

# Is reintroduction a solution?

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# Content

- Some definitions
- Reasons for an “no”
- Reasons for an “yes”
- Examples from projects
  - Amphibians: LIFE-Bombina
  - Plants: Blütenmeer 2020
  - Insects: Life Aurinia



# Definitions

„Is reintroduction a solution?“

- Reintroduction: resettlement of a specie at a site where it formerly occurred,  
=>Historical distribution data are required
- Solution: a tool to improve biodiversity



# *Reasons for a „no“ answer*

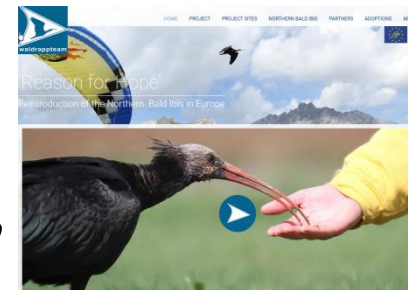
- If reintroduction is possible, destruction of nature is also possible, because that can be turned back.
- Whole ecosystems can not be reintroduced, so the protection of existing ecosystems has priority.
- Reintroduction is only possible for species where the autecology is known.
- Reintroduction is not possible for species where historical distribution data are lacking....or it might be an introduction





# Reasons for a „yes“ answer

- If natural recolonization is not possible a reintroduction might be useful, especially for species:
  - which have important function in ecosystems: as e.g. beaver, vultures, bison
  - which are part of the food chain, as e. g. amphibians
  - which are signal species for good conservation status => LIFE Aurinia
  - which improves the stability of ecosystems,
  - which makes the ecosystems complete again predators
- For the „beauty of nature“, as an value of itself, that humans can enjoy, as e. g. northern balt ibis
- For creation of a genetic reserve population => LIFE Bombina project in Denmark and Germany



# *Preconditions of reintroduction*

- Aim is to achieve a free living, self reproducing vital population
- IUCN criteria for reintroduction:
  - Threads which led to extinction had to be eliminated
  - Sufficient habitat for a vital population is available
  - Habitat can be managed for the needs of the specie
  - Habitats are protected
  - Monitoring of reintroduction success
  - “Fine tune management” for improval of habitat is possible after reintroduction




# *LIFE-Bombina projects in Denmark and Germany*

- Fire bellied toad at the edge of extinction: only small population left in sites with little or no possibilities to improve habitat for a vital population
- Solution: do as much as possible at existing habitats, reintroduce specie to sites which are better manageable as genetic reserve populations
- Clear conservation strategy developed and implemented with habitat complex model and metapopulation concept



Habitat management

# *Bombina habitat complex*

Sub-habitat component	Biological function
Spring foraging pond, rich in insect larvae, near hibernation site	
Sun exposed breeding ponds, meso- to “natural eutrophic” in extensive pastures, without fish	
Summer foraging pond, eutrophic to hypertrophic	
Mud flats under scrub, shallow waters in reeds, half dried ponds	
Deciduous forest, cliffs, stone walls, hedges closed to ponds	



breeding sites  
***Warm and natural clean water***





breeding sites

# *Right plant diversity+structures*





Summer foraging habitat

# *Re-activated woodland flooding*





# Population management: Rearing

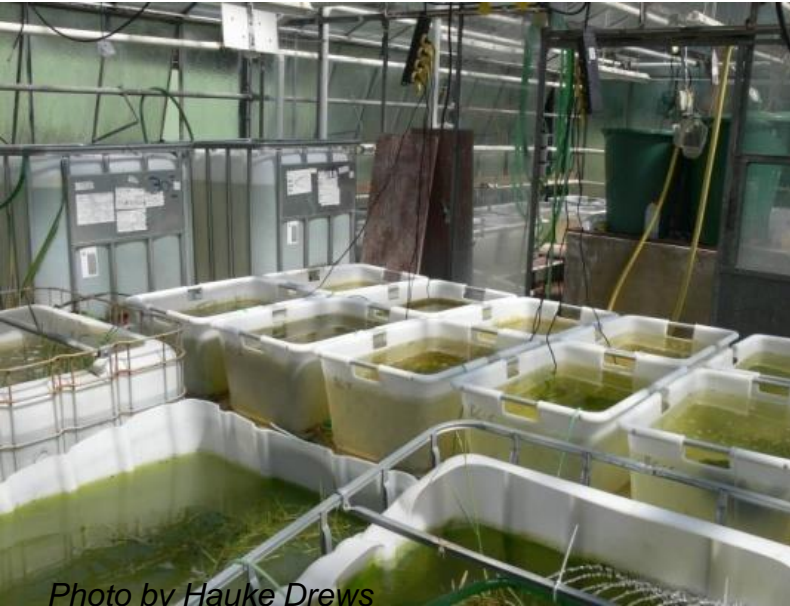


Photo by Hauke Drews



Photo by Wouter de Vries

- **Epiphytic coverings, right food**
  - **Keep tadpoles in good growth 24-7**
  - **Warm water, oxygen**
  - **Keep clean, change water**
  - **Daphnia for biological balance**



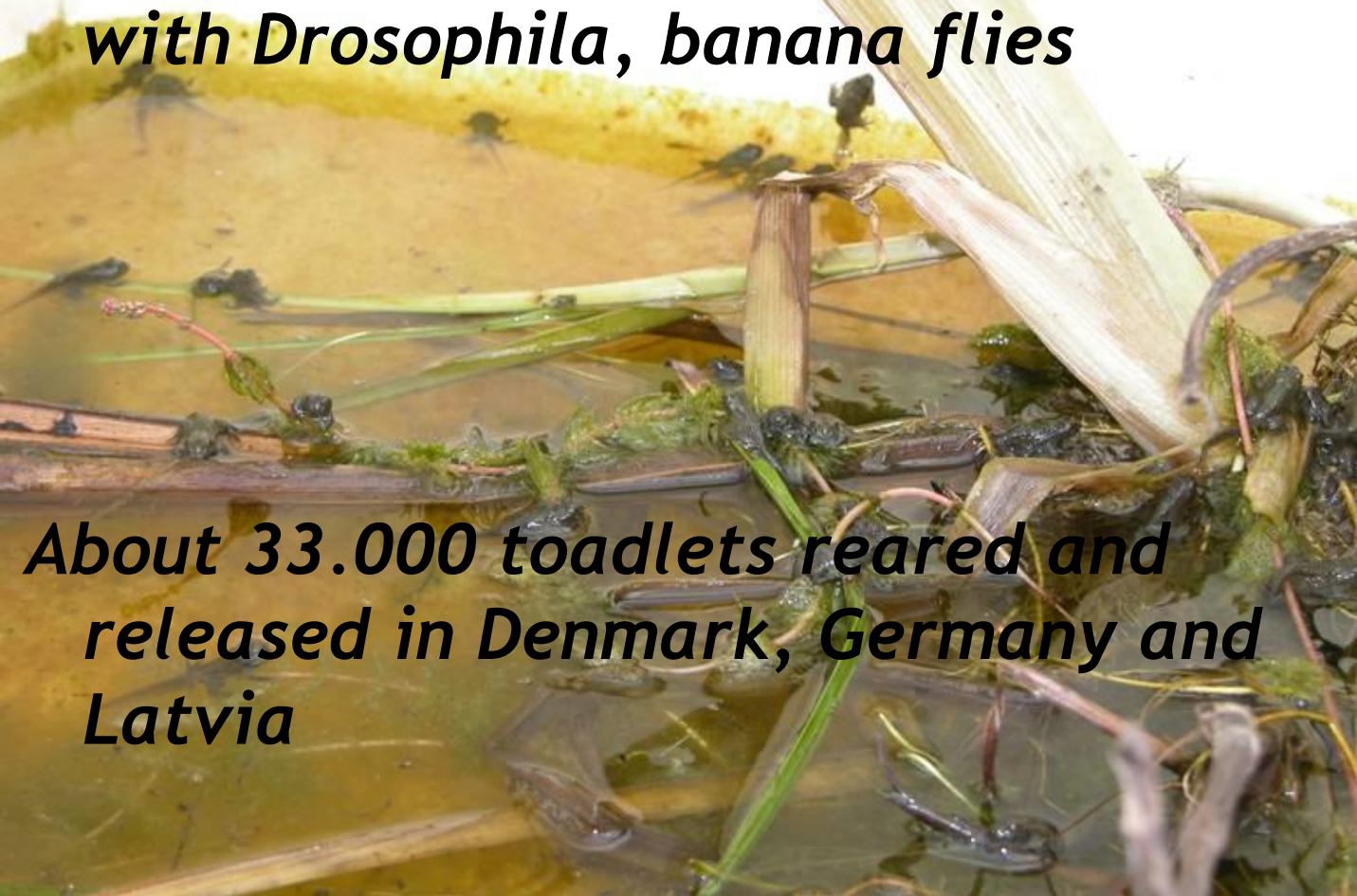
Photo by Birgit Bjerre Laursen





***Rearing: metamorphosed in aquarium***

***Create „shallow pond“ in aquarium Feed  
with Drosophila, banana flies***



***About 33.000 toadlets reared and  
released in Denmark, Germany and  
Latvia***



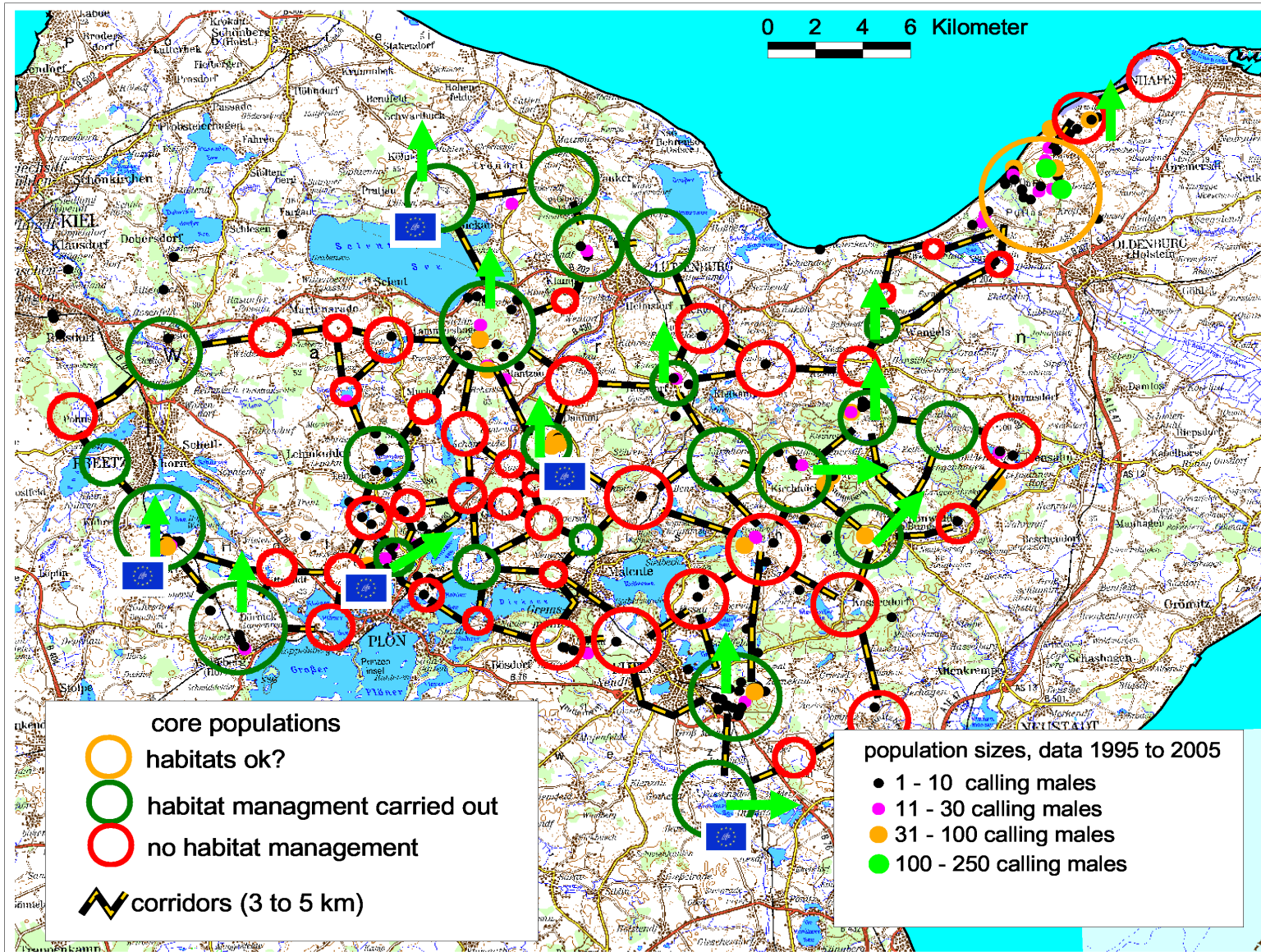
# Results: LIFE Bombina and Amphibian campaign


- **Prevention of extinction and increase of populations by combined habitat and population management was successful**
- **Habitat complex strategy and population management transferred to the management of *tree frog, moor frog, crested newt, spadefoot toad, green toad and natterjack toad* in more than 50 sites and in **SemiAquatic LIFE project**: *sand lizard* at 3 sites**

*After 15 years ongoing campaign: Schleswig-Holstein is the only region/Bundesland in Germany, where negative trends for most of the threatened amphibian species had been turned, due to the good development on nature conservation land.*



# Meta-Population concept



 funded by  
LIFE

 Population  
trend



# Plant management?

## Reasons for loss of diversity in grasslands in SH

- Increase of productivity by replacement of wild plants by highly productive plants, mainly cultural optimized grasses
  - Regular ploughing in 5 years turns and re-sowing by cultural grass (*Lolium perenne*)
  - Conversion to arable land for corn production (bio gas)
  - Herbicides against flowering plants
  - Up to 6 times cutting per season, after each cut: 100 kg/N application
  - Seed bank in the soils are dead after 20 years
  - Edges of fields are effected by nitrate and herbicides also
- => formerly common plant species disappear**



?



?



# Grasslands managed by nature conservation?

- Strategy for improvement for 20 years:
  - Extensive, whole year grazing without fertilization and feeding on site
  - Arable to grassland by natural succession
- Result:
  - plant diversity low in grasslands on former farmland
  - plant diversity increases on former military grounds due to relict populations of rare plants on site
  - Annual dispersal distance for many plants very low (except the wind dispersed) => isolation

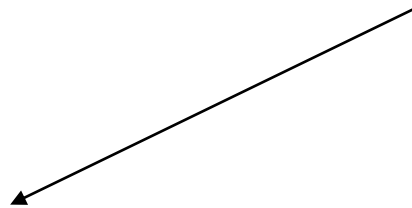
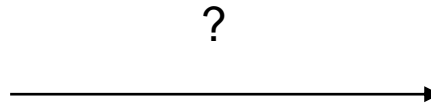




This negative trend can be turned by BLÜTENMEER 2020



Fresh hay transfer on  
former arable field



Postseefeldmark

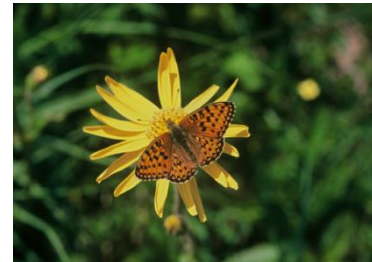
2014 and 2017



# Limited sources (SH)....



- Species rich grasslands lacking
- Rare plants are extinct or in very few populations often only at one or two sites
- About 265 grassland plant species are rare, which are also typical plants of N2000 types
- Grasslands in Europe are the most threatend habitat types





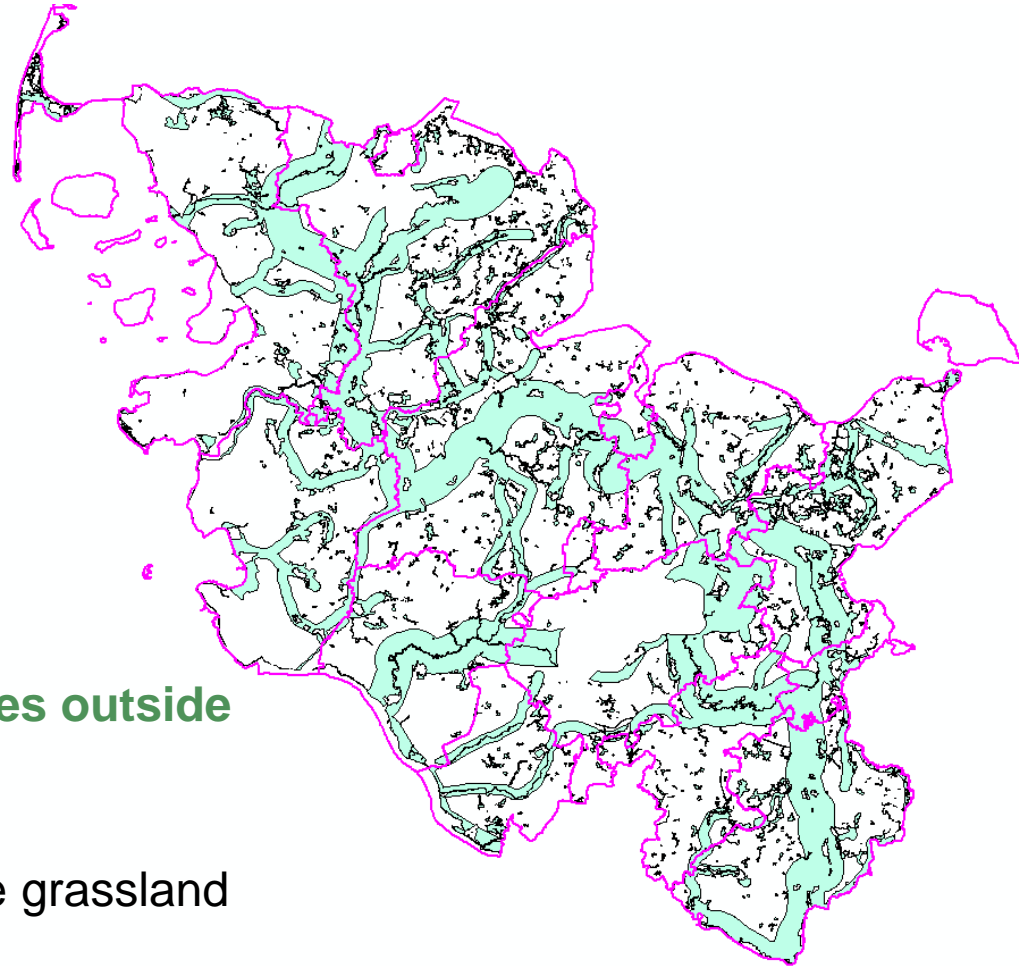
**BlütenMeer2020** one of the biggest  
projects from federal state fund for  
biodiversity

**Volume ~4,2 Mill. Euro (2,9 Mill. from  
program)**

**duration: April 2014 bis März 2020**

**idea: improve the grassland landscapes outside  
from N2000 sites**

„as best-practice-example for large scale grassland  
restoration in Germany“





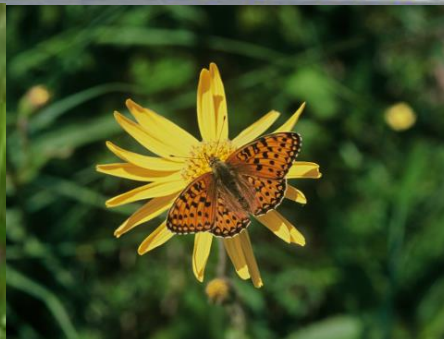


# Ark gardenery



## Tasks:

- Center for rearing endangered plants
- Production of regional seeds : 2018: 95 species in cultivation
- production of potted plants
- developing source sites for fresh hay







## BlütenMeer

2020

Mother plant site  
since 2015

60 plant species  
in mother plant  
culture

=> Seeds and  
potted plants

production





# Federal state concept for regional genetics by defined origins

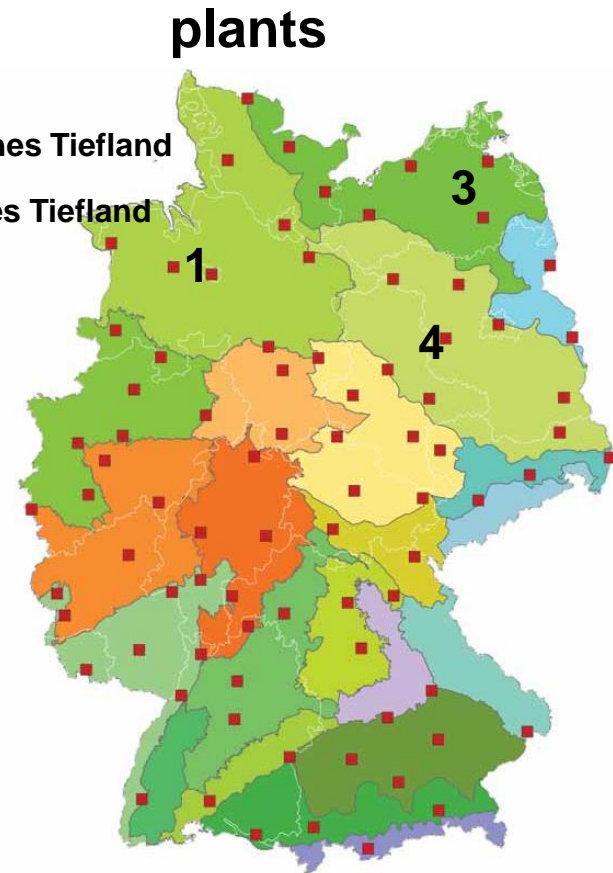
6 origins for trees and scrub

22 origins for grasses and flowering plants



1 = Nordwestdeutsches Tiefland

3 = Nordostdeutsches Tiefland



# Regio seeds and Regio+ seeds?

## Regio seeds

- To be collected and cultivated in the same origin
- Usage only in the same region allowed
- Base mixture with species which occur all over in the origin

## Regio+ seeds

- Regio+ = species with restricted areas in the origin
- Further improvement of diversity by addition of rare plants
- Controlled mixtures for defined sites







**Primula veris L.**  
**Wiesen-Primel**

**Rasterstatistik (Grundraster TK25)**  
TK25 mit Nachweis: 2040 von 3000  
Viertel-TK25 mit Nachweis: 5769 von 11956

Verbreitung der Farn- und Blütenpflanzen in Deutschland; aggregiert im Raster der Topographischen Karte 1:25000 Datenbank FlorKart (BfN) aus deutschlandflora.de (NetPhyD) Datenstand 2013

[kml-Ausgabe Rasterdaten](#)  
[csv-Ausgabe Rasterdaten](#)  
[csv-download AFE-GRID-DATA](#)

**Legende**

Floristischer Status

- einheimisch
- ◆ eingebürgert
- ▼ unbeständig, synanthrop
- ▲ kultiviert
- ? Angabe fraglich
- Angabe falsch

Schwerpunkt des Nachweiszeitraums:

- ◆ ▼ ▲ vor 1950
- ◆ ▼ ▲ zw. 1950 und 1980
- ◆ ▼ ▲ nach 1980

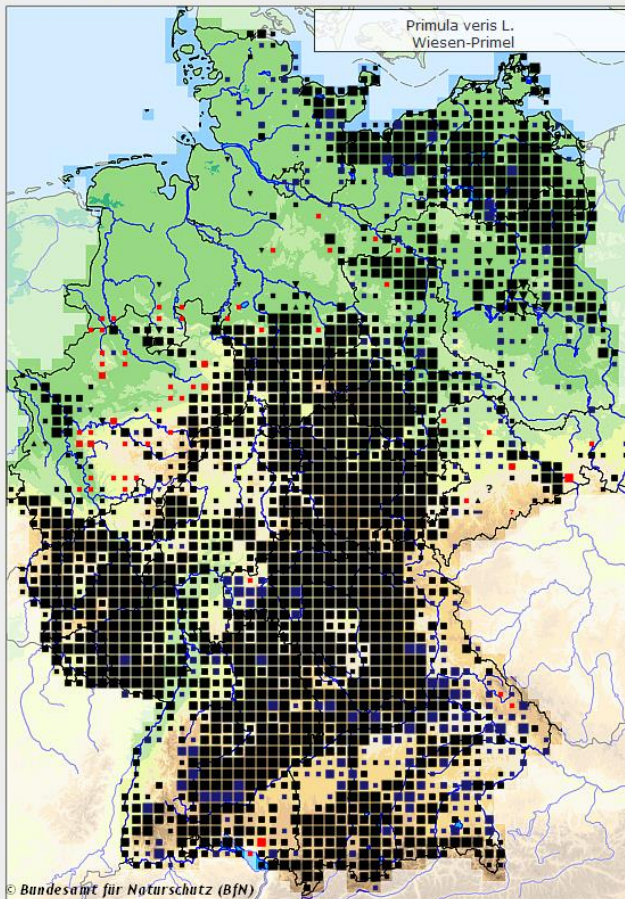
Vorkommen auf der TK25

- ◆ ▼ ▲ in vier Quadranten
- ◆ ▼ ▲ in drei Quadranten
- ◆ ▼ ▲ in zwei Quadranten
- ◆ ▼ ▲ in einem Quadrant

**Optionen**

- Rastergrenzen zeichnen

[Fenster schließen](#)



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Version 1.02 © 2013 - BfN - Web-Realisation: Thomas Schneider, Rudolf May - zuletzt aktuell







April 2017

*Primula veris: planting autumn*  
*2016 Groß Wesenberg (Trave valley)*

Nachwuchs April 2019: Keimlinge und Jährlinge



April 2019



## Results:

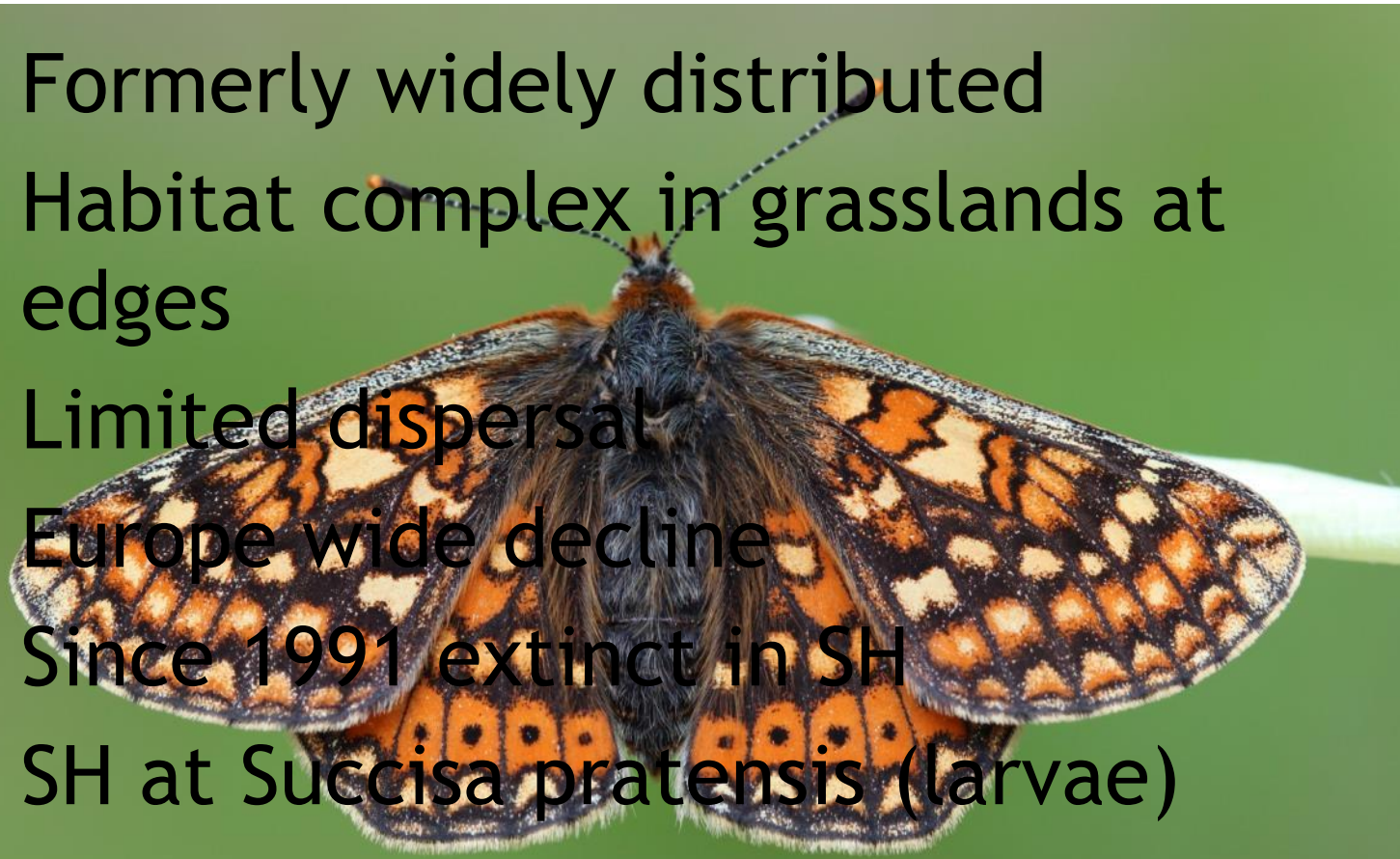
- 60 plant species covered by Ark Gardenerly
- 200.000 potted plants put out
- 250 ha grasslands improved and spreading to 2500 ha in same grazing units expected
- BlütenMeer GmbH: plants, seeds and service from April 2020 onwards
- Contact:  
[wolfgang.heigelmann@stiftungsland.de](mailto:wolfgang.heigelmann@stiftungsland.de)





# *Euphodryas aurinia* - LIFE Aurinia

- Formerly widely distributed
- Habitat complex in grasslands at edges
- Limited dispersal
- Europe wide decline
- Since 1991 extinct in SH
- SH at *Succisa pratensis* (larvae)
- Butterflies at yellow flowers as *Arnica montana*, *Scorzonera humile*





# *project targets*

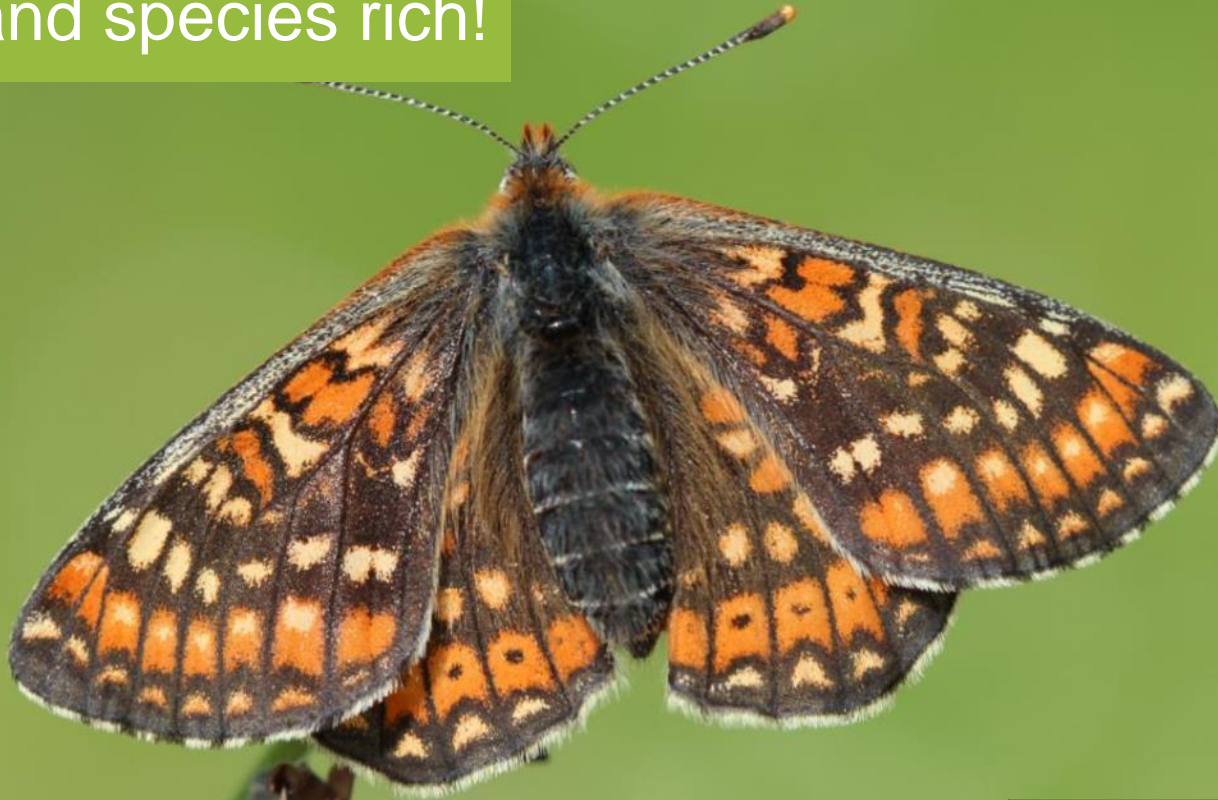


flower rich ...



# *project targets:*

... and species rich!



# Challenges and strategies

- Increase the plant diversity again to a level that all habitats for larvae and imagos are available
  - => missing habitats defined by expert group at each project site
- Different „starting points“ at the project sites from heathland over species poor grasslands to the worst spruce plantation
  - => huge set of actions among them also plant management
- Which source population?
  - => population genetics of museum material in comparison to existing populations in Denmark, Germany and Poland
- When is site ready for reintroduction?
  - => Managed habitats evaluated by expert group at each project site





# Trees and scrub clearing





# Grazing with goats





# Hydro-morphological actions





# From plantation to heathland





# From plantation to heathland





# Sowing



# *Succisa pratensis* for larvae

potted plants for reintroduction





# *Succisa pratensis* for larvae





# Nectar plants: Arnica and Scorzonera







## *Hay transfer: smale scale*



*... large scale*





# Some results



Maßnahmen/Erfolg

# Habitat management

- Scrub/tree clearing: 100 ha
- Hydromorphological measures: 16 ha
- Initial mowing: 83 ha
- Bare ground plots: 26 ha
- Goat grazing: 130 ha,
- New cattle grazing: 70 ha
- Transfer spruce plantation: 16 ha
- Vegetation management:
  - 38 ha sawing of target plants
  - 11 ha fresh hay transfer
  - 117.000 potted plants put out





# Reintroduction of the butterfly

problem:

- *Euphydryas aurinia* cannot colonize, relict population are > 300 km away

solution:

- Reintroduction of larvae and butterflies
- Selected the best source population
- Build up a captivity population



# Reintroduction - impressions





# Reintroduction

- In 2013 300 larvae from many winter nets collected in North Denmark.
- 146 females hatched, layed and they layed about 30.000 larvae (2014)
- 19.000 were released in 2014 before winter and 10.000 in spring 2015
  
- In total
- 100.000 larvae and 1300 butterflys released
  
- Count maximun
- 300 butterflys at one day (Geltinger Birk)
- 300 nets at one day (Reesholm)
  
- Vitale populations at 5 sites established, one site failed



.....so for this specie the reintroduction was a solution....



.....and Denmark has a genetic reserve population for free in

**Germany**





*...for your attention*



**Thank  
youuu  
...uuuh...  
...uuuh...  
...uuuh !**

