

Situation of turtles and amphibians in the North European lowlands



Shallow zones in the pond are vitally important for turtles and amphibians

The European pond turtle (*Emys orbicularis* L.), the Fire-bellied toad (*Bombina orientalis* L.) and the Great crested newt (*Triturus cristatus* L.) are threatened species in the North European lowlands. All 3 species need water habitats for their survival. The European pond turtle is completely dependent on water and spends almost whole year in different types of water bodies, which have functions as places for mating, feeding, hiding and hibernation. The Fire-bellied toad and the Great crested newt spend several months in the spring and summer months in ponds for courtship and mating as well as breeding and feeding. The loss of water bodies is one important reason for the decline of all 3 species. All species can inhabit the same ponds in spring during mating season and in summer for feeding. This folder explains which pond conditions all species need for their survival and what you can do to help them.

“Good pond” characteristics

A suitable pond habitat that suits all 3 species for longest time in their life cycles must have some key characteristics. The most important factors are depth, vegetation, exposure to sun and absence of fish.

Variation in depth and vegetation

The variation in depth and vegetation zone is fundamental because it provides hiding places and sources of food for all 3 species during almost all life stages.

Shallow zones with warmer water as well as floating and submerged vegetation are important factors for all 3 species as these zones are used for mating period, egg laying by amphibians and growing of juvenile amphibians and turtles during their first weeks of life. Adult turtles and amphibians stay also in deeper pond zones up to 1,5 m.

Exposure to the sun:

The spring is the most important time to heat and to get enough energy for reproduction period after long hibernation for all 3 species. Consequently, in this period all 3 species prefer to bath in the sun in the shallow and sun exposed parts of ponds, which are the warmest. The Pond turtle regularly basks on the banks of the pond, dead wood or pond vegetation. They can be observed in the shallow parts with warm water or on floating vegetation during warmer days. The Fire-bellied toad and the great crested newt choose warmer parts of ponds or to the sun exposed and covered with vegetation parts for heating.

Highly structured ponds offer many basking sites

Absence of fish:

The presence of fish has a severe negative influence on amphibians. The eggs and larvae of the Fire-bellied toad and Great crested newt are eaten by fish usually kept in the ponds: Crucian carp (*Carassius carassius*), Golden carp (*Carassius auratus*), Tench (*Tinca tinca*), Loach (*Misgurnus fossilis*), also Three-spined stickleback (*Gasterosteus aculeatus*). These fish species also consume many species of invertebrates reducing available sources of food for amphibians and turtles. The reproduction success of the Fire-bellied toad and the Great crested newt is totally limited and populations of these 2 amphibian species avoid ponds with fish populations.

Terrestrial habitat near the pond:

It is vital for the populations of the European pond turtle to have open south exposed sandy or sandy-clayish hilly areas with a lower vegetation cover for turtle nests. The presence of hibernation places, which can be logs of dead wood, stone fences or a forest with undisturbed soils full of old burrows of mammals is important for both Fire-bellied toad and Great crested newt.



Hibernation place equipped with old tree roots for turtles

Other ponds nearby forming a cluster:

A suitable habitat for viable populations of European pond turtles, fire-bellied toads and great crested newts consists of several types of water bodies, which have variations in size, depth, vegetation structure, sun exposure and are close connected to terrestrial habitats. European pond turtles and Fire-bellied toads migrate between several ponds over the year.



Several ponds form a habitat complex for various species

Optimal pond sizes for amphibians vary around 1000 m² while turtles prefer very small summer ponds with 10m² up to 5000m² non-seasonal-ponds.

How to preserve and restore water bodies?

Today, fewer farming activities in many areas lead to a general overgrowth and loss of open areas including ponds. In order to ensure more variation of different habitat types and a mosaic of various habitat structures as well as a higher biodiversity, habitats should be managed with adequate methods. If open sunny ponds are becoming lost in an area, fauna and flora requiring such ponds will disappear. The restoration of dried out or overgrown ponds or the creation of new ponds will prevent the disappearance of aquatic species in the long term.

Stop mud formation

Pond ecosystems may be damaged by thick layers of accumulated mud. Mud may be formed by pollution of household water, run off water reach of farmyard or artificial manure, leaves of nearby growing trees, or food remains and excrements of fed fish and ducks. The decomposition of dead material (algae, vegetation, animals, etc.) consumes all the oxygen. Therefore all the living organisms including turtles and amphibians disappear as well as many species even die. Only very resistant species survive like the great diving beetle (*Dytiscus marginalis*). Mud can be removed by machines – hydraulic

excavators should be used in such case as the wired excavators are not able to clean the pond nicely. With the same machine a steep shoreline should be flattened. The source of mud creation and runoff water from household or agriculture should be stopped or reduced.



Mud removal should be performed as the pond loses its esthetic and functionality

Remove unwanted vegetation

Naturally, ponds can overgrow very fast without appropriate care. Plants like willow bushes (*Salix* sp.), reed (*Phragmites australis*), cattail (*Typha* sp.) often grow on the sides of the pond spreading towards the whole water containing area. The shorelines are very often covered with bushes and trees which shade the ponds and reduce the water temperature. Shaded ponds with lower water temperatures are unsuitable for all species which need sunny water bodies and warm water. Plants and trees should be removed. Additionally, the taking out and cutting of new plants and trees should be carried out at an early stage and regularly to prevent a new overgrowth in restored pond.

Properly dig new ponds

Usually ponds are very often dug as deep “holes” with a steep shore and additionally inserted with fishes which are completely unsuitable for turtles, amphibians and other threatened insect and plant species afterwards. The dug out soil of the pond is mostly left around the pond. It is full of nutrients and lead to a fast overgrowth of the shoreline with bushes and trees. “The bad way of pond digging” is mainly carried out because of the lacking knowledge on types and ways to create ponds and the lack of machines.



New way of digging ponds: flatten the shores, remove dug soil

Install grazing of meadows and around ponds

Earlier grazing traditionally was used in many eastern countries but in soviet times this agricultural activity was interrupted or prohibited in protected areas. Hardy grazers e.g. the beef cattle breeds Galloways and Highlanders are very suitable for grazing activities. Such cattle breeds are robust, long-living, easy calving and they can stay most of the year outside. They feed on various species of grasses and herbs as well on the sprouts of bushes and small trees. This unselective grazing improves meadows and ponds and keeps the landscape open. With feeding and trampling at water's edges they keep also the shorelines open and prevent a fast overgrowth with reed, bushes and trees.



Grazing cattle rample the shoreline - the same place overgrown and after 1 year grazing

Be aware about fish!



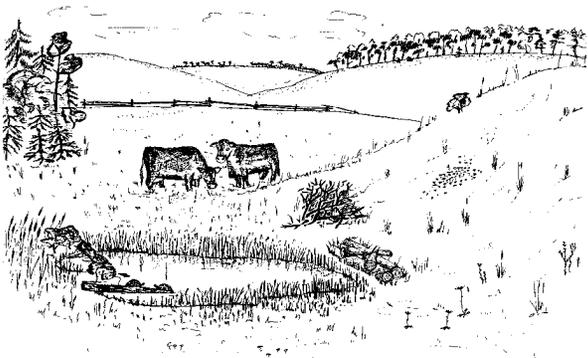
It's very old and still existing habit in Eastern European countries to set fish into every free pond on farm or in nature. Later fish thrive among local pond networks occupying almost all water bodies. Hence many amphibian and turtle populations become endangered.

Please, be aware that some ponds are very important as breeding and feeding places for protected species. Your willingness to cooperate will help to save threatened animals. Consult with environmentalists, which ponds must be removed from fish and ask their help.

Pond must totally emptied to remove the fish

Instructions for new pond digging

- To dig a pond where a previous pond dried out
- To dig a flat shore to make a slight inclination between shoreline and the deepest part of the pond
- not to destroy the layer of clay during digging
- To vary the depth of the pond e.g. to prepare a shallow zone which could dry out e.g. in late summer
- to dig in a bigger distance to farms and settlements (> 500 meters), because turtles can be disturbed by human activities except drinking of cattle
- to spread the soil of the pond in a bigger distance to the pond
- To leave dead wood at the shore as basking sites for turtles
- Not to put fish inside
- To dig a pond next to other ponds/ to include new ponds in a pond system



The positive side effect is that such a pond with a flat shore makes it easier to take water or to drink the cattle. The depth of the pond depends upon the clay layer, which may not be damaged in any case. The best time to intervene ponds is October-March when amphibians and turtles are in hibernation places. But you must be aware if the species are not present at the pond. **In any case we kindly ask you to consult with nearest environment protection agency or administration of protected areas before carrying out any works on ponds.**

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POND ECOSYSTEM

Pond Restoration and Creation for the European Pond Turtle, the Fire-bellied Toad and the Great Crested Newt



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