

SLUICE RIVER MARSH

Flora and Fauna Assessment



Report prepared for Fingal County Council

May 2008



Preface

This report was commissioned by Fingal County Council Parks Division as a series of separate studies concerning vegetation, birds, mammals, butterflies and dragonflies and has been brought together to give a picture of the current biodiversity and interest of the Sluice River marsh and adjoining area (Figure 1.1).

The work for each section was done as follows

Vegetation & Flora - Roger Goodwillie

Bird life - David Dillon

Mammals - Brian Keeley

Butterflies - David Dillon

Dragonflies (Odonata) - David Dillon

In combining these sections some editing has been done by Roger Goodwillie – who is responsible for any errors created during the process. The original reports are also held by Fingal County Council.

Relevant site photographs are included on pages after each section.

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1. INTRODUCTION

The Sluice River rises to the north of Dublin Airport and flows by way of Kinsealy into the head of Baldoyle Bay. Its lower course is meandering and it has been embanked since before 1830 to curtail tidal flooding. There are eight fields in the whole area of study (Figures 1.2, 2.1), the four in the west comprise the Sluice River marsh which is recognised as a proposed Natural Heritage Area (Code No 1763) by the National Parks and Wildlife Service and in the county development plans. The four eastern fields are drier and generally used as grazing land.

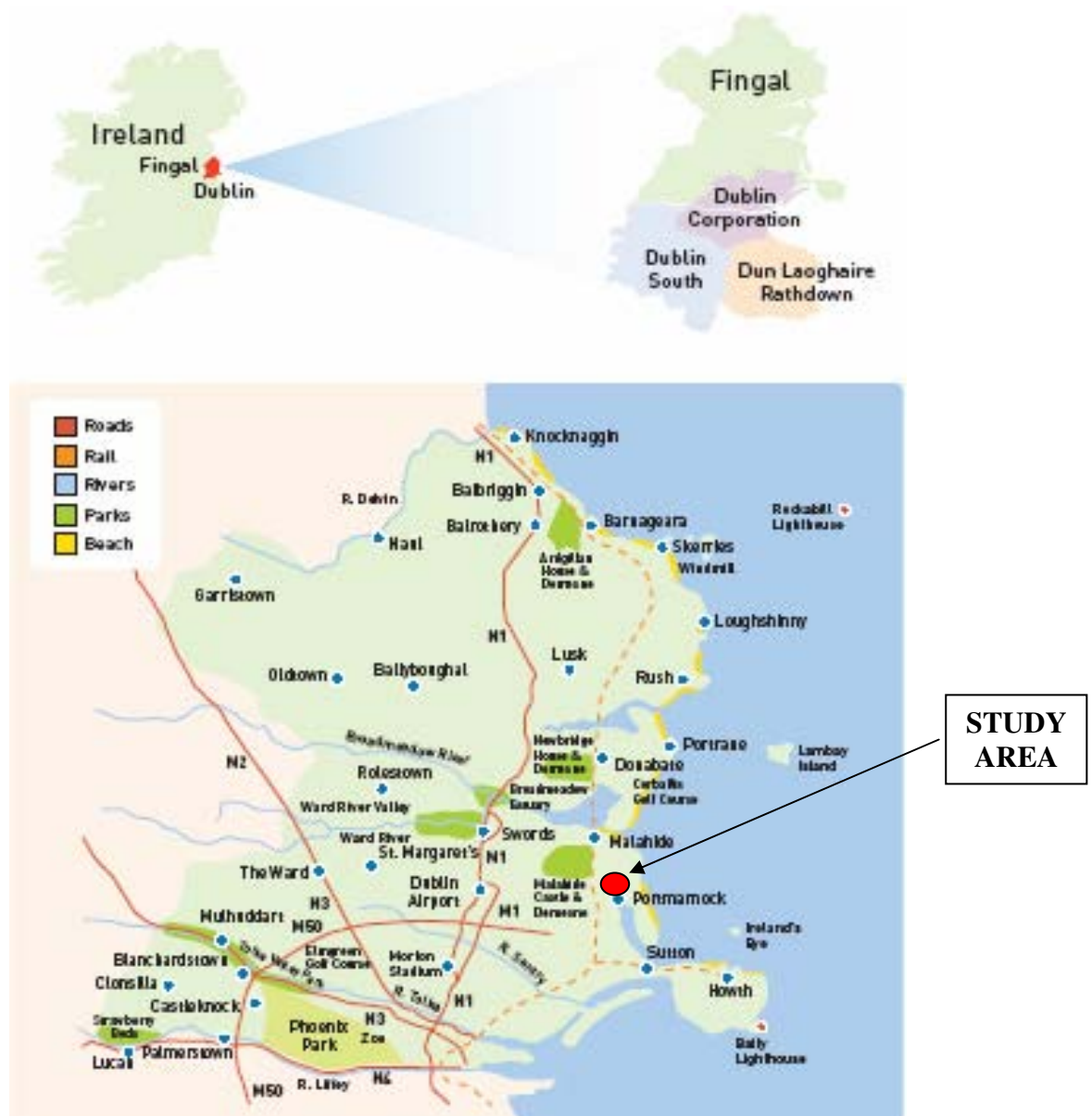


Figure 1.1 Location of Sluice River marsh in Fingal



Figure 1.2 Study area, east of railway line and north of Portmarnock Bridge

The river runs through sediments which are marine in origin and derived from onshore ice movement. They are rich in clay minerals and suitable for the production of bricks. A brick field is marked on the 1830 map west of the railway line but by 1900 clay extraction had moved to the east with the establishment of the Portmarnock Brickworks. The location of the works was in the field at the southwest corner of the study area, just off the old avenue to Portmarnock House – a current laneway. This operated until the 1920's and the raw material was excavated in a series of linear pits in the western half of the marsh beside the railway line. At first a N-S pond was dug at the southern end, parallel to the railway and now overgrown by trees. Later the excavation was extended to the northern field where a number of trenches were opened both N-S and E-W. Marks of these remain in the vegetation, particularly well seen in Figure 2.2. The eastern half of the area was not excavated; it may have been too sandy from the influence of Portmarnock beach and it has remained as grassland.

The area would naturally have been subject to a saltwater influence because of its height above sea level but this was probably prevented for a period by the river embankments and sluices. With the breakdown of these in the last century tidal inflow has returned and low-lying parts of the area are reverting to saltmarsh, possibly aided by a rise in sea level. Water from the lowest (N-S) section of the river now escapes from the channel during high tides into several field drains in the SE corner. From there it spreads its influence to much of the eastern part and into some of the western, marshy section, aided by its lower levels. Saltmarsh has consequently expanded and is probably larger now than during the last century.

Historically its outflow has been impeded by sand blowing onshore from the Portmarnock Spit

2. VEGETATION & FLORA

2.1 Methods

The vegetation was examined systematically by walkover through all parts except for some of the wet woodland along the railway where access is impossible. Information as to dominant and characteristic plants was collected and the resulting habitats identified with the scheme of the Heritage Council publication (Fossitt 2000). The mapping was done with the aid of aerial photographs over several years (1995-2004, Figures 2.1, 2.2) and these also suggested additional sites for examination. A special effort was made to look for rare and protected plants – for which GPS locations were recorded. Their locations are shown on Figure 2.3. Discussions with Declan Doogue and the National Herbarium (Matthew Jebb) added to the knowledge of the flora and are acknowledged with thanks.

Permanent sample plots (10x10m) were established and marked with wooden pegs in three characteristic communities (Figure 2.3) and relevés taken from four 1m quadrats inside. The purpose of having such records is to monitor future change in the vegetation which could be brought about by changes in management or sea level.

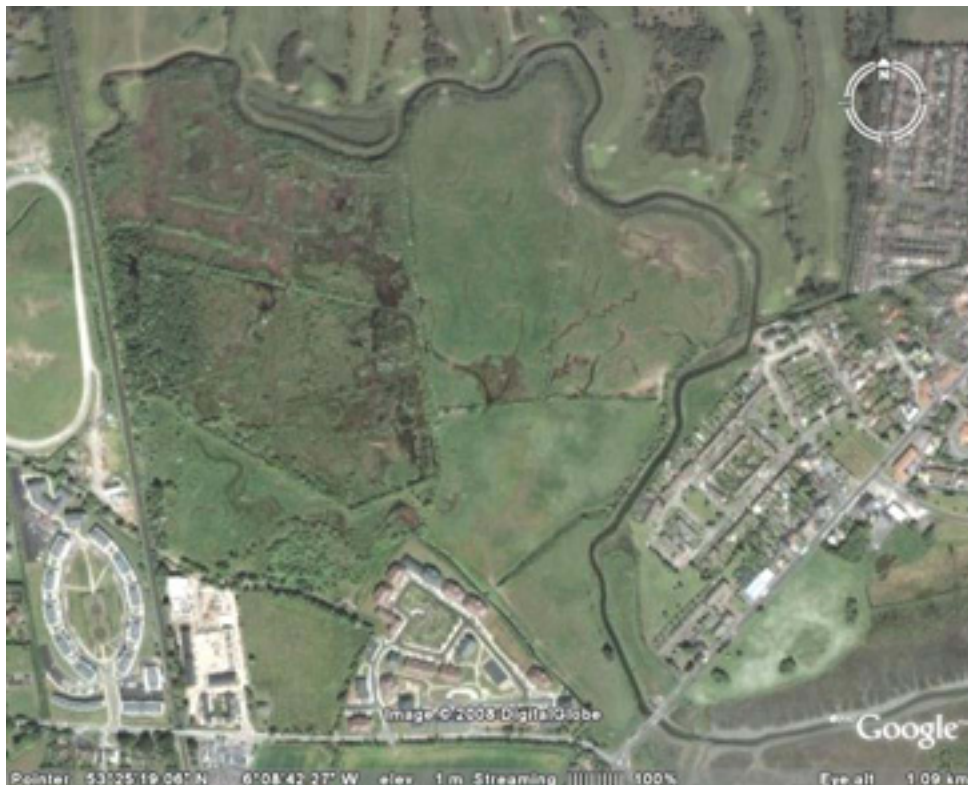


Figure 2.1 Modern (2006) photo. Note pattern in northwest corner of marsh



Figure 2.2. Aerial photo (1995) showing the distinction between eastern grassy fields and western wetland

2.2 Results – the habitats

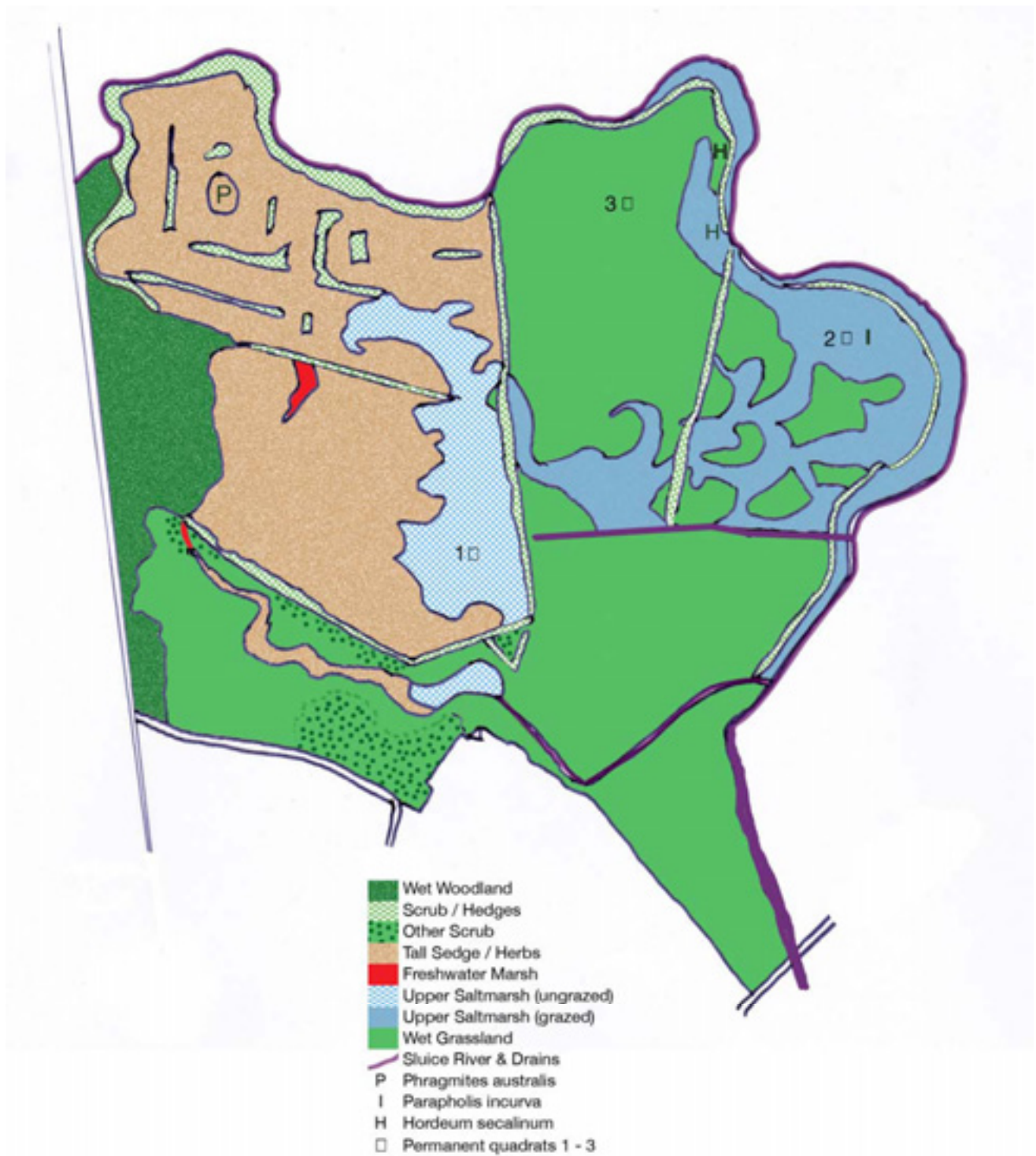
The habitat map (Fig. 2.3) shows the seven major habitats that occur. Starting from the railway line there is a unit of wet willow-alder wood (WN6 in Fossitt 2000), leading to reed and large sedge swamp (FS1) with some tall herb swamp (FS2) mixed in and occasional, more open patches of marsh (GM1). These gradually change to upper saltmarsh (CM2) to the east, which expands in grazed form along the Sluice River and adjacent low lying runnels. The remaining fields would be classified as wet grassland (GS4) though there are only occasional patches of rushes and sedges. Hedgerows (WL1) form the final category and follow the field boundaries and the river embankment. In drier places the hedges are expanding to produce a type of scrub whereas in the marshes they remain isolated on high spots.

2.2.1 Wet woodland

This habitat consists of former trenches and ponds with trees covering all intervening banks and forming a closed canopy except for a narrow N-S pool at the northern end (see aerial photo). Alder *Alnus glutinosa* is the main species with some grey willow *Salix cinerea* and crack willow *S. fragilis*. Beneath the trees bramble *Rubus fruticosus* is abundant and there is also some bittersweet *Solanum dulcamara*. The ground flora depends of the amount of light and includes

<i>Iris pseudacorus</i>	yellow flag
<i>Glyceria fluitans</i>	floating sweet grass
<i>Apium nodiflorum</i>	fool's watercress
<i>Equisetum fluviatile</i>	water horsetail
<i>Mentha aquatica</i>	water mint
<i>Caltha palustris</i>	marsh marigold
<i>Typha latifolia</i>	bulrush
<i>Angelica sylvestris</i>	wild angelica
<i>Urtica dioica</i>	nettle
<i>Galium palustre</i>	marsh bedstraw
<i>Lychnis flos-cuculi</i>	ragged robin

Occasional brighter places allow hard rush *Juncus inflexus*, false oat *Arrhenatherum elatius*, sorrel *Rumex acetosa* and fleabane *Pulicaria dysenterica* to grow while there is some water starwort *Callitriche* cf *stagnalis* in open water. The main pool could not be reached on foot but appears in the photograph to have vegetation at its southern end. Smaller pools in general are shaded and full of dead leaves without aquatic plants.



HABITATS OF SLUICE RIVER MARSH

2.2.2 Tall sedge and herb

The trees merge into tall sedges and herbs on their eastern side (Photo 2.1), either stands of bulrush *Typha latifolia*, grey clubrush *Schoenoplectus tabernaemontani* and one of common reed *Phragmites australis*, or hard rush *Juncus inflexus* and brown sedge *Carex disticha* mixed with a selection of tall herbs. *Typha*, *Schoenoplectus* and *Phragmites* form pure stands in places – the *Schoenoplectus* stands out in the aerial photograph as brownish oblong patches (Photo 2.2) – but the first two also occur in mixture. In the same way sea clubrush *Bolboschoenus maritimus* occurs as scattered plants along the western side but multiplies further east so as to dominate low lying sections. Associated with this tall cover are:

<i>Lythrum salicaria</i>	purple loosestrife
<i>Filipendula ulmaria</i>	meadowsweet
<i>Epilobium hirsutum</i>	great willowherb
<i>E. palustre</i>	marsh willowherb
<i>Lathyrus pratensis</i>	meadow vetchling
<i>Vicia cracca</i>	tufted vetch
<i>Holcus lanatus</i>	Yorkshire fog
<i>Eleocharis palustris</i>	common spike rush
<i>E. uniglumis</i>	slender spike rush
<i>Lemna trisulca</i>	ivy-leaved duckweed

A separate area of tall sedges occurs at the south centre where there is a brackish pool of dense sea clubrush *Bolboschoenus maritimus* with some sea arrowgrass *Triglochin maritimum* and saltmarsh rush *Juncus gerardii* (Photo 2.3). This narrows to the west along an old channel that is marked on the earliest map, and assumes a freshwater vegetation of great willowherb *Epilobium hirsutum*, rushes *Juncus articulatus*, *J. acutiflorus*, brown sedge *Carex disticha* and spike rush *Eleocharis palustris*, with some marsh species (see below).

2.2.3 Marsh

In a few places the vegetation cover is not dominated by these tall species and is more open and grassy. Some of them are the strips between former clay ponds in which creeping bent *Agrostis stolonifera*, marsh foxtail *Alopecurus geniculatus*, common sedge *Carex nigra*, false fox sedge *C. otrubae*, tall fescue *Festuca arundinacea*, silverweed *Potentilla anserina* and meadowsweet *Filipendula ulmaria* may grow. The wettest occurs close to the hedge between the two western fields and has a marsh community around shallow permanent water. Creeping bent *Agrostis stolonifera*, soft rush *Juncus effusus* and spike rush *Eleocharis palustris* are dominant species here and there is also some:

<i>Mentha aquatica</i>	water mint
<i>Ranunculus flammula</i>	lesser spearwort
<i>Phalaris arundinacea</i>	reed grass
<i>Glyceria fluitans</i>	sweet grass
<i>Senecio aquaticus</i>	marsh ragwort
<i>Myosotis laxa</i>	tufted forget-me-not

<i>Hypericum tetrapterum</i>	St John's wort
<i>Apium nodiflorum</i>	fool's watercress
<i>A.inundatum</i>	lesser marshwort
<i>Lemna trisulca</i>	ivy-leaved duckweed
<i>Samolus valerandi</i>	brookweed
<i>Baldellia ranunculoides</i>	lesser water plantain
<i>Alisma plantago-aquatica</i>	water plantain
<i>Hippuris vulgaris</i>	marestail

A similar freshwater site close to the southern hedge adds fleabane *Pulicaria dysenterica*, hoary willowherb *Epilobium parviflorum*, spotted orchid *Dactylorhiza fuchsii*, common duckweed *Lemna minor*, water figwort *Scrophularia auriculata* and field horsetail *Equisetum arvense*.

2.2.4 Saltmarsh

The limit of salt penetration from the estuary is not easy to determine in the field as the water backs up into drains that then open out into low-lying corners or old clay pits some distance away (Photo 2.4). Brackish water clearly affects the NE corner field, the southern part of the centre field and reaches about one third the way across the two main marsh fields. These western fields are not grazed so that the vegetation often includes sea clubrush *Bolboschoenus maritimus*, sea arrowgrass *Triglochin maritimum*, sea aster *Aster tripolium* and saltmarsh rush *Juncus gerardii*. Fox sedge *Carex otrubae*, wild celery *Apium graveolens* and sea plantain *Plantago maritima* are regularly found also in a sward that includes both creeping bent *Agrostis stolonifera* and marsh foxtail *Alopecurus geniculatus*.

Similar sites in the eastern half are grazed (Photo 2.5) and here the rush *Juncus gerardii* is joined by

<i>Agrostis stolonifera</i>	creeping bent
<i>Trifolium repens</i>	white clover
<i>Glaux maritima</i>	sea pimpernel
<i>Juncus ambiguus</i>	frog rush
<i>Atriplex prostrata</i>	spear-leaved orache
<i>Puccinellia distans</i>	reflexed saltmarsh grass
<i>Spergularia marina</i>	lesser sea spurrey
<i>Ranunculus sceleratus</i>	celery-leaved buttercup
<i>Poa annua</i>	annual meadowgrass
<i>Rumex crispus</i>	curled dock

In one slightly drier place close to the Sluice River this vegetation is augmented by curved hard grass *Parapholis incurva* and slender trefoil *Trifolium micranthum*.

The saltmarsh areas are frequently joined by shallow pools (Photos 2.6, 2.7) or deeper drains around the fields. In this latter site (Photo 2.8) celery-leaved buttercup *Ranunculus sceleratus* comes into its own, often with brackish water crowfoot *R.baudotii*, sea clubrush *Bolboschoenus maritimus* and blunt-fruited water starwort *Callitriche obtusangula*.

2.2.5 Wet Grassland

The shallow saltmarsh hollows in the eastern half are surrounded by grassland which covers much of the central field (Photo 2.9) and also the southern fringes. It is of varied composition with about ten grasses commonly found. i.e. creeping bent *Agrostis stolonifera*, Yorkshire fog *Holcus lanatus*, ryegrass *Lolium perenne*, crested dogtail *Cynosurus cristatus*, red fescue *Festuca rubra*, scutch *Elytrigia repens*, sweet vernal grass *Anthoxanthum odoratum*, meadow foxtail *Alopecurus pratensis*, marsh foxtail *A. geniculatus* and timothy *Phleum pratense*. It is based on a heavy clay soil but is not wet enough to be dominated by rushes. Patches of soft rush *Juncus effusus* and a little hard rush *J. inflexus* do occur but more widespread are

<i>Carex hirta</i>	hairy sedge
<i>Potentilla anserina</i>	silverweed
<i>Senecio erucifolius</i>	hoary ragwort
<i>Stellaria graminea</i>	field stitchwort
<i>Centaurea nigra</i>	knapweed
<i>Ranunculus repens</i>	creeping buttercup
<i>R. acris</i>	meadow buttercup
<i>Rumex acetosa</i>	sorrel
<i>Prunella vulgaris</i>	self-heal
<i>Trifolium pratense</i>	red clover
<i>Festuca arundinacea</i>	tall fescue
<i>Carex flacca</i>	glaucous sedge
<i>Cirsium palustre</i>	marsh thistle
<i>Lotus corniculatus</i>	birdsfoot trefoil

The NE corner of the site adds meadow barley *Hordeum secalinum* to this flora. It occurs in a 2-3m fringe beside the river embankment and especially around two drinking ponds on the field boundary (Photo 2.10). Here soft brome *Bromus hordeaceus* is also found on stable surfaces, with yarrow *Achillea millefolium*, autumn hawkbit *Leontodon autumnalis* and meadow vetchling *Lathyrus pratensis*. The trampled sides of these ponds is colonised densely by reflexed saltmarsh grass *Puccinellia distans*.

The southernmost field has been filled in the past (perhaps by material from the brickworks or Portmarnock House) so is at a higher level than those further north. It is covered by ryegrass *Lolium perenne*, Yorkshire fog *Holcus lanatus* and cocksfoot *Dactylis glomerata*. Ribwort plantain *Plantago lanceolata*, red bartsia *Odontites vernus*, common mouse-ear *Cerastium fontanum*, daisy *Bellis perennis*, yellow trefoil *Trifolium dubium* and red clover *T. pratense* are frequent

In the SW the grassland areas is variously colonised by clumps of brambles *Rubus fruticosus* and wild rose *Rosa canina* or bushes of grey willow *Salix cinerea* and hawthorn *Crataegus monogyna* which grow amongst a tall grass cover with fleabane *Pulicaria dysenterica*, meadowsweet *Filipendula ulmaria*, knapweed *Centaurea nigra*, catsear *Hypochoeris radicata* and birdsfoot trefoil *Lotus corniculatus*.

A feature of the south-western margins is the giant hogweed *Heracleum mantegazzianum* which is an aggressive introduced species colonising riverbank habitats throughout the country.

2.2.6 Hedges

The hedgerows consist of the same woody species with the addition of English elm *Ulmus procera* and privet *Ligustrum vulgare*. The elm is also frequent along the river embankments (Photo 2.11) and was obviously planted to stabilise them. Here there is sufficient dry ground for false brome *Brachypodium sylvaticum* but elsewhere there is often only room for tall or climbing plants such as cocksfoot *Dactylis glomerata*, false oat *Arrhenatherum elatius*, spear thistle *Cirsium vulgare*, hedge parsley *Torilis japonica*, meadow vetchling *Lathyrus pratensis*, goosegrass *Galium aparine* or field stitchwort *Stellaria graminea*.

A similar sort of habitat is offered by the bushes and scrub invading from the south-western corner (Photo 2.12).

2.3 Permanent quadrats

Results from the relevés are given in full in Appendix 1 and support the descriptions above. They emphasize the prevalence of grasses in the saltmarsh, and of white clover *Trifolium repens* where it is grazed. Grazing is also seen to prevent the occurrence of the tall clubrush species, *Schoenoplectus* and *Bolboschoenus*.

The relevés also show that grazing increases the plant diversity of the vegetation: nine species occur in two or more of the relevés in the grazed saltmarsh site as opposed to seven in the ungrazed. In the drier grassland the figure is fourteen but this would be expected as salt is a limiting factor for many species.

2.4 Evaluation

The study area holds a number of interesting habitats that are surprisingly little affected by modern development. The old brickfields have had no attention since they were abandoned while the eastern fields seem only to have been grazed in recent years. The flora that occurs is primarily a wetland one with some contribution of grassland species. The interplay of salt- and freshwater is one of the dominant ecological factors and likely to change in the future. The boundary of the salt influence based on the flora is marked in Figure 2.3 by the saltmarsh edge.

Several of the plant species are rare nationally, in particular the curved hard grass *Parapholis incurva* which had only been found in two places on the Howth peninsula before this survey. It is now added to a second 10km square for the country. Though not currently listed it is likely to be included in a forthcoming Flora Protection Order.

The meadow barley *Hordeum secalinum* is currently protected and very rare in Dublin (Doogue *et al* 1998), being confined to the Rogerstown area and formerly to Baldoyle. The Sluice River is a new site for it. Other notable species are brackish water crowfoot *Ranunculus baudotii*, slender trefoil *Trifolium micranthum*, lesser marshwort *Apium inundatum*, wild celery *Apium graveolens*, blunt-fruited water starwort *Callitriche obtusangula*, lesser water plantain *Baldellia ranunculoides* and slender spike rush *Eleocharis uniglumis*. All these are classed as rare or very rare in Dublin in Doogue (op.cit.)

In botanical terms the eastern half of the area is the more valuable for rare plants while the western has better developed communities. They should however be viewed as a unit and combined into any designation in future.



Photo 2.1. Wet alder wood showing transition to tall sedges and herbs



Photo 2.2. Old brick pit of glaucous clubrush *Schoenoplectus tabernaemontani* with edge of meadowsweet *Filipendula ulmaria* at left



Photo 2.3. Sea clubrush at SW corner seen through teasels



Photo 2.4. Ungrazed saltmarsh at southern end of area with scattered pool areas



Photo 2.5. Grazed saltmarsh with shallow channel from Sluice River (at right)



Photo 2.6. Saltmarsh channel by Sluice River picked out by orache *Atriplex prostrata*



Photo 2.7. Saltmarsh pool marked by curled dock *Rumex crispus*



Photo 2.8. Ditch at south end of saltmarsh with celery-leaved buttercup *Ranunculus sceleratus*



Photo 2.9. Looking west from Sluice River into grassland fields



Photo 2.10. Meadow barley *Hordeum secalinum* at pool edge near the Sluice River



Photo 2.11. Sluice River with golf club at left. Elms seen in hedge at centre



Photo 2.12. SW field with brambles and other bushes colonising around central channel

3. BIRD LIFE

3.1 Introduction

The study area supports a larger variety of bird species than might be expected. The primary reasons for this are the diversity and local rarity of the habitat and the proximity of Baldoyle Bay, an important site in winter for wildfowl and waders. As noted above the habitats include marsh and reedswamp, woodland and hedges, wet and dry grassland and saltmarsh. The relevance of Baldoyle Bay is that birds from there visit the study area to feed and roost, mainly during high tide. Brent geese and waders such as oystercatcher, curlew and both species of godwits frequent the eastern grassier sections at this time.

3.2 Breeding Birds

3.2.1 Methodology

The breeding survey was carried out by making three visits to the area in the southwest portion of the survey area. This area comprises a mosaic of wet habitats including marsh (GM1); wet grassland (GS4), reed and large sedge swamps (FS1) and some tall-herb swamps (FS2). The breeding survey was concentrated in this area due the scarcity of these habitat types in Fingal and consequently the surrounding semi-improved agricultural and amenity areas were not surveyed for breeding birds. However birds typical of the latter habitat types which were encountered in the wet areas were included in the survey. The survey area is indicated on Map 1 below.

The three visits were made in months of April, May and June and were made between 06.30 hours and 09.30 hours BST. Visits were made in the middle of each month on days when weather conditions were calm and bright to ensure maximum possibility for recording of breeding indicators. Spreading visits over these three months also increased the opportunities to record both early and late arriving migrants either side of the peak breeding activity that occurs in May.

Birds noted in the visits were categorised by observation of behaviour associated with on an indicative grid with a scale of 1 to 4; with a rank of 1 indicating evidence of breeding being present. A fuller outline of behaviours and categorisations is provided in Appendix 1.



Figure 3.1 Sluice Marsh - Breeding Bird Survey Area

3.2.2 Results

During the breeding season a total of 29 bird species were found (Table 1). Proof of breeding was obtained for 13 of these while a further 8 species seemed probable. One species is best classified as a possible breeder with the remaining 7 species unlikely to have bred.

Table 3.1 Birds seen in study area during breeding season

Species	April	May	June	Breeding	No of Pairs
Moorhen	✓	✓	✓	definite	3 to 5
Water Rail	✓	✓	✓	definite	2 to 6
Pheasant	✓		✓	probable	3
Mallard	✓	✓	✓	definite	4 to 6
Teal	✓			-	
Mute Swan	✓	✓	✓	definite	1
Curlew	✓			-	
Oystercatcher	✓			-	
Snipe	✓	✓	✓	probable	2 to 4
Redshank	✓		✓	-	
Buzzard	✓			-	
Sparrowhawk	✓	✓		probable	0 to 1
Kingfisher	✓			possible	
Blackbird	✓	✓	✓	definite	4 to 6
Song Thrush	✓	✓	✓	definite	2 to 3
Mistle Thrush	✓	✓	✓	definite	1
Robin	✓	✓	✓	definite	
Duncock	✓		✓	definite	4 to 6
Blue Tit	✓	✓	✓	probable	1 to 2
Stock Dove	✓	✓	✓	definite	2 to 4
Great Tit	✓	✓	✓	probable	1 to 2
Whitethroat		✓	✓	probable	0 to 1
Sedge Warbler	✓	✓	✓	definite	3 to 5
Grasshopper Warbler		✓	✓	probable	1 to 3
Spotted Flycatcher		✓	✓	definite	1
Wren	✓	✓	✓	definite	2 to 6
Grey Heron	✓	✓	✓	possible	
Little Egret	✓			-	
Skylark	✓	✓		probable	0 to 1

3.2.3 Key Species

Grasshopper Warbler

This species is relatively uncommon and as a trans-Saharan migrant it is prone to pressures in its wintering areas as well as pressures in breeding habitat and annual population changes can occur. A decline of 41% in breeding records in Ireland occurred between the two Breeding Bird Atlas (Sharrock; Gibbons) periods and the bird is an amber listed species in Birds of Conservation Concern in Ireland. Its preferred breeding habitat is damp and scrubby area where it spends most of its time in cover. Degradation of preferred breeding habitat due to intensification of agriculture is thought to be also connected with recent declines. Given this the habitat in marsh area is obviously suitable for this species and the presence of 3 singing males is notable.

Spotted Flycatcher

This species has declined in Ireland in recent years, particularly in the east of the country. It is a migrant species which winters in Africa and arrives in Ireland from April onwards and is subject to annual fluctuations in population. The overall trend over many years is downwards however and the species is amber listed in BOCCI.

Stock Dove

This species has a localised distribution in Ireland and is amber listed under BOCCI; at least two different pairs with fledged young were noted during the survey in Sections 1 and 4. During late autumn and winter flocks of up to 30 birds have been recorded in Sections 3 and 4.

Skylark

This species is amber listed in BOCCI due to declines associated with intensification of agriculture. The probability of breeding exists but positive habitat management could consolidate this position.

Snipe & Water Rail

Both these species are found in the wetter regions of the survey area and both are amber listed in BOCCI due to population declines associated with the degradation of wetland habitat in Ireland in recent years. The areas of habitat they inhabit in the survey area would remain attractive to these species in the context of a sensitive management regime.

The main locations of these species are shown in Figure 3.2 overleaf.

Figure 3.2 Sluice Marsh - Key Breeding Species

3.3 Winter birds

The area covered by the winter survey is larger than that covered by the breeding survey as it also includes the Sluice River and the grasslands that lie between the river and the wet areas along with the area covered in the breeding survey. The Sluice River (FW2) is partly tidal in the survey area and has been embanked along its course here. The area immediately to the south and west of the river consists of grassland that is grazed by horses extensively but there is no evidence of recent consistent application of fertilisers. This area of grassland is effectively divided into 4 discrete sections with three of these being identifiable by reference to hedgerows which divide them. The fourth section which is the highest part of the survey

area due to previous infilling with rubble and stonework (which occurred in the 1970s apparently) lies in the eastern part of the survey area, north of the point where the Sluice River enters Baldoyle Bay. There are sluice gates here which aim to limit the tidal surge upriver but the general area of the survey is prone to flooding during winter months. The sections included in this survey are indicated in Figure 3.3 following.



Figure 3.3 Sections for winter bird survey

This area has been systematically covered by the Irish Wetland Bird Surveys (I-WeBS) of wetlands since January 2006 and monthly counts have taken place in the periods January to March 2006 and September 2006 to March 2007. I-WeBS surveys are co-ordinated monthly counts organised by BirdWatch Ireland; they take place throughout Ireland on a simultaneous basis at high tide and run from September to March. During the counts wildfowl and waders are counted with birds of prey and gulls being optional. The counts in the Sluice Marsh area focus on wildfowl and waders only, these being the primary concern of I-WeBS. The counts were carried out on foot with aid of optics and all areas were visited in a clockwise fashion starting at Portmarnock Bridge. Generally counts were of 4 hours duration.

3.3.1 Results

At least twenty species of wildfowl and wader are present at times (Table 3.2) though there are probably 30 additional species of land birds regularly found.

Table 3.2: Numbers of wintering waterbirds in the study area

Species name	1999/00*	I-WeBS Counts for Portmarnock Marsh & Sluice River 2006/07								
		Jan-06	Feb-06	Mar-06	Apr-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07
Little Grebe	2		2	1		1	2			1
Grey Heron	2	1	4	9	3	4	4	18	16	5
Mute Swan	7			1	2	4	2		1	1
Mallard	5	12	27	22	15	43	55	11	37	24
Moorhen	3	2	1		1				3	2
Oystercatcher	3			12	6	4	114		2	
Lapwing	40					10				
Snipe	2	12	30	5	8	3	22	4	13	16
Curlew	16		11	19	5	8	79	45	24	25
Redshank	6	15	24	14	1		12			
Greenshank	2									
Black-headed Gull	1									
Brent Goose		325	34	291	108	27	97	227	270	241
Little Egret		3	1	1	3	4	4	2	3	1
Teal		13	2	25	7	58	152	34	67	14
Black-tailed Godwit		21	7	36	4	7	20	65	145	17
Bar-tailed Godwit									23	
Kingfisher		1	2	1	2	1		1	1	
Water Rail			1		1			1		
Wigeon								21	3	2
Monthly Totals	89	405	144	436	166	173	561	429	608	348

3.3.2 Key species

Brent Goose

The Brent found in the survey area are part of the larger flock that winters in Baldoyle Bay SAC, the first numbers of which begin arriving in September and steadily build up thereafter. While details of interchanges with Brent wintering in adjacent areas, such as The Bull or Swords, is imprecisely known there does appear from I-WeBS counts to be a discrete core using Baldoyle Bay. The average size of the Baldoyle flock in recent years is c.675 and the early part of the season is spent feeding on algae and sea grasses (*Enteromorpha* sp and *Zostera* sp.) in the estuary at low tide with a movement to amenity and other grasslands occurring later in the season. The number recorded in January 2006 of 325 is of international significance.

Observations in the study area fit in with this pattern with low numbers initially in the season and a build-up thereafter. The geese utilise the survey area both for roosting at high tide and as an active feeding zone at inter-tidal times and the area is obviously important for the birds given the numbers availing of it. Brent Goose is listed under Annex II of the Birds Directive and is an amber listed species in Birds of Conservation Concern in Ireland (BOCCI) (BWI & RSPB). The number present in January 2006 is in excess of the threshold for international significance and several months saw levels in excess of national significance. Within the survey area the geese primarily use Sections 1 and 2 but there is some inter-sectional movement and they do use Sections 3 and 4 but in smaller numbers.

Little Egret

The Little Egret first bred in Ireland in 1997 in Co. Waterford and has been increasing its range since then; it is listed under Annex I of the Birds Directive, it is also an amber listed species under BOCCI. As mentioned above there were indications that it bred in the general area during time of survey but precise location was not established. This is another species that utilises both Baldoyle Bay SAC and the survey area and birds are readily observed as they freely interchange between both areas. The survey area is used both as a roosting place at high tide and an active feeding zone and birds also roost in the wet woodland in southwest corner near the railway line at night time.

In addition to the data presented in the surveys this species has also been observed throughout the year on the site. It shows a preference for the Sluice River as it runs by Sections 3 and 4 and can be seen actively feeding there – the peak count for the site of 12 birds was in this area in September 2006 during a non-survey related visit.

Kingfisher

This is another Annex I species and is found in the survey areas from autumn through to spring generally along the course of the Sluice River but also it can be observed flying across Section 4 to the drainage channel at rear of apartment blocks. The species is also amber listed under BOCCI. There are no indications that it has bred in the area and this is probably due to relative scarcity of suitable riverbank where nesting can take place. There are however some small sections of bank that appear suitable and supplementation of these with artificial nest banks may be effective.

Bar-tailed Godwit

This is another Annex I species that occurs in internationally significant numbers in the Baldoyle Bay SAC; it is also amber listed under BOCCI. It was only recorded in one month during the survey period when 23 birds were found in Section 3. The presence that day was most likely related to lack of an available high-tide roost in the Bay because of inundation or disturbance.

Merlin

This is another Annex I species under the Birds Directive and normally breeds on upland moors and bogs. The known habit regular wintering by lone individuals at coastal sites fits in with the pattern of observations in survey area.



Figure 3.2 Location of key winter species

3.4 Evaluation & Discussion

The Sluice Marsh area is a good example of a wetland habitat that has become rare in the Fingal area. It is important for several bird species; in particular for wintering Brent Geese and Little Egrets as well as some breeding species such as Grasshopper Warbler, Whitethroat and Stock Dove that are relatively uncommon or declining. The presence of a breeding wader (Snipe) is also noteworthy in a Fingal context. A feature of the area is the lack of use by people and, consequently, of disturbance. The eastern part is grazed extensively by horses (about 20) and these sometimes venture into the wetter areas. The local gun club use the marsh and this is discussed further below. During summer months there is some activity from local residents but there does not seem to be significant disturbance. There are 2 primary schools and a secondary school in the immediate area of the marsh with additional primary and secondary schools in nearby Baldoyle. There is no evidence of the area being used for educational purposes by any of these.

The use of the eastern part of the area by birds normally present in Baldoyle Bay is likely to increase in importance in coming years as development takes place. Even now the growth in the local human population has caused an increase of foot traffic along the southern shore of Baldoyle Bay, which is a high tide roosting area. Similarly the amount of disturbance observed to birds roosting at Portmarnock Point, particularly by dog-walkers, has also increased in recent years. During such occasions of disturbance birds re-locate to the Sluice River area as it is a safe area. However an increase in tidal levels may put pressure on this.

In addition to being a candidate SAC Baldoyle Bay is designated as a Special Protection Area. Despite this, shooting is permitted to members of the local gun club and the club also uses the marsh area as a release site for reared Mallard in late summer. Direct shooting pressure is at its heaviest in the bay at the opening of the 'duck season' in September and this continues until November when it diminishes as the pheasant season opens. Shooting occurs most frequently between dusk and dawn and while the direct impacts are probably not significant, disturbance obviously does occur. On such occasions wildfowl can be observed leaving the bay and overflying Strand Road into the marsh to seek refuge. Some shooting does occur in the marsh area during season though it does not appear to be as intense as that which occurs in the bay itself. The sustainability of permitting shooting in both areas is questionable.

4. MAMMALS

4.1 Methodology

This section examines the mammal fauna using the area both as a feeding site and for breeding. The work involved the examination of all accessible areas for tracks, trails, burrows, faeces, food remains and the animals themselves. Local residents and golfers on the Malahide Golf course were questioned regarding observations made while on the site.

The Sluice River was examined on four separate visits to determine the mammal fauna present; July 11th and 12th 2007 during the daytime and at night for bats on July 10th and 11th.

The mammal assessment involved the examination of all accessible areas for tracks, trails, burrows, faeces, food remains and the animals themselves. Local residents and golfers on the Malahide Golf course were questioned regarding observations made while on the site.

Access to some of the site (including the wet woodland) was very difficult in daylight and potentially dangerous at night and wet woodland may have higher bat potential than evident in this assessment based on the observations made.

Human activity at night was concentrated along the housing on the eastern and south-eastern edge and there was no disturbance in any of the marsh area.

Weather conditions were good throughout the assessment and the bat activity noted reflects summer feeding and commuting on what would be expected to be an optimal night.

The bat assessment required a night time examination of the site from 9.30 pm to 12.00 am for the presence of feeding and commuting bats. A morning examination was not thought necessary since no bats apparently breed within the study area. Access to some of the site (including the wet woodland) was very difficult in daylight and potentially dangerous at night and wet woodland may have higher bat potential than evident in this assessment based on the observations made.

4.2 Results (Photo 4.1)

Soprano pipistrelle & Common pipistrelle

These two bat species were encountered during both survey nights. Soprano pipistrelles were noted along the Sluice River itself as well as along hedgerows within the marsh area. Common pipistrelle activity was greatest along the lane running approximately East-West on the perimeter of the site (south-western edge). This species was also noted along with soprano pipistrelle(s) along the perimeter of the wet woodland on the western boundary (along the railway line). In all areas, activity was attributable to no more than two bats at any given time.

This is surprisingly low given that there are clearly high concentrations of midges and mosquitoes within the marsh.

It is difficult to determine a definite cause for such a paucity of bat numbers with food being available (as evidenced by high swift feeding activity over the reed beds on the golf course prior to sunset). The young age of much of the housing may affect the availability of suitable roost sites for large bat populations.

Soprano pipistrelles are typically far more common close to water including rivers, lakes and ponds (this relates to reservoirs and man made water bodies as well as natural sites). This species forms the largest of all roost populations in Ireland and several hundred bats in one house is not unusual. Soprano pipistrelles have been noted in all Fingal studies to date in this series of biodiversity assessments and it is clear that this species is very abundant in Fingal.

Common pipistrelles have been present in similar abundance to soprano pipistrelles with a wider distribution into areas where prey would be less abundant including around housing.

Leisler's bat

This species was represented by a single individual on one of the nights in the north-western corner of the site (over the golf course and the river). This was the first bat noted on site at 10.00 pm on the night of July 10th 2007. It fed over this site for several minutes before moving out of range. Leisler's bats feed over a very large area and may in one night travel up to 40 kilometres to reach an alternative roost. Feeding may range from open pasture and parkland to lakes and ponds, over woodland and woodland edge, hedgerow, street and security lighting to moor land. The East Coast would appear to be a particularly good area for Leisler's bats and this species will roost in old and modern houses (especially dormer bungalows) as well as trees. Tree species of greatest benefit to this species include oak, beech and ash but horse chestnut is another species with great cavity forming capacities and potential for bats.

This species is likely to be roosting within a few hundred metres of the Sluice River marsh given that it was present in fully bright conditions and was likely to have emerged from the roost within minutes of its being first noted.

Otter

An otter spraint and otter footprints were identified under the railway bridge on the boundary of the site. Clearly otters avail of the river to feed and commute through the area. The banks of the river appear to offer good sites for a holt but none was seen in the accessible areas. Summer is a difficult time of year to examine river banks for otter signs as the vegetation often entirely obscures the soil and hence even a relatively large holt may be overlooked.

Otters are widespread in Ireland and may avail of a number of rivers in an area for feeding. Territories are demarcated by the positioning of faeces (spraints) on exposed rocks or vegetation or bare ground. Bridges are a typical sprainting site and at some bridges, piles of spraints may accumulate. Otters are known to use several rivers in Fingal including the Broadmeadow, the Tolka, the Ward and Delvin.

Irish hare

Hares were noted on the golf course along the banks of the Sluice River. Hare droppings were noted in the Sluice River marsh but no animals were seen. Golf courses are frequently a focal point for this species and golfers noted seeing them on most visits to the Malahide Golf Course.

The river would not form an obstacle to movement as hares are capable swimmers and will occasionally flee from danger by swimming (pers. obs. Bull Island).

Rabbit

Rabbits are ubiquitous within the study area and several rabbits were seen and several warrens were in evidence. Rabbit droppings, digging and grazing were evident in all sections of the study area both west and east.

Fox

Fox tracks were noted in several areas, crossing through the edge of the wet woodland, passing through hedgerow and wet ditches and footprints were noted in mud in one or two places. Fox scats were also found in various sites throughout the study area.

Golfers noted that they had occasionally seen foxes while on the golf course adjacent to the river.

Brown rat

Unsurprisingly, brown rats occur along the river and their signs are most in evidence at the railway/ river bridge and in areas close to the housing.

4.3 Evaluation

The western section of the study area is predominantly wet to very wet and within it there are few extensive areas of soil suitable for burrowing mammals such as badger. Indeed, no evidence of badger was noted or commented on by visitors or residents. This would not necessarily rule out the presence of badgers.

No otter holts were seen along the river banks and were a holt to be present here, it would be most likely within the stretch on the western end of the river (where the river emerges from under the railway bridge, indicated on Figure 1 by a blue curvy line). The bank is most suited to the establishment of a holt here and the vegetation is dense enough here to hide entrances from view.

Otters are dependant upon aquatic prey including fish, molluscs, crustaceans in addition to ducks, frogs and even rats and other incidentally available animals (in Wales, they have even been found to prey on lesser horseshoe bats).

The presence of stoats in the drier section of the Sluice River marsh cannot be ruled out especially given the abundance of rabbits.

Rabbits are the most evident mammal species here and they were encountered throughout the site even in the marshier areas once there was a hedgerow or ditch that provided adequate soil for a warren or simple holes.

Bat activity was lower than would be expected given the availability of insect prey. There are houses of varying ages in the vicinity but many of them are modern constructions. A disused church lies to the west of the site (beyond the trotting track) and while it was stated by the owner that no bats exist within it, access was not forthcoming for an assessment. Such a structure would provide potential for species such as brown long-eared bat, Natterer's, whiskered and Brandt's as well as pipistrelles and possibly Leisler's bats.

The wet woodland appears to be good feeding habitat but it is difficult to survey this site by night given that it is practically impossible by day to negotiate. Surveying along a section of the edge of this site did yield bat activity (common and soprano pipistrelles). This might be overcome by the use of remote equipment (bat detectors with recorders attached placed here by day and collecting data over several days).

The bat fauna may include one or more of the species noted earlier if the church were a roost site and this would certainly increase the significance of the site given that species such as Natterer's and especially whiskered bat are uncommon in Fingal.

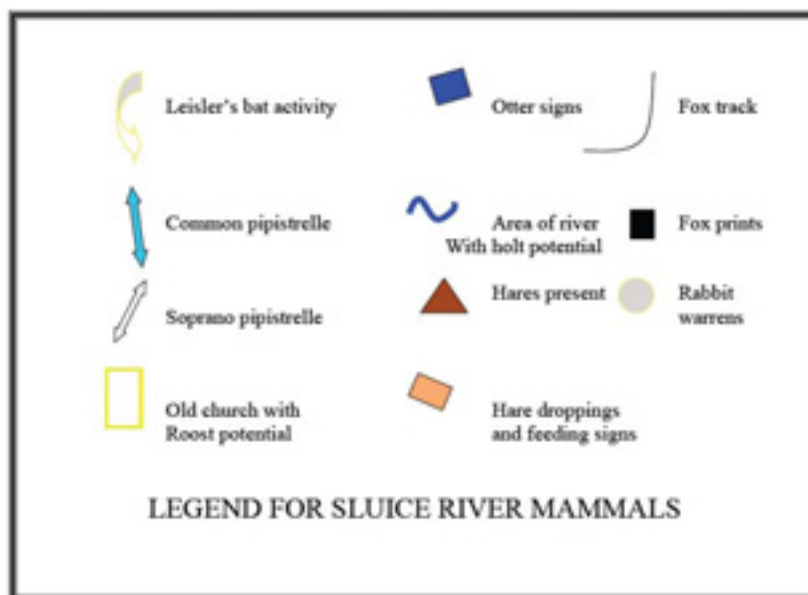
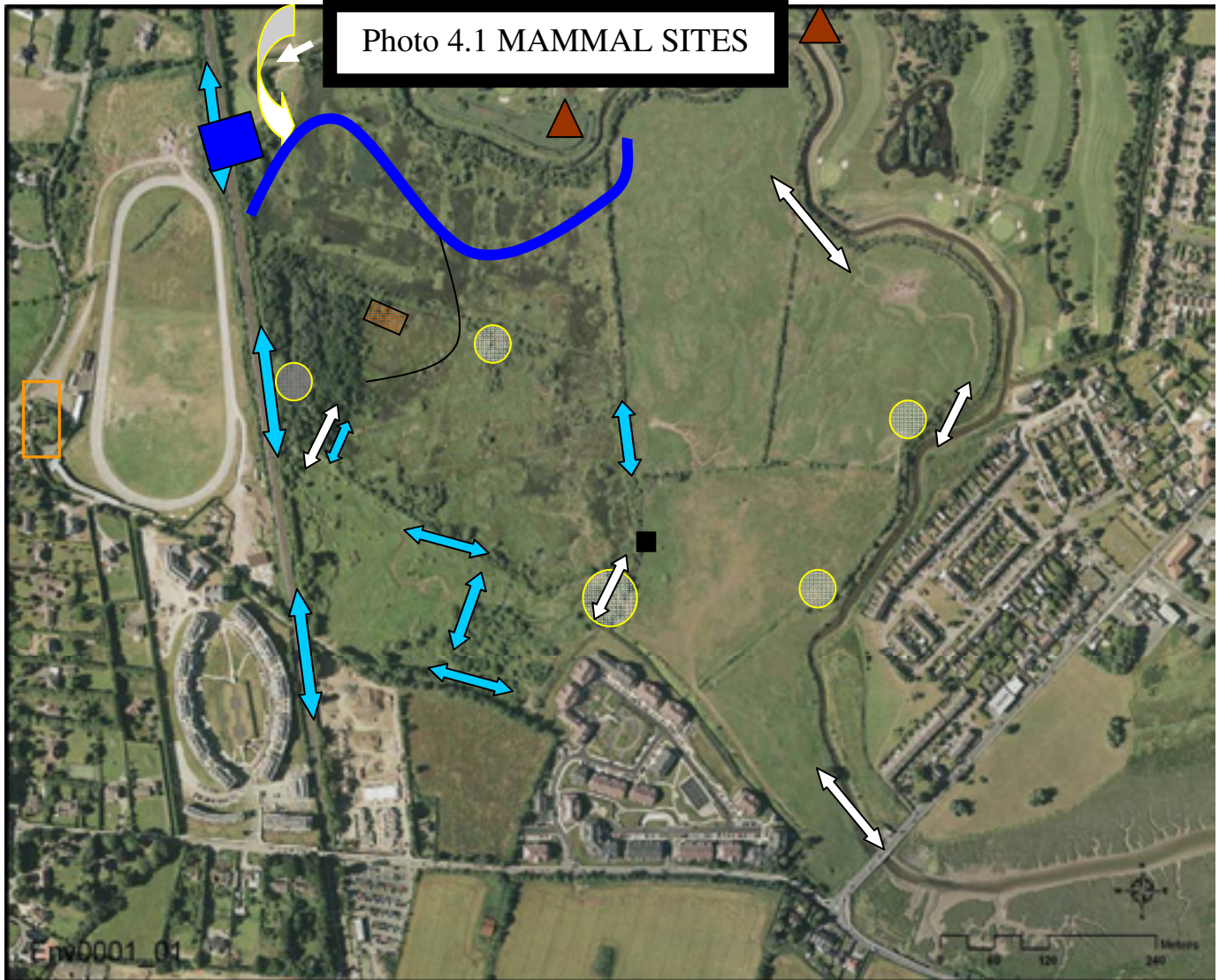




Photo 4.2. Bat Habitat

- (a) Wet woodland with high bat potential but impossible to fully evaluate at night
- (b) Trees with potential for bat box attachment at Sluice River Marsh



Photo 4.3

- (a) Bridge under railway with otter signs
- (b) Otter spraint on ledge under bridge
- (c) Otter paw print in mud (recent)
- (d) Hare on river bank on golf course
- (e) Rabbit warren
- (f) Hare droppings
- (g) Fox paw print
- (h) Fresh fox scat (atypical shape)

5. BUTTERFLIES

5.1 Introduction

The Sluice Marsh area has a variety of habitat types within its boundary and the aim of the survey was to record butterfly distribution and abundance by habitat type in the area. Butterflies are important indicators of biodiversity in an area as the majority of species have associations with particular semi-natural and natural habitats. Butterflies are also responsive to climate change and indicators such as range extension or increasing number of broods are evidence of this.

5.2 Methodology

Six transects of 100-200m were established in the area that reflect the habitats occurring there. Each one was walked once and butterflies seen within 5 metres of the transect were noted. Visits were made between 10.00 hours and 16.00 hours on the days listed below. The prevailing weather conditions on the days visits were made were in line with the parameters for recording butterfly activity outlined by the Butterfly Monitoring Scheme in the UK. The purpose of using the transect approach is to facilitate monitoring of populations and occurrence on an annual basis and thereby follow the effects of habitat change.

Date	Temperature	Daily Sunshine (hrs)	Rainfall (mm)	Windspeed
06/7/07	19.0	7.2	2.4	15
14/7/07	20.0	7.1	2.1	11
19/7/07	18.0	12.7	0.0	7
25/7/07	19.7	12.9	1.1	13
30/7/07	19.0	9.2	0.0	7

While conditions were suitable on the days visited they should be considered in the context of the predominantly wet weather from mid-June onwards. The prevailing conditions from that time were rainy and dull with lower temperatures than normal. Such conditions act to depress butterfly activity and this will have had some impact on the findings as numbers found would likely have been depressed. As this survey was the first one carried out by transect approach, direct comparability with previous fieldwork is not possible: however reference to such fieldwork is used to provide context. As the period of the survey does not match the flight periods for all species using the area previous fieldwork is used to identify such species in the species accounts.

5.3 Results

Thirteen species were recorded during the survey and of these three (23%) show increases in range at national level; four (30%) are stable and six (47%) are decreasing. Nationally these changes are due to habitat destruction and deterioration, fragmentation of landscape, intensification of agriculture and response to the effects of climate change. The populations in the Sluice Marsh reflect the national distribution. Below is a table showing totals of butterflies by species, by visit and by number of individuals recorded in respect of the species found in the survey period. To these the additional three may be added giving a total of 16.

Species	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Totals
Ringlet	48	32	84	51	69	284
Meadow Brown	41	28	51	30	40	190
Small Trtshell	2	9	8	8	9	36
Spkld Wood	6	3	5	6	6	26
Large White	7	9	12	14	2	44
Small White	1	2	3	1	1	8
Green-V White	0	5	16	3	5	29
Common Blue	0	0	0	0	7	7
Holly Blue	0	0	7	10	1	18
Red Admiral	2	2	2	2	1	9
Painted Lady	0	0	4	1	1	6
Peacock	0	0	0	3	1	4
Small Heath	0	1	1	0	0	2
All Species Total	107	91	193	129	143	

5.4 Species Accounts

Ringlet *Aphantopus hyperantus*

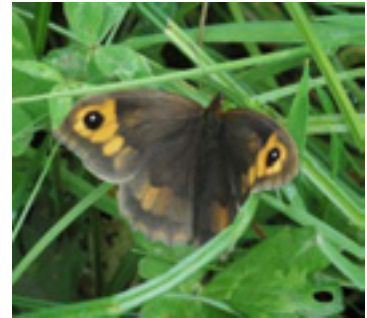
This is a species that lives in colonies in tall, mainly damp, grasslands. Its foodplants include coarser grasses such as Cock's-foot and meadow-grasses while Bramble is a favourite nectar source. It is widespread in Ireland occurring in 844 10km squares during surveys in the period 1995 – 2004. Its population is considered stable at present but increasing agricultural intensity has led to declines in some areas



The prevalent habitat in the Sluice Marsh area is obviously currently suitable for this species and it is the most numerous butterfly encountered. It was found in all Transects but with only a single occurrence in Transect 5 – an area of dryer, improved grassland and hedgerow. Transects 3 and 4 are most representative of the prevalent habitat in the survey area and the population of this species is likely to be well in excess of 1,000. A presence count in July 2006 on only the southern portion of the Marsh indicated 610 individuals present.

Meadow Brown *Maniola juritina*

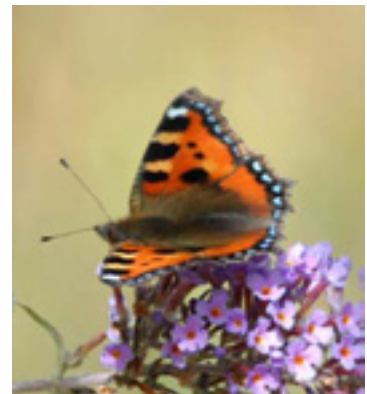
Another grassland species that lives colonially; its foodplants include fescues, bents, meadow grasses and Cock's-foot. It is widespread in Ireland and was recorded in 916 10km squares during the period 1995 – 2004. There is evidence of a small decline in population nationally.



It does not show the same preference for damp grassland as the Ringlet and is accordingly less abundant in the survey area than that species. However it is still plentiful and is the second most commonly encountered species, being encountered in all transects, and it was the most common species in the dryer area of Transect 5. The findings in the survey are broadly in line with experiences in previous years when a peak count of 110 individuals in the southern portion of the survey area was made. Given no significant changes in land use the population of this species appears secure at the site.

Small Tortoiseshell *Aglais urticae*

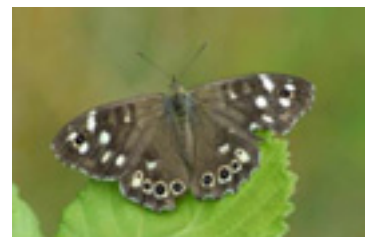
This is a common and widespread species. The main foodplant is the Common Nettle while it can also be seen nectaring on a wide variety of flowering plants. In Ireland it was recorded in 817 10km squares during the 1995 – 2004 period. At national level the population is considered to be stable.



It was encountered in 4 of the transects covered, being absent from the two wetter transects of 3 and 4. Adults of this species are highly mobile and can be present several kilometers from breeding site. Some nettle plants were examined for eggs and the gregarious larvae of this species during the survey but none were found; however by no means was it possible to examine all suitable plants.

Speckled Wood *Pararge aegeria*

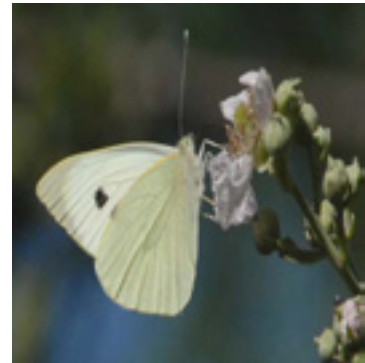
A common and widespread species of hedgerows and woodland. Larval foodplants include a wide range of grasses such as Yorkshire fog. It was recorded in 901 10km squares in the 1995 – 2004 period. It feeds largely on honeydew from aphids and is seldom seen nectaring on flowers. Whilst observation effort may be involved there are indications is increasing its range north-westwards and the Irish population is not considered to be of conservation concern.



It was encountered in 4 of the transects covered in the survey and in all cases it was present along hedgerows. Males of the species are territorial in respect of areas of hedgerow and often are detected as they rise to see-off intruders. The occurrence level in the Sluice Marsh area appears consistent with similar habitat (where found) in Fingal.

Large White *Pieris brassicae*

This is a conspicuous and widespread species and its numbers can be swollen by migration from the Continent. Larvae feed of species of the Cruciferae family and this can lead to problems in relation to commercially cultivated crops such as cabbage. It is a highly mobile species and can turn up in practically any areas but females tend to found relatively close to foodplants. It was found in 723 10km squares in the period 1005 – 2004 and though it is not threatened, this is indicative of a slight decrease in population and range.



In the survey area it was found primarily in the dryer transects, being most abundant along the hedgerow at transect 5. The occurrence in Transect 3 relates to ‘fly-by’ individual and underscores the mobility of this species. It is reasonably common in the Sluice Marsh area perhaps reflecting the cultivation of brassicae that is still undertaken in the general area.

Small White *Pieris rapae*

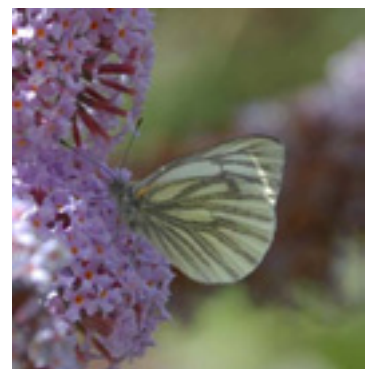
This species is not as reliant on cultivated crops as the previous one and larval foodplants include species such as Hedge Mustard and Charlock. It is reasonably widespread in Ireland but does not appear to be encountered as frequently as the Large White. In the 1995 – 2004 period it was recorded in 662 10km squares; while not threatened this represents a small decrease in distribution.



In the survey area it was found in 3 transects, primarily in circumstances where it was nectaring on Bramble flowers. It was not recorded as frequently as the Large White which reflects experiences in previous years. It is another highly mobile species which can be found in a variety of habitats.

Green-veined White *Pieris napi*

This species, similar to the Small White, also uses wild Cruciferae as larval foodplants. It is more widespread than the two previous White species, being recorded in 963 10km squares and the species is considered stable. A wide range of habitat is utilized but a preference is shown for damp and shaded places.

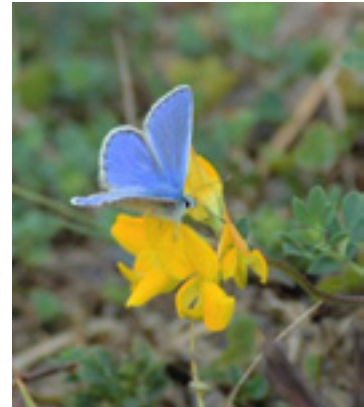


It was recorded most frequently in Transects 2 and 5 during the survey and was not obviously more common than the Large White. In this regard it should be noted that the survey timing meant that the second brood of this species was being encountered and this brood can have less adults than first brood.

Common Blue *Polyommatus icarus*

This species inhabits a variety of grasslands and Bird's-foot trefoil is the main larval foodplant though others such as White Clover may be used. It lives in discrete colonies and is double-brooded in this part of Ireland. During the 1995 – 2004 period it was recorded in 589 10km squares which indicated a small decrease in range.

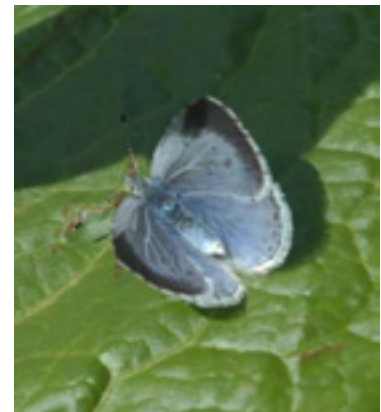
In the survey this species was only recorded in later visits which reflects the fact that second brood emergence occurs towards late July.



In general it was found in the dryer areas where the finer grasses are found. It was primarily found in two discrete areas and it is uncertain if one or more colonies are present in the survey area. Only one female, in Transect 6, was recorded and it appears that this species exists at site in small numbers.

Holly Blue *Celastrina argiolus*

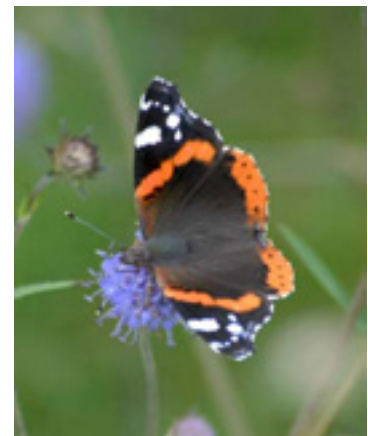
This is an interesting double-brooded species in the survey area with the larvae of the spring generation feeding on buds and terminal leaves of Holly while the summer generation feed on Ivy. In the southern parts of Ireland the species is triple-brooded in recent years while in northern parts it is single-brooded. It is increasing in Ireland though remains somewhat localised and was recorded in 208 10km squares in the 1995 – 2004 period.



In the survey area it was only found in transects where hedgerows were present and this is unsurprising as it is normally detected flying at head height along hedgerows. Given the requirements of the first generation the relative absence of Holly in the survey area is noteworthy. Both generations have been previously recorded in survey area during period 2003 – 2006.

Red Admiral *Vanessa atalanta*

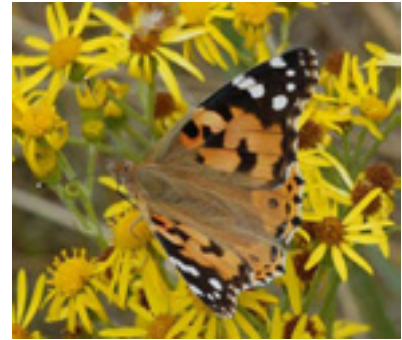
A migrant species from North Africa and southern Europe the Red Admiral can be found in a wide range of habitats with arrival commencing in late May though overwintering adults may be seen on the wing prior to this. Annual numbers recorded are prone to fluctuation on basis of weather conditions. The primary larval foodplant is young Common Nettle and territories may be established around nettle beds. Later in the year they can be found at sites nectaring, often in numbers, on plants such as Buddleia. It was recorded in 723 10km squares in the period 1995 - 2004 and population is regarded as stable.



As a highly mobile species its appearance in 5 of the transects is not a surprise. Eggs and caterpillars of this species were searched for during survey period but not found. However peak time for the larvae is August and September and they have been found in Sluice Marsh area during this time in 2006 in the areas adjacent to transects 5 and 6. Additionally the numbers seen in Fingal by observer throughout 2007 were much reduced to those witnessed in 2006.

Painted Lady *Vanessa cardui*

This is a long-distance migrant arriving in Ireland from the northern edge of the Sahara, the Middle East and central Asia. Accordingly its numbers are prone to fluctuation on an annual basis and 2007 was not a particularly good year for the species in Ireland. It appears not to be as widespread as the previous species and was recorded in 643 10 km squares in the 1995 – 2004 period. Members of the thistle families are the preferred larval foodplant and rough grassland is the preferred habitat.



This species was encountered in primarily in Transect 6 where its preferred larval foodplants are most common. No signs of breeding were noted and specimens recorded consisted of adults in flight or on Ragwort. Peak numbers of this species are usually noted in August and September and the incidence of occurrence during survey period is in line with, or slightly above, general rates in Ireland in 2007.

Peacock *Inachis io*

Another species which avails of Common Nettle as a larval foodplant the Peacock is a large and striking butterfly. It is also highly mobile and can turn up in a variety of habitats and can gather in numbers at preferred nectaring locations. It is a single brooded species with emergence from mid-July onwards though overwintering adults will emerge before this. It appears to be increasing in Ireland and was recorded in 834 10km squares during the period 1995 – 2004.



It was recorded in 3 transects and showed a strong association with hedgerows where it was encountered basking or nectaring. Signs of breeding were not observed during survey period but larvae were noted on Common Nettle in areas adjacent to Transects 5 and 6 during 2006.

Small Heath *Coenonympha pamphilus*

This is a grassland species that lives colonially. Its preferred larval foodplants are fescues and meadow-grasses. It is reasonably widespread in Ireland particularly near the coast and was found in 405 10km squares during the 1995 – 2004 period. This is indicative of a medium decrease in distribution.



This was the first time that this species has been recorded by observer in the survey area and was a pleasant surprise in what was not a great year for butterflies. In addition to this most of the survey area is rough grassland and suitable areas of finer grasses appear relatively scarce. Although colonial in nature it is known to be a mobile species and has been recorded frequently in the dunes at Portmarnock Beach. Whether the records during survey relate to a previously undiscovered colony or represent some pioneering from nearby populations is not certain.

5.5 Species not recorded on transects

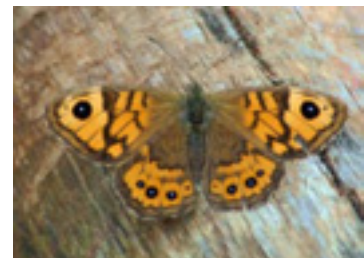
Orange Tip *Anthocaris cardamines*:

This species occurs regularly in the marsh area but it is single brooded and flight season is generally from late-April to June. As such it lies outside the survey period and was not encountered during same. Its favoured habitats include damp meadows and larval foodplants include Watercress and Lady's-smock and this species is encountered frequently – both males and females – in Spring in the area. The peak count in 2007 was in late May and consisted of 12 males and 4 females in the southern portion of the area. In Ireland it was recorded in 898 10km squares in the 1995 – 2004 period and its population is considered stable.



Wall *Lassiomata megera*:

This species was encountered in August 2006 when two individuals were encountered in an area of high ground south of Transect 6. It is a double-brooded species with the second generation being on the wing in August and September. The possibility of local origin for these sightings cannot be ruled out. The preferred habitat and larval foodplants such as Yorkshire Fog and Colt's-foot are certainly widely available in the survey area. The species has a predominantly coastal distribution in Ireland and was found in 407 10km squares in the 1995 – 2004 period which represented a medium decrease in distribution.



Clouded Yellow *Colias croceus*:

This is a migrant species that is prone to annual fluctuations and is generally not recorded as frequently as Red Admiral or Painted Lady. They arrive in early summer and favoured larval foodplants include Clover species and Bird's-foot Trefoil. It is not thought that this species survives Irish winters in any stage but this might change due to climate alterations. This species was recorded in survey area during 2006 – a 'good' year for the species in Ireland – but not during the survey period.



5.6 Evaluation

The species composition and abundance reflects the available habitat in the study area; for example the extensive damp grassland favours the Ringlet and Meadow Brown. Given the size of the area there is scope for special management to preserve and enhance the current biodiversity. Species such as Common Blue and Small heath which prefer drier habitats could benefit from this.

Butterfly Ireland has mapped the occurrence of butterflies in the country by 10km squares and uses three grades to express diversity. These are 1-9 species, 10-19 species and over 20 species. Only four 10km squares in the country had over 20 species while some 72 had 10 -19 species. Three of the squares with 10-19 species occur in Fingal so the diversity at Sluice Marsh appears significant at local level given the relative size of the site. At the landscape level species such as Grayling, Small Blue and Small Copper have been recorded nearby while Silver Washed and Dark Green Fritillary are to be found relatively close in Fingal, reinforcing the potential value of the area in terms of biodiversity

6. DRAGONFLIES & DAMSELFLIES – ODONATA

6.1 Introduction

The Sluice Marsh area was visited five times in July to identify and record Odonata activity. These insects breed in water and generally require pools with emergent vegetation in which to lay eggs. They hunt more widely however and may be encountered quite far from breeding habitat.

6.2 Methodology

Good monitoring practice for Odonata requires site visits to be made 2 hours either side of solar noon on still, sunny days with temperature above 14 degrees. Such days were not too frequent during July 2007 but visits between 11.00 and 15.00 hours were made in predominantly suitable conditions as follows;

Date	Temperature	Daily Sunshine (hrs)	Rainfall (mm)	Windspeed
06/7/07	19.0	7.2	2.4	15
14/7/07	20.0	7.1	2.1	11
19/7/07	18.0	12.7	0.0	7
25/7/07	19.7	12.9	1.1	13
30/7/07	19.0	9.2	0.0	7

Although these days were fine in themselves they should be considered in the context of the overall poor weather conditions that prevailed from mid-June onwards and the effects that this would have had on Odonata activity. This will be discussed further below.

There are several areas in the survey area where the water table remains above ground for most of the year. Seven such areas were targeted during the survey as providing suitable breeding habitat for these insects. Five were in tall herb swamps, one in tall reeds and one in a drainage ditch. The results are given by species with reference to Dragonfly Ireland, carried out in 2000-3 (see The Natural History of Ireland's Dragonflies – Brian Nelson & Robert Thompson)

During visits each of the areas was walked and Odonata activity noted with regard to numbers, gender, maturity and evidence of breeding such as pairs in tandem or oviposting. Details of such activity are outlined in species accounts below.

6.3 Species Accounts

Azure Damselfly *Coenagrion puella*

Adults mainly noted during visits; no actual indications of breeding. However one immature male was noted and is an indicator of probable breeding. This species was noted in small numbers in three areas. It has not been seen on the site since 2002 as far as is known but it has probably been present all along though recolonisation is a possibility. The species responds to nutrient enrichment but this is unlikely to have occurred recently in the study area.



Variable Damselfly *Coenagrion pulchellum*

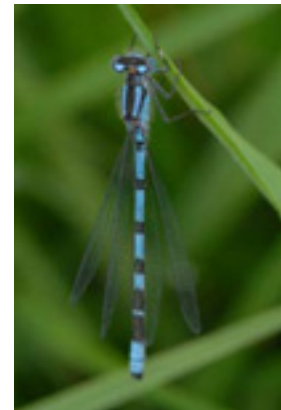
This species was noted in good numbers on all visits and is much more frequent than the previous one. It has been recorded in the previous three years also. At present it does not appear to be in decline at site but, in light of comments for above species, monitoring would be prudent.



Common Blue Damselfly *Enallagma cyathigerum*

This damselfly was only noted in ones and twos in two areas, totalling 5 individuals.

This pattern differs from previous years when it was numerous in the study area despite the lack of the large areas of open water which it seems to prefer. The extent to which apparent decline is a once-off occurrence or is linked to obvious increase succession needs further exploration.



Blue-tailed Damselfly *Ischnura elegans*

This was the damselfly species encountered most frequently at the Sluice River marsh (and elsewhere in the country) and was seen at all sampling sites, showing its ability to use all water types. The peak count at one site was of 57, including many tandem pairs. These observations are in line with those of previous years and the population of the area appears stable over this period.



Amber-winged Hawker *Aeshna grandis*

This species was observed only once during the survey and has not been seen in recent years. It was not recorded during DragonflyIreland though there is an earlier record from the period 1980 – 99.

The presence of a single specimen does not allow for much interpretation but the recent colonisation of Knock Lake may be relevant. The species is found along the canals in Dublin and also is found along the River Liffey at Lucan.

**Four-spotted Chaser** *Libellula quadrimaculata*

Adults were found in four areas of the site, some of them breeding. It is one of the more widespread dragonflies in Ireland but it does have a predominantly northern and western distribution preferring acid waters. It was not recorded in Co Dublin during the DragonflyIreland survey from 2000 – 2003 but is now also breeding at Knock Lake.

This species appears at present to have a small but sustainable population in the survey area. It is concentrated in the areas of existing open water and its future sustainability in the area is linked to the rate of succession of these areas.

**Ruddy Darter** *Sympetrum sanguineum*

This is the dragonfly species that was most frequently encountered during the survey period and was found in all but one of the sampling sites. The national distribution is largely in the midlands and east of the country; reflecting the species' preference for basic mesotrophic waters. Although an earlier record of one individual exists, it was not recorded from the site during DragonflyIreland nor was it recorded from Knock Lake – where it has been seen since then. The species preference for shallow, well-vegetated water is obviously well met in survey area. As well as laying eggs in water this species will also lay in vegetation beside water that is damp or prone to inundation. While not a problem in 2007 these aspects make it vulnerable to drought and, in the longer-term, to succession and encroachment of terrestrial vegetation.

**Common Darter** *Sympetrum striolatum*

This dragonfly is common in the study area and was seen in all types of habitat including hedgerows and grassland. Both adults and immatures were noted in all sampling sites though is not as abundant as the Ruddy Darter whose specific habitat requirements are more obviously met.



6.4 Evaluation

The survey found four species of damselfly and four of dragonfly to be present in the Sluice Marsh area during the survey. Evidence of breeding was present in respect of all these apart from Amber-winged Hawker.

Based on the findings of DragonflyIreland some of the species have shown range increases and now include Sluice Marsh or are consolidating their presence there. None of the species present are thought to be scarce or vulnerable in the short-term at national level. In Fingal the Sluice Marsh area would appear to be second only to Knock Lake in terms of range and populations of species present. It should be noted that Knock Lake contains far larger areas of open water that are more conducive to a larger species mix.

Only one species, Azure Damselfly, was recorded by me for the first time during the survey. Another species, Large Red Damselfly, has been recorded in 2005 and 2006 but was not noted during the survey. This species is the first to emerge – hence alternative name of Spring Redtail – and previous records were in May and June. It may be that later period of survey and prevailing weather depressed activity for this species at the site.

While the days on which visits were carried out were suitable for recording of Odonata activity they were relatively isolated examples among the prevailing dull and rainy days that were the norm from early June onwards. The excessive rain and reduced temperature and sunlight in July would have had an obvious effect in depressing Odonata activity in 2007. While systematic details were not maintained in respect of visits made during 2004 – 2006 by observer it was apparent that activity was greater in the previous years.

Two other damselfly species were hoped for in the survey but no indications of presence were obtained. The Emerald Damselfly was one of these as the habitat appears suitable and it has been recorded in Co Dublin previously. In addition potential habitat exists, in area F, for the Scarce Blue-tailed Damselfly. This species has a widespread distribution in Ireland, but remains localised where present due to specific habitat requirements.

Several other dragonfly species could potentially breed in the wetland. The Amber-winged Hawker was noted once during fieldwork but there was no trace of the other, the Common Hawker. The latter breeds in Co Dublin and was noted in Portmarnock area (c 1km from Sluice Marsh) in 2006.

Knock Lake may be quoted as an example of a good habitat for Odonata elsewhere in Fingal and two recent immigrants breed there - the Emperor and Lesser Emperor. These insects were recorded for the first time in Ireland in the DragonflyIreland surveys 2000-03. Both are southern European species and were found in Cork and Wexford initially – their range expansion being assumed to be linked to global warming. In 2004 the Emperor was first recorded at Knock Lake while the Lesser Emperor was first seen there in 2005. Strong circumstantial evidence of successful breeding of both species at the site exists. Simultaneously the Black-tailed Skimmer has successfully colonised Knock Lake as part of an eastwards expansion of its hitherto westerly distribution in Ireland.

These species all prefer open expanses of still water that are present at Knock Lake but largely absent from the Sluice Marsh. Plant succession at this latter site is gradually removing suitable breeding habitat for the majority of species. Area B, for example, is losing surface water visibly on an annual basis. The current state of the vegetation is favourable to a species such as Ruddy Darter but even this will pass as tree growth increases and takes the place of marsh plants.

7. CONCLUSION

The evidence from this survey is that the study area is a unique habitat in Fingal, one in which the ecology is very little affected by man and subject to natural processes related to tide and time. The eastern part is the natural hinterland of Baldoyle Bay and the only location of a brackish grazing marsh in the area. It contains several very rare plant species, the curved hard grass *Parapholis incurva* (to be protected) and meadow barley *Hordeum secalinum* (currently protected) being the main ones and acts as a feeding and resting area for the birds more generally seen in the Bay. Here at high tide in winter brent geese, black-tailed godwit, teal and curlew may be found, occasionally with bar-tailed godwit, lapwing and redshank. Herons and little egrets frequent the river and the kingfisher is regularly seen. In summer the extent of each habitat allows a diverse fauna to exist including, amongst the birds, water rail and snipe which require large habitat areas, as well as grasshopper warbler, whitethroat and stock dove. The butterflies and dragonflies are representative of the habitats without unusual species. The size of the site allows the possibility of habitat management to increase these groups. Mammals are limited in variety though the wet woodland has good potential for feeding bats if sufficient roosts are available for breeding.

It is clear that the two sections, east and west, cannot be separated in terms of ecological value; they are both worthy of designation and any other protection that is available. Although processes of change are slow there may come a time when site management will be required to retain the current habitat diversity. For example grazing is important in the eastern half and should not be terminated without proper study. Opportunities exist for management to further diversify the habitat, in particular to create small waterbodies for insect life, to allow wetter areas to develop in the eastern fields (for waders) and to limit the spread of the giant hogweed, at present confined to the SW margins. All these activities would increase the carrying capacity of the area for native species and add to its relative importance within the county.

Human access at present creates few problems for the flora and fauna though shooting is a negative influence. At the same time there is little use made for education or public enjoyment and there are opportunities to develop this considerably. School use may initially be most appropriate as it is limited in time and season and could be organised to minimise disturbance. Also access and ownership problems are less likely to arise. In the longer term the area has a high potential for educational and tourist use, with its inherent interest and also its position, close to population centres. Recent informal activities by local residents have been highly successful and a 'bio-reserve' with bird hides and dragonfly, butterfly and flora 'walks' would become a valuable feature of Fingal.

APPENDIX 1 – Botanical

Relevés

Results from four sub-samples each of 1m square in permanent plots. Figures in percentage cover. The compass readings give the rough location within the larger square.

Grazed saltmarsh – Irish grid reference 10 23676 43029

Species	NW	SW	SE	NE
<i>Agrostis stolonifera</i>	85	20	80	60
<i>Trifolium repens</i>	30	5	25	45
<i>Juncus gerardii</i>	10	40	5	5
<i>Festuca rubra</i>	5	5	-	5
<i>Puccinellia distans</i>	8	10	1	-
<i>Carex distans</i>	5	-	-	10
<i>Glaux maritima</i>	-	15	1	-
<i>Spergularia marina</i>	-	10	5	-
<i>Plantago major</i>	1	5	-	-
<i>Holcus lanatus</i>	-	-	-	15
<i>Alopecurus geniculatus</i>	-	-	5	-
<i>Poa trivialis</i>	-	-	-	5
<i>Poa annua</i>	-	1	-	-
<i>Potentilla anserina</i>	-	1	-	-
<i>Odontites vernus</i>	-	-	1	-
Bare ground	-	8	1	1

Ungrazed saltmarsh (Grid ref. 10 23230 42887)

Species	NW	SW	SE	NE
<i>Agrostis stolonifera</i>	70	20	30	50
<i>Juncus gerardii</i>	5	30	5	-
<i>Schoenoplectus tabernaemontani</i>	4	1	60	-
<i>Triglochin maritimum</i>	-	40	-	30
<i>Bolboschoenus maritimus</i>	10	-	-	5
<i>Alopecurus geniculatus</i>	8	5	-	-
<i>Ranunculus sceleratus</i>	1	1	-	1
<i>Eleocharis uniglumis</i>	10	-	-	-
<i>Festuca rubra</i>	-	-	-	10
<i>Juncus inflexus</i>	-	-	-	3
<i>Atriplex prostrata</i>	-	-	-	1
<i>Holcus lanatus</i>	-	-	-	1
<i>Poa pratensis</i>	-	-	-	1
<i>Potentilla anserina</i>	-	-	1	-
Bare ground/water				

Dry grassland (Grid Ref. 10 23401 43243)

Species	NW	SW	SE	NE
<i>Agrostis stolonifera</i>	30	20	15	15
<i>Holcus lanatus</i>	20	5	40	25
<i>Potentilla anserina</i>	10	15	-	25
<i>Ranunculus repens</i>	10	15	5	1
<i>Elytrigia repens</i>	5	10	15	-
<i>Trifolium repens</i>	5	2	30	-
<i>Poa trivialis</i>	5	10	-	15
<i>Carex hirta</i>	10	-	-	15
<i>Stellaria graminea</i>	2	-	2	5
<i>Rumex acetosa</i>	10	-	2	8
<i>Agrostis capillaris</i>	3	1	2	-
<i>Festuca rubra</i>	5	-	5	-
<i>Lolium perenne</i>	-	10	5	-
<i>Cerastium fontanum</i>	1	-	2	-
<i>Ranunculus acris</i>	5	-	-	-
<i>Plantago lanceolata</i>	-	-	5	-
<i>Lotus corniculatus</i>	1	-	-	-
<i>Trifolium pratense</i>	-	-	1	-

Species list on following page includes records made on this survey and those collected in NPWS files

Species list – higher plants (includes some data from NPWS files)

<i>Achillea millefolium</i>	<i>Equisetum fluviatile</i>	<i>Poa trivialis</i>
<i>Agrostis capillaris</i>	<i>Equisetum palustre</i>	<i>Polygonum aviculare</i>
<i>Agrostis stolonifera</i>	<i>Festuca arundinacea</i>	<i>Potentilla anserina</i>
<i>Alisma plantago-aquatica</i>	<i>Festuca pratensis</i>	<i>Potentilla reptans</i>
<i>Alnus glutinosa</i>	<i>Festuca rubra</i>	<i>Prunella vulgaris</i>
<i>Alopecurus geniculatus</i> ,	<i>Filipendula ulmaria</i>	<i>Puccinellia distans</i>
<i>Alopecurus pratensis</i> ,	<i>Galium aparine</i>	<i>Puccinellia maritima</i>
<i>Angelica sylvestris</i>	<i>Galium palustre</i>	<i>Pulicaria dysenterica</i>
<i>Anthoxanthum odoratum</i>	<i>Glaux maritima</i>	<i>Ranunculus acris</i>
<i>Apium graveolens</i>	<i>Glyceria fluitans</i>	<i>Ranunculus baudotii</i>
<i>Apium inundatum</i>	<i>Glyceria notata</i>	<i>Ranunculus flammula</i>
<i>Apium nodiflorum</i>	<i>Heracleum</i>	<i>Ranunculus repens</i>
<i>Arrhenatherum elatius</i>	<i>mantegazzianum</i>	<i>Ranunculus sceleratus</i>
<i>Aster tripolium</i>	<i>Hippuris vulgaris</i>	<i>Rorippa nasturtium-</i>
<i>Atriplex prostrata</i>	<i>Holcus lanatus</i>	<i>aquaticum</i>
<i>Baldellia ranunculoides</i>	<i>Hordeum secalinum</i>	<i>Rosa canina</i>
<i>Bellis perennis</i>	<i>Hypericum tetrapterum</i>	<i>Rubus fruticosus</i>
<i>Bolboschoenus maritimus</i>	<i>Hypochoeris radicata</i>	<i>Rumex acetosa</i>
<i>Brachypodium sylvaticum</i>	<i>Iris pseudacorus</i>	<i>Rumex conglomeratus</i>
<i>Bromus hordeaceus</i>	<i>Juncus acutiflorus</i>	<i>Rumex crispus</i>
<i>Callitriche obtusangula.</i>	<i>Juncus ambiguus</i>	<i>Rumex sanguineus</i>
<i>Callitriche stagnalis</i>	<i>Juncus articulatus</i>	<i>Salix cinerea</i>
<i>Caltha palustris</i>	<i>Juncus conglomeratus</i>	<i>Salix fragilis</i>
<i>Calystegia sepium</i>	<i>Juncus effusus</i>	<i>Samolus valerandi</i>
<i>Carex distans</i>	<i>Juncus gerardii</i>	<i>Schoenoplectus lacustris</i>
<i>Carex disticha</i>	<i>Juncus inflexus</i>	<i>Schoenoplectus</i>
<i>Carex flacca</i>	<i>Lathyrus pratensis</i>	<i>tabernaemontani</i>
<i>Carex hirta</i>	<i>Lemna minor</i>	<i>Scrophularia auriculata</i>
<i>Carex nigra</i>	<i>Lemna trisulca</i>	<i>Senecio aquaticus</i>
<i>Carex otrubae</i>	<i>Leontodon autumnalis</i>	<i>Senecio erucifolius</i>
<i>Carex panicea</i>	<i>Ligustrum vulgare</i>	<i>Senecio jacobaea</i>
<i>Centaurea nigra</i>	<i>Lolium perenne</i> ,	<i>Solanum dulcamara</i>
<i>Cerastium fontanum</i>	<i>Lotus corniculatus</i>	<i>Sparganium erectum.</i>
<i>Cirsium palustre</i>	<i>Lychnis flos-cuculi</i>	<i>Spergularia marina</i>
<i>Cirsium vulgare</i>	<i>Lythrum salicaria</i>	<i>Stellaria graminea</i>
<i>Crataegus monogyna</i>	<i>Mentha aquatica</i>	<i>Torilis japonica</i>
<i>Cynosurus cristatus</i>	<i>Myosotis laxa</i>	<i>Trifolium dubium</i>
<i>Dactylis glomerata</i>	<i>Odontites vernus</i>	<i>Trifolium micranthum.</i>
<i>Dactylorhiza fuchsii</i>	<i>Parapholis incurva</i>	<i>Trifolium pratense</i>
<i>Dipsacus fullonum</i>	<i>Persicaria maculosa</i>	<i>Trifolium repens</i>
<i>Eleocharis palustris</i>	<i>Phalaris arundinacea</i>	<i>Triglochin maritimum</i>
<i>Eleocharis uniglumis</i>	<i>Phleum pratense</i>	<i>Triglochin palustris</i>
<i>Elytrigia repens</i>	<i>Phragmites australis</i>	<i>Typha latifolia</i>
<i>Epilobium hirsutum</i>	<i>Plantago lanceolata</i>	<i>Ulmus procera</i>
<i>Epilobium obscurum</i>	<i>Plantago major</i>	<i>Urtica dioica</i>
<i>Epilobium palustre</i>	<i>Plantago maritima</i>	<i>Vicia cracca</i>
<i>Epilobium parviflorum</i> ,	<i>Poa annua</i>	
<i>Equisetum arvense</i>	<i>Poa pratensis</i>	

APPENDIX 2 Butterflies

Transects

The following transects were established and assigned the numerals 1 to 6 for reporting purposes. Where possible transects follow a straight line and to minimize disturbance existing tracks or paths were used. However in some instances this was not possible due to topographical or vegetative features. The transects are described hereunder and GPS co-ordinates given. Codification of habitat type is taken from 'A Guide to Habitats in Ireland – Fossit 2000'.

Transect 1: (GPS N53°25.244' W006°08.773' to N52°25.275' W006°08.758'):

Runs from south to north parallel to a hedgerow (WL1) with abundant bramble, alder and hawthorn. Crosses a small area of standing water after 10 metres and continues through along an area of semi-improved wet grassland (GS4) containing Silverweed, dock, knapweed, thistle ssp and nettle ssp. Grazing by horses is a feature here.



Transect 2: (N53° 25.266' W 006° 08.921' to N53° 25.232' to W 006° 09.008')

Runs in a south-westerly direction from a hedgerow (WL1) to cross a field of wet grassland (GS4) containing large area of Meadowsweet. Bird's-foot trefoil, juncus, clovers, Silverweed and teasel present also. Hedgerow consists of willow with willowherb, bindweed and nettle also present. Some very light or occasional grazing by horses is apparent here.



Transect 3: (N53° 25.329' W006° 09.004' to N53° 25.333' W006° 08.944')

Runs in a south-easterly direction from an area of tall-herb swamp (GM1) through wet grassland (GS4), with perhaps some elements of marsh (GM1) also included. Spotted orchid species, *juncus* and other grasses are present here along with clover, silverweed, trefoil and Ragged Robin. Minimal grazing apparent.



Transect 4: (N53° 25.422' W006°006° 08.902' to N53°25.401' W006° 08.835')

Runs in an easterly direction through an area of tall-herb swamp with dry ground intermittently present. *Juncus* species and coarser grasses predominate with Cock's-foot, clover and Marsh thistle also present. Grazing negligible here.



Transect 5: (N53° 25.395' W006° 08.777' to N53° 25.487' W006° 08.791')

Runs in a northerly direction parallel to a hedgerow (WL4) through an area of semi-improved grassland (GS) that is grazed frequently by horses. Hedgerow consists primarily of alder with some blackthorn and hawthorn. Fine grasses, thistle ssp, silverweed, dock and willowherb present.



Transect 6: (N53° 25.307' W006° 08.510' to N53° 25.251' W006° 08.567')

Runs along the river bank in a largely south-easterly to easterly direction. Area is semi-improved grassland (GS) with plentiful Ragwort, thistle, white clover, common nettle and umbellifers. Adjacent hedgerow is a mix of alder and hawthorn. Area is grazed frequently by horses and rabbits.



APPENDIX 3 – Odonata

Species Accounts

Azure Damselfly *Coenagrion puella*

Description

Males are coloured black and variegated blue with the females being coloured black and green. This species is superficially similar to both the Common Blue and Variable Damselflies but exhibits much narrower antehumeral stripes than the Common Blue. Close examination will also show the U-shaped mark on the topside of the abdominal segment which differentiates from the Variable. Larval development cycle is normally one year but significant elements of population can extend this to two years. Emergence is generally in mid-May to mid June with flight season extending to mid-August.



Habitat

Inhabits a wide range of waters but shows a distinct preference for smaller sheltered ponds. It will tolerate eutrophic sites but is sensitive to pollution.

Sluice Marsh Status

Adults mainly noted during visits; no indications of teneral, tandems or ovipositing noted. However one immature male was noted and is an indicator of probable breeding. This species was noted in only the areas C, D and E of site as follows;

Visit 1: One adult male in areas C & E: Total 2

Visit 2: One adult male and one adult female in area C; one immature adult male in area D: Total 3

Visits 3 & 4: Not recorded

Visit 5: One adult female area D: total 1

Irish Status and Conservation

Most common along the Shannon system and the drumlin belt of north Leinster/south Ulster. Outside of these core areas the species is less likely to be encountered and there are large gaps in distribution in both Connacht and east Leinster. The species does not appear to have been recorded in the survey area during DragonflyIreland but reference to occurrence during the period 1980-99 appears to exist. This species also occurs at Knock Lake.

Comment

This species has not been recorded by me during visits since 2002; its presence in previous years may indicate that this year's occurrence (and likely breeding) is not linked to increasing eutrophication. Increases in population for this species at local level have tended to be associated with decreases in the next species, due to increased eutrophication, and this association is one that should be monitored.

The presence of this species during survey may be an indicator that it has always occurred here in small numbers, and this would echo the earlier records. However given the apparent absence in recent years some recolonisation due to habitat change may be involved.

Variable Damselfly *Coenagrion pulchellum****Description***

A slender blue and black coloured species which is not dissimilar from the related Azure Damselfly, also found in Sluice Marsh. The most reliable field characteristic is the gap in the males' antehumeral stripes which generally gives them the appearance of exclamation marks. In addition this species appears more black than blue when viewed. It is not a territorial species and requires a minimum temperature of 12 degrees centigrade for flight to be possible. A one year cycle is the norm for this species but can be extended to two years if circumstances dictate. Emergence generally commences in May and extends throughout flight season which lasts into August.

***Habitat***

Essentially a species of lowland and still waters this is a characteristic species of fens, small lakes and ponds. While found in reduced numbers at eutrophic wetlands it is more frequent at mesotrophic ones.

Sluice Marsh Status

This species was noted on all visits as follows:

Visit 1: Two adult males and one adult female in area C; 4 adult males in area F: Total 7

Visit 2: One adult male in area C; 3 and one female in D; One adult male in E; pair in tandem in area F: Total 8

Visit 3: Single adult males in areas C and D; single immature in D; pair in tandem ovipositing in D. 2 males in F: Total 7

Visit 4: 3 males in area F was only record

Visit 5: 4 males and 1 immature in area C; 5 immatures, 3 adult males in area F; Total 13

Irish Status and Conservation

This is a species whose Irish distribution is concentrated along the Shannon Basin and Lough Neagh areas. Though recorded at Knock Lake during DragonflyIreland it was not noted at Sluice Marsh. Though no reliable trend indicators are available at national level, local declines, linked to increased eutrophication, have been observed.

Comment

This species is more common than previous one in survey area and has been recorded in the previous three years also. At present it does not appear to be in decline at site but, in light of comments for above species, monitoring would be prudent.

Common Blue Damselfly *Enallagma cyathigerum****Description***

Another blue and black damselfly this species is broader and more robust than the previous two and is easily told apart from them in the field by its wider antehumeral stripes. This species normally has a one-year life cycle but under severe circumstances extension to 4 years has been recorded in Europe. Emergence is continuous from May onwards and can be seen until September in some years.

***Habitat***

Found in a wide range of water types this species does show a preference for the presence of still and open water.

Sluice Marsh Status

Noted only in areas C and D as follows;

Visit 1; 1 adult male in C and 2 adult males in C and 1 adult male and 1 adult female in area D: Total 5

Visit 2; 1 adult male in C

Visit 4; 1 teneral in C and adult male in D

Irish Status and Conservation

Common and widespread, especially in habitats with large open water areas containing beds of submerged vegetation. During DragonflyIreland it was the second most widespread damselfly recorded in the country. It is frequently recorded at Knock Lake and can be abundant at that site.

Comment

This species was recorded in lower numbers than expected during the survey having regard to patterns of occurrence in the previous three years. While the site does not contain the preferred large areas of open water, the existence of some open water might have led to more being expected. The extent to which apparent decline is a once-off occurrence or is linked to obvious increase succession needs further exploration.

Blue-tailed Damselfly *Ischnura elegans***Description**

This is a slight species, noticeably thinner than other species above. The male is predominantly black with a single segment, S8, being coloured blue when seen from above. Females occur in a variety of forms that vary with age and no frequency distribution exists in Ireland for these forms. The form *violacea* appears frequently in the Sluice population. No information exists for lifecycle in Ireland but in the UK a one-year cycle obtains in southern England which extends to two years in northern England and Scotland.

**Habitat**

This species can be found at virtually every freshwater type below 200 metres including brackish waters.

Sluice Marsh Status

This was the species of odonata most frequently encountered during the survey. It was present in all areas and was the only damselfly found in areas A and G. The peak count was in area A on visit 2 when a total of 57, including many tandem pairs, was noted. All stages including teneral were noted during all visits. In area G numbers observed ranged from 2 adults on visit 1 to 5 adults on visit 4. Teneral were also noted in this area on visits 4 and 2. These observations are in line with those of previous years and the population of the area appears stable over this period.

Irish Status and Conservation

This is the most widespread of Irish odonata and the Sluice survey bears this out. It is frequently encountered in Knock Lake and during times of peak emergence can be extremely abundant there.

Comment

Given the frequency with which this species is found in survey area there appears to be no problems with the population on the site. Its peak occurrence in area A and its occurrence in G is indicative of the species ability to use a wider range of water types than other damselflies.

Amber-winged Hawker *Aeshna grandis****Description***

This is a large dragonfly and is easily identifiable due to its overall brown colouring which gives it its alternative name of Brown Hawker. It is not prone to disturbance by people and is one of the easiest dragonflies to observe. In western Europe emergence takes between 2 and 4 years with peak emergence occurring in July.

***Habitat***

This species is found in small lakes and fens and other non-flowing waterways such as the canals in Dublin.

Sluice Marsh Status

This species was observed only once during survey; an adult in area G during visit 5. This is the first time it has been recorded from survey area by observer in recent years. Though not recorded during DragonflyIreland either there is an earlier record from the period 1980 – 99. Given the presence of a single specimen breeding cannot be assumed although the possibility of local emergence may exist, however as this species is one of the more obvious odonata, presence in recent years would likely have been detected.

Irish Status and conservation

This species is primarily found along the Shannon Basin and the drumlin belt of south Ulster. A noticeable gap in distribution occurs in north-east Leinster in the DragonflyIreland survey and the species was not recorded from Knock Lake during this work. However it is now present and breeding there so some range expansion is apparent since 2000-03.

Comment

The presence of a single specimen does not allow for much interpretation but the colonisation of Knock Lake in this regard may be interesting. The species is found along the canals in Dublin and also is found along the River Liffey at Lucan. It may be the case that some range expansion is still in train at present but given the succession occurring at Sluice Marsh this may not be successful in survey area.

Four-spotted Chaser *Libellula quadrimaculata***Description**

A medium-sized, stocky dragonfly with little gender dimorphism. Adults are largely black and brown in body colour with lateral yellow markings along the segments. It is a very active dragonfly and aggressive in defence of its territory, often the first sign of presence is the sound of its wings beating against vegetation.

**Habitat**

Though this species is found in most types of still water a preference is shown for oligotrophic and acid waters, particularly those found on bogs. Rivers and streams tend to be avoided and it is not thought to breed in such waters. The presence of tall stands of vegetation to provide perching places is also a requirement.

Sluice Marsh Status

Adults found in areas B, C and E on all visits as follows;

Visit 1; 1 adult in B & E, 2 in C. Total 3
Visit 2; 2 adults in B, 2 in C, 1 in E. Total 5
Visit 3; 1 in C & B, 4 in E. Total 6
Visit 4; 1 in areas B, C & E. Total 3
Visit 5; 6 in area B, 1 in area C and 2 in area E.

In addition newly emerged specimens were noted as follows;

Visit 1; 1 in area B
Visit 6; 2 in area B and 1 in area E

Oviposting was also noted in area C on visit 2.

Irish Status and Conservation

This is one of the more widespread dragonflies in Ireland but it does have a predominantly northern and western distribution and there are significant gaps in its southern and eastern distribution. It does not appear to have been recorded in Co Dublin during the DragonflyIreland survey from 2000 – 2003 but is now breeding at Knock Lake.

Comment

This species appears at present to have a small but sustainable population in the survey area. It is concentrated in the areas of existing open water and its future sustainability in the area is linked to the rate of succession of these areas.

Ruddy Darter *Sympetrum sanguineum***Description**

A small dragonfly, this species is told from other darters by the male's waisted abdomen and all black colouring of the legs of both sexes. Mature males have a deep red colouring while females are yellowish in colour. Larval lifecycle is generally one year and diapause may be used. Emergence occurs from late June to September and the flight season can extend into late autumn.

**Habitat**

Primarily found on natural wetlands with a preference for shallow mesotrophic, to slightly eutrophic, waters that are well vegetated.

Sluice Marsh Status

This is the dragonfly species that was most frequently encountered during the survey period and was found in most areas as follows;

Visit 1; 1 male, 2 females and 7 immatures in area B; 3 males and 2 immatures in area C; 1 female and 4 males in area D; 2 immatures in area E; 1 male and 1 female in area F. Total 24

Visit 2; 4 males, 1 female and 12 immatures in B; male and female ovipositing in tandem in C, 1 immature; 5 immatures in D; 1 female and 11 immatures in E; 2 males and 1 immature in F. Total 40

Visit 3; 1 male in A; 1 male and 14 immatures in B; 5 males, 3 females and 7 immatures in C; 4 males & 2 immatures in D; 1 male in E; 1 male and female in F. Total 39

Visit 4; 7 males, 3 females and 8 immatures in B; 2 females & 4 immatures in C; 2 males, 3 females and 16 immatures in D; 4 immatures in E; 2 males and 4 immatures in F. Total 55

Visit 5; 2 immatures in A; 2 males and 12 immatures in B; 4 males and 9 immatures in C; male and female ovipositing in tandem, 3 immatures in D. 10 immatures in E; 1 male and 1 female in F. Total 46

Irish Status and conservation

This distribution is largely in the midlands and east of the country; reflecting its preference for base waters and avoidance of the more oligotrophic waters of the north and west. Although an earlier record, of one individual exists, it was not recorded from the site during DragonflyIreland nor was it recorded from Knock Lake. However it has also been recorded regularly, though in smaller numbers than above, at Knock Lake in recent years. There are no indications of any threat to its status at present.

Comment

This species preference for shallow, well-vegetated water is obviously well met in survey area. As well as laying eggs in water this species will also lay in vegetation beside water that is damp or prone to inundation. While not a problem in 2007 these aspects make it vulnerable to drought and, in the longer-term, to succession and encroachment of terrestrial vegetation.

Common Darter *Sympetrum striolatum***Description**

This species is superficially similar in size and colouration to the previous one but males have a more orange-red colouration and unwaisted abdomen. Both sexes lack the all-black legs of the former – showing a yellowish stripe on the outermost aspect. Development is generally a year and emergence occurs from mid-June onwards. In some years this may extend until October if temperatures permit.

**Habitat**

Found in most water types, including brackish ones, and can tolerate all but the most polluted ones. It is also known to wander far from water and can be found hunting in pondless gardens, hedgerows etc.

Sluice Marsh Status

This species was encountered in all the areas in the survey. Additionally it turned up, both adults and immature, in all types of habitat in the general area such as hedgerows and grassland. Because of this site-specific counts are probably not as important or relevant as they are for previous species above. However adults and immature were noted in areas A to G inclusive. It was the only darter found in area G and details from visit 5 are shown below for illustration;

Visit 5; 8 males; 4 females & 18 immatures.

Irish Status and Conservation

This is the most abundant and widespread Irish dragonfly, found in a wide variety of habitats. It was recorded in 719 10km squares during DragonflyIreland and is not considered to be under threat at present.

Comment

This species, though common at site, is not as abundant as the Ruddy Darter whose specific habitat requirements are more obviously met. Nonetheless, as a generalist, its requirements seem to be met at site and no threat would appear to be apparent in medium-term.