

**WORKABILITY OF THE NEW
'IUCN CATEGORIES OF THREAT'
WITH ODONATA IN SOUTH AFRICA**

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The workability of the recent '*IUCN Categories of Threat*' needs to be assessed for various taxa. During the time of preparation of these, a study was done on the feasibility for Odonata in South Africa. 8 South African spp. are currently Red Listed. The new *Categories* provide a highly workable framework for threat assessment, especially so with respect to changes in status, and stimulate discussion on whether certain spp. should be removed from the list, yet other spp. added. They also stimulate worthwhile research in single-species conservation albeit at a fairly high financial cost.

INTRODUCTION

Despite the huge numbers of invertebrate species, the taxonomic impediment (NEW, 1984) and the possibly high rate of current extinctions (MAWDSLEY & STORK, 1995), there is still merit in the species approach to some aspects of invertebrate conservation. One of the first steps to single-species conservation is Red Listing globally-threatened organisms. For inland invertebrates, this has three important facets. Firstly, Red Listing stimulates research, and with dragonflies, it has resulted in new sites being discovered and in information becoming available on changes in status (both for the better and for the worse) between the 1992 and 1994 *IUCN Red List of Threatened Animals* (IUCN, 1990; GROOMBRIDGE, 1993; SAMWAYS, 1995). Secondly, large, spectacular, rare and threatened species can be umbrellas for many other species when the ecosystem supporting them is conserved. Thirdly, when several highly-localized endemics occur together, they provide support towards the conservation of hot-spots, and in the case of inland invertebrates in South Africa, towards registration of a World Heritage Site (PICKER & SAMWAYS, 1996).

During the time of preparation of the new *IUCN Categories of Threat* (MACE & STUART, 1994; IUCN, 1994) a trial run was begun on the workability of these to an insect taxon (Odonata in this case) in a species-rich country (South Africa). This involved further field work which, in turn, improved the exactness of the categorization. Clearly, the *Categories*, and then the new work, stimulated each other.

This report aims to illustrate the workability of the new *Categories* using MACE & STUART (1994) and IUCN (1994), and to provide a comparison for other, similar reports.

THE SOUTH AFRICAN RED-LISTED SPECIES

The 1994 Red List gives eight South African endemic Odonata species (Tab. I). During 1992-1994 these species were re-investigated in view of their Red List status.

Table I
The South African Odonata species currently Red Listed (IUCN, 1994)

Old IUCN Category of Threat	Proposed new IUCN Category of Threat	Species	Locality	Year last seen
Synlestidae				
R	EN	<i>Chlorolestes apricans</i> Wilmot	Eastern Cape (Amatola Mountains)	1993
R	lc	<i>C. draconicus</i> Balinsky	Kwazulu-Natal (Drakensberg)	1995
R	nt	<i>Ecchlorolestes nylephtha</i> Barnard	Western Cape (Tsitsikamma)	1995
R	VU	<i>E. peringueyi</i> (Ris)	Western Cape (Slanghoekberge)	1993
Coenagrionidae				
I	DD	<i>Enallagma polychromaticum</i> Barnard	Western Cape (extreme S.W. Cape pools and marshes?)	1962
Platycnemididae				
I	Removed	<i>Metacnemis angusta</i> Sélys	Western Cape (extreme S.W. Cape?)	1920
Libellulidae				
I	DD	<i>Orthetrum rubens</i> Barnard	Western Cape (extreme S.W. Cape mountain slopes)	1977
V	DD	<i>Urothemis luciana</i> Balinsky	Kwazulu-Natal (St. Lucia estuary)	1959

COMMENTS ON THE 'IUCN CATEGORIES OF THREAT' PREAMBLE

EVOLUTIONARILY SIGNIFICANT UNITS. – Many insects have morphs and these would, presumably also qualify (see SAMWAYS, 1993 for details) as evolutionarily significant units (ESUs) (MORITZ, 1994; VOGLER & DeSALLE, 1994). This did not apply to these Odonata species.

DOUBTFUL TAXONOMIC STATUS. – *Metacnemis angusta* should be removed, as there is no verifying evidence that it is a good species. It was described in 1863 from a female from the "Cape of Good Hope". Another female was taken at Ceres in 1920, but since then, no further specimens have been seen. With only these two females and no male, it is uncertain whether this is a good species or a form of *M. valida* (PINHEY, 1984). This means that *M. angusta* should not be listed (unless a recent, male specimen is obtained), but rather categorized as 'Not Evaluated'. This elimination process should be rigorously applied to all species of doubtful taxonomic pedigree.

LACK OF DATA RELATIVE TO ADULT VERSUS LARVAL HABITAT. – *Orthetrum rubens* is a highly-localized south-western Cape endemic that has been seen only occasionally on montane slopes or in association with montane streams with pools. The larva and larval habitat are not known, and it is not known whether this species is truly threatened. This means that it must be assigned 'Data Deficient'. But should it be included in the Red List at all? In view of its extreme endemism and that its larval habitat might be threatened, it is better included as a stimulus to the gathering of more data. This lack of knowledge also applies to *Enallagma polychromaticum* and *Urothemis luciana*, and to many other invertebrate species.

BEING PRESENT IN RESERVES DOES NOT GUARANTEE PRESERVATION. – With many invertebrates, and their high population variability and frequent local extinction, the term 'Conservation Dependent' does not provide the same guarantee as it does with many larger animals. This was well-illustrated by four *Orthetrum* species. In 1990, the very localized *O. robustum* was recorded in the Greater St Lucia Park, and the rare *O. guineense* and *O. hintzi*, as well as the more widespread *O. brachiale*, at Mpenjati Reserve. Yet in 1994, they were absent, their pool and marshland biotopes having dried up. Despite the rains of 1994 and 1995, *O. robustum*, which is of conservation concern locally, has not returned.

SIGNIFICANCE OF COLONIZING ABILITY. – The *Category of Threat* simply provides an assessment of the likelihood of extinction under current circumstances (IUCN, 1994). These circumstances may change, and if the change is for the better, vagility of the insect may be playing a major role. For example, the two *Ecchlorolestes* species are highly stenotopic and water-bound. They are not good colonizers, as illustrated by their not returning to any of their former sites, despite some having improved. *O. rubens* however, is a strong flier and presumably a good colonizer (PINHEY, 1985) and might therefore respond quicker to restored sites. Certainly, in one restoration project, different invertebrate taxa clearly established at different

rates (WILLIAMS, 1993).

LOCAL VERSUS GLOBAL LISTING. – The significance of global versus local use of the *Categories* is particularly relevant to insects, although not in the case of these eight Odonata species which are restricted to one country and also to single provinces. Insects can be abundant in one country yet nationally rare in another, e.g. *Locusta migratoria* rare in Hungary. Some insect population fluctuations can be huge, and their ranges can show precipitous declines, even to extinction (LOCKWOOD & De BREY, 1990). It is important therefore, that regional listing is supplemented by a global listing.

COSTS AND IMPORTANT ROLE OF NON-PROFESSIONALS. – Searching for threatened and rare invertebrates, even in confined environments such as caves, can be very expensive and unrewarding. Many re-evaluations are therefore likely to be based on chance finds. Enthusiastic amateurs can therefore play an important role in re-evaluations.

CONSIDERATION OF VAGILITY AND SPATIAL SCALE. – Problems of scale are particularly acute with insect taxa, as some are relatively immobile and others highly mobile. Also, some are confined to specific microsites and others to a much broader geographical area. These differences are seen in the Red Listed dragonfly species here, with *E. peringueyi* apparently confined to two small stretches of two rivers, yet *O. rubens* appears to range widely. Yet there is the mysterious situation with *Urothemis luciana*. This large dragonfly was described from specimens caught in 1957 and 1959 at one locality, yet it has not been seen since, despite intensive searches. Is this a highly localized species that now is possibly extinct? Or is it a migrant from elsewhere in Africa that has not yet been investigated?

Different mobilities, as well as relatively broad locational data on data labels of many insect specimens, mean that field localities often cannot be pinpointed. This makes calculation of exact area of occupancy often quite unrealistic. The best working area for recording and computer mapping of insects in South Africa is a ¼° square. All that can be said is that the species occurs 'somewhere in that square'. In a topographically and vegetationally variable country like South Africa, only a few highly mobile species (and usually not threatened ones) occur throughout a whole ¼° square.

COMMENTS ON IUCN CATEGORIES OF THREAT 'DEFINITIONS' WITH REGARD TO INVERTEBRATES

Often distinct subpopulations occur (especially, for example, in lycaenid butterflies) and so it is reasonable to Red List specific subspecies or forms, or more precisely, ESUs. This does not apply to any of the eight dragonflies here.

Only with very detailed studies could features such as 'mature individuals' and, 'generation' be determined for invertebrates. 'Continuing decline' and 'reduction' can only really be assessed in terms of presence/absence within the area of occu-

pancy and not in total number of individuals. For the dragonflies here, this criterion could only be applied to *E. nylephtha*, *E. peringueyi* and *C. apricans*. In contrast, 'severely fragmented' is a highly appropriate description of threatened invertebrates, but population viability analysis is not.

IUCN CATEGORIZATION
OF THE EIGHT SOUTH AFRICAN RED-LISTED ODONATA

CHLOROLESTES APRICANS WILMOT

S t a t u s . – This extremely rare Gondwana relict damselfly was even rare and highly localized at the time of its discovery in the 1970s (WILMOT, 1975). It occurs in shallow streams in the Eastern Cape at several isolated localities between 700-1400 m a.s.l. It is clearly on the decline, as detailed searches in 1993 showed it to have disappeared from about half of its former sites. Threats include cattle-damage to riparian vegetation, cattle causing an increase in turbidity of the water, shading out of indigenous vegetation by the planting of black wattle (*Acacia mearnsii*), and washing of clothes in the streams. It does not occur in any protected area.

I U C N c a t e g o r i z a t i o n . – Endangered (EN), because area of occupancy < 500 km² and severely fragmented and a continuing decline in extent of occurrence as well as area of occupancy.

CHLOROLESTES DRACONICUS BALINSKY

S t a t u s . – This highly-restricted damselfly has been found only at a few localities in clear streams of the high Kwazulu-Natal Drakensberg between 1700 and 2300 m a.s.l. There is no evidence that it is on the decline or that it is threatened, and all known populations occur in protected areas. Although a highly-localized endemic, there is possibly a case for withdrawing it from the Red List.

I U C N c a t e g o r i z a t i o n . – It is not threatened, nor 'Conservation Dependent', nor possibly 'Near Threatened'. The Conclusion is that it should remain on the Red List for the next five years as 'Least Concern' (lc), and its status then reviewed.

ECCHLOROLESTES NYLEPHTHA BARNARD

S t a t u s . – This highly localized, deep-forest, stream species occurs in the Tsitsikamma and Knysna forests. Although as much as 59% of the latter has been felled, both forests are now fairly well protected. It has not been seen in Jonkershoek, Stellenbosch since 1940, despite recent intensive searches. It was relocated in Tsitsikamma in 1993 and 1995, having not been seen for 42 years.

IUCN categorization. – Currently the species is not threatened. Although this species depends on conservation of the pristine forests, it is not ‘Conservation Dependent’ as it is not a target taxon. The category ‘Near Threatened’ (nt) is appropriate.

ECCHLOROLESTES PERINGUEYI (RIS)

Status. – This extremely localized and highly stenotopic species of clear, montane streams was formerly more widespread. Today it is apparently restricted to upland reaches of only two streams which are in protected areas. However, the possible invasion of its last refuges by rainbow trout (*Salmo gairdneri*), sudden occurrence of a natural disaster, or even a moderate anthropogenic disturbance could see its demise.

IUCN categorization. – This species is potentially highly threatened. It possibly classifies as, ‘Vulnerable’ (VU) as its area of occupancy is less than 2000 km² and it exists at no more than 10 locations, yet there is apparently no ‘Continuing decline, inferred, observed or projected’.

The population may or may not be less than 10 000 individuals.

ENALLAGMA POLYCHROMATICUM BARNARD

Status. – This rare localized species of streams with thick vegetation near the coast of the southwestern Cape has not been formerly relocated since 1962, despite intensive searches, which may or may not have been in exactly the right biotope. There is no information on possible decline, correct status or types and intensity of threats.

IUCN categorization. – This species clearly falls into the ‘Data Deficient’ (DD) category.

METACNEMIS ANGUSTA SELYS

Status and IUCN categorization. – This species was excluded (see above) as there is no firm evidence that it is a good species. If it is good however, it could be classified as ‘Extinct’ (EX), but more strictly as ‘Data Deficient’ (DD). However, evidence at present suggests that it should be removed from the Red List.

ORTHETRUM RUBENS BARNARD

Status. – This species is a fairly wide southwestern Cape endemic of which little is known (see above). There is no information on possible decline, correct status or types and intensity of threats.

IUCN categorization. – Unquestionably ‘Data Deficient’ (DD).

UROTHEMIS LUCIANA BALINSKY

S t a t u s . – This species is a mystery, only being known from its type locality (see above). Despite very intensive searches, it has not been relocated since 1959. There is no information on possible decline, correct status or types and intensity of threats.

I U C N c a t e g o r i z a t i o n . – Unquestionably 'Data Deficient' (DD).

DISCUSSION

The sample of species here, in terms of knowledge of them and accessibility of their locations, is probably about midway between a situation in Europe and one in the remote parts of South America. Red Listing is clearly a valuable exercise, but only one small facet of biological conservation.

The new *IUCN Categories of Threat* definitely stimulate quantitative field work, which, in turn, increases the correctness of the categorization. They also provide increasing awareness of changes in status, rather than just the status per se. However, assessing this change is costly, with each species here costing about \$ 1000 to reassess. This included futile searches for species that could not be relocated.

This exercise illustrated the great value of good alpha taxonomy and good voucher specimens, with *M. angusta* having to be excluded at least until confirmed as a good species. The same should apply to *Paragomphus dicksoni* Pinhey, only known from one female, and not included on the list. Several other species are clearly 'Data Deficient', and the dilemma is whether to include them on the Red List or not. If, for example, *U. rubens* and *E. polychromaticum* are included, there is also some merit in including other data-deficient endemic species e.g. *Metacnemis valida* Hag., *Pseudagrion inopinatum* Balinsky, *P. newtoni* Pinhey, *P. umsingaziense* Balinsky, *Ceratogomphus triceraticus* Balinsky, *Syncordulia gracilis* (Burm.) and *S. venator* (Barnard) (SAMWAYS, 1995). Yet local endemism per se does not qualify a species, as some of these can be locally very common (e.g. *Chlorolestes fasciatus* (Burm.) and *Aeshna subpupillata* McL. among many others. However, 'Data Deficient' can be highly significant, as in the case of the mysterious *U. luciana*, a large dragonfly that has not been relocated, even at the type locality, despite intense searches.

C. apricans (EN), *E. nylephtha* (nt) and *E. peringueyi* (VU) could be categorized relatively easily. However, *C. draconicus* (lc) was more difficult, because although extremely rare and localized, all its populations are protected, at least under the umbrella of water catchment conservation. There is merit in leaving this species temporarily on the Red List.

In summary, the new *IUCN Categories of Threat*, at least for these dragonflies, are workable, and also provide a very good basis for further field work and re-assessment.

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