

Summary of findings about pond characteristics and amphibian presence

SWAN, M.J.S. & OLDHAM, R.S. (1993) Herptile sites volume 1: National Amphibian Survey final report. English Nature Research Report No. 38. Peterborough: English Nature.

The index to available pdf files is at

<http://publications.naturalengland.org.uk/publication/152355>

The most relevant section is Part 6 at <http://publications.naturalengland.org.uk/file/155364>

Amphibians generally (all species data together) showed

- No trend with pond size
- Were found less frequently in ponds <0.5m deep
- The proportion of occupation of ponds declined with increasing shade cover
- They avoided extremes of emergent vegetation coverage, so pond with no surface vegetation, and ponds with >75% cover had fewer amphibians
- A complete lack of submerged vegetation on the bottom was found to support fewer amphibians, but >75% bottom cover did not inhibit them
- Lower than average amphibian frequency in ponds which dried up annually

Fish and ponds

60% of garden ponds had fish in them

In the complete data set (field and garden ponds) the presence of fish correlated with *higher* amphibian frequency.

This effect disappeared when the garden ponds were excluded from analysis.

Garden ponds had lowest frequency of drying out in the data set (c5%), and this encouraged fish as well as amphibians, probably accounting for the positive relationship noted above

Frogs *Rana temporaria*

Frequency Found in c85% of garden ponds over whole country

Pond size Found in all ponds, but more in smaller (<25m²) ponds in the whole data set.

In countryside ponds there was no relation to pond size so the link to smaller ponds came from their liking for garden ponds, which are much smaller on average.

Pond depth Frogs showed no trend with pond depth

Shade Frog presence was significantly reduced in ponds with more than 25% shading, so they preferred unshaded ponds

Emergent vegetation Presence reduced when there was none

Submerged vegetation Presence reduced when there was none

Fish In whole data set, ponds with fish were preferred, in field sample no such effect

Drying out Over the whole sample frogs avoided pond which dry annually avoided, but not in the field sample alone – an effect of frogs liking garden ponds – which rarely are allowed to dry because they are stocked heavily with fish.

Frogs like all pond sizes including little and shallow garden ponds. They like a little shade, and some water vegetation. They don't mind ponds drying and tolerate fish in garden ponds.

Toads *Bufo bufo*

Frequency Found in c 35% of garden ponds around the whole country

Pond size Less common in smaller ponds <500m²

Pond depth Less common in ponds shallower than 0.5m

Shade Toads were less frequent in completely unshaded ponds and where ponds shaded more than 75% - they like cover at the pond edge.

Emergent vegetation Lower occupancy where there was no emergent vegetation

In field ponds more than 50% emergent vegetation cover lowered frequency

Submerged vegetation Lower occupancy where there was no submerged vegetation

Fish Much higher occupancy in ponds with fish

Drying out Reduced occupancy in ponds which ponds dry out every year, or only in drought. They prefer large water bodies that don't dry out (which also tend to support fish)

Toads prefer ponds larger and deeper than normally found in gardens. They like some shade but not a lot and need some aquatic vegetation. They prefer ponds which are big enough not to dry out, and don't mind fish.

Smooth newt *Lissotriton vulgaris*

Frequency Found in c40% of garden ponds, widely distributed, less in northern Scotland, South Wales and Corn

wall.

Pond size More frequent in ponds <750m² – but only when garden ponds were included in data set.

Pond depth Less common in sites <0.5m deep

Shade They avoided extremes with no shade or >75% shade

Emergent vegetation Avoided extremes with no or >75% emergent vegetation

Submerged vegetation Avoided extremes with no or >75% submerged vegetation

Drying out Ponds were more likely to be occupied if they were permanently wet of only dried out in times of drought.

So smooth newts occupy a full pond size range including gardens. They need some shade and vegetation, but not too much. Populations survive occasional drying-out.

Palmate newt *Lissotriton helveticus*

Frequency Found in c 10% of garden ponds. Common only in Southern England , West Wales and North West Scotland

Pond size Favoured smaller ponds <750m² in garden inclusive set , not in field ponds

Pond depth Less frequent in ponds <0.5m depth

Shade Showed no relationship to shade levels

Emergent vegetation Showed no clear relationship to emergent vegetation

Submerged vegetation Less frequent with no submerged vegetation.

Drying out In gardens no relation to dessication, in field set more often is sites that never dried

Fish In the garden pond data set they preferred ponds without fish

Palmate newts like a wide range pond size including small garden ponds. Not influenced by shade or emergent vegetation, but in gardens prefer ponds without fish.

Crested Newt *Triturus cristatus*

Frequency Found in only c8% of garden ponds. They live mainly in central and eastern lowland Britain

Pond size Lower frequency in small <25m² and large >750m² ponds.

Pond depth Found less often in ponds with depths <50cm

Shade Preferred ponds with a little (up to 25%) shading to those with none or >75% shading

Emergent vegetation Low frequency with zero cover

Submerged vegetation Low frequency with zero cover, in fields ponds much more common when submerged vegetation was 50-75% of substrate

Drying out More frequent in ponds which dry out occasionally in drought periods

Fish Lower abundance in ponds with fish

Crested newts prefer small to medium ponds (generally larger than in gardens) with marginal vegetation and without fish. Ponds which dry out occasionally are good because this limits the fish.