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TRANSFRONTIER CONSERVATION...

The Transfrontier Marine Protected Areas Project (TRANSMAP) is an ambitious regional research project aimed at generating a cutting edge scientific basis for wise transboundary management of marine conservation areas. In identifying a site with potential to become a marine protected area (MPA), various biological, physical and anthropocentric needs must be accommodated if it is to achieve its purpose. Although the Project has wide application, its activities are currently focussed on Tanzania, Mozambique and South Africa. Funded by the EU, it is implemented by scientists from twelve research institutions in seven countries. Transmap is divided into ten Work Packages (WPs), and recently ORI hosted a series of events relating to several of these WPs. Fascinating early results emerged.

...AS SEEN FROM OUTERSPACE

Mapping of coastal habitats that influence the marine environment is a Transmap priority and focus of WP2. In particular, such mapping can provide the template for collation of relevant existing and accumulated data in the case study areas of Tanzania, Mozambique and South Africa. Since it would be practically impossible to physically travel through the entire area mapping each habitat accurately, satellite imagery was used for this purpose. The premise is that each habitat gives off a unique spectral radiance that, with the help of specialised computer software, can be isolated and used to map individual habitats. Excellent maps are currently being generated and populated with data.

At an earlier Lisbon workshop it was agreed to use IDRISI Kilimanjaro software to produce such habitat maps. Project participants received hands-on training from Francisco Andrade (University of Lisbon) so as to have the necessary skills to undertake basic habitat differentiation. This comprised different techniques of processing satellite images, the various uses of the individual satellite bands, development of the unique signature files that characterise the individual habitats and the application of the signature files in classifying the total study area. While it is possible to differentiate the unique habitats that occur within an area from the satellite imagery, it is only made meaningful by incorporating local knowledge of the land cover types associated with each signature file.

To strengthen this aspect a field trip was undertaken to the Sodwana and Lake Sibaya area. This involved two methods of operation: firstly, by describing the land cover types encountered in the predetermined localities that had been highlighted during the computer assessment and, secondly, by recording GPS fixes within areas of different land cover types and associating these back to the signature files.

The event was attended by staff from the Centre for Sustainable Development of Coastal Zones (Mozambique), the National Environment Management Council (Tanzania), Ezemvelo KwaZulu-Natal Wildlife and ORI.

...AS DEFINED BY LEGAL INSTRUMENTS

Governance, or the lack of it, is pivotal to MPA management. In the case of transfrontier situations this presents special challenges as it requires compatibility between different countries' policy and legal frameworks, management processes and national objectives. These issues form the basis of WP8 & 9, which deal with legislation, policy and management relative to the three case study areas. The team dealing with this aspect, comprising lawyers, government officials and marine scientists from Mozambique, Tanzania, Portugal, Canada, Sweden and South Africa, assembled at ORI to review the considerable progress made.

An impressive document had been compiled as a preliminary assessment of multiple levels of governance which include global, regional (bilateral and multilateral) and domestic (national and provincial) authorities. This incorporated constitutional frameworks, legislation, formal policy statements as well as management plans related to conservation and marine protected areas in the case study areas. The assessment included an appraisal of those governmental bodies with mandates that include, or impact upon conservation and multiple-use of marine faunal and floral species and the marine environment. Moreover, each country has its own economic development plan, which further refines the focus of government resources and it is important that the project is compatible with those plans.

Internationally, the plethora of treaty and non-treaty instruments pertinent to marine species and ecosystem conservation was extensively documented. However, it was noted that many instruments were either not acceded to or poorly implemented at the regional level.

The ultimate goal of this governance assessment is to identify strengths, possible opportunities, weaknesses and potential threats of the existing regimes to the proposed network of marine protected areas. The relevance of this information extends beyond the immediate study areas and is expected to make a significant contribution to governance-related policy-making and management structures throughout the region. Hopefully this will contribute to achieving better integrated conservation and sustainable development of the marine environment in the Western Indian Ocean.

MONITORING BOAT LAUNCH SITES IN KZN

KwaZulu-Natal is a maritime province where the coast and its resources are an important asset to its Growth and Development Strategy. Accordingly, boat launch sites are a key feature of the KwaZulu-Natal coastline in providing access to coastal waters and marine resources for a variety of boat-based user groups. There are significant socio-economic benefits associated with marine boating activities, but these are invariably linked to some form of environmental cost. Wise coastal zone management should seek to improve the former and minimise or prevent the latter.

All of KZN's 30 launch sites outside harbour areas require formal licensing to ensure high environmental and safety standards. In support of good launch site management, a Boat Launch Site Monitoring System was introduced in 2004 which gathers information through a system of voluntary registers. This assists in the re-licensing of launch sites and improves the knowledge-base on activities in the coastal zone. The project depends on co-operation of the user groups and is implemented by the KZN Coastal Management Unit and Ezemvelo KZN Wildlife. ORI provides scientific and data processing support.

Although the project is new, some interesting early results have emerged. A total of 18 907 launch records were received for 2004 indicating that skiboats (63%) and inflatables (31%) were the most popular boat types, followed by jetskis (4%) and fishing skis (2%). Recreational fishing was the most important boat-based activity (48% of launches), followed by charter scuba diving (21%) and charter fishing (11%). Preliminary comparison of the 2004 data with earlier trends recorded by ORI in 1995 indicates that charter activities – especially fishing – have increased considerably over the past decade. As expected, weekends had the highest launching effort, accounting for 40% of recorded launches.

Launch site usage varied from site to site with most not reaching their statutory maximum daily launch limits. More than half the sites recorded no launches at all on more than 50% of days and only seven sites were used on more than 70% of days. The catch return section of the register recorded 120 species, totalling 60 000 fish. Seabreams (slinger, santer, etc.), kobs and geelbek and rockcods collectively made up 55% of the recorded catch. The registers include an outing-destination grid map, thereby presenting a unique opportunity to obtain information on the offshore spatial distribution of boating activities and fish catches. The Boat Launch Site Monitoring System is regarded as an excellent example of multi-stakeholder resource-use monitoring, and is setting an example for similar efforts in other coastal provinces.

Wish to find out more? Contact Pierre Pradervand (pierre@ori.org.za) or Tandi Breetzke (tandi.breetzke@dae.kzntl.gov.za).

Satisfied clients after another successful charter fishing outing from Shelley Beach.

REDUCING WASTED BYCATCH

The wasteful bycatch in many industrial fisheries around the world continues to be a hot topic. Prawn trawling in particular receives attention because it is notably wasteful compared to most. Although South Africa's prawn trawling sector is very small compared to other prawn trawling operations in the Western Indian Ocean, in some ways it is more advanced in terms of measures to reduce bycatch. Much of this can be attributed to ORI's Sean Fennessy, who has been addressing the prawn-trawler bycatch problem for several years.

At the regional level, progress in bycatch problems were recently reviewed by a specialist FAO/South West Indian Ocean Fisheries Commission workshop in Maputo. Here, representatives of countries from the region provided updates on national policies and regulations dealing with bycatch, and research initiatives to reduce bycatch or alternatives to optimise the use of bycatch. This was followed by a further workshop organised by ORI and KMFRI in Mombasa in which all countries on Africa's eastern seaboard were represented. Even Somalia, as well as several of the island states, notably Madagascar, where bycatch is also an important research focus, participated enthusiastically. In addition, there were also practical demonstrations, in which participants went to sea for the day on Maputo Bay trawlers in order to examine the abilities of square-mesh escape panels and a 90°-turned cod-end to release unwanted fishes. The workshop was a great success and a good introduction to the planned Ecosystem Approach to Fisheries workshop, which will be reported on in the next Oricle.

Workshop participants examine a square-mesh escape panel which is being inserted into a Maputo Bay prawn trawler net.

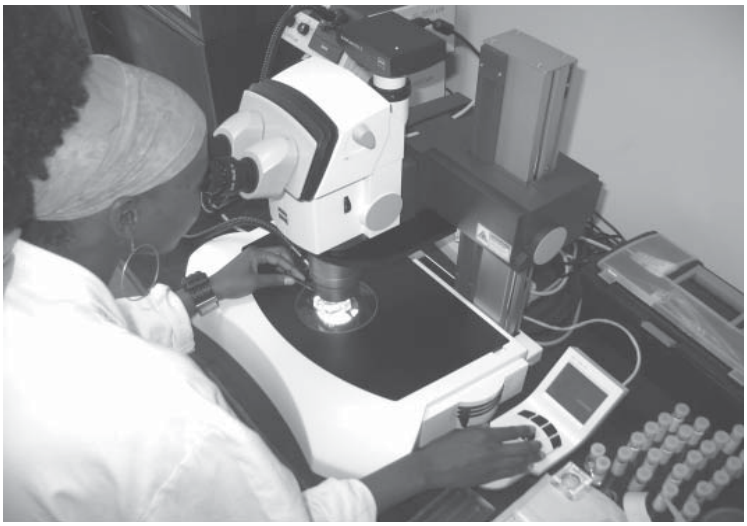
NEW RESEARCH EQUIPMENT FOR ORI

A move to new premises, the addition of several new scientific and support staff and the expansion into wider research portfolios precipitated strategic thinking to enhance the fixed asset profile of the organisation. After much deliberation, comparison and a good deal of time investigating new and available technology, the decision was made to purchase several key items of equipment. October was a bumper month for ORI when all of the new "playthings" arrived.

Two of these have extended and cross cutting applications in that most of the Institute's research programmes can make some use of these assets. The pride and joy is a fully motorised stereo binocular microscope with image capture and analysis components. The capabilities of the new Zeiss SteREO Discovery V12 with increased depth of field, excellent color reproduction, high-contrast images and significantly greater image information is technologically innovative in microscopy. This hi-tech marvel supports new patented optics with improved resolution and contrast combined into 20% more image information than any other comparable system to produce 3D images. The fully automated zoom and focus operations are combined with all the essential functions, and more, of a stereomicroscope in a single innovative operating unit SyCoP (Systems Control Panel) that combines switch, buttons, joystick and a touch screen. The entire system is modular, with the possibility of adding various components in time and as new research projects require.

To improve the *in situ* information captured during field surveys of coastal and marine environments, the need for a multi-parameter instrument was recognised. Such equipment should be flexible for most unattended monitoring, water quality sampling, profiling and logging applications. The environmental water monitoring solutions offered by YSI® seemed the logical choice. With a logging unit rated at 656 feet, the YSI 6600 can monitor up to 15 parameters simultaneously, including oxygen with the YSI Rapid PulseTM stirring-independent sensor and a turbidity sensor that has a self-cleaning feature. This system has the capability of logging all parameters at programmable intervals, storing 150,000 readings, at 15-minute intervals for up to 30 days. All information is fully downloadable via dedicated software that automatically graphs and databases vast amounts of information.

The two research boats (ORV-III & ORV-IV) purchased this year were much needed replacements for ORI's "fleet". ORV-IV is a 3.9m semi-rigid that replaces the old and dilapidated inflatable with its wooden floorboards and many slow punctures. This boat will be for specific use in estuaries or similar shallow and protected areas. The second boat, ORV-III, is a 6m semi-rigid and replaces the smaller 5.5m semi-rigid that has served ORI so well for the past five years. Space for scientific equipment is a fundamental problem and although the difference in length (just half a metre) seems of little significance to most, the carrying capacity of the new boat is far greater.



Mbali Mkhize gets to grips with ORI's new Zeiss SteREO Discovery V12 microscope.

ORI CONTRIBUTES TO FIRST INTERNATIONAL MARINE PROTECTED AREAS CONFERENCE

ORI has a long and credible record of involvement with marine protected area research and development, dating back to the creation of many South African MPAs, including the St Lucia Marine Reserve. This fact provided the basis for ORI's Bruce Mann to participate in the important International Marine Protected Areas Conference (IMPAC1) held recently in Geelong, Australia.

More than 800 participants from 80 countries shared their MPA experiences. Highlights included the perceptive conference address by Achim Steiner (Director General of IUCN), Sylvia Earle's passionate and challenging keynote presentation and the awarding of the WWF "Gift to the Earth" (WWF's highest accolade) to the Australian Government for the design and implementation of the Great Barrier Reef Marine Park zoning plan (33% of the park is now protected by "no-take" zones).

One of the most encouraging outcomes of IMPAC1 was the unanimous view from both the fisheries representatives and marine protected area specialists of the mutual necessity to work collaboratively. The value of the 'historic' knowledge held by local communities was recognised along with the importance of early community inclusion and co-management options. There was general acceptance of the need to go with the best scientific information available (whilst still seeking to improve knowledge = "moving whilst improving") rather than wait for 'perfection' and that it was essential to build in flexibility to cater for unforeseen changes. Progress towards High Seas MPAs was welcomed.

Each of the Theme and Issue Co-ordinators presented their respective findings on the last day of the conference. These individual outputs are available on the web (www.impacongress.org) for immediate reference purposes and will be subsequently incorporated into the Proceedings.

RESEARCH SNIPPETS

THE ANNUAL SAAMBR BULLETIN

ORI staff assisted in putting together a combined issue of the annual SAAMBR Bulletin for 2003 and 2004. This was a significant task as the period under review included the move from the old Sea World premises to SAAMBR's new home at uShaka Marine World. The issue also reflects on SAAMBR's history, as well as the Association's more recent activities. Copies of the Bulletin are available from the ORI library.

DISAPPOINTMENT WITH SUPPORT FOR 2006 RESEARCH PROJECTS

Each year ORI staff invests considerable time and capacity in developing a research programme on behalf of Ezemvelo KwaZulu-Natal Wildlife in its mandate to manage marine biodiversity and resource-use in this province. Project proposals are then submitted to Marine and Coastal Management as the national agency responsible for funding such work. It is disappointing that this support appears to be dwindling and that no new ORI projects are being supported in 2006, despite the many issues and the need for an improved scientific basis to resource management in KZN. ORI is concerned at the long-term impact on the KZN marine environment and will pursue the matter with the authorities concerned.

STUDENTS' CORNER

ORI continues to provide opportunities for post-graduate students and 2005 has seen several ORI-supervised students completing their degrees. Coral genetics were investigated by MSc graduate, Angus Macdonald, under the supervision of Mike Schleyer, and the estuarine fisheries of Richards Bay were described in an MSc by Bernadine Everett, supervised by Rudy van der Elst and Sean Fennessy. The offshore linefisheries of Richards Bay were studied by Sureka Jairam as part of her MSc, also supervised by Rudy and Sean.

Deep water and shallow water trawler bycatch were the respective topics investigated by MSc students Risha Persad and Mbali Mkhize, under the supervision of Rudy and Sean. The benthic biodiversity and management of Aliwal Shoal are being investigated by Jennifer Brash for her MSc under Mike Schleyer and Louis Celliers, and she will finish in early 2006. Operational Management Plans for harvested invertebrates in KZN are being prepared by Paul de Bruyn as part of his PhD, also supervised by Mike.

New student projects include a PhD thesis on molecular genetics and coral reef connectivity in the Western Indian Ocean by Angus Macdonald, supervised by Mike; the effectiveness of closed areas for sustainable fisheries in the Mozambique Quirimbas archipelago - this being an MSc by Alice Costa, supervised by Mike and Bruce Mann; and an MSc using a molecular approach to determine coral resilience to climate change, also supervised by Mike.

ORI COLLABORATES IN MADAGASCAR

One of the mandates of the Food and Agricultural Organisation (FAO) of the United Nations is to assist in the fostering of international co-operation in fisheries management and research, and to this end they assisted two delegates from South Africa and Kenya to attend a workshop on prawn fisheries management in Madagascar. Sean Fennessy from ORI attended, and was impressed with the collaborative and professional nature of the management of this resource there. He made valuable contacts for his bycatch reduction research, and established useful linkages for the South West Indian Ocean Fisheries Project.

AWARD FOR LONG SERVICE

Awards for long service were conferred on a number of SAAMBR staff at our recent AGM. Amongst those recognised was ORI's Elinor Bullen, who joined the Institute twenty years ago. Elinor is an enthusiastic and valuable co-ordinator of the Linefish Tagging Project, one of ORI's longest-running monitoring projects. She is also well-known in angling circles and still holds a world angling record for the capture of a giant kingfish.

RECENT PUBLICATIONS

BRASH, J.M. & FENNESSY, S.T. 2005. A preliminary investigation of age and growth of Otolithes ruber from KwaZulu-Natal, South Africa. *Western Indian Ocean Journal of Marine Science 4 (1): 21-28*.

GLASSOM, D., CHADWICK FURMAN, N.E. & ZAKAI, D. 2005. Methods and interpretation of coral recruitment studies: effects of anthropogenic disturbance? *Marine Pollution Bulletin 50 (9): 1019-1023.*

KRUGER, A. & SCHLEYER, M.H. 2005. Marine invertebrate catches recorded during the Ezemvelo KwaZulu-Natal Wildlife estuarine and marine patrols: 1995-2004. Oceanographic Research Institute, Durban: 112p. *(ORI Data Report 2005/5).*

PRADERVAND, P. 2005. National Marine Linefish System. A contribution to the 2005 KwaZulu-Natal State of the Environment Report: medium-term trends in the KwaZulu-Natal linefishery. Oceanographic Research Institute, Durban: 7p. *(ORI Data Report 2005/4)*.

PRADERVAND, P., MANN, B.Q., CELLIERS, L. & KHUMALO, M. 2005. Boat Launch Site Monitoring System: 2004 annual report. Oceanographic Research Institute, Durban, 62p. *(ORI Data Report 2005/7)*.

PRADERVAND, P. 2005. National Marine Linefish System: the Cape Vidal spearfishery 2000-2004. Oceanographic Research Institute, Durban: 5p. *(ORI Data Report 2005/8)*.