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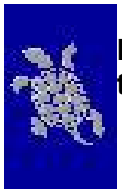

Project LIFE05NAT/LT/000094 "Protection of European pond turtle and threatened amphibians in the North European lowlands"

ACTION A.3: CRITERIA FOR FAVOURABLE CONSERVATION STATUS FOR POPULATIONS OF EUROPEAN POND TURTLES, FIRE-BELLIED TOADS AND GREAT CRESTED NEWTS

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Introduction

The EU Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (the Habitat Directive) was developed for ensuring the biological diversity by conservation of natural habitats and wild flora and fauna in all EU Member States. This directive is the basis of the creation of the Natura 2000 network which is an ecological network of species areas including natural habitat types and habitats of species. For that purpose measures have to be designed in order to maintain or restore the favourable conservation status as well as in order to undertake surveillance of the conservation status. Furthermore suitable indicators have to be described and defined for assessing and maintaining the conservation status. Species registered in Annexes II and IV of the Habitats Directive like *Emys orbicularis* encourages member states and accession countries to restore the species to a favourable conservation status across EU.

In order to evaluate and to determine the favourable conservation status for threatened species in different areas, regions and countries with similar habitat types and climatic conditions it is necessary to develop comparable criteria for the whole area. This was done for the European pond turtle, Fire-bellied toad and Great crested newt during the LIFE-Nature-Project “Protection of European pond turtles and amphibians in the North European Lowlands”. These criteria will help biologists and ecologists to determine the current conservation status while monitoring the species and finally to carry out regular evaluation of the effects of management measures or existing threats for the monitored populations in the northern range of the species distribution.

Furthermore, populations living under extreme living conditions at the border of species distribution can increase the genetic variation of a species e.g. *Emys orbicularis* in the North European lowlands (comp. MOCKFORD et al. 1999). However, these specific adaptations can be the fatality for the populations because of already smaller changes of the living conditions. Hence, populations at the edge of the species distribution should have a specific attention and a high protection priority (SCHLÜPMANN 1992, FRITZ 2000).

1. Criteria for defining the favourable conservation status of populations of *Emys orbicularis*

Individual numbers for the different conservation status of *Emys orbicularis*

A > 50/40 individuals - excellent (favourable on long term)
B 30-50/20-40 individuals - well (favourable on short term)
C 10-30/< 20 individuals - medium (unfavourable) (too small populations or declining)
D < 10 individuals - bad (highly unfavourable up to nearly extinct) (too small populations, declining, no or too small reproduction success)
E 0 individuals - extinct

Table 1 is based on the criteria by SCHNITTER et. al (2006) for the monitoring of *Emys orbicularis* in Germany. These criteria were revised, complemented and adapted to the conditions of the turtle populations and their habitats in the North European lowlands.

Tab. 1: Criteria for defining the favourable conservation status of populations of *Emys orbicularis*

Status category / Criteria	**A**	**B**	**C**	**D**
Status of populations	**excellent**	**well**	**medium**	**bad**
Population evidence LT Age structure	> 50 adults of different age classes	30-50 adults of different age classes	10-30 adults	< 10 adults
Population structure LT	> 12 subadults, in addition juveniles existing	at least 7-12 subadults, in addition juveniles existing	at least 7 subadults and/or juveniles	< 3 subadults and/or juveniles
Population evidence PL Age structure	> 40 adults of different age classes	20-40 adults of different age classes	10-20 adults	< 10 adults
Population structure PL	> 10 subadults, in addition juveniles existing	at least 5-10 subadults, in addition juveniles existing	at least 5 subadults and/or juveniles	< 3 subadults and/or juveniles
Population evidence DE Age structure	> 40 adults of different age classes	20-40 adults of different age classes	10-20 adults	< 10 adults
Population structure DE	> 10 subadults, in addition juveniles existing	at least 5-10 subadults, in addition juveniles existing	at least 5 subadults and/or juveniles	< 3 subadults and/or juveniles
Habitat quality	**excellent**	**well**	**medium**	**bad**

Status category / Criteria	**A**	**B**	**C**	**D**
status				
Water habitat				
Structure of the water bodies/ of the system of water bodies e.g. summer habitats, winter habitats with less danger of frost, structured shallows zones with submerse vegetation, woody and foliage plants in water and at shores as hiding and feeding sites, muddy ground	all components of the annual habitat optimal, lots of suitable pond structures e.g. lots of sunny summer habitats, several protected deeper and more shaded parts for hibernation, lots of structured shallow zones, lots of vegetation in water and at shores, thick mud layer	similar **A**, but few components of the annual habitat not optimal or not so abundant	several components of the annual habitat not optimal, insufficient variation in pond structure e.g. less sunny summer habitats, few protected deeper and more shaded parts for hibernation, less shallow zones, less vegetation in water and at shores, thin mud layer	most components of the annual habitat not optimal, pond is uniform, no variation in pond structure e.g. no sunny summer habitats, no protected deeper and more shaded parts for hibernation, no shallow zones, no vegetation in water and at shores, no mud layer
Total size of the water bodies/ of the system of water bodies if all or most of the water bodies are suitable	> 1 ha under normal conditions; exceptional minimum in very dry periods: > 0,3 ha	> 0,6 ha under normal conditions; exceptional minimum in very dry periods: > 0,2 ha	> 0,2 ha under normal conditions; exceptional minimum in very dry periods: > 0,1 ha	< 0,2 ha under normal conditions; exceptional minimum in very dry periods: < 0,1 ha
Number and structure of suitable basking sites e.g. shore, living and dead vegetation, stones	abundantly available, structure of shore and water structure suitable for basking e.g. protected sunny shores, tree trunks, shrubs, deadwood, foliage plants e.g. sedge tufts, cattail	similar **A** but suitable sites partly shaded or not so abundant	more unprotected open shores, water surface appears „tidy" and lack of suitable basking sites respectively	only unprotected open shores, water surface appears „tidy" and big lack of or no suitable basking sites respectively
Land habitat				
Characteristics of the bank vegetation/ structure as basking sites	sunny shores not too open, not too overgrown, shores with different inclinations e.g. steeper and more slightly inclined	only partly too open or too dense vegetation	larger area either too dense or too open, only 1 type of shore inclination e.g. steep or flat	almost all bank either too dense or too open, only 1 type of shore inclination e.g. steep or flat
Nesting sites				
Number of potential nesting sites	numerously existent (> 7)	sufficiently existent (5-7)	barely existent (3-4)	barely existent up to nonexistent (0-2)
Size per nesting site	> 300 m^2	200-300 m^2	100-200 m^2	< 100 m^2
Distance to next	< 300 m	300-600 m	> 600 m	> 1000 m

Status category / Criteria	**A**	**B**	**C**	**D**
water habitat				
Microclimate e.g. sun exposition, southern location on a slope, substrate, windbreak	very favourable e.g. sunshine (daily average > 10:00 h), southern exposition, slight and/or strong inclination (5-20°), sandy soil, xerothermic, windbreak	favourable e.g. sunshine (daily average > 07:00 h), flat (< 5°) and/or steep inclination (20-30°), sandy-loamy soil, partly less windbreak	unfavourable e.g. less sunshine (daily average < 07:00 h), more eastern and/or western exposition, loamy-sandy soil, less windbreak, less heat storing, risk of stagnant moisture	very unfavourable, e.g. too less sunshine (daily average < 05:00 h), northern exposition, loamy soil, no windbreak, no heat storing, bigger risk of stagnant moisture
Predation risk (e.g. wild boars, racoon dogs)	no or marginal e.g. adequate protection measures, low predator density	medium e.g. adequate protection measures, lower predator density	high and no or not sufficient protection measures	very high and no protection measures
Integration	**excellent**	**well**	**medium**	**bad**
Distance to the next population	< 500-1000 m	1000-2000 m	2000-3000 m	> 3000 m
Impairments	none up to marginal	medium	intense	very intense
General				
Pressure of leisure	none	infrequent at shores and in the range of nesting sites respectively	regular at shores and water-based and in the range of nesting sites respectively	regular and intense at shores and water-based and in the range of nesting sites respectively
Application of fertilisers and pesticides around water habitats	not ascertainable, buffer zone > 50 m	not ascertainable, buffer zone 20-50 m	ascertainable, no buffer zone	ascertainable, no buffer zone
Water habitat				
Utilisation of fishery	no utilisation	marginal and not dangerous for the species respectively	often and dangerous for the species respectively	numerous and very dangerous for the species respectively
Utilisation of water habitats e.g. cattle drinking, washing	no utilisation	marginal and not dangerous for the species respectively	often and dangerous for the species respectively	numerous and very dangerous for the species respectively
Water regime	undisturbed	marginally disturbed	intensely disturbed e.g. meliorations, afforestations	very intensely disturbed e.g. lots of meliorations, afforestations
Water habitat destruction e.g. overgrowth, gravel pit construction	no water habitat destruction	no water habitat destruction	threatened by water habitat destruction	heavily threatened by water habitat destruction

Status category / Criteria	**A**	**B**	**C**	**D**
Land habitat				
Habitat destruction e.g. succession, agriculture, afforestation, building, road construction	no land habitat destruction	no land habitat destruction	threatened by land habitat destruction	heavily threatened by land habitat destruction
Nesting sites				
Succession at nesting sites	none or adequate management measures	marginal, succession nonserious	progressing, succession serious and no adequate management measures	quickly progressing, succession very serious and no adequate management measures
Human disturbances by agricultural activities, grazing and trampling of cattle and horses particularly during nesting season	none	infrequent	less, but regular	intensive, regular
Isolation				
Road ways in the land habitat/ adjacent	not existent	less existent and scarcely frequented	existent and moderately frequented	more existent and numerously frequented
Inter- and intraspecific competition				
Allochthonous individuals	not existent	not existent	existent	existent
Exotic turtle species	not existent	not existent	existent	existent
Predation on adults				
Predation risk by alien species e.g. racoons	not existent	not existent	existent	existent

2. Criteria for defining the favourable conservation status of populations of Fire Bellied Toad (*Bombina bombina*).

Definition of two population structures of Fire Bellied Toad and Great Crested Newt.

There are mainly two types of fire bellied toads and great crested newt's population structures present in Lithuania, Poland, Germany and Denmark.

1. Isolated populations, which does not have possibilities for immigration. Each isolated population is dependent on a single breeding pond or very few ones.
2. Meta-populations, formed by several sub-populations of fire bellied toad or crested newt, which are connected to each other with migration corridors and ponds functioning as stepping stones for the two species. Thus the individuals can migrate freely between sub-populations. Even each sub-population has only a single breeding pond; the whole meta-population system offers several breeding possibilities for fire bellied toad or great crested newt to the connectivity.

The criteria for assessing the favourable conservation status of fire bellied toad or great crested newt are different depending on the type of population structure.

Isolated population

- In case of isolated population there have to be an annual stable breeding success, at least in 3 ponds, with distances between ponds no more than 300 m. However, in some natural floodplain landscapes, natural forest meadows habitats or city landscapes, the number of ponds with annual breeding success might be lower due to natural topography or urbanisation and with little chance to chance the situation.
- The ponds must be fish free, with the slopes of 5 ▪ - 20 ▪ and with clear water. The shallow water (up to 50 cm) should form at least 50% of the total area of the pond. There have to be swamp vegetation (less than 1 m high) present in the edges of the pond (more than 25%). 25%-50% of the total surface of the pond should be vegetated with floating vegetation (for example potamogeton natans or Glyceria fluitans), which covers maximum 50 % of the water surface inside its own vegetation zone.
- The effective population size should be at least 500 adults, which means that the population must count at least 1000 adults. Depending on the quality of foraging ponds and swamps and the terrestrial habitat, the average pond (natural eutrofic, fish free, spring depth of 0,5-1.5 m) can support different amount of adult fire bellied toads. The fire bellied toad can be flexible in its feeding behaviour and extend its terrestrial feeding period if ponds dry up early in the seasons as they do on relative more sandy flat terrain compared to moraine hills formed of clay. The fire bellied toad can use wet forest, dried out swamps, piles of logs and stone fences as hiding and terrestrial foraging habitat. So in areas with relative few ponds and ponds of drying out character the other terrestrial habitats become more important. In those situations the area of good

terrestrial habitat can compensate for relative few and poor quality of foraging ponds in order to sustain a favourable conservation status.

- The habitat components (breeding and foraging ponds, terrestrial foraging area and hibernation sites) should be safeguarded in the area where the population occurs.
- In case of poor terrestrial habitats, each site with a population of fire bellied toads should contain minimum 10 potential breeding ponds with a yearly breeding success in 3 ponds or alternatively, water surface of breeding waters of minimum of 5000 m^2. When terrestrial feeding habitats are poor (as fields or pine plantations) the amount of foraging waters should be 50 m2 per adult frog meaning an total area of foraging waters of 50.000 m2 (including the 5000 m2 of breeding ponds) are desirable. If the terrestrial habitat is richer (wet forest, wet grassland, pasture), the water surface could be 25 m^2 per adult frog thus with a need of 25000 m2 (including the 5000 m2 of breeding ponds) for one fire bellied toad population.
- In agricultural land there should be a buffer zone (uncultivated land) at least 20-50 m wide, around of each pond and preferably also such zone around good foraging habitats as wet forest.

Meta-population

If several fire bellied toad populations of less than 1000 adults are connected to each other (distance between two such sub-populations is 1.0 to 2.0 km), they form a meta-population network. In case of meta-population the individual sub-population can have less than 1000 adults, because the network of 20 sub-populations of approximately 100 adults could form a meta-populations of 2000 adults.

- Each sub-population must have an annual stable breeding success, in at least one ponds.
- The ponds must be fish free, with the slopes of 5 ▪ - 20 ▪ and with clear water. The shallow water (up to 50 cm) should form at least 50% of the total area of the pond. There have to be swamp vegetation (less than 1 m high) present in the edges of the pond (more than 25%). 25%-50% of the total surface of the pond should be vegetated with floating vegetation (for example potamogeton natans or Glyceria fluitans), which covers maximum 50 % of the water surface inside its own vegetation zone.
- The habitat components (breeding and foraging ponds, terrestrial foraging area and hibernation sites) should be safeguarded in the area where the sub-population occurs.
- The distance between two sub-populations should be 1.0 km and definitely not more than 2 km.
- The migration possibilities between sub-populations have to be assured for fire bellied toads by creating and restoring fish free water bodies and maintaining open semi-natural terrestrial habitats, and securing wet and dry forest with logs as good foraging, hibernation and migration.
- In agricultural land there should be a buffer zone (uncultivated land) at least 20-50 m wide, around of each pond.

3. Criteria for defining the favourable conservation status of populations of Great Crested Newt (Triturus cristatus)

Isolated population

- In case of isolated population there have to be an annual stable breeding success, at least in 5 ponds, with distances between ponds no more than 500 m. However, in some natural forest landscapes, mountainous or city landscapes, the number of ponds with annual breeding success might be lower.
- The ponds must be fish free, with the slopes of 20 ▪ - 40 ▪ and with clear water. The shallow water (up to 50 cm) should form at least 25% of the total area of the pond. There have to be swamp vegetation (less than 1 m high) present in the edges of the pond (more than 25%). 25%-50% of the total surface of the pond should be covered with floating vegetation.
- The effective population size should be at least 500 adults, which means that the population must count at least 1000 adults. Depending on the quality of terrestrial habitat, the average pond (fish free, spring depth of 1-1.5 m) can support different amount of adult newts. As the crested newt is known to be flexible in its feeding behaviour, in cases of poor terrestrial habitats (fields with intensive agriculture, scrub) water bodies are important not only as a breeding place, but also as a feeding ground. Thus in those situations the area of aquatic habitat should be relatively larger to sustain a favourable conservation status.

For example, in Denmark and Germany, where the terrestrial habitat is relatively poor, consisting often large intensively managed fields, the average pond with water table of 500 m^2 can support a population of approximately 100 adult newts.
In some cases much more than 100 adult newts can live in a 500 m2 pond, but in an average Danish/German pond one should not expect more than 100 adult newts.
The habitat components (breeding and foraging ponds, terrestrial foraging area and hibernation sites) should be safeguarded in the area where the population occurs.

- In case of poor terrestrial habitats, each site with a population of newts should contain either 10 ponds or alternatively, water surface of 5000 m^2. If the terrestrial habitat is richer (forest, grassland, pasture), the water surface could be 2500 m^2 for one newt's population.
- In agricultural land there should be a buffer zone (uncultivated land) at least 5 m wide, around of each pond.

Meta-population

If several newt populations of less than 1000 adults are connected to each other (distance between two such sub-populations is 0.5 to1 km), they form a meta-population network. In case of meta-population the individual sub-population can have less than 1000 adults, because the network of 20 sub-populations of approximately 100 adults could form a meta-populations of

2000 adults.

- Each sub-population must have an annual stable breeding success, in at least three ponds.
- The ponds must be fish free, with clear water and slopes of 20 ▪ - 40 ▪ . The shallow water (up to 50 cm) should form at least 25% of the total area of the pond. There have to be swamp vegetation (less than 1 m high) present in the edges of the pond (more than 25%). 25%-50% of the total surface of the pond should be covered with floating vegetation.
- The habitat components (breeding and foraging ponds, terrestrial foraging area and hibernation sites) should be safeguarded in the area where the sub-population occurs.
- The distance between two sub-populations should be 0.5 km and definitely not more than 1 km.
- The migration possibilities between sub-populations have to be assured for newts by creating and restoring fish free water bodies and maintaining open semi-natural terrestrial habitats.
- In agricultural land there should be a buffer zone (uncultivated land) at least 5 m wide, around of each pond.