



LIFE19 BG/NAT/000804 Conservation of Pomorie Lake coastal lagoon

Annual Report 2020

D.3 – Monitoring of dragonflies & water regime



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Cover picture: one of the Pomorie temporary ponds where the Dark Spreadwing *Lestes macrostigma* is expected to reproduce (© D. Popov / Green Balkan).

1 – Description of action D3

The project aims the long-term improvement of priority habitat 1150* Coastal lagoon in SCI Pomorie. The action D3 purpose is to improve our knowledge for dragonfly species in SCI Pomorie and to propose usage of dragonfly assemblages as an indicator of water quality in coastal habitats in the SCI. Conserving dragonflies and their habitat should be a priority because they are valuable environmental indicators. They rely on healthy aquatic ecosystems and healthy food chains. Threats to their wellbeing include habitat loss and decline of water quality. These threats are most evident for the “critically endangered” in Bulgaria Dark Spreadwing (*Lestes macrostigma*). Pomorie Lake is the only place in Bulgaria where this species has been established for the last 15 years. Its typical habitat is shore stagnant brackish water bodies (salinity of the water up to 13-14 ‰) with the presence of *Bolboschoenus maritimus*. The registered average salinity in Pomorie Lake now (12.58‰ in May 2019) is expected to influence the whole dragonfly assemblage, due to the specific salinity tolerance of every dragonfly species.

The monitoring will include following parameters:

- (1) salinity, water levels and weather conditions (temperature and rainfalls);
- (2) dragonfly habitat features: spring vegetation composition and cover;
- (3) dragonfly assemblage by assessing from spring to summer the density of each species (using transect counts) and the number of individuals successfully emerging from larval aquatic habitat to adult terrestrial habitat (using exuviate counts).

The developed monitoring scheme including the field protocol will be tested in the SCI Atanasovsko Lake (BG0000270) and SCI Mandra-Poda (BG0000271).

Gathered data during the monitoring will be stored in a database. BBF will be responsible for database maintenance. Data will be statistically analysed on the annual basis and result will be described in an annual report.

A scientific paper with project results will be developed during the second half of 2023 and will be then presented at the European Congress on Odonatology. TdV research institute will take the leadership of this transfer of knowledge.

The monitoring protocol developed in the frame of the current LIFE project will be proposed to the National Biodiversity Monitoring system as the Dark Spreadwing is listed there but there is no any monitoring scheme existing.

Monitoring the change in dragonfly assemblage, with an expected increase of *L. macrostigma* abundance as an indicator of habitat restoration, is needed to assess the success of the project. Expected results are:

- improved knowledge of the ecological requirements of dragonfly assemblage and especially the requirements of Dark Spreadwing in SCI Pomorie;
- developed monitoring scheme for dragonfly assemblage monitoring in Pomorie Lake, Assessment status of the Dark Spreading in Pomorie;
- proposed indicator for water quality in coastal habitats in the SCI;
- raised capacity of BBF team about dragonfly assemblage and their habitat features requirements. This knowledge will be very valuable for further conservation projects.

2 – Accomplished tasks

2.1 – Exchanging information about dragonflies (D.3)

Dragonflies are flying insects as adults but have aquatic larvae. A dragonfly assemblage can be defined as the list of species that reproduce successfully in a given water body; one species that would be observed at the water body but with no breeding evidence could not be included in the dragonfly assemblage *per se*. Hence, monitoring the dragonfly assemblages requires two basic skills: identifying species and recognizing the autochthony cues. Tour du Valat aimed to train Pomorie local staff to these skills. As a first input in that frame, a general training to odonatology has been provided on 3rd December 2020. Topics were: generalities, anatomy, life cycle (Figure 1), species identification, ecology, and how to record data.

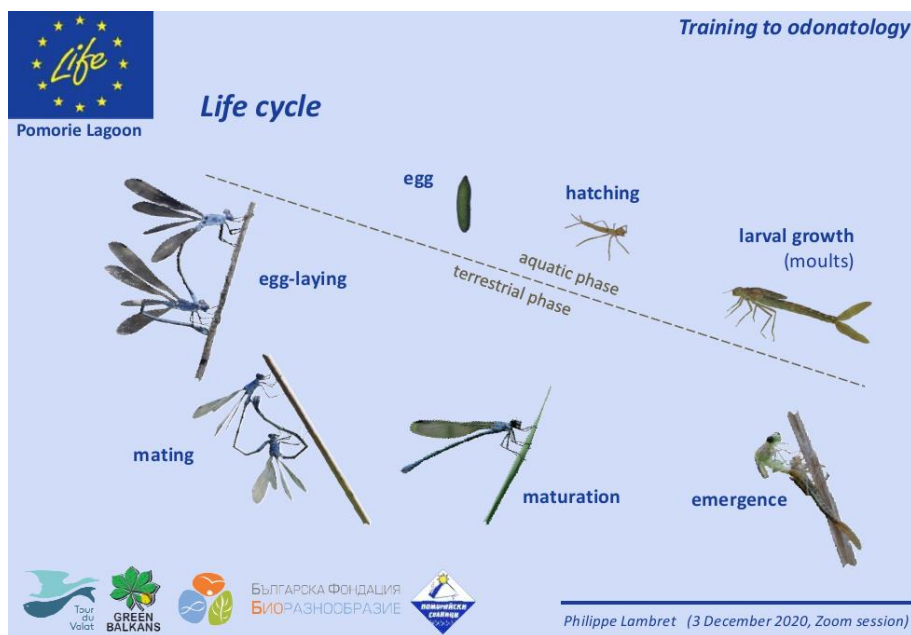


Figure 1. One of the slides of the general presentation training to odonatology: here the Dark Spreadwing *Lestes macrostigma* as an example (© P. Lambret / TdV).

Other information have been exchanged such as the relevant literature to study dragonflies in Bulgaria (e.g. Marinov 2000¹, Dijkstra & Lewington 2006², Beschovski & Marinov 2007³), and relevant contact of people having a good knowledge of the Bulgarian dragonfly fauna (e.g. Milen Marinov, Yordan Kutsarov, Tihomir Stefanov...).

¹ Marinov M. (2000) *Pocket field guide to the dragonflies of Bulgaria*. Eventus Publishing House, Sofia, 104 pp [in Bulgarian].

² Dijkstra K.-D.B. & Lewington R. (2006) *Field Guide to the Dragonflies of Britain and Europe*. British Wildlife Publishing, Gillingham.

³ Beschovski V. & Marinov M. (2007) Fauna, ecology, and zoogeography of dragonflies (Insecta: Odonata) of Bulgaria. In: Fet V. & Popov A. (eds.) *Biogeography and Ecology of Bulgaria*, Springer: 199-231.

2.2 – Launching the monitoring of water levels and salinities (D.3)

The dragonfly assemblages are depending on several biotic and abiotic features. Among these, hydroperiod (i.e. timing and duration of the flooding phase of a temporary water body) and salinity levels are decisive. Hence, the relevant places to set this monitoring were discussed: besides the main Pomorie water body, four temporary water bodies were selected (Figure 2).



Figure 2. Potential locations for the monitoring of water and salinity levels; the green dots were selected (© P. Lambret / TdV).

3 – Perspectives for 2021

1. Training local staff to the monitoring of dragonflies through a second presentation (from distance) and a field visit during the expected emergence of the Dark Spreadwing *L. macrostigma*.
2. Filling the databases in with the dragonfly and water monitoring data.



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