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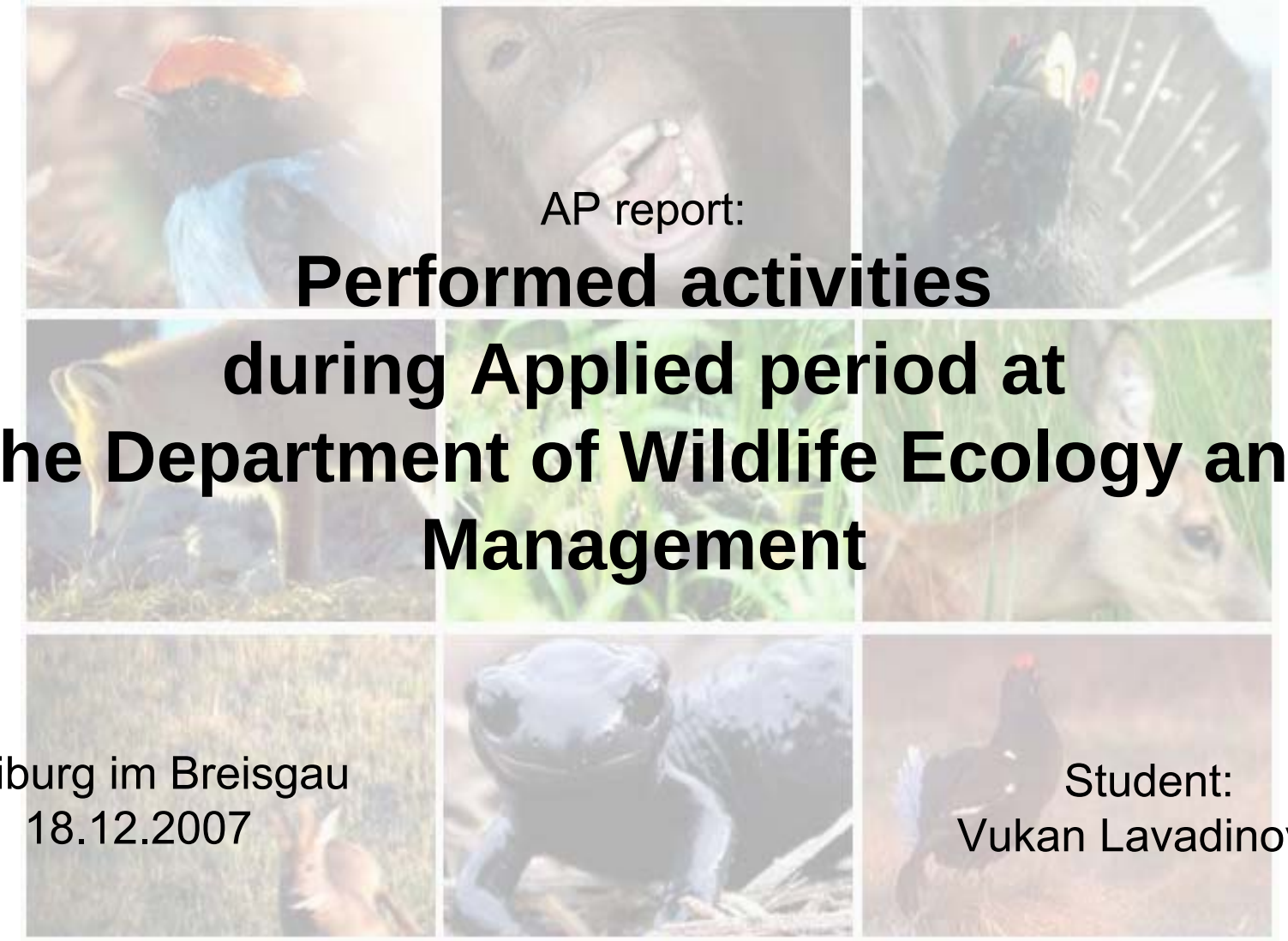

AP report:

Performed activities during Applied period at The Department of Wildlife Ecology and Management

Freiburg im Breisgau
18.12.2007

Student:
Vukan Lavadinović

Content

Introduction

Project I

Project II

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Conclusion

- Duration of AP was 10 weeks
- Host – The Department of Wildlife Ecology and Management
- Performed activities:
  - **Primary** (“Black grouse project”, Lynx management)
  - **Secondary** (attending modules, Policy presentation…)

Introduction

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Conclusion

Landscape change and black grouse decline in central Europe

Introduction

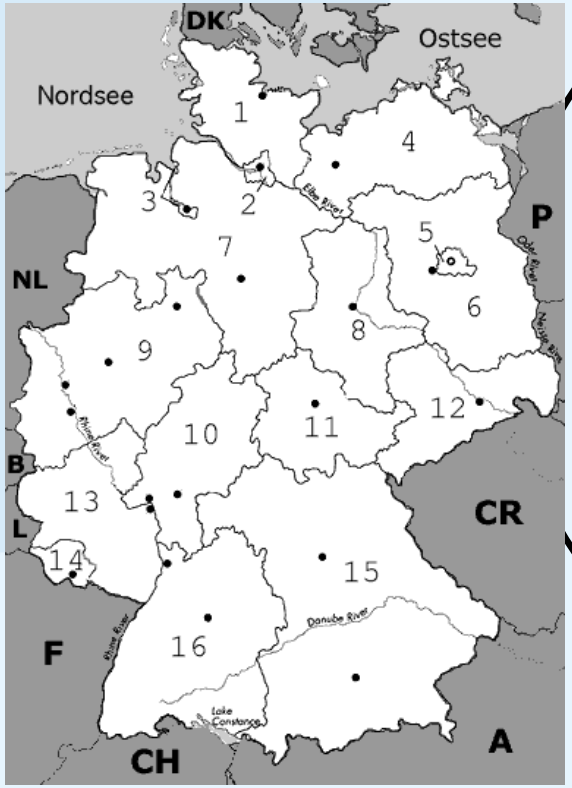
- Head of the department: Prof. Dr. Ilse Storch

- Mentor: Dipl. Biol. Tobias Ludwig

Introduction

- Project duration: **2003-2007**
- Funded by:
  - ***Deutsche Wildtierstiftung***
  - ***Adenauer-Stiftung***
  - ***Fazit Stiftung***
- Project partners:
  - ***IGF***
  - ***Universität Osnabrück***
  - ***NNA***

Introduction



Black grouse population decline

↕

Landscape changes

Arable forest mosaic

Introduction

- The black grouse is demanding species
- Adopted to continental/boreal climate
- Four types of habitats:
  - dry heathlands
  - wet forest edge habitats
  - peat bog habitats
  - subalpine mountain regions

Introduction

- The black grouse is red-listed in most Central European countries
- Drainage and destruction of wetlands
- Afforestation/conversion of heathers
- Aim of this study was to contribute to a better understanding of the landscape mosaic

Method

- Changes between 1958 – 1975
- Area: 360 km² in Lower Saxony
- 12 maps (1: 25.000)
- ArcView GIS 3.3 program

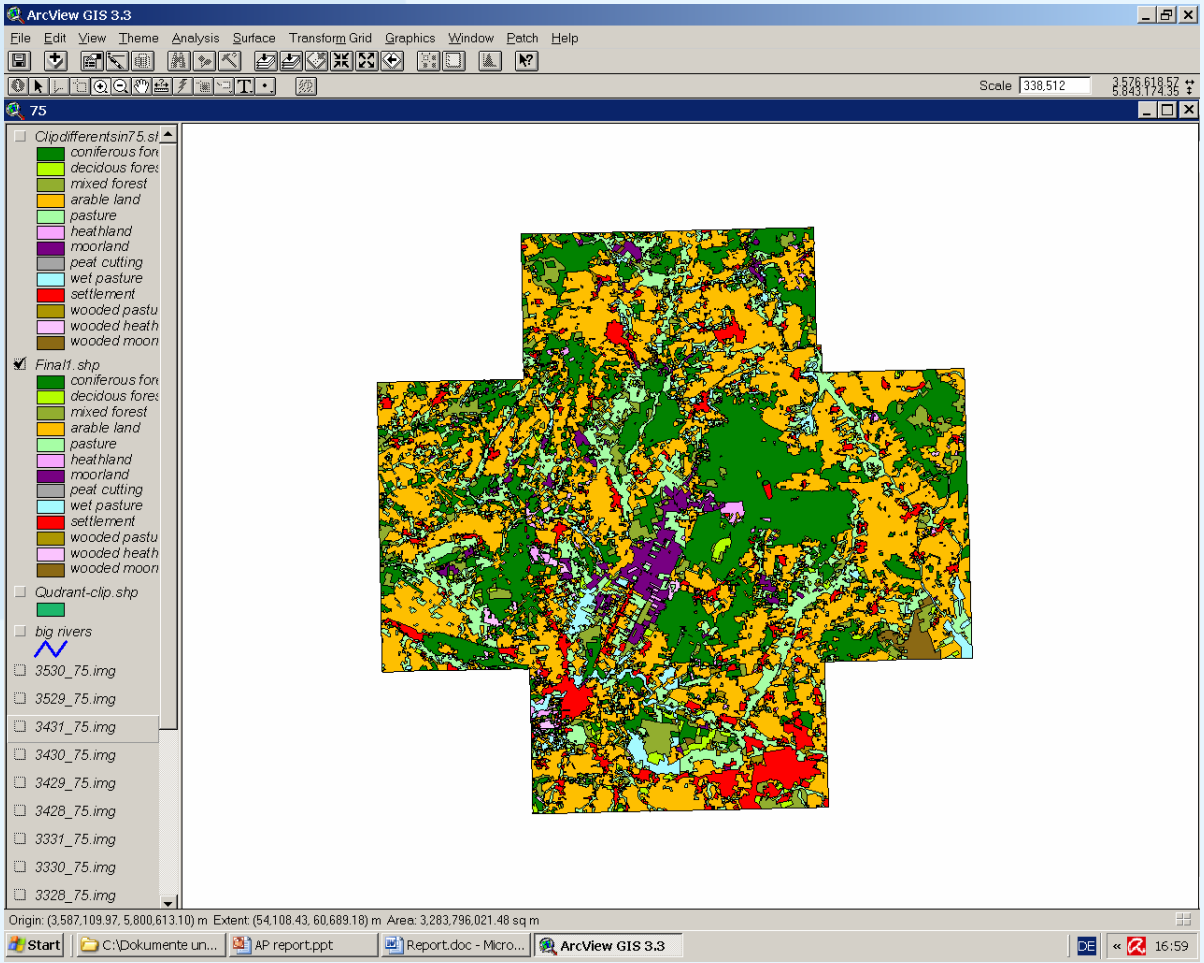
Method

- 13 land use classes

1.	Coniferous forest	10.
2.	Deciduous forest	15.
3.	Mixed forest	16.
6.	Arable land	71.
7.	Pasture	91.
9.	Heathlands	101.

Legend

Method



Method

- Comparison of total land area for years 1958 and 1975;
- Comparison of land area where black grouse population was maintained;
- Comparison of land area where black grouse population was lost.

Introduction

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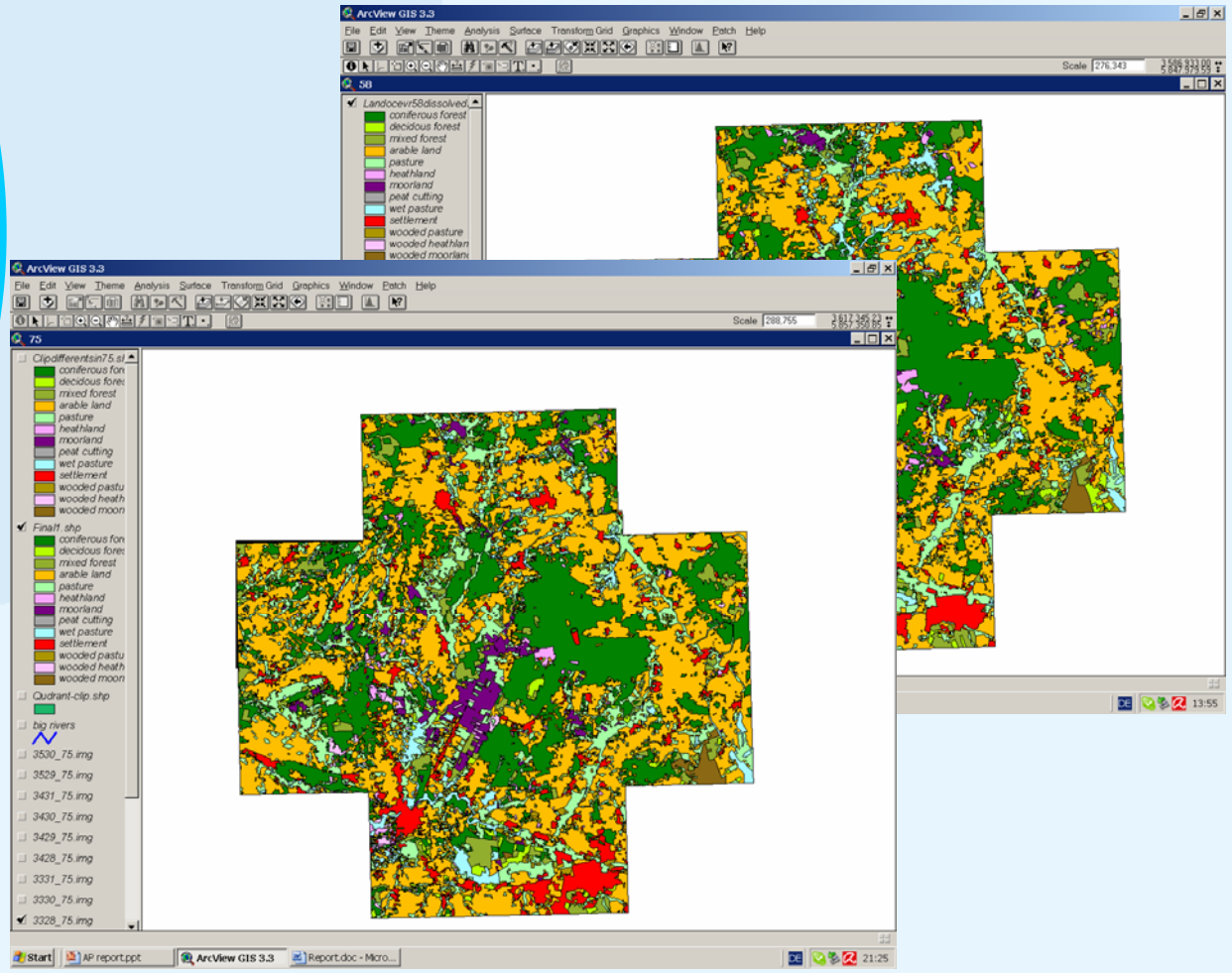
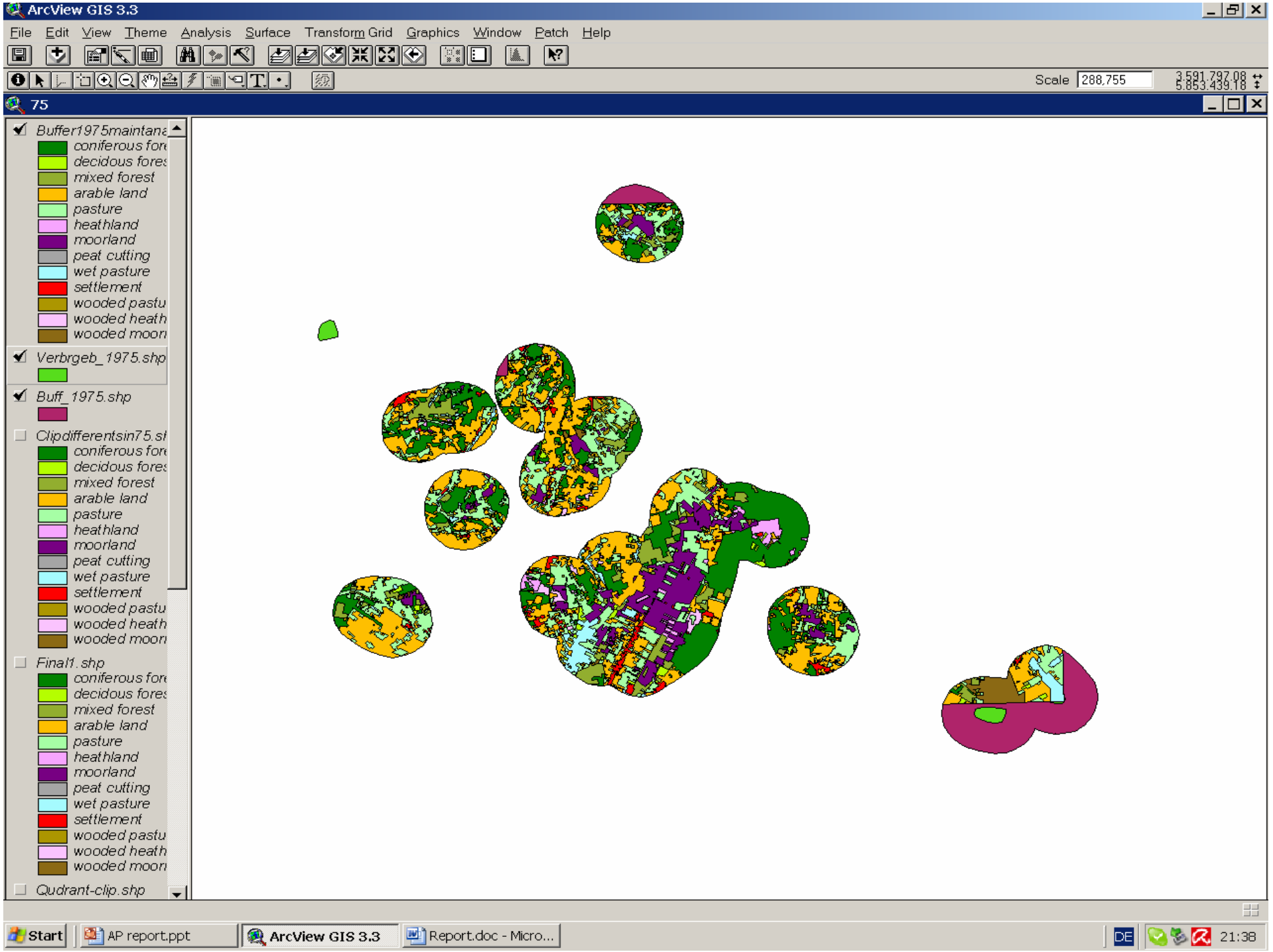
Method

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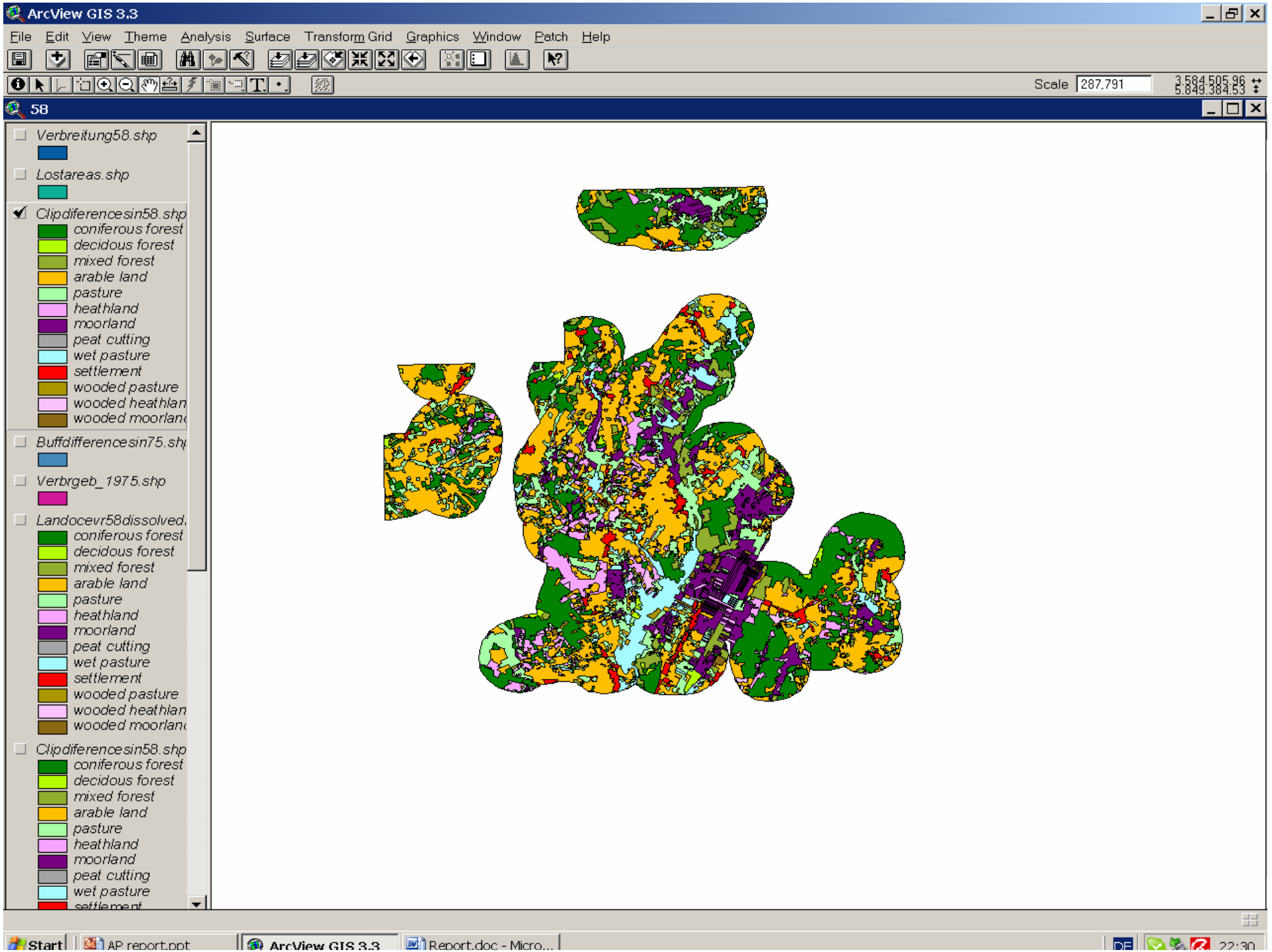
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Results

- In 1958 – 57%, in 1975 – 14%

Heathlands	**81%**	- 3.01%
Moorlands	**31.58%**	- 3.62%
Wet pastures	**66.90%**	- 4.80%

Type	Comparison Total area	Comparison Maintenance	Comparison Losses
Coniferous forest	5.09%	19.61%	17.89%
Deciduous forest	-21.1%	-22.22%	3.19%
Mixed forest	1.23%	0.21%	1.26%
Arable land	2.67%	9.22%	5.17%
Pasture	5.84%	26.82%	24.66%
Heathland	**-72.59%**	**-70.93%**	**-81.00%**
Moorland	**-27.72%**	**-24.3%**	**-31.58%**
Wet pasture	**-48.4%**	**-54.02%**	**-66.9%**
Settlement	31.72%	30.69%	40.6%
Wooded pasture	255.43%	16.81%	220.61%
Wooded heathland	77.25%	13.76%	45.6%
Wooded moorland	17.01%	-3.04%	-29.94%

Conclusion

- Study refers to an arable-forest mosaic of Central Europe
- Losses in habitat proportion
- Interspersion of bushes and trees makes black grouse habitat even more suitable
- Heathland, moorland and wet pasture have to be reconstructed over large areas

Conclusion

Abstract at conference

"Integral protection of forests –Scientific-Technological Platform

Belgrade, 12.12.2007

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Quantification of lanscape changes in a black grouse area in Lower Saxony


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Table 1 – Landscape changes between 1958 and 1975

Type	Comparison Total area	Comparison Maintenance	Comparison Losses
Coniferous forest	5.09%	19.61%	17.89%
Deciduous forest	-21.1%	-22.22%	3.19%
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Wet pasture	-48.4%	-54.02%	-66.5%
Settlement	31.72%	30.69%	40.6%
Wooded pasture	255.43%	16.81%	220.61%
Wooded heathlands	77.25%	13.76%	45.6%
Wooded moorland	17.01%	-3.04%	-29.94%

Results

Black grouse was distributed over 57% of the investigation area in 1958 and 14% in 1975. Our results indicate that most important habitats for black grouse at the landscape scale are heathlands, moorlands and wet pastures. These three habitat types were far more abundant inside the black grouse distribution (5.96%, 12.47%, 6.29%) than in the total investigation area (3.01%, 3.62%, 4.80%).

Proportions of these three potential habitat types changed dramatically within the time horizon of 17 years (table 1). In the situation black grouse were lost from the area, heathlands decreased by 81%, moorlands by 31,58% and wet pastures by 66,90%. Changes in habitat composition inside the maintained distribution were only slightly smaller (table 1). However, inside the maintained black grouse distribution area in 1958, moorland with 12.47% was more abundant than in the lost area (9.26%). Also proportion of wooded moorland was higher in the maintained area in 1958 (1.67, lost area: 0.31%). Percentage increase of arable land is higher in area where black grouse population was maintained, than where it was lost. Reason for this phenomena is difference in surface. Area of arable land where black grouse extinct in 1958 was higher than in areas where it maintained in 1975. The same situation is for settlement – the difference between percentages is not so high as it is in surfaces.

Conclusions

Our study refers to an arable-forest mosaic of Central Europe. It indicates that for a maintenance of black grouse populations over large areas presence of heathland, moorland and wet pasture is of primary importance (figure1). Obviously, landscape changes have affected black grouse distribution heavily.

It is concluded that landscape composition in 1958 seemed to be less suitable in areas that were subsequently lost. This can be seen from lower proportions in habitat and higher proportions in arable land as well as settlement area compared to maintained areas.

Losses in habitat proportion were higher in lost areas. It complies with expectation that areas with more human activities affected negatively black grouse habitats.

In correlation with our results is the conclusion, that interspersion of bushes and trees makes black grouse habitat even more suitable. This can be seen from the higher proportions in wooded moorland in the maintained black grouse distribution area. For the maintenance and recovery of black grouse populations probably more extensive class areas like heathland, moorland and wet pasture have to be reconstructed over large areas.

Introduction

The Black Grouse (Tetrao tetrix) is a demanding species with regard to seasonal habitats, quality of reproduction sites and wintering areas. For central Europe, Black grouse habitats can formally be divided in four groups: dry heathlands, wet pasture/ forest mosaic, peat bog habitats and mountain regions. The black grouse is red-listed in most Central European countries and especially populations in lowland farmland-forest mosaics have been heavily declining during the past decades. For lowland population persistence, conservation measures appear to be crucial that not only considers small-scale habitat features, but also take into account the landscape context. In Northern Germany, continuing afforestation of heathlands and peatbogs are among the most important large scale land use changes that are affecting black grouse populations.

Our study may contribute to a better understanding of the landscape mosaic, necessary for the maintenance of vital black grouse populations.

Method

Object of this paper was to quantify historic landscape changes between 1958 and 1975 in a black grouse area of about 360 km² in Lower Saxony, Germany, for a better understanding of the relationship between landscape changes and black grouse distribution derived from a historic map. Topographic maps were digitised with scale 1:25.000. Digitalization of maps was made in ArcView 3.3 program. Several land cover classes were recognized:

1. Coniferous forest
2. Deciduous forest
3. Mixed forest
4. Arable land
5. Pasture
6. Heathland
7. Moorland
8. Wet pasture
9. Settlement
10. Wooded pasture
11. Wooded heathlands
12. Wooded moorland

Category "Arable land" is presenting all areas which main function is agricultural. In category "Moorland" peat cutting areas were included and category "Settlement" all area with rendered human activities. Main focus was on black grouse habitats as heathland, moorland and wet pasture areas. Land cover proportions were taken for the total landscape as well as maintained and lost black grouse areas. Black grouse areas were derived by buffering core distributions with radius of 2000 meters. Comparison of landscape composition between 1958 and 1975 was made in three categories:

- Comparison of total land area;
- Comparison of distribution area where black grouse populations maintained;
- Comparison of distribution area where black grouse populations were lost.

Example of landscape changes between years 1958 and 1975

Figure 1- Map from 1958

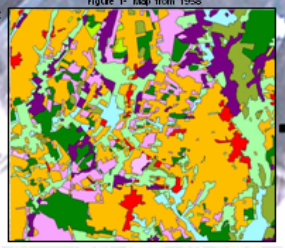
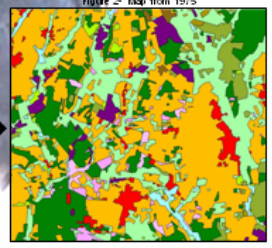


Figure 2- Map from 1975



Legend

Department of Wildlife Ecology and Management; Albert-Ludwig University Freiburg; Tennenbacherstr. 4; 79106 Freiburg; Germany

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Conclusion

Lynx management in Germany

- Literature research

- List of papers

- Key words:
  - Lynx,
  - conservation,
  - management,
  - Central Europe

Modules

- "Introduction to Global Environmental changes"
- "Landscape ecology"
  - "Why Landscape Ecology"
  - "Context for Ecology module"
  - "Concepts module"
  - …

Presentation

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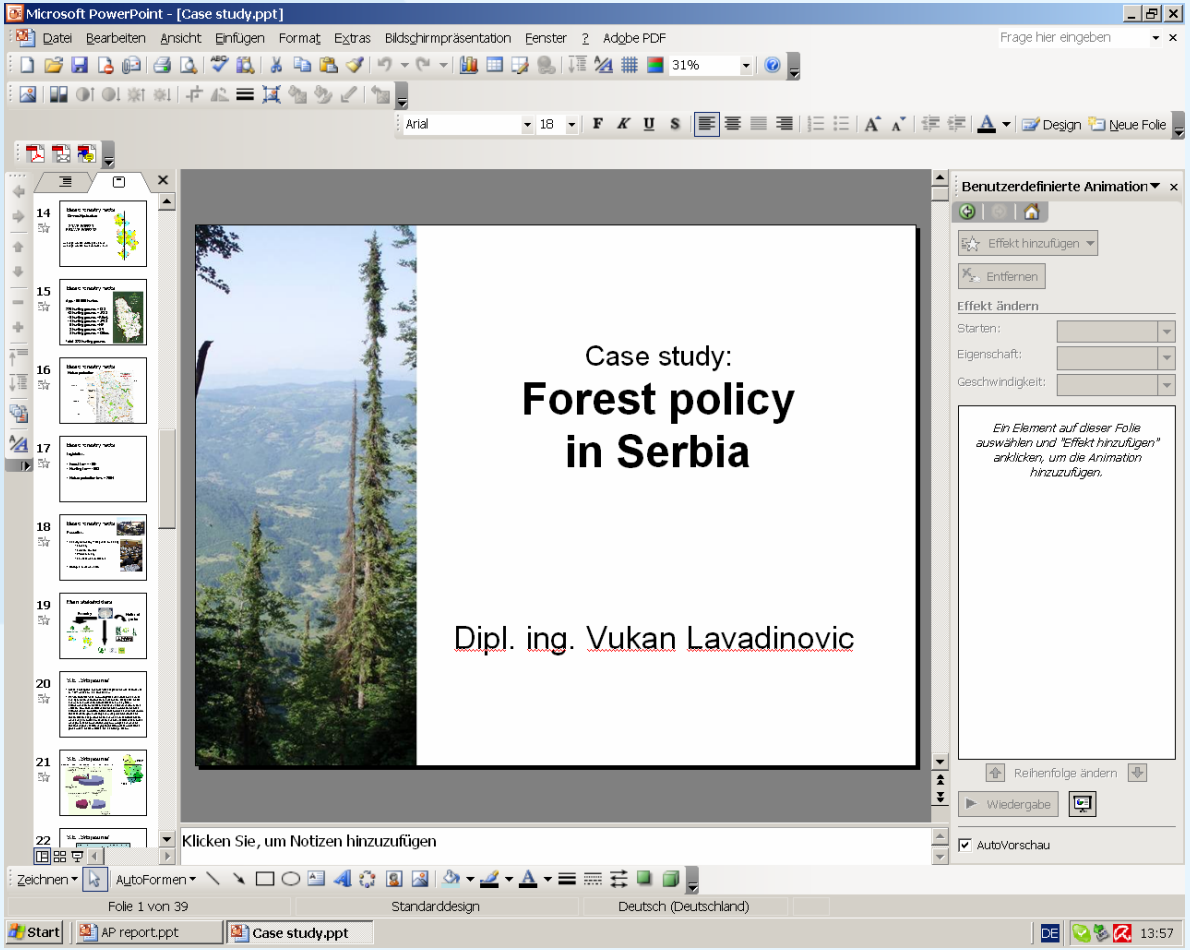

Introduction

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Presentation

- Basic forestry facts
- Main stakeholders
- Reconstruction process
- Ownership structure
- Legislative
- National Forest Program
- National Forest Action Plan

Article

- *“Revija šuma”*
- Swedish forestry

Conclusion

- Gained knowledge
- Practical experience
- New professional contacts
- Nice memories

Discussion

Questions

Remarks

Thank you for...

Thank you for...

Longanimity

Applied period

Courtesy

Patiante

Hospitality

Sharing

Nice meal

Help

Excursion

Teaching

Invitations

Back up

Education

Ἀττέντἰων

Support

Advices

TUTORIAL

Favors

GREAT TIME

Lessons

Nice memories

Instructions

Patience

Kindness

Hospitableness

Memorable experiences

Assistance