

Marine ¹Biodiversity in Sub-Saharan Africa: The Known and the Unknown

Proceedings of the Marine Biodiversity in Sub-Saharan Africa: The Known and the Unknown

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Edited by

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PROCEEDINGS OF SUB-SAHARAN AFRICAN MARINE BIODIVERSITY WORKSHOP

The following document records the proceedings of a workshop entitled “Marine Biodiversity in sub-Saharan Africa: the Known and the Unknown”, which was held in Cape Town, South Africa, from 24-26 September 2003. The workshop was an initiative of the Census of Marine Life (CoML) Programme, which has sponsored a series of other similar regional workshops, aimed at documenting the state of knowledge of marine biodiversity and at establishing regional networks of researchers to promote and co-ordinate future research in the discipline. Previous workshops have been held in Southeast Asia (Phuket, October 2001) and in South America (Conception, October 2002), and another is proposed for India in December 2003. The sub-Saharan African workshop was convened jointly by the Zoology Department at the University of Cape Town, the International Ocean Institute in Southern Africa (University of the Western Cape), and the South African Institute for Aquatic Biodiversity, and was supported financially by the Alfred P Sloan Foundation.

This workshop brought together African experts in the field of marine and coastal biological diversity from 14 coastal countries in sub-Saharan Africa, as well as relevant decision-makers, representatives of their governments, and representatives of related regional and global initiatives. Their mandate was to explore the state of knowledge of marine biodiversity in sub-Saharan Africa, and to evaluate the current status, and threats to, marine biological diversity in the region. The workshop also considered what actions could be taken to address shortcomings in the state of knowledge surrounding marine biological diversity in sub-Saharan Africa, and to mitigate current threats to this diversity.

It is our hope that these discussions will ultimately result in the establishment of a broader Action Programme to address these vital issues, and a committee was appointed at the conclusion of the meeting to take these matters forward. The proposed Action Programme could focus on a number of key areas, including:

- The formation of a network of biodiversity researchers and professionals in sub-Saharan Africa.
- Addressing key gaps in current knowledge of marine and coastal biological diversity in sub-Saharan Africa through, for example, mobilization of research funding.
- Information dissemination and communication, including the establishment and consolidation of the network of biodiversity researchers and professionals, and an electronic database of biodiversity and taxonomic resources (including species inventories, catalogues of museum holdings, lists of taxonomists working on different groups, etc.).
- Developing human, institutional and infrastructural capacity for furthering knowledge of marine and coastal biological diversity in the region through, for example, development of an MSc course in taxonomic and biodiversity studies, partnering with other institutions in exchange programmes, etc.
- Facilitating management of marine and coastal biological diversity in the region through, for example, provision of information through the database (including GIS-based information), provision of advisory services, etc.

Our thanks to the Sloan Foundation for their generous support, without which this workshop could not have taken place, to the workshop participants for the considerable effort they put into their presentations and written reports and to our host institutions for allowing us to become involved in this important exercise.

We trust you, the reader, will find these proceedings of interest

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SUMMARY OF THE WORKSHOP

ALAN WHITFIELD

Summary of the first two days of the workshop

Dr whitfield presented a summary of the first two days of the workshop in the form of a strengths, weaknesses and opportunities analysis.

General introduction

Africa is bathed by three oceans, and covers the widest latitudinal gradient of any continent, thus providing a tremendous opportunity to contribute to global marine biodiversity initiatives. Africa has a rich biodiversity, although this remains relatively poorly known, and is under threat from major human pressures.

Strengths

- rich diversity of marine life appreciated and beginning to be explored
- small core of dedicated scientists available to form the catalyst for future work
- problems associated with potential biodiversity loss have been identified, including habitat loss, over-exploitation, pollution, and invasive organisms
- lessons in marine biodiversity conservation
- online biodiversity databases are already up and running

Weaknesses

- limited capacity – human, infrastructure, financial
- biodiversity research not coordinated on a national or continental scale
- habitat destruction and over-exploitation already far advanced in many countries
- where laws are present to sustain biodiversity these are seldom enforced
- large dams have been built without reference to the consequences on marine productivity and biodiversity
- invasive biota appear to be on the increase despite legislation
- limited museums housing national biodiversity collections
- conversion of estuaries and lagoons into salt pans or shrimp farms before biodiversity and other options fully explored
- fisheries catches declining, and the impact on biodiversity is unknown
- little detailed information on the impacts of global warming on marine biodiversity

Opportunities

- new technologies available, including observation, data management and communication technologies
- value of biodiversity (and the processes that they support) needs to be promoted to all, especially politicians
- convert ‘bits and pieces’ research into coordinated national and international programmes with defined goals
- need to identify marine biogeographic regions and link these to biodiversity
- obtain greater sponsorship for biodiversity research from foreign fishing and oil companies?
- ensure training of taxonomists at the highest level
- identify the many species that have only been keyed out to generic or family levels
- initiate research on neglected groups and regions

- more aquaria around africa to increase public awareness of marine biodiversity
- elimination of destructive and non-selective fishing methods
- quantify impact of invasive species on african marine biodiversity
- reduce fishery by-catches to the benefit of biodiversity
- initiate mangrove reforestation where possible to increase coastal productivity and biodiversity
- establish national museums to curate african biodiversity collections
- balance offshore and inshore biodiversity efforts
- peace has brought opportunities for research in countries previously affected by conflict
- link physico-chemical and biological information to define marine biogeographic regions
- pay more attention to endemic species at national, regional, biogeographic and continental levels
- examine how natural system variability affects marine biodiversity
- identify threatened species and the cause(s) of their endangered status
- how do large dams affect marine biodiversity?
- encourage overseas taxonomists to become more involved in africa via collaborative projects
- identify 'hotspots' for marine biodiversity in same was as the ornithologists have done for birds
- create marine protected areas that are effective at sustaining african biodiversity
- ideal opportunity to conduct focused research on the impact of global warming on marine biodiversity
- need t use technology to refine taxonomy, create and update electronic databases
- link information gathering, communication and management
- need to create training opportunities and ensure that trained students are not lost
- there needs to be focused research on threatened habitats before these systems disappear
- scientists and non-scientists alike must make more use of online biodiversity websites
- etc.

INTRODUCTION TO WORKSHOP DISCUSSIONS

The workshop helped to identify what is known regarding marine biodiversity in sub-Saharan Africa, and to highlight what remains unknown. Working session discussions were held in order to use this information to develop a coordinated programme of action to further the state of knowledge of marine biodiversity on the African continent. These working session discussions were centered around the three themes of exploring mechanisms for information dissemination and communication, identifying and addressing key gaps in marine biodiversity knowledge in Africa, and developing appropriate capacity for furthering knowledge on Africa's marine biodiversity. In addition to these, a plenary discussion was held to explore future directions of the programme. In all cases, guidelines were prepared in order to assist participants to have meaningful discussions around the themes.

General guidelines to be considered in all working session discussions were as follows:

- Try to think holistically and programmatically rather than project-wise (although some projects will undoubtedly be identified during the discussions).
- Try to think continent-wise rather than nationally (although national perspectives will be invaluable in this process)
- Where possible, consider all aspects of marine biodiversity, including research, conservation, exploitation, etc.
- Discussions should be based on needs identified through this workshop and other processes such as the African Process, WSSD, GIWA, national processes, etc.
- It is important to keep a focus on the current regional political climate, in particular NEPAD

WORKING SESSION A
EXPLORATION OF MECHANISMS FOR INFORMATION DISSEMINATION
AND COMMUNICATION
Chair: Dr Dennis Gordon (OBIS)
Rapporteur: Mr Faghrie Mitchell (IOI-SA)

Guidelines

The guidelines provided for this working session were as follows. The workshop should have identified the following:

- A need for dissemination of marine biodiversity information and communication within sub-Saharan Africa
- What mechanisms currently exist for such information dissemination and communication in the region (and elsewhere)
- Some examples of how information dissemination and communication can be achieved

With this base, we are now ready to:

- Identify what is needed in terms of information dissemination and communication mechanisms related to marine biodiversity in sub-Saharan Africa
- Discuss what form such mechanisms should take

Identification of needs

A number of needs were identified regarding dissemination of biodiversity information and communication between researchers. These included:

- There is a strong need for dissemination of biodiversity information in a number of forms, including electronic databases, regional taxonomic guides, etc.
- There is a need to raise awareness of existing online and hard-copy resources
- There is a need to harmonize existing online databases, and to draw on existing material
- Online databases require linking with oceanographic and ecological data
- Africa-specific databases should be developed
- Communication and networking between researchers working on African marine biodiversity needs to be improved.

A vision for marine biodiversity information dissemination and communication in Africa in the year 2020

The participants formulated the following considerations for marine biodiversity communication in Africa:

- Every country has infrastructure for biodiversity information retrieval, access, and delivery, with shared information for all
- Have enough researchers working in taxonomy – trained personnel, funding (sustainable), technology (communications)
- Efficient communication and networking between researchers active in the field of marine biodiversity in Africa
- Buy-in from national governments at all levels for biodiversity appreciation and awareness, national ownership of biodiversity
- Appropriate, adequate and accessible databases which are integrated, and which aid the proper management of the biodiversity resources i.e. collected, archived, properly managed and accessible
- Link with other databases and initiatives

- Make use of existing infrastructure, for example the ODINAfrica.

Actions necessary to achieve the vision

The following actions were suggested in order to achieve the vision:

- Establish appropriate links between databases at all levels
- Implement technology to integrate and analyze biodiversity data
- Ensure human resources and infrastructure capacity for communication
- Establish a network for marine biodiversity research in Africa
- Establish national and/or regional hubs as clearing houses for biodiversity data
- Establish a program for training taxonomists, sourcing funding and enhancing infrastructure
- Crucial to align these goals and actions with CBD strategies
- Needs assessments and setting of priorities within different countries
- Ensure sustainability of database systems and data
- Improved data management.

Some considerations in establishing marine biodiversity databases for Africa

As a first step in the collaboration, it is suggested to use ODINAfrica to create biogeographical databases in those countries where they do not yet exist. It is important that existing databases are drawn into the system, and that there is a minimal set of fields common to all of these. This minimal set should be equal to, or greater than, the OBIS minimum set of data. Specifically, information on voucher specimens is seen as important.

To ensure that information is exchangeable, not only at the technical level, but also on the content level, a standard species list can be built. MASDEA, Species 2000 and other resources can be used to build this list. Participants to the network are invited to contribute their expertise (on a region or on a taxon) to this database.

ODINAfrica, Oceanographic Data and Information Network for Africa, is a UNESCO/IOC (Intergovernmental Oceanographic Commission)-led programme, funded by the Flemish Government, now entering its third phase. Emphasis in the first two phases was mainly on capacity building, both human resources, IT and connectivity, to facilitate up-to-date management of oceanographic/marine data and information. Capacity has been built to handle data streams, manage information resources, build and host web sites, and make databases available through these web sites. In the 20 countries participating to the ODINAfrica II project, there is now a functional National Oceanographic Data Centre, forming part of the International Oceanographic Data and Information Exchange programme (IODE) of the IOC.

For the third phase of ODINAfrica, the capacity built in earlier phases of the project will be used to generate and manage data streams. The emphasis will still be on physical oceanography. There is, however, also a wish to deal with biological data, mainly related to fisheries and biodiversity.

This creates an opportunity for collaboration with OBIS activities in Africa. Biological expertise from the African countries can be combined with the infrastructure and know-how built up in ODINAfrica, to make a contribution to the global OBIS programme in a relatively short time. Resources available within the ODINAfrica project can be made available to a possible OBISAfrica network. The library and information resources of ODINAfrica can make a substantial contribution to the future network. There are some financial resources available to forge links between the two networks.

WORKING SESSION B
IDENTIFYING AND ADDRESSING KEY GAPS IN MARINE BIODIVERSITY
KNOWLEDGE IN AFRICA

**Chairs: Prof. Charles Griffiths & Dr Larry Hutchings (University of Cape Town Zoology
Department & South Africa's Marine and Coastal Management respectively)**

Rapporteur: Dr Ceri Lewis (IOI-SA)

Guidelines

The guidelines provided for this working session were as follows. The workshop should have identified the following:

- The current state of knowledge of marine biodiversity in sub-Saharan Africa
- Areas where gaps exist in our current knowledge in geographical, taxonomic and genetic contexts
- Which of these knowledge gaps are of high priority and can be considered 'key' gaps (in terms of geographical, taxonomic and genetic contexts)

With this base, we are now ready to:

- Formally identify the key gaps in marine biodiversity knowledge in the region
- Identify what is needed to improve the state of knowledge surrounding these key gaps
- Discuss what form such intervention(s) should take

Identification of key gaps in marine biodiversity knowledge in Africa

Knowledge gaps in African marine biodiversity can be categorized as being in three areas:

- Taxonomic information
- Geographic regions
- Ecosystem/ biotope

Two different possible approaches to address these gaps in biodiversity knowledge were identified:

- Examine existing threats on a region by region basis and analyze habitat types and key taxonomic groups for that region. This becomes more difficult where taxonomic information is limiting
- Examine patterns amongst known 'proxy' groups of organisms and identify regional knowledge gaps where there is little existing knowledge on any group of organism. Well studied groups that could be used as 'proxy' organisms to look for geographical biodiversity patterns might be; fish, seaweeds, birds, shallow water echinoderms, large crustaceans, molluscs and mammals. Whilst there are many groups where detailed information is missing and must be studied, it will take a long time before enough is learnt about such groups for them to be useful in identifying patterns in biodiversity.

It was recognized that an opportunity exists in Africa to contribute to global biodiversity knowledge through the vast latitudinal gradient along the coast and presence of 6 biogeographical zones (2 tropical, 2 sub tropical, and 2 temperate). Some of these zones are well studied while very little information is currently available for others. Knowledge gaps were examined in more detail for each of the six zones.

Tropical East Coast

The following were highlighted as key gaps in marine biodiversity knowledge in this biogeographic region:

- Most estuaries on the tropical east coast (particularly benthos) have never been surveyed
- Very little info exists for the entire regions of Somalia, the Comoros and northern Mozambique, representing major geographical gaps
- The offshore benthos is not well known (shallower zones are far better known than deeper areas)
- Fauna and flora associated with seagrass beds
- Small crustaceans, polychaetes and meiofauna in general
- Planktonic systems in general poorly known
- Phytoplankton
- Soft corals

Sub-tropical East Coast (Southern Mozambique and KwaZulu-Natal)

The following were highlighted as key gaps in marine biodiversity knowledge in this biogeographic region:

- No surveys of offshore benthos beyond 140m depth, which is a soft bottomed trawled area
- Meiofauna (especially deeper than 140m) not known
- hydroids, bryozoans, octocorals of deeper waters

Warm Temperate East Coast

The following were highlighted as key gaps in marine biodiversity knowledge in this biogeographic region:

- Offshore beyond 30m has been surveyed and so is well known relative to the rest of Africa but there are still no systematics studies for this area and little taxonomic information
- The deep benthos is poorly understood
- There are deep water coral beds on the edge of the Agulhas bank which are poorly understood but which form an important fish refuge and there are known to be destructive fishing trawling taking place there.

Cool Temperate (Benguela) West Coast

The following were highlighted as key gaps in marine biodiversity knowledge in this biogeographic region:

- This was identified as the most-studied and hence best known of all African marine biogeographic regions
- There has been little benthic sampling in offshore regions and these areas can be considered knowledge gaps
- Deep water areas (>30m) of hard substratum are also not well known
- The slope biota, now supporting an important fishery, is poorly known.

Warm Temperate and Sub tropical West Coast

The following were highlighted as key gaps in marine biodiversity knowledge in this biogeographic region:

- This was identified as a transition zone where the regional hydrodynamics and biogeographical boundaries are poorly understood, so is in itself a knowledge gap
- Estuaries in Angola were identified as being key areas where little is known, together with inshore and even inter-tidal areas
- All taxa in the region poorly known though some work has been done. The information is, however, dispersed and has not been collated

- Mangroves were identified as being key gaps in biodiversity knowledge.

Tropical West Coast

The following were highlighted as key gaps in marine biodiversity knowledge in this biogeographic region:

- Estuaries and deltas
- Lagoons (some information exists for open lagoons, none for closed lagoons)
- Mangroves and seagrasses
- Taxonomic information is poor for deep offshore and pelagic regions and is particularly poor for benthos in all areas. Deep-sea fish and offshore fish are also poorly studied
- A census project has done some sampling in shelf areas off Angola so some data do exist for this region.

General gaps in knowledge across the whole continent:

- Deep-sea benthos (beyond 30m in all areas except in areas where the Coelacanth Project has collected data extending to 140m depth).
- Knowledge of benthic meiofauna is poor in the majority of regions
- Bryozoans were identified as a very poorly studied group across the whole of Africa
- It was identified that reference collections in Africa were often missing with collections/type specimens being overseas and not readily available
- Some knowledge gaps are due to human resource gaps. Knowledge sharing is vitally important in reducing these
- Coralline algae were also determined to be a group about which little is known.

General comments

Transition zones should be prioritized as a whole. These are key areas of limited species and are also zones which are likely to move over a period of years.

Further, more detailed gap analysis for each region is required.

Data collation of all previous studies is required since data often exists but is not readily available to be used together to give the ‘whole picture’ for a region.

Priorities and opportunities

Threats exist where there are high populations or extraction procedures taking place. In order to be able to prioritize threats in a meaningful way a full knowledge of all threats along the coast needs to be compiled into a ‘coastal sensitivity atlas of Africa’ ie a synthesis of all existing information into one all-encompassing document. This would detail all threats (as defined below) in association with habitat analysis for those areas. A destructive process occurring in a biodiversity ‘hotspot’ would then become a high priority.

Threats can be classified as:

- Population density and migration to the coast
- Extraction industries
- Pollution
- Development resulting in habitat modification
- Dam construction and modification of freshwater flow regimes
- Invasive alien species
- Climate change – increased frequency and/or intensity of extreme events

- Lack of political will, and shortcomings in enforcement ability
- Poverty (lack of alternatives)
- Trading in marine species, including aquarium fish, shells, hard corals, seahorses (CITES list), Muti trade, etc.

Some recommendations for filling the gaps

1. Identify experts who can work on the knowledge gaps and/or taxonomic groups which are poorly known and pool knowledge between regions
2. Encourage overseas experts to become involved in collaborative research and training, and in particular to train African scientists so that knowledge remains on the continent and does not leave with the visiting scientist
3. Individual reference collections are important for data quality in biodiversity studies and on-the-ground training (rather than relying on overseas museum collections which are not readily available)
4. Funding for museums to enable proper curation of collections. Possible institution twinning with overseas experts and institutions should be investigated. Countries can aid each other through biodiversity legislation to implement capacity building
5. Training core staff in both taxonomy and curation
6. Most countries have signed biodiversity legislation but implementing it requires funding which is a problem in Africa
7. A full and complete census of current Marine Protected Areas is required (allowing these to become reference areas)
8. A coastal sensitivity atlas reflecting both the biodiversity and existing threats is essential. The data already exist for the most part, but must be collated to be of use in identifying biodiversity 'hotspots'.
9. Web-based identification guides can be established as a way of sharing taxonomic knowledge. Identification resources need to be available to all. The knowledge often exists but not in a form widely available and in a regional format. Proper taxonomic information is vital for biodiversity studies.
10. Icon species e.g. dugongs, turtles, mammals, birds, sharks can be highlighted when canvassing for public support for biodiversity projects.

WORKING SESSION C

DEVELOPING APPROPRIATE CAPACITY FOR FURTHERING KNOWLEDGE OF AFRICA'S MARINE BIODIVERSITY

Chair: Dr Kim Prochazka (IOI-SA)

Rapporteur: Ms Jocelyn Collins (IOI-SA)

Guidelines

The guidelines provided for this working session were as follows. The workshop should have identified the following:

- What human, institutional and infrastructural capacity exists in sub-Saharan Africa for furthering the state of knowledge of marine biodiversity
- Where such capacity is lacking in geographical, taxonomic and genetic contexts

With this base, we are now ready to:

- Identify key gaps in capacity for furthering knowledge of marine biodiversity in Africa
- Identify whether these gaps are in the context of geography, taxonomy, genetics or a particular aspect of capacity (human, institutional or infrastructural)
- Identify what human, institutional and infrastructural capacity is needed to efficiently address shortcomings in marine biodiversity knowledge in sub-Saharan Africa
- Discuss how this might be achieved

Key capacity limitations

The following were identified as key shortcomings in existing capacity for marine biodiversity research on the African continent:

- Insufficient biodiversity researchers
- Very little capacity for research on genetic aspects of biodiversity
- Shortage of museums
- Existing museum capacity highly underdeveloped in terms of human capacity (scientists, curators and collections managers), infrastructure (facilities and equipment) and financial resources
- Inadequate facilities and equipment (e.g. Ships, sampling equipment, genetic labs etc.)
- Institutions suffer from resource problems (people, facilities, equipment, financial resources). This is linked to issues surrounding political will and priorities within government and institutions, as well as poorly defined institutional objectives
- There is a need to develop capacity for project development
- It was identified that capacity varies geographically. In relative terms the south-west has adequate capacity, some capacity exists in the east, and very little in the west, the south east (Mozambique) and the Indian Ocean islands.
- From a taxonomic perspective, capacity biases are based on the size of organisms (larger species are better known than smaller species), their accessibility, commercial importance, depth, attractiveness and availability of literature resources.

Human capacity for biodiversity research

There was a strongly identified need for additional biodiversity researchers and museum staff in Africa.

The following points were identified as policy-level considerations:

- Human capacity development efforts should be in line with identified taxonomic and geographic priorities
- Capacity development should maximize the use of existing expertise by utilize a blend of African and outside expertise
- Capacity development should take place physically on the African continent
- Development of human capacity requires back-up from other fields of biology
- A wider perspective of biodiversity should be promoted (e.g. ecosystem effects, effects of climate change, etc.)

Some practical considerations include:

- Encouragement of students through a coordinated, marketed project
- More information is required regarding what is available in terms of training of museum staff
- Develop a field course. Such a course would bring in experts from both Africa and abroad in order to train young biodiversity researchers. The field course could be mobile, focussing on the priorities of the country in which it is being run. This will have the double benefit of not only providing biodiversity training but also of utilizing the collective experience of the participating experts to contribute towards biodiversity knowledge in that country
- The development of Centres of Excellence should be encouraged. The rationale behind this is to avoid unnecessary duplication of effort and to establish centres that maintain a “critical mass” of researchers with a common interest. Such Centres of Excellence could be developed around taxonomic, ecosystem or geographical themes.

It is important to note that unattractive salaries are a stumbling block to any capacity building efforts. This presents a significant challenge to the development of marine biodiversity capacity.

Institutional capacity for biodiversity research

The following recommendations emerged surrounding further development of institutional capacity for biodiversity research:

- Each country should develop a national collection/museum irrespective of current research capacity. The rationale for this is to at least be able to build up biological collections irrespective of current taxonomic capacity. Once taxonomic capacity becomes available, the country will then be in a favourable position.
- It is important to develop an institutional network based around marine biodiversity. Such a network would include Universities, museums, research institutions, etc.

Infrastructural capacity for biodiversity research

The following points were highlighted in the discussions:

- Existing opportunities should be utilized (e.g. fishing vessels etc.)
- Links should be established with other programmes, projects and industries in the region
- Infrastructural capacity development should dovetail with human capacity development
- An audit of existing infrastructure should be performed. Such an audit would compile an inventory of existing infrastructure and further identify opportunities for sharing infrastructure, for upgrading infrastructure and ensuring its adequacy
- There is a strong need to develop and improve museum infrastructure
- There is a strong need to develop and improve genetic laboratory facilities
- It is critical to ensure that IT infrastructure is in line with current trends

Genetic diversity

The concept of a regional centre for genetic diversity research was discussed. The following points regarding such a centre were proposed:

- The centre need not be a traditional centre, but can be a virtual centre of linked organizations/institutions
- The centre would provide a focus for training activities
- Ongoing support to genetic diversity researchers could be provided through such a facility
- Such a centre would provide a focus for developing ‘critical mass’ of marine genetic diversity researchers
- A centre for genetic diversity would facilitate the sharing of resources within and between countries
- Such a centre would require external funding and a funding committee would be required
- The centre would need to create links with other initiatives, such as the Convention on Biological Diversity, etc.

The Way Forward
Chair: Dr Kim Prochazka
Rapporteur: Dr Ceri Lewis

Workshop oversights

Workshop participants were asked whether they felt that anything of importance had become lost due to the way the workshop was organized. A few salient points arose:

- The area of genetic diversity was largely unexplored during the workshop
- There is a need for greater understanding of the ecological processes which support biodiversity
- Biomass/abundance indicators are also important factors to consider when dealing with biodiversity
- The Antarctic and sub-Antarctic were not dealt with in the workshop

Towards an african marine biodiversity programme

The workshop and discussion sessions identified a number of needs for improving the state of marine biodiversity knowledge on the African continent, and a number of actions aimed at filling these needs. The workshop participants then engaged in a discussion aimed at developing a means to take this process further, and to ensure that the identified actions are implemented.

Workshop participants agreed that it was desirable that the process started during this workshop should be continued. It was further agreed to form a regional coordinating body that would work towards achieving the desired goals established in the three working sessions.

Such a body would give marine biodiversity researchers a collective voice, and could thus be used as a strategic entity. This body would seek the political support necessary to ensure the continuation of the ongoing programme. The programme would not have to wait on this political support before moving forward.

One of the most pressing tasks that this body would be charged with is to further investigate the feasibility of establishing an OBIS node for Africa, and to take advantage of funding that is currently available for this. Such a node should be developed as a portal through which access to national and other databases can be accessed.

With these considerations in mind, it was agreed to establish a Steering Committee to take the process of developing a marine biodiversity programme for Africa forward. It was decided that the Steering Committee should, at least initially, be made of up of a minimum of five individuals representing each of five major geographical regions (east, west, southwest, south, and Indian Ocean islands) and one person with experience in databases. These individuals would represent their region and network with people in their region. A process of nomination resulted in the following six people being offered positions on the Steering Committee. All have accepted, with the exception of the representative from Angola, who is awaiting official clearance.

Region	Individual	Country
Indian Ocean Islands	Mr Jude Bijoux	Seychelles
East Africa	Prof. Yunus Mgya	Tanzania
Southern Africa	Prof. Charles Griffiths	South Africa
West Africa	Mr AK Armah	Ghana

Southwest Africa
Databases

(Ms Maria Sardinha)
Mr Edward van den Berghe

Angola
(MASDEA, ODINAfrica)

At the closure, the meeting was urged to draft a resolution, listing countries that attended the meeting, and to seek support for this resolution through e-mail.

RESOLUTION ESTABLISHING AN AFRICAN MARINE BIODIVERSITY PROGRAMME

We, the participants of the African Marine Biodiversity Workshop:

- realizing Africa's important role as a steward of a rich and largely endemic marine biota,
- recognizing the potential of this marine biodiversity to contribute to the sustainable development of the African continent and the upliftment of its people,
- acknowledging that the marine biodiversity of Africa is relatively poorly known, and
- cognizant of the fact that numerous human activities present serious threats to marine biodiversity in the waters surrounding the African continent,

hereby support the development of an African Marine Biodiversity Programme, the objectives of which are to:

- develop a research programme aimed at addressing key gaps in our knowledge of marine biodiversity in Africa through the identification and implementation of research projects
- establish national and/or regional online databases, accessible via a common portal, for the exchange and sharing of marine biodiversity information across the continent
- establish a communications and information-sharing network to link those with an interest in marine biodiversity on the African continent
- establish a programme to develop human, institutional and infrastructural capacity in Africa in support of these aims.

We further support the establishment of an interim Steering Committee of the following representatives to take the development of the African Marine Biodiversity Programme forward:

Region	Individual	Country of residence
Indian Ocean Islands	Mr Jude Bijoux	Seychelles
East Africa	Prof. Yunus Mgaya	Tanzania
Southern Africa	Prof. Charles Griffiths	South Africa
West Africa	Mr AK Armah	Ghana
Southwest Africa	Ms Maria Sardinha	Angola
Databases	Mr Edward van den Berghe	(MASDEA, ODINAfrica)

Appendix

African marine biodiversity: the known and the unknown
Cape Town 23-26 September 2003

Programme

Tuesday 23 September 2003

18:00-20:00	Registration and Reception (incl. Tour of Aquarium)	Venue: Two Oceans Aquarium
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Wednesday 24 September 2003

08:50-09:00	Welcome	Prof. Charles Griffiths
Chairperson: Prof. Charles Griffiths		
09:00-09:30	Background to the Census of Marine Life (CoML)	Dr Cynthia Decker
09:30-10:00	National report: <u>Liberia & Cote d'Ivoire</u>	Dr Yacoube Sankare
10:00-10:30	National report: <u>Ghana, Togo & Benin</u>	Mr A.K. Armah
Tea break		
Chairperson: Dr. Anthony Ribbink		
11:00-11:30	National report: <u>Nigeria</u>	Mrs. C.E. Isebor
11:30-12:00	National report: <u>Cameroon, Sao Tome & Principe</u>	Mr Charles Gabche
12:00-12:30	National report: <u>Gabon</u>	Miss Carole Ogandagas
12:30-13:00	National report: <u>Angola</u>	Mr. Nkosi Luyeye
Lunch break		
Chairperson: Dr. Alan Whitfield		
14:00-14:30	National report: <u>Namibia,</u>	Ms Lizette Voges
14:30-15:00	National report: <u>South Africa</u>	Prof. Charles Griffiths
15:00-15:30	National report: <u>Mozambique</u>	Dr Antonio Hogueane
Tea break		
16:00-16:30	National report: <u>Tanzania</u>	Prof. Yunus Mgaya
16:30-17:00	National report: <u>Kenya</u>	Ms Ester Fondo

Thursday 25 September 2003

Chairperson: Dr. Cynthia Decker		
09:00-09:30	National report: <u>Mauritius & Reunion</u>	Dr. Mitrasen Bhikajee
09:30-10:00	National report: <u>Seychelles</u>	Mr. Jude Bijoux
Tea break		
Chairperson: Dr. Larry Hutchings		
10:30-11:00	Thematic report: Macroalgae	Prof. John Bolton
11:00-11:20	Thematic report: Biogeography of estuarine fishes in Africa	Dr. Alan Whitfield
11:20-11:40	Thematic report: Western Indian Ocean Project on marine biodiversity	Dr. Anthony Ribbink
11:40-12:10	Thematic report: Coastal and seabirds	Prof. Phil Hockey
Lunch break		
Chairperson: Dr. Jean Harris		
13:10-13:30	Related initiatives: Census of Marine Life (CoML) Indian Ocean	Dr. Mohideen Wafar

13:30-13:50	Related initiatives: Ocean Biogeographic Information Systems (OBIS)	Dr. Dennis Gordon
13:50-14:05	Related initiatives: Global Invasive Species Programme (GISP)	Dr. Lynn Jackson
14:05-14:15	Related initiatives: International Ocean Institute (IOI)	Dr. Kim Prochazka
14:15-14:30	Related initiatives: World Wide Fund For Nature in South Africa (WWF-SA)	Dr. Deon Nel
14:30-15:00	Related initiatives: Marine Species Database for Eastern Africa (MASDEA) and Ocean Data and Information Network for Africa (ODINAfrica)	Dr. Edward Vanden Berghe
Tea break		
15:30-15:50	Related initiatives: How to achieve a national biodiversity review and inventory	Dr. Dennis Gordon
15:50-16:10	Related initiatives: SeaweedAfrica Database	Mr. Martin Cocks
16:10-16:30	Related initiatives: Seawaste Network	Mr. Neil Griffin
16:30-17:00	Related initiatives: Benguela Current Large Marine Ecosystem Programme (BCLME)	Ms Maria Sardinha

Friday 26 September 2003

08:30-09:00	Summary of Days 1&2 – Dr. Alan Whitfield		
09:00-10:30	Working session A Chair: Dr. Dennis Gordon Rapporteur: Mr. Faghrie Mitchell Exploration of mechanisms for information dissemination and communication	Working session B Chair: Prof. Charles Griffiths Rapporteur: Ms Ceri Lewis Identifying and addressing key gaps in marine biodiversity knowledge in Africa	Working session C Chair: Dr Kim Prochazka Rapporteur: Ms Jocelyn Collins Developing appropriate capacity for furthering knowledge of Africa's marine biodiversity
Tea break			
Chairperson: Dr. Kim Prochazka			
11:00-12:30	Working session A continued...	Working session B continued...	Working session C continued...
12:30-13:00	Preparation of Working session report	Preparation of Working session report	Preparation of Working session report
Lunch break			
14:00-14:30	Report-back: Working session A – Session Chair & Rapporteur		
14:30-15:00	Report-back: Working session B – Session Chair & Rapporteur		
15:00-15:30	Report-back: Working session C – Session Chair & Rapporteur		
Tea break			
16:00-16:40	The way forward		
16:40-17:00	Adoption of meeting report and resolutions		
17:00	Meeting closure		

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