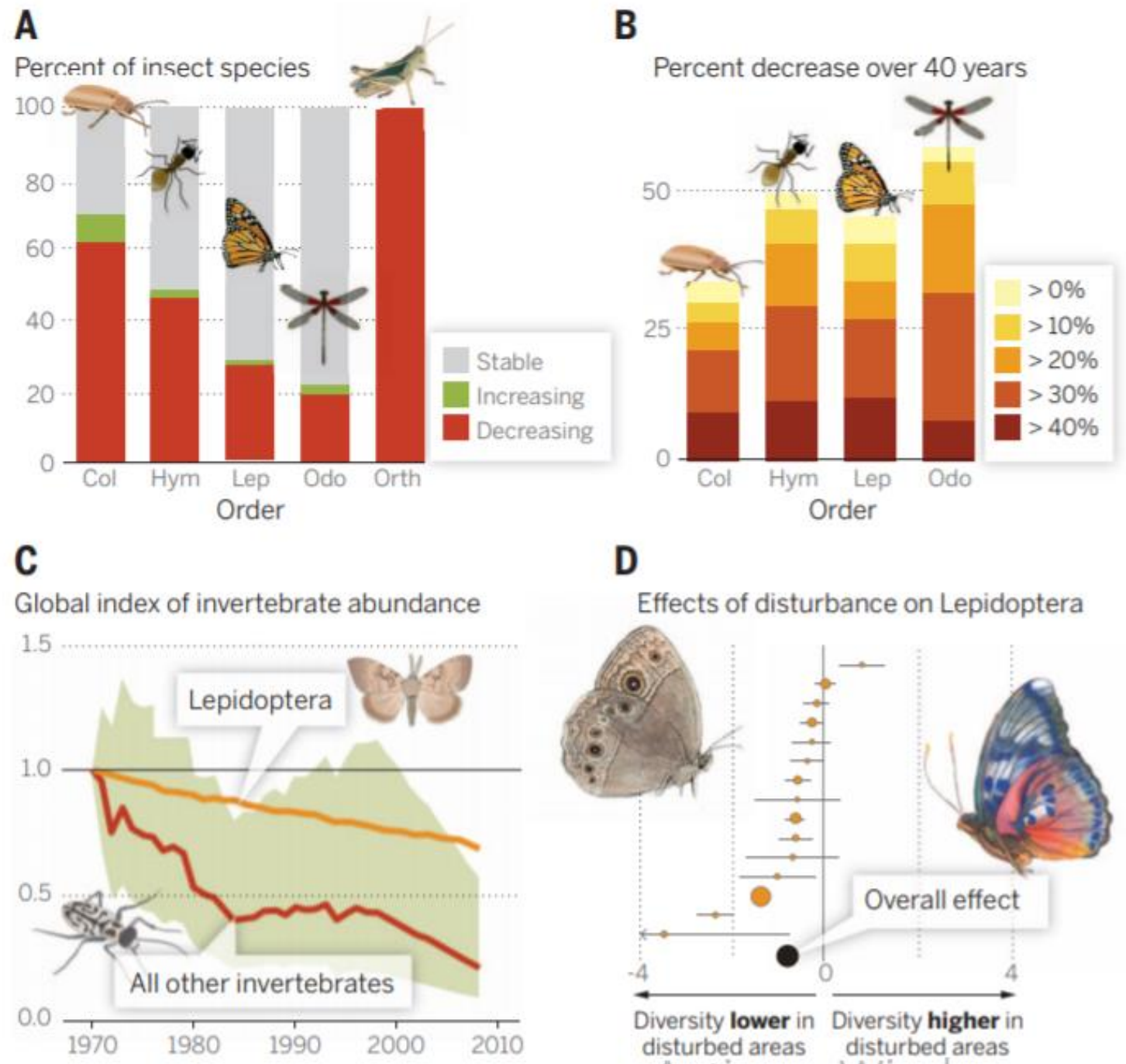




What does paludiculture contribute to arthropod diversity?

Gert-Jan van Duinen & Stef ten Dam

Fig. 1. Evidence of declines in invertebrate abundance. (A) Of all insects with IUCN-documented population trends, 33% are declining, with strong variation among orders (19). (B) Trends among UK insects (with colors indicating percent decrease over 40 years) show 30 to 60% of species per order have declining ranges (19). (C) Globally, a compiled index of all invertebrate population declines over the past 40 years shows an overall 45% decline, although decline for Lepidoptera is less severe than for other taxa (19). (D) A meta-analysis of effects of anthropogenic disturbance on Lepidoptera, the best-studied invertebrate taxon, shows considerable overall declines in diversity (19).



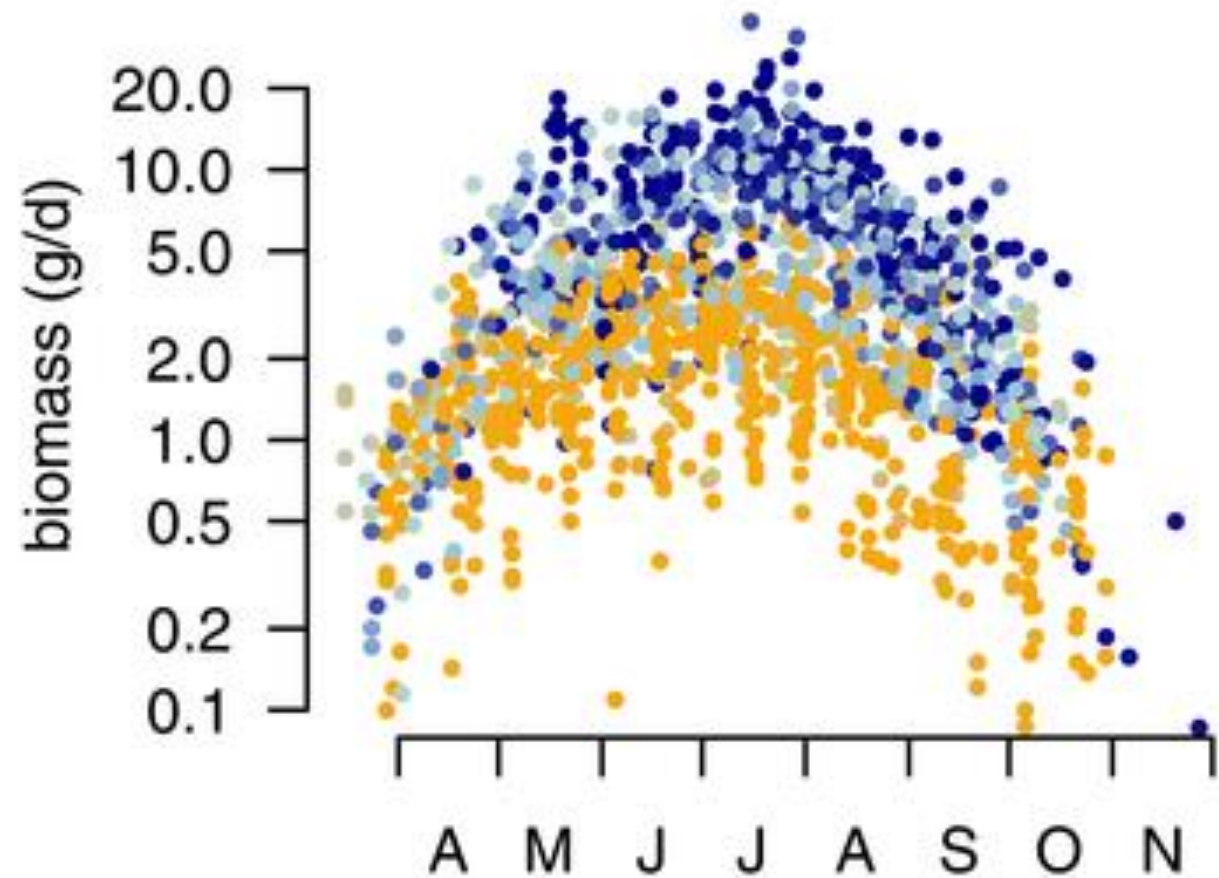
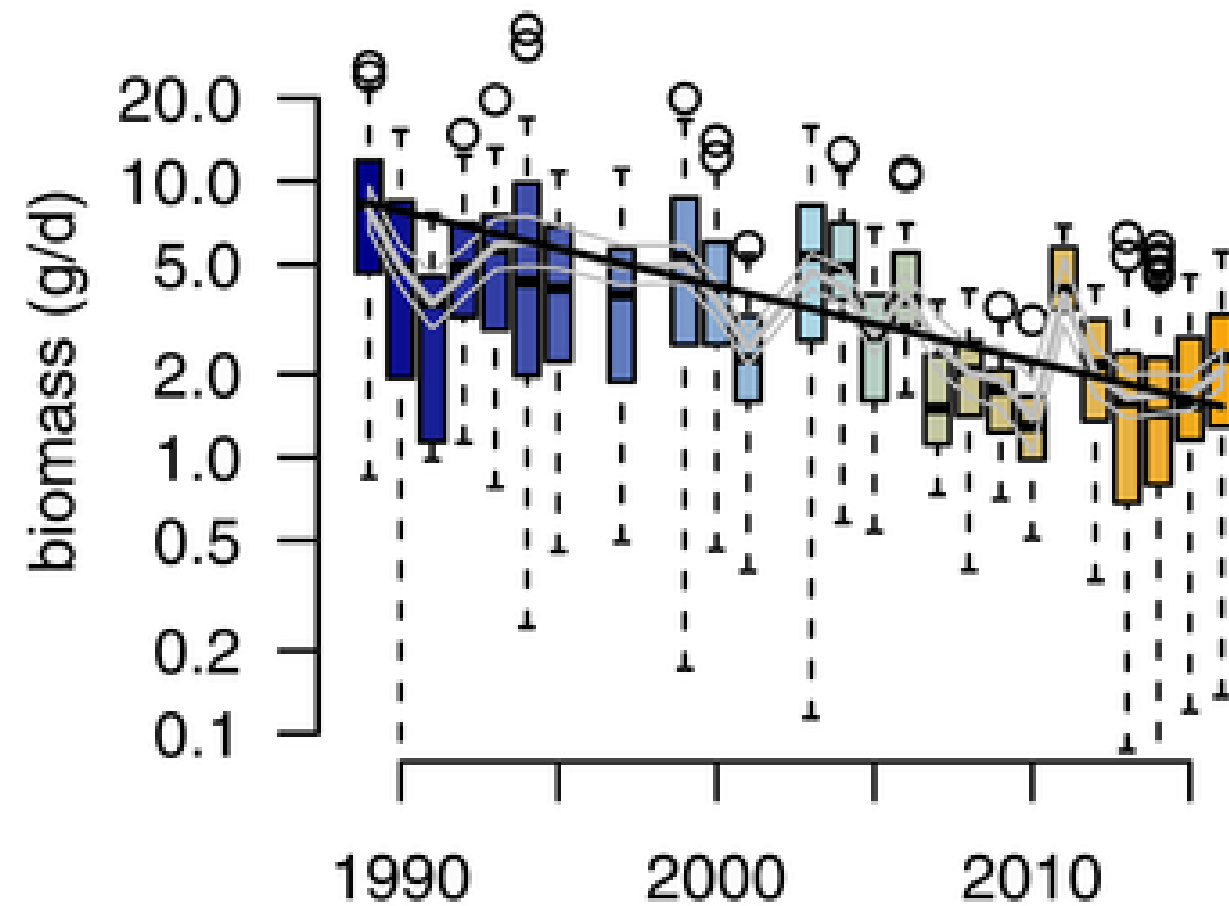
REVIEW

Defaunation in the Anthropocene

Rodolfo Dirzo,^{1*} Hillary S. Young,² Mauro Galetti,³ Gerardo Ceballos,⁴ Nick J. B. Isaac,⁵ Ben Collen⁶

More than 75 percent decline over 27 years in total flying insect biomass in protected areas

Caspar A. Hallmann^{1*}, Martin Sorg², Eelke Jongejans¹, Henk Siepel¹, Nick Hofland¹, Heinz Schwan², Werner Stenmans², Andreas Müller², Hubert Sumser², Thomas Hörrén², Dave Goulson³, Hans de Kroon¹



Food chain: Decline of insectivorous species



Drained peat soils → Subsidence → Greenhouse Gas Emission (CO_2 , N_2O)



Paludiculture: Pilot sites in NL



GREIFSWALD MOOR CENTRUM MOORWISSEN

INNOVATIE PROGRAMMA VEEN
 Omhoog met het Veen
 Toekomst voor boeren en natuur

Provincie Noord-Holland

LANDSCAP Noord-Holland

Paludi Culture
 cinderella

PEATCAP
 Natural capping of the Volgermeer by peat development

Veen Voer en Verder

Altenburg & Wymenga
 ECOLOGISCH ONDERZOEK

Stichting Bargerveen
 for ecosystem restoration

EDR
 Netwerk met toekomst
 Netwerk mit Zukunft

INTERREG Deutschland Nederland

Europäische Union
 Europese Unie

Radboud University
 VOETNOMINE-FELICITER




BETTER WETTER

van hall larenstein
 university of applied sciences

ELO
 European Landowners' Organisation

provincje fryslân
 provincie fryslân

LIT
 ACTIVE LEADERSHIP IN
 EDUCATION, ENTERPRISE
 AND ENGAGEMENT

natuurpark
 moor - veenland

Durham
 County Council

provincie Drenthe

RICH WATER WORLD

Canal & River Trust

VLM
 Provincie Noord-Brabant

provincie HOLLAND
 ZUID

Louis Bolk
 Instituut

Philippus
 Universität
 Marburg

HANZE WETLANDS

Radboud Universiteit

ILVO
 Institute Research Institute for
 Agriculture, Fisheries and Food

VEENWEIDEN
 INNOVATIECENTRUM

Waterschap De Dommel

Waterschap Aa en Maas

3N

AGRICULTURES & TERRITOIRES
 CHANGING ENGINEERING
 IN ATLANTIC

WEAR
 Waters Trust

Invertebrates 4 paludiculture pilots NL

4 sites: 3 *Typha latifolia* / 1 *Sphagnum* spp. AND 4 reference grasslands nearby (non-intensive use)

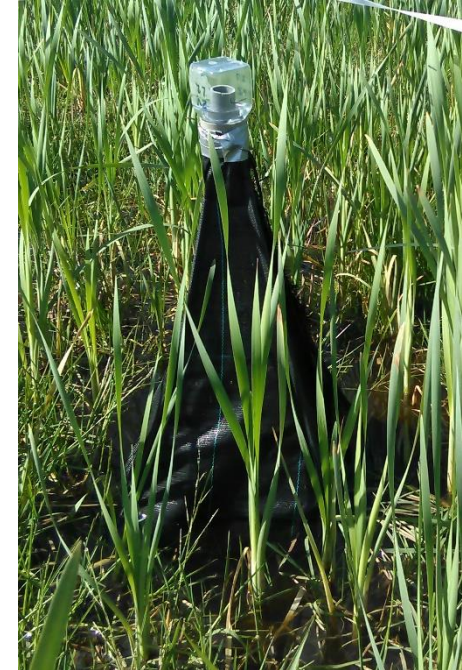
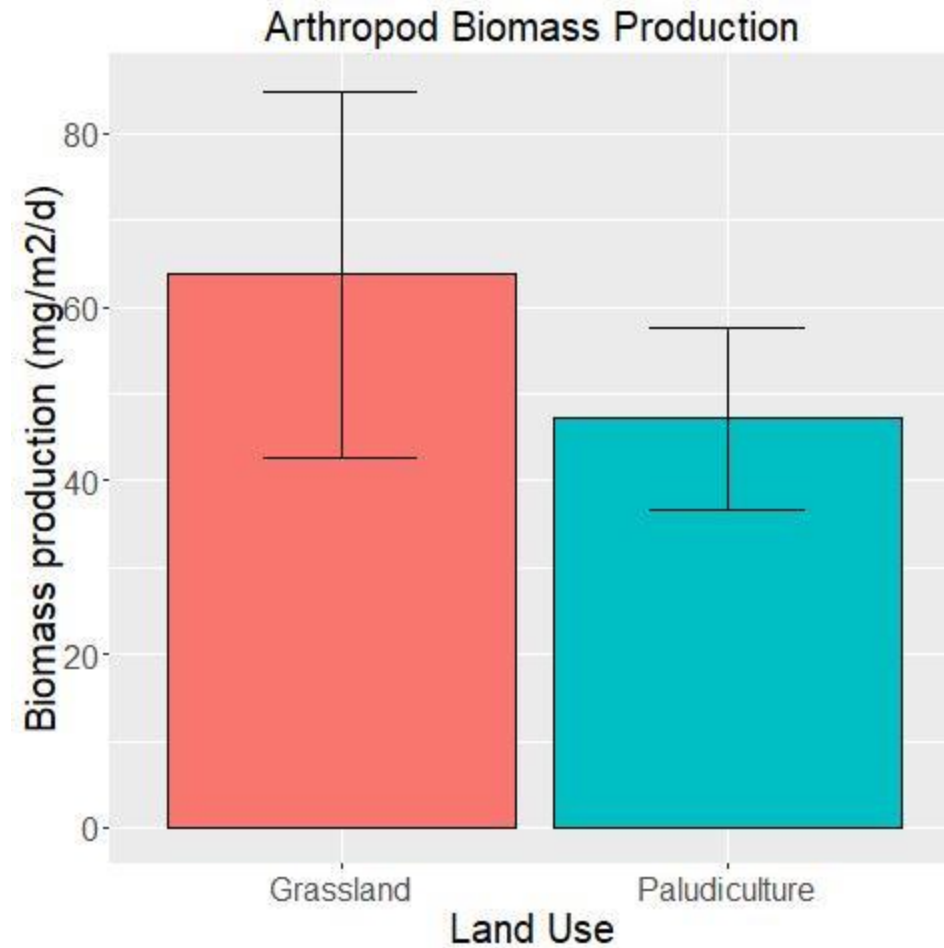
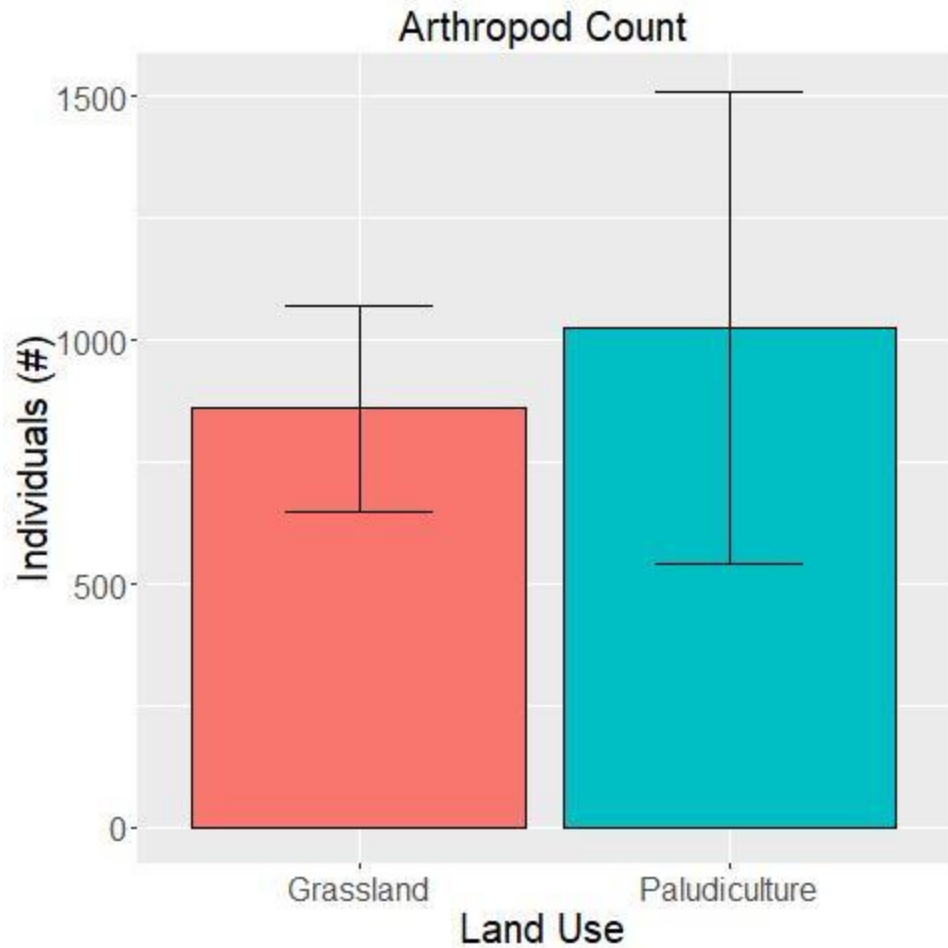
4 Emergence traps per site, 15th May – 30th June 2019



Invertebrates 4 paludiculture pilots NL

4 sites: 3 *Typha latifolia* / 1 *Sphagnum* spp. AND 4 reference grasslands nearby (non-intensive use)

4 Emergence traps per site, 15th May – 30th June 2019

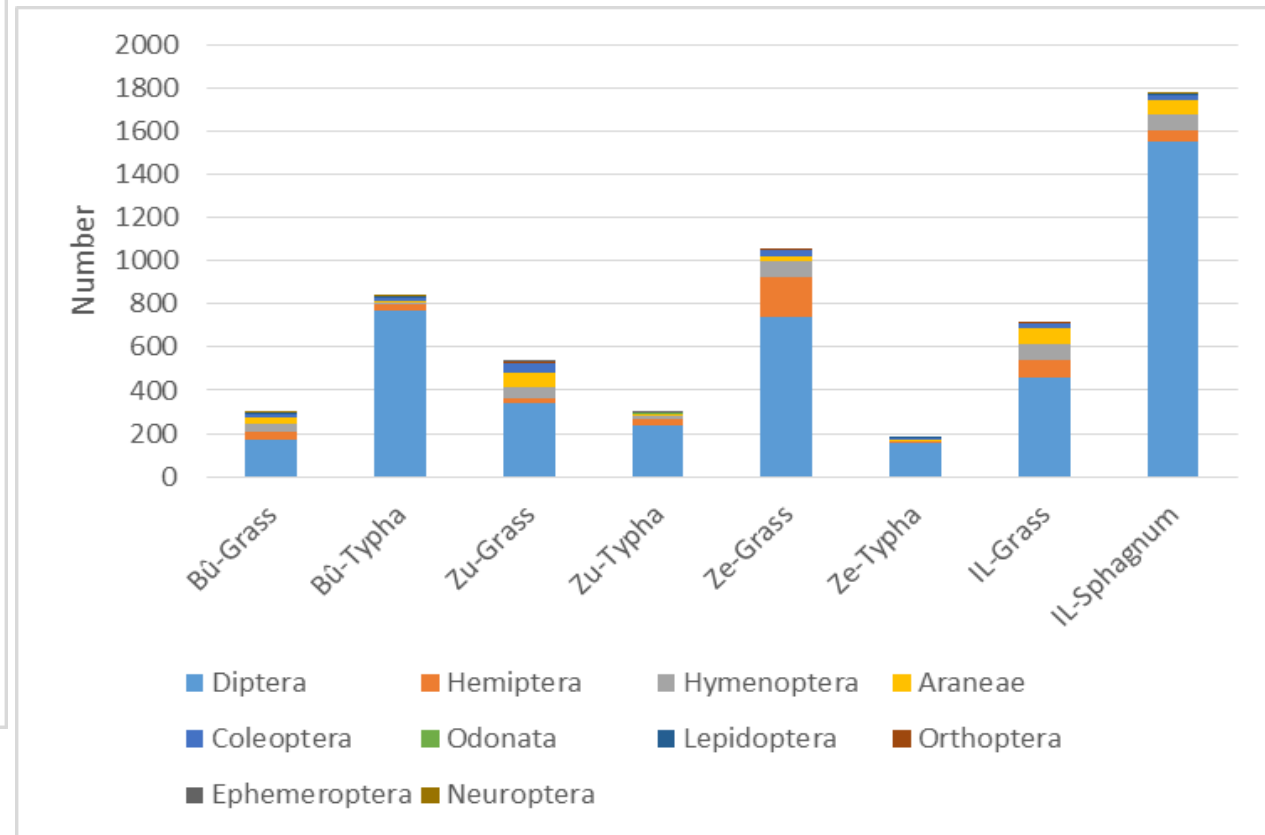
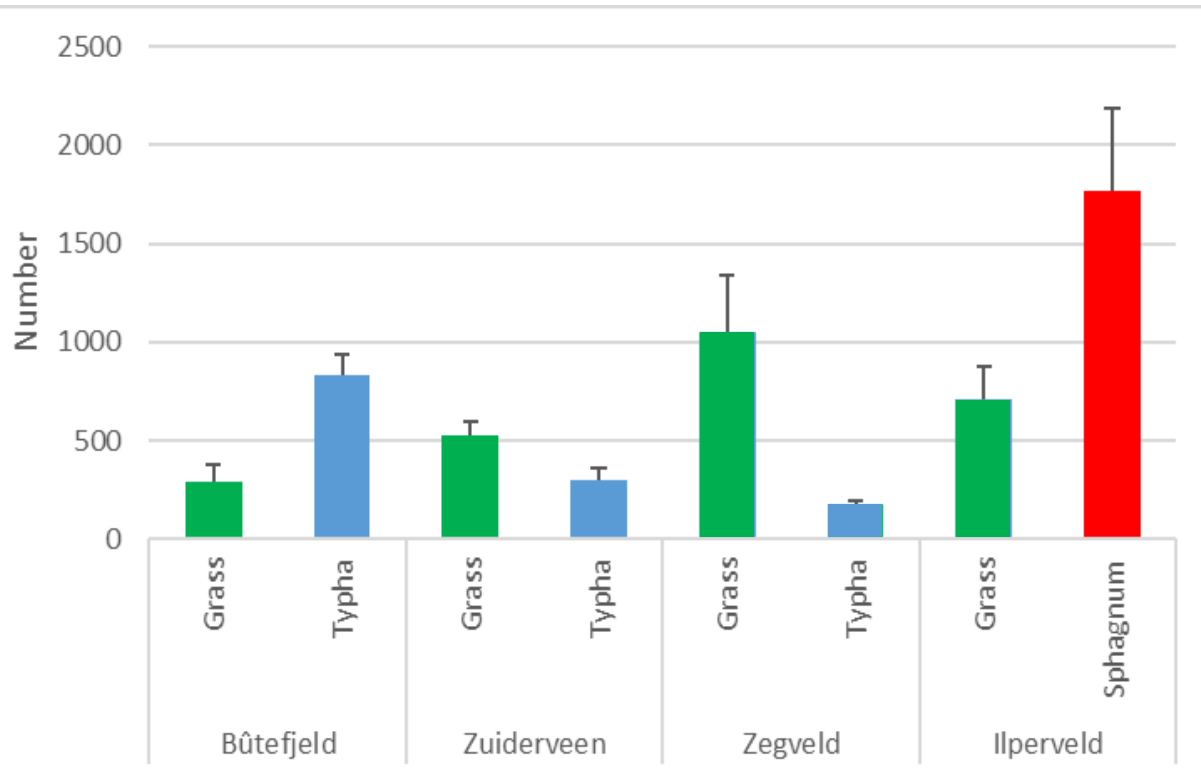


Copyright 2020 by M. Johnson - All Rights Reserved

Invertebrates 4 paludiculture pilots NL: *numbers*

4 sites: 3 *Typha latifolia* / 1 *Sphagnum* spp. AND 4 reference grasslands nearby (non-intensive use)

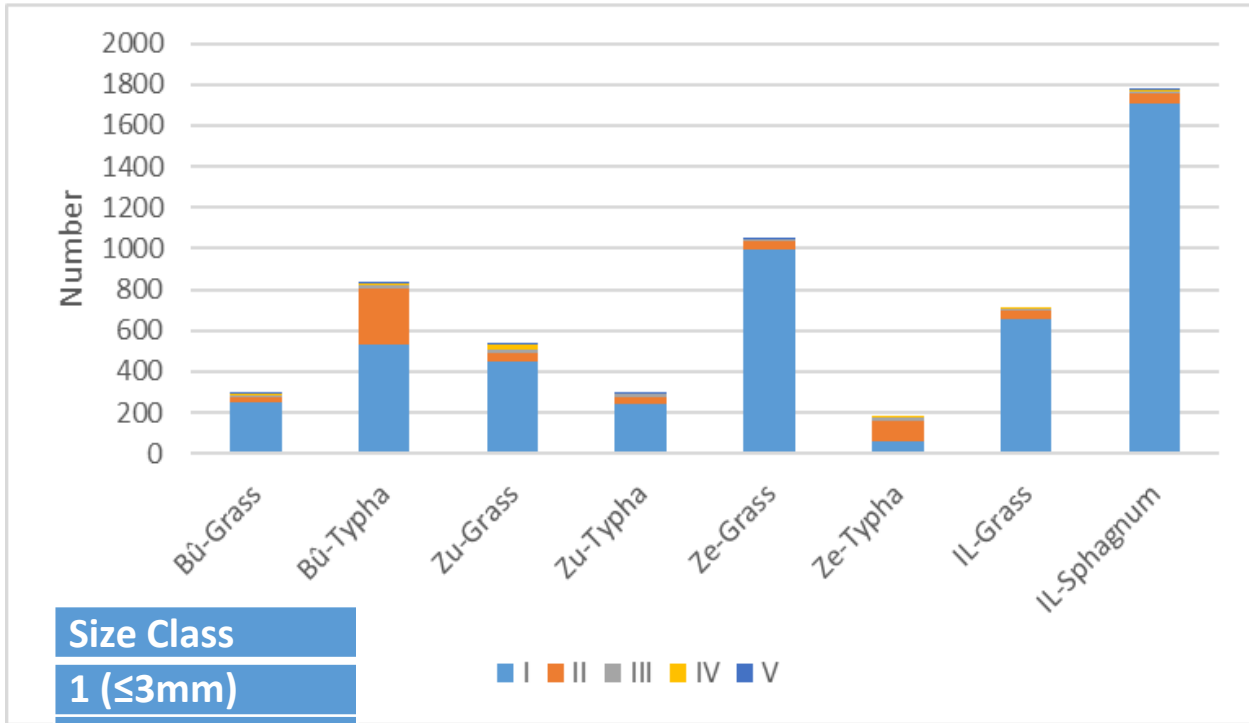
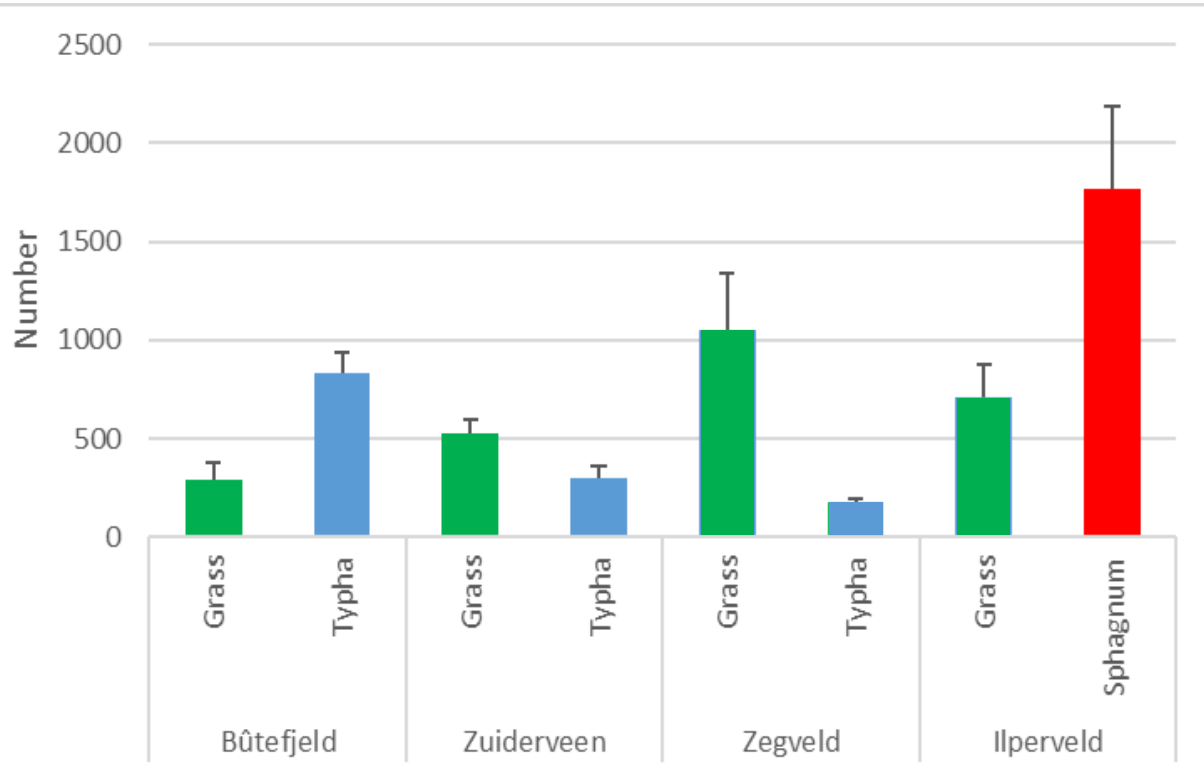
4 Emergence traps per site, 15th May – 30th June 2019



Invertebrates 4 paludiculture pilots NL: *numbers*

4 sites: 3 *Typha latifolia* / 1 *Sphagnum* spp. AND 4 reference grasslands nearby (non-intensive use)

4 Emergence traps per site, 15th May – 30th June 2019



- Size Class**
- 1 ($\leq 3\text{mm}$)
 - 2 (4–7mm)
 - 3 (8–11mm)
 - 4 (12–15mm)
 - 5 ($\geq 16\text{mm}$)

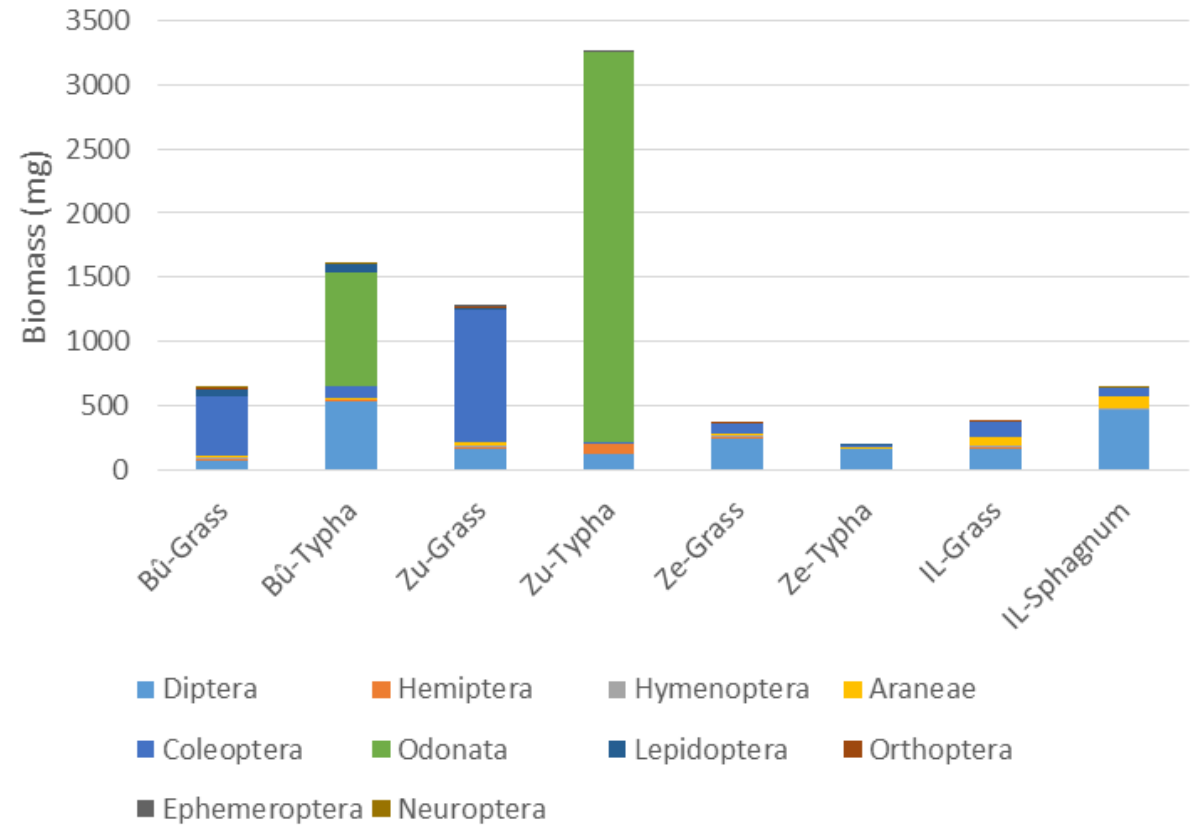
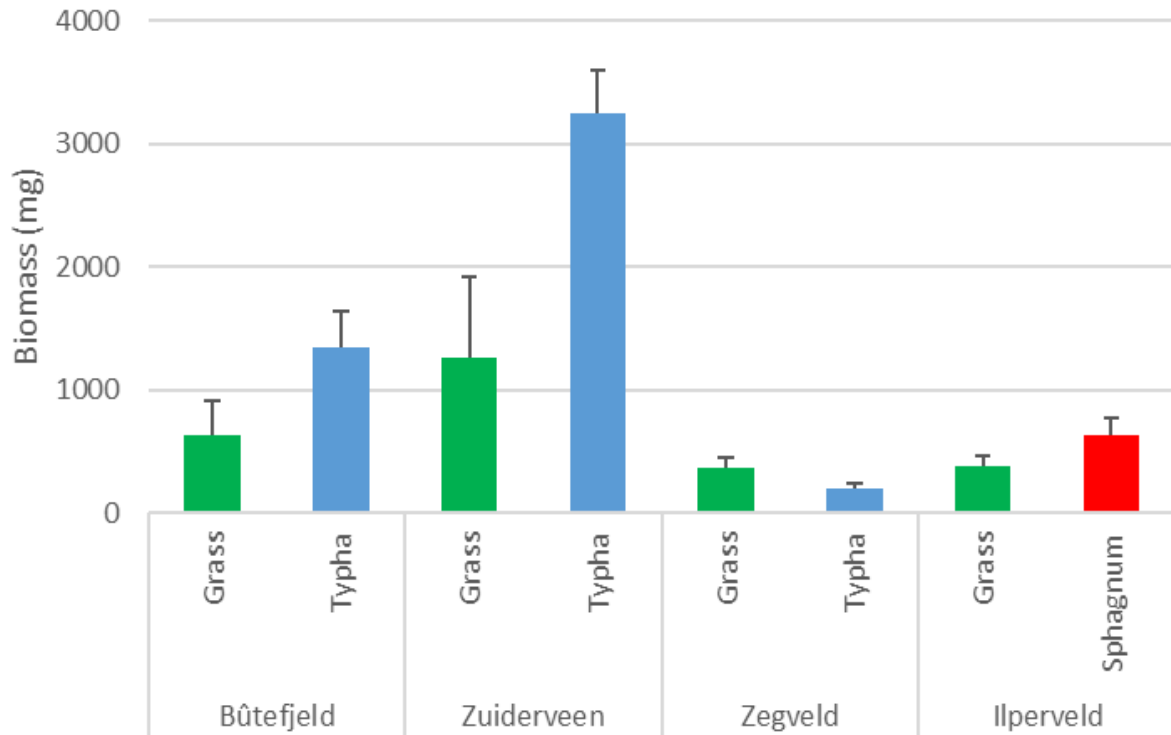
■ I ■ II ■ III ■ IV ■ V



Invertebrates 4 paludiculture pilots NL: *biomass*

4 sites: 3 *Typha latifolia* / 1 *Sphagnum* spp. AND 4 reference grasslands nearby (non-intensive use)

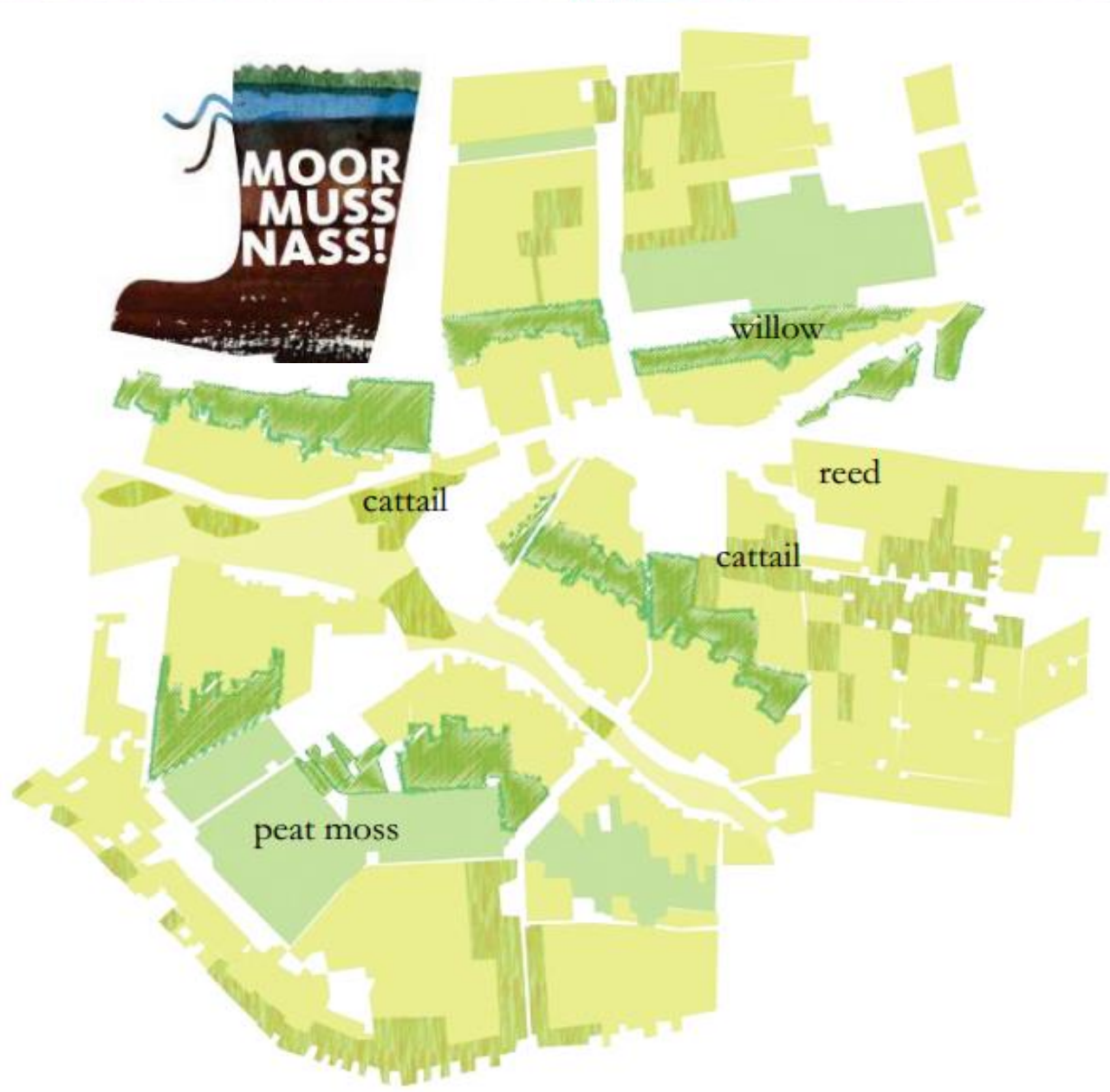
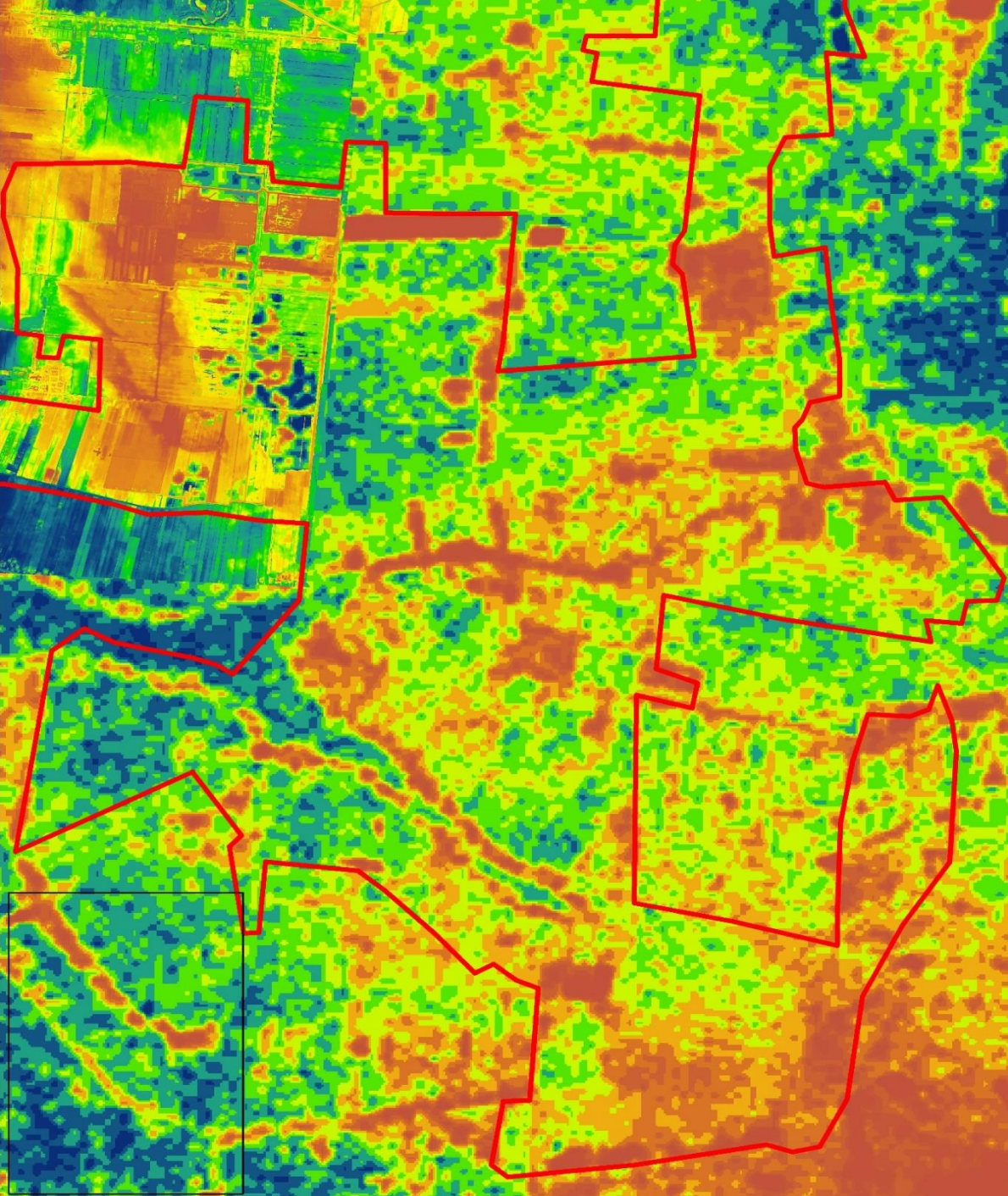
4 Emergence traps per site, 15th May – 30th June 2019



Conclusions

- Need also assessment invertebrates for conventional, intensively used and drained grassland.
- Change of drained grasslands into paludiculture may (not) change total biomass production of arthropods, but will anyway change community composition.
- Species composition depends on water regime, vegetation structure, nutrients...
- Consequences for predators, insectivorous birds: their species composition will change, as well.
- Since paludiculture produces a different arthropod community than grasslands, establishment of paludiculture is positive for overall biodiversity on the landscape scale.





Land use: cattail, reed, willow and peat moss

R. Hesselink (2019)

Thank you for your attention!



Radboud University

