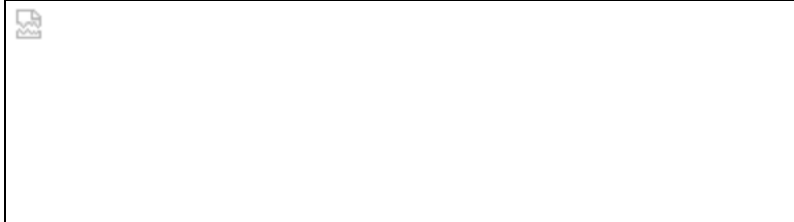


*Issue 4/5***NEWSLETTER** *Spring 1998*

*Reporting mire conservation  
across the world. Conserving  
mires, wherever they are. Your  
newsletter, your news, views,  
books, reports and meetings.*



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## EDITORIAL

Welcome to the 4/5th new-look Newsletter. I'm afraid we have to begin with an apology for the lateness of its delivery. We were almost ready to send it to Switzerland for printing and distribution when a serious virus-attack at Rob's new place of work (see below) reduced the entire Newsletter to an empty, useless disk. It's taken us a little while to reconstruct and in places re-write the document. The joys of technology....

We hope that you find the Newsletter a good way of keeping in touch with what is going on around the world of mire conservation. Obviously it can only be as good a Newsletter as the contributions allow it to be - if you don't tell us your news, we can't report it. However, we are already generating far more interest and mail from old and new contacts than in the past because of the Newsletter, and several of you have written to say how much you have enjoyed receiving it.

We noted some criticism that it was, in places, tedious because of the inclusion of the WG minutes. Fair criticism - minutes are never that interesting. Nevertheless, the minutes of such meetings are important because it shows you, the membership, how and why certain decisions are arrived at. There are also usually actions for the whole membership, and if you don't read the minutes you won't know what you are supposed to be doing as an active member of the IMCG Network.

You will be glad to know, however, that there are no minutes to report in this newsletter. Happy and thoughtful reading.

The Editors.

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As ever, a plea for contributions. Please, please, please - send your news. The newsletter follows, very approximately, the following guidelines:

- Working Group agenda
- Minutes of IMCG meetings
- Working Group proposals
- Decision Making Group decisions
- Liaison
- Mire protection in a country
- News
- Other symposia/meetings etc.

- Discussion papers for comment
- Letters and comment

A newsletter can only work if contributions are sent - and lots of them! Don't worry about getting the English slightly wrong - Rob Stoneman or [Richard Lindsay](#) will edit it if you wish (and in consultation with you). Equally, if you find it too difficult to write in English, then you could use German or Dutch ([Hans Joosten](#) will translate) or French (Phillipe Julve will translate).

Items should be sent to [The Secretariat](#); and, for inclusion in the next edition, must arrive by the end of July 1998.

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ADDRESS
<p>Rob has left the Scottish WT and is now working as the Director of the Sheffield Wildlife Trust. Rob and Richard continue to work together as Newsletter Editors, and the main secretariat remains at UEL, so, from now on, could all letters, faxes, e-mails go to the secretariat office at:</p> <p>The Secretariat of the IMCG</p> <p>Dept. Environmental Sciences</p> <p>University of East London</p> <p>London, E15 4LZ</p> <p>United Kingdom</p> <p>Tel: ++(44)-181-590-7000 ext. 4088</p> <p>Fax: ++(44)-181-849-3641</p> <p>e-mail: <a href="mailto:imcg@uel.ac.uk">imcg@uel.ac.uk</a></p> <p>(attached documents in Word'95, text, or RTF format, please)</p>

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## STEPHEN ZOLTAI

It is with great sadness that we have to report the death of one of the IMCG's founding members Stephen Zoltai. He died on 15 December from cancer, but, as his wife says, "Stephen worked until the last minute; he was still dictating a letter before he died." His enthusiasm, dedication and professionalism, combined with his profound modesty, was an example to us all. He will be sorely missed, and our deepest sympathies go to his wife, Elizabeth, and their family.

In the near future, Stephen's lifelong work on peatlands will be transferred to a permanent site at the Devonian Botanical Gardens, creating a Resource Centre bearing his name. In keeping with Stephen's commitment to education, this Centre will be available for others to benefit from his research, as well as related works.

A fund will be used to purchase items for this Centre, as well as to dedicate and maintain a Wetlands

Ecological area in his name at the Devonian Botanical gardens. Donations can be made out to:

Stephen C. Zoltai Peatland Resource Centre Fund,  
11908 41A Avenue,  
Edmonton AB T6J 0V9,  
Canada

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## **ALTERNATIVE NOBEL PRIZE FOR MICHAEL SUCCOW**

Michael Succow, Professor for Landscape Ecology and Nature Conservation and Director of the Botanical Institut and Botanical Gardens of Greifswald University (Germany) is one of the five persons from three continents to share the 1997 Right Livelihood Award for their contribution to a sustainable future for humanity. The Award - commonly known as the "Alternative Nobel Prize", including a sum of SEK 1.800,000 (approx. US\$ 240,000) will be presented at a ceremony in the Swedish Parliament, Stockholm, on Monday, December 8th 1997.

"In Michael Succow the Award honours "an exemplary commitment to safeguard important ecosystems and areas of outstanding natural value for future generations". Working closely with scientific colleagues, Succow has seized the opportunities presented by perestroika and the opening up of Eastern Europe and the former Soviet Union. He has nurtured the establishment of nature conservation reserves - first in his native Eastern Germany and now in the several republics of former Soviet Union." (Right Livelihood-Foundation).

Michael Succow was born in 1941 and graduated in biology from Greifswald University in 1965, where he was employed as a scientific assistant. He became involved in nature conservation and founded the organisation Florenschutz, for which he organised a conference in Czechoslovakia in 1972. In 1969, because of his sympathies with the Prague Spring, Succow left his post at the University. In 1973 he spent some months in Mongolia as a specialist advisor in soil science. In 1974 he became a scientific associate of the Institute of Soil Science Eberswalde of the Academy of Agricultural Sciences (AdL), working in his spare time on nature conservation issues. In 1985, with his fellow scientists Hans-Dieter Knapp and Lebrecht Jeschke, he published a list of endangered plant communities in Eastern Germany. In 1981 he led nature conservation visits to the Soviet Union. He continued to work for the AdL, which in 1987 recognised him as a Professor, but he was denied a position at a University. From 1985-87 he went seven times to Ethiopia as a land use consultant.

With perestroika in 1989, new opportunities were offered. Appointed as a deputy minister in the first post-Communist government, he set up a system of six biosphere reserves and five national parks during the last months of the GDR, in collaboration with his colleagues Knapp, Freude and Jeschke. Since then, the four colleagues (SKFJ) have worked hard to safeguard and extend areas of nature conservation in the former GDR, being prominent in the (not always successful) struggle against destructive developments (the Baltic Sea motorway, mass tourism infrastructure on Rügen-Island and the canalisation of the Elbe river bed).

In 1990 Succow was awarded the Lina-Haehnle-Medal for German Nature Conservation and was made Vice-President of the organisation Naturschutzbund Deutschland. Then followed an extraordinary period,

still ongoing, when the "Gang of Four" (SKFJ) travelled all over the former Soviet Union, and some other countries, helping to advise the new governments on land use and setting up biosphere reserves and national parks. This included seven reserves in Georgia, covering a third of the country and others covering a third of Mongolia. They have also been involved in establishing conservation programs in Kazakhstan, Kyrgyzstan and Usbekhistan, setting up three World Heritage Sites in Russia as well as reserves in Russia and Belarus. In all this work Succow and his colleagues have sought to build up environmental NGOs in the relevant areas and to ensure the full participation of the local population

Back at the University of Greifswald, Michael Succow has been stimulating interdisciplinary research in mire and peatland ecology, concentrating on the restoration of degenerated peatlands. He has developed an integrated curriculum for teaching land use and sustainable development and is developing partnerships with foreign universities, focussing on Eastern Europe and North and Central Asia. The University of Greifswald is setting up an ambitious international programme in landscape ecology and nature conservation in order "to prepare landscape ecologists for the challenges of the 21st century". In order to strengthen this approach, three new Professorial Chairs were recently founded at the Botanical Institute: one in Landscape Economics, one in Environmental Ethics, and one in International Nature Conservation.

As a member of the expert advisory committee of the Federal Environment Committee, Michael helped to design a general reform of land use policies in Germany. This would make an end to the present ecologically, economically and socially destructive system maintained only through strangling EU subsidies. In its place, Succow and colleagues propose a system which would render unnecessary chemically supported intensive agriculture, limit urban areas, establish wilderness areas, bring economic and social stability to rural areas and redirect EU subsidies to ecologically productive services. Back in their home states of Mecklenburg-Vorpommern and Brandenburg, Succow and his colleagues have lobbied for alternative land use. In North-eastern Germany they have stimulated a sustainable agriculture, with yet unpredictable advantages for the future German capital of Berlin. The biosphere reserves of Spreewald and, even more so, Schorfheide-Chorin have already become important pilot areas for nature conservation, sustainable agriculture and recreation as "flowering landscapes" in the former GDR, receiving a constant stream of international visitors. Michael Succow will appropriate the award to stimulate nature conservation in the 'east'.

## SUMMARY OF ACTION POINTS

Lest anyone should forget their responsibilities in the absence of the minutes, here's a summary of action points currently outstanding.

### Working Group Actions

Code	Person	Action	Subject
AP1	HJ	Write a paper	Record value of mires
AP10	RAL	Contacts	European Mires Book
AP13	RAL	Investigation	Funding
AP15	GMS	Write a paper	Membership
AP24	WG	Contacts	Work programme
AP26	RAL	Production	Flier
AP32	HJ	Contacts	IMCG/IPS meeting
AP33	Members	Reports	Papers for meeting

AP34	RAL	Contact	Send resolution replies to national reps
AP35	RAL	Letters	Formulate replies
AP36	RAL	Involve DMG	Approve replies
AP37	RAL	Contacts	Ramsar and Biodiversity Convention resolutions
AP38	RAL	Paper	IMCG Structure
AP39	WG	Paper	IMCG Structure
AP40	WG	Research	Funding
AP42	PJ	File	Mire species list
AP43	RAL	Contact	Wileys re. European mires book
AP44	PJ	Paper	Classification

### **Actions for 'members'**

<b>Code</b>	<b>Action</b>
M4	Kushiro Proceedings
M6	Comments and suggestions to PJ re. mire species list
M7	Comments on IMCG Aims
M10	Comments to PJ re. classification
M12	Distribute newsletter to increase 'membership'

## **THE IMCG FIELD SYMPOSIUM SOLOVETSKY ISLANDS 1997**

### ***Field Investigations on Solovetsky Islands***

Most IMCG trips involve local experts giving their enthusiastic IMCG audience the 'low-down' on all aspects of the mires visited. After a bit of discussion, the rapt audience then disperses across the mire; some to split the *Sphagnum recurvum* group into its constituent species and sub-species, others to delve into history with their coring rods, others simply to have a fag, a quick shot of vodka and catch up on the gossip (IMCG? Surely not!)

The trip to the Solovetsky Islands proved rather different in that the mires had previously been little studied. The emphasis for explanation switched to the visitors. This time the scatter of IMCG mire experts across the island was slightly more structured. At the end of the excursion, we had a short session during which we discussed what had been achieved. These results are preliminary and are reported here. Hopefully, further study is underway to provide fuller descriptions. The intention is that these will be reported in this newsletter in due course. But for a flavour of what we did:

The Solovetsky Archipelago is made up of six main islands and many smaller islands. It is predominantly forested with northern Taiga spruce forest (under the Russian Classification system). Twenty percent of the islands are covered in various mires; a mix of open patterned mire, sparsely forested pine and spruce

mires, birch-sedge-Sphagnum fens and some heavily wooded spruce mires.

On the field trip, five mires were studied in detail: a lake-side mire, an ombrotrophic pine bog, an open patterned mire complex and a set of young mires on beach terraces.

The first day consisted of visits to four mires, imaginatively named the first, second, third and fourth mires. The first mire was composed of a floating mat at the edge of a lake, merging into more solid mire. Tapi and Raimo (write up to be undertaken by Tapi) studied vegetation relevés. The densely wooded spruce mire at the second site was not studied. The third mire was clearly ombrotrophic with scattered pines. Kimmo reported on his group's activities. The surface was levelled using a new 'back to basics' technique - the Vodka bottle method devised by Kimmo and Tappi. Equipment consisted of a wooden plank with a vodka bottle tied to the top. This was levelled onto trees onto which marks were made to show the changes in level. The art of accurate levelling related to getting the right size bubble in the bottle to ensure the plank was truly level when it was being sighted onto the next tree. A new vodka bottle was required for the next day to allow for post levelling drinking. The levelled transect was also cored to reveal a 2m terrestrialisation sequence of lake gyttjas, Phragmites peat and Sphagnum peat with up to 10 fire horizons. Samples have been taken for pollen and diatom analysis as well as AMS dating.

The fourth mire was most spectacular: a wonderful complex of patterned mires stretching for kilometres in a series of elongated aapas divided by forested low hills. Only one finger of the complex was studied. Marina and Rob drew up a sketch map, four groups described the vegetation, Kimmo's group returned to the mire in the evening and the next day with new supplies of vodka to conduct more stratigraphic studies whilst Dimitri extracted pencil-thin cores of wood from pine trees to look at their history and age. Rob was elected to write a report on this mire.

Whilst all this study was going on, Stefan was checking out the bird populations. Breeding had finished with some species already on the move to the south. However, Stefan recorded over 60 bird species, 18 of which were regularly found on the mires we visited. Most impressive were numerous black and red throated divers, whooper swan, Arctic skua, common crane, golden plover and great snipe.

Our second foray was to the north to look at two 'eccentric ombrotrophic Sphagnum fuscum - scattered pine bogs' (possibly - classification was a constant source of discussion!). The levelers and corers went to work again finding a terrestrialisation sequence of gyttjas, Carex-Sphagnum-Menyanthes, E.vaginatum-Sphagnum-Vaccinium oxycoccus and Sphagnum balticum-E.vaginatum with six fire horizons. Other groups described the vegetation. Michael has kindly agreed to write up this one.

Another fantastically impressive set of mires was encountered on Muxsalma. A wonderful boat trip took us to this beautiful place; beauty only tempered by the terribly sad atmosphere surrounding the former prisons on the island. Beyond that sad scene, we walked through abandoned meadows and forest onto a breath-takingly-beautiful mire scene. A series of isostatic uplift terraces rising from the seashore were reminiscent of SE Asian rice terraces. In this case, though, they were purely natural and covered in a set of young peatlands: a place of exquisite natural loveliness. Well, I liked it.

The vegetation surveyors organised themselves to survey a series of relevés running from the shore to the wooded center of the island. At the seashore, the lowest terraces exhibited a salt-marsh flora. Further up, Carex mackenzie and brown mosses initiated the first layers of the incipient bogs. A terrace up and Sphagnum squarrosum could be found forming small hummocks, itself replaced by Sphagnum fimbriatum and Carex cordorhizza communities. Moving along the time-sequence, up the terraces, moved one onto dwarf shrub and Sphagnum fuscum communities eventually including Sphagnum angstroemii hollows. Quite how to classify these mires proved problematic because they are so young. Richard, Stefan, Asbjörn and Tatiana went on a hike to the far-west of the island to find highly patterned aapa mires with high ombrotrophic strings.

Raimo, who is also collating all the vegetation data to send to Michael for a comparison of various classification systems, will present a more detailed description. Tatiana will delve into the Russian archives to see if there is more information on these mire ecosystems

These mires exhibited very clearly something that was apparent from Day One. At first glance, the mires of the archipelago were typical of the northern Taiga (Russian classification). However, on studying these systems, it became obvious that the mires were strongly reflecting the strongly oceanic climate of the islands - making these mires somewhat unique.

They were certainly extremely beautiful and it was a privilege to see them.

### ***Report on the Solovetsky conservation status meeting***

The delegates of the Field Symposium discussed the conservation status of the Solovetsky Islands in some detail. Currently, the island is recognised as a cultural world heritage site recognising the immense significance of the monastery. Recognition of the natural wonder of the islands has mainly resulted from its bird populations. Indeed, the Russian authorities have conducted surveys and written reports which show it is worthy of Ramsar status on bird protection grounds alone. Unfortunately, these reports have not yet found their way to the Ramsar Bureau and formal status has yet to be conferred.

After seeing the mires of island, IMCG delegates strongly believed that greater protection status should be given to the islands given their pristine state and that they represented an unique type in the area - strongly oceanic northern Taiga mires which contrasted to the continental northern Taiga mires on the mainland.

Three ways of enhancing the protective status of the islands' natural heritage (including the mires) were proposed:

1. In line with the IMCG inspired article 6.1 of the Ramsar Convention which requests contracting parties to protect peatlands, the islands should be designated as a Ramsar site on the basis of its bird and mire interest.
2. That the world heritage status should recognise both the natural and cultural heritage of island. This mixed category is rarely used for world heritage sites but is appropriate here as the natural heritage of the islands is globally outstanding in terms of the islands' lakes, mires, shores and forests and the species that mix of habitats represent. A mixed cultural/natural status is particularly apt given a recognition that there has been some cultural influence on the islands natural heritage, in particular the creation of flower-rich meadows (now very uncommon in western Europe for example).
3. Whilst enhanced international recognition of the significance of the islands' natural heritage would be conferred through Ramsar and World Heritage status, it was recognised that the best protection would come through the designation of the islands as a Russian National Park. This which would provide a mechanism through which to channel international funding to manage the rich heritage of these islands in a sustainable manner for both the islands' wildlife and people.

Letters of Recommendation have been sent to the relevant authorities in pursuant of these aims.

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## **MEETING REPORTS**

### ***IUCN/WCPA European Regional Working Session***

Protecting Europe's Natural Heritage

Rügen, Germany, 9-13 November, 1997

Tatiana Minayeva reports from this Working Session as follows:

The conservation of wetlands through the use of protected-areas within Europe formed the main topic of this Working Session, led mainly by Ramsar Bureau and representatives from the World Conservation Monitoring Centre (WCMC).

The problem of Ramsar site as the protecting territories were discussed during the plenary session of 10th November by Michael J.B. Green (WCMC) and Tim Jones (Ramsar Bureau) in the presentation The Ramsar Convention in Europe: Providing Better Information in Support of its Effective Implementation. The abstracts of the presentation were distributed. The main points of the presentation were as follows:

It was emphasised that the majority of European Ramsar Sites are at least partially covered by protected area designations at national and sub-national level, in spite of the fact that one of the principal obligations of Contracting Parties to the Convention is to designate sites for the Ramsar List.

A series of objectives was put forward to be carried out by Contracting Parties, the Ramsar Bureau and partner organisations (notably Birdlife International, IUCN, Wetlands International and WWF):

identification of further wetlands that meet the Ramsar criteria for designation under the Convention;

identification of wetlands in need of restoration;

increasing the extent of wetlands designated under the Convention, particularly those types under-represented at national and global level;

develop and regularly maintain and disseminate, regional directories of wetlands and potential Ramsar sites;

use information from regional wetland directories, national wetland inventories and other sources to quantify global wetland resources and monitor trends in their conservation.

All activities must be based on the wetland inventory, although the European Wetland Directory is incomplete in terms of geographic and wetland coverage.

Information was presented on Priority Project No.13 (nice idea to have this number for wetlands!) within the framework of the Parks for Life programme, and also about the workshop "Towards an updated Pan-European Wetland Inventory" held in Montecatini Terme 22-24 January 1997. The importance of the Pan-European Wetland Inventory was discussed in terms of the generally known details. WCMC and the Ramsar Bureau (Mr Green and Mr Jones) then proposed that the criteria of international importance for wetlands, and thus the criteria for inclusion within the Pan-European Wetland Inventory, should be:

designation or proposed designation under international legal instruments or initiatives (e.g. Ramsar Convention, UNESCO Man and Biosphere Programme, World Heritage);

designation under EU habitats and Birds Directives (i.e. Natura 2000);

internationally important centre of biodiversity (e.g. Important Bird Area, Centre of Plant Diversity); and

refuge of species listed under international legal instruments or initiatives (e.g. Bern Convention, EU Directives, IUCN Red List of Threatened Animal or Plant Species).

Comments: Using these criteria, the majority of Russian peatlands have no chance of being selected for the Pan-European Inventory. These peatlands are relatively boring, with common and widespread species



of plants and are poor in bird diversity. They also have little or no international or national designation for conservation. The only modest function that they do have is that they provide fresh water to half of Europe.

A significant part of the presentation was devoted to the problems of data management. It was suggested that the optimum structure for data organisation and management might be to have the Ramsar Bureau as the political umbrella, working in collaboration with EEA and ETCNC. The technical lead would then be taken by Wetlands International, WCMC and others as appropriate within BCIS (the Biodiversity Conservation Information System - a consortium of international conservation organisations that is committed to providing better data access through decentralised computer networks). It was proposed that a metadatabase should be developed, linked with GIS, as a data management system. Using this as the basic information system, it would be possible then to construct the Wetland Information Network.

Comments: Here again I should like to apply to Eastern European and Russian experience. It is not practical, for countries with developing economies, to develop a system of any databases, networks, or data management based on advanced technologies. The potential or final users of the system do not have the technology to operate and manage the system. More generally, on meta-databases, we saw a clear demonstration of the way in which data can be transformed during transfer between originator and recipient, especially when combined with generalisation. We have found exactly these problems during our BRIM MAB database experience. Data checked three or four times were nevertheless still incorrect in the final version.

Comments: It would have been good if IMCG members had been able to take part, to represent the opinion of mire scientists, in the discussions of all these ideas. Of course after the various declarations the projects will proceed to develop the Pan-European inventory and will produce guidelines. It would be good if IMCG, in one way or another, was able to take part in this activity. However, IMCG was not mentioned in the presentations as a partner at all.

Within the IUCN/WCPA Regional Working Session, a workshop was held to discuss "Wetland Restoration and Protected Areas - a contribution to Implementation of the Ramsar Convention in Europe" (under the "Parks for Life Priority Project 13). Prof. Aitken Clark (UK - and former Chairman of the European Habitats Forum) led the Workshop. The Rapporteurs for the resulting plenary session were Tim Jones (Ramsar Bureau) and Jane Madgwick (Broads Authority). A total of 16 participants from 11 countries attended the Workshop, which focused on the central role of rehabilitation and restoration in the management of protected wetlands within Europe. Ms. Jane Madgwick gave a presentation about wetland restoration and rehabilitation in Europe. Tim Jones then spoke about the role of wetland restoration in meeting the goals of the Ramsar Convention. Four case-studies from different regions and different wetland types were presented: Danube Islands, Bulgaria and Danube Delta, Romania/Ukraine; Bierbza valley, Poland; Massaciucoli, Italy; the Norfolk Broads, UK. Additional information was provided about experiences in Russia and Turkey.

During discussions, a number of issues were raised with the participants:

- where can protected-area managers go for technical advice on restoration techniques?
- what scientific criteria can be established for guiding restoration/rehabilitation programmes?
- how can economic evaluation procedures be used to support the case for restoration?
- how can local communities best be involved in setting restoration targets?
- how can the success (or failure) of a restoration project be measured?
- what follow-up and monitoring is required?
- what role should the various international bodies play in tackling these issues?

There was then an attempt to answer these questions on the basis of the conclusions from the case studies. A number of more general conclusions were also presented:

- restoration/rehabilitation is an important component of management plans for most European wetlands;

- different scales and approaches are required;
- the current political context is highly favourable for wetland restoration projects (linked to flood-plain management, climate change, water management, EU Directives);
- wetlands provide essential functions and values for people (e.g. drinking water);
- wetlands require integrated ecosystem management, taking into account factors far beyond the protected-area boundaries;
- they are complex to restore, once damaged;

A number of particular links with the WCPA/Parks for Life programme were highlighted:

- wetlands and water management should be a priority under Parks for Life and should be taken into account when Priority Projects are redesigned and repackaged ;
- protected area managers should be encouraged to include wetland restoration as an integral part of overall management plans;

Parks for Life can play a major role as a network for sharing experience and expertise, especially by improving information flow from international level to field practitioners.

Unfortunately, there was no-one from IMCG to take part in this Workshop. I was wholly involved in the Biosphere Reserve Workshop being held in parallel with the Ramsar and IUCN Workshop. I was able to put in a brief appearance, and made a 5 minute presentation relating to the topics under discussion, in particular about:

- the activity of the Russian Branch of Wetlands International;
- the Fen Restoration Workshop in Russia;
- the IMCG joint proposal with Wetlands International concerning Eastern Europe and the possible subsequent development of that into Russia.

In addition to this, during the question & answer session I also tried to explain the degree of negative attitudes about peatland restoration commonly encountered from Russian scientists, the peat industry and the authorities. It seemed that few people at the Workshop were willing to believe me in relation to the scale of this problem.

On the whole, the Ramsar Workshop appeared to be vibrant and lively compared to most other workshops, which is always the case when wetland people get together. However, I would particularly emphasise how useful it would have been if a productive exchange of ideas between IMCG and those involved in developing the Parks for Life project had been possible during this Workshop.

### ***IMCG/IPS Meeting on Global Peatland Issues***

***Surwold, Germany, November 7-9, 1997***

This proved to be a useful and informative meeting between the two organisations, during which a number of issues were discussed. Although initially there was a certain amount of caution on both sides, the workshop was ably co-ordinated by Clayton Rubec, who ensured that constructive debate was encouraged and positive outcomes achieved.

Richard Lindsay, Michael Steiner, Hans Joosten and Philippe Julve represented the IMCG (although all views expressed on either side were understood to be personal views only).

The results of the workshop have been written up and published by Clayton. The meeting was considered to be sufficiently successful to merit further meetings, building on the discussions so far. A number of Action Points were agreed, and these will be followed up for the next IMCG/IPS meeting.

Key Action Points include: working together on mire terminology; establishment of a Working Group to prepare a Discussion Paper about wise-use guidelines; the possibilities of collaborative working on the next edition of Global Peat Resources; possible joint workshops at both the next Ramsar Conference (Costa Rica, 1999) and the Quebec Millennium Wetlands Event (2000).

For your own copy of Clayton's excellent summary, write to:

Clayton Rubec, Habitat Conservation Division, Canadian Wildlife Service, Environment  
Canada, Ottawa, Ontario, K1A 0H3, Canada.

In addition to the formal (well, fairly informal, in fact) workshop, we had a remarkable presentation from Jack Reiley about his work on the Indonesian peatlands. A presentation which steadily became more passionate and poignant because, at that very moment, a large proportion of the area he had worked on (and showed us in a video) was in flames.

Shortly after, late rains dampened the fires in Kalimantan and the smog finally cleared. Unfortunately the whole area has erupted again recently in another huge conflagration.

The vast amounts of carbon dioxide released with such destruction of the swamp forests are clearly of greatest global concern, but, as Jack Reiley pointed out, we are also all of us diminished when the orang-utang is lost from the wild because its habitat has vanished.

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## **FORTHCOMING MEETINGS, SYMPOSIA & CONGRESSES**

### ***Patterned Mires and Mire Pools Workshop***

***Durham, UK, April 6-7th 1998***

The British Ecological Society Mires Research Group and Aquatic Ecology Group are holding a joint workshop at the end of March to look at the whole issue of bog pools and patterning. It is to be held at the University of Durham, and will examine such topics as the origins and development of pools, and the ecology of plants and animals. It is intended that the conference will lead to an appraisal of the future of patterned mires which will identify the most relevant future research which would assist with their conservation. To register for the meeting, contact Val Standen.

The meeting includes invited papers from Dr Paul Glaser (University of Minnesota) and Dr Edgar Karofeld (Institute of Ecology, Tallin). Papers are still welcome and anyone wishing to submit one or present a poster for the last session on Monday, 6th April should send an abstract (50 words) to Dr V. Standen, Biological Sciences, University of Durham, Durham, DH1 3LE. Tel. ++(44)-191-374-3347, Fax: ++(44)-191-374-2417

e-mail: [Valerie.Standen@durham.ac.uk](mailto:Valerie.Standen@durham.ac.uk)

### ***Workshop***

## ***Global Mire Classification***

### ***Greifswald***

The IMCG Workshop on Global Mire Classification, to be held in Greifswald 25 - 29 March 1998, is currently being organised as an interactive process between several IMCG 'members'. It addresses the following issues:

#### 1. The hydrologic-genetic classification approach:

1.1 A basal classification system of hydrologic-genetic mire types, based on quantitative-hydrological characteristics. As a first impulse to the discussion, Michael Succow and Hans Joosten will prepare a classification proposal, that is an update and extension of the system presented in Succow's "Landschaftsökologische Moorkunde" (1988) (the book is now being prepared for its second, totally revised edition). This discussion paper will be send to participants prior to the workshop.

1.2 Hydrologic-genetic subdivisions of various basal mire types. Special attention has to be paid to gradient analysis of the types towards their climatical, geological, geomorphological and hydrological limits. Here we expect contributions from various "experts" on specific mire types. Feel free to react!

1.3 Higher integration levels of basal mire types: mire complexes etc. We hope especially for contributions from the "Canadian" and "Soviet" experience, as they have dealt extensively with this subject. The subject is very important with respect to conservation of „biodiversity on an ecosystem level", one of the aims of the Biodiversity Convention!

#### 2. The ecological classification approach:

2.1 A reflection on existing classification systems based on nutrient conditions (NPK, eutrophic, mesotrophic, oligotrophic) and alkalinity (acid, sub-neutral, alkaline).

2.2 The identification of possible other key factors for mire development and peat accumulation in "extreme" conditions, including salt and soda, permafrost, tephra, anthropogenic activities...., followed by

2.3 An attempt to identify such „theoretical" ecological mire types in praxis.

#### 3 The botanical classification approach

3.1 Global classification systems based on floristic and vegetational characteristics. Philippe Julve will prepare a discussion paper on this subject.

3.2 Classification systems based on growth forms and plant strategies.

3.3 Integration: Experience shows that various classification systems (hydrologic-genetic, ecological and botanical) may be integrated, at least on a regional level. A similar integration will be pursued on a global level.

#### 4 The geographical approach

4.1 Check if and how various mire classification systems, that several IMCG 'members' are currently developing for 'their' countries and regions, fit (e.g. hierarchically) in a global approach.

4.2 Inventory of different mire types and their global zonal distribution.

4.3 The role of "azonality", e.g. characteristics of mire types in mountainous areas.

4.4 The identification of geographical "white spots".

5 The semantics: Classification and terminology are closely related, as the consistency of mire terminology is to a large extent dependent on a consistent classification system and the development of such a system needs a consistent terminology. Terminology must therefore be an important part of the meeting. The item will get special attention from Ronald Hofstetter and Richard Lindsay.

To make this first IMCG classification workshop a success, also as a basis for developing a global mire conservation strategy, we need the expertise of every IMCG member. Therefore, think about how you could contribute and react with ideas, proposals, criticism etc. to Hans Joosten!

## **INTECOL VI**

### Global Wetlands at the Millennium

The Sixth Wetlands Symposium of the International Association of Ecology, INTECOL VI, on the theme of Global Wetlands at the Millennium will be held at Quebec City, Canada, August 6- 12, 2000. The organising committee comprised of representatives of Canadian universities, governments and industry invite your participation, expressions of interest in organising special workshops or symposium, and presentation of papers or posters.

Topics include: global water conservation, sustainable development issues, fisheries in wetlands, microbiological research, botanical studies, waterfowl habitat, conservation policy and legislation, wetlands restoration technology, wetlands as Carbon sinks, the role of wetlands in climate change, tropical peatlands, estuarine ecology, forestry in wetlands, as well as many other topics.

INTECOL VI will be a component of a Millennium Wetland Event with its meeting held in conjunction with: the 21st annual meeting of the Society of Wetland Scientists, the 11th World Congress of the International Peat Society and the 12th symposium of the International Mire Conservation Group as well as specialised meetings of Wetlands International and numerous other groups. The Convention on Wetlands and the IUCN Ecosystem Management Commission have offered to assist in implementation of the programme.

Full details on the scope of these meetings, field trips, registration, hotels and additional information completed at the web site <http://cqvb.qc.ca/wetland2000> or by contact with:

Wetland Millennium Event Secretariat

Attention Ms. Elizabeth MacKany

CQVB, Bureau 620, 2875, Boulevard Laurier

Sainte-Foy, Quebec, Canada G1V2MS

Phone (418) 657-3853 or Fax (418) 657-7934 or e-mail [cqvb@cqvb.qc.ca](mailto:cqvb@cqvb.qc.ca)

Or

Clayton Rubec

Chair, Organizing Committee INTECOL VI

Canadian Wildlife Service

Environment Canada

Ottawa, Ontario, Canada K1A 0H3

Phone (819) 953+0485 or Fax (819) 994-4445 or e-mail [clay.rubec@ec.gc.ca](mailto:clay.rubec@ec.gc.ca)

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## IN BRIEF

**The Aesthetics of Bogs, Fens and Peatlands** (Joensuu University) 3 - 6 June 1998 in Ilomantsi, Finland. Info: Yrjö Sepänmaa, University of Joensuu, P.O. Box 111, FIN-80101 Joensuu, Finland. Fax: + 358 13 251 3228.

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**Peatland restoration and reclamation.** (IPS et al.) 14 - 18 July 1998 in Duluth, Minnesota, USA. Info: Dr. Tom Malterer, Natural Resources Research Institute, University of Minnesota Duluth, 5013 Miller Trunk Highway, Duluth, MN 55811 USA; Tel. + 1 218 720 4324. Fax + 1 218 720 9410. Email: [tmaltere@sage.nrrri.umn.edu](mailto:tmaltere@sage.nrrri.umn.edu)

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**The spirit of peatlands.** Jubilee symposium 30 years of International Peat Society. (IPS) 7 - 10 September 1998 in Jyväskylä, Finland Info: IPS Maiju Salenius, Kuokkalantie 4, FIN-40420 Jyväskylä, Finland. Tel. + 358 14 674 042. Fax + 358 14 677 405. Email: [peatsocinternat@peatsoc.pp.fi](mailto:peatsocinternat@peatsoc.pp.fi)

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**Mires and trees.** (German Peat Society / Saxonian Academy for Environment, Nature Conservation and Forestry). 1 - 4 October 1998 in Niederlautenstein (Erzgebirge), Germany. Info: [Hans Joosten](mailto:Joosten@rz.uni-greifswald.de), Botanisches Institut, Grimmerstrasse 88, D-17487 Greifswald. Tel. + 49 3834 864128. Fax: + 49 3834 864114. E-mail: [joosten@rz.uni-greifswald.de](mailto:joosten@rz.uni-greifswald.de)

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## NEWS

### *United Kingdom News*

#### *The Great SAC Race*

The ramifications of the European Habitats Directive continue to rumble on in the UK with important implications for raised and blanket mires. The Directive is designed to bring especially rare and threatened habitats and species into favourable conservation status (which means habitats and species are not declining and are stable in their former range). All EU countries have not taken this Directive seriously enough and most are now being taken to court by the European Commission for failing to achieve targets on time. Relatively, the UK has done rather better than some countries. That is a cause for major concern since the UK government has taken a minimalist approach and is behind schedule.

Wildlife and Countryside Link (an umbrella body representing all the environmental non-governmental bodies in the England and Wales) has sent a sharp criticism of the UK's efforts to the European Commission in its report "The Great SAC Race: The way forward for the Habitats Directive in the UK". It's a damning indictment of the UK's position but offers a way forward by suggesting a raft of new sites which should be afforded 'Special Area of Conservation' status as well as summarising the key concerns of the W&CL.

It also illustrates how poorly the UK has approached the Directive through three case studies on raised bogs, native pinewoods and harbour porpoises). The raised bog section was written by the Peatland

Advisory Team (its last piece of work) of the Scottish Wildlife Trust.

It exposes a lot. Using only the scientific criteria laid out in the Directive, the Team came up with 102 sites across the UK that must be designated as SAC. Compare this to the 17 the government put forward.

### ***Thorne and Hatfield Moors***

A national newspaper in the UK - the Guardian - has heralded English Nature (the government body who 'protects' England's natural heritage) as managing to achieve the near-impossible: mismanaging its affairs more poorly than its predecessor - the much unloved (at the time) Nature Conservancy Council. Perhaps, a bit harsh, but its latest move to strip away the protective Site of Special Scientific Interest (SSSI) status of parts of Thorne and Hatfield Moors beggers belief.

The Peatland Campaign Consortium has hit back with a strong report of the hydrological, palaeoecological, invertebrate and geomorphological importance of the areas in question. Indisputably, and according English Nature's own guidelines, the Moors must be protected in its entirety. We await English Nature's decision - will they see sense or will the case go through the courts in a judicial review.

**STOP PRESS:** With IMCG links, the Peatland Campaign forced the Minister of Environment - Michael Meacher - to intervene. English Nature's Board backed off - the site remains a SSSI and continues to be cut away and destroyed - the campaign continues.

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### ***Indonesia***

We have received very disturbing reports of vast peat swamp fires burning out of control on the islands of Borneo and Sumatra. Whilst little is known of the full extent of the fires, early indications are that over a 1000 km<sup>2</sup> are burning out of control.

The effect on the rich biodiversity of the peat swamp forests must be devastating not least for the endangered Orang Utans for whom the peat swamp forests represent their last strongholds. More than that, the peat is 10-20m deep and covered in tropical rain-forest. The store of carbon that represents is truly massive. We must be experiencing a vast injection of new Carbon dioxide into the atmosphere: another nail in the coffin of our global climate.

Perhaps most disturbing is that most of these fires have been started deliberately by slash and burn farmers (to an extent) but mostly by loggers who clear undergrowth using fire at this time of year. The coincidence of an El Nino drought has exacerbated the situation. Most worrying is that 1997 is the second year of an incredibly devastating and idiotically unsuccessful scheme to convert a million ha of primary peat swamp forest to rice-paddy. It cannot work - the peat is completely unsuitable for rice cultivation - and yet the loggers have gone in and begun this vast clear-cutting programme. It was a disaster waiting to happen.

Clay Rubec is trying to spearhead help in tackling peat swamp fires through the IMCG. Contact the Secretariat for further information.

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### ***Ireland***

Buy a Bit of Bog

Ever dreamed of owning your very own slice of primeaval bog. Well now you can through the Irish Peatlands Conservation Council who have a scheme to raise money to buy threatened bogs in Ireland. Buyers receive colourful symbolic share certificates but most important of all is that buyers will be happy in the knowledge that every pound donated is worth four pounds to the IPCC as its matched with European Union grants. Go on ... buy some.

Contact Peter Foss at IPCC, 119 Capel Street, Dublin 1, Ireland. Tel/Fax ++353 1 872 2397 or e-mail [ipcc@indigo.ie](mailto:ipcc@indigo.ie) or web site at <http://aoife.indigo.ie/~ipcc>

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### ***Peatlands 2000 Conference***

The IPCC held a major one-day conference in Dublin on November 14, where its Peatland Conservation 2000 Plan was highlighted. This is a formula for a sustainable development strategy for peatland conservation in Ireland. Irish and international experts shared ideas on the wise use of bogland resources, examined the effectiveness of management and restoration techniques, and discussed peatland conservation strategies in other European Countries.

Contact IPCC for the proceedings.

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### ***France***

Philippe Julve reports of a new research programme which starts this October. It forms the mires part of the National Wetlands Research Programme and is officially titled "The Scientific Programme on the Hydrology of Mires". However, the research programme deals with questions relating to ecology, pedology, geology and carbon balance. It will attempt to understand the hydrological systems of 10 mires across France searching for commonality and differences between mires. The programme is linked closely to the EU Life Protection Programme that started two years ago which deals with the protection of 37 sites.

Contact Philippe Julve for details (Tel/Fax ++33 328 491 777)

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### ***Switzerland***

Last stocks of the book "Mires and Man" - the Proceedings of the 1992 IMCG Symposium (but including a remarkably detailed account of the origins of the Swiss landscape, environment and culture) will be sold at a reduced price of CHF 24.-- (postage included) instead of the ordinary price of CHF 64.--. Please send orders by e-mail ([margrit.voneuw@wsl.ch](mailto:margrit.voneuw@wsl.ch)) or to the following address:

Margrit von Euw, Swiss Federal Institute for Forest, Snow and Landscape  
Research, CH-8903 Birmensdorf, Switzerland

Buy now, while stocks last!

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### ***Canada***



Clayton Rubec, Barry Warner and NWWG are dedicating the 2nd Edition of The Canadian Wetland Classification System publication to Stephen Zoltai. It goes to press in a few weeks and will only be sold through the University of Waterloo - about \$20-\$30CA we think. Contact Barry Warner at: Wetlands Research Centre, University of Waterloo, Waterloo, Ontario Canada N2L 3G1

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***Sylvie Mauser has written with the following information and request:***

"I am currently developing an ecological ranking system for the peatlands (bog and fen) of boreal Alberta, Canada. It is a project supported by the co-operation of the University of Alberta, Alberta Environmental Protection, and Alberta Peat Harvesting Industry.

In Alberta, the pressures on peatlands are not primarily caused by the peat harvesting companies and forestry operations, but by the oil and gas industry. These oil and gas companies run literally thousands of seismic lines and pipelines through the boreal forest, thus fragmenting ecological units and altering the hydrology of all adjoining wetland systems.

In the northern part of the province, the soil contains large amounts of oil; these deposits are referred to as "oilsands" or "tarsands" and are opencast-mined for these deposits. Needless to say, kilometres of overburden (the natural top layer) are removed to start a new pit. Although restoration projects are undertaken, the natural mosaic of the boreal ecosystem is not re-created, and so bogs and fens are steadily removed from the natural landscape.

Currently there are no rules or regulations that govern the management of peatlands, and the attitude of "peatland=wasteland" prevails. Furthermore, the predominant feeling that there are plenty of resources in the north (in the boreal forest) does not encourage wise resource-use.

Considering the impact of such heavy industry, and the prevailing attitude, peatland management and conservation regulations are urgently needed. Since the IMCG is the international organisation involved with conservation of mire systems, I would like to become involved as a member, and at the same time draw upon your existing knowledge and expertise. I would ask IMCG members to please forward relevant material to me, and possibly forward this information to other individuals who may be involved with similar issues."

She has since written further, to say that a peat-powered electric generating plant is being built in central Alberta. The plant will consume approximately 300,000 tonnes of peat each year (at 65% moisture). All the peat will come from privately-owned land, which has different implications for conservation, when compared with the oil- and gas-affected areas, which are generally crown land.

Sylvie can be contacted as follows:

Sylvie Mauser

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## REPORTS

### *Some proposals towards a mire classification at world scale*

*Philippe Julve, November 1996*

Editors note: Philippe would like this article to be considered as a basis for discussion rather than the finished thing. Since classification, above all else, appears to cause the most confusion and discussion, I am sure IMCG 'members' will want to comment on the following proposal. Send your comments and letters to the Secretariat for inclusion in the next newsletter.

#### **1) The ontogenesis of the mires:**

If we look at a world-area map of such typical example of mire plants like the genus *Drosera* (in Meusal & al. 1965), or *Sphagnum* (in Daniels and Eddy 1990), we see that mires are widely distributed. Even in tropical areas, we find mires, for example, *Sphagnum* mires are found on the Malaysian islands or in the French West Indies (Guadeloupe), neutrophilous peat mire may be found along the coasts of French Guyana, at 5° northern latitude etc. So it is clear that Water is the most important ecological factor for the creation of a mire.

Of course, the greatest areas of mires, are found in cold boreal region or in the mountain belt of temperate mountains. At higher latitude or altitude, the cold temperatures decrease the production of organic matter, while at lower latitude or altitude, mineralization is accelerated.

What is important for the development of a mire is the water balance: the ratio between input (rain) and outputs (percolation or seepage, evapotranspiration). If this balance is positive, mire formation may occur.

This simple observation is valid at a world scale, and so it means that a classification of mire (at world scale) should be firstly based on this criteria, i.e. water. As the conditions of hydrology combined with local climate are the same all around the earth, it gives a good way to globally classify the mires at a landscape level (mesotope level), as these conditions are transposed in the geomorphology of the mires.

When the water balance is positive, two process of peat formation may occur: terrestrialization and paludification. These two processes, taking into account the origin and the physical properties of the feeding water, may give birth to seven classes of mire origin, in which may be included, as subtypes, all the classical mires types based on regional hydromorphology. Here are some examples with some common synonyms:

- limnogenous: ancient lake mires (Verlandungsmoore)
- fluviogenous: alluvial valley mires, transgression mires (Überflutungsmoore)
- thalassogenous: dune-slack mires (Dünenmoore)

- topogenous: swamp mires, palsa mires, polygonous mires (Versumpfungsmoore, Grundwasseranstiegsmoore, Palsamoore, Polygonalmoore)
- soligenous: sloping mires, spring mires, percolating mires, aapa mires (Überrieselungsmoore, Quellmoore, Durchströmungsmoore, Hangmoore, Aapamoore)
- condensarogenous: condensation mires (Kondenswassermoore)
- ombrogenous: blanket mires, saddle mires (Deckenmoore, Sattelmoore)

The kettle hole mires (Kesselmoore) should be scattered through different primary types, depending on the waterfed process.

## 2) The dynamic of the mires

Each ontogenetic mire type may dynamically change through the time, from a geotrophic stage towards an ombrotrophic stage. Some mires stay at the geotrophic stage, due to their young age or due to some special ecological local conditions. Even initiating blanket mires pass through a geotrophic stage when the peat producing process takes place. These dynamical phenomena may generally be observed at microtope level.

<b>Geotrophic Stage</b>	<b>Ombrotrophic Stage</b>	<b>Mineralized Stage</b>
water sheet, spring, lake or river	meteoric water	meteoric water secondarily enriched
	<b>Superficial Flow</b> meteoric water primarily enriched or running water	

Generalised formal structure of a possible dynamic of the mire

(after Julve, 1996 a)

The purely ombrotrophic stage (central stage of mire dynamic) may evolve towards a mineralized stage by natural or artificial drainage. The ombrotrophic stage may also be a little bit enriched, due to surface running water, or due to the chemical features of rain (oceanic areas).

So the concepts of "transition mires" (Übergangsmoore), simply represent a dynamic stage, while "mixed mires" show juxtaposed stages which may be fairly stable.

The "raised bogs" (Hochmoore, Regenmoore) which include eccentric bogs, concentric bogs, plateau bogs, atlantic bogs, plane bogs, simply represent the ombrotrophic stage of a mire which may have different origin. For example, an eccentric bog comes from a soligenous mire, a concentric bog comes generally from a topogenous mire, an Atlantic bog accept some surface enrichment which may shadow the mineral soil indicators limit, but may have all kind of origin, plateau bogs are simply very large concentric bogs, where the physical shape (see Ingram, 1982) has to adapt, plane bogs are simply very early stage of ombrotrophic differentiation, which can be blocked in some areas.

"Fens" (Niedermoores) and "swamps" (Flachmoore) are only different kind of geotrophic stages, which may be distinguish and subdivided through their edaphical peculiarities, reflected by their vegetation cover...

## 3) The vegetation of the mires:

At a finer scale (microform level), the classification purposes may reach the floristic-ecological perception level: wet margin (acidophilous or basophilous), aquatic margin (acidophilous or basophilous), geotrophic

stage (acidophilous or basophilous), ombrotrophic stage (acidophilous), mineralised stage (acidophilous or basophilous) or dry margin (acidophilous or basophilous).

### Formal Structure of Mire Vegetation

(modified after Julve 1996 a)

In Europe, the different stages may be characterised by these vegetation:

The aquatic margin may be occupied by aquatic communities (Potamogetonetea.) or amphibious short herbs communities (Littorelletea...).

The geotrophic stage is characterized by reed-swamps and big sedges communities (Phragmiti - Caricetea...) or fen vegetation (Caricetea nigrae): short sedges communities in humid zones or floating mats with helophytes (Menyanthes, Potentilla palustris, Carex lasiocarpa...) in more hydrophilous context. These vegetation may be combined phytocoenotically with bryophytes classes.

The ombrotrophic stage is characterized by special phytosociological class of peat-forming bryophytes, by relict species of fen class or pioneer of heathland classes (Calluno - Vaccinietea, Calluno - Ulicetea), which are optimal in the mineralized stage.

The wet margin is generally a stable equivalent of the geotrophic stage, which pass through stable zonation to mineral surroundings. A good example lies in the "lagg" of some mires.

The dry margin is often occupied by mesophilous grasslands (Nardetea, Festuco - Brometea) or meadows (Arrhenethea).

Some stages may be more or less wooded.

As has been shown by phytosociological works (currently still in progress), and even with differing methodology, for example: Succow (1974), Diersson (1982), Moen (1990), Steiner (1992), Julve (1996 b), the vegetation may well indicate the differing ecological gradient occurring on a mire site:

water supply type: depending on the water origin (rain, spring, flood, lake...) and quality (Mineralbodenwasserzeigergrenze of Du Reitz 1954) ;

climatic gradient: latitudinal, altitudinal, longitudinal (oceanic versus continental) ;

hydric gradient: accompanying primary succession, disturbances and regeneration ;

trophic gradient: oligotrophic - mesotrophic - eutrophic soils (with oligotrophilous - mesotrophilous - eutrophilous vegetation !) ;

pH factor: basic or acidic soils (neutrophilous or acidophilous vegetation) ;

mire expanse - mire margin zonation.

Vegetation may also well show the small-scale pattern of a mire as shown by Lindsay & al. (1985), with the correlation between vegetation and T-A terminology.

### 4) Conclusions:

To classify mires at a world scale, I would propose two different classification:

- one, which could be named "ontogenetic classification" is useful to understand the basic global features of mire creation on the earth, permitting comparison of the mires complexes at world scale, between very different region.

- a second, which could be named "floristico-ecological classification" (i.e. phytosociological classification) is useful to understand, compare and predict the ecological processes and features, at microform level.

The "morphogenetic classifications" currently in use are considered inconsistent, mixing at different level very differing criteria and features like: origin, actual shape, actual water supply, geography...

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## *An Introduction to the Peatlands of South Africa*

*P. Grundling*

## Introduction

Peat is a natural organic resource presently being deposited in wetlands in South Africa, ranging from the subtropical interdune mires of the Zululand/Mozambique Coastal Plain, to the temperate Highveld sponges. It forms an active part of the filter and storage capabilities of wetlands and plays a vital role, in

the daily lives of local communities, as a water and horticultural resource.

The peat in South Africa often occurs in ecologically sensitive wetland areas. Peat as a resource for clean drinking water is probably much more important than for other uses, especially in remote rural parts. Its value, in terms of commercial exploitation, must be weighed up against the value of a permanent supply of clean water.

In South Africa organic matter is classified as peat when its ash content is less than 50% and according to the different plant communities growing on the wetlands; these include mainly:

1. reeds and sedges with papyrus, bulrushes and ferns;
2. swamp forests with species like waterberry and ficus.

The plant communities existing at present on a peatland do not necessarily reflect the vegetation that formed the peat in the past. Careful examination of the micro-fossils within the peat, such as pollen grains and spores, can reveal the vegetation types and environmental conditions that existed during peat accumulation.

### **Peat Utilisation and Exploitation**

Mining/excavation of peat in South Africa is controlled by legislation through the Department of Agriculture. Plans to utilise a peat deposit must be accompanied by an impact-assessment study and rehabilitation plans must be approved by the Resource Conservation Division, Department of Agriculture, before exploitation can proceed.

It is clear that the accumulation rate of peatlands can not keep up with large-scale commercial utilisation for energy and horticultural use. The generation of peat is hindered by over- exploitation of water through drainage of a wetland and the consequent, clearing and burning of the biomass on the wetland. Drainage measures can even result in spontaneous combustion of the peat.

Peat is extracted by draining the wetland containing the peat and taking the peat out by hand methods or mechanised equipment. Mini excavators are most commonly used in South Africa.

### **Occurrence and Distribution**

Most peat occurs in active wetland systems. At present the South African peat resource estimations are based on the area of the wetland containing the peat and usually only on one auger hole per wetland. The shape of the wetland basin was also taken into account. As a result the estimations refer to inferred resources. South African peat resources are inferred at between 250 and 280 million m<sup>3</sup> moist peat, with more than 60% of the resource located in KwaZulu-Natal.

### **The Highveld Region**

Most of the peatlands in the Highveld regions of South Africa, from Lichtenburg in the west, to the eastern escarpment, occur in riverine valleys or are associated with natural springs and sponges. The vegetation of the Highveld forms part of the Rocky, Moist Clay, Dry Sandy, Moist Sandy, Moist Cool and Moist Cold Highveld Grassveld types. The eastern escarpment is covered by Wet Cold Highveld and North- eastern Mountain Grassland (Low and Rebelo (eds), 1996).

The Highveld contains about 30% of the total inferred amount of South African peat. Peatlands vary in size from a few hectares to over 2 500 ha and 0.5 - 6.5 m in thickness. Most of the peat in South Africa is mined in the central part of this region. It is expected that a lot more peatlands exist in the higher lying, cooler areas of the South African Highveld regions and the Drakensberg escarpment.

## Maputaland

Maputaland on the southern Mozambiquen Coastal Plain in the KwaZulu-Natal Province contain most of South Africa's peat resources. These Holocene peat deposits on the southern MCP are controlled by the underlying KwaBonambi coastal dune topography of late Pleistocene age. This has resulted in elongated peat bodies being accumulated in interdune valleys of the Holocene age Sibayi Formation. The vegetation in the area forms part of the Coastal Bushveld/Grassland (Low and Rebelo (eds), 1996). The peatlands are the result of accumulation of decaying reeds, sedges, papyrus and swamp forest and to a lesser degree raffia palms and mangoves.

About 230 peatlands have been recorded within the Zululand/Mozambique coastal plain of Maputaland. They vary in size from a few hectares up to 8 800 ha. Their thickness varies from 0.5 to 10 m and they contain 60% of South Africa's estimated resource.

The inferred resource north of Mbazwana consists of about 27 million m<sup>3</sup> of moist peat. This figure covers all the wetlands delineated in northern Maputaland. About half of the wetlands which contain peat fall within proclaimed conservation areas.

The inferred resource for the area south of Mbazwana to the Umfolozi River amounts to 131 million m<sup>3</sup> of moist peat. More than 80 % of the wetlands hosting the indicated reserves fall within proclaimed conservation areas, principally the Greater St. Lucia Wetland Park. The significance of these peatlands, as an integral part of active wetland systems, must be seen in context of the international recognition of this region as an important proclaimed Ramsar Convention Site (Convention on Wetlands of International Importance) and the suggested proposal for World Heritage Site status.

At present these peatlands are mainly utilised for in situ horticulture and as a water resource (Grundling, 1994; 1995). More peatlands are distributed along the South African coastal strip.

## Peat Accumulation

Present estimations on accumulation rates are based on the presence of exotic pollen in the peat, 14C age and thicknesses of peat in present peatlands. The Maputaland and Highveld peats are mostly of Holocene age. The Mfabeni peatland in the southern part of Maputaland that is of early Pleistocene age with an age of 45 000 years close to the base of accumulation (Grundling, 1996).

Based on 14C age datings, accumulation rates for the Holocene peats of Maputaland are on average 1.06 mm/year for the past 9,000 years. An average accumulation rate of 0.46 mm/year has been determined for some of the Highveld peats for the past 11,000 years (Grundling, 1996). The accumulation rate for the Mfabeni is estimated at 0.23 mm/year during the Pleistocene, followed by an enhanced rate of 0.43 mm/year during the Holocene (Grundling, 1996).

Linear curves of depth versus time for the Mfabeni and Maputaland peats do not indicate compaction. The presence of exotic pollen species in the peat cores, which can be dated to the introduction of certain cultures to the area, created the opportunity to determine accumulation rates over the past thirty years. The pollen-based accumulation rates vary from 0.26 to 18.5 mm/year and compare relatively well with the 14C ages. These rates differ significantly with previously indicated current accumulation rates of up to 100 mm/year (Mazus and Grundling, 1995).

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## REPORTS

### *Bryological Information on the Internet*

Bryonet is an international discussion group of bryologists and can be used for any information regarding a bryological topic such as addresses of experts, research projects, practical and theoretical questions on bryophyte ecology, bibliographical information, information in the 'grey literature' etc.

It is open to all interested in bryological issues, not only professionals. On an average day we receive ca. 5 messages, 99.9% bryology-related. The system is used seriously and is not clogged down with irrelevant issues.

Bryonet is managed by Dr. Janice M. Glime at Michigan Technological University, Houghton MI; tel ++1 906 487 2546, fax ++1 906 487 3167 For those interested to use the bryonet, please contact Dr Glime at [jmglime@mtu.edu](mailto:jmglime@mtu.edu)

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## BOOK REVIEWS

### *Conserving Bogs: The Management Handbook*

Stoneman, R. and Brooks. S (eds)

Stationary Office, 286pp, £80.00

Stationary Office, South Gyle Crescent, Edinburgh, EH12 9EB

The long awaited publication of this Management Handbook arrives at a time when the conservation and management of peat bogs remains at the cutting edge of worldwide conservation. This is more than just a practical manual. The writers, Stuart Brooks and Rob Stoneman, have researched well into the subject and although they say in the introduction that this is a cookbook of methods and techniques to help people effectively manage and conserve bogs', it offers much more.

The 'bogology' story unfolds with Part one, looking at the values and uses of bogs, which include biodiversity and landscape, bogs as an educational resource, peat extraction and pollution. Part two acts as an introduction to bog ecosystems, and it is emphasised that an understanding of these unusual habitats is key to effective conservation management. Part three details the way in which management plans should be prepared. The suggested format for a plan follows that developed by the Nature Conservancy Council and its successor bodies. The thought of writing large, in-depth plans can be awesome and the compilation of a brief plan is adequate. The layout of a brief plan is in the publication: Site Management Plans for Nature Conservation - A Working Guide (NCC, 1988). It would have been an advantage, and clearer to the reader, if this layout had been included in Part three. In section 3.4.2, project recording forms and the countryside management systems are all mentioned, but without prior knowledge of these, the bog manager could be confused. A list of projects and layout of the recording form would have helped. Part four continues with monitoring and site assessment that provides the data and information for the management plan production. To the practitioner, Part five is the guts of the book and this section includes management methods on hydrology revegetating peat surfaces, managing scrub and trees, grazing, burning and access. Here, there is a wealth of information and the techniques range from the DIY well tried and tested to the specialist input. Techniques include sheet-pile dams, sluices and weirs, boardwalks and the removal of trees. Part six of the book gives 29 examples of actual or conservation management across Europe. For further advice, the reader can contact each site manager to which the part refers, which adds a personal touch to the book. The final section is a number of appendices referring the reader to summary sections, including a glossary, which strangely omits the definition of peat. It was good to read a section on health and safety in appendix 4, an area which must not be overlooked, particularly when more and more conservation organisations rely on volunteers to carry out much of their work. The information on suppliers is disappointing. Four companies that market specialist equipment including dipwell tubing, electronic dipwell metres, gauge boards and peat augers are not listed. There are inaccuracies in the

vehicle listings as a ACV Engineering manufacture special attachment for use on the Glencoe ATVs and do not supply the machine and there is a well-known supplier of Argocats in Britain without having to contact the manufacturer in Canada for the local supplier as suggested.

The diagrams are good and informative. Black and white photographs are widely distributed throughout the book, they are well chosen, although I thought some were too small. One gremlin did slip through the net where Figure 1.20 is captioned as 'many lowland raised bogs have been destroyed by open cast coal mining and landfill operations', and the photograph is of the Flow Country shown earlier.

I was particularly impressed with the system of cross references. Each part is sub-divided into sections, for example, 5.1 refers to hydrology in Part 5, and 5.1 is identified in white numbers on a grey square situated on the outer edge of the relevant pages. Therefore, by flicking through the book one can very easily find a cross-reference elsewhere.

Apart from one or two minor type-settings discrepancies, this book is a 'must' for all bog managers and anyone interested in the world of peatlands. It encourages the reader to seek out the information and hopefully peatland communication will continue to thrive. The only point I find disheartening about *Conserving Bogs: the Management Handbook* is the price. At an extortion cost of £80, it seems the publishers are asking a high price for the 'definitive book on bog conservation management', which regrettably could be a limiting factor in its distribution, and inevitably its value to peatland conservation.

Peter C Roworth

Site manager, Humberhead Peatlands National Nature Reserve.

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### ***Biodiversity and Sustainability of Tropical Peatlands***

Jack Rieley and Sue Page

Samara Publishing Ltd 370pp £45.

This book arose from a conference held on the title in Palangka Raya, Central Kalimantan, Indonesia in 1995. It was a brave decision to hold a conference in one of the more inaccessible parts of the world - certainly the people living in Palangka Raya have probably never seen so many outsiders (orang puti) at one time.

It was, however, a particularly apt location as the town lies within a vast sea of tropical peatland forest. Although, in parts, this forest has been tampered with by the removal of larger trees, the forests remain reasonably intact and form one of the last great rainforests of the world. They have spectacular biodiversity including orang utan and hornbills as well as carnivorous plants reflecting the extreme ecological conditions of any peat bog. And yet, these are relatively unknown and unexplored ecosystems. Delving into the science base relating to tropical peat bogs, one is immediately struck on how little information there is, and particularly how little primary research has been undertaken. This is a shame. Giant logging schemes, rice paddy schemes added to the El Nino droughts have brought havoc to the system. We are in danger of losing an ecosystem before we've really got any idea about what we are losing.

This book is therefore particularly timely. It sets out 42 papers - 4 introductory statements and 38 scientific contributions. A framework is set out by Ed Maltby in his exposition on 'Guidelines for the Integrated Management and Sustainable Utilisation of Tropical Lowland Peatlands'. The remaining 34 papers are grouped under four main headings:

- History, development and inventory
- Characteristics and structure
- Forest Structure and biodiversity
- Exploitation, natural resource function and sustainability

This book acts as more than just a straight-forward conference proceedings as it presents the most up-to-date and comprehensive compendium of tropical peatland science.

In a way, it makes a sad read - there are no easy solutions to the ecological calamity that is being perpetuated on the tropical peatlands of Indonesia; we are I am afraid far from the sustainable scenarios which could be possible. Are we too late? This book and the conference that preceded it, is a brave attempt to bring some sense to decision making in the region - we can but hope.

Rob Stoneman

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***Aerial views and close-up pictures of 30 Estonian mires.***

The first book on telmatography.

Aaviksoo, K., H. Kadarik & V. Masing, 1997.

Ministry of Environment, Tallinn, 96 p.

Estonia has a superb record in publishing scientific and popular books on mires and peatlands. The newest of them is a nice bilingual (Estonian and English) booklet including pictures of 30 protected mires and mire complexes all over Estonia. The book has introductory chapters on mire development and mire types. Special attention is paid to the use of remote sensing techniques for mire research in the small chapters: "What can we see of the mire from different heights?", "Aerial photographs (with aerial photographs from 1951 and 1982 from the same bog: very illustrative!)", "How to interpret the aerial photographic patterns of mires, and "What can one see in satellite images". Because of their shortness, these chapters are sometimes a little bit confusing.

A chapter I liked very much "A journey through the ages and climatic zones" describes how plant and landscape forms from various geological periods and climatic zones can be observed in mires. A chapter on "Nature conservation in mires" includes an overview of the 30 mires with their mire extent, peat depth, protected area and (planned) protection status. For the international audience it would have been good to include some short notes on what the protection status of Landscape reserve, Nature Reserve and National Park imply in Estonian legislation.

The larger part of the booklet presents short descriptions of the 30 mires, with an aerial picture (in black and white), a topographic map (in colour) and some additional detail photographs with characteristic landscape views, plants or mire parts. Really very nice.

Some minor criticism: a picture with as underline "Typical treeless bog in Western Estonia" on p. 36 shows a transitional mire covered with pine, and the word bog is inconsistently used for both bog s.s. and mire (e.g. as transitional bog). Furthermore I do not expect that the aerial photos and maps inside this book will make your mire journey more interesting and safe as we can read on the backside of the book. Both maps and photos are not detailed enough to make trips really safe. However, this booklet will definitely raise the interest of many people in these marvellous landscapes. Next year, on the IMCG field symposium, we will take a look at some of them, I hope.

Hans Joosten.

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