

## TRANSLOCATION OF THREATENED LOCALITIES OF EASTERN EGGAR (*ERIOGASTER CATAX* L., 1758) AS A METHOD OF ACTIVE SPECIES PROTECTION BASED ON LOCALITIES IN SOUTHERN WIELKOPOLSKA

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**Abstract.** The aim of the study was to inventory potential habitats and localities of Eastern eggar *Eriogaster catax* (Linnaeus, 1758) on the route of expressway S5 Poznań-Wrocław at the Kaczkowo-Korzeńsko section. Insects from documented localities overlapping with the planned expressway were translocated to new locations, guaranteeing development and existence of this protected insect species.

**Key words:** *Eriogaster catax*, Natura 2000, inventory of insects, translocation

### INTRODUCTION

The subject of the study was to assess the occurrence of Eastern eggar *Eriogaster catax* (LINNAEUS, 1758), species code: 1074 – a representative of the butterfly order *Lepidoptera* from the family *Lasiocampidae* at the route of expressway S5 Poznań-Wrocław under construction in the section between Korzeńsko and Kaczkowo.

This species is covered by strict protection in Poland. The conservation status of the species in the Red Book of Endangered and Threatened Animal Species in Poland – EN (endangered). It is listed in Appendix II to the Bern Convention and in Appendices II and IV to the Habitat Directive [Buszko and Nowacki 2002, Buszko 2004].

An inventory of habitats and wildlife conducted in 2006-2007 (following the Habitat Directive) in forested areas administered by the State Forests National Forest Holding (Decision 61 of the General Director of the State Forests of 25.07.2006) specified 156 localities of Eastern eggar [Łabędzki et al. 2010]. They are clustered in two main locations in Poland. The most numerous population is found in the area administered by the Regional Directorate of the State Forests in Wrocław (126 localities). A total of 26 localities are reported in the area of the Regional Directorate of the State Forests

in Krosno. The species is found in small numbers also in the RDSF in Toruń (3 localities) and in Białystok (1 locality). Clumped distribution on the national scale poses a serious threat to any species. In the case of an accidental destruction of a biotope within the limits of its range a considerable proportion of the national population may be seriously affected. Threats and a proposal for protection measures concerning Eastern eggjar are presented in detail in a study by Chrzanowski et al. [2013] and Oleksy [2012]. The character of its distribution in Poland indicates the need to conduct thorough inventory in areas of planned investment projects not only in areas comprising known localities, but also potential biotopes of *Eriogaster catax*.

The aim of this study was to monitor the occurrence of Eastern eggjar in the area of the planned investment project and upon its identification – to translocate the local population to a new locality.

**Biology of the species.** The Eastern eggjar is a hygro-thermophilic species. It colonises blackthorn and hawthorn scrubs, occasionally also common pear scrubs, primarily in the vicinity of water bodies, wet meadows and oxbow lakes, but also exposed, insulated locations with a warm microclimate.

Its habitats include partly flood meadows, particularly fragments with young sprouts and dwarf shrubs of host plants. The species prefers semi-open localities, shielded from strong winds, but strongly insulated. It is also found in forest clearances.

Caterpillars develop in the spring leading a gregarious lifestyle, i.e. they develop in nests (cocoon), in which they shelter against their natural enemies and adverse thermal conditions in the early development period (caterpillars hatch at the onset of blackthorn flowering [Ruf et al. 2003, Oleksa 2012]. After the third moulting they enter the phase of solitary feeding and gradually disperse to neighbouring branches and shrubs. They pupate in solid cocoons on the ground.

Butterflies appear in September and October. Adults do not feed and nuptial flights last only several days. Females fly rather actively, gradually laying eggs in batches of several dozen and flying away from the hatching site. In this way the species spreads easily being in the phase of population growth. At the same time, for the maintenance of the metapopulation of the species it is necessary to preserve ecological corridors facilitating migrations, e.g. tree plantings along flood embankments and roads (Malkiewicz and Oleksa [2011], oral communication by A. Malkiewicz, Environmental impact analysis for the effects of realisation of the Programme to Construct National Roads for the years 2011-2015; 1047 Barczatka... 2011).

**Host plants.** Larvae feed on leaves of deciduous shrubs and trees – primarily blackthorn *Prunus spinosa* and other *Prunus* spp., hawthorn *Crataegus*, pear *Pyrus* spp., while in the last stages of development also roses *Rosa* spp., oaks *Quercus* spp. and birch *Betula* spp. [Buszko 1997, Łabędzki et al. 2010, Oleksa 2012]. Field observations indicate that this species in Poland prefers blackthorn [Oleksa 2012].

### Range of the species in Poland

The number of localities of the species in Poland has not been precisely specified. The first data on the distribution of the species indicated its occurrence in scarce and scattered localities in southern and central part of the country [Bielewicz 1973, Oleksa 2004, Buszko 2004]. Localities of the Eastern eggjar are also reported in 92 000 areas, i.e. PLH02\_12 Dolina Dolnej Baryczy, PLH020003 Dolina Łachy, PLH020036 Dolina

Widawy, PLH020017 Grądy w Dolinie Odry, PLH020051 Irykowy Zagon koło Gromadzynia, PLH020052 Pątnów Legnicki, PLH02\_07 Wzgórza Warzęgowskie, PLH020053 Zagórzyckie Łąki, Łęgi Odrzańskie, Dębniańskie Mokradła, PLH04\_18 Zbocza Płutowskie (Environmental... 2011)

The inventory conducted in the State Forests in 2006-2007, in the areas administered by the State Forests National Forest Holding, showed 156 localities [Chrzanowski et al. 2013]. We need to stress numerous reports on the occurrence of the Eastern eggar in forest divisions located in the vicinity of Wrocław and it may thus indicate that the general number of localities of this species is underestimated and it may be much higher.

Based on the above mentioned data it was found that the localities of the Eastern eggar are clumped at the boundary of southern Wielkopolska and the Lower Silesia. This shows the existence in this region of adequate temperature and humidity conditions and appropriate host vegetation promoting the species development. Thus a conflict may likely occur between the construction of road S5 and localities of the Eastern eggar.

The species lives in warm, well-insolated forest edges with southern exposure, scrubs on southern and south-western hill slopes, river banks, ravines as well as tree plantings and in-field and roadside scrubs [Łabędzki et al. 2010, Chrzanowski et al. 2013]. The species may be found in Natura 2000 habitats such as xerothermic grassland communities (*Festuco-Brometea*) and the southern exposure of xerothermic oak forests [Buszko 2004, Łabędzki et al. 2010].

## METHODS

The task of identifying habitats and localities of the Eastern eggar and its protection in the reported localities, specified in the Introduction, was performed in three stages:

- an inventory of potential habitats along the planned route of the road, conducted in the winter and early spring in order to limit the search area for the Eastern eggar to potential localities
- an inventory of localities based on the presence of egg batches (wintering on shoots, but difficult to find) and larvae feeding gregariously in cocoons in the investment area in the spring period
- the proposal of the translocation method for threatened localities, identification of locations for new localities, and upon approval for the translocation of threatened localities from the Regional Director of the Environmental Protection Agency, the translocation operation.

### Method of inventory and translocation of localities

The inventory was conducted using a modified research method proposed in Monitoring of species and habitats focusing on special habitat protection areas Natura 2000. MONITORING RESULTS (updated 2011-02-10) – 1074 Eastern eggar *Eriogaster catax* (Linnaeus, 1758) [Malkiewicz and Oleksa 2011]. In order to identify localities of the species, threatened by the construction of road S5 in the Korzeńsko-Kaczkowo section a thorough inventory was conducted in the pre-selected sites (indicating potential development of the Eastern eggar based on the presence of host plants). The works were performed in the early spring (before flowering and development of leaves on host

plants). They consisted in the inspection and search for egg batches and when found – application to GDEP to collect and translocate them to appropriate, unthreatened locations.

It is difficult to spot egg batches of the Eastern eggar in the period with no foliage. Eggs are laid on twigs of host plants and covered with greyish-brown hairs from the female's abdomen, which masks the entire batch and makes it difficult to spot. The moisture found on shoots additionally hinders an inventory. Snowfall in the period of observations practically prevents an inventory.

For this reason in the second stage (at the emergence of caterpillars from egg batches and feeding in cocoons) a repeated inspection was performed in order to search for cocoons with feeding larvae. Cocoons of feeding caterpillars are better visible and easier to spot, which may eliminate the error connected with omission of egg batches in the wintering period.

Caterpillars in cocoons feed for the first three development stages (to L4), which phenologically may take place by the end of May or mid-June (in 2012 year the transition of larvae from stage L3 to L4 took place in the second decade of May). Blackthorn shoots with identified cocoons were cut off at that time and translocated to blackthorn scrubs outside the investment area. Cut shoots were attached to shoots growing on site, facilitating passage of feeding caterpillars at older development stages to locally growing shoots. The selected translocation sites were blackthorn scrubs extending over one side of the investment site so that the future vehicle traffic does not disturb the flight and migration of butterflies.

For each identified locality of the Eastern eggar its location was determined by GPS and photographic documentation was prepared. The same operations were performed in relation to localities, to which cocoons and caterpillars were translocated.

## RESULTS

### Results of the inventory of potential habitats

Prior to the inventory, the Eastern eggar was recorded in localities between the towns of Kaczkowo and Rydzyna (oral communication by A. Malkiewicz). For this reason its occurrence in further localities situated within the investment site was very likely.

The following were established as potential habitats of the Eastern eggar within the investment site:

- the starting point of the Kaczkowo-Korzeńsko section at 79.800 km to 80.500 km between the railway embankment and the boundary of the investment site
- the section between the railway embankment and the boundary of the investment site at 82.000-84.000 km and the construction area of off-ramp exits
- the section between the railway embankment and the boundary of the investment site at 91.000-94.000 km
- the section along the investment site at 97.000-98.000 km.

Field inspections of the selected sections in the period of 16-20 January 2012 made it possible to state as follows:

- In the period of the inventory and inspection of blackthorn and hawthorn scrubs **no egg batches of the Eastern eggar were found**; however, it needs to be stressed that the weather during the inspection hindered observations – frequent intermittent snowfall and rain caused permanent wetting of plant shoots, which could have prevented spotting of egg batches.
- The largest phytocenoses of blackthorn scrubs are found in the first two above-mentioned sections.
- Starting from 91.000 km blackthorn scrubs are replaced by willow coppice, with blackthorn forming small edge scrubs at stand walls.
- The inspection showed scarce, occasional and in the opinion of the authors completely unjustified cases of destruction and clearance of blackthorn scrubs in the area adjacent to the investment site (the property owner is unknown to the authors, probably being land reclamation or railway companies).

### Results of the inventory of Eastern eggar cocoons and caterpillars

Among the four identified potential localities of the Eastern eggar its cocoons and caterpillars were found only in the first section. It is a belt of blackthorn-aspen scrubs with an admixture of single hawthorns and oaks, extending in a belt along the railway embankment and the boundary of the investment site at a distance of approx. 700 m. It is the greatest cluster of such vegetation in the inventoried area (Fig. 1-2).



Fig. 1. Belt of blackthorn scrub along the boundary of the investment site (barren ground) and railway tracks (invisible, on the right), a view in the winter period  
Rys. 1. Pas zarośli tarninowych wzdłuż granicy inwestycji (ziemia bez roślinności) i torów kolejowych (niewidocznych po prawej stronie), widok w okresie zimowym



Fig. 2. Belt of blackthorn-aspens scrubs along the railway embankment overlapping with the investment site

Rys. 2. Pas zarośli tarninowo-osikowych wzdłuż nasypu kolejowego kolidujący z inwestycją

### Description of the population

The Eastern eggar population from Kaczkowo is the greatest known to date in the Wielkopolska region (and the present Wielkopolskie province). Its size has not been clearly estimated due to fluctuations in individual years as well as due to its exclusion from the pilot-scale monitoring of habitats and species Natura 2000 in Poland [Malkiewicz and Oleksa 2011]. Generally the population size may be estimated at approx. 20-30 cocoons of caterpillars (2009-2012), i.e. FV according to the valuation of population status indexes. The observed parasitism by Tachinidae is relatively slight at 15-20% caterpillars in the population.

### Procedure of caterpillar translocation

Upon identification of the Eastern eggar in that site an application was filed at the Regional Director of the Environmental Protection Agency for a permit to translocate the species. The permit was granted by the decision of 27 June 2012 (WPN-II. 6401.84.2012.AG) and caterpillars in the number of approx. 70 (9-10 cocoons) were translocated (Fig. 3-4) to a new locality – in accordance with the terms and conditions of that decision.

The new locality of the species is: a belt of blackthorn scrubs extending along the drainage ditch south of the town of Trzebosz. Geographical coordinates of the locality: N: 51°39.414, E: 16°43.829.



Fig. 3. L-4 caterpillars during translocation to the new locality

Rys. 3. Gąsienice L-4 w trakcie przenoszenia na nowe stanowisko



Fig. 4. L-4 caterpillar (a close-up view) on a blackthorn twig

Rys. 4. Gąsienica L-4 (w zbliżeniu) na gałązce tarniny

Three large oaks are growing in the vicinity of the locality at a distance of approx. 200 m to the forest edge (Fig. 5). The shortest linear distance to the investment site is 3.7 km. The site was selected as promising for the translocated population due to optimal habitat conditions and the currently small size of the local subpopulation – several nests known since 2008 (Malkiewicz – unpublished data). The success of translocation needs to be monitored.



Fig. 5. General view of the Eastern eggar translocation locality in the form of a belt of blackthorn scrub

Rys. 5. Ogólny widok na stanowisko przeniesienia barczatki kataks – pas zarośli tarninowych

The locality is surrounded by arable fields. The nearest road to the locality is a ground road probably frequented by agricultural machines of field and forest owners. Locust trees are growing at the road. Thus there is no threat to the locality due to vehicle traffic or other investment operations.

## CONCLUDING REMARKS

The recorded locality of the Eastern eggar in the initial section of the construction site of road S5 near Kaczkowo is the most numerous locality of this species in the area of Rydzyna and Bojanowo.

The belt of blackthorn scrub was not damaged during road construction works and it is not threatened in the course of further works. It is adjacent to the roadway and from the crown of the constructed road it is separated by a belt of around a dozen metres. Thus there is no threat to the locality caused by construction works.

The locality may be threatened by scrub clearance not connected with the investment or the modernisation of the railway. This locality, located in the site seemingly at risk of destruction due to the vicinity of the expressway and the railway tracks to be modernised in the nearest future, should be constantly inspected and covered by nature conservation monitoring. Translocation of caterpillars in this year to another location does not guarantee complete collection of all caterpillars. It is likely that some caterpillars undergoing faster development had descended to the litter when pupation takes place and as such were not collected and translocated.

The new locality to which the caterpillars were translocated is situated in a more remote area among fields, away from busy roads; it also seems to be very similar in terms of scrub size as well as insolation and humidity conditions.

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## TRANSLOKACJA ZAGROŻONYCH STANOWISK BARCZATKI KATAKS (*ERIOGASTER CATAX* L., 1758) JAKO METODA CZYNNEJ OCHRONY GATUNKU NA PRZYKŁADZIE STANOWISK Z POŁUDNIOWEJ WIELKOPOLSKI

**Streszczenie.** Celem pracy była inwentaryzacja potencjalnych siedlisk oraz stanowisk występowania barczatki kataks *Eriogaster catax* (Linnaeus, 1758) na trasie przebiegu drogi ekspresowej S5 Poznań-Wrocław na odcinku Kaczkowo-Korzeńsko. Owady ze stwierdzonych stanowisk kolidujących z planowaną trasą zostały przeniesione na nowe miejsca, gwarantujące rozwój i egzystencję tego chronionego gatunku owada.

**Słowa kluczowe:** *Eriogaster catax*, Natura 2000, inwentaryzacja owadów, translokacja

Accepted for print – Zaakceptowano do druku: 16.09.2014

For citation – Do cytowania: Kuźmiński R., Malkiewicz A., Mazur A., 2014. Translocation of threatened localities of Eastern eggar (*Eriogaster catax* L., 1758) as a method of active species protection based on localities in Southern Wielkopolska. Acta Sci. Pol., Silv. Colendar. Rat. Ind. Lignar. 13(1), 15-23.