INTERNATIONAL MIRE CONSERVATION GROUP

NEWSLETTER

issue 2000/3, July 2000

The International Mire Conservation Group (IMCG) is an international network of specialists having a particular interest in mire and peatland conservation. The network encompasses a wide spectrum of expertise and interests, from research scientists to consultants, government agency specialists to peatland site managers. It operates largely through e-mail and newsletters, and holds regular workshops and symposia. For more information: consult the IMCG Website: http://ibs.uel.ac.uk/imcg/

IMCG has an elected chairman (Richard Lindsay), a Working Group (being a group of people that volunteered to keep the IMCG business going), and a Decision Making Group of 8 (now 7 since Marina Botch's death) elected members from various parts of the world, that has to take decisions between congresses.

Editorial

Here it is, Newsletter 2000/3. We hope it reaches everybody in time for the Quebec event. There, at the IMCG Congress, we will deal with the future of IMCG and we hope on the participation of as many members as possible. To involve members in the discussions on the constitution and in the election of the IMCG board, email-messages have been send around. If you have not reacted yet: do it immediately!!! For an up-to-date version of the draft IMCG constitution consult the IMCG website or contact the secretariat.

In future, we hope we will be able to distribute the IMCG Newsletter largely electronically, which is of course much faster. We will soon send an e-mail questionaire asking everyone about their possibilities and willingness to receive an electronic newsletter. Stay tuned. In the meantime, the Newsletter will also be available for download on the IMCG Website.

In this Issue you may also find some larger articles on the mires of Lesotho, Burns Bog in Canada, and the birds of the West-Siberian plain. If you want to use the Newsletter as a forum for publication of such articles, contact us.

As always, we took the liberty to (sometimes vigourously) edit available texts, a procedure necessary to guarantee short production times. Any mistakes and omissions are entirely our responsibility.

The next Newsletter 2000/4 is planned to appear by the end of this year. Deadline for submitting material is 15th November.

Please inform us on anything happening and all relevant books published to report on them in the Newsletter. In the meantime, keep an eye on the IMCG web-site: http://ibs.uel.ac.uk/imcg/

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Contents:

The Role of Peat in Finnish Greenhouse Balances

by Hans Joosten

Crill, P., Hargreaves, K. & Korhola, A., 2000. The Role of Peat in Finnish Greenhouse Gas Balances. Ministery of Trade and Industry Finland. Studies and Reports 10/2000. 71 p. FIM 76. Obtainable from Edita Ltd.

The Framework Convention on Climate Change (United Nations 1992) requires from countries to limit their anthropogenic emissions of greenhouse gases (GHG) and to protect and enhance the GHG sinks and reservoirs. According to the Kyoto protocol (1997), attention has to be paid to changes in GHG emissions by changes in land use (agriculture and forestry). The Finnish government has committed itself to reduce GHG emissions from Finland to 100% of the 1990 level by 2008 – 2012.

In November 1999 the Ministry of Trade and Industry of Finland commissioned a group of three scientists (Patrick Crill US, Ken Hargreaves UK, and Atte Korhola FIN) to assess the role of peat in Finland's GHG balances. Based on known facts, a comprehensive and objective account was requested of the impact that peat bogs (?) and the use of peat for energy production have on Finland's GHG emissions and sinks.

The assessment is interesting, because it is a serious attempt to quantify the peatland GHG balance for a country where good data on the extent and condition of peatlands are available. Furthermore, a lot of research on peatland carbon sequestration and GHG emissions has been done in Finland, including recent work of the Universities of Helsinki, Joensuu, and Kuopio (see former Newsletters). The review is furthermore important, because it may shed light on the "biofuel" and renewability character of peat, and on the sustainability of Finnish peat extraction, issues that are continuously brought forward by the Finnish peat extractors (see also "Biofuels and Peat in the EU" in this Newsletter). In May 2000, the researchers have presented their account.

Chapter 1 "Peatlands, carbon cycle, and climate change" presents a good overview of carbon dynamics in undisturbed peatlands, the general effects of forestry, agriculture, and peat extraction on peatlands, and the relations between GHG's and climate change. Especially the effects of peatland drainage for forestry are rather complicated. Increased aeration - other things being equal - results in faster peat decomposition rates. Simultaneously, aeration may, however, be accompanied by a decrease in peat pH and a lower peat temperature, which may again decrease the rate of organic matter decomposition. After drainage, typical peatland species are gradually replaced by forest vegetation with a larger net primary production, a larger biomass, and a different litter quality.

Chapter 2 presents and discusses the magnitude of the GHG fluxes of Finnish peatlands under different types of land use and the uncertainties of the estimates (Table 1). In a valuable appendix, all available direct measurements of GHG fluxes from Finnish peatland sites and many flux data from other northern peatlands are listed.

Table 1: Areas and annual GHG balances of Finnish peatlands under different land-use forms (slightly corrected after Table 6 from Crill et al. 2000). (- sequestration; + emission; ranges when not determined are not presented).

	area x 10^3 ha	CO_2 in 10^9 g	CH_4 in 10^9 g	N_2O in 10^9 g
Undisturbed peatlands	4 000	- 3010 ± 150	540	0.2
Peatlands drained for forestry	5 700	- 9 400 ± 5 500	93	7.1
Peatlands drained for agriculture	250	3 200 - 7 800	- 0.3 - + 0.3	2.8 - 4.5
Peat harvesting areas and stockpiles	63	668	0.4	0.1
Peat combustion		8088 ± 658	0.8 ± 0.2	1.3 ± 0.3

Chapter 3 discusses the radiative forcing arising from peatland use (Table 2). Especially the large negative forcing of peatlands drained for forestry is striking. The authors therefore warn for a possible "unethical policy", when Finland and other countries with extensive virgin peatlands drain these peatlands (and the consequent supposed – see later – improvement of the GHG sink) to get a "merchantable" GHG sink which may be traded.

In a comparison of various fuels, the report concludes that "the use of peat from either an undrained or forest-drained peatland has a greater (positive, HJ) impact on radiative forcing on the 100 year horizon than the continued use of coal and oil for power generation. The reason for this is that the carbon from the combusted peat is lost over a very short period and, when compared with the regeneration time for a peatland of thousands of years, only a small proportion of that loss is recovered over this time horizon." (p. 41) The radiative forcing due to the use of such peat is so large, that in scenario studies these uses do not appear in any scenario to replace coal. Indeed, the only use for peat (from cultivated peatlands) is found where it is combined with a variety of wood based fuels (p. 43).

The report concludes "that treating peat as being

analogous to wood (an accepted "biofuel") is not a valid approach. Similarly it is unreasonable to treat peat in the same way as coal, oil or gas since its regeneration time is far faster than these fossil fuels. Peat fuel should therefore be considered as a distinct category" (p. 44).

Table 2: Summary of radiative forcing of all Finnish peatlands using different time horizons (after Crill et al. Tables 13 and 15).

End-use of peatland	radiative forcing as 10^{12} g CO_2 equivalents (100 year horizon)	radiative forcing as 10^{12} g CO_2 equivalents (500 year horizon)
Undisturbed peatlands	+ 8.40 ± 0.15	- 0.54 ± 0.15
Forest drained peatlands	- 5.28 ± 5.5	- 7.61 ± 5.5
Agricultural peatlands	+ 6.63 ± 2.57	+ 6.12 ± 2.45
Peat harvesing and stockpiles	+ 0.71 ± n.d.	+ 0.69 ± n.d.
Peat combustion for energy production	+ 8.51 ± 8.97	+ 8.32 ± 0.71
Totals	**+ 18.97 ± 8.97**	**+ 8.06 ± 8.81**

Table 2 also illustrates the important effect of the time horizon chosen. With a 500 year horizon the positive radiate force of undisturbed peatlands (due to the CH_4 emissions) changes into a (small) negative one. The Kyoto protocol requires radiative forcing potential to be calculated according to a 100 year time horizon, but individual countries may additionally choose to use alternative time horizons for "information purposes only". The large differences between a 100 and a 500 year time horizon are caused by the strongly time dependent effect of CH_4 (see Table 3).

Table 3: The atmospheric lifetime and the IPCC (1996) accepted global warming potentials of trace gases over different time horizonts (expressed in CO_2 equivalents).

chemical species	atmospheric	global warming potential (mass basis) (time horizon)		
	lifetime (years)	20 years	100 years	500 years
CO_2	variable	1	1	1
CH_4	12 ± 3	56	21	6.5
N_2O	120	280	310	170

Chapter 4 discusses the after-use options for cutaway peatlands. The very few available data on CH_4 emissions from rewetted cut-away peatlands indicate that emissions are small in comparison to undisturbed peatlands. Chapter 5 pays some attention to the effects of peat extraction on water bodies and on biodiversity. Whereas the former can be substantial (but can be mitigated by technical measures), the effect on biodiversity is estimated to be small, because most biodiversity losses have already taken place consequent on the massive drainages for forestry and because the area for peat extraction is relatively small and often situated on previously forestry drained peatlands.

In chapter 6 the major conclusions are presented of which the following require some comments.

- The authors propose to introduce a new classification concept, that of "biomass fuel". "Unlike "fossil fuels" but similar to "biofuels", "biomass fuels" are renewable. However, due to the long time span required for building up a harvestable peat deposit, in comparison to wood biomass, peat can be regarded as a "slowly renewable fuel" only."
  This new concept does not bring much. Coal and oil are also renewable on a very long time span. For defining renewability for socio-economic purposes, time spans of "up to thousands of years" make no sense. After a specific timeframe has been chosen, something is renewable or it is not, and an intermediate category is superfluous, except – of course – for throwing dust in politic's eyes.
- "The carbon binding of undisturbed peatlands, and of those drained for forestry, is of such an order of magnitude that it may compensate for the emissions from the use of peat for energy production."
  With respect to peat extraction and combustion for energy, the report had already stated: "According to the best estimates, CO_2 emissions to the atmosphere from the energy use of peat (8.76 Tg) appear to be compensated for by the growth of undisturbed and forestry drained peatlands but uncertainties in the estimates of emissions from all sources and from agricultural peat would make calculation of total balance very uncertain." (p. 27, cf. p.44).

Table 4: Annual carbon balances of Finnish peatlands (?) under different land-use forms (after Crill et al. 2000 Tables 6 and 13). (- sequestration; + emission).

	total C in 10^9 g
Undisturbed peatlands	- 408 ± 28
Peatlands drained for forestry	- 2468 ± 1485
Peatlands drained for agriculture	+ 1485 ± 621
Peat harvesting and stockpiles	+ 180 ± n.d.
Peat combustion	+ 2184 ± 178

Table 4 shows, that peat extraction for energy in Finland (it remains unclear whether peat extraction for horticulture is included in the report) annually consumes almost 6 times more peat than is accumulating in the undisturbed mires of that country. Only by claiming the C-accumulation in forestry drained peatlands, a full "compensation" might be reached (but notice the large uncertainties of the forestry peatland data!).

To compensate peat combustion losses arithmetically by C-accumulation in undisturbed and forestry peatlands is, of course, fully arbitrary. Also peatland agriculture with its large carbon losses, or undisturbed peatlands with their positive radiative forcing (on the 100 year time horizon), or any other carbon emitting activity in Finland (e.g. traffic and industry) can rightfully claim that C-sequestration. Awarding it to peat combustion is no scientific issue but a political decision, with which the commission clearly exceeds its assignment to give an "objective account".

In general, the report gives a wealth of information on the GHG-peatland issue based on an up-to-date review of existing literature. Two fundamental points of criticism must, however, be made:

- The exact object of research remains unclear. The confusion already starts with the ministerial assignment, that talks about "peat bogs" and "bog types" when apparently something else is meant, as a large part of finnish peatlands and (other) suos are no bogs. The report on its turn talks about GHG balances of "peatlands", or "peat", or "the soil in ... peatlands", all terms being used without discrimination and without giving definitions. Clear definitions are necessary, because these terms mean different things in different countries and disciplines. This is especially important as the common Finnish word "suo" is not at all synonymous with the international term "peatland". The 5.7 x 106 ha of "peatlands" drained for forestry mentioned in the report, for example, probably refer to "suos", not to peatlands. And what about "soil in peatland"? According to the publications where the report refers to (i.e. Minkkinen & Laine 1998), this concept includes the recent raw humus layer of forest shrubs, tree litter, and mosses like Pleurozium which is not identical to peat.
- The report uses different time frames for various assessments. To some extent this is done from sheer necessity, because no other values are available, but the data are not discussed critically enough in this respect.
- The CO_2 balance values for the undrained peatlands are derived from the long-term C accumulation rates (LORCA) for undrained mires in Finland. The report states: "the direct correspondence of these long term accumulation rates with the present day C accumulation (is) not known." (p. 25). LORCA values (having a mean time horizon of say 5000 years) are certainly too low to express recent short term accumulation rates (cf. Turunen et al. manuscript in Turunen 1999).

  The CO_2 balance values for drained peatlands are derived from Minkkinen & Laine (1998) and represent the average annual values over a ca. 60 year post-drainage period (p. 22). Such values are clearly too high for calculating future carbon accumulation rates.

Especially the data of Minkkinen & Laine (1998) are incorrectly extrapolated toward time horizons for which they are not applicable. It is indeed recognized, that after drainage, "typical peatland species are gradually replaced by forest vegetation" (p. 15) and that "the species composition develops towards forest vegetation away from mire assemblages..." (p. 50), but its consequences are not sufficiently analysed. Minkkinen & Laine (1998) include the raw humus layer of drained peatland forests and the increased root growth of trees and shrubs in their peat concept. This is the very reason that forestry drained peatlands (initially) get a increase in "peat" carbon storage. Carbon accumulation in such forests is, however, not continuous, but eventually reaches zero, as is evident from the fact that no "Pleurozium-rootlet" peats or something similar are found in nature. Using the mean carbon accumulation data from a 50 – 60 year post drainage period for linear extrapolation towards a 100 or 500 year time horizon and for claiming the renewability of peat is

- wrong as the net forest litter accumulation rate is not constant but decreases toward zero after an initial optimum,
- inaccurate because the carbon loss of oxidizing peat is (and only temporarily) compensated by raw humus litter of completely different composition (forest litter • peat),
- perverse because a long term carbon reservoir is exchanged for a short time carbon sink.

These omissions may – wrongly - stimulate the very "unethical policy" for which the report warns...

Minkkinen, K. & J. Laine, 1998. Long-term effect of forest drainage on the peat carbon stores of pine mires in Finland. Can. J. For. res. 28: 1267 – 1275.

Turunen, J., 1999. Carbon accumulation of natural mire ecosystems in Finland – application to boreal and subarctic mires. PhD thesis, Joensuu.

IMCG Working Group Meetings in Łagow (Poland), March 2000

During the 3rd IMCG Workshop on global mire classification and terminology, several WG meetings were held. A great deal of attention was given to the formal status and future executive structure of IMCG. Also the IMCG Congress and Conference in Quebec were discussed. The congress is covered elsewhere in this Newsletter.
Other items discussed and later executed:

IMCG as Wetlands International expert group.
For a review on expert groups reference is made to Newsletter 2000/1. It should be noted that WI allows their expert groups to remain fully independent. As Expert group, IMCG will have to:
- prepare triannual plan of activity
- submit a triannual report on activities
- liaise in projects
- send Newsletter to WI
- attend WI Executive Board meetings and when possible attend regional meetings
- provide news items for the WI newsletter

As IMCG is doing most of these tasks anyhow, and considering the worldwide acknowledgement and increased influence through WI, the WG is of the opinion that the expert group status should be accepted.
ACTION: Richard Lindsay will bring this Working Group proposal before the Decision Making Group for voting

Offer from IUCN to IMCG (?) to become member to Commission for Ecosystem Management (CEM).
More information is needed on this.
ACTION: Richard Lindsay will contact Ed Maltby for more information. Item to be prepared and scheduled for the next Working Group Meeting

Telma 2000.
Telma2000 was not conceived to be a strategic plan (see Newsletter 2000/2) but rather a simple document identifying tasks of IMCG in relation to GAPP. It was proposed to skip the strategic plan and make an IMCG leaflet to be introduced at the Quebec 2000 event.
A draft leaflet has already been distributed among the WG members for comment.
ACTION: Richard Lindsay and the London office, together with Mette Risager and Tatiana Minaeva, will prepare the leaflet for the Quebec 2000 event.

IMCG feedback on the GAPP.
It was decided to communicate a concerted IMCG reaction to Jack Rieley. Michael Steiner and John Jeglum prepared an annotated GAPP document that was distributed among the WG for comment. Richard Lindsay has gathered and communicated these to Jack Rieley as IMCG's standpoint to the GAPP.

IMCG representation in STRP.
Andreas Grünig has offered to represent IMCG in the Scientific and Technical Review Panel to the Ramsar Convention (STRP) meetings for as long as his recent job change allows him to.

IMCG Newsletter.
Greifswald will continue to compile the Newsletter. As continued distribution after the end of 2000 is unsure, the possibilities of electronic distribution (Word/AdobeReader) will be checked; Please refer to elsewhere in this Newsletter. The Newsletter has also been put on the IMCG webpage.
An evaluation on the Newsletter by the WG was planned.
ACTION: WG sends comments on the Newsletter to Greifswald
For 2001 and onward, alternatives for distribution of the IMCG Newsletter will be sought.

IMCG webpage
Difficulties in accessing Philippe Julve's homepage http://perso.wanadoo.fr/philippe.julve/ are most likely due to his provider

Mire plant list
See elsewhere in this Newsletter.
The mire species list will be extended to a wetland species list, indicating whether a species is a wetland species or a specialised mire species.
ACTION: Thomas Heinicke will provide Philippe with a proposal on the organisation of the list
ACTION: Hans provides contact in S-America, John Jeglum in tropics, John C. will send species list of Ispani II

Red lists.
Greifswald has compiled a european list of birds, mammals, amphibians, plants, and bryophytes showing distribution and available red list data per country
ACTION: Thomas will send the files to Jaanus Paal, Philippe, Richard, Mette Risager & Tanja Minaeva
ACTION: Thomas Heinicke will provide a contribution in the next Newsletter
ACTION: Tanja will provide a red data book

Letter of support to Lubuski Nature Club
ACTION: Richard will draft a letter to WI to address the Econet fund for support to the club for a grant sufficient to buy the Ilanki valley area (visited during the sunday excursion);

3rd IMCG Classification and Terminology Workshop

The 3rd IMCG workshop on classification and terminology was held from 24-28 March 2000 in Łagow in Poland. After two years of fruitful discussions, the time had now come to make some concrete proposals and set some deadlines. The outcome of the discussions on the different topics is presented below.
The next workshop will take a more practical approach in that the different classification schemes and approaches will be applied in the field and tested on usefulness and compatibility. Jaanus Paal has offered to find suitable mire areas in Estonia en will organise this field workshop.

Plants (coord. Philippe Julve)
- Plants are useful to classify mires in many ways.
- It is proposed to extend the world mire plant species list to wetland and aquatic species (see elsewhere in this Newsletter).
- Plant classification at different levels will be used, in connection with hydrology, to test integration possibilities during the planned Estonian research trip.
- Tatiana Minaeva and Philippe Julve will work on a European synopsis of mire vegetation.
- Synusial approach has been discussed between members of the subgroup and should be shown in the field for discussion and comparison with classical approaches.

For more information please contact Philippe Julve:
e-mail: philippe.julve@wanadoo.fr

Hydrogenetic mire types (coord. Hans Joosten)
- A plenary presentation and discussion and smaller workshops were held

outcome:
- General acceptance of the approach.
- Text of the manuscript has to be refined:
  - include remarks on the regulation of peat formation by chemical processes, dependence on plant species, nitrogen availability;
  - more reference to existing systems of similar set-up (e.g. Lugo, Brinson; historical overview)
  - stress that the approach applies only to the ecotope level
  - stress that the approach applies only to living (peat accumulating) systems
  - more attention to the terms used
- The key on hydrogenetic mire types will focus on non-permafrost europe; keys of similar structure will have to be developed for other regions

involvement:
- Hans Joosten and John Couwenberg will work the text out further.
- Andrej Sirin will send remarks on existing systems, will send first parts of diss. habil., will test on inconsistencies, and will comment on present draft
- Frank Edom will provide half a page with thoughts on external factors (land use, climate)
- Ab Grootjans will work out the key
- Nikolai Bambalov will provide input on the influence of chemical properties on peat formation
- John Jeglum and Herbert Diemont wish to stay informed and will provide input and criticism
- Bryan Wheeler will be informed

deadlines:
- presentation in Quebec: August 2000
- input by Frank Edom: Sept. 2000
- key draft ready Okt. 2000
- article draft ready Okt. 2000

For more information please contact Hans Joosten:
e-mail: joosten@mail.uni-greifswald.de

Values (coord. Hans Joosten)
- A plenary presentation and discussion were held.

outcome:
- Fundamentals of approach accepted.
- Text will be used in the Wise Use Guidelines.
- The large values table that was presented will be restructured to simplify the complex of informational values and to incorporate the discussion input.
- The values aspect should also be part of the classification test workshop in Estonia next year.

appointments:
- People who have promised text contributions for the value part of the Wise Use Guidelines will be approached and will provide their textes in time.
- Donal Clarke of IPS and Hans Joosten will incorporate the (edited) texts in the Wise Use Guidelines.
- Hans Joosten will try to make a practical value typology for testing in Estonia, starting from the beginning of 2001.

For more information please contact Hans Joosten:
e-mail: joosten@mail.uni-greifswald.de

Wise Use Guidelines (coord. Hans Joosten & Donal Clarke)
- an introductory talk and small workshop were held

appointments:
- See also under „Values“
- Hans Joosten will continue writing on conflict analysis, boundary conditions, and guidelines
- Meeting with IPS 17 Mai 2000: presentation of annotated table of content
- Sectoral experts Piotr Ilnicki, Herbert Diemont, Tymo Nyronen, Juhanni Päivänen, Asbjørn Moen are going to provide 5p. papers as a discussion input for Donal and Hans. This paper will have no official status.
- First draft of Guidelines will be ready for Quebec.
- Appr. 10 people from each IPS and IMCG will be asked to comment on the full draft (100 p.) before the text will be accepted by the boards.
- A draft executive summary (5 p.) will be broadly distributed in the organisations and discussed.

- After Quebec, the draft will be discussed with other organisations.
- It is not yet clear whether and what kind of case studies will be added to the full draft.

Universal Mire Lexicon (coord. Ronald Hofstetter)
(A Proposed New Terminology for Mires and Related Systems)
Goal:- to produce a lexicon (terminology) for basic kinds of mires and related systems (wetlands) that exist worldwide for purposes of conservation;
Presentation of:
- general types of communication errors,
- types of problems associated with using existing terms,
- definition of "wet lands";
- requirements of a new universal lexicon;
- basis of a proposed lexicon using terms derived from Latin and Greek words;
- "Terrud" as the new general term for "wet land";
- Suggested terms for some basic types of wet lands.

Outcome of discussions:
- Proceed with the development of a wetland-mire lexicon based mainly on new terms;
- Restrict new terms, if possible, to either Latin or Greek. [Greek was subsequently selected because of its greater diversity of environmental terms.] Ron's suggested Greek-based term "Udutope" for the Latin-Greek hybrid term "Terrud" for "wet land" was rejected at the workshop because "tope" has a different meaning in landscape ecology;
- Revised definition of wet land was accepted by all attendees.

Appointments:
- Andreas Gruenig and Jaanus Paal offered their assistance in having the Greek components of the proposed new terminology evaluated;
- The IMCG Terminology Subcommittee will be expected to respond in a timely manner to updated drafts of the proposed new terminology.

Deadlines:
- A new set of proposed terms based entirely on Greek words will be developed by Ron by 12 May;
- Proposed new terms will be sent to Gruenig and Paal by 17 May via email;
- Comments on Greek terms should be returned by 15 June, but no later than 14 July;
- On the reception of comments on Greek terms, Ron will revise and distribute a proposed new terminology via email to IMCG Terminology Subcommittee and Lagow workshop attendees and select other individuals (hopefully) by 30 June;
- Using suggestions received through 21 July, Ron will revise the proposed lexicon; and
- Submit the revised new lexicon for incorporation on the IMCG web site by 31 July;
- Ron will present the revised Universal Lexicon for Wetlands, Mires and Related Systems as an oral presentation and poster at the Wetland Millennium Event in Quebec in August, 2000;
- Ron will further revise the new terminology, based on suggestions received through 1 September;

The revised paper on a new terminology to the IMCG for incorporation into the web site and will be send by Ron directly to those who have provided comments and have requested a copy of the paper.

In all, the workshop turned out to be fruitful and stimulating and we like to thank our Polish hosts of the Lubuski Nature Club for organising the technicalities of the workshop and taking us on an interesting field excursion.

Ramsar STRP Meeting

by Richard Lindsay

The Scientific & Technical Review Panel (STRP) of Ramsar Convention met in Gland from 28th June to 1st July. The IMCG was invited to attend as both Observer and Co-Chair of the STRP Peatland Working Group, and was represented by Andreas Grünig and Richard Lindsay.
The day prior to the STRP Meeting (27th June), the various STRP Working Groups met. The Peatland Working Group (PWG) discussions were led by Jack Reiley.

GAPP
The PWG considered how to incorporate the comments made so far by various organisations, including IMCG, into the Global Action Plan for Peatlands (GAPP). The Ramsar Bureau will send this modified version in the three official Ramsar languages to all Contracting Parties for comment as soon after the STRP meeting as possible. At Quebec 2000, the GAPP will be made available from the Ramsar stand to those wishing to review the latest version and comment to the PWG. After this wide consultation a new version will be presented to the Ramsar Standing Committee, via the STRP, 6 months prior to COP8 (the 8th Conference of Parties) to be held in Spain in early summer 2002. After this formal consultation process the document would go forward for formal adoption by Contracting Parties at COP8.

Guidelines for Ramsar Site-Selection
The Ramsar COP7 in Costa Rica explicitly expressed the need for better guidance to assist Contracting Parties in selecting peatland Ramsar Sites. Doug Taylor and Scott Frazier from Wetlands International (WI) presented an approach WI have been working on at the request of the Ramsar Bureau. This document is at an early stage in development, and comments are welcomed. It will either be posted on the STRP web-site, or can be obtained directly from Wetlands International.

Wise Use Guidelines
The PWG was updated on the latest programme for the development of the Wise Use Guidelines for Peatlands. The proposed programme for their further development would mean that a document might be ready for circulation some time during 2001. It might thus be possible to include a consultation period with Ramsar Contracting Parties prior to Ramsar COP8. It was recognised that, unlike the GAPP, these Guidelines were not developed specifically as a Ramsar document. Nevertheless, it was clear that the Joint Work Plan recently agreed between the Ramsar Convention and the Convention on Biological Diversity (CBD) provides an excellent locus for these Guidelines to form an important supporting document for both conventions.

The Quebec IMCG Congress and Conference

The 2000 IMCGC Congress will take place on Sunday 6 Aug 2000 in the Québec City Congress Centre, room 2000C, from 14:00h-18:00h. The room will already be available for IMCG from 9:00h for groups who want to meet in advance, e.g. for discussions and preparing resolutions, or just for meeting IMCG friends.After our Congress the general Welcome Reception starts in the room next door, so we are situated well!
The agenda of the Congress is as follows:

1. Welcome and introduction to IMCG.
2. Summary results of Questionnaire - IMCG Membership.
3. Presentation and formal adoption of Constitution.
4. Election of IMCG Board - results.
5. Election of Executive Committee - discussion.
6. IMCG support functions (web-site, mailing lists, Newsletter, etc.) - discussion and agreement on responsibility.
7. Discussion - Links with other organisations (establishment/maintenance of links, plus identification of IMCG link representatives):
   Wetlands International
   European Habitats Forum
   IUCN
   International Peat Society
8. Membership fees - discussion and decision.
9. Funding - existing and future approaches
10. IMCG Resolutions - identification of, and discussion about, proposals.
11. Projects - review of existing mechanisms and responsibilities.
12. Projects - review of future possibilities and responsibilities.

The IMCG Conference will take place on Monday, August 7, 13:30-18:00h and on Tuesday, August 8, 8:30-12:00h, and 13:30-18:00h in room 303B.
The programme on Monday includes: 1. Richard Lindsay - IMCG programs - present and future, 2. Jan Sliva and Leslaw Wolejko - Order from chaos - IMCG classification initiatives, 3. Ron Hofstetter - Universal mire lexicon, .4. Philippe Julve - Towards a global mire plant species list, 5. Carlos Thompson,

Richard Lindsay, F. Hochleitner, B. Teixera and F.C. Popolo - Fingerprinting the mires -towards a global catalogue of mire patterns, 6. John Couwenberg and Hans Joosten - Hydrogenetic mire classification, 7.Hans Joosten and Donal Clarke - Wise Use Guidelines for Peatlands - partnership and progress, 8. L. Jeschke, H. Joosten, J. Couwenberg and T. Heinicke - The IMCG European Mires Book, 9. Catherine O'Connell, Dublin, Ireland - Development of mire education programs.
On Tuesday, the following regional accounts will be presented: 10. Asbjørn Moen - Regionality of mire systems, 11. G. Marneweck and Piet Louis Grundling - An brief overview of the mires of Africa, south of the Zambezi River, 12. Yongxing Yang - Mire conservation in China - the latest research progress and current viewpoints, 13. Tatiana Minayeva - Status and information backgroung for peatland conservation in Russia, 14. Jean-Marc Hervio, Philippe Julve and Virginie Vergne - France: the lesson of domestic partnership (mire conservation in France), 15. Michael Succow - Towards mire conservation in northern and middle Eurasia, 16. W. Herbert Diemont, P. Ilnicki, N.N. Bambolov, J.K. Jeglum and K. Jenderedjian - The future use of peatlands, 17. Henk Zingstra - Central European Peatland Project, 18. Jaanus Paal - Estonian wetland inventory, 19. W. Bleuten, S.V. Vasliev and E.D. Lapshina - The scientific relevance of the greatest raised bog of the world: Vasuganskoe Bog (West Siberia), 20. A.T. Grundling, G. Marneweck and P. Grundling - An integrated approach towards protecting the wetlands of the Steenkampsberg Plateau, South Africa, 21. Raimo Heikkila, T. Lindholm and O. Kuznetsov - A multi-level analysis of Kauhaneva mire, western Finland, 22. Charlotte MacAlister - Surface water flow in mire hydrology and its functional links to ecology, 23. Meng Xianmin - Carbon flow and sink of peatlands in China and the present situation for protection, 24. V. Vergne and N.J. Whitehouse - The archive of the peat bogs: their value to conservation and a resource inneed of protection.

The latest schedule can be found under:
http://www.cqvb.qc.ca/wetland2000/english/common/newcfp/IMCGSYMPOSIUMI.html

Furthermore we plan to organize an informal and unformal evening for IMCG members in some restaurant down town old Quebec on Thursday evening.

Databases on wetland species in Europe, their distribution, and threat status

by Thomas Heinicke

Species biodiversity and rarity often provide incentives for the protection of mires and peatlands and may serve as suitable indicators for measuring their conservational value. In order to make the information more easily accessible and to provide a useful framework of national and international comparison, we have compiled electronic databases on wetland species. Currently, these are available for bryophytes, vascular plants, amphibians and reptiles, birds, and mammals in Europe (political borders) with information on distribution (occurrence per country), threat status (national red data lists), and listing in international conventions and agreements.
The data thus inform not only about the status of a species in one country, but also in a wider context. Therewith, aspects of the distributional pattern, the threat situation in other countries, in Europe as a whole, and on a world-wide scale (appendices of international conventions & agreements) can be taken into account when assessing the conservational value of mires and peatlands.
The database for plant species is based on the mire plant species list by Philippe Julve (http://perso.wanadoo.fr/philippe.julve/imcgproj.htm). It is enlarged with species related to wetlands. This because in a lot of cases it is unclear, whether a plant is a mire species in the whole distribution area or not. In future adding of information for each species is planned on the geographical distribution (plant geographical, altitudal distribution), habitat preferences per region, and more detailed ecological data. The same accounts for the bryophyte-list.
In case of animals (vertebrates) it is much more difficult to select mire species. Therefore, for Europe all (breeding) birds, all mammals, and all amphibians and reptiles have been listed. The user then has to decide whether in his country mires/peatlands are of importance to these animals or not. For birds already data on the frequency of occurrence (10 % limit) has been put in. This is also planned for the other groups.
The databases are currently available in MSExcel table-format. They will in future be put on the IMCG-website, but until then you can get them from
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Help is always welcome!

IMCG European Mires Book

by Lebrecht Jeschke & Hans Joosten

During the meeting in Łagow, the group of contributors present discussed the progress of the European Mires Book (working title) and identified several points of attention, including

- the full coverage of Europe,
- the timeplanning of the draft submission and consequent editing,
- conceptual coordination of and between chapters, and
- the lists of most important mires and peatlands.

Since Łagow we have been hunting for capable autors to fill remaining country gaps. We had success and were able to find good autors for Hungary and Azerbeidjan. Two additional small areas (Andorra and Faroer) could also be covered separately, but 2 countries in Europe are still open (Macedonia and Moldavia). As we want to get the whole European picture, we will continue looking.

Several authors asked for postponement of the deadline to sort out the statistics and to use spring and early summer of 2000 for checking in the field. We have therefore put the deadline for submission of most drafts to the end of July. This will still enable us to present an overview at the Quebec meeting. We have also scheduled a more extensive editing and redrafting timeperiod, because that appears to be necessary.

We are very content with the drafts we have received uptil now (from 20 countries, meaning we have already the most extensive overview of peatlands in Europe ever made!). Nevertheless, the manuscripts differ much in quality and content and we need much time to edit the manuscripts carefully, especially with respect to concepts and terminology.

Some objections were made to include lists of most important peatlands, including the risk of wrong priorities, and the incompleteness of every list. As the chapters are written by the peatland conservation experts of all countries, we should see it as our duty to name those mires that should not in any way be given up for economic reasons. Such lists can never be complete, but that should not withhold us from making a start. Naming any mire or peatland site means it is relieved from anonymity as a first step to its protection, long before such protected status can be official.

Wetlands International is very eager to publish the book, and we would also prefer to have it published by such an organisation instead of by a commercial publisher (who are also interested). We have been and are hunting for grants to publish the book for a reasonable price.

Mires of Northern Lesotho

by Gary Marneweck and Piet-Louis Grundling

1. introduction

The Kingdom of Lesotho is a landlocked country located in southern Africa, within the borders of the Republic of South Africa. The country has a population of about 2 million of which only about 14 % live in urban areas like the capital Maseru. Lesotho covers an area of about 30 375 km^2. It is also known as the mountain kingdom with rugged Alpine and sub-Alpine terrain above 2 000 m above mean sea level covering 75 % of the country. The people of Lesotho depend on subsistence agriculture and its economy is inextricably linked to that of South Africa with about 150 000 Basotho's (citizens of Lesotho) working there, mostly working in South African mines (about 100 000).

Twenty-seven mires were visited during two field trips in northern Lesotho in February 1999 and February 2000 respectively. The studied mires were found in the upper catchment areas of the Maliba-Matšo, Motete, and Motsoku Rivers in the Mokhotlong and Butha-Buthe Districts of Lesotho. The aim was to provide a baseline assessment of a large number and diversity of wetlands in order to get a better understanding of their current status. Thus, also current and potential threats to the long term conservation of these systems were identified, highlighting the key issues and concerns.

The study formed part of a larger Environmental Impact Study and monitoring programme by the Lesotho Highlands Development Authority on the Lesotho Highlands Development Project that aims to transfer water from the Lesotho catchments to a thirsty industrialised South Africa. The investigated wetlands occur at the source of the major feeder rivers to Katse Dam, the major reservoir of the project. They are mostly peat dominated systems and perform a critical hydrological role in the upper catchments in regulating the quality and quantity of water which flows into the feeder rivers of Katse Dam. The wetlands are key components in terms of the biodiversity of the Maluti Mountain landscape.

2. materials and methods

Wetland signatures were identified on a satellite image of the catchment of Katse Dam and transferred to 1:50 000 topographic maps.

Prior to the field visit, a number of wetlands of the Maliba-Matšo, Motete and Motsoku Rivers were identified as being representative of the various wetland types at the head of the respective catchments.

A key consideration for the field assessment was access; only those wetlands which were reasonably accessible from the road and eight wetlands within walking or driving distance from the main tar road between Oxbow to Letseng-la-Terae were sampled.

A standardised data sheet was used for the recording of the wetland attributes. For each wetland sampled, the following attributes were recorded:

- the geographic location (latitude and longitude);
- altitude;
- approximate area;
- aspect;
- slope;
- topographic setting, modified from that established for the application of WETLAND USE (Kotze, Breen and Klugg, 1994);
- vegetation zones, and
- erosion extent and severity.

Data was also collected on the wetland soils. Sketch maps were made of all the sites sampled.

Plant species from the wetlands were identified on site and were collected for identification and reference at the National herbarium in Pretoria/ Moss herbarium at the University of the Witwatersrand.

3. results and discussion

3.1 fens and bogs

The majority of the wetlands sampled were classified as fens which meant that they had an accumulation of peat due to perennial waterlogged conditions and that they were open ended wetland systems that received some drainage from surrounding areas or streams. They were dominated by short sedge and grass species within a wet meadow habitat. The wet meadows were dominated by short mat-like peat forming plants. Hummocks were common in the wet meadows. Peat depths varied but were commonly about 1 to 2 m in most of the wetlands. Peat depths greater than 4.5 m did occur and typical peat domes were evident in most of the systems. Gravel beds within the peat were common.

It has been widely acknowledged by various authors that the wetlands of the mountains of Lesotho are unique (Van Zinderen Bakker, 1965; Bakéus 1988, Marneweck, 1996 and Marneweck and Grundling 1999). Marneweck and Grundling (1999) identified a number of habitat types in the high altitude (2750 m - 3250 m) wetlands in the catchment areas of the Bokong, Motete, Motsoku and Maliba-Matšo Rivers. An interesting observation from both this and the Mohale study (Marneweck, 1996) was that none of the investigated mires (39 field sampled wetlands from the two areas in Lesotho) can really be classified as bog. This is in contrast to the many literature reports of the occurrence of bogs in Lesotho (Van Zinderen Bakker, 1955; Jacot Guillarmod, 1962 & 1963; Schwabe,1995). There also does not seem to be any indication of a relationship between aspect and mire type as reported by Schwabe (1995).

3.2 vegetation

In the fens in particular, the most abundant habitat type was the short sedge meadow which often had extensive areas covered in hummocks. Open water pools were often associated with the short sedge meadows and these were dominated by floating leaved and submergent aquatic vegetation.

Mixed sedge/grass meadows were the next most abundant habitat type and these comprised a mixture of grass and taller sedge species. Tall sedge meadows also occurred in some of the fens. These were most often associated with open water pools, where they occurred on the edges in permanently saturated zones with some surface water. The least common habitat type were the moss beds, which were restricted to isolated zones within a few of the fens. They were associated with the short sedge meadows and often dominated by hummocks.

The hummock plant communities were variable and ranged from being dominated by marginal species such as *Crassula setulosa* var. *setulosa* to being covered by short sedge meadow species such as *Limosella longiflora*, *Eriocaulon dregei* var. *sanderanum*, *Athrixia fontana* and *Cotula paludosa*. In some areas, grass species such as *Poa binata* also occurred on hummocks while in others, the hummock communities could not be distinguished from the surrounding short sedge meadow.

A total of seventy three plant species and two algae species were collected from the fifteen wetlands sampled during the first field visit. Of these, one grass *Agrostis* sp., three forbs *Helichrysum* sp., *Myosotis* sp., and *Senecio* sp., and one algae *Nitella* sp. could not be identified beyond genus level. Two species remained unidentified.

A seventy sixth species of plant, the submergent *Potamogeton pusillus*, was collected from the Motete River where it was found growing in the shallow slow flowing areas of the channel near the confluence of the Motete and Majoe-Liqhobo Rivers. An additional 46 unidentified species were collected during the second field visit at 12 sites and are at present at the National Botanical Institute in Pretoria, South Africa, awaiting identification.

A list of the plant species collected from the wetlands which were investigated is given below:

Agrostis bergianna Trin. var. *laeviuscula* Stapf
Agrostis lachnantha Nees var. *lachnantha*
Agrostis subulifolia Stapf
Agrostis sp.
Alepidea ciliaris F. Delaroche
Anthoxanthum ecklonii (Nees ex Trin.) Stapf
Athrixia fontana MacOwan
Bromus catharticus Vahl
Bryum alpinum Huds. ex With.
Carex cognata Kunth var. *drakensbergensis* (C.B. Clarke) Kük
Carex glomerabilis Krecz.
Carex subinflata Nelmes
Cineraria erodioides DC.
Colpodium drakensbergense Hedberg & I.Hedberg
Cotula paludosa Hilliard
Crassula setulosa Harv. var. *setulosa* forma *setulosa*
Deschampsia cespitosa (L.) P. Beauv
Eragrostis caesia Stapf
Eriocaulon dregei Hochst. var. *sonderianum* (Körn.). Oberm
Felicia drakensbergensis J.M. Wood & M.S. Evans
Festuca caprina Nees
Geranium multisectum N.E.Br.
Geum capense Thunb.
Haplocarpha nervosa (Thunb.) P. Beauv
Helichrysum cymosum (L.) D.Don subsp. *calvum* Hilliard
Helichrysum lineatum Bolus
Helichrysum trilineatum DC.
Helichrysum sp.
Helichrysum flanaganii Bolus
Helichrysum subglomeratum Less.
Hesperantha candida Baker
Isolepis angelica B.L.Burtt
Isolepis fluitans (L.) R.Br.
Isolepis setacea (L.) R.Br
Juncus dregeanus Kunth
Juncus exsertus Buchenau subsp. *lesuticus* B.L. Burtt
Juncus mollifolius Hilliard & B.L.Burtt
Kniphofia caulescens Bak.
Koeleria capensis (Steud.) Nees
Lagarosiphon muscoides Harv.
Limosella africana Glück
Limosella inflata Hilliard & B.L.Burtt
Limosella longiflora Kuntze
Limosella vesiculosa Hilliard & B.L.Burtt
Lobelia galpinii Schltr
Merxmuellera drakensbergensis (Schweick.) Conert
Merxmuellera stricta (Schard.)Conert
Myosotis sp.
Nitella sp.
Oxalis obliquifolia Steud. ex Rich
Pennisetum sphacelatum (Nees) T. Durand & Schinz
Pentaschistis galpinii (Stapf) McClean
Poa annua L.
Poa binata Nees
Polytrichastrum formosum (Hedw.) G.L. Sm.
Potamogeton pusillus L.
Potamogeton thunbergii Cham. & Schltdl.
Pseudognaphalium undulatum (L.) Hilliard & B.L. Burtt
Ranunculus meyeri Harv.
Ranunculus multifidus Forssk
Rhodohypoxis deflexa Hilliard & B.L. Burtt
Rumex crispus L.
Schoenoxiphium filiforme Kük.
Scirpus ficinioides Kunth
Sebaea marlothii Gilg
Senecio cristimontanus Hilliard
Senecio hypochoerideus DC.
Senecio polyodon DC. var. *subglaber* (Kuntze) Hilliard & B.L. Burtt
Senecio sp.
Senecio seminiveus J.M. Wood & M.S. Evans
Tolypella nidifica (O Müll) A. Braun
Trifolium burchellianum Ser.
Utricularia arenaria A.DC.
Utricularia livida E.Mey.

3.3 alluvial fans and associated mires

The interbedded gravel in the peat appears to be closely related to the alluvial fans which result from erosion of the Maluti mountain landscape, particularly on the steeper slopes. These fans deposit the eroded gravels onto the wetland surface and with time these gravels become incorporated into the peat layer as part of the accumulation process.

All of the fens sampled contained layers of fine to medium fine grained peat. These layers of peat are excellent in storing water but act much like clay in terms of not releasing the water. In contrast, the gravel layers and more fibrous peat layers tend to act more like conduits allowing the water to be released more easily. In combination then, the gravels and fibrous peat allow water to be transported down stream, while the finer grained peat and clay layers retain the water for longer periods. This would appear to be key in the retention, storage and slow release of water from the catchments and key in terms of the maintenance of baseflows in the streams. The loss of the peat and degradation of the fen structure due to various impacts may therefore have serious consequences for flow in the streams.

It is also important to consider that peat accumulation rates are slow (0.25 mm/ year) in southern Africa. The still active Mfabeni peatland in KwaZulu Natal for example, accumulated peat at 0.23 mm/year during the late Pleistocene and at 0.43 mm/year during the Holocene (Grundling, *et al*, 1998). Accumulation rates for some Highveld mires range from 0.18 mm/year (Rietvlei near Pretoria) to 0.78 mm/year for Aliwal North (Pajunen, 1996) (Table 1).

The peat ages and accumulation rates for most of the southern Africa mires are of the same order of magnitude. However it would appear that the Lesotho mires are the only peatlands which thus far have been shown to be associated with alluvial fans. This study appears to be the first to make this observation and the association of peat and gravel beds (alluvial fans) is fairly unique when compared to other southern African mires.

Table 1: Peat age, accumulation rates and thickness increments for a few selected southern African mires.

Mire	Age (C^{14} years B.P.)	Accumulation Rate (mm/year)	Thickness (m)	Source
Maluti Mts. Lesotho	8020	0.25	2	Van Zinderen Bakker and Wergner, 1974
Aliwal North	4320	0.78	3.4	Coetzee, 1967
Rietvlei	7130 / 1290	0.18	1.3 / 0.23	Scott and Vogel, 1983
Wonderkrater	14180	0.33	4.7	Scott, 1982
Mfabeni	43000 / 5290	0.23 / 0.43	9.9 / 2.5	Grundling, *et al.*, 1998

3.4 water storage capacity and water storage loss of the mires

The studied wetlands (first visit) had an average surface area of 6.12 ha (minimum 0.08 ha; maximum 33 ha), an average maximum peat thickness of 1.5 m (minimum 0.3 m; maximum 4.3 m), and a total inferred current water storage capability of 522 470 m^3. The total inferred potential water storage may have been 36 % more at 817 845 m^3.

Individual fens stored on average 34 831 m^3 (minimum 45 m^3 ; maximum 228 000 m^3) of water. Their potential water storage before degradation was on average 54 523 m^3 (minimum 300 m^3 ; maximum 285 000 m^3). Water storage losses were in certain cases as high as 85 %, with only a few of the fens still in relatively good condition. The average water loss as a result of degradation was 36 %.

3.5 impacts

Many of the wetlands have been degraded by anthropogenic impacts, ranging from agricultural practices (mainly livestock) to infrastructure development. The loss in wetland function still needs to be determined in full but key benefits such as storage, filtering, erosion control, carbon storage, base flow maintenance etc. have been limited severely at most study sites. The prospects for the successful halting of further degradation of many of these systems will depend on the development and implementation of a long-term rehabilitation strategy. Urgent attention must be given to direct on-site measures for curbing further deterioration of the wetlands, especially by stormwater drainage from roads and overgrazing by livestock.

4. conclusion

The mires of Lesotho are unique and quite unlike any other studied by the authors in southern Africa or visited in the northern Hemisphere. Further studies on these relatively small but interesting mires are urgently required and it is quite clear that the dessication and erosion of these wetlands, and particularly the fens, in the study area, has had dramatic impact on their storage capability. It is likely that many of the other high altitude mires show a similar trend of degradation. Since all these wetlands occur at the head of the major feeder rivers into Katse Dam, there is cause for concern relating to the long-term supply of good quality water to the reservoir.

5. acknowledgements

The authors would like to thank Mr.Tau Mahlelebe from the Lesotho Highlands Development Authority (Environmental and Social Services Group) for his assistance and support with the preparations and field work during this study. We would also like to thank the Lesotho Highlands Development Authority as well as Afridev Consultants for the opportunity to undertake this study. The authors would also like to express their gratitude to our families whose support during our time away from home was much appreciated.

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IMCG Newsletter goes electronic

Starting 2001, we will try to distribute the IMCG Newsletter (also) electronically. There are of course several possible ways of distribution and every one is asked to indicate which way he or she prefers. If you do not have e-mail or web access, we will of course keep sending you a paper copy of the IMCG Newsletter.

One possible way of electronic distribution is to attach a file to an e-mail message. The size of the Newsletter file amounts to appr. 250 Kb as an MS Word97 file (zipped < 100 Kb) and to appr. 1 Mb as an RTF file (zipped < 150Kb). Zipped files can be self-extracting so no additional zip-programme is needed.

Another way of distribution would be to put the Newsletter on the IMCG Homepage, as a downloadable file or as a web version that can be browsed online. An e-mail message would then be send out whenever a new issue of the Newsletter becomes available on the Web.

We will also hold a questionaire by e-mail considering this issue, so please make sure that the secretariat (imcg@ibs.uel.ac.uk) has your correct e-mail address. We will try to come up with a solution that is satisfactory to everyone; all three questions below may therefore be answered with yes.

- Would you want to receive the IMCG Newsletter as an e-mail attachment? Please indicate the prefered file format (MS Word97 or MSWord 5.0, RTF, zipped, self-extracting zipfile,...)
- Would you want to download the IMCG Newsletter from the IMCG homepage?
- Would you want to browse the IMCG Newsletter on-line?

or:

- Would you rather NOT have an electronic version of the IMCG Newsletter and receive a paper copy?

At the end of this year, we will distribute the next issue of the IMCG Newsletter both as a paper copy and – as a test – also electronically. Those people who do not have e-mail or web access or cannot reached before the end of October should contact us with their wishes.

Hans Joosten & John Couwenberg

PALPEAT – the Palaeopeatlands Research Group

by Keith Barber

Everyone interested in the conservation of mires must be aware of the tremendous importance of the archive of the peat itself and the many proxy records that may be obtained from it. The stratigraphy of European peat bogs was one of the earliest forms of proxy climate record with pioneer research by Blytt, Sernander, Weber and Lewis in the late 1800s and early 1900s, and the recognition of features such as Recurrence Surfaces. Much of this early work is described in Godwin's classic *Archives of the peat bogs* (1981) and in the same year I reviewed the history of research up to the late 1970s in my book *Peat stratigraphy and climatic change.* Over the last 20 years the number of researchers has greatly increased and modern work stresses the adoption of a multi-proxy approach, involving the analyses of plant macrofossil, humification, pollen and non-pollen microfossils, and testate amoebae, with more extended analyses such as magnetic properties, tephra, and isotope geochemistry being possible. Some recent relevant publications by the Southampton group are given below.

PALPEAT is a new research group supported by the UK Quaternary Research Association. Our basic aims are to stimulate research on the origins, development, changing biodiversity and proxy-climate record of the peatlands of Europe and North America. We also aim to collaborate on the generation of standard methodologies for data collection and management; to set agreed taxonomic standards, and to develop protocols for access to any centrally held data.

The group will run in parallel with EUROPEAT (European Peatlands and Palaeoclimate Research), a project of the PAGES (Past Global Changes) / PEP III (Pole-Equator-Pole, African-Europe transect) programme. Like PALPEAT it has grown out of the research activities of several laboratories and the collaborative research of a number of workers, but EUROPEAT is intended to be a specifically European mid-latitude contribution to the goal of reconstructing the climate changes of the late Holocene.

Although both PALPEAT and EUROPEAT originated from the research group at the Palaeoecology Laboratory of the Geography Department, University of Southampton (PLUS) we do not look upon ourselves as directing these activities - we wish to act as facilitators for free collaboration and cooperation in promoting peatland research, and it is up to any group member to propose and guide activities. We have activated a discussion list using the UK Mailbase system, and reports of past activities (meetings at Southampton and Newcastle) and future plans will be publicised there – point your browser at:

http://www.mailbase.ac.uk/lists/palpeat/

and for further details of PEP III see:

http://www.geog.ucl.ac.uk/ecrc/pep3/regions/mid-europe.stm

You can join the mailbase list from the above website and you will be e-mailed whenever any member contacts the list. The next meeting is now fixed for 13th - 15th September 2000, at QMW, London. It will focus on fungal remains and is being organised by Jeff Blackford and Jim Innes - contact them at J.J.Blackford or J.B.Innes both at qmw.ac.uk. Proposals for further meetings are always welcome.

Any researcher wishing to join in the activities of EUROPEAT is most welcome to contact me. During the rest of 2000 we will be compiling information on what research is being undertaken and then we hope to set up a session at the PAGES conference to be held in Aix-en-Provence, 27-31 August 2001.

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Some relevant publications involving PLUS researchers:

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Burns Bog Ecosystem Review
Synthesis Report for Burns Bog, Fraser River Delta, South-western British Columbia, Canada. Environmental Assessment Office, Victoria, BC. (executive summary)

by Hebda, R.J., K. Gustavson, K. Golinski and A.M. Calder, 2000.

Burns Bog is a raised bog ecosystem covering approximately 3,000 ha of the Fraser River delta between the south arm of the Fraser River and Boundary Bay. On June 1, 1999, the Government of British Columbia and Delta Fraser Properties Partnership – the owners of 2,200 ha of land within the Bog - agreed to undertake an ecosystem review to gain a full understanding of what is needed to preserve the ecological integrity of Burns Bog. The purpose of the Burns Bog Ecosystem Review (the Review) was to determine the factors crucial to preserving Burns Bog as a viable ecosystem, such as the hydrology, geology, flora and fauna. The BC Environmental Assessment Office (EAO) was charged with managing the review process.

The public and stakeholders contributed to developing the nature and scope of the studies undertaken. Gregory McDade, Q.C., Advisor to the Minister of Environment, Lands and Parks, facilitated public involvement throughout the review process. The public participated in reviewing study progress, and in Technical Review Meetings involving local, regional and international scientific experts. All project materials were accessible through the EAO Project Registry, at local information outlets, and over the Internet. The key Review findings and conclusions were developed from the results of technical studies, written submissions, Technical Review Meetings, and additional information and models developed by the EAO.

The data and models available were generally adequate to lead to conclusions concerning the requirements for the ecological viability of Burns Bog. However, the data and analyses used in the Review were limited by the short duration of the study, a lack of previous investigations, and limited comparative data and examples.

Burns Bog is globally unique on the basis of its chemistry, form, flora and large size. The Bog exhibits the typical characteristics of a raised bog ecosystem, including a peat mound above the regional water table, an internal water mound, acidic nutrient-poor water derived directly from precipitation, a two-layered peat deposit, and widespread peatland communities dominated by *Sphagnum* and members of the Heather family.

Today, the Bog is largely isolated from other natural areas by agricultural, residential and industrial development. Forty percent of the original bog area has been alienated by development. Many activities, especially peat mining, have disturbed the hydrology and ecosystems of more than half of the remaining bog area and these disturbances continue to affect the Bog today. Despite these disturbances, Burns Bog retains important ecological processes and continues to support distinct biotic communities. The destruction of vegetation and the upper porous acrotelm layer, combined with the alteration of the hydrological and soil regimes, have impeded the peat-formation process.

The Bog's hydrology is shaped by the water mound, fluctuating water levels in the acrotelm zone (top 50 cm), and an extensive system of ditches. The Bog's ecological viability is directly dependent on the extent and integrity of the water mound and the peat that encloses it. The upper porous acrotelm layer is vital to the persistence of the water mound and peat-forming communities dominated by *Sphagnum* mosses. Only 29% of the Bog's original acrotelm and its dynamic water storage zone remain intact. Water from the east side of Highway 91 may play an important role in sustaining shallow pools that support the main water mound.

The acrotelm plays a vital role in regulating and storing water. As a result of increased rapid discharge through ditches, the average position of the water table in the acrotelm is about 25 cm lower than it was in the 1930s. Many ditches reach to the centre of the water mound from all directions and threaten the future of the Bog. None of the natural drainage channels and little of the essential lagg zone at the margins remain in the Bog. Further disruption of the water mound poses high risk to the viability of Burns Bog. The existing area of acrotelm must be maintained and a fully functional acrotelm must re-develop over the area of the water mound.

A fully functioning lagg is required at the margins of the water mound. The lagg receives normal discharge from the bog and buffers bog water from adjacent mineral water. The overall loss of water storage and associated decline in the water table in the past few decades have contributed to the advance of forested vegetation adjacent to the lagg zone.

The Bog's water balance suggests a surplus of about 200 mm of precipitation over evapotranspiration for an average year. Monthly water balance analysis for an average year shows that there is a moisture deficit from April to September. The relatively low late summer water table, in the range of 27-39 cm below the surface, may explain why Burns Bog is located

near the climatic limits for raised bogs on the west coast of North America.

Typical bog water occurs in much of the main part of the Bog. It has low pH and relatively low calcium concentrations. A relatively narrow zone of transitional water, confined to the peat mass, separates bog water from surrounding mineral-rich waters. Non-bog water with moderate pH and relatively high mineral concentrations occurs outside the zone of transitional water and appears to be constrained outside the peat mass. Typical bog ecosystems are associated primarily with true bog water, and associated, in part, with transitional water.

Originally, the Bog was covered in open heath and *Sphagnum* vegetation with scattered scrub pines. Today seven forest, nine shrubby and herbaceous, and six sparsely vegetated ecosystems occur. The unforested phases of the Lodgepole pine–*Sphagnum* ecosystem are likely responsible for most of the peat formation. Herbaceous ecosystems occur widely on abandoned peat workings and in some natural areas. Lodgepole pine and birch forests encircle the peat-forming central zone. Other forests, mostly dominated by western redcedar, occur mainly east of Highway 91. These forests include scattered old-growth trees and are considered to be regionally rare. Hardhack communities occur in the lagg zone at the Bog margins under influence of mineral-rich groundwater. The undisturbed peat-forming plant communities of the southern third and the north-west sector of the Bog are vital to its survival.

Various plant species, including cloudberry, bog-rosemary, crowberry and velvet-leaf blueberry, occur at the limits of their geographic range and are recognized as genetically and ecologically important. The Bog also supports at least 12 species of *Sphagnum*, which constitutes 86% of the regional *Sphagnum* flora.

The Burns Bog area includes several nationally and provincially listed animals in both the core central area and at the periphery. The Bog harbours the only known population of the red-listed Southern Red-backed Vole in the province, as well as the red-listed Pacific Water Shrew. It provides critical habitat for the regional Greater Sandhill Crane population. Rare dragonflies and water boatmen occur in the distinct wet habitats of the Bog. Areas at the Bog's periphery are especially important to rare species and wildlife diversity. The Bog plays an important regional role in ecological and wildlife diversity by providing habitat for Fraser River estuary waterfowl, and maintaining the largest extent of bog ecosystems in the Fraser Lowland.

The Bog area is highly sensitive to fire because only about 540 ha of fully functional peat-forming vegetation may survive the next 100 years under the current fire regime. The Bog is also at risk to a series of drought years that could markedly lower the position of the late summer water table and threaten typical bog communities. The Bog area must remain large to withstand these disturbances. Connectivity is limited, but is required to maintain wildlife corridors and the long-term viability of the Bog.

The conditions for recovery of Burns Bog ecosystems are favourable because there are many patches of bog vegetation in the disturbed area and a large natural zone surrounding the disturbed core. Widespread *Sphagnum* regeneration is occurring in the abandoned peat workings of the central bog.

To ensure the Bog's ecological integrity and viability, the entire extant water mound and most of the lagg zone are required. This requirement includes all of the west and central portions of the Bog. The area east of Highway 91 and north of 72nd Avenue is required to support high biodiversity attributes, to provide water to the main part of the Bog west of Highway 91, and to connect the Bog to upland habitats. The main water mound zone needs to be connected to the area east of Highway 91 via a broad zone of *Sphagnum* regeneration and typical bog water. Water in the shallow ponds within this zone supports the water mound. To sustain the water mound and peat-forming vegetation, ditches that drain the core of the Bog must be blocked as soon as possible or the Bog will not survive.

In summary, the area required to preserve Burns Bog as a viable ecosystem includes about 2,450 ha of the remaining bog. Approximately 360 ha, mostly in the south-east and north-east portions of the study area, have significant values that support the Bog, but that are not required to ensure ecological viability. Only 14 ha are of low or no value to ecological integrity. Further studies of hydrology and wildlife are required to define the ecological configuration of specific sites at the margins of the area required for viability. A program of ongoing monitoring of key indicators of ecological integrity should be established to ensure the viability of this globally unique ecosystem.

Information about the Review, including the final report, is available at online at:
http://www.eao.gov.bc.ca/special/burnsbog.htm.

Second Aquatic Warbler Conservation Team Expedition 2000 to Western Siberia
(22 May – 4 June 2000)

by Martin Flade

In search for breeding areas of the globally threatened Aquatic Warbler, our "big team" of 12 (5 Germans, 2 Polishs, 1 Byelorussian and 4 Russians) and a helicopter crew operated in the northern Omsk Oblast between Ishim River, Lake Tenis, Vengerovo, Tara and Tevris (Irtysh). A small team operated separately in the Barabinskaya forest steppe at lake Chany and surrounding (Tsibulin/Steiof/Luetkenhaus).
Seven large fen mire tracts (area size 200–400 km² each) between the Irtysh and Ishim rivers were surveyed by helicopter. Four of these and an additional 4 mire tracts as well as the Lake Chany marshes were surveyed on the ground, totalling more than 2,500 km² of fen mires. Sunset and morning transect counts were performed over a total length of about 40 km. Thus it was possible to gather a good amount of data of bird communities of large remote fen mire tracts that are mostly inaccessible on the ground. The data, including description of vegetation and habitat structures, give a comprehensive impression of the recent situation of fen mires in the W-Siberian plain as well as of the breeding-bird communities, including globally threatened species and species at the edge of their range, e.g. *Pelecanus crispus, Aquila clanga, Porzana pusilla, Locustella luscinioides, Acrocephalus paludicola, Emberiza pallasi.*
The recent (1985-1995) drainage and destruction of two large mire tracts with more than 100 km² shows, that survey of fen mires and there conservation is urgently needed in the W-Siberian plain.
Most important results for single species have been:

Aquatic Warbler *Acrocephalus paludicola*
The first 2-3 singing males were found immediately, only 13 hours after landing in Omsk, near lake Busli, ca. 60 km S of Bolshiye Uki, constituing the first confirmed record of this species in W-Siberia since 18 years. Surprisingly, despite occurrence of vast areas of suitable habitat, only one other site was found with a singing male and (most likely) one female nearby (Boloto Jarovskoye, 60 km N of Lake Tenis).
Although surely not all Aquatic Warblers in the huge survey area were found, it is clear, that there are large areas of presumably suitable habitat, but only very few birds – we estimate between 5 and 50 males in total. The Omsk Oblast actually is situated at the easternmost edge of distribution range of the species. Most likely there are some more breeding populations in the Chelyabinsk and Tyumen regions, which are directly neighbouring to the west, but, according to the vegetation map, hold only much smaller habitat patches. Thus, there exists no large core population of some thousands of AW in W-Siberia, making the Polessye population (Belarus/ Ukraine/ Poland) the more important.
Also other Warbler species at the edge of their range in the survey area, for example Savi's Warbler (*Locustella luscinioides*) and Great Reed Warbler (*Acrocephalus arundinaceus*), showed large suitable habitats and only very few birds.
The range of AW probably has severely contracted during the past 30-40 years due to habitat destruction and fragmentation in European Russia and W-Siberia, and possibly also due to changes in the resting and wintering sites. According to records, 40 years ago AW might have reached the middle Ob river valley between Tomsk and Barnaul, which is 700 km further East (see review of AWCT 1999).

Dalmatian Pelican *Pelecanus crispus*
Following the request of Gerard Boere we counted the birds at lake Tenis, which holds the northernmost colony of this species, from helicopter. We counted (225-)250 Dalmatian Pelicans in total, out of which at least 50 were breeding (stayed on their nests). Additionally we recorded two White Pelicans *P. onocrotalus.* A serious threat to the Pelicans is obviously disturbance from boat, when local people take tourists directly to the Pelicans nests, flushing off all birds and thus make the eggs available to avian predators like gulls and corvids. A visitor management and education of local people is urgently needed.

Slender-billed Curlew *Numenius tenuirostris*
In contrast to our previous hopes it was not possible to detect Curlews or waders in general from helicopter in the fen mires, because structure and colour of spring vegetation make them invisible from helicopter, even when flying. The situation is quite different from short-grazed green floodplain meadows and pastures, where waders can be detected very well from the air. So we could only hope to find Sb Curlews by chance – but we did not. It has to be realised, that the whole remaining world population could breed in one single colony only. Regarding the huge area of possible habitats – in Omsk and Novosibirks Oblasts it can be more than 10,000 km² - and our poor knowledge about habitat choice of this species (quite different from Aquatic Warbler, see above), a systematic search for the species seems to be impossible at the moment. 50 observers would need more than 5 years to survey all suitable habitat areas in the W-Siberian plain. Probably the only realistic (but difficult enough) method for a systematic search would be to put radio transmitters on birds in the migration and wintering areas and search for them from helicopter or aeroplane in the

fen mire belt of W-Siberia. We will discuss this option more detailed in our final report.

Siberian Crane *Grus leucogeranus*
This species was not detected during our aerial surveys. The only known breeding place is situated north of our survey area near Tyumen, so that the probability of finding this species between Irtysh and Ishim was not very high. Since Whooper Swans (*Cygnus cygnus*) and Common Cranes (*Grus grus*) could be very well detected from helicopter we think that helicopter surveys are a suitable method to continue search for this species.

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Regional News

Biofuels and Peat in the EU

The European Commission (EC) recently discussed the issue of peat and biofuels. The issue was raised following a demand from CEN (Centre Européen de Normalisation) asking for a formal mandate from the EC for developing standards for biofuels.
The CEN is no European Union institution but is an independent organisation of industrial sectors in both EU Member States and other European countries. CEN aims to standardise norms for industrial products in Europe and can be compared with DIN in Germany, AFNO in France, or ISO at the international level. CEN works closely together with ISO and both organisations take over each others norms once they are approved. Such international normalisation is important in industrial negotiations and agreements and indirectly implies quality standards.
Finnish, Swedish and Irish delegates in CEN asked to enlarge the scope of its actions and to include peat in the normalisation process of biofuels.
In 2000, a meeting between the CEN and Directorates-General of the EC (DG-RTD, DG-TREN, and DG-ENV) took place. Peat was excluded from the CEN draft mandate, following the arguments below. Firstly, peat used for the production of energy is not a renewable (energy) resource within any reasonable economic time frame. Secondly, peat is still being formed under natural conditions, but both the total volume of peat and the extent of peatlands and mires currently decrease as a result of several sectors: forestry, agriculture, energy, etc. The total annual consumption and loss of peat in the EU occur at a greater speed than the annual accumulation of peat in the mires of the whole of Europe. Also on a global scale, the peat balance is negative. Additionally, the claim of the energy sector that present-day peat accumulation compensates for what is removed to produce energy, is clearly invalid for the EU. Furthermore, the claim is unfair: Why should peat accumulation only compensate for losses caused by peat combustion and not also for losses from peatland agriculture, peatland forestry, and for non-peat associated carbon emissions (traffic, industry etc.)? Peat may have similar physico-chemical properties to solid biofuels, the environmental effects of the use of peat are, however, completely different from those of the use of solid biofuels. Finally, peat is a natural resource and can not or should not be ‘standardised’ as solid biofuel. Biofuels are waste products from specific economic sectors (forestry, agro-food) and these economic sectors can control the composition and quality of the product. Peat on the other hand is a natural resource and there is thus no possibility to intervene, during the production process, in order to improve the quality or to steer (regulate) the market as in solid biofuels. Setting, as such, norms for ‘peat as an energy source’ by linking it with solid biofuels opens a back door to give peat a quality label it cannot and should not deserve.
The objective of the mandate is to encourage the development of renewable energy sources (RES) and to double their contribution over the next decade. Including peat in the mandate to CEN to standardise biofuels would further stimulate the production of peat as an energy source and this will certainly have a detrimental effect on the peat and peatland resources in Europe.

EC to take legal action against Ireland over Wild Birds Directive

Brussels, 6 January 2000
The European Commission has decided to make an application to the European Court of Justice against Ireland for non-respect of the European Union's Wild Birds Directive. The decision concerns the failure to curb sheep overgrazing, particularly in the west of Ireland.
The Wild Birds Directive (Council Directive 79/409/EEC on the conservation of wild birds) is the Community's oldest piece of nature conservation legislation, and one of the most important. It creates a comprehensive scheme of protection for the Community's wild bird species, covering the conservation of the most important bird habitats as well as controls on hunting and other forms of exploitation. It includes a requirement on Member States to classify a network of protected areas (known as special protection areas or SPAs) for the most threatened species; within SPAs, bird habitats must

be protected from deterioration. The Directive also requires habitat conservation measures outside of SPAs.

In the case of Ireland, the Commission has decided to make an application to the Court of Justice arising out of Ireland's failure to protect its largest SPA, the 26,000 hectare Owenduff-Nephin Beg Complex in County Mayo, from sheep overgrazing, as well as Ireland's failure to properly conserve in other areas the habitat of the Red Grouse *Lagopus lagopus hibernicus*, one of Ireland's most threatened breeding bird species. The Red Grouse is particularly dependant on heather, which is one of the plants worst affected by overgrazing. As regards the Owenduff-Nephin Beg Complex, evidence indicates that, in parts of it, overgrazing is so severe that it has led to serious erosion of the fragile peat soils. Apart from representing a threat to rare and endangered species such as the Greenland White-fronted Goose, *Anser albifrons flavirostris* and the Golden Plover, *Pluvialis apricaria*, this represents an unsustainable form of land-use, and a destruction of the outstanding natural assets of this region (where the Community has financially helped the establishment of a national park which should provide substantial tourism benefits).

In 1998, an important step was taken in the form of an across-the-board 30% destocking in overgrazed areas. However, other envisaged steps have not yet materialised. In particular, in 1998, the Commission and Ireland agreed a revised set of measures under Ireland's Rural Environment Protection Scheme (REPS) (which is supported by the Community's Agri-environment Regulation, 2078/92) in order to better address the problem of sheep overgrazing at national level, while helping at the same time to safeguard farmer incomes. This involved preparation of commonage plans setting out the necessary de-stocking.

In addition, the Commission has a contract with Ireland's National Parks and Wildlife Service which envisaged the preparation of habitat management plans for many of the areas affected by overgrazing by the end of March, 1999. Despite this, the Irish authorities have not delivered any habitat management plans for areas affected by overgrazing, including the Owenduff-Nephin Beg Complex, nor have they provided, by way of response to the Reasoned Opinion, details of the commonage plans and other measures which need to be put in place in the Complex.

Environment Commissioner Margot Wallstrom said: "If we are serious about the natural environment, we must be ready not only to identify areas of high natural value, but also to give proper protection to those areas. In the case of Ireland, the general need to tackle the devastating effects of sheep overgrazing seems to be accepted, and the Commission has agreed a financial package to help achieve this while safeguarding farmer incomes, but key actions to stabilise and redress the problem have still to be put into effect by the Irish authorities.

LIFE-NATURE: Financial support for Nature Conservation in Europe

by Geert Raeymaekers

The LIFE-Nature programme of the European Union has provided financial support for Nature conservation projects since 1984. This year, the third phase of the programme (2000-2005) has been approved. For 2000, applications for support must be submitted via the national authorities to the European Commission before 31 October 2000. Therefore, each participating country has set a date for submitting applications to the relevant national authorities.

LIFE-Nature support is available to Non-Governmental Organisations and Public Bodies of the 15 EU Member States and the following candidate countries: Estonia, Latvia, Hungary, Romania and Slovenia.

Before preparing a proposal, download the "Natura 2000 information file" from the web, providing background information on LIFE-Nature, the Application Forms, the LIFE-III Regulation, the administrative provisions of LIFE-Nature, and the addresses of the competent authorities and of the external teams of the European Commission's Directorate-General Environment.

Website of the DG-Environment of the European Commission:
http://europa.eu.int/comm/environment/nature/home.htm

New and recent Journals/Newsletters/Books/Reports

Gorke, M., 1999. Artensterben. Von der ökologischen Theorie zum Eigenwert der Natur. Klett-Cotta, Stuttgart, 376 p.

Recent calculations indicate that 25 - 50% of all present-day species will go extinct within the next 100 years. Very few studies have dealt systematically with the ethical significance of this global ecological crisis. The book „Artensterben“ of biologist and philosopher Martin Gorke fills many of the existing gaps.

The book starts with disposing of some misunderstandings with respect to ecology.

Some people (technological optimists) expect that the science of ecology will eventually provide sufficient understanding of ecological processes and relationships to enable an effective control of ecosystems and natural resources. Gorke argues that this belief is overly optimistic, because it disregards the fundamental limitations to ecological knowledge: the enormous complexity of ecosystems, the unpredictability of their dynamics due to chaos and contingency, their uniqueness which precludes far-reaching generalizations, and the limited possibilities of quantifying their qualities.

Others (incl. many conservationists!) think that norms for the "right" behaviour can directly be derived from ecological knowledge („nature knows best“). Gorke also contests this approach, not only by pointing that this is a *naturalistic fallacy* but also by showing that the associated concepts (ecological balance, ecological stability, ecological health, economy of nature etc.) are defectively defined, scientifically wrong, or misleading.

This, however, does not make ecological knowledge irrelevant. Ecology shows the necessity of taking possible side effects into consideration and of being aware of the fundamental limits to designing and planning. Furthermore, ecology reveals the basic principles that have been successful in biological evolution, including “error-friendlyness“, diversity, and self-organization. These principles may also constitute valuable guidelines for cultural evolution.

After having shown that the problems cannot be solved by scientific and technological progress and that nature does not provide ready-made prescriptions, the ethical dimensions of species extinction are examined. Should we protect nature and species simply because of their utility to us and to future generations? Or do they possess some kind of intrinsic value which obliges us to protect them for their own sake?

A detailed analysis shows that anthropocentric ethics fails to provide convincing justification for comprehensive species protection. Momentary utility can readily revert to the opposite by changing circumstances or by replacement with a product of technology. In terms of utility, it is irrational to defer some real and known benefit in favor of a theoretically possible but still unknown use of certain species („a bird in the hand is worth two in the bush“). Contrary to what ecologists thought in the 1970s, ecological theory no longer recognizes general functional utility for all species. Species diversity is no longer regarded as a guarantee for stability. Most ecologists even think that many species, especially rare ones, are probably "useless" for ecosystem functioning. Also the aesthetic arguments are very weak. According to recent estimates more than 95% of all species on Earth are arthropods, mostly insects, i.e. not the most popular group of species. For many groups of insects only a limited number of specialists is capable of recognizing and defining individual species. A large portion of humanity would barely notice when species numbers would be reduced from 30 million to 5 million.

Gorke furthermore points out that utilitarian arguments are even counterproductive: Reducing the value of nature to satisfying human needs tends to augment and justify the excessive utilitarian thinking that brought about the ecological crisis in the first place. Many nature conservationists feel themselves insincere when using utilitarian arguments. It may eventually undermine the very feeling of responsibility that led them to become active in nature conservancy in the first place.

In the last part of the book, Gorke analyses the holistic position. Any position in ethics is and must be founded on a worldview of certain basic, empirically derived assumptions. Holism rests upon our knowledge about the position of human beings in the universe. Astronomy, evolutionary biology, and ecology show that humanity is neither the pivot point nor the final end of the world. Nature, including inanimate nature, does not exist just for humans. If humanity can no longer be seen as the center of the world, also ethical anthropocentrism must be questioned: ethics can no longer be regarded *a priori* as something that is restricted to relationships between humans.

While the intrinsic value of nonhuman entities is usually demonstrated by selecting a particular „decisive“ quality (e.g. the condition of having consciousness or of being alive), Gorke departs from a fundamentally different point. At the fundaments of morality, we are forced to make an "original decision" between two basic options: "egoism" and "a moral (i.e. non-egoist) standpoint." If one opts for the latter, any selection of entities (not) worthy of moral consideration is an act of egoism, because *I* determine whom I will respect, when and under what circumstances. If having a moral standpoint is taken seriously, this kind of power play is not acceptable. The alternative to egoism can only be to extend moral consideration to *all others*. This is exactly the standpoint of holism.

Advocates of more restricted concepts of morality will object that it is by no means egoism to exclude certain entities of nature from the moral community but simply a rational and objective assessment of circumstances. Following Gorke’s analysis of the concept of morality, however, they carry the burden of proof. *They* must convincingly demonstrate that the lack of certain qualities makes exclusion necessary. In a detailed

discussion of the arguments of anthropocentrism, pathocentrism, and biocentrism Gorke shows that this has not been achieved. Whereever a logical relationship between moral considerability and some empirical quality has been claimed, a naturalistic fallacy is always involved. And whereever the claim is based solely on plausibility, the evidence appears to be purely arbitrary. A holistic position appears to be the only logical conclusion.

„Logical maybe, but not practical" is the first objection that comes in mind. In the final chapters of the book, the practical consequences of a holistic position are surveyed. The differences with a (non-egoistic) anthropocentric position appear not so much to be in the fundamentally different *types* of conflicts, but rather in the much larger *number* of conflicts to which an holistic ethic leads. With respect to species protection, holism means permitting nature to develop independently, allowing it to unfold autonomous dynamics whereever possible, and intervening for management purposes only in cases in which the diversity of species is endangered at a large geographical level. Regarding the way humans have to deal with nature in general, Gorke advocates with Albert Schweitzer that harming nature always involves a smaller or larger quantity of *guilt*, depending on how necessary the intervention is. This means that for evaluating environmental conflicts, an ethical „black/white" approach (allowed/forbidden) should be replaced by a graduated concept (the less harm the better).

In the final chapter of his work, Gorke presents a first reconnaissance to make his approach operational in daily practise by adapting the (originally biocentric) principles of Paul Taylor's *Respect for Nature*.

„Artensterben" is a convincing book, that should be read by everybody who deals with nature (who doesn't?). It impressed me similarly as Peter Singer's *Animal Liberation*. It only has three drawbacks:

- it is written in a ticking-off way: other positions are successively criticized before the central point is made, giving sometimes the impression of - what Germans call - „Hineininterpretation", i.e. a selective use of arguments,
- it is sometimes (but much less than most ethics papers I know) written in the unnecessary abundant style of philosophers who too often write what they are going to discuss, instead of just immediately doing it, and who too often state, that it is their opinion, conviction, interpretation, intuition or whatever, as if the reader would expect something else,
- the book is written in German, which will hamper the desirable international distribution.

An english translation with some small revisions would be highly applaudable.

Hans Joosten 150600

Lode, E. 1999. Wetland restoration: a survey of options for restoring peatlands. *Studia Forestalia Suecica 205.* 30pp.

The aim of this paper is to show how cut-over peat fields can be returned to their former peat accumulating state. The paper discusses various aspects of wetland restoration such as objective, principles, functions, renaturation, topography, hydrophysical properties, and vegetational response. Three different approaches to hydrotechnical water storage are discussed, ditch-blocking, creation of bunds lagoons or ponds, and the creation of buffer zones. There is an additional glossary with four sections of specific terms relating to mires and their development, peat, hydrology and hydrological processes in mires, peatlands and peat, and peatland management.

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Fedotov, Yu. P. (1999) Bolota of the „Bryanskiy Les" Zapovednik and of the Nerusso-Desnyanskoe Poles'e (flora and vegetation). Bryansk, 106 pp. (in russian)

This report describes the flora and vegetation of the bolota (wetlands and mires) in the "Bryanskiy Les" Zapovednik and the surrounding Nerusso-Desnyanskoe Poles'e, which are situated in the nemoral forest zone in the European part of the Russian Federation in the basin of the river Desna (a tributary stream of the river Dnepr).

Besides information on climate, geology, relief, hydrology, and landscape the author gives an overview of the morphogenetic types of bolota found (7 different types) and detailed information about floristic composition and structure of the wetland and mire vegetation (taxonomical and geographical aspects, 4 main phyto-coenoses). Furthermore a classification of the vegetation into 22 associations of 5 classes is given, using the classical phyto-sociological method. Two associations (Climacio-Betuletum pubescentis and Sphagno fallacis-Eriophoretum vaginatum) are newly described. For all units information on morphologic, systematic, ecological, geographical, and nature conservation aspects is given.

Finally, an assesment of the present situation and protection of bolota in the region is described.

Fedotov, Yu. & P. O.I. Evstigneev (1997) Vascular plants of the „Bryanskiy Les" Zapovednik and of the Nerusso-Desnyanskoe Poles'e (commented species list). Bryansk, 78 pp. (in russian)

After a short introduction into the treated region and the history of botanical research the author gives a commented checklist to the vascular plants of the region. For 870 species their geographical area, habitat preference, frequency of occurrence, and correlation to vegetation types are shortly described.

T.V. Egorova (1999): The sedges (Carex L.) of Russia and adjacent states (within the limits of the former USSR). St.-Petersburg: St. Petersburg Chemical-Pharmaceutical Academy; Saint-Louis: Missouri Botanical Garden Press. 772 pp. (in russian and english)

A completely new review of the genus Carex on the territory of the former USSR. The book gives an introduction to the history of taxonomical studies of the genus Carex L., their morphological, anatomical and biological features, and describes the geographical regions, relevant for the distribution of the 382 species and subspecies. The main part contains both a key to the different sections of the genus Carex (at least 69) as well as for each separate section. Information is given for each species about nomenclature and synonyms, geographical distribution, subspecies, and habitat preferences. For many (but not all) species detailed drawings, helpful for identification are given.
Additionally, the author gives information about geographical distribution and main ecological peculiarities of sedges in general and some notes to the evolution of the genus Carex L. In the appendix there is a table with chromosome numbers of each sedge species and a bibliography list of 930 references on the subject.

Kink, H. Andresmaa, E. and Orru, M. (1998) Eesti Soode Hüdrogeoökoloogia. Teaduste Akadeemia Kirjastus, Tallinn.

This review of hydroecological aspects of Estonian mires is written in Estonian and has a three page English summary. It covers various sites and various aspects of mire geology with examples of bedrock stratification and discusses resulting hydrological processes. Paludification processes are analysed along with water regime studies in particular of a spring mire in Viidumäe. The chemical composition of peat (pollutants, ash, mineral, ...) of different mire types is illustrated. A large section of the booklet is devoted to heavy metal analysis of peats taken from different depths. Analyses of hydrological conditions are presented from uplands, valleys, plateau's, and lowlands.

Meiner, A. (ed). (1999) Land Cover of Estonia, Implementation of CORINE Land Cover Project in Estonia. EEIC, Tallinn.

This publication gives an overview of CORINE (Co-ordination of information on the environment) land cover project in Estonia implemented in 1996-1998. The book project was prompted by increasing environmental problems and the need for a comprehensive inventory of Estonian land cover and is written in Estonian and English. The standard CORINE land cover nomenclature specifies 44 land cover classes, of which 32 types were identified in Estonia. The data presented includes working processes, fieldwork, methods of classification, interpretation, digitising of land cover, and completion of the database. A definition of land cover is given along with a description of thematic mapping, and outlines of satellite information and image processing. The maps include land cover classes such as artificial surfaces, construction sites, various types of agricultural and forest areas, moor and heathland, wetland, peatbog, and water bodies to name a few.

UPCOMING EVENTS

Global Wetlands at the Millennium

6 August 2000 - 12 August 2000, Quebec, Canada
Contact: Millennium Wetland Event Secretariat, Ms Elizabeth MacKay, bureau 620, 2875 Blvd. Laurier Ste-Foy, Quebec, Canada G1V 2M2. Tel.: +1-(418)-657-3853, fax: +1-(418)-657-7934
E-mail: qcvb@cqvb.qc.ca
http://www.cqvb.qc.ca/wetland2000/

Workshop "Biodiversity and dynamics of ecosystems in the North Eurasia"

21 August 2000 - 23 August 2000, Novosibirsk, Russia
Contact: Russian Academy of Sciences, Novosibirsk Akademgorodok, Russia
E-mail: kol@bionet.nsc.ru

Society for Ecological Restoration Conference: Lessons from the past Directions for the future

4 September 2000 -7 September 2000, Liverpool, United Kingdom
Contact: Conference secretariat at SER 2000, PO BOX 17, Newton le Willows, Merseyside WA3 2FQ, United Kingdom,
E-mail: ser2000@netcomuk.co.uk
http://www.ser.org

2nd International Symposium of the Pan-European Ecological Network (PEEN)

17 September 2000 - 19 September 2000, Rochefort, Belgium
Contact: Council of Europe Environment Conservation and Management Division, Palais de l'Europe Avenue de l'Europe, 67075 Strasbourg Cedex. Tel.: +33-3-88412253, Fax: +33-3-88413751
E-mail: environment@coe.int

2nd IUCN World Conservation Congress

04 October 2000 - 11 October 2000, Amman, Jordan
For more information contact your regional / country IUCN office.
E-mail: jth@iucn.org
http://www.iucn.org/amman/index.html

EXPO 2000 Humankind - Nature - Technology

1 June 2000 - 31 October 2000, Hannover, Germany
The key theme of the EXPO is "Humankind - Nature - Technology: A new world arising" and the EXPO is oriented towards the guiding principles of the Agenda 21. Various meetings on nature conservation and sustainable development take place at the EXPO 2000 and are listed throughout this calendar.
More information on EXPO 2000:
www.expo2000.de/home_40_e.html

If you know of anyone who would also like to receive the newsletter, of anyone who wonders why he or she is not receiving the newsletter anymore, of anyone who has moved and has since not received the newsletter, then let them please contact the secretariat with up-to-date address-information. Also if you have the slightest doubt the secretariat does not have your most up-to-date address, telephone- or fax-number, e-mail address, or anything else contact them.