

# **ASPEN HOVERFLY** (*Hammerschmidtia ferruginea*)

## **LOCAL BIODIVERSITY ACTION PLAN**

### **SUMMARY**

The aspen hoverfly is recognised as endangered in the Red Data Book, it is priority species listed in the UK Biodiversity Action Plan and is an indicator of forests of national importance. The fly is known to occur in only 12 locations in Scotland. It is found in large mature aspen woods and requires sufficient dead and standing dead timber to house and feed the larvae and sufficient ground vegetation to provide nectar for adults.

A number of factors threaten the fly. Aspen stands are crucial for the fly's survival. Existing stands have been damaged in the past by a variety of developments, including road building and conifer planting. Removal of dead timber (eg. for firewood) deprives the fly of an essential habitat for larvae. Some aspen woods are too small to support the fly and others lack an appropriate age structure including saplings, mature trees and dead timber. There is also some risk of specimens being taken for private collectors.

The Malloch Society has carried out an extensive survey of aspen hoverfly. From this, 10 recommendations have been proposed to ensure population survival. Objectives for conservation include legislation, management, advice and surveying.

Newly identified sites should be protected by suitable designation and management. Land managers should be made aware of the presence of the fly. Conservation measures include retention of dead timber and ground flora. Continued surveying is important to monitor population numbers and to identify future suitable woodlands.



## **1.0 CURRENT STATUS**

### **1.1 Species description**

A saproxylic hoverfly, found breeding under the bark of decaying aspen trees. This fly does not appear to mimic any wasp or bee.

### **1.2 Current national status and key sites**

*Hammerschmidtia ferruginea* is accorded Red Data Book 1 (RDB1) species status and is recorded as endangered in Shirt (1987) and Falk (1991). It is recorded as a good primary woodland indicator by Stubbs (1982), and listed as an indicator of internationally important forests by Speight (1989). In the UK this rare species is confined to Scotland - from Deeside north and westwards.

Prior to 1990 this species was only known in 8 sites in the British Isles (Falk, 1991). Although it has not declined since it was first discovered in 1905 by Col. J.W. Yerbury, it has always been regarded as one of the rarest of British hoverflies. The increase in records since 1990 is almost entirely due to the survey efforts of the Malloch Society. Between 1990-93 the Malloch Society carried out an extensive survey of existing and possible new sites, resulting in the extension of the fly's known distribution to 12 sites in Scotland (MacGowan, 1993).

### **1.3 Statutory importance**

- No legal status
- RDB 1 Endangered (Shirt, 1987; Falk, 1991)
- Listed by Speight (1989) as an indicator of forests of national importance
- On the priority list of the UK Biodiversity Action Plan

## **2.0 ECOLOGICAL DATA**

### **2.1 Habitat requirements**

The Aspen hoverfly is only found in large, mature aspen woods, or birch/pine woodlands with an aspen component. Larvae are found on dead wood and in large branches with a diameter of at least 30 cm (Rotheray, 1991). They feed on the micro-organisms associated with decomposition.

The adult fly, which is on the wing in summer, requires a nectar food source, obtained from wild flowering plants like bramble. Although no specific evidence exists, it appears that this fly does not travel far in search of suitable dead aspen wood. It has only been taken from aspen areas of at least 4.5 hectares in size, and has not been taken from smaller areas of aspen further than 1 km away from a 'core' breeding site. A 'core' site is therefore defined as a mixed deciduous, predominantly aspen woodland covering at least 4.5 hectares.

The importance of aspen as a breeding habitat for rare flies has been shown by MacGowan (1993) who has discovered ten Red Data Book species and eight notable species dependent on dead, standing and fallen aspen. Within North East Scotland, two sites have been identified as suitable habitats for the fly. At one site - a national nature reserve - the fly is already recorded. The other site, at woods on the River Findhorn, has not been surveyed but is certainly of a suitable size to support the fly.

### **3.0 CURRENT FACTORS AFFECTING THE ASPEN HOVER FLY**

#### **3.1 Decline in suitable aspen stands**

This species is intimately associated with aspen. Although aspen trees are common throughout Britain, the fly requires large mature stands which are relatively rare in Britain. In Scotland since 1990, damage has occurred at 4 of the 14 'core' aspen stands. No damage is known to have occurred, however, at the two potentially suitable sites in the North East area. Sites have been damaged due to road development, ring barking of mature trees and under-planting with conifers. Another site is threatened by proposals for a new sewage works and bungalow development. Dangers like these could threaten one of the two suitable large aspen woods in the North East. The other site, on a National Nature Reserve, already has statutory protection.

#### **3.2 Loss of dead standing and fallen timber**

Dead standing and fallen timber is often removed for firewood, or during tidying up. In winter rabbits and deer usually graze on aspen bark of recently dead and dying trees, thereby destroying the breeding micro habitat. The proposed introduction of beavers into Scotland will, in the views of the Malloch Society, be detrimental to this fragile habitat.

#### **3.3 Small size and isolation of aspen stands**

It has been noted that only aspen stands greater than 4.5 hectares are large enough to maintain continuity of fresh, suitably sized fallen timber for *H. ferruginea* to breed in (MacGowan, 1993). In the Highlands only 14 aspen stands conform to this size, of which only 12 are known to contain *H. ferruginea*. The hoverfly is not known from the numerous smaller isolated stands.

#### **3.4 Insufficient re-generation**

Small aspen stands in Scotland usually lack the required age structure of saplings, middle-aged trees and mature trees to ensure a constant supply of suitable dead timber for the future. Saplings are often grazed and killed by domestic stock, deer and rabbits, while mature trees are usually lacking, due to forestry operations.

#### **3.5 Threat from collecting by entomologists**

While there are very few entomologists actively collecting insects from aspen woods in Scotland, there is a threat from visiting entomologists eager to add a new species to their list. This threat is amplified by the fact that many other rare and newly identified species of insect have been discovered breeding in decaying aspen sap (10 RDBs).

Since the best way to collect *H. ferruginea* is by collecting and rearing larvae, there is a danger of destruction of a very vulnerable and rare habitat. This could lead to the loss of further colonisation, due to the bark drying off when peeled from the trunk of the tree. For this reason the grid references of suitable and known sites should not be made known generally.

#### 4.0 CURRENT ACTION

A survey of the status of *H. ferruginea* was carried out by the Malloch Society between 1990 and 1993, and the results published (MacGowan, 1993). Ten management recommendations were proposed to assure the continuance of aspen stands surveyed and their associated insect communities. There has been no action since this survey. These 10 recommendations are listed under Section 5, since they are all applicable to the 2 known suitable aspen sites in the North East area. Both of these sites with suitably large aspen stands, are already designated as SSSIs, one is also a NNR. SNH has commissioned a report on the current condition of all aspen stands from which the fly has been recorded.

#### 5.0 BENEFITS

This action plan aims to protect existing populations of aspen hoverfly. Protecting and expanding the habitat range will have positive impacts for landscape and other species which live in aspen and birch/pine woodlands.

#### 6.0 UK BIODIVERSITY OBJECTIVES AND PROPOSED TARGETS

The aspen hoverfly is listed as a priority species in the UK Biodiversity Action Plan. A UK action plan for the species has been published (UK Biodiversity Group 1999), with the following objectives:

- Maintain all populations at all known sites
- Enhance the population size at all known sites by 2010
- Restore populations to three suitable sites by 2010

UK objectives will be achieved by ensuring sympathetic management is in place in sites supporting populations of *H. ferruginea*; and by extending core aspen stands, encouraging regeneration around the fringes, and by linking up isolated stands within 1 km of these areas.

#### 7.0 OBJECTIVES AND PROPOSED TARGETS

##### 7.1 Legislation and Conservation Policy

**Objective 1** Protection of additional sites and habitats where the hoverfly is found.

##### Target

Wildlife and Countryside Act listing  
Woodland Grant Scheme recognition for aspen stands

##### Time

2000  
ongoing

The two known sites with suitably large stands of aspen are already designated as SSSIs, and one is also a NNR. If future surveys show *H. ferruginea* to be present in the River Findhorn woods, then legal protection for the site must be promoted. Similarly, if the Aspen hoverfly is discovered at any other suitable site then legal protection must be considered for these sites as well.

The habitat requirements of *H. ferruginea* must be taken into account in any woodland grant schemes, whether it be for felling or replanting.

## 7.2 Site safeguards and habitat management

**Objective 2** Protect aspen stands through good management practice.

**Target**

Advice and practical management

**Time**

ongoing

The regeneration of woods must be sought for those areas containing or likely to contain the aspen hoverfly. Site management of aspen woods must take into account the need to retain dead timber, encourage regeneration of the understorey, and increase numbers of flowering plants. Aspen planting should be encouraged and management to achieve greater connectivity between sites undertaken.

## 7.3 Species management and protection

**Objective 3** Encourage expansion of hoverfly range

**Target**

Introductions to new 'core' sites

**Time**

5 years

The micro-habitat of dead wood must be protected from drying out, for example, by moving suitable wood from direct sunlight into shade and onto damper ground. Experiments to increase the amount of sap runs, where the fly breeds, should also be undertaken. The detrimental effects of bark stripping by entomologists and herbivores, should be limited as much as possible, using fencing and other appropriate management techniques.

## 7.4 Advisory

**Objective 4** Management guidelines

**Target**

Inform land managers of the importance of hoverfly and provide management advice

**Time**

ongoing

Landowners, managers and reserve wardens must be made aware of the presence and importance of conserving this unique Scottish species, and the appropriate methods of conservation management. Guidelines to protect *H. ferruginea* must be drawn up for use by FC, FE, SNH area staff, FWAG SERAD, Highland Birchwood, the Cairngorms Partnership and other relevant authorities.

## 7.5 Research and monitoring

**Objective 5** Greater knowledge of fly's range and habitat requirements

**Target**

Survey possible new sites and distribution  
Develop non-destructive survey methods

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**Time**

2000

Further surveys of existing and possible new sites must be undertaken. Existing sites must also be monitored for changes to the woodland structure, especially the quantity of suitably aged fallen and dead standing timber.

## 7.6 Communication and publicity

**Objective 6** Increase public awareness

**Target**

**Time**

Involve schools and produce work packs  
Produce publicity material

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1999

The aspen hoverfly should be used to support the conservation of aspen and other dependent species in Scotland. It should also be used as an example to promote the wider awareness and appreciation of Scotland's unique insect fauna.

**This action plan was prepared by Kenneth Watt and the Malloch Society.**

## REFERENCES

Falk, S.J. 1991.

A review of the scarce and threatened flies of Great Britain (Part 1).

*Research and Survey in Nature Conservation*, **No. 39**. Nature Conservancy Council, Peterborough.

MacGowan, I. 1993.

The Entomological value of Aspen in the Scottish Highlands.

*Malloch Society Research Report No. 1*: 1-44.

Rotheray, G.E. 1991.

Larval stages of 17 rare and poorly known British hoverflies (Diptera: Syrphidae).

*Journal of Natural History*, **25**: 945-969.

Shirt, D.B. 1987.

*British Red Data Books: 2 Insects*. Nature Conservancy Council, Peterborough

Speight, M.C.D. 1989

Saproxylic invertebrates and their conservation. *Nature and Environment Series*, **No. 42**.

(Strasbourg: Council of Europe).

Stubbs, A.E. 1982

Hoverflies as primary woodland indicators with reference to Warncliffe Woods. *Sorby Record*,

**No. 20**: 62-67

UK Biodiversity Group 1999.

Tranche 2 Action Plans, Volume **IV** - invertebrates. English Nature, Peterborough.

Operational Objective	Outline Prescription	Objective	Personnel	Costs	Fund Source	Year	Priority
1. Legal protection.	New sites to be considered for WCA protection.	1	SNH			ongoing	H
2. Local conservation policy.	Review existing SSSI and other management documents for incorporation of specific references to aspen and the requirements of the hoverfly on relevant sites.	1	SNH, FE, LA			1999-01	H
3. Species requirements.	Felling and forestry schemes to continue to encourage consideration of aspen. Promote management of woodland for increased aspen abundance and greater connectivity between aspen stands.	1	SNH, FC, FE, SWT, FWAG			ongoing	H
4. Woodland grant application.	Continue and increase encouragement of aspen planting	1	SNH, FC, FE, SWT			ongoing	H
5. Promote conservation and encourage planting.	Promote planting of aspen through the North East rivers project, and through FWAG advisers. Encourage LAs to include aspen in planting schemes.		AC, FWAG, SNH, SEPA			ongoing	H
6. Site safeguards for "core" stands.	Ensure new large sites are covered by designations	2	SNH, FC, FE, LA, SWT			by 2000	H
7. Site safeguards for small stands.	Advice on site management to landowners.	2	SNH, FWAG			by 2000	M
8. Aspen protection.	Protect appropriate fallen and dead trees in suitable aspen stands.	2	SNH, LA			ongoing	H
9. Grazing protection.	Protect young aspen from grazing pressures.	2	SNH, LA			ongoing	H

Operational Objective	Outline Prescription	Objective	Personnel	Costs	Fund Source	Year	Priority
10. Conifer removal.	Remove conifers which are under planted within aspen stands, where appropriate.	2	SNH, FE, AC			ongoing	M
11. Individual mature tree protection.	Protect suitable mature trees in appropriate small and 'core' sites. These will supply the dead wood habitat in medium term.	2	SNH, FC, FE, LA, SWT			ongoing	H
12. Nectar source.	Encourage the spread of flowering nectar plants, through appropriate management, used by the adult fly as a food source.	2	SNH, FA, FE, LA, SWT			ongoing	M
13. Site introduction of fly larvae.	Test easibility of introducing the fly larvae into suitable aspen areas where no aspen flies occur	3	Malloch Soc.	£1,000	SNH	1998-01	L
14. Range extension.	Seek to extend the range of the fly to all 'core' size areas of aspen.	3	SNH			5 yr period	L
15. Beaver controls.	Ensure that any beaver reintroduction does not adversely affect core aspen stands	3	SNH			ongoing	H
16. Landowner awareness.	Advise landowners and managers of the presence and importance of conserving this fly and of its conservation requirements.	4	SNH			1999-01	M
17. Protection guidelines.	Draw up guidelines on how to protect the aspen hoverfly	4	Malloch Soc., SNH, AC	£1,000	SNH, AC	1999-01	M
18. Surveys for new sites.	Survey Findhorn site and other likely areas for new sites of the fly.	5	Malloch Soc.	£1,000		1998-01	M

Operational Objective	Outline Prescription	Objective	Personnel	Costs	Fund Source	Year	Priority
19. Life cycle research.	Research into the fly's life cycle requirements.	5	Malloch Soc.	£1,000		1998-01	L
20. Population monitoring.	Research new methods of population monitoring, without environmental damage.	5	Malloch Soc.	£1,000		1998-01	M
21. Distribution surveys.	Monitoring of distribution and abundance of the fly within its core areas.	5	SNH, Malloch Soc.	£1,000	SNH	to be arranged	M
22. Dead timber survey.	Monitor amount of dead timber within core areas and seek to maintain suitable supplies.	5	SNH, Malloch Soc.	£1,000	SNH	ongoing	M
23. School education.	School work packs to be developed to educate public of the need for insect conservation. Developed as part of a biodiversity education pack.	6	SNH, AC	£2,000	SNH	by 2001	L
24. Conservation education.	School work packs to be developed to illustrate animal/plant relationships, as part of a biodiversity education pack.	6	SNH, AC	£2,000	SNH	by 2001	L
25. Public awareness campaign.	Campaign through the production of posters, articles, leaflets and displays to educate the general public of Scotland's unique insect heritage. Produce educational material to cover a range of species of relevance to the LBAP, promoted through the North East LBAP partnership.	6	SNH, AC	£2,000	SNH	by 2001	L

**KEY**

**AC**-Aberdeenshire Council, **FC**-Forestry Commission, **FE**-Forest Enterprise, **FWAG**-Farming and Wildlife Advisory Group, **LA**-Local Authority, **SERAD**-Scottish Executive Rural Affairs Department, **SNH**-Scottish Natural Heritage, **SWT**-Scottish Wildlife Trust, **WCA**-Wildlife and Countryside Act.