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UNIVERSITY OF BIRMINGHAM

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RNDr. Jan BRUS, Ph.D.

University of Birmingham

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- patří mezi top 65 univerzit na světě
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- podle světového žebříčku univerzit publikovaného v listu The Times se Birmingham University umístila na 10. místě mezi univerzitami v Británii, 22. v Evropě a 66. na světě

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- Birmingham má přibližně tolik obyvatel jako Praha. Je však podstatně větší rozlohou. Centrum města tvoří Bullring se sochou býka, která je obklopena nákupními centry a stavbou architekta Kaplického (luxusní obchodní dům Selfridge), jež v noci svítí modře a je dominantou Birminghamu.


The Learning Centre

The School of Geography, Earth and Environmental Sciences

- vyhlášená pro svou dlouholetou historii na poli mezinárodní excelence ve výzkumu a výuce
- počátky výuky geologie v Birminghamu se datují k roku 1881
- geografie zde začala v roce 1924
- škola navazuje na své úspěchy prostřednictvím výzkumu a výuky s cílem řešit výzvy 21. století jako změna klimatu, výzkum obnovitelných zdrojů energie

Hlavní oblasti výzkumu

- Environmentální vědy o zdraví
- Geosystémy
- Společnost, hospodářství a životní prostředí
- Hydrologie
- Městské a regionální studia (Středisko pro městské a regionální studia)

Personální složení

- 60 akademických pracovníků
- 28 technických a podpůrných pracovníků
- 24 výzkumných pracovníků

- 150 studentů
- 90 studentů zapojených ve výzkumu

Excelence

- Professor David Hannah
- Dr Mike Beazley
- Dr James Bendle
- Professor Ian Fairchild
- Professor Stuart Harrad

Zázemí

- Škola nabízí výborné zázemí pro postgraduální studium díky obsáhlým kurzům a výzkumu.

Zaměstnanci a studenti těží z:

- Rozsáhlý mapový archiv a knihovna
- Earth Imaging Lab – laboratoř DPZ
- Stabilní izotopová laboratoř (SILLA)
- knihovna na životní prostředí

Přínos stáže

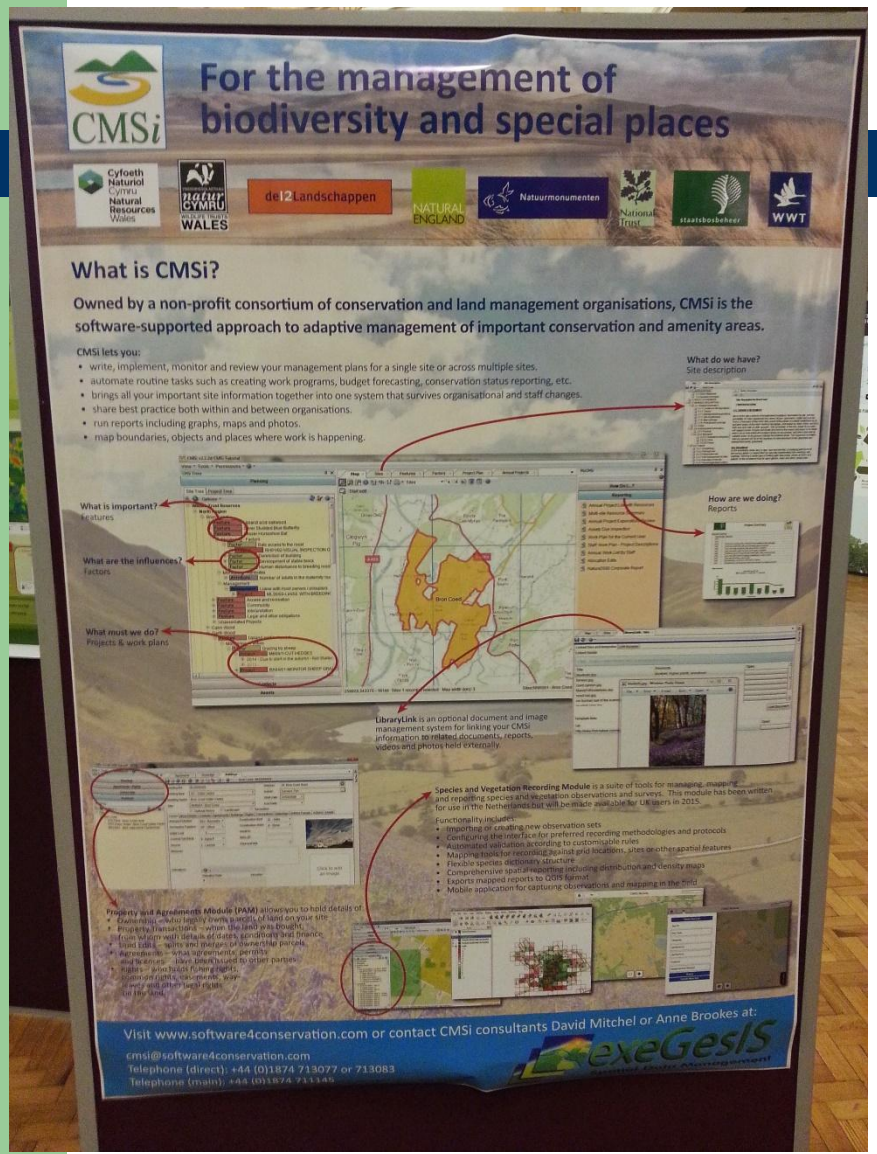
- nové poznatky o fungování sítí EUROPARC, IALE a dalších
- možnost konzultací s odborníky
- možnost vidět nové technologie

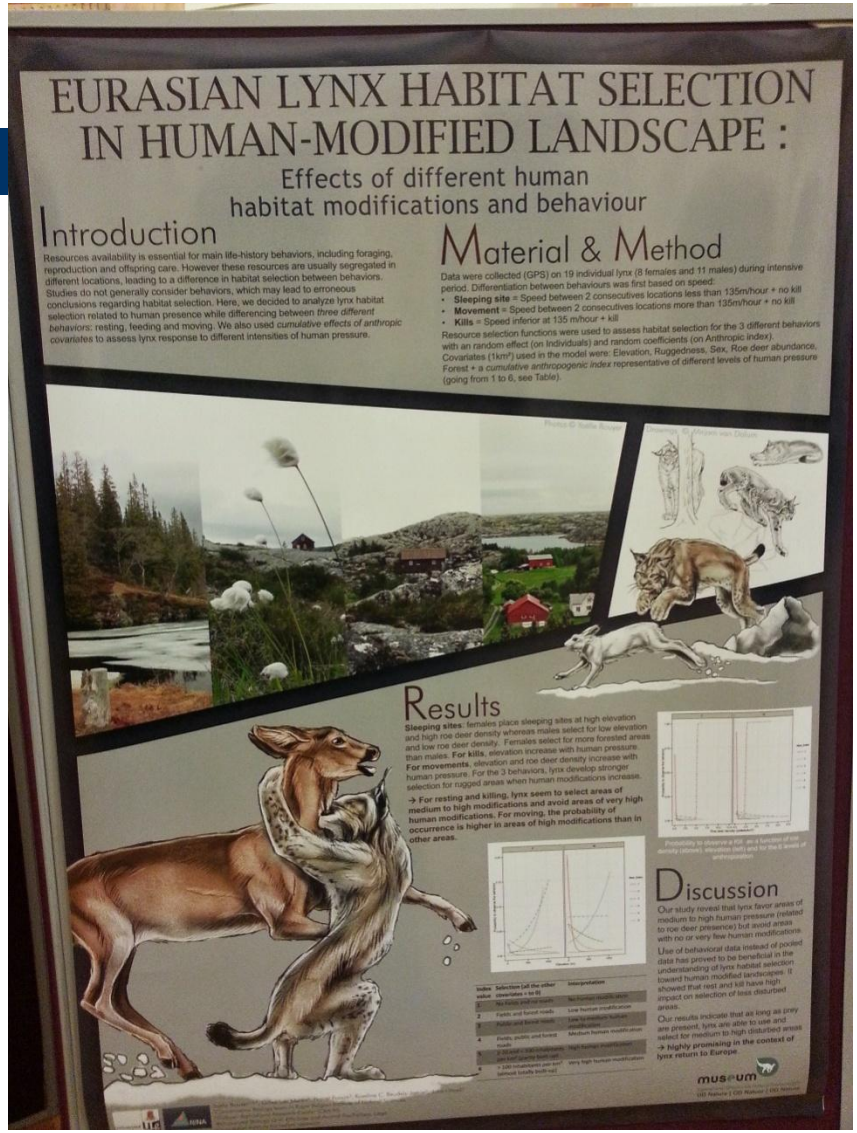
Konference Spatial Ecology & Conservation 2

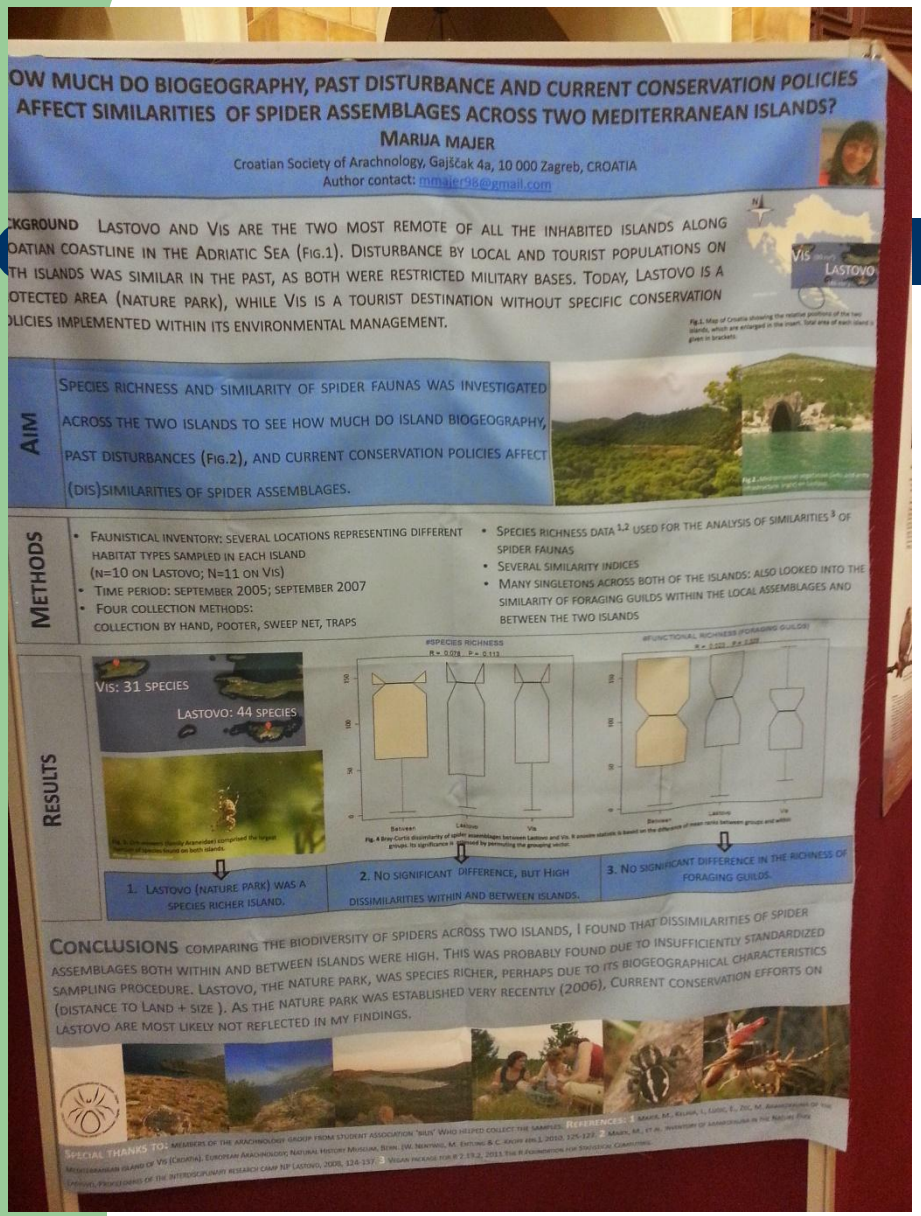
- konference byla zaměřena na prostorovou ekologii a ochranu přírody
- mnoho odborných příspěvků a konzultací
- odborníci z celého světa
- navázaní řady kontaktů

Přednesené příspěvky

- SDSS tool for the evaluation of the landscape
- Growth simulation model as a DST for conservation of floodplain forest ecosystems in temperate zone of Europe


CMSi
For the management of biodiversity and special places
Cyfoeth Naturiol Cymru Natural Resources Wales
natur CYMRU
de Landschappen
NATURAL ENGLAND
Natuurmonumenten
National Trust
staatsbosbeheer
WWT
What is CMSi?
Owned by a non-profit consortium of conservation and land management organisations, CMSi is the software-supported approach to adaptive management of important conservation and amenity areas.
CMSi lets you:
write, implement, monitor and review your management plans for a single site or across multiple sites.
automate routine tasks such as creating work programs, budget forecasting, conservation status reporting, etc.
brings all your important site information together into one system that survives organisational and staff changes.
share best practice both within and between organisations.
run reports including graphs, maps and photos.
map boundaries, objects and places where work is happening.
What do we have?
Site description
What is important?
Features
What are the influences?
Factors
What must we do?
Projects & work plans
How are we doing?
Reports
LibraryLink is an optional document and image management system for linking your CMSi information to related documents, reports, videos and photos held externally.
Species and Vegetation Recording Module is a suite of tools for managing, mapping and reporting species and vegetation observations and surveys. This module has been written for use in the Netherlands but will be made available for UK users in 2015.
Functionality includes:
Importing or creating new observation sets
Configuring the interface for preferred recording methodologies and protocols
Automated validation according to customisable rules
Mapping tools for recording against grid locations, sites or other spatial features
Flexible species dictionary structure
Comprehensive spatial reporting including distribution and density maps
Exports mapped reports to QGIS format
Mobile application for capturing observations and mapping in the field
Property and Agreements Module (PAM) allows you to hold details of
Visit www.software4conservation.com or contact CMSi consultants David Mitchel or Anne Brookes at:
cmsi@software4conservation.com
Telephone (direct): +44 (0)1874 713077 or 713083
Telephone (main): +44 (0)1874 711145
exeGesIS


EURASIAN LYNX HABITAT SELECTION IN HUMAN-MODIFIED LANDSCAPE :
Effects of different human habitat modifications and behaviour
Introduction
Resources availability is essential for main life-history behaviors, including foraging, reproduction and offspring care. However these resources are usually segregated in different locations, leading to a difference in habitat selection between behaviors. Studies do not generally consider behaviors, which may lead to erroneous conclusions regarding habitat selection. Here, we decided to analyze lynx habitat selection related to human presence while differencing between three different behaviors: resting, feeding and moving. We also used cumulative effects of anthropic covariates to assess lynx response to different intensities of human pressure.
Material & Method
Data were collected (GPS) on 19 individual lynx (8 females and 11 males) during intensive period. Differentiation between behaviours was first based on speed:
Sleeping site = Speed between 2 consecutives locations less than 135m/hour + no kill
Movement = Speed between 2 consecutives locations more than 135m/hour + no kill
Kills = Speed inferior at 135 m/hour + kill
Resource selection functions were used to assess habitat selection for the 3 different behaviors with an random effect (on individuals) and random coefficients (on Anthropic index).
Covariates (1km²) used in the model were: Elevation, Ruggedness, Sex, Roe deer abundance, Forest + a cumulative anthropogenic index representative of different levels of human pressure (going from 1 to 6, see Table).
Results
Sleeping sites: females place sleeping sites at high elevation and high roe deer density whereas males select for low elevation and low roe deer density. Females select for more forested areas than males. For kills, elevation increase with human pressure. For movements, elevation and roe deer density increase with human pressure. For the 3 behaviors, lynx develop stronger selection for ragged areas when human modifications increase.
→ For resting and killing, lynx seem to select areas of medium to high modifications and avoid areas of very high human modifications. For moving, the probability of occurrence is higher in areas of high modifications than in other areas.
Discussion
Our study reveal that lynx favor areas of medium to high human pressure (related to roe deer presence) but avoid areas with no or very few human modifications.
Use of behavioral data instead of pooled date has proved to be beneficial in the understanding of lynx habitat selection toward human modified landscapes. It showed that rest and kill have high impact on selection of less disturbed areas.
Our results indicate that as long as prey are present, lynx are able to use and select for medium to high disturbed areas
→ highly promising in the context of lynx return to Europe
museum



OW MUCH DO BIOGEOGRAPHY, PAST DISTURBANCE AND CURRENT CONSERVATION POLICIES AFFECT SIMILARITIES OF SPIDER ASSEMBLAGES ACROSS TWO MEDITERRANEAN ISLANDS?

MARIJA MAJER

Croatian Society of Arachnology, Gajščak 4a, 10 000 Zagreb, CROATIA

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CKGROUND LASTOVO AND VIS ARE THE TWO MOST REMOTE OF ALL THE INHABITED ISLANDS ALONG OATIAN COASTLINE IN THE ADRIATIC SEA (FIG.1). DISTURBANCE BY LOCAL AND TOURIST POPULATIONS ON TH ISLANDS WAS SIMILAR IN THE PAST, AS BOTH WERE RESTRICTED MILITARY BASES. TODAY, LASTOVO IS A OTECTED AREA (NATURE PARK), WHILE VIS IS A TOURIST DESTINATION WITHOUT SPECIFIC CONSERVATION OLICIES IMPLEMENTED WITHIN ITS ENVIRONMENTAL MANAGEMENT.

VIS

LASTOVO

AIM

SPECIES RICHNESS AND SIMILARITY OF SPIDER FAUNAS WAS INVESTIGATED ACROSS THE TWO ISLANDS TO SEE HOW MUCH DO ISLAND BIOGEOGRAPHY, PAST DISTURBANCES (FIG.2), AND CURRENT CONSERVATION POLICIES AFFECT (DIS)SIMILARITIES OF SPIDER ASSEMBLAGES.

METHODS

- FAUNISTICAL INVENTORY: SEVERAL LOCATIONS REPRESENTING DIFFERENT HABITAT TYPES SAMPLED IN EACH ISLAND (N=10 ON LASTOVO; N=11 ON VIS)
- TIME PERIOD: SEPTEMBER 2005; SEPTEMBER 2007
- FOUR COLLECTION METHODS: COLLECTION BY HAND, POOTER, SWEEP NET, TRAPS
- SPECIES RICHNESS DATA [1,2] USED FOR THE ANALYSIS OF SIMILARITIES [3] OF SPIDER FAUNAS
- SEVERAL SIMILARITY INDICES
- MANY SINGLETONS ACROSS BOTH OF THE ISLANDS: ALSO LOOKED INTO THE SIMILARITY OF FORAGING GUILDS WITHIN THE LOCAL ASSEMBLAGES AND BETWEEN THE TWO ISLANDS

RESULTS

VIS: 31 SPECIES

LASTOVO: 44 SPECIES

#SPECIES RICHNESS

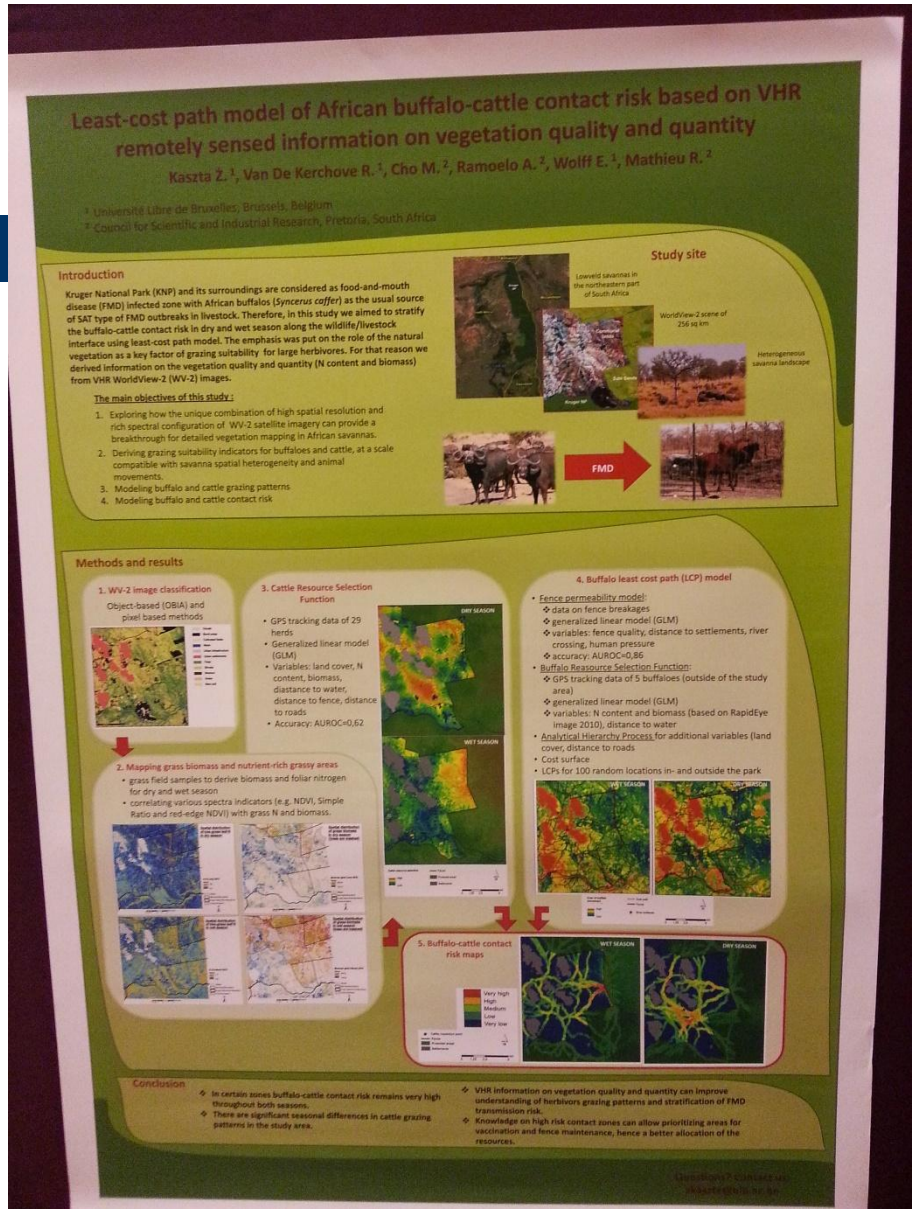
#FUNCTIONAL RICHNESS (FORAGING GUILDS)

1. LASTOVO (NATURE PARK) WAS A SPECIES RICHER ISLAND.
2. NO SIGNIFICANT DIFFERENCE, BUT HIGH DISSIMILARITIES WITHIN AND BETWEEN ISLANDS.
3. NO SIGNIFICANT DIFFERENCE IN THE RICHNESS OF FORAGING GUILDS.

CONCLUSIONS COMPARING THE BIODIVERSITY OF SPIDERS ACROSS TWO ISLANDS, I FOUND THAT DISSIMILARITIES OF SPIDER ASSEMBLAGES BOTH WITHIN AND BETWEEN ISLANDS WERE HIGH. THIS WAS PROBABLY FOUND DUE TO INSUFFICIENTLY STANDARDIZED SAMPLING PROCEDURE. LASTOVO, THE NATURE PARK, WAS SPECIES RICHER, PERHAPS DUE TO ITS BIOGEOGRAPHICAL CHARACTERISTICS (DISTANCE TO LAND + SIZE). AS THE NATURE PARK WAS ESTABLISHED VERY RECENTLY (2006), CURRENT CONSERVATION EFFORTS ON LASTOVO ARE MOST LIKELY NOT REFLECTED IN MY FINDINGS.

SPECIAL THANKS TO: MEMBERS OF THE ARACHNOLOGY GROUP FROM STUDENT ASSOCIATION "BIUS" WHO HELPED COLLECT THE SAMPLES.

REFERENCES: 1 ...



Least-cost path model of African buffalo-cattle contact risk based on VHR remotely sensed information on vegetation quality and quantity

Kaszta Ż. [1], Van De Kerchove R. [1], Cho M. [2], Ramoelo A. [2], Wolff E. [1], Mathieu R. [2]

[1] Université Libre de Bruxelles, Brussels, Belgium

[2] Council for Scientific and Industrial Research, Pretoria, South Africa

Introduction

Kruger National Park (KNP) and its surroundings are considered as food-and-mouth disease (FMD) infected zone with African buffalos (*Syncerus coffer*) as the usual source of SAT type of FMD outbreaks in livestock. Therefore, in this study we aimed to stratify the buffalo-cattle contact risk in dry and wet season along the wildlife/livestock interface using least-cost path model. The emphasis was put on the role of the natural vegetation as a key factor of grazing suitability for large herbivores. For that reason we derived information on the vegetation quality and quantity (N content and biomass) from VHR WorldView-2 (WV-2) images.

The main objectives of this study :

1. Exploring how the unique combination of high spatial resolution and rich spectral configuration of WV-2 satellite imagery can provide a breakthrough for detailed vegetation mapping in African savannas.
2. Deriving grazing suitability indicators for buffaloes and cattle, at a scale compatible with savanna spatial heterogeneity and animal movements.
3. Modeling buffalo and cattle grazing patterns
4. Modeling buffalo and cattle contact risk

Study site

Lowveld savannas in the northeastern part of South Africa

WorldView-2 scene of 256 sq km

Heterogeneous savanna landscape

FMD

Methods and results

1. WV-2 image classification

Object-based (OBIA) and pixel based methods

2. Mapping grass biomass and nutrient-rich grassy areas

- grass field samples to derive biomass and foliar nitrogen for dry and wet season
- correlating various spectra indicators (e.g. NDVI, Simple Ratio and red-edge NDVI) with grass N and biomass.

3. Cattle Resource Selection Function

- GPS tracking data of 29 herds
- Generalized linear model (GLM)
- Variables: land cover, N content, biomass, distance to water, distance to fence, distance to roads
- Accuracy: AUROC=0,62

DRY SEASON

WET SEASON

4. Buffalo least cost path (LCP) model

- Fence permeability model:
  - data on fence breakages
  - generalized linear model (GLM)
  - variables: fence quality, distance to settlements, river crossing, human pressure
  - accuracy: AUROC=0,86
- Buffalo Reasource Selection Function:
  - GPS tracking data of 5 buffaloes (outside of the study area)
  - generalized linear model (GLM)
  - variables: N content and biomass (based on RapidEye image 2010), distance to water
- Analytical Hierarchy Process for additional variables (land cover, distance to roads
- Cost surface
- LCPs for 100 random locations in- and outside the park

5. Buffalo-cattle contact risk maps

Very high
High
Medium
Low
Very low

Conclusion

- In certain zones buffalo-cattle contact risk remains very high throughout both seasons.
- There are significant seasonal differences in cattle grazing patterns in the study area.
- VHR information on vegetation quality and quantity can improve understanding of herbivors grazing patterns and stratification of FMD transmission risk.
- Knowledge on high risk contact zones can allow prioritizing areas for vaccination and fence maintenance, hence a better allocation of the resources.

MAPPING OF FOREST STANDS HEIGHT OVER SIBERIA (RUSSIA) APPLYING A BIOCLIMATIC MODEL

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Institute of Forest, Siberian Branch, Russian Academy of Sciences, Krasnoyarsk, Russia

Goals. To develop a regional bioclimatic model of forest stands (SibForStand) for Central Siberia within the Krasnoyarsk territory, (Fig 1) to predict stand dominant tree species and heights from site climate and predict changes in the forests in a changing climate during the 21 century. This bioclimatic model was extended to entire Siberia.

Methods. A database of about 1700 plots across Central Siberia that characterized a stand tree composition, height and a site quality class (bonitet) at 100 yr age as well as climates of plot habitats was built from inventory and literature data. This database was used to develop our bioclimatic model which is a regression model (Fig. 2) relating to Growing Degree-Days, 5ºC (GDD5), January temperature and Annual Moisture Index (AMI= GDD5/annual precipitation). Territory Siberia was classified into potential habitats for the major conifers (*Pinus sylvestris, Larix spp. Pinus sibirica and Abies sibirica*) that are characteristic of the climax Siberian forests.

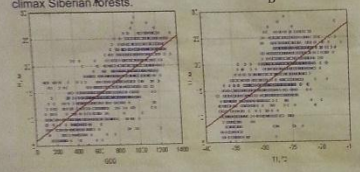

Fig. 2. Relationships of stand heights (H, m) and GDD5 (A) and January temperature (B):

$H = 16.1 + .296\ (T1) + 0.0106^{*}\ (GDD5)$,

T1 – January temperature, GDD Growing Degree-Days, 5C,

Statistics: N = 1714, R2 = 0.66, St.er. = 2.7, F (2, 1714) = 1635, $p < 0.0000$

Results. A set of electronic maps of the potential distributions of major forest-forming tree species (Fig. 3) and mean heights (Fig. 4) was obtained across Siberia in current climate and for 2090 climates from the climate change scenarios of the Hadley Center (www.ipcc-data.org).

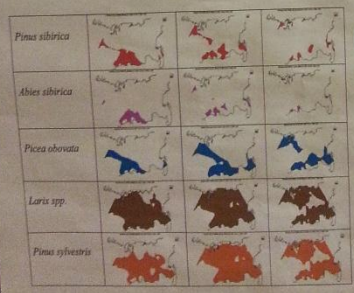

Fig. 3. Distributions (%) of major forest-forming conifers in Siberia in current (left) and HadCM3 B1 (center) and HadCM3 A2 (right) climates .

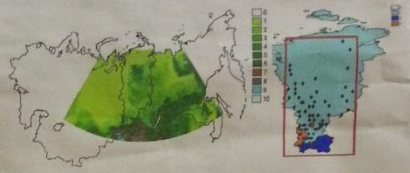

Fig. 1. Study area in central Siberia on the background of the former Soviet Union (left) and the Krasnoyarskii territory inside the red square (with locations of 90 weather stations used in our analysis)

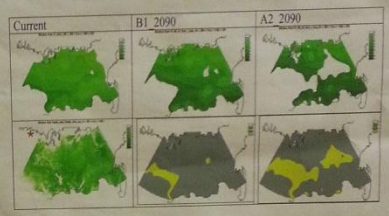

Fig. 4. Modeled stand heights (m) in a current climate and in HadCM3 B1 and A2 climates at 2090 and hot-spots of deforestation

* This is a sector of the NASA map "Heights of the World forests" (Fig.5)

Legend: 0 – not forested, Heights, m: 1. < 5; 2. 5 – 10; 3. 10 – 15; 4. 15 – 20; 5. 20 – 25; 6. 25 –30; 7. 30 – 35; 8. 35 – 40; 9. 40 – 45; 10. >45

The comparison between modeled (Fig. 4) and lidar-measured (Fig. 5) height maps in current climate using kappa statistics showed their fair match with $\kappa = 0.42$ that proved a fair work of our model

Fig. 5. The NASA map "Heights of the World forests" of 1 km resolution based on 2.5 min lidar measurements proved by ground truthing (Simard *et al.* 2011)

In current climate the stand heights across Siberia may achieve 20 m in middle and northern taiga zones (> 60N) and 30 m in the southern taiga and subtaiga zones (<60N).

In a changing climate of the 21st century, the stand heights may increase up to 40 м and higher in the southern taiga and lowland montane "black" *Pinus sibirica* and *Abies sibirica* taiga according to the both scenarios B1 and A2. The climatic range of productive stands, characterized by high quality class, would extend and shift about 500 km northwards, however, would stay in the southern taiga and "black" taiga on moist windward slopes over the Sayan mountains in the south of Central Siberia.

Acknowledgements. The study has been supported by the (IDS) # C11-2825-SI; # 10-04-280; # 10-05-043

giving nature a home

Assessing the Comprehensiveness of the SPA Network for European Birds

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Introduction

The Birds Directive is the European Union's oldest, and still one of its most important, pieces of nature legislation. A key element is the establishment of a network of Special Protection Areas (SPAs) targeted at protecting suitable habitat for endangered and migratory bird species, as listed on Annex 1 of the directive.

Since adoption by member states in 1979, both the Annex 1 list and the SPA network have been adapted and expanded several times in response to updated scientific knowledge and successive enlargements of the EU.

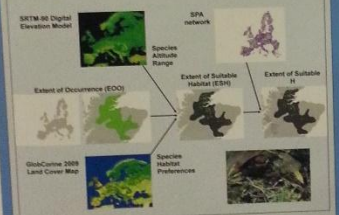
Aims

Here we assess whether the SPA network is effective in providing targeted coverage of suitable habitats for Annex 1 species as well as objectively assessed Species of European Conservation Concern.

Methods

- For all bird species breeding or wintering within the EU, we mapped Extent of potentially Suitable Habitat (ESH) using data on altitude, land cover and habitat preferences within the species range.
- We overlaid the SPA network to calculate Extent of Suitable Habitat within each SPA for each species .

Example: Scottish Crossbill



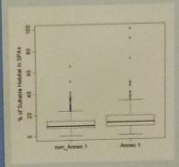
We compared...

1. Coverage of Annex 1 and non-Annex 1 species by the SPA network
2. Coverage of Annex 1 species with coverage of Species of European Conservation Concern (SPEC)
3. Coverage of species in different SPEC categories

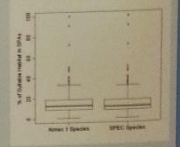
Species of European Conservation Concern

SPEC Category	European species of global conservation concern	Conservation status in Europe	Global population or range concentrated in Europe
SPEC 1	Yes	-	-
SPEC 2	No	Unfavourable	Yes
SPEC 3	No	Unfavourable	No
Non-SPEC (0)	No	Favourable	-

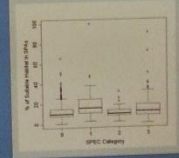
Results



Annex 1 species are significantly better covered by the SPA network than non-Annex 1 species ($p < 0.001$).



There is no significant difference in SPA coverage between Annex 1 species and Species of European Conservation Concern.



There is a significant difference in SPA coverage between species in different SPEC categories ($p < 0.001$).

SPEC 1 species are significantly better covered by SPAs than species in any other category.

Conclusions

Annex 1 species and species of global conservation concern are better covered by the SPA network than other species.

The SPA network provides targeted coverage of suitable habitats for species of conservation importance within the European Union.

UNIVERSITY OF BIRMINGHAM

- Děkuji za pozornost