

The Cranefly Recording Scheme in the British Isles; mapping, biotope studies and application to conservation objectives

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Abstract. The history of the Cranefly Recording Scheme covering Great Britain and Ireland is reviewed, a period of over 20 years since inception. The scheme has acted as a catalyst in the study of craneflies and other Diptera, including the participation of many amateurs. The British list has grown and knowledge of the distribution and ecology of species increased substantially. The application of the scheme to conservation objectives is discussed.

Key words: mapping, Great Britain, cranefly, Diptera, conservation.

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Britain has had a long tradition of amateurs studying the insect fauna, including Diptera. The way in which this activity has been encouraged and co-ordinated to improve knowledge of craneflies is discussed.

In the late 1960's I drew together the available data on *Ptychoptera* as a pilot study to see whether a cranefly recording scheme was a viable proposition. One thousand records were readily assembled from the literature, major museum collections and from my own and other people's records. Maps were plotted using the 10 km square grid as promoted by the Biological Records Centre (which had just begun to cover insects, following publication of a plant atlas). It was clear that worthwhile maps, and an advance in ecological understanding of distribution, was a reasonable goal even if 100% coverage of the British Isles was not possible.

There were at least 6 keen cranefly workers in Britain at that time. Dr R.I. VANE-WRIGHT and A.M. HUTSON at the British Museum were enthusiastic and joined with me (then an amateur) to start a Cranefly Recording Scheme covering Ptychopteridae, Tipulidae (broad sense), Trichoceridae and Anisopodidae. The latter two families were regarded as Tipuloidea on the British list at that time (they may not have otherwise been included, especially since the Trichoceridae had taxonomic problems that none of us were wishing to face). By the time the Biological Records Centre had produced record cards, it was 1973 that the scheme begun.

We soon had 50 people in support, readily coming to meetings from even 400 miles away. Field meetings and indoor meetings were successful, with newsletters and identification services to maintain interest. We were also immediately successful in adding species new to the British list, including a new genus (*Dicranoptycha*), caught by a novice.

It is important to recognize that though the support from a wide range of people was excellent, those taking part were not primarily interested in craneflies. They wanted a hoverfly recording scheme and this had the potential to draw more people into Diptera, and ultimately into assisting with cranefly recording. Hence after 3 years, more recording schemes were started and the official events were for Diptera on a broader basis.

By this time Dick VANE-WRIGHT and Tony HUTSON had found their museum careers moving away from craneflies so I was alone as organizer of the Cranefly Recording Scheme, and also co-ordinator of all recording schemes for Diptera.

There are now well in excess of 2000 10 km squares with post 1960 cranefly records. Hand plotted atlases to Tipulinae and Ptychopteridae were prepared in 1984, which the Biological Records Centre has not yet published (the latest promise is for 1992) and considerable further data is now assembled. However, even the early generation of maps gave a reasonable indication of distribution patterns and a much improved ecological statement has been achieved. Since the Biological Records Centre has been unable to meet earlier commitments to computerise data, this is a task I am now to undertake myself.

The recording scheme has greatly clarified knowledge of status (rare or common). It is now much more practical to say which sites and ecological situations are important for craneflies.

A different but inter-related project has been the Invertebrate Site Register for Great Britain which I started whilst employed by the Nature Conservancy Council (in 1974 I metamorphosed from a geologist to an entomologist in the Nature Conservancy Council, a government wildlife agency). The ISR has invited entomologists (and other invertebrate specialists) to report which sites are important and why. A series of documents, mainly on a county basis, have been prepared which review and grade these sites, together with bibliography, lists of specialists and other relevant information. The state of coverage of habitats is reviewed, drawing attention to important sites and faunas not properly represented on nature reserves and other conservation areas. A statement on each species of importance is given, including sites and ecology. The system is progressively becoming more refined and it is now possible to call up on computer a statement for over 15,000 species (about half the British invertebrate fauna) including common species - a list of bald meaningless Latin names is no way to promote an interest in invertebrates within the conservation movement. The purpose has been to bring invertebrates into mainstream conservation, the past reliance on a relatively few higher plants (c. 17,000 species) and vertebrates (c. 300 breeding species) being unacceptable.

It will be apparent that the Cranefly Recording Scheme (and other Diptera schemes) have set a firm basis for this conservation programme. Recognition of important sites and ecological situations is based upon the recording scheme effort. The status of a species is readily evaluated. Red Data Book species are defined as species currently occurring (or likely to occur) in no more than 15 10 km squares and nationally Notable species occur

(or are likely to occur) in up to 100 10 km squares (sometimes a little in excess if declining fast). These are Criteria Species in the evaluation of Sites of Special Scientific Interest (with protection in law) and National Nature Reserves. There is also some use of Regionally Notable species and a less formal list of local species.

Clearly the richest sites in Britain are important, for instance 100 species of Tipulidae (s.l.) at Wisley Common (SW of London) and 107 species at East Walton Common, a pingo site in East Anglia (pingos = crater like hollows with pools from a former tundra environment during the Pleistocene). Crane-flies have been an important element among the Diptera in advancing the case for creating National Nature Reserves, as at Crymlyn Bog (South Wales) where pollution from an oil refinery and other problems needed the sort of resolution that a nature reserve would bring.

Some vital habitats of little interest to botanists or ornithologists are immensely important to crane-flies and various other insects. A good example is the soft rock cliffs of the south coast of England, especially where sand with seepage ground water overlies clay to produce landslips. Various very rare crane-flies have been found in these situations in recent years, including *Helius hispanicus* and an *Idiopyga* that may be sp. nov.. Moreover, Britain has probably the largest extent of this high quality habitat in Europe. Such coasts erode fast, resulting in the demand for sea defences that cause the stabilisation of these cliffs and loss of crane-fly habitat. Another example is the river bank fauna which has proved to be richest on sandy rivers whose source is on granite or certain sandy rock formations. Crane-flies are being used in the evaluation and defense of river systems, there being much concern at present over the future of parts of the River Spey in Scotland, including the largest remaining natural river confluence fan in Europe, all other examples having been strongly regulated.

The scarcer *Ctenophora* are among the crane-flies that can be used as indicators of historic continuity of woodland with large trees and a good saproxylic (rotting wood) fauna. Indeed, these are among the indicator flies (for recognizing forests of international importance) included in a review by Dr Martin SPEIGHT of the urgent conservation needs of the saproxylic fauna throughout Europe; there is an important directive from the Council of Europe emphasising the importance of maintaining this fauna and its habitat.

Among the other conservation issues, my studies in Britain have demonstrated that even the minor ditching of streams (by 3-10 cm) can reduce the crane-fly fauna of streams/streamside marsh and carr by between 30 and 50%. On seepage carr similar ditching can result in a very rich fauna declining to a few ubiquitous species - the time lag for the full consequences can take 10 years in some cases.

A further major issue in Britain is the abstraction of ground water with the result that water tables fall; streams, ponds and seapages dry up. This compounds the problem in marshes and fens where nearly all rivers and streams have been deeply canalised. The problem is especially severe in the SE half of England as the human population increases, including large scale over-spill from cities into rural districts. Also modern agriculture now makes great demands on underground water for irrigation. Three consecutive years of summer and winter drought have brought the situation to a critical position, with extensive major local extinction of wetland crane-flies probable in many of the few

remaining good quality sites in East Anglia and elsewhere. The crane-fly fauna of East Walton Common, mentioned earlier, was among the successful arguments to counter proposal for ground water abstraction.

The Crane-fly Recording Scheme has played a major part in increasing the basis of knowledge on which conservation is advanced. The above cliff and river examples are built upon data gained from field meetings in under-recorded areas away from the home ranges of dipterists. For 17 years there have been major meetings, usually consisting of a week (or twin-centred two weeks) in the summer with 20-30 people, and a 4 or 5 day autumn meeting with 6-10 people. Each day the groups of people divide up into sub-groups of 3 to 6, each sub-group having its own itinerary of 2-3 sites depending on the nature of the site and season. Hence a party of 20 for a week has the capacity to cover perhaps 80-100 sites over a radius of 35-50 km. Large quantities of crane-flies are brought in each day and I determine all the material brought in by non-specialists. This considerable injection of manpower can dramatically improve knowledge of the Diptera fauna of an area.

It is only fair to say that many dipterists in Britain resist being addicted to crane-flies (the legs all drop off!). This is no real difficulty since both specialists and non-specialists refer large quantities of crane-flies to me for checking or primary identification. After the initial impetus the demand was for a hoverfly recording scheme. There are now 9 Diptera Recording schemes, and I found myself having to devise an identification book to make the hoverfly recording scheme viable. I am likewise nearing completion of a book on larger Brachycera. There is logic to this madness. If more people are to be brought into Diptera, they will become dipterists via hoverflies. After a few years they often want to branch out into other dipterous families. Thus as co-ordinator of recording schemes I have about 400 dipterists on the mailing list, of which about 100 are interested in crane-flies to varying degrees. There are also annual meetings in London covering Diptera as a whole, with an attendance of 100 - 120 from about all parts of Britain, and a Bulletin (in addition to the scheme newsletters) in order to foster enthusiasm. A journal, *Dipterists Digest*, has evolved out of the enterprise (not my initiative). The objective is now to clear myself of many of the organisational commitments, and have taken early retirement, so as to make time to get back into full swing on crane-flies again. A book on British crane-flies is high on the agenda and already some draft keys and a newsletter are well advanced. It is also hoped that after a delay of 7 years the Biological Records Centre will publish the preliminary atlases to the Tipulinae and Ptychopteridae.

As a footnote may I say that the field meetings and the annual meeting at the British Museum (normally first or second Saturday in November) are open to all. Crane-fly and indeed other Diptera specialists from other countries will be warmly welcomed.

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