

REVIEW OF THE SOUTH AFRICAN INSTITUTE FOR AQUATIC BIODIVERSITY (SAIAB)

6 - 13 September 2004

Report

Review Panel

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Review of the South African Institute for Aquatic Biodiversity (SAIAB)

Executive summary

The following review of the South African Institute of Aquatic Biodiversity (SAIAB) covers the period 1999 – 2004. Its purpose is to provide the NRF with a retrospective view on the performance of SAIAB, measured against the objectives stated in the institution's strategic plan (2000) and in all subsequent business plans. It also provides an assessment of the outcome and impact of the activities of SAIAB, and makes some recommendations regarding the strategic direction and operational execution of the SAIAB mandate. The review was conducted from 6 to 13 September 2004 by an international panel composed of Drs Christian Lévêque, Institut de Recherches pour le Développement (IRD), France (Convenor); Mark Gibbons, University of the Western Cape (UWC), South Africa; Richard Vari, Smithsonian Institution, USA. The review itself is based upon extensive documentation, as well as on interviews with all SAIAB staff and an extensive series of stakeholders (i.e. exceeding fifty) from about 30 institutions representing different arenas of research, resource management, public outreach, etc from all parts of South Africa.

The review panel's opinion is that SAIAB has been very successful in a number of areas. Strong management has brought SAIAB through the transition from a Declared Cultural Institution (DCI) to a National Facility (NF) without major disruptions to core operations, and it has successfully begun to address issues of race and gender equity. There has been an increase in the research component of SAIAB, and a broadening of scope to include the development of expertise in fish genetics. SAIAB is involved in a large number of national research projects, and is acting, through its Programmes Division as a respected leader for a number of regional science initiatives. The level of research productivity of most scientific staff is high, and several major products have been, or are in the final stages of being, published. There has been a steady increase in the size and geographic scope of the fish collection, which is recognised as an asset of international stature, and is being used by the global ichthyological community. There has been substantial progress towards the databasing of the fish collection, and there are concrete plans to ensure that this product will be remotely accessible. The library (its holdings and services) has been improved and it provides a valuable pan-African resource. The profile of SAIAB within the broader South and southern African community has been increased through the development of a very effective Communications and Environmental Education unit, which is providing a diverse range of much appreciated services and resources.

Despite the obvious successes of SAIAB over the last five years, we have a number of recommendations. These are summarised in the pages that immediately follow this and are contextualised elsewhere in the document.

The last five years should be seen, for SAIAB, as the transition period from a DCI to a NF. It needs to be recognised, however, that having made this transition, SAIAB must now consolidate its efforts and plans so that it can fulfil its mandate to the broader (national, regional and international) scientific community.

SAIAB specifically needs to interact more with the community in order to ensure that it can supply the services that are needed from it, and we recommend that an advisory board be appointed to facilitate this process. This is particularly important given that there is a perception within the community that the current activities of SAIAB do not reflect the institution's name and mandate. We urge SAIAB to discuss the issue of their name and the role that they can play within the sector, but recommend that they play to their strengths and continue to be, at the highest level, an incubator for research into taxonomy and systematics.

We recommend that SAIAB consolidates, and that the NRF expands, SAIAB's base in freshwater biodiversity as this field represents a significant, unique service-area and it is also one in which little fundamental work seems to be undertaken. To that end, it is recommended that SAIAB enter into strategic alliances with national and/or provincial bodies involved in freshwater resource management. We also urge SAIAB to consider building more of its activities around the provision of a database (structured in consultation with the community), which will not only allow SAIAB to readily provide a service to the community but it will also provide a powerful tool for research into issues of aquatic biodiversity. In order to achieve the research focus, it is recommended that the NRF treats SAIAB like its other NFs, and that it provides SAIAB with dedicated research funds, over and above those that are won by its staff through competition with the wider national community.

While SAIAB is generating good numbers of scientific publications, this is not balanced across all sectors of the organisation. SAIAB management and staff need to address this issue and to ensure that their research products find their way into the international press. SAIAB also needs to balance its research and service activities across all sectors, and to evaluate the role of the programme division in the generation of funds that can be used elsewhere in the organisation.

The continued growth of the fish collection is commendable, but SAIAB now needs to develop a long-term plan identifying the primary areas of coverage and methods for evaluating the appropriateness of new accessions. In the interest of efficiency we recommend that the new collection facility be designed with consideration of necessary capacity for collections management needs for both the short and long term.

SAIAB has made a proportionally large contribution to the training of new scientists in the field of ichthyology. Although many of these have been black and/or female, much of their training is done through Historically White Institutions (HWIs) and thought needs to be given as to how these training programmes could be rolled out to draw in other institutions. This has implications for the provision of new recruits to SAIAB, which currently sits with a succession problem in the area of institutional and programme management, and research into taxonomy and systematics. SAIAB should consider the issue of headhunting appropriate (especially black) candidates for these positions, but needs to carefully consider the tensions between excellence and equity. We recommend that the NRF provide SAIAB with a percentage of its bursaries to postgraduate studies, so that it can attract dedicated students to the institution.

It is our collective opinion that SAIAB is a successful institution that is generating a diverse array of quality research-based products and services in the field of southern African ichthyology. It is an institution that has a proud history and an excellent future, but in order to take full advantage of the opportunities, SAIAB needs to pay careful attention to its precise role within the community.

Review of the South African Institute for Aquatic Biodiversity (SAIAB)

Key recommendations

Christian Lévêque, Institut de Recherches pour le Développement, France (Convenor)
Mark Gibbons, University of the Western Cape, South Africa
Richard Vari, Smithsonian Institution, USA

The review panel's opinion is that SAIAB has been very successful in a number of areas and has efficiently transitioned from a Declared Cultural Institution (DCI) to a National Facility (NF). Some of the accomplishments of note are:

- The proactive management of the facility that has brought SAIAB through the transition without major disruptions to core operations and which has successfully begun the transformation to address issues of race and gender equity.
- Initiatives to bring salary scales in line with those of other NFs.
- The increase in the research component of the institute from five to eight full time equivalent employees.
- The development of a new area of expertise in fish genetics which is judged to be a valuable tool to address myriad biological questions.
- The numerous projects that have been undertaken in recent years and the relatively high level of productivity by most staff scientists, with several major products published during the review period or in final stages of production.
- The development of a Programmes unit that directs the African Coelacanth Ecosystem Programme (ACEP) project. ACEP directly ties to broader southern African initiatives such as the New Partnership for African Development (NEPAD). Additional initiatives in the development stage will further address that broader mandate.
- The steady increase in the size and geographic scope of the collection which is recognised by all stakeholders and the worldwide ichthyologic community as an asset of international stature.
- The progress on computerisation of the holdings in the fish collection, with the database to be available soon via a web portal.
- The development of plans for a new collections facility.
- The continued improvement of the library and its service operations which are considered by a broad spectrum of stakeholders to be a valuable resource in the pan-African context.
- The development of a very effective Communications and Environmental unit that has increased SAIAB's visibility.
- The satisfaction of all classes of stakeholders regarding the services provided by SAIAB (see also below concerning the present name of the Institute).

1 Performance of SAIAB as a National Facility

1.1 Research and publications

I Freshwater issues

- The need to reinforce SAIAB's expertise in freshwater systematics and ecology has been stressed both by the research team and by several stakeholders. This is strongly supported by us, and we recommend that the research staff be expanded to better address emerging needs in aquatic systems, particularly conservation, within South Africa and the region. This will require an increase in the base NRF funding of SAIAB following the development of a long-term research focus plan.
- Collaborations with the Department of Water Affairs and Forestry (DWAF) would better integrate the interaction between water management and aquatic biodiversity conservation.
- The role of SAIAB in contributing to the government process in developing national conservation guidelines should be carefully considered. Some stakeholders suggested that SAIAB should be proactive in that field and they expected it would act as a forum or a focus point for the various people involved in nature conservation.
- Good ideas and ambitious projects/programmes are expected by NRF. We encourage SAIAB to identify one or two projects on freshwater systems that could be comparable to the Coelacanth project in the marine environment and that could be a flagship for the Institute.
- SAIAB's activities in the freshwater sector overlap with those of DWAF and the Department of Land Affairs and Agriculture (DLAA). We urge SAIAB to enter into formal discussions with the relevant components of these Departments. One of the reasons is that any conservation policy needs to be linked to policies of water use management.

II Genetics and molecular capabilities

- SAIAB needs to appoint personnel able and willing to ask useful and responsible questions of the emerging molecular technologies in order to solve ecological, taxonomic and phylogenetic issues in line with its mandate, and attention should be given to this in succession planning.
- We would urge SAIAB to more formally explore relationships with the other genetics laboratories, not to duplicate their expertise or facilities, and to consider the advantages of laboratory personnel (especially students) working in a dynamic university environment. A formal agreement has been established with Rhodes University and that could also be the case with the genetics laboratory of Pretoria University which is willing to pursue collaboration with SAIAB.
- We would strongly discourage SAIAB from developing a technology driven centre in genetics although we recognise that the development of a (relatively unsophisticated) genetics laboratory at SAIAB may form part of long-term plans.

III Programme approach, common goals, team approach and collaboration to maximise impact

- SAIAB should continue to be, at the highest level, an "incubator" for taxonomy and systematics research, both nationally and regionally.
- We therefore recommend that the planning of research programmes emphasises multidisciplinary and cooperation between scientists of SAIAB as well as with scientists from other institutions when necessary.
- Future capacity building should be directed towards building research teams that address integrated research programmes. It is particularly important that newly

appointed scientists recognise the added value of multidisciplinary research. The future is not in individual research but in close collaboration between scientists sharing common goals and questions.

IV Publication strategy and absorption of huge amount of information

- While recognising a good level of publication on the whole, we recommend that some SAIAB scientists pay more attention to publishing in international journals, particularly leading journals in the subject field. In no case may the number of surveys undertaken be invoked to explain the absence of publications.
- SAIAB's research outputs should identify indicators of productivity more clearly (see Item 1.1.D on page 16).
- The extension of the geographic coverage and the frequency of the surveys have to be balanced with the capacity of the team to absorb the huge amount of information accumulated and to publish the results in a timely fashion; or to establish collaborations for the timely processing, interpretation and publication of the data.

V Critical mass of research staff and imbalances

- SAIAB's scientific staff should be significantly increased in the coming years. Obviously increasing the team requires an increase in the funds made available to SAIAB in order for it to fulfil the mandate as a NF.
- Increase the number of PhDs in the permanent research staff.
- Explore actively the appointment of postdoctoral fellows.
- The involvement of SAIAB in the South African National Biodiversity Institute (SANBI), as well as its possible role as a hub for freshwater biodiversity in South Africa will require more expertise than is available in the country. We therefore draw the attention of management to the need for balanced long-term planning between national and international projects/programmes.

VI Balance between research and service

- At the moment, the work programme of the facility is not balanced enough to ensure an appropriate allocation of time to both research and service activities across all sectors of the organisation and this needs attention. For example, almost all of the freshwater research is of a service nature and is externally driven, whilst almost all of the marine research activities are internally driven.
- Productivity in terms of scientific reports while useful should be balanced by publications in peer reviewed, preferably international, journals.

1.2 Collections

VII Library and fish collections

- Given the reality of the limitations of space (even assuming the development of a new storage facility) and collections management staff, the research staff should develop a long-term plan identifying the primary areas of coverage of the collection and methods for evaluating the appropriateness of new accessions. Where possible, other institutions in adjoining regions or, if necessary, outside Africa should be approached to serve as repositories for specimens in excess of SAIAB's needs or capacity.
- In the interest of efficiency we recommend that the new collection facility be designed with consideration of necessary capacity for collections management needs for both the short and long term. For the short term, the new facility should include space (if necessary with mobile shelving) to accommodate both the present

collections, and also to allow for growth at the present rate (ca. 4% per annum) over the next 15 to 20 year time frame. Given the likelihood of continued growth past 20 years, it would be most cost effective in the long term if the new facility were designed such that a second level of collections storage space could be added when necessary.

- Funding for the new collections storage facility should also include the resources necessary to upgrade storage containers for larger specimens. We recommend that the present inadequate storage containers for large specimens be replaced with tanks with adequate gaskets and closures. The reduced evaporation that would result from new containers would both facilitate collections management activities and reduce the occupational health and safety issues presented by the present containers.
- All primary types should be digitally photographed. This would make such images readily available to outside researchers and would ensure their availability to the ichthyological community in the event of damage or loss. This effort may require additional funding.

VIII Databases as a research tool, electronic availability, information and knowledge management

- The collection database should be available freely on the web as soon as possible, as part of the mandate of SAIAB to facilitate access to information.
- Databases are not only a modern and efficient tool to manage biological collections and other relevant information, but should be viewed as a powerful research tool for diverse scientific constituencies. As a consequence, database structures should be developed through close collaboration between scientists and information specialists.
- In most facilities dealing with natural sciences, both instrumentation and databases have a structuring effect on the scientific community. An obvious example involves telescopes where long-term astronomical observations are preserved in databases as a fundamental prerequisite for any research in that field. The situation is fairly similar for modern research in biodiversity. There is a need for exhaustive and long-term observations to assess the dynamics of biodiversity, as well as a dramatic need to improve sampling methodologies or observation means using the most relevant technology. SAIAB as a NF is the logical site for the development of this capacity.
- It is strongly urged that the SAIAB management and scientific staff further develop their strategy involving information management and that they prioritise the direction of this effort.
- Measures to objectively quantify the impact of the communication division in the field of outreach and education need to be identified with the NRF in order to assure comparability in such reviews across all NFs.

IX Intellectual property issues

- The collections database should be accessible to all potential users and a strategy to ensure the protection of sensitive information and intellectual property rights needs to be established, albeit with such restrictions as few as possible.
- Similarly, intellectual property rights policy involving the collections of original fish illustrations, photographs and slides need to be addressed as soon as possible.

X Cryogenic facility

- The cryogenic facility is currently focussed on the coelacanth programme and careful attention needs to be given how SAIAB will manage an expanded facility. As the single cryogenic facility in South Africa intended for long-term maintenance

of fish tissues, this unit should be funded at a level that would allow it to serve as a repository for samples of all groups of fishes, both inland and marine.

2 Management of the facility

2.1 Financial management

XI Inclusion of research funds and funds for bursaries and post-docs into baseline

- SAIAB and NRF need to expeditiously address the future financial challenges detailed on page 21 of the Self-Evaluation Report 1999-2004, in particular the succession issue.
- If not done to date, we urge that funds earmarked specifically for research to be undertaken at the NF be included in the baseline budget for SAIAB (National System of Innovation, Policy Development and Strategic Initiatives, 1994-2004; page 19).
- Mechanisms to further participation in science by undergraduates from historically disadvantaged communities in the aquatic sciences that fall under the mandate of SAIAB should be funded as noted under “The Education Sector” of the above-cited report.
- A reference library is also one that continuously updates its holding. Funds should continue to be available to buy books and journals.

XII Cost recovery for service tasks, overheads etc. and discounted where of benefit to SAIAB

- SAIAB is uniquely positioned within the African context to provide services in the inland and freshwater systems to a number of constituencies. Such a service function is an obvious component of the mandate of SAIAB. However, it also results in a number of associated costs.
- SAIAB along with the NRF and other appropriate government stakeholders should undertake an evaluation of both short and long-term costs (e.g. maintenance of multiple voucher specimens for many decades) to arrive at a standardised payment schedule for such services. This is particularly important when such costs exceed the level of service that a NF is expected to provide to other components of the government. SAIAB in consultation with NRF may decide that different overhead schedules should apply to the different classes of service requestors (e.g. industry versus non-government conservation organisations).
- We note that there has been no clear strategy by SAIAB regarding the sale of services to industry (what defines a commercial service and what constitutes an industry in this sector?).
- There is also a lack of clarity in the role of the programmes division in generating funds for other research within SAIAB.

2.2 Transformation

XIII The strategic staff development plan

- SAIAB should be encouraged to perhaps consider the issue of head-hunting appropriate black candidates for senior positions, and to ensure that retention and mentorship programmes are in place so that current staff is stimulated enough to pursue research in the core business area.

- SAIAB needs to carefully consider the tension between excellence and equity in its appointments, and to strategise around this so that its role as a national and regional leader in “aquatic biodiversity” is not jeopardised.
- While we recognise the constraints of attaining racial equity at the research level we urge SAIAB to develop innovative strategies that would enable it to increase access to, and training and retention of, students. This is particularly important given the ageing staff complement and that succession plans need to be implemented in a number of core areas (e.g. taxonomy and programme management) immediately.
- To this end we would suggest that the Department of Science and Technology (DST), through the NRF, supply SAIAB (as a NF) with “a percentage of its bursaries to postgraduate studies...” (such bursaries are its due and would help it to recruit and retain suitable young scientists). We would also recommend that SAIAB look at the possibilities of funding, or increasing the funding of, undergraduate fellowships and summer internships. SAIAB could also investigate opportunities for (co-) funding summer schools that would draw in learners and educators from across the region, thereby helping to consolidate its leadership in “aquatic biodiversity”.
- Of critical importance will be the eventual appointment of new recruits in the core national competencies of SAIAB: marine and/or freshwater (fish) taxonomy, and freshwater (fish) ecology. If SAIAB is to lead research in these fields at the national/regional level, careful consideration needs to be given to the individual research skills, capabilities and vision of prospective appointees.

3 Utilisation of the facility by external stakeholders and their degree of satisfaction

Most stakeholders' recommendations have been already incorporated in other issues. These are in summary:

- The name of the Institute and its scientific coverage (see Key Recommendation XVIII).
- The development of expertise in freshwater biodiversity in relation to other institutions concerned with freshwater management (see Key Recommendation I).
- The development of more formal partnership with University labs relevant for the SAIAB's fields of research (see Key Recommendation II).
- The increase in and funding for capacity building (see Key Recommendation XI).
- The need for SAIAB to serve as a forum for policy guidelines at the regional/national levels (see Key Recommendation XVI).
- The need to clarify the relationship between SAIAB/SANBI (see Key Recommendation XVII).

4 Strategic direction of the facility

4.1 How successful has SAIAB's transition from a DCI to a NF been?

XIV SAIAB as a South African Biodiversity Information Facility (SABIF) mode for “aquatic biodiversity”

- SAIAB could coordinate a national/regional database and act as the SABIF node for “aquatic biodiversity”, thereby generating a service analogous to that provided by, e.g., the Hartebeesthoek Radio Astronomy Observatory or iThemba Laboratory for Accelerator Based Sciences.

XV SAIAB as a forum for policy development in freshwater biodiversity

- As stated by various stakeholders, SAIAB could also provide a forum for, for example, national/provincial policy development in the area of freshwater biodiversity. A focus on the provision of a unique national/regional service needs to be explored by SAIAB in more detail, following consultation with the sector.

XVI Necessity of Advisory Board

- The recommendations of the system wide review of the Science, Engineering and Technology Institutes (SETIs) include the implementation of an advisory board to SAIAB. It could both help the Institute to refine its strategy and help it to establish links with other institutions and administrations.

4.2 Relationship between SAIAB and SANBI

XVII The proposed relationship SAIAB/SANBI

- SANBI is new, and there is uncertainty regarding exactly how it will fulfil its mandate. Yet it is also clear that in order to fulfil its mandate, SANBI will have to collaborate with a wide number of institutions, agencies and government departments working in the field of biodiversity that are recognised as leaders in their field of expertise. The information needed by SANBI from these other bodies would ideally be extracted from existing databases. Money would be made available by SANBI to pay for this service. We can anticipate that SAIAB will be one of those institutions contracted to provide data on fishes, but possibly also on other aquatic groups.
- The review team feels that the national niche for SAIAB is clear with respect to freshwater ecosystems, and SAIAB is the obvious data supplier for SANBI in this regard. However, the research landscape in the marine environment is more complex and although SANBI should draw on its in-house expertise in marine biodiversity from Marine and Coastal Management (MCM) as the first source of information, SAIAB could provide additional data in this area as appropriate.
- We are reluctant to make recommendations regarding the “home” of SAIAB to the NRF, especially with regard to the Department of Environmental Affairs and Tourism (DEAT) because SANBI does not yet know how it will operate. This landscape is confusing and dynamic, and we cannot recommend any move at this stage. As a consequence, it could be argued that SAIAB should remain within DST, in much the same way that the National Zoological Gardens is positioned within DST. That said, it is imperative that a dialogue be established between SAIAB and SANBI.
- SAIAB should be proactive and should be prepared to answer positively to the possible range of services that may be requested. Such service provision has a number of implications for the:
 - Management of data: it will be important to easily extract information that will be requested by SANBI from the database
 - Collection of data: what are the gaps in the inventory of South Africa biodiversity; what are the priorities for future ichthyological inventories.
 - The nature of collaborations that should be established with other institutions also managing databases (nature conservation boards, universities etc.).

4.3 Name of the Institute

XVIII Ichthyology or aquatic biodiversity?

- The main comment arising from stakeholders is that SAIAB only focuses on fish and does not cover all aquatic biodiversity as it would be expected given its name. In the absence of significantly increased funds (directly from DST, or with allocations from DEAT, Department of Arts and Culture (DAC), DWAF (etc.) and provincial budgets) and a significant increase in scientific expertise, it seems unreasonable for SAIAB to be nationally responsible for “aquatic biodiversity” (marine, brackish and freshwater environments; vertebrates, invertebrates, plants and protists) – especially given the increasing, but unknown, role that SANBI will play in this landscape. Aside from space constraints, there are also political issues that will need to be addressed.
- That said, there are opportunities for SAIAB to take a lead or central role in the management of information about “aquatic biodiversity” within the freshwater sector, but a decision to properly move in this direction (and thereby live up to some of the expectations raised by its current name) would require that SAIAB make some strategic appointments. Careful consideration should then be given to how SAIAB will deal with the issue of the national collections in the Albany Museum. We are aware that proposals to reinforce collaboration failed in the past. However the logic is there.
- The situation is more complex for the marine environment. MCM (DEAT) supports the greatest concentration of expertise. Marine ecologists can be found at almost all coastal universities and in the provincial environment and conservation departments of those provinces with a seaboard, as well as at the Oceanographic Research Institute (ORI) and SAIAB and in a number of private consultancies. MCM have the responsibility for marine biodiversity.
- If SAIAB’s strategy is to continue with a focus on fishes, then a name change becomes mandatory. Of course, re-branding will have a number of negative side effects, but if appropriate marketing is used this may be a short-term problem. Such a move would also require careful attention to the mentoring of current staff so that they are stimulated enough to pursue research in the core business area.
- We urge SAIAB to discuss the issue of their name and the role that they can play within the sector, but recommend that they play to their strengths. We recommend to extend the expertise of SAIAB at least to freshwater biodiversity and to develop partnerships in marine systems, with a leading role on fish.

4.4 Succession Planning

XIX A major concern for the future of SAIAB: succession planning

- There is an obvious gap between charismatic senior scientists and young scientists that should be well managed in order to avoid a failure in the expertise and management capacity of SAIAB. Although attention should be given to ensuring a steady pipeline of recruits for the future, it is clear that this may not solve their current crisis in time and alternatives (head-hunting, international appointments etc.) should be investigated.

Review of the South African Institute for Aquatic Biodiversity (SAIAB)

Report

Christian Lévêque, Institut de Recherches pour le Développement, France (Convenor)
Mark Gibbons, University of the Western Cape, South Africa
Richard Vari, Smithsonian Institution, USA

The review

The terms of reference indicate that “the focus of the review will be over the past five financial years ending in March 2004. The purpose will be to provide:

- a retrospective view on the performance of SAIAB in terms of the objectives stated in the strategic and business plans;
- an assessment of the outcome and impact of the activities of SAIAB;
- based on the above, recommendations regarding the strategic direction and operational execution of the SAIAB mandate”.

The review was conducted from 6 to 13 September 2004 by an international panel composed of Dr Christian Lévêque, IRD, France (Convenor); Mark Gibbons, UWC, South Africa; Richard Vari, Smithsonian Institution, USA.

What is SAIAB?

In the interest of brevity, we include only the key points that are highly relevant for the review process.

Vision: Serving Africa's needs in understanding fishes and aquatic environments.

Mission: To be an interactive hub focused on serving the nation through generating, disseminating and applying knowledge to understanding and solving problems on the conservation and wise use of African fishes and aquatic biodiversity.

The Institute is dedicated to achieving this mission through:

- Conducting research on marine, estuarine and freshwater fishes and aquatic ecosystems.
- Providing efficient access to information on African fishes and associated resource databases by using electronic and Internet technologies.
- Educating African people of all ages about fishes, aquatic biodiversity and the conservation and wise use of these resources.
- Caring for and developing the National Fish Collection, the JLB Smith Library and associated collections as international heritage resources.
- Developing comprehensive capacity in fish genetics in order to address relevant biodiversity issues at all levels.
- Educating and empowering new generations of African ichthyologists.
- Advancing equity within the Institute and its associated activities especially with regard to the hiring and training of staff (from Business Plan 2002).

The review document presented here tries to follow the dimensions outlined in Section 6 of the terms of reference (v 21 July 2004). These in turn generally reflect the goals established by SAIAB in their strategic plan (2000), and where appropriate we have addressed the issues of performance, assessment and recommendations (Section 4, ToR) for these goals in detail. There is some repetition in both the review dimensions and the way they address the strategic goals of SAIAB, and we have cross-referenced accordingly.

1 Performance of SAIAB as a National Facility (1999-2004) (see Item 6.2 of the Terms of Reference)

This section of the review focuses on the key activity areas of SAIAB: research, collections and communication, and refers to Goals 4-6 of the Strategic Plan (2000).

1.1 Research and publications (see Goal 4 of the Strategic Plan)

A Research

Thematic issues

Achievements

- A total of 40 projects/programmes were conducted in 2003/2004, of which 27 were linked primarily to marine and estuarine environments.
- A strategic review of research undertaken in December 2003 identified new fields of research, including genetics, and a reinforcement of capacities in inland water.

Assessment

- Research covered by SAIAB includes studies on the systematics, genetics, biology and ecology of fishes.
- The long-term expertise of SAIAB is rooted in fish taxonomy and systematics but many of the projects aim to answer conservation and management orientated problems, and 80% of the projects/programmes deal with the biology and ecology of fish.
- As stated by one of the team leaders, the major change when moving to SAIAB is that people started to work together, through regular meetings, collaborations, long-term planning. That is also our feeling.
- We recognise the importance of developing skills in genetics at SAIAB. Molecular data are vital to a proper understanding of taxonomy and systematics, and they provide a useful tool (sometimes the only tool) that can be employed to address evolutionary (e.g. processes driving speciation), ecological and management questions (e.g. population processes, stock identity).

Recommendations

- **The need to reinforce SAIAB's expertise in freshwater systematics and ecology has been stressed both by the research team and by several stakeholders. This is strongly supported by us** and we recommend that SAIAB carefully identify the specific fields of research in relation to the possible use of the database, the needs to develop conservation guidelines, the identification of threats and their consequences, etc.
- What appears to be lacking at SAIAB currently is personnel able and willing to ask useful and responsible questions of the emerging molecular technologies in order to solve ecological, taxonomic and phylogenetic issues in line with its mandate, and attention should be given to this in succession planning.
- **We would urge SAIAB to more formally explore relationships with the other genetics laboratories, and not to duplicate their expertise or facilities.** We would strongly discourage any move on the part of SAIAB to develop a technology driven centre in genetics that focuses on gene regulation and expression, or on biotechnology, as such work falls beyond its mandate. Although we recognise that the development of a (relatively unsophisticated) genetics laboratory at SAIAB may form part of long-term plans, we would nevertheless urge management to consider the advantages of laboratory personnel (especially students) working in a dynamic university environment.
- **Formal agreement has been established with Rhodes University and that could also be the case with the genetics laboratory of Pretoria University which is willing to**

pursue collaboration with SAIAB. Opportunities for the co-funding of personnel (especially at the student and post-doctoral level) exist and it is suggested that SAIAB explore these in some detail with appropriate partners.

- It is not clear how far SAIAB has been involved in the identification of research priorities by national and international conservation agendas (see Goal 4 of the Business Plan). SAIAB is a potential partner of the DEAT to provide expertise in discussion on international conventions (Convention on Biological Diversity, Ramsar, etc.).
- Collaborations with DWAF would better integrate the interaction between water management and aquatic biodiversity conservation.
- **The role of SAIAB in contributing to the government process in developing national conservation guidelines should be carefully considered.** Some stakeholders suggested that SAIAB should be proactive in that field and they expected it would act as a forum or a focus point for the various people involved in nature conservation.
- **SAIAB should continue to be, at the highest level, an “incubator” for taxonomy and systematics research, both nationally and regionally.**
- Modern research in the field of taxonomy needs to integrate different approaches. Genetics for instance allows taxonomists to better identify species, stocks and morphological variability. Meantime, genetics is very powerful in phylogenetic research, as well as in answering the questions of the drivers of speciation. However, experience proved that genetics itself cannot raise the key questions when working on evolution and speciation; collaboration with ecologists is therefore more than useful as far as they may identify the environmental conditions that lead to changes in population genetics. **We therefore recommend that the planning of research programmes emphasises multi-disciplinarity and cooperation between scientists of SAIAB as well as with scientists from other institutions when necessary. It is particularly important that newly appointed scientists recognise the added value of multidisciplinary research and they should be encouraged to develop integrated programmes.** The future is not in individual research but in close collaboration between scientists sharing common goals and questions.
- Good ideas and ambitious projects/programmes are expected by NRF. Paraphrasing the statement “think globally, act locally”, we encourage SAIAB to identify one or two projects on freshwater systems that could be comparable to the Coelacanth project in the marine environment and that could be a flagship for the Institute.

Geographic coverage

Achievements

- Major marine fish surveys off the coasts of South Africa, Mozambique and several Indo-Pacific islands.
- Major freshwater surveys in South Africa, Lesotho, Swaziland, Botswana, Zambia, Mozambique and Tanzania.
- Research opportunities in marine, estuarine and coastal environments are opening in Angola, which is an important biogeographic area, but very poorly known ichthyologically until now.

Assessments

- Areas of operation range from the Southern ocean to the African Rift lakes, from the deep ocean to transient floodplains. It is in the mandate of SAIAB to fulfil the NRF Strategic Priority 4: Focus on Africa, by increasing the number and the significance of collaborative research programmes and networks within the context of the Southern African Development Community and NEPAD. The expected impact is to develop African-based systems of knowledge generation and application.
- In this framework, the information collected in Southern Africa will be very useful for the implementation of an interactive decision-making Geographic Information System (GIS) as planned by the Programme Division.

Recommendations

- **The extension of the geographic coverage and the frequency of the surveys have to be balanced with the capacity of the team to absorb the huge amount of information accumulated and to publish the results in a timely fashion;** or to establish collaborations for the processing, interpretation, and publication of the data. In no case may the number of surveys be invoked to explain the absence of publications.
- Meantime it could be expected that the involvement of SAIAB in SANBI, as well as its possible role as a hub for freshwater biodiversity in South Africa will require more expertise than is available in the country. **We therefore draw attention of management to the need for balanced long-term planning between national and international projects/programmes.**

B Programmes

The Programmes Office, a relatively new initiative of SAIAB, was established in 2002 in response to discoveries/opportunities not envisioned during development of the 2001-2005 strategic plan. It nonetheless fits well into many of the goals outlined in that plan. The Programmes Office is currently involved in three initiatives:

The African Coelacanth Ecosystem Programme (ACEP)

Achievements

- This South African focused initiative, begun with DST funding focused on the South African populations of the species, has developed into a multinational, multidonor project dealing with multiple partners and now involves several neighbouring countries.

Assessment

- Although positioned outside the core research area of SAIAB, ACEP builds on those central research themes and on the internationally recognised contribution of the predecessor JLBSI to the field of coelacanth studies.
- The programme is an excellent platform on which to further national and international initiatives.
- The ancillary research activities of the project provide information pertinent to ongoing core SAIAB research efforts involving the systematics of marine fishes in the South African region.
- The programme has yielded the first detailed information on the ecosystems in which the species lives and thus holds promise for significant research spin-offs.

Recommendations

- In light of the scale of the project, it cannot be supported to any significant degree by SAIAB in its current form and it will be necessary for the project to be funded in its entirety by external sources.

Strategy to Conserve the Freshwater Biodiversity of South Africa

Achievements

- The programme is in its developmental phase with seed money raised for preliminary workshops.

Assessment

- This combined programme involving all nine provinces in South Africa and the six countries with which South Africa shares common water bodies aims to develop a strategy to care for the aquatic resources in those water bodies.

Recommendations

- **We feel that this programme builds on the obvious expertise of SAIAB staff in freshwater fishes of the region and urge SAIAB to develop external funds to support this important endeavour.**
- If this programme goes forward it will be critical to expand the capacity of SAIAB in terms of research on inland fishes.

Interactive Decision Making Hub for Southern and Eastern Africa

Achievements

- This initiative would integrate information and databases on aquatic ecosystems and databases into a decision making GIS framework.

Assessment

- The programme is too early in the development phase to allow critical review; however, such regional databases are crucial if the aquatic resources and biodiversity of the region are to be carefully and effectively managed.
- Such a programme provides a very good opportunity to bring together scattered information collected in several surveys of the Southern African region.

C Human resources

Achievements

- Research capacity has increased from five full time research scientist equivalents in 1999 to eight in 2003.
- Four of the eight full time research scientists have PhD degrees.
- Two of the scientists are rated as having “significant international recognition” in the NRF system and two as having “some international recognition”.

Assessment

- Seven permanent researchers work in marine and coastal systems, and only one on inland systems (with P. Skelton providing assistance as management responsibilities allow). This imbalance has been stressed by the management and by stakeholders.
- All the researchers in SAIAB are working at full capacity at present while there is an increasing demand on their services both at the national and international scales. The critical mass is low for a NF and any loss could be a disaster. Scientific capacity is the big issue for SAIAB.
- See also comments on succession planning under Item 4.4.

Recommendations

- **Increase the number of PhDs in the permanent research staff.**
- **Explore actively the appointment of postdoctoral students.**
- Given the:
 - number of programmes/projects, the observed increase in the demand of expertise at the national and international levels,
 - need to diversify the research activities (genetics, freshwater ecology, etc.),
 - effectiveness of the administrative and communication supports,
 - lack of high scientific expertise in fields like freshwater biodiversity in other universities or institution in the country,

we strongly recommend that SAIAB scientific staff should be significantly increased in the upcoming years. Following the statement of a stakeholder, SAIAB has to grow to fulfil its mission as a NF. **Obviously increasing the team requires increase in the funds made available by NRF in order for SAIAB to fulfil its mandate as a NF.**

D Scientific publications

Achievements

- The Business Plan of 2003/2004 clearly identified publications as a high level objective for 2003/2004 with the goal to increase the quantity and quality of refereed scientific publications. In fact, the increase in these areas in 2003 is significant.
- Many of these papers are published in outstanding international journals (12 papers in international journals, six in South African journals).

Assessment

- Very good level of publication in 2003 taking into account the many other involvements of the scientific team. However, publication performance in 2003 needs to be continued with the young and newly appointed scientists mentored so as to be productive.

Recommendations

- **The SAIAB research outputs should more clearly identify indicators of productivity:** papers published in recognised international journals, papers published in local and regional journals, books of outstanding importance, theses, contract reports, other scientific reports, policy reports of importance at the national level, symposium and seminars, popular articles.
- **Some SAIAB scientists should pay more attention to publication in international journals, particularly leading journals in the subject field.** Productivity in terms of scientific reports while useful should be balanced by publications in peer-reviewed journals.

1.2 Collections

(see Goal 5 of the Strategic Plan)

A National Fish Collection

Achievements

- The collection grew steadily by 21% over the review period.
- New material from new parts of the region has been accessioned.
- The collection is being appropriately curated with various problems with storage containers addressed.
- New collection management software (Specify) is being implemented.
- Improved access to the collections is being developed through Internet portals (“Fishbase” and “The Species Analyst”).
- All relevant staff has undergone training in curatorial systems and practice, with the collection brought into a single collections unit with the Library under the direction of a Collections Manager.
- Plans have been developed to move the fish collections to new and enlarged premises and revamp space for present collections to address other space needs within the present facility.
- The basis of a cryogenic facility has been established and other materials suitable for genetic studies of South African fishes have been collected.

Assessment

- Without a doubt the SAIAB fish collection is the pre-eminent collection of southern African fishes in the world and as such it provides a valuable resource.
- The rate of growth of the collection (ca. 4% per year) is in line with rates at other international fish collections where staff engages in similar biodiversity/taxonomic/ecosystem research.

- Management and staff have been proactive in addressing collections management issues at diverse levels in order to assure that the collections management practices including database accessibility are in line with international standards.
- A diverse range of local, regional and (importantly) international students and researchers has used the collection, both via on-site visits and loans. The scope of loans to the international ichthyologic community worldwide is noteworthy as is the geographic range of these scientists. This is reflective of the international importance of the collection.
- Although loans rates have remained relatively static, this reflects external factors such as the taxonomic and geographic scope of research projects initiated by outside users. Loan activity would be expected to increase once the listing of the holdings is accessible via the web portal.
- The cryogenic facility has been an important development in line with SAIAB's mandate.
- The developing collections of alcohol preserved tissues are a valuable resource for research on questions involving species discrimination, phylogeography and phylogeny.
- The Key Performance Indicators (KPIs) are appropriate though information regarding the backlog of lots should be provided.

Recommendations

- Given the high rate of growth in the collections, attention should be given to reducing the unnecessary duplication of material both via preaccession evaluation and by deposit of material in excess of SAIAB's research needs at other institutions.
- Given the reality of the limitations of space (even assuming the development of a new storage facility) and collections management staff, the research staff should develop a long-term plan identifying the primary areas of coverage of the collection and methods for evaluating the appropriateness of new accessions. Where possible, other institutions in adjoining regions or, if necessary, outside Africa should be approached to serve as repositories for material in excess of SAIAB's needs or capacity.
- **The collections database should be accessible to all potential users, and a strategy to ensure the protection of sensitive information and intellectual property rights needs to be established, albeit with such restrictions as few as possible.**
- **Funding for the new collections storage facility should also include the resources necessary to upgrade storage containers for larger specimens. The present containers are unsatisfactory in terms of specimen maintenance and both safety and health considerations.**
- Planning the new collection facility, one should keep in mind the expected growth of the fish collections as well as the development of invertebrate collections. Therefore, on the long term, the new facility might have potential for evolution and growth. Economy in the short term may result in more expenses in the future. The new facility should be designed to permit future expansion within the building footprint.
- All primary types should be digitally photographed. This would both make such images readily available to outside researchers and would ensure their availability to the ichthyological community in the event of damage or loss. This effort may require additional funding.
- The **cryogenic facility** is currently focussed on the coelacanth programme and careful attention needs to be given how SAIAB will manage an expanded facility. As the single cryogenic facility in South Africa intended for long-term maintenance of fish tissues, this unit **should be funded at a level that would allow it to serve as a repository for samples of all groups of fishes, both inland and marine.**

B Library

Achievements

- Contract developed with the Food and Agriculture Organisation (FAO) from 2002 through present for SAIAB library to provide a document dissemination service for selected African aquatic institutions.

- Continuation of the agreement with the National Inquiry Services Centre – South Africa (NISC-SA) which provides numerous journal titles to the SAIAB Library reprints (see SAIAB Self-Evaluation Report, Figure 18).
- A continued and substantial growth in the number of accessioned books and reprints (see Self-Evaluation Report, Figures 14, 15).
- Large number of items circulated (Self-Evaluation Report, Figure 16) with numbers of interlibrary loans to both national and international borrowers increasing during review period (see Self-Evaluation Report, Figure 17).

Assessments

- The library as a shared resource with Rhodes University serves not only the staff of SAIAB, but also several Departments of Rhodes University, as well as students and other stakeholders.
- The library (books, journals, and reprints) is recognised as a major resource by South African stakeholders. Diverse external South African stakeholders have commented on the importance of that facility for their research/conservation efforts. According to one stakeholder, the library is a “rock” supporting research on fishes in both inland and marine waters in the South African region.
- The value of the library within the pan-African context is clearly demonstrated by the frequent requests for photocopies by researchers and institutions from other regions of Africa. This FAO associated programme builds on the pre-existing strengths of the library and is an appropriate extension of the library service function.
- Staff was judged to very helpful and accessible by students and external stakeholders thereby making library resources readily available.

Recommendations

- According to some stakeholders, there is apparently only a single computer workstation within the library which can be used to access information on the library holdings. On some occasions this limitation has resulted in users being unable to access necessary information efficiently and the addition of a second workstation should be considered.
- The need for accessibility to on-line literature was noted by various stakeholders. The electronic subscriptions made available by Rhodes University may pose a problem, but that probably could be solved by appropriate techniques. While not fully aware of the parameters of the situation, we suggest SAIAB clarify, if necessary, the electronic availability of the information as part of its mandate as a NF.
- **A reference library is also one that continuously updates its holding. Funds should continue to be available to buy books and journals.**

C Images collections

Achievements

- SAIAB has engaged in proactive initiatives appropriate for a NF which will increase its visibility in the scientific and broader communities. Specifically:
- SAIAB has brought together a huge collection of original fish illustrations by Institute artists. This has both a potential commercial value and use as a resource tool. Illustrations have been transferred to appropriate acid-free storage containers.
- SAIAB is starting curation and digitisation of the vast number of photographs and slides of fishes, collecting sites and the surrounding environment that have been taken by present and past staff members. Their potential value for multiple uses including publications and research is high. By March 2004, 8000 images were captured in digital format.

Recommendations

- **SAIAB should continue the digitisation of the illustrations and slides and explore how these collections can serve as a profit centre for the Institute.**
- **Intellectual property rights policy involving the collections of original fish illustrations, photographs and slides need to be addressed as soon as possible.**

D Archives Collections

The Archives Collection (the private notes and other artefacts from past and present scientists) was identified as a potentially valuable, but as yet unassembled or properly curated resource, in the JLBSI Strategic Plan.

Recommendation

- This initiative should be pursued as soon as resources become available in the light of the recent retirement of some researchers at SAIAB and the likelihood of other retirements in that group within the upcoming five years.

E Knysa Angling Museum

Achievements

- Continued curation of the collection after removal from display.

Recommendation

- This collection of angling associated implements is extraneous to the mission of the NF. This material should be transferred to a more appropriate facility in order to free up space and allow focus on core projects.

F Databases

The SAIAB Strategic Plan (see Goal 5, page 4) aimed to develop and enhance the use and value of the Institute's internationally recognised collections and databases as African heritage resources. This should include:

- The development of knowledge databases created through the care, maintenance and expansion of biological and associated document collections.
- Projects should seek to develop databases and make these databases accessible and available to various user groups through appropriate media such as the Internet.

Achievements

- Discussion during Strategic Workshop (December 2003) of necessary future directions involving databasing needs, scope and directions.
- SAIAB recognition (Self-Evaluation Report 1999-2004, p. 55) that the most pressing professional need for the Institute in the short term was the appointment of an Information Technology specialist. This will facilitate the development of an information hub and expertise as part of SAIAB's mandate as a NF.
- Contract appointment by the Programme Division of a specialist to handle GIS and information needs.
- Preliminary discussions towards the goal of SAIAB serving as the "Hub" or at least a "virtual hub" for a programme that will integrate information and databases concerning aquatic resources within a decision-facilitating GIS-framework. This is appropriate both within the context of SAIAB's historical base in some elements of aquatic biodiversity and its present status as a NF.

Recommendations

- **It is strongly urged that the SAIAB management and scientific staff further develop their strategy involving information management and prioritise the direction of this effort.**
- Databases are not only a modern and efficient tool to manage biological collections and other relevant information, but should be viewed as a powerful research tool for diverse scientific constituencies. Taxonomists and biogeographers use databases with their associated figures when identifying or describing new species. In the southern African

context the inclusion of scanned copies of original descriptions would be an invaluable tool. Ecologists working on biodiversity dynamics, including the impacts of water management, climatic changes, the spread of invasive species, etc. would, in turn, benefit from other types of data. As a consequence, **database structures should be developed through close collaboration between scientists and information specialists.**

- In most facilities dealing with natural sciences, both instrumentation and databases have a structuring effect on the scientific community. An obvious example involves telescopes where long-term astronomical observations are preserved in databases as a fundamental prerequisite for any research in that field. The situation is fairly similar for modern research in biodiversity. There is a need for exhaustive and long-term observations to assess the dynamics of biodiversity, as well as a dramatic need to improve sampling methodologies or observation means using the most relevant technology. SAIAB as a NF is the logical site for the development of this capacity.
- **The collection database should be available freely on the web as soon as possible, as part of the mandate of SAIAB to facilitate access to information (see also Item A “National Fish Collection” above).**

1.3 Communications (see Goal 6 of the Strategic Plan)

Achievements

- A Communications and Environmental Education Division has been established with responsibility for environmental education, public and corporate communications, web site development and in-house publication services.
- An increasing range of educational resources has been developed.
- SAIAB has developed a high profile at national and regional Science Festivals.
- SAIAB has developed an outreach programme to local schools with the need of these efforts expanded by the use of one vehicle for their purpose. Funding for the vehicle was secured from external resources.
- SAIAB continues to organise tour groups around its facilities.
- SAIAB continues to publish a range of high quality in-house publications which are increasingly in demand.
- The level of communication between scientists and the media, through this division, has increased.
- The style of corporate communications has become more user-friendly.
- A user-friendly website has been developed.

Assessment

- SAIAB is to be congratulated on the way it has assembled such an efficient and user-friendly team. This strategic move has been a profound success.
- It has led to an efficient consolidation of resources.
- The visibility and accessibility of SAIAB has been improved.
- The range of educational products and scientific resources has been greatly improved and they are welcomed by the education sector.
- SAIAB’s educational and outreach programmes appear to be genuinely appreciated.
- As a NF, SAIAB’s public educational programme not only serves to highlight the diversity and importance of the rich, and in some cases threatened, fish faunas of South Africa, but it is a critical part of initiatives to encourage students of all backgrounds to consider careers in science in general and aquatic biology in particular.
- We recognise that community outreach activities are by their nature difficult to evaluate given that the intended results, an increased awareness by members of the target audience of aquatic biodiversity and the threats that it faces, are difficult to quantify. Similarly, it may be many years before it is apparent that the decision by a student to pursue a career in science was a consequence of their exposure to an outreach activity. That being said, the programmes that have been initiated by the staff at SAIAB, particularly in the

communications unit, are of the type utilised and judged to be successful in major educational museums in North American and Europe.

- The KPIs are appropriate.
- Although we have not been provided with the detailed plans that were used by SAIAB to develop a strategy with stakeholders, their results are evident.

Recommendations

- A strategy needs to be developed to ensure that staff members do not over-extend themselves.
- Increased collaboration, networking and sharing is encouraged between the different organisations involved in education and outreach programmes to ensure that they reinforce each other but do not duplicate efforts. SAIAB could take a national lead in this regard.
- Measures to objectively quantify the impact of this division in the field of outreach and education need to be identified with the NRF in order to assure comparability in such reviews across all NFs.
- SAIAB needs to develop a strategy to improve its corporate marketing within the region so that it can begin to play an increasing role there too.

2 Management of the facility

(see Item 6.4 of the Terms of Reference)

2.1 Financial management

(see Goal 3 of the Strategic Plan)

Finance issues of SAIAB as a NF involve multiple layers within government along with contract, grant and contributed funds. The high level objective is effective and efficient financial management (Business Plan).

Achievements

- Finances are now managed according to Generally Accepted Accounting Practice principles and are compliant with the Public Finance Management Act. This represents a significant improvement and a better asset-control over those systems in operation when JLBSI was a DCI.
- External and internal audits have been instituted.
- Fully computerised accounting system provides immediate access to financial data.
- Core funding has doubled over the five-year period and an extraordinary increase was granted for 2003-2004 to adjust the baseline salary equity (see Figure 7a, SAIAB Self-Evaluation Report 1999-2004), a critical development for the continued excellence of SAIAB.
- The level of contract income has increased unevenly during the review period.

Assessment

- The financial management system instituted during the transformation was not only critical for that process, but ensured a more risk-free financial environment. It provides the foundation for the efficient management of contract funds, both those internal to core SAIAB functions and also those run through the Programmes Office.
- As clearly documented in the SAIAB Self-Evaluation Report, 1999-2004 (see pages 18 to 23) the change of status of SAIAB from a DCI to a NF led to significant inputs of funds in order to address pay parity issues. This infusion allowed salaries within SAIAB to be brought into alignment with those of other NFs within NRF and involved a number of changes in personnel and finance operations.
- Increased funding directed towards salaries of all SAIAB staff (see Figure 9, SAIAB Self-Evaluation Report 1999-2004) is to be applauded in the light of its status as a research facility of international repute. SAIAB now offers salaries that are internationally competitive.

- It is clear from our discussions with stakeholders at various levels that SAIAB has very successfully undertaken the financial revamping necessitated by its transition to a NF and is to be congratulated on its efforts.

Recommendations

- **SAIAB and NRF need to expeditiously address the future financial challenges detailed on page 21 of the SAIAB Self-Evaluation Report 1999-2004, in particular the succession issue.**
- **If not done to date, we urge that funds earmarked specifically for research to be undertaken at NFs be included in the base budget for SAIAB (see National System of Innovation, Policy Development and Strategic Initiatives, 1994-2004; page 19).**
- Mechanisms to further participation in science by undergraduates from historically disadvantaged communities in the portion of the aquatic sciences that fall under the mandate of SAIAB should be funded as noted under “The Education Sector” of the above-cited report.
- SAIAB is uniquely positioned within the African context to provide services in the inland and freshwater systems to a number of constituencies. On the one hand, such a service function is an obvious component of the mandate of SAIAB; however, it also results in a number of associated costs.
- SAIAB along with the NRF and other appropriate government stakeholders should undertake an evaluation of both short and long-term costs (e.g., maintenance of multiple voucher specimens for many decades) to arrive at a standardised payment schedule for such services. This is particularly important when such costs exceed the level of service that an NF is expected to provide to other components of the government.
- A discussion should be entered into on the question of appropriate levels of overhead above and beyond costs for non-governmental stakeholders. This exercise should take into account both short and long-term costs. SAIAB in consultation with NRF may decide that different overhead schedules should apply to the different classes of service requestors (e.g. industry versus non-government conservation organisations).

2.2 Transformation

(see Goal 1 to 3 of the Strategic Plan and Item 6.5 of the Terms of Reference)

Achievements

- Pay parity for existing staff under NRF conditions of service has been achieved.
- An employment equity plan was drafted.
- Key posts were identified in critical skill shortages.

Assessment and Recommendations

- SAIAB management is to be congratulated on the way that it handled the issue of pay parity without negatively impacting on organisational line-function.
- **The transformation policies developed by SAIAB appear to be in line with national benchmarks, and achievements exceed those of many other Science, Engineering and Technology Institutes to date. SAIAB management is again to be congratulated on the way that it has achieved this without disrupting organisational harmony.**
- However, the employment equity policy that was developed by SAIAB in 2000 has, by their own admission, failed to achieve the targets set for racial transformation overall, and especially in three of the organisational categories, viz management, professional and contract workers. While this can be seen as a criticism, and strategies need to be revisited in order for SAIAB to achieve its equity targets, failures need to be viewed in the larger context of the South African situation.
- SAIAB should be encouraged to perhaps consider the issue of head-hunting appropriate black candidates for senior positions, and to ensure that retention and mentorship programmes are in place so that current staff are stimulated enough to pursue research in

the core business area. SAIAB needs to carefully consider the tension between excellence and equity in its appointments, and to strategise around this so that its role as a national and regional leader in “aquatic biodiversity” is not jeopardised.

- **While we recognise the constraints of attaining racial equity at the research level (generally declining enrolments to whole organism science at tertiary institutions for reasons of financial reward and job opportunities, as well as the geographical location of Grahamstown etc.), we urge SAIAB to develop innovative strategies that would enable it to increase access to, and training and retention of, students. This is particularly important given the ageing staff complement and that succession plans need to be implemented in a number of core areas (e.g. taxonomy and programme management) immediately.**
- To this end we would suggest that DST, through the NRF, supply SAIAB (as a NF) with “a percentage of its bursaries to postgraduate studies...” (these are its due and would help it to recruit and retain suitable young scientists). We would also recommend that SAIAB look at the possibilities of funding, or increasing the funding of, undergraduate fellowships and summer internships. They could also investigate opportunities for (co-) funding summer schools that would draw in learners and educators from across the region, thereby helping to consolidate its leadership in “aquatic biodiversity”.
- We applaud the efforts of SAIAB staff to draw on research students from, and to collaborate in student training at, institutions other than Rhodes University (which is in line with its function as a NF), which has hitherto been as a result of personal connections: it does not appear to stem from a wider recognition of SAIAB’s strengths as a NF (arising in part, perhaps, about confusion regarding its name (see Key Recommendation XVIII). Appropriate marketing strategies need to be implemented to improve this. Particular attention should be paid to reaching out to Historically Black Institutions (HBIs), and the undergraduate and BSc(Hons) training conducted by SAIAB at Rhodes University needs to be rolled-out to other institutions, including HBIs.
- Although gender equity has been attained across the organisation as a whole, attention should be paid to ensuring a balance across all categories in the future.
- There is some confusion between the racial targets set in 2000 (50:50 B:W – Strategic Plan Table 2) and those reported in 2004 as set in 2000 (60:40 B:W - SAIAB Self-Evaluation Report, pp. 16). It would assist evaluation if data are tabulated and not figured, and that current staffing is shown against targets. It would be helpful if staff reported on the www site, the corporate literature and the document provided by SAIAB to us were in agreement. It would also be helpful to know the breakdown of those staff that are employed on a full-time permanent and half-time permanent basis, and to what extent the latter are expected to be measured against KPIs. A full list of contract staff and their gender and racial status should also be provided.
- Although SAIAB policy has allowed for the personal upliftment and development of staff through training, it is not always clear that this has been aligned to SAIAB’s core business. SAIAB is urged to develop a strategic staff-development plan.
- Of the twelve MSc and PhD students trained (entirely or collaboratively) by SAIAB staff during the five-year review period, five are black and six are female. That stated, it should be realised that five (two black and two female students) had obviously started their training prior to the establishment of SAIAB. Although these twelve students have authored 22 of the 73 peer-reviewed publications generated through the review period no papers were produced by the black students. This poses questions about the quality of the black students trained or as to how they were mentored concerning publication of their research results. SAIAB is urgently requested to redress this issue in a meaningful way. Criticism aside, SAIAB’s proportional contribution to gender and racial transformation within the National System of Innovation (NSI) appears significant, although a high proportion of the black students are not active within the sector.

3 Utilisation of the facility by external stakeholders and their degree of satisfaction

(see Goal 6 of the Strategic Plan and Item 6.3 of the Terms of Reference)

We provide in this section a brief assessment of the main ideas arising from the interviews of various stakeholders on the question of the role of SAIAB as a NF. Some material detailed below has also been used elsewhere in the review. Most of these interviews were very productive and we would stress the shared view of most of the stakeholders that SAIAB is currently or potentially a useful facility for them. That point being noted there was also considerable commentary on the issue of present scientific coverage of SAIAB: should it be limited to fish or cover all aquatic biodiversity (see also discussion in Chapter 4 - Strategic direction of the facility).

- From discussions with various stakeholders, it is clear that the facility is a major and indeed invaluable resource for anyone engaged in studies of the marine and freshwater fishes of South Africa and adjoining regions. The importance of the SAIAB fish collections and library were attested to by numerous external stakeholders interviewed during the review and is clear at both the national and international levels given the utilisation of these resources by those outside stakeholders. Stakeholders are clearly satisfied with the willingness of staff of the facility to serve as sources of information on a variety of questions covering the spectrum of fish research in marine and inland waters. Publications by SAIAB scientists also were highlighted as valuable tools by members of the user communities and upcoming products are looked forward to with anticipation. Stakeholders were similarly positive about the services and resources available in the library which was recognised as a unique national and regional resource.
- Stakeholders hold SAIAB in high regard and as would be expected, the diverse groups of stakeholders each brought different perspectives to the discussion. Nonetheless, it was striking that one of the major issues raised by the vast majority of stakeholders involved the present name of the facility. Clearly, the renaming of the former JLBSI, which had a long history as an internationally recognised ichthyological centre, as SAIAB brought with it expectations. Specifically, it was assumed that the mandate of the new NF would extend beyond its traditional research focus on fishes to encompass many other taxa. Foremost among these were aquatic invertebrates (e.g. aquatic insects) and to a lesser degree the other groups (e.g. molluscs, corals) that contribute to the rich aquatic biodiversity in the inland and marine waters of South Africa and adjoining regions. Associated with this perception was an expectation that SAIAB might also assume the responsibility for the long-term maintenance of the national collections of these non-fish groups.
- In their comments the stakeholders were appreciative of the fact that SAIAB had not received additional funding to permit the capacity building that would be necessary to carry out the expanded mandate implicit in its present name. This expanded capacity would involve not only staff with expertise in non-fish groups, but also a significant expansion of infrastructure, support staff, and associated resources (e.g. pertinent necessary books, journals, and reprints). The sense of the stakeholders was that the necessary funding is unlikely to become available in the short, or perhaps even long, term. Furthermore, it was noted that numerous governmental stakeholders at the national and provincial levels would have to agree on the development of such an expanded NF. This was judged to be a complex process. In light of those issues, the consensus of the vast majority of the stakeholders was that the SAIAB should take on a name that better reflects the reality of its history and likely near term research foci (e.g. South African Institute of Ichthyology).
- Stakeholders involved in the study/conservation/management of inland fisheries and water systems emphasised that they felt that SAIAB lacked sufficient research capacity to address

the numerous outstanding questions involving freshwater fishes in South Africa and immediately adjoining regions. Such information is necessary to begin to address questions involving the possible consequences of anthropogenic alterations of water bodies and adjoining terrestrial systems, identify and endeavour to protect endangered species, manage stocks of species important for indigenous and sports fisheries, and deal with the issue of invasive species, many of which would likely have deleterious impacts on native fishes and other freshwater organisms. This class of stakeholders strongly recommended increased capacity in freshwater fish research at SAIAB in light of the likely short time from before issues in freshwater ecosystems become critical not only in South Africa, but also adjoining regions.

- Stakeholders in the Higher Education sector were positive about their interactions with SAIAB both in terms of the library and the willingness of staff to provide input to students whether resident at Rhodes or at other institutions. Many of the educators were cognisant of the need to develop the next generation of fish researchers in order to address upcoming retirements at SAIAB and to deal with equity issues. Summer training programmes for students and the inclusion of block grants to support students at different levels of development within the funding base of SAIAB were mentioned as new avenues to interest more students in the study of fishes and quickly address these issues.
- SAIAB has also been increasingly successful in reaching out to the non-research communities in South Africa by various initiatives including in-house tours and lectures, participation in local activities such as SciFest, and increasingly by its outreach to broader potential constituencies by its mobile education service. These initiatives and the revamped Ichthos and other non-research outreach programmes not only serve to highlight to the public the diversity and importance of the rich, and in some cases threatened, fish faunas of South Africa, but are a critical part of initiatives to encourage students of all backgrounds to consider careers in science in general and aquatic biology in particular.
- Community outreach activities are by their nature difficult to evaluate given that the intended results, an increased awareness by members of the target audience of aquatic biodiversity and the threats that it faces, are difficult to quantify. Similarly, it may be many years before it is apparent that the decision by a student to pursue a career in science was a consequence of their exposure to an outreach activity. That being said, the programmes that have been initiated by the staff at SAIAB, particularly in the communications unit, are of the type utilised and judged to be successful in major education museums in North American and Europe. Formal evaluation parameters of the success of these outreach programmes may be appropriate, but these are more appropriately developed by NRF in order to assure comparability in such reviews across all NFs. in order to assure .

4 Strategic direction of the facility

(see Goals 1 to 3 & 7 of the Strategic Plan and Item 6.1 of the Terms of Reference)

4.1 How successful has SAIAB's transition from a DCI to a NF been?

The SETI review defines a NF as a major National Facility centred on substantial instrumentation, equipment or skills base and is established to satisfy an identified national social, economic or technological need and which, because of expense or capabilities, is justified on the basis of shared research and/or service use by several organisations. The facility is made available for research by internal or external researchers on the basis of merit of proposals as assessed by peer-group review while service work is commercially supplied to industry. The work programme of the facility is balanced to ensure an appropriate allocation of time to both research and service activities.

It should be recognised that SAIAB is currently one of only two NFs that is not built around large equipment. Rather it is centred on a shared skills base and an ichthyological collection (specimens, literature) of national and international importance. In that sense, the transition from a DCI to a NF has been a smooth one, because its prime function as a DCI was collections' management and collections-based research. Nothing has changed, except that the stable base and resources provided by the NRF have allowed SAIAB to grow and secure the collections and to improve the diversity of the skills-base.

This has had a knock-on effect and it has allowed SAIAB to begin to confront one of its biggest challenges; that of providing a more service-orientated operation. This was to have been achieved by shifting its operational focus to national and international agendas and by engaging strategic national and regional stakeholders. The higher (than DCI) profile needed to achieve its recognition and worth was to be achieved through developing an effective communications strategy (see chapter 6.2.3) and by improving its presence throughout the national and regional sector, while at the same time taking cognisance of equity issues.

To a very large extent this has been achieved by a logical restructuring of the organisation, a more efficient use of available resources and by strong management.

While stakeholder satisfaction with SAIAB is generally satisfactory, and SAIAB is delivering on its mandate with regards to the generation, dissemination and application of knowledge on matters of national importance, it has yet to identify a focus for its (especially research) efforts. As a consequence, its skills base is perhaps not being drawn upon as much as it could be, or as efficiently and effectively as it could be. There is some duplication between the services offered by SAIAB and those offered elsewhere in the sector and this needs attention, though we recognise that efforts are complementary in most cases. Although the lack of focus may reflect the broader implications of the name change and poor corporate marketing, SAIAB is in a unique position to provide a service to the community. It could, for example, coordinate a national/regional database and act as the SABIF node for "aquatic biodiversity", thereby generating a service analogous to that provided by e.g. HartRAO or iThemba LABS. It could also provide a forum for, for example, national/provincial policy development in the area of freshwater biodiversity. A focus on the provision of a unique national/regional service needs to be explored by SAIAB in more detail, following consultation with the sector. It needs also to be investigated with a specialist advisory board to SAIAB: a structure that has not hitherto been implemented in accordance with the recommendations of the system wide review of SETIs.

At the moment, the work programme of the facility is not balanced to ensure an appropriate allocation of time to both research and service activities across all sectors of the organisation (see Item 1.1 above) and this needs attention. For example, almost all of the freshwater research is of a service nature and is externally driven, whilst almost all of the marine research activities are internally driven. We note in this regard that there has been no clear strategy by SAIAB regarding the sale of services to industry (what defines a commercial service and what constitutes an industry in this sector?). There is also a lack of clarity on the role of the programmes division in generating funds for other research within SAIAB.

With reference to the system wide review of SETIs it is clear that there has been no specific allocation of funds by relevant government departments (e.g. DEAT, DWAF) to SAIAB other than those competitively bid for by SAIAB staff. Such allocations are deemed important, as they will allow SAIAB to provide the services mandated from them as a NF.

In conclusion, it is recognised that SAIAB has made the first step in its transition from a DCI to a NF, and it must now consolidate its efforts and plans so that it can fulfil its mandate to the broader national and international scientific community.

4.2 Comment on the implication of the creation of SANBI on SAIAB

SANBI (South African National Biodiversity Institute) is new, and there is uncertainty regarding exactly how it will fulfil its mandate. There is some functional overlap between SANBI's mandate, as outlined in the Biodiversity Act, and that of SAIAB. SANBI must:

- Coordinate and promote the taxonomy of South Africa's biodiversity.
- Collect, generate, process, coordinate and disseminate information about biodiversity and the sustainable use of indigenous biological resources, and establish and maintain databases in this regard.

SANBI may

- Establish, manage, control and maintain collections of dead animals that may exist.

SAIAB by contrast, aims to serve Africa's needs in understanding fishes and aquatic environments, by being an interactive hub focused on serving the nation through generating, disseminating and applying knowledge to understanding and solving problems on the conservation and wise use of African fishes and aquatic biodiversity.

SANBI can be seen as a sector-specific institution (G von Gruenewaldt, 2004: A comparison of the mandates of the NRF and the South African National Biodiversity Institute and the transfer of the National Zoological Gardens to the NRF: A draft discussion document), serving the mandate of DEAT with regard to the management of biodiversity. SAIAB, by contrast, is a multi-sectoral institution serving the needs of a far wider community, and with interests extending beyond the national borders. As a consequence, it could be argued that SAIAB should remain within DST, in much the same way that the National Zoological Gardens is positioned within DST. That said, there is clearly an overlap in the function of SAIAB and SANBI and it is imperative that a dialogue between the two be entered into as a matter of some urgency in order to resolve these issues.

During an interview with Prof BJ Huntley, it became clear that SANBI has no intention of taking over SAIAB in the medium term. Yet it is also clear that in order to fulfil its mandate, SANBI will have to collaborate with a wide number of institutions, agencies and government departments working in the field of biodiversity that are recognised as leaders in their field of expertise. The information needed by SANBI from these other bodies would ideally be extracted from existing databases. Money would be made available by SANBI to pay for this service. We can anticipate that SAIAB will be one of those institutions contracted to provide data on fishes, but possibly also on other aquatic groups.

SAIAB should be proactive in these discussions and should be prepared to answer positively to the possible range of services that may be requested. Such service provision has a number of implications for the:

- Management of data: ease of extraction from the database of the information that will be requested by SANBI is important.
- Collection of data: what are the gaps in the inventory of South Africa biodiversity, what are the priorities for future ichthyological inventories.
- The nature of collaborations that should be established with other institutions also managing databases (nature conservation boards, universities etc.).

The evaluation team feels that the national niche for SAIAB is clear with respect to freshwater ecosystems, and that SAIAB is the obvious data supplier for SANBI in this regard. However, the research landscape in the marine environment is more complex and although SANBI should draw on its in-house expertise in marine biodiversity at MCM as the first source of information, SAIAB could provide additional data as appropriate.

We are reluctant to make recommendations regarding the "home" of SAIAB to the NRF, especially with regard to DEAT because SANBI does not yet know how it will operate.

Arguments based on the articles of SANBI's mandate highlighted above are premature, and SAIAB needs to explore its role there in the future. SAIAB's activities in the freshwater sector overlap with those of DWAF and DLAA (we urge SAIAB to enter into formal discussions with the relevant components of these Departments too: there is no existing formal relationship between SAIAB and these ministries, yet any conservation policy needs to be linked to policies of water use management), whilst those in the marine environment overlap with those of DEAT; of course there are also overlaps with DAC in terms of collections. This landscape is confusing and dynamic, and we cannot recommend a move at this stage.

4.3 To provide the Institute with a name that reflects its new dispensation within the NRF as a National Facility (see Goal 7 of the Strategic Plan)

Achievement

- SAIAB changed its name from the JLBSI in 2000.

Assessment and Recommendations

- Although the NRF board approved the renaming of SAIAB, this move has not been well received by the wider community – emotional issues aside. Indeed all the stakeholders that were interviewed by us expressed some concern about this. Clearly, the renaming of the former JLBSI, which had a long history as an internationally recognised ichthyological centre, as SAIAB brought with it certain expectations. Specifically, it was assumed that the mandate of the new NF would extend beyond its traditional focus on fishes to encompass many other taxa. Associated with this perception is an expectation that SAIAB might also assume the responsibility for the long-term maintenance of the national collections of these non-fish groups.
- Yet the research still being conducted by SAIAB staff, and the collections they maintain, are both nearly exclusively directed towards fishes¹.
- This uncertainty regarding the role that SAIAB plays within the sector, and the expectations its name engenders, is problematic, and effective marketing as a NF can only take place once SAIAB has put together a strategy (with input from its advisory board) to address this.
- In their deliberations about this issue, SAIAB staff needs to consider that almost all collections of aquatic invertebrates are insecure. They also need to take cognisance of the following issues:

Freshwater

- SAIAB holds the major freshwater fish collections in South Africa (though small holdings also reside at the South African Museum (SAM) in Cape Town, and in the Albany Museum in Grahamstown), as well as a library dedicated to fish. However SAIAB at the moment has no senior expertise in freshwater invertebrates; no collections of freshwater or brackish invertebrates; almost no significant literature on freshwater invertebrate taxonomy.
- The national collection of freshwater invertebrates resides in the Albany Museum in Grahamstown (~200 m from SAIAB), and collections of freshwater plants are concentrated in a small number of herbaria scattered across the country. What little taxonomic expertise there is in these groups of freshwater organisms, and supporting documentation, resides at the same institutions. The resources are few and they are localised.
- Expertise in freshwater ecology is more widely distributed amongst the various national and provincial conservation boards, the water-related and agricultural ministries (both provincial and national) and in some tertiary institutions and private consultancies. While the expertise in freshwater ecology may be greater than that in taxonomy, it should be realised that

¹ It is recognised that SAIAB manages a single project with a wider focus, the ACEP

much of the work is focussed on management and there would appear to be little fundamental work being conducted.

- Importantly, there is no single body that is coordinating research in, or that has a responsibility for, freshwater biodiversity.

Marine

- Whilst SAIAB may hold the national fish collection, another locally important (especially chondrichthyan) collection of marine fishes is housed at the SAM.
- There is no national collection of marine invertebrates and significant holdings reside at a number of provincial and national museums and research institutions. Collections of algae can be found at three herbaria. Supporting literature is also scattered.
- Expertise in the taxonomy of these marine taxa is similarly dispersed: SAIAB and the SAM support two permanent and one (respectively) marine fish taxonomists (each institution also has one emeritus appointment); there are two exclusively marine invertebrate, and no algal, taxonomists based at national or provincial museums/herbaria and expertise resides almost solely within tertiary and other research institutions.
- Ecological research on marine organisms and systems is also scattered across South Africa. MCM (DEAT) supports the greatest concentration of expertise, though as their name suggests, their work is focussed on the sustainable management of fisheries and coastal resources and ecosystems. Marine ecologists can be found at almost all coastal universities and in the provincial environment and conservation departments of those provinces with a seaboard, as well as at ORI and SAIAB and in a number of private consultancies. Although research is loosely co-ordinated through the South African Network for Coastal and Oceanic Research, there is much duplication of expertise.
- MCM have the responsibility for marine biodiversity.

In the absence of significantly increased funds (directly from DST, or with allocations from DEAT, Department of Arts and Culture, DWAF (etc) and provincial budgets), or of a big, sellable vision, it seems unreasonable for SAIAB to be nationally responsible for “aquatic biodiversity” (marine, brackish and freshwater environments; vertebrates, invertebrates, plants and protists) – especially given the increasing, but unknown, role that SANBI will play in this landscape. Aside from space constraints, there are also political issues that will need to be addressed.

That said, there are opportunities for SAIAB to take a lead or central role in the management of information about “aquatic biodiversity” within the freshwater sector, but a decision to properly move in this direction (and thereby live up to some of the expectations raised by its current name) would require that SAIAB make some strategic appointments. It would need, at the very least, to consider the appointment of a senior person/s in the field of freshwater invertebrates, who could take a lead in directing and conducting meaningful research in this environment. Careful consideration should then be given to how SAIAB will deal with the issue of the national collections in the Albany Museum. We are aware that proposals to reinforce collaboration have failed in the past. However the logic is there.

Such a focus on fresh- and brackish water biodiversity would inevitably create tensions within the marine sector of the aquatic community; the landscape of which is substantially more complex. However, given the responsibilities of MCM to manage marine biodiversity management, it is not unreasonable to imagine some contractual partitioning of function. SAIAB needs to take these issues into consideration in its discussions of a strategy around its name.

On the other hand, if SAIAB’s strategy is to continue with a focus on fishes, then a name change becomes mandatory. Of course, re-branding will have a number of negative side effects, but if appropriate marketing is used this may be a short-term problem. Such a move would also require careful attention to the mentoring of current staff so that they are stimulated enough to pursue research in the core business area.

We urge SAIAB to discuss the issue of their name and the role that they can play within the sector, but recommend that they play to their strengths.

4.4 Succession Planning

The ageing staff complement in certain core competencies (especially research) is a matter of great importance and SAIAB is urged to develop a strategic plan around this issue immediately.

Recommendations

- We recognise that this will not be easy given the tension between equity and excellence.
- **Although attention should be given to ensuring a steady pipeline of recruits for the future, it is clear that this may not solve their current crisis in time and alternatives (head-hunting, international appointments etc.) should be investigated.**
- Of critical importance will be the eventual appointment of new recruits in the core national competencies of SAIAB: marine and/or freshwater (fish) taxonomy, and freshwater (fish) ecology. If SAIAB is to lead research in these fields at the national/regional level, careful consideration needs to be given to the individual research skills, capabilities and vision of prospective appointees.

Acknowledgements

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A review such as this, conducted at a number of locations and with tight time-lines, would not be possible without logistic support. All those staff members in the corporate services division of the NRF are thanked for making this possible and for ensuring that our every need was met. We are grateful too for their thoughtful choice of accommodation.

We are especially grateful to those stakeholders that gave up their time for us: their input was invaluable and it helped to shape some of our thoughts in the review. These include: Prof A Booth, Prof P Britz, Prof M Davies-Coleman, Prof T Hecht, Prof C McQuaid, Prof C Johnson, Prof J Duncan, Prof P Terry, Mrs M Kenyon, Mrs L Burton, Ms A Childs, Mr J Stapley, Mr P Vorwerk (Rhodes University); Prof T Wooldridge (University of Port Elizabeth); Prof R Bally, Prof D Okeyo (University of Fort Hare); Prof C Griffiths, Prof G Branch (University of Cape Town); Prof A van Jaarsveld (University of Stellenbosch); Prof P Bloomer, Mr E Swartz, Mr A Klopper (University of Pretoria); Prof H Baijanth (University of KwaZulu-Natal); Dr J Cambray (Albany Museum); Dr L Compagno (SAM); Dr J Augustyn, Dr L Hutchings, Mr M Roberts (MCM); Dr K Hamman, Mr D Impson (Western Cape Nature Conservation); Dr I Russell (South African National Parks Board); Prof BJ Huntley (National Botanical Institute); Dr R Little (WWF - SA); Dr R Adam (DST); Mr P de Villiers (Free State Department of Environmental Affairs); Dr J Engelbrecht (Mpumalanga Nature Conservation); Mr M Nepfumbada, Mr M Silberbauer (DWA); Mrs L Sello (DEAT); Mr R Taylor (Ezemvelo KwaZulu-Natal Wildlife); Dr R van der Elst (Oceanographic Research Institute); Dr A Connell (CSIR, retired); Dr P Garrett (Two Oceans Aquarium); Mrs M Crampton (NISC-SA); Mrs P van Zyl (Yellowwoods Primary School); Mr B Wilmot (SciFest); Dr S Mitchell (Water Research Commission); Mrs B Damonse, Ms R le Roux, Ms L Labuschagne, Mr P Thompson (NRF); Dr T Andrew (EnviroFish Africa); Dr A Paterson (Coastal and Environmental Services).

Annex 1 - List of Acronyms

ACEP: African Coelacanth Ecosystem Programme
CBD: Convention on Biological Diversity
DAC: Department of Arts and Culture
DCI: Declared Cultural Institution
DEAT: Department of Environmental Affairs and Tourism
DLAA: Department of Land Affairs and Agriculture
DST: Department of Science and Technology
DWAF: Department of Water Affairs and Forestry
FAO: Food and Agriculture Organisation
FISHLIT: Fish Literature database
GAAP: Generally Accepted Accounting Practice
GIS: Geographic Information System
HartRAO: Hartebeesthoek Radio Astronomy Observatory
HBI: Historically Black Institution
IRD: Institut de Recherché pour le Développement
iThemba LABS: iThemba Laboratory for Accelerator Based Sciences
JLBSII: JLB Smith Institute of Ichthyology
KPI: Key Performance Indicator
MCEN: Marine and Coastal Educators Network
MCM: Marine and Coastal Management
MoU: Memorandum of Understanding
NEPAD: New Partnership for African Development
NISC-SA: National Inquiry Services Centre – South Africa
NF: National Facility
NRF: National Research Foundation
NSI: National System of Innovation
ORI: Oceanographic Research Institute
PFMA: Public Finance Management Act
RU: Rhodes University
SAASTA: South African Agency for Science and Technology Advancement
SABIF: South African Biodiversity Information Facility
SADC: Southern African Development Community
SAIAB: South African Institute for Aquatic Biodiversity
SAM: South African Museum
SANBI: South African National Biodiversity Institute
SANCOR: South African Network for Coastal and Oceanic Research
SciFest: Science Festival
SET: Science, Engineering and Technology
SETI: Science, Engineering and Technology Institute
ToR: Terms of Reference
WRC: Water Research Commission
UWC: University of the Western Cape

Annex 2 - Recommendations for Future Reviews

Panel for the Review of the South African Institute for Aquatic Biodiversity (SAIAB) - Christian Lévêque, IRD, France (Convenor); Mark Gibbons, UWC, South Africa; Richard Vari, Smithsonian Institution.

The review process was intense, involving three days of meetings with SAIAB staff and stakeholders in Grahamstown, one day of meetings with stakeholders in Cape Town, one day of meetings with stakeholders in Pretoria and slightly over two days in Pretoria discussing and writing the report. The overall process proceeded smoothly and was greatly facilitated by NRF staff in each location. Having arrived at the end of the process, we have several suggestions concerning future reviews:

A break in the interview process following the meetings at SAIAB would have been useful. Both Monday and Tuesday were completely filled into the evenings, followed by the departure for, and flight to, Cape Town on Wednesday afternoon. As a consequence of the full schedule, Review Panel members had little time to discuss the process, their ideas and questions with each other until the end of the interview process. Similarly, requests for additional information or clarification on issues directed to members of the SAIAB management and staff had to be squeezed in on an ad hoc basis between the press of other meetings. It was also clear in retrospect that the drafting of the final document would have proceeded more efficiently if the Review Panel had a period in the middle of the process to discuss their questions and conclusions immediately following the meetings with stakeholders at SAIAB. Such a discussion period would also have served as a useful foundation for subsequent meetings with stakeholders in Cape Town and Pretoria.

The panel was asked to address some issues beyond those usually considered in such reviews, in particular the charge to deal with transformation issues. The panel is cognisant of the need to address this issue and strongly supportive of race and gender equity at all levels within South African society. The question we have is whether such a Review Panel, composed as it was of a majority of foreigners, was the best mechanism to address this issue. That question is perhaps better addressed by an internal NRF panel that better understands the needs and challenges presented by this complex issue.

A second such issue involves certain aspects of the transition of SAIAB from a declared cultural institution to a national research facility. The panel members are ill equipped to evaluate many of the changes in the financial management practices of the Institute, but assumed that the appropriate NRF oversight operations were operating efficiently.

The panel deliberations and writing of the final report would have been facilitated by having an exact point-by-point correlation of the Terms of Reference and the Self-Evaluation. We recommend that Terms of Reference for future reviews be developed in advance of the Self-Evaluation process, with the latter prepared in the same order and directly answering the panel charges in the Terms of Reference. The review process was also complicated by the need to refer to a number of other documents in order to understand statements within the Self-Evaluation. Future Self-Evaluation packets should be freestanding documents with all necessary data in a single packet.

The actual writing of the report in Pretoria went well, but we urge that future panels be pre-emptively equipped with printers and printer supplies, and perhaps access to several full computer-work stations rather than having to use less user-friendly laptop units.