

Hoverflies (Diptera, Syrphidae) of Ballyannan Wood: 2003-2006 survey results

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1 INTRODUCTION

This report presents the results of hoverfly surveys carried out as part of the Ballyannan Wood Nature Reserve Project.

2 METHODS

I carried out the surveys by Malaise trapping and hand-netting.

I used three Malaise traps in 2003 and two in 2004 and 2005. The Malaise trap locations are shown on Figure 1. Because of the level of public access to the wood, these locations were in the middle of dense thickets of Brambles. The locations are all in clearings, and the traps were positioned so that they were exposed to uninterrupted sunlight for most of the day. I operated the Malaise traps from 1 June-31 October 2003, 28 March-18 October 2004 and 26 March-28 October 2005.

I carried out systematic hand-netting surveys on 25 dates (see Table 1). These surveys were carried out in good weather conditions, typically lasted 90-180 minutes and involved searching the main rides and other open areas for hoverfly activity. My coverage of different sections of the wood varied between surveys reflecting changes in distribution of hoverfly activity. Most of my surveys focused on the eastern block of the wood, with less coverage of the western arm reflecting the lower hoverfly activity in that section. In addition to these surveys, I also made casual records of interesting hoverfly species on various other dates.

Table 1. Seasonal distribution of systematic hand-netting survey dates.

	2003	2004	2005	2006
April		2	1	
May		4	1	1
June	1	2		2
July	3	1		1
August	5	1		
September	1			

I recorded the macrohabitats present in Ballyannan Wood, using the *Syrph The Net* macrohabitat classification (Speight & Castella, 2005).

3 RESULTS

3.1 MACROHABITATS

The macrohabitats present in Ballyannan Wood are described in Table 2.

Table 2. Macrohabitats recorded in Ballyannan Wood.

Macrohabitat ¹	Notes	
Major habitat components	Overmature and mature <i>Quercus/Carpinus/Ulmus</i> deciduous forest (WN2/WD1)	The broad-leaved component of Ballyannan Wood is dominated by Sycamore, but has a ground flora characteristic of Irish Oak-ash-hazel forests.
	Mature <i>Abies/Larix/Picea</i> conifer plantation (WD4)	
	Mature <i>Pinus sylvestris</i> conifer plantation (WD4)	
Minor habitat components	Overmature and mature humid <i>Fagus</i> forest (WD1)	Beech is a frequent component of the canopy, and small stands dominated by Beech are scattered through the wood.
	Overmature and mature acidophilous <i>Quercus</i> forest (WN1)	A narrow belt of Oak woodland on acid soils occurs along the edge of the estuary.
	Overmature and mature <i>Fraxinus</i> forest (WN2)	A small stand of Ash dominated woodland occurs in the north-eastern corner of the site.
	Atlantic thickets (WS1)	Thickets of Bramble occur in most open areas in the woodland.
	Mature <i>Salix</i> swamp (WN6)	A small area of <i>Salix</i> woodland occurs in the upper part of the infilled tidal channel, although the ground flora does not indicate a high water table.
	Reed bed (FS1)	Most of the infilled tidal channel is occupied by <i>Bolboschoenus maritimus</i> swamp with <i>Phragmites</i> towards the upper end. A little <i>Angelica</i> also occurs. The habitat is maintained by brackish seepages from the estuary, and there is no evidence of any freshwater seepages.
Supplementary habitats	Tall herb clearings/tracksides	
	Grassy clearings/tracksides	

¹ Macrohabitat classification follows Speight and Castella (2005). Corresponding habitat types in Fossit (2000) indicated in parentheses.

3.2 SPECIES RECORDED

I recorded 74 species of hoverfly, of which 52 were recorded by hand-netting and 65 occurred in the Malaise trap samples (Appendix 1).

Four of the species recorded are considered to be probably threatened or declining in Ireland: *Brachyopa insensilis*, *Brachypalpoidea lentus*, *Criorhina floccosa* and *Orthonevra nobilis* (Speight et al., 2005). Another two species, *Heringia vitripennis* and *Melangyna umbellatarum*, are also notable records.

Brachyopa insensilis is a saproxylic (i.e. dependent on dead or dying wood) hoverfly associated with sap-runs in beech and oak woodlands. In Britain it has been found to be widespread in urban areas with suitable trees (Ball & Morris, 2000; Stubbs & Falk, 2002). There are only two previous Irish records and it is considered to be threatened in Ireland (Speight, 2000). I found this species on sap-runs on two separate trees in May 2006: at the base of a Beech tree and around 6 m up a Lime tree (see Figure 1). In both cases, up to 20 adults could regularly be seen swarming around the sap-run up to early June.

Brachypalpoidea lentus is another saproxylic species, primarily associated with old oak woodland, but can also occur in old beech woodland. It is considered to be probably declining in Ireland, and has not previously been recorded from Co. Cork (Speight, 2000). In Britain, it is considered to be an ancient woodland indicator (Stubbs, 1982). I recorded one

individual in Malaise trap 1 in June 2003 and hand-netted one in May 2006, midway along the northern avenue.

Criorhina floccosa is another saproxylic species associated with beech and oak woodlands. It is considered to be declining, and possibly threatened, in Ireland, and has not previously been recorded from Co. Cork. I hand-netted two individuals, on separate occasions, in May 2004. In both cases, they were flying around the bases of large trees (an Ash and an Oak) in the north-east corner of the site; this behaviour may reflect the reported association with trunk cavities at the base of live trees (Stubbs & Falk, 2002).

Heringia vitripennis is an aphid-feeding species associated with oak woodland and fruit trees in Ireland and may be threatened (Speight, 2000). I caught several females in Malaise traps 1 and 3 in July 2004 and 2005. Female *H. vitripennis* cannot be reliably separated from some other *Heringia* species. However, *H. vitripennis* is the only one of this species group that has been recorded in Ireland as males.

Melangyna umbellatarum occurs in association with wet woodland where tall wetland umbellifers occur, on which its aphid-feeding larvae are known to develop (Speight, 2000). Therefore, at Ballyannan Wood, the species may be associated with the *Salix* swamp habitat, as *Angelica* occurs in the adjacent reedbed habitat. According to its mapped distribution, it appears to be rare in southern Ireland, with only one 50 km square occupied south of the Shannon Estuary, and it has not previously been recorded from Co. Cork. I caught one in Malaise trap 1 in August 2003.

Orthonevra nobilis is considered to be probably declining in Ireland and occurs in association with springs and flushes in various habitat types (Speight, 2000). There are no springs or flushes within, or adjacent to Ballyannan Wood. The nearest freshwater habitat is a canalised stream about 850 m from Ballyannan Wood. This stream appears to have a more or less permanent flow, and would, therefore, be classified as brook edge in the *Syrph The Nest* classification. *Orthonevra nobilis* is considered to be associated with seasonal brooks, but not with brook edge (Speight et al., 2005). I caught one in Malaise trap 2 in June 2003.

3.3 MACROHABITAT ASSOCIATIONS

53-71% and 73-89%, respectively, of the Irish and Co. Cork faunas associated with the woodland macrohabitats were recorded (Table 3). Of the species recorded, 14 are not associated with any of the macrohabitats present within Ballyannan Wood and probably represent visitors from outside the wood.

Species predicted for closed canopy *Quercus-Carpinus-Betula* but not recorded include:

- Eight saproxylic species. These are mainly rare species but including the more widespread *Brachyopa scutellaris* and *Sphegina elegans*. The absence of these two species may be due to the scarcity of sap runs: apart from during May-June 2006, I have not found active sap-runs during the main period of hoverfly activity.
- Six predatory species associated with tree and shrub foliage. These are all rare or scarce species, except *Didea fasciata*.
- One rare species associated with fungi (*Cheilosia longula*).

Table 3. Macrohabitat associations of Ballyannan Wood hoverfly fauna.

	Number of species recorded	% of predicted Irish fauna ¹	% of predicted Cork fauna ²
Humid <i>Fagus</i> ¹	22	71%	85%
<i>Quercus</i> / <i>Carpinus</i> / <i>Ulmus</i> ¹	24	62%	80%
acidophilous <i>Quercus</i> ¹	24	62%	86%
<i>Fraxinus</i> ¹	8	67%	89%
Atlantic thickets ²	12	71%	80%
Conifer plantations ²	16	53%	76%
<i>Salix</i> swamp ²	16	67%	73%
Reeds	4	36%	44%

Notes:

Macrohabitat associations and Irish status from Speight et al. (2005); only species coded 2 or 3 for the relevant macrohabitat included.

Co. Cork status from Speight and Gittings (submitted).

¹ Includes overmature and mature categories.

² Includes mature category only.

The Irish acidiphilous *Quercus* hoverfly fauna is very similar to the Irish *Quercus-Carpinus-Betula* fauna, while the Irish Humid *Fagus* and *Fraxinus* faunas are mainly subsets of the Irish *Quercus-Carpinus-Betula* fauna.

Species predicted for closed canopy conifer plantations but not recorded are mainly conifer specialist aphid feeding species. Results from the BIOFOREST project indicate that these species are very scarce in Ireland, despite the widespread availability of apparently suitable habitat. *Xylota jakutorum* is the only conifer specialist saproxylic hoverfly to occur in Ireland. I recorded this species for the first time in 2005. The larvae of this species develop in conifer stumps that have been attacked by the Pine Weevil (*Hylobius abietus*). The appearance of the species in 2005, therefore, may reflect the creation of suitable habitat conditions following felling of Sitka spruce stands the previous winter.

The *Salix* swamp associated hoverfly fauna recorded in Ballyannan Wood includes at least eight species that are not associated with any of the other woodland habitats. However, two of these species (*Eristalis pertinax* and *Syrphoctonus pipiens*) are habitat generalists that are probably frequent in the surrounding farmland. Another four species (*Chrysogaster solstitialis*, *Eristalis lineata*, *Platycheirus angustatus* and *Riponnensia splendens*) can occur in farmland with ground-water fed brooks and flushes, although this type of habitat does not occur in the immediate vicinity of Ballyannan Wood. The remaining two species (*Epistrophe grossulariae* and *Eupeodes bucculatus*) are woodland specialists and are, therefore, likely to be dependent on the *Salix* swamp habitat in Ballyannan Wood. There are another two wetland specialist species that are not strictly predicted for mature *Salix* swamp habitat according to the *Syrph The Net* database, but may be associated with this habitat in Ballyannan Wood. *Melangyna umbellatarum* is only predicted to occur in *Salix* swamp habitat where brook edges are present, but its habitat requirements may be fulfilled at Ballyannan Wood by the combination of the *Salix* swamp habitat and the presence of tall umbellifers in the adjoining reedbed. *Platycheirus peltatus* is only predicted to occur in young *Salix* swamp habitat, but, at Ballyannan Wood the adjoining reedbed may simulate the open habitat that occurs in young *Salix* swamp.

The four reedbed-associated species recorded in Ballyannan Wood are all habitat generalists, while none of the more specialist wetland species associated with reed beds were recorded.

Species associated with grassy/tall herb clearings are under-represented in the Ballyannan wood fauna compared to those tolerant of closed-canopy conditions (Figure 2). The species

predicted but not recorded for grassy clearings include five *Cheilosia* species and two *Chrysotoxum* species. The actual degree of under-representation of these species is probably greater than is indicated by Figure 2. Many of the species associated with grassy/tall herb clearings in *Quercus-Carpinus-Betula* can also occur in non-woodland habitats (such as field margins). Therefore, some of these species recorded in Ballyannan Wood may have originated from outside the woodland. For example, I only recorded a single individual of *Cheilosia albitarsis* and only recorded *Chrysotoxum bicinctum* from one Malaise trap sample. Both these species are usually common where they do occur and are readily sampled by both Malaise trapping and hand-netting. Therefore, the low numbers encountered in Ballyannan Wood suggest that they do not have established populations in the wood.

4 CONCLUSIONS

The hoverfly fauna of Ballyannan Wood has a high representation of the hoverfly fauna associated with closed-canopy Irish oak woodlands, including three scarce or rare saproxylic species and one scarce aphid-feeding species. Species associated with Irish oak woodlands that were not recorded at Ballyannan Wood are mainly scarce or rare species. Species associated with grassy/tall herb clearings are under-represented in the Ballyannan wood fauna compared to those tolerant of closed-canopy conditions. The *Salix* swamp habitat at Ballyannan Wood may support up to ten species that are not able to breed elsewhere in the wood, including four wetland/woodland specialists and another four partial specialists.

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Appendix 1 Hoverfly survey data

The following table shows the **number of individuals** caught in each Malaise trap each year, and the **number of visits** on which species were recorded during hand-netting visits in each year. Note the differences between years in the Malaise trapping periods (see Section 2) and in the seasonal distribution of hand-netting visits (see Table 1). The hand-netting data includes some records (of less frequently recorded species) from visits on which systematic hand-netting was not carried out (i.e., visits not included in Table 1). *Eristalis* species (excluding *Eristalis pertinax*) and *Syrphus* species are under-represented in the hand-netting data because, on many visits, these were not identified to species.

	Recorded by:		2003						2004						2005						2006	
	Malaise traps	Hand-netting	Malaise traps			Hand-netting	Malaise traps			Hand-netting	Malaise traps			Hand-netting	Malaise traps			Hand-netting	Hand-netting			
			1	2	3		Total	1	3		Total	1	3		Total	1	3			Total		
<i>Baccha elongata</i>	✓	✓	2			2			4	1	5	1			1	2	3					
<i>Brachyopa insensilis</i>		✓																	4			
<i>Brachypalpooides lentus</i>	✓	✓	1			1													1			
<i>Cheilosia albitarsis</i>		✓																	1			
<i>Cheilosia bergenshammi</i>	✓	✓								3	3	1							1			
<i>Cheilosia illustrata</i>	✓	✓		2		2		3				1				1			2			
<i>Cheilosia pagana</i>	✓	✓	3	1	1	5		9	1	10		12										
<i>Cheilosia scutellata</i>	✓	✓			1	1		1	1	1		1	3	4								
<i>Cheilosia semifasciata</i>	✓	✓						2		2												
<i>Cheilosia variabilis</i>		✓								1									1			
<i>Chrysogaster solstitialis</i>		✓								2					1				2			
<i>Chrysotoxum bicinctum</i>	✓	✓														3			3			
<i>Criorhina berberina</i>	✓	✓	1	1	2	4		21	5	26		2	3	5	1							
<i>Criorhina floccosa</i>	✓	✓													2							
<i>Dasyrphus albostriatus</i>	✓	✓			1	1		1	7	8		1	1	1								
<i>Dasyrphus tricolor</i>	✓	✓							3	3												
<i>Dasyrphus venustus</i>	✓	✓							1	1						1	1					
<i>Epistrophe eligans</i>	✓	✓						25		25		1	25	2	27	1			1			
<i>Epistrophe grossulariae</i>	✓	✓			1	1												2	1			
<i>Episyrrhus balteatus</i>	✓	✓	8	25	7	40		9	8	17		5	17	19					2			
<i>Eristalinus sepulchralis</i>	✓	✓	1	2		3																
<i>Eristalis abusioa</i>	✓	✓	1			1																
<i>Eristalis arbustorum</i>	✓	✓	1			1		1	5	1	1	2	1	1	2	1	2		1			

	Recorded by:		2003					2004			2005			2006
	Malaise traps	Hand-netting	1	2	3	Total	Hand-netting	1	3	Total	1	3	Total	Hand-netting
<i>Eristalis interrupta</i>	✓	✓	7	3	16	26	1	3	1	4	1	1	2	
<i>Eristalis intricaria</i>	✓	✓										1	1	1
<i>Eristalis lineata</i>		✓									1			
<i>Eristalis pertinax</i>	✓	✓	27	21	105	153	10	44	80	124	5	54	22	76
<i>Eristalis tenax</i>	✓	✓					4	2	3	5	1			2
<i>Eumerus strigatus</i>	✓		6	12	1	19		2	1	3		3	1	4
<i>Eupeodes bucculatus</i>	✓	✓												1
<i>Eupeodes corollae</i>	✓							16	3	19		1		1
<i>Eupeodes latifasciatus</i>	✓	✓		3		3	1	6		6		3		3
<i>Eupeodes luniger</i>	✓	✓		1	1	2		15	16	31		1		1
<i>Ferdinandea cuprea</i>	✓	✓	1	1		2		3	1	4		3		3
<i>Helophilus hybridus</i>	✓	✓		1	2	3						1		1
<i>Helophilus pendulus</i>	✓	✓	48	98	46	192	6	26	19	45	5	71	22	93
<i>Heringia vitripennis</i>	✓												2	2
<i>Leucozona glaucia</i>	✓	✓	8	1	16	25	7	2	1	3	2	1	2	3
<i>Leucozona lucorum</i>	✓	✓	4			4		5	5	10	3	1		1
<i>Melangyna lasiophthalma</i>	✓								5	5		2	6	8
<i>Melangyna umbellatarum</i>	✓		1			1								
<i>Melanostoma melinum</i>	✓	✓		5		5	1	4		4				
<i>Melanostoma scalare</i>	✓	✓	85	183	115	383	7	283	151	434	5	471	111	582
<i>Meligramma cincta</i>	✓	✓		1	1	2		5	5	10		1	2	3
<i>Meliscaeva auricollis</i>	✓	✓	12	16	11	39	1	4		4	1	1	1	2
<i>Meliscaeva cinctella</i>	✓	✓			2	2	2	3	4	7		1	2	3
<i>Merodon equestris</i>	✓									2	2			
<i>Myathropa florea</i>	✓	✓	2	6	7	15	6	12	7	19	6	9	7	16
<i>Neoscia podagrica</i>	✓	✓	13	13	7	33	1	12	3	15		10		10
<i>Orthoneura nobilis</i>	✓			1		1								
<i>Parasyrphus punctulatus</i>	✓							1	5	6		7	15	22
<i>Pipiza noctiluca</i>	✓											5		5
<i>Platycheirus albimanus</i>	✓	✓	153	151	68	372	4	221	77	298	10	185	35	220
<i>Platycheirus angustatus</i>	✓							1		1				2
<i>Platycheirus clypeatus</i>	✓							1		1				

	Recorded by:		2003				2004			2005			2006	
	Malaise traps	Hand-netting	1	2	3	Total	Hand-netting	1	3	Total	1	3	Total	Hand-netting
<i>Platycheirus granditarsus</i>	✓	✓	1			1	2	9			16	1	17	
<i>Platycheirus manicatus</i>	✓	✓					1	2						
<i>Platycheirus peltatus</i>	✓							1	1					
<i>Platycheirus scutatus</i>	✓	✓	4	6	4	14	1	41	23	64	24	4	28	1
<i>Rhingia campestris</i>	✓	✓	7	8	1	16	1	9	4	13	7		7	1
<i>Riponnensia splendens</i>	✓	✓	1	1	1	2		1		1				1
<i>Saeva pyrasiri</i>	✓	✓					1							
<i>Sericomyia lappona</i>	✓	✓												
<i>Sericomyia silentis</i>	✓	✓	3	2	7	12			6	6	2	7	9	
<i>Sphagina clunipes</i>	✓	✓	6	4	38	48	2	7	6	13	3	11	14	
<i>Syritta pipiens</i>	✓	✓					4	1		1				
<i>Syrphus ribesii</i>	✓	✓	17	9	17	43	1	91	173	264	19	13	32	
<i>Syrphus torvus</i>	✓	✓	8	8	27	43	1	52	71	123				
<i>Syrphus vitripennis</i>	✓	✓	7	1	11	19	1	2	34	36	8	5	13	
<i>Volucella bombylans</i>	✓	✓	4	11	2	17		2	1	3				2
<i>Volucella pellucens</i>	✓	✓	8		7	15	4	5	1	6	7	6	13	2
<i>Xylota jakutorum</i>	✓											1	1	
<i>Xylota segnis</i>	✓	✓	4	14	6	24	4	8	8	16	14	11	25	2
<i>Xylota sylvanum</i>	✓	✓	12	4	8	24	4	7	8	15	8	9	17	2

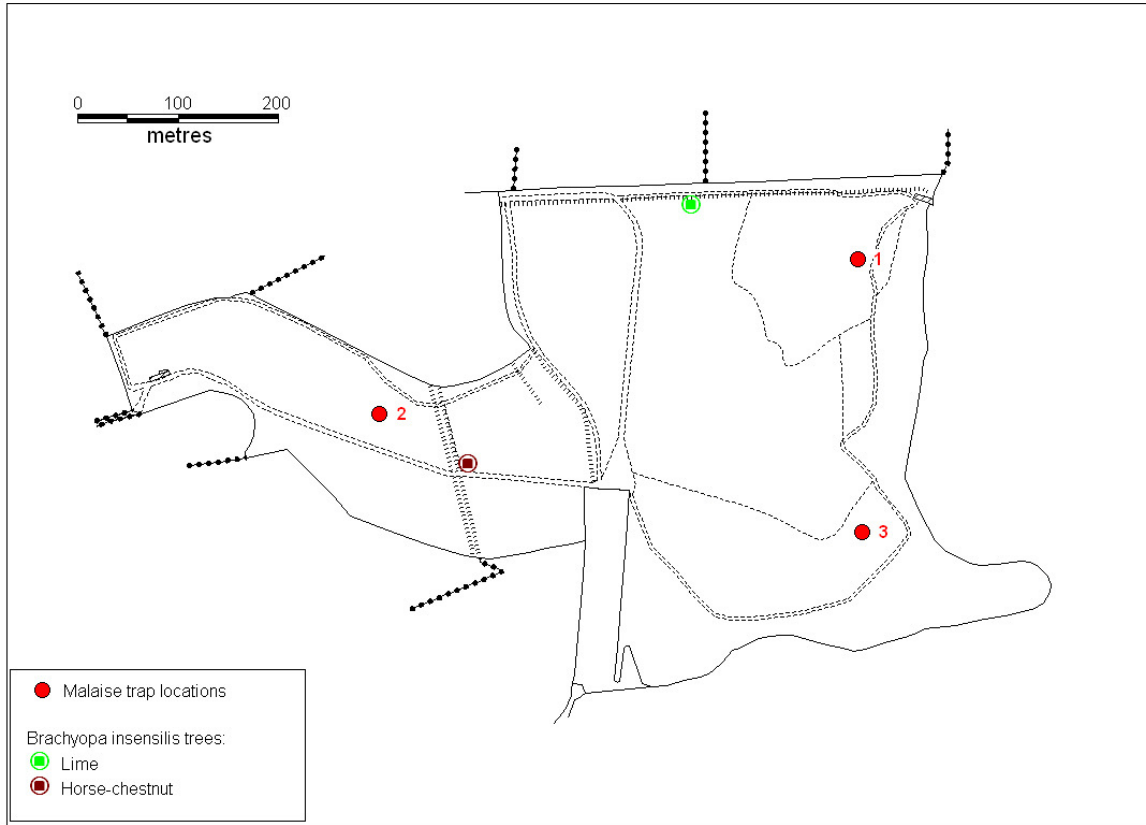


Figure 1. Malaise trap locations and *Brachyopa insensilis* trees.

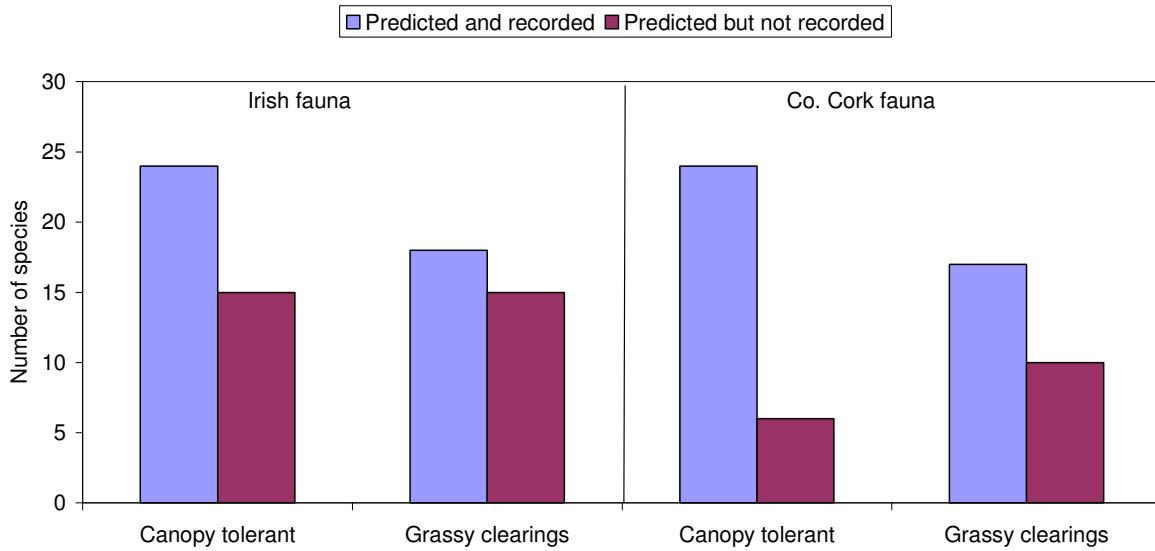


Figure 2. Habitat requirements of *Quercus-Carpinus-Betula* hoverfly fauna recorded at Ballyannan Wood.