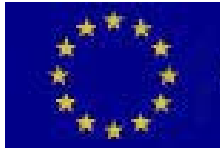


EC Project EuropeAid/ENV/2004-81917  
Integration of freshwater biodiversity in the development process throughout  
Africa: mobilizing information and site demonstrations.



## Workshop Report

# Biodiversity Assessment Tools for Inland Water Ecosystems in Southern Africa

19-22 May 2005

IUCN SSC Training Workshop for the SAIAB freshwater  
biodiversity assessment of Southern Africa



Hosted by the South African Institute for Aquatic Biodiversity (SAIAB),  
Grahamstown, South Africa

## **Introduction**

In December 2004, the IUCN Freshwater Biodiversity Assessment Programme secured funding from the European Commission to assess the conservation status of freshwater species across the African continent (EC Project EuropeAid/ENV/2004-81917). This is a report on the first biodiversity assessment training workshop for the Southern Africa region.

An initial assessment had already been completed for freshwater species in East African countries (Kenya, Uganda, Tanzania, Burundi and Malawi) (Darwall *et al.* 2005). To mark the start of the second phase of the African project, focusing on assessments of species in Southern African countries (South Africa, Swaziland, Namibia, Angola, Mozambique, Zambia, Botswana, Lesotho, AND Zimbabwe), four members of staff from the IUCN Red List and Freshwater Biodiversity Assessment Programmes co-facilitated a Red List training workshop. The workshop was held 19–23 May 2005 and was hosted by the South African Institute for Aquatic Biodiversity. 23 participants attended the four-day workshop (Appendix 1) and were trained to appropriately apply the IUCN Red List Categories and Criteria at both global and regional levels (IUCN 2001, 2003), and were shown how to use the IUCN's Species Information Service Data Entry Module (SIS DEM).

## **Workshop content**

The workshop agenda is attached in Appendix 2. Prior to the workshop, invited participants were asked to bring along some data for Southern African species in order to use these as a training exercise during the workshop (see Appendix 3).

After background presentations outlining the current project, the work of SAIAB and their involvement in the project, and the IUCN Red List Programme, participants were led through the draft IUCN Red List Training package. All participants had a copy of the training manual, which allowed them to easily follow the Power Point presentations throughout the workshop.

The introductory training presentation focused on explaining the IUCN categories, the terminology used in the assessment system (biological terms are used by IUCN, but the meanings of these terms in relation to the Red List categories and criteria are very specific), and the IUCN criteria attached to the three threatened categories (Critically Endangered, Endangered and Vulnerable).

Standard examples from outside of Southern Africa were supplied and participants broke into working groups to practice using the criteria. By initially focusing on examples that were unfamiliar to the participants, time could be spent on learning how to apply the categories and criteria rather than on debating whether the information supplied was up to date.

A second presentation (also detailed in the training manual) outlined the Guidelines for Application of IUCN Red List Criteria at Regional Levels. Participants were also reminded of some basic decisions that need to be addressed before embarking on a regional-level Red List based on IUCN criteria (e.g., whether all visiting non-breeding populations using the region be included on the list and, if not, how to determine what is included and what is excluded).

The participants again broke into working groups, this time to apply the categories and criteria and the regional guidelines to some Southern African species based on their own data brought along to the workshop.

The Red List training workshop is designed to be flexible and open, with plenty of time and opportunity for participants to interact with facilitators and discuss any points for clarification or problems they have with any aspect of the system. Presentations and working group sessions were interspersed with plenary discussions.

### Regional Case Studies

Day three of the workshop focused on the Southern African examples using data brought along by participants. Appendix 4 outlines the case studies used in this session. It should be noted that the assessments shown here are all test cases, based on information supplied and discussed during a training workshop, i.e., these ARE NOT the final regional Red List assessments. In all cases, the underlying data should be re-examined and the assessments repeated (e.g., none of the regional working groups used a 2x2 km<sup>2</sup> grid map overlay on a range distribution map to estimate area of occupancy, as recommended in the IUCN guidelines).

A summary of case studies, working group conclusions, and facilitator's comments follows:

Taxon	Provisional Assessment (IUCN categories)	Comments
<i>Mpasa</i> <i>Opsaridium microlepis</i> (Fish)	Vulnerable (VU A2abcde+3cde+4abcde; B2a(ii)b(iii,v)) National assessment for Malawi sub-population	Although it feeds in the Lake and mixes with individuals that spawn in neighboring countries, it is not known if there is a rescue effect from these other subpopulations. The species may be very specific to spawning sites.
<i>Caelatura kunensis</i> (Mollusc)	Near Threatened*	Downgraded from VU B2ab(iii)+D2 due to immigration from outside the region (Namibia).
<i>Etheria elliptica</i> (Mollusc)	CR B1ab(i,ii,iii,iv,v)+B2ab(i,ii,iii,iv,v)	There was no immigration into to the only population in Namibia found at the lower Kunene river. The original assessment therefore remains unchanged.
<i>Sphaerium capense</i> (Mollusc)	EN B1ab(iii)+B2ab(iii)	The species is wide spread outside Namibia and it is believed that immigration into the Namibian populations will decrease. However the regional populations are not thought to be a sink. The original assessment therefore remains unchanged.
<i>Paragomphis cataractae</i> (Dragonfly)	Vulnerable (VU D1+2) National Assessment for the Namibia sub-population	The sub-population was not considered a non-breeding visitor and there was no information to suggest immigration from the neighbouring sub-population in the Zambezi. The original assessment therefore remains unchanged.
<i>Pseudagrion kesteri</i> (Dragonfly)	Endangered (EN B2a(ii)b(iii,v)c(iv)) National Assessment for Namibia sub- population	The sub-population was not considered a non-breeding visitor and genetic evidence suggests no immigration from outside the country. The original assessment therefore

		remains unchanged.
<i>Prosopistomatidae</i> spp. (undescribed Mayfly)	Critically Endangered CR B1a(i,ii)b(iii)+2a(i,ii)b(iii)	This is a currently undescribed species (with voucher specimens) assessed as a sub-population within South Africa.

Through this exercise, participants gained a better understanding of the IUCN criteria and how they can be used at the regional level. Overall, the workshop participants demonstrated a good understanding of the criteria and the terminology used in the IUCN system. However, some points to note when carrying out future Red List assessments are:

1. Although the one-page summary of the IUCN categories and criteria is a useful document to remind assessors of the thresholds involved, the Red List Categories and Criteria booklet (IUCN 2001) is the rule-book for the system and should be referred to in conjunction with the user guidelines document (for the Florida system, the March 2004 user guidelines are being used (IUCN 2004) although there is an updated version of these guidelines now available).
2. "Location" is linked to the most severe threat to the taxon. The scope of the most serious threat determines the area of the location.
3. The IUCN guidelines recommend using a 2x2 km<sup>2</sup> grid overlay on the range map to determine area of occupancy. Also, the area of occupancy can be based on the smallest area essential to the survival of the taxon at any stage in its life cycle (e.g., for migratory fish, the spawning areas may be the smallest essential area, while for migratory birds, the feeding grounds may make up the smallest essential area).
4. At the start of the regional Red List process, a number of decisions about which taxa to include and which to exclude from the regional list need to be made (e.g., whether to use a filter to determine which visiting populations to include, or whether to include edge of range species, etc.).

## Appendix 1 – Workshop Participants List

- Mr Michael Angliss**, Specialist Scientist, Limpopo Environmental Affairs, PO Box 217, Polokwane, 0700, Tel: +27 (0)15 295 9300, Cell: 082 806 3234, Fax:+27 (0)15 295 5819, E-mail: [anglissmk@finptb.norprov.gov.za](mailto:anglissmk@finptb.norprov.gov.za)
- Mr Mbongeni Baninzi**, Technician and Data Capturer, Albany Museum, Somerset Street, Grahamstown, 6139, Tel: +27(0)46 622 2312, Cell: 083 505 0428, Fax: +27(0)46 622 2398, E-mail: [M.Baninzi@ru.ac.za](mailto:M.Baninzi@ru.ac.za)
- Mr Roger Bills**, SAIAB, Private Bag 1015, Grahamstown, 6140, Tel: +27(0)46 603 5800, Fax: +27(0)46 622 2403, E-mail: [R.Bills@ru.ac.za](mailto:R.Bills@ru.ac.za)
- Dr Jim Cambray**, Senior Specialist Scientist, Makana Biodiversity Centre, Albany Museum, Grahamstown, 6139, Tel: +27(0)46 622 2312, Fax: +27(0)46 622 2398, E-mail: [J.Cambray@ru.ac.za](mailto:J.Cambray@ru.ac.za)
- Mr Willem Coetzer**, Informations Systems Specialist, SAIAB, Private Bag 1015, Grahamstown, 6140, Tel:+27(0) 46 603 5800, Fax:+27(0)46 622 2403, E-mail: [W.Coetzer@ru.ac.za](mailto:W.Coetzer@ru.ac.za)
- Ms Barbara Curtis**, Consultant, Box 90020, Windhoek, Namibia, Tel: +264 61 223446, Fax: +264 61 223446, E-mail: [treeatla@mweb.com.na](mailto:treeatla@mweb.com.na)
- Mr Luis da Costa**, PhD Student, SAIAB, Private Bag 1015, Grahamstown, 6140, Tel: +27(0)46 603 5800, Cell: 076 278 6741, Fax:+27(0)46 622 2403, E-mail: [L.dacosta@ru.ac.za](mailto:L.dacosta@ru.ac.za)
- Dr William Darwall**, Freshwater Biodiversity Assessment Officer, IUCN – The World Conservation Union, 219c Huntingdon Road, Cambridge, CB3 0DL, United Kingdom, Tel: +44 1223 277966, Fax: +44 1223 277966, E-mail: [will.darwall@ssc-uk.org](mailto:will.darwall@ssc-uk.org)
- Mrs Mame Dagou Diop**, Projects Officer, Wetlands International, Africa Office, PO Box (BP) 80, GO Dakar, Senegal, Tel: +221 820 6478, Cell: +221 635 9185, Fax: +221 820 6479, E-mail: [dagouwet@sentoo.sn](mailto:dagouwet@sentoo.sn)
- Ms Fahiema Daniels**, Red List Officer, SANBI, Private Bag X101, Pretoria, 0001, Tel: +27 (0) 12 843 5283, Cell: 083 739 0409, Fax: +27(0) 12 843 5205, E-mail: [daniels@sanbi.org](mailto:daniels@sanbi.org)
- Mr Moustapha Diedhiou**, Marine Researcher, Institute of Marine Research (IIM)-Angola, Rua Mortala Mohamed S/N, Ilha de Luanda CP2601, Angola, Tel: +244 2 309732, Cell: +244 923 415727, Fax: +244 2 309732, E-mail: [diedhioum@hotmail.com](mailto:diedhioum@hotmail.com)
- Dr Ferdy de Moor**, Senior Specialist Scientist, Albany Museum, Somerset Street, Grahamstown, 6139, Tel: +27 (0)46 622 2312, Fax:+27 (0)46 622 2398, E-mail: [f.demoor@ru.ac.za](mailto:f.demoor@ru.ac.za)
- Dr Johan Engelbrecht**, Head: Aquatic and Herpetifauna Research, Mpumalanga Parks Board, Private Bag X1088, Lydenburg, 1120, Tel: +27 (0)13 235 1673, Fax: +27(0)13 235 1674, E-mail: [jseng@intekom.co.za](mailto:jseng@intekom.co.za)
- Ms Wendy Foden**, Programme Manager, Threatened Species Programme, SANBI, Private Bag X101, Pretoria, 0001, Tel: +27 (0)12 843 5288, Cell: 084 442 9141, Fax:+27 (0)12 804 5111, E-mail: [foden@sanbi.org](mailto:foden@sanbi.org)
- Mr Craig Hilton-Taylor**, Red List Programme Officer, IUCN – The World Conservation Union, 219c Huntingdon Road, Cambridge, CB3 0DL, United Kingdom, Tel: +44(1223) 277 966, Cell: 077 405 65204, Fax:+44(1223) 277 845, E-mail: [Craig.Hilton-taylor@ssc-uk.org](mailto:Craig.Hilton-taylor@ssc-uk.org)
- Mr Dean Impson**, Principal Nature Conservation Scientist, Cape Nature, Private Bag X5014, Stellenbosch, 7600, Tel: +27(0)21 866 8019, Cell: 082 414 0020, Fax:+27(0)21 866 1523, E-mail: [impsond@cncjnk.wcape.gov.za](mailto:impsond@cncjnk.wcape.gov.za)
- Mrs Helen James**, Assistant Curator, Department of Freshwater Invertebrates, Albany Museum, Somerset Street, Grahamstown, 6139, Tel:+27 (0)46 622 2312, Cell: 083 941 0059, Fax:+27(0)46 622 2398, E-mail: [H.James@ru.ac.za](mailto:H.James@ru.ac.za)
- Mr Cyprian Kapasa**, Deputy Director, Department of Fisheries, Fisheries Research Branch, PO Box 350100, Chilanga, Zambia, Tel: +260 (0)1 278597, Cell: 097 881501, Fax:+260 (0)1 278173, E-mail: [ckkapasa@yahoo.com](mailto:ckkapasa@yahoo.com)

**Dr Brian Marshall**, University of Zimbabwe, PO Box MP167, Mount Pleasant, Harare, Zimbabwe, Tel:+263 4 303211, Cell: (263) 091 261835, Fax+263 4 333407, E-mail: [bmarshall@science.uz.ac.zw](mailto:bmarshall@science.uz.ac.zw)

**Ms Krishni Naidoo**, Red List Officer, SANBI, Private Bag X101, Pretoria, 0001, Tel: +27(0)12 843 5002, Cell: 072 713 7584, Fax:+27(0)12 843 5205, E-mail: [knaidoo@uwc.ac.za](mailto:knaidoo@uwc.ac.za)

**Ms Leigh Potter**, Red List Officer, SANBI, Private Bag X101, Pretoria, 0001, Tel: +27(0)12 843 5002, Cell: 084 906 1611, Fax:+27(0)12 843 5205, E-mail: [potter@sanbi.org](mailto:potter@sanbi.org)

**Ms Caroline Pollock**, Red List Programme, IUCN – The World Conservation Union, 219c Huntingdon Road, Cambridge, CB3 0DL, United Kingdom. Tel: ++44 (0)1223 277966. Fax: ++44 (0)1223 277845. E-mail: [caroline.pollock@ssc-uk.org](mailto:caroline.pollock@ssc-uk.org)

**Prof Paul Skelton**, Managing Director, SAIAB, Private Bag 1015, Grahamstown, 6140, Tel:+27 (0)46 603 5800, Cell: 082 903 1615, Fax:+27(0)46 622 2403, E-mail: [P.Skelton@ru.ac.za](mailto:P.Skelton@ru.ac.za)

**Mr Kevin Smith**, Freshwater Biodiversity Assessment Programme, IUCN – The World Conservation Union, 219c Huntingdon Road, Cambridge, CB3 0DL, United Kingdom, Tel:+44 (0)1223 277966, Fax:+44(0)1223 277845, E-mail: [Kevin.smith@ssc-uk.org](mailto:Kevin.smith@ssc-uk.org)

**Dr Frank Suhling**, Technische Universität Braunschweig, Langer Kamp 19c, D-38106 Braunschweig, Germany, Tel: +49 531 391 5915, Cell: +49179 79 30613, E-mail: [f.suhling@tu-bs.de](mailto:f.suhling@tu-bs.de)

**Mr Denis Tweddle**, Honorary Research Associate, SAIAB, Private Bag 1015, Grahamstown, 6140, Tel:+27 (0)46 603 5800, Fax:+27(0)46 622 2403, E-mail: [d.tweddle@ru.ac.za](mailto:d.tweddle@ru.ac.za)

**Ms Janine Victor**, Chief Scientist: Red Lists, SANBI, Private Bag X101, Pretoria, 0001, Tel:+27 (0)12 843 5231, Cell: 084 506 3274, Fax:+27(0)12 804 3211, E-mail: [victor@sanbi.org](mailto:victor@sanbi.org)

## Appendix 2 – Workshop Agenda

# Biodiversity Assessment Tools for Inland Water Ecosystems in Southern Africa

19-22 May 2005

## IUCN SSC Training Workshop for the SAIAB freshwater biodiversity assessment of Southern Africa

**Workshop venue:** Centre for Further Education, Rhodes University, Grahamstown

### PROGRAMME

#### Day 1: Thursday, 19 May

- Objectives:*
- (i) *To introduce the purpose and utility of IUCN Red List assessments and their relevance to the EC Pan-Africa FW Biodiversity Programme.*
  - (ii) *To develop an understanding of the Categories and Criteria employed to assign Red List categories.*
  - (iii) *To discuss issues specific to assessment of freshwater taxa.*

**08:00**            **Registration**

08:30            Welcome and Introductions

08:40            Overview of SAIAB's work in southern Africa and plans for FW biodiversity assessment (Paul Skelton, SAIAB).

09:00            The aims and objectives of the EC Pan-Africa FW Biodiversity Assessment Project (William Darwall, IUCN Species Programme)

09:30            Overview of the SAIAB component of the Pan-Africa Project. (Paul Skelton, SAIAB)

**10:00**            **Tea Break**

10:15            Overview of the IUCN SSC Red List Programme (Caroline Pollock, IUCN Red List Programme)

11:00            Global Red List Categories and Criteria: applying the global criteria and their theoretical background (Craig Hilton-Taylor, IUCN Red List Programme)

**12:30**            **Lunch**

13:30            Global Red List Categories and Criteria: applying the global criteria and their theoretical background (Craig Hilton-Taylor, IUCN Red List Programme)

**15:30**            **Tea Break**

- 15:50 Discussion of issues raised (Plenary)
- 16:30 Red Listing issues specific to Freshwater taxa - worked examples
- 17:30 Discussion of issues raised (Plenary)
- 18:00 End of Day 1**

**Day 2: Friday, 20 May**

*Objective: Practical experience in global Red List assessments using examples provided*

- 08:30 Review of previous day - specific issues (Plenary)
- 09:00 Practical assessments - **4 working groups**  
Examples provided to demonstrate global assessments
- 10:30 Tea Break**
- 10:50 Practical assessments - **4 working groups**  
Examples provided to demonstrate global assessments
- 12:30 Lunch**
- 13:30 Practical assessments - **4 working groups**  
Examples provided to demonstrate global assessments
- 15:30 Tea Break**
- 15:50 Practical assessments - **4 working groups**  
Examples provided to demonstrate global assessments
- 17:00 Group Reports
- 17:30 Discussion of issues raised (Plenary)
- 18:00 End of Day 2**

**Day 3: Saturday, 21 May**

*Objectives:*

- (i) *To introduce the guidelines for regional Red List assessments.*
- (ii) *To provide practical experience of regional Red List assessments based on data brought to the workshop by participants.*

- 08:30 Regional guidelines - theory and examples (Caroline Pollock, IUCN Red List Programme)
- 09:30 Practical assessments - **4 working groups** (Data provided by workshop participants)
- 10:30 Tea Break**

- 10:50 Practical assessments - **4 working groups** (Data provided by workshop participants)
- 12:30 Lunch**
- 13:30 Report back to plenary from each group on findings and problems experienced
- 14:30 Discussion
- 15:30 Tea Break**
- 15:50 Review of topics covered
- 18:00 End of Day 3**

**Day 4: Sunday, 22 May**

- Objectives:*
- (i) *To introduce the IUCN SSC Species Information Service as a tool for data storage, management, analysis and dissemination.*
  - (ii) *To detail the protocol for mapping species distributions.*

- 09:00 Introduction to the IUCN Species Information Service Data Entry Module (SISDEM) (Kevin Smith, IUCN Freshwater Biodiversity Assessment Programme)
- 10:30 Tea Break**
- 10:50 Practical session on use of the SISDEM - **4 working groups** (1 x laptop for each group)
- 12:30 Lunch**
- 13:30 Species Mapping Protocols (William Darwall, IUCN Freshwater Biodiversity Assessment Programme)
- 14:30 Develop and discuss workplan/management for biodiversity assessments
- 18:00 Closure**

## Appendix 3 – Data Requirements

### DESCRIPTION OF DATA TO BE BROUGHT TO WORKSHOP

For the Red List training workshop, we find that people always learn the most when they are assessing taxa that they know or are at least familiar with them. We will be providing some case studies for everyone to use at the workshop, but we would also request that you all try to bring information for **at least one** taxon that you are working on or have some knowledge about. These can be species, subspecies, varieties or subpopulations; and the information can be just for the taxon in your country or for across the whole region (or even a major part of the region). You are welcome to bring data for more than one taxon, but certainly not for more than five taxa as time is limited. During the training workshop, the data that has been brought will be discussed in small working groups to obtain a conservation assessment for each taxon using the IUCN Red List Categories and Criteria and the Regional Application Guidelines. By the end of the workshop, we hope that everyone will feel sufficiently comfortable with the IUCN categories and criteria to be able to apply them to other taxa.

### TYPES OF DATA REQUIRED FOR RED LISTING SPECIES

Participants are requested to bring whatever data they have available for their taxa that relate to the parameters in the Red list Criteria (see below). Please do not spend a huge amount of time gathering together all this data, as it is not intended to be a full research project by itself.

So what type of information is needed in order to assess the conservation status of a species?

The IUCN Red List system has been designed to incorporate many different types of data. The system has also been designed to enable the assessment of a species for which there is relatively little data, as is the case with most threatened species. Therefore, **not all the data listed below are required to make a conservation assessment**, but any of the following information would be helpful in determining the conservation status of a taxon.

**Distribution:** What is the extent of occurrence and area of occupancy (or some other descriptor of range which can be used to derive these figures)? If possible, please bring distribution maps (these can be dot maps, polygon maps or maps with shaded grid cells of occurrence).

**Mature individuals:** What is the total number of **MATURE** individuals? If not available, what is the total population size, and what proportion are likely to be seedlings or old senescent plants?

**Population trends:** Is the population stable, increasing or declining? What are the population trends likely to be in the near future? If a population is declining what is the rate of decline and over what time period has it occurred/or will it occur? If possible, this information should cover the last ten years; however, if data are not available, over whatever time frame is available is fine.

**Subpopulations of locations:** What is the total number of subpopulations and/or locations? What is the area of each subpopulation and/or location?

**Fragmentation:** What is the degree of isolation between subpopulations and/or locations? Is there regular movement of propagules (e.g. seed or pollen) between subpopulations?

**Fluctuation:** Does the population tend to undergo extreme fluctuations?

**Generation time:** What is the average age of parents in the population?

**Threats:** What has caused, continues to cause, or may in the future cause a decline in the distribution or the number or mature individuals? For example, habitat loss, exploitation or introduced invasive species.

**Conservation Measures:** What action has been taken that has or is likely to reduce declines in a taxon's distribution or in the total number of mature individuals?

**IMPORTANT NOTE:**

To apply the regional guidelines, additional information on the above parameters is required for subpopulations outside of the country/region being assessed. As a final reminder, you do not need to bring data on all of the above parameters. Obviously the more data you have the easier it is to assign a category other than Data Deficient. But in most cases all you may know is something about the range and what is happening to the habitat. That is fine; just bring whatever information is readily available to you.

## Appendix 4 – Regional Case Studies

The IUCN Red List criteria and regional guidelines were used to assess Southern African species on Day 3 of the workshop. Workshop participants broke into four working groups (as below) and each group was asked to assess taxa they had data for. The groups then reported their findings for one taxon assessment in a plenary session

Group 1	Group 2	Group 3	Group 4
Luis da Costa	Rodger Bills	Barbara Curtis	Ferdy de Moor
Helen James	Mame Diop	Leigh Potter	Dean Impson
Krishni Naidoo	Denis Tweddle	Jim Cambray	Wendy Foden
Paul Skelton	Mbongeni Baninzi	Cyprian Kapasa	Fahiema Daniels
Frank Suhling	Johan Englebrecth	Moustapha Diedhiou	Brian Marshall
Facilitator	Facilitator	Facilitator	Facilitator
Will Darwall	Caroline Pollock	Kevin Smith	Craig Hilton-Taylor

### Case Studies presented in Plenary

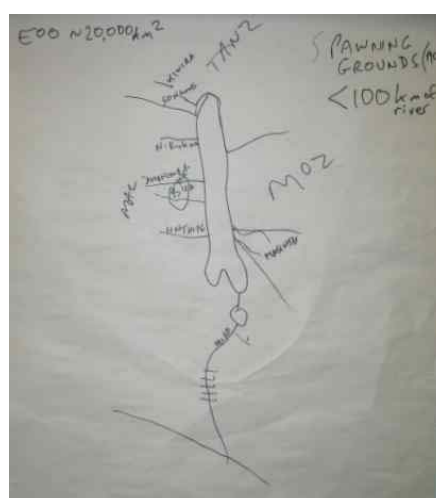
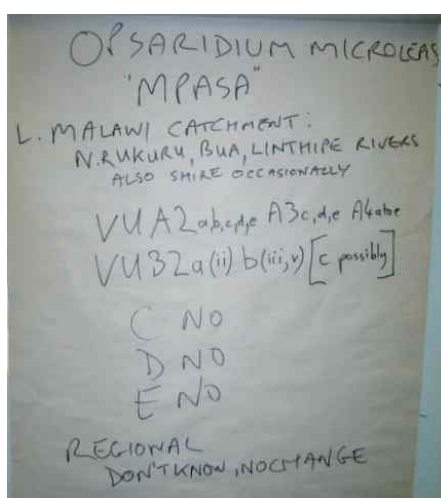
#### 1. Mpsa, *Opsaridium microlepis*

*Opsaridium microlepis* currently is not evaluated for the IUCN Red List (i.e., it does not appear on the 2004 list).

*O. microlepis* is a fish endemic to Lake Malawi. It feeds in the lake itself, but migrates to rivers to spawn. The assessment focused on the population using spawning rivers in the Malawi side of the lake. In this region, rivers are heavily impacted and the population is heavily fished.



Denis Tweddle presents working group 2's assessment of *Opsaridium microlepis*



Regular surveys carried out on the Bua River (1978–1995) using the same methodology each year have provided good data on population trends in this river. Catches from this

river (see table 1.1) indicate that the population declined between 1985 and 1991, and in 1992 no fish were caught in the river at all. At this time, biologists working on the river encouraged fishing regulations to be tightened in the area in order to help the population recover. This appeared to work, however the following year protesters against these regulations poisoned the river to such an extent that all fauna in the river was killed (including crocodiles).

	Year	CPUE (fish caught per day)
	1978	19
	1980	5
	1982	9
	1983	25
	1984	12
	1985	31
	1986	27
	1987	26
	1988	24
	1989	22
	1990	20
Fishing regulations imposed →	1991	6
	1992	0
	1993	20
Poison introduced into river →	1994	5
	1995	0

**Table 1** CPUE results from surveys carried out on Bua River (1978–1995)

Population declines are believed to be occurring in all the rivers in Malawi. There is a high human population across the whole area, fishing pressure is high, available spawning habitat (gravel beds and possibly cobble areas) is declining and spawning runs are often blocked. Three generations for this species is around 15 years.

Although a population decline of 80% or more could be estimated to have occurred in the Bua River, this is only one part of the species' range area. However, given the widespread nature of the threats to this species, there could be reason to believe that there has been a population decline of at least 30% in Malawi since 1990 based on a combination of observed population declines, CPUE data, declining habitat quality, direct exploitation, and pollutants (VU A2abcde). These threats are ongoing and assessors believe that it is likely that the population would suffer a further 30% decline over the next fifteen years based on declining habitat quality, continued exploitation and effects of pollutants (VU A3cde). Since A2 and A3 were used, the assessors also included the past and future criterion A4 (VU A4abcde).

The extent of occurrence (EOO) for this species is large as it includes the lake area and spawning rivers. It was estimated at over 20,000 km<sup>2</sup>. However, area of occupancy (AOO) was taken as essential spawning habitat available to the population (it is thought that individuals may be very site specific for spawning rivers) therefore it was thought likely that the area of occupancy is less than 100 km<sup>2</sup> (EN B2). The population is not considered severely fragmented. Although the threats to the species are ongoing across the whole AOO the number of locations (areas affected by one single threatening event)



*Caelatura kunensis* currently is not evaluated for the IUCN Red List (i.e., it does not appear on the list). The 'region' delineated for this assessment is Namibia.

*C. kunensis* is a freshwater mussel found at five locations in three different river systems, the Kunene, Okavango and Cuvelai. All three of the river systems where *C. kunensis* is found have their headwaters outside of Namibia, and in the case of the Okavango its delta is found across the border in Botswana.

The main threats to the species are siltation, water pollution and water abstraction. There is no information available on population numbers or trends. The extent of occurrence of *C. kunensis* is estimated to be around 30,000km<sup>2</sup>. The area of occupancy of the species is estimated to be 1,600km<sup>2</sup> when using a 2x2km<sup>2</sup> grid. However, using the actual area of occupancy, using length of the river x average width, the AOO is estimated to be 160km<sup>2</sup>.

Criteria B (restricted geographic range): The EOO is too large to qualify for Vulnerable (20,000km<sup>2</sup> threshold), but the AOO, when using the grid system, qualifies for Vulnerable (2,000km<sup>2</sup> threshold). However, if the actual AOO is used the threshold for Endangered is met (500km<sup>2</sup>). The species also qualifies for Endangered under sub criteria a (less than 5 locations) and b(iii) (continuing decline in quality of habitat).

Criteria D (very small or restricted population): *C. kunensis* qualifies for Vulnerable under D2 which has a threshold of the number of locations typically less than or equal to 5 locations.

The preliminary assessment for the Namibian population of *C. kunensis* therefore is **Vulnerable (VU B2ab(iii)+D2)**

#### **Regional Adjustment**

It is believed that individuals are immigrating into the regional population from upstream of all five locations in Namibia. This immigration is not expected to decrease. Therefore, the initial assessment is downgraded to Near Threatened.

**FINAL ASSESSMENT**  
***Caelatura kunensis* is Near Threatened\***

#### **Comments:**

**The EOO and AOO need to be measured accurately (they were estimated using very rough methods for this workshop) before assigning a final Red List Category for the Namibian population of *C. kunensis*.**

**It is important to note that the Red List Category assigned to *C. kunensis* would be Vulnerable and not Near Threatened if the actual AOO was used instead of the AOO calculated using the grid method.**

### **3. *Paragomphus cataractae***

*Paragomphus cataractae* is currently not evaluated for the IUCN Red List (i.e., it does not appear on the list). The 'region' delineated for this assessment is Namibia.

*Paragomphus cataractae* is a dragonfly known from only two locations within Namibia. There are no data on the rate of population decline. The EOO is < 20,000 km<sup>2</sup> (meets the threshold for VU B1) and AOO is < 500 km<sup>2</sup> (meets the threshold for EN B2). The population is not considered to be severely fragmented but is limited to only two locations (river rapids) (EN B2a). The major threats are dam construction which threaten to destroy its rapids habitat. There are no data on decline in the population, EOO, AOO or habitat quality and number of mature individuals. However, if there is a plan to build dams in the area then a decline can be projected for



Frank Suhling presents working group 1's assessment of *Paragomphus cataractae*

the future. Given the likelihood of future dam construction the species can be considered Near Threatened almost qualifying as EN B2ab.

There are no data on actual population size (for criterion C). The restricted AOO and number of locations qualifies the species as VU D1+D2. No quantitative study has been conducted so criterion E could not be applied.

The preliminary assessment for the Namibian population of *P. cataractae* therefore is **Vulnerable (VU D1+D2)**.

#### **Regional Adjustment**

The sub-population in Namibia is not a non-breeding visitor and there is no information on the likelihood of immigration from the nearest known sub-population outside Namibia in the Zambezi. Therefore the initial assessment remained unchanged.

**FINAL ASSESSMENT**  
***Paragomphus cataractae* is Vulnerable (VU D1+D2)**

#### **Comments:**

**Further investigations of any dam building strategy need to be conducted. If it is found that dam construction is planned for the locations where the species is found then the assessment would be upgraded to EN B2ab(i,ii,iii) on the basis of a suspected future decline in available habitat.**

4. Dean Impson. Regrettably this presentation was not recorded.