

British Dragonfly Society

Draft Management Fact File



Please note: These MFFs are still draft versions. Any comments sent to the [Conservation Officer](#) would be most welcome.

The Scarce Emerald Damselfly *Lestes dryas* Kirby 1890

Identification



© 1999 W J Furse ARPS

The Scarce Emerald Damselfly (*L. dryas*) is a medium sized metallic green insect that¹, unlike most other damselflies, usually rests with its wings half open² at an angle of approximately 45deg. Once mature the male and female develop different colouration with the males usually being more noticeable than the females. Adult males have bright blue eyes and develop a powder blue pruinescence on the thorax between the wings and on the segments at

the top and bottom of the abdomen (Fig. 1). In comparison, the females tend to be a much duller green and consequently are less easy to see (Fig. 2.).

The Scarce Emerald Damselfly can easily be confused with the more common Emerald Damselfly (*Lestes sponsa*)^{2,3} especially as they are often found together in the same habitat⁴. However, the Scarce Emerald Damselfly is more robust than its more common counterpart, and has subtle differences such as brighter blue eyes and less extensive pruinescence² in the male, and different abdominal markings on segment two in the female. The female Scarce Emerald Damselfly has rectangular paired spots as opposed to the rounded marks seen on the female Emerald Damselfly and the side of its body is also chocolate brown. Close examination of the anal appendages or the ovipositor is required to confirm identification beyond doubt³.

Lestes larvae and exuviae can be separated from other damselfly species firstly by the shape of the labium and prementum and banding of the caudal lamellæ³. However, separating the Scarce Emerald Damselfly and the Emerald Damselfly can only be achieved definitely by close examination of the mouthparts (i.e. labium and prementum)².



Status

As the name suggests, the Scarce Emerald Damselfly is a rare and local species, which has been recognised as vulnerable by the UK statutory conservation agencies^{5,6}. It is listed under category 2 (vulnerable) in the British Red Data Book on Insects. In 1980 this species was declared as "probably extinct", but in 1983 the species was rediscovered in Essex^{3,7}. The decline was thought to be a result of habitat loss and pollution⁸, although it is likely that the species was under recorded and overlooked at the time. Consequently, the exact status of *L. dryas* is unclear⁹. Recent records suggest that the species is out of immediate danger, although there are "no grounds for complacency"³ as the reasons for the recent decline still remain largely unexplained.

Distribution

L. Dryas is a Holarctic species and is widespread in the Northern Hemisphere², where its range extends across North America and Eurasia. In Europe it is widespread and can be found from Portugal to southern Finland, although it is more local in northern and central parts. It is also present in the Near East and Japan³.

In Britain the species has never been common, although historically it was more widely distributed in eastern England than it is today¹, ranging from East Sussex to South Yorkshire³. Currently the species has strongholds on the coastal and estuarine marshes of Essex and North Kent and in the Norfolk Brecklands. However, a few scattered colonies have also been discovered at other locations in East Anglia^{1,3}.

[Distribution map](#) from the [National Biodiversity Network Gateway](#) website.

Ecology and Habitat Requirements

L. dryas can occur in two types of habitat in the UK:

- It is usually found within the dense vegetation of shallow pools and drainage channels². On the coastal and estuarine marshes in Kent and Essex populations also use the borrow dykes, as well as ditches and marsh pools³. Lakes or ponds that are near the end of their natural cycle, supporting dense vegetation, are particularly suitable and breeding sites always appear to be well vegetated with submerged and emergent vegetation.
- The Scarce Emerald Damselfly can also be found in seasonal water bodies, which may subject to a temporary drying out period at the height of summer.

The occasional drying out of both types of habitat stops the presence of fish, which are major predators of *Lestes* larvae. These larvae tend to float in mid-water and so are easy preys for fish. *Lestes* are adapted to overwinter as eggs in vegetation, in order to survive drought conditions. However, an additional danger with this technique is that of the vegetation containing the eggs could be grazed, resulting in the potential eradication of a population¹³.

If water is present all year in well-vegetated ditches, the very dense vegetation makes predation difficult if fish are present.

Active management is required to prevent succession and to maintain the habitat for these populations. The shallow and temporary nature of such sites means that they often dry out during the summer months² and consequently *L. dryas* is adapted to cope with this. It seems likely that these habitat conditions actually eliminate both competitors and predators³. In the Norfolk Brecks, colonies populate seasonal water bodies (pingos) which dry out in summer and therefore contain no fish as predators. As there is little or no grazing on these sites, eggs that are laid in marginal plants are free to hatch the following year after water levels have risen¹³.

Unlike many Odonata species *L. dryas* often lives in brackish water although the degree of saline tolerance has not yet been established³. At sites where it is found, it appears that populations are extremely localised, and often nearby ditches that could also provide an apparently suitable habitat remain uncolonised. This suggests that there are subtle habitat preferences that have not yet been identified and require further research³.

After a lengthy mating, *L. dryas* lay their eggs while in tandem, inserting them into the stems of marginal plants, usually above the level of the water^{2,3}. Individuals have also been observed ovipositing into the

vegetation in dried out pools⁹. Unlike most other species of damselfly the eggs overwinter, hatching in the spring. The larvae then develop rapidly and can mature within 8 weeks. Generally, the larvae live among the dense vegetation although it is thought that they can also survive in mud beneath matted vegetation, which remains cool and moist⁹. Adults begin to emerge towards the end of June² and can be seen on the wing until the end of August, although they are not always easy to see preferring to stay within the marginal vegetation, especially in dull weather^{7,8}. Also when disturbed, they often feign death, folding legs and wings and falling down into the dense vegetation base.

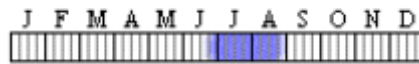


Figure 3. The Flight Period *L. dryas*

Current Threats

- Alteration of Site Hydrology:** - One of the greatest threats to *L. dryas* is over-abstraction² resulting in the lowering of water table, especially at sites where they breed in temporary pools^{1,10}. Contraction of the breeding range has been associated with agricultural activity, which has resulted in lower water tables during periods of drought, and the destruction of marshy habitat¹¹.
- Conversion of grazing marshes to arable farming:** - During the last century 30% of the grazing marshes have been lost through conversion to arable land¹², reducing the amount of suitable habitat for this species. In fact, in Essex *L. dryas* appears to be confined to large grazing marshes that have been saved from conversion to arable land by their conservation status.
- Over Grazing by Cattle:** - Overgrazing can make habitats untenable by opening up the vegetation and make shallow waters turbid. In addition excreta can foul the water causing pollution. Grazing cattle can also eat the vegetation that the eggs have been laid in and overwinter within¹³.
- Eutrophication and Toxic inputs:** - The runoff from agriculture is another area of concern. Heavy fertiliser application and chemical runoff pollute the aquatic system, contributing to the decline of suitable habitats. Nutrient enrichment can lead to a loss of aquatic vegetation and increased incidence of algal blooms making habitats unsuitable for *L. dryas*^{1,10}.
- Lack of Appropriate Habitat Management:** - Without appropriate management habitats soon become untenable for *L. dryas*. Lack of ditch management can result in water bodies permanently drying out, especially if combined with lowered water

tables. Insensitive management of the surrounding habitat can also have a detrimental impact on this species.

- **Habitat Destruction and Fragmentation:** - There has been a reduction in the amount of suitable habitats and these have increasingly become fragmented, through development, inappropriate management, over grazing and changing agricultural practices. Fragmentation is a particular problem because of the association, which *L. dryas* has with ditches that are vulnerable to drying out. As habitats become untenable, adjacent suitable habitats that can be colonised are required.
- **Site Development:** - There are several sites that are threatened by development, particularly along the Thames estuary, one of the species strongholds.
- **Climate Change:** - Although *L. dryas* is tolerant of brackish water, coastal flooding, caused by climate change, could have serious implications for the conservation of this species at coastal sites. Without sufficient coastal protection many of the coastal grazing marshes, which are important strongholds for the species, are likely to be inundated and lost.

Adapted from Benton *et al*, 1996³

Management

General Management Guidelines

- **General Management of Water bodies:**- Because *L dryas* is associated with ditches that are vulnerable to drying out and are undergoing natural succession, without management many sites will eventually be eliminated. Therefore, other ponds and ditches in the vicinity should be appropriately managed, or some even created for the species to colonise. Management should maintain a mosaic of habitat types, especially those in the later stages of hydrosere development. Since it is not yet clear exactly what the species' requirements are, large sites containing many water bodies are more likely to accommodate the diversity needed to provide suitable habitat for recolonisation.
- **Maintaining Grazing Marsh:**- Conversion of neighbouring land from grazing marsh to arable may be detrimental to existing populations and limit the chances of establishing new populations, particularly where runoff enters water courses. Every effort should therefore be made to maintain land under a system of extensive grazing in areas where the species is present or suspected, as well as land adjacent to these. However, care should be taken to protect

marginal plants from excessive grazing, as cattle may eat vegetation where the eggs of *L. dryas* have been laid (see earlier comments)¹³.

- **Control of Flooding:** - The proximity of the species' preferred habitat to the coast makes it vulnerable to changes in the nature of coastal flood defences. The presence and habitat requirements of the species should therefore be taken into consideration when planning new defence measures.
- **Research:** - Systematic research is needed to determine more exactly the habitat requirements of this species and whether it is able to maintain viable populations alongside marshes after conversion to arable farming.

Best Management Practice

- **Management of Ditches:** - In general, where the presence of *L. dryas* is known or suspected, any deepening of ditches or clearance of emergent vegetation should be confined to ditches which are liable to drying out permanently (even in winter and spring). Invasive management of breeding sites should not be carried out until recolonisation has been conclusively established nearby. Where the species is present and apparently thriving, the existing management regime should be continued, with minimal disturbance.
- **Vegetation Management:** - Since it seems likely that populations of *L. dryas* in borrow dykes benefit from shelter provided by rank grasses and rushes growing between the dykes and the sea walls, such sites should not be subjected to grass cutting before the end of August.
- **Managing Cattle Grazing:** - Wherever possible, grazing should be restricted particularly where it opens the vegetation and threatens the growth of tall emergent vegetation in ditches. This can be done by excluding grazing animals during the period of adult *L. dryas* activity, between the end of May and the end of August and/or by fencing inhabited ditches. Depending on the site, fencing may be a more appropriate management technique as it allows management to be zoned. This may be particularly important as different grazing schemes support and benefit a number of different species.
- **Survey Work:** - This should be conducted as a conservation priority to determine the extent of breeding populations of *L. dryas*.

Habitat Creation and Restoration

- **Habitat Creation:** - Although creation of suitable habitats may be difficult, it should be attempted where appropriate, particularly in the vicinity of existing colonies. However, consideration should also be given to targeting habitat creation with the aim of providing refuge areas in the event that a rise in sea level causes flooding of existing habitats.
- **Translocation:** - "This seems unlikely to succeed as a conservation measure given the limited knowledge of its seemingly exacting requirements"³.

Adapted from EA

Case Study?

References

1. **Merrit, R., Moore, N. W., Eversham, B. C., 1996,** Atlas of the dragonflies of Britain and Ireland. ITE Research Publication, No. 9. HMSO, London, pp.
2. **Nelson, 1997** in Field Guide to the Dragonflies and Damselflies of Great Britain and Ireland, Eds Brooks S. and Lewington R. British Wildlife Publishing, Hampshire.
3. **Benton, E., Moore N. W., Silsby J., 1996,** Management Guidelines: Scarce emerald damselfly *Lestes dryas* Kirby 1890 in the Species and Habitats Handbook, Environment Agency.
4. **Benton, E., 1985,** The dragonflies of Essex, Journal of the British Dragonfly Society 1(5), pp. 77-82.
5. **Parr, A., 2000,** An Annotated List of the Odonata of Britain and Ireland, Atropos 11, pp. 10 - 20
6. **Moore, N. M., 2000,** Applying IUCN criteria to assess threats to British dragonflies Dragonfly News (Newsletter of the British Dragonfly Society)37, pp. 19-20
7. **Benton E., and Payne, R. G., 1983,** On the Rediscovery of *Lestes dryas* Kirby, in Britain, Journal of the British Dragonfly Society 1 (2), pp. 28 - 30.
8. **Hammond, C. O., 1983 (2nd Edition revised by R Merrit),** The Dragonflies of Great Britain and Ireland, Harley Books, Colchester.
9. **Perrin, V. L., 1995,** Observations on *Lestes dryas* Kirby habitat in Norfolk: is there a typical inland site for this species? Journal of the British Dragonfly Society 11(2), pp. 25-26.

10. **Benstead, P., Drake, M., Jose, P., Mountford, O., Newbold, C., and Treweek, J., 1997**, The Wet Grassland Guide, RSPB, Sandy, Bedfordshire
11. **Moore, N. W., 1980**, *Lestes dryas* Kirby - a declining species of dragonfly (Odonata) in need of conservation: notes on its status and habitat in England and Ireland. Biological Conservation 17, pp. 143 - 148
12. **Heath, P., 1999**, The Past and Present Status of Norfolk Hawker *Aeshna isosceles* Mull in Britain, Atropos 8, pp. 13-21.
13. **Donnithorne, N.**, pers.comm. (March 2004)

Management file updated on 4 April 2004