

# Transhumance

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## A Tool of Species Conservation in Times of Climatic Change

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# Outline

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# Introduction

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# Transhumance

- is the practice of moving livestock between different rangelands according to the seasonally varying availability of forage
- tends to optimize the pastoral use of two complementary rangeland sites
- in the past has been a widespread form of animal husbandry throughout all of Europe

# Sheep Transhumance

## sheep

- have an extremely high potential of zoochory: serve as the best long-distance dispersal of a considerable quantity of seeds

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- are grazing in different rangelands thus these plant communities are connected

- are distributing plant seeds on different ecosystems and their habitats

- has converted Spain in a place of highest herbage species diversity (3.000 years of transhumant history)

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# Plant Species and Their Habitats

**plant species are**

- specialized to compete under the environmental conditions (EC) of a certain habitat

**habitats are**

- distinguished by certain conditions of climate, exposition, gradient, soil, topography, etc.
- modified consequently to changes of EC

# Species Selection

evolution depends on selection, while

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- certain alleles of a greater fitness increase in frequency (directional selection)
- environmentally more adapted plant species become more common
- selection fits the plant species to EC

# Species Extinction

extinction of species can be caused by

- suffering a lack in reproduction



- reproduction not finding the conditions of a favorable habitat



- plant species are not fit to EC:  
degraded habitats, toxic pollution (modern agriculture), fast changes of EC (climate), etc.

# Climatic Change

## climate getting more extreme

- mean annual temperature rises (up to 6.4°C)
- mean precipitation increases in the tropes, and decreases in the subtropes
- precipitation intensity increases, as well as the periods between rainfall events (□ droughts)
- heat waves will be more intense, more frequent and longer lasting

**global warming:** 25% of all plants and animals might become extinct by 2050

# Concepts of Species Conservation

conservation concepts are in need of

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an uptake of fauna and flora

an evaluation of uptakes

fit the conditions of species existence

create areas of botanically favorable EC  
and of sufficient size

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# natura 2000

## European Union states are obliged to

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- create a concept of conservation of their valuable fauna, flora and habitats
- setup areas as Nature Parks and connect them by a network of Green Corridors
- develop programs of habitat- and species-conservation as well as their monitoring

# Nature Parks

## Nature Parks excel in

- being protected from most human development and pollution
- being placed in largely undeveloped, often feature areas with exceptional native animals, plants and ecosystems
- being placed in developed areas with the goal of returning the area's native state as closely as possible

# Green Corridors

**Green Corridors cope with the task of**

connecting wildlife populations separated by human activities

allowing an exchange of individuals between several populations

lowering inbreedings within each population

re-establishing of extinct populations

# Ongoing Problems in Conserving Plant Species

concepts are endangered by

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setting undersized Nature Parks

isolated Nature Parks being surrounded by  
an ecologically not sustainable economy

small population sizes  inbreedings

quick changes of EC  passing the evolution

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# Transhumant Solution

**the migration of plant species**

- only option to escape from extinction

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**is supported by transhumance while**

- grazing animals are transporting the seeds towards more favorable habitats (EC) and plant communities (sheep epichory !!)

**co-evolutionary adaptation of plants to zoochorical benefits of grazing animals**

# Herdsman

the traditionally accomplished herdsman

- is perfect monitor of transhumant animal moves

has indigenous knowledge of ecosystems and corresponding plant species (e.g., medicinal plants)

- features indigenous veterinary knowledge

- knows the terrain like the back of his hand

# The Eco-Herdsman: a New Profession

herdsman profession gets institutionalized

50% public paid profession (50% traditionally paid)  
for conservation and/or formation services

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- ❑ herdsman's areas of activity and responsibility are enlarged: transhumant monitor, inspector of an adapted use of Nature Parks, guide of ecologic and nature excursionists, etc.

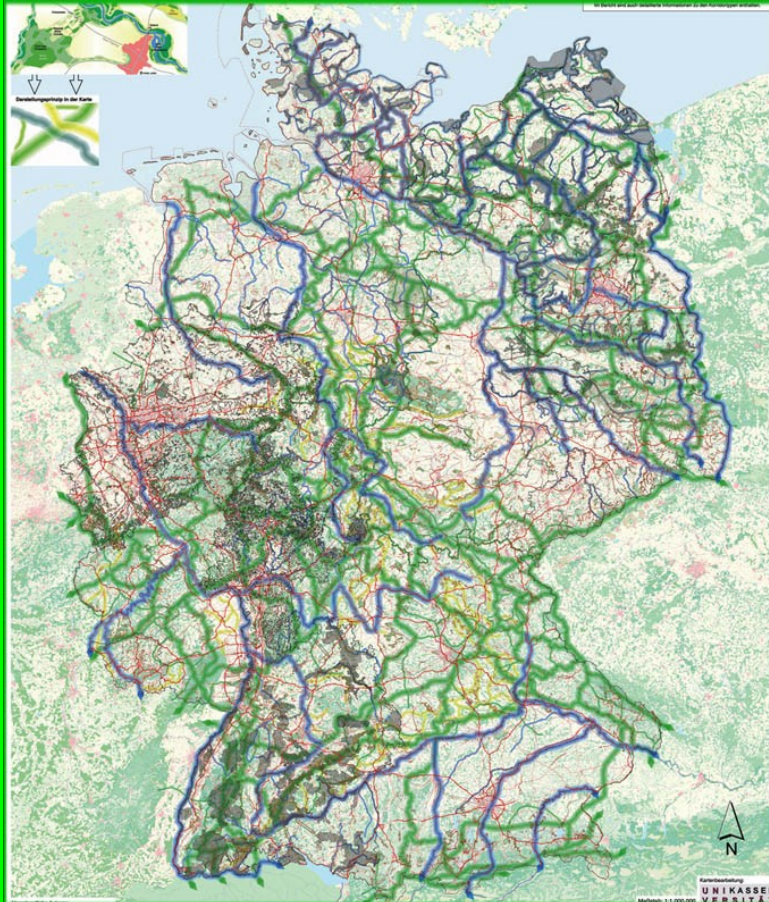
- ❑ academy of rural profession qualifies herdsmen

- ❑ traditional herdsmen teach their knowledge (technically assisted by an academy-master)

# Transhumant Networking: Connecting Nature Parks

- ❑ Nature Parks' botanical and faunistical value is by-monitored by herdsman
- ❑ Green Corridors connect Nature Parks (passing borderlines)
- ❑ in times of transhumant movements Green Corridors are exclusively reserved for livestock
- ❑ official functionaries help the herdsman in technicalities and in formalities

# Transhumant Animal Movements

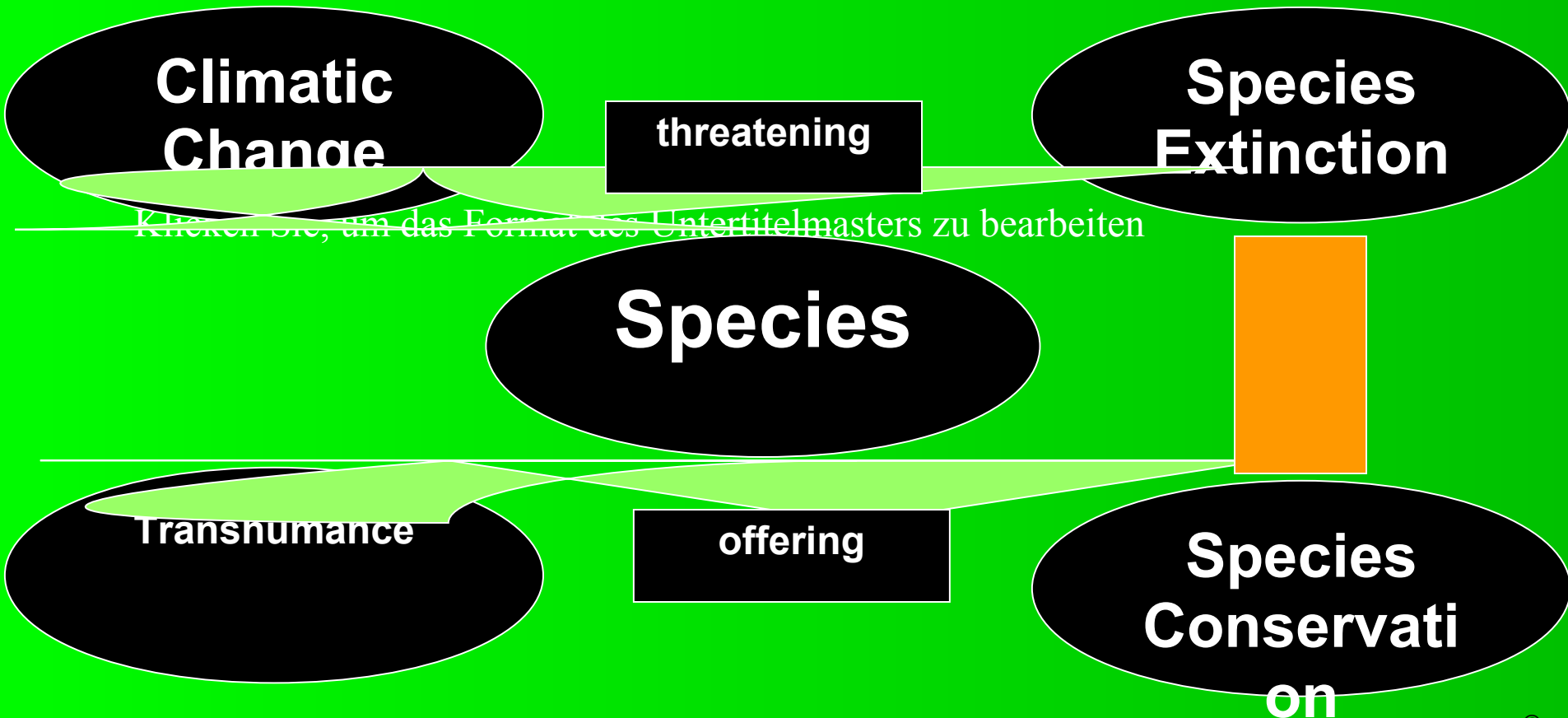


map of Green Corridors  
in Germany

most important rangelands of  
Germany:

- |                          |                     |    |           |
|--------------------------|---------------------|----|-----------|
| <input type="checkbox"/> | Ammergebirge        | BY | 28.861 ha |
| <input type="checkbox"/> | Lüneburger Heide    | NI | 23.473 ha |
| <input type="checkbox"/> | Allgäuer Hochalpen  | BY | 20.798 ha |
| <input type="checkbox"/> | Karwendel           | BY | 19.348 ha |
| <input type="checkbox"/> | Oberlausitzer Heide | SN | 13.000 ha |
| <input type="checkbox"/> | Unteres Odertal     | BB | 10.611 ha |
| <input type="checkbox"/> | Ohre-Drömling       | ST | 10.365 ha |

# Summary



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**Thank you,  
for your interest!**

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