THREATENED SPECIES LISTING STATEMENT

Caddis-flies, Trichoptera
(17 species)

Neboiss 1977

Status

Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999.....Not listed

Tasmanian *Threatened Species Protection Act 1995* .....Ranging from Rare to Extinct

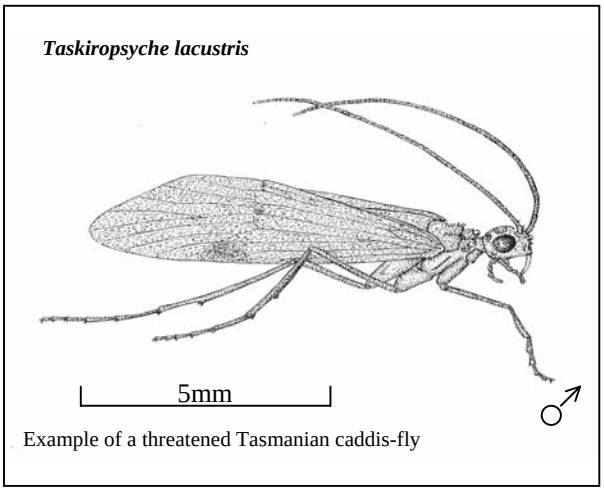
Description

Caddis-flies are typically inconspicuous, cryptic-coloured insects associated with aquatic ecosystems. There are approximately 480 known species of caddis-fly in Australia belonging to 25 families. Within Tasmania there are 189 known species (belonging to 21 families), of which nearly 70% are endemic (Neboiss 1977, 2002). Of these species, 17 are listed under the *Tasmanian Threatened Species Protection Act 1995*. Their status ranges from rare, endangered and extinct. Threatened Tasmanian caddis-flies incorporate 10 families and 15 genera. Thirteen of these species are endemic to the State.

Caddis-flies superficially resemble moths with tent-like wings and long antennae. However, they have hairs on their wings instead of scales and they do not have the coiled sucking mouthparts characteristic of moths. Larvae and adults range in length from 4 to 20 mm.

Larvae of the threatened caddis-fly species are all aquatic, although some of the other Tasmanian species have terrestrial larvae. The majority of their lifecycle is spent as larvae, while adults are usually short-lived. Adult female caddis-flies lay their eggs in water, usually attached to stones or aquatic plants. Some species are able to remain underwater for more than 30 minutes due to hairs which hold a thin film of air around their bodies, acting as a physical gill effectively allowing the insect to breathe under water.

Larvae can often be found on the undersides of rocks, protected by a collection of small pieces of stone, shells, or other materials which are held together by a secreted adhesive. Larvae may also be found in cylindrical cases, which they make and wear for protection. These portable cases are built from a variety of materials including sand grains and plant fragments. Usually only the head and legs protrude from the case and they will retract into this case when threatened or startled. Larvae that live without these protective covers are generally predators, feeding on other invertebrates, while other species feed on algae or detritus (rotting material).



Example of a threatened Tasmanian caddis-fly

Illustration: Karen Richards

Larvae body colour varies from yellow and green to brown. They have a distinct head, thorax and soft abdomen with three pairs of functional legs.

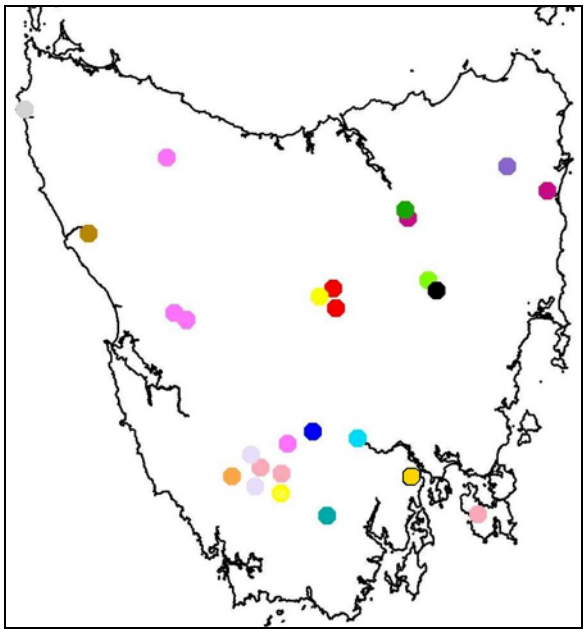
Pupation occurs underwater and lasts two to three weeks (Neboiss 1981). Adults emerge to the waters' surface and spend most of their adult life near water-bodies. They usually fly during the evening and shelter in vegetation, on tree stumps or under rocks during the day (Bryant and Jackson 1999).

Caddis-flies are an important food item for a variety of fish and other aquatic animals, including platypus (Neboiss *et al.* 1988). They are also a good indicator of water quality, as they do not tolerate high sediment and nutrient concentrations. They are well known by fly fishermen throughout the world who design lures to imitate larvae and adults.

Detailed descriptions of individual species and distributions can be found in Neboiss (1977, 1981 and 2002).

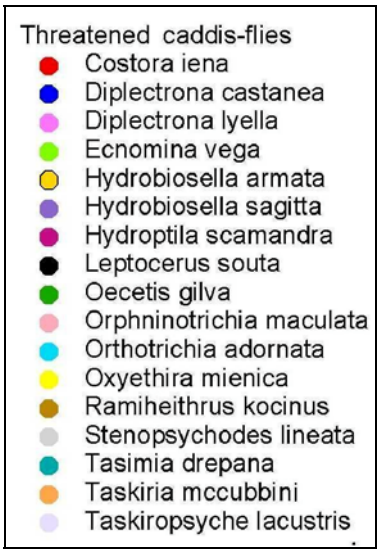
Distribution and Habitat

Caddis-flies are important components of Tasmania's freshwater ecosystems and can be found associated with most freshwater habitats such as streams, swamps, lakes and springs. Although they are distributed across the State, species tend to have a limited geographical range and many are known only from a single locality.



Known distribution of threatened Tasmanian caddis-flies

KEY



Important Locations

The following table lists the key locations for the 17 caddis-fly species listed under the Tasmanian *Threatened Species Protection Act 1995*. Two species are listed as Extinct (ex) and 13 are listed as Rare (r). Two species are listed as Endangered (Lake Pedder caddis-flies) and these are discussed in more detail in the Lake Pedder caddis-flies Listing Statement (Threatened Species Unit 2005).

Table 1

FAMILY	SPECIES	LOCATION
Conoesucidae	*Costora iena* ex*	Great Lake, Shannon River and near Miena
Ecnomidae	*Ecnomina vega* r*	Macquarie River 8 km west of Campbell Town
Hydropsychidae	*Diplectrona castanea* ex*•	Mt Field National Park area
Hydropsychidae	*Diplectrona lyella* r*	King River, Hellyer Gorge, Little Florentine River, Nelson Falls
Hydroptilidae	*Hydroptila scamandra* r	South Esk River, Evandale.
Hydroptilidae	*Orphninotrichia maculata* r	Wedge River; Gelignite Creek at Scotts Peak Dam road.
Hydroptilidae	*Orthotrichia adornata* r	Bushy Park
Hydroptilidae	*Oxyethira mienica* r*	Ouse River near Miena; unnamed creek on Scotts Peak Rd
Koririidae	*Taskiria mccubbini* e*	Lake Pedder
Koririidae	*Taskiropsyche lacustris* e*	Lake Pedder
Leptoceridae	*Leptocerus souta* r	Macquarie River west of Campbell Town
Leptoceridae	*Oecetis gilva* r*	South Esk River near Evandale
Philopotamidae	*Hydrobiosella armata* r*	Mt Wellington area and Huon River tributaries
Philopotamidae	*Hydrobiosella sagitta* r*	St Columba Falls near Pyengana
Philorheithridae	*Ramiheithrus kocinus* r*	Small creek near Corinna
Stenopsychidae	*Stenopsychodes lineata* r*	Bluff Hill Creek 12 km south of Marrawah
Tasimiidae	*Tasimia drepana* r*	Huon River 2 km upstream of Picton River

* = Endemic r = rare e = endangered ex = extinct • Status to be reassessed

Threats, Limiting Factors and Management Issues

Caddis-flies depend on an aquatic environment in good condition. Activities that alter water qualities such as temperature, turbidity, water flow, pH, dissolved oxygen and conductivity will adversely affect these species, particularly larval stages.

Key threats and limiting factors include:

- **Habitat loss and disturbance**, including clearance and/or burning of riparian and seepage-way vegetation, particularly in headwater or higher order streams, unrestricted stock access to streamsides, in-stream dam construction, channelisation, and extraction of rock and gravel from streambeds.
- **Alterations to drainage**, particularly diversion of prevailing water supplies and flow patterns along seepages, soaks and streams.
- **Waterway pollution**, through decreased water quality, including increased sediment loads, and excessive fertiliser/pesticide run-off.

Conservation Assessment

Historical Distribution

Compared with most other invertebrate groups, a considerable number of surveys for Trichoptera have been conducted in Tasmania. Nevertheless, little is known about the historical distribution of these species.

Area Currently Occupied

The threatened caddis-flies appear to have very restricted ranges, with species confined to the locations documented in Table 1. It is possible that further surveys will extend the known range of some species but most are naturally rare.

Population Estimate

Unknown

Reservation Status

The reservation status of threatened Tasmanian caddis-flies varies. Six species are not protected within reserves and occur on private land and State Forest. These include: *Tasimia drepana*, *Oecetis gilva*, *Leptocerus souta*, *Orthotrichia adornata*, *Hydroptila scamandra* and *Ecnomina vega*. Two species are fully protected in the Tasmanian Wilderness World Heritage Area: *Taskiropsyche lacustris* and *Taskiria mccubbini*. The remaining species have varied degrees of protection within National Parks, State Reserves and Conservation Areas.

Assessment Criteria

Taskiropsyche lacustris and *Taskiria mccubbini* meet the criteria for Endangered on the Tasmanian *Threatened Species Protection Act 1995* because of naturally small population sizes and areas of occupancy of less than 500 km^2.

Costora iena is considered extinct. *Diplectrona castanea* has been synonymised with *D. lyella* and is no longer considered extinct (Neboiss 2002), and will be de-listed from the *Threatened Species Protection Act* 1995.

All remaining threatened Tasmanian caddis-fly species meet the criteria for Rare on the Tasmanian *Threatened Species Protection Act 1995* as these species are subject to stochastic risk of endangerment because of a naturally small population sizes and areas of occupancy of less than 2000 km^2.

Recovery Program

Objectives

- To protect known and potentially suitable habitat for threatened Tasmanian caddis-flies, particularly for those species not currently protected within a reserve system.
- To locate additional populations of threatened Tasmanian caddis-flies.
- To ensure no deterioration in habitat and water quality at all known sites.

Management Actions

- There have been several surveys for caddis-flies in Tasmania. Neboiss (1977) surveyed 130 localities in Tasmania between 1965 and 1974; Neboiss *et al.* (1989) collected caddis-flies in western Tasmania; Chilcott (1988) surveyed specifically for the Lake Pedder and McCubbins caddis-flies; and Jackson (2000) surveyed caddis-flies from the Tasmanian World Heritage Area.
- Management actions have been developed by the Forest Practices Board specialists in conjunction with the Threatened Species Unit and other specialists to conserve existing populations in areas subject to forestry activities (on private and State land). Prescriptions endorsed by the Threatened Species Scientific Advisory Committee are available via industry planning tools, such as the *Threatened Fauna Manual for Production Forests* (Forest Practices Board 2000) and the *Threatened Fauna Advisor* (Forest Practices Board 2002). These are being used to protect known populations and likely habitat on land subject to forestry operations as well as surveying for new populations.
- No other specific management actions have been undertaken.

Actions Needed

- Ensure all potential developments near site locations are assessed to minimise or prevent impacts to habitat or water quality.
- Educate and encourage private landowners to minimise activities that threaten caddis-flies and adopt stream protection measures.
- Monitor the effectiveness of management prescriptions implemented in areas subject to forestry activities.
- Research into the impact of land use activities on aquatic threatened species, particularly those that inhabit headwater streams.
- Undertake research on the ecology of threatened species to determine life cycles, habitat requirements, population numbers and potential threats.
- Fully describe the habitat at known localities to assist in their protection and to facilitate further searches.
- Conduct further surveys to identify any extensions to the known range of individual species.

If you manage land with threatened aquatic animals, please consider these practices as outlined in the *Threatened Fauna Handbook* (Bryant and Jackson 1999):

- Avoid clearing native vegetation from stream side zones or stream banks. Vegetation provides shelter, shade (maintains water temperature), and essential food for insects, crayfish and other aquatic fauna. It also filters surface runoff (reducing nutrients and sediments), limits light levels, and maintains slope and bank stability.
- Stream zones should contain a mix of native understorey and overstorey plants where appropriate, including reeds, grasses, shrubs and trees. Diversity of vegetation along stream banks is important as trees, shrubs and ground cover all play different and important roles in stream bank stability. Establish vegetation as far down the base of the bank as possible. This may require special work to stabilise the toe of the bank or reduce its steepness to enable vegetation to establish.
- The width of vegetation buffers depends on the situation. The greater the buffer width, the greater the protection, the more diverse the buffer vegetation, the better the protection. In any case, for small, seasonally dry water channels buffers should be no less than 10 m wide each side, grading up to at least 60 m wide each side for larger stream zones. Two methods for calculating minimum buffer width are: a distance equivalent to the average dominant tree height, or if there are no trees, the amplitude distance between bends.
- Buffers are especially important at points where surface water enters small river channels or landscape depressions, and where flow concentrates.
- An effective buffer zone should also provide for the continuing input of large woody debris and leaf litter into the stream.

Weed and Willow Removal

- Cut and paint weeds with poison, leaving roots (and stumps of willows) intact to aid bank stability. Painting will also eliminate re-sprouting from suckers, e.g. willows.
- Removal of willows or dense weed mats must coincide with a re-vegetation program so that stream banks are not exposed to excessive erosion, light or loss of foliage. Remember that most aquatic animals like cool, shady places.
- Prevent any large, heavy machinery or structures from entering the wetland or stream bed, e.g. tractors, excavators, bridge supports, etc., even if they are being used for restoration activities. This will not only directly kill localised species and alter habitat for other aquatic animals, but the sedimentation caused by the disturbance will accumulate on the stream bed and smother fragile habitats.

Source Material

References

- Bryant, S and Jackson, J. (1999). *Tasmania's Threatened Fauna Handbook: What, Where and How to Protect Tasmania's Threatened Species.* Threatened Species Unit, Parks and Wildlife Service, Tasmania.
- Chilcott, S. (1988). Examination of the status of endangered species of Trichoptera (caddis-flies) in the Lake Pedder area. In W. Fulton (Ed.) Further collections of freshwater fauna from the World Heritage Area, Tasmania. *Inland Fisheries Commission Occasional Report* 88-03.
- Forest Practices Board (2000). Threatened Fauna Manual for Production Forests (Revised Version). Forest Practices Board, Hobart.
- Forest Practices Board (2001). *Threatened Fauna Adviser*. Expert System Program. Forest Practices Board and Department of Primary Industries, Water and Environment.
- Jackson, J. (2000). Threatened Trichoptera (caddisflies) from the Tasmanian Wilderness World Heritage Area. *Papers and Proceedings of the Royal Society of Tasmania* **134**: 55-61.
- Neboiss, A. (1977). A taxonomic and zoogeographic study of Tasmanian caddis-flies (Insecta: Trichoptera). *Memoirs of the National Museum of Victoria* **38**: 1-208.
- Neboiss, A. (1981). *Tasmanian Caddis-flies*. Fauna of Tasmania Handbook, No. 4. University of Tasmania. Hobart, Tasmania.

- Neboiss, A., Jackson, J. and Walker, K. (1989). Caddisflies (Insecta: Trichoptera) of the World Heritage Area in Tasmania – species composition and distribution. *Occasional Papers from the Museum of Victoria* **4**: 1-41.
- Neboiss, A. (2002). New genera and species, and new records of Tasmanian Trichopteria (Insecta). *Papers and Proceedings of the Royal Society of Tasmania* **136**: 43-82.
- St Clair, R. M. (2000). *Preliminary keys for the identification of Australian caddisfly larvae of the families Odontoceridae, Kokiriidae and Oeconesidae.* Identification Guide No. 30. Murray-Darling Freshwater Research Centre, Albury.
- Threatened Species Unit. (2005). Listing Statement: Lake Pedder Caddis-fly *Taskiropsyche lacustris* and McCubbins Caddis-fly *Taskiria mccubbini*. Nature Conservation Branch, Department of Primary Industries, Water and Environment, Tasmania.

Specialist Advice

- Dr. Jean Jackson, Inland Fisheries Service, Tasmania.

Review and Further Information

Statement prepared: (updated) June 2005

Prepared by: Esmé Atkinson.

Review date: When new information received.

Cite as: Threatened Species Unit. (2005). Listing Statement: Caddis-flies, Trichoptera. Nature Conservation Branch, Department of Primary Industries, Water and Environment, Tasmania.

Further information: Threatened Species Unit, Nature Conservation Branch, GPO Box 44 Hobart Tasmania Australia 7001. Ph 03 62 33 6556. Fax 03 62 33 3477.

Permit: It is an offence to kill, injure, collect or keep these species unless under permit from the Secretary, Department of Primary Industries, Water and Environment.