



# 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 Chaser** ***Libellula fulva* Müller**

### ***Identification***



"The Scarce Chaser (*Libellula fulva*) is one of 4 dragonflies found in Britain, in which the mature male possesses pale blue pruinescence on the abdomen"<sup>1</sup>. Prior to maturation the male and female look very similar<sup>2</sup> and are highly distinctive<sup>3</sup> with vivid orange colouration, black triangular shaped markings on the upper surface of each abdominal segment and dark bases to the wings<sup>3</sup>. Once mature the males develop a blue pruinescence on most of the abdomen, although the last three segments become black. Adult

males can be confused with Black Tailed Skimmers *Orthetrum cancellatum* and Keeled Skimmers *O. coerulescens*. However, during mating the female Scarce Chaser clings to the abdomen of the male producing a diagnostic wear pattern on the third segment. This can often be used to help separate these three species<sup>2</sup>.

The larvae are typically libellulid, but are easily distinguishable from other species as they have prominent dorsal spines<sup>4</sup>.

### **Key Identification Features**

- Immature males and females bright orange-brown, with black triangles on most abdominal segments
- Mature males have blue abdomens with black tip
- Both sexes have brown patches at the base of the hind wings

### ***Status***

*L. fulva* is scarce in Britain and is consequently listed under category 3 (scarce) in the British Red Data Book on Insects<sup>4,5</sup>. It is restricted to approximately 10 scattered river systems and nearby still waters in southern England<sup>6</sup> and despite being scarce to rare throughout its range, it can be locally abundant.

## ***Distribution***

The Scarce Chaser is a European species that has a relatively discontinuous distribution across its range<sup>4</sup>. It can be found from southern France to northern Germany and east throughout central Europe to Russia, although it appears to be rare in Spain<sup>1</sup>.

In Britain the Scarce Chaser is restricted to 6 main localities although evidence suggests that it may be expanding its range<sup>6</sup>. It is recorded from the Rivers, Yare (Norfolk), Waveney (Suffolk), Avon (Wiltshire/Somerset/Dorset/Hampshire), Arun (Sussex), Nene (Cambridgeshire/Northamptonshire), Great Ouse (Cambridgeshire/Bedfordshire/Huntingdonshire vice-county), North Stream and associated ditches (Kent) and the Frome, Stour and Moors (Dorset/Hampshire)<sup>1,2</sup>. New breeding colonies have been found on the Wey in Surrey and Hampshire, and current populations seem to be stable<sup>3</sup>.

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

## ***Ecology and Habitat Requirements***

The Scarce Chaser is a species of lowland river floodplains and is usually found inhabiting slow flowing rivers, water meadow dyke systems and occasionally mature gravel pits<sup>1</sup> (Milne) and nearby ponds<sup>3,6</sup>. It appears to prefer nutrient rich mesotrophic to eutrophic waters with a pH above 7.0<sup>4</sup>. Inhabited sites characteristically support patches of prolific emergent vegetation<sup>3</sup>, including Common Club Rush (*Schoenoplectus lacustris*), Reed Sweet Grass (*Glyceria maxima*), Branched Bur-reed (*Sparganium erectum*)<sup>1</sup> and Reedmace (*Typha*)<sup>4</sup>. Males have also been observed using silty inlets where Bur reed and Yellow Water-lily were growing along the river margins<sup>7</sup>. Observations suggest that *L. fulva* sometimes shows a preference for smaller, quieter streams<sup>8</sup>. This type of habitat is not rare in the UK and consequently it is difficult to determine the reasons for the paucity of the Scarce Chaser countrywide<sup>2</sup>.

Dense vegetation appears to be important habitat requirement. It provides niches for the developing larvae within the roots as well as offering shelter and emerging, basking and resting sites for the adults<sup>4</sup>. Semi-aquatic species such as Arrowheads (*Sagittaria*), Pondweeds (*Potamogeton*) and Mints (*Mentha*) also provide suitable breeding and development habitats for prey species<sup>2</sup>. Despite basking on the top of dense vegetation such as tall umbellifers<sup>3</sup> Scarce Chasers do not tolerate exposure<sup>4</sup> and the greatest densities of individuals tend to occur where there is scrub in close proximity to the river<sup>2</sup>. Adjacent woodland is used for maturation, roosting and feeding<sup>4</sup>, particularly in adverse weather<sup>2</sup>, although heavily shaded areas are usually avoided<sup>3</sup>.

Mating appears to be a relatively time consuming and rigorous affair, rarely lasting less than 15 minutes<sup>2,3</sup>. Once a female has been seized, the pair "flop down at ground level into the vegetation"<sup>3</sup> where copulation takes place. The female then oviposits alone, guarded by the male who hovers close by to ward off intruders<sup>1</sup>. She repeatedly flicks her abdomen onto the surface of the water, choosing slow flowing water, often close to the bank<sup>3</sup> or above the leaves of aquatic plant lying in the water<sup>9</sup>. Females will often stay over the same spot for several minutes<sup>1</sup> and the eggs, which are covered in a gelatinous coat, sink to the bottom and become attached to the substrate<sup>3</sup>. Once hatched the larvae take up to two years to complete their development, living among the silt, mud and semi decomposed detritus on the river bed<sup>3</sup>. They can usually be found where vegetable matter has been trapped in the roots of plants under the bankside in the lee of bends<sup>3</sup>. Synchronised emergence usually begins towards the end of May, although this can be delayed by bad weather. Goodyear<sup>8</sup> found that favoured emergence sites contained a thick growth of Reed Canary-grass (*Phalaris arundinacea*), with lesser growth of Branched Bur-reed (*Sparganium erectum*) and Common Reed (*Phragmites australis*). A variety of other aquatic plants were also present.

Adults can be seen on the wing until early August and observations suggest that males usually fly along the water's edge and not over open water<sup>9</sup>. By comparison females are more frequently found away from the breeding habitat. Observations made by Hinterman<sup>9</sup> indicated that when adults were encountered in surroundings adjacent to the river, they were frequently seen resting in scrub and trees or flying over unmown meadows. *L. fulva* appears to roost low down in relatively dense vegetation such as Stinging Nettles (*Urtica dioica*) or patches of tall grass and umbellifers. In these situations it "not only avoids potential predation and disturbance, but is also sheltered from adverse weather conditions"<sup>10</sup>.

## Summary of Main Habitat Requirements

- Large dykes and sluggish, meandering deep rivers
- Good water quality
- Adequate emergent vegetation
- Some aquatic vegetation, both submerged and floating species, and areas of slow flowing open water
- A certain amount of shrub or tree shelter.



Fig 2. Flight season

## Current Threats

- **Inappropriate River Management** - The removal of fallen trees, inappropriate weed cutting<sup>2</sup> and the use of herbicides for clearance of bankside vegetation<sup>1</sup> can all be detrimental<sup>3</sup>. Bankside sedges and grasses provide basking and vantage points for the adults as well as supplying additional detritus which improves the larval habitat. "Some conservation strategies encourage diversification and resist the felling of bankside trees. However over diversification within too small an area may well lead to a

decrease in the population of this species"<sup>2</sup>. Channel maintenance and vegetation management are important for drainage and wildlife. However, dredging with machinery can make habitats untenable. Research suggests that dredging has a negative impact on *L. fulva* as both the larvae and adults avoided stretches of the river that had been dredged<sup>9</sup>.

- **River Improvement Schemes** - Major river works that fundamentally alter the hydrological nature of the river have a detrimental impact on the Scarce Chaser. These alterations may lead to excessive scouring of the bed, loss of bankside vegetation and subsequently to a single habitat type bereft of additional ecological niches. The suitability of rivers for species such as *Libellula fulva* has also been impaired by 'improvement' schemes that create steep banks and deep straight watercourses<sup>11</sup>.
- **Altered Hydrology** - Over-abstraction of water may pose a serious threat to the Scarce Chaser, particularly as it can lead to low flows, higher water temperatures and deoxygenation<sup>3</sup>. The two year development period of this species means that seasonal drying of a river or physical change could exterminate the population. Furthermore, over-abstraction may result in a higher concentration of harmful effluents<sup>4</sup>.
- **Pollution** - It appears that the degree to which pollution poses a threat has not yet been established. Despite the fact that it has been suggested that its association with rivers and drainage channels makes it vulnerable to pollution<sup>1,6</sup>, it appears that *L. fulva* is more tolerant of agricultural and industrial pollution<sup>3</sup> when compared to other riverine species<sup>4</sup>. However, polluting inputs from domestic sources and industry in the form of organic pollution and toxic chemicals do pose threats.
- **Eutrophication** - Nutrient enrichment caused by leaching of agricultural fertilisers may be deleterious, promoting the growth of algal blooms and causing eutrophication<sup>2</sup>. Flow rate and/or oxygenation are thought to be important factors for the larvae of this species and algal growth and eutrophication can affect these.
- **Over-shading** - Although shelter appears to be an important requirement for the adults, the uncontrolled growth of marginal trees in breeding areas can pose a serious threat<sup>2</sup>. Territorial males require sunlit areas and some open water is needed by oviposting females<sup>2,3</sup>.
- **Excessive boat traffic** - This can cause turbulence and sediment resuspension, which may have consequences for growth of both emergent and submerged vegetation as well as having a direct impact on the larvae.

## **Management**

### **General Management Guidelines**

- **Survey Work** - Before any management is undertaken, surveys should be conducted to assess the species using the site and the impact that any management might have.

- **Maintaining Inhabited Sites** - In localities where the species occurs and thrives, it is vitally important that the habitat does not deteriorate from its current level in relation to the outlined threats.
- **Surrounding Landscape** - Hinterman<sup>9</sup> observed that more Scarce Chasers were seen flying over ungrazed pasture or unmown meadows than over grazed pasture or mown meadow. This suggests that management of the adjacent habitat must be undertaken with care, particularly where colonies are known to occur or during habitat restoration programmes.
- **Water quality** - This should not be allowed to deteriorate in habitats supporting the species, particularly in terms of nutrient enrichment, organic pollution and toxicity.
- **Boating Activity** - Wherever possible, the intensity and speed of boating activity should be controlled to avoid extensive disruption to larval habitats. Zoning the activity and imposing speed limits are likely to be beneficial.
- **Research** - Guidance on the appropriate management of sites inhabited by *L. fulva* is limited by our lack of knowledge or ability to explain its patchy distribution. Research is needed to address this.
- **Monitoring** - Once any management techniques have been carried out, monitoring should be undertaken to ascertain the degree of success and any changes in the populations, either positive or negative, to provide feedback for future management efforts.
- **Recording** - It is vital to try to confirm whether the species is breeding at a known site and to carefully observe similar sites in the area. The accepted method of obtaining proof of breeding is inappropriate for the Scarce Chaser, since exuviae are difficult to find. Following mass emergences, the counting of immature adults (whose abdomens of bright orange with black markings are very conspicuous) is a simple task. Careful observation during the latter part of May and early June of all areas where the suggested typical habitat occurs could lead to the discovery of new localities.

### **Best Management Practice**

- **River Engineering** - Any operations should provide areas of low current velocity in the channel. Within these, emergent and bankside vegetation should be encouraged and managed to ensure that patches of open water are maintained for oviposition. Continuity of the preferred habitat is required in all localities where the species occurs or may occur.
- **Scrub Management** - A careful balance must be struck between adequate shrub/tree cover and its shading effect upon the water. Scrub and trees should be managed as discreet clumps and at no time should shading exceed 50 per cent of water between 11:00 and 16:00 hours during the period from May to July.

- **Dredging** - Where possible dredging and vegetation removal should only be tackled from one side of the bank on alternate years to ensure that there is a refuge for the larvae and emergent vegetation for the adults. The frequency of dredging should be kept to a minimum to prevent continued disturbance to the habitat and consequently the fauna it supports.  
After dredging, plants and animals recolonise from nearby undredged stretches. Therefore, impacted lengths should be as short as possible and never more than 400 metres. This should ensure that sites are recolonised relatively quickly minimising the impact on the flora and fauna of a site. The alternative is to desilt in the centre of the channel leaving the river margins untouched.  
Although dredging may serve important drainage, flood alleviation, or navigation functions, shallow margins are required to support emergent vegetation and consequently invertebrates. Where possible shallows should be retained or even created.
- **Management of Aquatic Vegetation** - Where weed-cutting is required along rivers, this should be undertaken selectively to avoid extensive disruption to long stretches of the watercourse. Ideally, no more than one-third of the area of a given habitat should be cleared in any one year ensuring that there is a refuge for the larvae and emergent vegetation for the adults. The spoil from dredging and weed cutting should be left on the bank for several hours in order to allow evicted larvae to find their way back to the water. It should then be removed to ensure that runoff from plant decomposition does not feed directly into the watercourse.
- **Management of Dyke Vegetation** - Channel maintenance is important for drainage and wildlife, but in dykes where the species occurs, rotational management will be required to ensure that there are areas of open water for oviposition and undisturbed emergent vegetation for larval refuge and emergence supports. Again, no more than one-third of the available habitat should be cleared in any one year.

## **Habitat Creation and Restoration**

- **Habitat Restoration** - In areas where conditions can be improved with respect to potential threats, the species should return to sites from which it has been exterminated and therefore habitat restoration may be a useful strategy. Better water management could enable it to return to sites from which it has disappeared.
- **Translocation** - The Scarce Chaser disperses widely in the immature stage and is not yet sufficiently endangered to require translocation. Provided that its current localities are adequately safeguarded in the future, it is expected to maintain its local abundance.

## **References**

1. **Merrit, R., Moore, N. W., and Eversham B. C., 1996**, Atlas of the dragonflies of Britain and Ireland, ITE Research Publication, No. 9. HMSO, London, pp. 94-95.
2. **Winsland, D., 1996**, Dragonfly Wildlife Report, British Wildlife Magazine 7(3), pp. 184 - 185.
3. **Winsland, D., 1997**, Scarce Chaser *Libellula fulva* Müller in Field Guide to the Dragonflies and Damselflies of Great Britain and Ireland, Eds Brooks S. and Lewington R. British Wildlife Publishing, Hampshire.
4. **Winsland, D. C., Moore N. W., Silsby J., 1996**, Management Guidelines: Scarce Chaser - *Libellula fulva* Müller Southern 1764 in the Species and Habitats Handbook, Environment Agency.
5. **Shirt D. B., 1987**, British Red Data Book: 2 Insects. Nature Conservancy Council, Peterborough, pp. 402.
6. **Cham, S., 2000**, Discovery of a 'new' population of the Scarce Chaser *Libellula fulva* Müller on the River Stour in the Dedham Vale, Journal of the British Dragonfly Society 16(1), pp. 17-19.
7. **Holme, J. D., 1995**, Notes on *Libellula fulva* Müller on the River Avon near Bristol Journal of the British Dragonfly Society 11(1), pp. 20
8. **Goodyear, K. G., 1995**, Comparison of aquatic larval habitat of *Libellula fulva* Müller, Journal of the British Dragonfly Society 11, 2: pp 42-45.
9. **Hinterman, U., 1983**, The Influence of River Management on Four Dragonfly Species on the River Arun (Sussex). M.Sc. Dissertation, University College London.
10. **Cham, S., 1999**, Roosting behaviour of some British Odonata with notes on the Scarce Chaser *Libellula fulva* Müller on the River Stour in the Dedham Vale, Journal of the British Dragonfly Society 15 (2), pp. 58-60.
11. **Hammond, C. O., 1983 (2nd Edition revised by R. Merritt)**, The Dragonflies of Great Britain and Ireland, Harley Books, Colchester.

---

*Management file updated on 16 January 2003*