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Furnace Lough, County Mayo O.S. L 965 975

O.S. Discovery Sheet 31



Conservation Designation: Clew Bay complex SAC 001482

General description:

Furnace Lough is a large (125ha), deep (up to 21m) oligotrophic **natural “rock/peat” lagoon**, situated in the northeast corner of Clew Bay, 2 km northwest of Newport. The lake forms the lower part of the Burrishoole valley, separated from the larger Lough Feeagh to the north by a terminal moraine. The two lakes together comprise the Burrishoole Fishery, a fully dedicated research fishery monitored by the Salmon Research Agency of Ireland (Poole 1994). Seawater enters the lake on every tide but the large size of the lake and the volume of water passing through it ensure relatively low salinities at the surface throughout the year, but the lagoon is stratified with a permanent halocline at depth

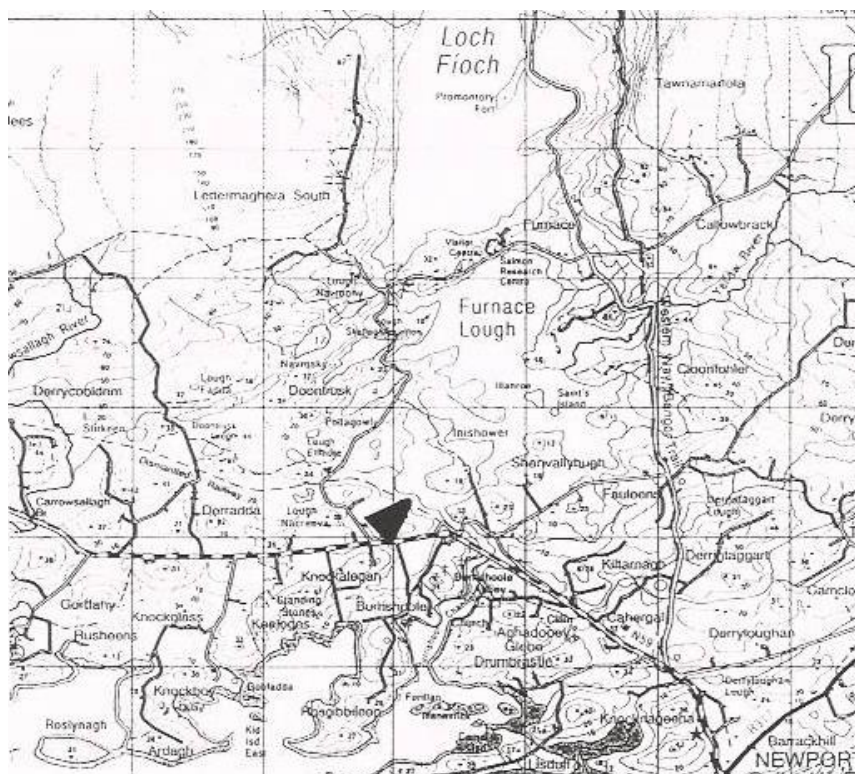


Figure 73.1 Location of map of Furnace Lough.

Furnace 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).

Flora

Vegetation was surveyed by P. Hatch in 1996 (Hatch 1996, Hatch & Healy 1998), by transects only, and no underwater observations were made. Therefore, the information available upon which to make this assessment is limited compared with most other sites. Areas surveyed for flora do not necessarily correspond with stations sampled for aquatic fauna.

Ruppia had a wide distribution, being found in all areas except the mouth of the outlet to the sea. *Ruppia maritima* occurred here and one sample has been determined as *Ruppia c.f. cirrhosa*. *Potamogeton pectinatus* occurred at two sites. *Chara aspera* var. *aspera* was found in two places.

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

A *Fucus* species was present at the mouth of the outlet channel but no aquatic higher plants were found here. Marginal areas are typically narrow and rocky and there was little variation in marginal vegetation. *Littorella uniflora* occurred at three sites and was associated with an *Eleocharis palustris* swamp community. *Phragmites* swamp occurred at the inflow from Lough Feeagh, in sheltered bays and fringing the two small southern islands. These are typically of open cover.

The survey in 1996 indicated an interesting species composition and a more thorough survey of its aquatic plant life would be desirable. It was therefore rated as of **potentially high conservation value.**

Fauna

Nine stations were selected for faunal sampling in Furnace Lough, 20-23/9/96 (Figure 73.2, Table 73.1).

Table 73.1 Positions of sampling stations in Roonah Lough 15-16/9/96, with salinity, depth of water and type of substratum.

	Sta A	Sta B	Sta C	Sta D	Sta E	Sta F	Sta G	Sta H	Sta I
GPS position	L9603 9748	L9615 9780	L9683 9820	L9719 9813	L9731 9659	L9669 9556	L9588 9683	L9624 9670	L9634 9689
Salinity(psu)	0-10	0-10	1.8-17	15	0-10	10-22	?	0-12	10-12
Depth(cm)	0-100	0-200	0-200	0-100	0-125	0-200	?	0-100	0-100
Substratum	Rocks, cobbles, coarse sand	Stones, sand, organic silt	Not known	Large rocks, gravel, sand	Peat, tree stumps	Peat, stones, sand	?	Rocks, stones, coarse sand	Rocks, stones, coarse sand

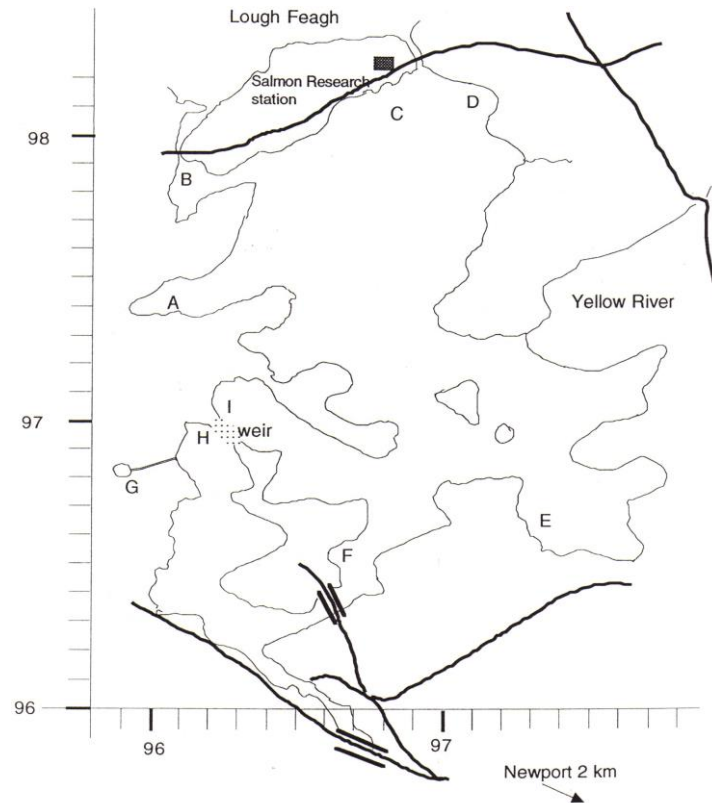


Figure 73.2 Sampling stations used at Furnace Lough.

Among 35 taxa recorded, 32 were identified to species (Table 73.2). Three of these species are lagoonal specialists, three others are proposed specialists for Ireland, and three others appear to be rare species.

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 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%).

Allomelita pellucida. Amphipod crustacean recorded at Kilcoole, Co. Wicklow, six sites in Cork (Cuskinny, L. Beg, Kilkeran, Lissagriffin, Farranamanagh, Reenydonegan), and recently in the River Lee (Cott *et al.* 2007), and in Furnace L., Co. Mayo. There are also 2 unconfirmed records for Ballyvodock (Co Cork) and Muckinish (Co. Clare). The only previous records are for L. Hyne and Glengarriff in Co. Cork and Furnace L. (Costello *et al.* 1989). Proposed as a lagoonal specialist for Ireland by Oliver and Healy (1998).

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).

Table 73.2 Aquatic Fauna Recorded in Furnace Lough, Co. Mayo. June and September, 1996. L.T. = light-trap, F = fyke net, + = present; o = occasional; c = common; a = abundant; Species in bold text are lagoonal specialists or rare species.

Fauna	Sampling Stations																
	A	L.T.A	B	L.T.B	C	L.T.C	D	L.T.D	E	L.T.E	F	L.T.F	G	L.T.G	H	L.T.H	I
Cnidaria <i>Aurelia aurita</i>							+				+				+		+
Turbellaria	o						a				o				+		+
Crustacea																	
Mysidacea <i>Neomysis integer</i>	c	c100	c	c100			c	c100	o	60	+	4	o		+	c.500	+
Isopoda <i>Jaera albifrons</i>												o					
<i>J. ischiosetosa</i>							o					c					
<i>J. nordmanni</i>	+						o					c					
<i>Lekanesphaera hookeri</i>	c	c75	c	c.75			a	>1000	c	30	c	45	o	50	+	c.100	+
Amphipoda	o		o				o		c		a		+		+		+
<i>Allomelita pellucida</i>			+						+						+	+	
<i>Corophium volutator</i>	+		+						o								
<i>G. duebeni</i>	+										+					+	+
<i>G. zaddachi</i>		+	+				+				+		+			+	
<i>Lembos longipes</i>												+					
<i>Leptocheirus pilosus</i>												+					
Decapoda <i>Crangon crangon</i>	1																
<i>Carcinus maenas</i>	F, 1											F, 26					
<i>Palaemon elegans</i>												c	3				
<i>Palaemonetes varians</i>																1	
Insecta																	
Odonata <i>Ischnura elegans</i>			2									(+)	+	3			
<i>Sp. 2</i>			+														
Hemiptera Corixidae												1	o				
<i>Notonecta glaucum</i>													1				
<i>Hydrometra stagnorum</i>	+																
<i>Gerris lacustris</i>			+														
Coleoptera			2						o		+				+		
<i>Haliplus ruficollis</i>			+														+
<i>Hygroporus memnonius</i>																	
<i>Megasternum obscurum</i>																	
<i>Nebrioporus depressus</i>									+								
Diptera Chironomidae			+				+				+				+		+
Mollusca																	
Prosobranchia Hydrobiidae	c	12	a				a		a	75	a	3	+		+	+	+
<i>Potamopyrgus antipodarum</i>	+	+	+				+		+	+	+	+	+	+	+	+	+
Bivalvia <i>Mytilus edulis</i>													+				+
<i>Abra sp.</i>													+				+
Bryozoa <i>Conopeum seurati</i>	+						+				+				+		+
Teleostei <i>Anguilla anguilla</i>	+		F, 2								F, 1	1	+				
<i>Gasterosteus aculeatus</i>	+		+	3	+	8	+		+		c		+	2	+	1	+
<i>Platichthys flesus</i>	F, 6		F, 2				+				F, 3						
<i>Pomatoschistus microps</i>	+	1	+				+		+		+					1	

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.

Other species of interest:

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).

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).

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

The fauna comprised marine, euryhaline, oligohaline and freshwater species and was more diverse than had been expected from results of a previous survey by Parker(1977), when only one species was in any way abundant. In 1996 there was a particularly high diversity of small crustaceans. The most interesting features of the fauna were the diversity of Jaera and amphipod species, and the near absence of the normally ubiquitous euryhaline species Palaemonetes varians. The species assemblage typifies a lagoon with some direct contact with the sea allowing entry of jellyfish, prawns, shrimps, crabs and flatfish. Most of the species are characteristic of brackishwaters in the middle salinity range and those associated with higher or lower salinities were mostly present in low numbers only. Potential colonists from the sea may be inhibited from entering the lake by the two weirs. The relatively low number of oligohaline and freshwater species in such a large system, into which flow a number of streams, is surprising and indicates that tidal waters reach to all parts of the lake. A semi-isolated pool, in which the salinity was lower than the main body of the lake, may act as a refuge for species less tolerant of high salinity from which they can recolonise the lake when conditions become tolerable.

The aquatic fauna is rated as of **moderate-high conservation value** based on its relatively high diversity and the presence of rare and unexpected crustaceans.

Ecotonal Coleoptera

Fifteen species of staphylinid and nine species of carabid beetles were recorded at Corragau in 1996 (Good 1996, Good & Butler 1998), one of which (*Bembidion bipunctatum*) is regarded as indicator species. However, and based on ecotonal coleoptera the site is regarded as of **no conservation value**.

Summary

Furnace Lough is a large (125ha), deep (up to 21m) 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. It resembles a sea lough but is unusual in being permanently stratified. The aquatic fauna was more diverse than indicated by previous studies and reflected the wide range of ecological conditions. The fauna was notable particularly for the high diversity of crustaceans, six lagoonal specialists and several rare species. The vegetation survey indicated an interesting species composition but **further study of the aquatics is needed**. It is of high conservation value as an unusual geomorphological type in Ireland. The presence of a research station on its shores ensures continuous monitoring of environmental conditions. Overall conservation value is rated as high.

Overall Conservation Value = High

Conservation Status Assessment (from Oliver 2007)

Impacts	Deep stratified lagoon with natural periodic overturns and anoxia. Salmonid farms but significant flushing. Leisure fishing.
Conservation Status	Favourable

Further Information

Parker (1977) described the lake in reference to the biology of *Neomysis integer*, De Burgh & Smart (1969) reported on the hydrography of the lake and its planktonic and littoral organisms, and Poole (1994) studied the European eel (*Anguilla anguilla*) in the Burrishoole system. 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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