RIVER HEALTH

NEWSLETTER OF THE RIVER HEALTH PROGRAMME

No 6 • DEC 1999

TOWARDS PROVINCIAL IMPLEMENTATION

With the deadline for full implementation of the River Health Programme fast approaching, provincial implementation teams are gearing up towards the current short-term target of "by December 2000, provincial implementation teams implement the RHP for at least one river system per province."

The North West Province

The North West Province RHP implementation team have accepted the challenge and have recently made their first strides towards provincial implementation.

Aerial surveys

During September this year, Mr Stuart Mangold (Department of Agriculture Conservation and Environment, North West) of the RHP provincial implementation team, with assistance from Dr Neels Kleynhans and Mr Dana Grobler of the Institute for Water Quality Studies (IWQS) conducted a helicopter survey of three key rivers in the eastern region of the province. Video footage for habitat assessment was taken for the Groot Marico, Heks and a large portion of the Elands River. The aerial survey also contributed information of possible monitoring and reference fish and SASS sites as well as land-use activities within the catchment.

Field trip

The helicopter survey was followed by a "ground-truthing" investigation of the potential SASS sites spotted from the air. Ms Christa Thirion, Ms Mary-Jean Gabriel and Ms Annelize Gerber of the IWQS and Mr Zeth Setenane from the Department of Water Affairs and Forestry office in Hartebeespoort were joined by the North West RHP provincial champion, Dr Margaret Kalule-Sabiti, Mr Stuart Mangold and eight nature conservation staff (all from the North West Department of Agriculture, Environment and Conservation) for a three-day field trip. This was a welcome training opportunity for the staff newly appointed to the Provincial Monitoring Sub-directorate to experience first hand the SASS biomonitoring technique in action. These officials,

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Dr Margaret Kalute-Sabiti and Annelize Gerber get "SASSing" in the Groot Marico River

This is the sixth issue of the River Health newsletter. We focus on the RHP Awareness Day held recently in the Free State, the North West Province gearing towards provincial implementation, industry's involvement in biomonitoring in Mpumalanga, more about community-supported project and the bio-monitoring data storage system.

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HOW YOU CAN CONTRIBUTE

The success of the River Health Programme depends upon the involvement of as many stakeholders in water resource management as possible. If you or your organisation would like to know more about the programme and how you can become involved, please contact:

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based in various centres around the province such as Mafikeng, Vryburg, Mothibistad, Zeerust, Brits and Rustenburg, will ultimately be doing the biomonitoring fieldwork in the North West. Four sites on the Groot Marico and two on the Heks River were sampled during this field trip.
Other key rivers within the province were also identified for biomonitoring. These are:

- the Mooi River near Potchefstroom which is facing serious environmental threats such as the effects of leaching from slimes dams at gold mines. This impacts on both groundwater and surface water quality.
- the section of the Vaal River forming the boundary between the Free State and the North West; it is envisaged that this will be a collaborative biomonitoring venture with the Free State
- the Molopo River in the northern region of the province
- the dolomitic eyes or springs such as the Molopo, Schoonspruit, Malmane and Wondergat Eyes, which have been identified as unique waterbodies of special conservation significance and extremely sensitive to the effects of abstraction and groundwater pollution.

Where to from here?

The immediate plan to get the North West River Health Programme fully functional is to train the three monitoring teams in SASS. It is hoped that this will be done by the end of this year and that monitoring will begin in earnest within the first three months of next year. All efforts will be made to start fish sampling and riparian vegetation monitoring as well. The North West Department of Agriculture, Environment and Conservation will be collaborating with the University of Potchefstroom and the University of North West on RHP related research.

For more information on biomonitoring in the North West Province

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River Health Programme Awareness Day in the Free State

A whole-team approach: The Municipality of Virginia, the DWAF and Free State DEAT joined forces with the Sand/Vet Forum to create awareness of the value of biomonitoring.

About forty stakeholders attended the River Health Programme (RHP) Awareness Day that was recently held in Virginia in the Free State.
The event was held mainly for members of the Sand/Vet Forum and was organised by personnel from the Departments of Water Affairs and Forestry (Free State) and Environmental Affairs and Tourism (Free State), the Municipality of Virginia and personnel from the Institute of Water Quality Studies, Pretoria.

The aim of the Awareness Day was to create awareness of the activities of the Free State RHP and to demonstrate the value of biomonitoring in managing water resources, particularly in the Sand/Vet River catchment which has been identified as a priority catchment in the Free State region because of large-scale industrial, mining and agricultural activities and effluent discharges. In view of this, the Sand/Vet Forum was initiated in 1992 and have since made significant progress towards developing a community-based holistic river management strategy. This has led to the establishment of a biomonitoring programme in the catchment.

In giving the interested group of stakeholders background on biomonitoring in the Free State, the provincial champion, Mr Pierre de Villiers, said that creating awareness of a programme such as the RHP is the key to illustrating the value of biomonitoring and the role it will play in managing the country's water resources.

The group was also treated to a SASS4 and fish sampling demonstration at the Bloudrif Spruit in order for them to gain first-hand experience of the methods used in biomonitoring and to compare the results obtained from the different methods.

The event was met with many positive comments and enthusiastic interest.

More information

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Industry's involvement in biomonitoring in the Upper Olifants River, Mpumalanga

In contributing to the proper management of the country's water resources, the power generation and mining industries (Ingwe Coal, Anglo Coal, Duiker Mining, Sasol Coal, Woestalleen Colliery and Eskom) in the Witbank Dam and Middelburg Dam sub-catchments are jointly funding a two-year biomonitoring programme in all the major tributaries in the upper section of the Olifants River. This biomonitoring programme was implemented to assist with management of the Mine Water Managed Release Project, which is co-ordinated by the company Wates, Meiring & Barnard (Pty) Ltd, and the Department of Water Affairs and Forestry.

ECOSUN (Ecological Consultation and Environmental Monitoring specialists) was appointed to conduct the biomonitoring programme, which commenced during March 1999. The main objectives of this programme are to measure, assess and report on the health, status and possible trends of the ecosystems of the rivers and streams in the Witbank Dam and Middleburg Dam sub-catchment. This will help to identify possible impacts of managed saline mine water releases on the health of the aquatic ecosystem and to identify trends or changes that may occur as a result of these releases.

The biomonitoring programme includes response and habitat indicators like the South African Scoring System (SASS4) Index, Fish Assemblages Integrity Index (FAII), Habitat Quality Index (HQI) and the Integrated Habitat Assessment System (IHAS). This programme is regarded as a dynamic staged decision-making process which will be continuously evaluated in order to incorporate new needs and the latest research findings.

ECOSUN is working closely with Dr Johan Engelbrecht of the Mpumalanga Parks Board (RHP Provincial Champion for Mpumalnga). Data gathered during the biomonitoring programme will be incorporated into the RHP database.

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Call to industry

The River Health Programme would like to hear from industry about the role that biomonitoring is playing in their environmental performance management, particularly in attaining ISO 14001 status.

Please forward a short summary and a photo or two of your biomonitoring activities to:

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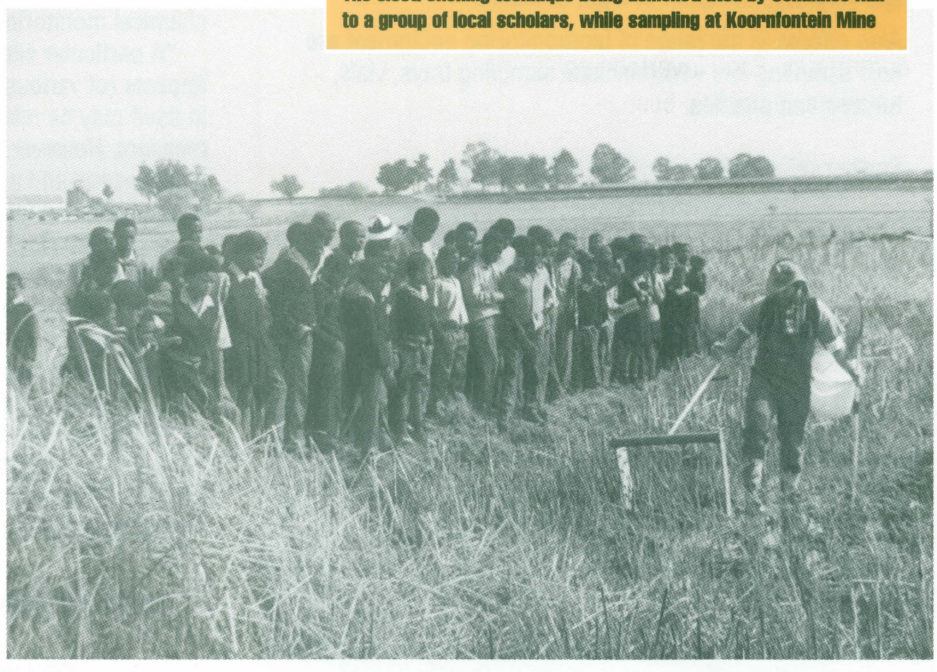
SASS developer

The South African Scoring System (SASS) index was developed by Dr Mark Chutter of AfriDev Consultants in Pretoria. This was reported incorrectly in the previous newsletter. We apologise to Dr Chutter.

The electrofishing technique being demonstrated by Johannes Rall to a group of local scholars, while sampling at Koornfontein Mine



COMMUNITY-SUPPORTED PROJECTS

The development of linkages between the River Health Programme (RHP) and communities living in priority catchments is progressing well. Through community-supported projects facilitated by the Grassroots Communication and Environmental Education programme of the RHP, the benefits of improving the health of rivers in priority catchments are demonstrated to communities and the means of involving them are investigated.

Community-supported projects

So far, three community-supported projects have been established. These are the Cork Trust community in the Sabie River catchment on the border of the Mpumalanga and the Northern Province, the Bloudrif and the Meloding communities in the Sand/Vet catchment, Free State Province.

A series of meetings and workshops were held with community representatives in both catchments. The meetings culminated in visits to the river where community representatives were provided with a brief historical and geographical background of the river as well as the impacts of human activities that contribute to the deterioration in the river's health.

Members of the technical team demonstrated the SASS4 method, its usage and general interpretation of the results. This helped to raise the community representatives' awareness of the problems in the aquatic ecosystem. At the same time, members of the team were made aware of local complexities associated with those problems.

Social tools

The information gathered from the interaction with the three communities will be used to develop what can be called "social tools" for use by river ecologists and water resources managers during the implementation of the biomonitoring programme of the RHP. The tools will provide water resource managers with an insight into the traditional and cultural attributes of communities in catchment areas, especially rural communities. Water resource managers will be introduced to different approaches of interacting with communities, what to do and what not to do when seeking the involvement of a community in the RHP. These tools will also assist resource managers to develop an appreciation of the socio-economic circumstances that often lead to the deterioration of the quality of the resource.

More information

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What is SASS?

SASS (South African Scoring System) is a rapid method for assessing river ecosystem health from the aquatic invertebrate community. Each invertebrate family or genus has been assigned a score between 1 (very tolerant of change) and 15 (very sensitive to change). The families and their scores are listed on a check list. Invertebrates are collected from the river, tipped alive into a large white tray containing water, where they swim about. The tray is examined as to the kinds of animals present which are ticked off on the check list. From the animals found it is possible to calculate the sum of the scores of the animals found, the number of kinds of animals and the average score per kind of animal. The higher these three scores the more healthy the river ecosystem.

BIOMONITORING SHORT COURSE

A short course on **"The role and use of biological monitoring in aquatic resource assessment"** will be held in Grahamstown from 21-25 February 2000.

The course was initiated by the Institute for Water Quality Studies (IWQS) of the Department of Water Affairs and Forestry and the CSIR's Division of Water, Environment and Forestry (Environmentek) and is currently coordinated by the Institute for Water Research at Rhodes University in Grahamstown.

Aquatic biomonitoring, or response monitoring is increasingly used as a monitoring and assessment tool in water resource management. This course will provide a basic understanding of the concepts, advantages, uses and limitation associated with different biomonitoring techniques, including field bio-assessment and toxicity bioassays. The course is designed to address the relevant concepts and the interplay between biomonitoring and resource management, rather than the technical details of how to conduct monitoring. There will be a balance between theoretical lectures (presented by experts from various organisations), hands-on exposure in the laboratory and field, group discussions and problem solving. Presentations and course material will be in English.

WHO SHOULD ATTEND?

Mid-level managers, planners and other officials from government or private institutions who need and want to improve their knowledge and use of biomonitoring in general.

COST

The course fee is R3 500 per person (excluding accommodation) and includes lecture material and use of field and laboratory equipment.

ENQUIRIES

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The rivers database

Part of the success of the River Health Programme will depend on the production of accurate and reliable information. Thus, it is imperative that biomonitoring data are efficiently stored and accessible to all users. At present one of the problems facing the River Health Programme (RHP) is that biomonitoring data are not stored or managed in a standard fashion. The lack of a standard biomonitoring data protocol was one of the driving forces behind the initiation of the Rivers Database Project, which is currently being undertaken by Southern Waters and Softcraft Systems of Cape Town. The project's goal is to develop a national biomonitoring database specifically for the collation of data that is important to the River Health Programme.

The Rivers Database has a hierarchical structure, and is divided into three sections, each of which contains data that are assessed with different frequencies, ranging from basic site information such as location, which is unlikely to change, through to sample specific data, which are recorded after every site visit. Information at all levels will be easily accessible to users through a querying framework.

It is envisaged that a central body such as the Department of Water Affairs and Forestry (DWAF) would maintain the Rivers Database, with each province or authority having their own Rivers Database. Although mechanisms of updating the Rivers Database at provincial and national levels are being explored, the exact process of data transferal has not yet been finalised. However, it is likely that the Rivers Database will link up with the Water Management System (WMS) which is being developed by DWAF and which will ultimately house all water-resource related data. Discussions are currently under way with the database architects of the WMS to determine the most efficient means of transferring data between the Rivers Database and the WMS. A prototype of the Rivers Database will be available to all biomonitoring practitioners by December 1999.

For further information regarding the Rivers Database

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SASS training in the Western Cape

The River Health Programme is attracting much interest and support from industry in the Western Cape says Mr Jannie van Staden, RHP provincial champion for the Western Cape. This comes in the wake of the recently completed study on the assessment of the biological health of the Keursboom River, its tributaries and adjacent rivers using the SASS4 biomonitoring index. The study was conducted by Allanson Associates, Consulting Aquatic Ecologists.

Industries and municipalities have identified a need to train their staff to conduct biomonitoring in order for them to be proactive in their commitment to protect the country's water resources. In May this year, Professor Brian Allanson of Allanson Associates presented a SASS4 training course to some municipal and Mossgas employees in Knysna.

Mossgas have committed themselves to sponsoring the next SASS4 biomonitoring course in the Western Cape.

For further information on biomonitoring in the Western Cape:

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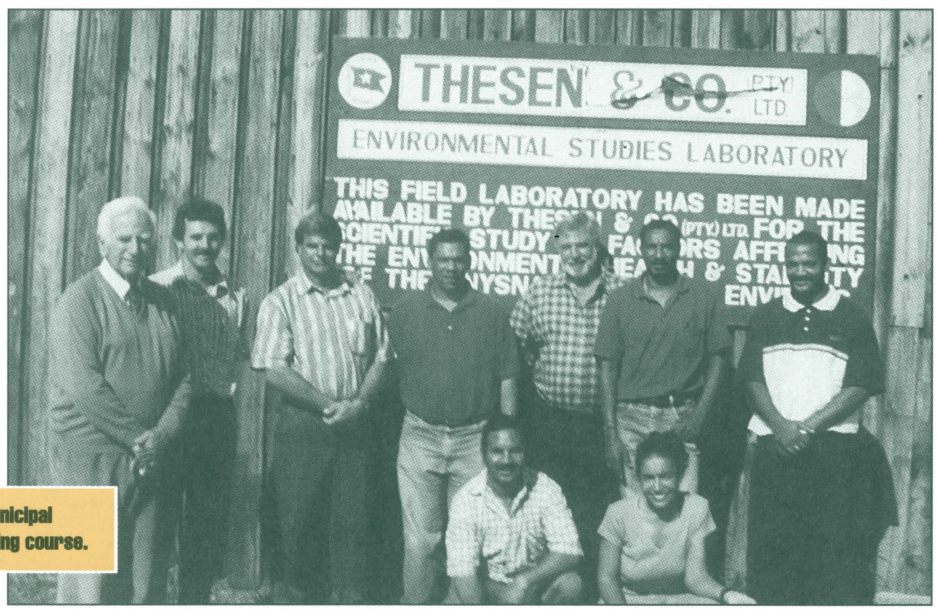

Prof Brian Allanson with Mossgas and municipal employees who attended the SASS4 training course.

ADVERTORIAL

Biomonitoring
nets and equipment

Freshwater scientists and entomologists are always on the look out for well-made and functional biomonitoring nets and ancilliaries.

Recently, a small manufacturing concern called CATCH EM BIOMONITORING has appeared on the local market to meet some of these needs, in particular the need for biomonitoring nets.

"CATCH EM" nets have been developed to meet the exacting needs of field work with strong seams, reinforced edges and corners and, an easy to use design. The technologies incorporated in these nets have been subjected to stringent field tests to ensure reliable service and results. Every net includes a small repair kit for fixing any minor damage on site. All nets are made from top quality imported nylon netting, produced to exact standards of mesh.

Standard size nets for SASS 4 requirements are usually available at fairly short notice, while custom-made nets like drift nets and other sampling nets, produced to individual specifications, may take a little longer. Nets are offered in various mesh sizes from 950 micron down to 50 micron. "CATCH EM" also offers standard net frames as well as custom-made sizes.

Of special interest to entomologists is the 2 m Malaise Trap designed to monitor the migration of insects. These are assembled across a flight path (eg. over a small stream) and insects intercepted are captured separately allowing determination of flight direction.

Also offered in the range of biomonitoring equipment are field sampling kits which include sampling trays, vials, forceps and pipettes.

Further information Mr George Johnstone
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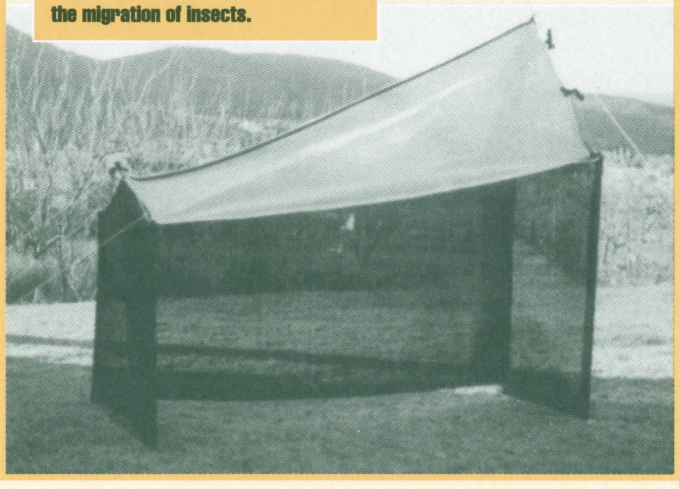
The Malaise Trap designed to monitor the migration of insects.



National Implementation Assessment available

The National Implementation Assessment is now available as Report 8 of the NAEBP Report Series.
The Implementation Assessment is a document which RHP Provincial Champions can use for basic guidance during implementation. Although the RHP overall is generally regarded as a success story, implementation in some provinces still faces considerable challenges. The document captures the essence of strategies that have proved successful in other provinces, summarises the evolution of the RHP, the status quo of the programme in terms of current national legislation and development of biomonitoring procedures and tools and also provides contact details of people whom RHP Provincial Champions can approach for further details. It also outlines the vision of the RHP for the year 2005 and the road ahead in terms of implementation.

Advantages of Biomonitoring

The following excerpt from the document highlights the advantages of biomonitoring:

"An important reason for using biomonitoring is that the integrity of the biota of riverine ecosystems provides a direct, holistic and integrated measure of the integrity of the river as a whole.

"Chemical monitoring of water quality reflects short-term conditions that exist at the time of sampling. A pollution "spike" (perhaps resulting from a single minor spill) can conceivably pass a monitoring site in a period shorter than the sampling frequency. Should this spike have a negative impact on, say, an aquatic invertebrate or fish community, it may be weeks, months or even years before this community returns to previous levels. Biomonitoring is more likely to detect this impact than chemical monitoring and do so long after the initial impact.

"A particular site may also be subjected to many minor impacts (of various kinds) over an extended period. Each impact in itself may be relatively small and, individually, difficult to measure. However, the cumulative impact, including antaganostic and synergistic effects, will be reflected in the ecological integrity.

"Biomonitoring, in general, offers a range of tools that can be tailored to particular purposes as well as to the available resources. These range from advanced eco-toxicological studies to simpler rapid assessments. A rapid biological assessment using the most widely-used invertebrate index, SASS4, is relatively cheap and can be conducted on-site."

The Implementation Assessment was compiled by Dr Kevin Murray of Insight Modelling Services, after extensive discussion with RHP Provincial Champions, researchers and other people involved in biomonitoring methods and procedure development.

If you are interested in obtaining a copy of the report, contact Liesl Hill at
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