

# Flora & Fauna Guarantee Action Statement

#46

This Action Statement was first published in 1993 and remains current. This version has been prepared for web publication. It retains the original text of the action statement, although contact information, the distribution map and the illustration may have been updated.

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## Hemiphlebia Damselfly *Hemiphlebia mirabilis*



Hemiphlebia Damselfly (*Hemiphlebia mirabilis*)



Distribution in Victoria (DSE 2002)

### Description and Distribution

The Hemiphlebia Damselfly (*Hemiphlebia mirabilis* Selys 1868 Odonata: Hemiphlebiidae), is a small insect with a wingspan of 22 mm and total length of 24 mm (Davies 1985). It is bright metallic green with white anal appendages (Wells et al. 1983). The species was originally described by Selys in 1868 and more fully in 1877 (Yen et al. 1990).

This damselfly is of unusual scientific interest as it exhibits primitive and unique structural features in both adult and larval stages (Wells et al. 1983), and has unusual display behaviour (Sant & New 1988). The Hemiphlebia Damselfly is taxonomically isolated, being placed in a superfamily (Hemiphlebioidea) of its own. It has been described as a 'living fossil'.

The Hemiphlebia Damselfly is endemic to Australia and was first recorded from Port Denison, northern Queensland (Selys 1869). However, as subsequent discoveries have been confined to central and southern Victoria, the Queensland record is thought to have been an error (Wells et al. 1983).

Additionally, it was discovered near Mount William in Tasmania during 1992 (Trueman et al. 1992) and on Flinders Island in Bass Strait (Endersby 1993). The first Victorian records came from floodplain lagoons in the Goulburn Valley at Alexandra and in the middle to upper course of the Yarra River at the turn of the century (Wells et al. 1983, Davies 1985).

After continued but declining numbers of sightings, searchers failed to find the Hemiphlebia Damselfly on the Goulburn River floodplain in the late 1970s. By this time, the original habitat had been largely degraded by agriculture, in particular, the effects of livestock and changed drainage patterns (Trueman et al. 1992).

In 1977, a single specimen was captured at Wilsons Promontory National Park, Victoria. However, its significance was not recognised (Sant & New 1988). A viable colony was found at Wilsons Promontory in 1985 by Davies (1985) and the species has since been recorded as being locally common at two

sites in the park: Cotters Lake and a small swamp adjacent to Five Mile Road. The habitat comprises seasonally flooded heathland swamps with emergent sedges (Sant & New 1988).

In January 1992, the Hemiphlebia Damsel fly was rediscovered in central Victoria in a billabong on private property beside the Yea River at Yea. Subsequent searches of the area showed the species also survives on the Goulburn River floodplain near Alexandra (Trueman et al. 1992).

The Hemiphlebia Damsel fly is a univoltine (breeds once a year) species. The adults are present from late November to late February and spend large amounts of time resting on vegetation; they are thought to be weak fliers (Yen et al. 1990). Female damselflies probably insert eggs into aquatic vegetation (Sant & New 1988). The larvae are predators on a wide range of small invertebrates (Yen et al. 1990).

The adult damselflies are more commonly found away from water rather than over it (Trueman et al. 1992). It has been suggested that the eggs of Hemiphlebia can withstand drought. The habitats at Wilsons Promontory may dry out in summer (Davies 1985, Sant & New 1989).

## Conservation Status

### Current Status

Wells <i>et al.</i> (1983)	Endangered worldwide
DCE (1991)	Vulnerable in Victoria
SAC (1991)	Threatened

The Hemiphlebia Damsel fly has been listed as a threatened taxon on Schedule 2 of the Flora and Fauna Guarantee Act 1988.

### Reasons for Conservation Status

Determination of the current distribution and abundance of Hemiphlebia Damsel fly was given the highest priority among conservation projects on the order Odonata at the inaugural meeting of the International Union for Conservation of Nature and Natural Resources Odonata Specialist Group (IUCN) in 1980 (Moore 1982).

Within Victoria, population decline of the Hemiphlebia Damsel fly in the Goulburn and Yarra Valleys has occurred with changes in land use. Many of the vegetated floodplain lagoons suitable for the damselfly have been severely altered as a result of land clearing, wetland drainage, river regulation and cattle grazing (Yen et al. 1990).

The known populations at Wilsons Promontory are isolated from each other and highly localised (Yen et al. 1990). Highly localised populations are susceptible to local extinctions through inappropriate management regimes or catastrophic events.

Davies (1985) estimated population levels of around 100 per 10 m<sup>2</sup> in sheltered patches of reeds, with similar numbers recorded in the following two flight seasons.

In its final recommendation, the Scientific Advisory Committee (1991) has determined that the Hemiphlebia Damsel fly is:

- in a demonstrable state of decline which is likely to result in extinction;

- significantly prone to future threats which are likely to result in extinction; and
- very rare in terms of abundance and distribution.

## Major Conservation Objectives

The major conservation objectives are to:

- conserve and appropriately manage habitat of the Hemiphlebia Damsel fly;
- rehabilitate degraded habitat where necessary in order to maintain and enhance the known populations of Hemiphlebia Damsel fly;
- survey previously known, currently known and potential habitats of Hemiphlebia Damsel fly;
- determine the extent of suitable habitat areas and remaining populations of the Hemiphlebia Damsel fly, especially on public land;
- investigate the ecological requirements of the Hemiphlebia Damsel fly; and
- formulate and implement appropriate management which aims to conserve and enhance populations of the Hemiphlebia Damsel fly.

## Management Issues

### Ecological Issues Specific to the Taxon

Habitat conservation is paramount to the survival of the remaining populations of Hemiphlebia Damsel fly in both central and southern Victoria. More information is required on the distribution, biology and ecology of the Damsel fly to assist management.

Populations at Wilsons Promontory lie entirely within the national park and, with appropriate habitat management, would appear more secure than those in the Goulburn Valley which are on private land. Activities that affect the habitat of the damselfly, such as fire, may be catastrophic to isolated populations in the short term. The long-term effects of such events are unknown. An ecological burning program is conducted in heath adjacent to the Five Mile Road swamp. This program may need to be specifically modified to achieve the damselfly conservation objectives.

A fuel reduction burn, which burnt much of the Five Mile Road swamp in April 1987, was responsible for reducing the area of suitable habitat, and probably resulted in the low numbers recorded for the following two flight seasons (Sant & New 1988, Yen et al. 1990). In early 1992, numbers were still low in the burnt section, but relatively high in unburnt areas of the swamp (T. New pers comm.).

Populations of the damselfly may only be temporarily reduced by fire and recover in a few years. The Five Mile Road swamp, which supported the largest known population of the damselfly prior to the 1987 fire, had been burnt in 1951 and again in 1957, while other nearby swamps of a similar nature (not known to support significant numbers of Damsel flies) were not burnt. Cotters Lake, on the other hand, which also supports a significant number of Hemiphlebia Damsel flies, has remained unburnt for over 40 years (J. Whelan pers comm.). The known populations at Wilsons Promontory do not appear to be threatened by current management practices, such as control burning, ecological burns and mowing of fire-breaks.

Fire occurs naturally in the area from lightning strikes. Furthermore, regular rotational fuel reduction burning of areas surrounding Hemiphlebia Damsel fly habitat may promote vegetation succession, therefore maintaining damselfly numbers (T. New pers. comm.). Conversely, cessation of the ecological burning program of the heath surrounding the freshwater swamps will eventually lead to decline of the heath and its replacement with dense Coast Tea-tree (*Leptospermum laevigatum*) scrub, which could alter the wetland ecosystem and thereby affect damselfly populations.

At the Five Mile Road swamp, damselflies congregate in mown areas of the swamp (T. New pers. comm.). Mowing may have assisted survival of the Hemiphlebia Damsel fly at this site, during and immediately after the 1987 burn, by providing a refuge area (Yen et al. 1990).

### Wider Conservation Issues

Conservation of suitable swamp habitats at Wilsons Promontory and in the Goulburn Valley will enhance the local survival of all other species associated with such habitats. Surveys and ecological studies for the damselfly will improve knowledge of the invertebrate fauna and the ecology of wetland communities.

### Social and Economic Issues

Based on current populations, achieving the major conservation objective will have only minor social or economic effects.

Should more populations be found on private land, rehabilitating and protecting Hemiphlebia Damsel fly habitats may require modification of agricultural activities from key habitat areas. Additionally, water may need to be directed from or retained on private land in some instances. This may affect a small number of landholders, with financial effects depending on the size of the exclusion areas.

However, restoration efforts (fencing, revegetation etc.) also create positive effects for landholders through improved water quality and on farm management of water, salinity control, pest plant and animal control, and shelter for livestock. The Land for Wildlife scheme is an avenue for consulting with and educating landholders regarding habitat rehabilitation and the value of such works.

The current fire control activities (mowing and burning) at the Five Mile Road swamp site appear compatible with the habitat requirements of the Hemiphlebia Damsel fly.

## Management Action

### Previous Management Action

1987 Mowing of a roadside fire-break was discontinued along the western side of the Five Mile Road swamp in 1987, before it was determined as non-detrimental to the Hemiphlebia Damsel flies.

The Five Mile Road swamp was partly fenced later in the same year to exclude cattle from the area. The fence has

been successful in allowing regeneration of vegetation in the swamp (T. New pers. comm.).

1988 A report on the biology and conservation of the Hemiphlebia Damsel fly was prepared (Sant & New 1988).

1992 Cattle grazing was phased out of Wilsons Promontory National Park.

## Intended Management Action

### Population and Habitat Inventory

- La Trobe University, with assistance from CNR where appropriate, to undertake survey and assessment of freshwater swamps on Wilsons Promontory and floodplain billabongs of the Goulburn Valley, to determine the distribution of Hemiphlebia Damsel fly populations and areas of suitable habitat. The survey will initially concentrate on public land areas in the Goulburn Valley.
- Develop an annual monitoring program for all known populations of Hemiphlebia Damsel fly. Monitoring will occur both before and after management actions likely to disturb the population, such as controlled burning, and after natural disturbances, such as wildfires. The monitoring program is to last for five years from the implementation of this action statement, and thereafter, as required.
- Determine any threatening processes for newly located populations of Hemiphlebia Damsel fly, and undertake remedial action where necessary. Additionally, the habitat will be mapped and vegetation of surrounding areas documented.

### Habitat Management

- Determine the role of fire in the ecology of freshwater swamp communities and its effect on Hemiphlebia Damsel fly populations.  
In conjunction with landholders and water authorities, manage activities likely to affect quantity or quality of water runoff into damselfly habitat to ensure that there are no adverse effects.

### Wilsons Promontory

- On the basis of the above studies, CNR should consider the requirements of damselfly conservation in the development of an ecological burning program for the heathlands surrounding freshwater swamp habitat in Wilsons Promontory National Park. Where required, include specific measures regarding:
  - time between fires
  - fire season
  - fire intensity, if practical
  - rotational burning of swamps and provision of flight corridors between burnt and unburnt swamps
  - effect of fire on wetland fauna and flora.

### Five Mile Road Swamp

Resume annual mowing of the roadside fire-break adjacent to the western side of the Five Mile Road swamp; mowing to occur outside the main flight season (late November to late

February inclusive).

Undertake prescribed burns in areas adjoining the swamp only when the population has recovered and stabilised from previous burns.

Remove the fence which is no longer required.

## **Cotters Lake**

Monitor condition of habitat and population.

## **Goulburn Valley**

- In conjunction with La Trobe University Zoology Department and the Murray-Darling Freshwater Research Centre, conduct surveys for the Hemiphlebia Damselyfly over a minimum of two consecutive seasons at known and potential sites, during the optimum flight period of the species.
- Consult landholders with Hemiphlebia Damselyfly habitat regarding its significance, requirements, rehabilitation, water quality and flows, pest plant and animal control, incentives schemes and the Land for Wildlife scheme.
- Provide the Goulburn Valley local community with information on the damselyfly to increase public awareness and solicit areas where surveys may prove fruitful.
- Assess, document and photograph sites where the Hemiphlebia Damselyfly occurs.
- Establish permanent monitoring sites.
- Develop and, where possible, implement site-specific management guidelines.
- Monitor Hemiphlebia Damselyfly populations annually for five years, then review monitoring frequency.

## **Other Desirable Management Actions**

- La Trobe University to undertake a study of Hemiphlebia Damselyfly to clarify its habitat requirements and life history pattern, with assistance from CNR where appropriate.

## **Legislative Powers Operating**

### **Legislation**

Flora and Fauna Guarantee Act 1988: regulates the taking of listed taxa from the wild; it has provision for preserving habitat and promoting conservation actions.

Wildlife Act 1975: regulates the taking and possessing of wildlife. Invertebrates listed under Schedule 2 of the Flora and Fauna Guarantee Act 1988 become 'Protected Wildlife' under the Act.

National Parks Act 1975: provides protection for flora and fauna within National Park boundaries.

### **Licence/Permit Conditions: Guidelines and Instructions**

Once listed under the Flora and Fauna Guarantee Act 1988, a permit to collect the species is required under the Wildlife Act 1975 as it becomes protected fauna. A permit must be obtained from the Wildlife Licensing Section of the Flora and Fauna Branch, CNR.

A permit to trap, take or possess specimens of the Hemiphlebia Damselyfly should only be issued if CNR is satisfied that the proposal has a direct benefit to the conservation of the species. An additional permit to trap, take or possess specimens of the Hemiphlebia Damselyfly in Wilsons Promontory National Park is required under the National Parks Act 1975, and must be obtained from the Director of National Parks Service, CNR.

## **Consultation and Community Participation**

To date, consultation regarding management of Hemiphlebia Damselyfly populations has been between CNR's Yarram and Alexandra regional offices and Dr T. New of the Department of Zoology, La Trobe University. Consultation will continue with Dr. New, and will be held with landholders affected by the proposed works.

Preliminary discussions have been held between Dr. New and the Murray-Darling Basin Commission regarding funding for the proposed survey. CNR will liaise with the Commission regarding possible funding and proposed rehabilitation works.

## **Implementation, Evaluation and Review**

CNR's Yarram and Alexandra regional offices will be responsible for coordinating the implementation of this action statement. The Flora and Fauna Guarantee Officers of these offices will monitor the effectiveness of actions taken. The action statement will be reviewed in 1997.

## **Contacts**

### **Management**

Flora and Fauna Guarantee Officers, Yarram and Alexandra regional offices, Department of Conservation and Natural Resources.

### **Biology**

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## Compilers

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## Further information

Further information can be  
obtained from Department  
of Sustainability and  
Environment Customer  
Service Centre on 136 186.

Flora and Fauna  
Guarantee Action  
Statements are available  
from the Department of  
Sustainability and  
Environment website:  
<http://www.dse.vic.gov.au>

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## Personal Communications

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