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**Development of a Pilot Ecological Network through Nature Frame areas in South Lithuania**

LIFE+ Nature project ECONAT LIFE09NAT/LT/00581. FINAL SEMINAR. 2014 August 26 – 28

# LATVIAN EXPERIENCE IN CONSERVATION OF *EMYS ORBICULARIS*

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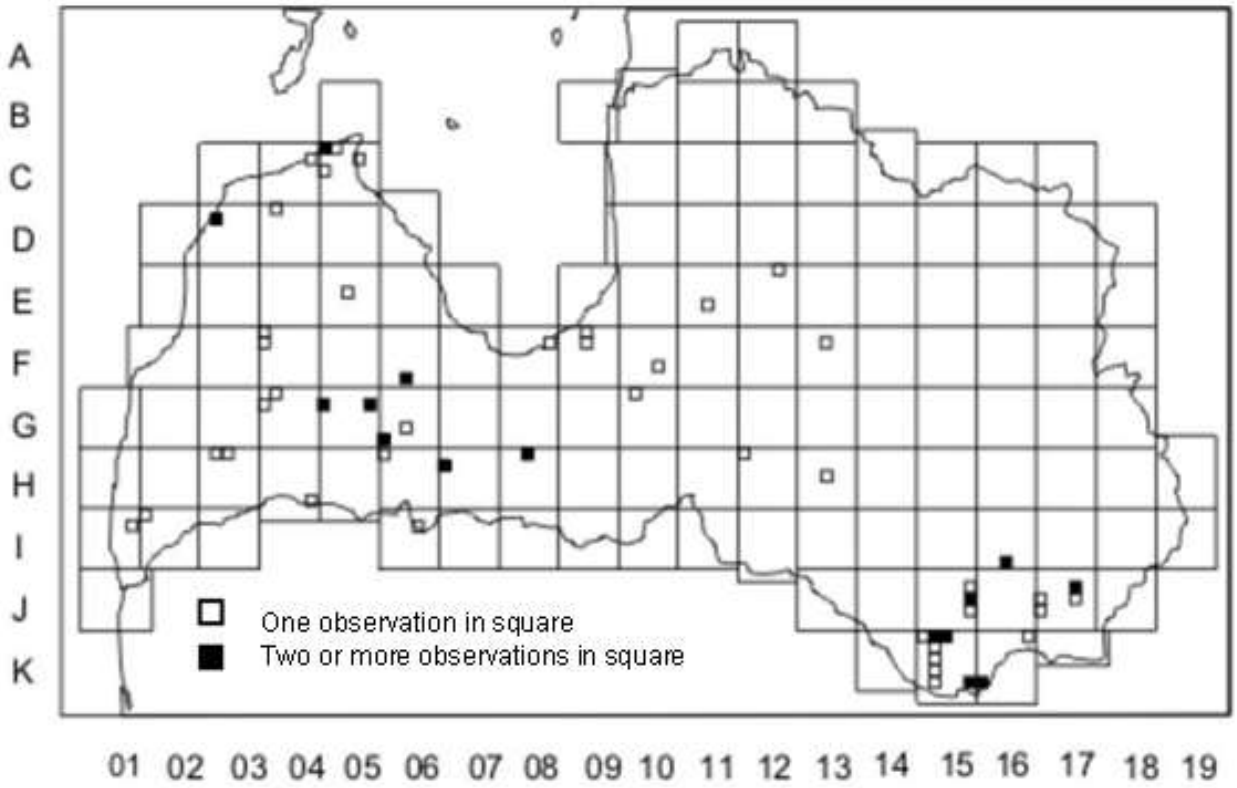
*Emys orbicularis* (Linnaes, 1758) is a rare autochtone Reptile species of Latvia, our country is situated on the northern edge of the species distribution (Meeske et al. 2002; Fritz 2003; Meeske et al. 2006).

In connection with this it is important to conserve or restore *E.orbicularis* populations in Latvia (Pupiņš, Pupiņa 2007).




# Introduction

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Turtles found in Latvia in 2010 carapax and plastron:
# ***1***.; 16. # ***2***.; 17. # ***3***.; 18. # ***4***.; 19:

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Pond of findings # ***2***.; 17.

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# ***2***.; 17.

- The Plan on protection of *E.orbicularis* in Latvia singles out the main **natural** limiting factors for *Emys orbicularis* in Latvia:
- 1) the coldest climate in all the area of *E.orbicularis*;
- 2) overgrowing of biotopes;
- 3) influence of natural predators (traumatized by predators compose 52,94% from the number of examined *E.orbicularis* (n=17).


14 of April

- The main negative factors of **anthropogenic** origin are the following:
- 1) **capture** and **removal** from nature of adult *Emys orbicularis* by people (People catch *E.orbicularis* in nature in 44% of all cases (n=90), here in 33% of all cases *E.orbicularis* finally eliminates from nature;
- 2) **destruction** of biotopes (amelioration);
- 3) influence of **transport** (traumatism and probable death of *Emys orbicularis* on the roads), 23,53% (n=4) of examined *E.orbicularis* (n=17) are traumatized by transport;
- 4) **exotic predators** introduction into Latvia (*Nyctereutes procyonoides*, *Neovison vison*, possible *Ondatra zibethicus*) and others.
- 5) **exotic turtles** (registered 9 species and subspecies) and their **parasites**

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- Reduction of populations of *Emys orbicularis* and fragmentation of the area may result from the influence of such factors. That leads to limitation of contacts and genetic interexchange among groups of turtles. Such interexchange of genes and contacts of border Latvian groups with stronger maternal southern populations of **Belarus** and **Lithuania** seems to be especially important.

- The **realized Emys projects** are:

- 1) authors' private permanent project "**Emys-Latvia**" (since 1985) – research of distribution and ecology, zooculture ex-situ (Pupins, Pupiņa, 1996);
- 2) "**Research** of pond turtle (*E. orbicularis* L.) ecology in Latvia" (2001) – research of ecology ex-situ;
- 3) "The peculiarities of forming of **negative attitude** towards nature" (2001-2003) – research of attitude towards *E. orbicularis*;
- 4) "**Looking** for pond turtle in Latvia" (2005) – research of distribution, education;
- 5) "Research in ecology and conservation of *E. orbicularis*, *Bombina bombina*, *Dytiscus latissimus* in Latvia" (2006) – research of distribution, ecology ex-situ, biotopes;
- 6) "Support to realisation of **Daugavpils University** doctoral studies" (2004-2007) – research of distribution, ecology in-situ and ex-situ (Pupins, 2007; Pupins, Pupina, 2008; 2009; 2011);
- 7) "Development of the **Plan of conservation** of pond turtles *E. orbicularis* (L.)" (2007) – development of the official strategy of conservation in Latvia, description of main threats and conservation measures (Pupiņš, Pupiņa 2007);
- 8) "Printing of **two brochures** on fire-bellied toads, pond turtles and its conservation in Latvia" (2007) – education;
- 9) "Development of entrepreneurship as an element that forms **municipal environment**" (2008) – education, creation of ***E. orbicularis* granite sculpture** in Daugavpils, South-East part of Latvia.

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- ***Current conservation project*:** LIFE+ Project "Conservation of rare reptiles and amphibians in Latvia" (Acronym: LIFE-HerpetoLatvia) # LIFE09NAT/LV/000239
- ***Location:*** Latvia
- ***Project duration:*** 2010-2014
- ***Local Emys conservation problems:*** The Conservation Plan (Pupiņš, Pupiņa, 2007) urgently required implementation in Latvia. The most important problems for conservation of *E. orbicularis* in Latvia were the following:
- 1) degraded water and eggs-laying biotopes;
- 2) becoming extinct small populations and last individuals;
- 3) degraded corridors for contacting between populations;
- 4) old facilities of the breeding centre for long-term keeping of a breeding group;
- 5) low level of knowledge on *E. orbicularis* among land-owners of Latvia.

LIFE-HerpetoLatvia

- ***Conservation project activities and main results:***
- 1) preliminary study of becoming near to extinct population on the territory of Nature 2000 Silene Nature Park;
- 2) development of the Plan on management of the population of Silene Nature Park;
- 3) restoration of biotopes on the territory of Silene Nature Park;
- 4) renovation of the Rare reptiles and amphibians breeding centre;
- 5) rearing and long-term growth of juvenile turtles for releasing into nature;
- 6) improvement of becoming extinct populations by releasing headstarted *E. orbicularis*;
- 7) education of population of Latvia.

- **The main results** of the project are and will be the following:
- 1) restored biotopes in Silene Nature Park that create a green corridor for contacts of *E. orbicularis* populations;
- 2) renovated and entirely functioning Rare reptiles and amphibians breeding centre;
- 3) for the first time in the history of Latvia **42 young adult turtles**, that were reared in the Centre, are released in wild in 2014;
- 4) a wide network of educational arrangements, notice boards and brochure about *E. orbicularis*.
- The present project has apparent very long-term after-LIFE effectiveness and sustainability.

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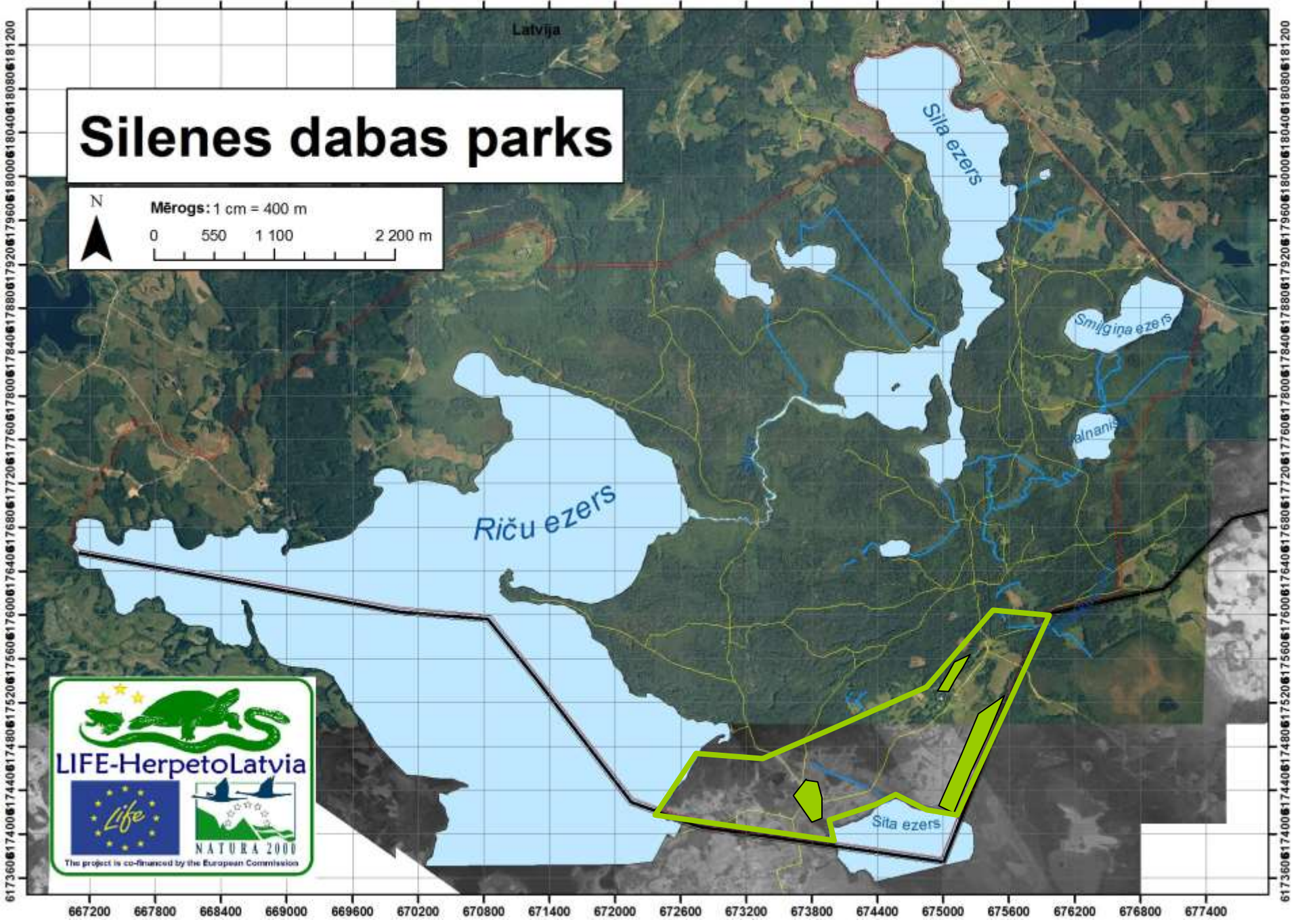
- Capacity rising for breeding ex-situ

**Problems and solutions**

| Information on status in Latvia | Registered problem in Latvia or by the beginning of our zooculture | Our solution used in the zooculture | Result in our zooculture |
|---|---|---|---|
| *E.orbicularis* eggs laying places are unknown in Latvia. | It is impossible to use popular technology of *E.orbicularis* eggs sampling in nature for an incubation in incubator. | The full zooculture of *E.orbicularis* ("from adult to adult") is used for a receiving of its eggs in Latvia. | The *E.orbicularis* are living in our full zooculture since 1985. |
| Latvian populations of *E.orbicularis* are extremely small, some sites with some animals are known only. | Sampling of adult turtles for a breeding group from nature can destroy the structure of population | For the creation of our breeding group were used only the turtles caught by local people and kept in their homes for a time. | No any *E.orbicularis* in our breeding group is caught in the nature, all are received from a people. |
| There were illegally introduced allochtone *E.orbicularis* in Latvia (we know about 2 animals). | The allochtone *E.orbicularis*, caught in nature, unintentionally can be used as a part of a breeding group. | All the *E.orbicularis* of the breeding group are checked for their autochthonity, the autochthones animals used for the breeding only. | The *E.orbicularis* caught in Latvia are checked for autochthonity. |
| The number of sampled from local people *E.orbicularis* is very small, only some of them are adult females. | The number of received in a zooculture eggs and juveniles will be small. | The first (n=5) generations of *E.orbicularis* are used for an increase of the basic breeding group only. | The *E.orbicularis* from our first generations take part in reproduction now. |
| In artificial conditions of zooculture constant climate the living and sexual cycles of males and females can be un-synchronized. | The eggs can be non-fertile. | We rear the breeding group in a native climate conditions in out-door basins according the natural living and sexual cycle. | Most of eggs are fertile in our zooculture. |
| The sex of *E.orbicularis* is dependent from a temperature of eggs incubations. | The sexual structure of breeding group, created after years from a reared juveniles, can be non optimal. | We use the temperature conditions of incubation for a regulation of a future breeding group sexual structure. | In the generations there are males and females in our zooculture. |
| The *E.orbicularis* eggs develop in a sand earth in nature. | If the regime of incubation don't meets the turtles needs, the eggs can't develop. | We used 2 foam rubbers as a substrate for eggs incubation. | Almost eggs develop successfully during the incubation in zooculture. |
| The juveniles turtles cut eggs shell dyring hatchling. | If the eggs shell isn't cut, the hatchlings can die. | We cut all the eggs shell in the eggs portion next day after first hatchling turtle. | Almost all hatchlings go out from the eggs shells successfully. |
| In a zooculture the juveniles are very vulnerable for conditions of food and light. | The reared juveniles turtles can have illness of development (scoliosis etc.). | We use a special program of feeding (living insects, gammarus, cats food, fish with bones, chicken hearts) and UV-lighting. | The turtles develop normally in our zooculture. |
| In a nature on the north edge of its area the *E.orbicularis* adultness is achieved after many years. | The juveniles *E.orbicularis* can take part in reproduction after a many years only, if they are living in the nature in Latvia. | We rear the juveniles *E.orbicularis* to an adult/subadult status (~ 5-6 years) in a zooculture. | The first generations turtles growing in a zooculture are adults now. |
| A predation is very dangerous for juveniles *E.orbicularis* in nature, for adult animals the predation is less dangerous. | The predators danger is very actual for a long time of growing of *E.orbicularis* in nature. | We will introduce adult/subadult *E.orbicularis* (~ 5-6 years) in the nature only. | The introduction will be possible after receiving of biggest number of adult turtles in our zooculture (after 6-7 years), in present time all the turtles are used for improvement of breeding group. |
| In a natural climate conditions the juveniles *E.orbicularis* can grow slow in Latvia. | The juvenile *E.orbicularis* growing and development need for many years. | We use optimal conditions of zooculture (food, temperature, light, filtration etc.) for an acceleration of juveniles growing and development in a zooculture. | Our juvenile turtles are fast growing. |
| The *E.orbicularis* reared in a zooculture have personal experience for a living in zooculture only. | The adult *E.orbicularis*, received from a zooculture, can be not adapted for a living in nature conditions. | We use a special adaptation time for an year in out-door fenced basin in a semi-natural biotope. | Our adult *E.orbicularis* are living in out-door fenced basin in a semi-natural biotope with semi-natural feeding. |
| The *E.orbicularis* reared in zooculture haven't experience in contacts with dangerous predators and humans. | The *E.orbicularis* from a zooculture haven't fear from humans or from big animals. | We use a special taught fearing program. | The turtles of our zooculture living in out-door basin have fear from humans and big animals. |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Smilgiņa ezers
Riču ezers
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- **Emys orbicularis as umbrella species**
- Latvia is the most northern country, in which passes the northern boundary of the European area of *Bombina bombina* (Kuzmin et al. 2008).

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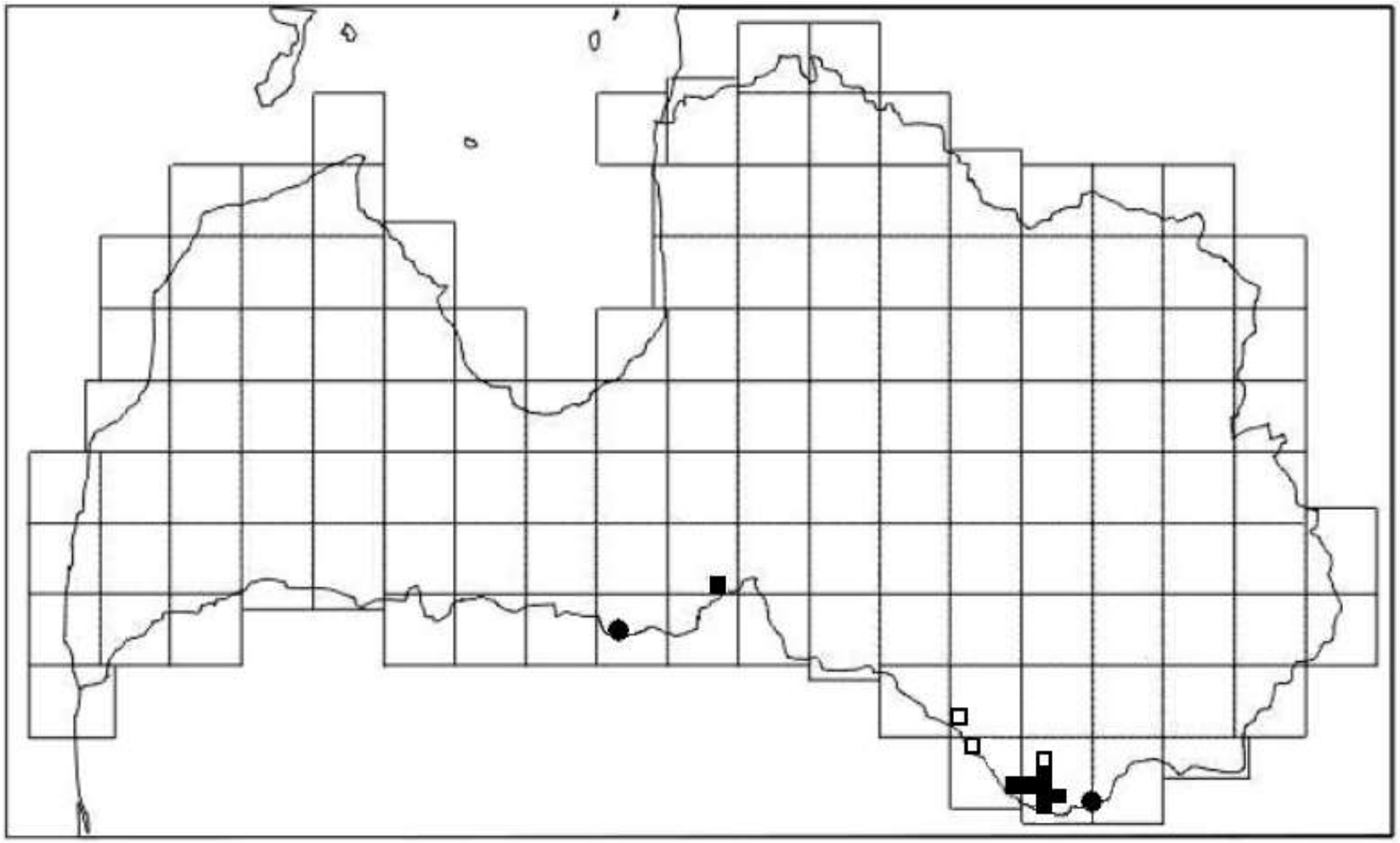

- Found in Latvia in recent years some new populations of *Bombina bombina* are located on non-protected territories, including the largest population of Latvia called “Demene”.

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# Acknowledgements

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