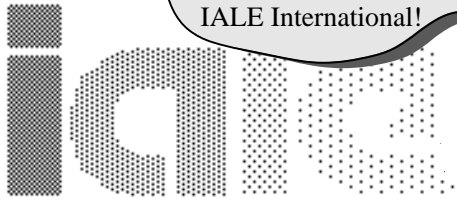


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Vol. 18 no. 6, December 2000



Bulletin

International Association for Landscape Ecology

SPECIES MATTER: BIODIVERSITY IN EDUCATION

by Petra Lindemann-Matthies

The vision

In view of the increasing reduction in biodiversity due to human activities it has been argued that people will only miss species if they know them and have developed a relationship with them. The crucial question is how people can be motivated to notice plants and animals and, consequently, become familiar with species and their diversity. A further question is how successful educational efforts are in fostering such a familiarity.

Children in primary schools are an important target group, because young children are particularly interested in plants and animals. Moreover, frequent contact with nature during childhood is a very important factor for the development of concern about nature and a commitment to nature conservation. Unfortunately, taxonomy and systematics as the basis for recognising and measuring biodiversity are currently unfashionable in academic biology. This attitude spills over into school curricula, and consequently children are given few opportunities to observe, study, and identify species. Recently, the biodiversity crisis has generated a renewed interest in organismic biology, and evoked demands for a greater emphasis on the study of organisms and their diversity in education. However, pupils should not be passive recipients of meaningless names and information. Biodiversity education should be an active process in which pupils observe and investigate plants and animals in their immediate environment, become intimate with local species, and finally understand and value biodiversity.

In the following I will present some results of a large study on children's cognition of biodiversity in Switzerland. The study included the evaluation of an educational programme called "Nature on the way to school".

Address of the author: Department of Environmental Sciences
University of Zürich, CH-8057 Zürich, Switzerland, E-mail:
petral@uwinst.unizh.ch

The educational programme "Nature on the way to school"

In 1995, the Swiss Nature conservation organisation 'Pro Natura' launched a new educational programme called 'Nature on the way to school' as an educational supplement mainly for primary schools. The main aims of the programme were the promotion of opportunities for children to experience nature at first-hand, the promotion of awareness of nature in children's everyday lives, and the promotion of interest in and tolerance of local wild plants and animals. During the programme, the children investigated organisms on their way to school, and, in a so called 'Nature Gallery', placed a picture frame around their favourite natural object and explained it to the general public.



The study

The programme presented an ideal opportunity to study the everyday-life perception of biodiversity by children. Teachers that had ordered the educational material for their classes were asked to participate in the study and received a set of questionnaires. Possible effects of the programme were evaluated using a pretest/posttest-design with a test group and a control group. The classes of the test group took part in the programme, whereas the classes of the con-

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trial group did not participate, but also filled in the questionnaires. In total, more than 6000 children from 359 classes participated in the study.

Important results

To investigate children's everyday-life perception of biodiversity, the children were asked to list the plants and animals they noticed on the way to school and to make an assessment of their abundance. On average, children could name 5 plant and 6 animal taxa. Unspecified taxa (e.g. 'trees', 'flowers') were among the most commonly listed by children of all age-groups, indicating a lack of training in taxonomy at school. Children most frequently noticed pets like cats and dogs, and garden plants like dandelion, daisies, and tulips. In residential areas these species are common and apparent. However, children's perception of organisms may also reflect their preference for particular species. When the children were asked to name the plant and the animal they thought to be most attractive, most of them listed garden and decorative plants, pets, and exotic animals. Only about a quarter of the children particularly appreciated one of the wild plants or wild animals of Switzerland. This may also be due to a lack of awareness of local organisms, because children could obviously only name organisms as their favourite whose names they knew. Although children listed more animal than plant taxa, they had the feeling that the abundance of plants was greater than that of animals. This is not surprising, because plants are sessile and very conspicuous, whereas animals are only occasionally to be seen. Another factor could be the tendency of children to equate animals with mammals. One child that had the impression that there were hardly any animals around, wrote in the questionnaire: 'because there are no cats and dogs on my way to school'. However, in view of the loss of biodiversity it is essential that children become intimate with local species and learn to distinguish different organisms. Children's general feeling that

there are many plants around might otherwise lead them to the misconception that there are also many species of plants around. Similarly, the absence of pets might be mistaken for a low animal diversity.

Participation in the educational programme significantly increased the number of plant and animal taxa that children noticed on their way to school. During the programme the children not only increased their awareness of familiar species in the local environment, but also became intimate with wild plants and animals of Switzerland previously unknown to them. This is a pleasing result because the aim of the educational programme was to increase in particular children's perception of local species. The positive effects of the educational programme increased with the number of lessons taught, indicating that increased efforts of teachers were rewarded.

Participation in the programme also increased children's appreciation of local wild plants, in particular that of wildflowers. There was a positive relationship between children's perception and appreciation of species. The more wild plants and animals children noticed in their local environment, the more likely they were to especially appreciate one of these organisms. Moreover, the more additional wild plants the children noticed due to the programme, the higher was the increase in their appreciation of these species. This supports the hypothesis that people first have to know species before they can develop a relationship with them.

In conclusion, the educational programme 'Nature on the way to school' was successful. Children increased both the perception and appreciation of the local flora and fauna, and their awareness of diversity. It has been proposed that biodiversity education should start with organisms children can emphasise with readily. The current 'pet- and dandelion perception' of children could thus be a starting point for biodiversity education, but should be followed by multiple active experiences with the local diversity of wild plants and animals. Such an educational approach might lead to a better understanding of biodiversity and further its preservation in the long term.

The IALE Bulletin is distributed six times a year to the members of the IALE. The IALE - International Association for Landscape Ecology - was founded in 1982 to promote communication between scientists, planners and interdisciplinary scientific research. IALE Executive Committee: **President:** Richard J. Hobbs (CSIRO Wildlife and Ecology, Private Bag, P.O., Wembley WA 6014, Australia), tel +61 8 9333 6442 fax +61 8 9333 6444 email Richard.Hobbs@per.dwe.csiro.au; **Past President:** John A. Wiens (USA), email jaws@lamar.colostate.edu; **Vice Presidents:** Duning Xiao (China), email Indscp@iae.syb.ac.cn; Kathryn Freemark (Canada), email kathryn.freemark@ec.gc.ca; Margareta Ihse (Sweden), email ihse@natgeo.su.se; Francoise Burel (France), email francoise.burel@univ-rennes1.fr; **Secretary General:** Michael Moss (Faculty of Environmental Sciences, University of Guelph, Guelph, Ontario, N1G 2W1 Canada), tel +1 519 824-4120 ext.4800 fax +1 519 763-4686 email mmoss@uoguelph.ca; **Bulletin Editor and Deputy Secretary General:** Felix Kienast (Swiss Federal Institute of Forest, Snow and Landscape Research WSL, CH-8903 Birmensdorf, Switzerland), tel +41 1 739 23 66 fax +41 1 737 40 80 email felix.kienast@wsl.ch; **Treasurer:** Rob Jongman (WAVU, Department of Physical Planning and Rural Development), Gen. Foulkesweg 13, 6703 BJ Wageningen, The Netherlands, tel +31 317 483 713 fax +31 317 482 166 email R.H.G.Jongman@Alterra.wag-ur.nl

IALE on the Internet: IALE International: <http://www.crle.uoguelph.ca/iale/>

REPORT FROM THE TREASURER

by Rob Jongman, IALE Treasurer

The report from the treasurer is appearing late in the year 2000. This has been caused by personal and professional circumstances. The report for 1999 has been discussed and agreed in the meeting of the Executive Committee in Bangor (UK) September 6, 2000. The balance of 1999 shows an increasing income through membership payments. This is a good sign, because it means that the organisation is important to the members. We see an increasing activity of the regions throughout the world. The revival of the German chapter, as well as the the Australian, the Portuguese and the Swiss region are good examples. The finances of 1999 are positively influenced by the IALE Snowmass conference. Mailing fees have not been a major issue, because other parties still covered these expenses. Here we might realize further savings due to electronic mailing. The year 1999 closed with a positive balance. IALE as a world organisation is not rich, but is able to be active.

For the year 2000 the expectations are good: The balance will be positive. In 1999 it became clear that the Snowmass congress had more external funds than expected. The resulting positive balance will considerably influence the budget of IALE in the year 2000. In 2001 the new directory should be available for IALE members. An important challenge of the coming years is to promote IALE's interactive Web page and electronic communication.

Kluwer has announced that the subscription for Landscape Ecology has been raised from US\$60 in 2000 to US\$ 80 for regular members and US\$ 60 for student members in

2001 and 2002. Student members have to send a copy of their student card or a declaration from their University with the subscription. The corresponding changes are included in the membership form for 2001 that is included in the issue of the bulletin.

In 2001 the treasurer would like to get in touch with the Central and Eastern European regions and the Asian regions to develop their interaction with the world organisation both in activities and financial support.

The Directory 2000

It was planned to publish the new directory of IALE in 2000. However, many regions changed their executive committees, regional boards and membership lists and elections have been taken place in many regions. Due to these changes the treasurer has not yet received all information needed for a new directory. Since several regions have elections now, the treasurer has decided to postpone the publication until February 2001. We expect to receive the corresponding information by the end of January 2001.

Landscape-ecology.org and IALE.WS

Within the next months the new web page of IALE will be developed. IALE has claimed the names *Landscape Ecology.org* and *IALE.WS*. Other names such as *IALE.org* have already been claimed by completely different organisations or by regional IALE-organisations. *Landscape ecology.org/IALE.ws* will be the portal for "Landscape ecology world-wide" with links to all regional organisations. It can be used as a communication platform for working groups, congress funding possibilities and job-announcements. We hope to be ready by fall 2001.

Balance 1999	In	Out	Saldo
starting balance 1-1-1999	1.904,16		
fee individual members 1999	10.381,57		
fee individual members 2000	824,39		
fee individual members 2001			
fee regions	7.371,17		
Directory (reservation)		3.000,00-	
bulletin		2.204,55-	
travel		766,94-	
Promotion material		82,18-	
mailing		77,07-	
IALE Congress 1999	83.272,54	83.374,85-	
Landscape Ecology		3.876,13-	
general		1.491,71-	
banking and interest account		223,84-	
support fund		907,56-	
external income	459,00		
subtotal	103.753,83	96.004,83-	7.749,00
Subtotal			
Support fund/savings			
Starting capital 1-1-1999	3.785,09		
Interest	97,15		
Added funds 1999	907,56		
Subtotal	4.789,80		4.789,80
Total			12.538,80

Budget plan 2000	In	Out	Saldo
Starting balance 1-1-1999	7.749,00		
fee individual members 1999			
fee individual members 2000	10.000,00		
fee individual members 2001	1.000,00		
fee regions	10.000,00		
Directory		2.000,00-	
Bulletin		3.000,00-	
Travel		4.000,00-	
Promotion material		500,00-	
Mailing		5.000,00-	
IALE Congress 1999	20.000,00		
Landscape Ecology		5.000,00-	
General		1.500,00-	
Banking and interest account		500,00-	
Support fund		20.000,00-	
Web page IALE		3000,00-	
External income	1.000,00		
Subtotal	49.749,00	44.500,00-	5.249,00
Support Fund/Savings			25.000,00
Total			30.249,00

Balance 1999 and budget plan 2000 (currency: Euro)

MEETING REPORTS

Topics in Ecology: Structure and function in plants and ecosystems: An international symposium in honour of Ivan Impens was held in Antwerp on 21 October 2000. Ivan Impens retired from the University of Antwerp (UIA) on 1 October 2000 after an academic career of nearly 40 years. The symposium reflected a diversity of research fields related to plant and vegetation ecology. The scope ranged from single-leaf and plant ecophysiology, physical ecology, community ecology, to landscape and global ecology. Cross-cutting themes are forest productivity, atmospheric pollution, climate change, biodiversity and habitat fragmentation. The coupling of structure to function on different temporal and spatial scales was a leitmotiv. The philosophy of the symposium was to bring together former or present co-workers, friends and peers of Ivan Impens, who are all active in disciplines related to plant and vegetation ecology. The invited speakers reflected a spectrum of topics, scales, scientific backgrounds, and methodologies.

The papers presented at the symposium are included in the volume "Topics in ecology: structure and function in plants and ecosystems", together with a range of others contributed by scientists from Europe, Africa and the US. The papers deal with various aspects of ecology covering different hierarchical levels of organisation: leaf, plant, stand, ecosystem, landscape, region, and globe. An editorial board has peer reviewed and edited the 30 contributions, which are grouped in six sections: (1) Forest production ecology, (2) Patterns and processes from landscape to global scale, (3) Biodiversity and ecosystem function, (4) Impact of rising CO₂ concentration of vegetation, (5) Adaptation and response to the physical environment, and (6) Human disturbance upon ecosystems. Sixty-five authors from 12 countries contributed to the book.

Impressum: Topics in ecology: structure and function in plants and ecosystems, R. Ceulemans, J. Bogaert, G. Deckmyn and I. Nijs (eds.), University of Antwerp (UIA), Wilrijk, 327 pp., ISBN 90-5728-022-1. The volume can be ordered (US\$ 30, incl. mailing costs) from N. Calluy (nadine.calluy@ua.ac.be) or J. Bogaert (jan.bogaert@ua.ac.be).

written by: J. Bogaert (jan.bogaert@ua.ac.be)

Multifunctional Landscapes and the related Ph.D. Course, Roskilde/Holbæk, October 2000: The theme "Multifunctional Landscapes" was certainly intriguing and attractive when one considers the number of participants (296) and number of countries (35) represented. The organisers applied accordingly this theme in the time management of the event. It looks like the challenge was "how to integrate as much as different activities in a small time lapse and let synergy do the rest". This needs some experimentation as combining two sessions of plenary lectures, ten parallel sessions, poster sessions, six workshops, a landscape exhibition, pre-conference excursions, two meetings of the pan-European forum on landscape monitoring and a Ph.D. course in less than a week. Apparently, joint multifunctionality leads to intensive activities. It worked. Well prepared confer-

ence materials (including a multilingual cup), the most convenient accommodation at the Roskilde Hallerne and always efficient and helpful staff were keys to the success.

The Ph.D. Course started already on Saturday 14th October in the 'Submarine' field station in Holbæk and had as theme "Studying Multifunctional landscapes and Participating in Scientific Conferences". More than fifty students applied for it, only twenty were accepted, coming from all over the world. They trained themselves in making the 'perfect poster', 'the perfect paper' and 'perfect presentation', learning most from each other during long and intensively filled days. After the conference, a new question arose: was it a 'Perfect Conference'? Wrong question as perfection never can be achieved, but the effort to try was worthwhile. My personal feeling is that the integration of the Ph.D. course in the conference was at least for the students a successful experience.

Looking at the presentations and recalling many discussions during the conference, I think only a start was made in understanding and debating about multifunctional landscape and I have the feeling that the outcome is still rather confusing for many. Understanding each other's language and reasoning is an important issue and "life discussions" are probably more effective here than reading each other's publications. I am curious how the 'recommendations' will act upon how landscape researchers are thinking and debating, how landscape research, in particular in Europe, can become more focussed and implemented into management and policy. A lot happened during the conference and still will happen, as also 'multifunctional' forms of publishing are presented to the participants. We are dealing now with the future of landscape research as well.

written by: Marc Antrop (marc.antrop@rug.ac.be)

MEETINGS

September 5-8, 2001

The 10th Annual Meeting of the UK regional chapter of the International Association for Landscape Ecology (IALE-UK): Hedgerows of the World: their ecological functions in different landscapes. University of Birmingham, UK.

People from Britain feel that hedgerows are archetypically British. They are wrong! Other features which might come under a broader definition of hedgerows are widespread throughout the world. Thus fencerows in America, linear roadside vegetation in South Africa and *Vetiver* stabilisation hedgerows in Thailand might all have similar landscape functions (albeit at different scales) to European hedgerows.

This conference aims to bring together hedgerow researchers from around the World to share information and to consider whether there are aspects of more broadly defined hedgerows that might offer new insights into some ecological issues and, consequently, re-focus research effort. Sessions will include: the definition and character of hedgerows; their value to wildlife; and physical processes.

More information: Colin Barr (cjb@ceh.ac.uk). You may like to monitor the IALE-UK web site (www.iale.org.uk) for further details.