



LITHUANIAN
FUND FOR
NATURE

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Management of European pond turtle habitats in Lithuania



Pond turtle status and problems in Lithuania

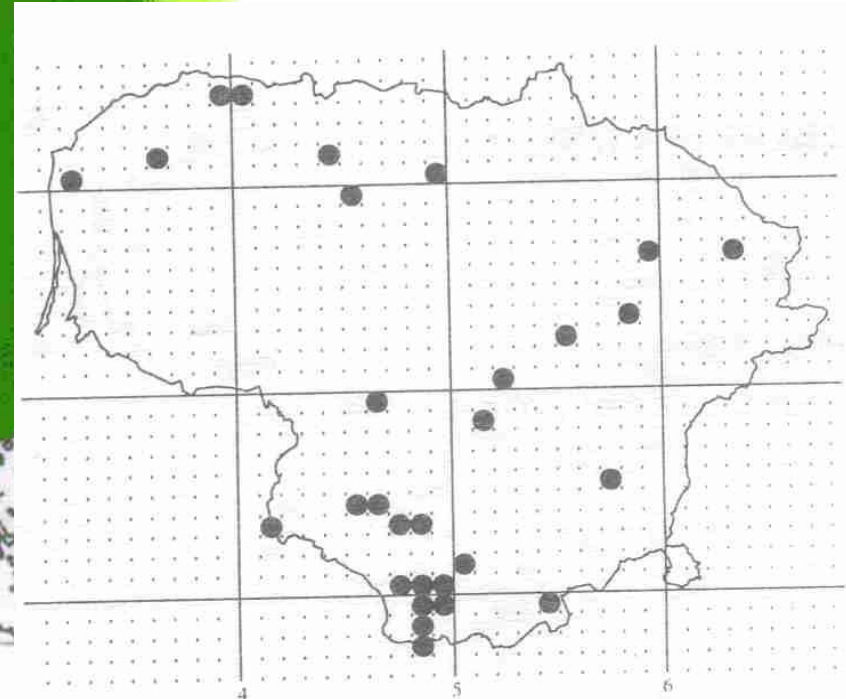
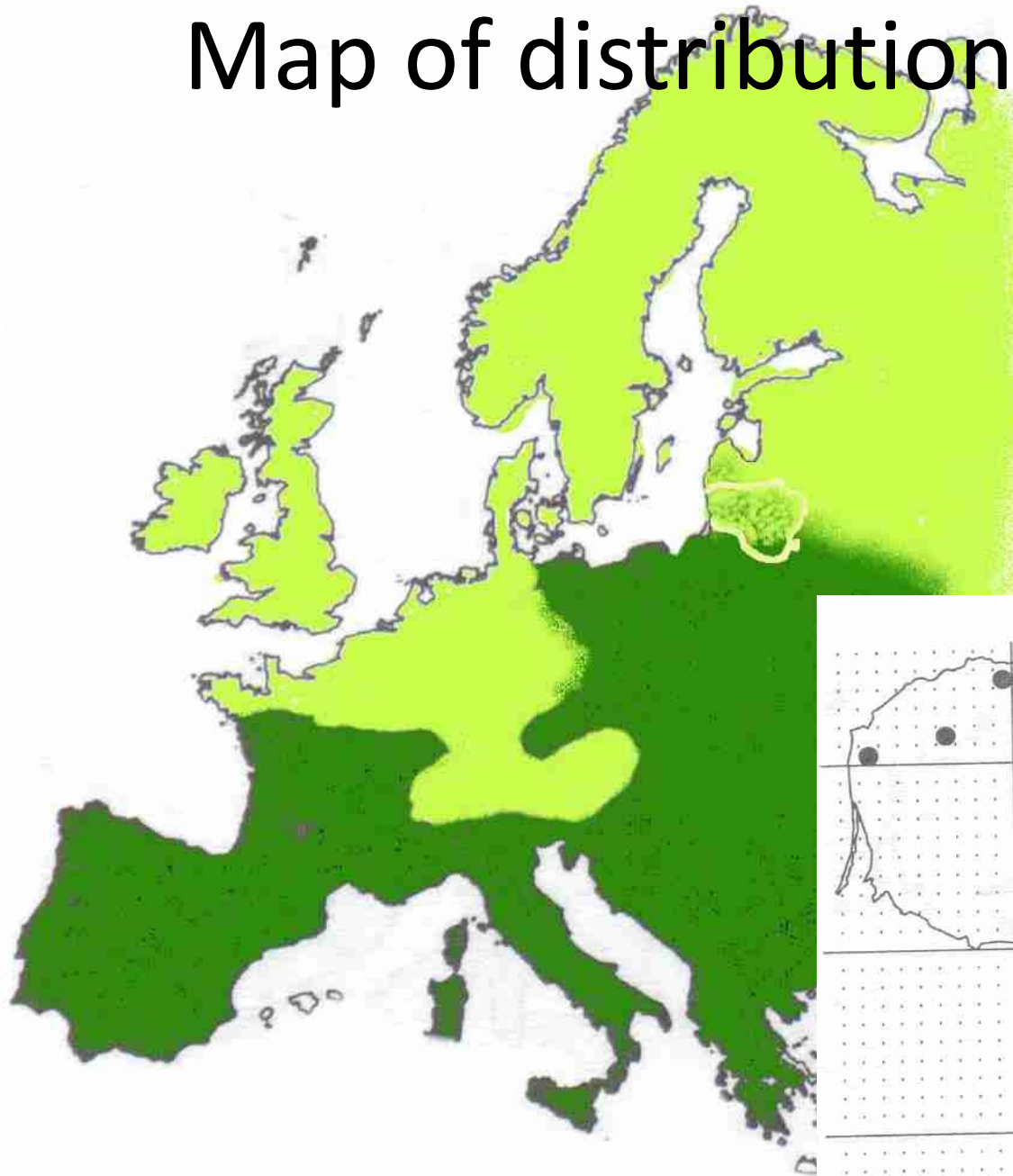
Implemented projects

Results and continuation

Pond turtle metapopulation

- There are about 300 turtles (red book, 2007)
- 7 natura 2000 sites with about 20-40 individuals per site in Southern part of Lithuania
- In Latvia small population in very southern part on Lithuanian border

Map of distribution



Project area		<i>Emys orbicularis</i>	<i>Bombina bombina</i>	<i>Triturus cristatus</i>
L03 Petroskai	2005	Conservation status 2 > 30 individuals (adults, subadults and juveniles)	none	Conservation status well
	2008	Conservation status 2 > 30 individuals (about 15 subadults and juveniles)	Conservation status medium > 10 calling males	Conservation status well
	2013	>30 individuals. observed in 2 restored ponds	>10 calling males in 3 ponds	
L04 Meteliai/ Juodobale herpetological reserve	2005	Conservation status 2 >40 individuals (adults, subadults and juveniles)	Conservation status medium Only one breeding pond,	Conservation status 3
	2008	Conservation status 2 > 40 individuals (adults, subadults and juveniles)	Conservation status well Several breeding ponds now	Conservation status medium Only one pond
	2013	> 40 individuals (adults, subadults and juveniles)	Conservation status well Several breeding ponds now	Conservation status medium Only one pond
L05 Kuciuliske	2005	Conservation status 1 60-70 individuals (about 50 adults and about 15 juveniles and subadults)	Conservation status medium	Conservation status well
	2008	Conservation status 1 > 70 individuals (> 50 adults and > 20 juveniles and subadults)	Conservation status medium	Conservation status well
	2013	Conservation status 1 > 80 individuals (> 50 adults and > 30 juveniles and subadults)	Conservation status medium	Conservation status well
L06 Straciunai/ herpetological reserve	2005	no evidence	none	none
	2008	no evidence	none	none
L06 Straciunai/ turtle pond	2005	Conservation status 3 about 20 individuals (mostly adults)	none	none
	2008	Conservation status 3/4 about 20 individuals (mostly adults)	Conservation status medium – 1 pond with 5-7 calling males	none
	2013	Conservation status 3/4 about 20 individuals (mostly adults)	Conservation status medium – 1 pond with 5-7 calling males	none
L07 Bestraigiske	2005	Conservation status 3 about 20 individuals (mostly adults, no juveniles)	none	none
	2008	Conservation status 3 about 20 individuals (> 16 adults, at least 2 subadults, no juveniles)	none	none
	2013	Conservation status 2 about 30 individuals (> 16 adults, at least 2 subadults, 10 juveniles)	none	none

Conservation status

- **Individual numbers for conservation status of *Emys orbicularis***
- **1** > 50 individuals P favorable on long term (>20 years)
- **2** 30-50 individuals P favorable on short term (10-20 years)
- **3** 20-30 individuals P unfavorable (too small populations or declining)
- **4** 10-20 individuals P highly unfavorable (too small populations, declining and too small reproduction success)
- **5** < 10 individuals P nearly extinct (no or too small reproduction success)
- **6** - 0 individuals P extinct

Identified threats:

1. Habitat fragmentation and migration barriers,
2. Loss of water bodies,
3. Overgrowth of water bodies,
4. Loss of nesting areas,
5. Lack of hibernation places,
6. Loss of terrestrial habitats,
7. Intensive agriculture,
8. Predation on nests,
9. Fish introduction,
10. Lack of public environmental awareness,
11. Lack of international co-operation.

The measures are:

1. Pond digging and restoration,
2. Improvement and creation of turtle nesting sites,
3. Creation of hibernation sites,
4. Establishing a grazing management,
5. Management of terrestrial habitats,
6. **Rearing of turtles to support small populations,**
7. Small-scale genetic investigation in order to separate authentic turtle populations from genetically polluted populations in West-Poland and Germany,
8. Education of experts and the public

Projects

- Restoration of turtle habitats
 - In 1999-2000
 - UNDP small grants programme
 - Value – about 30,000 Euro
- LIFE NELEAP LIFE05NAT/LT/000094 »Protection of European pond turtles and amphibians in the northern European lowlands"
 - Duration of the project in 2005-2009
 - The total value of 2.3 million Euro, cofinanced by EU – 50%, partners and other funds – 25%
 - Place the project in Lithuania, Poland and Germany
- LIFE CONAT LIFE09NAT/LT/000581 "pilot ecological network in southern Lithuania Creation
 - Project implementation period 2009-2014,
 - The total value of 766,000 Euro, cofinanced by EU – 50%, Lithuanian Ministry of Environment – 25%, partners – 25%
 - Project location Lithuania

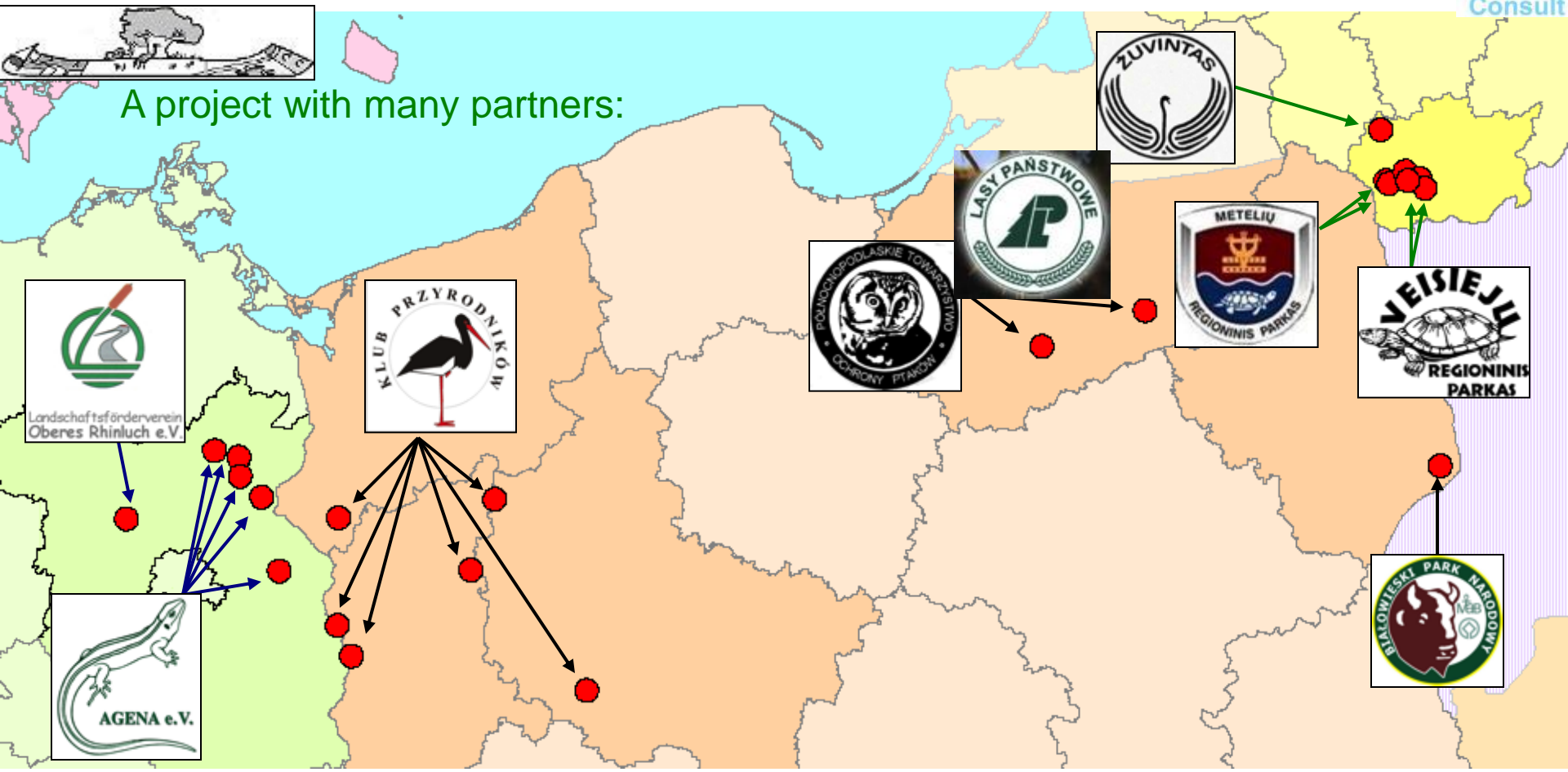
Protection of *Emys orbicularis* and amphibians in the North European lowlands (LIFE05NAT/LT/000094)



Main beneficiary  LITHUANIAN FUND FOR NATURE

In cooperation with

A project with many partners:



The species:



- The European pond turtle

A relict from the earliest time

Project cover 20% of population in Lithuania,
75% in West and East Poland and 90% in
Germany

The Fire-bellied toad

A representative from the Jurassic period

Project cover 15% of population in Lithuania, 5% in
Poland and 10% in Brandenburg



The Great crested newt

A representative from the Eocene epoch

Project cover less than 10% of population in Lithuania
and about 1% in Poland and Brandenburg



Why protect Europe's oldest reptile and amphibians?

From an ecological point of view, it's a question of securing the European biodiversity.

From an ethical point of view, it's a question of respect for old living forms

Project objectives:

- To ensure the favourable conservation status of the European pond turtle in the North European lowlands.
- To ensure a favourable conservation status of the European fire-bellied toad and the Great crested newt in the areas where they occur together with European pond turtle.
- To demonstrate how to protect and ensure European fire-bellied toad in artificial and drained lowland meadows of Brandenburg in Germany and in the large natural swamps and fenland of Zuvintas Biosphere Reserve in Lithuania.
- To demonstrate the validity of protection measures for European fire-bellied toad and Great crested newt as well as other amphibian species such as Tree frog and Common spadefoot toad.
- To exchange intensively the experiences with regard to habitat and population management of European pond turtle in connection with habitat management of European fire-bellied toad and Great crested newt.
- To educate local inhabitants and involve them in species protection and habitat management activities.





Development of Pilot Ecological Network through Nature Frame Areas in Southern Lithuania

ECONAT LIFE09 NAT/LT/581

Main beneficiary



Associated beneficiaries



What is the project about

- Project aim - To create an ecological network in Southern Lithuania by ensuring favourable conservation status for and the saving of threatened populations of selected Annex II and Annex IV species and simultaneously enhancing the ecological value of the target area.
- Objetives:
 - To develop a pilot ecological network in Southern Lithuania
 - To secure the long-term viability of Annex II and Annex IV species populations
 - To save the small and isolated populations of *Emys orbicularis* and *Hyla arborea* threatened amphibians in Southern Lithuania
 - To raise awareness towards local inhabitants and wider audience
 - To generate, share and exchange expert knowledge

Target species

- Reptiles – european pond turtle, sand lizard
- Amphibians
- insects

ECOLOGICAL NETWORK WILL HELP TO CONSERVE THESE SPECIES:

European tree frog (*Hyla arborea*)

The European tree frog is the rarest frog in Lithuania. It is one of the smallest frogs in Europe; it grows up to not more than 3–5 cm length. It has adhesive discs at the end of its fingers, therefore these frogs can climb on a vertical surface. Most often tree frogs are bright green but they can change their colour and become even grey as a consequence of weather conditions and other factors, which are not yet fully understood. Tree frogs breed in the ponds with rich submersed vegetation and shallow zones. The water surface should be not overshadowed, allowing it to be heated quickly by the sun. Adult tree frogs spend a lot of time climbing on the vegetation around their aquatic habitat. They hibernate in the burrows, decaying trees, piles of stones and even in cellars.

Sand lizard (*Lacerta agilis*)

The sand lizard is a little bit bigger and more colourful than the other Lithu-

anian species, the viviparous lizard (*Lacerta vivipara*). Sand lizards are brown, with a liny pattern of brown and white spots. During the breeding season (April – May) males change their colour into bright green, only a stripe along their back remains brown. The length of a sand lizard (with the tail) can be more than 20 cm. These lizards can live up to 12 years. It is the only lizard in Lithuania that lays eggs.

Common spadefoot toad (*Pelobates fuscus*)

A spadefoot toad has a smooth skin with marbled pattern. Its pupils are vertical like those of cats. Its hind feet are equipped with spade-like warts, used for digging itself into the earth. Spadefoot toads are nocturnal, during the day they hide underground. If they feel threatened, they can burrow themselves quickly, even at night. In spring, during the breeding period, the males call under the water, trying to attract females. Their voices resemble a muffled thumping. Spadefoot toads can be spotted easiest, when they are in their tadpole stage. Among all tadpoles found in Lithuania, they are the biggest –



Spadefoot toad burrowing into sand



Sand lizard



Pond turtle basking in the sun

European pond turtle (*Emys orbicularis*)

The pond turtle is a relict species from previous warmer periods. Nowadays this species in Lithuania is on the northern edge of its distribution. A few decades ago they were still present in all Lithuania. Today, they are only found in the southern parts, which are the least affected by melioration. Local people call these animals "iron frogs". European pond turtles can grow up to 30 cm in length. However, to reach this size takes a lot of time. These turtles are longevous – they can live even more than 100 years. Pond turtles survived only in natural or semi-natural landscapes, which were abundant with slack water bodies. To complete their habitat, there have to be sandy slopes (easily heated by the sun), in which the turtles make their nesting sites, present within a radius of a few hundred meters.

Green toad (*Bufo viridis*)

The dorsal side of this toad shows a green marbled pattern. It breeds in small shallow water bodies. These nocturnal toads prey on invertebrates in the fields covered with sparse vegetation. In the daytime they seek shelter. Burrows, decaying trees, piles of stones or cellars are used for hiberna-



Green toads often live close to the homesteads

tion. Among amphibians, green toads are the ones most adapted to living close to humans – sometimes these toads are abundant in ponds and gardens, they can be seen in greenhouses. Still, the main reason, why the green toad is endangered, is – like with all other rare amphibians – alteration, destruction and fragmentation of suitable habitats.

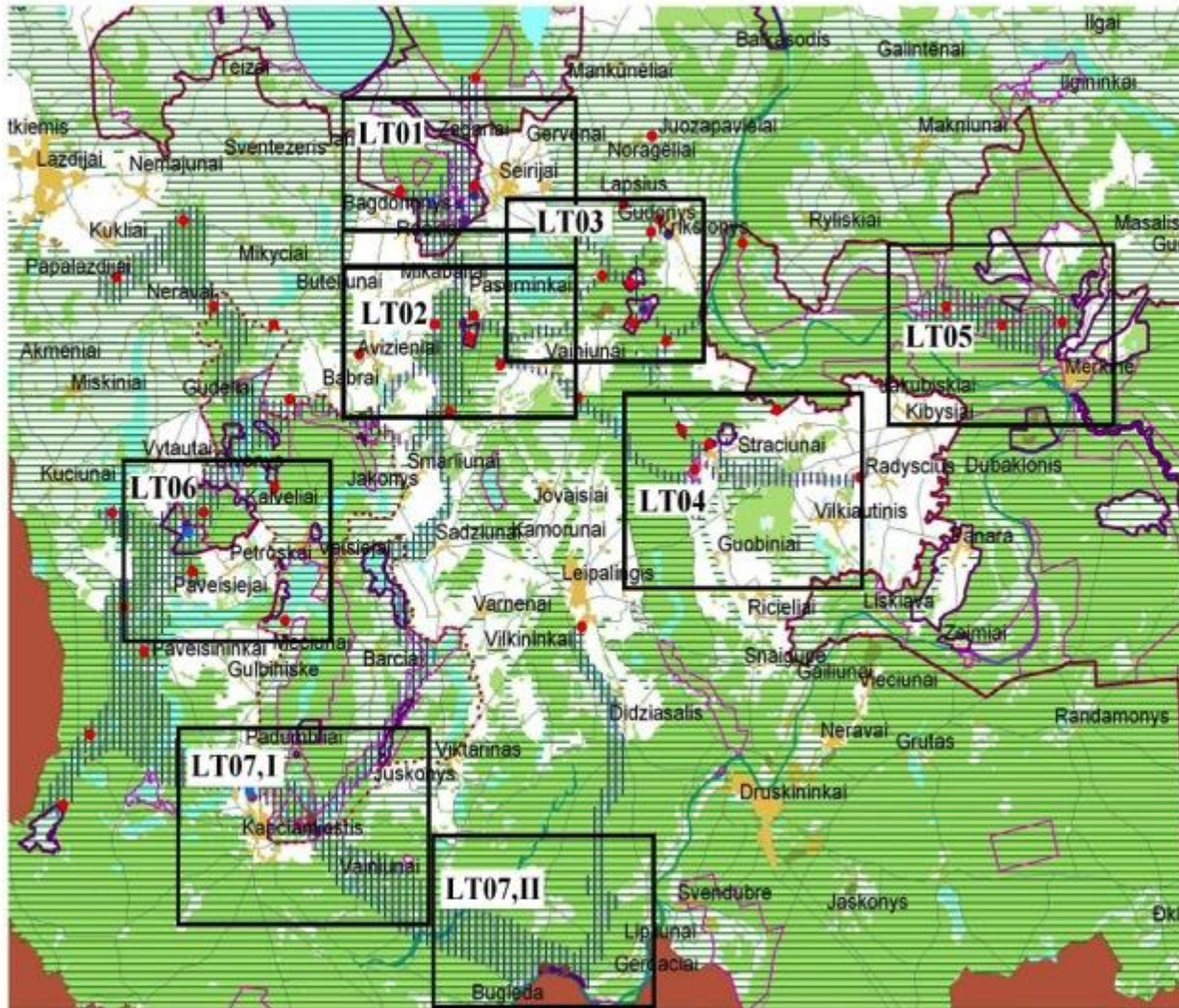
Large White-faced Darter (*Leucorrhinia pectoralis*)

The biggest dragonfly from the genus *Leucorrhinia*, grows up to 4 cm in length. From the other species is distinguished by a yellow spot on its tail. It reproduces in small slack water bodies with patchy coverage of sedges and cat's-tails, which can be quickly warmed up by the sun. Its larvae develop for two years. The larvae are active during daytime, therefore they are easily noticeable by the predators. These dragonflies do not survive in waterbodies inhabited by fish.



Large White-faced Darter

General location of the project area



LEGEND

- Natura 2000 area
- Regional Park
- Corridors
- Area of eco network
- Project area
- Nature reserve
- Water body
- River
- Forest
- Quarry
- Urban territory
- Infrastructure

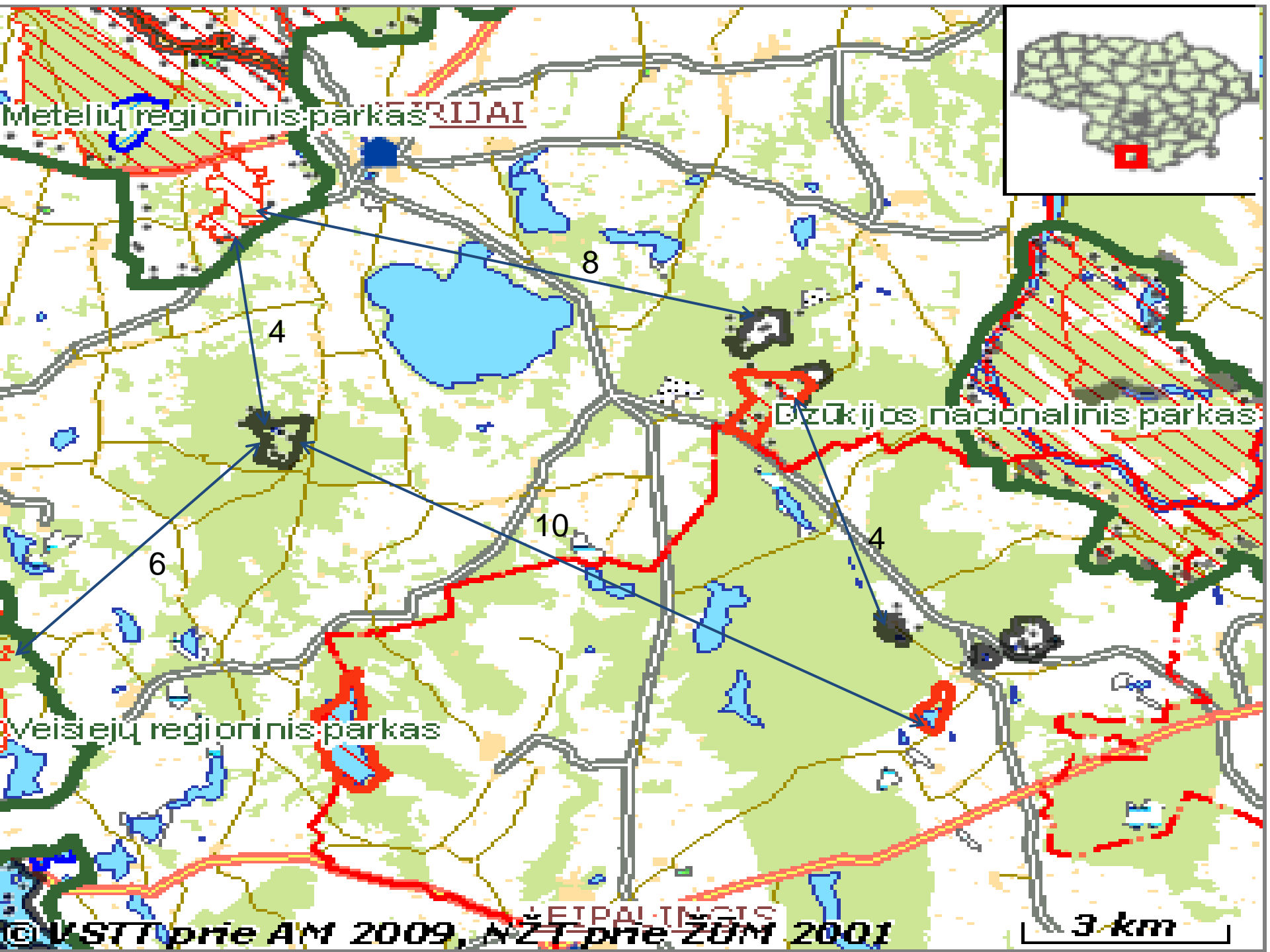
- Local population of *Emys orbicularis*
- Local population of *Triturus cristatus*
- Local population of *Hyla arborea*
- Local population of *Bufo viridis*
- Local population of *Bufo calamita*
- Local population of *Bombina bombina*

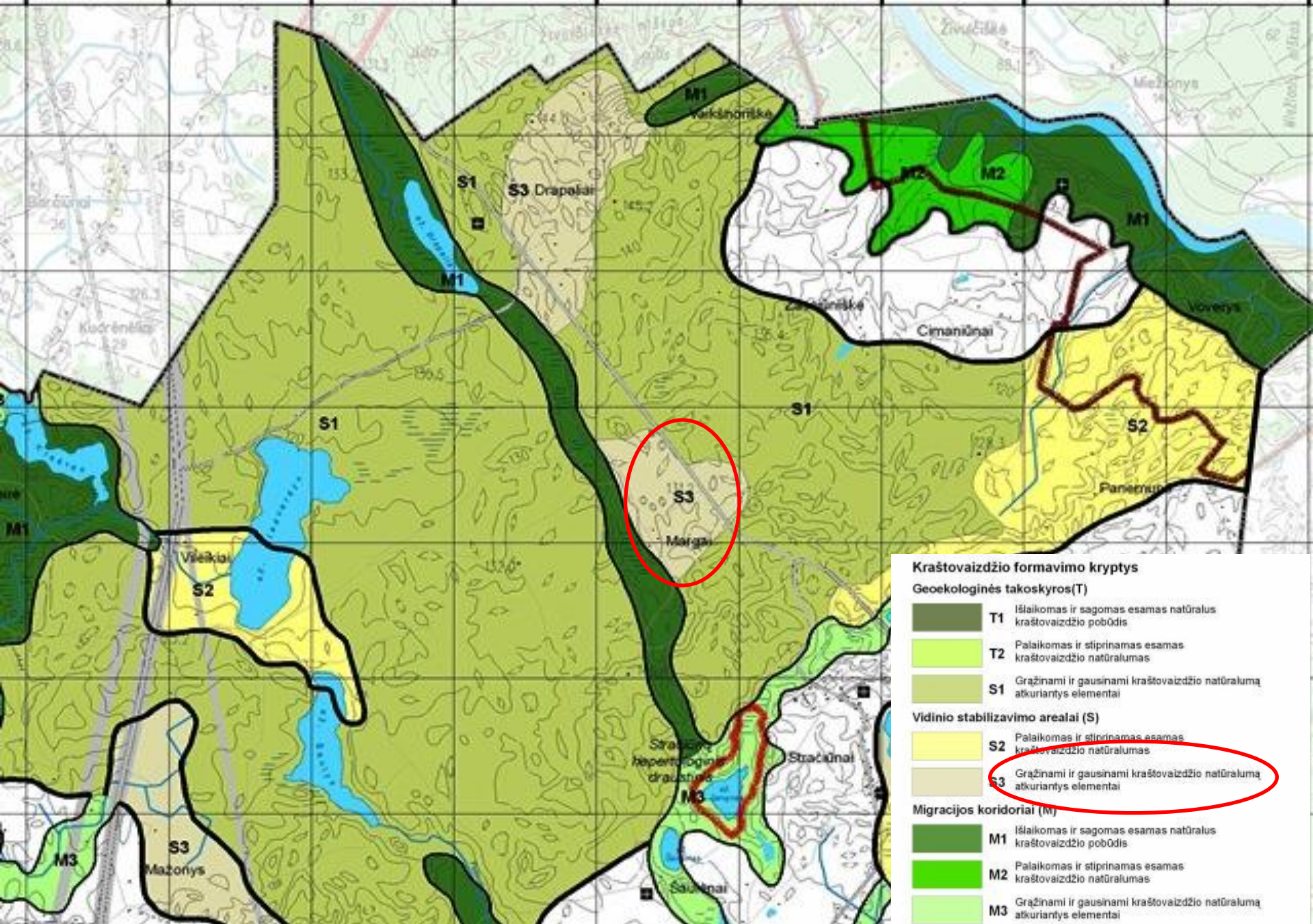
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BACKGROUND

- Does Natura2000 function as a real network?
- Species and habitat protection occurs only within Natura 2000 sites.
- Small and isolated populations have no perspectives to survive
- „Nature frame“ – it is a network, which can be adopted for species needs.





Kraštovaizdžio formavimo kryptys

Geoeologinės takoskyros(T)

- T1** Išlaikomas ir sagomas esamas natūralus kraštovaizdžio pobūdis
- T2** Palaikomas ir stiprinamas esamas kraštovaizdžio natūralumas
- S1** Gražinami ir gausinami kraštovaizdžio natūralumą atkuriantys elementai

Vidinio stabilizavimo arealai (S)

- S2** Palaikomas ir stiprinamas esamas kraštovaizdžio natūralumas
- S3** Gražinami ir gausinami kraštovaizdžio natūralumą atkuriantys elementai

Migracijos koridoriai (M)

- M1** Išlaikomas ir sagomas esamas natūralus kraštovaizdžio pobūdis
- M2** Palaikomas ir stiprinamas esamas kraštovaizdžio natūralumas
- M3** Gražinami ir gausinami kraštovaizdžio natūralumą atkuriantys elementai

D Degraduotos gamtinio karkaso teritorijos

Actions

- Preparation: inventory and local action plans will be prepared, evaluation of favourable conservation status setting up 5 new Natura2000 sites, elaboration of methods for network establishment and its' regulation, agreements with landowners
- Habitat restoration outside Natura 2000 sites: 20 wetland areas and 30 small sand pits will be restored, 120 new ponds will be dug and/or restored, 40 nesting sites will be created and/or restored, area grazing by hardy grazers installed in 2 farms
- Population management - elaboration of turtle and tree frog rearing methods fitting to Lithuanian conditions, rearing of turtles ex-situ by collecting eggs in most risky places
- Education activities, networking

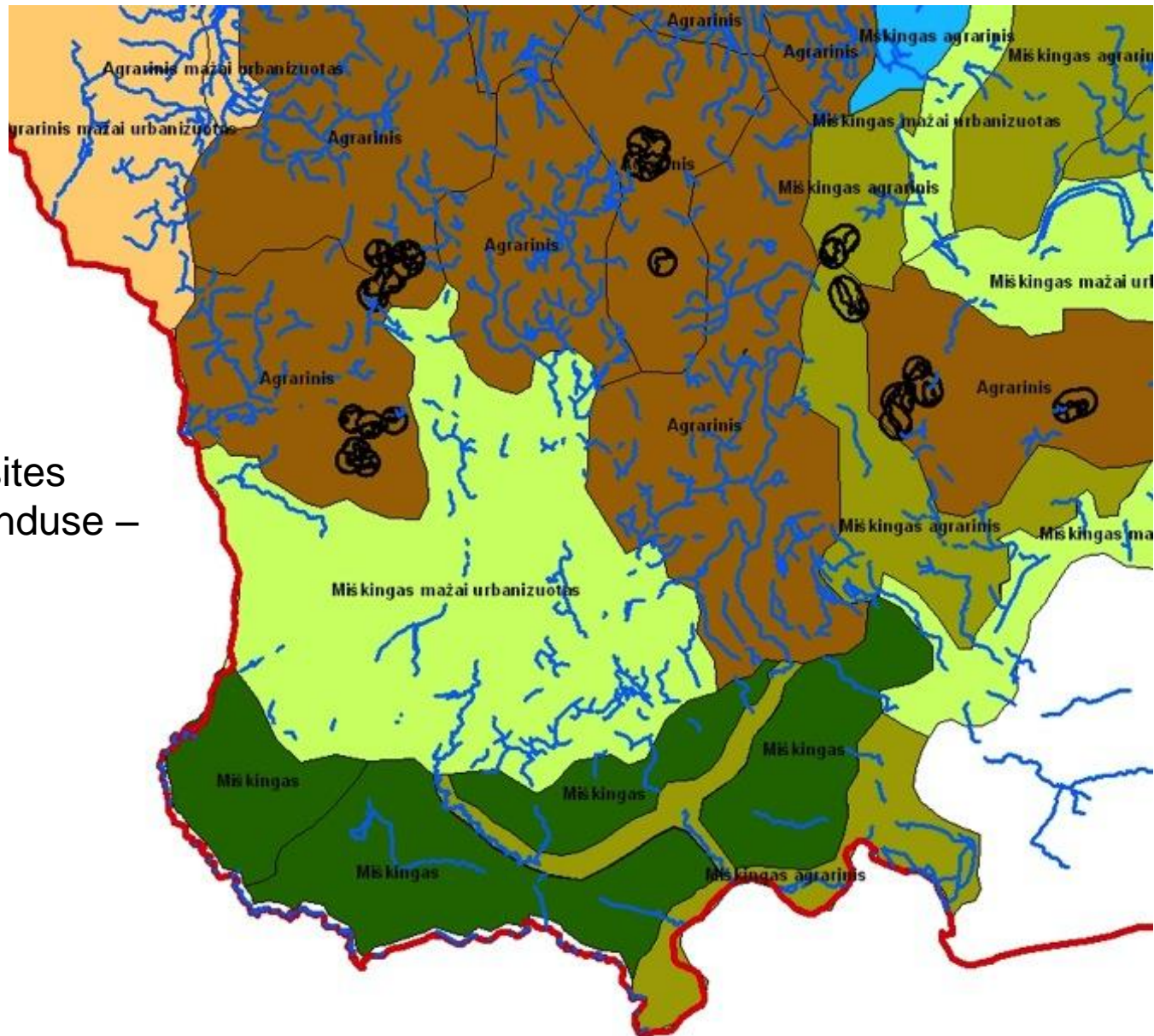
What was done in Lithuania

- Overall more than 250 different type of water bodies restored (dug, removed mud and bushes)
- 60 nesting sites restored by removing trees, scrapping the upper layer, protecting by metal grids and fencing
- >50 hibernation sites prepared for amphibians by putting branches and root logs
- 3 beef cattle farms installed to ensure long term management

Typical habitat

- Typical habitat:
 - Extensive agriculture fields with mosaic structures: meadows, water bodies, wetlands
 - Landscape is hilly morein. Upper soils dominated by clay or clay loam, or clay loam covered by other soils

Physiogeomorphological biotops



Pond turtles sites
Dominated landuse –
agriculture

Most important characteristics for water bodies – main characteristics

Maximal and average depth – about 1-2 meters, while for amphibians – 0,5 m max

Bottom – muddy, water - braunish

Possible some overgrowth by trees and bushes

Coverage by water vegetation – up to 80%

Shallow shoreline

Different water body than used by amphibians

Hibernation sites

- Hibernating individuals could be found in very natural forest swamps e.g. alder swamps, in swamps, in different types of natural or near-natural, eutrophic or mesotrophic, permanent ponds as well as in smaller lakes, quagmires, channels and in exceptional cases in natural temporary ponds, too. In some areas e.g. in West-Poland animals hibernate in artificial ponds like fish ponds, too

Characteristics	Requirements
Water depths	40-100 cm, hibernation sites should not dry up during winter
Water temperature (°C)	without longer periods of frozen temperatures, 2 to 6 °C
Water quality	no special requirements, about neutral pH
Pond ground (substrate)	as a rule, deep mud layer
Microclimate	protected position with no strong temperature fluctuations with good windbreak (e.g. coves, reeds, channels, forest ponds, fens with trees e.g. alder fens, alder forests)
Structure/vegetation	rich in structure by dead-wood and/or roots, rhizomes, tufts
Cover	rich in cover, dead vegetation, foliage, dead-wood
Lighting conditions	unshaded up to shaded
Position (aspect: disturbances)	protection from disturbances, as a rule, hardly accessible locations

Nesting sites

- most of the nests are located in places with southern, south-eastern and south-western expositions.
- vegetation cover of 5 up to 95 %
- flat, slight and strongly inclined areas ($0-20^{\circ}$), exceptionally, single nests are dug in steeper ground (up to $40-50^{\circ}$)
- high predation rate on nests is known (up to 70-90 %)
- Ponds in small distances to the nesting sites (< 300 m), which supply hiding sites for nesting females and first ponds for hatchlings, are very important.

Genetic analyses

- Mitochondrial DNA was analysed for haplotypes. Results:
 - Lithuania - all populations are genetically pure, autochthonous.
 - Poland – also all analysed populations (Eastern, Western part might be autochthonous. Animals inhabiting the investigated east-polish project areas (Nadrowskie bagno Reserve, Karzełek Lake and an intraforest pond near Likusy) have the same mitochondrial haplotype Ia as the Lithuanian turtles.
 - Germany - 5 autochthonous relict populations, but another haplotype than in Poland and Lithuania. Biggest inbreeding possibility due to distant populations