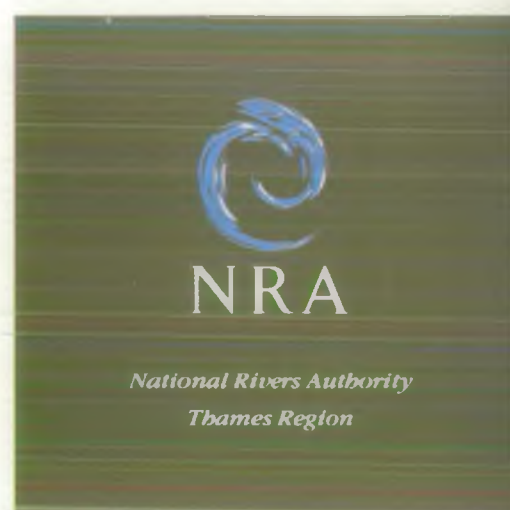


# **DATCHET, WRAYSBURY, STAINES AND CHERTSEY FLOOD STUDY AQUATIC BIOLOGY**

**Baseline Survey Report**

VOLUME 2

**April 1990**



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THE DATCHET, WRAYSBURY, STAINES AND CHERTSEY FLOOD STUDY

AQUATIC BIOLOGY - PART 2

A SURVEY OF THE WETLAND VEGETATION AND AQUATIC MACROINVERTEBRATES  
OF THE ABBEY RIVER AND CHERTSEY BOURNE

POND ACTION  
JANUARY 1990

C/O BIOLOGICAL & MOLECULAR SCIENCES  
OXFORD POLYTECHNIC  
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## **SUMMARY**

### **Survey sites and dates of surveys**

Wetland vegetation and aquatic macroinvertebrates were surveyed on the Abbey River and the Chertsey Bourne. The full length of the Abbey River (3.5km) was surveyed. The Chertsey Bourne was surveyed between the M3/M25 motorway interchange and its confluence with the River Thames (approximately 6.5km). Vegetation surveys were carried out between 10-14 November 1989. Macroinvertebrate surveys were carried out on 16 November 1989.

### **Physical features**

The mean width and depth of the channel and the composition of the substrate were recorded at the macroinvertebrate survey sites. The Abbey River was 7-9m wide and 0.8-1.3m deep. Substrates were generally dominated by silt. The Chertsey Bourne was 4-8m wide and 0.6-1m deep. Substrates were more varied than in the Abbey River.

### **Wetland plant communities**

The Abbey River supported a moderately rich plant community with 48 species, including four local species (one introduced) recorded. Only four aquatic plant species were recorded. The Chertsey Bourne supported a rather richer plant community (58 species recorded) with 8 local and 12 aquatic species. A 300m section of Lengths 9 and 10 of the Chertsey Bourne (adjacent to Chertsey Meads) supported the best developed stands of wetland vegetation recorded on either the Chertsey Bourne or the Abbey River.

### **Aquatic macroinvertebrates**

Mean BMWP scores and ASPT values in both the Abbey River and the Chertsey Bourne were low (Abbey River - 76:3.91; Chertsey Bourne - 70:3.89). BMWP scores and ASPT values in the Chertsey Bourne were considerably lower than predicted by the Institute of Freshwater Ecology RIVPACS programme (predictions were not available for the Abbey River). The results suggested that both streams were either polluted and/or lacking in habitat diversity.

### **Assessment of nature conservation value**

The Abbey River and Chertsey Bourne supported similar plant communities. However, the greater numbers of local and aquatic (floating-leaved and submersed) plant species recorded in the Chertsey Bourne indicated its plant community was of higher conservation value than that of the Abbey River.

In comparison to other British rivers the plant community of the Chertsey Bourne appeared to be of intermediate to high nature conservation value. The plant community of the Abbey River was of intermediate to low nature conservation value.

On the Abbey River, the plant communities of Lengths 3, 4, 5 and 6 were of intermediate value for nature conservation. The communities of other lengths were of low value for conservation. On the Chertsey Bourne the plant communities of Lengths 1, 2, 3, 5, 6, 9, 10, 11 and 12 were of moderate to high nature conservation value. Remaining lengths of the Chertsey Bourne were of intermediate or low value for conservation.

Aquatic macroinvertebrates were surveyed only at family level so it was not possible to make a full assessment of the nature conservation value of the macroinvertebrate communities. However the results of the family level surveys suggested that the conservation value of the communities was unlikely to be high in either river.

**PART 2. A SURVEY OF THE WETLAND VEGETATION AND AQUATIC MACROINVERTEBRATES OF THE ABBEY RIVER AND CHERTSEY BOURNE**

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## 1. INTRODUCTION

The Abbey River was surveyed from the point where it leaves the River Thames at Penton Hook marina (TQ 042689) to its confluence with the R.Thames at Chertsey (TQ 054670), a distance of approximately 3.5km.

The Chertsey Bourne was surveyed from the M3/M25 motorway junction (TQ 018680) to its confluence with the R.Thames at Chertsey (TQ 070655), a distance of about 6.5km.

## 2. AIMS OF THE SURVEYS

The aims of this Section of the Aquatic Biology report were:

- (i) To provide baseline data on the wetland vegetation and aquatic macroinvertebrates of the Abbey River and Chertsey Bourne.
- (ii) To assess the nature conservation value of the Abbey River and Chertsey Bourne and identify areas which were likely to be sensitive to environmental impact.

## 3. METHODS

### 3.1 PHYSICAL FEATURES

Standard physical data required for the Institute of Freshwater Ecology (IFE) RIVPACS prediction programmes were obtained at each site at which macroinvertebrates were sampled. This included mean depth, mean width and substrate composition.

Bank angles were measured at various points in each 500m length of the rivers with a clinometer.

### 3.2 WETLAND PLANTS

The wetland plants recorded were those listed on the National Pond Survey wetland plant list (see Appendix 9.1). This list of aquatic and wetland plants is based on the Nature Conservancy Council wetland plant species list with modifications recommended by M Palmer and T. Rich (pers. comm.).

Plants were identified in the field where possible, being taken back to the laboratory for examination where necessary. Submersed macrophytes were collected with a grapnel where the rivers could not be waded. Standard keys and guides were used to identify the specimens (see References). Callitriche sp. and Batrachian Ranunculus species were not identified because unsuitable vegetative material was available at the time of the survey (Rich and Rich, 1989). Because the surveys were undertaken late in the autumn it is likely that further plant species would be recorded if surveys were repeated in the summer.

Maps were prepared of each 500m length of the rivers. Conventions for vegetation mapping generally followed those recommended in the

NCC draft methodology for surveys of wildlife in river corridors (NCC, 1985). In addition, bank structure and composition of the vegetation were described for representative sections of the river and annotated on the maps. Substrate and flow were not described on the maps.

### 3.3 AQUATIC MACROINVERTEBRATES

Macroinvertebrates were collected using the procedure followed by NRA Thames Region staff. This sampling method is based on the IFE RIVPACS sampling requirements.

Survey sites were short lengths of the stream (a distance equivalent to about 10 stream widths) representative of the 500m length. Each site was kick- and sweep-sampled for a total of three minutes. The material collected was sorted on the bankside for a total of 45 minutes. A further 15 minutes was spent searching appropriate microhabitats for additional taxa.

Three locations were sampled on the Abbey River and five on the Chertsey Bourne (see Appendices 5 and 6).

### 3.4 ASSESSMENT OF NATURE CONSERVATION VALUE

The wetland plant communities of the two streams were classified using methods modified from those recommended by the Nature Conservancy Council (NCC) (NCC, 1989). Although the modified method did not include recording of mosses and lichens, their inclusion would be very unlikely to have changed the outcome of the classification results. Two lengths of 1km (two adjacent 500m lengths) were selected from each stream for the classification. The species lists of the four 1km lengths are given in Table 3.

A provisional system was devised for ranking the nature conservation value of wetland plant communities (see Table 1). This took into account the occurrence of rare and local species and the abundance of wetland vegetation. The system assesses the value of the communities in relation to the plant communities of other British rivers.

The nature conservation value of the plant communities of individual 500m lengths of the Abbey River and Chertsey Bourne were also assessed using the criteria shown in Table 1.

TABLE 1. PROVISIONAL SYSTEM FOR ASSESSING THE NATURE CONSERVATION VALUE OF WETLAND PLANT COMMUNITIES

| CONSERVATION<br>VALUE | DESCRIPTION OF TYPE OF COMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VERY HIGH             | <p>Supporting above average numbers of plant species for the NCC community type (NCC, 1989), including Rare (ie Red Data Book) species. Above average numbers of local species present. The community is likely to include species listed by Palmer and Newbold (1983) as requiring protection. Extensive stands of marginal, emergent or aquatic plants present. Note that some sites with rare species may be relatively species-poor.</p> <p>Sites in this category are likely either to be Sites of Special Scientific Interest in their own right, or within larger SSSI's.</p> |
| HIGH                  | <p>Supporting above average numbers of plant species for the NCC community type. No rare (ie Red Data Book) species present. At least average numbers of local species for the NCC community type present. The community is likely to include species listed by Palmer and Newbold (1983) as requiring protection. Well developed stands of marginal, emergent or aquatic species present.</p> <p>Sites in this category are likely to be within SSSI's or sites of local nature conservation value.</p>                                                                             |
| INTERMEDIATE          | <p>Supporting average numbers of species for the NCC community type. No rare (ie Red Data Book) species recorded. Numbers of local species below average for the NCC community type. The community may include species listed by Palmer and Newbold (1983) as requiring protection. Well developed stands of marginal, emergent or aquatic species present.</p>                                                                                                                                                                                                                      |
| LOW                   | <p>Supporting below average number of species for the NCC community type. No rare or local species. Few or no large stands of marginal, emergent or aquatic plants.</p>                                                                                                                                                                                                                                                                                                                                                                                                              |

#### 4. THE WETLAND VEGETATION OF THE ABBEY RIVER

##### 4.1 SUMMARY DESCRIPTION OF THE WETLAND VEGETATION OF THE ABBEY RIVER

###### 4.1.1 Introduction

The Abbey River supported a moderately diverse wetland flora with 48 species recorded including four local species. The aquatic flora was impoverished with only four species recorded. The abundance of all wetland species was generally low.

###### 4.1.2 Marginal and emergent wetland plants

Forty-four species of marginal and emergent wetland plants were recorded including four local species.

The richness of the community and abundance of stand-forming species was greatest in the middle lengths of the river (Lengths 3-5). However, even here the community was only moderately rich in species. Lengths 1 and 2 and Lengths 6 and 7 supported generally impoverished communities with the few marginal or emergent species generally present in low abundance. The impoverishment of the flora in Lengths 1 and 2 may have been exacerbated by dredging in some areas during 1989.

The differences in the vegetation of Lengths 1, 2, 6 and 7 compared to Lengths 3-5 almost certainly reflected changes in land-use along the river. Land-use in Lengths 1, 2, 6 and 7 was predominantly urban and suburban whilst land-use adjacent to Lengths 3-5 was agricultural or semi-natural. In Lengths 3-5 the river banks were also lower than in the remaining lengths allowing a greater diversity of species to colonise the banks.

Epilobium hirsutum and Urtica dioica were the most abundant wetland species on the river banks. Most other wetland species were present in low abundance or were common only locally.

On the channel margins tall emergent species generally occurred as scattered fringeing stands occupying less than 5% of the channel margin in each length. Only in Lengths 2, 4 and the first half of Length 6 did stands of emergents occupy a greater proportion of the channel (up to 20%). Sparganium erectum was the dominant emergent species, with Phalaris arundinacea and Carex riparia locally common. Typha latifolia, Iris pseudacorus and Glyceria maxima were occasional. Small stands of Schoenoplectus lacustris were growing in the river channel in Length 4. A single stand of a Typha with the vegetative characters of T. angustifolia had been planted by the landowner above Abbey Bridge in Length 6. Scattered stands of Nasturtium officinale, Myosotis scorpioides and Rorippa amphibia were also recorded growing as emergents on the channel margins.

#### 4.1.3 Aquatic plants

The aquatic (submersed and floating-leaved) flora was very impoverished with only four common taxa recorded.

Stands of Callitriche sp. were locally common in Length 5 and occasional in Lengths 6 and 7. All other species were uncommon. Elodea nuttallii was recorded in very low abundance in Lengths 5 and 6 and stands of Nuphar lutea were occasional in Length 1. A single stand of Nymphaea alba was growing in mid-channel in Length 4.

nodiflorum) were frequent.

The right bank and bank top were initially dominated by a similar community to that of Lengths 1-3. Like the left bank there was an increase in species-richness downstream with the occurrence of a number of species not recorded elsewhere along the river (eg Rumex hydrolapathum and Ranunculus sceleratus).

A single stand of Nymphaea alba was recorded in the channel near the top of this length. Schoenoplectus lacustris was recorded growing in mid-channel just upstream of the footbridge at TQ 041677.

Submersed water plants were absent.

#### 4.2.5 Length 5. M3 motorway bridge (TQ 041675) to TQ 045672

##### Land-use and bank structure

The left bank was bordered by pasture. The bank was fenced in the upper part, and grazed in the lower part of the length. Land adjacent to the right bank was predominantly occupied by a farm and its outbuildings with some marginal woodland. The banks were variable in height and profile, but typically had slopes of 30-40 degrees and heights between 0.5m and 1.5m.

##### Vegetation

Length 5 supported a moderately rich and abundant flora of common wetland species. Vegetation on the left bank was generally richer in species than on the right, particularly where the left bank was grazed. The right bank supported fewer species in lower abundance mainly because of the intensive land-use around the farm or heavy shading from marginal trees. A single stand of Typha (probably angustifolia) was recorded in a small embayment on the left bank just west of Abbey Bridge (TQ 043672). The latter had been recently planted by the landowner.

Stands of Callitriche sp. were common and occasional Elodea nuttallii was recorded. No other submersed plants were found.

#### 4.2.6 Length 6. TQ 045672 to footbridge at TQ 049671

##### Land-use and bank structure

Upstream, both banks of the river were bordered by pasture. Livestock had access to the banks and there was some poaching, particularly on the left bank. Further downstream the right bank was wooded and land on the left bank occupied by an overgrown orchard. Bank height ranged between 1m and 1.5m and bank profiles were more variable and generally lower than in most other reaches, (typically 20-40 degrees).

## Vegetation

Upstream the length supported a moderately rich and abundant community of common wetland species, with large marginal stands of emergents including S.erectum, G.maxima, C.riparia and P.arundinacea. Stands of M.scorpioides, R.amphibia and Mentha aquatica were also common. Stands of Callitriche sp. were common in the channel.

Downstream, both banks supported species-poor communities largely because of the shade from overhanging trees or the intensity of land-use in the suburban surroundings. A few marginal stands of S.erectum were present.

Throughout the length stands of Callitriche sp. were common, and E.nuttallii occasional, in the channel.

### 4.2.7 Length 7. Footbridge (TQ 049671) to River Thames (TQ 053670)

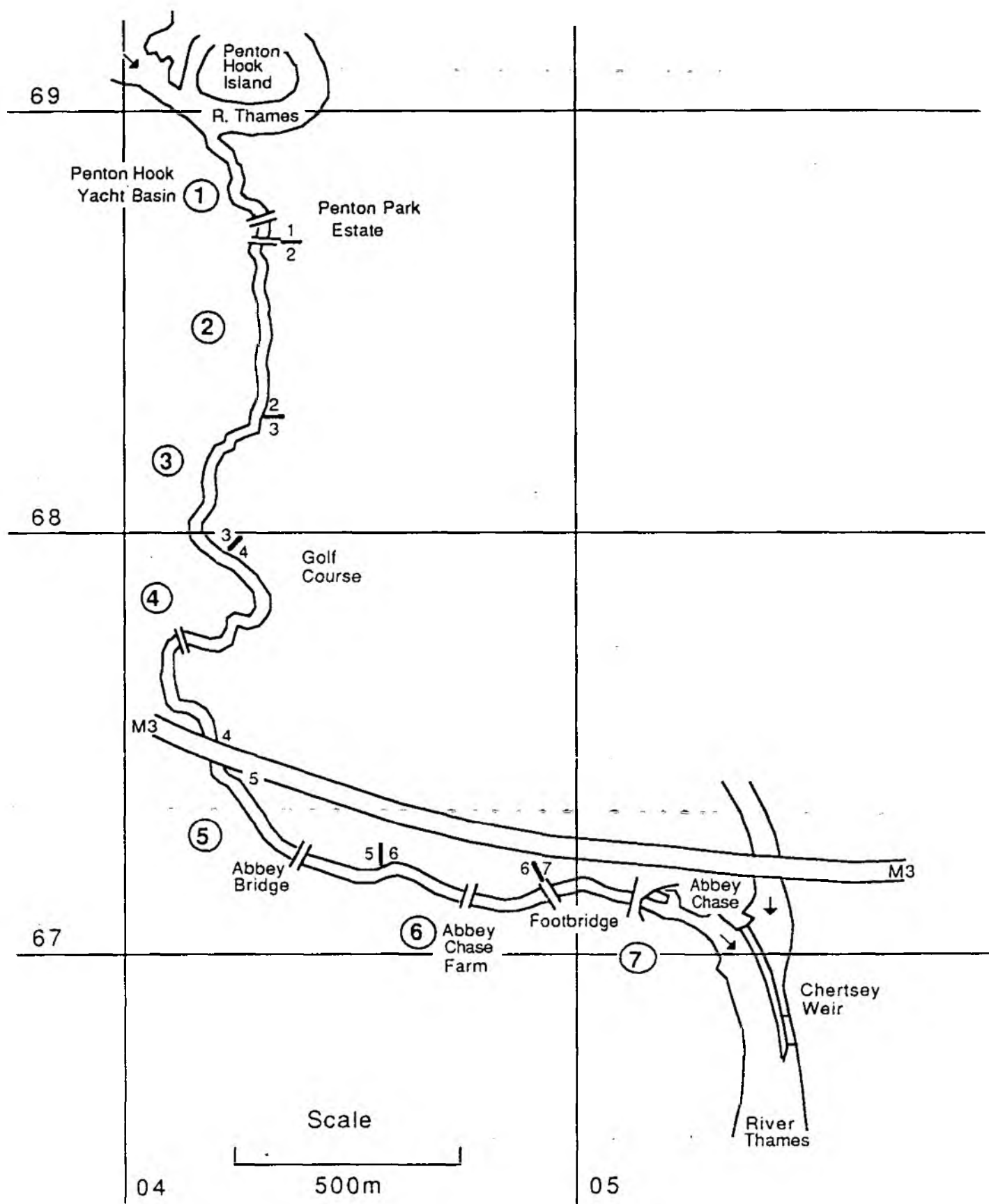
#### Land-use and bank structure

At the start of the length the left bank was bordered by suburban gardens. Downstream from the bridge at TQ 051671 to the confluence with the Thames the left bank was bordered by agricultural land. Land adjacent to the right bank was occupied by suburban gardens throughout the length. The banks were 1-2m high with slopes typically of 35-55 degrees. A short length of the right bank was vertical and artificially reinforced.

#### Vegetation

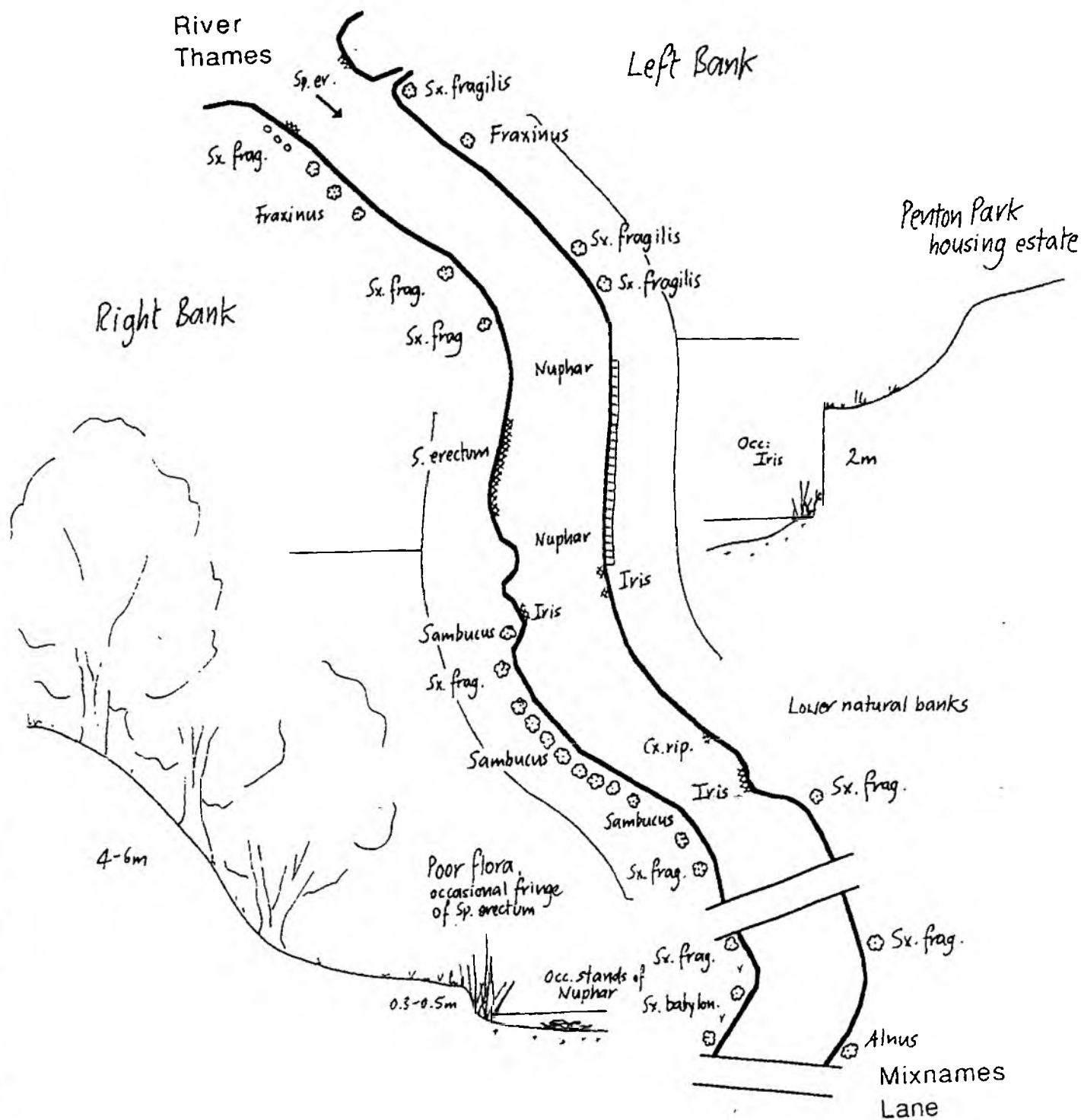
Marginal and emergent wetland vegetation was generally species-poor and present in low abundance. Species-richness was greater downstream where the banks became less shaded and less intensively managed. Stands of emergents, in particular, were much larger near the confluence with the Thames (eg S.erectum, P.arundinacea, G.maxima). Acorus calamus was recorded in this area, the only part of the Abbey River in which it was found. Occasional stands of Callitriche sp. were recorded in the channel.

# ABBEY RIVER: LOCATION OF LENGTHS

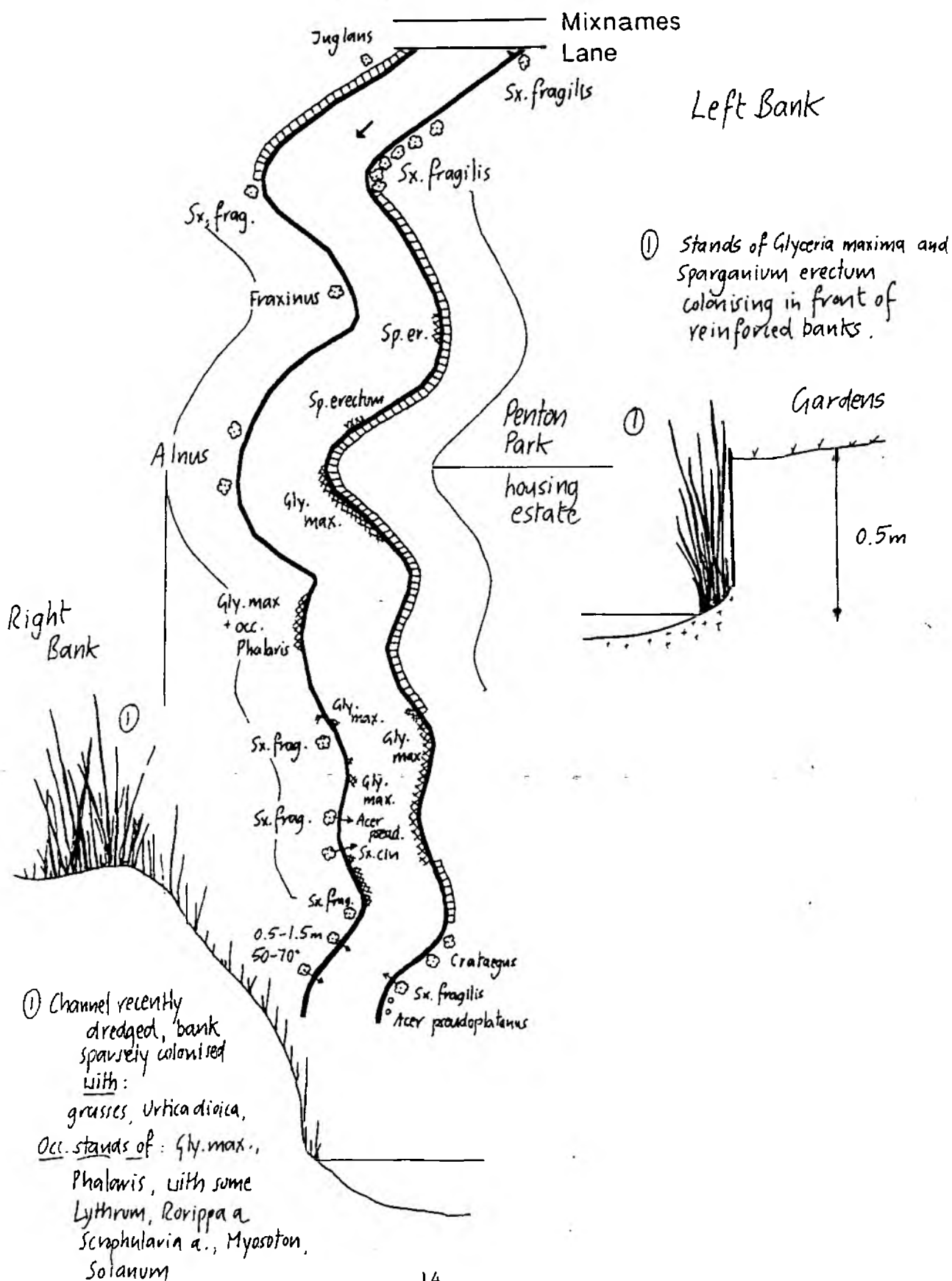




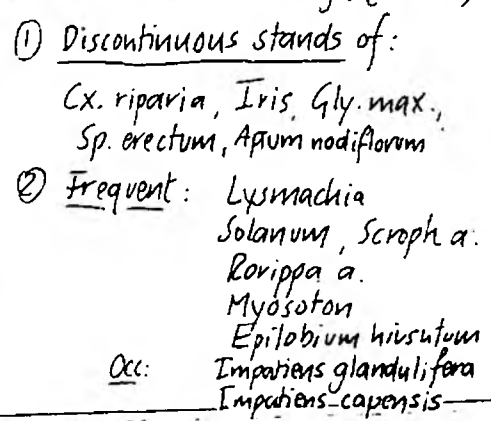
ABBEY RIVER: Length 1. River Thames to Mixnames Lane  
(TQ 041689 - 043687)



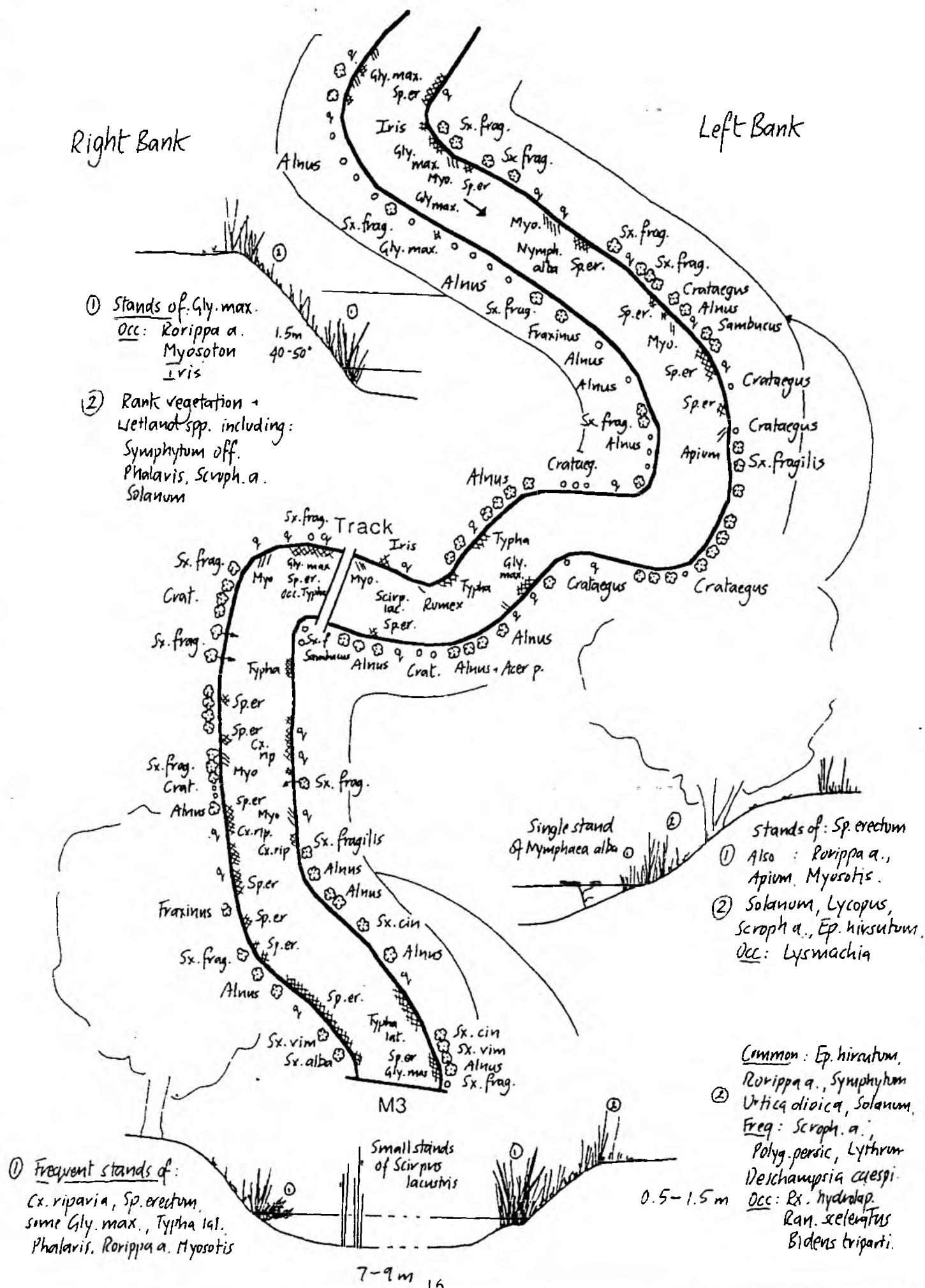
ABBEY RIVER: Length 2. Mixnames Lane (TQ 043687)  
to TQ 043683.



!

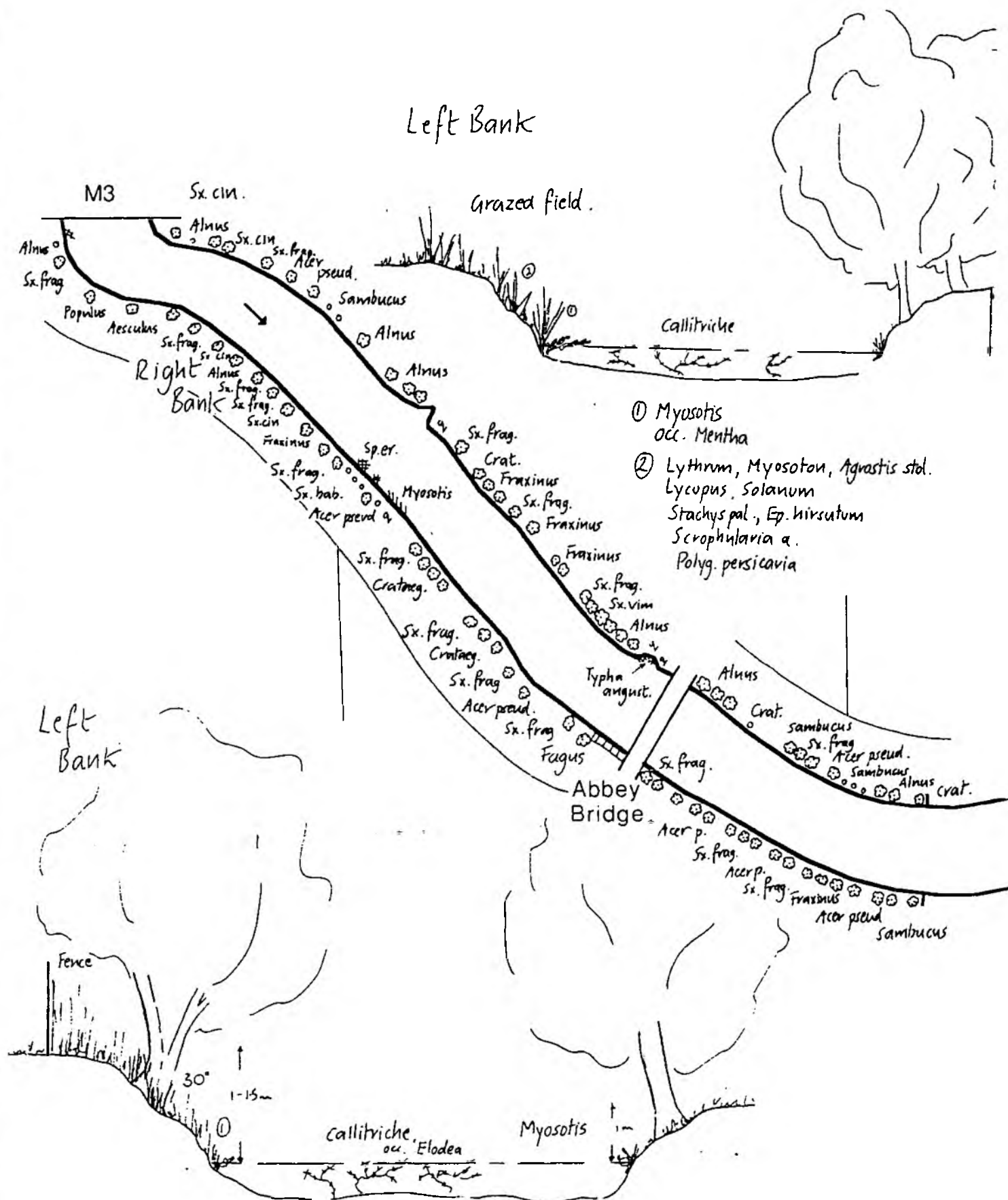


ABBEY RIVER: Length 4. TQ 041680 to M3 (TQ 041675)



ABBEY RIVER: Length 5. M3 (TQ 041675) - TQ 045672

Left Bank

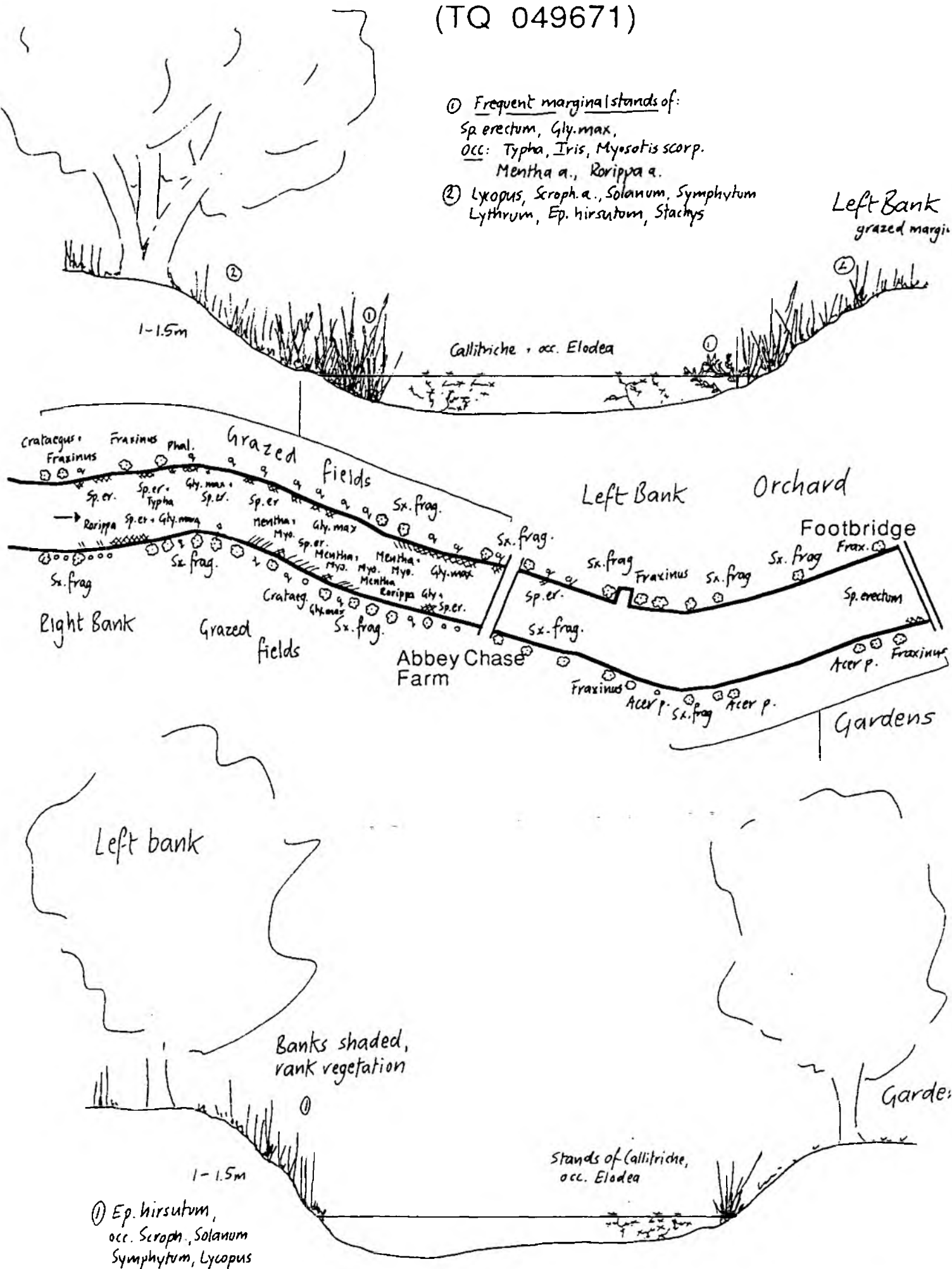


① *Myosotis*  
occ. *Mentha*

② *Lythrum*, *Myosoton*, *Agrostis stol.*  
*Lycopus*, *Solanum*  
*Stachys pal.*, *Ep. hirsutum*  
*Scrophularia a.*  
*Polyg. persicaria*

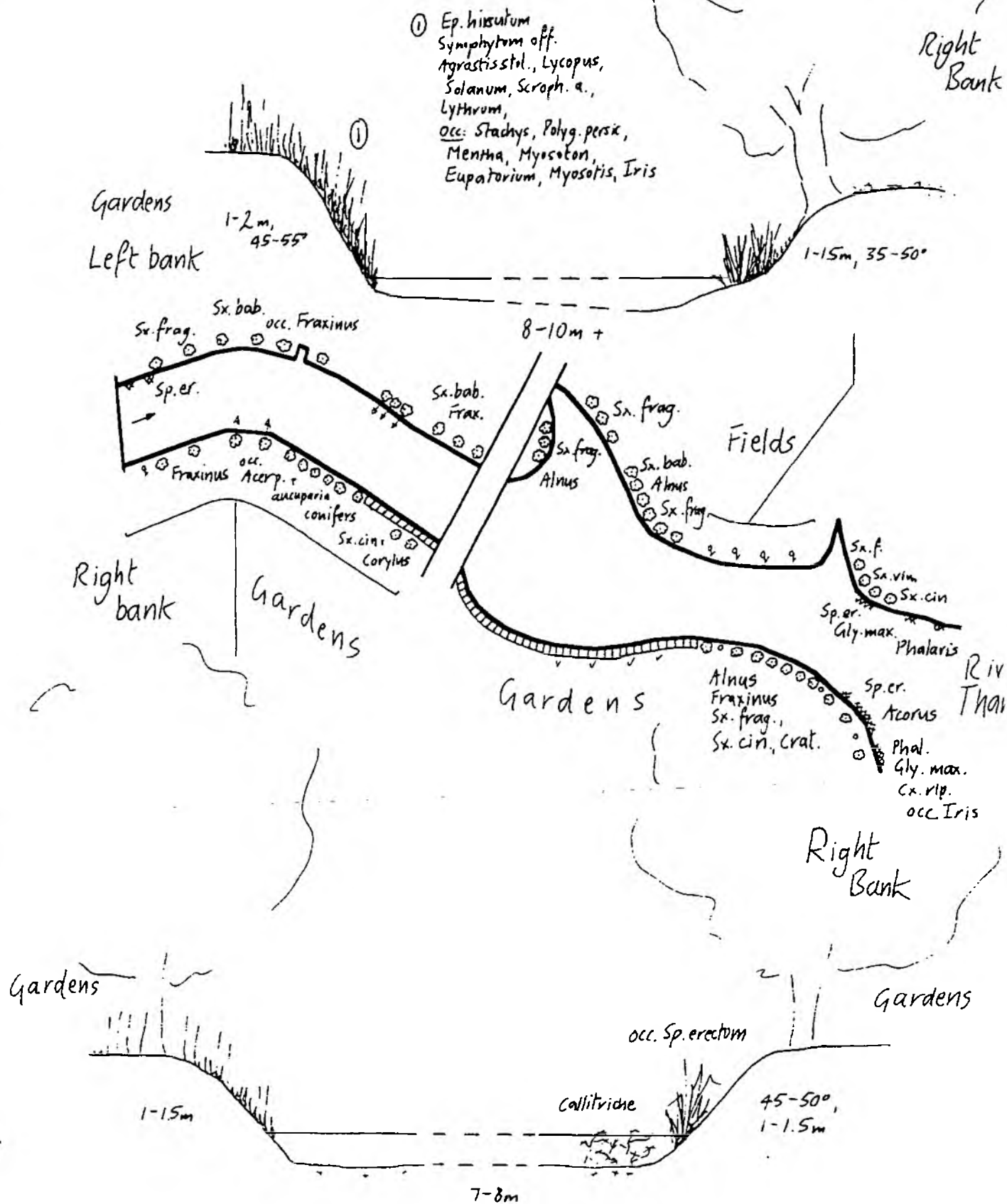
① *Sparganium erectum* + occ. *Typha angustifolia*  
Banks: *Scrophularia a.*, *Lythrum*, *Myosoton*,  
*Lycopus*, *Stachys*, *Solanum*, *Polyg. persic.*  
*Ep. hirsutum*, *Agrostis stol.*

ABBEY RIVER: Length 6. TQ 045672 to Footbridge  
(TQ 049671)





# ABBEY RIVER: Length 7. Foot Bridge to River Thames (TQ 049671 - TQ 053670)



## 5. THE WETLAND VEGETATION OF THE CHERTSEY BOURNE

### 5.1 SUMMARY DESCRIPTION OF THE WETLAND VEGETATION OF THE CHERTSEY BOURNE

#### 5.1.1 Introduction

The Chertsey Bourne supported a moderately diverse wetland flora with 59 species recorded including 8 local species and 12 aquatic species.

#### 5.1.2 Marginal and emergent wetland plants

Forty-seven species of marginal and emergent wetland plant were recorded in the Chertsey Bourne. Five local emergent or marginal species were recorded including Oenanthe crocata which is listed by Palmer and Newbold (1983) as being in need of special protection in the Thames catchment.

The abundance of marginal/emergent species and the richness of the community varied considerably but was best developed in the 0.3km unshaded section on Chertsey Meads (part of Lengths 9 and 10). The flora was also moderately species-rich or abundant in Lengths 1, 3 and 5 where the banks were either unshaded and dominated by grassland or where the surrounding land supported semi-natural vegetation. The abundance of wetland vegetation was greatest in Length 5 but the community was relatively poor in species. In this length Rorippa amphibia, Sparganium erectum and Phalaris arundinacea, some of the commonest species on the Chertsey Bourne, dominated the plant community. Where the stream passed directly through suburban and urban areas (parts of Lengths 4, 7, 8, 11 and 12) the flora was typically very impoverished.

On the banks E.hirsutum and U.dioica were the most abundant wetland species. Juncus effusus, Scrophularia auriculata, Solanum dulcamara, Lycopus europaeus, Agrostis stolonifera and Impatiens glandulifera were also widespread and common. Most other species generally occurred less frequently or were common only locally.

On the channel margins tall emergent species generally occurred as scattered fringeing stands occupying 2-10% of the channel margin. Larger or more continuous stands occurred locally particularly in Lengths 5, 9 and 10. Sparganium erectum was the dominant emergent species. P.arundinacea was common whereas T.latifolia, G.maxima and C.riparia were occasional. Stands of Phragmites australis occurred locally on both banks of the stream on Chertsey Meads (at the top of Length 10). I.pseudacorus was locally frequent in suburban areas, particularly in the lowest lengths of the river.

Scattered stands of N.officinale, M.scorpioides and locally R.amphibia were common along the river channel, particularly in Lengths 1 and 5.



### 5.1.3 Aquatic plants

Twelve aquatic species were recorded including 3 local species.

The aquatic community of the river changed noticeably downstream. In Lengths 1-5 the only submersed species recorded were Callitriche sp. and Sparganium emersum. From Length 6 onwards the richness of the aquatic community increased: Elodea nuttallii became frequent, and often abundant, and Ceratophyllum demersum and Nuphar lutea occasional. Potamogeton natans and Lemna gibba occurred rarely. Sagittaria sagittifolia was recorded in Length 6 during a preliminary visit to the river in September, but was not evident when the full survey was undertaken in November.

In Lengths 11 and 12 the composition of the aquatic flora again changed. Potamogeton crispus and Ranunculus (probably fluviatilis) became locally abundant on gravelly substrates where the river ran through Hamm Court. E.nuttallii and C.demersum became much less common.

## 5.2 DETAILED DESCRIPTION OF THE WETLAND VEGETATION OF THE CHERTSEY BOURNE (MAPS 1-12)

### 5.2.1 Length 1. M3/M25 Junction (TQ 018680) to Footbridge at TQ 024680

#### Land-use and bank structure

Land on the left bank of the stream was predominantly improved grassland. Upstream a footpath separated the river bank from the fields but downstream the banks were grazed. On the right bank land upstream supported rank vegetation and scrub. This was replaced by grazed fields downstream.

Both banks were trapezoidal upstream and about 1.5m high with 50-70 degree slopes. Downstream, where the river bordered grazed fields, the banks sloped more gently and were locally poached.

#### Vegetation

The bank and margins were moderately rich in common wetland species, growing mainly on the lower bank and at the waters edge. There was a fairly extensive fringe of Myosotis scorpioides and Nasturtium officinale, often with Rorippa amphibia growing as an emergent on both margins of the channel. Oenanthe crocata occurred rarely. Stands of tall emergents (Sparganium erectum, Typha latifolia) were common but less extensive.

Sparganium emersum and Callitriche sp. were common throughout the length. Callitriche was particularly abundant in riffle areas towards the end of the length.

### 5.2.2 Length 2. B388 road bridge (TQ 024680) to M3 road bridge (TQ 029678)

#### Land-use and bank structure

The left bank, dominated by rank grassland, lay adjacent to St Ann's Lake in Thorpe Park. On the right bank an area of open grassland and scrub lay between the stream and the M3 motorway.

The stream was trapezoidal in cross-section, usually with 50-90 degree slopes and heights of 1-2m. The banks occasionally sloped more gently (20-30 degrees) on meander bends.

#### Vegetation

The left bank was variably shaded by a variety of native and exotic trees and shrubs. The right bank had little shade (15%). Common marginal and emergent wetland species were present in low abundance. Bidens cernua occurred rarely on grassy unshaded banks. Stands of S. erectum, M. scorpioides and R. amphibia were sparse but more frequent towards the downstream end of the length. There were occasional stands of S. emersum and Callitriche sp. throughout the length.

### 5.2.3 Length 3. M3 Motorway bridge (TQ 029678) to footbridge at TQ 034675

#### Land-use and bank structure

Upstream both banks were bordered by open ground with tall herbaceous vegetation and scrub. Further downstream the left bank was bordered by woodland and the right bank by amenity grassland around landscaped gravel-pit lakes.

The banks were generally steep (30-70 degrees) and variable in height (typically 0.7-2m but locally up to 4m high).

#### Vegetation

The stream supported discontinuous stands of typical marginal species throughout the length. The bank vegetation was rather limited by the degree of shade and the height and steepness of the banks. Locally, the less shaded sections of the left bank supported a richer flora with stands of Lysimachia vulgaris on the banks and stands of N.officinale, M.scorpoides and Veronica beccabunga at the channel margins.

S.emersum and Callitriche sp. were common upstream of the length where there were faster flows and areas of gravelly substrate. Submersed vegetation was otherwise limited.

### 5.2.4 Length 4. Footbridge (TQ 034675) to Inlet (TQ 036669)

#### i) Footbridge to Hamperstone Bridge (TQ 034672)

#### Land-use and bank structure

Both sides of the stream lay adjacent to landscaped gravel pit lakes with a mixture of scrub and amenity grassland. The stream banks were variable in height and profile, (30-70 degrees inclination, typically 0.5-1.5m high). The sloping banks immediately upstream of the Hamperstone Bridge were reinforced with concrete sandbags.

#### Vegetation

Both banks were variably shaded by trees, including a number of old, coppiced, Salix fragilis. The right bank above the Hamperstone Bridge was dominated by a dense stand of Rubus sp. and Reynoutria japonica. Stands of common marginal and emergent wetland species generally became richer and more extensive downstream where S.erectum, T.latifolia and G.maxima dominated the flora.

The channel supported occasional stands of Callitriche sp. growing in marginal sediments. S.emersum was occasional throughout most of the length, but became abundant in the gravelly areas around and between the Hamperstone road bridges (TQ 03446728 to 03486723).

ii) Hamperstone road bridge (TQ 034672) to Inlet (TQ 036669)

Land-use and bank structure

Below Hamperstone Bridge, Length 4 was predominantly urban, with a building site on the left bank and a timber yard on the right. Below the timber yard the right bank was occupied by wooded wasteland with suburban housing beyond.

The stream banks were 0.7-1.5m high with 30-60 degree slopes. At the time of the survey the left bank was being sheet-piled at the beginning and end of the length.

Vegetation

Salix sp., Alnus glutinosa and Populus sp. shaded large areas of the banks and channel. Few marginal and emergent wetland species were recorded and those that were present were found in low abundance. The channel supported occasional stands of Callitriche sp.

5.2.5 Length 5. Inlet (TQ 036669) to Guildford Street bridge (TQ 041666)

i) Inlet at TQ 036669 to inlet at TQ 039667

Land-use and bank structure

Land on both sides of the stream was dominated by tall herbaceous vegetation and scrub. The banks of the stream were lower and less steeply sloping than in most other lengths of the river (typically 20-45 degrees, 0.5-1m high).

Vegetation

Although only moderately rich in species, the first 250m of Length 5 supported a greater abundance of marginal and emergent plants than any other area on the Chertsey Bourne.

The banks of the first half of Length 5 were largely unshaded. The banktop was dominated by Phalaris arundinacea, Urtica dioica and Epilobium hirsutum. The banks and channel margins supported an almost continuous stand of S.erectum, P.arundinacea, N.officinale and R.amphibia. N.officinale, in particular, formed large stands which occupied between 1/4 and 3/4 of the channel in the upper half of Length 5.

Submersed plants were absent. Lemna minor and L.gibba occurred sporadically in sheltered areas at the margin of the river.

ii) Inlet at TQ 039667 to Guildford Street Bridge (TQ 041666)

Land-use and bank structure

The land on both banks of the stream was occupied by wooded, suburban gardens. The banks were 1-1.5m high with slopes of 30-60 degrees.

Vegetation

Both banks and channel were typically heavily shaded by Acer pseudoplatanus and Salix sp. (especially S.fragilis). Very few marginal or emergent plants were recorded and those present were found in very low abundance. Submersed species were absent.

5.2.6 Length 6. Guildford Street bridge (TQ 041666) to Free Prae Road bridge (TQ 044663)

Land-use and bank structure

Length 6 passed through a suburban area with amenity grassland, marginal woodland, schools and a carpark. The banks were varied but typically had trapezoidal profiles, with heights of 0.5-1.5m and 30-70 degree slopes.

Vegetation

The banks of the stream were variably shaded, predominantly by A.glutinosa, S.fragilis, Acer pseudoplatanus and Quercus sp.. Rubus sp. was common. Shading was locally heavy, especially upstream. Upper bank and bank top vegetation was generally sparse because of the shade and intensity of management. Emergent and marginal wetland species were those typical of the Chertsey Bourne, with stands dominated by S.erectum, N.officinale and M.scorpioides.

The submersed flora was generally richer in species than in Lengths 1-5. Elodea nuttallii and Nuphar lutea were present between the road and foot bridges at the top of the length with frequent Callitriche sp. and S.emersum. Ceratophyllum demersum was present in low abundance. Sagittaria sagittifolia was found locally upstream of the footbridge at TQ 04126649)

5.2.7 Length 7. Free Prae Road bridge (TQ 044663) to Fordwater Road bridge (TQ 049661)

Land-use and bank structure

Length 7 had predominantly urban surroundings although a short section of the right bank lay adjacent to a grazed field. The banks varied considerably in height and profile and included natural and reinforced sections.

Vegetation

The banks supported frequent A.glutinosa, S.fragilis and Crataegus monogyna. Where shading was locally heavy, the growth of bank vegetation was restricted. Typical marginal wetland species were present, but the abundance of most species was low. Stands of emergent plants were not very extensive, particularly in the more shaded area in the middle of the length.

As in Length 6 the submersed flora was quite rich and dominated by E.nuttallii. Callitriche sp. and S.emersum were frequent and N.lutea and C.demersum occasional. The most extensive stands of submersed plants were restricted to the upper and lower parts of the length.

5.2.8 Length 8. Fordwater Road bridge (TQ 049661) to Chertsey Meads footbridge (TQ 052661)

Land-use and bank structure

In the upper half of the length the land on the left bank was occupied by urban and suburban developments. Downstream the left bank lay adjacent to Chertsey Meads. Throughout the length the land on the right bank was occupied by urban and suburban developments. The banks were typically steep and either trapezoidal or stepped with a steep bank behind.

Vegetation

i) Fordwater Bridge (TQ 049661) to beginning of Chertsey Meads (TQ 052661)

The banks in the upper half of Length 8 were heavily shaded by S.fragilis and A.glutinosa and supported a small number of common wetland species in low abundance. The marginal and emergent flora was also impoverished, its development restricted by shade, the height of the banks and the intensity of surrounding land-use.

E.nuttallii was common in the channel with occasional stands of Callitriche sp..

ii) **Beginning of Chertsey Meads (TQ 052661) to Chertsey Meads footbridge (TQ 052661)**

In the lower half of Length 8 the right bank was overhung, and heavily shaded, by mature S.fragilis. The left bank was less shaded and supported grasses and ruderals. Both banks and channel margins supported an impoverished flora of common wetland species. E.nuttallii was common in the channel.

**5.2.9. Length 9. Chertsey Meads footbridge (TQ 052661) to TQ 057658**

**Land-use and bank structure**

The left bank of the stream was bounded by the grassland of Chertsey Meads. The right bank was initially shaded by trees but downstream became more open where it bordered an area of grazed pasture (fenced). The banks were generally trapezoidal and locally very steep (40-70 degree slopes, 1-2.5m high, usually 1.5-2m high). The banks were reinforced in some areas above the stream inlet at TQ 05396600.

**Vegetation**

Upstream, the right bank was typically heavily shaded by S.fragilis, S.babylonica and Aesculus hippocastanum. The shade restricted the abundance and species-richness of wetland vegetation on both banks. Occasional stands of Apium nodiflorum grew where the margins were less shaded. E.nuttallii was common in the channel with occasional Callitriche sp. and C.demersum.

Further downstream Length 9 supported the richest wetland vegetation recorded on the Chertsey Bourne. A diverse mixed stand of emergent and marginal species grew extensively along both banks and on the channel margins. In the channel E.nuttallii was abundant and S.emersum and Callitriche sp. common. C.demersum was occasional at the margins.

**5.2.10 Length 10. TQ 057658 to Footbridge at TQ 062656)**

**Surrounding land-use and bank structure**

The left bank of the stream was bounded by the grassland of Chertsey Meads. Upstream, the right bank was bordered by grazed pasture and areas of open ground dominated by tall ruderals. Further downstream the right bank was shaded by marginal trees or woodland. Throughout the length the banks were steep and trapezoidal (40-70 degree slopes, 1-2m high).

## Vegetation

Upstream, the length supported well-developed stands of Phragmites australis. On the right bank these stands spread into a scrubby fen area beyond the stream, but were shaded-out where marginal trees became denser. E.nuttallii was common in the channel.

The lower parts of the length supported discontinuous stands of typical marginal species. Bank vegetation was rather limited by the amount of shade and the height of the banks. Both banks supported small stands of Lysimachia vulgaris growing under partial shade. E.nuttalli was abundant in the channel. S.emersum, C.demersum and Callitriche sp. were frequent. Potamogeton crispus was recorded from a gravelly riffle just below the confluence with Woburn Park Stream (TQ 062657), at the bottom of the length.

### 5.2.11 Length 11. Footbridge (TQ 062657) to road bridge at TQ 067657

#### (i) Footbridge at TQ 062657) to road bridge at TQ 065657)

##### Land-use and bank structure

Upstream Length 11 was bounded on both sides by the grassland of Chertsey Meads, both banks supporting trees. The banks were steep and generally trapezoidal in profile (40-70 degree slopes, 1-2m high).

##### Vegetation

Unshaded sections supported a flora of moderate to low species-richness and generally low abundance. The most heavily shaded banks supported very few species. E.nuttallii was common in the channel and S.emersum and C.demersum occasional. Nuphar lutea was recorded at the end of the length growing on muddy sediments.

#### (ii) Road bridge at TQ 065657 to road bridge at TQ 067657

##### Land use and bank structure

In the lower parts of Length 11 both sides of the stream were bounded by urban gardens. The banks were frequently shaded and were very variable in height and profile. Most banks were steep and partly or completely reinforced.

##### Vegetation

Stream banks directly adjacent to the gardens were poor in wetland species although occasional stands of Iris pseudacorus did occur along the channel margins. Where the left bank was unmanaged it supported a small number of wetland species such as Impatiens glandulifera and P.arundinacea. Ranunculus sp. and P.crispus were common in the channel, particularly in faster flowing sections with gravelly substrates. S.emersum, E.nuttallii and Callitriche sp. were frequent.



5.2.12 Length 12. Road bridge (TQ 067657) to confluence with River Thames  
(TQ 070655)

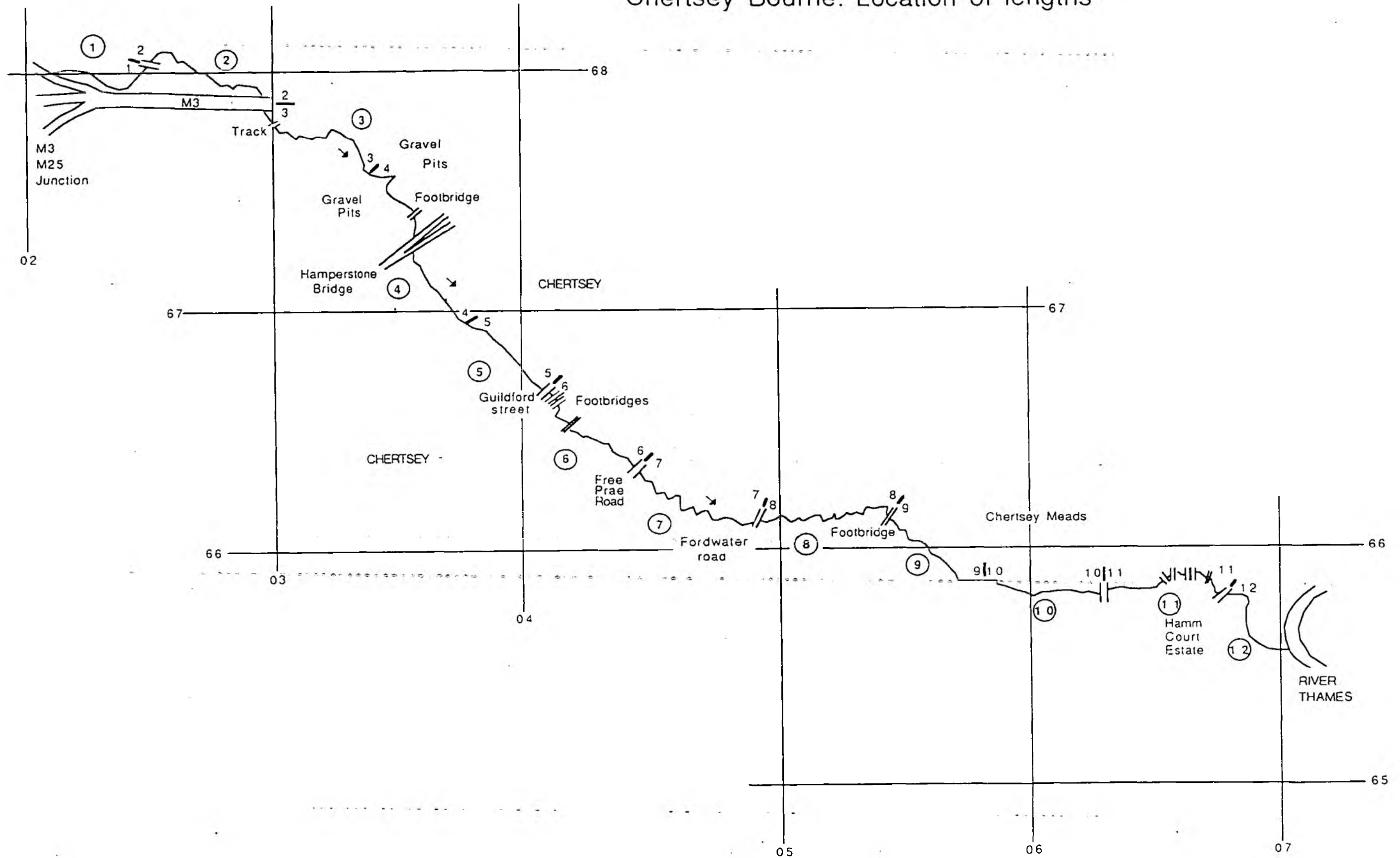
**Land-use and bank structure**

Upstream the left bank supported a strip of marginal woodland. Further downstream this was replaced by grazed pasture or amenity grassland. The right bank was bounded by suburban gardens throughout the length. The banks were very variable in height (0.5-5m) and profile and the right bank was reinforced along part of its length.

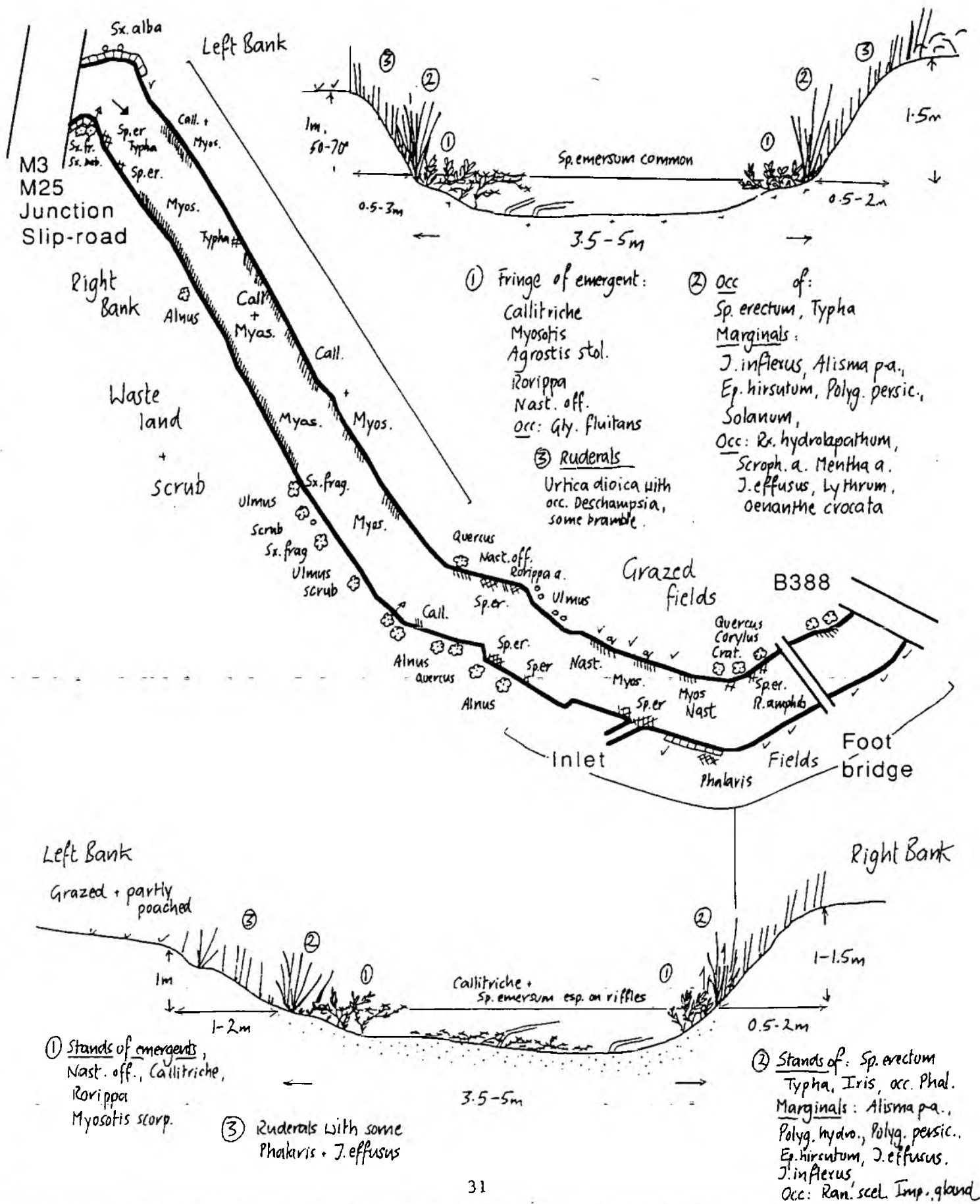
**Vegetation**

The bank and marginal vegetation was very sparse at the upper end of the length, with the left bank steep and heavily shaded and the right bank gardened. Downstream the vegetation became richer where the bank became more open, but was still moderately poor in species. Ranunculus sp. and P.crispus were present in the channel, particularly in the faster flowing sections at the top of the length. N.lutea was recorded in more sluggish sections downstream.

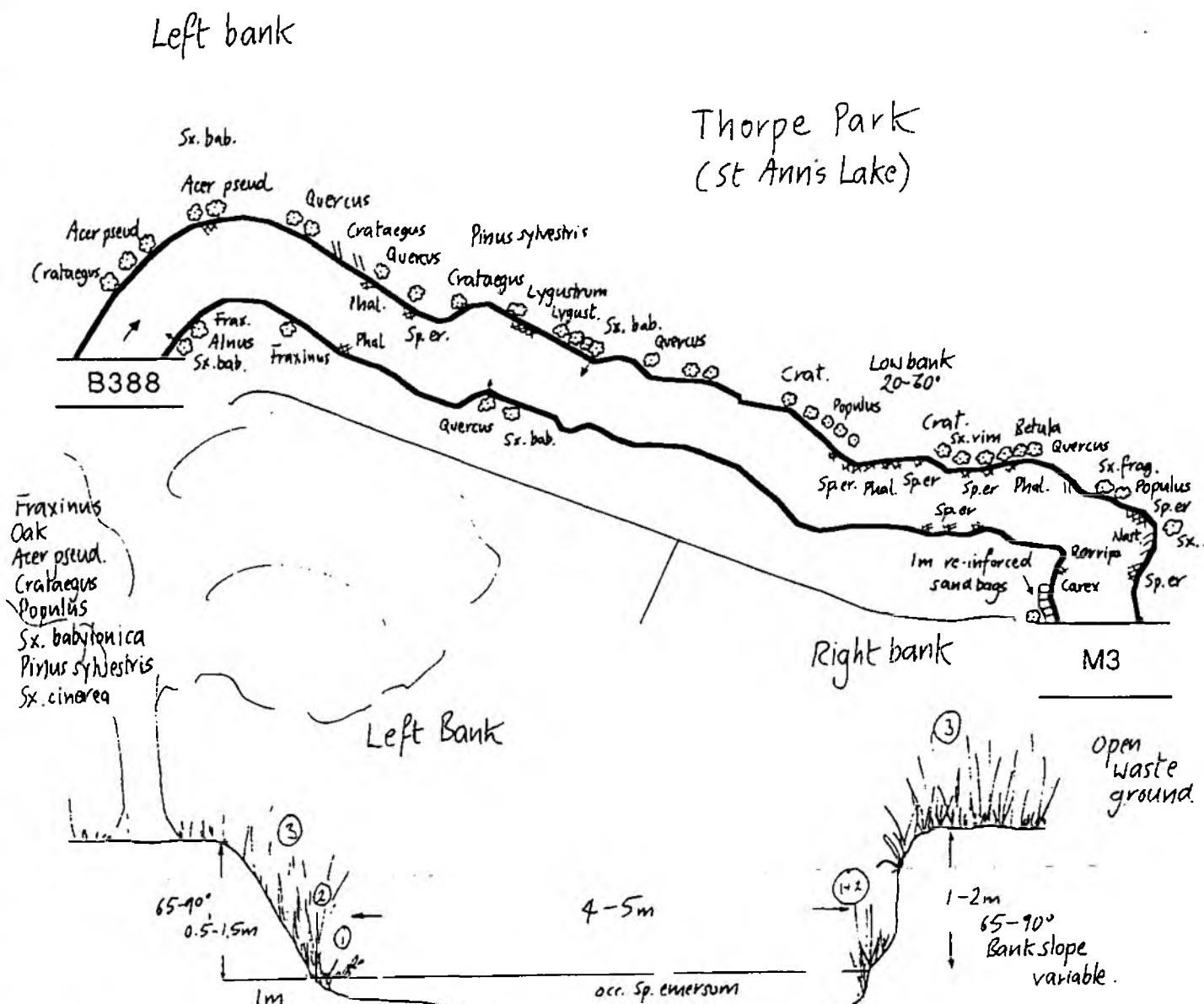
# Chertsey Bourne: Location of lengths



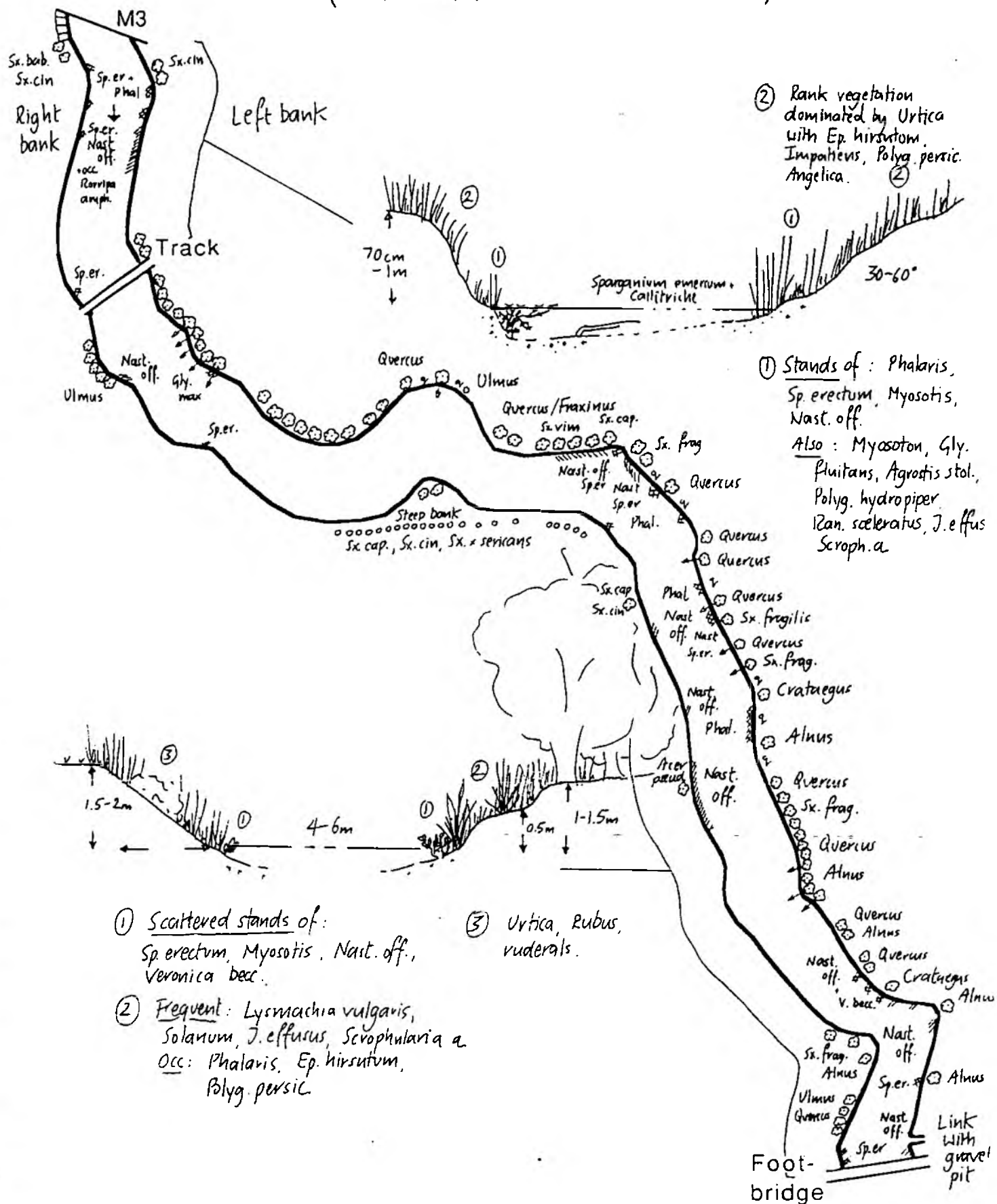
CHERTSEY BOURNE: Length 1. M3/M25 Junction to Thorpe Road (B388) (TQ 018681- TQ 024680)



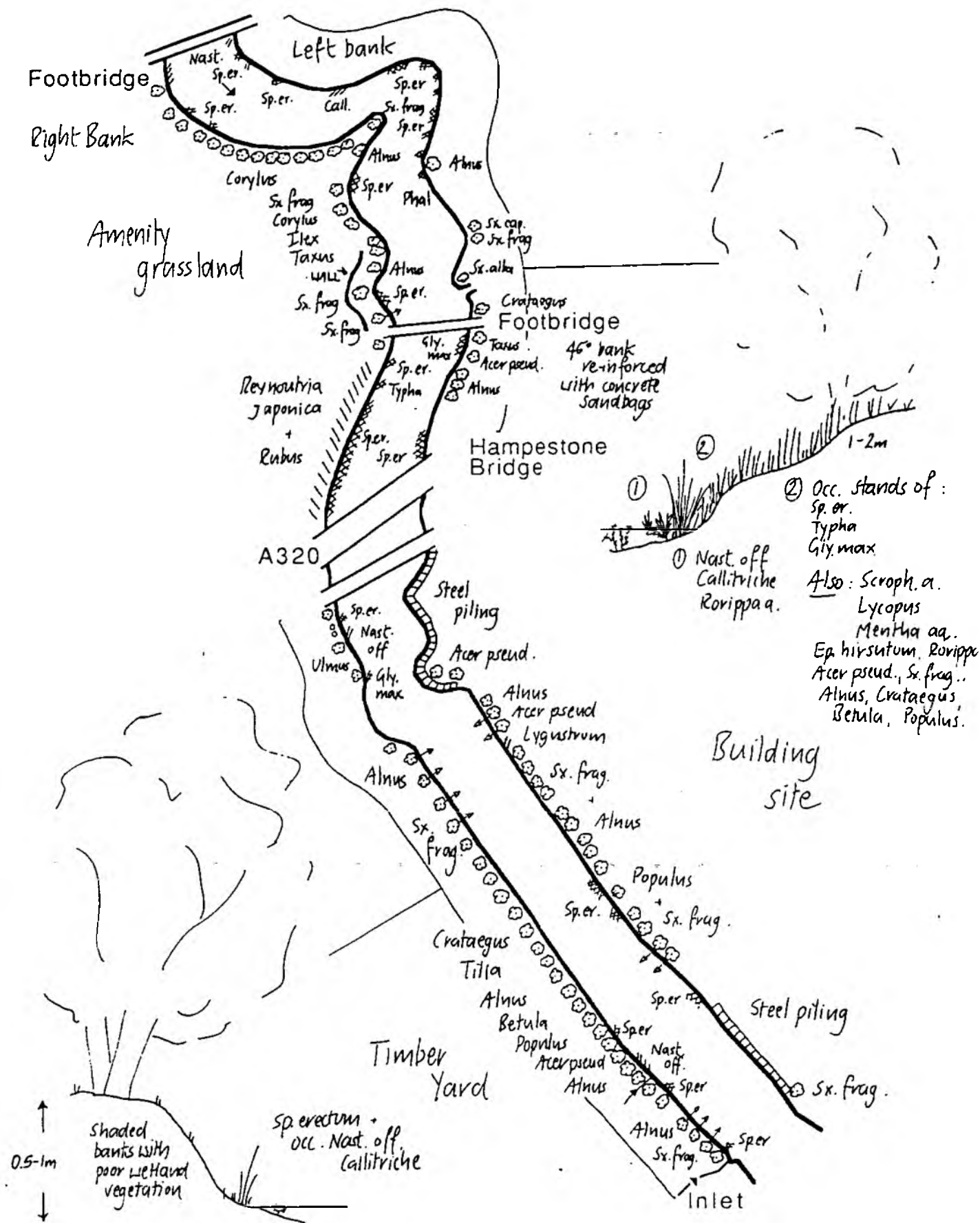
# CHERTSEY BOURNE: Length 2. Thorpe Road (B388) to M3 (TQ 024680 - TQ 029678)



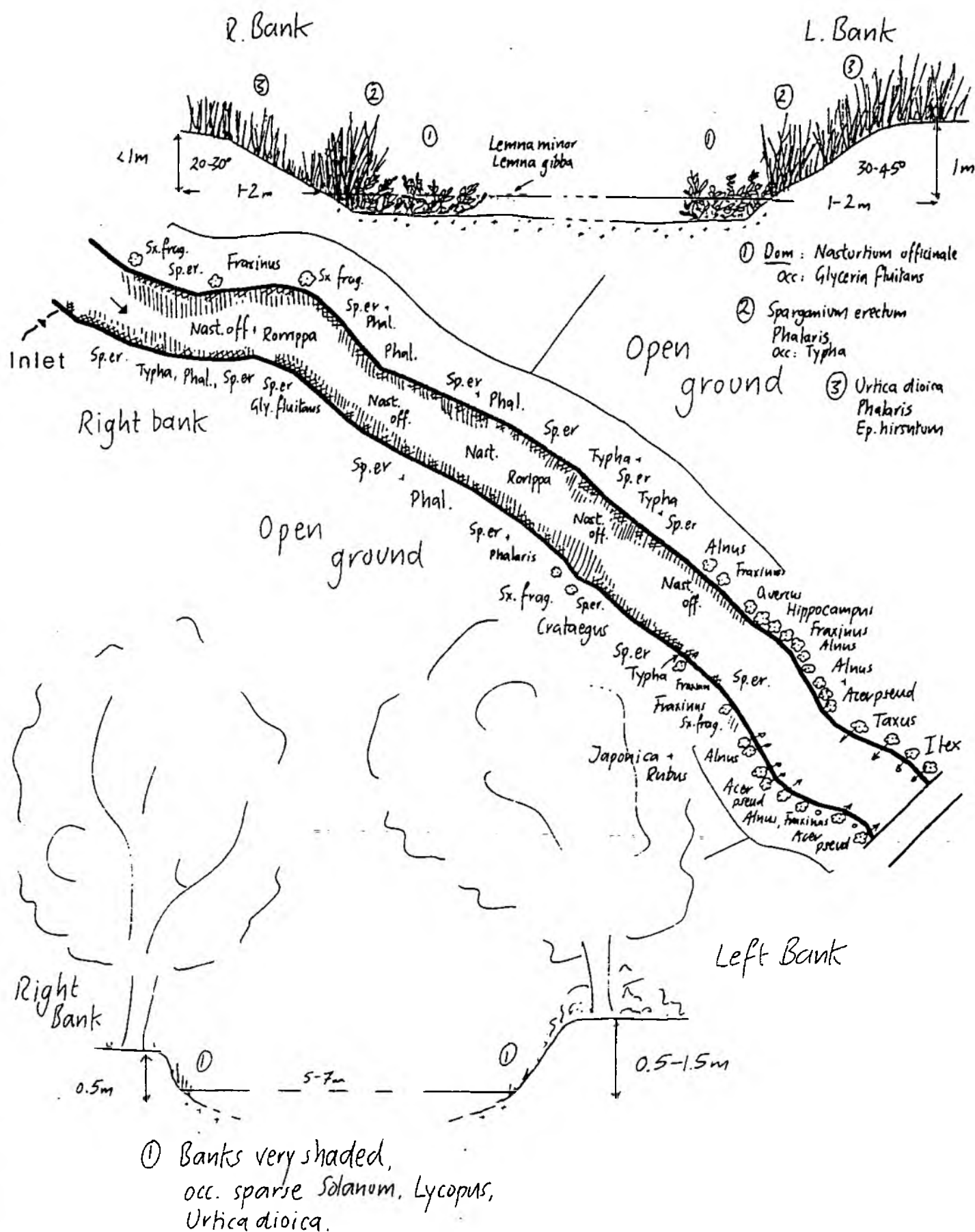
CHERTSEY BOURNE: Length 3. M3 to Footbridge  
(TQ 029678 - TQ 034675)



CHERTSEY BOURNE: Length 4. Footbridge to Inlet  
(TQ 034675 - TQ 036669)

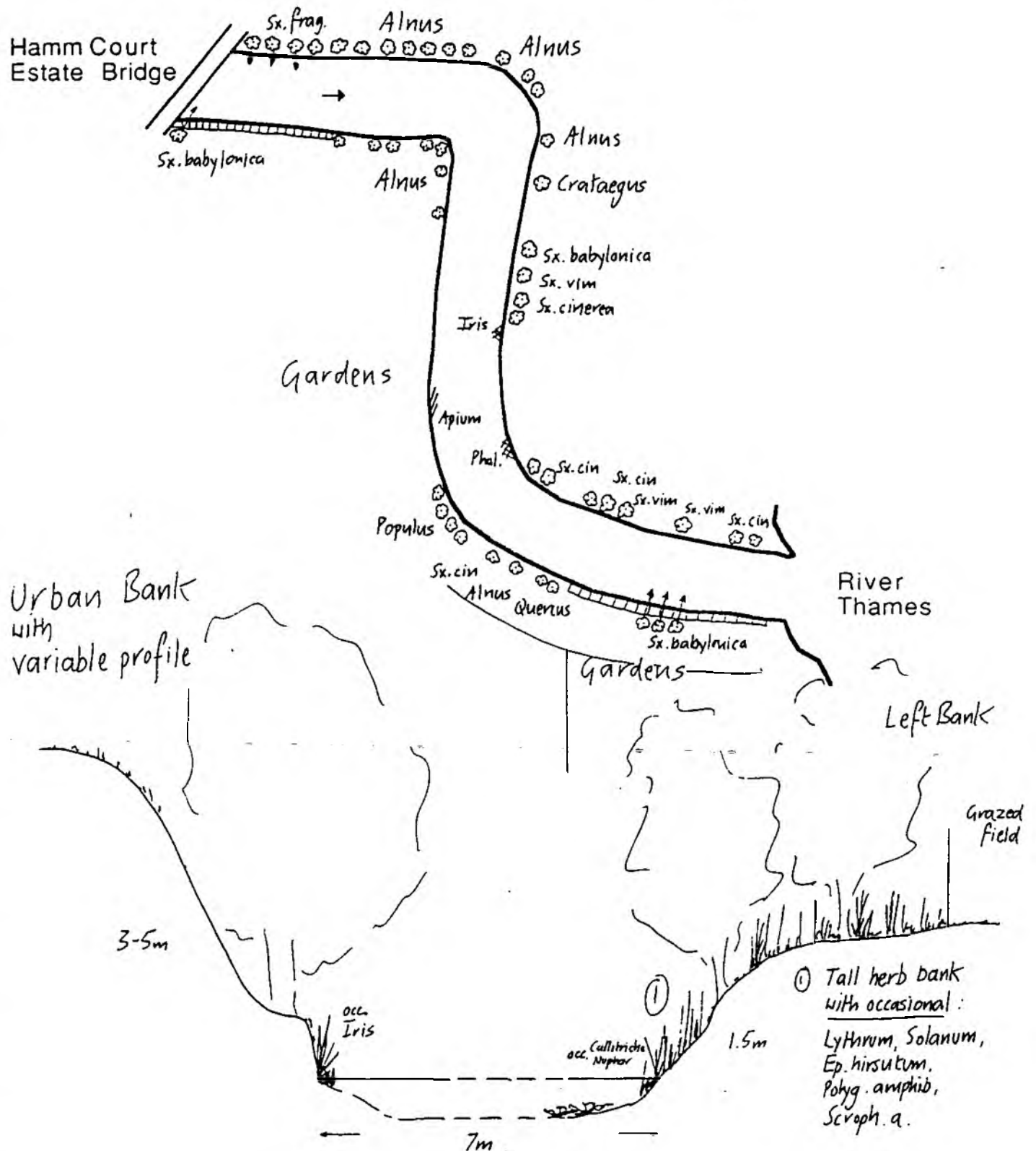


CHERTSEY BOURNE Length 5: Inlet to Guildford Street  
(TQ 036669 - TQ 041666)



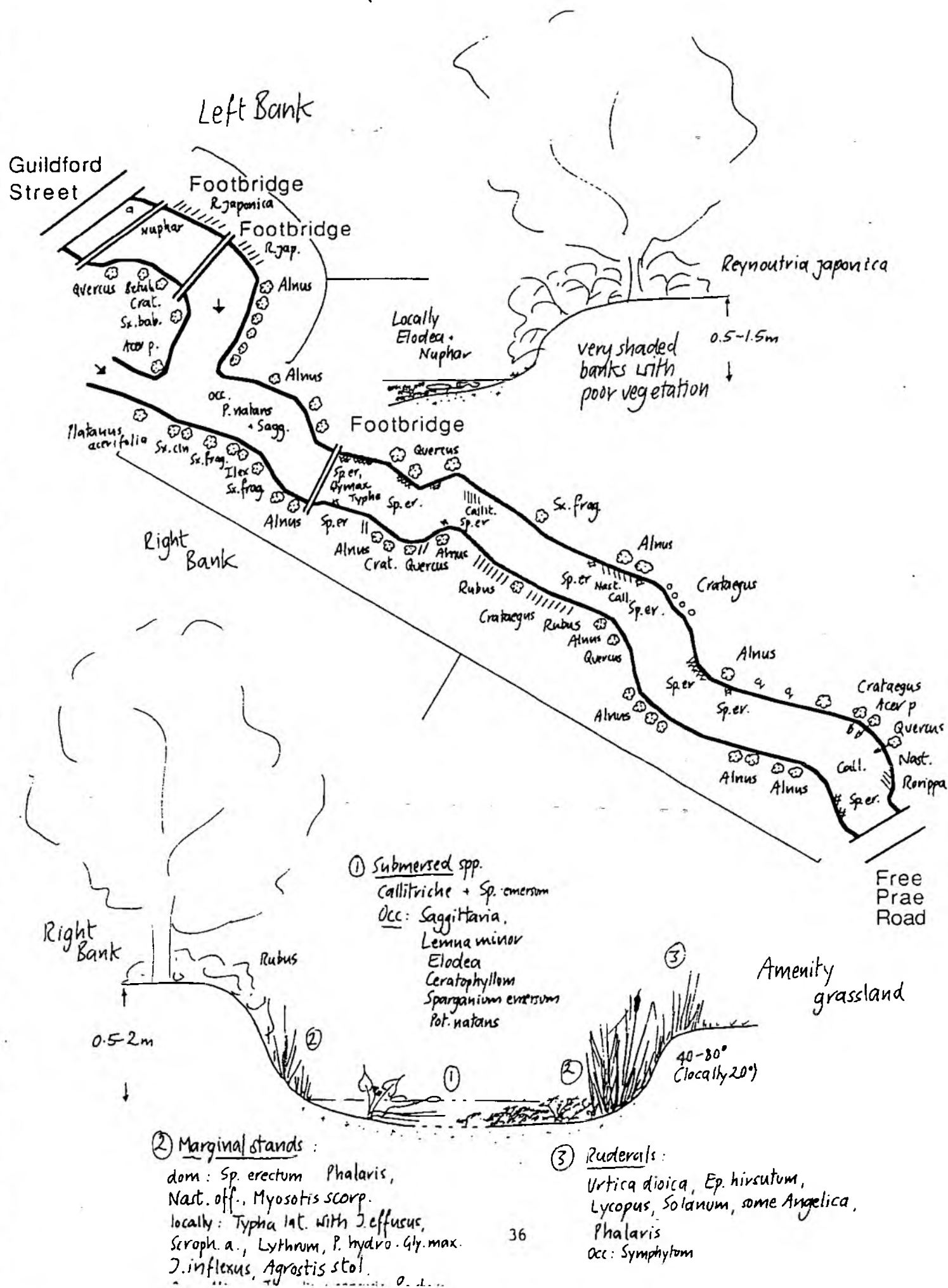


CHERTSEY BOURNE: Length 12. Hamm Court Estate Road to  
R. Thames (TQ 067657 - TQ 070655)

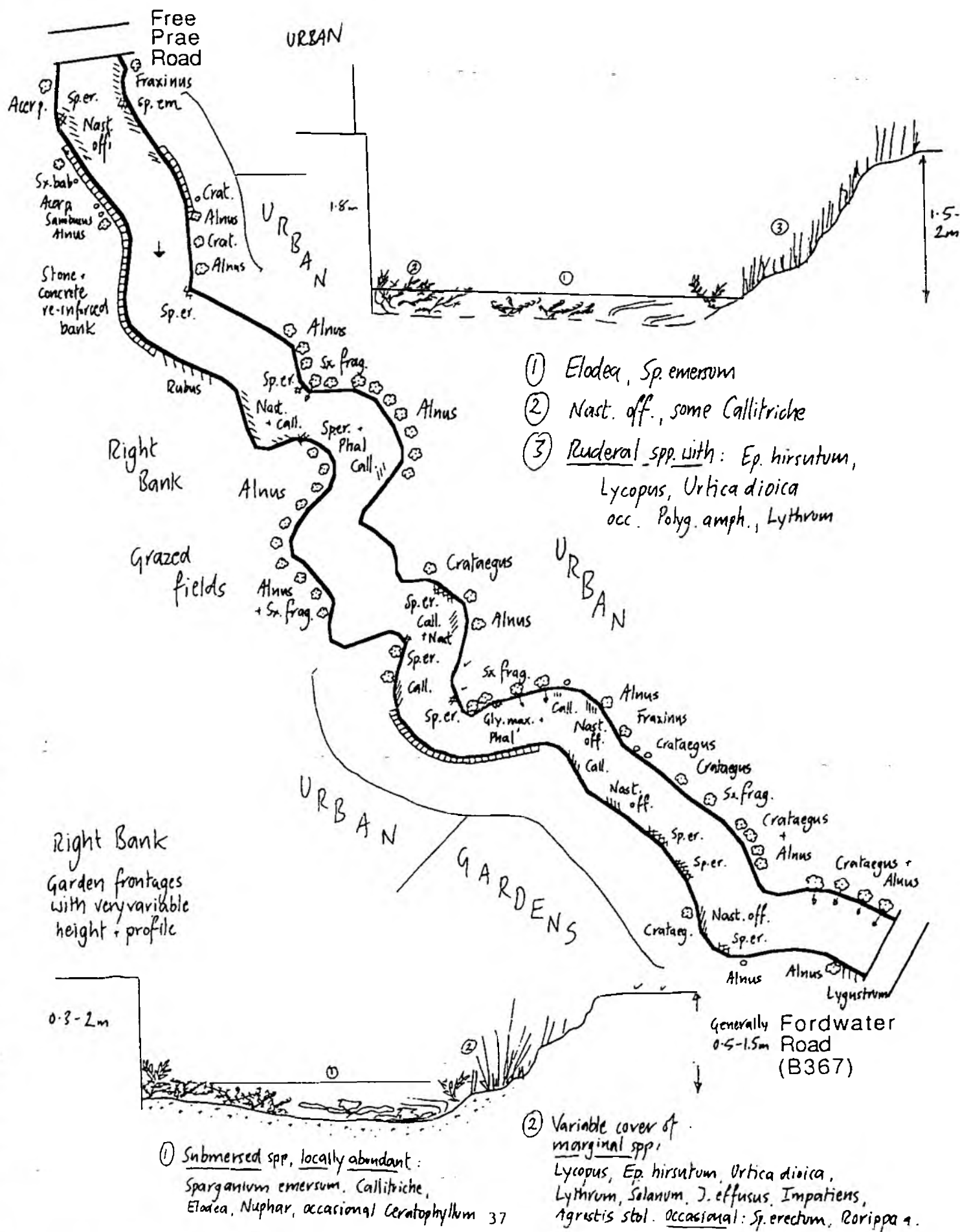




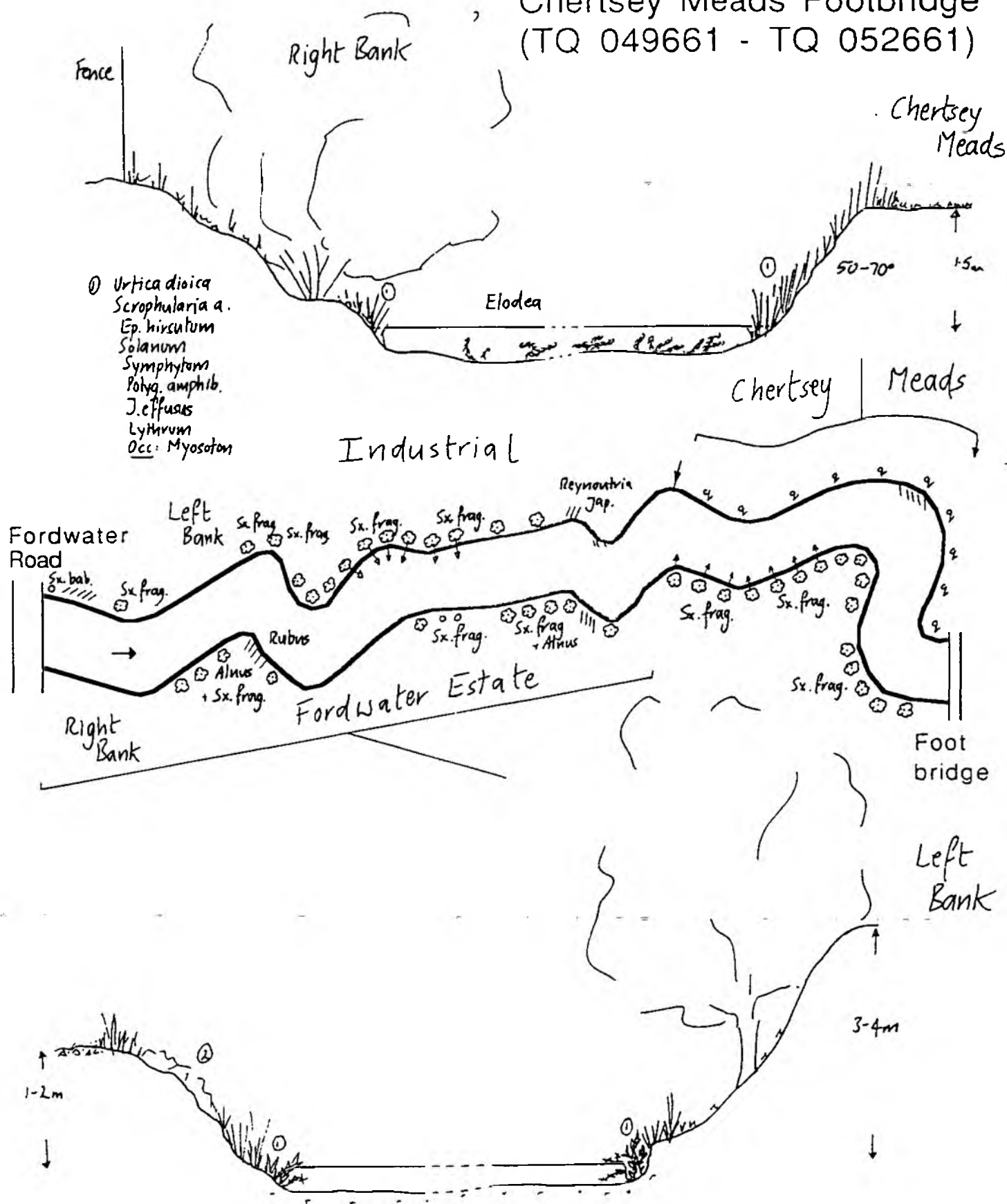
CHERTSEY BOURNE: Length 6. Guildford St. to Free Prae Rd.  
(TQ O41666 - TQ 044663)



# CHERTSEY BOURNE: Length 7. Free Prae Road to Fordwater Road (TQ 044663 - TQ 049661)



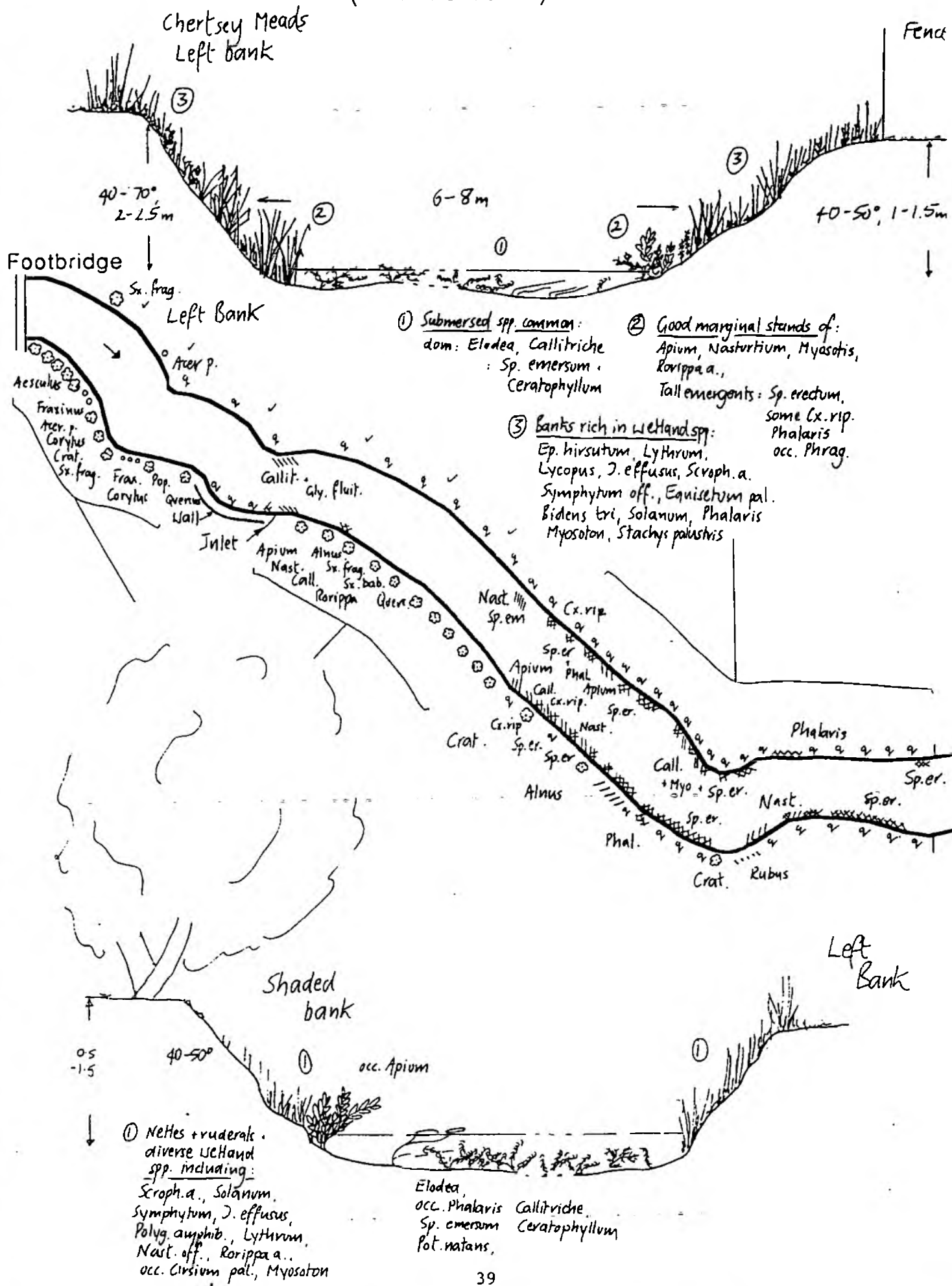
CHERTSEY BOURNE: Length 8. Fordwater Road to  
Chertsey Meads Footbridge  
(TQ 049661 - TQ 052661)



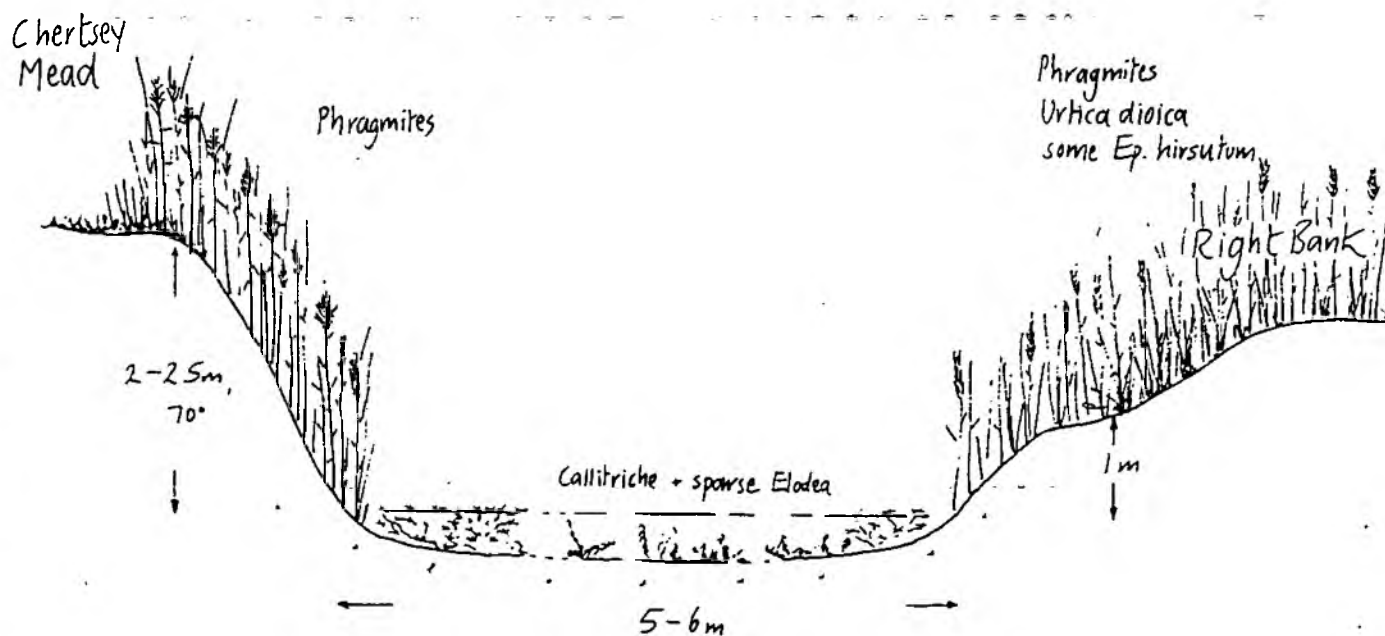
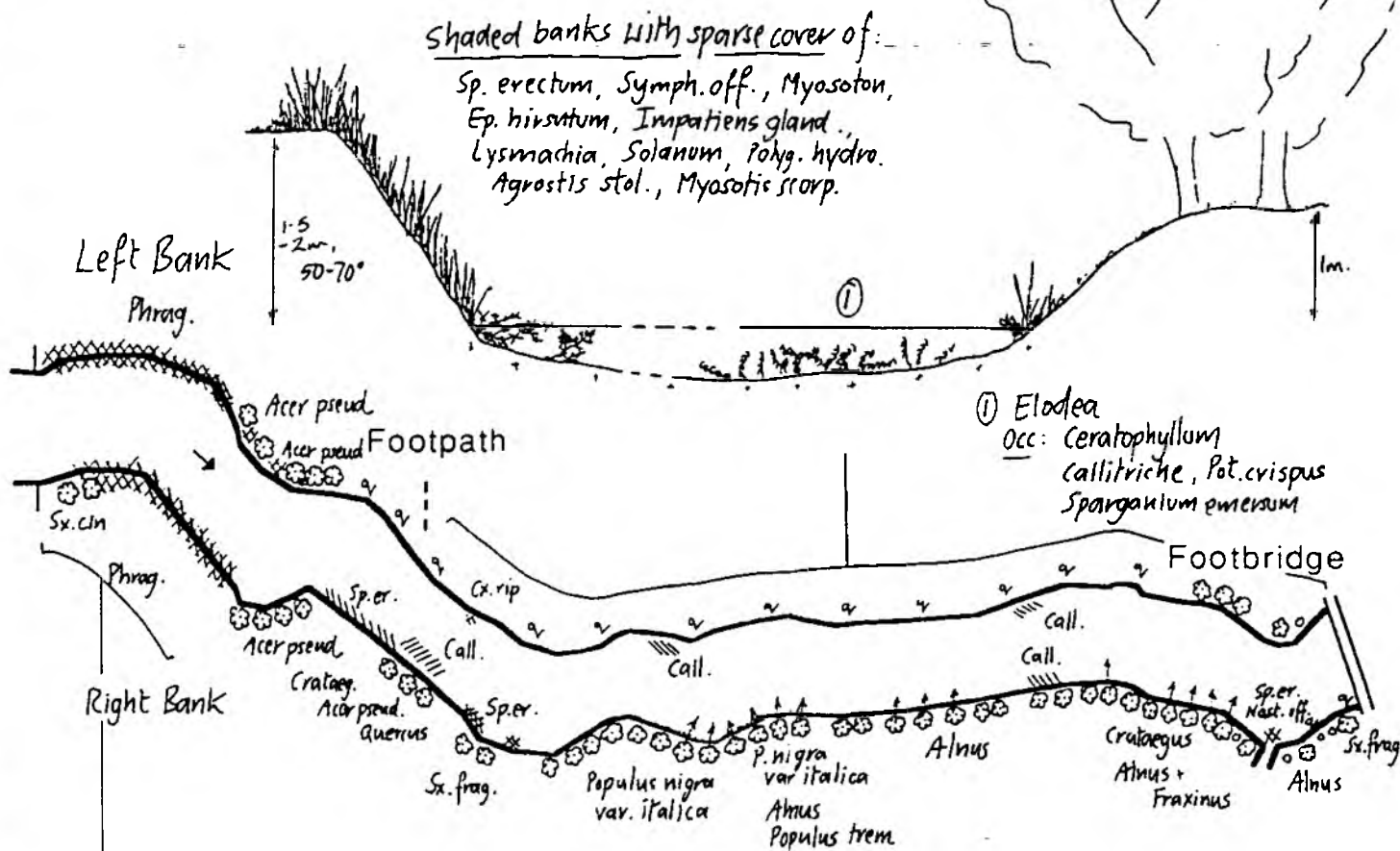
① Occ. marginal stands of:  
*Callitriche*, some *Nast. off.*, +  
*Rorippa a.*, *Lemna minor*

② Unshaded banks with:  
*Ep. hirsutum*, *Lythrum*,  
*Occ. Scroph. a.*, *Solanum*,  
*Impatiens gland.*, *Polyg. amphib.*,  
*Myosotis*, v. *occ. Phragmites*

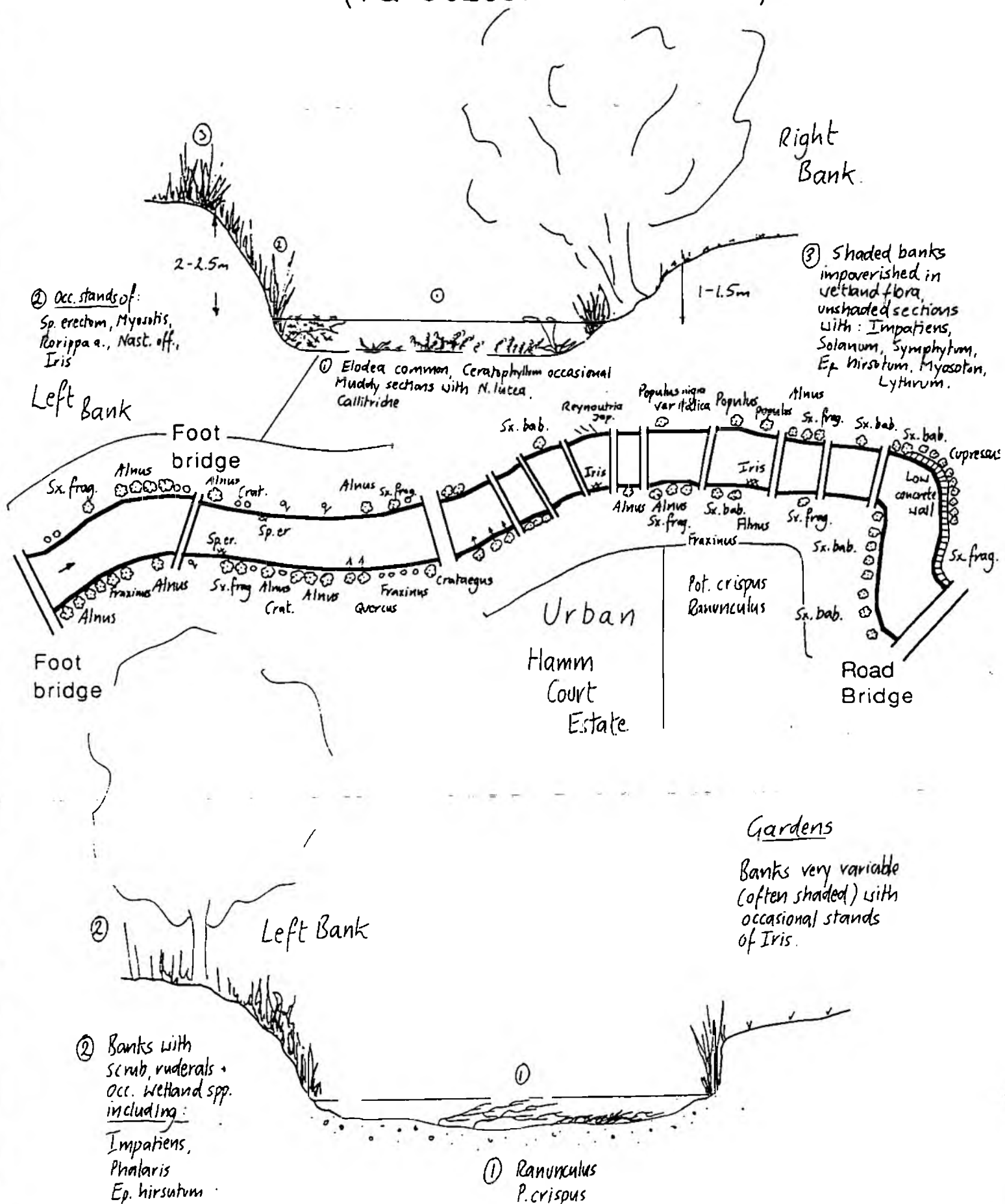
CHERTSEY BOURNE: Length 9. Chertsey Meads Footbridge  
(TQ 052661) to TQ 057658



# CHERTSEY BOURNE: Length 10. TQ 057658 to Footbridge (TQ 062657)



# CHERTSEY BOURNE: Length 11. Footbridge to Road Bridge (TQ 062657 - TQ 067657)





## 6. THE AQUATIC MACROINVERTEBRATES OF THE ABBEY STREAM AND CHERTSEY BOURNE

### 6.1 RESULTS AND DISCUSSION

The results of the macroinvertebrate surveys of the Abbey Stream and Chertsey Bourne are presented in Appendices 3 to 6 and summarised in Table 2.

The BMWP (Biological Monitoring Working Party) scores and ASPT (Average Score Per Taxon) values for the Abbey River and the Chertsey Bourne were low, reflecting the scarcity of pollution intolerant taxa (see Table 2). For the Abbey Stream the mean BMWP score was 76 (+/-7) and the mean ASPT value was 3.91 (+/-0.21). For the Chertsey Bourne the mean BMWT was 70 (+/-9) and the mean ASPT 3.89 (+/-0.09). The BMWP scores and ASPT values of the two streams were not significantly different.

Predicted BMWP scores were available from earlier Thames Water/NRA surveys for some sections of the Chertsey Bourne (NRA Thames Region, Biological Database). Predicted BMWP scores ranged from 125-150 and were considerably higher than the observed scores recorded in this survey. Poor water quality, rather than lack of habitat diversity, appeared to be the main factor responsible for the low BMWP scores in the Chertsey Bourne. The Bourne had relatively high flow rates and extensive stands of aquatic vegetation and appeared to have a variety of microhabitats suitable for pollution intolerant taxa (such as Ephemerellidae, Ephemeridae and Leptoceridae).

No predicted scores were available for the Abbey Stream. Both lack of habitat diversity (low flow rates and lack of submersed vegetation) and poor water quality were probably responsible for the absence of pollution intolerant taxa and the consequent low BMWP scores and ASPT values.

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TABLE 2. SUMMARY OF THE BMWP SCORES AND ASPT VALUES FOR THE ABBEY RIVER AND CHERTSEY BOURNE.

---

ABBAY RIVER

|   |    |      |
|---|----|------|
| A | 83 | 3.95 |
| B | 74 | 4.11 |
| C | 70 | 3.68 |

CHERTSEY BOURNE

|   |    |      |
|---|----|------|
| A | 84 | 4.00 |
| B | 61 | 3.81 |
| C | 66 | 3.88 |
| D | 71 | 3.94 |
| E | 68 | 3.78 |

ABBAY RIVER

|      |        |             |
|------|--------|-------------|
| MEAN | 76+/-7 | 3.91+/-0.21 |
|------|--------|-------------|

CHERTSEY BOURNE

|      |        |             |
|------|--------|-------------|
| MEAN | 70+/-9 | 3.89+/-0.09 |
|------|--------|-------------|

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## **7. ASSESSMENT OF THE NATURE CONSERVATION VALUE OF THE ABBEY RIVER AND CHERTSEY BOURNE**

### **7.1 DATA USED TO ASSESS NATURE CONSERVATION VALUE**

#### **7.1.1 Introduction**

The nature conservation value of the Abbey River and Chertsey Bourne was assessed using data on wetland plant communities and aquatic macroinvertebrates identified to family level.

Plant community types were identified and their conservation value assessed using the criteria listed in Table 1. Family level aquatic macroinvertebrate data was used to assess water quality but was of only limited use in assessing the nature conservation value of the macroinvertebrate community.

#### **7.1.2 Classification of the wetland plant communities**

The plant communities of two 1km sections of the Abbey River and two sections of the Chertsey Bourne (see Table 3) were classified using methods modified from those recommended by NCC (1989). The species recorded in each of the 1km sections, and their river community types, are listed in Table 3.

The classification indicated that both the Abbey River and Chertsey Bourne supported NCC Type II and Type IV communities. Type II communities are "clay rivers" and Type IV communities "rivers with impoverished ditch floras in lowland England" (Holmes, 1983; NCC, 1989). The identification of impoverished ditch communities may have been a misclassification since both the Abbey Stream and the Chertsey Bourne appeared to support more aquatic species than is typical for Type IV communities (see Holmes, 1983).

#### **7.1.3 The occurrence of local plant species, aquatic plant species and the development of stands of wetland vegetation**

The Chertsey Bourne supported seven local species compared to the four local species (including one introduced) in the Abbey River (see Table 4). The Chertsey Bourne supported twelve aquatic species (of which three were local). The Abbey River supported four aquatic species. The Chertsey Bourne supported more extensive stands of marginal and aquatic plants than the Abbey River.

#### **7.1.4 Water quality**

In the Chertsey Bourne predicted BMWP's and ASPT's were higher than those observed indicating that water quality and/or habitat diversity were reduced.

Predicted BMWP scores and ASPT values were not available for the Abbey River. However, the absence of BMWP Group 1, 2 and 3 families suggested that water quality and/or habitat diversity in the Abbey River were also reduced.

## **7.2 THE NATURE CONSERVATION VALUE OF THE ABBEY RIVER AND CHERTSEY BOURNE**

### **7.2.1 The relative nature conservation value of the Abbey River and Chertsey Bourne**

Classification of plant communities showed that the Abbey River and the Chertsey Bourne supported similar plant communities. Macroinvertebrate survey results also suggested that there was no difference in water quality in the two rivers.

However, numbers of local plant species and aquatic plant species, and the abundance of wetland vegetation, indicated that the Chertsey Bourne was of relatively greater nature conservation value than the Abbey River.

### **7.2.2 The nature conservation value of the Abbey River and Chertsey Bourne in relation to other British rivers**

The average numbers of species of wetland plants (excluding lichens, liverworts and mosses) associated with Type II and IV communities was recalculated from Holmes (1983). Type II communities supported approximately 33 species and Type IV communities approximately 23 species (note that the Type IV community, which was regarded by Holmes (1983) as species-poor, may have been misclassified).

The Abbey River Type II community supported fewer species than average whereas the Chertsey Bourne Type II community supported about average numbers of species. The Type IV communities both included above average numbers of species.

In the national context, the wetland plant community of the Abbey River appeared to be of low to intermediate nature conservation value. The community of the Chertsey Bourne appeared to be of intermediate to high value for nature conservation (see Table 1).

Aquatic macroinvertebrates were surveyed only at family level so it was not possible to make a full assessment of the nature conservation value of the macroinvertebrate communities. However the results of the family level surveys suggested that the conservation value of the communities was unlikely to be high in either river.

## **7.3 ASSESSMENT OF THE NATURE CONSERVATION VALUE OF INDIVIDUAL LENGTHS OF THE ABBEY RIVER AND CHERTSEY BOURNE**

### **7.3.1 Introduction**

This section provides an assessment of the conservation value of the individual 500m lengths on each river. Lengths of intermediate to high nature conservation value identified in this section should be protected from damaging environmental impacts.

The conservation value of each length was assessed using the plant community criteria listed in Table 1. Water quality (which did not vary significantly between lengths) was not considered in this section.

### 7.3.2 Abbey River

Four of the 500m lengths of the Abbey River supported local species. None of the lengths supported large stands of marginal, emergent or aquatic species.

Local plant species were recorded in Lengths 3, 4, 5 and 6. The stands of marginal/emergent vegetation in Lengths 3-5 were the best developed on the Abbey River but were limited in area and included relatively few species. None of the 500m lengths of the Abbey River were of more than intermediate nature conservation value.

### 7.3.3 Chertsey Bourne

Eight of the 500m lengths on the Chertsey Bourne supported either extensive stands of marginal/emergent plants or local species. All were of intermediate value for nature conservation.

Local plant species were recorded in Lengths 1, 2, 3, 5, 6, 9 and 10 (see Table 4). The wetland plant community was best developed in parts of Length 7/8 adjacent to Chertsey Meads. This was the only area where stands of Phragmites australis were recorded on the Chertsey Bourne and was the area of highest nature conservation value on the Chertsey Bourne.

Length 5 supported the best developed stands of vegetation although species richness was relatively low. Lengths 4, 7, 8, 11 and 12 supported impoverished plant communities of low conservation value.

TABLE 3. WETLAND PLANTS RECORDED IN THE 1KM SECTIONS OF THE ABBEY RIVER AND CHERTSEY BOURNE

|                                 | ABBAY RIVER |   | CHERTSEY BOURNE |   |
|---------------------------------|-------------|---|-----------------|---|
|                                 | A           | B | A               | B |
| <i>Agrostis stolonifera</i>     | +           | + | +               | + |
| <i>Alisma plantago-aquatica</i> | -           | + | +               | + |
| <i>Angelica sylvestris</i>      | -           | - | -               | + |
| <i>Apium nodiflorum</i>         | -           | - | -               | - |
| <i>Barbarea vulgaris</i>        | -           | - | -               | + |
| <i>Bidens cernua</i>            | -           | - | +               | - |
| <i>Bidens tripartita</i>        | -           | + | -               | + |
| <i>Callitriche</i> sp.          | -           | + | +               | + |
| <i>Carex riparia</i>            | +           | + | -               | - |
| <i>Ceratophyllum demersum</i>   | -           | - | -               | + |
| <i>Deschampsia caespitosa</i>   | -           | + | +               | - |
| <i>Elodea nuttallii</i>         | -           | + | -               | + |
| <i>Epilobium hirsutum</i>       | +           | + | +               | + |
| <i>Filipendula ulmaria</i>      | -           | + | -               | - |
| <i>Glyceria fluitans</i>        | -           | + | +               | - |
| <i>Glyceria maxima</i>          | +           | + | -               | + |
| <i>Impatiens capensis</i>       | -           | - | -               | + |
| <i>Impatiens glandulifera</i>   | -           | + | +               | - |
| <i>Iris pseudacorus</i>         | +           | + | +               | - |
| <i>Juncus effusus</i>           | -           | + | +               | + |
| <i>Juncus inflexus</i>          | -           | + | +               | + |
| <i>Lemna minor</i>              | -           | - | -               | + |
| <i>Lycopus europaeus</i>        | -           | + | +               | + |
| <i>Lysimachia vulgaris</i>      | -           | + | -               | - |
| <i>Lythrum salicaria</i>        | +           | + | +               | + |
| <i>Mentha aquatica</i>          | -           | + | +               | - |
| <i>Myosotis scorpioides</i>     | -           | + | +               | + |
| <i>Myosoton aquaticum</i>       | +           | + | -               | - |
| <i>Nasturtium officinale</i>    | -           | + | +               | + |
| <i>Nuphar lutea</i>             | +           | - | -               | + |
| <i>Nymphaea alba</i>            | -           | + | -               | - |
| <i>Oenanthe crocata</i>         | -           | - | +               | - |
| <i>Phalaris arundinacea</i>     | +           | + | +               | + |
| <i>Potamogeton natans</i>       | -           | - | -               | + |
| <i>Polygonum amphibium</i>      | -           | + | -               | + |
| <i>Polygonum hydropiper</i>     | -           | - | +               | + |
| <i>Polygonum persicaria</i>     | -           | + | +               | - |
| <i>Ranunculus sceleratus</i>    | -           | + | +               | + |
| <i>Rorippa amphibia</i>         | +           | + | +               | - |
| <i>Rumex hydrolapathum</i>      | -           | + | +               | - |
| <i>Sagittaria sagittifolia</i>  | -           | - | -               | + |
| <i>Schoenoplectus lacustris</i> | -           | + | -               | - |
| <i>Scrophularia auriculata</i>  | +           | + | +               | + |

TABLE 3. WETLAND PLANTS RECORDED IN THE 1KM SECTIONS OF THE ABBEY RIVER  
(cont.) AND CHERTSEY BOURNE

|                                            | ABBAY RIVER |             | CHERTSEY BOURNE |             |
|--------------------------------------------|-------------|-------------|-----------------|-------------|
|                                            | A           | B           | A               | B           |
| <i>Solanum dulcamara</i>                   | +           | +           | +               | +           |
| <i>Sparganium emersum</i>                  | -           | -           | +               | +           |
| <i>Sparganium erectum</i>                  | +           | +           | +               | +           |
| <i>Symphytum officinale</i>                | -           | +           | +               | +           |
| <i>Typha angustifolia</i>                  | -           | +           | -               | -           |
| <i>Typha latifolia</i>                     | -           | +           | +               | +           |
| <i>Urtica dioica</i>                       | +           | +           | +               | +           |
| <br>TOTAL NUMBER OF SPECIES                | <br>14      | <br>37      | <br>30          | <br>32      |
| <br>NCC RIVER VEGETATION<br>COMMUNITY TYPE | <br>TYPE IV | <br>TYPE II | <br>TYPE II     | <br>TYPE IV |

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TABLE 4.     DISTRIBUTION OF LOCAL SPECIES IN THE ABBEY RIVER AND CHERTSEY BOURNE

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**ABBAY RIVER**

Bidens tripartita

Occasional on unshaded grassy banks in Lengths 3 and 4, but dying back at the time of the survey. Because of this possibly present, but not recorded, elsewhere on the river.

Lysimachia vulgaris

Common on the Left bank of the channel in Lengths 3 and occasional in Length 4, often under partial shade.

Rorippa amphibia

Common on grassy banks in Length 4. Occasional on banks and at the channel margins in Lengths 3, 5 and 6.

(Typha angustifolia

Recently planted by farmer in a small embayment in Length 5 upstream of Abbey Bridge)

**CHERTSEY BOURNE**

Bidens cernua

Small number of plants, on unshaded grassy river banks particularly in Lengths 2 and 3.

Bidens tripartita

Occasional plants growing on muds near to the water's edge or on grassy banks, especially in Length 9.

Ceratophyllum demersum

Occasional in Lengths 9 and 10 in slower flowing water at the sides of the channel.

Lemna gibba

Occasional in slow flowing sections in Length 5.

Lysimachia vulgaris

Common on the Right of the channel in Length 3 and present on both banks in Length 10. Often under partial or moderate shade.

Oenanthe crocata

Occasional on unshaded grassy lower bank in Length 1.

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TABLE 4. DISTRIBUTION OF LOCAL SPECIES IN THE ABBEY RIVER AND CHERTSEY  
(cont.) BOURNE

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Rorippa amphibia

Recorded in most lengths, generally growing on the lower bank, on sediments at the waters edge or as an emergent in shallow water at the edge of the channel.

Sagittaria sagittifolia

A small number of stands growing in shallow water near the water's edge in Length 6. Only recorded during a reconnaissance visit to the Chertsey Bourne in September. Possibly present, but not recorded, elsewhere.

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# APPENDIX 9.1 NATIONAL POND SURVEY - Wetland Plant List

## SUBMERGED, FLOATING AND EMERGENT PLANTS

*Acorus calamus*  
*Agrostis stolonifera*  
*Alisma lanceolatum*  
*Alisma plantago-aquatica*  
*Apium inundatum*  
*Apium nodiflorum*  
*Aponogeton distachyos*  
*Azolla filiculoides*  
*Baldellia ranunculoides*  
*Berula erecta*  
*Butomus umbellatus*  
*Callitriche hamulata*  
*Callitriche hermaphrodita*  
*Callitriche obtusangula*  
*Callitriche platycarpa*  
*Callitriche stagnalis*  
*Callitriche truncata*  
*Callitriche sp. (undetermined)*  
*Caltha palustris*  
*Cardamine amara*  
*Carex acuta*  
*Carex acutiformis*  
*Carex elata*  
*Carex lasiocarpa*  
*Carex nigra*  
*Carex paniculata*  
*Carex pseudocyperus*  
*Carex riparia*  
*Carex rostrata*  
*Carex vesicaria*  
*Catabrosa aquatica*  
*Ceratophyllum demersum*  
*Ceratophyllum submersum*  
*Cicuta virosa*  
*Cladium mariscus*  
*Crassula helmsii*  
*Egeria densa*  
*Elatine hexandra*  
*Eleocharis acicularis*  
*Eleocharis palustris*  
*Eleocharis fluitans*  
*Elodea canadensis*  
*Elodea nuttallii*  
*Equisetum fluviatile*  
*Equisetum palustre*  
*Eriophorum angustifolium*  
*Glyceria declinata*  
*Glyceria fluitans*  
*Glyceria maxima*  
*Glyceria plicata*  
*Glyceria sp. (fine leaved)*  
*Groenlandia densa*  
*Hippuris vulgaris*  
*Hottonia palustris*  
*Hydrocharis morsus-ranae*  
*Hydrocotyle vulgaris*  
*Iris pseudacorus*  
*Isotetes lacustris*  
*Isotetes setacea*  
*Juncus bulbosus*  
*Juncus effusus*  
*Lagarosiphon major*  
*Lemna gibba*  
*Lemna minuscula*  
*Lemna minor*  
*Lemna trisulca*  
*Lemna polytriza*  
*Littorella uniflora*  
*Lobelia dortmanna*  
*Lythrum portula*  
*Mentha aquatica*  
*Menyanthes trifoliata*  
*Myosotis laxa*  
*Myosotis scorpioides*  
*Myosotis secunda*  
*Myosoton aquaticum*  
*Myriophyllum alterniflorum*  
*Myriophyllum spicatum*  
*Myriophyllum verticillatum*  
*Nasturtium microphyllum*  
*Nasturtium officinale*  
*Nuphar lutea*  
*Nymphaea alba*  
*Nymphaeoides peltata*  
*Oenanthe aquatica*  
*Oenanthe fistulosa*  
*Oenanthe fluviatilis*  
*Phalaris arundinacea*  
*Phragmites australis*  
*Pilularia globulifera*  
*Polygonum amphibium*  
*Polygonum hydropiper*  
*Potamogeton alpinus*  
*Potamogeton bertholdii*  
*Potamogeton coloratus*  
*Potamogeton crispus*  
*Potamogeton friesii*  
*Potamogeton gramineus*  
*Potamogeton lucens*  
*Potamogeton natans*  
*Potamogeton obtusifolius*  
*Potamogeton pectinatus*  
*Potamogeton polygonifolius*  
*Potamogeton praelongus*  
*Potamogeton pusillus*  
*Potamogeton trichoides*  
*Potamogeton hybrid(s)*  
*Potentilla palustris*  
*Ranunculus aquatilis*  
*Ranunculus baudotii*  
*Ranunculus circinatus*  
*Ranunculus flammula*  
*Ranunculus fluitans*  
*Ranunculus hederaceus*  
*Ranunculus omiophyllus*  
*Ranunculus peltatus*  
*Ranunculus penicillatus*  
*Ranunculus scleratus*  
*Ranunculus trichophyllus*  
*Rorippa amphibia*  
*Rumex hydrolapathum*  
*Sagittaria sagittifolia*  
*Schoenoplectus lacustris*  
     ssp. *lacustris*  
     ssp. *tabernaemontani*  
*Sparganium angustifolium*  
*Sparganium emersum*  
*Sparganium erectum*  
*Sparganium minimum*  
*Stratiotes aloides*  
*Subularia aquatica*  
*Typha angustifolia*  
*Typha latifolia*  
*Utricularia australis*  
*Utricularia intermedia*  
*Utricularia vulgaris*  
*Veronica anagallis-aquatica*  
*Veronica beccabunga*  
*Veronica catenata*  
*Veronica scutellata*  
*Wolfia ariza*  
*Zannichellia palustris*  
  
*Algae:*  
*Chara sp.*  
*Nitella sp.*  
*Tolypella sp.*  
*Enteromorpha sp.*  
*Filamentous planktonic*  
  
*Bryophytes:*  
*Fontinalis antipyretica*  
*Riccia fluitans*  
*Ricciocarpus natans*  
*Sphagnum sp.*

## OTHER WETLAND PLANTS

*Alopecurus geniculatus*  
*Anagallis tenella*  
*Andromeda polifolia*  
*Angelica archangelica*  
*Angelica sylvestris*  
*Barbarea intermedia*  
*Barbarea stricta*  
*Barbarea vulgaris*  
*Bidens cernua*  
*Bidens tripartita*  
*Blysmus compressus*  
*Calamagrostis canescens*  
*Calamagrostis epigejos*  
*Cardamine pratensis*  
*Carex curta*  
*Carex demissa*  
*Carex diandra*  
*Carex disticha*  
*Carex flacca*  
*Carex hostinana*  
*Carex lasvigata*  
*Carex lepidocarpa*  
*Carex limosa*  
*Carex otrubae*  
*Carex panicea*  
*Carex pendula*  
*Carex pulicaris*  
*Carex spicata*  
*Cirsium dissectum*  
*Cirsium palustre*  
*Conium maculatum*  
*Crepis paludosa*  
*Cyperus longulus*  
*Dactylorhiza fuchsii*  
*Dactylorhiza incarnata*  
*Dactylorhiza majalis:*  
     *D. majalis* ssp. *praetermissa*  
     *D. majalis* ssp. *purpurella*  
*Deschampsia caespitosa*  
*Drosera rotundifolia*  
*Eleocharis multicaulis*  
*Eleocharis quinqueflora*  
*Eleocharis uniglumis*  
*Epilobium adenocaulon*  
*Epilobium hirsutum*  
*Epilobium neretoides*  
*Epilobium obscurum*  
*Epilobium palustre*  
*Epilobium parviflorum*  
*Epilobium tetragonum*  
*Epipactis palustris*  
*Erica tetralix*  
*Eriophorum latifolium*  
*Eriophorum vaginatum*  
*Eupatorium cannabinum*  
*Filipendula ulmaria*  
*Frangula alnus*  
*Galium boreale*  
*Galium palustre*  
*Galium uliginosum*  
*Geum rivale*  
*Hypericum elodes*  
*Hypericum tetrapterum*  
*Impatiens capensis*  
*Impatiens glandulifera*  
*Impatiens noli-tangere*  
*Isotetes cernua*  
*Juncus acutiflorus*  
*Juncus articulatus*  
*Juncus bufonis*  
*Juncus compressus*  
*Juncus conglomeratus*  
*Juncus inflexus*  
*Juncus subnodulosus*  
*Achillea ptarmica*  
*Alnus glutinosa*  
*Alopecurus aequalis*  
*Lotus uliginosus*  
  
*Lycopus europaeus*  
*Lysimachia nummularia*  
*Lysimachia vulgaris*  
*Lythrum salicaria*  
*Mimulus guttatus*  
*Mimulus luteus*  
*Molinia caerulea*  
*Montia fontana*  
*Myrica gale*  
*Narthedum ossifragum*  
*Oenanthe crocata*  
*Oenanthe lachenalia*  
*Osmunda regalis*  
*Parnassia palustris*  
*Pedicularis palustris*  
*Petasites hybridus*  
*Pinguicula vulgaris*  
*Polygonum lapathifolium*  
*Polygonum persicaria*  
*Potentilla erecta*  
*Potentilla dysenterica*  
*Ranunculus lingua*  
*Rhynchospora alba*  
*Rorippa palustris*  
*Rorippa sylvestris*  
*Rumex maritimus*  
*Rumex palustris*  
*Sagina procumbens*  
*Salix sp.*  
*Schoenus nigricans*  
*Tricophorum cespitosum*  
*Scrophularia auriculata*  
*Scutellaria galericulata*  
*Senecio aquaticus*  
*Senecio fluviatilis*  
*Sium latifolium*  
*Solanum dulcamara*  
*Stachys palustris*  
*Stellaria alsine*  
*Stellaria palustris*  
*Symphytum officinale*  
*Thalictrum flavum*  
*Thelypteris palustris*  
*Tofieldia pusilla*  
*Triglochin palustris*  
*Urtica dioica*  
*Valeriana dioica*  
*Viola palustris*

APPENDIX 9.2     WETLAND PLANTS RECORDED IN THE ABBEY RIVER AND CHERTSEY  
BOURNE

| SPECIES                         | Abbey<br>River | Chertsey<br>Bourne |
|---------------------------------|----------------|--------------------|
| <i>Acorus calamus</i>           | +              | -                  |
| <i>Agrostis stolonifera</i>     | +              | +                  |
| <i>Alisma plantago-aquatica</i> | +              | +                  |
| <i>Angelica sylvestris</i>      | +              | +                  |
| <i>Apium nodiflorum</i>         | +              | +                  |
| <i>Barbarea vulgaris</i>        | +              | +                  |
| <i>Bidens cernua</i>            | -              | +                  |
| <i>Bidens tripartita</i>        | +              | +                  |
| <i>Callitriche</i> sp.          | +              | +                  |
| <i>Carex otrubae</i>            | +              | +                  |
| <i>Carex riparia</i>            | +              | +                  |
| <i>Ceratophyllum demersum</i>   | -              | +                  |
| <i>Cirsium palustre</i>         | -              | +                  |
| <i>Deschampsia caespitosa</i>   | +              | +                  |
| <i>Elodea nuttallii</i>         | +              | +                  |
| <i>Epilobium hirsutum</i>       | +              | +                  |
| <i>Equisetum palustre</i>       | -              | +                  |
| <i>Eupatorium cannabinum</i>    | +              | +                  |
| <i>Filipendula ulmaria</i>      | +              | +                  |
| <i>Glyceria fluitans</i>        | +              | +                  |
| <i>Glyceria maxima</i>          | +              | +                  |
| <i>Impatiens capensis</i>       | -              | +                  |
| <i>Impatiens glandulifera</i>   | +              | +                  |
| <i>Iris pseudacorus</i>         | +              | +                  |
| <i>Juncus bufonius</i>          | +              | -                  |
| <i>Juncus effusus</i>           | +              | +                  |
| <i>Juncus inflexus</i>          | +              | +                  |
| <i>Lemna gibba</i>              | -              | +                  |
| <i>Lemna minor</i>              | -              | +                  |
| <i>Lycopus europaeus</i>        | +              | +                  |
| <i>Lysimachia vulgaris</i>      | +              | +                  |
| <i>Lythrum salicaria</i>        | +              | +                  |
| <i>Mentha aquatica</i>          | +              | +                  |
| <i>Myosotis scorpioides</i>     | +              | +                  |
| <i>Myosoton aquaticum</i>       | +              | +                  |
| <i>Nasturtium officinale</i>    | +              | +                  |
| <i>Nuphar lutea</i>             | +              | +                  |
| <i>Nymphaea alba</i>            | +              | -                  |
| <i>Oenanthe crocata</i>         | -              | +                  |
| <i>Phalaris arundinacea</i>     | +              | +                  |
| <i>Phragmites australis</i>     | -              | +                  |
| <i>Polygonum amphibium</i>      | +              | +                  |
| <i>Polygonum hydropiper</i>     | +              | +                  |
| <i>Polygonum persicaria</i>     | +              | +                  |
| <i>Potamogeton crispus</i>      | -              | +                  |
| <i>Potamogeton natans</i>       | -              | +                  |
| <i>Ranunculus sceleratus</i>    | +              | +                  |
| <i>Ranunculus</i> sp.           | -              | +                  |
| <i>Rorippa amphibia</i>         | +              | +                  |
| <i>Rorippa palustris</i>        | -              | +                  |
| <i>Rumex hydrolapathum</i>      | +              | +                  |

APPENDIX 9.2 (contined).

| SPECIES                            | Abbey<br>River | Chertsey<br>Bourne |
|------------------------------------|----------------|--------------------|
| <i>Sagittaria sagittifolia</i>     | -              | +                  |
| <i>Schoenoplectus lacustris</i>    | +              | -                  |
| <i>Scrophularia auriculata</i>     | +              | +                  |
| <i>Solanum dulcamara</i>           | +              | +                  |
| <i>Sparganium emersum</i>          | -              |                    |
| <i>Sparganium erectum</i>          | +              | +                  |
| <i>Stachys palustris</i>           | +              | +                  |
| <i>Symphytum officinale</i>        | +              | +                  |
| <i>Typha angustifolia</i>          | +              | -                  |
| <i>Typha latifolia</i>             | +              | +                  |
| <i>Urtica dioica</i>               | +              | +                  |
| <i>Veronica anagallis-aquatica</i> | -              | +                  |
| <i>Veronica beccabunga</i>         | -              | +                  |
| <b>TOTAL</b>                       | <b>48</b>      | <b>59</b>          |

LOCAL SPECIES

|                                |          |          |
|--------------------------------|----------|----------|
| <i>Bidens cernua</i>           | -        | +        |
| <i>Bidens tripartita</i>       | +        | +        |
| <i>Ceratophyllum demersum</i>  | -        | +        |
| <i>Lemna gibba</i>             | -        | +        |
| <i>Lysimachia vulgaris</i>     | +        | +        |
| <i>Oenanthe crocata</i>        | -        | +        |
| <i>Rorippa amphibia</i>        | +        | +        |
| <i>Sagittaria sagittifolia</i> | -        | +        |
| <i>Typha angustifolia</i>      | +        | -        |
| <b>TOTAL</b>                   | <b>4</b> | <b>8</b> |

**APPENDIX 9.3    AQUATIC    MACROINVERTEBRATE FAMILIES RECORDED IN    THE    ABBEY**  
**RIVER**

|                         | Site A | Site B | Site C |
|-------------------------|--------|--------|--------|
| <b>Group 1 Families</b> |        |        |        |
| None                    |        |        |        |
| <b>Group 2 Families</b> |        |        |        |
| None                    |        |        |        |
| <b>Group 3 Families</b> |        |        |        |
| Polycentropididae       | +      | -      | -      |
| <b>Group 4 Families</b> |        |        |        |
| Viviparidae             | -      | +      | -      |
| Unionidae               | +      | +      | +      |
| Corophiidae             | +      | -      | -      |
| Gammaridae              | +      | +      | +      |
| Coenagriidae            | +      | +      | +      |
| <b>Group 5 Families</b> |        |        |        |
| Hydrometridae           | +      | -      | -      |
| Notonectidae            | +      | +      | +      |
| Corixidae               | +      | +      | +      |
| Haliplidae              | +      | +      | +      |
| Dytiscidae              | -      | -      | +      |
| Tipulidae               | -      | +      | -      |
| Planariidae             | -      | +      | -      |
| <b>Group 6 Families</b> |        |        |        |
| Baetidae                | +      | +      | +      |
| Sialidae                | +      | -      | +      |
| Piscicolidae            | +      | -      | -      |
| <b>Group 7 Families</b> |        |        |        |
| Valvatidae              | +      | -      | +      |
| Hydrobiidae             | +      | +      | +      |
| Lymnaeidae              | +      | +      | +      |
| Physidae                | +      | +      | +      |
| Planorbidae             | +      | +      | +      |
| Sphaeriidae             | +      | +      | +      |
| Glossiphoniidae         | +      | +      | +      |
| Erpobdellidae           | -      | -      | +      |
| Asellidae               | +      | -      | +      |
| <b>Group 8 Families</b> |        |        |        |
| Chironomidae            | +      | +      | +      |
| <b>Group 9 Families</b> |        |        |        |
| Oligochaeta             | +      | +      | +      |
| (whole class)           |        |        |        |

**APPENDIX 9.4    AQUATIC    MACROINVERTEBRATE    FAMILIES    RECORDED    IN    THE**  
**CHETRTSEY BOURNE**

|                         | Site A | Site B | Site C | Site D | Site E |
|-------------------------|--------|--------|--------|--------|--------|
| <b>Group 1 Families</b> |        |        |        |        |        |
| None                    |        |        |        |        |        |
| <b>Group 2 families</b> |        |        |        |        |        |
| Agriidae                | +      | -      | +      | +      | -      |
| <b>Group 3 Families</b> |        |        |        |        |        |
| None                    |        |        |        |        |        |
| <b>Group 4 Families</b> |        |        |        |        |        |
| Unionidae               | +      | -      | +      | -      | -      |
| Gammaridae              | +      | +      | +      | +      | +      |
| Coenagriidae            | +      | +      | +      | +      | +      |
| <b>Group 5 Families</b> |        |        |        |        |        |
| Gerridae                | +      | -      | -      | -      | +      |
| Notonectidae            | -      | +      | -      | +      | +      |
| Corixidae               | -      | -      | -      | +      | +      |
| Haliplidae              | -      | +      | -      | +      | -      |
| Dytiscidae              | -      | +      | -      | -      | +      |
| Hydropsychidae          | +      | -      | -      | -      | -      |
| Simuliidae              | +      | -      | -      | -      | -      |
| Planariidae             | +      | +      | +      | -      | -      |
| Dendrocoelidae          | -      | -      | -      | +      | -      |
| <b>Group 6 Families</b> |        |        |        |        |        |
| Baetidae                | +      | +      | -      | -      | -      |
| Sialidae                | -      | +      | -      | -      | +      |
| Piscicolidae            | +      | -      | -      | +      | -      |
| <b>Group 7 Families</b> |        |        |        |        |        |
| Valvatidae              | +      | -      | +      | +      | +      |
| Hydrobiidae             | +      | -      | +      | +      | -      |
| Lymnaeidae              | +      | -      | +      | +      | +      |
| Physidae                | +      | +      | +      | +      | +      |
| Planorbidae             | +      | +      | +      | +      | +      |
| Sphaeriidae             | +      | +      | +      | +      | +      |
| Glossiphoniidae         | +      | +      | +      | -      | +      |
| Erpobdellidae           | +      | +      | +      | +      | +      |
| Asellidae               | +      | +      | +      | +      | +      |
| <b>Group 8 Families</b> |        |        |        |        |        |
| Chironomidae            | +      | +      | +      | +      | +      |
| <b>Group 9 Families</b> |        |        |        |        |        |
| Oligochaeta             | +      | +      | +      | +      | +      |
| (whole class)           |        |        |        |        |        |

## APPENDIX 9.5 ABBEY RIVER BMWP SCORES, ASPT VALUES AND PHYSICAL FEATURES

### Site A

Grid reference: TQ 04226812

Mean width: 7m.

Mean depth: 130cm.

Substratum Composition:

Boulders/cobbles: 0%

Pebbles/gravel: 0%

Sand: 5%

Silt/clay: 95%

BMWP Score: 83

BMWP ASPT: 3.95

### Site B

Grid reference: TQ 04136775

Mean width: 9m.

Mean depth: 100cm.

Substratum Composition:

Boulders/cobbles: 0%

Pebbles/gravel: 20%

Sand: 20%

Silt/clay: 60%

BMWP Score: 74

BMWP ASPT: 4.11

### SITE C

Grid reference: TQ 04756715

Mean width: 8m.

Mean depth: 80cm.

Substratum Composition:

Boulders/cobbles: 0%

Pebbles/gravel: 0%

Sand: 5%

Silt/clay: 95%

BMWP Score: 70

BMWP ASPT: 3.68

APPENDIX 9.6 CHERTSEY BOURNE BMWP SCORES, ASPT VALUES AND PHYSICAL FEATURES

Site A

Grid reference: TQ 02376800

Mean width: 5m.

Mean depth: 100cm.

Substratum Composition:

Boulders/cobbles: 0%

Pebbles/gravel: 70%

Sand: 0%

Silt/clay: 30%

BMWP Score: 84

BMWP ASPT: 4.00

Site B

Grid reference: TQ 03426745

Mean width: 4m.

Mean depth: 65cm.

Substratum Composition:

Boulders/cobbles: 0%

Pebbles/gravel: 10%

Sand: 10%

Silt/clay: 80%

BMWP Score: 61

BMWP ASPT: 3.81

Site C

Grid reference: TQ 04026665

Mean width: 8m.

Mean depth: 62cm.

Substratum Composition:

Boulders/cobbles: 20%

Pebbles/gravel: 20%

Sand: 20%

Silt/clay: 40%

BMWP Score: 66

BMWP ASPT: 3.88

Appendix 9.6 (continued).

Site D

Grid reference: TQ 05256610

Mean width: 6m.

Mean depth: 100cm.

Substratum Composition:

Boulders/cobbles: 0%

Pebbles/gravel: 0%

Sand: 5%

Silt/clay: 95%

BMWP Score: 71

BMWP ASPT: 3.94

Site E

Grid reference: TQ 06496578

Mean width: 7m.

Mean depth: 70cm.

Substratum composition:

Boulders/cobbles: 0%

Pebbles/gravel: 10%

Sand: 40%

Silt/clay: 50%

BMWP Score: 68

BMWP ASPT: 3.78



APPENDIX 9.7 THE COMMON NAMES OF WETLAND PLANTS RECORDED IN THE RIVERS

| SPECIES NAME                    | COMMON NAME             |
|---------------------------------|-------------------------|
| <i>Acorus calamus</i>           | Sweet-flag              |
| <i>Agrostis stolonifera</i>     | Creeping Bent           |
| <i>Alisma plantago-aquatica</i> | Water-plantain          |
| <i>Angelica sylvestris</i>      | Wild Angelica           |
| <i>Apium nodiflorum</i>         | Fool's Water-cress      |
| <i>Barbarea vulgaris</i>        | Winter-cress            |
| <i>Bidens cernua</i>            | Nodding Bur-marigold    |
| <i>Bidens tripartita</i>        | Trifid Bur-marigold     |
| <i>Callitriche</i> sp.          | Starwort                |
| <i>Carex otrubae</i>            | False Fox-sedge         |
| <i>Carex riparia</i>            | Greater Pond-sedge      |
| <i>Ceratophyllum demersum</i>   | Rigid Hornwort          |
| <i>Cirsium palustre</i>         | Marsh Thistle           |
| <i>Deschampsia caespitosa</i>   | Tufted Hair-grass       |
| <i>Elodea nuttallii</i>         | Nuttall's Waterweed     |
| <i>Epilobium hirsutum</i>       | Great Willowherb        |
| <i>Equisetum palustre</i>       | Marsh Horsetail         |
| <i>Eupatorium cannabinum</i>    | Hemp-agrimony           |
| <i>Filipendula ulmaria</i>      | Meadowsweet             |
| <i>Glyceria fluitans</i>        | Floating Sweet-grass    |
| <i>Glyceria maxima</i>          | Reed Sweet-grass        |
| <i>Impatiens capensis</i>       | Orange Balsam           |
| <i>Impatiens glandulifera</i>   | Indian Balsam           |
| <i>Iris pseudacorus</i>         | Yellow Flag             |
| <i>Juncus bufonius</i>          | Toad Rush               |
| <i>Juncus effusus</i>           | Soft Rush               |
| <i>Juncus inflexus</i>          | Hard Rush               |
| <i>Lemna gibba</i>              | Fat Duckweed            |
| <i>Lemna minor</i>              | Common Duckweed         |
| <i>Lycopus europaeus</i>        | Gipsywort               |
| <i>Lysimachia vulgaris</i>      | Yellow Loosestrife      |
| <i>Lythrum salicaria</i>        | Purple-loosestrife      |
| <i>Mentha aquatica</i>          | Water Mint              |
| <i>Myosotis scorpioides</i>     | Water Forget-me-not     |
| <i>Myosoton aquaticum</i>       | Water Chickweed         |
| <i>Nasturtium officinale</i>    | Green Water-cress       |
| <i>Nuphar lutea</i>             | Yellow Water-lily       |
| <i>Nymphaea alba</i>            | White Water-lily        |
| <i>Oenanthe crocata</i>         | Hemlock Water-dropwort  |
| <i>Phalaris arundinacea</i>     | Reed Canary-grass       |
| <i>Phragmites australis</i>     | Common Reed             |
| <i>Polygonum amphibium</i>      | Amphibious Bistort      |
| <i>Polygonum hydropiper</i>     | Water-pepper            |
| <i>Polygonum persicaria</i>     | Redshank                |
| <i>Potamogeton crispus</i>      | Curled pondweed         |
| <i>Potamogeton natans</i>       | Broad-leaved Pondweed   |
| <i>Ranunculus sceleratus</i>    | Celery-leaved Buttercup |
| <i>Ranunculus</i> sp.           | Water-crowfoot          |
| <i>Rorippa amphibia</i>         | Great Yellow-cress      |
| <i>Rorippa palustris</i>        | Marsh Yellow-cress      |
| <i>Rumex hydrolapathum</i>      | Water Dock              |

Appendix 9.7 (continued).

SPECIES NAME

COMMON NAME

|                                    |                      |
|------------------------------------|----------------------|
| <i>Sagittaria sagittifolia</i>     | Arrowhead            |
| <i>Schoenoplectus lacustris</i>    | Common Club-rush     |
| <i>Scrophularia auriculata</i>     | Water Figwort        |
| <i>Solanum dulcamara</i>           | Bittersweet          |
| <i>Sparganium emersum</i>          | Unbranched Bur-reed  |
| <i>Sparganium erectum</i>          | Branched Bur-reed    |
| <i>Stachys palustris</i>           | Marsh Woundwort      |
| <i>Symphytum officinale</i>        | Common Comfrey       |
| <i>Typha angustifolia</i>          | Lesser Bulrush       |
| <i>Typha latifolia</i>             | Bulrush              |
| <i>Urtica dioica</i>               | Common Nettle        |
| <i>Veronica anagallis-aquatica</i> | Blue Water-speedwell |
| <i>Veronica beccabunga</i>         | Brooklime            |

TREES AND SHRUBS

|                           |                |
|---------------------------|----------------|
| <i>Acer psedoplatanus</i> | Sycamore       |
| <i>Alnus glutinosa</i>    | Alder          |
| <i>Corylus avellana</i>   | Hazel          |
| <i>Crataegus monogyna</i> | Hawthorn       |
| <i>Fagus sylvatica</i>    | Beech          |
| <i>Fraxinus excelsior</i> | Ash            |
| <i>Ilex aquifolium</i>    | Holly          |
| <i>Juglans regia</i>      | Walnut         |
| <i>Populus sp.</i>        | Poplar         |
| <i>Quercus sp.</i>        | Oak            |
| <i>Salix alba</i>         | White Willow   |
| <i>Salix babylonica</i>   | Weeping Willow |
| <i>Salix caprea</i>       | Goat Willow    |
| <i>Salix cinerea</i>      | Grey Willow    |
| <i>Salix fragilis</i>     | Crack Willow   |
| <i>Salix viminalis</i>    | Osier          |
| <i>Sambucus nigra</i>     | Elder          |
| <i>Ulmus</i>              | Elm            |

Latin and English equivalents from Dony et.al. (1986).

APPENDIX 9.8 KEY TO MAP SYMBOLS

|     |                                                 |
|-----|-------------------------------------------------|
|     | Artificial bank                                 |
| ⊗   | Mature tree(s)                                  |
| ←⊗  | Overhanging tree(s)                             |
| ○   | Young tree(s)                                   |
| /// | Scrub/shrubs                                    |
| ⊞   | Stand of tall emergents (Reed/sedge)            |
| /// | Stand of low emergents/marginals in the channel |
| q   | Wetland vegetation on banks or margins          |
| ✓   | Bank reseeded or mown                           |
| 9   | Floating-leaved plants                          |
| ○ ○ | Sand/shingle                                    |
| + + | Clay                                            |

APPENDIX 9.9     STATUS IN BRITAIN OF RARE AND LOCAL PLANTS RECORDED IN THE  
ABBEEY RIVER AND CHERTSEY BOURNE

Status and distributions from Clapham, Tutin and Moore (1988).

SUBMERSED AND FLOATING-LEAVED SPECIES

LOCAL

Ceratophyllum demersum (Ceratophyllaceae)

A local plant of ponds and ditches. Scattered throughout England.

Lemna gibba (Lemnaceae)

A local plant of still waters.

Sagittaria sagittifolia (Alismataceae)

A rather local plant of shallow water in ponds, slow flowing rivers and canals. Scattered throughout England.

EMERGENT AND MARGINAL SPECIES

LOCAL

Bidens cernua (Compositae)

A locally common plant of ponds and streamsides and especially places with seasonal standing water. Scattered throughout the British Isles.

Bidens tripartita (Compositae)

A locally common plant of ditches, pond and lake margins and streamsides. Scattered throughout the British Isles.

Lysmachia vulgaris (Primulaceae)

Locally common in fens and beside rivers and lakes. Scattered throughout the British Isles.

Oenanthe crocata (Umbelliferae)

In wet places, usually calcifuge. Mainly in south and west of Great Britain. Listed by Palmer and Newbold (1983) as an aquatic plant recorded from more than 100 10 x 10km squares in Great Britain, but which needs special protection in the Thames catchment.

Rorippa amphibia (Cruciferae)

Locally frequent by ponds ditches and streams. Recorded from south-east to north England.

Typha angustifolia (Typhaceae)

A locally common plant of reed-swamps, ponds, canals and slow flowing rivers. Scattered throughout the British Isles.