09/04/2021

# Subject │ Minutes of the follow-up Second Working Group 4 Meeting of COST Action CA18221: “PEsticide RIsk AssessMent for Amphibians and Reptiles”

1. **Welcome and introduction of participants**

The participants (**Annex 1**) were welcomed by Paulien Adriaane and Wim Beltman, leaders of Task 2.3.

1. **Adoption of agenda**

The agenda (**Annex 2**) for the meeting was adopted.

1. **General scope of the task 2.3**

Paulien Adriaane and Wim Beltman presented the general scope of task 2.3 within the context of PERIAMAR, and the goals to implement the task during the action lifetime.

1. **Amphibian ponds; aim, data collected in EFSA opinion and questions**

Characteristics of amphibian ponds were discussed in order to get to know the requirements for the simulation model for the fate and behaviour of the pesticide in the amphibian breeding pond.

*Depth, water surface area and side slope:*No real min and max, 10-20 cm up to 2 m is most common. Bigger and deeper lakes: amphibians on the edge, not in the central part, but this may influence pesticide concentrations at the edge.

Lakes less frequent, more small ponds/streams. Whether a pond is permanent or temporary may depend on the year. Permanent : at least few metres in diameter, northern Europe may be smaller.

New amphibian pond construction in NL: minimum of 25 \*25 m with a wish of 1/5yr to fall dry (-> fish die, so reset for amphibians). If fish present: no amphibians anymore. New ponds should have gentle slopes on west, north, east side to receive the sun in the morning, midday and afternoon, deeper parts for overwintering (2 m) and ‘bumpy’ side slopes.

Generally side slope not so important if at least amphibians can come in and out.

*Water temperature:*Paper from Germany: up to 37˚C. Higher is rare, not occurring, even in Spain. Many amphib can deal with cold or/and warm water, so no restrictions. Temperature does have an influence on the time of development of e.g. tadpoles. Overwintering: tadpoles as well as adults may be inactive in winter.

*Sediment:*No limitation on depth, the current 10 cm in TOXSWA does seem reasonable and a priori not too shallow. In fact there are no data on sed depth. Often overwintering in pond is not so important, most overwinter outside the pond.  
The ticker the layer, the less oxygen it contains.

*Water plants, pH:*No water plants up to high density is possible, depending on species. High densities may provoke pH variations (easily 8-10.5). Generally, permanent ponds always do have some vegetation. All in all, no limitations.

Wide range of pH is also possible. Some species tolerate low pH of e.g. 4. Exceptional case: high pH ammonia becomes ammoniac gass which may be toxic

*Surrounding vegetation:*Nothing to lots of reeds is possible. E.g. some toads like to burrow themselves in surrounding soil.

*Eutrophic state, turbidity, light/shadow:*Clear water is better than muddy water.  
Highly trophic: some species can deal with it (but may be developing slowly then).  
Light/shadow: sun is always good, but some species live in forest ponds in the shade.

Salty water may sometimes be a problem in NL, but other species may tolerate this.

*Hydrology pond:*‘Good amphibian pond has neither inlet, nor outlet.’ -> no fish can then disturb the amphibians.  
Too fast flow may not be so suitable.

*Pesticide entries:*Atmospheric deposition: no evidence in EU (like in California). Long range only known to deposit in colder areas (poles). Probably minor route within EU compared to spray drift deposition, etc.  
Eroded soil: if too much, turbid water, may become a problem. No data.

*Other:*Background pond density is important: cluster of ponds are likely to be more supportive for amphibs.

No specific *Regulatory zones issues*: no parameters to exclude.

*Conclusions* concerning *TOXSWA model* development:  
1. Simulation of temporary pond is important: e.g. within a time series of 20 years the model needs to allow for a pond running dry during a number of years  
2. The model should be able to simulate a plausible hydrology in the pond, without having a permanent water inlet (what the current EU FOCUS pond has), i.e. only based upon rainfall, evaporation, (upward or downward) seepage and possibly surface runoff or drainage water. Water depth should vary as function of time.  
3. A sediment depth of 10 cm seems OK, 25 cm is not needed (would have consequences for run time model)

1. **Short summary of discussion and outlook to agenda for day 2**

The main aspects of the group discussion were highlighted and wrapped up to be addressed during the second part of the meeting. The following questions types are set:

* Questions on temporary ponds
* Questions on databases, probably not much on hydrological/physical/chemical parameters? Maybe European Pond Conservation Network or Ponderful has useful information?

1. **Summary and conclusions of day 1**

After welcoming participants to the second meeting day, the conclusions from day 1 are revisited and the objectives for day 2 presented.

1. **Remaining questions on temporary pond characteristics and requirements for TOXSWA model**

Characteristics of amphibian ponds were discussed in order to get to know the requirements for the simulation model for the fate and behaviour of the pesticide in the amphibian breeding pond.

Temporary ponds

*Definition of temporary pond:*

Ponds which have a predictable annual dry phase, usually in the order of 3 – 8 months, predominantly during summer and autumn (J.V. Ward, 1992. Aquatic insect ecology. 1. Biology and habitat. John Wiley, New York).

The dry phase is unpredictable. In South Europe a temporary pond can be dry for 5-8 years and next carry water all year round for several years in a row, depending on rainfall. . So temporary ponds may be ponds that dry up every year in summer, or have a more unpredictable behaviour as e.g. the one described above, or e.g. only dry up once every 5 years.

Is every amphibian pond an amphibian breeding pond: in general yes.

*Depth, water surface area:*A few centimeters is minimum.

In the UK the minimum water surface area for a temporary pond is taken 1 m2.

*Which period water should be present to allow for amphibians to fully develop:*The minimum period is 2 weeks. In general it is 2 months, that allows for a good reproductive success. Some species are very elastic, i.e. they can speed up their metamorphosis when the pond is desiccating.

In Spain ponds can be present from February, but can also be present from November onwards only, because before the ponds were dry. In the latter case amphibians can only breed from Nov onwards

With climate change in UK and Switzerland ponds can present and used for breeding also from February.

The ponds are present in general in the Spring period, which is from February onwards in South, and March to May in Central Europe. General breeding season is early spring

*Pelophylax* are breeding in Porto beginning of April, and in Switzerland in April-July.

There is not an operational rule that the development period of amhibians can be described with a rule based on the sum of temperature and number of days (SUM(T x day)).

*Vegetation in and around temporary ponds*

No vegetation in general in temporaryponds, except of e.g. flooded meadows.

*Question of WENR for data of field study in which water balance was measured regularly to validate hydrology TOXSWA*

Some data are available for a vernal pond in North-America/USA (D.D. Williams. 2006. The biology of temporary waters. Oxford University Press). Data may also be obtained via the European Biodiversity Conservation Network.

Request for data will be done in whole PERIAMAR group.

1. **Inventory of suitable databases and design of a format to describe the databases**

Data may be available from national conservation institutions or local works. The availability of data can also be checked in Amphibian Biology Book Series; which give an overview for every European country.

The minimum data preferred to be available in the databases would be:

* Water depth. Often the water depth is not available. This will not exclude the suitability of the database.
* Surface area
* Information regarding surrounding area (agricultural or not)

Request for data will be done in whole PERIAMAR group.

1. **Closing**

Conclusions concerning TOXSWA model development:

1. Simulation of temporary pond is important: e.g. within a time series of 20 years the model needs to allow for a pond running dry during a number of years

2. The model should be able to simulate a plausible hydrology in the pond, without having a permanent water inlet (what the current EU FOCUS pond has), i.e. only based upon rainfall, evaporation, (upward or downward) seepage and possibly surface runoff or drainage water. Water depth should vary as function of time.

3. A sediment depth of 10 cm seems OK, 25 cm is not needed (would have consequences for run time model).

## LIST OF ANNEXES

**Annex 1 – Attendance List**

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**Annex 2 – Agenda**

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