Proceedings
NCR-days 2006

Proceedings of the NCR-days held November 2 - 4, 2006
at the University of Twente, Enschede

D.C.M. Augustijn
A.G. van Os (eds.)

January 2007

Publication of the Netherlands Centre for River Studies
NCR publication 31-2007
ISSN 1568-234X
Building ‘De Horst’ at the University of Twente campus, venue of the NCR-days 2006.
Preface

Since 2000 the Netherlands Centre of River studies (NCR) organises the NCR-days, an open platform for people interested in scientific research on river issues. The NCR-days 2006 were successfully held on 2 and 3 November 2006 at the University of Twente in Enschede with an excursion to the IJssel on 4 November.

The NCR-days were opened by prof. dr. Rikus Eising, dean of the Faculty of Engineering Technology of the University of Twente, followed by a keynote speech of dr. Dieter Saha, project manager at the secretariat of the International Commission for the Protection of the Rhine (ICPR) in Koblenz. In his presentation he discussed the issues ICPR is dealing with and related this to the workshop themes.

This year was chosen to organise three workshops to cover a range of topics that would attract people from various disciplines as well as people from outside the NCR-partners. The first workshop, organised by Madelinde Winnubst of Radboud University Nijmegen, focused on public participation in river management. The second workshop, organised by Arjen Hoekstra of the University of Twente, generated discussion on flood protection and risk management. Ad Jeuken of RIZA organised the third workshop on the role of scientific knowledge in the European Water Framework Directive. Reports on the workshops can be found in these proceedings.

Besides the keynote and three workshops, the programme consisted of 28 posters and 13 oral presentations. In total 34 papers were submitted for publication in these proceedings and give a good impression of the ongoing research within NCR. Powerpoint slides of the oral presentations can be found on the NCR website (www.ncr-web.org). This website also contains some photos of the NCR-days and the excursion to the IJssel north of Deventer. Some of the photos are also included in these proceedings.

We would like to thank Anke Wigger and Joke Meijer, secretaries of the Department of Water Engineering and Management (WEM) at the University of Twente and Jolien Mans of the NCR secretariat for their tremendous efforts in organising the NCR-days 2006, and René Buijsrogge of the WEM-department for the technical assistance during the NCR-days. The financial support by the Netherlands Organisation for Scientific Research, Earth and Life Sciences (NWO/ALW) is also gratefully acknowledged.

We believe the NCR-days 2006 with over a 100 participants were a successful event that provided plenty of opportunity for young and senior scientists and practitioners of various universities and institutes to exchange knowledge, share experiences and discuss ideas. We hope these proceedings serve as a valuable memory of these days.

Denie Augustijn
Water Engineering and Management
University of Twente
P.O. Box 217
7500 AE Enschede

Ad van Os
Programming secretary NCR
Netherlands Centre for River studies
P.O. Box 177
2600 MH Delft
Contents

Preface ................................................................................................................................................ 1

Introduction ...................................................................................................................................... 4

Keynote

D.M. Saha
International cooperation in the field of water management within the international Commission for the Protection of the Rhine (IPCR) ................................................................. 6

Workshops

M. Winnubst
Workshop 1 Limits to participation: a retrospective ................................................................. 8

A.Y. Hoekstra
Workshop 2 Management of flood risk; from science to implementation ............................................. 10

A. Jeuken
Workshop 3 Obstacles for the implementation of the Water Framework Directive? An impression .... 12

Policy processes

M. van Tilburg
Knowledge transfer and utilisation in water system management: knowledge and perceptions in dailypactice ................................................................. 14

S. Hommes, H.S. Otter, J.P.M. Mulder, S.J.M.H. Hulscher
Getting grip on complex water issues? A case study: Rotterdam Mainport, Appropriate Assessment Wadden Sea ................................................................. 16

A.L. Gerritsen
The implementation processes of the European Framework Directive and Natura 2000 in the Netherlands ................................................................. 18

G.T. Raadgever, G. Becker
Perspectives on future flood management on the lower Rhine ................................................................. 20

Water quality and ecological aspects

A.J. van Bokhoven
The potential of climate change on the water quality of the Rhine River ............................................. 22

M.T.H. van Vliet, J.J.G. Zwolsman, H. Middelkoop
Effects of droughts and floods on the water quality and drinking water function of the river Meuse: a preview of climate change? ................................................................. 24

A. Domnisoru, B. de Jong
Effects of global warming on water quality of rivers ................................................................. 28

W.E. Penning, J. Icke, E.M. Meijers
2D modelling of large submerged macrophyte stands in shallow lakes; effects of seasonal growth and decay on hydromorphology and water quality ................................................................. 30

J.C. Rozemeijer, H.P. Broers, H. Passier, B. van der Griff
The influence of groundwater quality on surface water quality: case study Noord-Brabant (southern Netherlands) ................................................................. 34

Ecological quality of urban water systems in the large river district ................................................................. 36

Riverine habitat use of the Corncrake (Crex crex) in the Netherlands ................................................................. 38

A.F. van Loon, R. Dijkema, M.E.F. van Mensvoort
Hydrological classification in mangrove areas; a case study in Can Gio, Vietnam ................................................................. 40
Development and application of a GIS-based method for effect assessment of cyclic floodplain rejuvenation on landscape and biodiversity ................................................................. 42

S.J. Vreugdenhil, K. Kramer, T. Pelsma
How to select floodplain sections suitable for the regeneration of softwood and hardwood tree species? .................................................................................................................. 44

J.J. Warmink, M.W. Straatsma, H. Middelkoop
Novel field techniques for measuring hydrodynamic vegetation density .............................................. 48

M.T.B. van den Broek, M. Schoor, M.J. Baptist
Effect of softwood vegetation on groyne field morphology ................................................................... 50

L.V. van den Bosch, K. Gorski, L.M. de Bruijn, D. Zolotaryov, S.V. Yakovlev, H. Middelkoop
Changing flood pulse dynamics and their impact on fish recruitment in the Volga-Akhtuba floodplain (Russia) ........................................................................................................ 52

Geological and hydrological aspects

S. van Asselen, E. Stouthamer
Reconstruction of Holocene compaction rates and its effects on alluvial architecture .......................... 54

I.J. Bos, H.J.T. Weerts, H.J.A. Berendsen
The influence of lakes on fluvial systems in a deltaic setting: the Vecht Angstel as an example .......... 57

S. Poyck, G.H. de Roolj, R. Uijlenhoet, B. de Bièvre, W. Buylaert
Closing the waterbalance for a hillslope plot in the Ecuadorian páramo ............................................. 60

Flood protection

H.S.I. Vreugdenhil, L. Meijer, L. Hartnack, T. Rijken
FloodHouse: a new approach in reducing flood vulnerability .............................................................. 64

A.Y. Hoekstra, J.L. de Mrk
Adapting to climate change: the self-learning dike .............................................................................. 66

J. Harke, A.J.G. van der Maarel, R.M.J. Schielen, J.S. Ribberink
Building on piles in floodplains ............................................................................................................. 68

C. Redeker, B. Stalenberg
Urban flood protection strategies ......................................................................................................... 70

Modelling

F.L. Beaman, H.P. Morvan, N.G. Wright
Large Eddy Simulation for conveyance estimation .............................................................................. 72

S. Hopton, N.G. Wright
Introduction to SPH and potential uses in fluid modelling ................................................................. 74

S. van Vuren
Development of a 2D model for sustainable navigation channel improvement in the River Rhine ..... 76

D.F. Kroekenstoel, L.R. Wentholt, C. de Gooijer
FLIWAS, the flood information and warning system ......................................................................... 78

J.A.E.B. Janssen, R.M.J. Schielen
The mind in the model: capturing expert knowledge with the help of fuzzy logic ............................. 80

C.F. van der Mark, A. Blom, S.J.M.H. Hulscher
Irregularity of bedform dimensions ................................................................................................... 82

Author index ................................................................................................................................... 87

NCR Supervisory Board and NCR Programme Committee ......................................................... 88

NCR Publications series ................................................................................................................. 89
Riverine habitat use of the Corncrake (*Crex crex*) in the Netherlands

R.S.E.W. Leuven ¹, G. Atsma ², K. Koffijberg ², A.M. Schipper ¹

¹ Department of Environmental Science, Institute for Wetland and Water Research, Radboud University, P.O. Box 9010, 6500 GL Nijmegen, The Netherlands; r.leuven@science.ru.nl

² SOVON Dutch Centre for Field Ornithology, Rijksstraatweg 178, 6573 DG Beek-Ubbergen, The Netherlands; kees.koffijberg@sovon.nl

Abstract
The distribution of singing males of the Corncrake (*Crex crex*) in floodplains along Rhine River branches in the Netherlands over the period 2001-2005 indicates that preferred breeding habitat is located in production meadows, pastures and rich-structured herbaceous ecotopes. Frequently occupied floodplains are characterized by a diverse, heterogenic landscape with a limited number of ecotope types.

Introduction
The Corncrake *Crex crex* is a rail species (Fig. 1) that strongly relies on mosaic-like riverine landscapes for breeding (Fig. 2). Habitat destruction and deterioration have caused major population declines. The species is considered a ‘Near Threatened Species’ throughout the world and is included in Red Lists of most European countries. It is a species of European Conservation Concern. The Corncrake is a target species for nature conservation in river floodplains in the Netherlands. This paper describes the distribution and landscape-ecological characteristics of breeding habitat in floodplains along Rhine River branches in the Netherlands.

Methods
Breeding habitat was analysed by relating locations of singing males to riverine ecotopes and landscape composition of floodplains. Geographical coordinates of singing sites (n = 956) recorded during standardized annual field surveys (2001-2005) by SOVON volunteers were combined with a GIS map of river ecotopes. Records from the first and second simultaneous surveys (i.e. at the beginning and end of June) were analysed separately to determine possible temporal shifts in habitat preference. Landscape-ecological characteristics of floodplains with different occupation frequencies (0, 1, 2, 3 and ≥ 4 years; n = 40, 22, 13, 17 and 15, respectively) were calculated per floodplain and expressed as Shannon Diversity Index (SHDI) of ecotope patches, patch density and patch type density.

Figure 1. An adult Corncrake in herbaceous vegetation (Photo: A. van der Zijpp).

Figure 2. Typical breeding habitat of the Corncrake in the floodplain Ossewaarden along the river IJssel (Photo: J. Veldman).

Figure 3. Occupation frequencies of floodplains over the period 2001-2005.
Results and discussion

There is only a small number of floodplains where Corncrakes frequently settle (Fig. 3). These floodplains also support significantly higher densities of singing males than remaining ones (data not shown). Most singing sites are located in production meadows, pastures and rich-structured herbaceous ecotopes (Fig. 4).

Figure 4. Frequency distribution of singing sites in riverine ecotopes.

Preferred breeding habitat is characterized by relatively open but tall vegetation subject to mowing or natural rejuvenation regimes (e.g. by inundation). These provide suitable vegetation covers that do not become too dense to move through. During the breeding season, a shift occurs from agricultural to more naturally managed areas (Fig. 5), possibly due to disturbance of (production) grasslands by mowing and to improved habitat suitability of more natural sites as a result of drying and vegetation development.

Figure 5. Ecotope preference during two breeding periods (N: number of singing males; *: significant difference using Chi-square test at p < 0.05).

The occupation frequency is highest in floodplains characterized by a high SHDI (Fig. 6) and low patch type density (Fig. 7).

Figure 6. Shannon diversity index (Means and standard errors) for floodplains varying in occupation frequency (different letters indicate significant differences using Games-Howell test for unequal variance at p < 0.05).

Figure 7. Ecotope patch density and patch type density (means and standard errors) for floodplains varying in occupation frequency (different letters indicate significant differences using Games-Howell test for unequal variance at p < 0.05).

Conclusions

• The number of important corncrake floodplains is very limited.
• Distribution of singing males indicates that preferred breeding habitat is located in production meadows, pastures and rich-structured herbaceous ecotopes.
• Frequently occupied floodplains are characterized by a diverse, heterogenic landscape with a limited number of ecotope types.
• Early mowing of floodplain grasslands could be an important disturbance factor during the breeding season.
• Riverine breeding habitat should be treated with care when designing physical reconstruction and management plans for floodplains (e.g. Room for the rivers).