

Report - the preliminary underwater survey of Thrupp Lake

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Between 5th May and 18th June 2010 I conducted four dives in different parts of Thrupp Lake, together with other members of the Oxford University Underwater Exploration Group (OUUEG). We covered much of the area of the lake deep enough for scuba diving. The details of the dives are listed in Table 1 (to the right), and their approximate itineraries are shown on the updated contour map (Figure 1 - at the end of the report). In this report, I briefly discussed the lake topography, aquatic life seen, human impact, and suitability of the lake for scuba diving.

Date	Time	Visibility	Water temp.
5 th May	18:30	5-8 m	14°C
13 th May	19:00	4-5 m	14°C
16 th June	17:00	1-3 m	18°C
18 th June	20:00	3 m	19°C

Table 1. Some details of the four survey dives

Topography

A contour map based on the results of a 1992 survey (Fig. 2A) gave a general idea about depths in the lake, and was useful when planning the diving. However, it did not accurately represent the bottom structure, particularly complex in the deep area west of the chain of islands. That part of the lake appeared to consist of a few smaller basins (up to 5.5m deep), channels and underwater ridges, with steep, and at times almost vertical slopes, and included elements such as a road approx. 3m wide, cut 1m into the surrounding rock, running east from the large island in the western corner of the lake. Based on the observations made during the dives, I have made several corrections to the original map (Fig. 2B). It needs to be noted that our itineraries were only approximate, and depth estimates at the areas covered during the June dives were made difficult by tall aquatic vegetation. Therefore, the updated map cannot be regarded as accurate, particularly at around the deep area west of the chain of islands. However, I believe that the updated contour map represents the actual depth distribution in the lake considerably better than the original map.

The bottom of the lake is rocky and generally covered with a layer of silt a few centimetres deep. The silt is less readily disturbed than in most freshwater sites I had visited before, except for the deeper part west of the chain of small islands, where the layer of fine silt was much thicker. This has certainly contributed to the visibility being above average for a typical freshwater lake.

Flora and fauna

The lake is inhabited by a diverse plant and animal community, and I identified some of the organisms seen during my four dives. I recognized four species of vascular plants, three taxa of algae, three species of fish, four species/taxa of molluscs, and several groups of arthropods or other invertebrates. They are listed in Table 2 at the end of this report. As far as I am aware, none of these organisms are classified as threatened or endangered in the UK.

Species composition differed between shallow areas of the lake and the deeper part west of the chain of islands. In the shallow zone, the bottom was densely covered with macrophytes, generally shorter than 50cm in early May, but often exceeding a length of 2m in mid-June. Swan mussels and all fish were seen among the vegetation. The species were not evenly distributed

within a shallow zone: four macrophyte species tended to grow in single-species patches, and swan mussels were more common in the eastern part of the lake. In the deep zone, which spread over a much smaller area, the bottom was covered with a thicker layer of silt, with few vascular plants, but larger numbers of globular and filamentous algae. I saw many snails and crustaceans in the deep zone, likely because they were easier to spot in the absence of dense vegetation; however, there were no fish or swan mussels below 3.5m. I also observed temporal differences in species number and distribution: particularly, planktonic crustaceans were much more numerous in May, and I only saw a single fish (pike) during two May dives, despite good visibility. In contrast, in June I observed several schools of perch, in addition to pikes and a tench. Major seasonal changes in population sizes of planktonic organisms and in distributions of fish are a normal part of an annual cycle in lakes, but I do not understand the absence of fish in May, when we explored different zones and areas of the small lake.

Human impact

During the survey, we spotted several man-made objects on the bottom. In the eastern-central part of the lake, we found two large, empty steel barrels, bricks (including a few groups of bricks tied together with a rope), several pieces of foil / plastic sheets, and objects such as a car tyre, cooking pot and iron. We also found several pieces of slag. None of these objects appeared to be of concern to divers or the environment. Also, in two of the deepest basins west of the chain of islands we saw single plastic pipes of approx. 10cm diameter, linking the opposite sides of each basin, and buried on both sides in the silt. There were no indications of their original purpose, or whether they are still being used.

Suitability for scuba diving

Thrupp Lake is suitable for diving and snorkelling. The visibility is sufficient for safe diving (although this might be changing depending on the weather and season), I found no site-specific hazards, and the ecosystem does not appear vulnerable to small-scale diving activities. Furthermore, the diversity of aquatic life and interesting topography of the area west of the chain of islands certainly make the site attractive. However, the average and maximum depths of the lake are very low by diver standards, abundant vegetation makes it difficult or impossible to dive in the summer, and the access to the shore and entry into the water are not easy. For these reasons, I do not think that Thrupp Lake has a potential of becoming a popular dive site. However, I believe that members of local diving clubs would generally be interested in an occasional fun dive in the lake, which would also be of interest to snorkelers, and could become a convenient training location. Opening the site to more regular diving and snorkelling would require some careful planning, but would certainly increase awareness in the Oxfordshire diving community of the local conservation issues and of freshwater ecology.

Future plans

I have enjoyed exploring Thrupp Lake myself, and I would be interested in continuing the exploration of the lake. Several OUUEG members are interested in accompanying me. Depending on the particular needs, I will be able to map some areas of the lake in more detail (possibly using an inflatable boat owned by OUUEG), collaborate on a more professional survey, collect animals or plants for identification by experts, or if identification keys can be accessed, I could attempt identification myself. However, the very abundant vegetation in the lake makes diving very difficult or impossible until the vegetative parts of the macrophytes die and decompose, which I expect to happen between September and November. I am therefore not expecting to do any more dives in Thrupp Lake until Autumn 2010, but afterwards I will be available until at least Summer 2011.

Vascular plants

Curly-leaf pondweed	<i>Potamogeton crispus</i>	Abundant	Over 90% of the bottom area of the lake is densely covered with a mosaic of these four plant species. In June, these plants, commonly exceeding the length of 2 metres, were taking up much of the total volume of the lake.
Fennel pondweed	<i>Potamogeton pectinatus</i>	Abundant	
Common water-crowfoot	<i>Ranunculus aquatilis</i>	Abundant	
Canadian waterweed	<i>Elodea Canadensis</i>	Abundant	

Algae

Stonewort	<i>Chara sp.</i>	Common	Locally abundant; in June masked by vascular plants
Filamentous algae	?	Common	Form dense carpets in some areas, particularly in deep zone
Globular algae	?	Common	Clusters of globules of 1-2cm diameter, on mud throughout the lake

Vertebrates

Pike	<i>Esox lucius</i>	Occasional	One very large (> 1 m) fish briefly spotted on 13 th May, seven juveniles (10-15 cm long) seen on 18 th June.
Tench	<i>Tinca tinca</i>	Rare	One large (approx 0.5 m) fish seen on 18 th June
Perch	<i>Perca fluviatilis</i>	Common	Several schools of small fish seen in June

Molluscs

Swan mussel	<i>Anodonta cygnea</i>	Common	Common throughout the lake, but particularly in the eastern part
Common bithynia	<i>Bithynia tentaculata</i>	Common	Frequent in western part of the lake
	<i>Lymnaeidae sp.</i>	Abundant	Frequent on plants and mud throughout the lake
	<i>Planorbidae sp.</i>	?	Some empty shells found

Arthropods

Waterlouse	<i>Asellus aquaticus</i>	Common	Frequent, particularly in western part of the lake
	<i>Amphipoda spp.</i>	Common	On vegetation, particularly in western part of the lake
	<i>Cyclopoida spp.</i>	Abundant	Very large numbers of planktonic crustaceans seen in May
water fleas	<i>Cladocera spp.</i>	Abundant	
caddisflies	<i>Trichoptera spp.</i>	Common	On vegetation and on the bottom
mayflies	<i>Ephemeroptera spp.</i>	Common	
stoneflies	<i>Plecoptera spp.</i>	Common	
true flies	<i>Diptera spp.</i>	Common	

Others

leeches	<i>Hirudinea sp.</i>	Occasional	Few individuals seen on the bottom
flatworms	<i>Turbellaria sp.</i>	Occasional	
hydrozoans	<i>Hydra sp.</i>	Abundant	Large numbers of polyps on vegetation

Table 2. Plant and animal taxa seen in Thrupp Lake during the survey

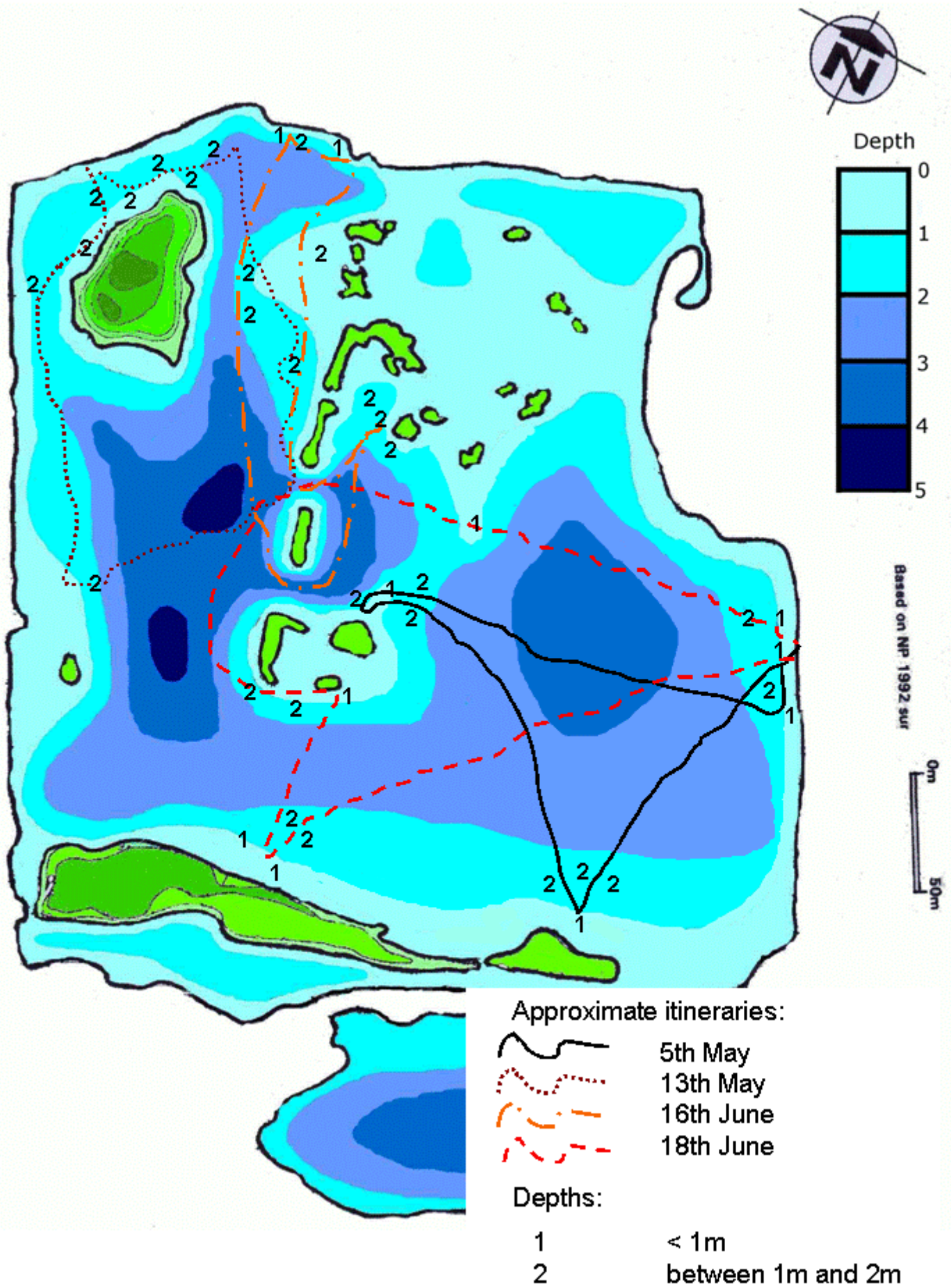


Figure 1. Approximate itineraries of the four survey dives

A. Contour map based on the results of 1992 survey



B. Map partially updated, based on the results of P. Lukasik's 2010 survey

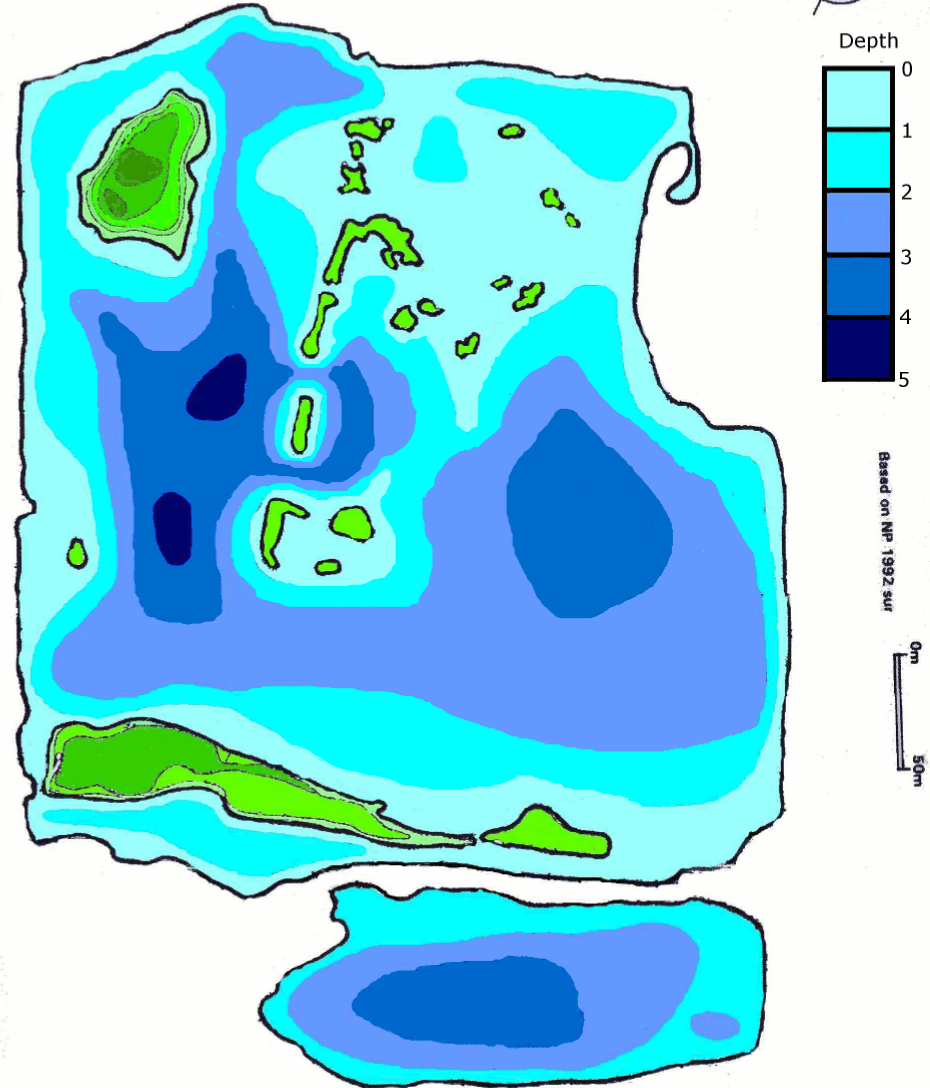


Figure 2. Original and updated contour maps of Thrupp Lake