

**4.2 Broadmeadow Water, County Dublin O.S. O 215 473
O.S. Discovery Sheet 50**



Conservation Designation: Malahide Estuary
SAC 000205, SPA 004025, pNHA 000205

General description:
Situating 2km east of Swords and 1km northwest of Malahide. A large (280ha) **artificial lagoon** formed behind a coastal embankment carrying a railway line (Maps 1 & 2), ranging in salinity at the time of sampling (18-21/9/03) from almost fresh (1.2 psu) at the inner most part, up to 32.6 psu near the tidal inlet

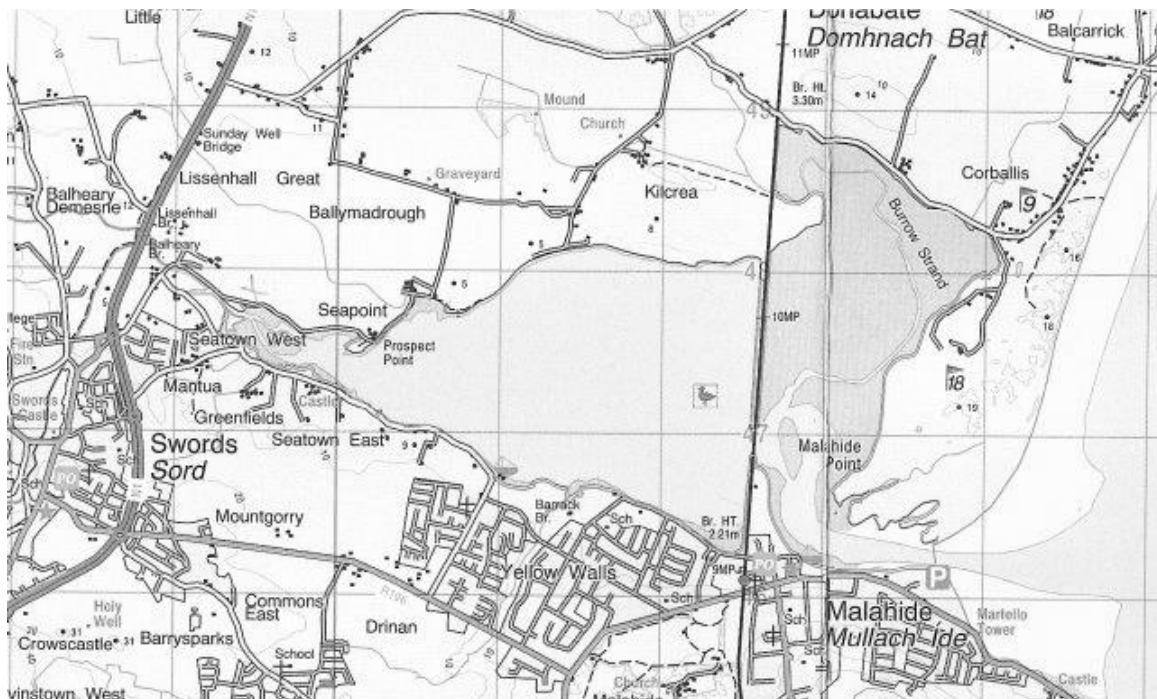


Figure 2.1 Location of map of Broadmeadow Water lagoon.
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Broadmeadow Water lagoon was surveyed in 2003 as part of a PhD study (Oliver 2005) and used in a biological classification of Irish coastal lagoons. Five stations were selected for the sampling of aquatic fauna and flora (Figure 2.2, Table 2.1).

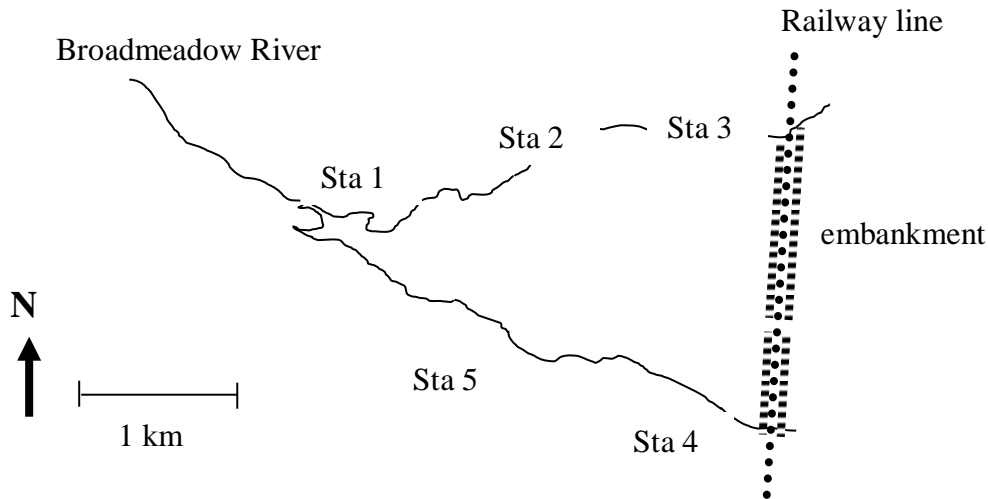


Figure 2.2 Sampling stations used at Broadmeadow Water lagoon from 18-21/9/03.

Flora

A total of 15 floral taxa were recorded at Broadmeadow lagoon, of which 7 were identified to species (Table 4.2.1). 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* recorded in Broadmeadow was not specifically identified, 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.

None of the other plants recorded are of any special interest. Based on aquatic vegetation, Broadmeadow water lagoon is regarded as of **low conservation value**.

Table 2.1 Positions of sampling stations in Broadmeadow Water lagoon, 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.

	Station 1	Station 2	Station 3	Station 4	Station 5
GPS position	O 20086 47849	O 20160 48209	O 19480 48350	O 22469 47091	O 21349 48818
Sampling dates	18-21/9/03	18-21/9/03	18-21/9/03	18-21/9/03	18-21/9/03
Salinity (psu)	32.1	32.4	1.2-12.6	32.6	32.2
Temperature (°C)	20.1	16.8	18.2	20.3	16.4
Depth (cm)	0-60	0-80	0-50	0-60	0-80
Substratum	soft mud, occ. stones on shoreline	soft mud, occ. stones on shoreline	gravel & soft mud, occ. stones	gravel & soft, sandy mud, occ. stones	soft sandy mud, stones on shoreline
	% cover	% cover	% cover	% cover	% cover
BARE - mineral	90	70	40	85	85
BARE - rotting vegetation	5	5	40	+	+
ALGAE					
Chlorophyta	<i>Chaetomorpha linum</i>	+			
	<i>Cladophora sp.</i>	+	5	10	+
	<i>Enteromorpha sp.</i>	2	5	10	2
	<i>Ulva sp.</i>	5	10	5	2
Phaeophyta	<i>Fucus serratus</i>			+	5
Rhodophyta	<i>Dumontia contorta</i>	+	2		
	<i>Ceramium sp.</i>	+	7	7	7
	<i>Chondrus crispus</i>				+
	<i>Griffithsia flocculosa</i>	+	+		
	<i>Polysiphonia sp.</i>	+	3	3	3
Xanthophyta	<i>Vaucheria sp.</i>		+		
ANGIOSPERMS	<i>Phragmites australis</i>		+		
	<i>Ruppia sp.</i>		+		
	<i>Scirpus maritimus</i>		+		
	<i>Spartina sp.</i>		+		

Fauna

A total of 51 faunal taxa were recorded at Broadmeadow lagoon, of which 46 were identified to species (Table 2.2). Four of these taxa are regarded as lagoonal specialists:

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 (Oliver and Healy 1998).

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. Most of the other fauna appear to be common, typically estuarine, rather than “lagoonal” fauna.

Table 2.2 Faunal taxa recorded at stations in Broadmeadow lagoon 18-21/9/03.

(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, F = fyke net. Species in bold text are lagoonal specialists or rare species.

		Station 1			Station 2			Station 3			Station 4			Station 5				
		Sw	L.T.	Ab	Sw	L.T.	Ab	Sw	L.T.	Ab	Sw	L.T.	Ab	Sw	Sed	L.T.	Ab	
Cnidaria	<i>Actinia equina</i>												r				c	
	<i>Obelia dichotoma</i>			o			o						o				c	
	<i>Obelia longissima</i>			o			o						o				c	
	<i>Sagartia ornata</i>			c			a						o	13.3			a	
Annelida	Oligochaetes <i>Heterochaeta costata</i>									o							o	
	Polychaeta <i>Amphitrite figulus</i>												o				o	
	<i>Arenicola agg</i>												c				c	
	<i>Lanice conchilega</i>												c				c	
	<i>Nereis diversicolor</i>						c			o			o				o	
	<i>Pomatoceros lamarcki</i>												a				o	
	<i>Glycera</i> sp.		1	r											4.0		o	
	Crustacea	Cirripedia <i>Balanus balanus</i>						o						o				a
<i>B. crenatus</i>							o						o				o	
<i>B. improvisus</i>				o			c			o			c				a	
<i>Elminius modestus</i>							o						a				o	
Mysidacea <i>Mesopodopsis slabberi</i>																	o	
<i>Neomysis integer</i>		8.3	3	c	10.0		o	6.7	12	o								
<i>Praunus flexuosus</i>		3.3	4	o	41.7	1	c				24.7	0	o	57.7	0.0	12	c	
Isopoda <i>Jaera albifrons</i>																		
<i>Lekanesphaera rugicauda</i>			1	r				0.7	3	o								
Amphipoda <i>Corophium volutator</i>														r				
<i>Gammarus locusta</i>		0.3	2	o	4.0		o	6.7		c	3.0		o					
<i>Melita palmata</i>				r	2.0		o	4.0		o	0.7		o	0.7			o	
Decapoda <i>Carcinus maenas</i>				a			a			o			a					
<i>Crangon crangon</i>		4.0	1	o	1.7	1	o				0.7		o	2.3			o	
<i>Palaemon elegans</i>														0.3			r	
<i>P. serratus</i>	4.3		o	5.3		o				18.0	3	c	2.7			o		
<i>Palaemonetes varians</i>							1.0		r									
<i>Pilumnus hirtellus</i>																	o	
Insecta	Heteroptera <i>Sigara stagnalis</i>							1		r								
	Diptera <i>Chironomidae</i>												r					
Mollusca	Prosobranchia <i>Hydrobia ulvae</i>												o					
	<i>Littorina littorea</i>																	
	<i>L. saxatilis</i>						r										o	
	<i>Cerastoderma</i>																	
	Bivalvia <i>glaucum</i>						r											
	<i>Mytilus edulis</i>			r			o						o				a	
	<i>Modiolula phaseolina</i>						r											
	<i>Venerupis saxatilis</i>																	
	<i>Alcyonidium gelatinosum</i>																	c
	<i>Bowerbankia gracilis</i>																	o
<i>Conopeum seurati</i>			c			o							o				o	
<i>Electra pilosa</i>																	c	
Tunicata	<i>Ascidiella aspersa</i>												r					
Pisces	<i>Anguilla anguilla</i>			o F=3			o (F=3)											
	<i>Gasterosteus aculeatus</i>																	
	<i>Mugilidae</i>			o (F)			o (F=2)			2 F?								
	<i>Pleuronectes flesus</i>			c (F)						4 F?			3 F?					
	<i>Pomatoschistus microps</i>					2	o			4 F?			c				c	
	<i>Syngnathus acus</i>																r	
	<i>Taurulus bubalis</i>																r	

Mesopodopsis slabberi is described as an abundant and characteristic estuarine mysid in northwest Europe by Barnes (1994). The specific identification of *Sagartia* was not confirmed but is believed to be *S. ornata*.

A very similar fauna recorded in the previous survey by Healy *et al.* (1993). Based on aquatic fauna, the site is regarded as of **moderate conservation value**.

Conservation Status Assessment (from Oliver 2007)	
Impacts	Eutrophication from sewage at upper end. Otherwise flushed by tides. Urbanisation. Industrial/commercial activities. Dumping. Boating/leisure activities.
Conservation Status	Unfavourable-Inadequate

Summary

The Broadmeadow lagoon is a large "**estuarine**", **artificial lagoon** with a relatively large number of taxa (15 floral, 51 faunal) most of which are typically estuarine species but with a small suite of typically lagoonal species, with 2 floral and 4 faunal lagoonal specialist species but no particularly rare species recorded.

Overall Conservation Value = Moderate

Further Information

E.I.A carried out by Healy *et al.* (1993). 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.
- Barnes, R.S.K. 1994. *The brackish-water fauna of northwestern Europe: a guide to brackish-water habitats, ecology and macrofauna for field workers, naturalists and students*. Cambridge University Press. 287 pp.
- 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., Lyons, J. and P.Galvin. 1993. *Environmental impact study of the aquatic fauna of the Inner Malahide Estuary, Co. Dublin*. Unpubl. Report to Dublin County Council.
- Healy, B., Oliver, G.A., Hatch, P. & Good, J.A. 1997. *Coastal lagoons in the Republic of Ireland. Vol. 3. Inventory of lagoons and saline lakes*. Report to the National Parks and Wildlife Service, Dublin.
- Oliver, G.A. 2005. *Seasonal changes and Biological Classification of Irish Coastal Lagoons*. PhD Thesis. U.C.D., Dublin. Available on www.irishlagoons.com
- Oliver, G.A. 2007. *Conservation status report: Coastal Lagoons (1150)*. Unpublished report to the National Parks and Wildlife Service, Dublin.
- 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.
- Wyse Jackson, P.N. 1991. Distribution of Irish marine Bryozoa, together with biographical notes relating to the chief researchers in the group. *Bulletin of the Irish Biogeographical Society*. 14: 129-18.