

**4.1 Greenore Golf Course, County Louth. O.S. J 215 102.
O.S. Discovery Sheet 29**



Conservation Designation: NONE

General description:

Situated 1km southwest of Greenore on the banks of Carlingford Lough. A series of 4 small **artificial lagoons** (Maps 1 & 2), covering approximately 2.5ha, ranging in salinity from 0.5 to 26 psu at the time of sampling (17/06/2003), formed behind a coastal embankment, partly as a result of landscaping of a golf course.

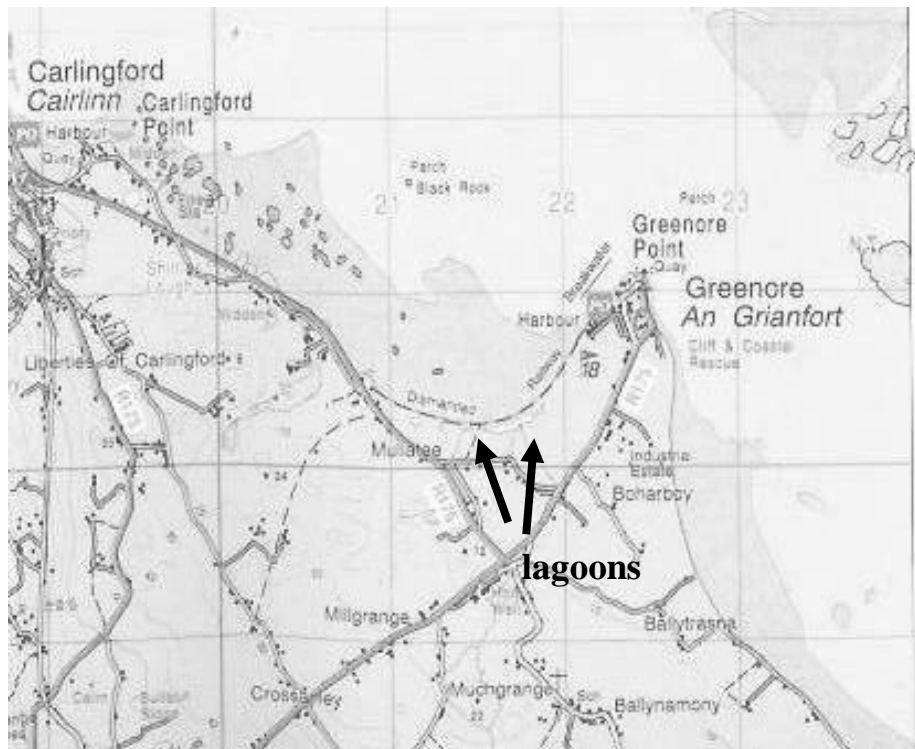


Figure 1.1 Location of map of Greenore Golf Course lagoons.

Greenore lagoons were surveyed in 2002/2003 as part of a PhD study (Oliver 2005) and used in a biological classification of Irish coastal lagoons. Four stations were selected for the sampling of aquatic fauna and flora (Figure 1.2, Table 1.1)

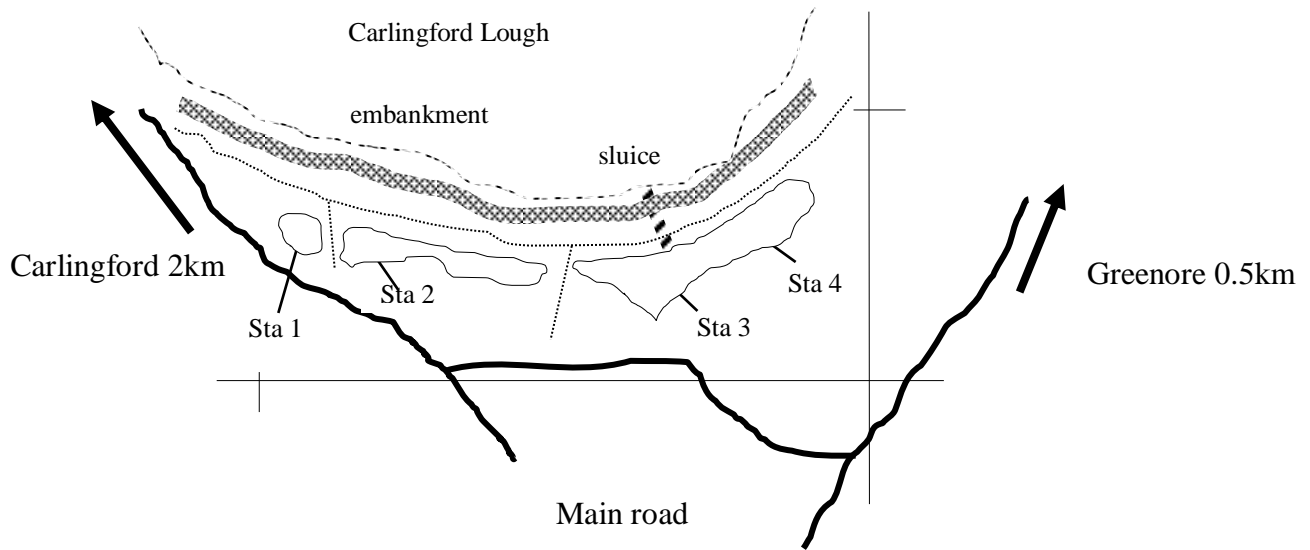


Figure 1.2 Sampling stations used at Greenore Golf Course lagoons 17/6/2003.

Flora

A total of 16 floral taxa were recorded at Greenore Golf course, of which 12 were identified to species (Table 1.1). Two 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.

***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 at Greenore, but is assumed to be *R. maritima*, which appears to be the more common of the species and was found at 41 of the 87 lagoons surveyed.

None of the other plants recorded are of any special interest.

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

Table 1.1 Positions of sampling stations in Greenore Golf course lagoons, 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.

	Station 1	Station 2	Station 3	Station 4
GPS position	J 211 69 10292	J 21239 10297	J 21727 10291	J 21847 10365
Sampling date	17/06/2003	17/06/2003	17/06/2003	17/06/2003
Salinity (psu)	0.2-0.7	12.6-22.9	13.6-32.0	26.1
Temp (°C)	18.1	19.2-20.5	19.5-15.9	21.7
Depth (cm)	20-30	30	0-40	0-50
Substratum	soft mud	soft mud and gravel	Soft mud and gravel	muddy sand
	% cover	% cover	% cover	% cover
BARE - mineral	30	30	55	40
BARE - rotting vegetation	10	10		+
ALGAE				
		20	+	
Chlorophyta		10	15	25
	30	10	10	10
			+	
	5	40	20	15
		5	10	
Rhodophyta			+	
			+	
ANGIOSPERMS	+			
	+			
	+			
	20			
	+			
	+			
			+	40
	50		+	
		2	+	

Fauna

A total of 54 faunal taxa were recorded at Greenore Golf course, of which 48 were identified to species (Table 1.2). Five of these taxa are regarded as 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.

Notonecta viridis Hemipteran insect (back-swimmer) recorded on the east coast at Kilcoole, on the south coast at Lady's Island L., Tacumshin L., Ballyteige, Clogheen/White's Marsh and Kilkeran L. and also on the west coast at Reenydonegan, Co. Cork and L. Donnell, Co. Clare. A rare brackish water species in Ireland.

Table 1.2 Faunal taxa recorded at stations in Greenore Golf course lagoons 17/6/2003.
 (Sw = mean of 3x 30 second sweeps, Sed = mean of 3 x 0.005m² diameter sediment cores, L.T. = Light trap, **Ab** = overall abundance of all sampling methods, including visual searches)
 r = rare, o = occasional, c = common, a = abundant. Species in bold text are lagoonal specialists or rare species.

Greenore		Station 1				Station 2				Station 3				Station 4			
Taxa		Sw.	Sed	L.T.	Ab	Sw.	Sed	L.T.	Ab	Sw.	Sed	L.T.	Ab	Sw.	Sed	L.T.	Ab
Cnidaria	<i>Actinia equina</i>												r				
	<i>Sagartia ornata</i>												o				
Nemertea	Nemertea indet.									1			r	0.7		5	o
Annelida	Oligochaeta <i>Tubifex benedii</i>					26.3			c		3.3		o	1.0	0.3		r
	Polychaeta <i>Arenicola</i> agg																o
	<i>Cirratulus</i>												o				
	<i>Malacoceros fuliginosus</i>					0.3			r	0.7	0.3		o				
	<i>Nereis diversicolor</i>					0.7	1.7		o	0.3	2		o				
	Hirudinea ? <i>Helobdella stagnalis</i>	0.7			o												
Crustacea	Mysidacea <i>Neomysis integer</i>									0.7			o				
	<i>Praunus flexuosus</i>							1	r			2	1.0				
	Isopoda <i>Idotea chelipes</i>					16			c								
	<i>I. baltica</i>									8		5	o	5		7	o
	<i>Lekanesphaera hookeri</i>					29.7		6	c	5.3			o	2		1	o
	<i>Jaera</i> sp.								o	3.7	0.7		c				
	Amphipoda Amphipoda indet					0.3			r	13.6	34.3	2	c	13.5	9.3		c
	<i>Corophium volutator</i>								o	6.3	34.3		c	1.3	9		c
	<i>Gammarus duebeni</i>									0.3			r				
	<i>Gammarus finmarchicus</i>													0.5	0.3		r
	<i>Gammarus locusta</i>									4			c				
	<i>Gammarus zaddachi</i>					0.3			r	3			c				
	Decapoda <i>Carcinus maenas</i>												o				
	<i>Crangon crangon</i>												r				
	<i>Palaemon elegans</i>											1	r				
	<i>Palaemonetes varians</i>					1		15	o								
Arachnida	Hydracarina indet.																
Insecta	Odonata <i>Ischnura elegans</i>	4			c												
	Heteroptera Corixidae indet.	8		2	o	3			r								
	<i>Corixa</i> sp.	0.3			r												
	<i>Gerris odontogaster</i>												o				
	<i>Gerris thoracicus</i>	0.3			r								o				
	<i>Gerris</i> sp	0.3			r								o				
	<i>Notonecta viridis</i>	8.3			c	0.3			r								
	<i>Hesperocorixa sahlbergi</i>	0.3			r												
	<i>Sigara dorsalis</i>	0.3			r												
	<i>S. lateralis</i>	3.3		2	o	3			o								
	<i>S. scotti</i>	0.3			r												
	Coleoptera <i>Gyrinus substriatus</i>	0.3			r	0.3			r								
	<i>Haliphus rufficollis</i>	0.3		1	r	0.3			r								
	<i>Helophorus brevipalpis</i>	0.7			o	0.7			o								
	<i>Hydroporus palustris</i>	0.3			r	0.3			r								
	<i>Hygrotus inaequalis</i>	1.7		1	c	0.3		1	r								
	<i>Laccobius bipunctatus</i>			1	r												
	<i>Laccophilus minutus</i>	0.3			r												
	larvae	5.7		1	c				o								
	Diptera Chironomidae	1.7	84	12	a	18.3			c	3	1.3		o	6	7	4	o
	Ephydra					3.3			o				r	0.3			r
Mollusca	Prosobranchia <i>Hydrobia ulvae</i>									1			r				
	<i>Littorina littorea</i>												r				
	<i>L. saxatilis</i>									7			o	9			o
	<i>Onoba aculeus</i>									4		2	o	0.7		2	r
	<i>Potamopyrgus antipodarum</i>	23.3		3	c				r								
	Pulmonata <i>Lymnaea peregra</i>	29.3		4	a	1.0			o	2			o				
	Bivalvia <i>Mytilus edulis</i>												r				
	<i>Modiolula phaseolina</i>												r				
Teleostei	<i>Gasterosteus aculeatus</i>	5.7		3	c	16.7		6	c	2.7		1	o	4.7		11	c
	Mugilidae												o				o
	<i>Pleuronectes flesus</i>												o				

According to Southwood and Leston (1959), *N. viridis* was recorded only for Wexford and North Kerry. Recorded previously in Lady's Island L (Healy *et al.* 1982) in Lady's Island L. and the North Slob by Galvin (1992) and from the Dingle Peninsula by McCarthy and Walton (1980). *N. viridis* is found at inland sites in the U.K. but appears to be largely restricted to lagoons in Ireland, and was proposed as a lagoonal specialist for Ireland by Oliver and Healy (1998).

Onoba aculeus Gastropod mollusc recorded also at 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.

For such a small site the fauna of Greenore lagoons is surprisingly rich, reflecting the range of salinities in the different pools, and includes a small suite (5 species) of lagoonal specialist species. Based on aquatic fauna, the site is regarded as of **moderate conservation value**.

Summary

The lagoons at Greenore Golf course lagoons are small and no particularly rare species were recorded, but they are an interesting series of pools with differing salinity regimes, and with a relatively large number of taxa (16 floral, 54 faunal) comprising both freshwater species such as the beetles and corixids together with more typically estuarine species and a small suite of typically lagoonal species, with 2 floral and 5 faunal lagoonal specialist species.

Overall Conservation Value = Moderate

Conservation Status Assessment (from Oliver 2007)

Impacts	Eutrophication in one of the 4 lagoons (5% of area). Other 3 flushed by tides. Golf course.
Conservation Status	Unfavourable-Inadequate

Further Information

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

References:

- Bamber, R.N. 1997. Assessment of saline lagoons within Special Areas of Conservation. *English Nature Research Reports* No. 235.
- Barnes, R.S.K. 1989. Coastal lagoons of Britain: An overview and conservation appraisal. *Biological Conservation* 49: 295–313.
- Galvin, P. 1992. *The ecology of the brackish-water lagoons of Wexford and east Cork*. MSc thesis, University College, Dublin.
- Hatch, P. & Healy, B. 1998. Aquatic vegetation of Irish coastal lagoons. *Bulletin of the Irish Biogeographical Society*. 21: 2-21.
- Healy, B. 2003. Coastal Lagoons. In: *Wetlands of Ireland*. R. Otte (ed). Chapter 4. University College Dublin Press. Dublin. 44-78.
- Healy, B., Bates, R. & McGrath, D. 1982. Marine Fauna of Co. Wexford - 5. Lady's Island Lake. *Irish Naturalists' Journal* 20: 509-560.
- Healy, B., Oliver, G.A., Hatch, P. & Good, J.A. 1997. *Coastal lagoons in the Republic of Ireland. Vol. 3. Inventory of lagoons and saline lakes*. Report to the National Parks and Wildlife Service, Dublin.
- McCarthy, T.K. & Walton, G.A. 1980. *Sigara selecta* (Fieb.) (Heteroptera: Corixidae) new to Ireland, with notes on water bugs recorded from the Dingle Peninsula. *Irish Naturalists' Journal* 20: 64-6.
- Oliver, G.A. 2005. *Seasonal changes and Biological Classification of Irish Coastal Lagoons*. PhD Thesis. U.C.D., Dublin. Available on www.irishlagoons.com
- Oliver, G.A. 2007. *Conservation status report: Coastal Lagoons (1150)*. Unpublished report to the National Parks and Wildlife Service, Dublin.

- Oliver, G.A. and Healy, B. 1998 Records of aquatic fauna from coastal lagoons in Ireland. *Bulletin of the Irish Biogeographical Society*. **21**: 66-115.
- Southwood, T.R.E. & Leston, D. 1959. *Land and water bugs of the British Isles*. Wayside and Woodland Series. Warne & Co. London. 436 pp.