



Effects of afforestation on hoverfly (Diptera, Syrphidae) biodiversity

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Afforestation in Ireland

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BIOFOREST Project

Multidisciplinary research into of biodiversity of commercial plantation forests in Ireland

3 sub-projects:

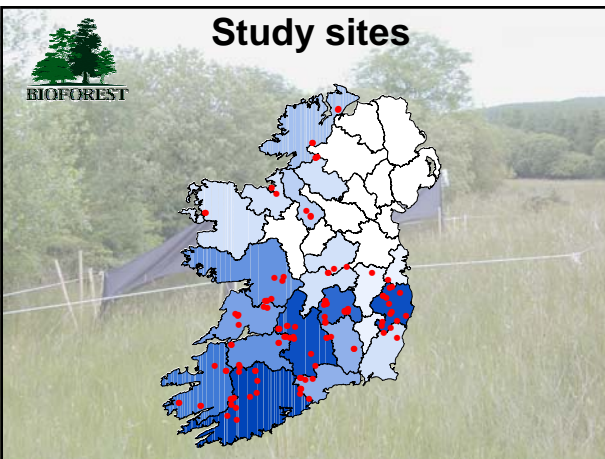
- Biodiversity assessment of afforestation sites
- Biodiversity across the forest cycle
- Biodiversity of open spaces in mature forests

Hoverfly surveys

- Paired surveys of unplanted and 5 year old plantations (24 pairs of sites)
- Surveys of 3 forest types and 5 age-classes (38 sites)
- Surveys of open spaces in 12 forests



Study sites



Survey methods

- Malaise trapping
- 2-4 traps per site
- Sampling from mid-June - late August, early May - mid July, early May - late August
- Macrohabitats recorded using the Syrph The Net habitat classification
- Selected microhabitat parameters recorded



Scope of this talk

- Biodiversity value of afforestation sites
- Biodiversity value of spruce plantations:
 - closed canopy
 - open spaces
- Net effect on biodiversity

Hoverfly fauna recorded

- 112 species recorded (63% of total Irish fauna)
- 1 species new to Ireland: *Lapposyrphus lapponicus*
- 4 threatened species: *Parasyrphus nigritarsis*, *Platycheirus amplus*, *Xanthandrus comtus*, *Xylota florum*
- 7 vulnerable species: *Chalcosyrphus nemorum*, *Chrysogaster virescens*, *Meligramma guttata*, *Orthonevra geniculata*, *Orthonevra nobilis*, *Platycheirus immarginatus*

Biodiversity in afforestation sites – humid grassland

Mean:

- 23.5 species/site (SD 5.3)
- 34% of Irish humid grassland fauna

Max:

- 32 species
- 46% of Irish humid grassland fauna

Biodiversity in afforestation sites – moor and blanket/cutover bog

Mean:

- 15.6 species/site (SD 4.1)
- 33% of Irish moor and blanket/cutover bog fauna

Max:

- 20 species
- 43% of Irish moor and blanket/cutover bog fauna

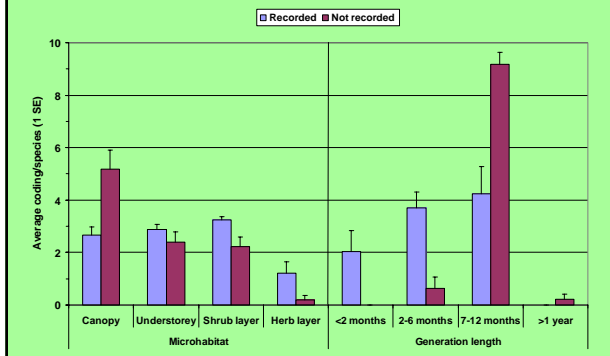
Biodiversity in afforestation sites – threatened species

- *Chrysogaster virescens*, *Epistrophe nitidicollis*, *Meligramma guttata*, *Parasyrphus nigritarsis*
- *Platycheirus amplus*, *Platycheirus immarginatus*, *Orthonevra geniculata*, *Orthonevra nobilis*

Biodiversity of closed canopy spruce plantations

- 15 of 27 Irish spruce plantation species recorded
- One species new to Ireland (*Lapposyrphus lapponicus*)
- Most aphid-feeding conifer specialist species not recorded
- Species not recorded mainly scarce or rare:
 - Not recorded, mean 2.7 50 km squares (SE 2.6)
 - Recorded, mean 34 50 km squares (SE 6.4)

Characteristics of aphid-feeding conifer-associated hoverflies

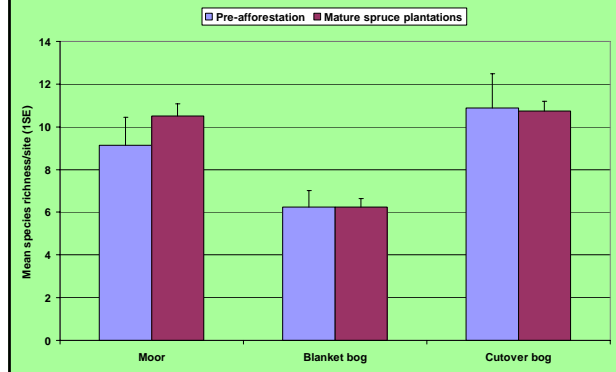


Forest specialists in mature spruce plantations

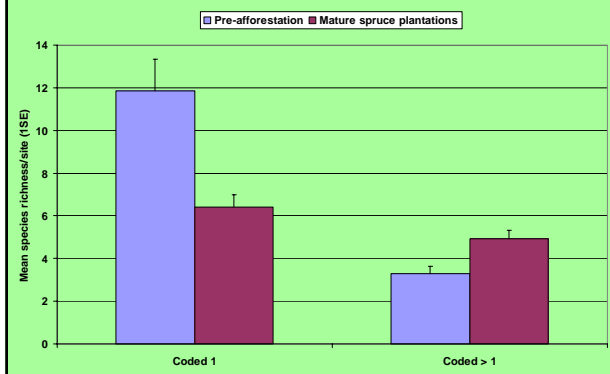
- Ubiquitous: *Sphegina clunipes*, *Xylota jakutorum* (wet sites)
- Widespread: *Didea fasciata*, *Parasyrphus punctulatus*, *Scaeva selenitica*
- Rare: *Lapposyrphus lapponicus* (plus others?)



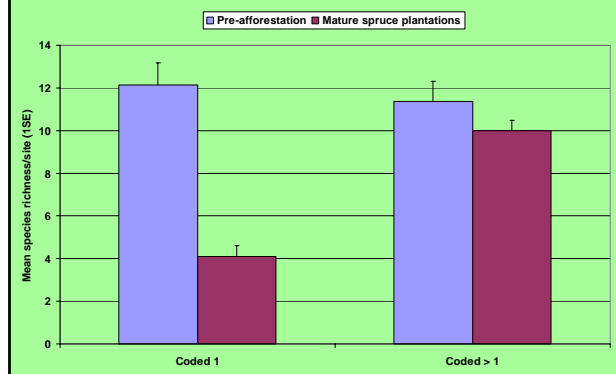
Moor and blanket/cutover bog fauna: pre-afforestation bog/moor sites compared to open spaces in mature spruce



Improved grassland fauna: pre-afforestation improved grassland sites compared to open spaces in mature spruce



Humid grassland fauna: pre-afforestation humid grassland sites compared to open spaces in mature spruce



Indicator species: pre-afforestation

	Bog/moor	Improved grassland	Humid grassland
<i>Cheilosia albipennis</i>		✓	✓
<i>Cheilosia bergenstammi</i>		✓	✓
<i>Cheilosia pagana</i>			
<i>Eristalis lineata</i>			✓
<i>Eumerus strigatus</i>		✓	
<i>Eupeodes corollae</i>		✓	
<i>Eupeodes latifasciatus</i>		✓	✓
<i>Lejogaster metallina</i>		✓	
<i>Neoscia podagrica</i>		✓	
<i>Platycheirus angustatus</i>			✓
<i>Platycheirus peltatus</i>			✓
<i>Platycheirus rosarum</i>			✓
<i>Platycheirus scambus</i>	✓		✓
<i>Sphaerophoria interrupta</i>			✓
<i>Syrirta pipiens</i>			✓
<i>Trichopsomyia flavitarsis</i>	✓		✓
<i>Volucella bombylans</i>			✓

Indicator species: pre-afforestation

	Bog/moor	Improved grassland	Humid grassland
<i>Cheilosia albipennis</i>		✓	✓
<i>Cheilosia bergenstammi</i>		✓	✓
<i>Cheilosia pagana</i>			
<i>Eristalis lineata</i>			✓
<i>Eumerus strigatus</i>		✓	
<i>Eupeodes corollae</i>		✓	
<i>Eupeodes latifasciatus</i>		✓	✓
<i>Lejogaster metallina</i>		✓	
<i>Neoscia podagrica</i>		✓	
<i>Platycheirus angustatus</i>			✓
<i>Platycheirus peltatus</i>			✓
<i>Platycheirus rosarum</i>			✓
<i>Platycheirus scambus</i>	✓		✓
<i>Sphaerophoria interrupta</i>			✓
<i>Syrirta pipiens</i>			✓
<i>Trichopsomyia flavitarsis</i>	✓		✓
<i>Volucella bombylans</i>			✓

Indicator species: open spaces in mature spruce

	Bog/moor	Improved grassland	Humid grassland
<i>Chrysotoxum fasciatum</i>	(✓)		✓
<i>Episyrphus balteatus</i>		✓	✓
<i>Eristalis interrupta</i>	✓	✓	
<i>Sericomyia lappona</i>	(✓)		✓
<i>Syrphus ribesii</i>		✓	

Conclusions

- Afforestation sites
 - Typical sites do not have high hoverfly biodiversity
 - But may be important for maintaining local biodiversity
 - But rare species can occur
- Mature plantations support few forest specialists
- Open spaces in mature plantations:
 - Important role in maintaining hoverfly biodiversity
 - But do not support full range of pre-afforestation fauna

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Project Website

<http://bioforest.ucc.ie>