

***FYNBOS FORUM***

***ANNUAL***

***RESEARCH MEETING***

**P R O G R A M M E**

17-18 July 1996  
The Nekies near Worcester

*Organised under the auspices of the  
Foundation for Research Development*

*by*

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## WEDNESDAY, 17 JULY 1996

08:00-09:00 Registration

*Chairperson : Dave McDonald*

09:00-09:10 Welcome : Christo Marais

09:10-09:30 Managing a community driven project - Fynbos Working for Water Project : Ken Coetzee / Tony Marshall

09:30-09:50 Communication strategy for the trial phase of the Fynbos Water Conservation Project : Aletta Jordaan

09:50-10:10 Integrating biological control into the Fynbos Working for Water Project : Mike Morris / Tony Gordon

10:10-10:30 Analysis of the impacts of alien plants on water resources - progress and issues : Dave le Maitre / A Chapman / G Forsyth / D Versfeld

10:30-11:00 TEA

*Chairperson : Penny Mustart*

11:00-11:30 The urban Fringe: Management of the natural/urban interface : Paul Britton / James Jackelman

11:30-11:50 Default management and the loss of fynbos species on the eastern Cape Flats : LM Raitt / Bruce McKenzie

11:50-12:20 Urban Conservation - Politics and Problems :  
Urban Conservation Managers Forum  
Managing fauna in Fynbos restoration :  
Dalton Gibbs *(Poster)*

12:20-12:50 Socio-economic challenges and perceptions attached to the management of natural areas : Desmond Stevens

12:50-13:50 LUNCH

*Chairperson : Christo Marais*

13:50-14:50 Fynbos Forum Annual General Meeting

14:50-15:10 TEA

*Chairperson : Maryke Middelmann*

15:10-15:30 An investigation into possible reasons for a decline in bontebok numbers in the De Hoop Nature Reserve :  
Ann Scott / Neil Fairall

15:30-15:50 Planning for coastal dune fynbos communities in response to development pressures : Gavin Hällstromm

15:50-16:10 Conservation of Fynbos legumes - Is it possible? :  
Annelise Schutte / Jan Vlok

16:10-16:30 Fire in the Fynbos: The saying of the sangomas and the ideas of an idiot : Neil Fairall

16:30-16:50 Competitive interactions amongst fynbos plants: A neglected perspective : Jan Vlok / Dick Yeaton

16:50-17:00 Comparing floras from five veld types in the Fynbos Biome : Chrisna Joubert *(Poster)*

17:00-17:30 Informal discussions

17:30-19:00 Witblits a part of Boland Culture - Klein Plasie Museum

19:00-20:30 Braai

## THURSDAY, 18 July 1996

07:30-08:30 Breakfast (only for those who stayed at The Nekkies on Wednesday, 17th)

*Chairperson : Charlie Boucher*

08:30-08:50 An analysis of the Fynbos Industry : **Maryke Middelman / Gerard Malan**

08:50-09:10 Integrated Catchment Management : Some lessons from the "Working for Water" programme : **Brian van Wilgen**

09:10-09:40 Integrated catchment management - a new approach in the Palmiet River catchment : **Barbara Gale**

09:40-10:00 Integrated Environmental Management to escape "the tyranny of small decisions": the need for local to regional landscape-level initiatives in the Western Cape : **Chris Burgers**

10:00-10:10 A multitemporal Landsat TM databank for the De Hoop area : **Leaza van Wyk** (Poster)

10:10-10:30 Private Nature Reserves - An Owners Perspective: **Douglas Jeffery**

10:30-10:50 Fire management strategies in natural areas within the urban environment : **David Daitz / Paul Britton / James Jackelman**

10:50-11:10 TEA

*Chairperson : Neil Fairall*

11:10-11:30 The Fynbos Working for Water Project - Why it is worth the while even though production is low : **Christo Marais / JB Eckert / Bertie van Hensbergen**

11:30-11:50 Restoration in the Fynbos Biome - **Charlie Boucher**

11:50-12:10 Clearing Invasive alien plants in the riparian zone - The Practice : **Chris Martens**

12:10-12:20 Fynbos fights back: One year of restoration following alien pine clearings and soil disturbance : **Pat Holmes** (Poster)

12:30-12:40 The challenges facing the conservation of threatened plant species in the Cape Metropolitan area (CMA) : **Lee Jones** (Poster)

12:40-12:50 Du Toitskloof national road reconstruction: environmental considerations and rehabilitation techniques : **Charlie Boucher** (Poster)

12:50-13:50 LUNCH

*Chairperson : Charlie Boucher*

13:50-16:00 Restoration and Fynbos Working for Water Field Trip - Du Toitskloof

***ABSTRACTS***

***OF***

***ALL***

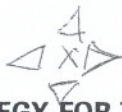
***PRESENTATIONS***

## MANAGING A COMMUNITY DRIVEN PROJECT - FYNBOS WORKING FOR WATER

K Coetzee / T Marshall  
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stages of starting up a big labour intensive reconstruction and development project are discussed. The aspects of training and community participation proved to be the major challenges. The socio-political aspects of the project provided the most unexpected problems during the "start-up" period while productivity remains a big problem currently. A highlight of the project is the successful implementations of an environmental education programme for both project workers and their community schools.

A major challenge now is to convert the supervisors and workers of the project into productive entrepreneurial contractors - working for water and forests.



### COMMUNICATION STRATEGY FOR THE TRIAL PHASE OF THE FYNBOS WATER CONSERVATION PROJECT

A Jordaen  
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The success of the Fynbos Water Conservation Project is and was - particularly during the critical trial period - largely reliant on public support and acceptance, in order to establish the project's concepts and principles. To achieve this, it was necessary to design a communication strategy which encompassed the needs and various implications of the project.

During the last months of the trial phase a communication campaign was conducted. The objectives of the campaign and the target audiences were

clearly defined in consultation with the project's management, with the aim of reaching as wide an audience as possible. Electronic and print media were used to publicise the message. Events were planned to increase in frequency until a carefully selected focus point which coincided with World Day for Water on 22 March 1996.

The achievements of the campaign can be ascribed to a few pertinent factors: well-defined aims, a clear message, a satisfactory budget, and last but certainly not least - the support and confidence of the project's management.

### INTEGRATING BIOLOGICAL CONTROL INTO THE FYNBOS WORKING FOR WATER PROJECT

MJ Morris / AJ Gordon  
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It is important that existing and future biological control programmes are integrated into the overall implementation of this far reaching project. Despite the fact that the emphasis of the project is on mechanical removal of alien vegetation, biological control agents can play a central role both in the short and long term success of the project. The optimal use of the agents will, however, depend on adequate planning and the integration of their use into the management programmes for each area. In some cases reserves may need to be established to protect the agents and enable them to multiply. The agents can then disperse from these reserves into areas of regeneration. Agents can also be harvested from these reserves and distributed to new areas. Agents should also be established in areas which will only be cleared several years from now in order to reduce seed banks and help prevent further dispersal of the aliens. Certain alien species, under effective biological control, should be disregarded or at least given a low priority for clearing. Biological control agents can be used to reduce the negative impacts of clearing and in some cases help reduce the costs of clearing. Additional biological control agents should also be introduced to help control emerging alien invasive species.

## ANALYSIS OF THE IMPACTS OF ALIEN PLANTS ON WATER RESOURCES: PROGRESS AND ISSUES

D le Maitre / A Chapman / G Forsyth / D Versfeld  
Environmentek - CSIR  
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The Water Research Commission is funding a 15 month project to assess the impacts of alien plants on water resources in South Africa. This project is being run by the Division of Water, Environment and Forestry Technology of the CSIR. The aim of the project is to provide information which can be used to prioritise alien plant control operations and ensure that the money for weed control is spent effectively.

The broad aims of the project are: to determine the what areas have been invaded and how badly; to assess the impact of these invasions on river flows; and to estimate the cost scenarios of the results of taking control actions or not taking them. The emphasis is on getting a really good 'extent of invasives' baseline for 'woody' alien plant species (those likely to have significant impacts on water resources). This information will be used to set priorities for alien control operations nationally and regionally. The project is also identifying and rating other important impacts of aliens. In addition we will attempt to identify gaps in the current knowledge and priorities for further research.

The project has been divided into three phases: data capture, analysis and scenario generation. Our emphasis at present is primarily on gathering baseline data and mapping the alien invaded areas of South Africa at a 1:250 000 scale. The aliens are mapped according to percentage cover or density classes. The mapping is done in workshops involving a broad range of local experts, from various organisations, as well as by interviewing knowledgeable individuals. The mapped information (areas and linear features eg rivers) is digitised and stored in a GIS. The data will be cross checked against other sources to assess its validity and whether there are gaps. We are also developing ideas on how to model this information at a scale that is compatible

with national and provincial decision making and how to generate scenarios. The outputs from the study are going to provide information on the extent, density and species composition of alien invaded areas by magisterial district and tertiary catchment. Case studies will be done of selected government water supply schemes and catchments.

Two key issues which have emerged are :

1. How can we get the best possible estimates of how much water different alien plant species use?
2. How to model the spread and increasing densities of invasive aliens at this scale?

The aim of this paper is to stimulate constructive debate about how best to tackle these issues.

### THE URBAN FRINGE : MANAGEMENT OF THE NATURAL/URBAN INTERFACE

PEN Britton / JJ Jackelman  
National Parks Board  
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CLAREMONT 7735

The management of the urban fringe presents unique problems for managers and planners. This is particularly the case in the Cape Peninsula, but as the Metropole expands, the management of the urban fringe in other areas such as Gordon's Bay and Somerset West will become increasingly problematic.

## DEFAULT MANAGEMENT AND THE LOSS OF FYNBOS SPECIES ON THE EASTERN CAPE FLATS

LM Raitt / B McKenzie  
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Eight areas of indigenous vegetation on the eastern Cape Flats outside of nature reserves were monitored over a twenty year period during which the rare species, Proteaceae and Ericaceae present were recorded. A similar but more rapid pattern of loss was recorded for the rare than the common species. However, because the number of occurrences of rare species was initially much lower, the actual number and proportion of rare species remaining at the end of the twenty year period was significantly lower than the common species. The main causes of loss are alien species, frequent fires and mowing. Without proper management and maintenance of natural habitat even some common species become rare and selection for ruderals, sprouters and annuals occurs. Rare species and many common species have no longterm future unless adequate active habitat management and maintenance takes place.

### URBAN CONSERVATION - POLITICS AND PROBLEMS

Urban Conservation Managers Forum

This talk focuses on the politics and problems of "urban conservation" looking at the Cape Metropolitan Area (CMA) as a case study. This area lies in the southwest corner of the Cape Floristic Region and is at present experiencing rapid urbanisation. By the year 2010 there will be more than 4.5 million people living in the CMA, a doubling in the 30 year period between 1980 and 2010. It has been estimated by the year 2010, some 265 000 new housing units will be required.

Ad hoc urbanisation has resulted in a marked reduction of the natural vegetation and a paralleled high number of threatened species. Inappropriate planning and historical mismanagement of the remaining natural open space has further exacerbated the problem.

However, it is often not so much as inappropriate planning, as the available planning documents not being implemented. For example the Greening of the City Report (produced by the City of Cape Town in 1982 and 1984) was a visionary planning document. Little of this document, which took time and money to produce, was ever implemented. It is questioned whether the policies in the newly accepted Metropolitan Spatial development Framework (Cape Metropolitan Council 1996) will ever be implemented. There is a lack of political will to consolidate and conserve natural urban open space in the CMA.

The existing urban nature reserves on the Cape Flats are also experiencing various management problems. Certain of these are highlighted by a series of posters :

- Managing fauna when restoring Fynbos - Dalton Gibbs  
eg Grysbok, porcupine and guineafowl - management options
- Conservation of urban river corridors: problems - Barry Patterson

A brief outline of each poster will be given as part of the talk.

### MANAGING FAUNA IN FYNBOS RESTORATION

Poster

D Gibbs  
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The impact of 3 species, namely Grysbok (*Raphicerus melanotis*), Porcupine (*Hystrix africaeustralis*) and Guineafowl (*Numida meleagris*), on restoring an area of sand plains Fynbos at Rondevlei Nature Reserve on the Cape Flats.

Management options for the above species.



## SOCIO-ECONOMIC CHALLENGES AND PERCEPTIONS ATTACHED TO THE MANAGEMENT OF NATURAL AREAS

D Stevens / C Marais  
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Transforming the image of the environment in the eyes of the broader community is a daunting task. In the past the environment and environmental conservation were seen as the pet subject of a few privileged people. The environment should be the concern of the community as a whole. How do we change the ratio of *environmental awareness : number of people interested and concerned*. This is a challenge, public servants and other people involved in the field of environmental conservation (or nature conservation) are faced with. The authors are involved in the Fynbos Working for Water Project. They have learnt some lessons and have some ideas on an approach to achieve a high ratio of *awareness : interested people*. To achieve this the community should have ownership of the environment and should understand the benefits of conserving their environment.

The paper will discuss some of the challenges and even be arrogant" enough to make some proposals.

### AN INVESTIGATION INTO POSSIBLE REASONS FOR A DECLINE IN BONTEBOK NUMBERS IN THE DE HOOP NATURE RESERVE

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Numbers of the rare bontebok *Damaliscus dorcas dorcas* declined in the De Hoop Nature Reserve, southwestern Cape, from 1984 to 1990. Possible reasons for the decline were investigated. The methods comprised population analysis and an investigation into habitat and animal condition. The results indicate that ground censuses were probably consistent underestimates prior to 1991. A lack

of suitable habitat (namely young veld) prior to 1991, and increased intra- and interspecific competition for grazing resulted in poor nutrition and a loss in animal condition. Consequently, the lambing percentage was reduced, and parasitism and the mortality rate increased. A total of 291 mortality records was collated. Other negative factors include a paucity of water sources, periodic dry spells and a marked mineral deficiency. Increasing numbers of ostrich were considered to present a further threat in terms of competition for bontebok grazing habitat. More than 100 bontebok were translocated from the reserve to other areas from 1980 to 1989, and approximately 100 moved into better habitat in the adjacent Overberg Test Range. After a large section of the reserve was burnt in 1991 the habitat improved. Consequently, there was an improvement in animal condition and lambing percentage, whereas parasitism declined. The mortality rate remained high until 1991, however, whereafter it decreased. The above parameters were verified and confirmed by means of an interactive population model for the bontebok. Recommendations are made for the future management of bontebok in the De Hoop Reserve.

### PLANNING FOR COASTAL DUNE FYNBOS COMMUNITIES IN RESPONSE TO DEVELOPMENT PRESSURES

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The Keurbooms dune system remains one of three main systems along the Garden route which has not been entirely developed by speculative development. The dune system, situated between Plettenberg Bay in the west and Natures Valley in the east, is a series of more-or-less parallel ridges approximately 10 km long. The vegetation of these dunes is typically coastal dune fynbos and dune thicket.

Until recently these dunes have not experienced large-scale development, but recent political decisions regarding the decision-making of development on

these dunes has potentially rubber-stamped all future large-scale developments. Neither policy nor legislation has been able to set standards for development on these dunes. Pro-active planning is therefore essential with the main aim of the planning process to justify the conservation worthiness of these dunes, relative to other systems.

The quadrat sampling technique was used to obtain plant community and taxonomic data, to enable comparisons with Robberg and Goukamma Nature Reserves. This data highlighted some of the differences between this dune system and other dunes systems within proclaimed nature reserves. The relative conservation worthiness, taxonomic comparison, vegetation sensitivity and lists of rare and endangered plant species can be used in decision-making for various development options.

#### CONSERVATION OF FYNBOS LEGUMES - IS IT POSSIBLE?

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Species of eight fynbos genera have been analyzed in terms of their geographical distribution, local abundance and habitat specificity. From the results it is quite clear that the majority of species (70%) have a narrow distribution range, of which most are habitat specialists and occur in small populations only. Only 30% of the species are generally widespread, with more species being habitat specialists than generalists. Few species (7%) are common and widespread. These results are compared with other plant groups for which data are available.

This analysis was done to determine which fynbos areas are rich in localized species, which would give an indication of where nature reserves need to be established. The implications for the conservation of fynbos legumes are discussed.

#### FIRE IN THE FYNBOS: THE SAYINGS OF THE SANGOMA'S AND THE IDEAS OF AN IDIOT

N Fairall  
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The kingdom of the fynbos is a very special place, unlike any other place and the denizens themselves unlike other places are also different, they are all plants, or so say the sangoma's. These plants are not food for animals, they are fuel for fires.

Because everything is so different in this kingdom only sangoma's can give advice about how to change the fuel into fire and idiots that have experienced fire in other areas where fuel is also eaten by animals should really not express an opinion.

Some idiots don't know how to keep quiet, and realising that basic principles stay the same, it is possibly pertinent (or impertinent) to share some of these thoughts.

In grassveld and in fynbos fire is affected by climate, South Africa's climate is unpredictable, therefore fire was quite likely unpredictable, for the same reason fire was sometimes repeated in a short period and sometimes only after a long period.

History tells us that the early European seafarers found a variety of antelope in the kingdom, these normally eat grass, so there was something other than fynbos growing here. This grass also has certain fire requirements, can one of the reasons for the present paucity be the long fire cycles prescribed by the old sangoma's?

We also know that the original South Africans had cattle and sheep, they also knew about fire, surely they "managed" the grazing!

These ideas will be developed to give another perspective on fire management in the fynbos.

### COMPETITIVE INTERACTIONS AMONGST FYNBOS PLANTS: A NEGLECTED PERSPECTIVE

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RI Yeaton

Fynbos management regimes (fire regimes) may determine the outcome of competitive interactions amongst fynbos understorey and overstorey species. Competitive interactions may determine the structure and composition of fynbos communities and ultimately the species richness of fynbos landscapes. A better understanding of competitive interactions in fynbos communities may enable fynbos managers to manipulate fire regimes to ensure that the species richness of fynbos communities is maintained.

The role which overstorey proteoid shrubs play in determining the outcome of competitive interactions amongst understorey species will be discussed in this paper.

### COMPARING FLORAS FROM FIVE VELD TYPES IN THE FYNBOS BIOME

Poster

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Plant lists from localities in five different veld types were compared to determine the relationship at family and genus level. These localities include West Coast Renosterveld on Signal Hill, mixed Mountain Renosterveld/Karoo

in the Karoo National Botanical Garden Reserve outside Worcester, Strandveld, Mountain Fynbos in Swartboschkloof near Stellenbosch and Forest on Table Mountain south of Cape Town and in Swartboschkloof. The West Coast Renosterveld and Forest sites have the highest and lowest species richness respectively.

Sørensen's coefficients were calculated and expressed as percentage similarities at family and genus level. The data show that West Coast Renosterveld and Strandveld have the highest level of similarity at both the family (44%) and genus level (30%); while the lowest similarities occur between Forest and Mountain Renosterveld/Karoo ie 25% and 3% respectively. Furthermore, Mountain Renosterveld/Karoo have relatively poor relationships with the other four veld types, while Mountain Fynbos, with its high percentage similarity with three of the four veld types, appears to occupy a central position among the veld types of the Fynbos Biome.

Thirteen families are shared among the five vegetation types ie Anacardiaceae, Asparagaceae, Asphodelaceae, Asteraceae, Cyperaceae, Ebenaceae, Euphorbiaceae, Fabaceae, Loranthaceae, Poaceae, Restionaceae, Rubiaceae and Scrophulariaceae. Only two genera are common among the five localities ie *Protasparagus* and *Myrsiphyllum* in the family Asparagaceae.

### AN ANALYSIS OF THE FYNBOS INDUSTRY

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The indigenous flow industry is a small, but integral part of agriculture in the

Western Cape region of South Africa. The flower industry uses a natural resource and turns it into valuable foreign currency as well as directly employing more than 4000 people. The monetary value of the industry is approximately R81,7 million, of which the dried flower component is approximately R37,22 million. The industry shows promising signs of growth potential, but certain aspects need considerable attention for this growth to be realised.

While the main problems facing the fresh flower industry are addressed by the ARC Fynbos Unit at Elsenburg, the dried flower industry needs the assistance of the wider scientific community. A SWOT analysis is done.

**INTEGRATED CATCHMENT MANAGEMENT:  
SOME LESSONS FROM THE "WORKING FOR WATER" PROGRAMME**

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The Working for Water Programme was initiated in October 1995 as a result of an application to the Minister of Water Affairs and Forestry to provide funds for the clearing of alien plants in the fynbos biome. These plants, which use large quantities of water, pose one of the largest threats to our water resources. Initial funding of R25 million was granted by the minister (Prof Kader Asmal) from RDP funds, for use in the financial year 1995/96. In addition, R7 million was allocated to the programme by the forest industry. By the end of that year (31 March 1996), a total of R24 730 539 had been spent; 33000 ha had been cleared in 12 projects in 6 provinces; and 6163 jobs had been created.

This achievement was ahead of the planned targets, and has been received as a success - ie real delivery in terms of RDP goals.

A further R50 million has been allocated to the programme for the 1996/97 financial year. However, if the programme is to continue at the level it had reached in March 1996, R82 million will be required. In addition, several new projects have been started, some of which will be funded by water users (such as two initiatives valued at R10 million each, from Rand Water and Umgeni Water respectively).

Bridging finance has been sought from a number of sources. These include foreign donors, municipalities, the forest industry, and job-creation funds. However, the ultimate goal of sustainable funding, preferably on a "user-pays" basis, is still being developed. This is essentially a problem of integrated catchment management, where all beneficiaries of the products of soundly managed catchments should contribute to such management in a holistic and sustainable way.

At present, the management of the programme has been transferred to the Department of Water Affairs, where sustainable funding options are being investigated. The programme finds itself at an crucial stage. While the benefits are obvious, the funding models are not in place to support the programme.

This paper reviews the current options for funding of the programme, and the benefits that would arise from such funding.

**INTEGRATED CATCHMENT MANAGEMENT -  
A NEW APPROACH IN THE PALMIET RIVER CATCHMENT**

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Engineering has, historically, provided water resources and hazard protection as and when they were needed. The relatively new science of hydrology has

changed thinking, and engineering is no longer seen as the ultimate solution to all water use problems. Hydrologists have now revealed important links between land-use and freshwater - both its volume (quantity) and quality. Land-use changes involving urbanisation, afforestation, and drainage have a proven link with unwelcome changes in volume and timing of river flow. Armed with the scientific evidence of a range of land-use links to the freshwater environment, hydrologists have raised the river basin (entire catchment from source to sea) into a spotlight of debate over sustainable resource planning within a spatial unit understood by its inhabitants.

One of the fundamental principles of a new water law has been identified as that of Integrated Catchment Management, including the establishment of catchment authorities which will have statutory powers. Catchment management planning is the process by which the problems and opportunities resulting from water-related catchment uses (i.e. direct use of the water environment or an activity which impacts on it) are assessed and action is proposed to optimise the overall future well-being of the water environment. The preparation of catchment management plans will involve all stakeholders within a catchment, including water users outside the catchment who wish to make use of the water within the catchment.

On the 8 February 1995, the Minister of Water Affairs and Forestry approved the Palmiet Phase 1 Water Scheme, on condition that an integrated management plan for the Palmiet Catchment Area was drawn up and implemented. This plan must ensure that the water resources in the area are used in a sustainable way to benefit both present and future generations.

This paper looks at the application of Integrated Catchment Management in a local context, the process to date towards a catchment management plan for the Palmiet River catchment and some ideas on "the way forward" ("straw dog" approach).

**INTEGRATED ENVIRONMENTAL MANAGEMENT TO ESCAPE  
"THE TYRANNY OF SMALL DECISIONS": THE NEED FOR  
LOCAL TO REGIONAL LANDSCAPE-LEVEL INITIATIVES IN THE  
WESTERN CAPE**

CJ Burgers  
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"Integrated Environmental Management" (IEM) is still mainly associated with the evaluation of new development projects although individual businesses are also starting to apply IEM procedures to their existing operations as an adjunct to "green auditing". However, the point that will be emphasized in this talk is that it is essential that IEM or more correctly, "integrated management of human impacts on the environment", be applied to all existing human activities from a local to national (and global) level.

Local communities must increasingly take responsibility for maintaining the quality of their own environments. It is primarily at the local level that the requirements for sustainability must be implemented. One of the primary functions of government (both national and provincial) must be to ensure that the mechanisms, and minimum standards, are put in place to enable them to do so.

It is suggested that the spatial component of landscape-level IEM be built on three overlapping initiatives in the Western Cape, viz

- \* **bioregions** (delineated primarily on river subcatchments or drainage basins),
- \* **biosphere reserve zoning** (core conservation areas, buffer zones, and transition areas), and
- \* **conservation initiatives for major environments** (eg karoo, mountainous areas, coastal lowlands, coastal zone, and marine environment).

## A MULTITEMPORAL LANDSAT TM DATABANK FOR THE DE HOOP AREA

Poster

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A databank containing one Landsat TM image per year, ranging from 1990 to 1996 of the De Hoop area, has been compiled as part of a co-operative project between the Institute for Soil, Climate and Water (ARC) and Cape Nature Conservation. This archival time-series of imagery is well-suited for applications as monitoring of vegetation change over time. Prior to such comparative studies, however, it is necessary to calibrate all images in the databank to a single reference image in order to account for the fact that images were captured on different dates and under varying atmospheric conditions. A technique described by Hall *et al* (1991) was used for the radiometric calibration of the images after precision geometric registration was carried out.

### PRIVATE NATURE RESERVES - AN OWNERS PERSPECTIVE

D Jeffery  
Environmental Consultant  
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KLAPMUTS 7625

Private Nature Reserves (PNR's) are established through application to Cape Nature Conservation and through them the Premier of the Cape Province. The establishment of such a reserve is notified in a Provincial Gazette. Any person who has established such a nature reserve may abolish it any time he pleases. What long term advantages does this hold for conservation in the province?

Owners of PNR's are under no contractual obligation to conserve their land and in fact the CNC ordinance provides no legislation protection for these reserves. No finances are available and very little manpower is available from CNC to assist with the management of these areas.

I will briefly present a case study of my concerns regarding the status of PNR's and make some suggestions as to how the situation can be improved.

### FIRE MANAGEMENT STRATEGIES IN NATURAL AREAS WITHIN THE URBAN ENVIRONMENT

D Daitz / PEN Britton / J Jackelman  
National Parks Board  
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In some large catchment areas, the implementation of a patchwork of controlled burns has proved difficult to implement. In urban areas, the implementation of a patchwork system has even more constraints, yet it is probably the most effective system of reducing fire hazards and limiting wild fire spread within urban reserves. If a patchwork system is to be achieved, innovative ways of overcoming the constraints will be required.

Protection of adjoining urban properties will also probably not only still require firebreaks of some kind, but also measures taken by the property owners themselves. During wild fires, there is generally panic in the adjoining urban area, with post fire accusations of incompetence voiced against the authorities. If this is to be avoided, innovative fire protection and control measures will have to be introduced in conjunction with education and training of property owners. This paper will examine some of these options.

**THE FYNBOS WORKING FOR WATER PROJECT -  
WHY IT IS WORTH THE WHILE EVEN THOUGH PRODUCTION IS LOW**

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The Fynbos Working for Water Project has two clients, the environment and the community. People working in the project from, both the community and the formal public service are all experiencing an enormous amount of change. The formal public service workers are being introduced to "community mechanics" and the communities are introduced to government regulations and red tape.

In the process the people in the project have to adapt to each others "institutional cultures". In some circles this could be seen as a wasting of money, but in *The real world* - is it? The paper will make some comparisons between the *Formal Public Service* and the *Project*, with the emphasis on financial efficiency, socio-economic benefits and the environment.

**RESTORATION IN THE FYNBOS BIOME**

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A synthesis of aims, methods and results of some restoration programmes in the biome are presented.

**CLEARING INVASIVE ALIEN PLANTS IN THE RIPARIAN ZONE -  
THE PRACTISE**

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An overview of the planning, methodology and monitoring of alien clearing operations in riparian zones with particular reference to cost effectivity and restoration processes.

**FYNBOS FIGHTS BACK: ONE YEAR OF RESTORATION FOLLOWING  
ALIEN PINE CLEARINGS AND SOIL DISTURBANCE**

Poster

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A fynbos restoration trial was set up at Noordhoek in order to investigate various ways to revert the site to fynbos vegetation following the removal of an old alien stand. Topsoil was stripped and respread to simulated disturbance by mining. Treatments included three topsoil depths, four seed treatments and a fertilizer treatment. Even after several decades of pine invasion, topsoil was an important source of fynbos propagules: up to half the seedlings recorded derived from the soil. Topsoil was essential for survival and growth of seedlings: subsoil plots attained very low cover. There was no difference in seedling density between shallow and deep soil treatments. However, canopy cover increased more for all seed treatments in deep soil compared to shallow soil over summer, indicating a benefit of deep topsoil for seedling growth. Topsoil was an important source of ericoid shrubs and geophytes which appear to have long-lived propagules. Proteoid shrubs were absent from the topsoil and other growth forms such as graminoids and forbs were under-represented. Addition of fynbos annuals only marginally increased the number of herbaceous

seedlings. Similarly, addition of *Cynodon* and Geraniaceae only slightly boosted the seedling counts.

**THE CHALLENGES FACING THE CONSERVATION OF THREATENED PLANT SPECIES IN THE CAPE METROPOLITAN AREA (CMA)**

Poster

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Much valuable work has already been published regarding the threatened status of vegetation types as well as the high number of individual Red Data Book Plant species within the CMA. These vegetation types include the highly threatened Sand Plain Fynbos and West Coast Renosterveld.

The Search and Rescue Project (a threatened plant project funded by World Wide Fund for Nature and based at the Flora Conservation Committee of the Botanical Society of South Africa) has been intimately involved with the preservation of species since 1988, through initiatives to promote both the preservation of habitat and/or the implementation of *ex-situ* conservation measures.

In a brief overview of the challenges facing the long term conservation of this most extraordinary area, the potential for co-operative solutions will be examined through a pictorial presentation of the issues.

**DU TOITSKLOOF NATIONAL ROAD RECONSTRUCTION:  
ENVIRONMENTAL CONSIDERATIONS AND REHABILITATION TECHNIQUES**

Poster

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Thirteen kilometres of the N1 National Road through the Du Toitskloof Valley are currently being reconstructed by the Department of Transport.

Mitigating measures used to counteract the impact of the road on the picturesque mountain slopes include landscaping to imitate the appearance of adjacent slopes and landforms. The rehabilitation of vegetation on disturbed sites utilizes three techniques; (a) the return of site-specific topmaterial and seed to original localities; (b) the improvement of seed germination using commercially produced smoke extract in the hydroseeding mix and (c) the enhancement of the visual appearance of the disturbed areas by implanting botanically interesting, attractive, rare and functionally useful local species. A nursery was established on site to produce the required 60 000 indigenous plants from plant material collected entirely from the valley. A 70% canopy cover has been achieved within 18 months.

An environmental impact study identified that pollution would have a major impact on the special standards Molenaars River. A biotic evaluation index, determined from monthly sampling in the river, indicates that natural seasonal changes override localized construction changes. To minimize pollution of the river and limit damage to riparian vegetation specially designed and constructed reinforced earth walls have been installed.



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