

Metapopulation management of arborea and other amphibians in Schleswig-Holstein Germany

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with contributions from

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Amphi Consult



- Stiftung Naturschutz
- Amphibian conservation until 2000
- New strategy
- Amphibian data and status
- Amphibian campaign
- Habitat complex approach
- Meta-Population concept for hyla
- Actions on site: habitat and population management
- Maintaining ponds
- Results
- Funding amphibian work

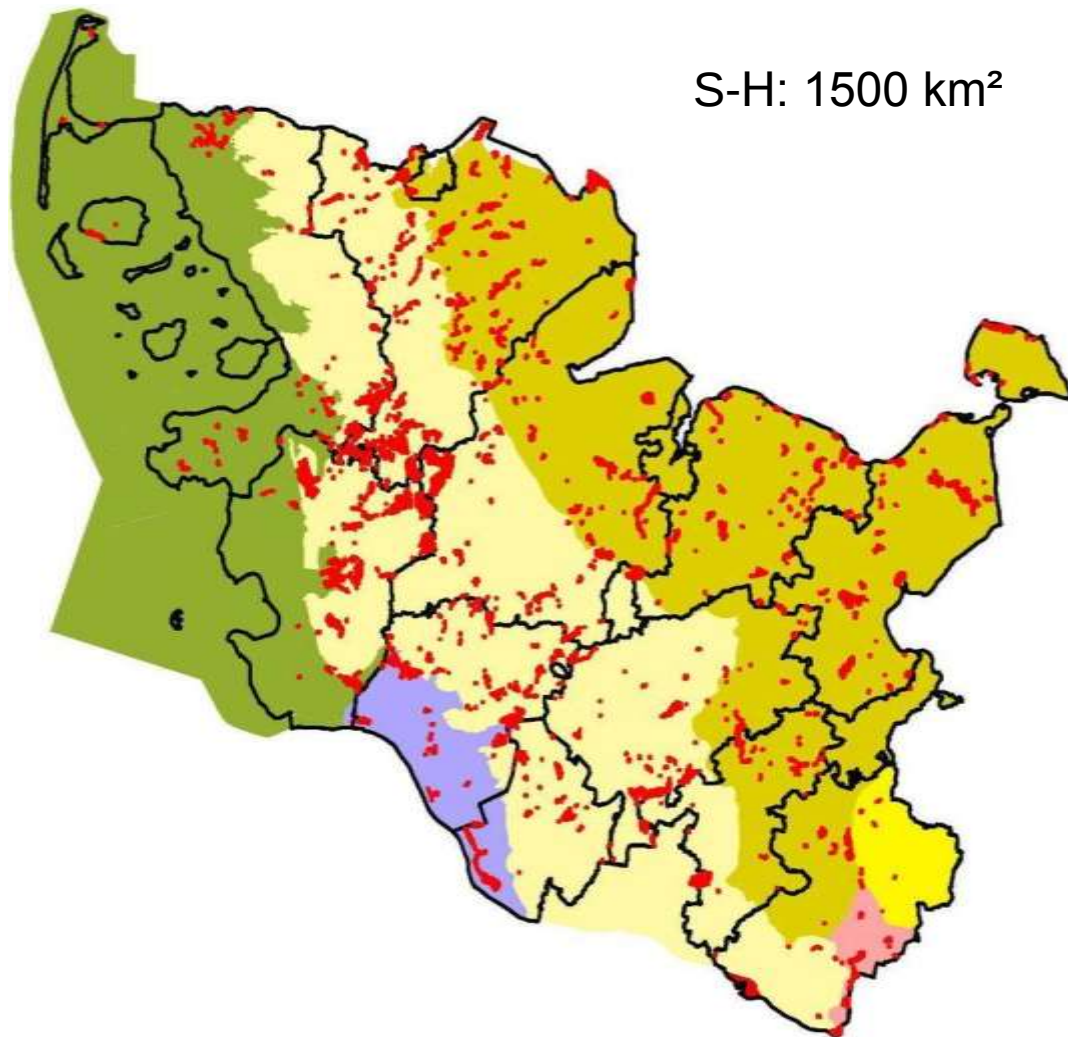




Schleswig-Holstein



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S-H: 1500 km²

- Glacial landscape from east to west: clay hills, sandy plains and wetlands, marsh
- Land use: 70% farm land, 10% woodlands, 5% lakes and rivers, 15% infrastructure
- State foundation for nature conservation in Schleswig-Holstein with 50 employees
- Land purchase for nature conservation since 30 years (red spots) mainly within biotope network plan (15% of area)
- 33.000 ha own land managed for habitats and species (2% of the area)

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15 years of amphibian conservation failed (1985-2000)



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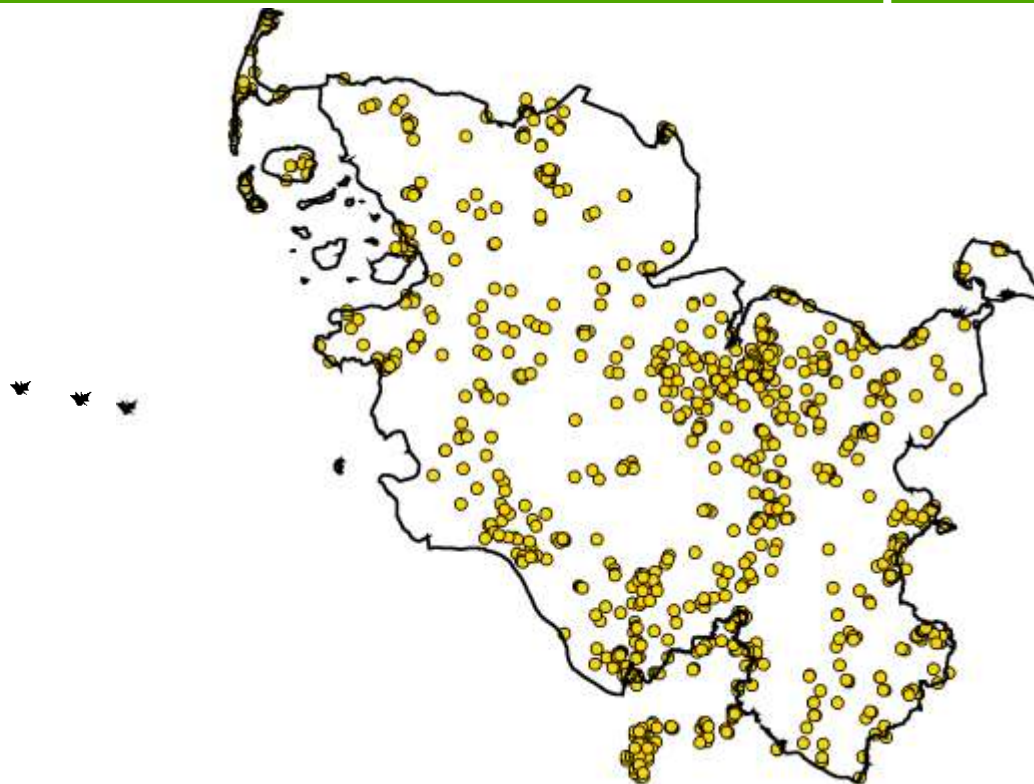
- Lack of precise data: Where are the last breeding ponds of rare species?
 - New ponds were made with agri-env. schemes, where farmers allowed a pond
 - Permission fixed the pond locality on a precise place
 - Monitoring of digging by water engineer (not by biologist)
 - Small populations nearly have no colonization potential
 - Ponds got too fast eutrophicated/ overgrown
 - Single ponds instead pond clusters were created
- ⇒ Only random success for common species and no success for rare species!
- ⇒ New strategy needed: data collection and improved conservation work
- ⇒ Search for successful amphibian management in 2002



- Contact in 2002
- Good examples from amphibian conservation in Denmark:
 - Targeted pond digging for specific species
 - Population management for small populations
 - Organising the land management surrounding the ponds



- 35.000 data in WINART data base (LLUR) since 2000 collected
- Data from 1880 (literature) onwards
- Target species FFH Annex II and IV:
 - Fire-bellied toad
 - Great crested newt
 - Green toad
 - Natterjack toad
 - Tree frog
 - Spadefoot toad
 - Moor frog





Status in 2003 of amphibian species



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- Threatend to extinction: green toad, fire-bellied toad
- Severe decline: natterjack toad
- Decline: tree frog, moor frog,
- Trend uncertain due to lack of precise data: spadefoot toad, Great crested newt
- Rare species: alpine newt, palmate newt (released)
- Wide spread : green frog, grass frog, common toad



....is a campaign for FFH annex II+IV amphibian species, which was started in 2003

Aims:

- Prevent extinction of rare species
- Support small populations
- Enable species to re-colonize natural distribution range



Green toad



Fire-bellied toad



New Strategy



- Support last (core) populations with targeted habitat management actions to prevent local extinction
 - Aims:
 - Enable and increase reproduction
 - Improve survival rate
 - Increase number over individuals up to 1000 adults
 - Provide “surplus” individuals for migration
- Increase the available habitat by pond campaign for threatened species
- Optimize the land habitats and the land use
- Involve experienced biologist from Amphi Consult for daily monitoring of pond digging campaign
- Develop a meta-population concept for each specie

Management of fire-bellied toad populations in the Baltic region



LIFE04NAT/D/000028

Hauke Drews, Niels
Damm and Lars
Briggs



Fire-bellied toad, Klokkefrø, Rotbauchunke (*Bombina orientalis*)



Bombina habitat complex



Habitat component

Biological function

Spring foraging pond

Near hibernation site, feeding, females matures eggs

Breeding ponds, meso- to “natural eutrophic”

Calling males and breeding success (good tadpole survival + growth)

Summer foraging pond, eutrophic to hypertrophic

Adults and juveniles feeding and good survival from predation

Terrestrial foraging habitat

Adults and juveniles feeding, good shelter from predation and draught

Woodland, hedges with stone piles

Hibernation, close to ponds reduce migration losses



Hyla habitat complex



Habitat component	Biological function
Breeding ponds: meso- to “natural eutrophic”, drying up in end July or large water fluctuation with shallow zones	Calling males, fast up heating of the water concentrates a large number of males (good tadpole survival + growth)
Slightly cattle trampling in breeding ponds	Provide “dusty” water were the tadpoles are camouflaged against predators
Broad leaved, structural divers vegetation in the surrounding meadows of the pond in end of June, optimal bramble scrub	Gives shelter and first land habitats for fresh metamorphosed (no mowing at that time, only grazing!)
Hedges, groups of trees, southern exposed forest edges, sunny inner forest edges	Terrestrial foraging habitat, save migration
Woodland, mammalian dens?	Hibernation sites



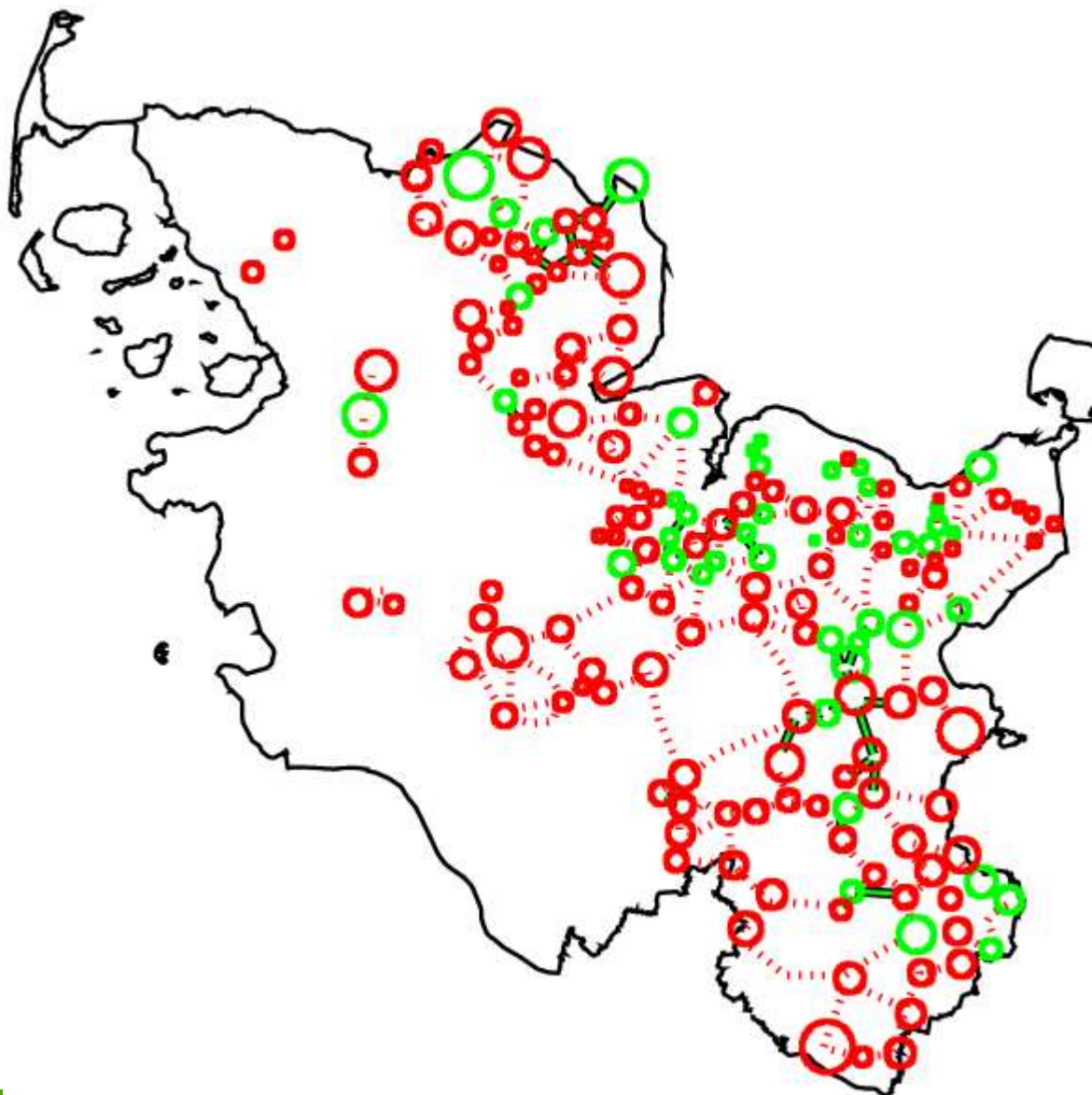
Typical landscapes



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Green circles: Habitats suitable

Red circles: habitat improvement recommended

Red dots: Korridor does not function

Green line: Korridor in function (dispersal of hyla monitored)



Pond digging



Blomnath 2004: 20
calling hyla males

Spring 2014: more then 500 calling hyla in 10 ponds





Creation of ponds



- Test holes: soil, water level
 - Test ditches: soil in pond bottom, definition of edges, size
 - Defining water quality by special measures:
 - clay work,
 - putting incoming drainage in a closed pipe around a pond,
 - reducing catchment of a pond
- => Pond creation is experts work, especially in degraded landscapes for threatened species, where there is limited space for ponds



Test holes



Former temporary pond





Test holes



Former kettle hole or pot hole pond

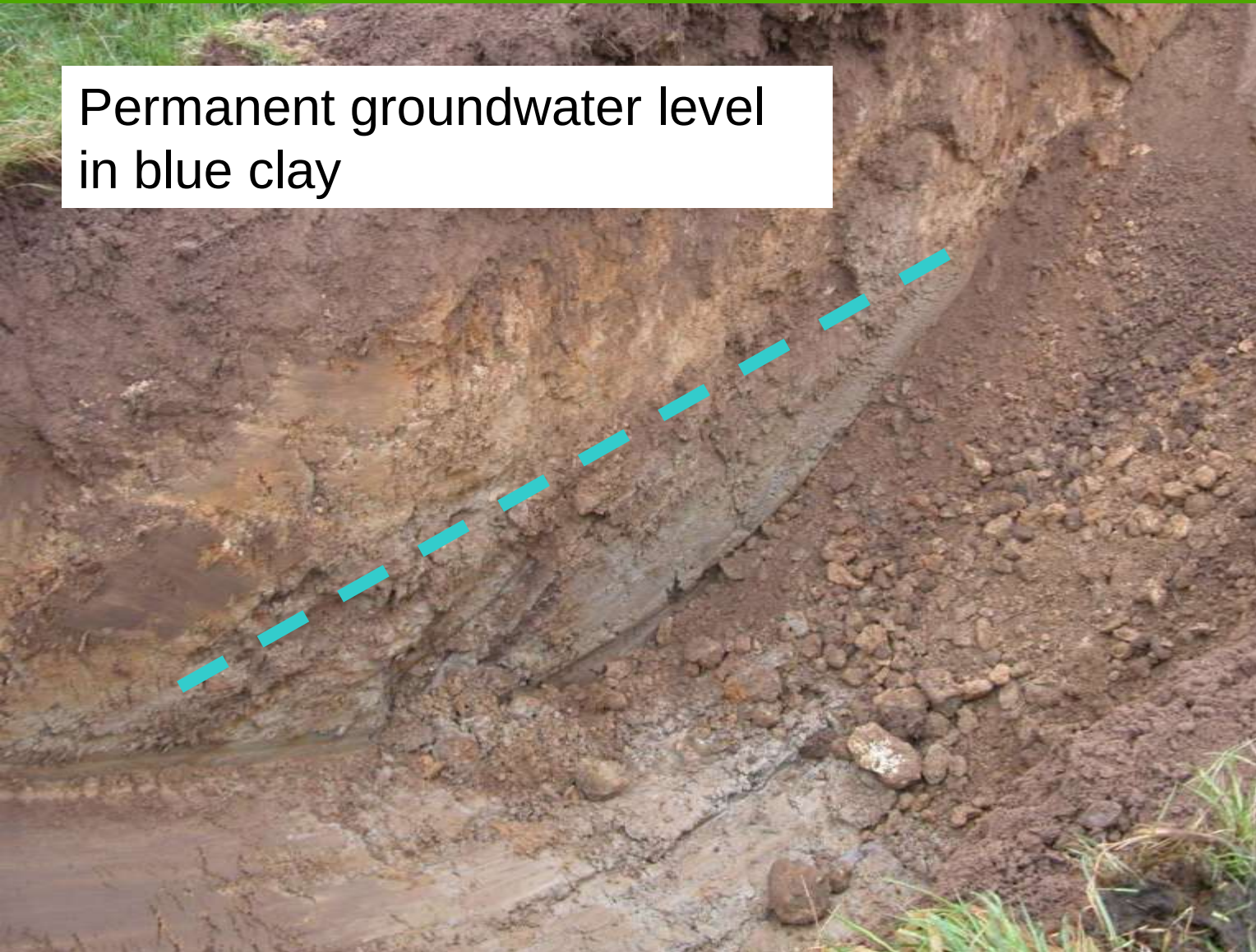




Test holes



Permanent groundwater level
in blue clay





Test ditches



27/03/2007 15:49



Test ditch





Test ditches as cross





Habitat management

U-shape dams in the soil

invented by Peer Ravn, Amphi Consult



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Habitat management

U-shape dams in soil



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Ponds on nutrient rich soil





Removing topsoil





Habitat management

Removing topsoils 2004



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Bungsberg



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- Removing drainage
- Excavate topsoil above drainage
- Avoid phosphorus release from peat: cover pond bottom partly with clay





Leave old pond bottom!!!



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....and do not break blue clay pond bottom



Seed bank





Creation of flooding



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Sirksfelde 2004



Sirksfelde 2014: uncountable Hyla calling
on 3 ha of temporary flooding



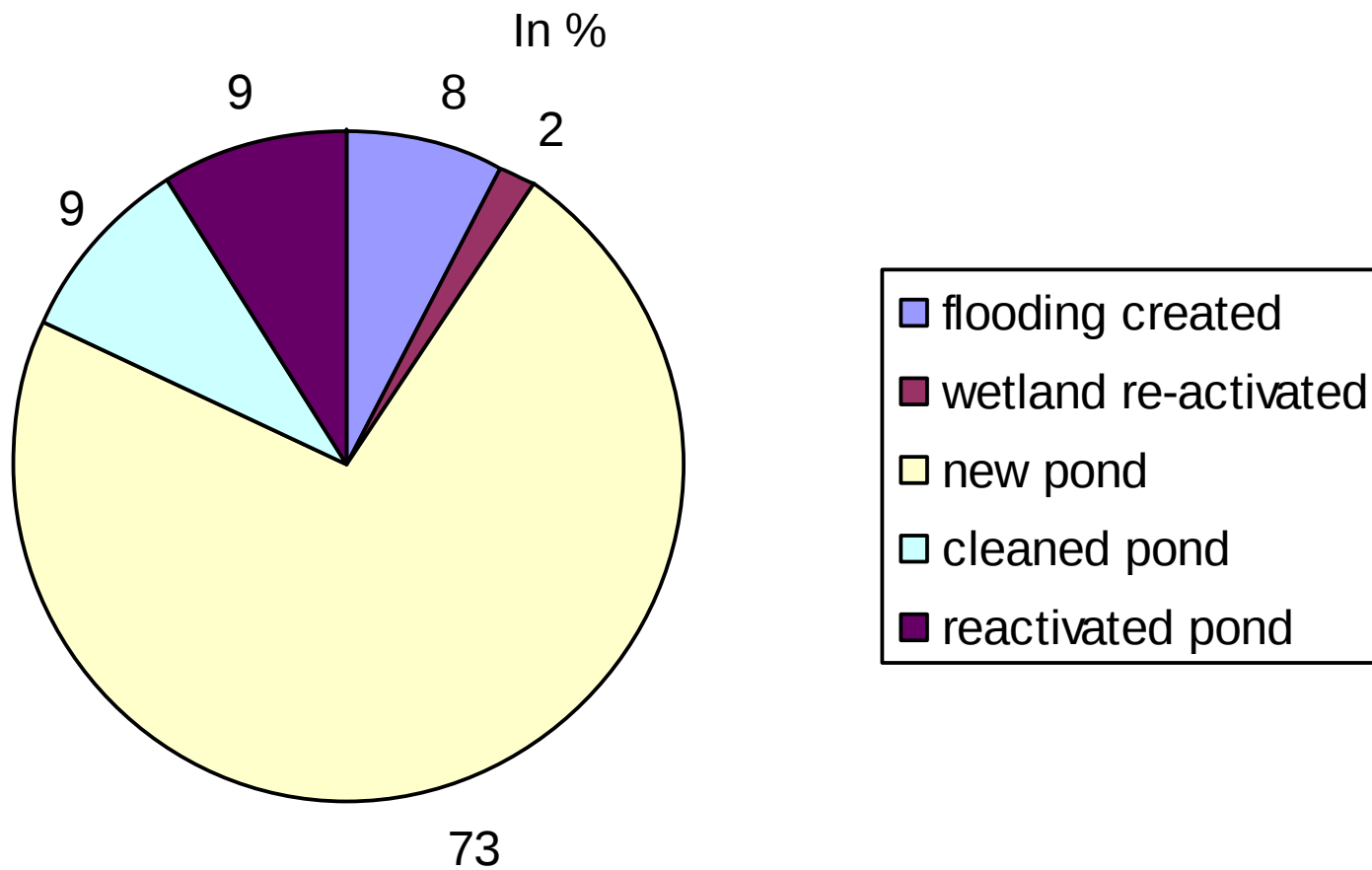
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Pond campaign since 2004

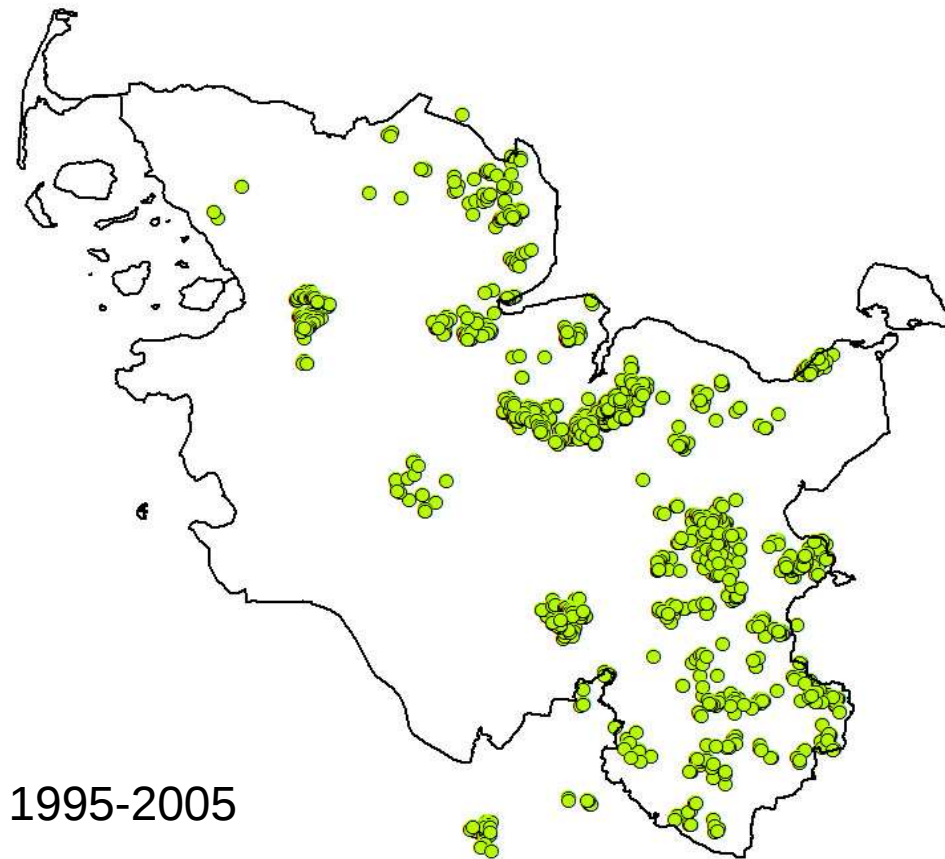


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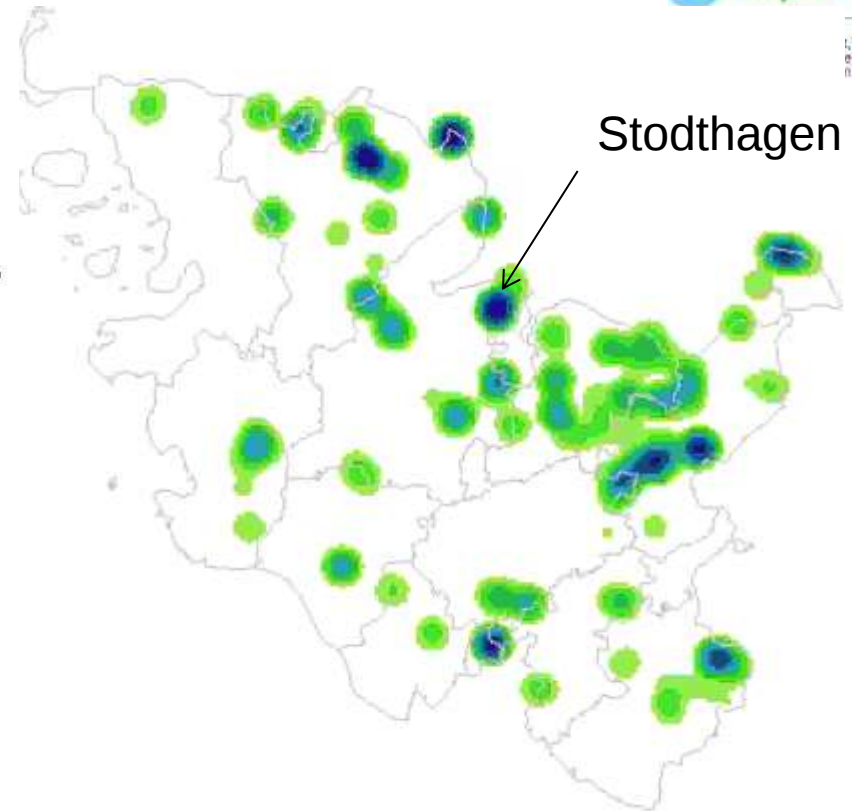


Amphi Consult

Landwirtschaft,
nat. ländliche Räume
Schleswig-Holstein



1995-2005



the darker green-blue - the more ponds



pond cluster Stodthagen (2005)



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Why and when use population management?



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Why:

- *Rearing is a valuable tool to recreate a population in good conservation status when it is clear that improval of habitat is not enough to reach the goal.*



When:

- *Rearing must follow creation or re-creation of good habitat and can not stand alone.*
- *The threats that resulted in decline or extinction must be eliminated.*
- *Close monitoring of results of release of reared animals and follow up with habitat management if needed.*

- For reintroduction:
- Source population: small, with about 20 callers in 4 km distance
- Campaign over 3 years (07-09)
- Total release of over 3000 young hyla
- Financed by CAP,II (Rural development funds): 25.000 € via Ministry of agriculture, environment and rural areas
- In 4th year after release: first reproduction
- 2013 uncountable number of hyla all over





pond cluster Stodthagen (2013)



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Maintaining breeding ponds

- *Typha latifolia* and *Salix*-scrub: fast establishment by wind spread seeds
 - *Juncus effusus*: shading of shallow zone of the pond which is needed as foraging area for young fire-bellied toads
 - *Phragmites australis*: Shading out all shallow zones in a pond
- ⇒ Overgrowing of new dug or restored ponds within 3-5 years





Grazing - Why robust grazers whole year?



- *Typha latifolia* is grazed in late summer when it is hot and cattle step into the pond for cooling
- *Salix* scrub is grazed in early march when flowers start to grow by de-barking!
- *Juncus effusus* is grazed after frost mainly in Jan/February
- *Phragmites australis*: shall be grazed during growing phase in spring, trampling of roots is also effective
- Dairy cattle avoid soft ground, if they can





Grazing for breeding ponds



- per ha: approx. 0.5 to 0.6 animal units
- Pond bank length per animal unit: 70 -100 m



- 2003: Red list S-H:
“threatened (RL 3)”
- 2014: according to N2000 evaluation scheme in „good conservation status“:
 - More sites (occurrences) with *hyla arborea* compared to 1992
 - 92% coverage of the historical distribution range (quadrants of planning sheets)
 - dispersal from core populations is ongoing as from Geltinger Birk
 - Migration distance: 5-10 km



Geltinger Birk 2014





Financing such projects



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- Ministry of Agriculture, Environment and rural areas funding via CAP “rural development funds” : directly targeted actions to improve of populations: pond digging, land habitat management, population management: 4 Mio. € since 2004
- LIFE-Bombina project: 1 Mio. € in Germany
- Within LIFE-Baltcoast project: 355.000 € for Green toad and Natterjack toad in coastal habitats
- Compensation agency: since 2008 40 projects were started also for amphibians including a translocation of a natterjack toad population to a new created site: 400.000 €
- Private donations up to 100.000 € (came due to PR work: frog concerts, bombina song contest)



...for attention



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**Thank
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...uuuh !**

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