

10 Flora and Fauna

10.1 Introduction and Brief

The Aquatic Services Unit, University College Cork, was requested by Arup Consulting Engineers to undertake a flora and fauna impact survey of a proposed development site on the Barnahely/Ringaskiddy Peninsula in the townland of Ringaskiddy, Co. Cork. In fulfilment of the study, the Aquatic Services Unit undertook a survey of the flora, birds and mammals of the proposed development site, the fieldwork for which was carried out in May and June 2001. A field survey of insects was undertaken by the Aquatic Services Unit in September 2001. The Aquatic Services Unit was not requested to assess the impacts of emissions, which might arise from the site. Aquatic Services Unit was provided with an appraisal of construction phase activities in order to assist in their analysis of impacts.

This chapter presents the reports of the flora and fauna surveys of the site, undertaken by the Aquatic Services Unit. The areas in the vicinity of the site, which are designated for protection under the EU Habitats Directive, the EU Birds Directive and the Wildlife Act are listed and the potential impact of the waste management facility on these areas is addressed. The chapter concludes with a description of the mitigation measures, which Indaver Ireland proposes, and the residual impacts.

10.2 General Site Location and Description

The site is a long, east-west rectangle sandwiched between the Ringaskiddy Road to the north and lands containing the Martello Tower to the south. The higher southern portion of the site is separated from the lower northern portion of the site by a very steep strip of sloping ground. Much of the area, which was probably farmed in the past, is now largely overgrown by Gorse and Bramble scrub (especially toward the east) with areas of overgrown Hawthorn and deciduous woodland (west-center). On the north central and northwestern portion of the site, on the lower ground adjoining the road, a number of fields are under grazing or arable agriculture. Rough grazing also exists along the southern site boundary along the high ground. The centre of the site is presently occupied by a scrap metal business. Refer to Figure 10.1.

The site is bounded by the West Channel separating the Ringaskiddy mainland from Spike Island. There is a narrow shingle beach here with steep earthen cliffs. Immediately to the south the land is used for pasture and to the north across the Ringaskiddy Road the land comprises port-related commercial properties and waste ground with a variety of invading vegetation types. Land-use in the peninsula as a whole, which juts into Lower Cork Harbour, comprises mainly pasture fields subdivided by Hawthorn and Bramble hedgerows with varying levels of tree cover and a number of large manufacturing concerns, mainly involved in pharmaceuticals.

10.3 Flora

10.3.1 Site Description

The development area comprises an area of pasture, scrub and scrub wood to the east of Ringaskiddy village. The site occupies an area of level ground, which has been excavated from a

former hillside and an escarpment area above this area of flat ground. The soil removed from the hillside has been used for land reclamation purposes elsewhere in the Ringaskiddy area and the escarpment which runs east-west at the site is not a natural geomorphological feature.

10.3.2 Survey of Flora

The site was surveyed on 10 June 2001. Nomenclature used in the report follows Stace (1991) for vascular plants and ferns and Smith (1978) for mosses.

The main focus of the survey was the description of the flora of the areas of semi-natural habitat, which may be impacted upon during the construction phase of the proposed Waste Management Facility. Characteristic species compositions are described in the text. The survey concentrated on areas of the site, which will be most affected by the construction phase. To facilitate the presentation of results, the survey area has been divided into 7 Areas, which are shown in Figure 10.1.

The flora encountered in each of the areas surveyed, are listed in tables which have been included in Appendix 10.1 of this report.

10.3.3 Evaluation of Principal Vegetation Types

The development site supports 4 principal habitat types, Mesotrophic Grassland of slightly basic circum-neutral to slightly acid soils, Mixed Scrub Woodland, Gorse Scrub, and Hedgerows.

The grassland types can be best described as representative of 3 principal vegetation associations, the *Centaureo-Arrhenatherum* (O' Sullivan 1965), the *Centaureo-Cynosurus cristati* (Braun-Blanquet and Tüxen 1952) and the *Lolio-Cynosuretum cristati* (Braun-Blanquet and De Leeuw 1936), or as mosaics of these associations.

The extreme eastern area of the site area (Area 4) supports the most representative community of the *Centaureo-Arrhenatherum* but this vegetation community often with co-dominant *Dactylis glomerata* is found throughout the areas of grassland at the site Areas 1, 2, 4, 5, 6 and 7. This community most often supports rank species-poor ungrazed grassland on free-draining mesotrophic soils (Rodwell 1992). The grass *Arrhenatherum elatius* is most often associated with coarse grasses of the *Molinio-Arrhenatheretea*, *Dactylis glomerata* and *Holcus lanatus*, tall herb species such as *Urtica dioica* and *Heracleum sphondylium* are also common (Rodwell *op. cit.*). Such community structures are similar to those found at the Ringaskiddy Site. This community is rather species poor and is of very common distribution in Ireland and is therefore not of high conservation interest.

However a sedge (*Carex divulsa*), which is of rare to occasional distribution in Ireland is found in association with the *Centaureo-Arrhenatherum* at the Ringaskiddy development site, Area 4. The occurrence of this sedge adds significantly to the conservation interest of this area (Area 4) of grassland at Ringaskiddy (see Mitigation Measures below).

Communities best represented by *Centaureo-Cynosurus cristati* (Braun-Blanquet and Tüxen 1952) and the *Lolio-Cynosuretum cristati* (Braun-Blanquet and De Leeuw 1936) form the base floristics of the other more species rich less rank grassland communities of the site, Areas 1, 2, 4, 5, 6 and 7. These vegetation communities are characterised by species such as *Centaurea nigra*, *Lotus corniculatus*, *Luzula campestris*, *Leucanthemum vulgare*, *Anthoxanthum odoratum*, *Trifolium repens*, *Trifolium pratense* and *Rumex acetosa*, *inter alia* (Rodwell 1992) together with



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<p>Habitat Types (Flora)</p>	<p>Figure No : 10.1</p>

grass species such as *Cynosurus cristatus*, *Festuca rubra* and *Lolium perenne*. These species are of widespread distribution at the site, and occur in Areas 1, 2, 4, 5, 6, and 7.

More heathy stands of the *Centaureo-Cynosurus cristati* and the *Lolio-Cynosuretum cristati* support species such as *Calluna vulgaris*, *Polygala serpyllifolia* and *Veronica officinalis* inter alia; such variants occur in Area 5.

Damper stands with species such as *Poa pratensis*, *Poa trivialis*, *Potentilla anserina*, *Lotus uliginosus* and *Agrostis stolonifera*, inter alia occur in Areas 1, 2 and 6.

Species compositions more typical of low sward *Centaureo-Cynosurus cristati* and *Lolio-Cynosuretum cristati* occur in Areas 4, 5, 6 and 7.

The *Centaureo-Cynosurus cristati* and the *Lolio-Cynosuretum cristati* communities are not nationally rare unimproved grassland types but because of the general loss of such semi-natural grassland habitat in recent times the conservation interest of such areas has increased.

The food plant of the Burnet Moth, *Lotus corniculatus*, occurs profusely at the site and many moths were observed during the survey. The areas of scrub wood have a good native mix with *Quercus petraea* x *robur*, *Fraxinus excelsior*, *Sorbus aucuparia*, *Sambucus nigra*, *Ilex aquifolium*, *Salix cinerea*, *Crataegus monogyna*, *Prunus spinosa*, inter alia, regenerating very well. Other non native species such as *Buddleja davidii* and *Acer pseudoplatanus* also occur but will not negatively effect the regeneration of a semi-natural woodland and vegetation to the west of the site (Area 3).

As yet the ground flora layer of the woodland is poorly developed because of the open structure of the woodland, with a ground cover dominated by *Pteridium aquilinum* and *Rubus fruticosus* agg. However, it is expected that as the woodland area matures, a good woodland structure will develop naturally. Because of the immaturity of the scrub-woodland stand no phytosociological classification can be put forward for it.

Gorse *Ulex europaeus* is extremely common in Ireland. Therefore, the areas of scrub Gorse at the development site is of little intrinsic botanical or conservation interest. The Gorse scrub, however provides habitat and cover for birds (e.g. stone chat observed at site) and mammal species and may be more important in this context. Gorse scrub occurs in Areas 4, 5, and 7.

The hedgerows at the site are for the most part overgrown (by *Ulex europaeus* and *Rubus fruticosus* agg.) and badly maintained and of general low conservation interest.

The western boundary of the site, which supports mature *Fraxinus excelsior* (Ash), is the hedgerow of most significant conservation value. All other hedges on the site are of poor conservation value.

No red data list or protected plant was found during this survey.

10.3.4 Impact and Mitigation

The main impact of the Development at Ringaskiddy will occur to the east and due north of the present Hammond Lane industrial precinct and will lead to loss of vegetation of 90-100% over Areas 1, 2, 4, 5 and 7. These areas support some of the areas of best representation of the mesotrophic grasslands at the site. This habitat will invariably be lost during the construction

phase. However, the vegetation communities while of some conservation value are not nationally rare or scarce (i.e. the Centaureo-Arrhenatherum Centaureo-Cynosurus cristati and Lolio-Cynosuretum cristati), and are in fact among the most common of our semi-natural grassland types.

It is however, recommended that the uncommon sedge (Webb 1977), *Carex divulsa* should be transplanted from Area 4 to another favourable area of habitat in the Ringaskiddy area in order to conserve it in the area.

The other areas, Areas 3 and 6 will be very little impacted by the development, as they will remain largely undisturbed. These areas afford opportunities for maintaining a level of natural interest at the site.

The management of the remaining areas of semi-natural grassland at the site should be optimised to favour the emergence and maintenance of a species rich sward with an appropriate mowing and grazing regime. It is recommended, therefore, that a formal management plan be drawn up to optimise the native species diversity of this and other areas of the site which will remain unaffected by the development. The area of scrub wood could be developed as an area of native woodland and planted with an appropriate mix of native species Oak, Ash, Holly etc. It is recommended that non-natives be removed from this area of wood to increase the natural interest of the site.

'Landscaping' of any sort, which would entail the removal of, and of the native vegetation in those areas, which will not be affected by the development, should be avoided and non-native species should not be introduced to these areas.

10.4 Fauna - Mammals

10.4.1 Introduction

The site was visited and work done on the 25, 28 of May and 1, 2 and 3 of June 2001. The area was searched for signs of medium sized mammals and trapped (30 trap nights) for small mammals. Results are divided into medium sized mammals found, small mammals found and recommendations. Mammals found on the site are indicated by underlining in text and listed in recommendations. There are no rare mammals on the site, although some (bats) may visit it. Only one of the wild mammal species (badgers) that occurs on the site is protected.

10.4.2 Medium Sized Mammals

Rabbits (*Oryctolagus cuniculus*) are very common, with their tracks and signs found all over the site but in particular on grass. Indeed, the site is dominated by rabbit-grazed rough scrub and grassland, and rabbit grazing is likely to be responsible for the maintenance of this habitat. There are also a lot of 'garden-escape' plants, which give cover to the rabbits. These rabbits form the major prey for the foxes (*Vulpes vulpes*) and to a lesser extent the badgers (*Meles meles*), which also occur on the site. Badgers would predate the young rabbits in nests.

As there is a lot of furze scrub in the area and this type of habitat is known to harbour badger's setts (burrows) on Great Island, nearby. It was considered necessary that the entire site be intensively searched for such setts. Three setts were found - two not active and one active (Figure 10.2.). Elder (*Sambucus nigra*), a food plant of badgers is a shrub that is frequently found



Legend:

- - - Tracks
- Dens
- L Latrine of medium sized mammals
- B Above Ground Beds of medium sized mammals

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Figure Title : Locations of Mammal Burrows found

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at badgers' setts. Therefore efforts to find the setts were concentrated on areas where elder occurred. All three setts found were near elder. One of the non-active setts had one hole, it would therefore be classed as an outlier sett (for definitions see Smal 1993). The other non-active sett had two holes and would be termed a subsidiary sett, if active. The third sett was very active, had an associated latrine and above ground bed plus four (or more) active holes. This is classified as a main sett, and it occurs immediately west of Hammond Lane at the interface between area 2, which will be developed and Area 3, which will remain undisturbed.

There is a network of both fox, and badger tracks on the site, and both species breed and forage on the site. The fox earth (burrow) occurs in Area 4 (Figure 10.2) an area which will be approximately 95% covered, care should be taken when construction is being done that these animals do not gain access to buildings as this is undesirable for both people and the foxes. The fox earth is surrounded by prey remains, mainly of rabbits, but also butchered beef remains, clearly therefore these foxes are raiding rubbish nearby.

Table 10.1 Burrows of Medium Sized Mammals Found

Mammal Type	Location	Number
Rabbits	Many	All habitats
Foxes	One (breeding)	Willow scrub (Fig 10.2)
Badgers	Three, one active	Western scrub, under elder (Fig 10.2)

10.4.3 Small Mammals

On such a site wood mice (*Apodemus sylvaticus*) would be expected but none were trapped. Their number may be low due to competition with bank voles and the high numbers of predators on the site. Two bank voles (*Clethrionomys glareolus*), an introduced mammal, were trapped. These have been present in this area since between 1983-1992 (Smiddy & Sleeman 1994). No pest rodent species were found.

Pygmy shrew (*Sorex minutus*) is also likely to be present on the site, in areas of long grass. Bats may visit the site, at night like the swallows during the day, although there are no suitable roost sites for bats on the site.

10.4.4 Evaluation & Recommendations

The site is of medium interest with regard to wild mammals. The species found were; bank vole, rabbit, fox, and badger. Pygmy shrew and wood mice are also likely to be present. Badgers (which are fully protected by law) are without doubt breeding on the site. May-June is not an ideal time to search for setts, particularly this year with the extensive recent growth, and there may be more setts on the site that were missed, in particular there may be a sett in the Hammond Lane property which was not entered. There are badger paths leading under the fence into Hammond Lane. It is recommended that another search for setts be carried out in winter, if possible, when searching is easier due to the lack of foliage on trees and undergrowth.

There are a number of options for dealing with the presence of badgers on the site. One is allow the sett to remain and build around it. However, given that these setts tend to be very large labyrinths (Neal & Cheeseman 1999) this may not be possible. The badger might be persuaded to move to another sett nearby, if a suitable one exists. This would have to be done by a qualified person with expertise.

10.4.5 Impact

It is likely that when construction begins the foxes will have moved on. The badgers will remain, and may even return to the site even if the sett is removed. Therefore, the option of allowing the sett to remain should be examined. It is essential that the badgers have access to pasture well away from public roads if they are to survive. If some of the scrub on slopes were allowed to remain this would produce insects for bats and birds.

10.5 Fauna - Birds

10.5.1 Introduction

This report summarises the results of an ornithological survey of the receiving environment at a coastal terrestrial site at Ringaskiddy Co. Cork. The bulk of the habitats are situated on the north facing flank of an east- west running ridge that extends inland from the littoral of Cork Harbour. The land to the north is mostly flat but it rises steeply to the south. The southern extremity of the site, though forming the summit of the ridge, is again mostly flat and comprises relatively extensive meadows bordered by areas of bramble and gorse both of which are classical secondary succession species in County Cork. Overall, the bulk of the site is made up of abandoned farmland that has been mostly fallow for at least 30 years. There has been some industrial development adjacent to the site. Insofar as there is evidence of dumping parts of the site appear to have undergone periodic disturbance. A network of pathways would suggest usage of the area by the public.

The primary objective of the survey was to describe the breeding bird communities occupying the site, which is to undergo major industrial development. It must be noted however that the timing of the breeding bird survey was not optimal. Breeding bird surveys should commence in late March or early April and continue into June. This survey's data was collected over two days in June (June 13 and 21 2001) following a preliminary general site visit on 14 May. However, May and early June 2001 were notably cold and windy. Therefore, while the results should be treated with caution, it is possible that the breeding season was somewhat delayed because a majority of the expected species were found and most were in song or otherwise provided aural signatures through alarm calls.

10.5.2 Methods

Transect Method

The transect method (Bibby *et al.* 1992) was used to survey the breeding birds at the site. All bird species either heard (aural registration) or seen (visual registration) within 50m on either side (but exclusively in front of the observer) of the centre line of the walked transect were identified and counted. As it was necessary to return along the track of most of the transects any species not encountered in the original survey has been included for completeness. This involved only single individuals of two species.

Point Counts

The point-count method was employed at one copse-like site at the western end of the study area (Figure 10.3). Each point count lasted for 10 minutes. All bird species within 50m were recorded as either visual or aural registrations.

Sampling Programme

A total of 9 transects and one point count were undertaken (Figure 10.3). Transects 1 to 3 were in areas of disturbed meadow and were surveyed only once. Transects 4 to 9 and the point count site were each surveyed twice. All sampling was carried out from the late afternoon 1445 to approximately 2000 hrs.

Optical Instruments

Lieca 10* 42B binoculars and a tripod mounted Swarovski 15-60X telescope were used as appropriate.

Weather

Surveying was confined exclusively to days in which the weather conditions for surveying were excellent i.e. low wind speeds, zero precipitation and good visibility.

10.5.3 Results

A total of 31 species was recorded during the formal surveys (Appendix 10.2). Two additional species namely the Kestrel and Swift were recorded at other times. Some species though not recorded may be present at the site albeit in low numbers. These include the Treecreeper, Coal Tit and Mistle Thrush. An individual of the latter species was seen about 1km from the site. It is also possible that the area is visited by the Chough and by the Raven. The Sparrow Hawk, Merlin and Peregrine Falcon may also occasionally seek prey in this area (especially in view of the large number of pigeons) but no signs of these species or of owls were noted.

Some migrant species were also found to be absent- most notably the Blackcap and Cuckoo. The former species has a loud song and if present would have been detected. The Cuckoo is now a scarce species especially in areas of intensive agriculture. It is likely that wintering birds like the Redwing and Fieldfare visit this site as may Snipe and Woodcock though the habitat is not suitable for large numbers of the latter two species.

However, the breeding bird community at this site is interesting. Thus, while none of the species can be classified as rare or threatened some birds such as the Skylark, Linnet and Stonechat are believed to be in sharp decline (van Strein et al 2001). The Whitethroat though apparently increasing is only locally distributed in County Cork and the status of the Stock Dove (McLoughlin & Casey, 2001; Anon., 2001) remains uncertain. Breeding Shelduck are locally distributed around Cork Harbour and little is known of the effects on this species of intensification in agriculture, industrialisation and urbanisation. Although the Shelduck was heard at this site no proof of breeding was obtained. However, the habitat is ideally suited to this species.

As mentioned it is the avian community, which is notable at this site (see for example Lysaght 1989; Moles & Breen 1995; Holt 1996). The relatively high species diversity is associated with the structural complexity of the vegetation. There is flourishing ground layer, which merges into a low shrub layer dominated by bramble. This in turn grades into a gorse dominated sere which in some areas is replaced by a spatially restricted tree layer.

10.5.4 Evaluation of the Habitats for Birds

The combination of Stock Dove, Linnet, Skylark, Whitethroat, Reed Bunting and high densities of Stonechat and Dunnock though once relatively common in rural and especially coastal County Cork is now difficult to find. Therefore, this habitat complex, though effectively man-made is something of an ecological oasis and is a valuable site for birds.

10.5.5 Negative Impacts

Virtually all of the habitat within areas 1, 2, 4, 5 and 7 (as indicated in the botanical report) will be removed i.e. the areas surveyed by transects 1, 2, 3, 4, 5 and the eastern part of transects 6 and all of 9. The habitats surveyed in transects 6, (western part) 7 and 8 i.e. botanical areas 6 and 3 (inclusive of the point count area) will remain largely intact. While the carrying capacity of the entire site will be reduced for birds, the remaining conserved habitats should enable much of the existing bird community to remain extant.

10.5.6 Mitigation

The habitats, within which the proposed development is to take place, have become rarer and so the bird community resident there are notable for this reason. The remaining conserved habitats i.e. areas 3 and 6 (as indicated in the botanical survey) are of ornithological interest and therefore every effort should be made to retain its current ecological status. The grasslands (Area 6) and secondary successional (scrub/woodland) habitats (Area 3) will require proper management and professional assistance should be sought in order to achieve this.

10.6 Fauna - Insects (Butterflies, Moths and Dragonflies) Lepidoptera & Odonata

10.6.1 Methods

The study area was surveyed in generally dry, but cloudy weather, on the afternoon of 5th September 2001. On the evening of the following day moths were monitored at a mercury-vapour light-trap in a hollow near the north-east corner of the site. On the first occasion, sampling commenced in the relatively open north-eastern area, and proceeded southwards along the eastern margin of the scrub, adjacent to the thistle-dominated open area at the eastern end. *Lepidoptera* were sampled along the open corridor between areas of scrub westwards near the southern margin, both by netting and by direct observation. Leaf-mines (route taken by larvae when eating within leaves), were recorded mainly along the hedgerows in the south-western part of the site.

10.6.2 Results

In all, 30 species of *Lepidoptera* were recorded during two visits to the site. The total consisted of 5 species of butterfly & 25 species of moth (see Appendix 10.3). The single species of *Odonata* recorded, *Sympetrum striolatum*, is a ubiquitous and late-flying species, frequently found flying far from freshwater habitats. None of the species recorded on this site is of special conservation significance. The presence of two mainly coastal species, *Polyommatus icarus* and *Zygaena filipendulae* shows that the site has some of the characters of a coastal grassland habitat. Both these species feed on *Lotus corniculatus*, and are generally scarce at inland locations in county Cork, but all the remaining species are generally distributed in the surrounding area.



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= Point Count

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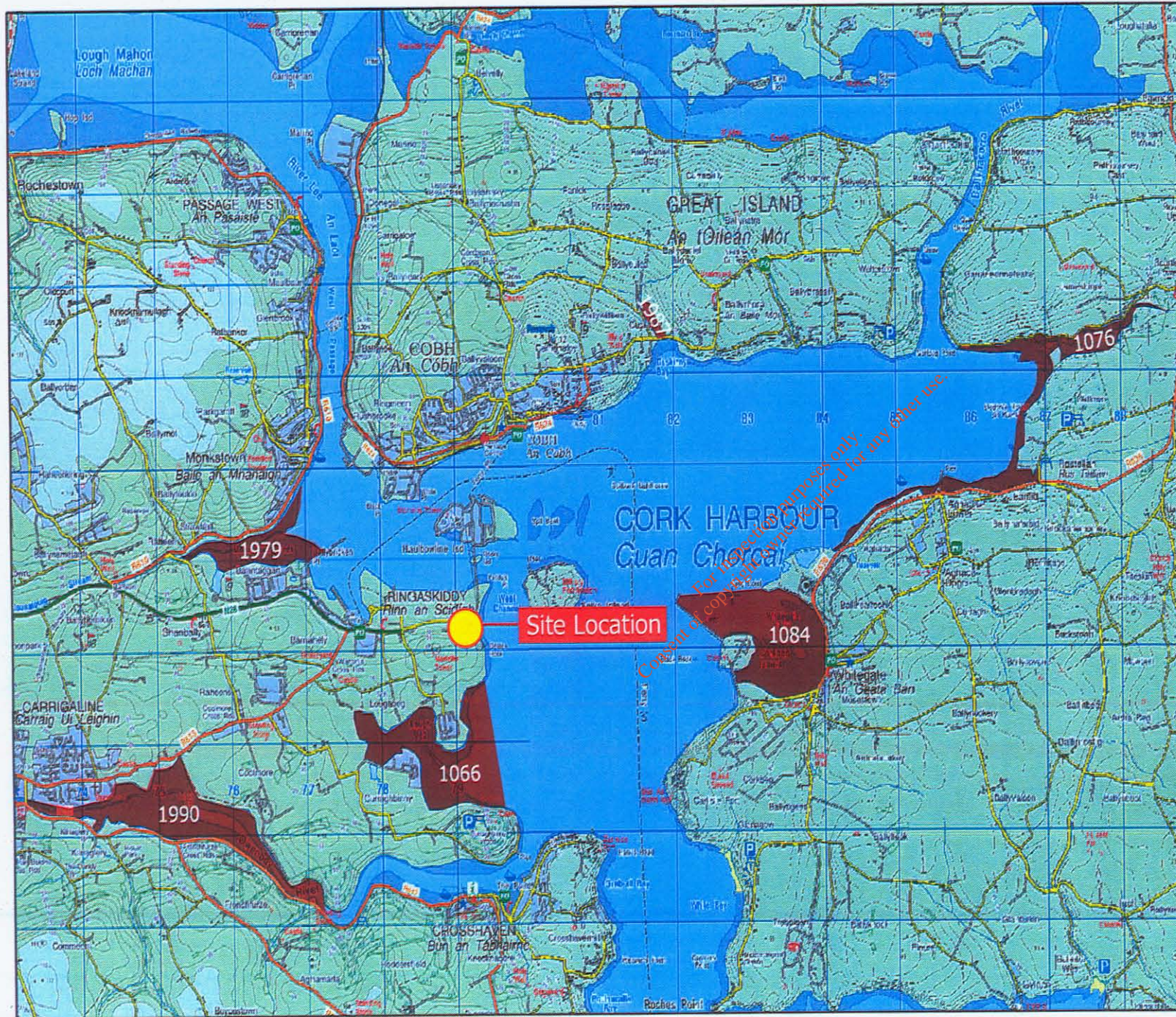
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Figure Title :
Bird Survey Transects

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10.3



No:	Location:
1066	Loughbeg
1076	Rostellan Lough, Aghada Shore and Poul nabibe River
1084	Whitegate Bay(proposed)
1979	Monkstown Creek
1987	Cuskinny Marsh

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Figure Title :
**Designated Areas in Lower
Cork Harbour Area**

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10.4

The survey was carried out late in the season, when many species of butterfly and moth have clearly ceased flying. While it is fully possible that some scarcer species have been missed as a result of late sampling, the species recorded strongly suggest that the site is of little entomological interest. This is probably a reflection of the previous history of the site, with disturbance of habitat, combined with the nature of the surrounding countryside with intensive farming combined with the entomologically uninteresting shoreline of low eroding cliff, with stones and mud along the shore.

10.6.3 Impact

The impact of the planned development will vary between different sections of the site (refer to Section 10.3.4). The loss of 90-100% of habitat in Areas 1 and 2 can be considered relatively unimportant, as there is little of ecological interest here, and at most this is restricted to some sections of hedgerow. Areas 3 and 6 contain what are probably the best areas of scrub and hedgerow on the site, but these areas will remain largely undisturbed. A much greater impact can be expected in Areas 4 and 7, the eastern part of the site, where a 95% loss of plant cover is foreseen. The loss of gorse here, is probably not significant, as gorse is common and widespread in the surrounding areas, and the three gorse-feeding species recorded (*A. nervosa*, *C. succedana* & *P. pruinata*) are common to abundant in Co Cork and beyond. The main impact here is likely to be on species of coastal grassland, such as *Z. filipendulae* and *P. icarus* and *S. chenopodiata*. The first two of these species are, however, known to occur in nearby localities, while *S. chenopodiata* is almost ubiquitous in grassy areas.

10.7 Designated Areas

The Irish Government proposes to designate sites for environmental protection under the European Union Natural Habitats Directive, 92/43/EEC, the European Union Birds Directive, 79/409/EEC, and the Wildlife Act. These are Special Areas of Conservation (SAC), Special Protection Areas (SPA), and Natural Heritage Areas (NHA), respectively. There are a number of proposed NHAs in the Lower Harbour. These are as follows:

- 001987 Cuskinny Marsh
- 001076 Rostellan Lough, Aghada Shore and Poul nabibe Inlet
- 001084 Whitegate Bay proposed
- 001990 Owenboy River
- 001979 Monkstown Creek
- 001066 Lough Beg

Lough Beg is also a proposed SPA. There are no proposed SACs in the vicinity of the site.

Figure 10.4 shows the designated sites in the vicinity of the site.

The air quality study indicated that the emissions to the air from the Ringaskiddy facility will be minor and limited to the immediate environs of the site. The facility will not have a significant impact on any of the proposed Natural Heritage Areas or the Special Protection Area in the vicinity.

10.8 Proposed Mitigation Measures

Indaver Ireland proposes to implement the mitigation measures proposed in the Flora and Fauna study.

Flora

The uncommon sedge *Carex divulsa* will be transplanted to a suitable area on site. A formalised management plan will be prepared for the areas of semi-natural grassland in the south-western part of the site, which will be retained. Where necessary the appropriate professional guidance will be sought.

The proposed landscape scheme (refer to Chapter 5), has been prepared with input from the botanist who undertook the flora evaluation. One aim of the scheme is to enhance the habitat value of the site. The introduction of non-native species will be avoided where possible. The area of scrub woodland will be developed as an area of native woodland.

Mammals

The semi-natural grassland in the south-western part of the site will be retained and managed to maintain the habitat. The area where the active badger sett is located will be avoided during construction. The only disturbance to it will be the removal of non-native plant species and the development of native woodland.

Another search for badger setts will be carried out in January 2002, when the foliage has died back, as recommended in the Aquatic Services Unit report. If an active sett is found in an area of the site, which is likely to be disturbed, Duchas will be informed.

Birds

In areas 3 and 6, in the western and southern portion of the site, the semi-natural grassland and the scrub woodland respectively, will be retained and the habitat potential of the scrub woodland will be enhanced. This will allow much of the existing bird community to remain.

10.9 Residual Impacts

The sedge *Carex divulsa* will be transplanted. The bird population and the numbers of rabbits and foxes on the site will be reduced due to the loss of habitat in the eastern and northern part of the site.

10.10 References

- Anon., (2001) Birds of Conservation Concern in Ireland (list) Birdwatch Ireland
- Lysaght, LS (1989) Breeding Populations of Farmland in Mid-West Ireland in 1987, *Bird Study* 36, 91-98
- Moles, RT & Breen, J (1995) Long-term within Lowland Farmland Bird Communities in Relation to Field Boundary Attributes, *Biology & Environment: Proc: R.I.A* 95b (No.3) 203-214
- Rodwell, J. (ed.)(1992) British Plant Communities Volume 3: Grasslands and Montane Communities:. Joint Nature Conservation Committee, Cambridge University Press, Cambridge.
- Smith, A.J.E. (1978). The Moss Flora of Britain and Ireland. Cambridge University Press.
- Stace, C. (1991) New Flora of the British Isles. Cambridge University Press, Cambridge.
- Webb, D.A. (1977) An Irish Flora. Dundalgan Press, Dundalk.
- Neal, E and Cheeseman, C.L. (1999) Badgers Poyser Press, London
- Smal, C.M. (1995) The Badger and Habitat survey. Government Publication, Dublin
- Smiddy, P & Sleeman, D.P. (1994) The Bank Vole in Co Cork. *Irish Naturalists' Journal* 24: 360-364.
- Van Strein J, Pannekock J, Gibbons DW (2001) Indexing European Bird Populations Using Results of National Monitoring: A Trial of a New Method *Bird Study* 48, (2) 200-214
- Bradley, J. D. & Fletcher, D. S. (1979) A Recorder's Log Book or Label List of British Butterflies and moths. 136 pp. London
- Leraut, P. J. A. (1997) Liste systématique et synonymique des Lépidoptères de France, Belgique et Corse (deuxième édition). Supplement à Alexanor, 45, rue Buffon, F-75005 Paris 5^e.

Appendix 10.1 Plant Species Composition List

Characteristic Species Composition Lists of Site Habitats (including any species of significant interest)

For each area of the site investigated habitat type:

Area 1 (Meadow Area, Hedgerow, Disturbed Ground)

Meadow

Agrostis stolonifera
Anthoxanthum odoratum
Arrhenatherum elatius
Centaurea nigra
Cerastium fontanum
Cynosurus cristatus
Dactylis glomerata
Elymus repens
Festuca rubra
Holcus lanatus
Hypochaeris radicata
Lolium perenne
Plantago lanceolata
Poa pratensis
Poa trivialis
Prunella vulgaris
Ranunculus acris
Ranunculus repens
Rumex acetosa
Rumex crispus
Senecio jacobaea
Stellaria graminea
Taraxacum officinale
Trifolium pratense
Urtica dioica
Veronica chaemydrys

Hedgerows

Arum maculatum
Crataegus monogyna
Escallonia macrantha
Galium aparine
Hedera helix
Heracleum sphondylium
Pteridium aquilinum
Rubus fruticosus agg.

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Ulex europaeus
Vicia cracca
Vicia sativa
Vicia sepium

Disturbed Patches (exposed earth)

Anagallis arvensis
Geranium dissectum
Ononis repens
Papaver rhoeas
Poa annua
Vicia sativa

Area 2 (Damp Field, Hedgerows, Overgrowing Field Area)

Damp Field

Agrostis stolonifera
Alopecurus pratensis
Anthoxanthum odoratum
Centaurea nigra
Cerastium fontanum
Cirsium arvense
Dactylis glomerata
Holcus lanatus
Juncus effusus
Lathyrus pratensis
Lotus uliginosus
Phleum pratense
Plantago lanceolata
Potentilla anserina
Ranunculus acris
Ranunculus repens
Rumex acetosa
Rumex obtusifolius
Stellaria graminea

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Overgrown Field Area (south of field)

Cirsium arvense
Dactylis glomerata
Epilobium hirsutum
Galium aparine
Heracleum sphondylium
Pteridium aquilinum
Urtica dioica

Field Boundaries

Agrimonia eupatoria
Crataegus monogyna

Fraxinus excelsior
Galium aparine
Hedera helix
Lonicera periclymenum
Rubus fruticosus agg.S
Sambucus nigra
Vicia sepium
Scrophularia nodosa

Area 3 (Area of Scrub and Scrub Wood)

Acer pseudoplatanus
Buddleja davidii
Cirsium arvense
Crataegus monogyna
Dactylis glomerata
Fraxinus excelsior
Galium aparine
Geranium robertianum
Geum urbanum
Hedera helix
Heracleum sphondylium
Heracleum sphondylium
Ilex aquifolium
Lonicera periclymenum
Primula veris
Prunus spinosa
Pteridium aquilinum
Quercus petraea x robur
Ranunculus repens
Rubus fruticosus agg.
Salix cinerea
Sambucus nigra
Sorbus aucuparia
Ulex europaeus
Urtica dioica
Vicia cracca
Vicia sativa

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Area 4 (Area of Rank Arrhenatherum elatius dominated grassland, Area of shorter-turf grassland)

Rank Arrhenatherum elatius Dominated Grassland

Anthoxanthum odoratum
Arrhenatherum elatius
Carex divulsa
Centaurea nigra
Cirsium arvense
Dactylis glomerata
Festuca rubra

Galium aparine
Heracleum sphondylium
Holcus lanatus
Lotus uliginosus
Plantago lanceolata
Potentilla reptans
Pteridium aquilinum
Rubus fruticosus agg.
Stellaria graminea
Trifolium repens
Ulex europaeus
Urtica dioica
Vicia sativa

Shorter Turf

Agrostis capillaris
Anthoxanthum odoratum
Bellis perennis
Centaurea nigra
Cerastium fontanum
Cynosurus cristatus
Festuca rubra
Hypochaeris radicata
Leontodon sp.
Leucanthemum vulgare
Lolium perenne
Lotus corniculatus
Luzula campestris
Plantago lanceolata
Plantago lanceolata
Potentilla reptans
Prunella vulgaris
Pseudoscleropodium purum
Rhytiadelphus squarrosus
Stellaria graminea
Trifolium medium
Trifolium pratense
Trifolium repens
Veronica chamaedrys
Vicia sativa

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Area 5 (Rough Grassland and Scrub with exotics) Rough Grassland (with heathy elements)

Agrostis capillaris
Anthoxanthum odoratum
Bellis perennis
Calluna vulgaris
Holcus lanatus
Centaurea nigra
Festuca rubra

Hypericum perforatum
Hypochaeris radicata
Leontodon sp.
Leucanthemum vulgare
Lotus corniculatus
Luzula multiflora
Rumex acetosa
Rumex acetosella
Polygala serpyllifolia
Potentilla erecta
Trifolium pratense
Trifolium repens
Veronica officinalis
Plantago lanceolata
Cirsium arvense
Potentilla erecta

Rank Rough grassland on top of escarpment (Dominant Species)

Dactylis glomerata
Arrhenatherum elatius
Holcus lanatus
Urtica dioica
Pteridium aquilinum
Rubus fruticosus agg.

Scrub Area

Ulex europaeus
Ajuga reptans
Stachys sylvatica
Salix cinerea
Salix sp.
Rubus fruticosus agg.
Vicia cracca
Vicia sativa

Planted Exotics

Buddleja davidii
Escallonia macrantha
Cotoneaster microphyllus
Picea sitchensis
Inter alia

Hedgerows (Species poor on south/east of site)

Crataegus monogyna
Rubus fruticosus agg.
Lonicera periclymenum
Ulex europaeus
Pteridium aquilinum

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*Hedera helix***Area 6 Pasture (mosaic of damp rank and drier pasture)****Damp Rank Pasture**

Rumex acetosa
Rumex obtusifolius
Dactylis glomerata
Holcus lanatus
Ranunculus repens
Ranunculus acris
Lolium perenne
Arrhenatherum elatius
Potentilla reptans
Veronica chamaedrys
Plantago lanceolata
Poa pratensis
Poa trivialis
Heracleum sphondylium
Urtica dioica
Heracleum sphondylium
Galium aparine

Drier Pasture areas

Conopodium majus
Vicia sativa
Anthoxanthum odoratum
Festuca rubra
Lotus corniculatus
Ranunculus bulbosus
Potentilla reptans
Trifolium repens

Hedgerows

Fraxinus excelsior
Clematis Vitalba
Acer pseudoplatanus
Rubus fruticosus agg.
Crataegus monogyna
Ulex europaeus
Ulmus procera
Prunus spinosa
Hedera Helix
Bromus hordeaceus
Brachypodium sylvaticum
Arum maculatum
Geranium robertianum

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Area 7 (Gorse Scrub, Dry and Disturbed Damp Grassland)**Gorse Scrub**

Betula pubescens
Salix cinerea
Salix sp
Ulex europaeus
Buddleja davidii
Dactylis glomerata
Arrhenatherum elatius
Rubus fruticosus agg.

Dry and Disturbed Damp Grassland

Agrostis capillaris
Achillea millefolium
Agrostis stolonifera
Anagallis arvensis
Anthoxanthum odoratum
Bellis perennis
Carex flacca
Carex nigra
Centaurea nigra
Cerastium fontanum
Cynosurus cristatus
Equisetum arvense
Festuca rubra
Hypochaeris radicata
Juncus bulbosus
Leontodon sp.
Leucanthemum vulgare
Lolium perenne
Lotus corniculatus
Luzula campestris
Medicago lupulina
Plantago lanceolata
Potentilla anserina
Potentilla reptans
Prunella vulgaris
Pseudoscleropodium purum
Rhynchospora squarrosus
Stellaria graminea
Trifolium dubium
Trifolium medium
Trifolium pratense
Trifolium repens
Veronica chamaedrys
Vicia sativa

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Appendix 10.2

Species and Numbers of Individual Birds Recorded in Ringaskiddy Survey.

Species	T1	T2	T3	T4a	T4b	T5a	T5b	T6a	T6b	T7a	T7b	T8a	T8b	T9a	T9b	Point c 1	Point c 2
Shelduck	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Pheasant	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Rock Dove	0	0	0	0	FO	0	0	0	FO	0	0	0	FO	0	0	0	0
Woodpigeon	FO	FO	FO	FO	FO	FO	3	0	5	2	0	2	3	1	FO	0	1
Stock Dove	0	0	0	0	FO	0	0	0		0	2	0	1	0	0	0	0
Skylark	0	0	0	1	1	1	0	1		0	0	0	0	1	1	0	0
Swallow	FO	FO	FO	FO	FO	FO	FO	FO	FO	FO	0	0	0	FO	FO	0	0
Meadow Pipit	0	2	2	4	2	1	0	1	2	0	0	0	0	0	0	0	0
Pied wagtail	0	0	0	0	0	0	0	0	0	0	0	0	0	FO	0	0	0
Wren	0	0	0	3	0	1	0	1	3	0	1	0	1	1	2	0	1
Dunnock	1	0	0	4	8	0	0	1	2	1	0	1	3	1	1	0	1
Robin	1	0	0	1	1	0	0	2	1	0	0	0	0	1	0	1	1
Stonechat	0	2	0	0	3	0	0	2	6	1	0	0	0	0	4	0	2
Blackbird	0	1	0	0	5	1	2	0	2	1	0	0	0	2	1	0	1
Song Thrush	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Whitethroat	0	0	0	0	2	0	0	4	2	3	1	0	0	2	0	3	0
Chiffchaff	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	2
Willow Warbler	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Goldcrest	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Blue Tit	0	0	0	3	4	0	2	1	1	0	0	3	1	0	0	5	0
Great Tit	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0
Magpie	3	0	0	3	NC	0	1	0	1	0	2	1	0	3	1	2	0
Jackdaw	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Rook	0	0	0	0	0	0	0	0	0	0	0	0	FO	0	0	1	0
Hooded Crow	0	0	0	0	5	0	0	0	1	0	0	0	0	0	0	0	0
Starling	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0
Chaffinch	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	1	2
Bullfinch	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
Greenfinch	1	0	0	2	9	0	1	2	6	1	0	1	0	0	1	1	0
Goldfinch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Linnet	1	0	2	8	5	0	1	6	10	4	1	0	1	2	1	0	0
Reed Bunting	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0
TOTALS	8	5	4	30	62	4	11	23	44	14	8	8	13	26	12	15	12

APPENDIX 10.3 Species Lists (Lepidoptera & Odonata) taken at Ringaskiddy**LEPIDOPTERA (Butterflies & Moths)**

m. v. trap = Mercury-vapour Light-trap

Nomenclature and species sequence follow Leraut (1997), but the Bradley & Fletcher (1979) species number is also included

"areas" refer to the divisions used for the botanical survey (refer to Figure 10..1)

NEPTICULIDAE

108 *Stigmella crataegella* (Klimesch, 1936). Larval mines on *Crataegus monogyna*, W785641 (area 6), 5.ix.01.

67 *Stigmella plagicolella* (Stainton, 1854). Larval mine on *Prunus spinosa*, W785641 (area 6), 5.ix.01.

GRACILLARIIDAE

288 *Caloptilia stigmatella* (Fabricius, 1781). Larval cone on *Salix cinerea*, W787643 (area 2), 5.ix.01.

303 *Parornix anglicella* (Stainton, 1850). Larval cone on *Crataegus monogyna*, W788641 (area 5), 5.ix.01.

323 *Phyllonorycter oxyacanthae* (Frey, 1856). Larval mine on *Crataegus monogyna*, W786641 (area 3, scrub), 5.ix.01.

YPONOMEUTIDAE

421 *Argyresthia bonnetella* (Linnaeus, 1758). One, W785641 (area 6), 5.ix.01.

COLEOPHORIDAE

584 *Coleophora alticolella* Zeller, 1849. Larval cases on *Juncus effusus*, W791642 (area 7), 5.ix.01.

ELACHISTIDAE

706 *Agonopterix nervosa* (Haworth, 1811). One beaten from gorse, W791642 (area 7), 5.ix.01.

ZYGAENIDAE

169 *Zygaena filipendulae stephensi* Dupont, 1900. Three cocoons, W790641 (area 5), 5.ix.01; ca. 10 cocoons, W789641 (area 5), 5.ix.01; cocoon on grass stem, W791642 (area 7), 6.ix.2001.

TORTRICIDAE

1042 *Acleris rhombana* (Denis & Schiffermüller, 1775). Two, W785641 (area 6), 5.ix.01.

1138 *Epinotia nisella* (Clerck, 1759). One at m. v. trap, W791642 (area 7), 6.ix.2001.

1159 *Rhopobota naevana* (Hübner, [1817]). One, W785641 (area 6), 5.ix.01.

1255 *Cydia succedana* (Denis & Schiffermüller, 1775). One beaten from gorse, W791642 (area 7), 5.ix.01; one, W792642 (area 4), 5.ix.01.

1076 *Argyroploce lacunana* (Denis & Schiffermüller, 1775). Three, W785641 (area 6), 5.ix.01; one, W786643 (area 2), 5.ix.01.

1104 *Endothenia quadrimaculana* (Haworth, 1811). One taken at m. v. trap, W791642 (area 7), 6.ix.2001.

PYRALIDAE

1344 *Eudonia mercurella* (Linnaeus, 1758). Male taken at m. v. trap (dissected), W791642 (area 7), 6.ix.2001.

1388 *Udea lutealis* (Denis & Schiffermüller, 1775). One, W786643 (area 2), 5.ix.01.

PIERIDAE

1550 *Pieris rapae* (Linnaeus, 1758) Small White. Female flying around Crucifers, W791642 (area 7), 5.ix.01.

LYCAENIDAE

1574 *Polyommatus icarus* (Rottemburg, 1775) Common Blue. Male & female, W791642 (area 7), 5.ix.01.

NYMPHALIDAE

1614 *Pararge aegeria tircis* (Zeller, 1839) Speckled Wood. Two, W791642 (area 7), 5.ix.01; six, W790641 (area 5), 5.ix.01; one, W785641 (area 6), 5.ix.01; two, W786643 (area 2), 5.ix.01; one, W787643 (area 2), 5.ix.01

1626 *Maniola jurtina* (Linnaeus, 1758) Meadow Brown. Two, W790641 (area 5), 5.ix.01.

1593 *Aglais urticae* (Linnaeus, 1758) Small Tortoiseshell. One, W791642 (area 7), 5.ix.01; W792642 (area 4), 5.ix.01; one, W790641 (area 5), 5.ix.01.

GEOMETRIDAE

1665 *Pseudoterpna pruinata* (Hufnagel, 1767) Grass Emerald. One, W792642 (area 4), 5.ix.01.

1732 *Scotopteryx chenopodiata* (Linnaeus, 1758) *Shaded Broad-bar*. One, W791642 (area 7), 5.ix.01; one, W792642 (area 4), 5.ix.01; one, W785641 (area 6), 5.ix.01; one at m. v. trap, W791642 (area 7), 6.ix.2001.

1764 *Chloroclysta truncata* (Hufnagel, 1767) *Common Marbled Carpet*. Two at m. v. trap, W791642 (area 7), 6.ix.2001.

NOCTUIDAE

2134 *Xestia xanthographa* (Denis & Schiffermüller, 1775) *Square-spot Rustic*. Three at m. v. trap, W791642 (area 7), 6.ix.2001.

2126 *Xestia c-nigrum* (Linnaeus, 1758) *Setaceous Hebrew Character*. Two at m. v. trap, W791642 (area 7), 6.ix.2001.

2111 *Noctua janthe* (Borkhausen, 1792) *Lesser Broad-bordered Yellow Underwing*. Three at m. v. trap, W791642 (area 7), 6.ix.2001.

2109 *Noctua comes* Hübner, [1813] *Lesser Yellow Underwing*. Two at m. v. trap, W791642 (area 7), 6.ix.2001.

2107 *Noctua pronuba* (Linnaeus, 1758) *Large Yellow Underwing*. One at m. v. trap, W791642 (area 7), 6.ix.2001.

ODONATA (Dragonflies & Damselflies)

Sympetrum striolatum (Charpentier, 1840) *Common Darter*. One, W791642 (area 7), 5.ix.01; one, W785641 (area 6), 5.ix.01.

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