

# **The distribution of crayfish populations in the River Thame in summer 1996**

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## **Executive summary**

1. Sixty sites on the River Thame and tributaries were test trapped between 15 and 19 August 1996 to determine the distribution and presence of the white clawed crayfish *Austropotamobius pallipes* (Lereboullet, 1858) and the signal crayfish *Pacifastacus leniusculus* (Dana, 1852).
2. No white clawed crayfish were captured and no signal crayfish were captured above Long Crendon, or below Brookhampton. Within their range the distribution of signal crayfish was discontinuous.
3. Although the results of this survey were similar to a previous survey completed in November 1995, there is evidence of a gradual migration upstream. This being 1.5km in 9 months.

## 1. Introduction

In November 1995 a distribution survey of the crayfish populations in the River Thame was completed (Ibbotson, Furse & Dewey, 1995). The primary objective of that survey system was to identify the most suitable reaches to be used for a detailed study into the impacts of signal crayfish *Pacifastacus leniusculus* (Dana, 1852) on the flora and fauna of the River Thame. A secondary objective was to ascertain whether native crayfish *Austropotamobius pallipes* (Lereboullet, 1858) were still present in the catchment or not.

During the study 36 sites were sampled. These were mostly on the main river channel but also in some of the major tributaries. No native crayfish were found. However, there was some doubt as to whether this was the result of the survey being completed during the cold winter months when crayfish activity is lowest and capture most difficult. For this reason and because some of the tributaries had not been sampled the survey was repeated during the summer of 1996 and over a more extensive range. This was felt to be important because native crayfish had been reported as present in the Thame catchment as recently as 1992 in the Milton Ditch and between 1988 and 1990 at Notley Abbey (NRA Biologists Reports).

## 2. Site description

The River Thame runs from just north of Aylesbury, through Thame to join the River Thames south of Oxford. It is approximately 60 km in length and for the greater part it drains improved pasture.

Its proximity to the two conurbations of Aylesbury and Thame and the use of the adjacent land for pasture, means there is pressure to manage the river for flood control purposes. The greater part of the river is embanked and dredged approximately every 5 years to reduce the risk and incidence of flooding.

This type of flood relief management will have had deleterious effects on the distribution of crayfish in the River Thame, as it makes the habitat less suitable for these animals (Hogger, 1988).

Once the river flows past Aylesbury it is used extensively for coarse fish angling. The anglers find the signal crayfish a nuisance because they remove bait from hooks. This is particularly a problem when the crayfish are numerous and angling organisations have been known to ask commercial crayfishermen to reduce the density of crayfish.

There is considerable exploitation of the signal crayfish population. Much of the river between Thame and Chippinghurst Manor is fished commercially. These activities are dominated by one commercial fisherman.

### **3. Methods**

Between 15 and 19 August 1996, 60 sites between the source of the River Thame and its confluence with the River Thames were test trapped for the presence of crayfish. The sites included the main river and most of its major tributaries (Figs 1-3; Annex A). Test trapping involved placing 4 disinfected baited traps in the river, leaving them overnight and recovering them the next day. There were two sizes of traps (mesh size 15mm and 30mm) and two of each size were used. Crayfish captured inside the traps were counted, identified and measured.

One of three categories of abundance were assigned to each site depending on the number of crayfish captured in each trap. These categories were absent, less than 5 per trap and between 5 and 9 per trap.

### **4. Results**

No white clawed crayfish were captured and no signal crayfish were captured above Long Crendon (NGR SP 707 078), or below Brookhampton (NGR SU 598 977). The distribution was discontinuous with crayfish being captured in small pockets but being apparently absent in adjacent sites (Fig 1-3).

There were a few tributaries with large crayfish populations, notably the Haseley Brook (Sites 30 & 32, Fig 2) and the Peppershill Brook (Site 56, Fig 2). Smaller populations were shown to be present in the Gainsbridge Brook (Site 31, Fig 2), Milton Ditch (Site 58, Fig 2), Worminghall Brook (Site 54, Fig 2), Tiddington Brook (Site 15, Fig 2), Cuttle Brook (Site 53, Fig 2) and the Scotsgrove Brook (Site 10, Fig 3).

In general, the distribution of signal crayfish was very similar to that found in the survey of November 1995. However the upstream limit appears to have moved from Thame to Long Crendon (approx 1.5km) between the two surveys and crayfish were found in the Scotsgrove Brook above Thame.

Key

○ no crayfish

● <5 per trap

● 5-9 per trap

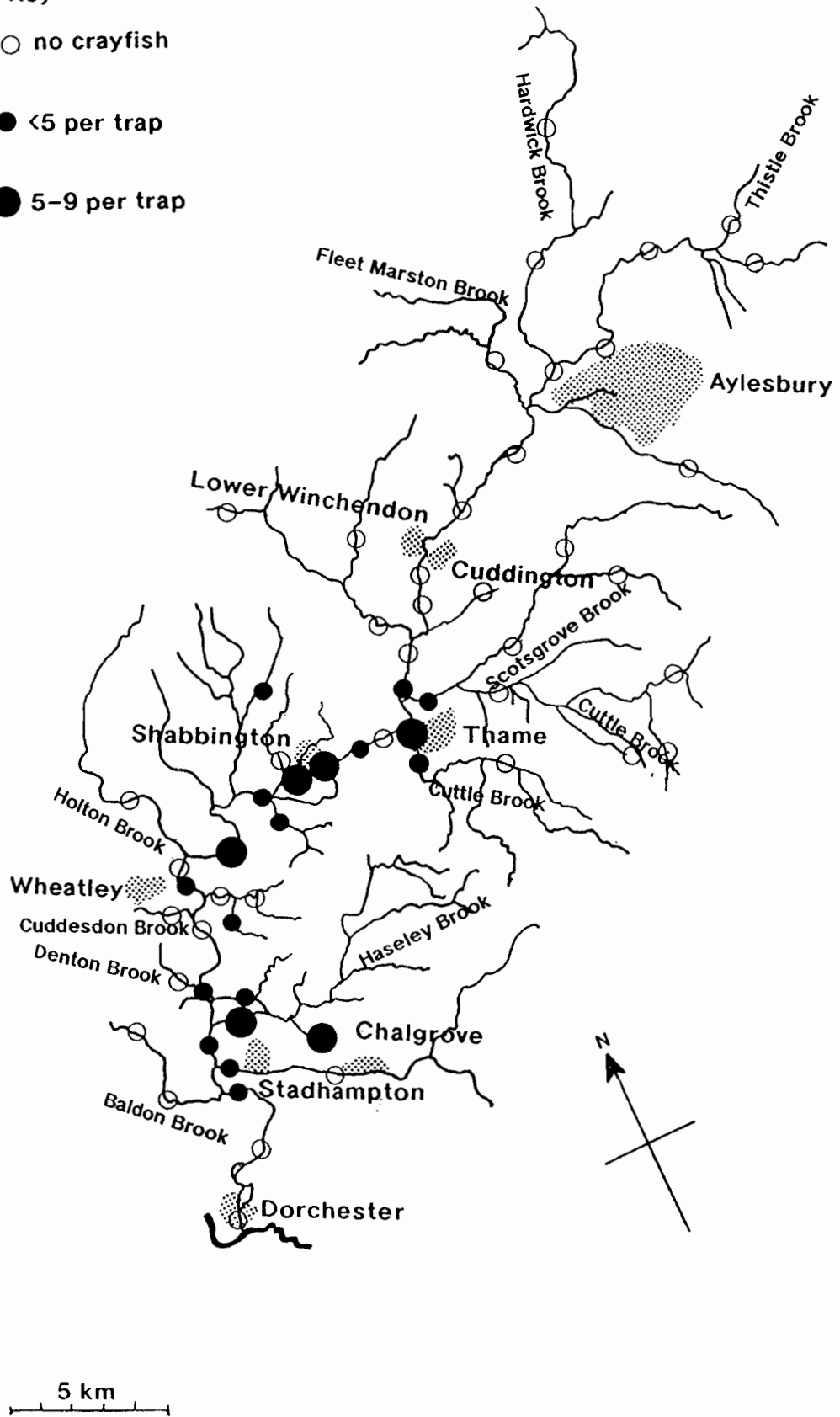


Figure 1. The distribution and relative abundance of signal crayfish in the River Thames, August 1996

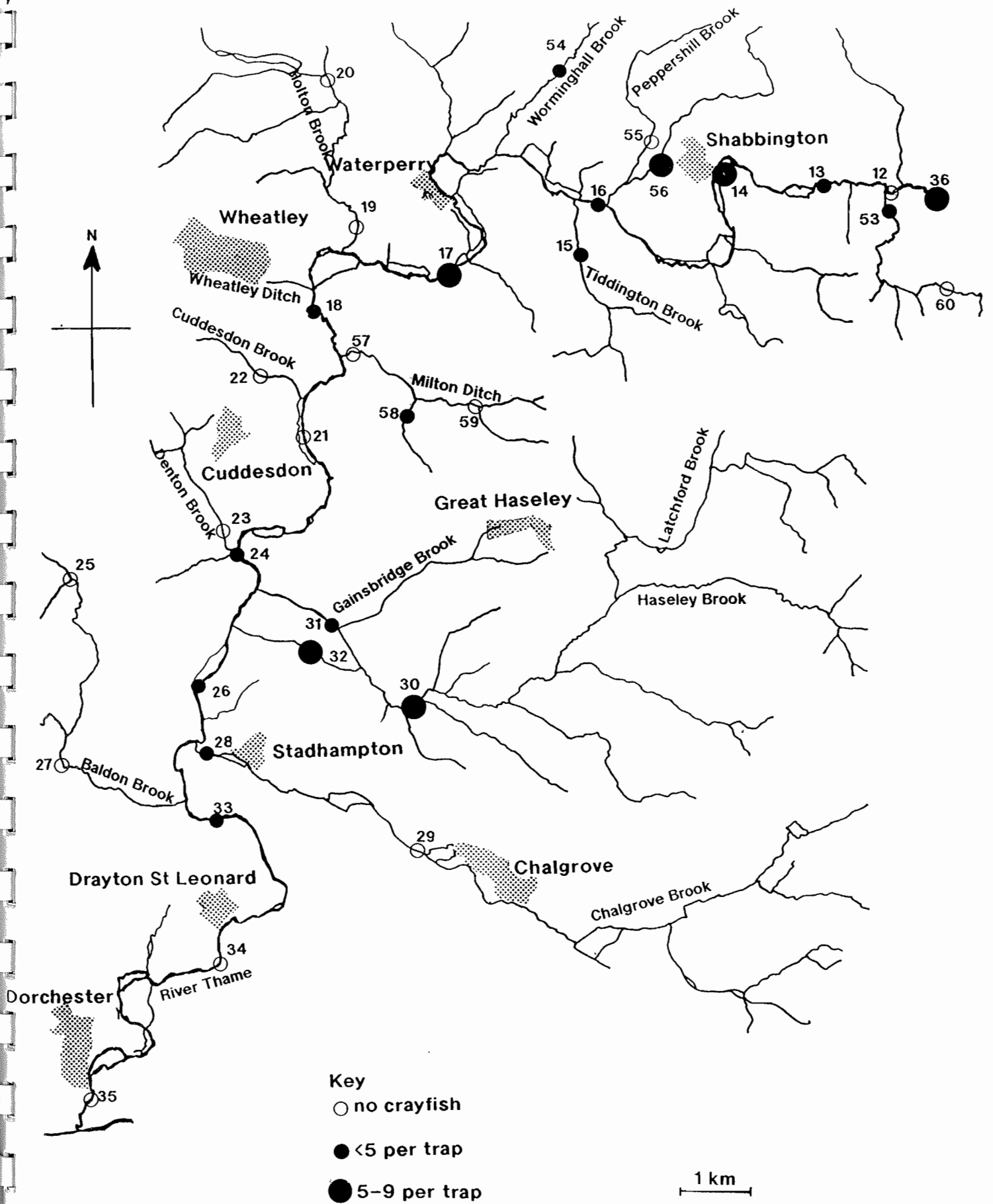


Figure 2. The distribution and relative abundance of signal crayfish in the River Thames below Thames, August 1996.



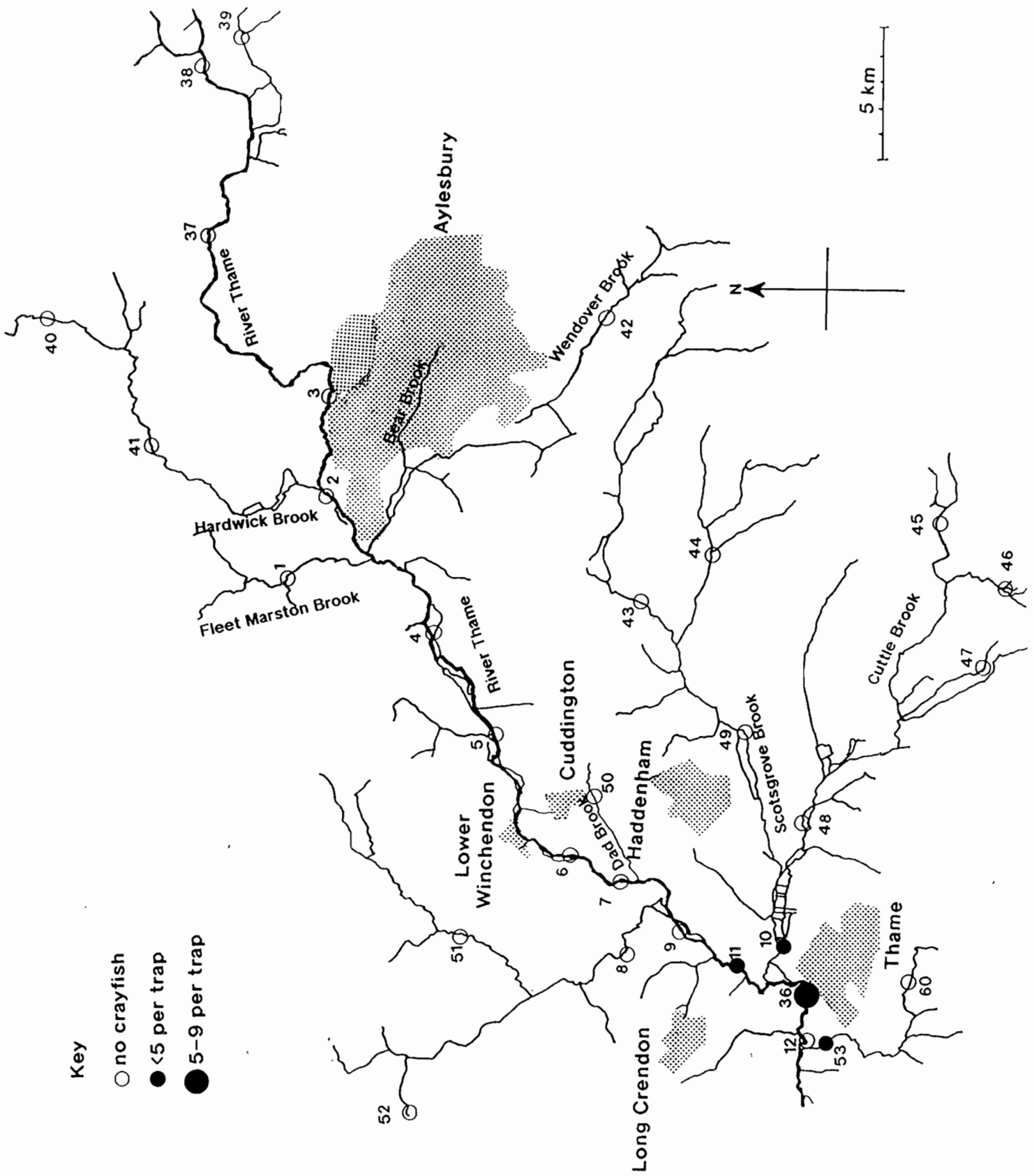


Figure 3. The distribution and relative abundance of signal crayfish in the River Thames above Thame, August 1996.

Table 1 Numbers and mean size of crayfish captured at each site on the River Thame, August 1996

| Site Number | Grid Reference | Average Number per Trap | Average Carapace Length (mm) |
|-------------|----------------|-------------------------|------------------------------|
| 1           | SP 782 161     | 0                       | -                            |
| 2           | SP 797 154     | 0                       | -                            |
| 3           | SP 815 153     | 0                       | -                            |
| 4           | SP 771 135     | 0                       | -                            |
| 5           | SP 751 123     | 0                       | -                            |
| 6           | SP 729 111     | 0                       | -                            |
| 7           | SP 723 101     | 0                       | -                            |
| 8           | SP 709 100     | 0                       | -                            |
| 9           | SP 714 088     | 0                       | -                            |
| 10          | SP 711 070     | 0.5                     | 5.4                          |
| 11          | SP 707 078     | 1                       | 5.8                          |
| 12          | SP 693 066     | 0                       | -                            |
| 13          | SP 685 067     | 1                       | 5.45                         |
| 14          | SP 669 070     | 6                       | 6.0                          |
| 15          | SP 649 058     | 4.5                     | 4.1                          |
| 16          | SP 652 065     | 1.5                     | 4.3                          |
| 17          | SP 632 055     | 7                       | 5.2                          |
| 18          | SP 612 048     | 0.5                     | 3.7                          |
| 19          | SP 618 051     | 0                       | -                            |
| 20          | SP 614 082     | 0                       | -                            |
| 21          | SP 611 031     | 0                       | -                            |
| 22          | SP 605 039     | 0                       | -                            |
| 23          | SP 599 017     | 0                       | -                            |
| 24          | SP 602 014     | 2                       | 3.5                          |
| 25          | SP 578 011     | 0                       | -                            |
| 26          | SU 596 996     | 3.5                     | 6.0                          |
| 27          | SU 576 984     | 0                       | -                            |
| 28          | SU 598 985     | 0.5                     | 3.4                          |
| 29          | SU 627 977     | 0                       | -                            |
| 30          | SU 627 993     | 6                       | 4.9                          |
| 31          | SP 615 005     | 1.5                     | 4.1                          |
| 32          | SP 612 001     | 8.5                     | 4.3                          |
| 33          | SU 598 977     | 1                       | 5.95                         |
| 34          | SU 599 955     | 0                       | -                            |
| 35          | SU 580 936     | 0                       | -                            |
| 36          | SP 700 065     | 6                       | 4.25                         |
| 37          | SP 846 176     | 0                       | -                            |
| 38          | SP 879 176     | Dry                     | -                            |
| 39          | SP 884 168     | 0                       | -                            |
| 40          | SP 828 209     | 0                       | -                            |

| Site Number | Grid Reference | Average Number per Trap | Average Carapace Length (mm) |
|-------------|----------------|-------------------------|------------------------------|
| 41          | SP 806 187     | 0                       | -                            |
| 42          | SP 830 103     | 0                       | -                            |
| 43          | SP 776 096     | 0                       | -                            |
| 44          | SP 785 083     | Dry                     | -                            |
| 45          | SP 792 042     | 0                       | -                            |
| 46          | SP 779 029     | 0                       | -                            |
| 47          | SP 769 023     | Dry                     | -                            |
| 48          | SP 735 064     | 0                       | -                            |
| 49          | SP 751 077     | 0                       | -                            |
| 50          | SP 739 105     | Dry                     | -                            |
| 51          | SP 712 130     | Dry                     | -                            |
| 52          | SP 679 141     | Dry                     | -                            |
| 53          | SP 702 060     | 1                       | 5.75                         |
| 54          | SP 647 083     | 0.5                     | 5.1                          |
| 55          | SP 659 074     | Dry                     | -                            |
| 56          | SP 661 071     | 5                       | 4.3                          |
| 57          | SP 618 043     | 0                       | -                            |
| 58          | SP 625 034     | 0.5                     | 4.9                          |
| 59          | SP 635 036     | Dry                     | -                            |
| 60          | SP 712 046     | 0                       | -                            |

## 5. Discussion

The absence of any native crayfish at any of the sites would suggest that native crayfish are now extinct from the River Thame and its tributaries. It is not certain what the causes of this extinction are, particularly in the upper reaches because the distribution of signal crayfish extends to no further upstream than Long Crendon. In the absence of disease the native species ought to be able to survive in upstream reaches where signals are absent. It is however possible that the disease has been transported upstream by other vectors which could include angling equipment, crayfish traps, dredging equipment, birds, fish or other animals.

The distribution of signal crayfish is not very different from the distribution described in the survey completed in November 1995. It remains discontinuous throughout the main river channel. This is probably the result of two major influences; these being the sites of original successful introduction where crayfish have spread from and the regular dredging activities which reduce the populations locally.

There is evidence of a gradual process of upstream migration and colonisation, with the upstream limit of their distribution moving from Thame Bridge to Long Crendon about 1.5 km upstream. If this migration and colonisation continues, and there is no reason to suppose that it will not, then there are likely to be increased pressures for the commercial fishery to be extended to other areas.

## 6. References

Hogger, J. B. (1988) Ecology, population biology and behaviour. In *Freshwater crayfish: biology, management and exploitation*, edited by D.M. Holdich and R. S. Lowery, 114-144. London: Croom Helm.

Ibbotson, A. T., Furse, M. T. & Dewey, K. 1995. The distribution and baseline survey of the crayfish populations in the River Thames. Report to the National Rivers Authority, Thames Region, 9pp.

## Annex A. Grid references and site names of sites test trapped in August 1996.

|    |            |                         |                        |
|----|------------|-------------------------|------------------------|
| 1  | SP 782 161 | Berryfields Farm        | Putlowes Tributary     |
| 2  | SP 797 154 | Quarrendon House Farm   | River Thame            |
| 3  | SP 815 153 | Elmhurst                | Thistle Brook          |
| 4  | SP 771 135 | Eythrope Park           | River Thame            |
| 5  | SP 751 123 | Mainshill Farm          | River Thame            |
| 6  | SP 729 111 | Cuddington Mill Farm    | River Thame            |
| 7  | SP 723 101 | Chearsley               | River Thame            |
| 8  | SP 709 100 | Railway Embankment      | Notley Abbey Tributary |
| 9  | SP 714 088 | Notley Abbey            | River Thame            |
| 10 | SP 711 070 | Scotsgrove House        | Cuttle Brook           |
| 11 | SP 707 078 | Works                   | River Thame            |
| 12 | SP 693 066 | Thame Bridge            | River Thame            |
| 13 | SP 685 067 | North Weston            | River Thame            |
| 14 | SP 669 070 | Shabbington             | River Thame            |
| 15 | SP 649 058 | Tiddington              | Tiddington Tributary   |
| 16 | SP 652 065 | Draycot                 | River Thame            |
| 17 | SP 632 055 | Waterstock              | River Thame            |
| 18 | SP 612 048 | A40 Crossing            | River Thame            |
| 19 | SP 618 051 | Helton Mill             | Holton Brook           |
| 20 | SP 614 082 | Parsons Farm            | Holton Brook           |
| 21 | SP 611 031 | Cuddesdon Mill          | River Thame            |
| 22 | SP 605 039 | Castle Hill             | Cuddesdon Brook        |
| 23 | SP 599 017 | Chippinghurst Manor     | Denton Brook           |
| 24 | SP 602 014 | Chippinghurst Manor     | River Thame            |
| 25 | SP 578 011 | Toot Baldon             | Baldon Brook           |
| 26 | SU 596 996 | Chiselhampton           | River Thame            |
| 27 | SU 576 984 | Marylands Farm          | Baldon Brook           |
| 28 | SU 598 985 | Stadhampton             | Chalgrove Brook        |
| 29 | SU 627 977 | Nr Langley Hall         | Chalgrove Brook        |
| 30 | SU 627 993 | Cowlease Copse          | Haseley Brook          |
| 31 | SP 615 005 | Little Milton           | Gainsbridge Brook      |
| 32 | SP 612 001 | Coldharbour             | Haseley Brook          |
| 33 | SU 598 977 | Brookhampton            | River Thame            |
| 34 | SU 599 955 | Lower Grange            | River Thame            |
| 35 | SU 580 936 | Bridge End              | River Thame            |
| 36 | SP 700 065 | Thame Island            | River Thame            |
| 37 | SP 846 176 | Rowsham Bridge          | Rowsham Brook          |
| 38 | SP 879 176 | Nr. Thistle Brook Farm  | Thistle Brook          |
| 39 | SP 884 168 | Whitwell Farm           | Unnamed                |
| 40 | SP 828 209 | Hardwick Bridge         | Hardwick Brook         |
| 41 | SP 806 187 | Hardwick Brook          | Hardwick Brook         |
| 42 | SP 830 103 | Nr. Stoke Mandeville    | Wendover Brook         |
| 43 | SP 776 096 | Nr. Ford                | Scotsgrove Brook       |
| 44 | SP 785 083 | Nr. Lower Waldrige Farm | Scotsgrove Brook       |
| 45 | SP 792 042 | Nr. The Mill            | Cuttle Brook           |
| 46 | SP 779 029 | Nr. Pitch Green         | Cuttle Brook           |
| 47 | SP 769 023 | Nr. Henton              | Cuttle Brook           |
| 48 | SP 735 064 | Nr. Tythrop House       | Unnamed                |
| 49 | SP 751 077 | Nr. The Manor           | Unnamed                |
| 50 | SP 739 105 | Nr. Dad Brook House     | Dad Brook              |
| 51 | SP 712 130 | Musk Hill Farm          | Unnamed                |
| 52 | SP 679 141 | Dorton                  | Unnamed                |
| 53 | SP 702 060 | Thame                   | Cuttle Brook           |
| 54 | SP 647 083 | Worming Hall            | Worminghall Brook      |
| 55 | SP 659 074 | Little Ickford          | Peppers Hill Brook     |
| 56 | SP 661 071 | Little Ickford          | Peppers Hill Brook     |
| 57 | SP 618 043 | Unknown                 | Milton Ditch           |
| 58 | SP 625 034 | Nr. Great Milton        | Milton Ditch           |
| 59 | SP 635 036 | NNE Great Milton        | Milton Ditch           |
| 60 | SP 712 046 | Thame                   | Cuttle Brook           |

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