FYNBOS FORUM

Programme

THEME: Delivering the Goods

10-13 August 2004
Club Mykonos
LANGEBAAN

Organised by the Fynbos Forum Committee.
Funded by C.A.P.E.
AND
The Conservation and Management of Ecosystems and
Biodiversity Focus Area of the National Research Foundation

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ACKNOWLEDGEMENTS

FYNBOS FORUM
10- 13 August 2004

Club Mykonos, Langebaan

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1. The Conservation and Management of Ecosystems and Biodiversity Focus Area of the **National Research Foundation** (and Richard Cowling, and his Secretary, Joy Kritzinger, UPE, for facilitating the funding from NRF)

2. Cape Action for the People and the Environment (C.A.P.E.)
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3. SANParks, **Table Mountain National Park** - administrative assistance

4. SANParks**, West Coast National Park** - Fieldtrips, and Geelbek accommodation

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7. Thank to The Capacity Building Programme managed by WWF-SA's **Table Mountain Fund** for sponsoring 30 Forum participants.

COMMITTEE MEMBERS 2003 – 2004

Chairman:	Ms Julia Wood
Vice Chair:	James Jackelman
Committee:	Mr Mark Botha
	Donnovan Kirkwood
	Dr Richard Knight
	Dr Connie Krug
	Ms Bongiwe Magasela
	Dr Christo Marais
	Mrs Maryke Middelmann
	Ms Zohra Parkar-Salie
	Dr Dave Richardson
	Mrs Anne-Lise Schutte Vlok
	Mr W Stewart
Secretariat:	Ms Wendy Paisley

FYNBOS FORUM MISSION

The Fynbos Forum is an affiliation of researchers, planners, managers, landowners and a range of other stake-holders that meets annually to discuss management issues and research results, and to formulate priorities for future research and conservation management actions required to ensure the conservation and sustainability of Fynbos ecosystems.

In order to achieve this goal, we undertake to assess biological resources, ensure institutional capacity and consider socio-economic issues.

PREVIOUS FYNBOS FORA

1988	:	Avalon Hotel, Montagu
1989	:	ClanWilliam
1990	:	Stellenbosch, The University of Stellenbosch, Die Ark
1991	:	Bredasdorp, Potberg
1992	:	UCT, Cape Town
1993	:	16 & 17 Maart (Drosdy Museum, Swellendam)
1994	:	13-15 Julie (Bien Donné, Stellenbosch)
1995	:	5-6 Desember (Mispah Youth Centre, Grabouw)
1996	:	17-18 Julie (The Nekkies Dist. Worcester)
1997	:	16-18 Julie (Genadendal)
1998	:	22-24 April (Die Herberg, Waenhuiskrans, Arniston)
1999	:	September (Rein's Nature Reserve, Albertinia)
2000	:	7-9 Junie (Ganzekraal Holiday Resort & Conference Centre)
2001	:	01-03 August (Calitzdorp Spa)
2002	:	14-16 August (Goudini, Rawsonville)
2003	**:**	**05-08 August (Hartenbos Resort, Hartenbos, Dist. Mossel Bay)**

Fynbos Forum 10-13 August 2004
Programme Overview

Time	Tue 10 Aug	*Wed 11 Aug*	Thur 12 Aug		Fri 13 Aug	
7h15		**Breakfast & late registration**	**Breakfast**		**Breakfast**	
8h00		Full plenary: Opening Address - Tasneem Essop	Parallel workshop1: Environmental Education Processes and Priorities in the Fynbos	Parallel workshop 2: Biodiversity Guidelines and Land Use Planning	Paper session 7: Stewardship	Parallel Paper 8: Monitoring & Evaluation 8h45 Parallel paper 9: Applied Research – Flora
8h30		Paper Session 1: Institutional Partnerships and Development				
9h00	Capacity Building Support Workshop: Invited Participants					
10h00						
10h15					Poster Session 3: Stewardship; Monitoring & Evaluation; Applied Research; Urban Conservation & Tea	
10h30		**Tea**	**9h30 Tea will be served during the workshops**			
11h00		Paper Session 2: Economics	Parallel Paper Session 5: Restoration & Rehabilitation	Parallel Paper Session 6: Aquatic Systems	Parallel Paper Session 7 (cont): Stewardship 11h30 Parallel Paper Session 11: Applied Research - Fauna	Parallel Paper Session 10: Urban Conservation 12h15 Workshop 3: Urban Conservation

<table>
<tr><td>13h00</td><td colspan="2"></td><td colspan="2"></td><td colspan="3" rowspan="2">Poster Session 2: Spatial Planning; Biological Invasives; Restoration; Aquatic Systems</td><td></td></tr>
<tr><td>13h15</td><td colspan="2"></td><td colspan="2" rowspan="2">Lunch</td><td>13h20 Awards & Closure</td></tr>
<tr><td>13h30</td><td colspan="2"></td><td colspan="3" rowspan="2">Lunch</td><td rowspan="2">Lunch</td></tr>
<tr><td>14h15</td><td colspan="2"></td><td>Paper Session 3: Spatial Planning</td><td>Paper session 4: Biological Invasives</td></tr>
<tr><td>14h30</td><td colspan="2"></td><td colspan="2" rowspan="3"></td><td colspan="3" rowspan="3">14H30 Depart on Field Trips</td><td rowspan="6"></td></tr>
<tr><td>15h00</td><td colspan="2">Registration</td></tr>
<tr><td>16h00</td><td colspan="2">Tea</td><td colspan="2">Tea</td></tr>
<tr><td></td><td colspan="2">Registration</td><td>Paper Session 3: Spatial Planning cont.</td><td>Paper Session 4: Biological Invasives cont.</td></tr>
<tr><td>17h00</td><td colspan="2">Poster Session 1: Institutional Partnerships & Development; Economics; Education</td><td colspan="2" rowspan="2">17h10 AGM</td></tr>
<tr><td>17h30</td><td rowspan="2">Info Session 1: C.A.P.E. 101</td><td rowspan="2">Info Session 2: New Environ-mental Legislation</td><td rowspan="2">Western Cape Wetlands Forum meeting</td><td rowspan="2">Discussion Group 1: Alien vegetation and incentives: Key opportunities and challenges</td><td rowspan="2">Discussion Group 2: Branding & Licensing Agree-ments</td></tr>
<tr><td>18h00</td><td colspan="2">Info Session 3: Orange List</td></tr>
<tr><td>18h30</td><td colspan="2">Brief welcome: Julia Wood
Video 1: Stewardship
Video 2: Working for Fire</td><td colspan="2">Wine Tasting</td><td colspan="3"></td></tr>
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19h30	Dinner	19h30 Dinner	Greek Evening & Band (Casablanca)	

Fynbos Forum 10-13 August 2004
Final Programme

Time	Tue 10 Aug	
9h00 – 12h30	CBP support workshop Invited participants *Rodney February*	
15h00 – 17h00	**Registration**	
16h00	**Tea - will be served during registration**	
17h00	**Poster Session 1: Institutional Partnerships & Development; Economics; Education**	
17h30	Information Session 1: CAPE 101: An introduction to the Cape Action for People and Environment programme, for beginners *Mandy Barnett*	Information Session 2: New environmental legislation *Mark Botha*
18h30	**Brief welcome: Julia Wood** **Video 1: Stewardship** **Video 2: Working for Fire**	
19h30	**Dinner**	
Time	***Wed 11 Aug***	
7h15	Breakfast & late registration	

8h00	Full plenary: Opening address – Tasneem Essop (Environmental MEC) **Chair: Julia Wood**
	Paper Session 1: Institutional Partnerships & Development **Chair: Christo Marais**
8h30	Bioregional programmes *Kristal Maze*
8h45	All hands on deck: Steering the Titanic into calmer waters *Trevor Sandwith*
9h00	THE SAEON FRAMEWORK AND FYNBOS NODE **Johan Pauw**
9h15	The Denel Overberg Test Range – an unlikely partnership ***Alan Heydorn*** *& Kas Hamman*
9h30	Delivering the goods through productive partnerships ***Jane Harrington***
9h45	Banking on Bulbs: Integrating community participation and biodiversity conservation into the design of visitor facilities on the Bokkeveld Plateau *Arlene Steenkamp*
10h00	Local government's role in biodiversity conservation: Implementing partner or Cinderella? *Lorraine Gerrans*
10h15	Keynote: Changing the Face of Conservation in the City ***Tanya Goldman*** *& Lewine Walters*
10h30	**Tea**
	Paper Session 2: Economics Chair: Kristal Maze
11h00	**The role of economics in the conservation of the Cape Floristic Region** *Jane Turpie*
11h15	**Financial sustainability in the TMNP**

	Barry Stoffels *& Brett Mydral*	
11h30	The costs of managing Fynbos - theory to reality ***Richard Davies*** *& Adriaan Abrahams*	
11h45	The Business of Conservation: Delivering the Goods. *Augustine Morkel*	
12h00	ACCREDITATION Marketing products from the Cape Floral Kingdom *Maryke Middelmann*	
12h15	Delivering the goods for the sustainable harvesting of wild rooibos tea (*Aspalathus linearis*) *Rhoda Louw*	
12h30	Flower Valley Conservation Trust *Leslie Richardson*	
12h45	From planning to participation - some good news stories from Walker Bay *Sean Privett*	
13h00	Achieving financial sustainability for the Conservation Planning Unit. *Selwyn Willoughby*	
13h15	**Lunch**	
	Parallel Paper Session 3: Spatial Planning **Chair: Abigail Kamineth**	**Parallel Paper Session 4: Biological Invasives** **Chair: Rene Jasson**
14H15	Keynote: 30 years of conservation planning in the Cape Floristic Region: what have we learned? *Mathieu Rouget*	Keynote: The Case for the Prosecution *David Waddilove*
14h30	Plant extinction due to pollinator loss in small conservation areas *Anton Pauw*	Invading Alien Plant (IAP) Clearing status and the Implementation of the Conservation of Agricultural Resources Act –CARA (Act No 43 of 1983) in the Working for Water Programme, Western Cape. ***Theo Manuel****, Wessel Wentzel and Liezl Bezuidenhout*
14h45	South Africa's National Spatial Biodiversity Assessment: Results and Applications, with a Focus on the CFR ***Mandy Driver,*** *Philip Desmet, Mandy Lombard, et al*	The role of legislation in the management of invasive alien plants: human dimensions affecting the implementation of legal instruments on the Cape Peninsula. *Samantha Ralston*
15h00	An assessment of the value of genetic algorithm-derived species envelopes for conservation planning, with particular reference to the Cape Floristic Region. *J Reeler****, R Knight, & AG Rebelo***	A proposed classification of invasive alien plant species in South Africa: towards prioritizing species and areas for management action *Theresa Mgidi*
15h15	An evaluation of biodiversity assessment in the Cape Lowlands ***S Brownlie,*** *C de Villiers****, & A Driver***	The Centre for Invasion Biology – implications and opportunities in the fynbos *Dave Richardson*
15h30	The Greater Cederberg Biodiversity Corridor: Identifying Spatial Priorities *Glynnis Barodien*	Arundo donax: Implications of a riparian invader for river systems in the Klein Karoo. ***Jeff Manuel*** *& Richard Knight*

15h45	Prioritization of the City of Cape Town's Biodiversity Network, identification of Biodiversity Nodes and the development of criteria for the establishment of Biological Corridors ***Jason Ely,*** *R Knight, M Laros, et al*	The effects of invasion by alien shrubs and trees on the fuel properties of ecosystems in the Western Cape, South Africa *Terence Jayiya*
16h00	**Tea**	
16h20	Mainstreaming Biodiversity Priorities in Spatial Development Frameworks. *Nancy Job*	Alien invasions of the herpetofaunal kind: signs we cannot ignore *Ernst Baard*
16h35	Development of a web-based systematic conservation planning system for the City of Cape Town *Richard Knight*	Impacts of alien fish species on freshwater fishes of certain Western Cape river systems *Buthelezi, S.N.P*
16h50	Potential impacts of future land use and climate change on the Red Data Book status of the Proteaceae in the Cape Floristic Region *Bastian Bomhard*	Getting the aliens out: identifying priority rivers for alien fish eradication in the Cape Floristic Region. *Dean Impson*
17h10	**AGM**	
18h00-18h20	Information Session 3: The Orange List: a safety net for biodiversity in South Africa *Janine Victor &* ***Mark Keith***	
18h30	**Wine Tasting**	
19h30	**Dinner**	

Time	**Thur 12 Aug**	
7h15	**Breakfast**	
8h00-11h00	**Parallel Workshop 1:** **Environmental education processes and priorities in the Fynbos Biome** **Convenor: Ally Ashwell**	**Parallel Workshop 2:** **Biodiversity Guidelines and Land Use Planning** **Convenors: Mandy Driver & Susie Brownlie**
9h30	**Tea – will be served during the workshops**	
	Parallel Paper Session 5: Restoration & Rehabilitation **Chair: Anne Lise Schutte-Vlok**	**Parallel Paper Session 6: Aquatic Systems** **Chair: Mzwai Peter**

11h00	Restoration on the edge: results of a trial investigating Lucerne control and indigenous sowing in an old field on the fynbos-karoo ecotone *Pat Holmes*		The rehabilitation of a Palmiet (*Prionium serratum*) wetland in the Krom River: a case study. *Japie Buckle*
11h15	Rehabilitation methodology in the restoration of Strandveld Chenfos mine (West Coast Fossil Park), near Langebaan *Roy Lubke &* ***Deon van Eeden***		Studying the nature and rehabilitation of alien invaded riparian zones in the south Western Cape ***M K Reinecke*** *& Jackie King*
11h30	The removal of invasive alien vegetation and the restoration of fynbos on the Schapenberg and along the Sir Lowry's River by private landowners. ***Andreas Groenewald****, D Marais & H Epstein*		The impacts of channelisation and winter flooding on the macro-invertebrate assemblages of the Kuils River, Western Cape, South Africa. *Ruth-Mary Fisher*
11h45	"Delivering the Goods" or "Mission Impossible *Gerald Wright*		Development of policy and a planning tool for the conservation of river biodiversity in South Africa *Jeanne Nel*
12h00	Succession in Swartland Shale Renosterveld, with different grazing intensities and ploughing histories *Benjamin Walton*		Implementing the River Health Programme in the Outeniqua Nature Reserve ***Paul Buchholz*** *C Reed & SA Kuschke*
12h15	Effects of disturbances on the re-establishment of shrubs and tuft grasses on old-field in Renosterveld ***Donald Midoko Iponga****, Cornelia B. Krug & Suzanne J. Milton*		Ecological and Environmental Impacts of Bulk Extraction from the Table Mountain Group (TMG) Aquifer System *Tim Aston*
12h30	Reconstructing Ecological Processes in West Coast Renosterveld: The Grazers, the Fires and the Humans *Rainer Krug*		CRR: WWF-SA's Marine programme *Deon Nel*
12h45	The Renosterveld Restoration Project: Results and Prospects ***Connie Krug*** *, R Krug, D Midiko Iponga, et al*		
13h00	**Poster Session 2: Spatial Planning; Biological Invasives; Education; Restoration; Aquatic Systems**		
13h30	**Lunch**		
14h30	**Depart on Field Trips**		
17h30 - 18h30	Western Cape Wetlands Forum Meeting	Discussion Group 1: Alien vegetation and incentives: Key opportunities and challenges Convener: Mark Botha	Discussion Group 2: Branding & Licensing Agreements Convenor: Leslie Richardson
19h30	**Greek Evening & Band (Casablanca)**		

Time	**Fri 13 Aug**	
7h15	**Breakfast**	
	Parallel Paper Session 7: Stewardship **Chair: Charl de Villiers**	*Parallel Paper Session 8: Monitoring & Evaluation* **Chair: Guy Palmer**
8h00	Keynote: "Stewardship - what it really takes" *Chris Martens*	Keynote: Monitoring and Evaluation:- The Ukuvuka Experience *Sandra Fowkes*
8h15	"The nuts & bolts of forging landowner relationships & stewardship agreements. *S Winter & K Delahunt*	***Measuring success in GEF funded projects*** *Amanda Younge*
8h30	What motivates a private landowner in the greater Cape Town area to conserve renosterveld. *Ruth Parker*	Threatened Species Monitoring Programme **Tilla Raimondo**
		Paper Session 9: Applied Research: Flora **Chair: Rhoda Louw**
8h45	Benefits to farmers versus benefits to society- a synthesis of the benefits of conservation farming in biodiversity hotspots in South Africa *John Donaldson*	Fire monitoring in the Gouritz Region – 20 years of data gathering. **Anne Lise Schutte-Vlok**
9h00	Getting Communities involved in Conservation: The Custodians for Rare and Endangered Wildflowers (CREW) *Ismail Ebrahim*	The limitations of short-term vegetation surveys in species-rich, fire-prone fynbos vegetation – a case study from Grootbos Nature Reserve, South Africa. **Sean Privett**
9h15	Feedback on the West Coast Lowlands Project ***Nicolaas Hanekom*** & *Jimmy Walsh*	***Integrating Fynbos fire ecology into Fynbos Conservation Management*** *Helen de Klerk*
9h30	Agulhas Biodiversity Initiative *Ferde Hugo*	The impact of Planted Proteas outside of their natural habitat within the Table Mountain National Park. *C Jackson* ***& AG Rebelo***
9h45	CAPE in Action - Planning and implementing the Greater Cederberg Biodiversity Corridor 25 & 28 *Jaco Venter*	Is it a rats tail, a cats tail or an old wives tail: Testing the bird perch hypothesis in Babiana ringens? *Bruce Anderson****, W Cole, & S Barrett***

10h00	The St Francis Conservancy Project: Thoughts from the Half-way Mark. *Brian Reeves*	***Petal Movement in Cape Wildflowers protects pollen from exposure to moisture*** *Amrei von Hase*
10h15	Nuwejaars Wetlands SMA: An inception Phase from a group of landowners *Ferde Hugo*	The effect of different land use options on the plant diversity of West Coast Strandveld *Nicolaas Hanekom*
10h15	Poster Session 3: Stewardship; Monitoring & Evaluation; Applied Research; Urban Conservation	
10h30	Tea – will be served during poster session	
		Parallel Paper session 10: The Urban Environment and its impact on Biodiversity Conservation **Chair: Lewine Walters**
11h00	Conservation Stewardship site selection in action: using the WCNCB Biodiversity Site Assessment Form *Donovan Kirkwood*	New Paradigm in Urban Conservation – deepening community partnerships ***Mzwai Peter**, Linden Rhoda & Luzann Hendricks*
11h15	Stewardship and Partnerships: Challenges in the C.A.P.E. context *Bongiwe Magasela*	Attitudes of local communities to the current and future usage of Wolfgat, a lowland fynbos protected area on the Cape Flats, South Africa. ***Theo Manuel** & T Hoffman*
	Parallel Paper session 11: Applied Research: Terrestrial & Aquatic Fauna **Chair: Donovan Kirkwood**	
11h30	What do DNA sequencing studies add to our developing understanding of species diversity and endemism in the Cape Fold Mountain herpetofauna? *Michael Cunningham*	The Cape Town CUBES Group *Ruida Pool*
11h45	Genetic heritage of the endemic freshwater fish of the Cape Floristic Region ***P Bloomer**, E R Swartz, & M Cunningham*	**Schools: Educating for the Environment** ***Paula Hathorn***
12h00	Speciation and limits to distribution in Ghost frogs (*Heleophryne*) *Kate Henderson & M Cunningham*	Implementation at Blaauwberg: A Core Conservation Area for Cape Town *Clifford Dorse*
12h15	Biogeographic history shows support for a radiation of dwarf chameleons in the Cape Fold Mountains, South Africa. *Krystal Tolley*	**Workshop 3: Urban Conservation** Convenor: George Davis

12h30	Determining Sustainable Stocking Rates for Bontebok (*Damaliscus dorcas dorcas*) in the Bontebok National Park: Bontebok, Stocking rates, Sustainability, Carrying Capacity *C Luyt*	
12h45	Avian icon of C.A.P.E. conservation? Progress, set-backs and lessons at the halfway stage of the Black Harrier Project *Andrew Jenkins*	
13h05	Paper session 11: The Urban Environment and its impact on Biodiversity Conservation (cont……..) **Chair: Christo Marais** A genetic evaluation of the sub-populations of the endangered Cape Flats Cone Bush (*Leucadendron levisanus*) – implications for management protocols ***Dalton Gibbs***	
13h20	**Awards & Closure**	
13h30	**Lunch**	

POSTER TITLES

Poster Session 1
Institutional Partnerships & Development; Economics; Education

Tuesday 10 August 2004 @ 17h00

1. Conservation Initiatives Engaging Municipalities: Processes to be followed - *Eleanor McGregor*
2. Is the NRF delivering the goods in Fynbos research in South Africa? - *Jimmy Khanyile*
3. Six years of the Table Mountain Fund: What has been achieved and where are we going - ***Zohra Parkar-Salie**, Julia Wood & Rodney February*
4. TMF's Capacity Building Programme - ***Rodney February**, Julia Wood, & Zohra Parkar-Salie*
5. The Ukuvuka Campaign – Contractor Development Programme - *Marie Van Heerden*
6. A Job well done: The Protea Atlas Project! Protea Atlas Conservation - *Tony Rebelo*
7. Van Stadens, Changing from Wild Flower to Nature Reserve - ***W Berrington***, *T. Matsha & M. Plaaitjie*
8. The Overberg Useful Plants Project (OUPP) - *Phakamani Xaba*
9. BIOTA in the CFK: what are we doing? - *Tessa Oliver*
10. A Park for All, Forever - *Christa Botha*
11. Is the vegetation of Paarl Mountain Nature Reserve delivering the goods? - *Sue Milton*
12. Inhouse Training & Improved Educational Outreach - ***Sydney Ngcakana**, Kholeka Sylvia Zemva, & Jane Harrington*
13. Environmental Initiatives within Kouga - *Lorraine Egans*
14. Cederberg Wilderness Educational and Awareness Campaign - *Jakob Hanekom*
15. The Green Futures Horticulture and Life skills College - building sustainable livelihoods through nature based education - ***Susan Lochner**, Zwelithini Gwele, July Dingani, Nzuzo Nkhili and Goodwill Lolwana*

Poster Session 2

Spatial Planning; Biological Invasives; Restoration; Aquatic Systems

Thursday 12 August 2004 @ 13h00

16. Delivered: A New Vegetation Map! Vegetation Mapping Conservation - *Tony Rebelo*
17. How Information was sourced and managed for utilization in the Cederberg Conservation Planning Project - *Judy Scott*
18. Sandveld in Crisis - the role of record keeping in conservation planning and management - *Johan Burger* & ***Verna Love***
19. Effects of clearing treatment and the post burn environment on seed banks of the alien invasive shrub *Acacia saligna* in the Silvermine Nature Reserve, Cape Peninsula. - *Rene Jasson*
20. Conservation in Agroecosystems: Effects of woody aliens on epigaeic arthropod assemblages - ***Carmen Kassier*** *& M.A. McGeoch*

21. Bass unleashed: Investigating the impacts of an invasive predator on the indigenous fishes of a fynbos mountain stream Indigenous fish, bass, impacts - ***Darragh Woodford***, *Dean Impson and Jenny Day*

22. Seed Germination and seedling establishment in bare clay soils - **Luzanne Hendricks** *(to be "spoken to" by either Clifford Dorse or Adele Pretorius*)

23. Mine rehabilitation success — population dispersal from translocated plants - ***Marius Myburg*** *& Sue Milton*

24. Mine rehabilitation success - dispersal from translocated plants **- *Ann du Plessis*** *& Sue Milton*

25. The Ecological Health of the South-Western Cape Riparian Ecosystems - challenges and management what future for the Cape Flats Kedestes - *Ayanda Matoti*

26. Assessing the impacts of water quality in the Eerste River, using macroinvertebrates as indicators (SASS 5) - *Chantal Petersen*.

27. Habitat Integrity of the Gourits River System: River Health Programme - ***Cecile Reed****, Wietsche Roets and Arne Purves*

28. Will we save aquatic systems on the Cape Flats? Key City, Aquatic Systems - *Tsolofelo Hlatywayo*

29. An approach to conserving aquatic biodiversity in the City of Cape Town – *Candice Haskin*

30. Keysers River Restoration Project **-** *Mandy Nofke &* ***Natalie Newman***

Poster Session 3
Stewardship; Monitoring & Evaluation; Applied Research; Urban Conservation

Friday 13 August @ 10h15

31. Landuse Advice within Western Cape Nature Conservation Board - *Verna Love*

32. The "Firebreak" dilemma - *Pierre Combrink &* ***Augustine Morkel***

33. A suite of projects to deliver the goods in the Overberg - *Lauren Waller*

34. Herpetofaunal exploration of the Cape Fold Mountains: A photo documentary - ***Michael Cunningham****, Krystal Tolley, Kate Henderson & Kelley Whitaker*

35. Recent and ongoing speciation in Austroglanis catfishes of the Cederberg **- *Michael Cunningham****, Ernst R Swartz and Roger Bills*

36. Mitochondrial DNA sequencing as a tool for unraveling the taxonomic and distributional complexities of dwarf chameleons in the eastern Cape Floristic Region. - ***Krystal Tolley*** *& Marius Burger*

37. Small Mammal Community composition in west coast renosterveld - *Connie Krug*

38. What future for the Cape Flats Kedestes - *Tamaryn Allan*

39. Pollinator diversification is not delivering the goods to three sympatric Satyrium orchids – ***Christo Botes****, Richard Cowling, & Şerban Procheş*

40. Bergvliets Best Kept Secret - Die Oog - *Natalie Newman*

41. Bracken Nature Reserve - *Tshepo Mambolo*

42. Identification and mapping of the remaining coastal dunes of the City of Cape Town - *Lorraine Gerrans*

WORKSHOPS

Information Session 1: Tuesday 10 August 2004 @ 17h30.

CAPE 101: An introduction to the Cape Action for People and Environment programme, for beginners

Mandy Barnett, *Programme Developer, CAPE, Private Bag X7, CLAREMONT 7735*

The Cape Action for People and Environment (CAPE) Programme is a partnership programme that aims to conserve and restore the precious biodiversity of the CFR, while delivering significant benefits to the people of the region. It is one of three bioregional programmes that straddle the Fynbos, Succulent Karoo and sub-tropical thicket eco-regions of South Africa, and it is being hailed internationally as ground breaking for the approach is proposes, and the work that is being undertaken.

However, in spite of many of us being familiar with the acronym, what CAPE actually is remains a mystery…

CAPE 101 aims to provide a simple introduction to the CAPE programme, and to provide background information about the programme's rationale, strategy and progress to members of the fynbos community.

This presentation will explore the following:

- Who is CAPE and who's involved?
- What's different and groundbreaking about the strategy?
- Where are we working and what are we doing:
- What are some of the challenges we are facing?
- How can you get involved?

Information Session 2: Tuesday 10 August 2004 @ 17h30

New Environmental Legislation

Mark Botha, *Conservation Unit, Botanical Society of South Africa, Private Bag X10, CLAREMONT 7735*

The Policy & Legislation overview is a brief session on the new and impending legislation that will impact on biodiversity management in the Fynbos biome. It is aimed at a people working in the field and attempts to provide an overview of some useful new legal tools and opportunities

Parallel Workshop 1: Thursday 12 August @ 08h.00

Environmental education processes and priorities in the Fynbos Biome

Ally Ashwell, *EnvironEds, 24 Michel Walk, MARINA DA GAMA, 7945*

We invite people involved or interested in all forms of environmental education in the Fynbos Biome to attend this workshop. We are interested in scoping the extent and diversity of education programmes that are operating in the region and promoting the conservation of the biome. We also hope to identify possible needs and opportunities in relation to environmental education in the biome. The outcomes of the workshop will help to inform the CAPE EE support programme that is being established in the Environmental Education Unit at Rhodes University.

Parallel Workshop 2: Thursday 12 August 2004 @ 08h.00

Workshop session: Biodiversity in Land-Use Planning and Environmental Assessment

Mandy Driver [1], Susie Brownlie [2], Charl de Villiers 1
[1] Conservation Unit, Botanical Society, Private Bag X10, CLAREMONT 7735
[2] De Villiers Brownlie Associates, CLAREMONT

This is an emerging area of focus in the biodiversity sector and in the C.A.P.E. programme. The aims of the session are to share information on projects and initiatives that deal with mainstreaming biodiversity in land-use planning and environmental assessment, to identify gaps and opportunities for collaboration, to identify opportunities for engaging proactively with the planning and environmental assessment communities, and to take forward the development of Fynbos Forum Biodiversity Guidelines for Environmental Assessment. Draft guidelines will be presented for discussion and comment.

Discussion Group 1: 12 August 2004 @ 17h30

Alien Vegetation and Incentives: Key Opportunities and Challenges

Mark Botha, *Conservation Unit, Botanical Society of South Africa, Private Bag X10, CLAREMONT 7735*

The discussion group on Invasive Alien Species and Incentives to control them will focus on what the current framework is for providing alien clearing incentives, and will dissect the recent Working for Water policy document on Alien Control on Private Land.

Discussion Group 2: 12 August @ 17h30

Branding and Licencing Agreements
(Please meet with Lesley to discuss format after the Welcome and Videos on First Night)
Lesley Richardson, *Flower Valley Conservation Trust, P O Box 174, GRABOUW, 7160*

Workshop 3: Friday 13 August @ 12h15

Urban Conservation:
(Content will be determined during the Urban Conservation paper Session)
George Davis, NBI, Private Bag X7, CLAREMONT 7735

FIELDTRIPS

FYNBOS FORUM 2004

12 August 2004 @ 14h30

1. **A boat trip to the islands** off the West Coast National Park.. Visit to the islands off the coast focusing on the natural history of the birds and sea life of the islands. **Run by NPB staff**. (Limited numbers)

2. **Flowers of the West Coast National Park**. A guided tour around the park with interpretation of the natural history and history of the area. The tour will end at Postberg Nature Reserve, which usually puts on a spectacular display of Spring annuals and geophytes. **Run by National Parks Board staff.**

3. Wetlands and the role...CANCELLED

4. - "What do fossils, flowers and sustainable development have in common"? (West Coast Fossil Park). Leaders - **Deon van Eeden and Pippa Haarhoff** (Small Cost involved).

5. **Conservation on the Langebaan Peninsula**. A tour around some of the important sites in the area with an discussion of some of the pressures on the natural habitat, including the calcrete thicket north of Mykonos (easily

accessible) and a visit to a granite koppie on Langebaan Lagoon which has some lovely endemics e.g. *Oscularia vredebergensi*s and superb views. **Guided by Barrie Low**.

6. - **West Coast wonders - flowers in spring**!. A tour around some of the sites in the Langebaan area with good displays of interesting Spring flowers. Exact sites will depend on what's flowering that week. **Guided by Nick Helme.**

7. A visit to a bird hide on the Berg River estuary where a talk about the importance of this area for bird and fish conservation will be given. The Berg estuary has been proposed as a Ramsar site. The soon to be constructed Berg River Dam in the upper Berg River near Franschhoek will have a major impact on the estuary if instream flow requirements are not released from the dam. **Guided by Guy Palmer and Dean Impson**

Paper

Abstracts

Paper Sesion 1: Institutional Partnerships & Development

The South African National Biodiversity Institute: New opportunities for synergies in biodiversity conservation.

Kristal Maze, *National Botanical Institute, Pvt Bag X101, Pretoria 0001*

South Africa enacted the Biodiversity Act in June this year. This legislation provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998.

The Act also provides for the establishment of the South African National Biodiversity Institute (SANBI). SANBI will be responsible for a suite of biodiversity functions including for example: monitoring the status of species and ecosystems; coordinating taxonomy; promoting research; and, collecting, generating, coordinating and disseminating information about biodiversity.

This presentation will:

- give a very brief introduction to the Biodiversity Act and the functions of SANBI,
- focus on how SANBI will take shape, emphasizing opportunities for new partnerships,
- highlight some of the innovative programmes that are already underway.

All hands on deck: Steering the Titanic into calmer waters

Trevor Sandwith, *CAPE Coordination Unit, Private Bag X7,CLAREMONT 7735*

It is generally appreciated that the Cape Floristic Region is in a rapid state of decline that will result in permanent loss of biodiversity. To arrest this decline, stabilise the situation and turn it around is the challenge of C.A.P.E. (Cape Action for People and the Environment). But it's not simply a matter of applying the brakes and slowing the rate of biodiversity loss. The actions demanded are complex and difficult to put in place, particularly when the enabling environment is not conducive to change and the systemic, institutional and individual capacity is weak in many areas. The lessons learned in implementing the first phase of CAPE emphasize both the challenges and conditions/ pointers for success. In this paper, the experience of piloting many interventions of CAPE are discussed, and the conclusion is reached that a multifaceted approach is not only useful, but necessary, resulting in a critical mass of developments involve science, community participation, institutional partnerships and strategic financing. At the same time, a calculated risk must be taken.... will the suite of options, even if implemented well, succeed in turning the ship?

THE SAEON FRAMEWORK AND FYNBOS NODE

Key Words: Long-Term, Environmental Change, Network

JOHAN C. PAUW, *South African Environmental Observation Network, National Research Foundation, , PO Box 2600, Pretoria. johan@nrf.ac.za*

SAEON is an initiative of the Department of Science and Technology, the NRF, the environmental research community, various government departments and science councils, conservation agencies and industry. Its purpose is to develop and sustain a dynamic South African observation and research network that generates, archives and provides reliable environmental information, based on long-term observations over a range of ecoregions and land uses, required by policy and decision makers for sustainable management of natural resources and habitat.

The paper discusses the organisational aspects of SAEON, its scientific framework and progress with the development of a node for Fynbos ecosystems. Strategies for information management and education outreach will be addressed. The paper raises the importance of regional networking and the distinguishing aspects of an institutionalised network organisation.

A missile testing facility becomes a test bed for a successful partnership in conservation

*__Heydorn, AEF__, **Hamman KCD, ***Pieterse F and ****Steenkamp, OC
51 Stellenoord, Stellenbosch, 7600;WCNCB, P/Bag X100, Cape Town, 8000;*
****OTR, P/Bag X12, Bredasdorp,7280; ****SAAF, P/Bag X12, Bredasdorp,7280.*

During 1983 the Hey Commission was appointed by the then Minister of Environmental Affairs, to evaluate and to make recommendations on the potential impact of an already approved, but highly controversial, missile test range to be established by Krygkor (now Denel), on the coastal plain between Waenhuiskrans and Cape Infanta. The Hey Commission submitted its report and recommendations in November 1983. Subsequently a committee known as the Overberg Review Committee (ORC) was established to fulfill the function of reviewing the environmental management of the Greater De Hoop Conservation area in the Bredasdorp Plain region of the Western Cape. This includes three areas utilised for distinctly different purposes. Over a period of 21 years, OTR (Overberg Test Range), a division of Denel, has established, and operates, an internationally utilised missile testing facility on a large terrain, which borders the sea east of Waanhuiskrans. Slightly further inland, the South African Air Force (SAAF) operates a sophisticated test flight and development centre, for which the flat terrain of the Bredasdorp Plain at sea level is eminently suitable. To the west, the Western Cape Nature Conservation Board (WCNCB) manages the De Hoop Nature Reserve encompassing both coastal and mountainous components, which are of substantial importance in terms of the protection of terrestrial and marine biodiversity, environmental education and tourism.

Bordering these three facilities are private farms utilised for the cultivation of wheat and related crops, as well as for sheep, cattle and ostrich farming. The nearby village of Waenhuiskrans is home to a community largely dependent on fishing for income. Both De Hoop Nature Reserve and Waenhuiskrans are of considerable importance to regional and national tourism, as are the Agulhas National Park and the provincial De Mond Nature Reserve, situated to the west. Because of the exceptional beauty and scenic diversity of this region with its marine-, coastal-, coastal plain- and mountainous components, it is also a popular destination for tourists from other countries.

Today the main task of the ORC is to co-ordinate and review environmental management of this sensitive and diverse area in order to realize the agreed objectives of all partners. The ORC consists of representatives of the three main partners, namely OTR, the SAAF and the WCNCB, as well as the agricultural and fishing communities in the region. The Committee is assisted through the appointment of specialists in the fields of terrestrial and marine ecology, environmental education and environmental management. SANParks is represented on the ORC because of the close proximity of the Agulhas National Park.

The main objectives of the Overberg Review Committee for the Greater De Hoop Conservation area could be summarized as follows:

- to review and co-ordinate conservation management practices in the area;
- to collaborate with other role players in the area;
- to assist with the conservation of cultural and archeological features of the area;
- to maintain the ISO14001 norms and standards achieved by OTR & SAAF;
- to minimize operation related discomfort for neighboring farmers and fishing communities through continues liaison and educational initiatives; and
- to ensure the conservation and maintenance of natural ecological processes of the area.

A workgroup recently appointed by the ORC found that the main recommendations of the original Hey Committee are still adhered to.

DELIVERING THE GOODS THROUGH PRODUCTIVE PARTNERSHIPS

Keywords: Partnerships, Services, Delivery

Jayn Harrington, *Garden Route Botanical Garden Trust, 49 Caledon Street, George, 6529*

The mission of the Garden Route Botanical Garden Trust is to establish and maintain the indigenous Garden Route Botanical Garden and the Moriarty Environmental Education Centre (which incorporates the Southern Cape Herbarium) – for education, research, conservation and recreational purposes. These are “the goods” we’d like to deliver and in order to do this better we initiated a CEPF funded project to explore the most effective role for the Southern Cape Herbarium and Garden Route Botanical Garden in conservation in the Southern Cape.

Through funding from CEPF, the GRBGT was able to hold participatory workshops & meetings which would -
1. Identify the botanically related needs of conservation role-players and biodiversity initiatives in the Southern Cape.
2. Arrive at workable strategy and partnership agreements that would help to empower and capacitate the Herbarium and Botanical Garden to deliver the identified services.
3. Ensure the creation of a relevant "afrocentric" facility & research centre which uses new and technologically up-to-date methods, and which builds on the unique Indigenous knowledge held in the region.

The paper will examine this process, with reference to partners, **partnerships** - and their dynamics;

*parcels of goods and **services**; and the **delivery** of these. The outcome of which will be efforts to make the GRBG and the SCH:*

- *The core holder of - herbarium & living plant collections within the Southern Cape; relevant taxonomic and horticultural management information, all other related and relevant data.*
- A support structure for local civil society efforts to consolidate data in support of appropriate land use.
- A support structure for local civil society initiatives to integrate biodiversity concerns into policy and local government procedures.

Banking on Bulbs: Integrating community participation and biodiversity conservation into the design of visitor facilities and tourism development on the Bokkeveld Plateau

Arlene Steenkamp, *The Nieuwoudtville Coordinator, Banking on Bulbs, Project, Nieuwoudtville*.

The Nieuwoudtville community is located on the Bokkeveld Plateau, a region that boasts the greatest diversity of geophytes (bulbous plants) in the world and is an important transition area between two Southern African Biodiversity Hotspots, the Succulent Karoo and the Cape Floristic Region. There is a general recognition that tourism to Nieuwoudtville's spring flora displays is increasing every year. As such, the local community and government are seeking to develop facilities that can support and expand the benefits of this burgeoning industry and tourism development is a top priority within the Municipality's IDP. In partnership with Conservation International and the Hantam Municipality, the Nieuwoudtville community hosted a Design Charrette in March 2004. This five-day intensive workshopping process brought various architect, landscape architects, conservation, and interpretation specialists together with the entire community to generate tangible plans for new visitor infrastructure that reflects a common conservation and cultural theme that the community wanted to highlight for visitors. This paper will present the methodology and the lessons learned from the Nieuwoudtville experience for other regions that might want to use a similar process.

Local government's role in biodiversity conservation: Implementing partner or Cinderella?

Lorraine Gerrans, *City of Cape Town, P O Box 16548, VLAEBERG, 80*18

South Africa is governed by three spheres of government, each with defined roles and areas of service delivery. However, many areas of environmental management overlap between spheres of government and others fall through the gaps: One such function is biodiversity conservation. Since local government restructuring in 2000, every action to conserve biodiversity takes place with the jurisdiction of a local municipal or district council. However, conservation and biodiversity programmes have remained focused at national and provincial level, with little attention given to enhancing the role of local government in the long term sustainability, health and vibrance of South Africa's biodiversity. This is particularly relevant in the Cape Floristic Kingdom where high levels of endemism and diversity occur in small geographic areas. Is local government the Cinderella of biodiversity conservation and enhancement? If so, who is the magic witch?

This paper explores how the service delivery role of local government impinges and impacts on biodiversity conservation. Many opportunities occur within local government to protect and conserve biodiversity and ecological processes. These opportunities could play a critical in the long term sustainability of biodiversity. Example are illustrated with regard to three municipal functions: Land use management, rates collection, and open

space management. The paper explores ways in which local government, within its current developmental mandate, must become a key implementing partner in biodiversity conservation programmes. The functions of local government must be harnessed to conserve biodiversity in the Cape Floristic Kingdom, and to demonstrate that local government and biodiversity are linked in a mutually beneficial way.

Changing the Face of Conservation in the City

Keywords: City, Partnerships, Conservation

Tanya Goldman **& Lewine Walters**
Cape Flats Nature, Edith Stephens Wetland Park, Lansdowne Road, Philippi and Cape Flats Nature / City of Cape Town, Strandfontein Depot, Weltevreden Road, Mitchells Plain

In 2004, Cape Flats Nature - a partnership project between the City of Cape Town, the National Botanical Institute, the Table Mountain Fund and the Botanical Society of South Africa – introduced dedicated on-the-ground nature conservation management at all of its four pilot sites for the first time. The nature conservators are employed by the National Botanical Institute with funds from the Critical Ecosystem Partnership Fund and the Table Mountain Fund's Capacity Building Programme; seconded to the City; and managed according to a terms of reference between Cape Flats Nature and the City.

The presentation will describe this institutional partnership and the strategy behind the arrangement, and explore the role of Cape Flats Nature as a catalyst in building a new cohort of urban conservation managers skilled to work in a people-centred way that links conservation and community development. A nature conservator working within this institutional arrangement will share her experience and lessons learnt in the process.

PAPER SESSION 2:

Economics

The role of economics in the conservation of the Cape Floristic Region

Jane K Turpie, *PercyFItzPatrick Institute, University of Cape Town, RONDEBOSCH 7701*

Because of the increasing pressure on natural resources, conservation efforts generally are doomed to be inadequate unless they take socio-economic contexts into account and turn conservation to the private economic advantage. Resource economics addresses the multiple facets of conservation. Economic studies of ecosystems, including the CFR, have tended to concentrate on estimating their economic value, which is fundamental to providing justification of conservation efforts where funds are limiting. The potential for using such baseline studies in conservation planning efforts have been largely overlooked, however. Nevertheless, valuation studies, while providing necessary background information, are generally not sufficient to secure the adequate conservation of biodiversity. Economic analysis offers insight into the causes of biodiversity loss, and through this understanding, offers a number of tools which can potentially reverse this trend. These include a variety of incentive and financing measures, including payments for ecosystem services. Applying these tools in an effective way is critical to their success and requires a very careful approach.

Financial Sustainability in the Table Mountain National Park

Barry Stoffels, *SANParks, Table Muntain National Park, TOKAI*

"The Graduate School of Business has completed a study of the economic impact the Table Mountain National Park has had on the local, provincial and national economies since its inception in 1998. The report shows that the TMNP has made significant contributions to the economy in the form of operational and project spend as well as the benefits that accompany job creation and skills development. Also, while less quantifiable, the natural capital of the Park - the mountains and the sea - greatly enhances the City's tourism appeal as well as creating real estate boom. "

The costs of managing Fynbos - theory to reality

Richard Davies [1,] and Adnaan Abrahams 2
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[2] *W Cape Nature Cons. Board, P Bag X100, CAPE TOWN*

The costs of managing Fynbos are dependent mostly on human induced inputs. Fynbos has survived millennia without our "expert" management. We therefore need to manage it according to the threats it faces. These are largely thought of (and indeed are still important) as alien invasives, inappropriate fire regimes and isolation of remnant pockets or complete removal by other landuses, largely agriculture. However tourism, not through obvious direct use, but rather through competing for funds and peoples perception of their access to these resources is increasingly demanding conservation's financial resources. This coupled with a very poor understanding by many as to how conservation is financed and managed has increased this challenge.

This would form the basis of the presentation, but I need to firm it up and finalise it with the WCNCB on Monday, when we will send a final abstract through to you.

The Business of Conservation: Delivering the Goods

Key Words: Business Models, Strategy Delivery, Conservation Economy

Augustine Morkel, *Kirstenbosch National Botanical Garden, Rhodes Drive, Cape Town*

In the business world, the objective of any organisation is to compete within the respective markets of their market offering and maximising their performance in those markets to reap returns to their shareholders. In the conservation sector it is basically the same with a change in focus: developing strategies to promote, empower and develop a sustainable South African Economy for our shareholders – the local and global community. The Conservation organisations in South Africa are role players in an economy where it literally has the potential to influence every single participant in the South African economy and the respective markets, as well as be influenced. The question is… How do we respond to these whilst trying to deliver our objectives through our strategies?

As a build up to my MBA thesis, the purpose of this presentation will be an attempt to create discussion, broaden horizons and paint a broader picture of how our efforts as conservation organisations have performed and can perform, in the future of South Africa, to "Deliver the Goods".

ACCREDITATION
Marketing products from the Cape Floral Kingdom

Maryke Middelmann, *SAPPEX, Private Bag X12, Botrivier 7185, Tel. 028 284 9745, email: sappex@honingklip.com*

The European consumer is very demanding in terms of quality and value. Flower from Colombia that were thought to have been produced under unhealthy conditions (workers being subjected to poisonous substances) and using child labour, caused a boycott of flower produced there, much to the detriment of the Columbian efforts to get people out of drug trafficking. In order for 3rd world countries to be able to provide assurance to discerning European buyers, all kinds of checks and balances were put into place, leading to a number of certification and quality assurance labels. At the same time various countries worked on their own "code of conduct" or "code of practice".

The main emphasis of the German flower label was conformance to Social aspects, whereas the groundswell demand for better environmentally friendly practises, gave rise to the Dutch flower label. Therefore, a few of these flower labels, like Blumen (Germany) MPS (The Netherlands) and EurepGAP will be compared and explained, as well as the reason why SAPPEX has embarked on a "Code of Practice" for the Fynbos Industry.

Delivering research goods for the sustainable harvesting of wild rooibos tea (*Aspalathus linearis*)

Keywords: *aspalathus linearis;* sustainable harvesting; wild rooibos tea

Rhoda Louw, *IPC, Botany Dept, University of Cape Town, Private Bag, RONDEBOSCH 7701*, rlouw@botzoo.uct.ac.za

Wild rooibos tea (*Aspalathus linearis*) occurs naturally in a narrow distribution area between the Cederberg and the southernmost parts of the Northern Cape. The species is adapted to low rainfall, acidic sandstone soils and dry summers characteristic of the winter-rainfall region. In the past the historically marginalised members of the Suid Bokkeveld community had little or no access to local markets and wild tea was mostly harvested for domestic use. More recently, the community-based Heiveld Co-operative has established an export market with wild rooibos as an organic and fairly traded product. With increasing demand on the plants and their natural habitat, the Heiveld co-operative requested that research be done on differential harvesting of wild rooibos tea. Research has been underway since January 2003 and will continue until October 2004. Preliminary results suggest that harvest height, harvest season and phenology play an important role in the sustainability of harvesting practices. The final results will be used as a basis for a booklet on sustainable harvesting practices of wild rooibos tea.

Harvesting of wild fynbos - a sustainable land use?

Lesley Richardson, *Flower Valley, Tel: 021 - 859 3710, Lrichard@mweb.co.za*

The Flower Valley Conservation Trust has been subcontracted by the Agulhas Biodiversity Initiative (ABI) to demonstrate the viability of sustainable harvesting of wild fynbos as a land-use option for the Agulhas Plain. The Trust will provide support to the fynbos industry to expand both the local and international markets and exports of sustainably harvested wild fynbos.

This particular use of fynbos is seen as the key to balancing social, economic and conservation aspects in this part of the world, for the following reasons:

- It enables landowners to derive income from fynbos in its natural state;
- It provides livelihoods for rural communities and entrepreneurial opportunities for new entrants into the industry; and
- It maintains the integrity of the lowland fynbos habitat through controlled harvesting of a limited number of species.

The Trust's component of the ABI programme will do the following:

- Develop a certification system and market certified products to a niche market;
- Monitor the quality and quantity of picking from the 20,000ha flower supply network;
- Empower landowners and rural residents to use the resources available to them in a creative and sustainable way. ABET, skills programmes and micro-enterprise development are important components, taking the multi-generational and cultural situation of the local communities on the Agulhas Plain into account. Early childhood development and environmental education within a broader youth programme through the medium of the fine and dramatic arts also form part of the programme.

All facets of the wild fynbos industry are partners in this integrated programme. They include pickers, landowners and exporters, NGOs and corporates as well as local government and conservation and agriculture agencies at both provincial and national level.

The limitations of short-term vegetation surveys in species-rich, fire-prone fynbos vegetation – a case study from Grootbos Nature Reserve, South Africa.

Key words: Vegetation surveys, rare species, diversity

S.D.J. Privett[1] and H.H.M. Lutzeyer[2]
Grootbos Nature Reserve, PO Box 148, Gansbaai, 7220, email:info@greenfutures.co.za

Field biologists undertake vegetation surveys in the fynbos for a variety of reasons. The results of these studies are often used for making important decisions on sites biodiversity value, irreplaceability and ultimately habitat survival. These studies are often constrained by very short time frames and seasonal constraints. This paper

poses the question, how useful are short-term surveys in species-rich, fire-prone landscapes? We compare the results of a detailed, yet relatively short-term (two month) vegetation survey of a property, with those of an ongoing six-year survey of the same property. The study shows that less than half of the total diversity of the site was recorded in the initial survey, that certain growth forms such as geophytes and annuals were under-represented and that virtually all the Red Data species were only recorded during the ongoing study.

Achieving financial sustainability for the Conservation Planning Unit.

Keywords: Information Management, Financial sustainability, Funding

Selwyn Willoughby *Conservation Planning Unit, WCNCB, Private Bag X7, Kirstenbosch Research Centre, Rhodes Drive, 7735, Newlands , Cape Town*

The Conservation Planning Unit (CPU) has been established to act as a "one-stop-shop" for biodiversity information within the Cape Floristic Region. The CPU facilitates the exchange of information between government, non-governmental organizations, academic institutions and the public. As part of its seed funding obligations, the Unit must create a sustainable financial base to ensure long-term sustainability. The potential approach to achieve long-term financial sustainability is through the development of a financial sustainable plan (FSP).

A FSP is a statement about how the Conservation Planning Unit (CPU) is going to match financing with program objectives over the short-, medium- and long-term. It is an assessment of the financing challenges and a strategy for dealing with those challenges. The FSP must be completed in consultation- and in negotiation with funding partners. Assuring predictable and adequate funding will benefit the CPU in focussing on achieving its vision of ensuring that biodiversity considerations are included in land-use decision-making practices.

The presentation will outline the need for a FSP, the components of the plan, the approach, objectives and outcomes.

The Business of Conservation: Delivering the Goods

Key Words: Business Models, Strategy Delivery, Conservation Economy

Augustine Morkel, *Kirstenbosch National Botanical Garden, Rhodes Drive, Cape Town*

In the business world, the objective of any organisation is to compete within the respective markets of their market offering and maximising their performance in those markets to reap returns to their shareholders. In the conservation sector it is basically the same with a change in focus: developing strategies to promote, empower and develop a sustainable South African Economy for our shareholders – the local and global community. The Conservation organisations in South Africa are role players in an economy where it literally has the potential to influence every single participant in the South African economy and the respective markets, as well as be influenced. The question is… How do we respond to these whilst trying to deliver our objectives through our strategies?

As a build up to my MBA thesis, the purpose of this presentation will be an attempt to create discussion, broaden horizons and paint a broader picture of how our efforts as conservation organisations have performed and can perform, in the future of South Africa, to "Deliver the Goods".

Parallel Paper Session 3:

Spatial Planning

11 August 2004

30 years of conservation planning in the Cape Floristic Region: what have we learned?

Keywords: conservation planning, implementation tools, conservation priorities.

Mathieu Rouget, *Kirstenbosch Research Centre, National Botanical Institute, Private Bag X7, Claremont 7735. email: rouget@nbi.ac.za*

The first assessment of the adequacy of conservation areas was done in 1974. Since then, many conservation assessments have followed, sometimes with little implementation on the ground. A recent assessment of South Africa's biodiversity status (as part of the National Biodiversity Strategy and Action Plan) offers the opportunity to reflect on progress made in conserving the Cape Floristic Region over the last 30 years. Using new data, I present recent analysis of conservation status, based on levels of ecosystem endangerment, protection status, irreplaceability pattern of endemic and threatened species and important areas for ecosystem processes. This reveals that the Fynbos biome contains 16 out of 23 critically endangered South African vegetation types. The identification of priority vegetation types and priority areas are compared with previous assessments. Although the broad-scale identification of conservation priority, at a broad has not considerably changed since 1974, new implementation tools are now available to better conserve biodiversity in the Cape Floristic Region.

Plant extinction due to pollinator loss in small conservation areas

Keywords: habitat fragmentation, pollination, conservation

Anton Pauw, *Department of Botany, University of Stellenbosch, Private Bag X1, Matieland 7601*

Established conservation areas were assessed for their ability to conserve specialized pollination mutualisms between oil-collecting bees and a community oil-secreting plants. Pollination rate and hence seed production varied among conservation areas from near 100% to zero. Key factors that significantly influenced the ability of nature reserves to conserve the orchid-bee mutualism were: 1) soil type 2) successional stage of the vegetation and 3) the interaction between reserve size and the nature of the surrounding land-use. Pollination failure occurred in nature reserves with sandy soil, and in small conservation areas (4 – 385 ha) in a highly transformed matrix. Patterns of pollinator abundance across the landscape were found to be associated with the kinds of plant species present in the community. Species with high demographic dependence on pollination were absent from areas where pollinators where rare, suggesting that pollinator loss resulted in plant extinction. Less vulnerable members of the community were able to persist through vegetative reproduction or reliance on alternative pollinators. The study suggests strategies for pollinator conservation in fragmented landscapes.

South Africa's National Spatial Biodiversity Assessment: Results and Applications, with a Focus on the CFR

Key words: Systematic biodiversity planning; priority areas for biodiversity conservation; conservation status of ecosystems

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Mandy Lombard, *Independent consultant, gemsbok@nbi.ac.za*
Kristal Maze*, SA National Biodiversity Institute, kmaze@mweb.co.za*
Jeanne Nel, *CSIR Environmentek, jnel@csir.co.za*
Belinda Reyers, *Zoology Department, University of Stellenbosch,breyers@sun.ac.za*
Mathieu Rouget, *SA National Biodiversity Institute, rouget@nbi.ac.za*

South Africa's first National Spatial Biodiversity Assessment (NSBA) was recently completed, as part of the country's National Biodiversity Strategy and Action Plan (NBSAP). The NSBA is led by the NBI, and the NBSAP is led by DEAT.

The NSBA has the following aims:

- To identify broad spatial biodiversity priority areas
- To develop implementation options for each priority area
- To provide a national context for biodiversity plans at the sub-national scale

Systematic conservation planning methods were used to identify national biodiversity priority areas, integrating terrestrial, marine and freshwater analyses.

The main spatial products of the NSBA are:
1. Conservation status of ecosystems (identifies which ecosystems are most threatened)
2. Protected area gap analysis (identifies which ecosystems are least protected)
3. Analysis of species of special concern
4. National-scale ecological processes
5. Vulnerability to future land-use pressures and alien invasive species
6. Overall priority map, integrating results from all the other products

Each of these products will be presented, with a particular focus on results in the CFR, and potential applications of each product will be outlined.

The NSBA identifies 23 critically endangered terrestrial ecosystems in South Africa. Of these, 16 are in the Cape Floristic Region. Two of the 15 national biodiversity priority areas identified by the NSBA are in the CFR (Cape Mountains and Little Karoo; Cape Coastal Forelands). The NSBA thus confirms the CFR as a national priority for biodiversity conservation.

An assessment of the value of genetic algorithm-derived species envelopes for conservation planning, with particular reference to the Cape Floristic Region.

KEYWORDS: Conservation planning, species distribution, modelling

J. Reeler[1*], R. Knight[1] and A. Rebelo[2].
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Species distribution models (SDMs) play an increasingly important role in conservation in many areas of the world. With the increase in computing power available to the average person, and the persistent demand on conservationists to provide accurate and timely plans from a minimal set of data, SDMs are rapidly filling the role of a primary information source for such decision-making processes. However, very little assessment of the accuracy of these systems has been carried out; although they are entirely accurate, they can give very varied results, and the consequent selection of reserve systems might well be biased by the internal assumptions of the model.

GARP (Genetic Algorithms for Ruleset Production) is one such model which has been widely used throughout the world in the past couple of years for a variety of applications, such as modelling invasive species, infectious diseases and global warming. It is particularly well suited to such a role, due to its ability to robustly extrapolate species distribution from a vanishingly small set of point data. The Protea Atlas database, on the other hand, represents one of the largest and most complete databases of species record data in the world. Through modeling the potential and actual distributions of several species of protea within the CFR, the accuracy of this program is appraised, and its utility for conservation purposes is assessed, with particular focus on the Cape Floristic Kingdom.

AN EVALUATION OF BIODIVERSITY ASSESSMENT IN THE CAPE LOWLANDS
Biodiversity, environmental assessment, official decisions

Brownlie S[1], **De Villiers C[2]**, Driver A[2], Gerber G[3], Job N[2], Laidler D[3], Love V[4]
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A paper by Le Maitre *et al.* (1997)1 reported a serious neglect of functional biodiversity in environmental impact assessments in South Africa. In this presentation we look at whether this situation has changed. The authors reviewed a series of environmental assessments and the ensuing Records of Decision in the CFR in the last two years, and assessed to what extent biodiversity criteria had been taken into account in the studies and official decisions. This presentation is based on a joint investigation between the Botanical Society of SA, Department of Environmental Affairs and Development Planning, and Western Cape Nature Conservation Board. The study was informed by the realisation that biodiversity is commonly cited as a definitive component of "triple bottomline sustainability" and is routinely referred to in environmental assessments. The recent promulgation of the NEMA Biodiversity Act, plus spatial informants such as the National Spatial Biodiversity Assessment and finescale conservation plans, have further bolstered the conceptual importance of biological and ecosystem diversity in development planning and environmental assessment. This paper reports: how assessment criteria were developed in **consultation with biodiversity and environmental practititioners (private** and state sectors); how the reports and Records of Decision were evaluated in terms of these criteria; the findings of the evaluation; and suggestions on how the findings could inform the development of guidelines for biodiversity assessments.

Prioritization of the City of Cape Town's Biodiversity Network, identification of Biodiversity Nodes and the development of criteria for the establishment of Biological Corridors

Keywords: Cape Town, biodiversity, nodes, corridors

Jason Ely[1], Richard Knight[1], Marlene Laros[2], Rodney Cronwright[3], Kate Snaddon[4] and Grant Benn[5]

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Cape Town is one of only three cities worldwide that ranks as an urban biodiversity hotspot. The vision of a Biodiversity Network for the City of Cape Town (CCT) is to conserve biodiversity at a landscape level. During 2001/2002 a project aimed at identifying a representative conservation network was initiated by the Environmental Management Department of the CCT. The project used a "Systematic Conservation Planning" approach to identify remnants of land within the City of Cape Town's Municipal Boundaries that would need to be conserved to ensure the protection of a representative sample of the areas biodiversity. The goal of this strategic objective is to ensure that appropriate, effective and efficient management plans and policies are developed and implemented at each of the Primary Biodiversity Conservation Areas identified. The Biodiversity Network brings together approaches that could be adopted for the purposes of prioritising remnants, corridors (including their most effective width) and the intersection points of these corridors (nodes), and biodiversity network anchor points (which could be nodes or key remnants), using methodologies that draw on Island Biogeography Theory, Landscape Ecology, Meta Population Theory and the current "Systematic Conservation Planning" techniques. The prioritisation of the Network's Biodiversity areas were developed around set criteria for landuse types and delineated into categories A, B and C which were aligned with the CCT's Biodiversity Strategy strategic objectives and which can be effectively integrated with the Metropolitan Open Space System and Spatial Development Framework.

Mainstreaming Biodiversity Priorities in Spatial Development Frameworks.

Key words: Systematic Conservation Planning, Municipal Biodiversity Summary Map

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Putting Biodiversity Plans to Work (PBPTW) is a two-year project undertaken by the Conservation Unit of the Botanical Society of South Africa, in partnership with the Conservation Planning Unit of the Western Cape Nature Conservation Board. The project is funded by the Critical Ecosystem Partnership Fund as part of the C.A.P.E. programme, and aims to mainstream the use of systematic conservation plans in the land-use planning and decision-making system in the Western Cape province.

One of the focus areas of the project includes incorporating the outputs of the Cape Lowlands Renosterveld Project into biodiversity priority maps that can be included in the local municipal Spatial Development Framework of four pilot municipal areas (Drakenstein, Swartland, Cape Agulhas, and Theewaterskloof). This paper presents

some of the key practical considerations we have identified thus far and includes looking at ways systematic conservation planning can inform the spatial planning categories outlined in Bioregional Planning terminology.

Development of a web-based systematic conservation planning system for the City of Cape

Keywords: City of Cape Town, Systematic Conservation Planning, Web Application

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As the growth of the Internet increases with respect to access and functionality so opportunities increase for the development of on-line Decision Support Systems (DSS). Consequently sophisticated databases and web-based Geographical Information Systems (GIS) are being ported across to the Internet. Too date, few real decision making tools have emerged on the Internet and none have addressed systematic conservation planning. This paper reports on a proof of concept for a systematic conservation planning DSS for the City of Cape Town. The application is built around an Apache Tomcat 5.0 server and a MySQL Database Server and an ARC IMS server provides the application with GIS functionality.

The application is based on plant species lists for 93 sites supplied by Coastec Species and Sites (SaS) database. The user has the ability to select from this database and make their own database from selection at Family, Genera and Species levels as well as which sites to use. Both new species and new sites can be added to the database to accommodate new or revised information and so the database can be maintained online. Once a user has selected a subset of the data to work with they can then select from a choice of reserve selection algorithms (iterative and a parsimony rule set such as used in C-Plan or a Genetic Algorithm using either a greedy or a rarity rule set). The user can set various conservation targets which can include the minimum number of sites for each species to be conserved (1 to 5 sites) and the proportion of all species to be conserved (100 to 66%). The results are in the form of reports of sites that match the conservation targets set and can be zipped for distribution. Each site is hyperlinked to an online GIS map for viewing. This application will be demonstrated as a live intranet application.

Potential impacts of future land use and climate change on the Red Data Book status of the Proteaceae in the Cape Floristic Region

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Threatened species are commonly classified according to IUCN Red List Categories and Criteria. It is however debatable whether or not current Red List and Red Data Book assessments appropriately capture future threats to species survival such as those caused by land use change and climate change.
In South Africa's Cape Floristic Region (CFR), high-resolution data of the Protea Atlas Project, spatially explicit predictions of habitat transformation and spatially explicit, species-specific climate change predictions provide an opportunity to investigate the potential impacts of future land use and climate change on the extinction risk of the Proteaceae. Here I calculated a 'future' Red Data Book status for 229 Proteaceae taxa endemic to the CFR for the year 2020, and compared it to their currently proposed Red Data Book status. For this I developed eight different land use and climate change scenarios for 2020. Four scenarios consider only the effects of habitat transformation and, indirectly, conservation, ranging from worst to best-case estimates of these parameters. The remaining four scenarios include the impacts of climate change.
From present to 2020, a considerable number of Proteaceae will be uplisted by up to three threat categories, and the proportion of threatened vs. not-threatened taxa will rise by up to 6%, depending on the future scenario. Overall, climate change has the most severe effects on the Proteaceae, but habitat transformation severely affects some taxa as well. Interestingly, Proteaceae from different regions or altitudes within the CFR respond differently to the future threats.
These findings can be applied in future conservation planning and action, including the assessment, management and monitoring of threatened Proteaceae, where they can assist in the prioritization of certain taxa, groups of taxa and regions.

Parallel Paper Session 4:

Biological Invasives

The Case for the Prosecution:

David Waddilove**,** ***Earthworks, 14 Aberdeen Road, NEWLANDS 7700*****.**

This paper will provide a brief overview of the development and content of Regulation 16 and 17 of the Conservation of Agricultural Resources Act that relate to the control of weeds and invader plants. It will detail the establishment of a pilot legal compliance initiative involving the National Department of Agriculture, National Department of Justice, the local authority and NGO's aimed at implementing the legislation in the Cape Peninsula. It will consider some of the problems experienced and successes achieved in the initiative and will conclude with observations on some constraints and other considerations relevant to the broader implementation of the regulations.

Invading Alien Plant (IAP) Clearing status and the Implementation of the Conservation of Agricultural Resources Act –CARA (Act No 43 of 1983) in the Working for Water Programme, Western Cape.

Keywords**:** Invading Alien Plants, CARA, Working for Water Programme

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An assessment of the extent of IAP's in the Western Cape found that information to provide a complete picture is incomplete. In the Western Cape, an estimated 3,727 million hectares out of a total area of 12,931 million hectares (28%) is invaded. This converts to 626 100 hectares of condensed IAP's which equals 4,84% of the area of the Western Cape. Since its inception, in 1995, the Working for Water Programme has grown to from 13 to 37 projects, has spent approximately R500m, and has conservatively cleared 100 000 * ha initial and 300 000 *ha in follow up clearing operations. Currently, the Programme is embarking on a process of improving the information through the utilization of the colour aerial photography which is available. Aerial photography of the Western Cape except the Karoo has been completed while the rectification to the standard national 1:10 000 orthophoto grid is still in progress. We found that the best approach to obtain information is through a localized process which needs to be repeated for all the quartenary catchments in the region to give a true reflection of the extent of IAP's. Due to the costs involved, it will take many years before clearing operations will commence in all the catchments. A different approach is required to ensure that acceptable levels of data is available to prioritise projects in the future. The regional re-prioritization strategy, its Fire Management strategy, biological control strategy, aquatic weed strategy, and information improvement strategy, will be shared. The integrated, interdepartmental approach involving DWAF, NDA and DEAT to achieve effective transfer of ongoing responsibility to manage cleared land under the CARA legislation will also be shared.

The role of legislation in the management of invasive alien plants: human dimensions affecting the implementation of legal instruments on the Cape Peninsula.

Key Words**:** Legislation, invasive alien plants, human dimension

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In South Africa regulations under the Conservation of Agricultural Resources Act (CARA) oblige landowners to control declared invaders on their property. The effectiveness of this legislation in changing behaviour and attitudes of land-users was investigated on the Cape Peninsula. Surveys were conducted among private landowners to assess: 1) understanding of invasive species; 2) understanding of, and ability to comply with, the legislation; 3) motivation for removing invasive species; 4) motivation for keeping invasive species; 5) the

effectiveness of a targeted education campaign; and 6) patterns of compliance. The results showed that respondents had a good level of understanding of the problem of invasive species, but a poor ability to identify listed species. The main motivation for removing invasive species was to protect the environment, and to improve gardens. Less than 30% of respondents cleared invasives because of the law, or threat of being fined. Respondents who did not wish to remove invasive plants did so primarily because of the shade, shelter and aesthetics of the plants. Many also did not believe that invasive plants in their garden pose a threat. Most of this group would remove the plants if they were convinced of the threats posed. More information, a monthly tax, or a legal document would also increase compliance. Almost half the respondents would remove invasive plants if it affected property values. A recent targeted education campaign appeared to have had little measurable impact on attitudes. While the majority of respondents had heard of the law, few knew who enforces, it or what the penalty for non-compliance is. The general opinion was in favour of the legislation. Insights gained from study were used to make recommendations to help direct the focus of future education campaigns, and improve implementation of the legalisation.

A proposed classification of invasive alien plant species in South Africa: towards prioritizing species and areas for management action

Key words**:** major invaders, emerging invaders, prioritizing

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Many invasive alien plant species in South Africa are already well-established and cause substantial damage, while scores of others are at the early stages of invasion (only recently introduced and/or entering a phase of rapid population growth). Management programmes must target well-established invaders, but must also give appropriate attention to emerging problems. Protocols for objectively prioritizing species in the two groups for management action are lacking. To this end, we describe the objective derivation of two lists of invasive alien plants in South Africa, using available quantitative data and expert knowledge on current patterns of distribution and abundance, life-history traits, and (for emerging invaders) estimates of potential habitat, with particular focus on the major and emerging invaders of the fynbos biome. 'Major invaders' are those invasive alien species that are well-established, and which already have a substantial impact on natural and semi-natural ecosystems. 'Emerging invaders' currently have less influence, but have attributes and potentially suitable habitat that could result in increased range and consequences in the next few decades. These lists, and groupings within them, provide a useful means for prioritizing species for a range of management interventions at national, regional and local scales.

The Centre for Invasion Biology – implications and opportunities in the fynbos

Keywords: Biological invasions, invasive alien species, ecosystem management

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As part of the National Research Foundation and Department of Science and Technology's drive to create "centres and networks of excellence in science and technology "… "as a key component of the human capital and

transformation dimensions of government policy", funding has been secured for the creation of a centre for the study of biological invasions in South Africa. In accordance with sponsor's requirements, the centre will be known as the "DST Centre of Excellence for Invasion Biology" (hereafter CIB). The CIB will have its physical home at Stellenbosch University but will involve researchers from other universities and parastatal organizations. Funding is assured for 10 years. The Centre will address a wide range of issues relating to biological invasions (all taxa) in South Africa, and will aim to form close partnerships with all organizations with an interest in, or responsibility for dealing with, invasive alien species. In accordance with the requirements of the centers of excellence, the CIB will aim for "sustained distinction in research while simultaneously generating highly qualified human resource capacity … to impact meaningfully on key national and global areas of knowledge". The CIB will build critical mass in a field where South Africa has already produced world-class science and innovative solutions to problems, but where many challenges remain.

This paper will sketch the vision, mission and objectives of the CIB, and its initial priorities for research and education. Special attention will be given to identifying challenges and opportunities for the CIB in the fynbos biome.

Arundo *donax*: Implications of a riparian invader for river systems in the Klein Karoo.

Keywords: riparian invader vegetation mapping, semi-arid region

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Literature indicates that *Arundo donax*, a category 1 riparian invader (Act 43 of 1983), is at its most aggressive in semi-arid regions. The Klein Karoo is thought to possess the most dense and most concentrated infestation of *A. donax* in South Africa. Standard geomorphological assessment (Rowntree, 1999) is logistically impractical to implement in these rivers, but expert opinion and literature states that dense stands of *A. donax* also create a significant flood risk and that it alters channel morphology and disturbs the natural flow of a river.

In the Klein Karoo, management occurs largely through *ad hoc* burning and manual harvesting. The management of *A. donax* on riverbanks adjacent to farmland is further explicitly tied to market demand for the reed; for on-site use as a building material and to prevent farmland encroachment. Over the last two centuries, *A. donax* has developed a variety of uses in the area: as a building material and as range of a value-added products. It can be considered a definite livelihood provider to the local communities, and as such the economic effect of this invader on the catchment cannot be ignored, especially as the area has a high unemployment figure.

Exploratory vegetation assessments indicate that the density and aggressiveness of this invader leads to reduction of riparian floral biodiversity where A. *donax* occurs. High resolution mapping of the area will also deliver an accurate assessment of the extent of the current infestation. Preliminary desiccation data also show that *A. donax* extracts substantial amounts of water from the catchment.

A need thus exists for a proper overall strategy that can address all aspects of river health and prevent the spread of *A. donax*, whilst also crucially investigating opportunities for tangible benefits to the larger human population through proper management of
this alien.

The effects of invasion by alien shrubs and trees on the fuel properties of ecosystems in the Western Cape, South Africa

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Two sites invaded by *Acacia cyclops* and *Pinus pinaster* were sampled for vegetation height and stratification, biomass and fuel loads, and moisture contents. Invasion of renosterbos shrublands by *P. pinaster* increased total

biomass 10.8 times, from 12.83 t/ha to 139.60 t/ha, while invasion of strandveld shrublands by *A. cyclops* raised total biomass from 23.11t/ha to 86.74 t/ha. The fuel mass (all biomass with diameter < 6 mm) was raised 7.8-fold following invasion by *A. cyclops*, while above ground live woody plant material showed a more than 5-fold increase. The *P. pinaster* fuel mass increased by a factor of 2.2. Invasion by pines also resulted in a 16-fold increase in above ground live woody plant material. Moisture contents of live leaves of the two invasive species did not differ significantly (P >0.05) from those of fynbos species. Data were used to construct fuel models for the simulation of fire behaviour through the use of the BehavePlus fire modeling system. Simulated rates of fire spread were higher in the invaded areas, compared to uninvaded areas of both study sites with simulated flame lengths showed a similar pattern.

Alien invasions of the herpetofaunal kind: signs we cannot ignore

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South Africa has a large number of invasive alien species which need constant attention from conservation and other agencies, and the degree of success through manual and biological control varies regionally, as well as to the extent to which agencies can allocate resources to the problem. While invasive alien control is continuing, at least two indigenous amphibian invaders from more subtropical climates have recently invaded sites in the Western Cape successfully. The painted reed frog, through natural invasion long the South Coast and suspected translocation into the Cape Town area, and the guttural toad, through suspected deliberate translocation into Cape Town, have become established in the extreme southwestern Cape and now breeds successfully in the winter rainfall region. It appears that sub-tropical species find Western Cape and Fynbos climates more and more attractive and suitable. Regional climate change may in fact enhance this invasive processes further. Invasions elsewhere include indigenous Cape dwarf geckos from the Lowveld into Bloemfontein, tropical house geckos invading along the East Coast, incidents of American snapper turtles in George and rattlesnakes on the Highveld. The booming reptile pet trade in South Africa is looking to import more and more snakes and lizards as pets. These species include taxa, such as leopard geckos and bearded lizards from climatic zones very similar to that of the Western Cape, the Cape Floristic Region (CFR) and the rest of South Africa. Deliberate releases and accidental escapes of these species, as well as the difficulty in controlling invasions of this kind, pose a significant threat to our CFR endemic and indigenous herpetofauna and conservation and other agencies need to be aware of this and establish risk assessment protocols and effective control measures.

Impacts of alien fish species on freshwater fishes of certain Western Cape river systems

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Effects of invasive alien fish species are clearly manifested in many rivers of the Western Cape Province (WCP). Results of **site-specific** fish surveys done during the assessment of rivers, conducted by the River Health Team, are presented. While there was a large number of alien fishes caught from the main channel of the Gouritz, no indigenous fishes were found. Of the five species recorded, four were alien (banded tilapia *Tilapia sparrmanii*, carp *Cyprinus carpio*, largemouth bass *Micropterus salmoides* and smallmouth bass *M. dolomieu*) and the only indigenous species (chubbyhead barb *Barbus anoplus*) was caught from one of the tributaries. Keurbooms River still had indigenous fishes (Cape kurper *Sandelia capensis* and Eastern Cape redfin *Pseudobarbus afer*), although effects of alien invasion are evident in the upper reaches of this system. Other systems highlighting the impact of alien fishes on indigenous species are the Hex and Bitou river systems. The former illustrates a situation where a causeway separates two distinct fish communities, indigenous and alien above and below the causeway, respectively. While the latter indicates that the alien infestation seems to cause more pronounced negative effect than the water quality of the system.
Conservation measures aimed at protecting our unique endemic fishes of the WCP are underway.

Information Session 3

Title: The Orange List: a safety net for biodiversity in South Africa

J.E. Victor and **M. Keith*** *Research Scientist, Threatened Species Programme, National Botanical Institute, Pretoria, South Africa, Tel: +27 12 804 3200, ax: +27 12 804 3211, Keith@nbi.ac.za*

We introduce the concept of the Orange List as a way of assessing and recording the conservation importance of taxa that are rare and of special concern but are not on a Red List. We highlight the necessity for additional recognition of taxa at risk of becoming threatened, including organisms that are Near Threatened, Data Deficient, Rare or Declining but do not meet the IUCN criteria for Red List categories. The Orange List will comprise taxa that require anticipatory conservation planning, to avoid future Red Listing. We propose a systematic method for assessing the rarity of taxa for inclusion in the Orange List, which should be used in addition to Red Lists, so drawing attention to those other taxa of special concern that should be conserved to pre-empt the possibility of such species becoming threatened in the future.

Thursday 12 August 2004

Parallel Paper Session 5:

Restoration & Rehabilitation

Restoration on the edge: results of a trial investigating Lucerne control and indigenous sowing in an old field on the fynbos-karoo ecotone

Key words: ground preparation, seedling establishment, competition

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The study was done at Matjiesrivier Nature Reserve in the Cederberg and monitored over a three-year period. The objectives were to compare the effectiveness of ploughing and herbiciding in controlling Lucerne, whilst simultaneously investigating the sowing of indigenous species and “nurse” plants in restoring indigenous vegetation. The study site lies on the valley bottom with fynbos vegetation on sandstones upslope to the west and succulent karoo vegetation on the lower slopes and shales to the east. The target plant community is a shrubland on alluvial sands, containing elements of fynbos, renosterveld and succulent karoo. Average annual rainfall is 220mm. Soil analyses indicated that % clay in the old field was intermediate between the sandstone and shale-derived soils, and slightly higher than the uncultivated valley bottom soil. Old field soil was higher in major plant nutrient concentrations than the uncultivated soil.

Both herbiciding and ploughing reduced Lucerne density and foliage projective cover, with ploughing having the greater effect. Six indigenous species of annual and 14 indigenous species of perennial successfully established from the seed mix. Two species of indigenous annual and one indigenous perennial emerged from the soil seed bank. After three years, 15 indigenous perennial species persisted at the site, with Asteraceae being the dominant taxon from sown seed. Higher than average rainfall during the first winter ensured good germination and high initial perennial densities (60/m^2). Severe thinning took place during the first summer. Further results will be discussed, including the impacts of ground preparation treatments, alien species and grazing on plant establishment and the development of plant cover and vegetation structure.

REHABILITATION METHODOLOGY IN THE RESTORATION OF STRANDVELD ON CHEMFOS MINE (WEST COAST FOSSIL PARK), NEAR LANGEBAAN

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Vegetative rehabilitation with local indigenous species, in the arid environment of south-western Cape is not an easy task. The restoration of Strandveld on a variety of sites at the disused phosphate mine, Chemfos, near Langebaan, thus required the use of innovative techniques and a re-visit of proven approaches. Production of low volumes of indigenous seed during droughts has resulted in new methods of harvesting and seed preparation for cultivation. In order to ensure adequate germination of the seed, the production of smoke concentrates to apply in aqueous hydro-seeding mixtures with seeds, (thus boasting germination) has been developed, tested in bio-assay techniques and applied in field situations. Production of rooted cuttings of indigenous woody seeded material in large quantities, has taken many hours of development of horticultural techniques. Planting out of plants and seedling mats in a variety of different localities on the mine site has resulted in the establishment of a nucleus of Strandveld vegetation with an evident increase in biodiversity. Along with the eradication of alien woody invaders through physical, chemical and biological control methods, the Strandveld vegetation is slowly returning to an area once devoid of all local plant cover.

The success of the programme, which has been carried out over the last eight years, is being assessed in a vegetation analysis this winter for comparison with the original information recorded in a plant and soil survey in 1995.

The removal of invasive alien vegetation and the restoration of fynbos on the Schapenberg and along the Sir Lowry's River by private landowners.

Keywords: River fynbos restoration

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Wedderwill Country Estate lies beneath the Helderberg mountains and covers > 300 hectares of mountain fynbos, farmland and forest on the eastern portion of the Schapenberg hills above the Sir Lowry's Pass Village. The Sir Lowry's River rises just above and to the north of the estate and runs for one to two kilometers through part of estate which is now a private game reserve. To the northern border of Wedderwill lies Vergelegen estate and to the south Knorhoek farm. Wedderwill is a founder member of the Schapenberg/Sir Lowry's Conservancy.
After a devastating fire raged for a week along the western slopes of the Helderberg mountains in February 1997, alien vegetation grew quickly on Wedderwill and neighbouring properties to cover much of the fynbos regrowth. The Sir Lowry's river was infested with wattle (acacia mernsii, acacia malanoxylon, acacia pycnatha, acacia longifolia, acacia saligna), gum (eucalyptis gomphocephala) and pine (pinus radiata, pinus pinaster) trees. A vigorous alien vegetation eradication campaign conducted over a number of years by Working for Water and Wedderwill's local labour force has removed almost all the invading plants allowing the fynbos to restore beautifully. The successful river clearance has had positive effects on river flow down stream including in the Sir Lowry's Village. This initiative costing millions of rands, was financed solely by the owners of the estate without external financial support and is a most commendable conservation effort by a private landowner. The restoration of the natural enviroment is an example to the area of what can be achieved and what should be attempted by all similarly infested properties within the conservancy and elsewhere. The Wedderwill alien vegetation clearance and fynbos restoration project will be presented as an example of unaided, successful "delivery of the goods" by private initiative.

Delivering the Goods" or "Mission Impossible"?

Gerald Wright, *Helderberg Nature Reserve, Somerset West*

The paper would outline the project of rehabilitating an area of 2100ha on the estate which is heavily infested with alien vegetation and would illustrate:

* The Environmental Trust of Anglo American and their involvement.
* The planning of the project which is planned to cover ten years.
* The costs involved.
* A Black Empowerment project.
* Methods of clearing and rehabilitation.
* Increase in water flow.
* Steps being taken to protect Renosterveld on the estate.

The area being has not been cleared in some sections for the last fifty years and a devastating fire swept through the estate during 1997 further compounding the problem.
A large portion of the area was planted to kikuyu grass for grazing of cattle and sheep by previous owners.
Anglo Board have committed the company to the project and at this stage of the project have set aside R13 000 000 for the duration.
The project will show where bad management has taken place and the steps being taken to make every effort to show the commitment of Anglo to the environment as a whole.

Succession in Swartland Shale Renosterveld, with different grazing intensities and ploughing histories

Keywords: disturbance, phytosociology, succession, Swartland Shale Renosterveld

BA Walton, SJ Milton and A Le Roux, *University of Stellenbosch*

Swartland Shale Renosterveld is restricted to fertile fine-grained soils in the winter–rainfall region of the South Western Cape. Between 91% and 97% of this vegetation type is transformed. Remaining fragments have an irreplaceable conservation value, and a high richness of endemic geophytes. The challenge for conservation is that there is scant information on Renosterveld vegetation composition and its responses to disturbances. Research is based at three sites near Wellington; Voelvlei Provincial Nature Reserve (WCNCB), Elandsberg Private Nature Reserve and Krantzkop munitions factory (Armscor) forming a contiguous fragment (now officially one Conservancy). The primary research aim is to identify or ascertain patterns of secondary plant succession in Swartland Shale Renosterveld and associated old fields, following disturbance by ploughing, with the interaction of grazing. The key research questions are; (1) Does Total species and Lifeform group richness differ between natural vegetation and old fields? (2) With different grazing intensities, does Total and Lifeform group richness differ amongst seral stages? (3) What are the dominant Lifeforms in different seral stages and levels of grazing intensity? (4) What is the difference in cover abundance and diversity of the Lifeforms amongst seral stages? (5) What is the alien plant species richness amongst seral stages with different levels of grazing intensity? A comparison of community composition and cover abundance of old field vegetation is made with adjacent natural unploughed “controls” using the Braun Blanquet procedure. The effects of ploughing on community structure, with the inclusion of grazing will be established, and provide an indication of the rate of secondary succession onto old fields. These comparisons also occur across a gradient of increasing large mammalian herbivore grazing intensity. Sampling was conducted in winter and spring using re-modified Whittaker plots (1000m^2). A hierarchical classification, description and floristic interpretation of Renosterveld and old field vegetation was made using TWINSPAN.

Effects of disturbances on the re-establishment of shrubs and tuft grasses on old-field in Renosterveld

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Conservation efforts in general over the past decade have been shifting from a focus on the preservation and protection of intact systems to the restoration of degraded systems (Young, 2004). Most of West Coast Renosterveld was transformed by ploughing mainly for wheat production and more recently vineyard expansion (Fairbanks al., 2004). The remaining natural vegetation is mostly found on private land and less than 4% is to date under formal protection. The proportion of land under protection can be increased by incorporating abandoned farmland in the protected areas network. Previous studies have shown that grass competition is the main factor inhibiting the return of natural vegetation on these abandoned fields.
Aim of this project was to determine whether grass removal (using burning, herbicide or brushcutting) in combination with reseeding, would hasten recovery of natural vegetation on old agricultural lands. The research was motivated by the need to find a cost-effective method for restoration of natural Renosterveld vegetation at a large scale on in Elandsberg Private Nature Reserve (EPNR). For this restoration experiment three different questions were asked:
1. Which treatment gives the quickest restoration?
2. Which treatment gives the highest species richness /diversity?
3. Which treatment is the cheapest/ most feasible for the landowner/ farmer?

The results indicate that there were no significant differences in species diversity between treatments at the end of sampling (total number of species). However, at the end of sampling the species richness was lowest on the plots treated with herbicide and higher in the other plots with the highest species richness recorded in the control treatment, which is followed by the burned plots.

Reconstructing Ecological Processes in West Coast Renosterveld:
The Grazers, the Fires and the Humans

Rainer M. Krug*, Cornelia B. Krug*, Donald Midoko Iponga*, Ian P. Newton#, Ndafuda N. Shiponeni+, Benjamin A. Walton* & Suzanne J. Milton*
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Like many other Mediterranean shrublands, West Coast Renosterveld, is a highly transformed landscape. The transformation began in pre-historical times with the indigenous Khoekhoen herders, who used fire to obtain additional grazing pastures for their livestock, and has continued until today with transformation due to agriculture (mainly through ploughing) and urbanization. This transformation over hundreds and thousands of years resulted in a landscape with an extremely high level of fragmentation, and only about 5% of West coast Renosterveld remains in its original range (the largest patch is estimated to be ca. 7400ha). Remnants of natural vegetation are surrounded by a matrix of high intensity farmland (mainly cereals and vineyards). Only a few sites remain where the patches are joined by a matrix of natural vegetation types. But even these fragments are exposed to heavy anthropogenic influences and the effects of fragmentation. In addition to these physical transformations, the large herbivores, which were found in Renosterveld by the European settlers were hunted to local extinction. Therefore it is likely that patterns and processes currently present in Renosterveld are not the same as they were before Europeans arrived in the Cape. In this paper we intend to draw a picture of the landscape how it presented itself to the first European settlers based on historic records and recent research and compare these to the pattern and processes happening today.

The Renosterveld Restoration Project: Results and Prospects

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West Coast Renosterveld is typically associated with fertile shale soils in low-lying areas. This association with fertile soils has resulted in extensive transformation of the vegetation through human intervention, leaving less than 5% of the extent of the original vegetation. The remaining fragments are isolated, within a matrix of agricultural and urban areas, and the vegetation is degraded.
An IUCN recommendation states that 10% of each vegetation type should be formally conserved, but in the case of West Coast Renosterveld, less than 4% are under protection, and many vegetation remnants are on private lands. To reach the IUCN conservation goal, degraded natural areas and abandoned agricultural areas need to be restored and incorporated in the current conservation network. The return of natural vegetation to abandoned fields is limited, as results of studies within the Renosterveld Restoration Project have shown. Even after decades of abandonment, and close proximity to natural vegetation, indigenous vegetation seems to be unable to re-colonise these areas. Plants mainly rely on wind and animals as dispersal agents. Nevertheless, only a subset of seeds produced reaches the areas to be colonised, and there, establishment of these species is hampered by competition of mainly alien grasses. To assess potential restoration efforts, experiments were carried out to determine which methods are most suitable to facilitate the return of natural vegetation to set aside land. Nevertheless, the results and lessons learned from the project need to be transferred to real-life applications to increase the areas under conservation.

The rehabilitation of a Palmiet (*Prionium serratum*) wetland in the Krom River: a case study.

J. Buckle, *Working for Wetlands*

The Krom River is situated in the eastern corner of the fynbos floristic region. The Krom River is characterized by a couple of valley bottom fen-type peat basins, which is dominated by Palmiet, *Prionium serratum*, an emergent macrophyte. Various impacts on the river over the past 70 years have caused severe deep gully erosion of the main stream channel. The extent of the erosion and possible causes for the erosion will be discussed. In 2001 the Working for Wetlands program started with rehabilitation interventions to stop further headcut erosion from taking place in the river. The type of interventions and progress with the rehabilitation program will be discussed and illustrated.

Studying the nature and rehabilitation of alien invaded riparian zones in the south Western Cape

M K Reinecke and Dr J M King
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Riparian zones are valuable and important components of river ecosystems, filtering sediments, controlling nutrient input and stabilizing banks. These areas are particularly prone to invasion by alien plant species, in part due to the availability of water, in sometimes in otherwise dry areas, and also their dynamic, frequently disturbed nature. The effect of alien invasive plant species on indigenous terrestrial communities has been well studied locally; numerous studies show a reduction in vegetation cover and number of plant species. Locally there have been few investigations of indigenous and invaded riparian areas. Differences have been observed between riparian and hill slope communities in response to *Pinus radiata.* Some work has been done on the impact of *Acacia mearnsii* on indigenous vegetation communities of parts of the Breede and Berg River systems and there has been a detailed study on the indigenous mountain stream riparian communities of the Hottentots Holland Mountains. A new research project is looking at (1) the community structure and species composition of riparian vegetation in response to the presence of different invasive plant species and (2) vegetative recovery after clearing in these areas.

The impacts of channelisation and winter flooding on the macro-invertebrate assemblages of the Kuils River, Western Cape, South Africa.

Kuils River, channelisation, macro-invertebrates

Ruth-Mary Fisher, *South African National Parks, Scientific Services: Rondevlei, P.O. Box 176, Sedgefield, 6573, E-mail: ruth-maryf@sanparks.org*

Urbanisation and storm water input in the Kuils River catchment has led to flooding problems in the Kuilsrivier central business district with channelisation undertaken to increase the carrying capacity of the channel and to reduce the flood risk. This study aims to establish the impacts of channelisation on the macro-invertebrate assemblages and the general health of the river.

The Western Cape received exceptionally high rainfall during the winter of 2001. There was an upstream migration of bank erosion during May 2001 followed by massive bank failure during July 2001, which could be attributed to the winter floods and downstream channelisation. Further channelisation was undertaken during October – November 2001 to replace a landowners land and to increase the channel's capacity to accommodate larger magnitude flows.

The flooding and subsequent channelisation resulted in a uniform channel shape, which resulted in reduced substratum and flow diversities. These resulted in a reduced diversity of aquatic habitats, which correlated with a reduced diversity of aquatic macro-invertebrates. The average SASS4 scores for all the sites in both years were less than 20, number of taxa below 6 and the average score per taxa (ASPT) below 5. The presence of hardy taxa indicates a severely impaired ecosystem, which could be attributed to the fact that the Kuils River catchment is urbanised and extensively disturbed.

Development of policy and a planning tool for the conservation of river biodiversity in South Africa

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Systematic biodiversity planning is an applied branch of terrestrial conservation biology that seeks to identify spatially explicit options for biodiversity conservation. The goal of the River Biodiversity Planning and Policy Project is to develop a conservation tool that will achieve representative freshwater conservation targets, while remaining fully compatible with more advanced terrestrial conservation planning approaches.

Trade-offs are inevitably required between protecting rivers (achieving biodiversity conservation) and achieving economic development. Not all rivers can be maintained in natural or even good states. An aspect that has not been addressed by the National Water Policy or the National Water Act (Act 36 of 1998) is the setting of national conservation targets for freshwater ecosystems. There is no explicit guidance regarding the overall level of protection that is desirable. The question to be asked is how many rivers should receive a high protection status in order to state that South Africa's collective network of rivers is healthy. A second question is, which should be protected in order to claim that a representative mosaic of rivers and the associated riverine biodiversity is protected or conserved in the long term.

A national initiative between DWAF and CSIR aims to address these questions. The conceptual framework of this initiative is presented, along with supporting data from a pilot study conducted within South Africa and the province of Mpumalanga.

Implementing the River Health Programme in the Outeniqua Nature Reserve

Keywords: Biomonitoring, River Health Programme

Paul Buccholz[1], **Cecilé C. Reed[1] and Alkarien Kuschke[2]**
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The Outeniqua Nature Reserve conserves some of the most important water catchment areas in the southern Cape supplying water to the towns of George and Mossel Bay. Despite the fact that very little research has been conducted on the availability of water in this region, new housing, golf course and polo field developments are taking place at an alarming rate. As custodian of water in South Africa, the Department of Water Affairs and Forestry initiated the River Health Programme in 1994. This programme monitors the biological and habitat integrity of rivers and aids in making ecologically sound decisions regarding the use of water in SA. Since no standard aquatic monitoring had ever been conducted in the Outeniqua Nature Reserve, it was decided to adopt the methods and indices used in the RHP to monitor the health of rivers emanating from this protected area. In so doing, making the data comparable with other river health monitoring taking place throughout the country. Monitoring sites were selected on 10 rivers throughout the reserve as well as where they flowed out of its boundaries. These sites were monitored seasonally for a year using SASS5 and IHAS. Water quality samples were also collected seasonally and analysed in collaboration with the George Municipality. As expected, results indicated that most sites within the boundaries of the reserve were pristine and could be considered as reference sites for the area, while most sites outside the reserve were severely impacted. The data obtained to date has formed the basis for long term monitoring in this important water catchment area and will form an integral part of any aquatic management decisions taken in future. Furthermore, the data could contribute to future decisions being taken regarding the availability of water for prospective developments within this entire region.

Ecological and Environmental Impacts of Bulk Extraction from the Table Mountain Group (TMG) Aquifer System

Tim Aston *MSc Ecology Student, UCT*

Faced with increasing water demand the City of Cape Town has begun investigating the potential of the TMG aquifer system as a means of increasing the cities water supply. A number of ecosystems have been identified as having varying degrees of dependence on the ground water discharge from this aquifer. I am focusing on ground water (gw) fed seeps which are highly dependent on gw discharge and are of extreme conservation importance, supporting a number of the Fynbos' palaeo-endemics. I aim to identify seep dwelling species which are highly

dependent on this gw, information which will be useful in the mapping of gw fed seeps as well as in assessing the potential impacts of abstraction. I will also take the first step in the development of a monitoring system capable of detecting the impacts of abstraction by identifying which seep dwelling species are the most susceptible to drought stress (ie which species should be monitored) as well as the potential of remote sensing as a means of detecting the drying out of gw fed seeps.

WWF-South Africa's Marine Programme

Dr Deon Nel and Aaniyah Omardien
Marine Programme, WWF-SA, Private Bag X2, DIE BOORD 7613

This programme will develop and manage a cohesive and effective marine and coastal conservation support programme that is relevant to the priority marine conservation needs of South Africa and is aligned with international programmes and protocols. The *modus operandi* of the Programme will be to consult with marine conservation partners to develop a strategic focus and plan for priority activities, to guide the development of high-priority marine conservation projects and to secure resources for their implementation. The geographical focus of the Programme will be the marine areas under the jurisdiction of South Africa – including those in the Southern Ocean – as well as linked interventions up the western and eastern coasts of southern Africa.
The vision of the programme is to ensure that Government, local communities, business and industry, and all other interest groups continue to work together to build a future in which the marine biodiversity and ecosystem processes of southern Africa are preserved for the long-term economic, social and environmental benefit of all.

The Marine Programme will focus its activities around six measurable targets:

1. Priority habitats, species and marine systems that require special conservation attention identified by WWF-SA and partners and accepted by relevant government agencies by 2005.
2. The establishment and implementation of a network of, ecologically representative and effectively managed Marine Protected Areas (MPAs) covering at least 20% of each marine habitat type by 2020.
3. At least half the fish stocks that are currently categorised as over-exploited or depleted are restored to a sustainably managed state by 2020, and the status of all sustainably exploited fish stocks are maintained.
4. At least three fisheries certified by the Marine Stewardship Council (MSC) as sustainably managed by 2010.
5. Achieve security for the Southern Ocean Patagonian Toothfish fishery, and eliminate illegal, unregulated and unreported fishery activities by 2015.
6. By-catch of endemic or threatened species is reduced to acceptable levels by 2008.

In addition, priority will be given to activities that address the above targets, but fall within the crosscutting themes of community development and conservation education.

FRIDAY 13 AUGUST 2004

PARALLEL PAPER SESSION 7: STEWARDSHIP

"Stewardship - what it really takes"

Keywords: contractual agreements, biodiversity targets, resources

Chris Martens, *Western Cape Nature Conservation Board, Walker Bay Nature Reserve, 16 17th Avenue, Voëlklip, Hermanus, 7200; ph: 028-314 0185; chriscip@maxitec.co.za*

Landowner conservation partnerships have traditionally been ad-hoc, with little long-term commitment and were seldom target driven in terms of habitat conservation. They have also not necessarily been pursued in a way which contributes to landscape scale conservation.

The C.A.P.E. Program, and the Western Cape Nature Conservation Stewardship Initiative in particular, has sought to change this. Much of the groundwork has been completed with a number of products being developed, which will assist in setting up these agreements.

The Western Cape Nature Conservation Board, through its stewardship program and the protected area expansion in the Cederberg, Gouritz and Agulhas initiatives, has a significant number of contractual agreements under negotiation and a number signed.

How are these contractual agreements going to contribute to reaching the targets necessary to ensure that biodiversity remains intact, in a way which will sustain the natural processes across the landscape? We will examine the role of stewardship and it's contribution to biodiversity targets in the critical habitats of the Western Cape and what will be required in terms of resources and capacity to maintain these agreements.

"The nuts & bolts of forging landowner relationships & stewardship agreements"

Keywords: landowners, negotiations, legal contracts

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Since March 2003, stewardship activities have been piloted in three areas in the Western Cape through a partnership between Cape Nature Conservation and the Botanicals Society of SA. A number of landowners in these areas have expressed interest in adopting one of three stewardship options for their farms (namely Conservation Areas, Co-operation Agreements & Contract Nature Reserves). But what exactly is the detailed process that has had to followed to get a stewardship agreement in place to secure the biodiversity value of the land? And what stumbling blocks and surprises have the Stewardship Programme staff encountered along this steep learning curve since last year? We will take a look behind the scenes of the stewardship implementation process by discussing a number of properties that will serve as examples of the variety of issues that have emerged in each instance. Individual landowner incentive needs and expectations have been very varied and a flexible, tailor-made approach has been required in each case. It has become clear that negotiations with landowners around the future status of their land is a slow process, sometimes with many twists and turns along the way!...

What motivates a private landowner in the greater Cape Town area to conserve renosterveld.

Keywords: Incentives, Private landowners, Renosterveld

Ruth Parker, *Percy FitzPatrick Institute,University of Cape Town, Rondebosch, 7701*

Conservation of renosterveld is critical with less than 3% remaining and about 80% in the hands of private landowners. Legislation preserving renosterveld has as yet failed to prevent further ploughing and private landowners in Cape Town and the surrounding area are likely to make more money by developing rather than conserving their renosterveld fragments.

The new Property Rates Act stipulates that the rate that each property owner pays is determined by the value of the property and the local government rates policy. Property rates rebates therefore have the potential to provide incentives for conservation. Private landowners were interviewed to establish to what extent financial incentives, such as the municipal rate rebate, are seen as a potential incentive and what they value most about their renosterveld. Other incentives such as fire services and alien clearing are also examined. The results of the survey are used to determine what best motivates a landowner to conserve.

Benefits to farmers versus benefits to society- a synthesis of the benefits of conservation farming in biodiversity hotspots in South Africa

John Donaldson, Jane Turpie, Noel Oettle

Managing biodiversity in agricultural landscapes is critical for the conservation of biodiversity.

The Conservation Farming Project (funded by the GEF) examined farming practices in four areas with exceptional biodiversity and evaluated the benefits to society versus the benefits to farmers of different land use practices. Over a four year period, the project assessed biodiversity benefits (e.g. plants, insects, reptiles, small mammals, large mammals), carbon sequestration, soil health, water runoff and infiltration, pest control, and productivity on 33 farms, including farms where biodiversity conservation was an explicit objective of the farming practice. Economic and social factors were investigated to determine whether biodiversity-friendly practices were financially and socially viable and to identify what sort of economic or social interventions would improve biodiversity conservation. The results from each area were integrated and evaluated using ecological economic models (STELLA) or scenarios (using MS Excel).
This presentation provides a synthesis of the key results focusing on results that have relevance to conservation in the Cape Floristic Kingdom. The results show that there was a high variance in biodiversity benefits, which were not consistently associated with pre-selected conservation farms, and that retention of particular landscape elements was often more important for biodiversity conservation than the management practices applied at the farm level. The four study areas could be divided into three categories: sites with a strong congruence between benefits to farmers and benefits to society, resulting in a rapid changeover to conservation friendly practices; sites with relatively little difference (between farming practices) in benefits to farmers or benefits to society, resulting in a low need to find better land use practices; and sites with a low congruence between benefits to farmers and benefits to society, resulting in a need to find economic or social incentives for the implementation of better land use practices. In some instances the costs of changing to more biodiversity-friendly land use practices could be financed by increasing eco-tourism opportunities or finding markets for carbon sequestration via the global carbon fund. In other instances, high level interventions are required to change land use practices.

Getting Communities involved in Conservation:
The Custodians for Rare and Endangered Wildflowers (CREW) Program in Action

Key Words: Volunteer Involvement, Conservation action, CAPE lowlands

Ismail Ebrahim, *CREW, NBI, KIRSTENBOSCH, Ebrahim@nbi.ac.za*

CREW a CEPF funded CAPE programme is one and half years into its implementation. The project focuses on involving civil society groups within priority areas of the CAPE lowlands to conserve threatened plants and habitats. We are working with 7 groups in 6 areas. The main project activities so far include getting civil society: working with local authorities to conserve critical sites; surveying fragments for threatened plant populations; building local awareness among land owners; and contributing to the management of conservation worthy sites. CREW recognises the value of volunteer involvement and aims to facilitate their integration into conservation initiatives in the lowlands of the CFR. We would appreciate advise on how to deal with our main challenges including influencing local authorities and land owners, building groups capacity to contribute to conservation and keeping volunteers motivated.

Feedback on the West Coast Lowlands Project

Nicolaas Hanekom & Jimmy Walsh
WCNCB, Malmesbury

Using the Cape West Coast Biosphere Reserve as lead agent and the Western Cape Nature Conservation Board as implementing agent for the project. The advantages thereof and the way forward. The activities undertook to implement the project and the status with feedback on the activities. To give feedback on what can be done without a huge amount of money to implement projects. All the activities were implemented without the use of overseas funding. Explanation of how it was done and the advantages and disadvantages thereof.

LandCare Area Wide Planning and integration into the IDP process

Ferdé Hugo (presenter), H Germishuys, and T Carinus
Dept of Agriculture, LandCare, PO Box 43, Caledon 7230.

LandCare Areawide Planning is a comprehensive problem solving process that integrates social, economic and ecological concerns over defined geographical areas. This process strives to sustain and improve environmental health through a natural resource management approach that integrates locally driven initiatives.

Locally led conservation is a concept whereby local people lead the planning process based on locally identified needs. Local people determine the resource issues (i.e. problems and opportunities), define the geographic area that affects these issues, and implement a planning process that will help achieve the desired conditions. Agencies, programs, and others provide technical and financial resources to help solve those needs and implement solutions.

CAPE in Action - Planning and implementing the Greater Cederberg Biodiversity Corridor

Key words: corridor, co-management, implementation

Jaco Venter, *WCNCB-offices, Porterville jtventer@intellect.co.za*

This groundbreaking initiative is based on the joint conservation of a "lived in, worked in" protected landscape. It creates partnerships between landowners, local communities and authorities, non-governmental organisations as well as formal conservation agencies with the overall aim to conserve the biodiversity of the Greater Cederberg region (including the Sandveld, Bokkeveld and Tankwa-Karoo). It incorporates a variety of land-uses and it emphasises the value of natural and cultural resources of the area.

Participation is completely voluntary. Although the primary aim is conservation, the project provides specific opportunities for social upliftment, and will stimulate local economic development. This means that the appropriate conservation actions will be integrated with other social responsibilities such as raising HIV/Aids awareness and building capacity to create additional sources of income through tourism development.

The vision of the GCBC is as follows:
From Karoo to coast we in the Greater Cederberg Biodiversity Corridor share a common purpose for biodiversity conservation through sustainable utilization of its unique living landscape.

Nuwejaars Wetlands Special Management Area Initiative

Ferdé Hugo (presenter), H Germishuys, and T Carinus
Dept of Agriculture, LandCare, PO Box 43, Caledon 7230.

Nuwejaars Wetlands Special Management Area Initiative is towards the establishment and management of a special management area with the objective to rehabilitate and conserve the Nuwejaars Wetlands and other natural habitats in the eco system and ensure sustainable use of productive adjoining farmland.

Conservation Stewardship site selection in action: using the WCNCB Biodiversity Site Assessment Form

Don Kirkwood and Anton Wolfaardt
WCNCB Scientific Services, WCNCB, Private Bag X5042, STELLENBOSCH 7599

A brief overview of the WCNCB Biodiversity Site Assessment form and how it is used to capture the conservation importance and management requirements of sites of conservation importance that are owned and managed by private landowners or local government. While the form and our priority areas are designed to complement existing conservcation planning initiatives, it also addresses more pragmatic features of conservation in off-reserve sites, including very localised conservation networks, landowner willingness, and much much more.....

This assessment process is relatively new and under constant revision, so the talk will be kept short to allow plenty of time for audience feedback.

Communication: Challenges in the C.A.P.E. context

Keywords: partnerships, communities, biodiversity

Bongiwe Magasela, *Communications Manager, CAPE, Private Bag X7, CLAREMONT 7735*

One of the desired outcomes of the C.A.P.E. implementation programme is to create a collective awareness among contributors of a total set of activities that will deliver the C.A.P.E. goal, and to raise awareness among a wider group of organizations and society at large. Yet there remains a challenge for the existing suite of institutions to identify themselves as joint contributors to the achievement of the C.A.P.E. strategy.

At the C.A.P.E. Partners' Conference, communication emerged as a key challenge facing the implementation of the C.A.P.E. programme. However, there are many good stories to be told about how partners are implementing C.A.P.E., the challenge is to:

- identify best ways to 'tease' them out, and
- communicate them to ensure that lessons learned are passed on and expertise is shared.

THIS PRESENTATION WILL EXPLORE THE FOLLOWING:

- what are some of the challenges we are facing?
- how can we further expand the partnerships?
- what can C.A.P.E. partners and implementing agencies do to promote the C.A.P.E. strategy?

13 August 2004

PARALLEL PAPER SESSION 8:

MONITORING & EVALUATION

Monitoring and Evaluation (M&E): The Ukuvuka experience

Sandra Fowkes, *Campaign Manager of Ukuvuka 1*
Metaplan, Tel 021 788 7123, Fax 021 788 6218, sandra@metaplan.co.za

Discussions at the recent CAPE conference focussed on the need for increased understanding of what M&E could deliver and how the environmental sector best uses the insights of this growing profession.
The purpose of the presentation is to share some of Ukuvuka's experiences of M&E, as well as some lessons and then to suggest some questions / challenges from those working in the environmental / conservation / developmental fields to M&E specialists.

There is an increasing need for competent M&E

This is the 5 year term of South Africa's new democracy for delivery. It is also the time in which the country is increasingly looking at the effectiveness and efficiency with which we apply our limited resources. Evaluation is a recent entry to the professions – the first Evaluation Association in the USA was started in 1984.

Ukuvuka experience of M&E

0.1% of the original campaign budget was allocated to "auditing" performance against KPIs (key performance indicators).
Over its 4 year life, Ukuvuka commissioned the evaluations of:

- fire and life safety education project,
- awareness raising; structural; and behaviour change initiatives related to fire in informal settlements
- alien clearing and social delivery
- the whole campaign - summative and formative

In addition, analysis was done from the perspective of knowledge management of working in partnership; and the Land Consolidation project.

There are many kinds of M&E – and the conventional quantitative against objectives / targets / indicators, though important, misses many of the aspects relevant to tracking the changes in people's awareness, attitudes and behaviour. We need to draw more widely on the range of qualitative as well as quantitative approaches that have

been developed and tested. Some ideas will be presented as well as some of the current challenges and questions.

Measuring Success in GEF Projects"

Amanda Younge, *Amanda Younge CC, 53 Hofmeyr Street, GARDENS 8001*

C.A.P.E. is about to begin a number of implementation projects, with funding for 5 - 6 years from the GEF. This level of funding is not likely to be repeated, so we need to ensure that this money is used to turn the tide of biodiversity loss and land degradation. How do we measure success? How will we know that our work wont be a drop in the ocean or a flash in the pan? How do we begin projects with the end in mind?

Threatened Species Monitoring Program:
Key Words: Monitoring, Endangered Plants, Volunteers

Tilla Raimondo, *raimondo@nbi.ac.za*

The imminent South African National Biodiversity Institute has as one of its mandates monitoring and reporting on the status of threatened species in South Africa. The NBI's Threatened Species Program is preempting this responsibility by piloting the monitoring of threatened plants within the CFR. This presentation will outline the Threatened Species Program's Monitoring Strategy. Monitoring will be conducted at two different levels:

1) Surveys of populations of all endangered plants throughout the CFR and collection of data on threats to the populations, population size and area of extent.
2) Demographic monitoring of selected species to inform management

The TSP is working closely with WCNCB on this program and is involving reserve staff in monitoring populations of threatened plants within reserves. The program also capitalises on botanical amateur expertise and willingness to contribute to conservation by getting volunteers to survey areas outside of reserves. The TSP has lists of target species and organises regular fieldtrips to collect information. The program is very recent only starting in June 2004.

13 AUGUST 2004

PAPER SESSION 9

APPLIED RESEARCH: FLORA

Fire monitoring in the Gouritz Region – 20 years of data gathering

Key words: Fires, post-fire monitoring, Proteaceae

Anne Lise Schutte-Vlok, ***Western Cape Nature Conservation Board, Private Bag X658, Oudtshoorn, 6620***

Post-fire monitoring, using non-sprouting overstorey Proteaceae species as indicators, was initiated in the Gouritz Region in 1979. Proteaceae parent:seedling regeneration data collected for 85 fires on six reserves in the region have been analysed. The effects of pre-burn veldage, season of fire, slope and cause of fire on the regeneration success of *Protea* and *Leucadendron* species have been investigated. The results of the analyses are presented and discussed.

The limitations of short-term vegetation surveys in species-rich, fire-prone fynbos vegetation – a case study from Grootbos Nature Reserve, South Africa.
Key words: Vegetation surveys, rare species, diversity

S.D.J. Privett[1] and H.H.M. Lutzeyer[2]
Grootbos Nature Reserve, PO Box 148, Gansbaai, 7220, email:info@greenfutures.co.za

Field biologists undertake vegetation surveys in the fynbos for a variety of reasons. The results of these studies are often used for making important decisions on sites biodiversity value, irreplaceability and ultimately habitat survival. These studies are often constrained by very short time frames and seasonal constraints. This paper poses the question, how useful are short-term surveys in species-rich, fire-prone landscapes? We compare the results of a detailed, yet relatively short-term (two month) vegetation survey of a property, with those of an ongoing six-year survey of the same property. The study shows that less than half of the total diversity of the site was recorded in the initial survey, that certain growth forms such as geophytes and annuals were under-represented and that virtually all the Red Data species were only recorded during the ongoing study.

Integrating Fynbos fire ecology into Fynbos conservation management

Helen de Klerk, Guy Palmer, et al.
WCNCB, Scientific Services, Private Bag X 5042, STELLENBOSCH, 7599

The Western Cape Nature Conservation Board (WCNCB) has been through an intensive period of developing protocols to integrate area-specific research into Fynbos fire ecology parameters (minimum fire return period based on youth phase and years required to maturity for indicator species) into decision-making processes on fire management on nature reserves in the fynbos. This talk will detail how these protocols have been developed through collaboration of academics and managers, and how these protocols are being implemented. It will also present some preliminary findings.

The impacts of plants Protea species, outside of their natural distribution, within the Table Mountain National Park.

C. Jackson, T. Rebelo & C. Cheney.

For at least 50 years, several *Protea* species have been extensively introduced onto the Cape Peninsula beyond their natural range of distribution. Reasons sited for the introduction of these species onto the Cape Peninsula include the perception that local diversity should be increased and allowing “better forms” of certain species to mix with natural populations. This presentation looks at the extent of the problem of these ‘Alien Proteas’ within the Table Mountain National Park in terms of: then number of species introduced, the extent of hybridisation between local and introduced species, and competition with local *Protea* species. Management strategies for the preservation or removal of these species area outlined.

Is it a rats tail, a cats tail or an old wives tail?
Testing the bird perch hypothesis in Babiana ringens

Bruce Anderson [1], William Cole [2,] @ Spencer Barrett [2]
[1] *School of Botany and Zoology, University of Kwa-Zulu Natal, South Africa*
[2] *Dept of Botany, University of Toronto, Canada*

A strange fleshy, twig-like structure projects above the bright red terrestrial flowers of *Babiana ringens.* This unique structure is actually a highly modified inflorescence spoke where all aerial side branches have been lost in favour of a single branch at ground level. This oddity has given rise to the common name of "catstert" (cats tail) or "rotstert" (rats' tail). An adaptive explanation for this is that malachite sunbirds use the twig to perch on while pollinating. However, on the west coast, where *B. ringens* grows, there are several bird-pollinated plants with terrestrial flowers that have no perch at all. So we ask whether the tail in Babiana ringens really is adaptively significant. We manipulated plants from two populations by removing their perches and compared seed set, fruit set, and outcrossing rates with unmanipulated plants. Our results conclusively show that seed set, fruit set and outcrossing rates are decreased when the spikes are removed, suggesting that the spike is truly adaptive.

PETAL MOVEMENT IN CAPE WILDFLOWERS PROTECTS POLLEN FROM EXPOSURE TO MOISTURE

Amrei von Hase; Richard COWLING and Allan ELLIS

We investigated diurnal patterns of petal movement (upright and reflexed) and sensitivity of pollen to moisture in a winter-flowering flora from the desert coast of Namaqualand, South Africa. Specifically, we tested the hypothesis that nocturnal flower closure associated with upright petal movement affords protection to pollen from winter precipitation. The proportion of open flowers in eight species from seven genera and three families, increased rapidly above air temperatures of about 20oC. Flower temperature explained most of the variance in petal status. About 90% of the variance in flower temperature was explained by air temperature while radiation, wind speed and relative humidity had no significant independent effect. Petal opening was more closely correlated with temperature than the closing response, which may be under the additional control of endogenous factors. Pollen exposed to moisture overnight had a significantly higher frequency of damaged grains than control pollen in the majority of study species within the Aizoaceae and Rosaceae. We found no evidence that pollen of asteraceous species exhibiting flower closure is sensitive to moisture. We conclude that pollen damage and the reduction in male fitness that may result from exposure to rain, dew and fog has provided an important selective impetus for the widespread evolution of upright petal movement and associated flower closure found among more than 3500 species in the predominantly winter and spring flowering Cape fynbos and succulent karoo floras.

The effect of different landuse options on the phyto-diversity of west coast strandveld

Nicolaas Hanekom, *WCNCB, Malmesbury*

Strandveld has been, and still is, primarily a stock-farming area. The vegetation contains many palatable species and provides adequate natural pasture. Strandveld is highly seasonal vegetation, with a growth peak in the wet months from autumn to spring, although some shrubs grow at other times of the year.

a) Species diversity indexes
b) landuse options and phyto diversity
c) landuse options and pyto diversity in plant functional groups

Changes in plant species richness and diversity were investigated across a fence or old fence line separating conservation for 34 years, conservation for 11 years south and north, cattle and goat grazing, sheep grazing and strip ploughed areas grazed by sheep in and around Rocherpan Nature Reserve, South Africa. Species were recorded using the modified Whitakker plot and the species richness; Margalef, Pielou, Shannon-Wiener and Simpsons diversity indexes were used to determine the significant differences between the phytodiversity of the different land uses. Significant differences between species richness and abundances were found between the different land uses. The significant differences were founds under the conservation 11 years north land use. The annual plant species diversity and abundances under the grazing land uses was higher than the conservation land uses. The perennial species diversity and abundances was higher in the conservation land uses and lower in the grazing land uses.

13 AUGUST 2004

PARALLEL PAPER SESSION 10

THE URBAN ENVIRONMENT & ITS IMPACT ON BIODIVERSITY CONSERVATION

New Paradigm in Urban Conservation – deepening community partnerships
City, Partnerships, Community

Zwai Peter, **Linden Rhoda and Luzann Hendricks**
Cape Flats Nature, Edith Stephens Wetland Park, Lansdowne Road, Philippi and Cape Flats Nature, >>> Wolfgat; Harmony Flats and Edith Stephens Nature Reserves

Cape Flats Nature is a partnership project between the City of Cape Town, Table Mountain Fund, Botanical Society of South Africa and the National Botanical Institute as an implementing partner. The project aims to build a knowledge base of good practices in sustainable management of City conservation sites, in a way that benefits the surrounding communities, particularly townships where income are low and the living conditions are poor.

We will share case studies that illustrate lessons learned in building partnerships with local communities, at two of our four pilot sites. Linden Rhoda an area manager at Wolfgat Nature Reserve, faced with a deeply divided community and difficult challenges in working with local structures. As a student intern, Luzann Hendricks, successfully built a community working group looking after a patch of land with high conservation value in the Strand area. Now as the area manager of Edith Stephens Wetland Park, she is faced with challenges of transferring those lessons to more complex and formally structured communities, around the present site.

Cape Flats Nature's Communication Manager will draw out lessons from these and other site – level experiences, in adopting an action – focused approached as opposed to prioritising the formation of formal governance structures, when starting to work with communities to achieve conservation objectives.

Attitudes of local communities to the current and future usage of Wolfgat, a lowland fynbos protected area on the Cape Flats, South Africa

Keywords**:** Attitudes, Local communities, Lowland Fynbos

T.L. Manuel and MT Hoffman
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Two questionnaire surveys were conducted in communities living adjacent to a lowland fynbos reserve called the Wolfgat Nature Reserve. The first survey compared attitudes of residents (N=200) and community leaders (n=100) of the neighbouring Mitchells Plain, while the second survey compared attitudes of the immediately, adjacent but culturally different communities of Tafelsig (n=31) and Harare (n=30). In both surveys, we examined their attitudes to the current and future role of the area, how the area integrates with different socio-economic themes and how, despite various challenges and threats, ongoing usage could be achieved. Results from the Mitchells Plain survey indicate that attitudes of leaders are generally reflecting the attitudes of residents, while there are strong differences in attitudes of the culturally different communities towards funding the area and the education and job-creation role of the area.
Based on the findings of both surveys, implications for the management of the area will be shared.

The Cape Town CUBES Group

Ruida Stanvliet [1]; George Davis [2]; Joanne Jackson [3]; Benjamin Lane [4]; Joseph Mokhoele [5]; Willem Smith [6]; Quintus Thom [7]

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4 CUBES, Columbia University Earth Institute, 2910 Broadway, Hogan Hall B-16, MC 4335, New York, New York 10027, USA. Email address: ben2002@columbia.edu
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6 Provincial Department of Environmental Affairs and Development Planning, Private Bag X 9086, Cape Town, 8000. Email address: wsmith@pgwc.gov.za
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CUBES is the Columbia University/UNESCO Joint Program on Biosphere and Society. CUBES operates in collaboration with identified partners in a network of sites around the world, including Cape Town. A CUBES Cape Town Urban Biosphere Group compiled the Cape Town Case Study in the course of 2003. The Cape Town CUBES Group emerged as a result from lessons learned through this work.

The Cape Town CUBES Group (CTCG) has now been established as a cross-disciplinary and multi-institutional group that will focus on the interface of environmental conservation and poverty alleviation in the urban context. The group will facilitate long-term conversation and collaboration at the technical level, and could serve as a resource for the policy making and implementing bodies.

The CTCG is a public sector partnership whose purpose is to catalyze local action and debate regarding the role that biodiversity conservation can play in social development and the alleviation of poverty. It will achieve this by: (1) serving as a knowledge hub, both thematically and institutionally; (2) actively promoting linkages between social and ecological issues; (3) facilitating development of action-based, multi-disciplinary projects working at the interface of poverty alleviation and biodiversity conservation; and (4) providing technical support where possible to existing initiatives, programs and projects.

This paper will provide information on the Cape Town CUBES Group and how it could be a valuable partner in delivering the goods in the urban context.

Schools: Educating for the Environment
Environmental Education, Partnerships

Paula Hathorn**, *Cape Flats Nature, Edith Stephens Wetland Park, Lansdowne Road, Philippi***

Cape Flats Nature is a partnership project that aims to build sustainable, people-centred conservation practice at its four pilot sites in the city. All of the pilot sites are surrounded by poor communities. The pressure on the sites for alternative use, particularly housing, is extremely high.

The challenge we face is to build an appreciation and protectiveness of the pilot sites rooted in the communities on their borders. Environmental education is a key way in which communities become aware of the conservation sites and benefit from them.

The environment is integrated into every learning area of the school syllabus which creates opportunities for working with educators, many of whom need to develop their capacity to teach the environmental aspects of the curriculum. The sites are evolving as "outdoor classrooms" where learners can discover, care for and enjoy the environment on their doorstep.

Cape Flats Nature is involved in education partnerships with CBO's, NGO's and the Western Cape Education Department. This paper will explore different ways of approaching environmental education, as well as the benefits and challenges of the partnerships we have developed in this area of work.

Blaauwberg Conservation Area (BCA) – Feedback and Progress Report

Adelé Pretorius & Clifford Dorse
Blaauberg Conservation Area, Tel: (021) 554 0957 Email: bca@sybaweb.co.za

At the 2002 Fynbos Forum, Joanne Jackson gave a presentation entitled "Blaauwberg Conservation Area (BCA) – Moving towards achieving the vision. This presentation outlined why the BCA is so special, gave a brief project history, described what had been achieved to date and what the main challenges were facing the project.

Much has happened in the last two years. Feedback will be given on what has been achieved since the previous presentation and what challenges the BCA now faces.

13 AUGUST 2004

PARALLEL PAPER SESSION 11

APPLIED RESEARCH : TERRESTRIAL & AQUATIC FAUNA

What do DNA sequencing studies add to our developing understanding of species diversity and endemism in the Cape Fold Mountain herpetofauna?

Michael Cunningham[1], Kelley Whitaker[1], Catherine L. Henderson[2], Krystal A. Tolley[3], Paulette Bloomer[1]
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The Cape Fold Mountains (CFM) hold a highly endemic herpetofauna that is particularly rich in 'palaeoendemic' lineages (ancient groups with few or no close relatives). A developing database of locality records reveals that endemic CFM species are strongly structured into 5-6 regional assemblages. There are also strong patterns in the distribution of diversity, with highest species richness in the south-west and fewer species in the easternmost ranges. Despite these generalities in the geography of species diversity, the processes responsible for these patterns, and the time scale over which they have developed, are not obvious. Analyses of species diversity do not generally consider the degree of similarity among related taxa in different areas. Conversely, widespread species are informative only in so far as they show cohesion across regions. In addition, new frog and reptile species continue to be recognised from the CFM, through increasing knowledge of geographical diversity, different resolutions of taxonomic uncertainties, changing species concepts, or occasionally, from completely new discoveries. These taxonomic shifts demand ongoing reappraisals of species richness and endemism. Phylogeography, the inference of population histories from DNA sequence data, offers an additional, historical-process oriented perspective on geographical diversity. Here we use bioclimatic envelope based estimates of individual species distributions, within montane blocks, to make quantitative predictions of species diversity, species endemism and transitions between regional assemblages across the CFM. We compare and combine these patterns with analyses of gene-lineage diversity across a representative subset of Cape Fold Mountain taxa. We show that regional patterns of species diversity are matched by similar, but more detailed structuring of gene lineages within species. Genetic diversity is greater in the west than in the east, suggesting recent expansion of eastern populations from one or two refugia, and long fragmentation of those in the west.

Genetic heritage of the endemic freshwater fish of the Cape Floristic Region

Keywords: Freshwater fish, genetic diversity, genetic heritage

P. Bloomer[1], E.R. Swartz[1], M. Cunningham[1], H. Roos[1], R. van Niekerk[1], I.R. Bills[2], J.A. Cambray[3], N.D. Impson[4] & P.H. Skelton[2]
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Within-species or genetic diversity is one of the three fundamental levels of biodiversity and is relevant to fynbos conservation in several ways. The amount and distribution of within species diversity records the history of that species; of how abundance has changed with past climates and of historical connections among currently isolated areas. By combining patterns of diversity across species we can reconstruct a history of the fynbos landscape and develop a greater appreciation of diversity hotspots across the Cape Floristic Region (CFR). Genetic analyses can also identify historically independent lineages within species, some adapted to different environments, or even unrecognized species. Of the 19 primary freshwater fish species that have been recorded from the CFR, 16 are endemic and of these 13 are threatened. Our main focus on three genera: *Pseudobarbus*, *Sandelia* and *Galaxias*, representing nine recognised species, revealed the presence of 25 unique evolutionary lineages. Based on the distribution of genetic diversity we have identified priority rivers that either house unique lineages or harbor high levels of diversity. These rivers are important to to maintain ecological and evolutionary processes within individual species and to conserve the genetic heritage of endemic freshwater fishes in the region.

Speciation and limits to distribution in Ghost frogs (*Heleophryne*)

[1]Catherine Lys Henderson **and** [2]**Michael Cunningham**
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Ghost Frogs (family Heleophrynidae, genus *Heleophryne*) are a relictual Gondwanic lineage confined to temperate montane areas of Southern Africa. Within the Cape Fold Mountains five closely similar forms of *Heleophryne* (*depressa*, *purcelli*, *orientalis*, *regis* and *hewitti)* replace each other from North-West to East. In addition there are several populations of uncertain status that inhabit more isolated ranges in these mountains (Kammanassie and Baviaanskloof). A divergent form, *rosei*, is restricted to Table Mountain. Distributional modelling of *Heleophryne* using the Garp Modelling System provided a poor match to known range limits, indicating that either the model scale or the model parameters did not reflect the factors that control *Heleophryne* distribution. Bioclimatic factors alone, in particular rainfall over the driest quarter, provide a better match to current distribution, but showed extensive overlap in the bioclimatic envelope of different *Heleophryne* species. This pattern is consistent with historical isolation of ecologically equivalent forms in different areas, and is further supported by analyses of mitochondrial DNA sequence variation, which identified three historical lineages within the Cape Fold Mountains.

Biogeographic history shows support for a radiation of dwarf chameleons in the Cape Fold Mountains, South Africa.

Krystal A. Tolley[1], Andrew A. Turner[2] and Conrad A. Matthee[1]
[1]Evolutionary Genomics Group, University of Stellenbosch, Matieland 7602, South Africa
[2]Western Cape Nature Conservation Board, Stellenbosch, South Africa

There are at least five species of dwarf chameleons (*Bradypodion*) endemic to the Cape Fold Mountains of South Africa. These species have allopatric or perhaps parapatric distributions, but the phylogenetic patterns and historical biogeography that have shaped these distributions are largely unexplored. By investigating the phylogeography of this group through two mitochondrial markers (ND2 and 16S) it appears that the complexity of their distributions and diversity of lineages has been underestimated. DNA samples were obtained from 136 chameleons from 47 Quarter Degree Grid Cells in the Cape Floristic Region. Phylogenetic analyses (parsimony, maximum likelihood & Bayesian analysis) produced congruent topologies that showed two well supported clades. Within these clades, sequence divergence among lineages is low, and haplotype networks show patterns of reticulate evolution, suggesting fairly recent origins for some of the lineages. A dispersal-vicariance analysis and a relaxed Bayesian molecular clock indicate that divergence between the two main clades probably occurred through a vicariance event approximately 14mya (±4.4my). Within each of these main clades, both dispersal and vicariance have a played role in shaping present day distributions, which may be related to environmental changes in association with climatic shifts. The most recent series of dispersal events are indicated to have occurred less than 4mya, suggesting the origins of present day lineages are founded in the Pliocene.

Determining Sustainable Stocking Rates for Bontebok (*Damaliscus dorcas dorcas*) in the Bontebok National Park

Keywords: Bontebok, Stocking rates, Sustainability, Carrying Capacity

Chavoux Luyt *Department of Conservation Ecology, University of Stellenbosch e-mail: educluyt@sun.ac.za*
David Ward *Department of Conservation Ecology, University of Stellenbosch*

A frequent question by farmers interested in conservation is: "I would like to (re)introduce some game species on my piece of natural veld (renosterveld/fynbos). How many can I have?" A similar question could be asked by the Park managers at Bontebok National Park: "How many animals can we keep on Bontebok National Park without a deterioration in the plant biodiversity?" This study aimed to answer these kind of questions. A short overview of methods used traditionally to answer similar questions are given. Then one method, using habitat preferences, is discussed as it was applied in Bontebok National Park. GIS was used to map the different habitat factors and the actual distribution of Bontebok was correlated to the different factors. Fire was found to be by far the greatest

factor for short-term habitat preferences by Bontebok. Fire also has a long-term effect on the numb!er of breeding territories established. When a greater area was burnt, more territories (and greater potential for breeding) was established. It was concluded that generally it is fire-frequency that will determine the numbers of Bontebok that can be sustained on the Bontebok National Park, as fire has a greater direct effect on the plants than grazing.

Avian icon of C.A.P.E. conservation?

Progress, set-backs and lessons at the halfway stage of the Black Harrier Project

Andrew Jenkins**, Odette Curtis & Rob Simmons**
Western Cape Raptor Research Programme, Percy FitzPatrick Institute, University of Cape Town, Rondebosch 7701

The CEPF-funded Black Harrier Project (BHP) was started in January 2003, and is scheduled to run until December 2005. The initial, key objectives of the project were to (i) promote environmental awareness and understanding within civil society in the Overberg and Swartland regions by encouraging interest in the Black Harrier, a conspicuous, charismatic, predatory bird, that is essentially endemic to the Fynbos Biome, (ii) build conservation capacity by involving landowners and conservators in practical aspects of the project, and by training postgraduate students, and (iii) research the ecological link between the welfare of harrier populations and the welfare of threatened, lowland habitats within the CFR, thereby evaluating the Black Harrier as a legitimate indicator of the quality of renosterveld and lowland fynbos fragments.

At the halfway stage of the project, we report back on progress made and problems encountered in working towards these objectives, and present plans for the next 18 months of the project, that we hope will see the BHP make a meaningful and sustainable contribution to the C.A.P.E. initiative, and establish the Black Harrier as a recognised icon of conservation in the region. Three postgraduate students have done thesis work within the broader scope of the BHP. We have determined that the harrier's rodent prey base is impacted by habitat transformation processes, and that breeding pairs are highly sensitive to habitat quality, and only breed in the larger, more intact fragments of lowland vegetation. Despite having produced and widely distributed an information brochure, gained exposure for the project in both print and broadcast media, given numerous talks to a variety of interest groups, and visited many landowners and conservators to involve them directly in harrier monitoring, we have fallen behind in some of our awareness, understanding and capacity targets. We discuss reasons for, and solutions to, some of these shortfalls.

PAPER SESSION 11

THE URBAN ENVIRONMENT.... cont

A genetic evaluation of the sub-populations of the endangered Cape Flats Conebush (*Leucadendron levisanus*) – implications for management protocols.

Dalton Gibbs, *City of Cape Town, Fishermans Walk, ZEEKOEIVLEI, 7941*

The Cape Flats conebush (*Leucadendron levisanus*) is a narrow endemic that formerly ranged across the Cape Flats in suitable habitat from Muizenberg to Eerste River, occurring as far north as Mamre. An isolated population occurred in the Fish Hoek – Noordhoek Valley, separated from the main Cape Flats population by the Steenberg Mountain range. The species is now listed as endangered, being reduced to about 500 plants that are fragmented by urban sprawl into six sub-populations.

A number of people have commented on visual differences between populations, particularly those of the Fish Hoek population, which appear shorter, more robust and larger leaved than Cape Flats plants. These perceived differences may be caused by a number of abiotic factors or be an indication of a distinct genetic trait in the population. Given the species' localised pollination, short dispersal distances and the isolation caused by the Steenberg Mountain range, it was theorised that the Fish Hoek sub-population was beginning to display unique identifiable genetic traits.

If it were assumed that the rise of sea level at the end of the last age has prevented the Cape Flats and Fish Hoek populations from interchanging genes, then any genetic drift that the Fish Hoek plants might display would provide a convenient clock to measure early geographic speciation.

Urban development has reduced the Fish Hoek population to two plants, with a further twenty plants conserved at the Rondevlei and Zandvlei Nature Reserves. A genetic comparison between the Fish Hoek and Cape Flats populations are vital in attempts to restore the species as well as the genetic integrity of sub-populations.

A genetic evaluation of the Fish Hoek, Kenilworth and Blaauwberg plants was undertaken using the Amplified Fragment Length Polymorphism Technique (AFLP).
The results of this evaluation and the management implications are presented.

Poster

Abstracts

Poster Session 1

Institutional Partnerships & Development; Economics; Education

Tuesday 10 August 2004 @ 17h00

1. Conservation Initiatives Engaging Municipalities: Processes to be followed

Eleanor McGregor, *Baviaanskloof Mega-Reserve Project, Wilderness Foundation, Port Elizabeth*

Conservation initiatives are expected to integrate and align their development ideas and plans with that of their Local and District Municipalities. This alignment does not happen by the conservation initiative simply submitting (on paper) their needs and documenting what the project can do for the municipality.

It requires constant interaction with the relevant individuals in the municipalities and an understanding of the municipal Integrated Development Planning and related Spatial Development Planning processes. Only when the municipality understands how the conservation project and the municipality can jointly see to the municipal needs, the ideas and needs of the conservation initiative will be included into the municipal IDP's and SDP's.

When the planning processes are aligned, benefit delivery is facilitated i.e. development of a Natural Resource Interpretation centre in the municipal area, upgrading of a specific road that is an access road to the conservation area, improved schooling facilities and medical services for communities living inside the mega-reserve, job creation, etc.

The poster is a summery of the methods and processes that the Baviaanskloof Mega-Reserve Project followed, when attempting to align Reserve and Municipal Planning processes, that has proved to be successful.

2. Is the NRF delivering the goods in Fynbos research in South Africa?

Jimmy Khanyile, *Professional Officer, Conservation & Management of Ecosystems And Biodiversity NRF, PRETORIA*

The Fynbos Biome is considered to have the highest plant diversity in South Africa and the rest of the world. This biome occupies about 6% of South Africa and mainly found within the Western Cape. Its vegetation contains a highest level of endemic plant species, which is the highest level of endemicity on any subcontinent. As one of the country's heritage, fynbos biome requires good management and custodianship. This floristic kingdom with its unique vegetation has a potential to attract tourists and also become world's nature conservation zone. Therefore, innovative ways on the management of this rich biome requires good research which is aligned with the Research and Development strategy of our country. Research will go a long way in creating wealth of knowledge about the fynbos. The NRF has a strategic role to play in this, since it is mandated by the government to support through funding, promote and increase capacity in research knowledge. Over the past years, fybos research has received funds from the NRF through the Conservation & Management of Ecosystems & Biodiversity (CMEB) focus area. Recently there are new initiatives established within the NRF to further benefit environment and conservation research, such as SAEON, SABIF & SABI.

The poster shows recent support of the NRF in fynbos research for the 2000 to 2004 period. It also shows grant holders, student support and amounts of funding allocated by the NRF towards fynbos research for the similar time period as above.

3. SIX YEARS OF TABLE MOUNTAIN FUND PROJECTS – WHAT HAS BEEN ACHIEVED

Zohra Parkar-Salie, Julia Wood & Rodney February
WWF-SA, Private Bag X2, DIE BOORD 7613

The Table Mountain Fund (TMF), an associated trust of WWF-SA, over the last five and half years have run or running about 70 projects. Early this year the projects were reviewed for their relevance, effectiveness, efficiency, impact and sustainability. The results, the subject of this poster, were fed into the TMF's Strategic Plan review.

4. TMF'S CAPACITY BUILDING PROGRAMME

Rodney February*, Julia Wood & Zohra Parkar-Salie
CBP,TMF,WWF

TMF's Capacity Building programme, funded by the Critical Ecosystem Partnership Fund, has been operating for just over a year and half. During this time there has been a large amount of successes with some very valuable lesssons learnt. This poster gives information on its objectives and looks back at the progress of the project over the last year and half.

5. Ukuvuka Campaign – Contractor Development Programme

Marié van Heerden*, City of Cape Town: South Peninsula, 3 Victoria Road, Plumstead, 8000*

The Santam/Cape Argus Ukuvuka Operation Firestop Campaign came to a close at the end of June 2004. During it life the campaign funded three different development programmes. This poster looks at the last six-month programme – its failures and successes.

6. A Job well done: The Protea Atlas Project!

Protea Atlas Conservation

Tony Rebelo, *Protea Atlas Project, National Botanical Institute Kirstenbosch*

The Protea Atlas Project has collected over 250 000 records of Proteas from 60 000 localities in the Cape Flora. Final data checking is nearing completion and herbarium data are being geo-referenced. A preliminary assessment of the Red Data Book status has been done electronically using IUCN criteria and it is planned to workshop the results to determine their validity later this year, prior to releasing an official Red List Status. Final maps of all species distributions for the entire CFR using Bayesian Modelling is expected late in 2004. These and summaries of other data collected by atlassers - such as flowering and growth phenology, threats such as picking, agriculture and alien invasion, pollination data and many casual field observations - together with syntheses such as conservation status, threat profiles, Red List status and abundance patterns will form the basis of the Protea Atlas.
The Protea Atlas Project - and it atlas - is a tribute to the hundreds of atlassers who collected this invaluable data base. Proof that amateurs and layman can contribute significantly to the science, conservation and mapping of our biodiversity. We salute them!

7. Van Stadens, Changing from Wild Flower to Nature Reserve

Keywords: Rehabilitation, Local vegetation, Conservation

W. Berrington, T. Matsha, M. Plaaitjie, *Van Stadens Nature Reserve, P.O. Box 187, Thornhill, 6375*

The Van Stadens reserve was established 52 years ago and was run as a Wild Flower reserve. At that time little agricultural development had taken place between the reserve and Port Elizabeth. Alien vegetation was also less prevalent than it is today. Large tracts of natural vegetation spanned the area and the importance / vulnerability of this unique vegetation type had not been realised. The reserve was used to introduce plants from all over South Africa for display. Most, but not all successful plants were of Western Cape origin. The natural vegetation of the

area was not appreciated and visitors mostly came to view plants foreign to this area. This reserve has about 6 RDB plant spp occurring naturally in it and the natural vegetation is unique to this area.

Large tracts of previously unused natural vegetation have now either been invaded by alien plants or ploughed up for agricultural purposes, thus leaving the reserve as a key remnant of this vegetation type. Our plan is to remove the plants not natural to the area from where they had been planted in the veld and to rehabilitate these areas. A core area of display specimens will however be retained around the entrance / office complex. Our plan is thus to manage the land as a natural system and to remove those elements foreign to it. The reserve will thus no longer be managed as a refuge /display area for plants coming from all over SA

8. The Overberg Useful Plants Project (OUPP)

Phakamani Xaba, *National Botanical Institute, Urban Conservation Unit, Overberg Useful Plants Project, Harold Porter National Botanical Garden, PO Box 35, Betty's Bay.*

The Overberg region is one of the epicenters or 'hot spots' of Fynbos biodiversity in the Western Cape, and boasts the first biosphere reserve in South Africa, the Kogelberg. This offers a wealth of opportunities in terms of environmental awareness, research, conservation and sustainable use of natural resources. Its remote location, coupled with a lack of expertise and funding, severely hampers the initiation of such projects.

The OOUP focuses on marginalised community in Kleinmond, Hawston and Hermanus, and aims to develop horticultural and entrepreneurial skills through the establishment of community supported indigenous nursery and the establishment of domestic gardens. In addition, it aims to promote environmental awareness, sustainable use of our indigenous flora by developing partnerships with relevant groups. Transfer of knowledge on traditional useful plants combined with horticultural skills can secure community commitment to conservation. Using traditional useful plants as a sustainable natural resource contribute to improving quality of life and poverty alleviation, and support our collaborative conservation efforts with communities.

The OUPP is facilitated by the (National Botanical Institute) NBI under the Urban Conservation Unit, with NGOs and governmental bodies as potential funding sources. The OUPP has an operational support base at Harold Porter National Botanical Garden, which already contributes to local community upliftment and development of ongoing partnerships.

9. BIOTA in the CFK: what are we doing?

Keywords: Fynbos, Renosterveld, Succulent Karoo.

Tessa Oliver, *BIOTA liaison officer- South Africa,c/o Department of Biodiversity and Conservation Biology, University of the Western Cape, Private Bag X17, Bellville 7535*

Some exciting BIOTA projects are happening in the Cape Floristic Kingdom. These include a study of parasites in striped field mice, various ant species in renosterveld, small mammal communities in fynbos, plant functional types and the effects that climate change will have on succulents.

10. A Park for All, Forever

Christa Botha*, Table Mountain National Park, P.O, Box 62 Simon's Town 7995*

The aim of this poster is to illustrate the Table Mountain National Park's mission to make this Park truly accessible for all South Africans, but especially our close neighbours. Environmental Education plays an important role in our mission. It enhances the experience of visitors to TMNP through environmental interpretation and educational activities, so as to encourage repeat visits. On a day-to-day basis we strive to increase the number and broaden the range of groups receiving a quality learning experience in TMNP.

We encourage involvement of local communities in the Park as to understand, appreciate and support the conservation work of the Park. The poster shows our daily attempts to involve everybody in making this A Park for All, Forever.

11. Is the vegetation of Paarl Mountain Nature Reserve delivering the goods? Patterns, processes and perspectives.

Milton SJ[1], Scott M[2], Dean WRJ[3] and van der Merwe A[4]
1. *Conservation Ecology Department, University of Stellenbosch,* ***sukaroo@mweb.co.za***
2. ***Mykes@intekom.co.za***
3. *FitzPatrick Institute, University of Cape Town,* ***lycium@mweb.co.za***
4. *Drakenstein Municipality, Paarl,* ***Albert@drakenstein.gov.za***

We present information and ideas that developed during the preparation of a plant checklist and vegetation survey of Paarl Mountain Nature Reserve. First we discuss the history of collecting on the mountain and role of the Paarl Mountain Herbarium which now houses 394 of the 710 plant species collected within the Paarl Mountain Nature Reserve to date. We then describe the spatial patterns in plant communities and species richness caused by altitude, moisture, soil depth and animal activities, before moving to temporal patterns including phenology and succession. The 8 plant communities mapped during the 2003 survey were microphyll shrublands, proteoid fynbos, moist fynbos, silvertree woodland, riparian restioid fynbos, Olea forest and boulder succulents. Species-richness decreased with altitude and with canopy cover. Finally we ask "Is the vegetation of Paarl Mountain Nature Reserve delivering the goods?" Here we consider the contribution that the vegetation of Paarl Mountain Nature Reserve makes toward long-term conservation of biodiversity, provision of goods and services, education and recreation, and solicit opinions on future scenarios involving tourism, biosphere management, game introduction and consumptive use of various resources.

12. Inhouse Training & Improved Educational Outreach

Keywords: Training, Educational Outreach, Communities

Sydney Ngcakana **and Kholeka Sylvia Zemva, & Jayne Harrington,**
Garden Route Botanical Garden Trust, 49 Caledon Street, George 6529

The mission of the Garden Route Botanical Garden Trust is to establish and maintain the indigenous Garden Route Botanical Garden and the Moriarty Environmental Centre for education, research, conservation and recreational purposes.
The education aspect starts "at home" with employees being provided with many opportunities to acquire new skills and understanding through in house training.

A result of this has been an improved ability to communicate with, and educate all communities on the importance of plants in maintaining biodiversity. An increased exposure to, and understanding of the resource facilities that the GRBG and Southern Cape Herbarium has to offer, has helped to ensure that all communities are made aware of the user friendly nature of these facilities.

Improved communication also ensures that the GRBGT is better able to understand the needs of a wider community of users, and to work towards capacitating the organisation to meet these needs.

13. ENVIRONMENTAL INITIATIVES WITHIN KOUGA

Key Words: Municipality, private sector, conservation

Lorraine Egan. *Environmental Practitioner (Kouga Municipality). P.O.Box 11, Loerie, 6370*.

Kouga, as part of the Cape Floristic Kingdom (CFK), deserves priority status when it comes to conservation and management of our valuable natural resources. Indeed, much is happening in Kouga in this regard. On reviewing the environmental initiatives occurring in the region, focusing on the driving forces behind these initiatives as well as those parties responsible for their implementation, it is clear that the private sector plays an integral role in environmental conservation and environmental problem-solving. Local authorities have undergone a major

transformation in structure as well as function, with increased responsibility particularly in the fields of spatial planning and land use management, but have often not been supplied with the infrastructure to deal with this. The effectiveness of Kouga Municipality's efforts with regard to environmental conservation is hampered by a severe lack of capacity (funding and staff) as well as the low priority assigned to environmental concerns. Detailed plans and advice (STEP, CAPE etc.) are of limited use if an institution lacks the people and the money to act on them. Thus, Kouga Municipality has had to rely increasingly on partnerships with private stakeholders. A more structured environmental department and a solution to the problem of lack of capacity are urgently needed in order to increase the effectiveness of conservation efforts in the Kouga region.

14. Cederberg Wilderness Educational and Awareness Campaign

Awareness Campaign; Clanwilliam Cedar, Cederberg Wilderness and Surrounding Conservancies

Jakob Hanekom, *Private Bag X6, Clanwilliam, 8135*

This is an International sponsored project by RARE, CEPF and WCNCB to promote the conservation of a flagship species the Clanwilliam Cedar. This will be achived by raising awareness regarding the factors that influencing the Cederberg Wilderness and Surrounding Conservancies. The awareness campaign will target local schools, general public and farmers as well as conservancy members. Activities that will be used in the campaign include Posters, fact sheets, puppet shows, sermon sheets, costume visitation for schools, art competition, a legislation booklet and a school song. Pre and post project questionnaire survey was and will be conducted.
At the end of the campaign a report back will be done at University of Kent at Canterbury where training for the campaign was received.
POSTER The poster is part of the awareness activities of the campaign and look at the following aspects:
THE CEDERBERG

- It Describe what the Wilderness offer people
- What factors have an influence on the area?
- Describe the endemic Clanwilliam Cedar
- Challenge reader to Take part in conservation action

15 The Green Futures Horticulture and Life Skills College - building sustainable livelihoods through nature based education.

Susan Lochner, Zwelithini Gwele, July Dingani, Nzuzo Nkhili and Goodwill Lolwana.
GreenFutures, Grootbos Private Nature Reserve, Gansbaai

The college is built on Greootbos Private Nature Reserve. We train 12 unemployed people to do the fynbos gardening.
Its is a hands on course - where the students do propagation of fynbos, landscaping wth fynbos, fynbos gardening, fynbos restoration. We do a lot of visits to nature reserves, and other fynbos institutions. Practicals have been done at Harold Porter, Kirstenbosch, and Thje Eden Project.

Thursday 12 August 2004 @ 13h00

Poster Session 2

Spatial Planning; Biological Invasives; Restoration; Aquatic Systems

16. Delivered: A New Vegetation Map!

Vegetation Mapping Conservation

Tony Rebelo, *Protea Atlas Project, National Botanical Institute Kirstenbosch*

Progress with the new Fynbos Vegetation Map will be outlined. All vegetation units have been checked. All boundaries have been checked. An electronic copy of the map is available from the National Botanical Institute.

The text is nearing completion and includes and introduction to the major vegetation types and the following for each type: synonyms, vegetation descriptions, dominant and characteristic species, endemic species and notes on ecology, transformation and conservation status, a graphical climate summary, and other information. These form part of the publication "Vegetation Types of South Africa, Lesotho and Swaziland", which should be ready for publication early in 2005. A summary of the key features (endemicity, transformation, conservation), showing patterns of diversity, threat and conservation status will be presented.

17. How Information was sourced and managed for utilization in the Cederberg Conservation Planning Project.

Judy Scott & Glynnis Barodien
Conservation Planning Unit, WCNCB, Private Bag X7, Kirstenbosch Research Centre, Rhodes Drive, 7735, Newlands , Cape Town

This poster will present the methods used for sourcing creating and amalgamating information for use in the Greater Cederberg Biodiversity Corridor Planning Project. It will explore and represent graphically the inter-relationship that exists between conservation planning, Knowledge and Information Management and Geographical Information Systems

18. Sandveld in Crisis - the role of record keeping in conservation planning and management.

Key Words: Sandveld, Transformation, Monitoring

Johan Burger[1] and **Verna Love[2]**
[1] Cederberg Mega Park - Conservation Services, Western Cape Nature Conservation Board, P.O. Box 26 Porterville 6810
[2] Scientific Services - Landuse Advisory Unit, Western Cape Nature Conservation Board, P/Bag x5014 Stellenbosch 7599

Even though C.A.P.E. defined much of this area as being between 0-60% irreplaceable, the C.A.P.E. information is based on a spatial transformation layer, which is over six years old. Extensive transformation of natural veld by agriculture has occurred is this area since the C.A.P.E. layer was created. The options for conserving a representative proportion of this vegetation and its associated biodiversity are greatly reduced with these high levels of transformation.

Results from a recent analysis on the rates of transformation in the Sandveld region will be presented, highlighting the importance of record keeping and monitoring for conservation planning and management, as well as an urgent need for action in the Sandveld.

19. Effects of clearing treatment and the post burn environment on seed banks of the alien invasive shrub *Acacia saligna* in the Silvermine Nature Reserve, Cape Peninsula

Key words: seed banks, management practices, clearing techniques

[1]R. Jasson, [1]K. Esler & [2]Cheney, C
[1]Department of Botany, University of Stellenbosch, Private Bag XI, Matieland 7602
[2]Table Mountain National Park, P O Box 37, Constantia 7849

This study investigates the extent of pre- and post-fire *Acacia saligna* seed banks under differing stand ages and differing clearing techniques in the Cape Peninsula National Park, with the aim of informing best management practices. Three sites, Noordhoek, Fish Hoek and Steenberg undergoing varying clearing techniques were sampled. Two of the sites (Fish Hoek and Steenberg) had been cleared and the biomass stacked (stack burn treatment) for burning during winter 2003. The third site (Noordhoek) was to receive a standing – burn treatment in winter 2003. Three key questions were asked in this study. Does the method of alien clearing influence the number of seeds available for regeneration in a post-clearing, post-burn environment? Is there a correlation between stand age and size of seed bank? How variable is the seed bank size with soil depth? The numbers of

seeds were reduced significantly across all three sites after burning regardless of the clearing method. Seed stores were reduced to about 10% of the number of seeds that were present in the soil prior to burning. The matrix had not been taken into account with stack burns and thus there is an underestimation of actual numbers of seeds remaining after burns. There is a correlation between stand age and size of the seed bank. Mature stands of *A. saligna* appear to have greater seed stores than immature stands, although the sample size of the stands needs to be increased. Cumulative mean percentage viability of *A. saligna* seeds remaining in the soil were not very high (40-67%) with no significant difference between sites. Overall the stand burn treatment seem to be the best option for removal of alien vegetation but irrespective of clearing treatments, enough seeds always remained in the soil to regenerate new *Acacia* stands.

20. Conservation in Agroecosystems: Effects of woody aliens on epigaeic arthropod assemblages

Key words: Renosterveld, ants, conservation potential

C. Kassier & M.A. McGeoch
Spatial Physiological and Conservation Ecology Group, Department of Conservation Ecology, University of Stellenbosch, Private Bag X01, Matieland, 7602. E-mail: ckassier@sun.ac.za.

The Renosterveld of the Cape Floristic Region, South Africa, is highly threatened by agriculture and is extensively fragmented. Its formal conservation status is low, increasing the importance of remaining Renosterveld patches on privately owned farms. This study aimed to determine the general conservation value of Renosterveld patches in agroecosystems, particularly looking at the epigaeic (ground dwelling) arthropod fauna. More specifically, the study investigated the effect that alien woody plants have on the conservation potential of these fragments. Pitfalls were used to collect arthropod data from 14 sites, seven invaded with alien perennial plants and seven uninvaded sites, on De Rust Estate, Grabouw, during December 2002. Each site contained six pitfalls. The results showed that these fragments support a high diversity of arthropods, especially ants (Formicidae), implying that fragments in agroecosystems do have a valuable role to play in the conservation of Renosterveld and its fauna. However, the presence of woody alien invasives caused a decline in total arthropod abundance as well as a decline in total ant species richness and abundance. Ant assemblage structure also differed significantly between invaded and uninvaded sites, although ant species richness and abundance per site were not significantly different. Although ants, which dominate the epigaeic fauna in this habitat during mid-summer, are generalist omnivores and therefore do not have highly specialised habitat requirements, differences were still found between invaded and uninvaded sites. Invertebrate taxa with specialised habitat requirements, such as bees and other Hymenoptera, may therefore be expected to show more markedly negative responses to invasion of Renosterveld fragments by alien invasive perennials. Invasive species management must therefore form an integral part of strategies for Renosterveld conservation.

21. Bass unleashed: Investigating the impacts of an invasive predator on the indigenous fishes of a fynbos mountain stream

Keywords: Indigenous fish, bass, impacts

Darragh Woodford[1], **Dean Impson[2] and Jenny Day[1]**

[1.] *University of Cape Town, Private Bag, Rondebosch, 7701*
[2] *Scientific Services, Western Cape Nature Conservation Board*

The rivers of the Cape Floral Kingdom are home to a highly endemic and endangered fish fauna. A major threat to the conservation of these indigenous fish is the presence of alien invasive fish species in most of the region's river systems. The Clanwilliam Olifants system is the region's biodiversity and endemism hotspot, containing 8 threatened endemic fish species. The Rondegat River, a tributary of the Olifants, rises in the Cedarberg Mountains and flows into Clanwilliam Dam. The lower reaches of the river have been invaded by smallmouth bass (*Micropterus dolomieu*), a predatory fish considered to be a serious threat to indigenous fish throughout the region. Seasonal surveys of the river have revealed significant differences in the fish communities at invaded compared to non-invaded sites, with the former showing a dramatic loss of indigenous fish abundance and diversity. The Clanwilliam yellowfish (*Labeobarbus capensis*), the only indigenous species found at both invaded and non-invaded sites, appears to be suffering heavy predation pressure during early life history stages. The extermination of the bass in the lower Rondegat would appear to be the best way to rehabilitate the Rondegat, as well as similarly affected rivers within the Cape Floral Kingdom.

22. SEED GERMINATION AND SEEDLING ESTABLISHMENT IN BARE CLAY SOILS

Lizanne Hendricks, (to be "spoken to" by either Clifford Dorse or Adele Pretorius)
Blaauberg Conservation Area (BCA), Eerstesteen Resort, Otto du Plessi Drive, Blaauberg

(Background for your info) For many years the BCA has been an unofficial "playground" for off road vehicles. Many years of abuse have resulted in extensive erosion damage on the clay slopes of Blaauwberg Hill. In addition to this extensive alien invasion occurred within the boundaries of BCA. In 2004 extensive erosion control measures and an invasive alien clearing programme were implemented. From this the need arose for rehabilitation measures for this unique area.

Plots were laid out on two different slopes. Different methods of soil preparation was undertaken in each plot. Observations were conducted on a regular basis to determine the most effective rehabilitation method. The poster will discuss results of this and indicate manage methods.

23. Mine rehabilitation success – population dispersal from translocated plants

Marius Myburg and Sue Milton
Department of Conservation Ecology, University of Stellenbosch, South Africa.
e-mail 13428721@sun.ac.za & sukaroo@mweb.co.za

Namakwa Sands is a surface mine 30 km West of Lutzville and is owned by Anglo American PLC. It specializes in the extraction and beneficiation of ilminite, zircon and rutile from the heavy mineral sand ore-body. The Mineral Separation Plant (MSP) is located 7 km from Koekenaap (23 km from Lutzville). At the Mineral Separation Plant, electrostatic, dry magnetic and gravity methods separate Illminite, rutile and zircon. The non magnetic product supplied by the mine site is acid leached to remove iron coatings. Acid fumes from the acid leach circuit are released from an extraction pipe located on top of the MSP building. In this pilot study to detect acid effects on vegetation, we examined leaf condition and seed production of three common plant species to the SE and NE of the plant. We found that the health indicators for selected plant species in the two sites to the SE of the MSP were worse than those to the NE of the MSP. During the winter the dominant wind will be from the NW and these two sites were also situated at a slightly higher altitude. Although no obvious and severe signs of the effect of the acid were noted in this pilot study, the downwind environmental impact of the fumes on the surrounding vegetation needs to be quantified to determine the risk of the released fumes to the environment. Once the significance of the risk has been assessed appropriate management plans will be put in place to reduce the impact.

24. Mine rehabilitation success –dispersal from translocated plants

Anne H. du Plessis and Sue Milton
Department of Conservation Ecology, University of Stellenbosch, South Africa.
e-mail 13546066@sun.ac.za & sukaroo@mweb.co.za

Mining is one of the cornerstones of South Africa's Economy, with the Namakwa Sands (Anglo American Corporation) mining activities near Brand-se-Baai north of Lutzville and the smelter at Saldanha, offering important employment and development opportunities. The Namakwa Sands project extracts 'heavy minerals', such as ilminite, zircon and rutile. Surface mining disturbs the environment. Mining companies are therefore required to rehabilitate the damage at their own expense (Minerals and Petroleum Resources Development Act of 2004). Rehabilitation includes collection of topsoil, backfilling of tailings to the original macro-contours, placing of topsoil, and stabilisation of the area with windbreaks and natural vegetation. Revegetation methods use seeding with of local plant species, propagation of plant cuttings and plant transplantations. *Othonna floribunda* and *Zygophyllum morgsana* are two of the species of translocated plants in this area, and our study was focussed on these. Both

species had survived well for three years after translocation, despite the dry winter of 2003, and had flowered and seeded. *O. floribunda* produces a high abundance of small seeds and *Z. morgsana* a small quantity of large seeds. Seedlings of both species were found at distances of up to 30 m from the original translocated plants, but *O. floribunda* seedlings were more numerous, particularly within 15 m of the parent plants. Seedlings were found at greater distances to the south of the translocated plants than to the north of them, and this is attributed to the northwesterly wind that prevails in the wet winter growing season.

25. MANAGEMENT.

Ayanda Matoti**,** *Western Cape Nature Conservation Board, Private Bag x5014, Stellenbosh, 5700, South Africa*.

The National Department of Water Affairs and Forestry (DWAF) initiated a River Health Programme (RHP) in 1994, to assess the biological and ecological integrity of South African river systems. River health is an integrated measure of various conditions that are necessary for proper ecosystem functioning and the ability of the system to deliver valuable goods and services. Riparian vegetation is one of the biotic measures used to reflect the effect of disturbances that occur in an ecosystem over temporal and spatial scales. The modification in structure of the riparian vegetation alters its function, and ultimately ecological processes in rivers. The ecological integrity of the Western Cape Rivers was assessed as part of the RHP. The riparian vegetation index was used to measure the degree of modification of vegetation from its natural state. The ecological health of many rivers change from natural in its upper reaches to good in the middle reaches and poor in its lower reaches. Most of the upper reaches are in mountain areas or in nature reserves and are unaccessible to human disturbances. Invasion by alien plant species(*Acacia mearnsii, A. saligna, and A longifolia*) and bank modification is a serious problem in the lower reaches. Different management options have been suggested to improve the condition of disturbed riparian zones.

26. ASSESSING THE IMPACTS ON WATER QUALITY IN THE EERSTE RIVER, USING MACROINVERTEBRATES AS INDICATORS (SASS 5)

Keywords: River health, macroinvertebrates, water quality

Chantel Petersen, Western Cape Nature Conservation Board: Scientific Services, Private Bag x 5014, Stellenbosch, 7600

Rivers provide water, which is our most valuable resource. It has long been realized that these systems are complex and dynamic and numerous studies have assisted in understanding their physical and biological functioning. Rivers are the most degraded natural resources due to both past and current human activities and there is an increasing demand on water, especially in semi-arid areas. There has been a growing concern about the water quality within the Eerste River, southwestern Cape. The river is subjected to a range of impacts, which includes a dam in the upper reaches, weirs, trout hatchery, recreation, interbasin water transfer (summer releases), poor quality of sewage and wine effluents and over-abstraction.

A student project was conducted during 2003 whereby the South African Scoring System (SASS) version 5 was used to assess the water quality of the Eerste River. SASS 5 is an index of the National River Health Programme, which uses macroinvertebrates to assess water quality. Ten sites were selected along the river and of its tributaries and sampled on a seasonal basis. The sites were selected to specifically illustrate the variation in water quality due to the impacts along the Eerste River and included only the upper river reaches with a cobble substratum. Samples were also taken from marginal and aquatic vegetation and gravel if these habitats were available. The present study use the same sites as previously selected but sampling occurs on a monthly basis for a more detailed analysis. The preliminary results are presented.

27. Habitat Integrity of the Gourits River System

River Health Programme

Cecilé C. Reed**, Wietsche Roets and Arne Purves**
Western Cape Nature Conservation Board, Scientific Services, Private Bag X6546, George, 6530 , email: aquatics@pgwc.gov.za

The Gourits River system originates from three major tributaries in the southern Cape and drains one of the most unique and biologically diverse catchments in the world. To the north of the Outeniqua Mountains, the Olifants, Gamka and Touws tributaries drain through the "Central Little Karoo", which is one of the priority areas for conservation identified by the Succulent Karoo Ecosystem Plan. After the confluence of these major tributaries, the Gourits River flows south towards the ocean through South Africa's Thicket Biome, which is a major centre for biodiversity. Unfortunately large parts of this mostly arid catchment have been dominated by poor agricultural land use practices, over abstraction and inadequate irrigation schemes. In recognition of the urgent need to examine the ecological state of the Gourits River system, river health assessments were initiated in 2003 as part of the National River Health Programme (RHP). An aerial survey, undertaken as part of the river health habitat integrity assessment together with initial SASS5 results have illustrated the progressively deteriorating environmental conditions from the headwater reaches of the catchment down to the lowland rivers. Agricultural practices in the floodplains have impacted severely on riparian vegetation, resulting in destabilisation of riverbanks, increased sedimentation and channel shift. Furthermore, SASS 5 results have similarly indicated that many of the upper reaches are still very much in sound ecological condition, compared to habitat destruction and associated poor water quality conditions in many of the lowland reaches. The upper reaches of these rivers act as refugia for fragmented populations of endemic aquatic organisms in the southern Cape and it is therefore critically important to ensure their preservation. The information from these RHP surveys will enable objective and scientifically sound decisions to be made on the effectiveness of existing river management and conservation policies in the Gourits River system.

28. Will we save aquatic systems on the Cape Flats?

Keywords: City, Aquatic Systems

Tsolofelo Hlatywayo**, Kgalalelo Malesele & Stacy-Ann Michael**
Cape Flats Nature / City of Cape Town, Strandfontein Depot, Weltevreden Road, Mitchells Plain
Cape Flats Nature / City of Cape Town, Edith Stephens Wetland Park, Lansdowne Road, Philippi
Cape Flats Nature / City of Cape Town, Helderberg Nature Reserve,

The Cape Flats area has extensive sand deposits, which hold a ground water resource known as the Cape Flats aquifer. This aquifer is recharged principally from precipitation. The Cape Flats also has extensive wetlands, a habitat that is becoming increasingly rare in the Western Cape. Many factors cause the loss of our aquatic systems, and most have to do with people. Industrial and commercial developments, new settlements and the introduction of alien species are all as a result of the human race of which every person must be held accountable and must be able to play a role in saving our natural resources.

Edith Stephens Wetland Park, Macassar estuary and Harmony Flats all have one thing in common: water has always been precious in these areas. We cannot just discard the water because it plays a crucial role in plant and animal life. These areas used to have well functioning unpolluted aquatic systems. But the water table at Harmony Flats Nature Reserve has dropped to dangerous levels, at Edith Stephens Wetland Park the seasonal wetland is impacted by industrial seepage, while the Macassar estuary is threatened by high levels of pollution.

This poster will illustrate the path to destruction and opportunities to save these aquatic systems. The question is: Will we save our aquatic systems on the Cape Flats from fading away?

29. An approach to conserving aquatic biodiversity in the City of Cape Town

Key words: Biodiversity, Aquatic Ecosystems, Integrated Catchment Management

Candice Haskins, *Scientific Services, City of Cape Town, PO Box 16548, Vlaeberg 8018*

The City of Cape Town is currently implementing its Biodiversity Strategy in fulfillment of its Integrated Metropolitan Environmental Policy (IMEP), and in recognition of its position in the Fynbos Biome and the role it can play in support of C.A.P.E. The Strategy focuses on seven areas (*viz*. Primary Biodiversity, Secondary Biodiversity, Aquatic Ecosystems, Invasive species, Education / Awareness and Biodiversity Legislation), each with an action plan coordinated by a working group comprising city personnel from various line functions. Interaction with external role players is achieved through networking and the Biodiversity Forum. Abell, Thieme,

Dinerstein and Olson (2002) stated that, in contrast to terrestrial ecosystem conservation, the conservation of aquatic ecosystems should focus less on *what* to conserve and more on *how* to protect it, and that "integrated river basin management", which has traditionally focused only on water quantity and quality issues can enhance biodiversity conservation too. Clearly, healthy aquatic ecosystems are more likely to support biodiversity that is representative and appropriate to this urban city than polluted, poorly managed fragmented systems. The Aquatic Ecosystems Working Group therefore maintains that much can be achieved by enhancing Cape Town's existing integrated catchment management activities while encouraging consideration of biodiversity into Catchment and River Management plans, Catchment Forums, development proposals etc. In brief, the Aquatic Ecosystems Action Plan has six themes each with a handful of specific activities:

- Enhancing management and conservation of aquatic biodiversity through the principles of integrated catchment management;
- Protecting aquatic biodiversity by setting appropriate Resource Quality Objectives;
- Protecting aquatic biodiversity by maintaining and/or rehabilitating aquatic ecosystem structure and function;
- Protecting aquatic biodiversity through the management and reduction of water pollution;
- Protecting aquatic biodiversity through the control of alien invasive species;
- Conservation and management of key / indicator aquatic species.

30. Keysers River Restoration Project

Mandy Noffke & Marié van Heerden (presented by **Natalie Newman)**
Wetland Solutions, P.O. Box 719, Noordhoek, 7985

The Keysers River Restoration Project is a partnership project between the local authority, WESSA, Working for Wetlands and businesses in the Tokai area. The partnership strives to maintain and improve the section of the river between Military Road and Tokai Road extension.

POSTER SESSION 3

Stewardship: Monitoring * Evaluation: Applied Research: Urban Conservation

Friday 13 August 2004

31. Landuse Advice within Western Cape Nature Conservation Board (WCNCB)

Key Words: Landuse, Decision-making, Monitoring

Verna Love. *Scientific Services - Landuse Advisory Unit, Western Cape Nature Conservation Board,. P/Bag x5014 Stellenbosch 7599*

WCNCB has recently set up a Landuse Advisory Unit, which forms part of Scientific Services. One of the aims of this Unit is to be the central point through which all WCNCB comments on landuse, development, mining and all other applications flow before being submitted to the Department of Environmental Affairs and Development Planning. Applications and the comments provided are logged in a central database for, amongst other, monitoring and evaluation purposes. This presentation aims to give a brief overview of the Unit and its function within WCNCB. Preliminary results extracted from the database will also be presented.

32. The "Firebreak" dilemma

Key Words: Compliance, Fire belt, Fire break.

Pierre Combrink & **Augustine Morkel**.
Cape Peninsula Fire Protection Association (CPFPA). Kirstenbosch National Botanical Garden, Rhodes Drive, Cape Town.

The implementation and enforcement of the National Veld & Forest Fire Act 101 of 1998 has led to debate around the placement of firebelts between landowners/ managers. At present on the Cape Peninsula, this legislation is being tested in court in cases between the local authorities and private landowners. This poster will provide a perspective on the dilemma of establishing fire belts in context of the members and non-members of the CPFPA and the implications on the Fire Protection Association and their members.

33. A suite of projects to deliver the goods in the Overberg"

Keywords: CAPE targets, suite of projects, outcomes

Lauren Waller, *Western Cape Nature Conservation Board, Walker Bay Nature Reserve, 16 17th Avenue, Voëlklip, Hermanus, 7200; ph: 028-314 0185; laurencip@maxitec.co.za*

The Western Cape Nature Conservation Board (WCNCB) has aligned its objectives and focused its capacity towards achieving targets set by C.A.P.E.

We examine the suite of projects and initiatives in the Overberg that seek to address the wide range of challenges facing conservation management in this region, and predict possible key outcomes.

34. Herpetofaunal exploration of the Cape Fold Mountains : A photo documentary

Keywords: frog, reptile, inventory

Michael Cunningham[1], Krystal Tolley[2], Kate Henderson[3] & Kelley Whitaker[1]
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The Cape Fold Mountains carry a rich frog and reptile fauna with around 98 species (17% of the Southern African total), including 49 species that are endemic, or near endemic, to the Cape Floristic Region. This predominantly montane fynbos herpetofauna is distinct from that of other habitat units within the Cape Floristic region (26 endemics) in taxonomic composition and in broad patterns of distribution. The montane fauna is rich in palaeoendemic lineages, those that carry within themselves an ancient and fragmentary record of the temperate African biota. Many taxa share species or genera with other montane regions, in particular the Karoo escarpment, the Drakensberg, and the highveld escarpment of south-eastern Africa. In general montane endemic taxa are widespread within one of five regions (Northwest, Southwest, Central, Southern Coastal, Eastern) and there are few highly localized endemics. This poster is a pictorial summary of frog and reptile diversity within the Cape Fold Mountains, and of an ongoing WWF-Table Mountain Fund project that aims to document this diversity on a scale suitable for conservation planning. The sole aim of this poster is aesthetic impact**.**

35. Recent and ongoing speciation in *Austroglanis* catfishes of the Cederberg

Keywords: fish, phylogeography, ecological speciation, Cape Floristic Region

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Two species of rock catfish, *Austroglanis gilli* and *A. barnardi*, are restricted to rivers flowing from the Cederberg mountains and together with *A. sclateri* from the Gariep-Vaal system these comprise the endemic Southern African family Austroglanididae. *Austroglanis barnardi* occurs in a specific habitat type, shallow cobble riffles in the lower sections of streams. This critically endangered species is known from only three tributaries of the Olifants River. *Austroglanis gilli*, an endangered species, occurs throughout the distribution of *A. barnardi*, and more widely in tributaries and in the mainstream Olifants and Doring Rivers. Contrary to our expectations, analyses of mitochondrial DNA sequences and allozyme data demonstrated that the morphologically similar species from the Olifants and Gariep river systems, *A. gilli* and *A. sclateri*, are distantly related, whereas the morphologically less similar but co-occurring species *A. gilli* and *A. barnardi* share gene lineages. A fixed allozyme difference between sympatric populations of *A. gilli* and *A. barnardi*, in both the Heks and Noordhoeks Rivers, suggests that this sharing of genes is due to a recent speciation rather than ongoing hybridisation. Mitochondrial DNA gene frequency differences among different stream populations of the same species indicate that there is little migration among tributaries. On a more local scale, strong clines in colour pattern, allozymes and mitochondrial DNA along the Jan Dissels River suggest very limited interbreeding among sites as close as 2km apart, and may indicate ongoing speciation within the Cederberg rock catfish.

36. Mitochondrial DNA sequencing as a tool for unraveling the taxonomic and distributional complexities of dwarf chameleons in the eastern Cape Floristic Region.

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The evolutionary relationships and taxonomic status of dwarf chameleons in the eastern Cape Floristic Region is not well understood. Through a combination of field observations and mitochondrial DNA sequencing (ND2 and 16S), it has become apparent that morphological and genetic evidence are often in conflict. In some instances,

species that are morphologically quite different, show close genetic relationships, *eg. Bradypodion taeniabronchum* and *B. ventrale*. In other cases there are substantial genetic differences between lineages, with little morphological differentiation. For example, dwarf chameleons from the Kouga and the Baviaanskloof mountains were thought to represent a single undescribed species. However, chameleons from these two mountain ranges show large sequence divergence (6.8% for ND2) that is more than twice the value between *B. taeniabronchum* and *B. ventrale*. The evolutionary relationships within this group are reticulate in nature, making taxonomy difficult to resolve. Application of only mitochondrial data to resolve the taxonomy of this group is therefore insufficient, because mitochondrial DNA may only indicate historical isolation of lineages, and if used independently, may not be a good indicator of species definitions. Therefore our next step toward resolving the taxonomy of this group is the inclusion of nuclear DNA markers, in conjunction with a full morphological analysis.

37. Small mammal community composition in West Coast Renosterveld fragments

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Very few studies on small mammals have been conducted in West Coast Renosterveld, and the effect of habitat fragmentation on these small mammal communities is very little known.
In the study presented, small mammal communities in Renosterveld fragments are being investigated, and the influence of vegetation structure and diversity, as well as fragment size and land use on the community composition is considered.

38. WHAT FUTURE FOR CAPE FLATS KEDESTES?

Key Words: *Kedestes*, endangered, Cape Flats

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Kedestes barberae bunta and K. lenis lenis are threatened, narrow endemic butterflies found on the Cape Flats. Their habitat consists of stands of Imperata cylindrica (Cottonwool grass), occurring in damp seeps between dunes, usually in Strandveld vegetation.

It was recently decided that the two butterfly subspecies are to be included for the first time in the new Red Data Book for butterflies with "endangered" status. This decision was made on the basis of a research project in 2003, which consisted of an evaluation of the taxonomic and habitat status of the two subspecies. The butterflies were found to be highly threatened by habitat destruction, mainly as a result of urban development and the encroachment of alien vegetation.

It is believed that very few populations, with low numbers, still exist. This is of great concern in conservation terms, especially because future developments (e.g. R 300 toll road extension) are designated for areas where remnant populations occur, for example Zandvlei Nature Reserve.

The proposed poster for the 2004 Fynbos Forum will deal with the subject of these two threatened butterflies. It will give an overview of their general characteristics, distribution, habitat requirements, conservation status and threats to their survival, as brought out by the previous research project.

39. Pollinator diversification is not delivering the goods to three sympatric *Satyrium* orchids

Keywords: pollination ecology, *Satyrium*, co-existence

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It is generally believed that specialized pollinator relationships and elaborate floral mechanisms in orchids prevent interspecific pollination, with the genetic isolation of many sympatric species seemingly based on ethological or mechanical barriers only. This preliminary study indicated that *Satyrium coriifolium* Sw., *S. princeps* Bolus, and *S. membranaceum* Sw. are sympatric, partially synchronous in their flowering for part of their individual ranges

(around Port Elizabeth), and that they share a common bird pollinator. Artificial cross-pollination between the three species resulted in hybrid seed set. It is suggested that these species have not evolved a specific guard against hybridization, instead they rely on ecological constraint being too harsh on the putative hybrids for survival. A more in-depth investigation will be conducted during the present flowering season at which time the shift in peak flowering period as an avoidance mechanism towards natural hybridization will be confirmed. Pollen flow between sympatric species will be determined with the aid of dye powders as to estimate the actual amount of possible hybridization events. PCA analyses on floral measurements will aim to elucidate the presence of a putative hybrid between *Satyrium princeps* and *S. membranaceum* present in the coastal fynbos of Port Elizabeth.

40. Bergvliets Best Kept Secret - Die Oog

Natalie Newman, *City of Cape Town, Private Bag x5, Plumstead, 7800*

Die Oog is over 250 years old and was a dam on Bergvliet farm, the third oldest farm in the Constantia valley ,Cape Town.

Its name derives from the fact that a significant source of the water flowing into the dam is a spring. In August 2003 a group of local residents combined to form the "Friends of Die Oog" with the aim of preserving Die Oog as a bird sanctuary and a nature area. The Friends of the Die oog and the City of Cape Town have formed a informal partnership and are working towards ensuring a more enviromenatally sound ecosystem to be enjoyed by all.

41. Bracken Nature Reserve

Keywords: Past, Present, Future

Tshepo Mamabolo, *Racecourse Road, Durbanville*

The poster will be illustrating the three different stages of the history of Bracken Nature reserve i.e. past, present and the future. The reserve consist of granite kopie that has unique vegetation, therefore it has high conservation value. For the past decade or even more the reserve has not been managed and as the result parts of the reserve are highly degraded and in urgent need of rehabilitation. Presently I was appointed to manage the reserve, the prior priority is to rehabilitate the parts of the reserve are botanically valuable, re establish a supportive relationships with the different user groups e.g. T he Pick n Pay Environmental group) as they were actively involved in the part of the reserves functioning in the past but due to lack of motivation amongst other problems they withdrew their involvement. Future plants will involve the establishment of an E.E centre (making use of an old reservoir that's in the reserve), creating a green corridor between Bracken Nature Reserve and Paarde kopie and continue to gain support from user groups in order to ensure the effective management of the Reserve.

42. Identification and mapping of the remaining coastal dunes of the City of Cape Town

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The CCT has 307 km of coastline stretching from Silwerstroom Strand in the north-west to Kogel Bay in the south-east including two of the largest bays in South Africa, namely Table Bay and False Bay. A number of important coastal processes are the key driving forces behind the unique coastal environment. One of these key processes is aeolian or windblown sediment transport, a key factor in the formation and maintenance of the dune systems. The dune systems support a range of unique vegetation types, including West Coast and South Coast Strandveld and Sand Plain Fynbos. Uncoordinated management and extensive development in the coastal zone has in recent years placed great pressure on, and interrupted coastal processes. This has had a significant effect on the formation and maintenance of dune systems and in turn has resulted in the decline of biodiversity in the vegetation types they support.

The City has adopted Coastal Zone Management and Biodiversity Strategies, which propose an integrated approach to coastal management, and aims to ensure long-term conservation and enhancement of the City's unique biodiversity.

The poster gives an overview of a study initiated by the City of Cape Town in 2003 to map and classify all the remaining dune systems within the City of Cape Town. A simple classification system was developed which was used to demarcate chief dune system types and their ecological status. To illustrate how this project relates to the implementation of the Biodiversity and Coastal Zone Management strategies, three examples are used: Development of Sustainable Coastal Management Programmes for each of the 43 Coastal Management Units identified along the City coastline, a coastal monitoring programme currently being implemented and the implementation of a biodiversity network with functional biodiversity corridors and anchors.