

Pond Design for Terrapins in the UK

Probably a bit of background would be useful. I caught my first wild Painted Turtle in 1974 in a little pond in Freedom, New Hampshire since then I have been committed to American turtles. I have lived in the USA twice and have been a member of herpetological and chelonian societies over there. My other hobby is canoeing so I have had the very good fortune to watch and catch turtles in their habitats from Vancouver to Maine, from Michigan to Florida.

Upon return to the UK I have had the time and resources to build a custom pond for my turtles. I have had the pond running now for some 8 hibernation cycles. Its volume is some 200 cubic metres and it is naturally fed and is unfiltered. It is effectively a natural pond. Over the years I have stocked it by re-homing American turtles; mostly Sliders (*Trachemys* sp) and Cooters (*Pseudemys* sp). I have re-homed many animals now and feel that over that time I have gained some experience with the issues associated with re-homing.

I have compared my results with those of the Red Eared Terrapin Education Centre (RETEC) in Somerset and consider my own findings very similar to their start up experience.

In a nutshell, animals that have been kept in a glass box which are then moved into a bigger pond with other animals have a probability of surviving of no better than 50%. This can be drastically improved with good pond design.

Lets explore the reasons for the high mortality rate.

- 1) They have never had to go through a selection process as they would in the wild. So the weak ones are still part of the population.
- 2) Mostly they have been kept in clinical conditions with no contact with natural pathogens so no natural immunity is ever built up.
- 3) The hibernation process is frighteningly hard on a turtles physiology, many of the organs change for hibernation. The blood cycle is modified and even the calcium in the carapace is used as a buffer for blood chemistry. If the animals has had problems for whatever reasons including poor diet and its body or organs have not grown well then it simply will not have all the tools to see it through hibernation. We have all seen animals with poor diet and Vit A and Vit D problems – these just don't make it through the winter. In addition keepers simply do not realise how debilitated turtles are by the cold UK spring temperatures and their inability to move/swim - so drowning is also a common cause of loss.
- 4) Contrary to popular opinion Sliders are not as hardy as commonly stated. There is just a lot of them, so statistically some will survive.
- 5) I was fortunate enough to have visited Elmar Meier in Munster Zoo recently and part of the discussion centred upon stress and the effect it had on the immune system, physical well being and social behaviour. Tortoise keepers see stress manifest very easily in their pets yet turtles also suffer from stress but because of their environment and current husbandry practices it is not as fully recognised.
- 6) In an overstocked enclosed pond/aquarium disease will spread like wildfire and it is simply impractical to screen these animals for all diseases.

So what do we need to consider when we first start to design a pond.

- 1) Location

Our terrapins must have mid-day sun, they should be able to enjoy it without being constantly scared into the water.

2) Hibernation

Terrapins hibernate in the bottom of ponds or rivers. Some burrow into the mud, some wedge themselves in under branches and some use existing holes dug by other animals. If an animal is dug into the mud the oxygen content of that mud is effectively nil. Terrapins have mechanisms that cope with such anoxic conditions. Our terrapins must be provided with somewhere to locate themselves safely for the winter. A roof tile on bricks is fine provided the terrapin can fit underneath it! Place your water lily tub on top and we have a great hibernaculum.

3) Depth

Ideas on water depth need clarifying. The temperature of the water is really not that important. What is important is that it does not become ice. It is the ice crystals that will kill terrapins. Last years cold winter saw some 4 cm of ice on my pond (Somerset). With an insulating covering on one of my smaller ponds I successfully hibernated in 20 cm of water.

There is no given rule, however from the Midlands going south I believe that a half metre deep pond in a sheltered spot would be OK.

4) Banks

I have already stated that after hibernation in the cold water our terrapins are very slow. Their survival is very much improved if the pond has a bottom that slopes from the deepest part right up to the basking spot minimising their energy requirements for that first gasp of air in the spring. Smooth sides in a pond will kill the terrapins.

5) Filter

Unless your pond is a big natural pond a filter will be required. Assume an adult turtle makes as much mess as a Koi carp. I don't believe in huge flow rates. For my 1000 litre pond I turn the water around in an hour and that's more than enough. Turtle like to have shallow water that warms up. Try and provide it in a shallow section that is not touched by the moving water.

6) Other factors

Terrapins live in a three dimensional world but many domestic ponds are very simple in terms of the space under the surface. Yet in the wild there is a varied underwater experience. If the pond is for terrapins or other life apart from just fish then providing additional 3 dimensional features works really well. This not only provides exploration stimulus but also provides privacy opportunities that may sometimes be welcome by females.



Picture #1

The picture above shows my original pond. It works well and I keep many re homes in naturalistic conditions. However it has a couple a major flaws in its design which will be fixed this year. To protect it from the heron I built it with steep sides. This was a huge mistake as cold turtles must have sides which can be walked up. In the beginning of the year some simply do not have the energy to swim up.



Picture #2

This photograph shows a pond I built for the European pond turtles. It is two building blocks deep (17 inches). There will be no fish, so swimming space is unnecessary. LIDL is an excellent place and provided blue trays which are great at stacking. With these I built a 3D structure as well as a couple of hibernation sites. I also placed a couple of trays on bricks so the turtles could hide underneath. You can see I have a very small pump that is connected to a swirl filter this then pumps up into the guttering which is filled with a layer of biological media. This is working fantastically well as is recommended as an idea for other ponds



Picture #3

This picture shows the pond some 3 months later. The animals do seem to do well here. I have seen no bickering or territory issues. I have seen the animals hunting and searching as they do in the wild. The 45° slope works very well, they seem to like to sneak to the surface under the weed.

This has been a very satisfactory and easy pond to build.

Small Turtles Pond

Whilst the pond above is very successful it required some skills in its build. I needed another pond for smaller animals which I also wanted to build more efficiently and simplify for the non builder.

One important premise is that I would insulate the pond surface for the winter therefore my design case would assume a max of 20mm ice (a factor of two to that which I measured in a similar placed pond last year). On that basis I elected to build the sides of the pond in 100mm polystyrene (4 inches).

The size is convenient as it is also possible to buy cheaply 4 inch posts.



Picture #4

I decided that the pond would be 30 cm deep (12 inches). You can see that I cut the posts to 50cm length and planted them in the dirt. I spaced them to be the width of a polystyrene sheet so minimal cutting would be needed. Cutting was done with a normal wood saw. The top was planked to set the depth of the pond. Check and double check with a spirit level. I added support posts that will later hold the glazing sides.



Picture #5

You can see the sides now being filled with the polystyrene and the outside clad with feather board. When done there it becomes an insulated box with 4 inch thick walls.



Picture #6

The bottom was lined with carpet. I used remaining polystyrene cut at 45* to make the sloping sides. This made the insulation at the bottom a foot thick. I fitted a tank connected at the end for the overflow pipe. I have provided dry land areas at both end of the enclosure. The liner was stapled to the outside of the planking. Where the corner seams folded over I filed the gap with silicone to prevent loss of water through capillary action up the crease.



Picture #7

You can see the overflow pipe which will be connected to a deep gardening tray to provide a shallow paddling pool.



Picture #8

The depth of the pond will be set by the white pipe sticking out of the tray. I have lined the inside of the pond with pond underlay to give the turtles good purchase with their claws. This was glued into position using Stixall glue from Toolstation.

The white pipes are glue fit overflow plumbing constructed to provide a middle shelf and thus effectively double the walking and exploration area of the pond. Tiles are placed on top and some

were glued in position using silicon sealant. The blue pipe is the pump output.



Picture #9

This picture shows the zig-zag course for the internal stream, it will move the water from the filter to the other end of the pond. It will hold a huge amount of bio filter. The top of the stream bed edges

is flush with the top of the pond.



Picture #10

This picture shows near completion. I have added more tiles on top of the stream bed so that animals can explore and hide in privacy. The water flow is barely perceptible despite the 1200l/hr pump. Just right.

I have clad the sides with the clear roofing material. It is 26cm high. This stuff can be cut with scissors on a warm day. It was screwed to the wooden side posts.

I have placed the cloche to give an idea of how winter protection can be offered. I intend to use twin wall roofing glazing.



Picture #11

This filter is another variation on my favourite. LIDL did this party container set for £5.99 It is stackable and includes a separator grid. This is so simple to do.

In one tray cut a hole for the inlet pipe – any pipe about 30 – 40 mm will do. In the other tray cut holes in the bottom. Fit grid into the tray with the holes in the bottom. Then fit the foam.



Picture #12

Pour into the bottom tray some mechanical filter media. I think the corrugated pipes are just right.

I bought a pump for £16 squid and fitted it under the lid using a tie wrap. Hole in the side of the lid provided for the pump outlet.

Put a little hole in the lid to let the air out as the pond is filling.

Job done.



Picture #13



Picture #14

I was greedy and bought two sets. I used one of the trays to add another section to the filter again putting holes in the bottom of the tray. I have found since operating for some months that the lid catch sometimes moves so do ensure you have clipped it properly..

You could use the Really Useful Boxes from Ryman's of course. They have a better lid hold down action., but you have to fix the bottom unit lid to the box above though.

Conclusion

There is still much to learn about keeping turtles outside in the UK, I have not mentioned which species would be suitable neither have I talked in-depth about hibernation, health or diet. However the building of a pond that is suitable for turtles is a very important starting point.

There are a few web sites and organisations more geared for terrapins and turtles that can offer help and even the chance to re home one of these animals.

Tortoise Trust Forum, The Reptile Forum UK (RFUK) and Terrapin-Info.

Most areas in the UK have excellent Tortoise and Turtle groups and often they will have turtles available for re homing.