivalvia	*Mya arenaria*	r					
Bryozoa		***Conopeum seurati***	o	o	o	a	a	c
Pisces		*Gasterosteus aculeatus*		o	c	c		
		Gobius niger						o
		Pomatoschistus microps			o	o	o	

The aquatic fauna of Cara na gCaorach is not rich, but is typically lagoonal with five lagoonal specialists, and two other apparently rare species. Based on aquatic fauna, the site is therefore rated as of **moderate conservation value**.

Ecotonal coleoptera

Only one species of carabid and six species of staphylinid beetles were recorded in 1998 by Good & Butler (2000, Healy 1999a, b), although one species, ***Stenus lustrator,*** **is** an indicator species. Previous to the lagoon surveys there were only three records for this species in Ireland, but it was found at eight lagoons in 1996 and 1998. This beetle appears to be characteristic of lagoons and saline lakes with well developed peat shore habitat. However, despite the presence of this species, based on ecotonal coleoptera Cara na gCaorach is rated as of **low conservation value**.

Summary

Relatively few species were recorded in Cara na gCaorach, but several of these are lagoonal specialists (3 floral, 5 faunal), one of which is rare. The main feature of conservation value is the presence of the rare charophyte ***Lamprothamnium papulosum.*** For this reason alone, the site would be rated as of high conservation value. Faunistically, it is typically lagoonal, but also contains two apparently rare crustaceans. It is also a good example of a **rock/peat** lagoon, which is a rare lagoon type in Europe in an area of scenic value, which should be regarded as an important gradation of a lagoonal habitat from Cara Fionnla to the open sea of Camus Bay. Overall conservation value is therefore rated as high.

Overall Conservation Value = High

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

Further Information

Listed as a lagoon by Healy *et al.* 1997, Healy 2003 and Oliver 2005. Surveyed in 1998 for vegetation (Roden 1999) and ecotonal coleoptera (Good & Butler 2000) and partially for aquatic fauna (Oliver 1999). Results of the 1998 survey were summarised by Healy (1999a, b). Surveyed again for aquatic fauna and flora by Oliver in 2006 and included in the Conservation Status report (Oliver 2007).

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4.64 **Loch an Mhuilinn, County Galway** O.S. L 754 331 (Mill Loch), O.S. Discovery Sheet 44

Conservation Designation: Kilkieran Bay and Islands SAC 002111

General description:

Mill Lough is a small (6ha), mostly shallow (1-2m), but up to 4-5m at the southern end, **"rock/peat" lagoon**, with a natural bridged outlet, situated in the north of Ard Bay, western Connemara, 4 km west of Carna. Mill Lough is included as a good example of a type of lagoon, similar to the Scottish "obs", which are characteristic of parts of the west coast of Ireland, especially in Connemara. They are permanent, shallow and brackish, with restricted tidal influence due to the presence of a "barrier" of peat, and in this case rock. Seawater appears to enter on all tides, but large amounts of freshwater also enter. Salinity probably varies considerably both spatially and temporally, and ranged from 6-31psu at the time of sampling (27-29/9/96).

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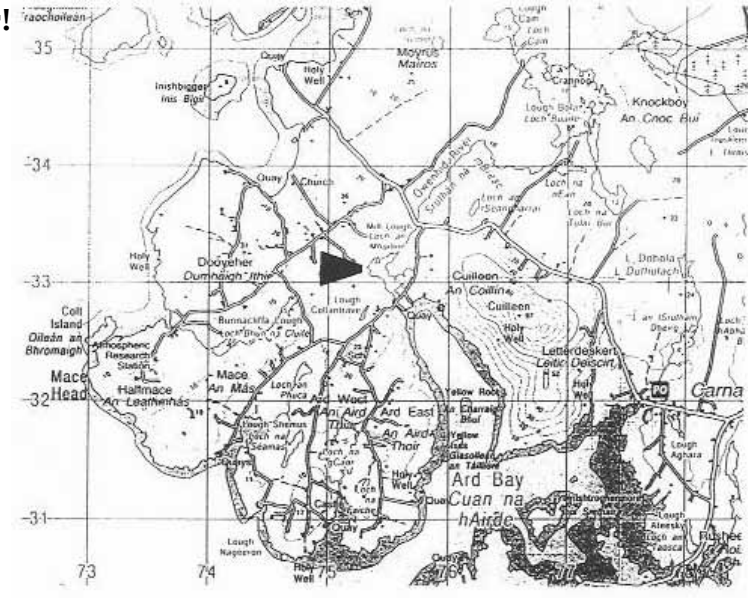

Figure 64.1 Location of map of L. an Mhuilinn (Mill L.)

Mill Loch was surveyed in 1996 for vegetation (Hatch 1996, Hatch & Healy 1998), aquatic fauna (Healy & Oliver 1996, Oliver & Healy 1998) and ecotonal coleoptera (Good 1996, Good & Butler 1998). Results of these surveys are summarised by Healy *et al*. (1997a,b,c), Healy & Oliver (1998) and Healy (1999, 2003). Sampling stations for fauna do not necessarily correspond with those of flora or ecotonal coleoptera.

Flora

Vegetation was surveyed by P. Hatch in 1996 (Hatch 1996, Hatch & Healy 1998), but no underwater observations were made.

Ruppia cirrhosa occurs around the whole site but was not found in dense beds. Some ***Zostera*** fragments were found washed up on the shore in places. Fucoid algae were common in the tidal inlet with one species occurring frequently along the rocky shores of both the east and west to within approximately 100 metres of the main freshwater inflow.

Relatively few floral taxa were recorded in Mill Lough, and only one species (*R. cirrhosa*) is a lagoonal specialist.

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. *R. cirrhosa* was only identified at 23 lagoons (26%), but species was not determined at 12 sites.

Marginal vegetation was more or less uniform. *Juncus maritimus* salt tolerant community was dominant between stretches of bedrock shore. Small open *Phragmites* swamps occurred in sheltered areas of the north and south east.

Mill Lough would seem to be a species-poor site with no particularly notable aquatic species. However, a survey of the deeper regions could well yield more interesting results and the site is therefore rated as **potentially valuable**.

Fauna

Four stations were selected for faunal sampling in Mill Loch in 1996 (Figure 64.2, Table 64.1).

Table 64.1 Positions of faunal sampling stations in Mill Loch 27-29/9/96, with salinity, depth of water and type of substratum.

	Sta A	Sta B	Sta C	Sta D
GPS position	L 7559 3285	L 7543 3308	L 7556 3319	L 7567 3309
Salinity(psu)	31	34	2-6	20
Depth(cm)	0-80	0-60	0-300	0-150
Substratum	Smooth granite bedrock, stones, gravel, sand, silt, peat.	Soft organic mud, loose peat, occasional stones.	Granite bedrock, stones, sand, organic silt/mud	Granite rock, loose peat, soft organic mud.

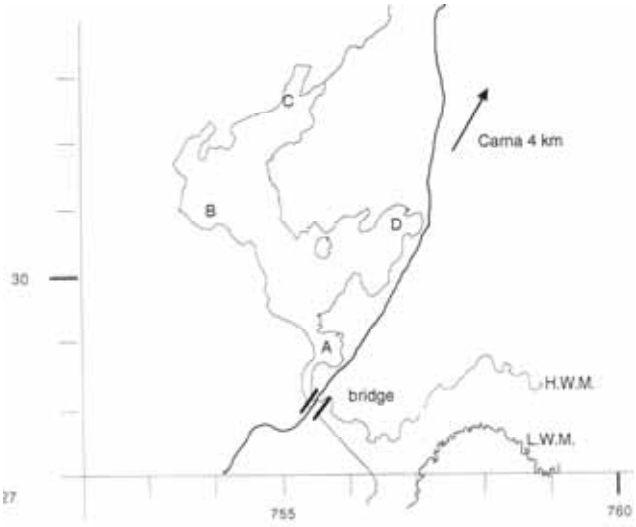

Figure 64.2 Faunal sampling stations used at L. an Mhuilinn (Mill L.).

A total of 30 faunal taxa were recorded, of which 28 were identified to species (Healy & Oliver 1996, Oliver & Healy 1998). Four of these species are lagoonal specialists in Britain and one species (*Jaera nordmanni*) is a proposed specialist for Ireland, but all of these "specialists" 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.

The greatest number of species was recorded near the sea inlet. One limnic species, a beetle, was recorded from near the freshwater inlet. The aquatic fauna was typical of a lagoon with a significant tidal inflow and a medium to high salinity. Sedentary marine species such as tunicates and bryozoans were occasional near the sea inlet. Localised areas of low salinity allow some oligohaline species to survive e.g. near a stream inlet where one beetle species was taken. No rare species were recorded.

Based on aquatic fauna, Mill Lough is rated as of **moderate conservation value**.

Table 64.2 Aquatic Fauna Recorded in Mill Lough, Co. Galway. June and September 1996. L.T. = light-trap, + = present; o = occasional; c = common; a = abundant; F = Fyke net. Species in bold text are lagoonal specialists.

Fauna		Sampling Stations							
		A	L.T.A	B	L.T.B	C	L.T.C	D	L.T.D
Cnidaria	*Dynamena pumila*	+							
Annelida	*Arenicola marina*	+							
	Hediste diversicolor	1						1	
Crustacea									
Mysidacea	*Leptomysis lingvura*					1			
	Neomysis integer	c	35	a	500	c	c100	c	c100
	Praunus flexuosus	1?							
Isopoda	***Jaera nordmanni***	c		o					
	Lekanesphaera hookeri		40	c	?	+	1	c	23
Amphipoda	*Corophium volutator*							c	
	Gammarus duebeni							+	
	G. zaddachi	+		+				+	
Decapoda	*Carcinus maenas*	+		+		F, 5		c	
	Palaemon elegans	o							
	P. serratus					F, 1			
	Palaemonetes varians	o		o		c		c	4
Insecta									
Coleoptera	*Cercyon lateralis*								
Diptera	Chironomidae	c		o		c		o	
Mollusca									
Prosobranchia	*Hydrobia ulvae*	5						7	
	Littorina obtusata	1							
	Potamopyrgus antipodarum			1		+		1	
Bivalvia	***Cerastoderma glaucum***	c				c			
Bryozoa	***Conopeum seurati***	+		+		+		+	
	Flustrellidra hispida					+			
Tunicata	*Ascidiella scabra*	+							
Teleostei	*Anguilla anguilla*	F, 2		+		+			
	Gasterosteus aculeatus	o	1	o	3	+		c	
	Labrus bergylta	F, 1							
	Mugilidae					F, 12			
	Platichthys flesus	F, 1						o	
	Pomatoschistus microps	o		o	3			o	1

Ecotonal coleoptera

Only 5 species of staphylinid and a single species of carabid were recorded at Mill Lough in 1996 (Good 1996, Good & Butler 1998), none of which are indicator species. Based on ecotonal coleoptera, the site is rated as of **no conservation value**.

Summary

Mill Lough is a natural **"rock/peat" lagoon**, and as such is good example of an unusual type of lagoon in European terms, similar to the Scottish "obs", but it is small, and no particularly rare species were recorded in 1996. There is some evidence of pollution from domestic and agricultural sources but the effects do not appear to be severe and are probably limited by tidal flushing. The aquatic fauna is typical of a lagoon with a significant tidal inflow and a medium to high salinity. A total of five lagoonal specialists were present but all are relatively common in lagoonal habitats in Ireland. The vegetation appeared to be species poor with only one lagoonal specialist (***R. cirrhosa***) and no other notable aquatic species, but **deeper areas were not sampled, and no underwater observations were made.** Ecotonal Coleoptera were poorly represented and no indicator species were recorded. Overall conservation value is rated as moderate.

Overall Conservation Value = Moderate

Conservation Status Assessment (from Oliver 2007)	
Impacts	Dumping in small areas.
Conservation Status	Favourable

Further Information

Mill Lough was surveyed in 1996 for vegetation (Hatch 1996, Hatch & Healy 1998), aquatic fauna (Healy & Oliver 1996, Oliver & Healy 1998) and ecotonal coleoptera (Good 1996, Good & Butler 1998). Results of these surveys are summarised by Healy *et al*. (1997a,b,c), Healy & Oliver (1998), and Healy (1999, 2003). Included in a biological classification of Irish coastal lagoons (Oliver 2005) and in the Conservation Status Assessment (Oliver 2007).

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Bamber, R.N. 1997. Assessment of saline lagoons within Special Areas of Conservation. *English Nature Research Reports* No. 235.

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

Healy, B. & G.A. Oliver. 1996. *A survey of Irish coastal lagoons: Aquatic Fauna*. Unpublished report for Dúchas, The Heritage Service. Dublin.

Healy, B. & Oliver, G.A. 1998. Irish coastal lagoons: summary of a survey. *Bulletin of the Irish Biogeographical Society.* **21:** 116-50.

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

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4.65 **Lough Ateesky, County Galway** O.S. L 781 307
O.S. Discovery Sheet 44

Conservation Designation:	Kilkieran Bay and Islands SAC 002111
General description:	

A small (2ha), shallow (<1m) "**saltmarsh" lagoon,** situated 1km south of Carna, Co. Galway, north of the road to Mweenish Island. The bed of the lagoon is mostly bare mud and salinity is generally high and measured 31psu at the time of sampling (7/10/06).

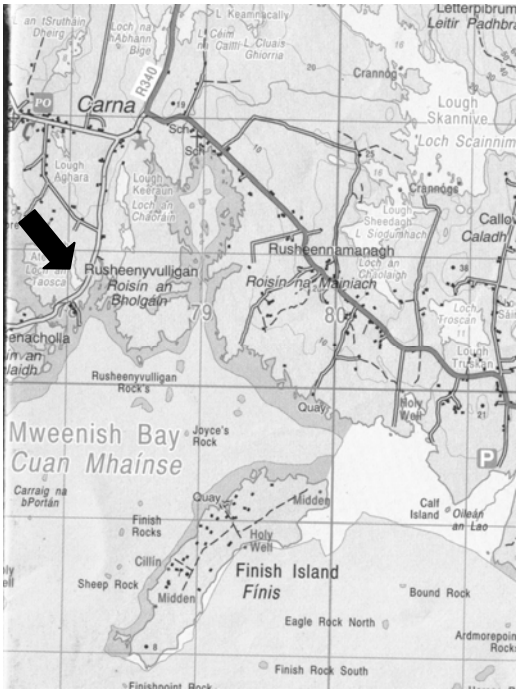

Figure 65.1 Location map of L. Ateesky.

L. Ateesky was surveyed on 7/10/06 for aquatic fauna and flora. The lagoon is small, and relatively homogeneous, and the entire lagoon was sampled as a single sampling station (Figure 65.2, Table 65.1)

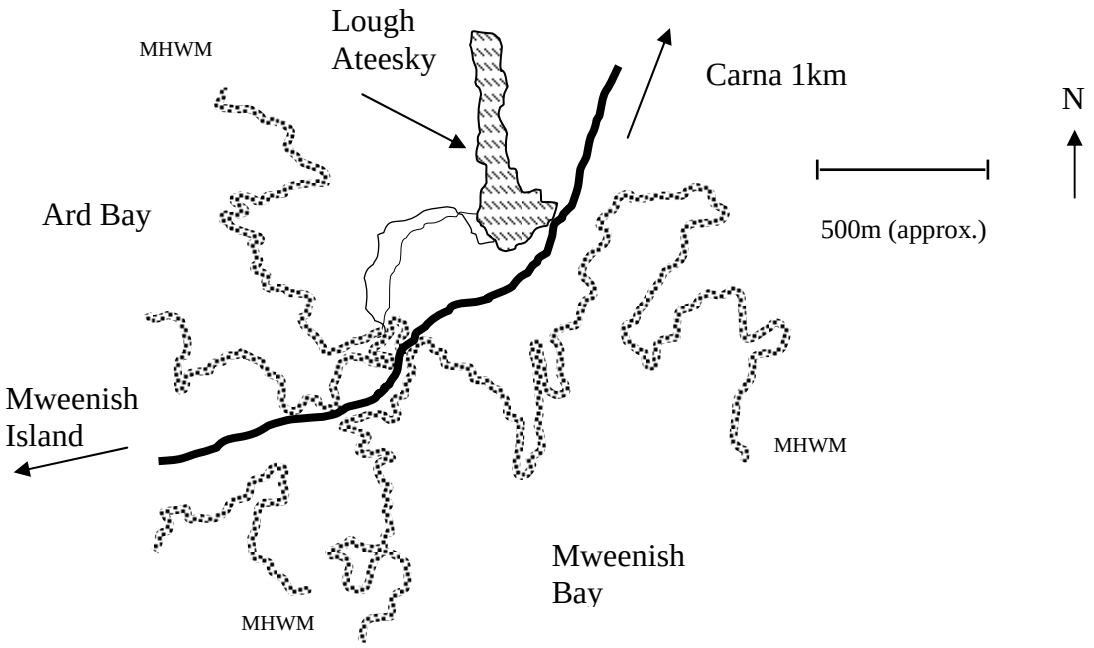

Figure 65.2 Sketch map of Lough Ateesky lagoon.

Flora

Lough Ateesky is an "estuarine" lagoon and most of the bed of the lagoon consisted of bare, soft mud (Table 65.1).

Table 65.1 Percentage cover of vegetation and bare ground in Lough Ateesky on 7/10/06, with salinity, temperature, depth of water and type of substratum. Species in bold text are lagoonal specialists. + = present

GPS position	L 78037 30728
Salinity (psu)	31.2
Temperature	14.6
Depth (cm)	0-30
Substratum	soft mud, occasional hard surfaces
Percentage cover:	
Algae	
Chlorophyceae	
Chaetomorpha linum	50
Cladophora sp.	+
Enteromorpha sp.	5
Ulva sp.	+
Phaeophyceae	
Ascophyllum nodosum	drift
Fucus vesiculosus	drift
Bare soft mud	50

Only six floral taxa were recorded when sampled in 2006, most of which are common estuarine algae. One species (***Chaetomorpha linum***) is a lagoonal specialist, but even this species is common in lagoonal habitats in Ireland.

There is some doubt about the taxonomic status of the unattached lagoonal form of ***C. linum***, 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.

Based on floral taxa, Lough Ateesky is rated as of **low conservation value**.

Fauna

Most of the bed of the lagoon consists of bare, soft mud, which is a characteristically species-poor habitat. Only 15 faunal taxa were recorded (Table 65.2), all of which are common estuarine animals, with the possible exception of a small amphipod ***Leptocheirus pilosus*** (unconfirmed), which is a proposed specialist for Ireland. Only one other species is a lagoonal specialist (*P. varians*), and even this species is often common in estuaries and is one of the most common "specialists" found in lagoons.

Table 65.2 Faunal taxa recorded at stations in Lough Ateesky 7/10/06.
r = rare, o = occasional, c = common, a = abundant. Species in bold text are lagoonal specialists

			Sta 1
Nematoda		indet.	o
Annelida			
	Polychaeta	*Nereis diversicolor*	r
		Syllidae indet.	r
Crustacea			
	Mysidacea	*Praunus flexuosus*	o
	Amphipoda	*Gammarus*	o
		?Leptocheirus pilosus	a
	Decapoda	*Carcinus maenas*	o
		Palaemon elegans	o
		Palaemon serratus	o
		Palaemonetes varians	o
Insecta			
	Diptera	Chironomidae indet.	o
Mollusca			
	Gastropoda	*Hydrobia ulvae*	o
Bryozoa		*Bowerbankia gracilis*	o
Tunicata		*Ciona intestinalis*	o
		Polyclinidae indet.	o
Pisces		*Pomatoschistus microps*	c

Leptocheirus pilosus Amphipod crustacean recorded at three lagoons in Co. Cork (Rostellan, Cuskinny, and Rosscarbery) in association with *C. insidiosum* and possibly Raffeen (unconfirmed), and also at L. Ateesky (unconfirmed) and L. Athola, Co. Galway and Furnace L., Co. Mayo. The only other known Irish localities are the south side of Wexford Harbour (Costello *et al.* 1989) and on the North Slob, Co. Wexford (Galvin 1992). Proposed as a lagoonal specialist for Ireland by Oliver and Healy (1998).

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.

Lough Ateesky is an "estuarine" lagoon and is relatively species-poor. Apart from the unconfirmed amphipod, *L. pilosus*, none of the other fauna recorded are particularly rare. The presence of the tunicate *Ciona intestinalis* is interesting, but it is only found on hard substrates provided mostly by domestic refuse. If the identity of the amphipod is confirmed the site would be rated as of moderate conservation. If it proves to be a more common species, the site would be rated as of **low conservation value**.

Summary

Lough Ateesky is a small, shallow **"saltmarsh" lagoon** with relatively low number of taxa (6 floral, 15 faunal). A maximum of three lagoonal specialists were recorded in 2006. Two of these are very common in lagoonal habitats in Ireland, but one of them (***Leptocheirus pilosus*** unconfirmed) is a rare amphipod. Apart from the unconfirmed amphipod, none of the other fauna recorded are particularly unusual. If the identity of the amphipod is confirmed the site would be rated as of moderate conservation. If it proves to be a more common species, the site would be rated as of **low conservation value**.

Overall Conservation Value = Low/Moderate

Conservation Status Assessment (from Oliver 2007)	
Impacts	Mostly very shallow. Natural eutrophication. Temperatures may be high in summer, resulting in death and decay. Silting up.
Conservation Status	Unfavourable-Inadequate

Further Information

This site was only added to the list of lagoons in 2006. Included in the Conservation Status Report (Oliver 2007). The Carna Research Station may have some further information, but otherwise none is available.

References:

Bamber, R.N. 1997. Assessment of saline lagoons within Special Areas of Conservation. *English Nature Research Reports* No. 235.

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4.66	**Loch an Chaoráin, County Galway** (Lough Keeraun)	O.S. L 784 315 O.S. Discovery Sheet 44

Conservation Designation: NONE

General description:

Lough Keeraun is a small (2ha), **"rock/peat" lagoon**, with a stream running through it, from an "upper" freshwater lake. It is situated in the northern part of Mweenish Bay, 0.5 km south of Carna. Seawater enters from the south, only occasionally and salinity is probably low most of the time, and measured 6.5-7.4psu at the time of sampling (7/10/06), but water flowing from the lagoon measured 8.6psu, suggesting more saline water may remain at depth in central areas which were not surveyed. **Underwater observations should be made in this lagoon.**

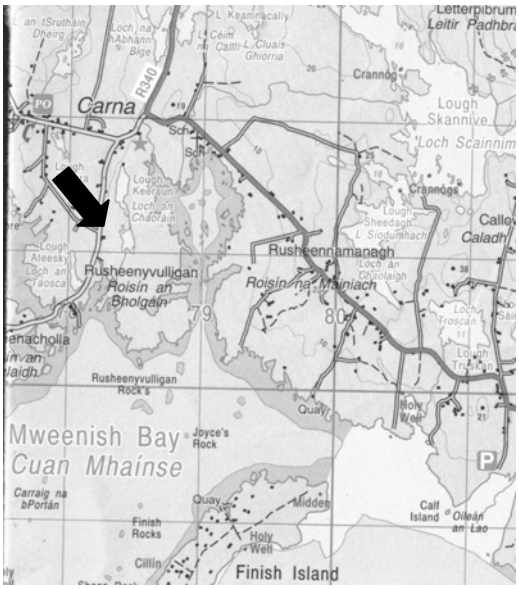

Figure 66.1 Location map of Lough Keeraun.

Lough Keeraun was surveyed on 7/10/06 for aquatic fauna and flora. The lagoon is small and only two stations were selected for sampling at this time (Figure 66.2, Table 66.1).

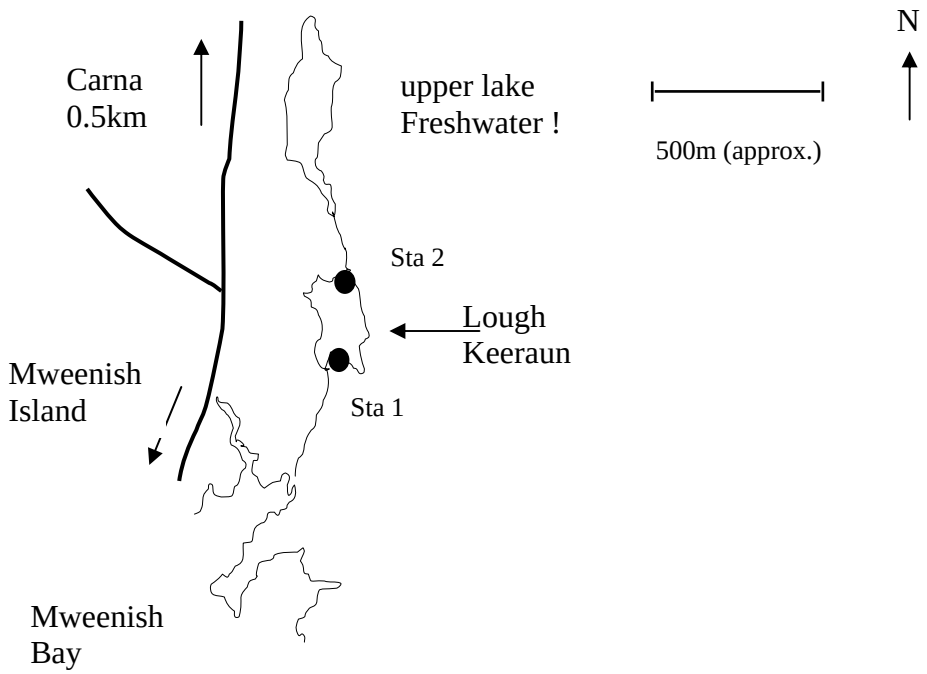

Figure 66.2 Sketch map of sampling stations in Lough Keeraun 7/10/06.

Flora

Only 5 floral taxa were recorded in Lough Keeraun on 7/10/06. The southern part of the lagoon is dominated by emergent *Scirpus maritimus* and the northern part is dominated by filamentous *Cladophora* sp.

Table 66.1 Positions of sampling stations in Lough Keeraun, 7/10/06, with percentage cover of vegetation and bare ground, salinity, temperature, depth of water and type of substratum. + = present

	Sta 1	Sta 2
GPS position	L 78438 31036	L 78460 31170
Salinity(psu) at surface	7.3	6.5
Salinity(psu) at 1m depth	7.4	7.3
Temperature at surface	12.4	13.2
Temperature at 1m depth	12.2	12.8
Substratum	Granite bedrock, stones, peaty mud	Granite bedrock, stones, peaty mud
Percentage cover:		
Algae		
Cladophora sp.	10	50
Enteromorpha sp.	+	+
Angiosperms		
Juncus sp.	5	
Scirpus maritimus	70	
Potamogeton pectinatus	+	+
Bare ground - mud	10	20
rock/stones	15	20

Patches of emergent *Phragmites australis* and *Cladium mariscus* were seen at the northern end of the lagoon, but outside the sample areas. Only very small amounts of any other species were found. Perhaps more extensive beds of *Potamogeton pectinatus* occur at depth in the central parts of the lagoon which were not surveyed, due to the difficulty of accessing the lagoon with a boat. It is possible that *Ruppia* and even charophytes may occur at depth. **Underwater observations should be made in this lagoon.**

In the absence of an underwater survey, based on aquatic flora, this lagoon is rated as of **no conservation value**.

Fauna

A total of 19 faunal taxa were recorded in Lough Keeraun, most of which are freshwater insects (Table 66.2), especially beetles and corixids, but three species are lagoonal specialists and one (*Plea leachi*) appears to be more frequently recorded in brackish water in Ireland.

Table 66.2 Faunal taxa recorded at stations in Lough Keeraun, 7/10/06.
r = rare, o = occasional, c = common, a = abundant. Species in bold text are lagoonal specialists or rare species.

			Sta 1	Sta 2
Crustacea	Mysidacea	*Neomysis integer*	o	
	Amphipoda	*Gammarus duebeni*	o	c
	Decapoda	***Palaemonetes varians***	r	
Insecta	Odonata	*Ischnura elegans*	c	c
	Trichoptera	indet.	o	
	Heteroptera	*Corixa panzeri*	o	
		Gerris	r	
		Plea leachi	o	c
		Sigara dorsalis	c	
		Sigara stagnalis		o
	Coleoptera	*Haliplus confinis*	o	c
		Hygrotus inaequalis		o
		Laccophilus minutus		o
		Noterus clavicornis	o	
	Diptera	Chironomidae indet.	o	o
Mollusca	Pulmonata	*Potamopyrgus antipodarum*	a	a
Bryozoa		***Conopeum seurati***	c	
Pisces		*Gasterosteus aculeatus*	r	
		Pleuronectes flesus		o

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.

Plea leachi has been recorded from Ballyteige, Tacumshin and The North Slob (Co. Wexford) and from Kilcoole (Co. Wicklow) and curiously from two sites in Galway (Doorus Lakes, Lough Keeraun). Recorded previously from Tacumshin and Ballyteige (Galvin 1992). Otherwise appears to be rare, but is small and could be overlooked. Halbert (1935) recorded it from L. Gill (Co. Kerry) and described it as

widespread, but local, usually "in stagnant water near the coast". Proposed as a lagoonal specialist for Ireland, but there is now some doubt about this decision.

Sigara stagnalis Hemipteran insect (water-boatman). A common lagoonal specialist found at 36 of the 87 (41.4%) lagoons 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 Lough Keeraun, and most of these are common freshwater species, but a small suite of lagoonal specialists were also found, most of which are relatively common in lagoonal habitats in Ireland, but they nevertheless confirm the lagoonal status of the site. Based on aquatic fauna, Lough Keeraun is rated as of **moderate conservation value.**

Summary

Lough Keeraun is a good example of a small **"rock/peat"** lagoon, a type of lagoon, similar to the Scottish "obs", which are characteristic of parts of the west coast of Ireland, especially in Connemara. They are permanent, shallow and brackish, with restricted tidal influence due to the presence of a "barrier" of peat or rock. Aquatic flora appears to be poor, but an underwater survey may find it to be more interesting. Aquatic fauna is also relatively poor, and largely dominated by freshwater species, but also including a small suite of lagoonal specialists which confirm the site's status as a coastal lagoon. Overall, it is a good example of a small "rock/peat" lagoon and is rated as of moderate conservation value.

Overall Conservation Value = Moderate

Conservation Status Assessment (from Oliver 2007)	
Impacts	Poaching by cattle in some areas.
Conservation Status	Favourable

Further Information

Listed as a lagoon by Healy *et al.* 1997, Healy 2003 and Oliver 2005 and included in the Conservation Status Assessment (Oliver 2007).

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