Latvia – Lithuania Cross Border Cooperation Programme 2007-2013

Project LLIV-250 TEAMWORK
"Joint resistance to bioinvasions for sustainable agriculture and management of natural resources "

Maksims Balalaikins

EXPEDITIONS REPORT

For the year 2013

Daugavpils, 1.02.2014

CONTENT

INTRODUCTION

A short summary of the situation regarding the invasion spread in the territory. Introducee the aim of the reporting period and target. Identify tasks that have been designed to solve (about 2000 charachters).

One of the major threats to native biological diversity is now acknowledged by scientists and governments to be biological invasions caused by alien invasive species. Invasive alien species are non-native species whose introduction and spread outside their natural past or present ranges pose a threat to biodiversity. They occur in all major groups, including animals, plants, fungi and micro-organisms, and are considered at least on islands to be the second most important reason for biodiversity loss worldwide (after direct habitat loss or destruction) (Shine et al., 2009). The expansion of invasive species can have an important effect not only on our natural resources, but also on human health, and economy. The world annual economic losses from invasive species are estimated to be over $120 billion each year. (http://democrats.naturalresources.house.gov/)

About 10 000 alien species have been registered in Europe. Some of these species were introduced on purpose and remain economically important. However, a proportion of the alien species established cause significant damage to native biodiversity and can be classified as invasive alien species according to the Convention on Biological Diversity (EEA, 2009).

Latvia has no national database on alien species, just individual databases on individual species. Only one species is indicated as economical important invasive species in Latvia – Sosnowsky hogweed (*Heracleum* sosnowsky). Approximately 1000 alien species are known in Latvia and part of these species may be invasive. The aim of the reporting period is to clarify composition, spread and the frequency of invasive species in the project territory. To reach the objective following tasks were set:

to survey known localities of invasive species;
to find new invasive species localities;
to carry out assessment of the situation.

DESCRIPTIVE PART OF THE REPORT

Set out the research methodology, assess its reliability and accuracy, list all carried out tasks according to the calendar schedule, indicate what tasks were carried out, which were not; explain why there is a delay in carrying out certain tasks. Present the research results and a summary of the analysis, indicating the importance of the new results (about 10 000 charachters)

Results and methodology.

During this research attention was paid to various invertebrates, fish and plant species. Overall, during the season 7 plant and 7 animal species were found in project territory. The most frequent invasive plant considered Canada goldenrod (*Solidago canadensis*) 30 localities was observed. Very frequent invasive plants are also Sosnowsky hogweed (*Heracleum sosnowskyi*) (20 localities) and Ash-leaf Maple (*Acer negundo*) (17 localities). The most frequent animal species are zebra mussel (*Dreissena polymorpha)* (5 localities) and Chinese sleeper (*Perccottus glehni*) (4 localities).

The survey of plants and animals was based on random selection method of the plots. This survey method was less systematic than the methods used in the performance of the monitoring.The use specific monitoring techniques would have conflicted with the need to inspect a large number of sites.

Estimates of abundance were made for fishes, invertebrates and plants. The size of sampling areas was not standardised. This allowed maximum flexibility in obtaining comprehensive species lists in the least amount of time.
The following data was collected at all survey localities:

- date;
- observer(s);
- administrative locality
- coordinates, (GPS/Map; for some rapid sites the site number was marked on a topographic map, with coordinates determined later);
- species;
- habitat;
- area (where the invader spread)
- abundance.

Methods:

Collection using the entomological net. This is one of the basic methods used to collect the Phytophagous invertebrates. As a result, of sweeping with entomological net through the grass or shrubs (usually 10 - 20 sweeps) invertebrates that are staying on different parts of the plants are collected. A lot of species can be also collected during the flying. Most part of the material are collected using this method.

Shaking down the beetles from the tree or bush boughs. Under a small tree or shrub placed a white cloth (easy to use sheets) and shaking the boughs, until the invertebrates, which are staying on boughs fall down, where they are collected by hand or using exhauster.

The visual examination of the habitats.

- The visual examination of the plants and their particular parts. The majority of invertebrates are free living, and they are easily recorded on different parts of the plant (leaves, stems or flowers).

- The visual examination of litter and ground cover. Litter and ground cover is inhabited by many species of flightless organisms.

- The visual examination of dead wood, fallen logs, as well as live damaged trees. A lot of invertebrates species are staying under the bark of dead and damaged trees and in dead wood.

- The visual examination of water body shores habitats. Shores of various water bodies as well as the water bodies are inhabited by different invasive species, which are also found on the underwater the plant parts.

Equipment: entomological net, hydroentomological net, camera, plastic specimen containers, flashlight.

In 2013 8 expeditions were carried out:

1. **The 16th September route was Daugavpils – Rēzekne – Ludza – Daugavpils;** the total lenght of the route was 303.48 km. During the trip were made 4 stops: Rēzekne, Rēzekne county: Verēmi parish,

Bērzgale parish, Ludza. Overall, during the trip were found 7 alien species and was marked 12 localities (App 7-10);

2. **The 23th September route was Daugavpils – Krāslava – Kaunata – Rēzekne - Daugavpils**; the total lenght of the route was 287.88 km. During the trip were made stops: Lazovka, Tabore, Veckaplava, Krāslava, Lipušķi, Kaunata parish, Čornaja parish, Rēzekne. Overall, during the trip were found 5 alien species and was marked 15 localities (App 7-10);

3. **The 25th September route was Daugavpils – Jēkabpils – Aizkraukle – Aizkraukle county - Daugavpils;** the total lenght of the route was 318.33 km. During the trip were made 8 stops: Jaunjelgava county (turn to Talsiņa), Sērene, Jaunjelgava county, Sērene parish, dump "Totēni", Jaunjelgava county, Sērene parish, quarry environs,Jaunjelgava county, Sērene parish, near Daugava River, Aizkraukle, Aizkraukle county, Jersika. Overall, during the trip were found 5 alien species and was marked 8localities (App 7-10);

4. **The 30th September route was Daugavpils – Ilūkste – Aknīste – Nereta county - Daugavpils;** the total lenght of the route was 257.58 km. During the trip were made 7 stops: Daugavpils, Ilūkste, Ilūkste county; Ilūkstes county, Baltmuiža bog environs, Aknīste county, Viesīte county, Neretas county. Overall, during the trip were found 4 alien species and was marked 8 localities (App 7-10);

5. **The 7th October route was Daugavpils – Asūne – Šķaune – Daugavpils;** the total lenght of the route was 318.18 km. During the trip were made 7 stops: Maļinova, Špoģi, Aglona station, Dagda, Ezernieki, Šķaune, Asūne. Overall, during the trip were found 5 alien species and was marked 13 localities (App 7-10);

6. **The 9th October route was Daugavpils – Preiļi – Viļāni – Nagļi – Gaigalava – Daugavpils;** the total lenght of the route was 318.18 km. During the trip were made 6 stops: Aizkalne parish, Preiļi parish, Galēni, Nagļi, Īdeņa, Gaigalava parish. Overall, during the trip were found 5 alien species and was marked 7 localities (App 7-10);

7. **The 11st October route was Daugavpils – Viļaka – Baltinava - Daugavpils;** the total lenght of the route was 409.09 km. During the trip were made 3 stops: Salnava parish, Baltinava parish, Viļaka. Overall, during the trip were found 5 alien species and was marked 7 localities (App 7-10);

8. **The 14th October route was Daugavpils - Kalkūni - Svente – Šedere – Lociki – Naujene – Krauja – Vecstropi - Daugavpils;** the total lenght of the route was 83.48 km. During the trip were made 8 stops: Daugavpils, Vecstropi, Lociki, Naujene, Krauja, Kalkūni, Svente, Šedere. Overall, during the trip were found 6 alien species and was marked 10 localities (App 7-10);

During expedition in 2013 were found the following species (total 14):

Animals:

1. *Dreissena polymorpha* (5 localities);

2. *Limax maximus* (1 locality).

3. *Perccottus glehni* (4 localities).

4. *Otiorhynchus smreczynskii* (2 localities);
5. *Oxythyrea funesta* (3 locality).
6. *Argiope bruennichi* (1 locality).
7. *Phaneroptera falcata* (1 locality).

Plants:

1. *Solidago canadensis* (30 localities);
2. *Echinocytis lobata* (4 localities);
3. *Heracleum sosnowskyi* (20 localities);
4. *Acer negundo* (17 localities);
5. *Elodea canadensis* (10 localities);
6. *Impatiens parviflora*(1 locality);
7. *Phalacroloma septentrionale* (1 locality).

Short description of observed alien species.

Dreissena polymorpha

Dreissena polymorpha) is a small freshwater mussel. Size of shell: 20-50 x 10-25 x 15-30 mm. Shell elongate and D-shaped, thin. Shell colour polymorphic, often with zigzag lines. The zebra mussel shells are attached to the substrate with strong byssal threads, which come out of their umbo on the dorsal side. This species was originally native to the lakes of southern Russia.
Habitat: lakes, rivers, ponds (Taylor 1902).

Limax maximus.

The body length of the adult is 10-20 cm. The body color is pale-grey, ash-colored, brownish or sometimes yellowish-white. The body color is pale-grey, ash-colored, brownish or sometimes yellowish-white. The body is longitudinally streaked or spotted with black. Mantle usually darker, spotted or marbled, but not banded, with darker pigment. Tentacles are uniform reddish-brown. Sole is white. Slime is colourless and very sticky. This species is widely distributed, but it is generally considered to be native to Europe and parts of western Africa, and perhaps parts of the Mediterranean.
Habitat: very different – woodland, gardens, hedgerows, basements (Taylor 1902).

Perccottus glenii

The Chinese sleeper resembles a perch, ruffe or sculpin. The eyes are placed high on the head which has a rounded snout and projecting lower jaw. There is little or no gap between the two dorsal fins, the front one

of which has six to eight spines and the back one nine to eleven soft rays. The anal fin has one to three spines and seven to ten soft rays. The pelvic fins are not fused together which helps to distinguish this fish from the gobies. The second dorsal and the anal fins are both more rounded and shorter than the gobies and the caudal fin is also more rounded. The general colour is brownish with a checker-board pattern of darker marks or dark barring. There are dark lines on the head radiating from the eye. This species can reach a length of 25 centimeters and the greatest recorded weight for a specimen is 250 grams. The Chinese sleeper is native to the Far East but appeared in ponds in Eastern Europe in the early twentieth century and has since spread to large parts of the Danube, the Vistula and other river basins where it is considered an invasive species.
Habitat: ponds, closed water-bodies and slow-moving streams (Reshetnikov 2010).

Otiorhynchus smreczynskii

The body of *O. smreczynskii* is dark-brown, antennae and legs are paler. Pronotum is with long setae and large punctures, often confluent on the disc, forming short longitudinal lines. Interstriae are flat, with very fine and rare punctures, which are not covered with pubescence. Elytra are oval with two different in shape kinds of yellow-grey scales, very thin ones and lanceolate ones. Fore femora are with a sharp biapical tooth; fore tibia on the inner edge are distinctly notched. Length 4.3–5.9 mm. Species is native to Eastern Europe.
Habitat: gardens, parks (Balalaikins & Bukejs 2011).

Oxythyrea funesta

The adults appear early in the spring, they grow up to 8–12 millimetres. Body colour is black, more or less bronzed. Most of the specimens show six white spots in two longitudinal rows on pronotun and many others on elytra. They are completely covered with a white pubescence (easily visible in profile). Older specimens usually have no hairs, as they are rubbed off with time. This beetle is present in most of Europe, in the East Palearctic and in the Near East.
Habitat: meadows (Tamutis & Dapkus 2013).

Argiope bruennichi

The large abdomen features yellow, black and white stripes, and the cephalothorax is covered with silver colored hair. When viewed from underneath you can see two yellow stripes running lengthways along the abdomen. . Length 25 – 40 mm. The wasp spider (*Argiope bruennichi*) is a species of orb-web spider distributed throughout central Europe, northern Europe, North Africa, parts of Asia and in the Azores archipelago.
Habitat: coastal calcareous meadows, fallow lands, roadsides.

CONCLUSIONS AND RECOMMENDATIONS

During the observation of the alien species in different localities in Eastern Latvia, was found that the invader is present in all surveyed sites. The presence of these organisms is dependent on the intensity of economic activity in local area. There are not observed large fields overgrown with invasive plants

(*Heracleum sp. Solidago sp.*) in areas with high agricultural activity. In these areas, occurred only some invasive plants. Most part of invasive plants was found on roadsides, edges of forests, at dumpsites, and unmanaged fields. One of the most widely distributed invasive organisms in TEAMWORK project territory is zebra mussel (*Dreissena polymorpha).* This mollusc has stable populations in largest lakes and Rivers of Eastern Latvia region. Zebra mussel is a common species in Rivers Daugava, Rēzekne and Aiviekste, in Lakes Lubāns and Rāzna. Struggle with these molluscs is very difficult. It is important not move these organisms from one body of water to another. The same condition also applies to invasive fish species, particularly to Chinese sleeper (*Perccottus glehni*). During the last year's expeditions not revealed a harlequin ladybird (Harmonia axyridis), very dangerous invasive insects species. This beetle was found in Latvia in 2010, and its spread in local fauna is unknown. Currently, other non-native species that were found during the expeditions are not considered to be invasive, but it is necessary to continue the observations of the spread of these species. These species are wasp spider *(Argiope bruennichi)* andbush cricket *(Phaneroptera falcata).* The weevil *Otiorhynchus smreczynskii* is widely distributed in the largest cities of the project territory, but its impact on natural habitats has not been established, so it cannot be considered as a complete invasive species now. Some species, such as the emerald ash borer (*Agrilus planipennis*) are forecasted sojourners in Latvian fauna, they deserve special attention.

ABSTRACT

This part of the report should contain the information that may be published (about 2000 characters).

One of the major threats to native biological diversity is now acknowledged by scientists and governments to be biological invasions caused by alien invasive species. Invasive alien species are non-native species whose introduction and spread outside their natural past or present ranges pose a threat to biodiversity. They occur in all major groups, including animals, plants, fungi and micro-organisms, and are considered at least on islands to be the second most important reason for biodiversity loss worldwide (after direct habitat loss or destruction) (Shine et al., 2009).The expansion of invasive species can have an important effect not only on our natural resources, but also on human health, and economy. The world annual economic losses from invasive species are estimated to be over $120 billion each year. (http://democrats.naturalresources.house.gov/)

About 10 000 alien species have been registered in Europe. Some of these species were introduced on purpose and remain economically important. However, a proportion of the alien species established cause significant damage to native biodiversity and can be classified as invasive alien species according to the Convention on Biological Diversity (EEA, 2009).

Latvia has no national database on alien species, just individual databases on individual species. Only one species is indicated as economical important invasive species in Latvia – Sosnowsky hogweed (*Heracleum* sosnowsky). Approximately 1000 alien species are known in Latvia and part of these species may be invasive.

During this research attention was paid to various invertebrates, fish and plant species. Overall, during the season 7 plant and 7 animal species were found in project territory. The most frequent invasive plant considered Canada goldenrod (*Solidago canadensis*) 30 localities was observed. Very frequent invasive plants are also Sosnowsky hogweed (*Heracleum sosnowskyi*) (20 localities) and Ash-leaf Maple (*Acer*

negundo) (17 localities). The most frequent animal species are zebra mussel (*Dreissena polymorpha)* (5 localities) and Chinese sleeper (*Perccottus glehni*) (4 localities).
During the last year's expeditions not revealed a harlequin ladybird (Harmonia axyridis), very dangerous invasive insects species. This beetle was found in Latvia in 2010, and its spread in local fauna is unknown. Currently, other non-native species that were found during the expeditions are not considered to be invasive, but it is necessary to continue the observations of the spread of these species. These species are wasp spider *(Argiope bruennichi)* andbush cricket *(Phaneroptera falcata).* The weevil *Otiorhynchus smreczynskii* is widely distributed in the largest cities of the project territory, but its impact on natural habitats has not been established, so it cannot be considered as a complete invasive species now. Some species, such as the emerald ash borer (*Agrilus planipennis*) are forecasted sojourners in Latvian fauna, they deserve special attention.

REFERENCES

Balalaikins M., Bukejs A. 2011. *Otiorhynchus smreczynskii* (Coleoptera: Curculionidae) – a weevil new to Estonia and Lithuania, with notes on its occurrence and bionomy in the Eastern Baltic region. *Acta Zoologica Lithuanica* 21 (4): 263 – 267.

EEA . 2009. technical report: The impacts of invasive alien species in Europe

Reshetnikov A.N., 2010. The current range of Amur sleeper *Perccottus glenii* Dybowski, 1877 (Odontobutidae, Pisces) in Eurasia. Russian Journal of Biological Invasions. 1(2): 119-126.

Shine, C., Kettunen, M., Mapendembe, A., Herkenrath, P. Silvestri, S. & ten Brink, P. 2009. Technical support to EU strategy on invasive species (IAS) – Analysis of the impacts of policy options/measures to address IAS. Final report for the European Commission. UNEP-WCMC (Cambridge) / Institute for European Environmental Policy (IEEP), (Brussels, Belgium). 104 pp + Annexes.

Taylor, J. W. (7 November) 1902. part 8, pages 1-52. *Monograph of the land and freshwater Mollusca of the British Isles. Testacellidae. Limacidae. Arionidae*. Taylor Brothers, Leeds. Introduction page XV., pages 34-52.

Vytautas Tamutis & Dalius Dapkus , Zoology and Ecology (2013): Distribution of Oxythyrea funesta (Poda, 1761) (Coleoptera: Scarabaeidae, Cetoninae) in Lithuania, Zoology and Ecology, DOI: 10.1080/21658005.2013.870366

http://democrats.naturalresources.house.gov/

APPENDICES

1. Collected research data.
2. Visual material from expeditions.