

NATIONAL RED LIST OF SOUTH AFRICAN ODONATA*

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Using the IUCN categories and criteria, the conservation status of the South African dragonfly fauna has been assessed. IUCN recommendations for adjusting the global categories and criteria for national red listing have been taken into consideration. A total of 40 taxa are listed as threatened or near-threatened, which is 25% of the national total (160 sp. and ssp.). The precautionary rather than evidentiary approach is taken throughout, especially as many sp. are marginal and although not threatened globally are highly threatened locally. Nevertheless, it is clear that locally the South African odonate fauna is under severe threat, especially the stream sp. Many of the threats are synergistic, both with natural drought/flood cycles, and with other threats. Restoration of hydrological regimes and riparian conditions are promoting conservation of this odonate assemblage.

INTRODUCTION

The *IUCN Red List of Threatened Species* (IUCN, 2006) provides an authoritative list of globally-threatened species. Recommendations have been made for globally-threatened Odonata species resident in Africa (SAMWAYS, 2002a; CLAUSNITZER & JÖDICKE, 2004). The IUCN criteria used for some of these species are further honed here.

Suggestions have been made for employing the IUCN (World Conservation Union) categories and criteria of threat nationally and regionally (GÄRDENFORS, 2001; GÄRDENFORS et al., 1999, 2001). While the conservation status of South African dragonflies has been assessed (SAMWAYS 1996), it is timely now to provide a list of nationally red listed species based on the categories and criteria of threat as proposed by the IUCN (2001, 2003). Such a list is useful for

* The lay-out and presentation follow those traditionally used in the national Red Lists. – [Eds]

both geographical prioritisation and for background for Environmental Impact Assessments. A critique of this approach was provided by SAMWAYS (2002b) and further details of timing of assessments by SAMWAYS & GRANT (2006). A detailed study of the importance of montane refugia for the Western Cape endemics is given by GRANT & SAMWAYS (2006). Distributional modelling of these data have also begun (FINCH et al., 2006).

A national list is provided here, as a forerunner to future lists both for Odonata elsewhere and for other taxa in South Africa and other regions.

DATA BASE

Data were gathered between December 1987 and April 2006, with extensive and intensive searches for all Odonata species being undertaken intermittently throughout that period. Data were both positive (species present) and negative (species absent) and recorded on a spatial-relational data base (PIPER & SAMWAYS, 2001). Historical records prior to 1983 are those of PINHEY (1984, 1985).

Vernacular names are those agreed upon after workshoping through Pinhey's Heritage African Odonata Network (PHAON). Vernacular names are part of the red listing process, and have great currency for practical conservation management of invertebrates (SAMWAYS, 2002b).

Global categorisation following IUCN (2001) and national categorisation follows IUCN (2003). The percentages of the global population (GÄRDENFORS et al., 1999) are defined here, in most cases very approximately, and based on extent of occurrence. The approach taken here is precautionary rather than evidentiary as regard to threats (IUCN, 2001), but does not include species that are simply rare. Indeed, in some cases some nationally rare species have benefited from the construction of farm reservoirs (e.g. *Anax tristis* Hagen, 1867) and surface mine scrapings (e.g. *Aethriamanta rezia* Kirby, 1889).

SOUTH AFRICAN RED LIST OF ODONATA SPECIES

ZYGOPTERA

Synlestidae

Taxon name: *Chlorolestes apricans* Wilmot, 1975

Common name: Basking Malachite

National status: EN B2ab(i,ii,iii,iv)

Global status: EN B2ab(i,ii,iii,iv)

Percentage of global population: 100%

Distribution: South Africa

Rationale: Qualifies because of small number, and small size of populations, several of which have been lost between 1974 and 2001 through habitat loss and transformation, and an area of occupancy of less than 500 km².

Range and population: In the early 1970's this species was known from ten sites (WILMOT, 1975), whereas by 2001, it was known from only two, showing a decline in extent of occurrence, area of occupancy, as well as decline in extent and quality of habitat. Today it is known only from the Kubusi River at Stutterheim and Thorn River, Eastern Cape. Possibly less than 1000 adults exist.

Habitat: Clear, shallow, rocky streams with riffles and glides, and with an abundance of long grass, herbs and indigenous bushes (oviposition site) overhanging the water.

Threats: Highly threatened by the synergistic effects of cattle trampling of banks, shading of streams with invasive alien *Acacia mearnsii*, and possibly detergent and rainbow trout. This species is not known from any formally protected area.

Conservation measures: Searches for further localities are urgently required. Removal of *A. mearnsii* should continue. Liaison with local farmers is essential so that cattle only enter the streams at certain points, fencing off other areas of the stream.

Taxon name: *Chlorolestes elegans* Pinhey, 1950

Common name: Elegant Malachite

National status: VU A2a; B1ab(i,ii,iii,iv); D2

Global status: NT

Percentage of global population: ca 20%

Distribution: Malawi, Mozambique, South Africa, Zimbabwe

Rationale: In South Africa, only known from the Soutpansberg, Limpopo Province. It was absent from Haenertsberg in January 1997 where it occurred in March 1956. It was recorded on the Broederstroom in January 1997 but was absent in April 2001 as a result of a change to the riverine habitat from the floods of February 2000. However, it was recorded from a small stream in natural forest at Woodbush in April 2001. It qualifies because of a combination of very restricted extent of occurrence, area of occupancy and threats from plantation forestry and invasive alien riparian plants.

Range and population: Occurs also in Malawi, Mozambique and Zimbabwe, where its conservation status has not been assessed. In South Africa, there are no records from outside the Soutpansberg. This large damselfly, occurs at low population levels, with very few individuals along any one stream.

Habitat: Forested montane (at ca 1200-1500m a.s.l.) streams with sunflecks and deposition pools.

Threats: Vulnerable to stream disturbance, especially removal of tree canopy. Plantation forestry with *Pinus* and *Eucalyptus* poses an additional threat. This may include silting of streams during felling operations. Invasive alien riparian woody plants, especially *Acacia mearnsii* also pose a threat, although oaks (*Quercus* sp.) do not.

Conservation measures: It is essential to obtain further information on its extent of occurrence and area of occupancy. Leaving natural forest adjacent to streams during plantation afforestation is essential. Restoration of streams with natural forest would be distinctly beneficial. Such restoration should first involve removal of alien invasives, especially *A. mearnsii*.

Taxon name: *Chlorolestes umbratus* Hagen in Sélys, 1862

Common name: White Malachite

National status: NT

Global status: NT

Percentage of global population: 100%

Distribution: South Africa

Rationale: This South African endemic species was formerly known from many localities in the Western Cape (PINHEY, 1984). Today it is known from only six. Although its population has probably stabilised, it is prone to stochastic human impacts, especially loss of forest canopy habitat loss through plantation forestry and invasive alien riparian trees, especially *Acacia mearnsii* SAMWAYS & TAYLOR (2004). At one site it has reappeared as a result of removal of invasive alien trees. Although its area of occupancy is less than 2000 km², its population level appears to have stabilized, which qualifies as NT rather than VU.

Range and population: Today known from isolated localities from Franschhoek, Western Cape to Tsitsikamma Forest Western Cape and Eastern Cape. The recent (February 1999) Franschhoek locality is encouraging, and the small population appears to have re-established as a result of removal of alien trees.

Habitat: Clear, forest streams with sunflecks and deposition zones. Indigenous bushes overhanging the water are essential oviposition sites.

Threats: Plantation forestry coupled with loss of natural forest appears at least historically to have been a major threat. Today, the impact of invasive alien trees shading out perching and oviposition sites appears to be most major impact.

Conservation measures: Stopping further loss of natural forest is critical. The removal of invasive alien trees, especially *Acacia* spp., is proving to be immensely beneficial. Further searches are also required.

Taxon name: *Ecchlorolestes nylephtha* (Barnard, 1937)

Common name: Queen Malachite

National status: NT

Global status: NT

Percentage of global population: 100%

Distribution: South Africa

Rationale: This South African endemic was formerly known from more localities than it is today. It is now confined to the Tsitsikamma Forest area where it may be prone to deforestation, and therefore susceptible to stochastic human impacts. Although its area of occupancy is less than 2000 km², its population level appears to have stabilized, which qualifies it as NT rather than VU.

Range and population: Today only known from streams near Storms River, Knysna and in the Tsitsikamma Forest, Western Cape/Eastern Cape.

Habitat: Fern-fringed small streams in the deep shade of full-forest canopy.

Threats: While the extent of occurrence and area of occupancy may have stabilised, there is always the risk that further natural forest canopy might be lost.

Conservation measures: Further searches are required. No specific conservation measures are being undertaken, while current protection of natural forest is maintaining its habitat intact.

Taxon name: *Ecchlorolestes peringueyi* (Ris, 1921)

Common name: Marbled Malachite

National status: VU D2

Global status: VU D2

Percentage of global population: 100%

Distribution: South Africa

Rationale: This species was formerly much more widespread than it is today, within the Cape Fold mountains area, Western Cape, Although apparently stabilised, its small extent of occurrence and area of occupancy suggests it may be highly susceptible to stochastic human disturbance.

Range and population: Today it is only known from small, boulder-filled streams in the upper reaches of small rivers in the Cape Fold Mountains.

Habitat: Clear, montane streams with large, lichen-covered boulders.

Threats: These are several and synergistic. Invasive alien riparian plants, over-extraction of water, and rainbow trout appear to act together as a threatening process.

Conservation measures: Over-extraction of water is not likely to be reversed. In the upper headwater streams beyond the reach of rainbow trout and in the absence of invasive alien riparian trees and bushes, this species appears temporarily safe. Continued removal of invasive alien trees should continue.

L e s t i d a e

Taxon name: *Lestes dissimulans* Fraser, 1955

Common name: Cryptic Spreadwing

National status: VU D2

Global status: LC

Percentage of global population: ca 1%

Distribution: South Africa, north to Kenya and Senegal.

Rationale: Although widespread in Africa, this species is very rare in South Africa and apparently susceptible to the effects of El Niño drought/wet cycles, which could be synergistic with human impacts.

Range and population: Widespread in Africa. Known formerly from Mosdene Swamps, Naboomspruit (PINHEY, 1984), this species has now been re-discovered in that general area. In January 2000, it was found at Ndumo Game Reserve, northern KwaZulu-Natal.

Habitat: Waterholes and pools with an abundance of tall grasses and reeds, with nearby thick bush.

Threats: This species, being in a game reserve, is more susceptible to the vagaries of El Niño drought/wet cycles than to human impact. However, should cattle

be allowed to trample its habitat, this could have a serious impact.

Conservation measures: Further searches are required. Maintenance of Ndumo Game Reserve in its current state is essential. No species-specific measures are being undertaken.

Taxon name: *Lestes ictericus* Gerstacker, 1869

Common name: Tawny Spreadwing

National status: VU D2

Global status: LC

Percentage of global population: ca 1%

Distribution: South Africa, north to Kenya and Senegal.

Rationale: Although widespread in Africa, this species is only known from a limited area in northern KwaZulu-Natal, where it is subject to El Nio drought/wet cycles, which could be synergistic with human impacts.

Range and population: Widespread in Africa, this species in South Africa is only known from isolated localities.

Habitat: At Ndumo Game Reserve, it was at a still reach of river with a profusion of grasses on the banks.

Threats: This species is probably more susceptible to the vagaries of El Nio drought/wet cycles than to human impact. However, should cattle be allowed to trample its habitat, this could have a serious impact.

Conservation measures: Further searches are required. Maintenance of Ndumo Game Reserve in its current state is essential. No species-specific measure are being undertaken.

Platycnemididae

Taxon name: *Metacnemis angusta* Selys, 1863

Common name: Ceres Featherlegs

National status: VU D2

Global status: VU D2

Percentage of global population: 100%

Distribution: South Africa

Rationale: Formerly known from only two female specimens, last one collected in 1920. This species was thought possibly to be extinct, until a population was discovered on the Dutoitsrivier, near Villiersdorp, Western Cape (SAMWAYS & TARBOTON, 2006). This population occurs where invasive alien trees (*Acacia mearnsii*) have been removed along a river course (SAMWAYS et al., 2005).

Range and population: Known only from one site in the Western Cape.

Habitat: Weedy, bush-fringed pools in river braids.

Threats: Invasive alien plants are a known primary threat. Drainage of pools may also be a threat.

Conservation measures: Further searches should be made. Removal of invasive alien trees is a key conservation measure.

Taxon name: *Metacnemis valida* Hagen in Selys, 1863

Common name: Kubusi Featherlegs

National status: EN A2c; B1ab(i,ii,iii)+2ab(i,ii,iii)

Global status: EN A2c; B1ab(i,ii,iii)+2ab(i,ii,iii)

Percentage of global population: 100%

Distribution: South Africa

Rationale: This species does not occur in any formally protected area. Its limited number of populations (currently only two are known) are highly vulnerable to invasive alien trees and to cattle trampling. Both these impacts have caused the loss of earlier known localities (e.g. Kubusi River, Keiskammar Road).

Range and population: Only known from the Amatola-Winterberg, especially around Stutterheim, Eastern Cape. At the two known sites, population levels are low, numbering no more than 30 or so individuals. Although these population levels would qualify it for CR, it is suspected that other populations exist in the area but have not yet been discovered.

Habitat: Shallow, rocky streams and rivers with a partial canopy of indigenous trees.

Threats: These appear to multiple and synergistic, with cattle trampling of the banks and shading out of its habitat by *Acacia mearnsii* being of major concern. Rainbow trout and domestic detergent may be secondary impacts.

Conservation measures: Further searches are urgently required. Removal of invasive alien trees, especially *A. mearnsii*, should continue. Translocation to a protected area should be considered.

Coenagrionidae

Taxon name: *Ceriagrion suave* Ris, 1921

Common name: Suave Citril

National status: RE

Global status: LC

Percentage of global population: ca 1%

Distribution: South Africa, north to Ethiopia and The Gambia.

Rationale: This widely distributed and common species elsewhere is at the edge of its geographical range in South Africa, where it has not been seen since 1951 (BRINCK, 1955), when it was recorded in the Kruger National Park. Intensive recent ongoing searches in recent years have not produced new records. It is probably more susceptible to El Niño drought/wet cycles than to anthropogenic impacts.

Range and population: In South Africa, only known from the Kruger National Park, at least formerly.

Habitat: Pools with grassy margins, and marshes.

Threats: These appear to be natural, particularly drought, more than anthropogenic. However, as the wild mammals are confined to the park and as they impact substantially on marshy areas in times of drought, the anthropogenic

impact is distal.

Conservation measures: Further searches required. No specific measures are being undertaken, nor are currently planned.

Taxon name: *Pseudagrion assegaii* Pinhey, 1950

Common name: Spearhead Sprite

National status: VU B1ab(i,ii,iii,iv)

Global status: LC

Percentage of global population: ca 5%

Distribution: Botswana, South Africa, Zambia, Zimbabwe

Rationale: This is a rare species in South Africa, known only from the Limpopo Province, where it is highly susceptible to the effects of drought. In 2001, it had disappeared from its former localities of Ellisras and Mosdene swamps, where it was last seen in 1979 (PINHEY, 1984). However, populations have since been rediscovered in the area. The anthropogenic impact is indirect in that water extraction is usually maximum when the water is lowest, making this species vulnerable.

Habitat: Grassy-fringed pools with lilies and partial shade.

Threats: Overextraction of water from its habitat.

Conservation measures: Further searches required. No specific measures in place, nor envisaged.

Taxon name: *Pseudagrion c. coeleste* Longfield, 1947

Common name: Catshead Sprite

National status: VU D2

Global status: LC

Percentage of global population: ca 5%

Distribution: South Africa, north to Chad

Rationale: Although probably not threatened elsewhere in Africa, this species was known in South Africa only from Lower Sabie weir, Kruger National Park (CLARK & SAMWAYS, 1994). The species was not present there in April 2000 owing to the major change to its habitat as a result of the February 2000 floods. It was discovered on the Oliphants River in May 2004.

Range and population: Only known from the southern part of the Kruger National Park, where it was not abundant, even prior to the 2000 floods.

Habitat: Shaded or open riverine pools in savanna.

Threats: Floods which are exacerbated by poor catchment management is the most threatening process.

Conservation measures: Monitoring recovery of the rivers in the Kruger National Park is essential. Improvement of catchments to reduce flooding is critical.

Taxon name: *Pseudagrion coeleste umsingaziense* Balinsky, 1963

Common name: Catshead Sprite (southern form)

Taxonomic note: This subspecies formerly had full species status (*P. umsingaziense*), but is now be-

lieved to be a subspecies of *P. coeleste*. This subspecies inhabits pools and seeks shade from the mid-day sun, while *P. c. coeleste* is present in more open, riverine habitats.

National status: VU, B2ab (ii,iii), D2

Global status: VU, B2ab (ii,iii), D2

Percentage of global population: 100%

Distribution: South Africa

Rationale: This subspecies appears always to have been highly localised. Much of its habitat has been transformed, especially the type locality where the subspecies was rediscovered in February 2001. This area (Richard's Bay) continues to undergo major development, making this species vulnerable.

Range and population: The known persistent populations are only in the Richard's Bay area, KwaZulu-Natal. Individual specimens have been recorded at Cape Vidal and Sodwana Bay. The recording from the Limpopo Province (PINHEY, 1984) appears to be *P. c. coeleste*.

Habitat: Lily-filled grassy margins of lakes with a partial tree canopy.

Threats: Urban development threatens this subspecies. Besides drainage and building construction, the mowing of lake margins also poses a threat.

Conservation measures: Further sites need to be located. No specific conservation measures are in place, although leaving the margin of Lake Umsingazi intact and avoidance of mowing of margins of nearby lakes at Richard's Bay would contribute greatly to the conservation of this subspecies.

Taxon name: *Pseudagrion inopinatum* Balinsky, 1971

Common name: Badplaas Sprite

National status: EN A4c; B1ab(ii,iii)+2ab(ii,iii)

Global status: EN A4c; B1ab(ii,iii)+2ab(ii,iii)

Percentage of global population: 100%

Distribution: South Africa

Rationale: Known from only a few specimens from two localities, only one female of this species has been rediscovered since 1968, and this was near its type locality (Badplaas, Mpumalanga).

Range and population: The type series is from Badplaas, and an earlier specimen from the 'Drakensberg' (BALINSKY, 1971; PINHEY, 1984). This species appears to have a very localised distribution, with subpopulations probably awaiting discovery. This species has been intensively searched for over several years, with discovery of only one female in 2002.

Habitat: Montane streams with an abundance of tall grasses and herbs on the banks.

Threats: Uncertain, but livestock farming, damming of streams, invasive alien trees, and possibly trout, together may impact on this species. These anthropogenic threats may aggravate susceptibility to drought and flood, the latter of which have scoured the type locality.

Conservation measures: Continued searches are essential. No specific conservation measures in place, nor currently planned.

Taxon name: *Pseudagrion makabusiense* Pinhey, 1950

Common name: Green-striped Sprite

National status: VU B1ab(i,ii,iii,iv)

Global status: LC

Percentage of global population: ca 10%

Distribution: D.R. Congo, Mozambique, South Africa, Zambia, Zimbabwe

Rationale: In South Africa, it was recorded at Hanglip, Soutpansberg in May 1979 (PINHEY, 1984). This locality is now severely disturbed with plantation trees and overgrowth by invasive alien trees. Despite intensive searches at this site, it has not been rediscovered there. It has however, been rediscovered at several river localities in the Limpopo Province, and may be susceptible to overgrowth by alien trees.

Range and population: Currently this species is only known to occur in the rivers of the arid northwest of the Limpopo Province.

Habitat: Grassy-fringed, slow rivers with partial canopy.

Threats: These are distinctive and immediate, and include the poor forestry practice of planting into the riparian zone and allowing proliferation of invasive alien bushes and trees.

Conservation measures: Searches should continue. No specific conservation measures are in place, nor currently planned.

Taxon name: *Pseudagrion newtoni* Pinhey, 1962

Common name: Harlequin Sprite

National status: VU D2

Global status: VU D2

Percentage of global population: 100%

Distribution: South Africa

Rationale: Formerly known for certain only from KwaZulu-Natal (PINHEY, 1984) (the Cape records appear to be a misidentification of *P. h. hageni*). This species has not been rediscovered in KwaZulu-Natal, despite intensive searches. However, it was rediscovered in January 2001 in Mpumalanga (SAMWAYS et al., 2005). Besides its natural rarity, this species' specialised riparian habitat is under threat from increasing pressure from domestic livestock grazing and trampling of the water's edge. Ongoing insidious threat from alien fish may also be a threat.

Range and population: The earlier Cape records (PINHEY, 1984) are doubtful, and are probably *P. h. hageni*. The type locality is Nqutu, KwaZulu-Natal, which today is heavily disturbed by alien trees and overgrazing by domestic cattle. Currently, the only known population is Pilgrim's Rest, Mpumalanga.

Habitat: Fine, tall grasses and reeds at the margins of swift, clear, upland rivers.

Threats: These are probably multiple, and include cattle grazing of banks, invasive alien trees, and possibly damming of rivers, and possibly also alien trout.

Conservation measures: Further searches are required. Interestingly, the Pilgrim's Rest site is a restored one, with invasive alien trees, especially *Acacia mearnsii*,

having been removed many years ago. Further removal of invasive alien trees and prevention of cattle from impacting on river banks should be undertaken.

Taxon name: *Pseudagrion sjoestedti* Förster, 1906; – *pseudosjoestedti* Pinhey, 1964

Common name: Rufous-faced Sprite

National status: CR B1ab(i,ii,iii,iv)

Global status: LC

Percentage of global population: ca 5%

Distribution: This subspecies ranges from South Africa north to The Gambia

Rationale: In South Africa, this species was formerly known only from the lower reaches of the Sabie River in the Kruger National Park (CLARK & SAMWAYS, 1994). Its tree-covered habitat was radically changed by the floods of February 2000, and this species was absent from that site in April 2001. Presumably, it faced a similar fate in Mozambique. Currently, there is no known South African population.

Range and population: Prior to February 2000, it was known only from the south-eastern corner of the Kruger National Park, where apparently it no longer occurs.

Habitat: Tree-covered pools of savanna rivers.

Threats: These appear to be principally natural, although these maybe exacerbated by unknown human impacts.

Conservation measures: No conservation measures are in place, nor are planned. Monitoring to determine whether the species re-establishes should be undertaken.

Taxon name: *Pseudagrion sudanicum* Le Roi, 1915

Common name: Blue-spotted Sprite

National status: LC

Global status: LC

Percentage of global population: ca 1%

Distribution: South Africa north to Sudan and Ghana

Rationale: The South African population in the Kruger National Park suffered heavy mortality during the floods of February 2000. In April 2001, only two individuals were found on the Sabie River and none on the Crocodile River, despite having been abundant prior to the floods (CLARK & SAMWAYS, 1994; STEWART & SAMWAYS, 1998). It was however, in abundance at Engelbrecht dam, a new locality in April 2001, indicating that this species does not qualify for Vulnerable. It also occurs locally in the Limpopo Province.

Range and population: In South Africa, currently only known from the Kruger National Park (Shingwedzi and Lower Sabie areas) and the northwestern region of the Limpopo Province. Its population level may either decrease or increase in the future.

Habitat: Tall reeds and grasses fringing sluggish reaches of savanna rivers.

Threats: Poor catchment management which exacerbates floods is by far the most important threat.

Conservation measures: None currently in place, although it occurs in a protected area. Monitoring of its area of occupancy and extent of occurrence is essential.

Taxon name: *Aciagrion* cf. *zambiense* Pinhey, 1972.

Common name: Opal Slim

Taxonomic note: There has been some taxonomic confusion with regards to types (K.-D. Dijkstra, pers. comm.), and this species awaits further taxonomic clarity.

National status: NA

Global status: LC

Percentage of global population: ca 5%(?)

Distribution: South Africa, north to Tanzania

Rationale: Not known in South Africa prior to February 2001, where it was located at Mfabeni swamp, Cape Vidal, KwaZulu-Natal. To date, it is only known from this site, and may have been forced south by the floods of February 2000 in Mozambique. As it is known only from this one site which periodically almost dries out, this species may be prone to regional extinction.

Range and population: Only known from Mfabeni swamp, Cape Vidal, where it occurs in large numbers.

Habitat: Extensive marshland bordered by trees.

Threats: As it occurs in a protected area, threats are natural, especially El Niño droughts, rather than anthropogenic.

Conservation measures: Searches for further localities are required. No specific conservation measures are in place, nor envisaged. Monitoring of the population is recommended.

Taxon name: *Aciagrion pinheyi* Samways, 2001

Common name: Emerald-striped Slim

Taxonomic note: There is confusion concerning the types of this species, and further taxonomic study is required (K.-D. Dijkstra, pers.comm.)

National status: VU B2ab(ii,iii); D2

Global status: VU B2ab(ii,iii); D2

Percentage of global population: 100% (currently)

Distribution: South Africa

Rationale: Only known from one locality, where it is highly susceptible to El Niño droughts. This is a greater threat than anthropogenic ones, as the locality is in a protected area, Ndumo Game Reserve. However, as this area is subject to land claims, this species may be vulnerable.

Range and population: Occurs in small numbers in a few pans in Ndumo Game Reserve. It is highly likely to occur across the border in Mozambique where its status is currently unknown.

Habitat: Pools and pans with an abundance of grasses, reeds and lilies, and with

fringing thick bush.

Threats: Current threats are natural, especially drought. Future threats may include agricultural disturbance.

Conservation measures: Searches for further localities are needed. Currently there are no specific or envisaged conservation measures.

Taxon name: *Proischnura polychromatica* (Barnard, 1937) [formerly *Enallagma polychromaticum*]

Common name: Mauve Bluet

National status: CR B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)

Global status: CR B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)

Percentage of global population: 100%

Distribution: South Africa

Rationale: Despite intensive searches, this species has not been rediscovered at its type locality. This species was however rediscovered at one locality in November 2003, and is the only known population.

Range and population: Few individuals of this species have been recorded (PINHEY, 1984), with the type locality being Sevenweekspoort, and a further specimen being recorded from Franschhoek, Western Cape. The only known extant population is on the Dutoitsrivier, near Villiersdorp and currently it is less than 50 individuals (SAMWAYS et al., 2005).

Habitat: Pools in river braids with an abundance of sedges.

Threats: These are multiple, and include habitat loss to agriculture and urbanisation, shading out of the habitat by invasive alien trees (SAMWAYS & TAYLOR, 2004), lowered water level of streams resulting from irrigation, and possibly predation from alien trout.

Conservation measures: Further searches are essential. Removal of invasive alien trees is having an immediate beneficial effect on this species.

Taxon name: *Proischnura subfurcata* (Sélys, 1876) [formerly *Enallagma subfurcatum*]

Common name: Fork-tailed Bluet

National status: RE

Global status: LC

Percentage of global population: ca 1%

Distribution: South Africa, north to Ethiopia and Nigeria

Rationale: Although abundant elsewhere in Africa, this species was last recorded in South Africa at Zeekoevlei, Cape Town in 1950 (BRINCK, 1955). This habitat was radically transformed and polluted in the middle to late 20th century. Although this habitat is now much improved, the species seems not to have reappeared. Intensive searches in recent years have failed to rediscover it.

Range and population: Although widely distributed throughout Africa, currently no population is known in South Africa. There are some doubts as regards the earlier South African records as the elevations and habitat do not accord with

those elsewhere in Africa.

Habitat: Grass-fringed pools and streams in bush or forest.

Threats: Urban development and pollution have impacted on this species. Invasive alien woody plants, especially *Acacia* spp. may also be a threat.

Conservation measures: Further searches required. No specific conservation measures are in place, nor are currently planned.

Taxon name: *Agriocnemis gratioiosa* Gerstäcker, 1891

Common name: Gracious Wisp

National status: VU D2

Global status: LC

Percentage of global population: ca 2%

Distribution: South Africa, north to Tanzania

Rationale: This species appears to be at the edge of its geographical range in South Africa, where only two small populations are known. Both of these are in KwaZulu-Natal, and with periodic El Niño droughts, the water bodies are highly likely to dry out, although these populations do not appear threatened from further anthropogenic impact.

Range and population: In South Africa, the only two known populations are in coastal KwaZulu-Natal (Mtunzini and Umbogavango). It has not been rediscovered at its earlier known locality of ‘Umsingazi swamp’, Richards Bay (BALINSKY, 1961).

Habitat: Tree-fringed pools and marshes.

Threats: Urban expansion, particularly acting synergistically with natural drought.

Conservation measures: Searches for further localities are needed. Currently there are no specific or envisaged conservation measures.

Taxon name: *Agriocnemis r. ruberrima* Balinsky, 1961

Common name: Orange Wisp

National status: EN A2a; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)

Global status: This subspecies is not currently globally red listed (SAMWAYS, 2002; 2004). However, recent searches have indicated a major decline in recent years and therefore should now be listed as EN A2a; B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)

Percentage of global population: 100% for subspecies *ruberrima*.

Distribution: This subspecies is only known from coastal, northern KwaZulu-Natal, South Africa (BALINSKY, 1961). A further subspecies *albifrons* Balinsky, 1963 occurs in the Okavango swamps, Botswana, which may, on more detailed analysis, turn out to be a separate species.

Rationale: This subspecies has not been rediscovered at its type locality (Richards Bay) which has been extensively urbanised since this taxon was discovered (BALINSKY, 1961). A further population was known from Mfabeni Swamp (SAMWAYS, 1999), Cape Vidal, but only one male was found in February 2001, despite intensive searching. Drought in recent years and invasion of its habitat by *Agriocnemis exilis* and *Aciagrion congoense* may be partly responsi-

ble, or synergistic with human impact. The future of this subspecies is of considerable concern.

Range and population: Recorded only from northern, coastal KwaZulu-Natal.

Currently there is no known strong population.

Habitat: Marshes with shallow water and abundance of tall, reddish reeds.

Threats: Apparently multiple. Urbanisation and drainage appear to have deprived this species of source habitat, especially alongside drought conditions. Interspecific competition from more opportunistic Zygoptera species may also contribute to its decline.

Conservation measures: Further searches for strong populations are urgently needed. Currently there are no specific or envisaged conservation measures.

Chlorocyphidae

Taxon name: *Chlorocypha consueta* (Karsch, 1899)

Common name: Southern Red Jewel

National status: VU B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv); D2

Global status: NT

Percentage of global population: ca 1%

Distribution: South Africa north to Tanzania

Rationale: Known in South Africa from only one specimen caught in northern KwaZulu-Natal prior to 1951 (PINHEY, 1984). This species is clearly highly localised, and with afforestation of streams and the impact of invasive alien vegetation, it is vulnerable.

Range and population: Although widespread farther north in Africa, this species has only been recorded from one KwaZulu-Natal locality.

Habitat: Clear, rocky, montane streams

Threats: Stream disturbance in its various forms, including riparian vegetation removal, impact from invasive alien trees, especially *Acacia mearnsii*, and agricultural disturbance of stream water.

Conservation measures: Searches for further localities are needed. Currently there are no specific or envisaged conservation measures.

ANISOPTERA

Gomphidae

Taxon name: *Lestinogomphus angustus* Martin, 1911

Common name: Spined Fairytail

National status: NT

Global status: LC

Percentage of global population: ca 5%

Distribution: South Africa, north to Kenya and Ivory Coast

Rationale: There are very few records of this species in South Africa. Although

widespread in tropical Africa, there are few suitable habitats for it in South Africa. Its stronghold was the Sabie River in the Kruger National Park, but the floods of February 2000 led to a major change of habitat. Nevertheless, one female was recorded in April 2001. Currently it is known from less than ten locations, although these are extensive, making NT rather than VU applicable.

Range and population: Besides the southern Kruger National Park, this species has been recorded from coastal, northern KwaZulu-Natal, Gauteng, and the Limpopo Province.

Habitat: Bush- or tree-fringed, fairly swift rivers.

Threats: Natural catastrophes appear synergistic with urbanisation (in northern KwaZulu-Natal). Invasive alien trees may also pose a threat, alongside heavy extraction of water for agricultural purposes reducing flow.

Conservation measures: Further searches are needed, especially in the Waterberg, and in KwaZulu-Natal, where it has not been recorded since 1960. Monitoring of the Sabie River population is essential. No specific measures are currently in place, nor planned.

Taxon name: *Gomphidia q. quarrei* Schouteden, 1934

Common name: Quarre's Fingertail

National status: VU B1ab(i,ii,iii,iv)

Global status: LC

Percentage of global population: ca 2%

Distribution: Botswana, Malawi, South Africa, Zambia, Zimbabwe. The subspecies *confinii* Pinhey, 1974 occurs in Mozambique.

Rationale: In South Africa, only known from three specimens from Skukuza, Kruger National Park. Despite intense searches, it was not rediscovered on the Sabie River in April 2001. This appears to be because its reedy habitat had been radically transformed by the floods of February 2000.

Range and population: Although widespread farther north, this species seems to have a restricted habitat that formerly existed in South Africa only in parts of the Kruger National Park.

Habitat: Reedy savanna rivers with open bush or forest with clearings.

Threats: The greatest threat in South Africa appears to be natural with major floods transforming its habitat. Perhaps damming of rivers poses a localised threat.

Conservation measures: Renewed searches in the Kruger National Park are essential. No specific conservation measures are in place, nor currently planned.

Taxon name: *Neurogomphus zambeziensis* Cammaerts, 2004

Common name: Zambezi Siphontail

National status: VU B1ab(i,ii,iii,iv)

Global status: LC

Percentage of global population: ca 5%

Distribution: Mozambique, South Africa, Zambia, Zimbabwe

Rationale: There are only two South African records: Pafuri, Kruger National Park and Ndumo, KwaZulu-Natal. Despite intensive searches in recent years, this species has not been rediscovered. Possibly the floods of February 2000 have had an impact, at least in the Kruger National Park.

Range and population: This appears to be a localised species throughout its geographical range, and even more so in South Africa where it is known from only two specimens from the margins of large savanna rivers of KwaZulu-Natal and Limpopo Province.

Habitat: Tall grass and other low vegetation near wide, meandering rivers.

Threats: This species may be simply rare, being at the edge of its geographical range in South Africa, rather than truly threatened. However, the major changes to the river systems of the Kruger National Park as a result of the floods of February 2000 may have altered its habitat, particularly that of the larva, adversely.

Conservation measures: Further searches are required. No specific conservation measures are in place, nor currently planned.

Taxon name: *Crenigomphus cornutus* Pinhey, 1956

Common name: Horned Talontail

National status: VU B1ab(i,ii,iii,iv)

Global status: LC

Percentage of global population: ca 5%

Distribution: Botswana, South Africa, Zambia, Zimbabwe

Rationale: This species is probably naturally rare in South Africa, being at the southern extremity of its geographical range. There is only one old record “Kruger National Park” (PINHEY, 1985). Nevertheless, with synergistic effects of damming and silting of rivers coupled with the habitat modification caused by the floods of February 2000, this species is tentatively listed as Vulnerable.

Range and population: In South Africa, this species is only known from one record in the Kruger National Park. Despite intense searches in April 2001, no further specimens have been recorded.

Habitat: Savanna rivers with marginal grassland

Threats: These are unknown for certain, but are likely to be a combination of river disturbance and natural flood/drought cycles.

Conservation measures: Further searches are needed. No specific conservation measures are in place, nor currently planned.

Taxon name: *Ceratogomphus triceraticus* Balinsky, 1963

Common name: Cape Thorntail

National status: VU B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)

Global status: VU B1ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)

Percentage of global population: 100%

Distribution: South Africa

Rationale: This large species was discovered near Franschoek (BALINSKY, 1963). Despite intensive searches at its type locality in recent years, it has not

been rediscovered there, despite improvement of habitat through riparian alien tree removal. Although widely distributed in the Western Cape (PINHEY, 1985), the rivers in the area have been substantially transformed, especially through overextraction of water for agriculture and the impact of invasive alien trees.

Range and population: This species has been previously recorded from four localities in the Western Cape (PINHEY, 1985) and recently (as single specimens) from four other localities.

Habitat: Rocky, shallow rivers, with deposition pools, and possibly farm dams.

Threats: Various and synergistic, including reduced flow of rivers, invasive alien trees, and possibly alien trout.

Conservation measures: Further searches are needed, especially where there has been habitat improvement. No specific measures in place, nor currently envisaged, although the removal of invasive alien trees is clearly beneficial.

Taxon name: *Paragomphus dicksoni* Pinhey, 1969

Common name: Cape Hooktail

Taxonomic note: This 'species' is only known from the female holotype (PINHEY, 1969), and without a male, it is not possible to be certain whether this is a valid species or a form of *P. cognatus* (Rambur, 1842). Evidence is accumulating that this is a morphological variant of *P. cognatus*.

National status: DD

Global status: DD

Percentage of global population: 100%

Distribution: South Africa

Rationale: This 'species' is only known from the female holotype (PINHEY, 1969), and without a male, it is not possible to be certain whether this is a valid species or a form of *P. cognatus* (Rambur, 1842). As the Cape streams have been so transformed by water extraction, invasive alien trees and trout, the threats are likely to be synergistic

Range and population: Only known from the type locality of Oudebosch, Zonderend River, Western Cape (PINHEY, 1985).

Habitat: Clear, shallow, open, rocky rivers.

Threats: Possibly invasive alien trees and trout.

Conservation measures: Taxonomic verification needed after further searches have been conducted. No specific measures in place, nor currently envisaged.

A e s h n i d a e

Taxon name: *Aeshna ellioti* Kirby, 1896; – *usambarica* Förster, 1906

Common name: Elliot's Hawker

National status: VU B1 ab(ii,iii)+2ab(ii,iii)

Global status: LC

Percentage of global population: ca 2%

Distribution: South Africa, north to Ethiopia, with the nominotypical subspecies *ellioti* in D.R. Congo

Rationale: In South Africa, this species was formerly known only from the Soutpansberg and Marieps Mountain (PINHEY, 1985). Despite intensive searches in recent years and with such transformation of the Soutpansberg, this species was not rediscovered in the area. Encouragingly, a specimen was discovered much farther south at Kaapsehoop, Mpumalanga in April 2001.

Range and population: In South Africa, this species is only known from a few specimens at scattered localities the northern Drakensberg and from Kaapsehoop, near Nelspruit.

Habitat: Montane pools adjacent to natural forest.

Threats: Afforestation, invasive alien trees and possibly alien fish.

Conservation measures: Further searches are required. No specific conservation measures are in place, nor currently envisaged. However, the construction of farm dams adjacent to natural forest appears to benefit this species.

Taxon name: *Gynacantha villosa* Grünberg, 1902

Common name: Hairy Duskhawker

National status: VU B2ab(ii,iii,iv)

Global status: LC

Percentage of global population: ca 1%

Distribution: South Africa, north to Tanzania and Senegal.

Rationale: Although widespread and common elsewhere in Africa, this species is only known from two records in South Africa (PINHEY, 1985). Although much of its habitat is in reserves, these are currently subject to land claims and are under development for ecotourism. However, this species, being at the southern end of its geographical range in South Africa, may in fact be naturally rare.

Range and population: In South Africa, only known from swamp forest in coastal, northern KwaZulu-Natal.

Habitat: Streams in swamp forest.

Threats: Loss of habitat through tree removal, and construction of infrastructures for ecotourism.

Conservation measures: No specific measures in place, and none currently envisaged. It is essential to continue to monitor overall conservation of coastal swamp forest.

C o r d u l i i d a e

Taxon name: *Syncordulia gracilis* (Burmeister, 1839)

Common name: Yellow Presba

National status: VU B2ab(i,ii,iii); D2

Global status: VU B2ab(i,ii,iii); D2

Percentage of global population: 100%

Distribution: South Africa

Rationale: This very scarce and localised species has disappeared from many of its former localities in the Western Cape (PINHEY, 1985). Currently, in that

area it is only known from the Kogelberg Reserve. Similarly, despite intensive searches in the northern Drakensberg, where it was recorded in 1948 (PINHEY, 1985), it has not been rediscovered in that area. At all localities, invasive alien trees pose a serious threat to this species, making it vulnerable.

Range and population: Formerly known from several localities in the Western Cape (PINHEY, 1985), this species today is known only from the Palmiet River, Kogelberg. On 11 November 2000 it was also discovered on the Mooirivier, Prentjiesberg, Eastern Cape.

Habitat: Clear, fast, hard-bottomed rivers in treeless river valleys.

Threats: Invasive alien trees are probably the foremost threat. Afforestation is a serious, localised threat. Trout may also possibly be a threat.

Conservation measures: No specific measures are in place, nor are any envisaged. However, the conservation of catchments, especially through the 'Working for Water Programme' will benefit this species.

Taxon name: *Syncordulia venator* (Barnard, 1933)

Common name: Mahogany Presba

National status: VU B2ab(i,ii,iii); D2

Global status: VU B2ab(i,ii,iii); D2

Percentage of global population: 100%

Distribution: South Africa

Rationale: This species appears never to have been common. It is confined to the Western Cape (PINHEY, 1985; SAMWAYS, 1999), where the impact of invasive alien trees, heavy water extraction of streams, and possibly alien trout, all act synergistically, making it vulnerable. Despite intensive searches in recent years, it has not been rediscovered on Table Mountain where it was recorded in the 1930s.

Range and population: Confined to the montane streams of the Western Cape, this species is known today only from the Hawequas mountains. Its geographical range may be a little wider than this, but further searches are required to determine its full extent.

Habitat: High, rocky, montane streams partially fringed with trees.

Threats: Probably the synergistic effects of invasive alien trees, agricultural activity around streams, and possibly trout, are all having an impact.

Conservation measures: No specific measures are in place, nor currently envisaged. However, conservation of catchments in general, removal of alien trees through the 'Working for Water Programme' and cessation of trout reintroductions will all contribute towards reducing vulnerability of this species.

Taxon name: *Phyllomacromia monoceros* (Förster, 1906)

Common name: Unicorn Cruiser

National status: DD

Global status: NT

Percentage of global population: ca 1%

Distribution: South Africa, north to Kenya

Rationale: Although widespread in Africa, this species is only known from two specimens from montane areas which have been radically transformed.

Range and population: In South Africa, only known from two specimens from Mpumalanga.

Habitat: Montane streams and rivers in hot, bushy savanna.

Threats: These are various and include invasive alien vegetation, mine effluent and possibly agricultural run-off and alien fish.

Conservation measures: No specific measure in place, nor currently envisaged. Firstly, further searches for the species are needed.

Libellulidae

Taxon name: *Orthetrum rubens* Barnard, 1937

Common name: Elusive Skimmer

National status: DD

Global status: DD

Percentage of global population: 100%

Distribution: South Africa

Rationale: This species appears always to have been rare, and was last seen in 1977 (PINHEY, 1979). Despite very intensive searches in recent years, this species has not been rediscovered. This is cause for concern as its habitat has been greatly transformed. In particular, it has not been rediscovered at its type locality, Kirstenbosch Botanical Gardens, Cape Town since 1927 (PINHEY, 1985).

Range and population: Known in the past from various localities in the Western Cape (PINHEY, 1979). Currently there are no known populations.

Habitat: Clear, fast, rocky montane streams with pools and fringing bushes.

Threats: These are various and synergistic, including invasive alien trees, plantation forestry, agricultural disturbance and probably alien trout. On the Cape Peninsula, urbanisation is an added threat.

Conservation measures: No specific measure are in place, nor currently envisaged. Further searches are urgently required to determine whether viable populations still exist. Threats could then be determined.

Taxon name: *Diplacodes pumila* Dijkstra, 2006

Common name: Dwarf Percher

Taxonomic note: The types of this and related species are confused and require taxonomic clarification.

National status: EN B1 ab(i,ii,iii,iv)+2ab(i,ii,iii,iv)

Global status: LC

Percentage of global population: ca 5%

Distribution: South Africa, north to Kenya

Rationale: The specimens found in South Africa were formerly known as *D. deminuta* Lieftinck, 1969. There has however been confusion over the types,

and the species requires redescription (K.-D. Dijkstra, pers. comm.). Although formerly recorded from the Limpopo province (1975) and KwaZulu-Natal (1979, 1990) (PINHEY, 1985; SAMWAYS, 1999), this species has not been rediscovered at the former localities where it was known to occur. It appears that natural drought exacerbates overextraction of water for both urban and agricultural development.

Range and population: In South Africa, formerly known from “Klipfontein, Transvaal” and Greater St Lucia Wetlands Park. Despite intensive searches in recent years, this species has not been rediscovered at St Lucia, and currently there is no known population in South Africa.

Habitat: Marshy pools

Threats: It appears that drought plays the major role. But this is exacerbated by further extraction of water for urban and agricultural purposes.

Conservation measures: No specific measures in place, nor currently envisaged. Firstly, it is essential that searches continue to find viable populations of the species within the country.

Taxon name: *Olpogastra lugubris* (Karsch, 1895)

Common name: Slender Bottletail

National status: VU D2

Global status: LC

Percentage of global population: ca 1%

Distribution: South Africa, north to East and West Africa

Rationale: A very common and widely distributed species elsewhere in Africa, it is marginal whether this species should be included on this National Red List as it is known from three specimens from the Kruger National Park and one recent record from Limpopo Province (W. Tarboton, pers. comm.). It is at the southern extremity of its geographical range in South Africa, and is possibly more rare than anthropogenically threatened. Nevertheless, the former Pafuri-Limpopo habitat has been radically transformed by the floods of February 2000, so that currently there is no known habitat at the site. It was not rediscovered there or anywhere else in the Kruger National Park, during an intensive search in April 2001.

Habitat: Reed beds at river, lake and pool margins

Threats: Probably natural flood and drought cycles are more important than anthropogenic pressures, although the floods are exacerbated by catchment land modification.

Taxon name: *Parazyxomma flavicans* (Martin, 1908)

Common name: Banded Duskdarter

National status: VU B2ab(iii); D2

Global status: LC

Percentage of global population: ca 1%

Distribution: South Africa, north to East and West Africa

Rationale: In South Africa, this highly localised species is confined to coastal swamp forest where tree removal at Richards Bay and adjacent to Lake Ngoboseleni, Sodwan Bay, is a cause for concern.

Range and population: In South Africa, known only from Richards Bay (PINHEY, 1985) and Sodwana Bay. It is likely also to occur at Kosi Bay but no specimens have been recorded there to date.

Habitat: Coastal, hot, swamp forest

Threats: Tree removal through urbanisation at Richards Bay and from small-farmer agriculture at Sodwana Bay is a major threat.

Conservation measures: No specific measures in place, nor currently envisaged. However, overall coastal swamp forest protection would greatly assist this species.

Taxon name: *Urothemis luciana* Balinsky, 1961

Common name: St Lucia Basker

National status: VU B1ab(i,ii,iii,iv)

Global status: LC

Percentage of global population: 100%

Distribution: South Africa, Mozambique

Rationale: Currently, this species is only known from coastal, northern KwaZulu-Natal and southern Mozambique. Discovered in 1958 (BALINSKY, 1961), this species was not seen for many years, but rediscovered in December 2000 at Kosi Bay. It is under threat from general human population growth and from indirect pressures of tourism. It was not included on the global red list (SAMWAYS, 2002a) as it also occurs in Mozambique and it may not be globally threatened.

Range and population: Currently known from St Lucia (BALINSKY, 1961) and Kosi Bay, where it is scarce and erratic in appearance (SAMWAYS, 2002a). Recently also discovered in southern Mozambique (W. Tarboton, pers. comm.).

Habitat: Semi-open coastal bush with lakes and pools

Threats: Tree and bush removal, cattle trampling of lakesides and urban sprawl from tourism.

Conservation measures: No specific measures are in place, nor currently envisaged. Further searches are urgently required, especially of its larval habitat which has not yet been confirmed. Coastal ecosystem conservation in general will benefit this species.

DISCUSSION

SIGNIFICANCE OF NATIONAL RED LISTING

South Africa has a rich endemic odonate fauna, some taxa of which are globally threatened (SAMWAYS, 2002a; 2004) (Tab. I). An additional taxon (*Agriocnemis r. ruberrima*) is added here to that list (Tab. I). Excluding *Paragomphus dick-*

Table I
Nationally threatened South African Odonata taxa.

Taxon	Global Red List Category	National Red List Category	Current distribution within South Africa	National endemic	Conservation management essential (see text for details)	Known to currently occur within a formal reserve
<i>Chlorolestes apricans</i>	EN	EN	EC	Yes	Yes	No
<i>C. elegans</i>	NT	VU	LP	No	Yes	Yes
<i>C. umbratus</i>	NT	NT	WC, EC	Yes	Yes	Yes
<i>Ecchlorolestes nylephtha</i>	NT	NT	WC, EC	Yes	Yes	Yes
<i>E. peringueyi</i>	VU	VU	WC	Yes	Yes	Yes
<i>Lestes dissimulans</i>	LC	VU	KZN, LP	No	No	Yes
<i>L. ictericus</i>	LC	VU	KZN	No	No	Yes
<i>Metacnemis angusta</i>	VU	VU	WC	Yes	Yes	Yes
<i>M. valida</i>	EN	EN	EC	Yes	Yes	No
<i>Ceragrion suave</i>	LC	RE	MP	No	No	Uncertain
<i>Pseudagrion assegai</i>	LC	VU	LP	No	No	No
<i>P. c. coeleste</i>	LC	VU	MP	No	Yes	Yes
<i>P. c. umsingaziense</i>	LC	VU	KZN	Yes	Yes	Yes
<i>P. inopinatum</i>	EN	EN	MP, (KZN?)	Yes	Yes	No
<i>P. makabusiense</i>	LC	VU	LP	No	Yes	No
<i>P. newtoni</i>	VU	VU	MP, (KZN?)	Yes	Yes	No
<i>P. sjoestedti</i>	LC	CR	MP	No	No	No (formerly Yes)
<i>P. sudanicum</i>	LC	LC	MP, LP	No	No	Yes
<i>Actagrion cf. zambianse</i>	LC	NA	KZN	No	No	Yes
<i>A. pinheyi</i>	VU	VU	KZN	Yes (but likely No)	No	Yes
<i>Proischnura polychromatica</i>	CR	CR	WC	Yes	Yes	Yes
<i>P. subfurcata</i>	LC	RE	WC	No	No	No
<i>Agriocnemis gratioiosa</i>	LC	VU	KZN	No	No	Yes
<i>A. r. ruberrima</i>	EN	EN	KZN	Yes (the ssp.)	No	Yes
<i>Chlorocypha consueta</i>	NT	VU	KZN	No	No	Yes
<i>Lestiniogomphus angustus</i>	LC	NT	GT, KZN, MP, LP	No	No	Yes
<i>Gomphidia quarrei quarrei</i>	LC	VU	MP, LP	No	No	Uncertain

Table I (continue)

<i>Neurogomphus zambeziensis</i>	LC	VU	KZN,LP	No	No	Uncertain
<i>Crenigomphus cornutus</i>	LC	VU	LP	No	No	Yes
<i>Ceratogomphus triceraticus</i>	VU	VU	WC	Yes	Yes	Yes
<i>Paragomphus dicksoni</i>		DD	DD	WC	Yes, if valid taxon	? No
<i>Aeshna Ellioti usambarica</i>	LC	VU	MP,LP	No	No	Uncertain
<i>Gynacantha villosa</i>	LC	VU	KZN	No	No	Yes
<i>Syncordulia gracilis</i>	VU	VU	KZN (?), EC, WC	Yes	Yes	Yes
<i>S. venator</i>	VU	VU	WC	Yes	Yes	Yes
<i>Phyllomacromia monoceros</i>	NT	DD	MP	No	No	No
<i>Orthetrum rubens</i>	DD	DD	WC	Yes	Yes	Uncertain
<i>Diplacodes pumila</i>	LC	EN	KZN, (LP?)	No	No	Uncertain
<i>Olpogastra lugubris</i>	LC	VU	LP	No	No	Yes
<i>Parazyxomma flavicans</i>	LC	VU	KZN	No	Yes	Yes
<i>Urothemis luciana</i>	LC	VU	KZN	No	No	Yes

CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, RE = Regionally Extinct, NA = Not Applicable, EC = Eastern Cape, GT = Gauteng, KZN = KwaZulu-Natal, LP = Limpopo Province, MP = Mpumalanga, WC = Western Cape.

soni, which is awaiting taxonomic clarification, 40 taxa are listed here as threatened or near-threatened. This is 25% of the current national total taxa (160).

Since SAMWAYS (2002b), two species have been removed from the national check list. *Pseudagrion helenae* Balinsky, 1964 and *P. inconspicuum* Ris, 1931 are misidentifications, being *P. coeleste* and *P. draconis*, respectively. The nationally red-listed taxa given here includes 23 species that in South Africa are at the southern edge of their geographical range. It is arguable whether these species are simply very rare or whether they are truly threatened. But rare species at the edge of their range often are rare (LAWTON, 1993) and are susceptible to local extinction both from natural and anthropogenic causes (SCHREEVE et al., 1996). In particular, the various impacts may be synergistic, and it is in many cases difficult to tell what are the immediate and proximate threats. Additionally, these edge populations may be isolated and effectively sink populations (PULLIAM & DANIELSON, 1991). Once extinct, these edge populations may not re-establish, at least for a

long time, as the source population may be far removed. The several species that suffered from the floods of February 2000, which greatly modified their habitats, have been the subjects of catchment modification which amplified the flood water. This caused two taxa to be 'nationally extinct'. For *Pseudagrion c. coeleste* this was brief, with the species reappearing in 2004. In the case of *P. sjoestedti pseudosjoestedti*, it has not yet reappeared.

Against this background, it is important to consider the point made by IUCN (2001) that threats should be viewed as precautionary rather than evidentiary. The reasoning behind this is that there is more opportunity to react positively to impending threats than to threats that are already causing serious decline of a taxon. Besides, it is also essential to maintain as much genetic diversity as possible to ensure future viability of the taxon.

MANAGEMENT IMPLICATIONS

Table I lists those species that are currently under some sort of risk in the various Provinces. This is to enable conservation agencies, national, provincial, local and private, to rapidly identify the species most in need of conservation attention. However, as the eastern and northern parts of South Africa are subject to the drought and flood events of El Niño, this leaves conservation agencies largely powerless to supply specific and immediate action for a particular species. These are all geographically marginal taxa, whose fate at the southern edge of their geographical ranges is largely determined by vagaries of climate. Nevertheless, they are also highly susceptible to anthropogenic pressure. What this means in terms of positive conservation action, is that the future of these taxa, assuming weather conditions are not adverse, lies in conservation of the hydrological regimes and landscape pattern and processes to reduce overall anthropogenic disturbance.

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