

Aquatic and terrestrial habitat restoration and effect in ECONAT LIFE09 NAT/LT/000581 . Lars Briggs, Amphi Consult



Contect

- Methods of restoration
- Effect on *Hyla arborea* population
- Effects on Invertebrates on the habitat directive.
- Recomendations for conserving the aquatic habitats in the corridors in future.

Many pond edges are overgrown with bushes



After bushes. Easy to do on the ice



Some deeper exsisting ponds are only cleared of bushes from south side.



The roots must be dig out to have a longer effect.



Aquatic and terrestrial restoration one picture for *Emys orbicularis*



Poen made in wet depressing. Black soil, turf and mud spreaded on fields







The follow pictures show example of results on pond projects

- First picture is a pond dug in LIFE 2004-2008 project inside area with cattle farm



Small cattle pond near Petroškos. *Emys orbicularis*, calling *Hyla arborea*, *Leucorrhinia pectoralis*

Next pictures from
LIFE ECONAT 2009-2013



4-5 year old pond near Petroškos. *Dytiscus latissimus*, *Leucorrhinia pectoralis*. Well developed floating and riparian vegetation.



4-5 year old pond near Petroškos. *Leucorrhinia pectoralis*. Not much vegetation. Might be an important invertebrate pond in 3-4 years from now.



Newly restored pond. *Leucorrhinia pectoralis*. Already breeding site for *Leucorrhinia pectoralis*. Note that some of the original *Carex* vegetation is still present.



Newly restored pond. *Leucorrhinia pectoralis*. Already breeding site for *Leucorrhinia pectoralis*. Note that some of the original *Carex* vegetation is still present.

Nest site maintained with grass cutting and removal



Aquatic and terrestrial restoration one picture for *Emys orbicularis*



Inventories of species on the habitat directive in ECONAT LIFE09 NAT/LT/000581 .



Amphi Consult part of the final Inventories of biodiversity 2014

- Amphibians inventoried by dip netting in all 164 pond project sites.
- *Hyla arborea* calling male survey 2014.
- Invertebrates inventories in 60 not restored habitats and 30 restored habitats.

Key result for *Hyla arborea*

- The whole population is in increase.
- Calling in some of the new pond along the border to Belarus.
- Spreaded northwards and colonized amphibian and turtle ponds in Petroskai Forest.

Survey of Aquatic insects in Econat

- 60 lakes and floodings + approx. 30 ponds
- Conducted in the first two weeks of May 2014, by Lars Iversen. PHD in Amphibian Consult and Copenhagen University as supervisor.
- Dipnetting and observing adult dragonflies around the aquatic habitats
- ITS A PICTURE OF THE AQUATIC INSECTS IN CORRIDORES IN 5 YEARS TIME IN 160 RESTORED PONDS COMBINED WITH REST OF LAKES AND WETLANDS.

The Lithuanian Aquatic insects on the habitat directive*

Dragonflies:	Annex	Found in Econat
Aeshna viridis	IV	
Leucorrhinia pectoralis	II+IV	x
Leucorrhinia albifrons	IV	x
Leucorrhinia caudalis	IV	x
Sympecma paedisca	IV	x
Beetles:		
Dytiscus latissmus	II+IV	x
Graphoderus bilineatus	II+IV	x

**Only species from standing waters are listed*

Leucorrhinia pectoralis – annex II +IV

- Found in 37 % of the localities investigated.
- Very abundant in carex floodings and smaller ponds in the vicinity of these.
- The population seems to be in a favorable condition



Leucorrhinia caudalis – annex IV

- Found in 6 permanent lakes.
- Abundant in mesotrophic lakes with well-developed submerged vegetation.
- The population in the ECONAT region is likely in a favorable condition.
- In the future the species might be threatened by eutrophication of the larger lakes in the region



Leucorrhinia albifrons – annex IV

- Found in 5 permanent lakes and 2 floodings.
- Present but not abundant in floodzones in lakes and carex floodings with well-developed submerged vegetation.
- In the future the species will likely be threatened by eutrophication and drainage of shallow zones around lakes



Sympecma paedisca– annex IV

- Only one record from a vegetated pond
- The species must be surveyed in April in order to get a proper impression of the status and distribution in the area.
- Thus the conservation status of the species still unknown in the area.



Dytiscus latissimus – annex II + IV

- Found in 2 permanent lakes and 1 pond.
- Present but low abundant in clean lakes with well-developed submerged vegetation.
- Found in one pond close to a larger alder swamp.
- The status of the species in the area is considered unfavorable.



Graphoderus bilineatus – annex II + IV

- Found in 12 permanent lakes and carex floodings.
- Present in habitats with well-developed submerged vegetation and large floodzones.
- The status of the species in the area is considered favorable.
- Future threads include dranaige of flood zones and isolation due to fragmentation



Keystone habitats – Permanent lakes



Keystone habitats – Permanent lakes

- Containing source populations of many habitat species

Threads: Eutrophication, drainage of floodzones, isolation due to fragmentation.

Actions: Minimize nutrient inlet from the surrounding landscape, enlargement of shallow bay areas.

Keystone habitats – Carex floodings



Keystone habitats – Carex floodings

- Containing source populations of many habitat species, acting as stepping stones in the landscape

Threads: Eutrophication, drainage of floodzones, isolation due to fragmentation.

Actions: Minimize nutrient inlet, blocking drainage, enlargement of shallow flooded areas.

Keystone habitats – Ponds



Keystone habitats – Ponds

- Acting as stepping stones in the landscape, containing (reserve) populations of many habitat species

Threads: Eutrophication, Overgrowth, drainage and filling, isolation due to fragmentation.

Actions: Minimize nutrient inlet, creating natural banks, digging new ponds.