



Bulletin

International association for landscape ecology

INTEGRATIVE PROGRESS IN LANDSCAPE ECOLOGY

Personal impressions and comments to the eight annual US-IALE symposium Oakridge march 1993 by Zev Naveh.

Having attended the second annual meeting of the US-IALE chapter and now, six years later the recent meeting, my impressions on recent developments in American landscape ecology were probably more striking than those experienced by regular participants and members of this largest chapter of our society. This meeting was sponsored by the Environmental Sciences Division of the prestigious Oakridge National Laboratory which has most probably the largest concentration of very active senior landscape ecological researchers in the USA. Working mostly as a close team, this group had a very significant influence on the development of what we are calling (Naveh & Lieberman, in press) "Quantitative Spatial Landscape Ecology". This group contributed also much to the scientific and social success of this meeting. This was especially true for Monica Turner, who served not only as the never-tiring local host and took well care of the organization and the excellent refreshments and lunches. As usual, she also presented a very fine paper on spatial heterogeneity and fire ecology in collaboration with Robert Gardner and William Hargrove from Oakridge and William Romme from Fort Lewis College, Colorado. My first favourable general impression was that of a very lively, pleasant and dynamic gathering which was distinguished by the great proportion of young and inquisitive scientists, presenting papers and posters with no lesser high quality than those of their seniors. The second, favourable impression was the great number of professional land managers, foresters, conservationists and restorationists taking active part and delivering mostly in collaboration with

research scientists more than half of the 73 lectures, which introduced a clear bias toward solving-oriented studies. Such close team work in which theoreticians, empiricists and professional land planner and managers combine forces to resolve down-to-earth problems should serve, in my opinion, as the most promising model for landscape ecological research, which will distinguish it from most other ecological disciplines. This will be especially the case if the team will include also specialists from the humanities and social sciences. (See my remarks below). The almost overwhelming variety of innovative approaches and methods offered, were a reflection of the dynamic nature and the progress made in quantitative spatial landscape ecology. This was achieved mainly by making clever use of recent advancements in remote sensing, computerized mapping and modelling techniques, and promising mathematical theories, such as fractal geometry, information theory, wavelet analysis, and others. In this meeting it became very apparent that many American landscape researchers (and not only landscape architects and planners!) are finally realizing that they are not dealing with so-called "disturbed natural ecosystems", but with human-used and modified semi-natural and cultural landscape which have been shaped in the past and are driven presently by a closely interwoven network of natural and cultural forces. At least a third of the lectures were devoted to problems of human land uses and to agricultural and urban landscapes. In some of these, integrative ecological and socio-economic models were applied, fulfilling thereby the plea expressed by Robert O'Neill from Oakridge in his

opening plenary lecture "to incorporate more socio-economic theory". But several central speakers went even farther in their attempts to broaden the narrow bio-ecological conceptual and methodological framework which has characterized up-to-now this American version of landscape ecology. Thus, Hal Salwasser from the University of Montana, made a strong point in his eloquent banquet address on the important and unique contribution by landscape ecology for blending peoples need with long-term land health by integration of biological, physical, social, and economic sciences in ecosystem management. Carol Franklin from Andropogon Associates, Philadelphia, showed in her very lucid plenary lecture how to realize a creative and holistic place-related integration of nature and man in landscape design, management and restoration projects. Along similar lines, Andrea Sessa and Jeff Lakey from Colorado State University demonstrated the importance of bridging landscape-ecological and human-ecological and anthropological aspects in the restoration of natural riverbeds and upland vegetation in Central Oregon. In another fine integrative plenary lecture, Ingrid Burke from Colorado State University, Ft. Collins, presented, what actually could be called an integrative Total human Ecosystem study of agricultural land use in the Central Plains. However, our message of a transdisciplinary conception of landscape ecology was delivered in a most explicit and original way by Benjamin Sherman, a young graduate student from the University of Wisconsin, Madison. His poster

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ECOSYSTEM CLASSIFICATION FOR ENVIRONMENTAL POLICY AND CONSERVATION

By Frans Klijn

On 17 and 18 December 1992, a workshop was held on ecosystems classification. The workshop was organised by the Centre of Environmental Science (CML) and the Rijksherbarium/ Hortus Botanicus (RHHB) of Leiden University. The workshop was endorsed by IALE and financially supported by WWF, RIVM, RIZA and the Leiden University Fund. It was held in Leiden, the Netherlands.

Seventeen invited scientists from 7 Northwest-European countries attended the workshop, all working on ecosystem classification from a landscape ecological viewpoint.

Ecosystems in hierarchical context

Extensive discussions were held on the precise object of classification, viz. ecosystems, and the precise object of mapping, viz. ecotopes or comparable land units.

Haber demonstrated the place of the ecosystem in a hierarchy of organizational levels, especially those of importance for the realm of ecology. This hierarchy contained the subsequent levels of organism, population, community, ecosystem, landscape, human society-environment system, ecosphere, earth.

Udo de Haes suggested that another axis could be distinguished, perpendicular to the organizational levels, viz. of spatial scale levels, which would be relevant for practical mapping. This implies that ecosystems can be distinguished from very small up to the earth as a whole, encompassing landscape and ecosphere. The organizational level would remain the same, viz. ecosystem. Below the ecosystem we would then find organisms and abiotic components, above the human-society-environment system.

Lenz pointed out the necessity to relate any organizational level to the ones above and below. This would then fit nicely, because ecosystems are made up

of biotic and abiotic components (soil, vegetation) while their functional significance can be understood fully only in relation to the society-environment system.

Ecotopes or an 'ecosystem's full topology'

The concept of ecotope was discussed as the location of a concrete ecosystem. Haber suggested to distinguish between an ecotope's essence and its 'contents' (in a structural/ functional meaning: "Wirkungsgefüge"). This raised discussion on the difference between physiotope (only abiotic) and ecotope. It was felt that, because an ecotope has an ecosystem as 'contents', it ought to differ from the physiotope. In general, a physiotope was expected to be larger, in fact determining the potential ecosystem.

Udo de Haes and Klijn argued the use of a series of different terms for different scale levels, using the word ecotope only for one spatio-temporal scale level at which vegetation is relatively stable and homogeneous, while for other scale levels ecozones, ecodistricts etc. could be used.

General aspects of classification

Then the topic of classification itself was discussed. In this context a number of dichotomies was revealed:

Firstly, Zonneveld distinguished between geographers who took to mapping and biologists who took to typology first. A second, closely connected division could be made between 'splitters' (everything is the same, unless you see a difference; often in mapping from aerial photographs) and 'lumpers' (everything is different, unless you cannot detect the difference; often in plant sociology, where each relevee is considered as unique).

Another dichotomy emerged from the presentations, viz. between those who

started with a theoretical framework for their classification and mapping, and those who put priority to the sampling of data, applying a relatively standard quantitative method to achieve a classification afterwards (e.g. TWINSPLAN or alike).

The first approach is connected with relatively strict guidelines to classifying and mapping, often top-down. The second approach, exemplified by Bunce, very much depends on the sampling which determines the outcome of in itself elegant quantitative methods. Bunce argued 'thinking when sampling', while others inclined to correcting for oversampling or undersampling afterwards. A 'wrong' sampling technique often results in unique types, especially in the hands of 'splitters'. In this context, Godron reminded of the pragmatism of Braun-Blanquet who always warned against such an unpractical tendency.

With respect to the relation between classification and environmental hazards - impact prediction - three different views were expressed:

- Lenz argued the need to follow a functional approach in the design of the classification. The processes (fluxes) between ecosystem components would be most differentiating.

- Udo de Haes preferred to start with the processes in order to define the most relevant scale level, the most relevant abiotic and biotic parameters and to carefully bare these in mind in selecting the different characteristics for the classification, although these should themselves be structural characteristics.

- Some others expected that an ecosystems classification would always be appropriate for application in environmental policy analyses, because ecosystems classification implies the classification of tangible 'wholes', covering 'everything'.

It was concluded that approaches 1 and 2 were complementary, especially after

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DEADLINES FOR THE BULLETIN in 1993: 15th September and 15th December.

having ascertained that the functional approach could be regarded a subdivision of main ecosystem types that were defined on the basis of structural characteristics such as "forest, dominated by *Picea abies* on footslope".

Requirements on classifications in relation to nature valuation

Nature valuation criteria in most cases remained implicit, even if three attendants addressed the monitoring question. It appeared that two groups of criteria were used most frequently:

- the surface area of ecosystems or landscape elements (e.g. Brandt)
- species diversity / rareness: national, regional, international (Groen/ Van der Meijden, Claessen/ Pakes, De Blust/ Paelinkx).

For monitoring the nature value, data were considered the main bottleneck by all attendants. Especially the recurrent mapping and sampling of ecosystems appeared a too time-consuming and costly activity. Two approaches to deal with this problem were presented:

- the use of floristic data as substitute for ecosystem maps (total coverage in grid);
- a monitoring network (not try to achieve total coverage, but sample)

It was felt that for nature valuation, data on biotic components were required because these are considered as the best expression of nature value, even at small mapping scales.

The papers presented are now being prepared to be part of a book, which will be published at the end of 1993.

Frans Klijn

The eight US-IALE symposium.....

(continued)

presented a transdisciplinary theoretical and methodological framework for ecological assessment, monitoring and management of complex landscapes, transcending both the conventional bio-ecological paradigms of landscape ecology and the traditional jurisdictional land boundaries. For this purpose he integrated contemporary theories in ecology, economics, history, geography and regional planning and applied advanced quantitative methods of multivariate analysis and neural networks. My only critical comment regards the program: Whereas the plenary sessions left, rightly, some time for questions and discussions, the remaining program was condensed into 8 short lectures of 15 minutes, mostly dealing with different subjects presented in two simultaneous morning and afternoon sessions. These did not allow any time for interaction and feedback. The great number of these short technical papers, presenting only facts and figures should have been complemented by a couple of joint sessions or symposia with longer lectures, devoted to the central theme. It would be also very worthwhile if in all future meetings of IALE we would allow more time for general reflection and contemplation on the state of art and the future directions of our science. Sometimes, such discussions, if well guided, recorded and edited for publication, could be

more valuable than short, technical papers which can be presented in a more efficient way in posters and published in journals. In concluding, this meeting has shown clearly, that our American colleges have not only made further advancement in their quantitative spatial methods and their practical application. They have made also an important step toward a broader transdisciplinary and holistic conception of landscape ecology. This reflects very well the generally emerging trend toward a gradual amalgamation and the convergence of the different versions of landscape ecology into a broader and chiefly problem-solving oriented global science, which was noticeable already at the Fourth World Congress in Ottawa, in 1992. On a more general note, it seems to me that we have made already good progress in landscape ecology research, but we are still lagging behind in the field of academic and professional teaching and training. As long as a considerable number of well recognized universities in the world, and especially in English talking countries are not offering full fledged courses in landscape ecology and full interdisciplinary graduate programs with landscape ecology and management as core courses, "we are not yet in business". This should become now, in my opinion, our greatest challenge.

Zev Naveh.

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IALE MEETINGS

**Announcement and Call for Papers:
Spatial and Temporal Models for Analysing Pattern and Process in Landscapes.**

Ninth Annual U.S. Landscape Ecology Symposium IALE. 23-26 March 1994. University of Arizona, Tucson, Arizona.

Landscape ecology focuses on the linkages between spatial and temporal patterns at broad scales and ecological and socio-economic processes. The symposium will examine the use of spatial and temporal models for analysing this interplay between pattern and process. The meeting will be hosted by the University of Arizona and held in adjacent conference facilities at the Doubletree Hotel. As in the past, the symposium will consist of 2 1/2 days of contributed papers and posters, several keynote addresses, several half-day field trips on Thursday afternoon, and several full-day field trips on Saturday.

Abstracts are invited for contributed papers and posters covering any aspect of landscape ecology. Posters will be displayed throughout the meeting and are highly encouraged as a means to minimise the number of concurrent oral presentation sessions. At the membership's request, oral presentations will be expanded to 20 minutes this year. This means that fewer oral presentations will be allowed (approximately 70). In addition, this year we will be giving award(s) for Best Students Paper(s). If you wish to be considered for this award, please identify yourself when you submit your abstract. Abstracts are requested in machine-readable form. The preferred method of submission is e-mail, but IBM WordPerfect, or ASCII are also acceptable. The abstract must be limited to 300 words and use the following format.:

Jordan, Michael 1) and Georg Bush 2), 1) University of Chicago, Chicago, IL 61800, and 2) University of Texas, Austin TX. The landscape ecology issues we face.

Now begin the text of the abstract...(300 words).

Any abstract not following the format will be rejected. Disks or

e-mail plus three hard copies of the abstracts should be sent by 22 November 1993 to Dr. Margaret M. Moore, Program Chair, School of Forestry, Box 15018, Northern Arizona University, Flagstaff, AZ 86011 (e-mail (Internet) mmm@alpine.for.nau.edu; fax: 602-523-1080; phone 602-523-7457)

For more information on the Ninth Annual Symposium contact the local host Dr. Guy McPherson, School of Renewable Natural Resources, 325 Biological Sciences East Building, University of Arizona, Tucson, AZ 85721. (Bitnet GRMAC@ARIZVMI; Fax: 602-621-8801; phone 602-621-5389); or the Program Chair mentioned above.

US-IALE Foreign Traveling Scholar Award

Each year US-IALE offers an award to a foreign participant attending the US symposium. The award is based on the quality of the abstract submitted to the meeting as well as the participant's need. Preference is given to participants from developing countries, particularly in the Americas. The award comes with a \$250 US cash prize to be applied toward travel to the symposium. It is the intention of US-IALE to give this award again this year. Last year the recipient was Nuri Trigo, from the Metropolitan University of Mexico. Her work involves national park protection in Mexico's central volcanic plateau. Because few people requested to be considered for this award last year, we urge that you identify yourself or another person as a deserving candidate for this award. The next US-IALE Symposium will be held 23-26 March 1994 in Tucson, AZ (see related symposium announcement) and abstracts must be submitted by 22 November 1993. To be eligible for the award, a candidate must send a copy of a submitted abstract with a request to be considered to: Jim Thorne, Chair, Foreign Traveling Scholar Award, Dept. of LARP, 210 South 34th Street, University of Pennsylvania, Philadelphia, PA 19104-6311 USA.

DIARY

Kiel, Germany 28 September - 2 October 1993

International Conference on the State of Art in Ecological Modelling. Contact: Sven Erik Jørgensen, Environmental Chemistry, Universitetsparken 2, 2100 København Ø, Denmark. Tel: +45 45 37 57 44.

Warsaw, Poland 6-9 October 1993

Landscape research and its application in environmental management.. Preparing meeting for IALE workgroup on Landscape system analysis in environmental management.. Contact: Andrzej Richling, Fac. of Geography and regional studies, 00-927 Warszawa, Krakowskie Ptzedmiescle 30. Tel: (022) 20 03 81

Utrecht, The Netherlands 11-14 October 1993

Ecological Engineering - a 4-day course Contact: University of Utrecht, Dept. of Plant Ecology and Evolutionary Biology, P.O.Box 800.84, 3508 TB Utrecht, Tel: +31 30 536700

Thessaloniki, Greece 4-6 November 1993

Satellite Technology and GIS for Mediterranean Forest Mapping and Fire Management - international Workshop. Contact: Michael A. Karteris, Lab. of Forest Management and Remote Sensing, Aristotelean University, P.O.Box 248, Thessaloniki 54006, Greece. Tel: +30 31 992542

Buenos Aires, Argentina 18-26 January 1994

The World Conservation Union General Assembly Contact: Richardo Bayón, IUCN, 28 rue de Mauverney, 1196 Gland, Switzerland. Tel: (4122) 9990115 Fax: 9990010

Manchester, England 20-26 August 1994

Ecological Progress to meet the Challenge of Environmental Change - VI INTECOL Congress of Ecology. Contact: The Secretary, The Manchester Conference Center, UMIST P.O.Box 88, Manchester, M60 1QD, UK

Prague, Czech Republic 22-26 August 1994

IGU Conference 1994: Environment and Quality of Life in Central Europe. Contact: IGU RC, Albertov 6, 128 43 Praha 2, Czech Republic Tel: +42 2 203608 Fax: +42 2 296025

Jerusalem, Israel 21-26 June 1995

6th International Conference on Preservation of Our World in the Wake of Change. Contact: Yosef Steinberger, Dept. of Life Sciences, Bar-Ilan University, Ramat-Gan 52900 Israel. Tel: (972-3) 5318571 Fax: (972-3) 771088