2060

COGGES LINK ROAD - RIVER CORRIDOR SURVEY (7202 F2)

A SURVEY OF THE WETLAND VEGETATION OF TWO 1.5KM LENGTHS OF THE RIVER WINDRUSH

POND ACTION
SURVEYED: 9-11 JUNE 1991
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SUMMARY

This report describes a standard NCC methodology river corridor survey of 3km of the River Windrush immediately east of Witney, Oxfordshire. Survey work was undertaken on 9-11 June 1991.

The river in the survey area supported a moderately species-rich wetland flora with 52 species recorded, including 11 aquatic species. 3 local and 2 locally common species were recorded but none of these is regarded as needing special protection in the Thames catchment.

The marginal and emergent plant community was moderately species-rich (41 species), abundance of marginals varying from moderate to good. Marginal and emergent vegetation was broadly similar in species-richness, abundance and species composition throughout the survey area. One area, the grazed and slightly poached banks of Length 4, supported a wider variety of marginal and emergent species than all other areas.

11 aquatic species were recorded, including 2 local species. The aquatic community was most diverse in a 300m band running east-west across both arms of the river between the southern end of Lengths 1 and 4 (GR 43599 20966) and the middle of Lengths 2 and 5 (GR 43598 20922).

The floodplain (bounded by a the ditch to the east of the river) was predominantly intensively managed grassland and arable fields. It was of low nature conservation value.

CONTENTS

1. INTRODUCTION

This report describes a river corridor survey of the River Windrush at Witney. The survey was undertaken from the point where the river divides into two arms (4359 2099) to the point where each arm passes beneath the A40 (4359 2086) and (4364 2087). The total length of channel surveyed was about 3km. In addition an area of floodplain was surveyed in the area bounded by the ditch running from 43610 20952 to 43645 20877.

The river corridor survey was carried-out following the standard methods recommended in 'Surveys of Wildlife in River Corridors (Draft Methodology)' (NCC, 1985).

2. METHODS

Field maps were prepared of each 500m length of the river. The base maps provided were redrawn (the original channel width was doubled) to increase the clarity of the maps. Maps were modified in the field to take account of recent changes in channel shape. Conventions for vegetation mapping followed NCC recommendations. In addition, bank structure and vegetation compsition were described for representative sections of the river and annotated on the maps.

The plants recorded were those listed on the Nature Conservancy Council wetland plant species list. Plants were identified to species level in the field where possible, being taken back to the laboratory for clarification where necessary. Submerged macrophytes were collected with a grapnel where the river could not be waded. Callitriche sp. were not identified to species level because suitable flowering material was not available at the time of the survey.

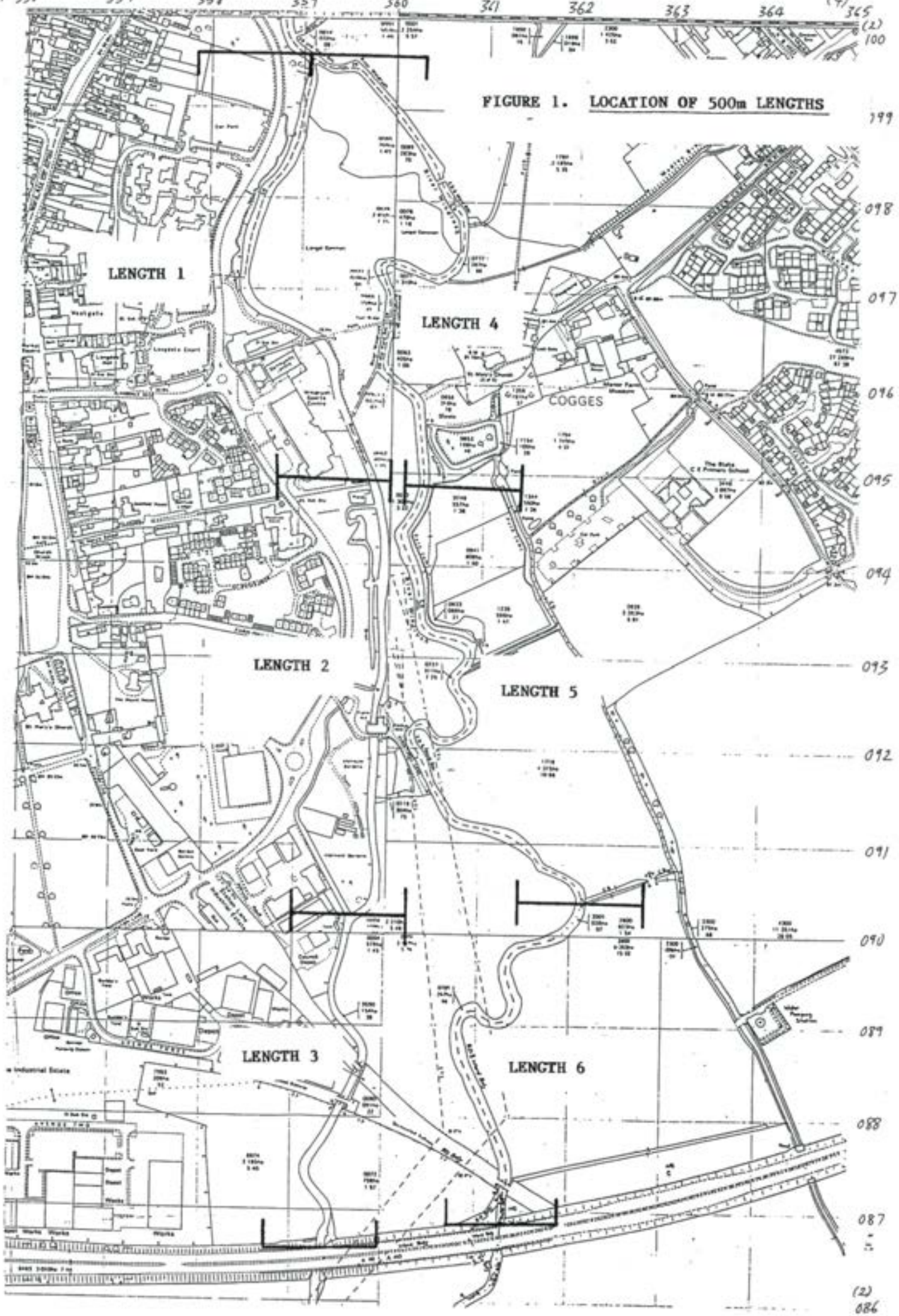


FIGURE 1. LOCATION OF 500m LENGTHS

3. GENERAL DESCRIPTION OF THE WETLAND VEGETATION OF THE RIVER WINDRUSH IN THE SURVEY AREA

3.1 Introduction

The River Windrush in the survey area supported a moderately species-rich wetland flora with 52 species recorded, including 11 aquatic species (see Appendix 1 for list of species). The flora included 3 local and 2 locally common species.

3.2 Marginal and emergent wetland plants

41 species of marginal and emergent wetland plant were recorded in the survey area, a moderately species-rich assemblage. The abundance of marginal and emergent plants varied from moderate to good.

Most lengths supported marginal and emergent vegetation that was broadly similar in species-richness, abundance and species composition. However, individual lengths varied in the distribution of their marginal stands (eg fringing both banks or concentrated onto point bars in meandering sections).

One area, the grazed and slightly poached banks of Length 4, supported a wider variety of marginal and emergent species than all other areas. This area was adjacent to relatively unimproved pastures grazed by cattle. The combination of less intensive land-use and grazing (which prevented tall emergents from dominating the marginal flora) allowed a richer community to develop (see also Section 3.6 below).

3.3 Typical composition of the marginal/emergent community

On the upper banks Epilobium hirsutum (great willowherb) and Urtica dioica (common nettle) were the most abundant wetland species. Symphytum officinale (comfrey), Eupatorium cannabinum (hemp-agrimony) and Filipendula ulmaria (meadowsweet) were also widespread and common.

On the lower banks and at the waters edge the abundance of wetland species varied considerably according to bank slope. Steep banks were generally fringed by only a thin or discontinuous fringe of tall emergent and wetland herb species. More gently sloping margins generally supported more extensive mixed and monodominant stands of emergents. Three emergents species, Phalaris arundinacea (reed canary-grass), Glyceria maxima (reed sweet-grass) and Sparganium erectum (branched bur-reed), were common throughout the lengths surveyed. Carex acutiformis (lesser pond-sedge) and Carex riparia (greater pond-sedge) were locally dominant on the margins of both arms of the river, especially in the more southerly lengths.

A number of wetland herbs were common, growing as single species stands or in mixed stands with the dominant emergent species. The most abundant of these were Rorippa amphibia (great yellow-cress), Solanum dulcamara (bittersweet) Nasturtium officionale (Green water-cress), Stachys palustris (marsh woundwort) and Mentha aquatica (water mint). Occasional to frequent species included Apium nodiflorum (Fool's Water-cress), Berula erecta (Lesser Water-parsnip), Myosotis scorpioides (water forget-me-not) and Rumex hydrolapathum (Water Dock).

3.4 Aquatic plants: species richness and composition of the community

11 aquatic species were recorded, including 2 local species. The most abundant aquatic was Ranunculus penicillatus (stream water-crowfoot) which occurred frequently to abundantly throughout the lengths surveyed, particularly in faster flowing sections. Three Potamogeton species were also recorded, P.pectinatus (fennel pondweed), P.lucens (shining pondweed) and P.perfoliatus (perfoliate pondweed). P.pectinatus was locally co-dominant with R.penicillatus in the eastern arm and occasionally in the west arm of the river, favouring shallow gravel substrates. P.lucens was locally dominant to abundant in the eastern arm and P.perfoliatus was an occasional in both arms.

Callitriche sp. (starwort), Elodea canadensis (Canadian pondweed) and Lemna minor (common duckweed) were frequently recorded in low abundance in marginal vegetation and slack water areas at the channel edge. Callitriche sp. and Sparganium emersum (unbranched bur-reed) also formed occasional submerged stands in fast flowing sections. Small submerged plants of Sagittaria sagittifolia (arrowhead) were recorded in Lengths 2 and 5. Further stands of this species might be evident later in the year.

3.5 Local and locally common marginal, emergent and aquatic species

Three local species and two locally common species were recorded (see Appendix 6.2 for status and distribution). None of the species recorded were listed by Palmer and Newbold (1983) as being in need of special protection in the Thames catchment.

3.6 Variations in the vegetation of the survey area

The marginal wetland communities were generally similar in species composition and diversity throughout the survey area, only Length 4 standing out as having a noticeably richer marginal community than other areas (see Section 3.2 above). Length 4 supported a number of species absent from, or uncommon in, other lengths (see description of Length 4) and was also the only area where the local sedge Carex pseudocyperus (cyperus sedge) was recorded.

Unlike the marginal/emergent communities the, aquatic communities changed noticeably downstream. In particular, the aquatic community was most diverse in a 300m band running east-west across both arms of the river between the footbridge at the southern end of Lengths 1 and 4 (GR 43599 20966) and Farm Mill (middle of Lengths 2 and 5, 43598 20922).

Species largely restricted to this zone included all the local and locally common aquatic species recorded in the survey. Potamogeton perfoliatus (perfoliate pondweed) was present in this section in both arms (see Appendix 2). Potamogeton lucens (shining pondweed) was locally very abundant in the west arm only and Sagittaria sagittifolia (arrowhead) was present very occasionally in both arms. Butomus umbellatus (flowering-rush) was present in both arms and mostly limited to this area though there were a few plants upstream. The factors causing this change in aquatic vegetation were unclear. However, substrate composition may be important as substrates appeared to be finer in this area with sand instead of the gravels and cobbles more typical of other areas.

4. DESCRIPTION OF FLOOD PLAIN

The flood plain was surveyed in the area bounded by the ditch running from GR 43610 20952 to GR 43645 20877 (see Figure 2).

The area was dominanted by intensively managed grassland and arable fields and held little wildlife interest.

At the northern end of the site the ditch line originated from a large dry moat, the centre of which supported secondary woodland dominated by sycamore (Acer pseudoplatanus) with some ash (Fraxinus excelsior), maple (Acer campestre), crack willow (Salix fragilis) and elder (Sambucus nigra). The understory of the wood was dominated by Urtica dioica (common nettle) and Hedera helix (ivy).

The three fields south of the moat adjacent to Manor Farm were all reseeded ryegrass (Lolium perenne) pastures (see photograph 1 overpage).

Two large fields, occupying the remainder of this floodplain area, were both intensively planted with arable crops (see photograph 2).

Two ditches running from the boundary ditch to the R. Windrush (at GRs 43608 20929 and 43622 20903) were dry. The nothern most ditch was heavily shaded and supported very few wetland plant species. The southern ditch was artificially lined with no wetland community.

Two small ponds connected to the ditch line at GR 43611 20951 were also dry, but retained a wetland vegetation dominated by Phalaris arundinacea (reed canary-grass) (see photograph 1 overpage) with frequent Polygonum amphibium (amphibious bistort) and occasional Lithrum salicaria (purple loosestrife), Solanum dulcamara (bittersweet), Mentha aquatica (water mint), Myosotis scorpioides (water forget-me-not) and Alopecurus geniculatus (marsh foxtail).

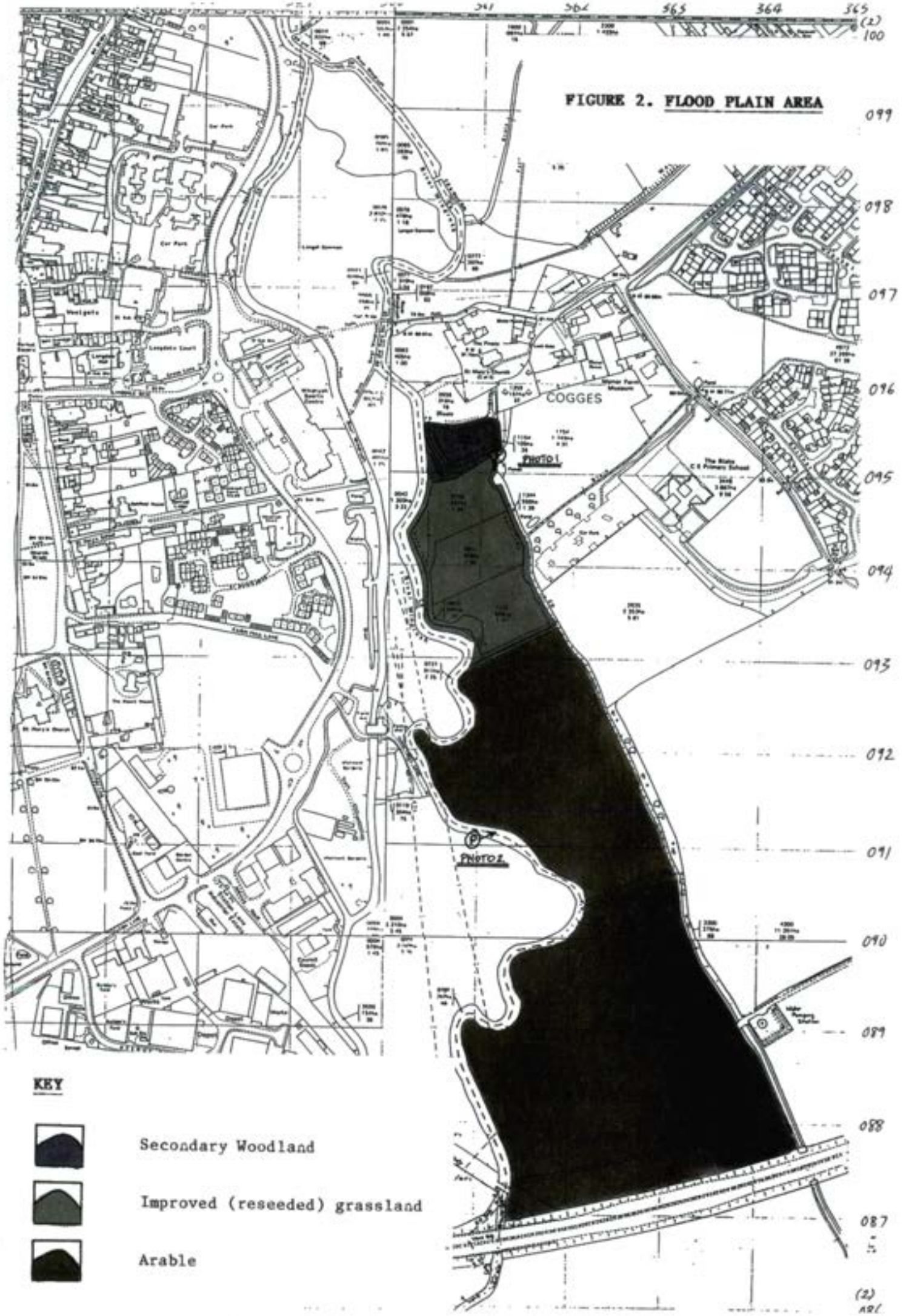


FIGURE 2. FLOOD PLAIN AREA
COGGES
PHOTO 1
PHOTO 2
KEY
Secondary Woodland
Improved (reseeded) grassland
Arable

PHOTOGRAPH 1 Looking westwards across improved pasture (to the right) with one of the two dry, on-ditch ponds in the foreground (left).

PHOTOGRAPH 2 Looking eastwards across the arable fields with the wooded ditch line on the horizon.

5. DETAILED DESCRIPTION OF THE WETLAND VEGETATION OF THE RIVER WINDRUSH (MAPS 1-6)

5.1 LENGTH 1. West Arm: River divergence (GR 43590 20995) to drain inlet (GR 43598 20949)

Land-use. The west bank of the river was separated from the urban areas of Witney by a strip of woodland 10-50m wide. The east bank was separated from the east arm of the Windrush by areas of rank or mown amenity grassland.

Bank structure. Along most of the length the more shaded west bank was relatively low in height and angle (0.5-1m, 10-30 degrees). The east bank was typically higher (1-1.5m) and frequently very steep (60-90 degrees). Bank structure at the very south of the length was more variable.

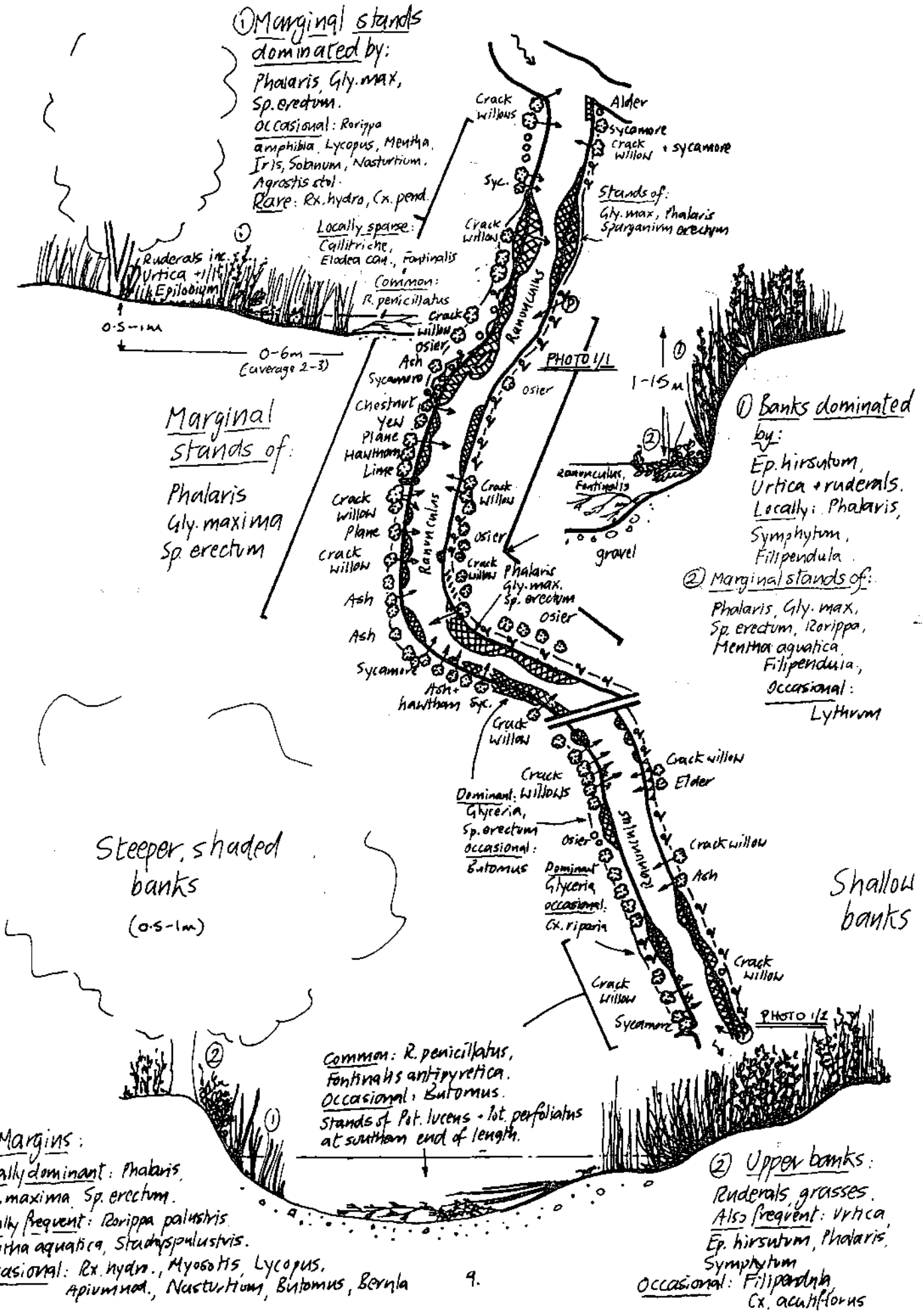
Shade. The West bank, was typically moderatly to heavy shaded by the adjacent woodland belt. The east bank was much more open with many of the bordering trees set back from the bank, so not casting shade on the channel.

Vegetation The generally steep east bank typically supported only a thin fringe of wetland emergents and herb species. Some stands of tall emergents were developed in the channel, particularly Sparganium erectum (branched bur-reed) Phalaris arundinacea (reed canary-grass) and Glyceria maxima (reed sweet-grass).

The west bank generally had much lower bank slopes and typically supported more extensive emergent stands. The abundance of upper bank species on the west margin was frequently inhibited by shade from overhaning trees, although locally this encouraged the occurrence of species such as Carex pseudocyperus (cyperus sedge) which were not found in other lengths of the river. Small stands of Butomus umbellatus (flowering-rush) were recorded in the downstream part of the length, south of the footbridge at GR 43592 20965.

Aquatic vegetation was dominated by Ranunculus penicillatus (stream water-crowfoot) which was common throughout the length, although not as abundant as in most other lengths. Fontinalis antipyretica (willow moss) was frequent. Potamogeton lucens (shining pondweed) was abundant at the very south of length mixed with occasional Potamogeton perfoliatus (perfoliate pondweed) but neither were recorded upstream of the footbridge. Callitriche sp. (starwort) and Elodea canadensis (Canadian pondweed) were locally frequent, especially downstream of the bifurcation at north of the length where they had colonised muddy sediments near the channel margins.

LENGTH 1


①Marginal stands dominated by:
Phalaris, Gly. max, Sp. erectum.
Occasional: Rorippa amphibia, Lycopus, Mentha, Iris, Solanum, Nasturtium, Agrostis stol.
Rare: Rx. hydro, Cx. pend.
Locally sparse: Callitriche, Elodea can., Fontinalis
Common: R. penicillatus
Ruderals inc. Urtica + Epilobium
0·5–1m
0–6m (Coverage 2–3)
Crack willows
Alder
Sycamore
Crack willow + sycamore
Syc.
Stands of: Gly. max, Phalaris Sparganium erectum
Crack willow
Ranunculus
PHOTO 1/1
Ash
Sycamore
Chestnut
Yew
Plane
Hawthorn
Lime
Crack willow
Plane
crack willow
Ash
Ash
Sycamore
Ash + hawthorn Syc.
osier
Crack willow
Phalaris Gly. max. Sp. erectum
Marginal stands of:
Phalaris
Gly. maxima
Sp erectum
1–1·5m
① Banks dominated by:
Ep. hirsutum, Urtica + ruderals.
Locally: Phalaris, Symphytum, Filipendula.
Ranunculus, Fontinalis
gravel
② Marginal stands of:
Phalaris, Gly. max, Sp. erectum, Rorippa, Mentha aquatica, Filipendula.,
Occasional: Lythrum
Crack willow
Elder
Dominant: Willows
Glyceria, Sp. erectum
occasional: Butomus
Crack willow
Ash
Dominant Glyceria
occasional: Cx. riparia
Crack willow
Crack willow
Sycamore
PHOTO 1/2
Steeper, shaded banks
(0·5–1m)
Shallow banks
Common: R. penicillatus, Fontinalis antipyretica. Occasional: Butomus.
Stands of Pot. lucens + lot. perfoliatus at southern end of length.
① Margins:
Locally dominant: Phalaris, Gly. maxima Sp. erectum.
Locally frequent: Rorippa palustris Mentha aquatica, Stachys palustris.
Occasional: Rx. hydro., Myosotis, Lycopus, Apium nod., Nasturtium, Butomus, Berula
② Upper banks:
Ruderals, grasses.
Also frequent: Urtica, Ep. hirsutum, Phalaris, Symphytum
Occasional: Filipendula, Cx. acutiformis

LENGTH 1. WEST ARM

PHOTOGRAPH 1/1 Steep eastern banks (left) colonised by wetland herbs, ruderals and grasses. More gently sloping western margins (right) supporting mixed emergents and wetland herbs at channel edge. Woodland belt behind.

PHOTOGRAPH 1/2 Unshaded eastern margins fringed with emergents: Phalaris arundinacea (Reed Canary-grass) and Glyceria maxima (Reed Sweet-grass). Western margins overhung by a belt of secondary woodland. Potamogeton lucens (shining pondweed) dominant in the channel.

5.2 Length 2. West Arm: Drain inlet (GR 43598 20949) to ditch inlet (GR 43596 20902)

Land-use. At the nothern end of the length the west bank was fringed by a belt of woodland separating it from the urban areas of Witney. Southwards this gave way to allotments and then waste ground. The east bank was bordered by a strip of rank grassland occupying the area between the two Windrush channels.

Bank structure. Bank heights varied between 0.5-2m. Profiles varied along the length from approximatley 20 degrees to either near vertical or steep two-stage banks.

Shade. Shade was generally moderate with 10-20% of the banks typically overhung. In the area bordering the allotments (south of bridge at GR 43598 20921) heavy shade locally restricted the development of marginal plants.

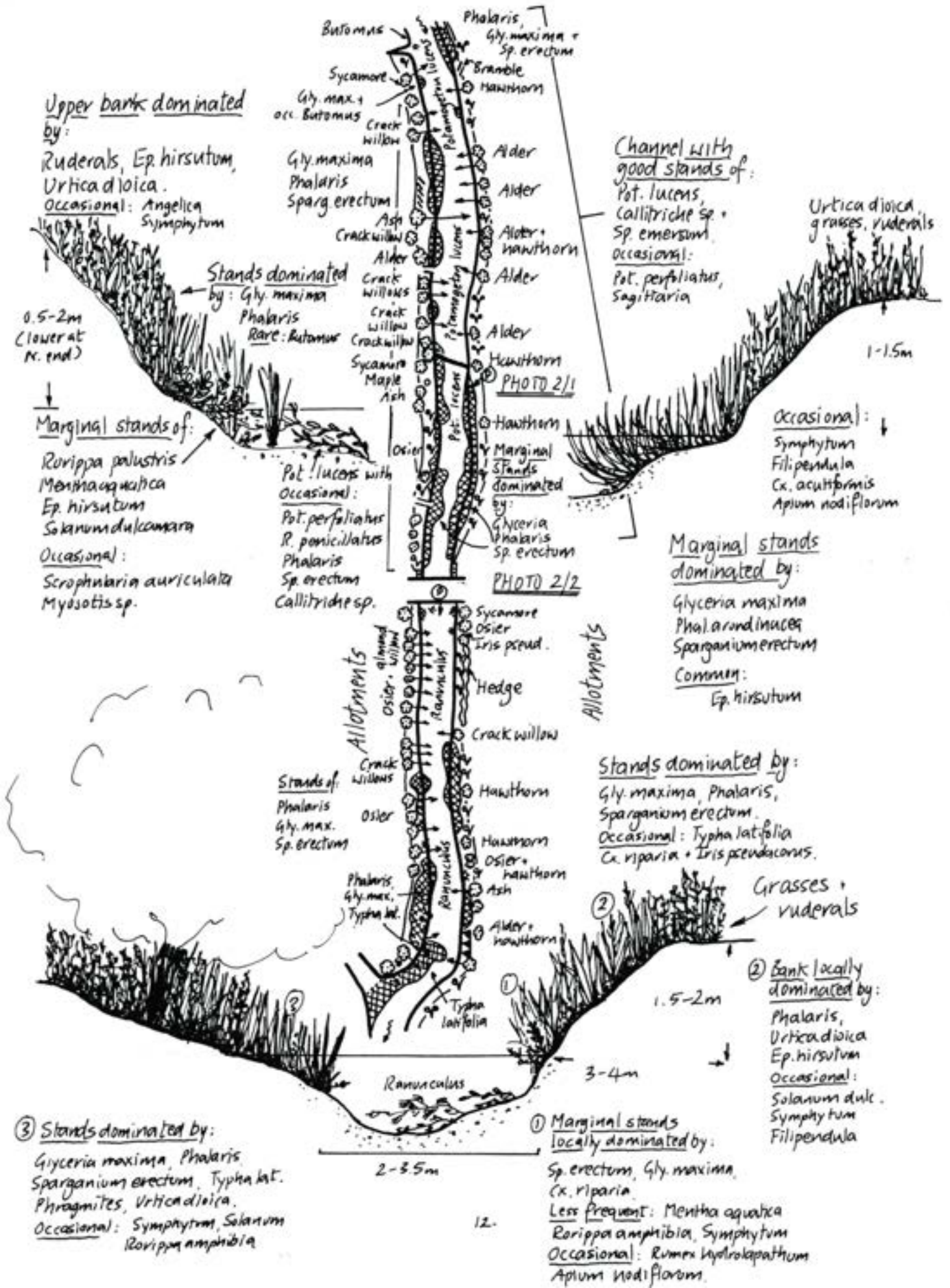
Vegetation. Shallow-angled banks supported mixed and monodominant stands of the typical emergents: Phalaris arundinacea (reed canary-grass), Glyceria maxima (reed sweet-grass) Sparganium erectum (branched bur-reed). Carex acutiformis (lesser pond-sedge) and Carex riparia (greater pond-sedge) were locally dominant on the 'step' of two-stage banks. At the southern end of the length the west bank locally supported stands of Typha latifolia (bulrush) and Phragmites australis (common reed), both species which were very uncommon in other lengths.

Wetland herbs typical of the river (see Section 3 and overpage) were freqent within tall emergent stands at the waters edge and mixed with grasses and ruderals on the upper bank.

Stream water-crowfoot (Ranunculus penicillatus) was abundant in the open channel throughout the length. Potamogeton lucens (shining pondweed) was frequent and locally dominant above the bridge at 43598 20921. It was frequently mixed with the less abundant Potamogeton perfoliatus (perfoliate pondweed). Callitriche sp. (starwort) and Sparganium emersum (unbranched bur-reed) formed occasional submerged stands in fast flowing sections. Callitriche sp. was also recorded with Elodea canadensis (Canadian pondweed) and Lemna minor (common duckweed) in marginal vegetation and slack water areas at the channel edge.

Sagittaria sagittifolia (arrowhead) and Butomus umbellatus (flowering-rush) were occasionally recorded in the northern half of the length, growing submerged in the channel (see Appendix 2).

LENGTH 2


Upper bank dominated by:
Ruderals, Ep. hirsutum, Urtica dioica.
Occasional: Angelica Symphytum
0.5-2m (lower at N. end)
Stands dominated by: Gly. maxima Phalaris
Rare: Butomus
Marginal stands of:
Rorippa palustris
Mentha aquatica
Ep. hirsutum
Solanum dulcamara
Occasional:
Scrophularia auriculata
Myosotis sp.
Pot. lucens with
Occasional:
Pot. perfoliatus
R. penicillatus
Phalaris
Sp. erectum
Callitriche sp.
Butomus
Sycamore
Gly. max. + occ. Butomus
Crack willow
Gly. maxima
Phalaris
Sparg. erectum
Ash
Crack willow
Alder
Crack willows
Crack willow
Crack willow
Sycamore
Maple
Ash
Osier
Phalaris, Gly. maxima + Sp. erectum
Bramble
Hawthorn
Alder
Alder
Alder + hawthorn
Alder
Alder
Hawthorn
PHOTO 2/1
Hawthorn
Marginal stands dominated by:
Glyceria
Phalaris
Sp. erectum
PHOTO 2/2
Channel with good stands of:
Pot. lucens,
Callitriche sp. +
Sp. emersum
occasional:
Pot. perfoliatus,
Sagittaria
Urtica dioica, grasses, ruderals
1-1.5m
Occasional:
Symphytum
Filipendula
Cx. acutiformis
Apium nodiflorum
Marginal stands dominated by:
Glyceria maxima
Phal. arundinacea
Sparganium erectum
Common:
Ep. hirsutum
Allotments
Allotments
Sycamore
Osier
Iris pseud.
Hedge
Crack willow
Stands of:
Phalaris
Gly. max.
Sp. erectum
Crack willows
Osier
Hawthorn
Hawthorn
Osier + hawthorn
Ash
Alder + hawthorn
Phalaris, Gly. max., Typha lat.
Typha latifolia
Stands dominated by:
Gly. maxima, Phalaris,
Sparganium erectum.
Occasional: Typha latifolia
Cx. riparia + Iris pseudacorus.
Grasses + ruderals
1.5-2m
3-4m
Ranunculus
2-3.5m
② Bank locally dominated by:
Phalaris,
Urtica dioica
Ep. hirsutum
Occasional:
Solanum dulc.
Symphytum
Filipendula
③ Stands dominated by:
Glyceria maxima, Phalaris
Sparganium erectum, Typha lat.
Phragmites, Urtica dioica.
Occasional: Symphytum, Solanum
Rorippa amphibia
① Marginal stands locally dominated by:
Sp. erectum, Gly. maxima,
Cx. riparia.
Less frequent: Mentha aquatica
Rorippa amphibia, Symphytum
Occasional: Rumex hydrolapathum
Apium nodiflorum

LENGTH 2. WEST ARM

PHOTOGRAPH 2/1 Channel margins fringed by tall emergents Glyceria maxima (Reed Sweet-grass) and Sparganium erectum (Branched Bur-reed) with Epilobium hirsutum (Great Willowherb) and Urtica dioica (Common Nettle) dominant on the banks. Potamogeton lucens (shining pondweed) and Potamogeton perfoliatus (Perfoliate pondweed) common in the channel.

PHOTOGRAPH 2/2 Shaded margins bodering allotments locally restricting the development of channel marginal and bank vegetation. Ranunculus penicillatus (Stream water-crowfoot) common on gravel and cobble riffles in the chanel.

5.3 Length 3. West Arm: Ditch inlet (GR 43596 20902) to A40 Road bridge (GR 43594 20866)

Land-use. The east bank was bordered by an area of overgrown pasture 100-200m wide, separating the east and west arms of the Windrush. In the north of the length the west bank was borderd by urban surfaces. Downstream, the west bank was bordered by an area of rank grassland/wasteground separating the river from the new buildings of the Wittan Park industrial estate.

Banks. The banks were generally steep (typically 30-80 degrees) particularly in the upstream half of the length. The height of both banks varied between 0.5 and 2m.

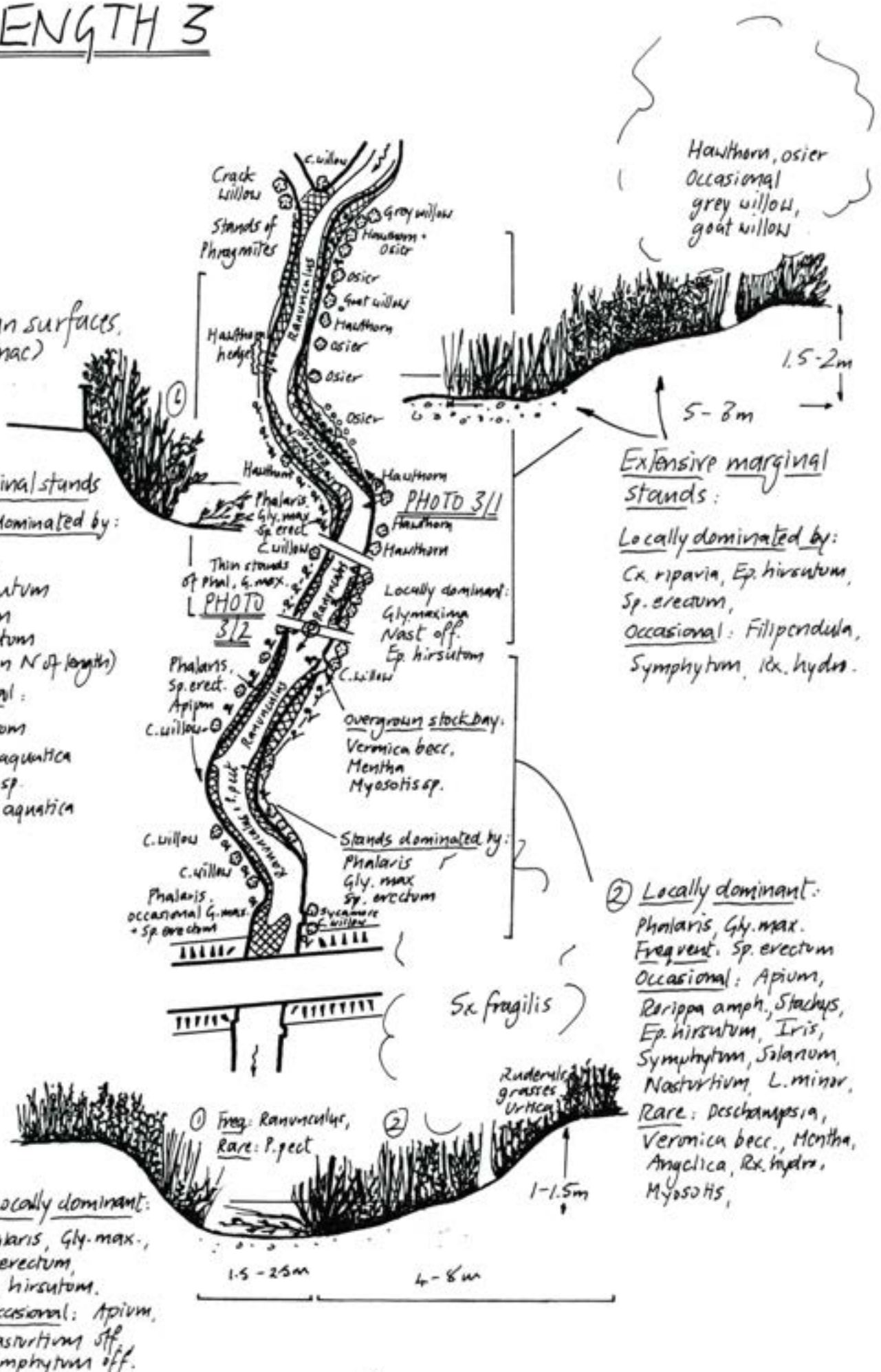
Shade. The west bank was little shaded throughout the length. The east bank was approximatly 20% shaded, mainly by crack willow (Salix fragilis) and hawthorn (Crataegus monogyna) on the bank top.

Vegetation. Stands of tall marginals formed a semicontinous band 0.5-8m wide along both banks through most of the length. Phalaris arundinacea (reed canary-grass), Glyceria maxima (reed sweet-grass) and Sparganium erectum (branched bur-reed) were the main dominants. Carex acutiformis (lesser pond-sedge), Carex riparia (greater pond-sedge) and Phragmites australis (common reed) were locally common.

Wetland herbs typical of the river (see Section 3 and overpage) were again frequent at the channel edge and amongst stands of taller dominants. An old stock bay at GR 43595 20880 supported secies such as Myosotis scorpioides (water forget-me-not), Veronica beccabunga (brooklime) and Mentha aquatica (water mint) which were otherwise uncommon in the length.

Stream water-crowfoot (Ranunculus penicillatus) was abundant in the open channel throughout length. Fontinalis antipyretica (willow moss) was frequent. Potamogeton pectinatus (fennel pondweed) was locally co-dominant with R. penicillatus towards the south end of the length.

LENGTH 3


Crack willow
Stands of Phragmites
c. willow
Grey willow
Hawthorn + osier
osier
Goat willow
Hawthorn
osier
osier
osier
Hawthorn hedge
Ranunculus
Urban surfaces (tarmac)
Hawthorn
Hawthorn
PHOTO 3/1
Hawthorn
Hawthorn
Phalaris. Gly. max Sp. erect
c. willow
Thin stands of Phal. G. max.
PHOTO 3/2
Ranunculus
Locally dominant: Gly. maxima Nast off. Ep. hirsutum
Phalaris. Sp. erect. Apium
c. willow
Ranunculus
c. willow
overgrown stock Day. Veronica becc. Mentha Myosotis sp.
Ranunculus
c. willow
c. willow
Phalaris. occasional G. max. + Sp. erectum
Sycamore c. willow
Stands dominated by: Phalaris Gly. max Sp. erectum
Sx fragilis
Ruderals grasses Urtica
Hawthorn, osier Occasional grey willow, goat willow
1.5-2m
5-8m
Extensive marginal stands:
Locally dominated by:
Cx. riparia, Ep. hirsutum, Sp. erectum,
Occasional: Filipendula, Symphytum, Rx. hydro.
① Marginal stands
Locally dominated by:
Phalaris
Ep. hirsutum
Solanum
Sp erectum
(Phrag. in N of length)
Occasional:
Symphytum
Rorippa aquatica
Myosotis sp.
Mentha aquatica
② Locally dominant:
Phalaris, Gly. max.
Frequent. Sp. erectum
Occasional: Apium, Rorippa amph., Stachys, Ep. hirsutum, Iris, Symphytum, Solanum, Nasturtium, L. minor,
Rare: Deschampsia, Veronica becc., Mentha, Angelica, Rx. hydro., Myosotis,
① Freq: Ranunculus, Rare: P. pect
② Ruderals grasses Urtica
1-1.5m
① Locally dominant:
Phalaris, Gly. max.,
Sp. erectum,
Ep. hirsutum.
Occasional: Apium,
Nasturtium off
Symphytum off.
1.5-2.5m
4-8m

LENGTH 3. WEST ARM

PHOTOGRAPH 3/1 West bank (left) with mixed stands of wetland herbs and marginal emergents bordering urban areas. East bank supporting more extensive stands (Sparganium erectum (Branched Bur-reed) and Carex riparia (Greater Pond-sedge)).

PHOTOGRAPH 3/2 Margins supporting stands of emergents with wetland herbs at waters edge (Nasturtium officinale (Green Water-cress), Solanum dulcamara (Bittersweet), Stachys palustris (Marsh Woundwort)) and on bank (mainly Epilobium hirsutum (Great Willowherb), Urtica dioica (Common Nettle)). R.penicillatus (Stream water-crowfoot) abundant in the channel.

5.4 LENGTH 4. East Arm: River divergance (GR 43590 20995) to ditch inlet (GR 43603 20949)

Land-use. The northern half of the east bank (above the foot bridge at GR 43599 20967) was bordered by relatively unimproved, cattle grazed pasture. Downstream of the bridge this turned to improved pasture and then to secondary woodland (developed on an old moated site that is part of the Manor Farm Museum). The west bank was typically bordered by rank grassland.

Bank structure. Along most of the length the east bank was low angled and, where grazed, lightly poached. Excepting point bar sequences, the west bank was generally steep, frequently 60-90 degrees and 0.6-1.m high

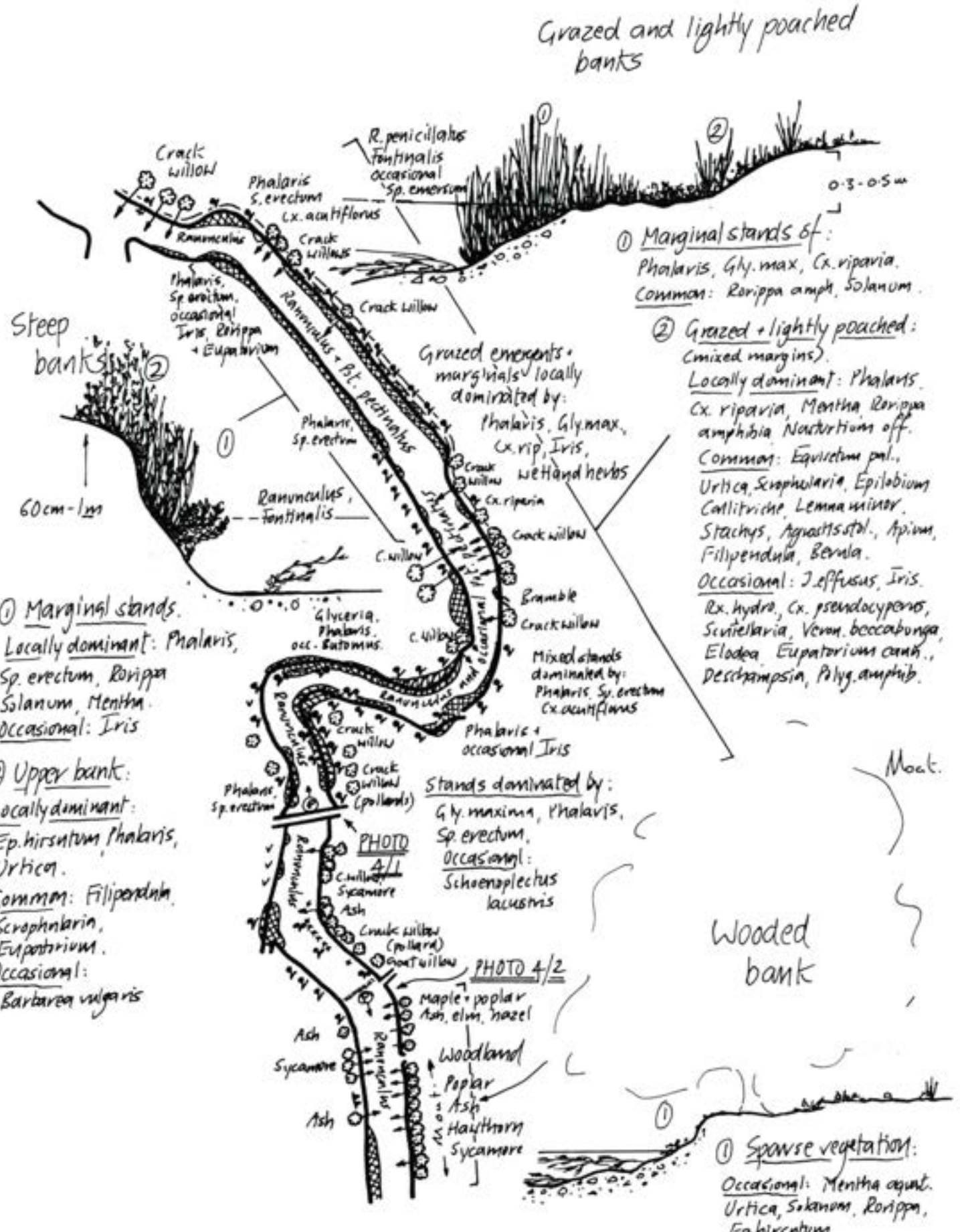
Shade. Secondary woodland bordering the moat shaded part of the east bank at the downstream end of the length, but most banks were unshaded except for a few scattered (often pollarded) willows.

Vegetation. The grazed eastern margins of the northern half of the length supported a 1-3m fringe of typical tall emergent species with occasional Schoenoplectus lacustris (common club-rush) and Butomus umbellatus (flowering-rush) present at the channel edge. The lightly poached and grazed edge behind this waterside fringe (see overpage) supported a relatively rich marginal wetland flora including a number of species rare or absent in other lengths. These included Carex pseudocyperus (cyperus sedge), Scutellaria galericulata (skullcap), Hypericum tetrapterum (square-stalked St John's wort), Polygonum amphibium (amphibious bistort) and Equisetum palustris (marsh horsetail).

Other margins generally supported thin to locally good stands of mixed emergents and marginal species. The south-east bank abbutting the moat was heavily shaded with little marginal or bankside vegetation.

The submerged plant community was dominated by Ranunculus penicillatus (stream water-crowfoot) which was common throughout the length. Potamogeton pectinatus (fennel pondweed) was locally co-dominant, particularly in shallow riffle areas in the northern half of the length. Fontinalis antipyretica (willow moss) was common on hard substrates (eg stones and cobbles) in the channel. Elodea canadensis (Canadian pondweed), Callitriche sp. (starwort) and Lemna minor (common duckweed) were locally frequent particularly within the flooded, poached edges of the grazed north-east margin (see Profile overpage).

LENGTH 4


Grazed and lightly poached banks
Crack willow
Phalaris
S. erectum
Cx. acutiflorus
R. penicillatus
Fontinalis
occasional
Sp. emersum
0·3 - 0·5 m
① Marginal stands of:
Phalaris, Gly. max, Cx. riparia.
Common: Rorippa amph, Solanum.
② Grazed + lightly poached:
(mixed margins).
Locally dominant: Phalaris, Cx. riparia, Mentha, Rorippa amphibia, Nasturtium off.
Common: Equisetum pal., Urtica, Scrophularia, Epilobium, Callitriche, Lemna minor, Stachys, Agrostis stol., Apium, Filipendula, Berula.
Occasional: J. effusus, Iris, Rx. hydro, Cx. pseudocyperus, Scutellaria, Veron. beccabunga, Elodea, Eupatorium cann., Deschampsia, Polyg. amphib.
Steep banks
60cm - 1m
Ranunculus, Fontinalis
Phalaris, Sp. erectum
Ranunculus + Pt. pectinatus
Phalaris, Sp. erectum, occasional Iris, Rorippa + Eupatorium
Grazed emergents + marginals locally dominated by: Phalaris, Gly. max, Cx. rip, Iris, wetland herbs
① Marginal stands.
Locally dominant: Phalaris, Sp. erectum, Rorippa, Solanum, Mentha.
Occasional: Iris
Glyceria, Phalaris, occ. Sparganium
② Upper bank:
Locally dominant: Ep. hirsutum, Phalaris, Urtica.
Common: Filipendula, Scrophularia, Eupatorium.
Occasional: Barbarea vulgaris
Crack willow
Bramble
Mixed stands dominated by: Phalaris, Sy. erectum, Cx. acutiflorus
Phalaris + occasional Iris
Stands dominated by: Gly. maxima, Phalaris, Sp. erectum.
Occasional: Schoenoplectus lacustris
Mock.
PHOTO 4/1
Sycamore
Ash
Crack willow (pollard)
Goat willow
PHOTO 4/2
Maple + poplar, Ash, elm, hazel
Woodland
Poplar
Ash
Hawthorn
Sycamore
Wooded bank
① Sparse vegetation:
Occasional: Mentha aquat. Urtica, Solanum, Rorippa, Ep. hirsutum

LENGTH 4. EAST ARM

PHOTOGRAPH 4/1 East (right) margin bordered by relatively unimproved pasture. Margins lightly poached by cattle, with a relatively diverse wetland herb flora including a number of species not recorded in other lengths. Ranunculus penicillatus (Stream water-crowfoot) abundant in the channel.

PHOTOGRAPH 4/2 East margin (left) heavily shaded by secondary woodland surrounding an overgrown moat. Steep west bank. Ranunculus penicillatus (Stream water-crowfoot) very abundant on a gravel riffle in the channel.

5.5 Length 5. East arm: Ditch inlet (GR 43603 20949) to ditch inlet (GR 43621 20904)

Land-use. The east bank of the river was bordered by improved grassland and arable fields. The west bank was bordered by rank grassland.

Bank structure. Banks were typically 1-1.5m high, but bank slopes varied considerably as the river ran through a series of meanders, alternating between steep banks (locally vertical earth cliffs) and the lower angles of pointbar sequences.

Shade. Shading was relatively light, with trees scattered or in small clumps lining approximatly 5-10% of the channel margins. Trees were mainly willow species (Salix fragilis, S.viminalis, S.cinerea), sycamore (Acer pseudoplatanus), hawthorn (Crataegus monogyna and occasional alder (Alnus glutinosa) and ash (Fraxinus excelsior).

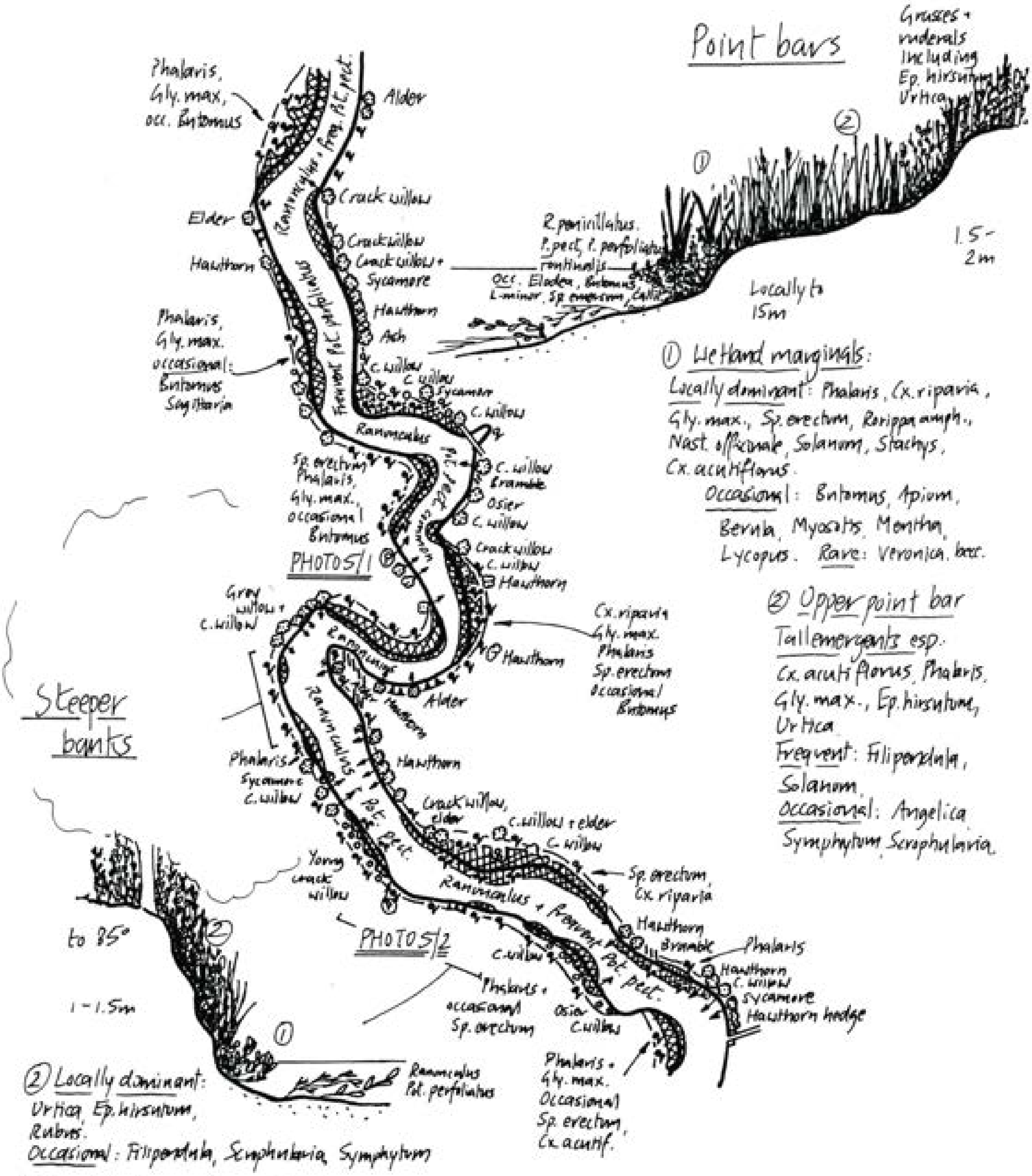
Vegetation. The vegetation structure and community alternated around meander bends as the bank angle changed. Point bars supported extensive stands of tall emergents, particularly Phalaris arundinacea (reed canary-grass), Glyceria maxima (reed sweet-grass), Carex acutiformis (lesser pond-sedge) and locally Carex riparia (greater pond-sedge). Sparganium erectum (branched bur-reed) was common at the channel edge with stands of wetland herbs such as Rorippa amphibia (great yellow-cress), Solanum dulcamara (bittersweet) and Mentha aquatica (water mint).

Sagittaria sagittifolia (arrowhead) and Butomus umbellatus (flowering-rush) were occasionally recorded in the northern half of the length growing submerged within the channel and within emergent vegetation at waters edge (see Appendix 2).

The steeper banks had variable cover of ruderals and wetland species including Epilobium hirsutum (great willowherb), Eupatorium cannabinum (hemp-agrimony), Filipendula ulmaria (meadowsweet) and Urtica dioica (common nettle) with, locally, a thin fringe of the common emergents and marginals at the waters edge (see Profile overpage).

The submerged plant community was dominated by Ranunculus penicillatus (stream water-crowfoot) which was abundant throughout the length. Potamogeton pectinatus (fennel pondweed) was frequently co-dominant in the southern half of the length. Potamogeton perfoliatus (perfoliate pondweed) was also frequent in the northern half of the length. Fontinalis antipyretica (willow moss) was occasional to frequent throughout. Callitriche sp. (starwort), Elodea canadensis (Canadian pondweed) and Lemna minor (common duckweed) were occasional in slacks at the channel margins.

LENGTH 5


Point bars
Grasses + ruderals including Ep. hirsutum, Urtica
1.5 - 2m
Locally to 15m
R. penicillatus, P. pect, P. perfoliatus, fontinalis
occ. Elodea, Butomus, L. minor, Sp. emersum, Callit.
① Wetland marginals:
Locally dominant: Phalaris, Cx. riparia, Gly. max., Sp. erectum, Rorippa amph., Nast. officinale, Solanum, Stachys, Cx. acutiflorus.
Occasional: Butomus, Apium, Berula, Myosotis, Mentha, Lycopus. Rare: Veronica. becc.
② Upper point bar
Tall emergents esp. Cx. acutiflorus, Phalaris, Gly. max., Ep. hirsutum, Urtica
Frequent: Filipendula, Solanum,
Occasional: Angelica, Symphytum, Scrophularia.
Phalaris, Gly. max, occ. Butomus
Alder
Ranunculus + freq. Pot. pect.
Crack willow
Elder
Hawthorn
Crack willow
Crack willow + Sycamore
Hawthorn
Ash
Phalaris, Gly. max. occasional: Butomus, Sagittaria
Frequent Pot. perfoliatus
c. willow
c. willow
Sycamore
c. willow
Ranunculus
Sp. erectum, Phalaris, Gly. max., occasional Butomus
c. willow
Bramble
Osier
c. willow
Crack willow
c. willow
Hawthorn
PHOTO 5/1
Grey willow + c. willow
Cx. riparia, Gly. max. Phalaris, Sp. erectum, occasional Butomus
Hawthorn
Alder
Hawthorn
Steeper banks
Phalaris, Sycamore, c. willow
Hawthorn
Ranunculus + Pot. pect.
Crack willow, elder
c. willow + elder
c. willow
Young crack willow
Sp. erectum, Cx. riparia
Ranunculus + frequent Pot. pect.
Hawthorn
Bramble
Phalaris
PHOTO 5/2
c. willow
Hawthorn, c. willow, Sycamore, Hawthorn hedge
Phalaris + occasional Sp. erectum
Osier, C. willow
Phalaris + Gly. max. Occasional Sp. erectum, Cx. acutif.
to 85°
1 - 1.5m
Ranunculus, Pot. perfoliatus
② Locally dominant: Urtica, Ep. hirsutum, Rubus.
Occasional: Filipendula, Scrophularia, Symphytum
① Occasional: thin fringe of tall emergents + wetland marginals eg Solanum, Stachys.

PHOTOGRAPH 5/1 Point bar on west (left) bank with low angles, colonised by emergent stands dominated by Phalaris arundinacea (Reed Canary-grass), with Glyceria maxima (Reed Sweet-grass), Sparganium erectum (Branched Bur-reed) and low growing herbs such as Rorippa amphibia (Great Yellow-cress) locally frequent.

PHOTOGRAPH 5/2 Bank bordered by mixed stands of marginal and bankside herbs with Nasturtium officinale (Green Water-cress) common at the waters edge. E.hirsutum (Great Willowherb) and U.dioica (Common Nettle) dominating upper banks. R.penicillatus (Stream water-crowfoot) and Potamogeton pectinatus (Fennel Pondweed) co-dominant in channel.

5.6 LENGTH 6. East Arm: Ditch inlet (GR 43621 20904) to A 40 bridge (GR 43613 20869)

Land-use. The river was bordered by arable fields to the east and abandoned pasture and rank grassland to the west.

Bank structure. Banks were typically approximately 1.5m high. Bank slopes were very variable, particulalrly along the winding northern half of the length where point bars alternated with steep banks and cliffs around meander bends.

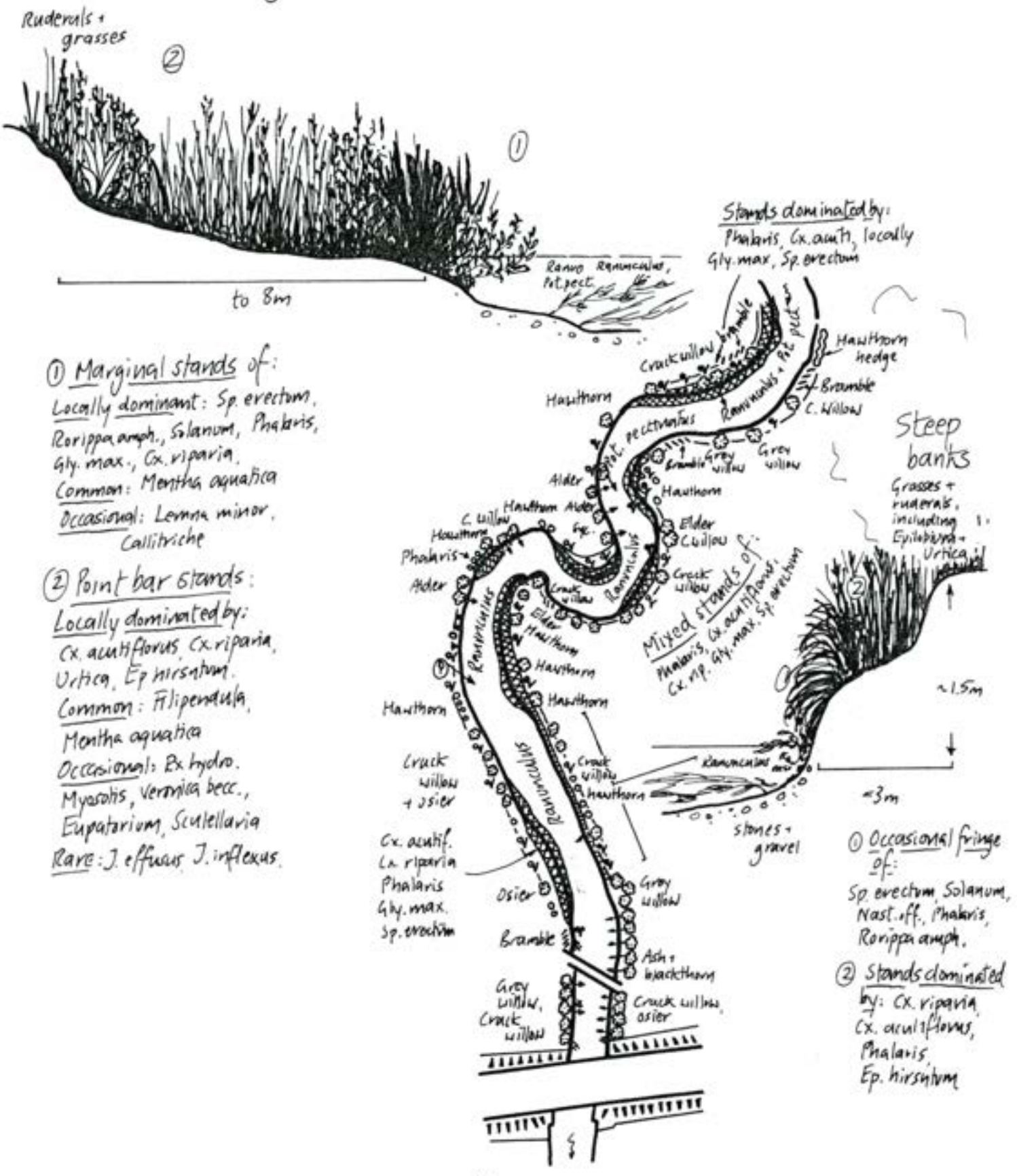
Shade. Along most of the length scattered trees (mainly Salix spp., A.glutinosa and Acer pseudoplatanus) cast relatively light shade (‡10%) on the river margins. At the southern end of the length, above the A40 road bridge,heavy shade locally restricted the growth of wetland vegetation.

Vegetation. In the northern half of the length the vegetation was similar to Length 5, with point bars supporting locally extensive mixed wetland stands and thin fringes growing on steeper eroded banks. In the southern half of the length very steep and two stage channel banks frequently supported stands dominated by Carex acutiformis (lesser pond-sedge) or Carex riparia (greater pond-sedge) and less frequently Phalaris arundinacea (reed canary-grass), Glyceria maxima (reed sweet-grass) and Sparganium erectum (branched bur-reed) (see Profile overpage).

The submerged plant community was dominated throughout the length by Ranunculus penicillatus (stream water-crowfoot). Potamogeton pectinatus (fennel pondweed) was also frequently present, particulalrly in the northern half of the length. Elodea canadensis (Canadian pondweed), Callitriche sp. (starwort) and Lemna minor (common duckweed) were occasional in sluggishly flowing areas at the margin of the river.

LENGTH 6

Point bar vegetation



① Marginal stands of:
Locally dominant: Sp. erectum, Rorippa amph., Solanum, Phalaris, Gly. max., Cx. riparia.
Common: Mentha aquatica
Occasional: Lemna minor, Callitriche

② Point bar stands:
Locally dominated by: Cx. acutiflorus, Cx. riparia, Urtica, Ep. hirsutum.
Common: Filipendula, Mentha aquatica
Occasional: Rx hydro. Myosotis, Veronica becc., Eupatorium, Scutellaria
Rare: J. effusus, J. inflexus.

① Occasional fringe of:
Sp. erectum, Solanum, Nast. off., Phalaris, Rorippa amph.

② Stands dominated by: Cx. riparia, Cx. acutiflorus, Phalaris, Ep. hirsutum

PHOTOGRAPH 6/1 Meander bend with point bar on the east (left) bank dominated by tall emergents (Phalaris arundinacea (Reed Canary-grass) and Sparganium erectum (Branched Bur-reed)). Outer bank very steep and often poorly colonised.

PHOTOGRAPH 6/2 Two-stage eastern bank (left). Locally fringed by N.officinale (Green Water-cress) with 'step' colonised by P.arundinacea (Reed Canary-grass) (Carex acutiformis (Lesser Pond-sedge), C.riparia (Greater Pond-sedge) downstream). Western (right) bank abbutting overgrown pasture, dominated by E.hirsutum (Great Willowherb), and P.arundinacea (Reed Canary-grass), with occasional Rumex hydrolapathum (Water Dock).

APPENDIX 6.1 WETLAND SPECIES RECORDED

SPECIES NAME	COMMON NAME
Agrostis stolonifera	Creeping Bent
Alopecurus geniculatus	Marsh Foxtail
Angelica sylvestris	Wild Angelica
Apium nodiflorum	Fool's Water-cress
Barbarea vulgaris	Winter-cress
Berula erecta	Lesser Water-parsnip
Butomus umbellatus	Flowering-rush
Callitriche sp.	Starwort
Carex acutiformis	Lesser Pond-sedge
Carex pendula	Pendulous Sedge
Carex pseudocyperus	Cyperus Sedge
Carex riparia	Greater Pond-sedge
Deschampsia caespitosa	Tufted Hair-grass
Elodea canadensis	Canadian pondweed
Epilobium hirsutum	Great Willowherb
Equisetum palustre	Marsh Horsetail
Eupatorium cannabinum	Hemp-agrimony
Filipendula ulmaria	Meadowsweet
Fontinalis antipyretica	Willow moss
Glyceria fluitans	Floating Sweet-grass
Glyceria maxima	Reed Sweet-grass
Hypericum tetrapterum	Square-stalked St John's wort
Iris pseudacorus	Yellow Flag
Juncus effusus	Soft Rush
Juncus inflexus	Hard Rush
Lemna minor	Common Duckweed
Lycopus europaeus	Gipsywort
Lythrum salicaria	Purple-loosestrife
Mentha aquatica	Water Mint
Myosotis scorpioides	Water Forget-me-not
Nasturtium officinale	Green Water-cress
Phalaris arundinacea	Reed Canary-grass
Phragmites australis	Common Reed
Polygonum amphibium	Amphibious Bistort
Potamogeton lucens	Shining pondweed
Potamogeton pectinatus	Fennel Pondweed
Potamogeton perfoliatus	Perfoliate pondweed
Ranunculus penicillatus subsp. pseudofluitans var. pseudofluitans	Stream water-crowfoot
Rorippa amphibia	Great Yellow-cress
Rumex hydrolapathum	Water Dock
Sagittaria sagittifolia	Arrowhead
Schoenoplectus lacustris	Common Club-rush
Scrophularia auriculata	Water Figwort
Scutellaria galericulata	Skullcap
Solanum dulcamara	Bittersweet
Sparganium emersum	Unbranched Bur-reed
Sparganium erectum	Branched Bur-reed
Stachys palustris	Marsh Woundwort
Symphytum officinale	Common Comfrey
Typha latifolia	Bulrush
Urtica dioica	Common Nettle
Veronica beccabunga	Brooklime

Latin and English equivalents from Dony et.al. (1986) The English names of wild flowers. BSBI. 2nd edition.

APPENDIX 6.2 STATUS AND OCCURRENCE OF LOCAL AND LOCALLY COMMON SPECIES

BUTOMUS UMBELLATUS (Flowering-rush)

National status and distribution: Rather local, rare in Wales and not native in Scotland. In ditches, ponds and canals, and at margins of rivers.

Occurrence in surveyed section: Occasional on the west arm of the Windrush in length 1 and 2 between GR 43593 20964 and 43600 20930 and on the east arm in lengths 4 and 5 between GR 43598 20972 and 43609 20923. Growing as an emergent plant near the margins in gently flowing water up to 1m deep on muddy sediments. Also growing submerged on sandy substrates in moderatly fast flowing water up to 1.5m deep.

SAGITTARIA SAGITTIFOLIA (Arrowhead)

National status and distribution: Rather local. Scattered throughout England and rarer in the north and parts of Wales. In shallow water in ponds, canals and slow flowing rivers on muddy substrata.

Occurrence in surveyed section: Found rarely in both arms of the Windrush around GR 43597 20949 and 43603 20935. Only small and submerged plants were recorded. Other plants may be evident later in the year.

CAREX PSEUDOCYPERUS (Cyperus Sedge)

National status and distribution: Local in England to N.lancs. By slow flowing rivers, in ditches, ponds, and stagnant water in woods.

Occurrence in surveyed section: A single small clump recorded on a grazed river bank partly shaded by a pollarded willow near the top of length 3 at GR 43598 20993.

POTAMOGETON LUCENS (Shining pondweed)

National status and distribution: Locally common in south and east England. Lakes, ponds, canals and small streams on nutrient rich inorganc substrata.

Occurrence in surveyed section: Common in length 2 on the west arm of the Windrush between GR 43597 20949 and 43598 20917. Typically growing in mid channel on sandy (often rather organic rich) sediments.

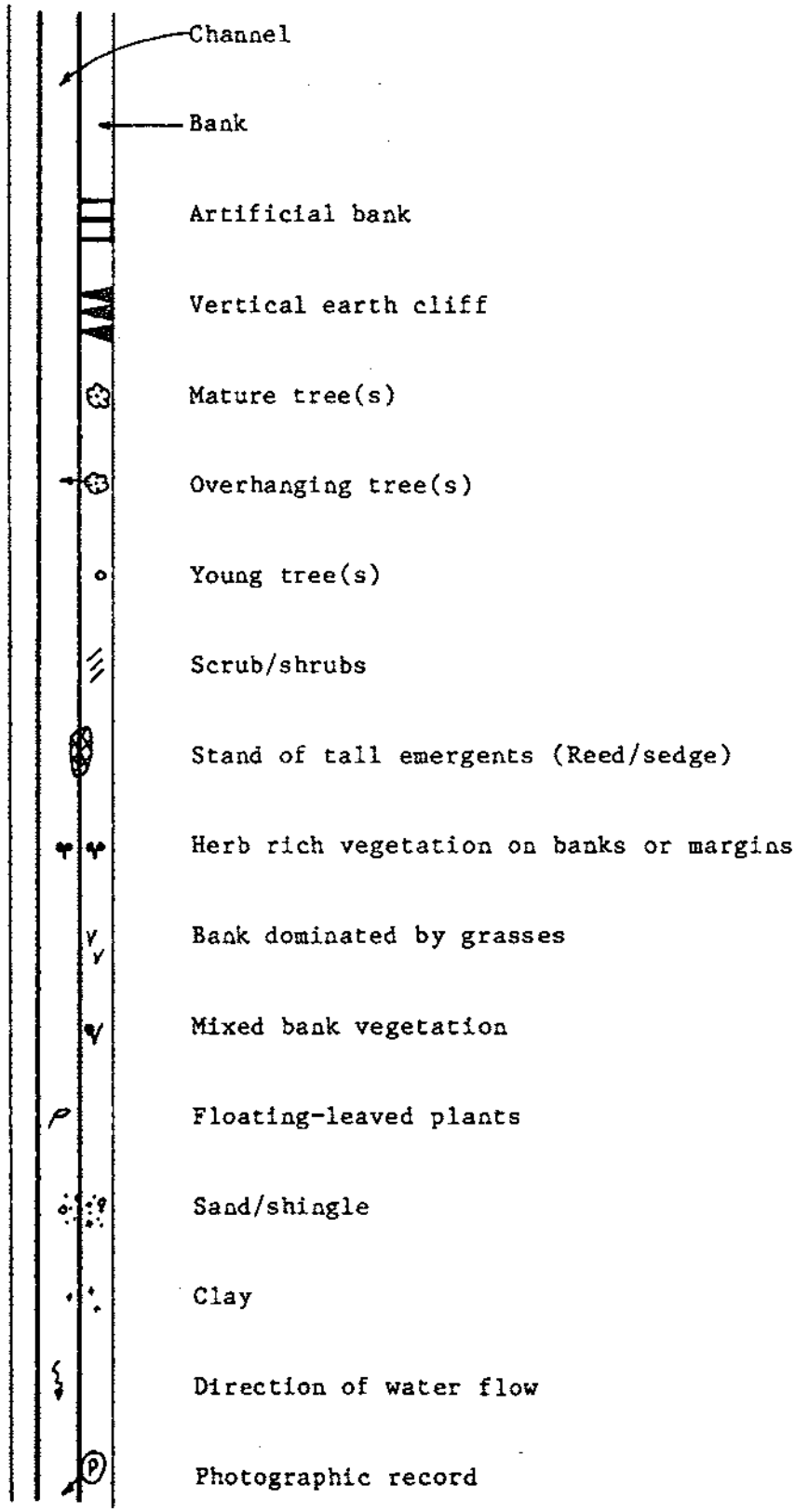
RORRIPA AMPHIBIA

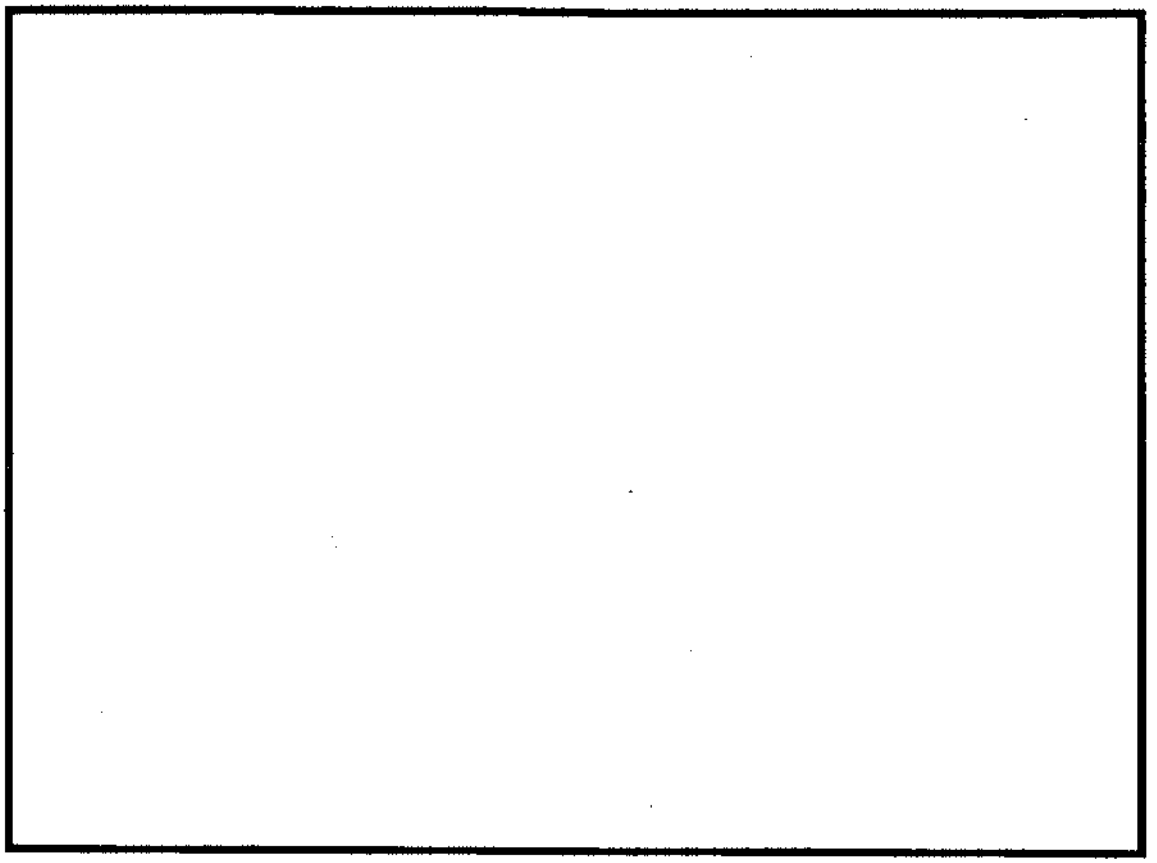
National status and distribution: Locally frequent from Somerset and Kent northwards to Lankashire and NE Yorkshire. Local in marginal sedge-swamp by eutrophic streams, ditches and pools with very variable water levels.

Occurrence in surveyed section: Common at the stream margins and more occasionally mixed in with tall emergent stands on the stream banks.

National status and distribution of species from: A.R. Clapham, T.G. Tutin and and D.M. Moore (1987) Flora of the British Isles. CUP. 3rd edition.

APPENDIX 6.3 KEY TO MAP SYMBOLS





Scanning File Divider

2060

Whitney River Corridor

Survey

Pond Action

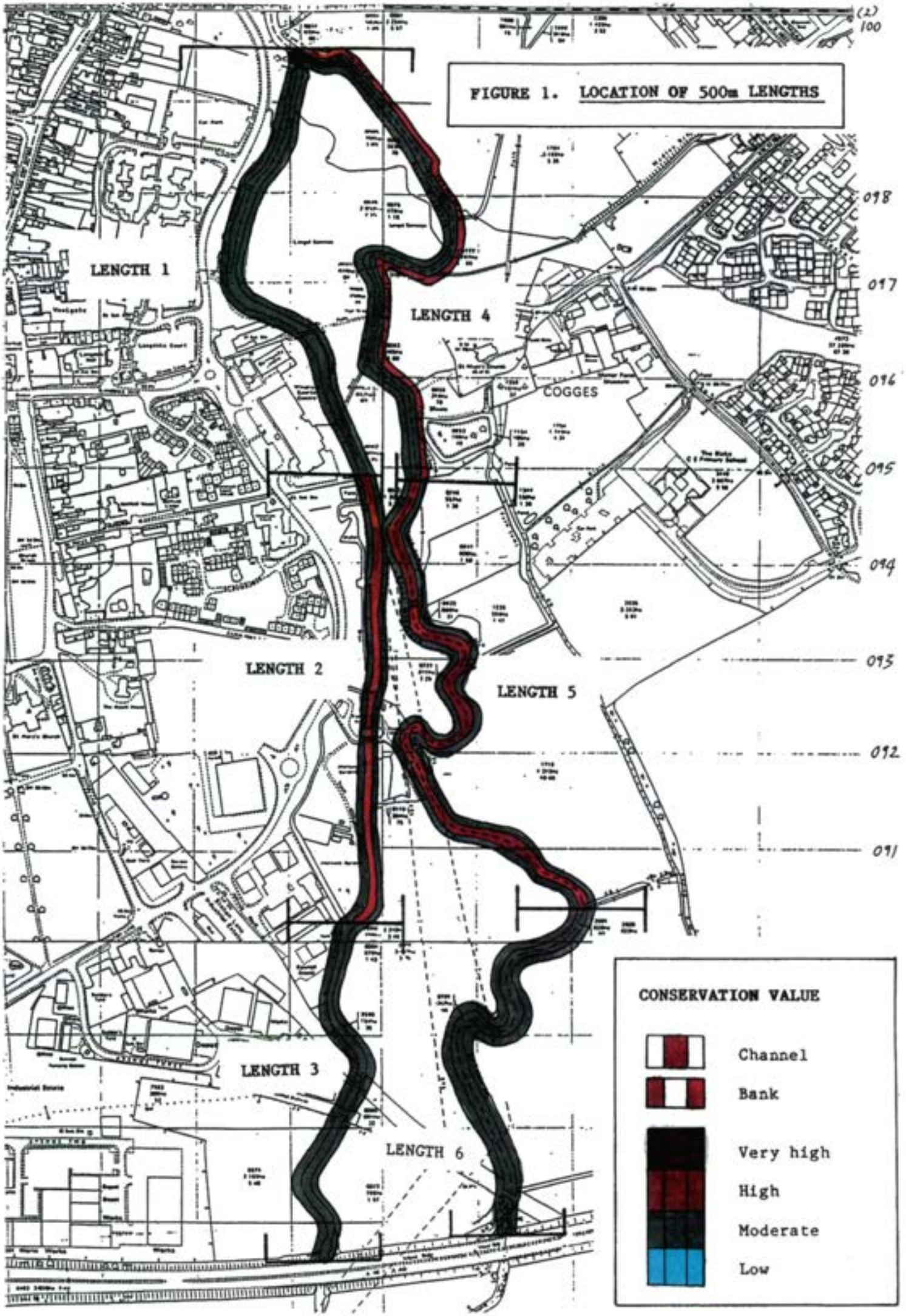
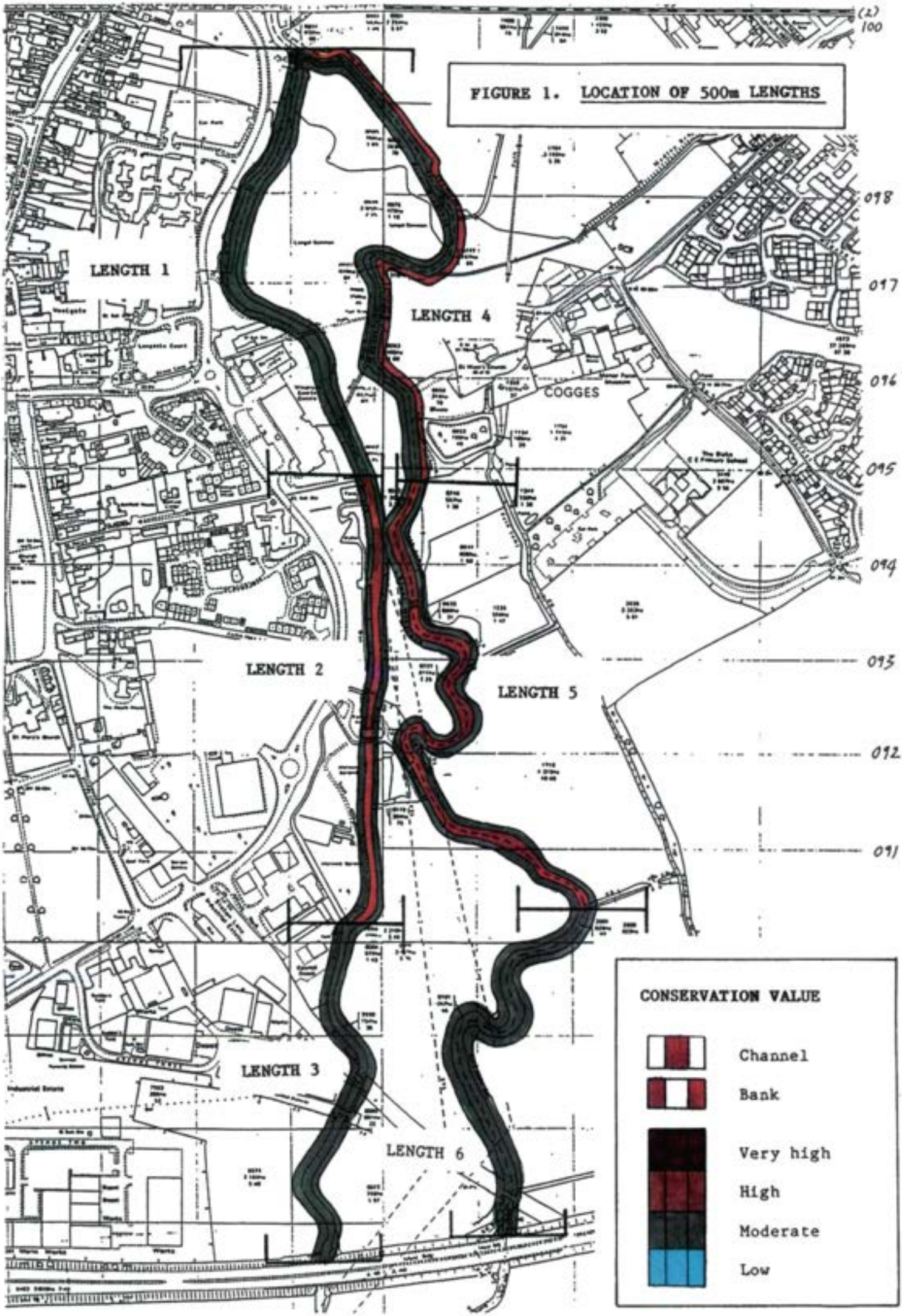


FIGURE 1. LOCATION OF 500m LENGTHS
LENGTH 1
LENGTH 2
LENGTH 3
LENGTH 4
LENGTH 5
LENGTH 6
COGGES
098
097
096
095
094
093
092
091
CONSERVATION VALUE
Channel
Bank
Very high
High
Moderate
Low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098
097
096
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094
093
092
091
CONSERVATION VALUE
Channel
Bank
Very high
High
Moderate
Low

PHOTOGRAPH 1/1 Steep eastern banks (left) colonised by wetland herbs, ruderals and grasses. More gently sloping western margins (right) supporting mixed emergents and wetland herbs at channel edge. Woodland belt behind.

PHOTOGRAPH 1/2 Unshaded eastern margins fringed with emergents: Phalaris arundinacea (Reed Canary-grass) and Glyceria maxima (Reed Sweet-grass). Western margins overhung by a belt of secondary woodland. Potamogeton lucens (shining pondweed) dominant in the channel.

PHOTOGRAPH 1/1 Steep eastern banks (left) colonised by wetland herbs, ruderals and grasses. More gently sloping western margins (right) supporting mixed emergents and wetland herbs at channel edge. Woodland belt behind.

PHOTOGRAPH 1/2 Unshaded eastern margins fringed with emergents: Phalaris arundinacea (Reed Canary-grass) and Glyceria maxima (Reed Sweet-grass). Western margins overhung by a belt of secondary woodland. Potamogeton lucens (shining pondweed) dominant in the channel.

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PHOTOGRAPH 1/2 Unshaded eastern margins fringed with emergents: Phalaris arundinacea (Reed Canary-grass) and Glyceria maxima (Reed Sweet-grass). Western margins overhung by a belt of secondary woodland. Potamogeton lucens (shining pondweed) dominant in the channel.

COGGES LINK ROAD - RIVER CORRIDOR SURVEY (7202 F2)

A SURVEY OF THE WETLAND VEGETATION OF TWO 1.5KM LENGTHS OF THE RIVER WINDRUSH

POND ACTION
SURVEYED: 9-11 JUNE 1991
REPORT DATED: 14 JUNE 1991

C/O BIOLOGICAL & MOLECULAR SCIENCES
OXFORD POLYTECHNIC
GIPSY LANE
HEADINGTON
OXFORD OX3 0BP

SUMMARY

This report describes a standard NCC methodology river corridor survey of 3km of the River Windrush immediately east of Witney, Oxfordshire. Survey work was undertaken on 9-11 June 1991.

The river in the survey area supported a moderately species-rich wetland flora with 52 species recorded, including 11 aquatic species. 3 local and 2 locally common species were recorded but none of these is regarded as needing special protection in the Thames catchment.

The marginal and emergent plant community was moderately species-rich (41 species), abundance of marginals varying from moderate to good. Marginal and emergent vegetation was broadly similar in species-richness, abundance and species composition throughout the survey area. One area, the grazed and slightly poached banks of Length 4, supported a wider variety of marginal and emergent species than all other areas.

11 aquatic species were recorded, including 2 local species. The aquatic community was most diverse in a 300m band running east-west across both arms of the river between the southern end of Lengths 1 and 4 (GR 43599 20966) and the middle of Lengths 2 and 5 (GR 43598 20922).

The floodplain (bounded by a the ditch to the east of the river) was predominantly intensively managed grassland and arable fields. It was of low nature conservation value.

CONTENTS

3. GENERAL DESCRIPTION OF THE WETLAND VEGETATION OF THE RIVER WINDRUSH IN THE SURVEY AREA

3.1 Introduction

The River Windrush in the survey area supported a moderately species-rich wetland flora with 52 species recorded, including 11 aquatic species (see Appendix 1 for list of species). The flora included 3 local and 2 locally common species.

3.2 Marginal and emergent wetland plants

41 species of marginal and emergent wetland plant were recorded in the survey area, a moderately species-rich assemblage. The abundance of marginal and emergent plants varied from moderate to good.

Most lengths supported marginal and emergent vegetation that was broadly similar in species-richness, abundance and species composition. However, individual lengths varied in the distribution of their marginal stands (eg fringing both banks or concentrated onto point bars in meandering sections).

One area, the grazed and slightly poached banks of Length 4, supported a wider variety of marginal and emergent species than all other areas. This area was adjacent to relatively unimproved pastures grazed by cattle. The combination of less intensive land-use and grazing (which prevented tall emergents from dominating the marginal flora) allowed a richer community to develop (see also Section 3.6 below).

3.3 Typical composition of the marginal/emergent community

On the upper banks Epilobium hirsutum (great willowherb) and Urtica dioica (common nettle) were the most abundant wetland species. Symphytum officinale (comfrey), Eupatorium cannabinum (hemp-agrimony) and Filipendula ulmaria (meadowsweet) were also widespread and common.

On the lower banks and at the waters edge the abundance of wetland species varied considerably according to bank slope. Steep banks were generally fringed by only a thin or discontinuous fringe of tall emergent and wetland herb species. More gently sloping margins generally supported more extensive mixed and monodominant stands of emergents. Three emergents species, Phalaris arundinacea (reed canary-grass), Glyceria maxima (reed sweet-grass) and Sparganium erectum (branched bur-reed), were common throughout the lengths surveyed. Carex acutiformis (lesser pond-sedge) and Carex riparia (greater pond-sedge) were locally dominant on the margins of both arms of the river, especially in the more southerly lengths.

A number of wetland herbs were common, growing as single species stands or in mixed stands with the dominant emergent species. The most abundant of these were Rorippa amphibia (great yellow-cress), Solanum dulcamara (bittersweet) Nasturtium officionale (Green water-cress), Stachys palustris (marsh woundwort) and Mentha aquatica (water mint). Occasional to frequent species included Apium nodiflorum (Fool's Water-cress), Berula erecta (Lesser Water-parsnip), Myosotis scorpioides (water forget-me-not) and Rumex hydrolapathum (Water Dock).

3.4 Aquatic plants: species richness and composition of the community

11 aquatic species were recorded, including 2 local species. The most abundant aquatic was Ranunculus penicillatus (stream water-crowfoot) which occurred frequently to abundantly throughout the lengths surveyed, particularly in faster flowing sections. Three Potamogeton species were also recorded, P.pectinatus (fennel pondweed), P.lucens (shining pondweed) and P.perfoliatus (perfoliate pondweed). P.pectinatus was locally co-dominant with R.penicillatus in the eastern arm and occasionally in the west arm of the river, favouring shallow gravel substrates. P.lucens was locally dominant to abundant in the eastern arm and P.perfoliatus was an occasional in both arms.

Callitriche sp. (starwort), Elodea canadensis (Canadian pondweed) and Lemna minor (common duckweed) were frequently recorded in low abundance in marginal vegetation and slack water areas at the channel edge. Callitriche sp. and Sparganium emersum (unbranched bur-reed) also formed occasional submerged stands in fast flowing sections. Small submerged plants of Sagittaria sagittifolia (arrowhead) were recorded in Lengths 2 and 5. Further stands of this species might be evident later in the year.

3.5 Local and locally common marginal, emergent and aquatic species

Three local species and two locally common species were recorded (see Appendix 6.2 for status and distribution). None of the species recorded were listed by Palmer and Newbold (1983) as being in need of special protection in the Thames catchment.

3.6 Variations in the vegetation of the survey area

The marginal wetland communities were generally similar in species composition and diversity throughout the survey area, only Length 4 standing out as having a noticeably richer marginal community than other areas (see Section 3.2 above). Length 4 supported a number of species absent from, or uncommon in, other lengths (see description of Length 4) and was also the only area where the local sedge Carex pseudocyperus (cyperus sedge) was recorded.

Unlike the marginal/emergent communities the, aquatic communities changed noticeably downstream. In particular, the aquatic community was most diverse in a 300m band running east-west across both arms of the river between the footbridge at the southern end of Lengths 1 and 4 (GR 43599 20966) and Farm Mill (middle of Lengths 2 and 5, 43598 20922).

Species largely restricted to this zone included all the local and locally common aquatic species recorded in the survey. Potamogeton perfoliatus (perfoliate pondweed) was present in this section in both arms (see Appendix 2). Potamogeton lucens (shining pondweed) was locally very abundant in the west arm only and Sagittaria sagittifolia (arrowhead) was present very occasionally in both arms. Butomus umbellatus (flowering-rush) was present in both arms and mostly limited to this area though there were a few plants upstream. The factors causing this change in aquatic vegetation were unclear. However, substrate composition may be important as substrates appeared to be finer in this area with sand instead of the gravels and cobbles more typical of other areas.

4. DESCRIPTION OF FLOOD PLAIN

The flood plain was surveyed in the area bounded by the ditch running from GR 43610 20952 to GR 43645 20877 (see Figure 2).

The area was dominanted by intensively managed grassland and arable fields with very little wildlife interest.

At the northern end of the site the ditch line originated from a large dry moat, the centre of which supported secondary woodland dominated by sycamore (Acer pseudoplatanus) with some ash (Fraxinus excelsior), maple (Acer campestre), crack willow (Salix fragilis) and elder (Sambucus nigra). The understory of the wood was dominated by Urtica dioica (common nettle) and Hedera helix (ivy).

The three fields south of the moat adjacent to Manor Farm were all reseeded ryegrass (Lolium perenne) pastures (see photograph 1 overpage).

Two large fields, occupying the remainder of this floodplain area, were both intensively planted with arable crops (see photograph 2).

Two ditches running from the boundary ditch to the R. Windrush (at GRs 43608 20929 and 43622 20903) were dry. The nothern most ditch was heavily shaded and supported very few wetland plant species. The southern ditch was artificially lined with no wetland community.

Two ponds connected to the ditch line at GR 43611 20951 were also dry, but retained a wetland vegetation dominated by Phalaris arundinacea (reed canary-grass) (see photograph 1 overpage) with frequent Polygonum amphibium (amphibious bistort) and occasional Lithrum salicaria (purple loosestrife), Solanum dulcamara (bittersweet), Mentha aquatica (water mint), Myosotis scorpioides (water forget-me-not) and Alopecurus geniculatus (marsh foxtail).

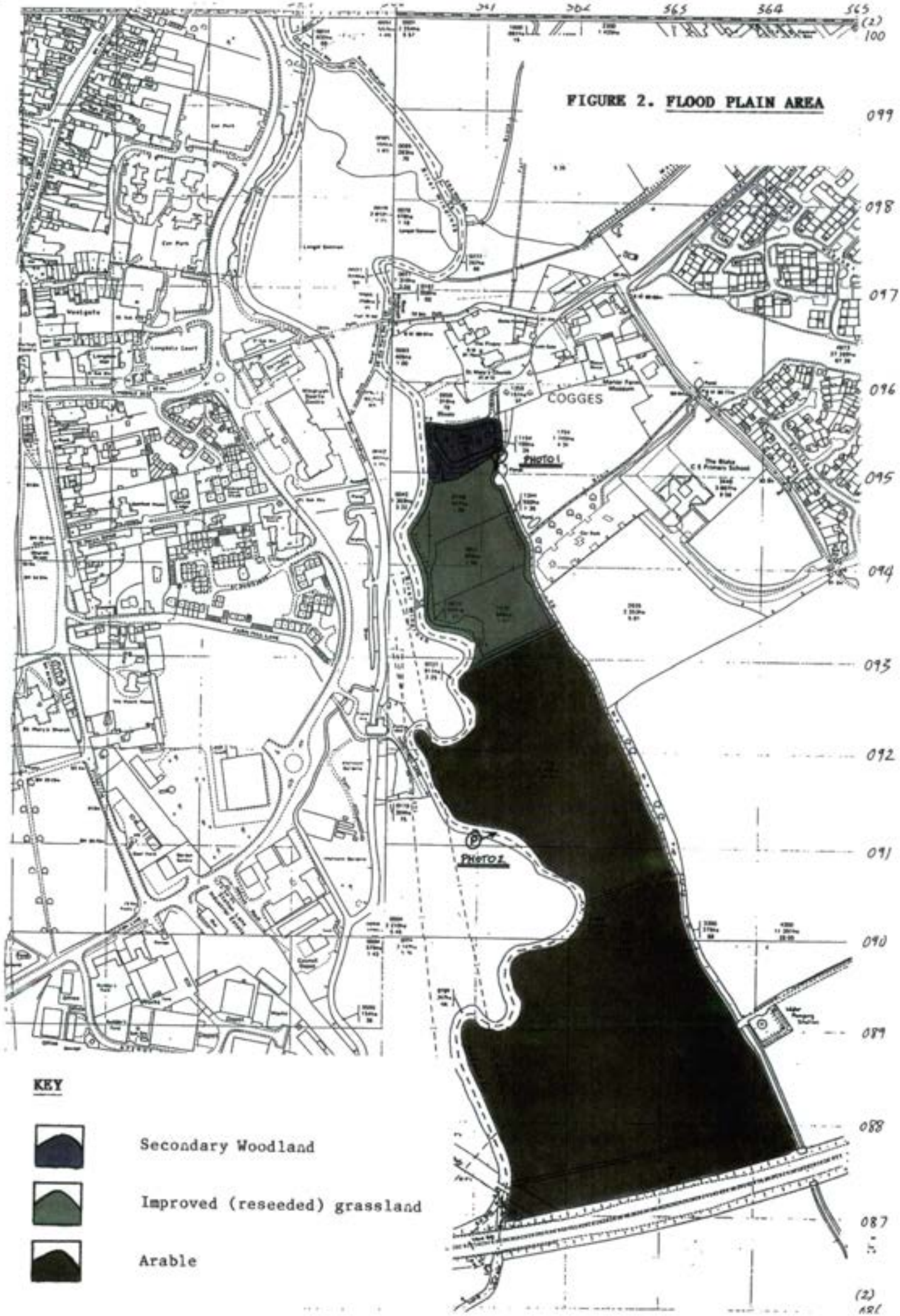


FIGURE 2. FLOOD PLAIN AREA
COGGES
PHOTO 1
PHOTO 2
KEY
Secondary Woodland
Improved (reseeded) grassland
Arable

4. DESCRIPTION OF FLOOD PLAIN

The flood plain was surveyed in the area bounded by the ditch running from GR 43610 20952 to GR 43645 20877 (see Figure 2).

The area was dominanted by intensively managed grassland and arable fields and held little wildlife interest.

At the northern end of the site the ditch line originated from a large dry moat, the centre of which supported secondary woodland dominated by sycamore (Acer pseudoplatanus) with some ash (Fraxinus excelsior), maple (Acer campestre), crack willow (Salix fragilis) and elder (Sambucus nigra). The understory of the wood was dominated by Urtica dioica (common nettle) and Hedera helix (ivy).

The three fields south of the moat adjacent to Manor Farm were all reseeded ryegrass (Lolium perenne) pastures (see photograph 1 overpage).

Two large fields, occupying the remainder of this floodplain area, were both intensively planted with arable crops (see photograph 2).

Two ditches running from the boundary ditch to the R. Windrush (at GRs 43608 20929 and 43622 20903) were dry. The nothern most ditch was heavily shaded and supported very few wetland plant species. The southern ditch was artificially lined with no wetland community.

Two small ponds connected to the ditch line at GR 43611 20951 were also dry, but retained a wetland vegetation dominated by Phalaris arundinacea (reed canary-grass) (see photograph 1 overpage) with frequent Polygonum amphibium (amphibious bistort) and occasional Lithrum salicaria (purple loosestrife), Solanum dulcamara (bittersweet), Mentha aquatica (water mint), Myosotis scorpioides (water forget-me-not) and Alopecurus geniculatus (marsh foxtail).

PHOTOGRAPH 1 Looking westwards across improved pasture (to the right) with one of the two dry, on-ditch ponds in the foreground (left).

PHOTOGRAPH 2 Looking eastwards across the arable fields with the wooded ditch line on the horizon.

PHOTOGRAPH 1/1 Steep eastern banks (left) colonised by wetland herbs, ruderals and grasses. More gently sloping western margins (right) supporting mixed emergents and wetland herbs at channel edge. Woodland belt behind.

PHOTOGRAPH 1/2 Unshaded eastern margins fringed with emergents: Phalaris arundinacea (Reed Canary-grass) and Glyceria maxima (Reed Sweet-grass). Western margins overhung by a belt of secondary woodland. Potamogeton lucens (shining pondweed) dominant in the channel.

5.2 Length 2. West Arm: Drain inlet (GR 43598 20949) to ditch inlet (GR 43596 20902)

Land-use. At the nothern end of the length the west bank was fringed by a belt of woodland separating it from the urban areas of Witney. Southwards this gave way to allotments and then waste ground. The east bank was bordered by a strip of rank grassland occupying the area between the two Windrush channels.

Bank structure. Bank heights varied between 0.5-2m. Profiles varied along the length from approximatley 20 degrees to either near vertical or steep two-stage banks.

Shade. Shade was generally moderate with 10-20% of the banks typically overhung. In the area bordering the allotments (south of bridge at GR 43598 20921) heavy shade locally restricted the development of marginal plants.

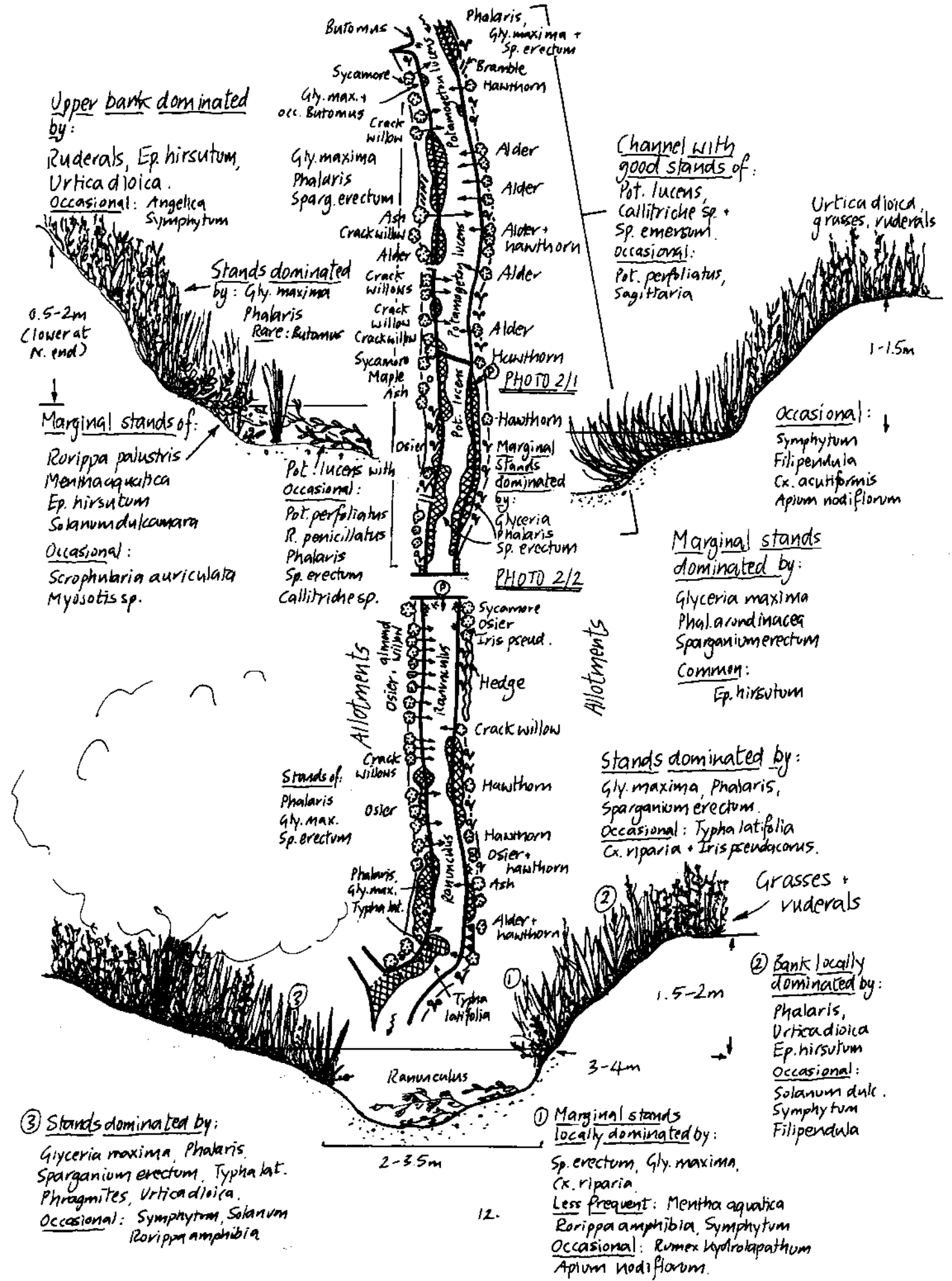
Vegetation. Shallow-angled banks supported mixed and monodominant stands of the typical emergents: Phalaris arundinacea (reed canary-grass), Glyceria maxima (reed sweet-grass) Sparganium erectum (branched bur-reed). Carex acutiformis (lesser pond-sedge) and Carex riparia (greater pond-sedge) were locally dominant on the 'step' of two-stage banks. At the southern end of the length the west bank locally supported stands of Typha latifolia (bulrush) and Phragmites australis (common reed), both species which were very uncommon in other lengths.

Wetland herbs typical of the river (see Section 3 and overpage) were freqent within tall emergent stands at the waters edge and mixed with grasses and ruderals on the upper bank.

Stream water-crowfoot (Ranunculus penicillatus) was abundant in the open channel throughout the length. Potamogeton lucens (shining pondweed) was frequent and locally dominant above the bridge at 43598 20921. It was frequently mixed with the less abundant Potamogeton perfoliatus (perfoliate pondweed). Callitriche sp. (starwort) and Sparganium emersum (unbranched bur-reed) formed occasional submerged stands in fast flowing sections. Callitriche sp. was also recorded with Elodea canadensis (Canadian pondweed) and Lemna minor (common duckweed) in marginal vegetation and slack water areas at the channel edge.

Sagittaria sagittifolia (arrowhead) and Butomus umbellatus (flowering-rush) were occasionally recorded in the northern half of the length, growing submerged in the channel (see Appendix 2).

LENGTH 2


Upper bank dominated by:
Ruderals, Ep. hirsutum, Urtica dioica.
Occasional: Angelica Symphytum
Stands dominated by: Gly. maxima Phalaris
Rare: Butomus
0.5-2m (lower at N. end)
Marginal stands of:
Rorippa palustris
Mentha aquatica
Ep. hirsutum
Solanum dulcamara
Occasional:
Scrophularia auriculata
Myosotis sp.
Pot. lucens with
Occasional:
Pot. perfoliatus
R. penicillatus
Phalaris
Sp. erectum
Callitriche sp.
Butomus
Sycamore
Gly. max. + occ. Butomus
Crack willow
Gly. maxima
Phalaris
Sparg. erectum
Ash
Crack willow
Alder
Crack willows
Crack willow
Crack willow
Sycamore
Maple
Ash
Osier
Potamogeton lucens
Phalaris, Gly. maxima + Sp. erectum
Bramble
Hawthorn
Alder
Alder
Alder + hawthorn
Alder
Alder
Hawthorn
PHOTO 2/1
Hawthorn
Marginal stands dominated by:
Glyceria
Phalaris
Sp. erectum
PHOTO 2/2
Channel with good stands of:
Pot. lucens,
Callitriche sp. + Sp. emersum.
Occasional:
Pot. perfoliatus,
Sagittaria
Urtica dioica, grasses, ruderals
1-1.5m
Occasional:
Symphytum
Filipendula
Cx. acutiformis
Apium nodiflorum
Marginal stands dominated by:
Glyceria maxima
Phal. arundinacea
Sparganium erectum
Common:
Ep. hirsutum
Allotments
Allotments
Sycamore
Osier
Iris pseud.
Osier, almond willow
Ranunculus
Hedge
Crack willow
Crack willows
Osier
Hawthorn
Hawthorn
Osier + hawthorn
Ash
Alder + hawthorn
Phalaris, Gly. max. Typha lat.
Ranunculus
Typha latifolia
Stands of:
Phalaris
Gly. max.
Sp. erectum
Stands dominated by:
Gly. maxima, Phalaris,
Sparganium erectum.
Occasional: Typha latifolia
Cx. riparia + Iris pseudacorus.
Grasses + ruderals
1.5-2m
3-4m
2-3.5m
Ranunculus
② Bank locally dominated by:
Phalaris,
Urtica dioica
Ep. hirsutum
Occasional:
Solanum dulc.
Symphytum
Filipendula
① Marginal stands locally dominated by:
Sp. erectum, Gly. maxima,
Cx. riparia.
Less frequent: Mentha aquatica
Rorippa amphibia, Symphytum
Occasional: Rumex hydrolapathum
Apium nodiflorum.
③ Stands dominated by:
Glyceria maxima, Phalaris,
Sparganium erectum, Typha lat.
Phragmites, Urtica dioica.
Occasional: Symphytum, Solanum
Rorippa amphibia

LENGTH 2. WEST ARM

PHOTOGRAPH 2/1 Channel margins fringed by tall emergents Glyceria maxima (Reed Sweet-grass) and Sparganium erectum (Branched Bur-reed) with Epilobium hirsutum (Great Willowherb) and Urtica dioica (Common Nettle) dominant on the banks. Potamogeton lucens (shining pondweed) and Potamogeton perfoliatus (Perfoliate pondweed) common in the channel.

PHOTOGRAPH 2/2 Shaded margins bodering allotments locally restricting the development of channel marginal and bank vegetation. Ranunculus penicillatus (Stream water-crowfoot) common on gravel and cobble riffles in the chanel.

5.3 Length 3. West Arm: Ditch inlet (GR 43596 20902) to A40 Road bridge (GR 43594 20866)

Land-use. The east bank was bordered by an area of overgrown pasture 100-200m wide, separating the east and west arms of the Windrush. In the north of the length the west bank was borderd by urban surfaces. Downstream, the west bank was bordered by an area of rank grassland/wasteground separating the river from the new buildings of the Wittan Park industrial estate.

Banks. The banks were generally steep (typically 30-80 degrees) particularly in the upstream half of the length. The height of both banks varied between 0.5 and 2m.

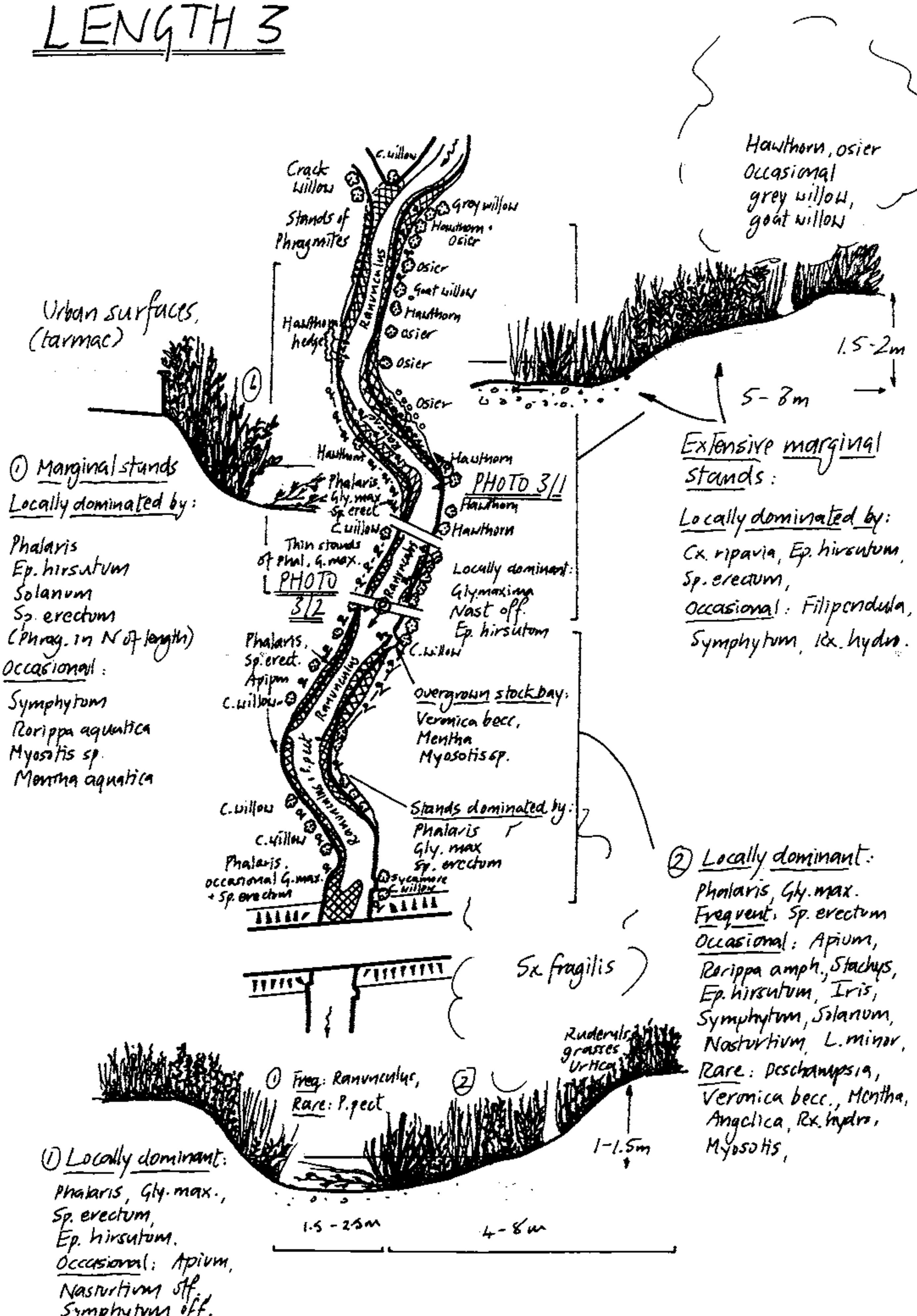
Shade. The west bank was little shaded throughout the length. The east bank was approximatly 20% shaded, mainly by crack willow (Salix fragilis) and hawthorn (Crataegus monogyna) on the bank top.

Vegetation. Stands of tall marginals formed a semicontinous band 0.5-8m wide along both banks through most of the length. Phalaris arundinacea (reed canary-grass), Glyceria maxima (reed sweet-grass) and Sparganium erectum (branched bur-reed) were the main dominants. Carex acutiformis (lesser pond-sedge), Carex riparia (greater pond-sedge) and Phragmites australis (common reed) were locally common.

Wetland herbs typical of the river (see Section 3 and overpage) were again frequent at the channel edge and amongst stands of taller dominants. An old stock bay at GR 43595 20880 supported secies such as Myosotis scorpioides (water forget-me-not), Veronica beccabunga (brooklime) and Mentha aquatica (water mint) which were otherwise uncommon in the length.

Stream water-crowfoot (Ranunculus penicillatus) was abundant in the open channel throughout length. Fontinalis antipyretica (willow moss) was frequent. Potamogeton pectinatus (fennel pondweed) was locally co-dominant with R. penicillatus towards the south end of the length.

LENGTH 3


Hawthorn, osier
Occasional
grey willow,
goat willow
Crack willow
c. willow
Stands of Phragmites
Grey willow
Hawthorn + Osier
Osier
Goat willow
Hawthorn
osier
Osier
Osier
Ranunculus
Urban surfaces, (tarmac)
Hawthorn hedge
1.5-2m
5-8m
Extensive marginal stands:
Locally dominated by:
Cx. riparia, Ep. hirsutum,
Sp. erectum,
Occasional: Filipendula,
Symphytum, Rx. hydro.
① Marginal stands
Locally dominated by:
Phalaris
Ep. hirsutum
Solanum
Sp. erectum
(Phrag. in N of length)
Occasional:
Symphytum
Rorippa aquatica
Myosotis sp.
Mentha aquatica
Hawthorn
Phalaris
Gly. max
Sp. erect
C. willow
PHOTO 3/1
Hawthorn
Hawthorn
Thin stands of Phal. G. max.
PHOTO 3/2
Locally dominant:
Glymaxima
Nast off.
Ep. hirsutum
Phalaris,
Sp. erect.
Apium
C. willow
C. willow
overgrown stock bay:
Veronica becc.
Mentha
Myosotis sp.
Stands dominated by:
Phalaris
Gly. max
Sp. erectum
C. willow
C. willow
Ranunculus + P. pect
Phalaris,
occasional G. max.
+ Sp. erectum
Sycamore
C. willow
② Locally dominant:
Phalaris, Gly. max.
Frequent: Sp. erectum
Occasional: Apium,
Rorippa amph., Stachys,
Ep. hirsutum, Iris,
Symphytum, Solanum,
Nasturtium, L. minor,
Rare: Deschampsia,
Veronica becc., Mentha,
Angelica, Rx. hydro,
Myosotis,
Sx. fragilis
Ruderals, grasses, Urtica
① Freq: Ranunculus,
Rare: P. pect
②
1-1.5m
① Locally dominant:
Phalaris, Gly. max.,
Sp. erectum,
Ep. hirsutum.
Occasional: Apium,
Nasturtium off.
Symphytum off.
1.5 - 2.5m
4 - 8m

PHOTOGRAPH 3/1 West bank (left) with mixed stands of wetland herbs and marginal emergents bordering urban areas. East bank supporting more extensive stands (Sparganium erectum (Branched Bur-reed) and Carex riparia (Greater Pond-sedge)).

PHOTOGRAPH 3/2 Margins supporting stands of emergents with wetland herbs at waters edge (Nasturtium officinale (Green Water-cress), Solanum dulcamara (Bittersweet), Stachys palustris (Marsh Woundwort)) and on bank (mainly Epilobium hirsutum (Great Willowherb), Urtica dioica (Common Nettle)). R.penicillatus (Stream water-crowfoot) abundant in the channel.

5.4 LENGTH 4. East Arm: River divergance (GR 43590 20995) to ditch inlet (GR 43603 20949)

Land-use. The northern half of the east bank (above the foot bridge at GR 43599 20967) was bordered by relatively unimproved, cattle grazed pasture. Downstream of the bridge this turned to improved pasture and then to secondary woodland (developed on an old moated site that is part of the Manor Farm Museum). The west bank was typically bordered by rank grassland.

Bank structure. Along most of the length the east bank was low angled and, where grazed, lightly poached. Excepting point bar sequences, the west bank was generally steep, frequently 60-90 degrees and 0.6-1.m high

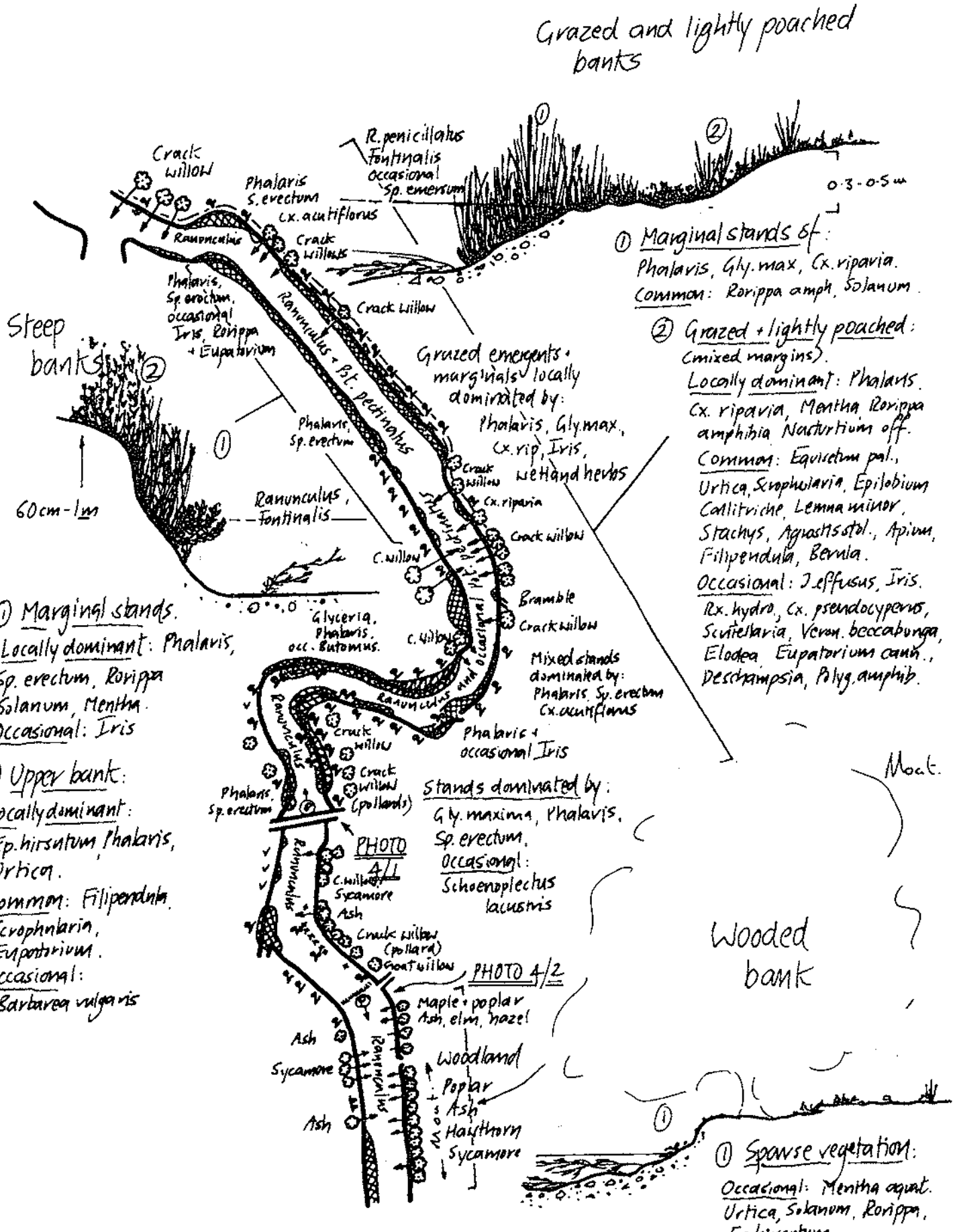
Shade. Secondary woodland bordering the moat shaded part of the east bank at the downstream end of the length, but most banks were unshaded except for a few scattered (often pollarded) willows.

Vegetation. The grazed eastern margins of the northern half of the length supported a 1-3m fringe of typical tall emergent species with occasional Schoenoplectus lacustris (common club-rush) and Butomus umbellatus (flowering-rush) present at the channel edge. The lightly poached and grazed edge behind this waterside fringe (see overpage) supported a relatively rich marginal wetland flora including a number of species rare or absent in other lengths. These included Carex pseudocyperus (cyperus sedge), Scutellaria galericulata (skullcap), Hypericum tetrapterum (square-stalked St John's wort), Polygonum amphibium (amphibious bistort) and Equisetum palustris (marsh horsetail).

Other margins generally supported thin to locally good stands of mixed emergents and marginal species. The south-east bank abbutting the moat was heavily shaded with little marginal or bankside vegetation.

The submerged plant community was dominated by Ranunculus penicillatus (stream water-crowfoot) which was common throughout the length. Potamogeton pectinatus (fennel pondweed) was locally co-dominant, particularly in shallow riffle areas in the northern half of the length. Fontinalis antipyretica (willow moss) was common on hard substrates (eg stones and cobbles) in the channel. Elodea canadensis (Canadian pondweed), Callitriche sp. (starwort) and Lemna minor (common duckweed) were locally frequent particularly within the flooded, poached edges of the grazed north-east margin (see Profile overpage).

LENGTH 4


Grazed and lightly poached banks
Crack willow
Phalaris S. erectum Cx. acutiflorus
R. penicillatus Fontinalis occasional Sp. emersum
Ranunculus
Crack willows
Phalaris, Sp. erectum, occasional Iris, Rorippa + Eupatorium
Crack Willow
Ranunculus + Rt. pectinatus
Steep bank
60cm - 1m
Phalaris, Sp. erectum
Ranunculus, Fontinalis
C. willow
Glyceria, Phalaris, occ. Butomus.
Grazed emergents + marginals locally dominated by: Phalaris, Gly. max., Cx. rip, Iris, wetland herbs
Crack willow
Cx. riparia
Crack willow
Bramble
Crack willow
C. willow
Mixed stands dominated by: Phalaris Sp. erectum Cx. acutiflorus
Ranunculus and occasional
Phalaris + occasional Iris
Crack willow
Crack willow (pollards)
Phalaris, Sp. erectum
PHOTO 4/1
C. willow, Sycamore
Ash
Crack willow (pollard)
Goat willow
PHOTO 4/2
Maple + poplar Ash, elm, hazel
Ash
Sycamore
Ash
Woodland
Poplar
Ash
Hawthorn
Sycamore
Stands dominated by: Gly. maxima, Phalaris, Sp. erectum, Occasional: Schoenoplectus lacustris
Mod.
Wooded bank
0.3 - 0.5 m
① Marginal stands of: Phalaris, Gly. max, Cx. riparia. Common: Rorippa amph, Solanum.
② Grazed + lightly poached: (mixed margins). Locally dominant: Phalaris. Cx. ripavia, Mentha Rorippa amphibia Nasturtium off. Common: Equisetum pal., Urtica, Scrophularia, Epilobium Callitriche, Lemna minor, Stachys, Agrostis stol., Apium, Filipendula, Bernia. Occasional: J. effusus, Iris. Rx. hydro, Cx. pseudocyperus, Scutellaria, Veron. beccabunga, Elodea Eupatorium cann., Deschampsia, Polyg. amphib.
① Marginal stands. Locally dominant: Phalaris, Sp. erectum, Rorippa Solanum, Mentha. Occasional: Iris
② Upper bank: Locally dominant: Ep. hirsutum, Phalaris, Urtica. Common: Filipendula, Scrophularia, Eupatorium. Occasional: Barbarea vulgaris
① Sparse vegetation: Occasional: Mentha aquat. Urtica, Solanum, Rorippa, Ep. hirsutum

LENGTH 4. EAST ARM

PHOTOGRAPH 4/1 East (right) margin bordered by relatively unimproved pasture. Margins lightly poached by cattle, with a relatively diverse wetland herb flora including a number of species not recorded in other lengths. Ranunculus penicillatus (Stream water-crowfoot) abundant in the channel.

PHOTOGRAPH 4/2 East margin (left) heavily shaded by secondary woodland surrounding an overgrown moat. Steep west bank. Ranunculus penicillatus (Stream water-crowfoot) very abundant on a gravel riffle in the channel.

PHOTOGRAPH 5/1 Point bar on west (left) bank with low angles, colonised by emergent stands dominated by Phalaris arundinacea (Reed Canary-grass), with Glyceria maxima (Reed Sweet-grass), Sparganium erectum (Branched Bur-reed) and low growing herbs such as Rorippa amphibia (Great Yellow-cress) locally frequent.

PHOTOGRAPH 5/2 Bank bordered by mixed stands of marginal and bankside herbs with Nasturtium officinale (Green Water-cress) common at the waters edge. E.hirsutum (Great Willowherb) and U.dioica (Common Nettle) dominating upper banks. R.penicillatus (Stream water-crowfoot) and Potamogeton pectinatus (Fennel Pondweed) co-dominant in channel.

5.5 Length 5. East arm: Ditch inlet (GR 43603 20949) to ditch inlet (GR 43621 20904)

Land-use. The east bank of the river was bordered by improved grassland and arable fields. The west bank was bordered by rank grassland.

Bank structure. Banks were typically 1-1.5m high, but bank slopes varied considerably as the river ran through a series of meanders, alternating between steep banks (locally vertical earth cliffs) and the lower angles of pointbar sequences.

Shade. Shading was relatively light, with trees scattered or in small clumps lining approximatly 5-10% of the channel margins. Trees were mainly willow species (Salix fragilis, S.viminalis, S.cinerea), sycamore (Acer pseudoplatanus), hawthorn (Crataegus monogyna and occasional alder (Alnus glutinosa) and ash (Fraxinus excelsior).

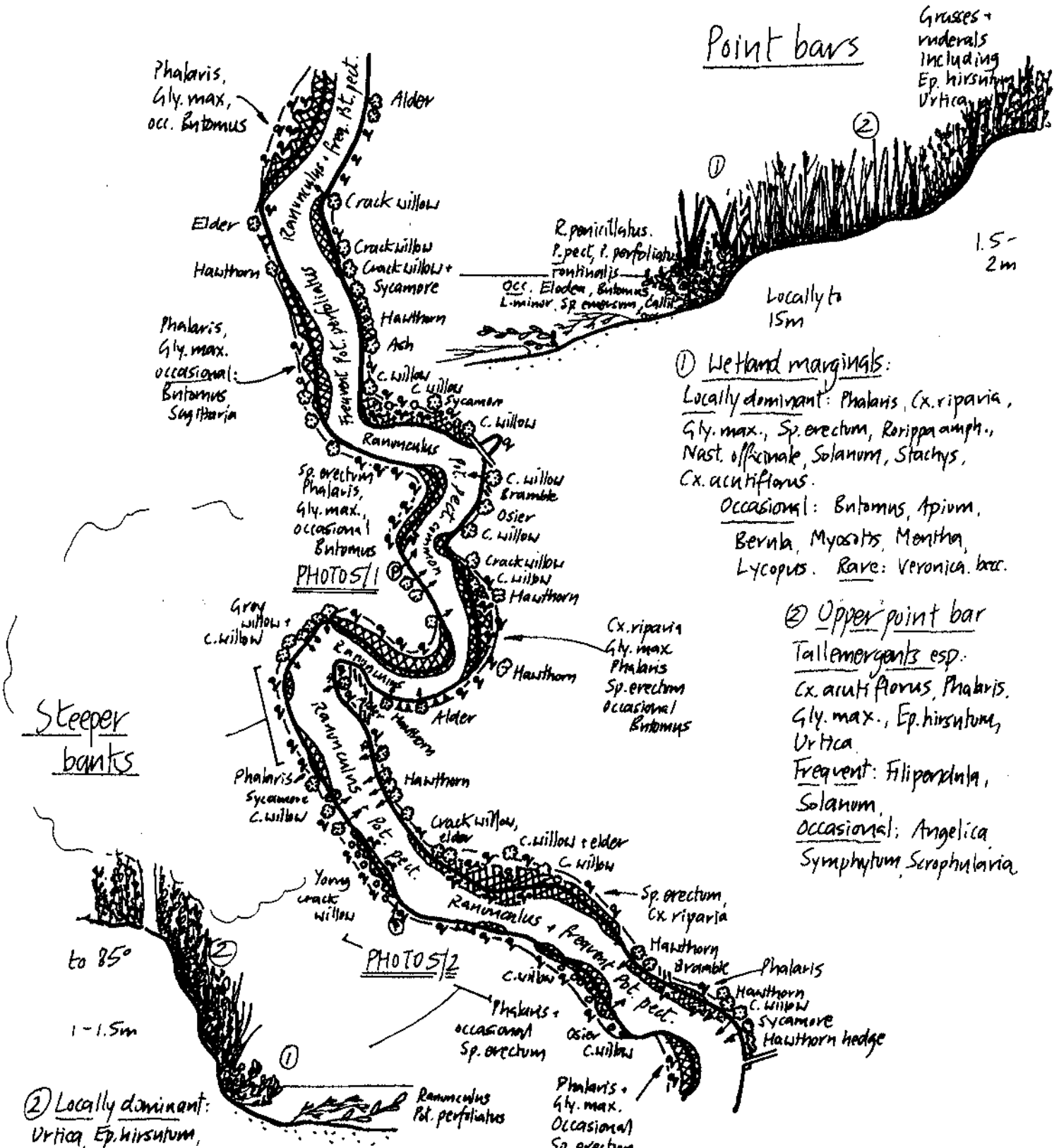
Vegetation. The vegetation structure and community alternated around meander bends as the bank angle changed. Point bars supported extensive stands of tall emergents, particularly Phalaris arundinacea (reed canary-grass), Glyceria maxima (reed sweet-grass), Carex acutiformis (lesser pond-sedge) and locally Carex riparia (greater pond-sedge). Sparganium erectum (branched bur-reed) was common at the channel edge with stands of wetland herbs such as Rorippa amphibia (great yellow-cress), Solanum dulcamara (bittersweet) and Mentha aquatica (water mint).

Sagittaria sagittifolia (arrowhead) and Butomus umbellatus (flowering-rush) were occasionally recorded in the northern half of the length growing submerged within the channel and within emergent vegetation at waters edge (see Appendix 2).

The steeper banks had variable cover of ruderals and wetland species including Epilobium hirsutum (great willowherb), Eupatorium cannabinum (hemp-agrimony), Filipendula ulmaria (meadowsweet) and Urtica dioica (common nettle) with, locally, a thin fringe of the common emergents and marginals at the waters edge (see Profile overpage).

The submerged plant community was dominated by Ranunculus penicillatus (stream water-crowfoot) which was abundant throughout the length. Potamogeton pectinatus (fennel pondweed) was frequently co-dominant in the southern half of the length. Potamogeton perfoliatus (perfoliate pondweed) was also frequent in the northern half of the length. Fontinalis antipyretica (willow moss) was occasional to frequent throughout. Callitriche sp. (starwort), Elodea canadensis (Canadian pondweed) and Lemna minor (common duckweed) were occasional in slacks at the channel margins.

LENGTH 5


Point bars
Grasses + ruderals including Ep. hirsutum, Urtica
Phalaris, Gly. max, occ. Butomus
Alder
Crack willow
Elder
Crack willow
Crack willow + Sycamore
Hawthorn
Hawthorn
Ash
Phalaris, Gly. max. occasional: Butomus Sagittaria
C. willow
C. willow
Sycamore
C. willow
Ranunculus
Sp. erectum Phalaris, Gly. max., occasional Butomus
C. willow
Bramble
Osier
C. willow
Crack willow
C. willow
Hawthorn
PHOTOS 1
Grey willow + C. willow
Cx. riparia Gly. max Phalaris Sp. erectum occasional Butomus
Hawthorn
Alder
Steeper banks
Phalaris Sycamore C. willow
Hawthorn
Crack willow, elder
C. willow + elder
C. willow
Young crack willow
Sp. erectum, Cx riparia
Ranunculus + frequent Pot. pect.
Hawthorn
Bramble
Phalaris
Hawthorn
C. willow
Sycamore
Hawthorn hedge
PHOTOS 2
to 85°
1 - 1.5m
Phalaris + occasional Sp. erectum
Osier
C. willow
Phalaris + Gly. max. Occasional Sp. erectum, Cx. acutif.
Ranunculus Pot. perfoliatus
R. penicillatus. P. pect, P. perfoliatus, pectinatus occ. Elodea, Butomus, L. minor, Sp. emersum, Callit.
1.5 - 2m
Locally to 15m
① Wetland marginals: Locally dominant: Phalaris, Cx. riparia, Gly. max., Sp. erectum, Rorippa amph., Nast. officinale, Solanum, Stachys, Cx. acutiflorus. Occasional: Butomus, Apium, Berula, Myosotis, Mentha, Lycopus. Rare: Veronica. becc.
② Upper point bar Tall emergents esp. Cx. acutiflorus, Phalaris, Gly. max., Ep. hirsutum, Urtica Frequent: Filipendula, Solanum, Occasional: Angelica Symphytum, Scrophularia
② Locally dominant: Urtica, Ep. hirsutum, Rubus. Occasional: Filipendula, Scrophularia, Symphytum
① Occasional: thin fringe of tall emergents + wetland marginals eg Solanum, Stachys.

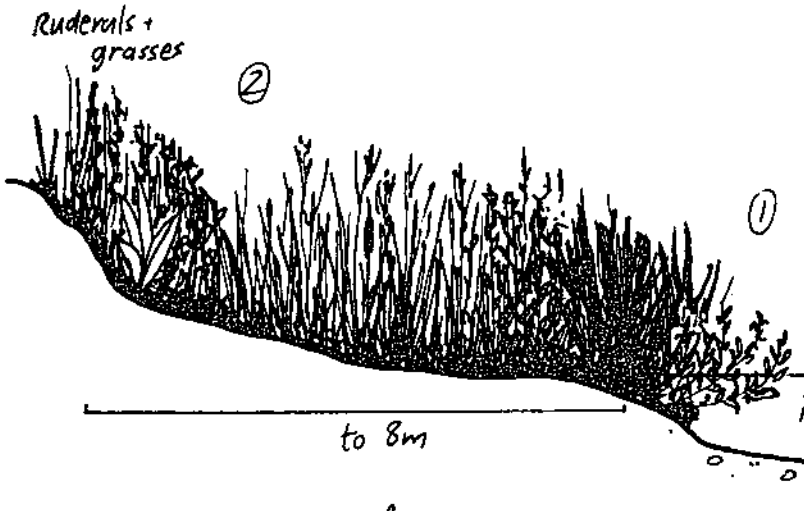
LENGTH 6. EAST ARM

PHOTOGRAPH 6/1 Meander bend with point bar on the east (left) bank dominated by tall emergents (Phalaris arundinacea (Reed Canary-grass) and Sparganium erectum (Branched Bur-reed)). Outer bank very steep and often poorly colonised.

PHOTOGRAPH 6/2 Two-stage eastern bank (left). Locally fringed by N.officinale (Green Water-cress) with 'step' colonised by P.arundinacea (Reed Canary-grass) (Carex acutiformis (Lesser Pond-sedge), C.riparia (Greater Pond-sedge) downstream). Western (right) bank abbutting overgrown pasture, dominated by E.hirsutum (Great Willowherb), and P.arundinacea (Reed Canary-grass), with occasional Rumex hydrolapathum (Water Dock).

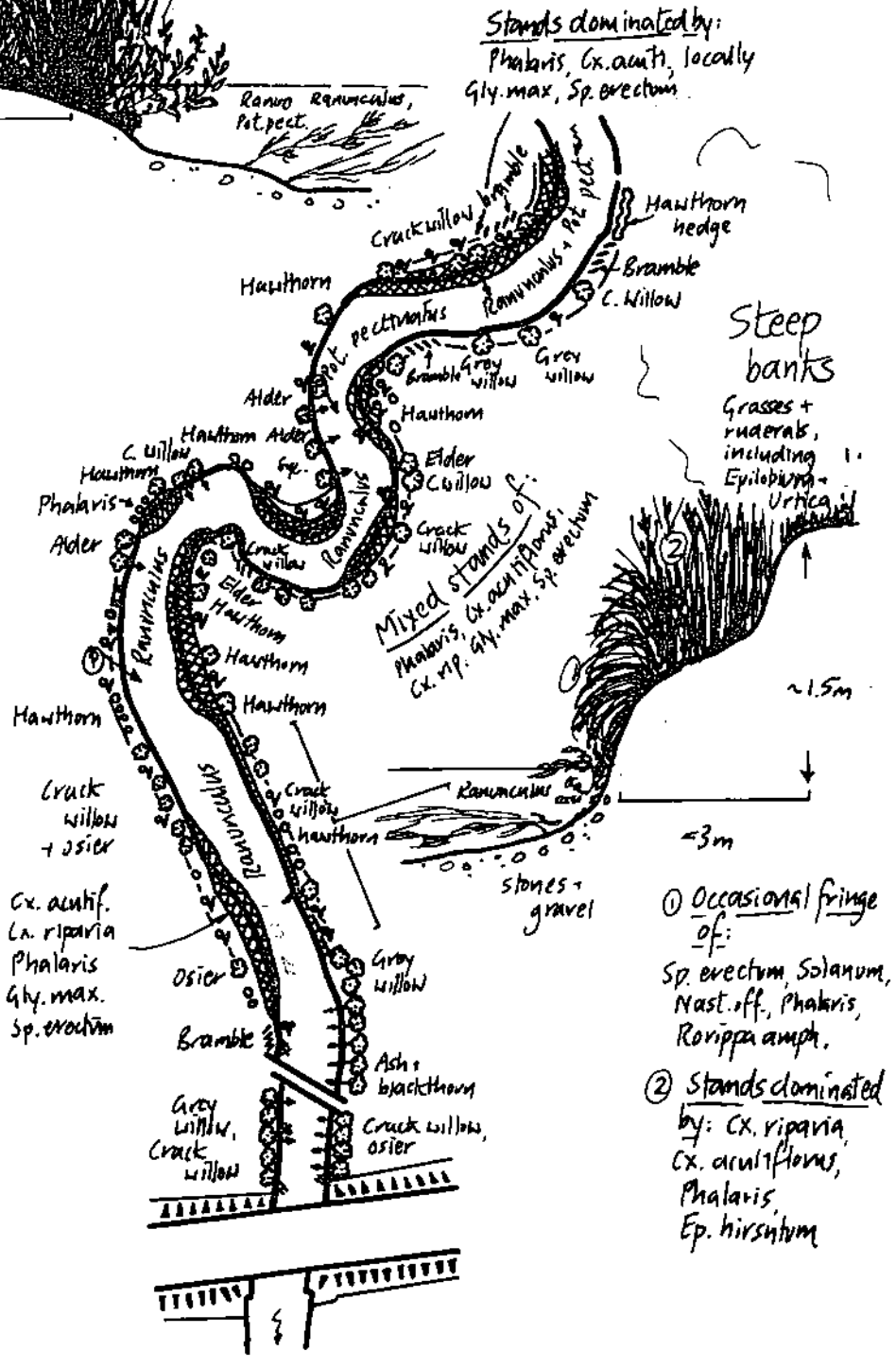
LENGTH 6

Point bar vegetation



① Marginal stands of:
Locally dominant: Sp. erectum, Rorippa amph., Solanum, Phalaris, Gly. max., Cx. riparia.
Common: Mentha aquatica
Occasional: Lemna minor, Callitriche

② Point bar stands:
Locally dominated by:
Cx. acutiflorus, Cx. riparia, Urtica, Ep hirsutum.
Common: Filipendula, Mentha aquatica
Occasional: Bx hydro. Myosotis, Veronica becc., Eupatorium, Scutellaria
Rare: J. effusus, J. inflexus.



① Occasional fringe of:
Sp. erectum, Solanum, Nast. off., Phalaris, Rorippa amph.

② Stands dominated by: Cx. riparia, Cx. acutiflorus, Phalaris, Ep. hirsutum

5.6 LENGTH 6. East Arm: Ditch inlet (GR 43621 20904) to A 40 bridge (GR 43613 20869)

Land-use. The river was bordered by arable fields to the east and abandoned pasture and rank grassland to the west.

Bank structure. Banks were typically approximately 1.5m high. Bank slopes were very variable, particulalrly along the winding northern half of the length where point bars alternated with steep banks and cliffs around meander bends.

Shade. Along most of the length scattered trees (mainly Salix spp., A.glutinosa and Acer pseudoplatanus) cast relatively light shade (⅛10%) on the river margins. At the southern end of the length, above the A40 road bridge,heavy shade locally restricted the growth of wetland vegetation.

Vegetation. In the northern half of the length the vegetation was similar to Length 5, with point bars supporting locally extensive mixed wetland stands and thin fringes growing on steeper eroded banks. In the southern half of the length very steep and two stage channel banks frequently supported stands dominated by Carex acutiformis (lesser pond-sedge) or Carex riparia (greater pond-sedge) and less frequently Phalaris arundinacea (reed canary-grass), Glyceria maxima (reed sweet-grass) and Sparganium erectum (branched bur-reed) (see Profile overpage).

The submerged plant community was dominated throughout the length by Ranunculus penicillatus (stream water-crowfoot). Potamogeton pectinatus (fennel pondweed) was also frequently present, particulalrly in the northern half of the length. Elodea canadensis (Canadian pondweed), Callitriche sp. (starwort) and Lemna minor (common duckweed) were occasional in sluggishly flowing areas at the margin of the river.

APPENDIX 6.1 WETLAND SPECIES RECORDED

SPECIES NAME	COMMON NAME
Agrostis stolonifera	Creeping Bent
Alopecurus geniculatus	Marsh Foxtail
Angelica sylvestris	Wild Angelica
Apium nodiflorum	Fool's Water-cress
Barbarea vulgaris	Winter-cress
Berula erecta	Lesser Water-parsnip
Butomus umbellatus	Flowering-rush
Callitriche sp.	Starwort
Carex acutiformis	Lesser Pond-sedge
Carex pendula	Pendulous Sedge
Carex pseudocyperus	Cyperus Sedge
Carex riparia	Greater Pond-sedge
Deschampsia caespitosa	Tufted Hair-grass
Elodea canadensis	Canadian pondweed
Epilobium hirsutum	Great Willowherb
Equisetum palustre	Marsh Horsetail
Eupatorium cannabinum	Hemp-agrimony
Filipendula ulmaria	Meadowsweet
Fontinalis antipyretica	Willow moss
Glyceria fluitans	Floating Sweet-grass
Glyceria maxima	Reed Sweet-grass
Hypericum tetrapterum	Square-stalked St John's wort
Iris pseudacorus	Yellow Flag
Juncus effusus	Soft Rush
Juncus inflexus	Hard Rush
Lemna minor	Common Duckweed
Lycopus europaeus	Gipsywort
Lythrum salicaria	Purple-loosestrife
Mentha aquatica	Water Mint
Myosotis scorpioides	Water Forget-me-not
Nasturtium officinale	Green Water-cress
Phalaris arundinacea	Reed Canary-grass
Phragmites australis	Common Reed
Polygonum amphibium	Amphibious Bistort
Potamogeton lucens	Shining pondweed
Potamogeton pectinatus	Fennel Pondweed
Potamogeton perfoliatus	Perfoliate pondweed
Ranunculus penicillatus subsp. pseudofluitans var. pseudofluitans	Stream water-crowfoot
Rorippa amphibia	Great Yellow-cress
Rumex hydrolapathum	Water Dock
Sagittaria sagittifolia	Arrowhead
Schoenoplectus lacustris	Common Club-rush
Scrophularia auriculata	Water Figwort
Scutellaria galericulata	Skullcap
Solanum dulcamara	Bittersweet
Sparganium emersum	Unbranched Bur-reed
Sparganium erectum	Branched Bur-reed
Stachys palustris	Marsh Woundwort
Symphytum officinale	Common Comfrey
Typha latifolia	Bulrush
Urtica dioica	Common Nettle
Veronica beccabunga	Brooklime

Latin and English equivalents from Dony et.al. (1986) The English names of wild flowers. BSBI. 2nd edition.

APPENDIX 6.2 STATUS AND OCCURRENCE OF LOCAL AND LOCALLY COMMON SPECIES

BUTOMUS UMBELLATUS (Flowering-rush)

National status and distribution: Rather local, rare in Wales and not native in Scotland. In ditches, ponds and canals, and at margins of rivers.

Occurrence in surveyed section: Occasional on the west arm of the Windrush in length 1 and 2 between GR 43593 20964 and 43600 20930 and on the east arm in lengths 4 and 5 between GR 43598 20972 and 43609 20923. Growing as an emergent plant near the margins in gently flowing water up to 1m deep on muddy sediments. Also growing submerged on sandy substrates in moderatly fast flowing water up to 1.5m deep.

SAGITTARIA SAGITTIFOLIA (Arrowhead)

National status and distribution: Rather local. Scattered throughout England and rarer in the north and parts of Wales. In shallow water in ponds, canals and slow flowing rivers on muddy substrata.

Occurrence in surveyed section: Found rarely in both arms of the Windrush around GR 43597 20949 and 43603 20935. Only small and submerged plants were recorded. Other plants may be evident later in the year.

CAREX PSEUDOCYPERUS (Cyperus Sedge)

National status and distribution: Local in England to N.lancs. By slow flowing rivers, in ditches, ponds, and stagnant water in woods.

Occurrence in surveyed section: A single small clump recorded on a grazed river bank partly shaded by a pollarded willow near the top of length 3 at GR 43598 20993.

POTAMOGETON LUCENS (Shining pondweed)

National status and distribution: Locally common in south and east England. Lakes, ponds, canals and small streams on nutrient rich inorganc substrata.

Occurrence in surveyed section: Common in length 2 on the west arm of the Windrush between GR 43597 20949 and 43598 20917. Typically growing in mid channel on sandy (often rather organic rich) sediments.

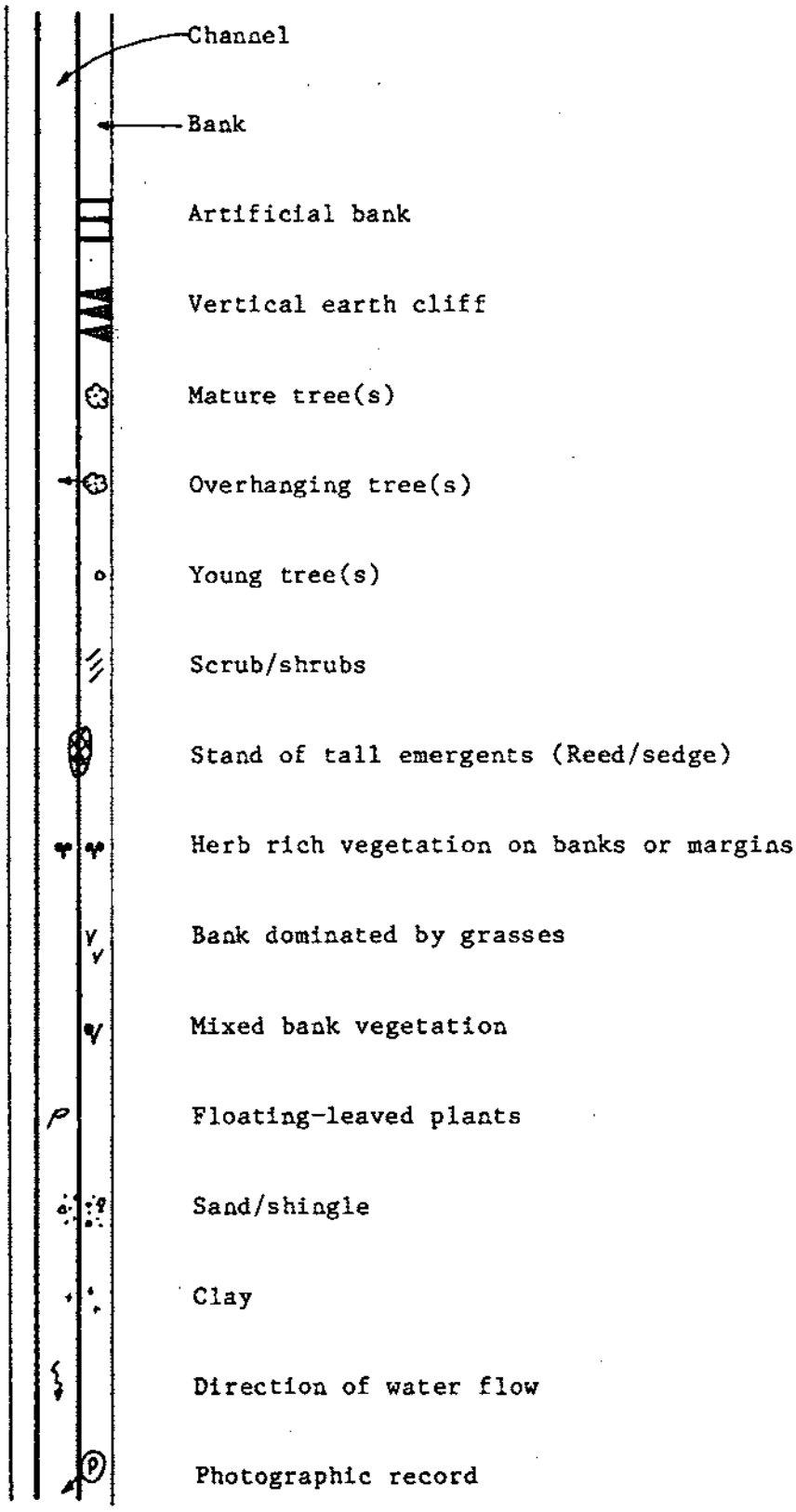
RORRIPA AMPHIBIA

National status and distribution: Locally frequent from Somerset and Kent northwards to Lankashire and NE Yorkshire. Local in marginal sedge-swamp by eutrophic streams, ditches and pools with very variable water levels.

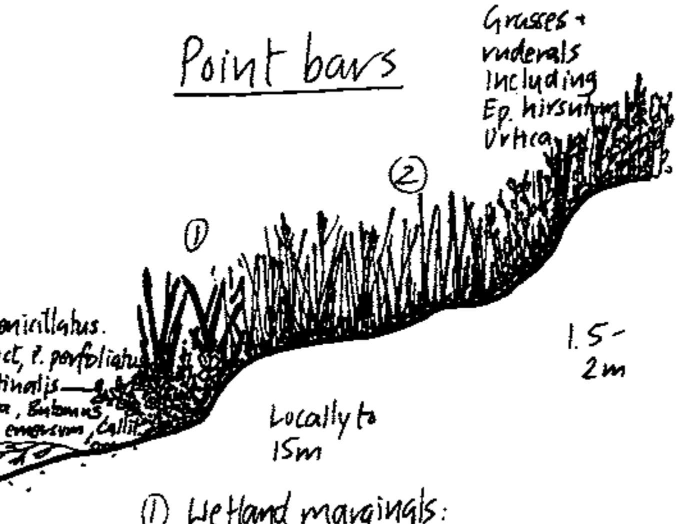
Occurrence in surveyed section: Common at the stream margins and more occasionally mixed in with tall emergent stands on the stream banks.

National status and distribution of species from: A.R. Clapham, T.G. Tutin and and D.M. Moore (1987) Flora of the British Isles. CUP. 3rd edition.

APPENDIX 6.3 KEY TO MAP SYMBOLS



LENGTH 5



① Wetland marginals:
Locally dominant: Phalaris, Cx. riparia, Gly. max., Sp. erectum, Rorippa amph., Nast. officinale, Solanum, Stachys, Cx. acutiflorus.
Occasional: Butomus, Apium, Berula, Myosotis, Mentha, Lycopus. Rare: Veronica. becc.

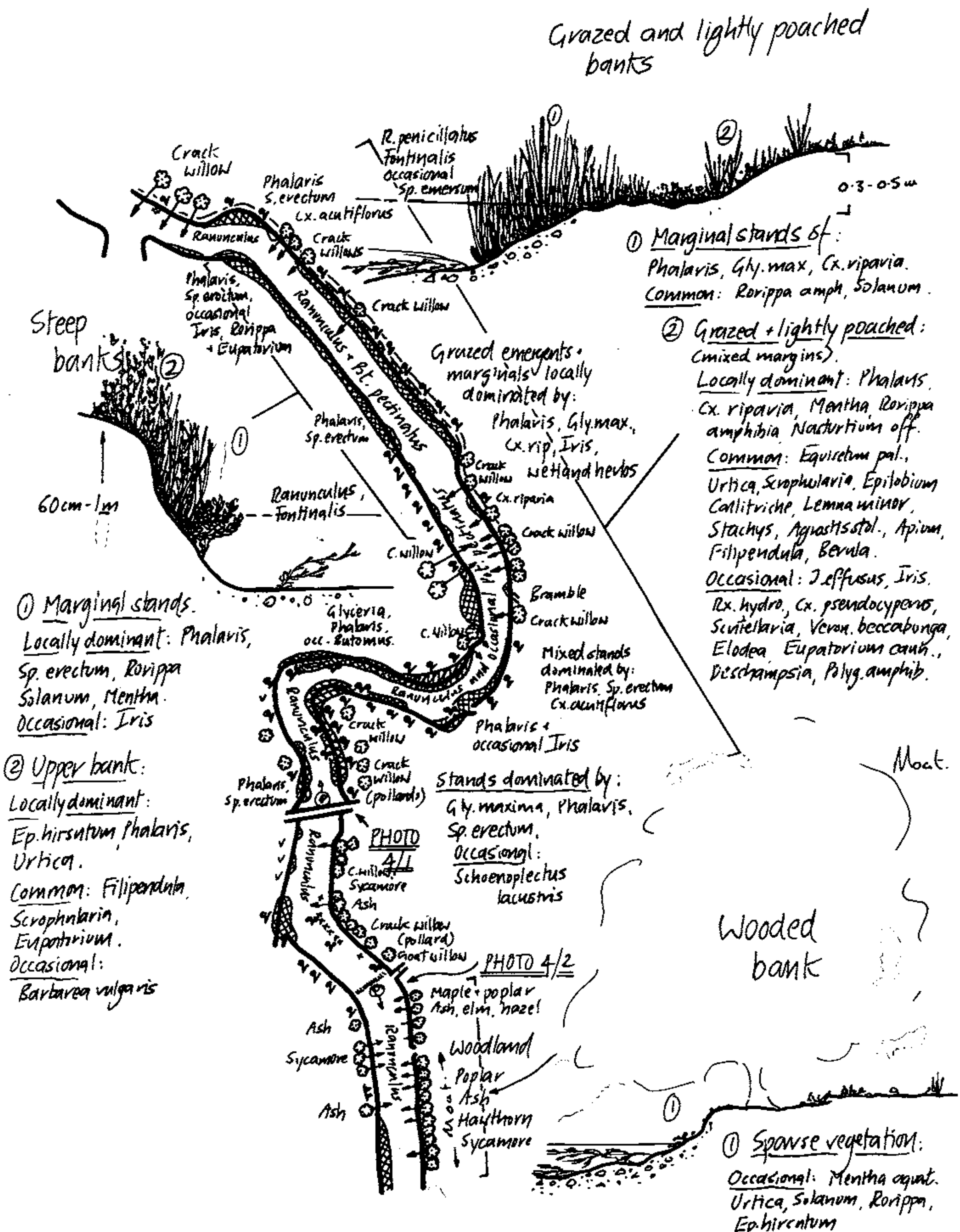
② Upper point bar
Tall emergents esp.
Cx. acutiflorus, Phalaris, Gly. max., Ep. hirsutum, Urtica.
Frequent: Filipendula, Solanum.
Occasional: Angelica, Symphytum, Scrophularia

Phalaris, Gly. max, occ. Butomus
Alder
Ranunculus + freq. Pot. pect.
Elder
Crack willow
Crack willow
Crack willow + Sycamore
Hawthorn
Hawthorn
Ash
Phalaris, Gly. max. occasional: Butomus, Sagittaria
Frequent Pot. perfoliatus
C. willow
C. willow
Sycamore
C. willow
Ranunculus
Pot. pect. common
Sp. erectum Phalaris, Gly. max., occasional Butomus
C. willow
Bramble
Osier
C. willow
PHOTO 5/1
Crack willow
C. willow
Hawthorn
Grey willow + c. willow
Cx. riparia Gly. max. Phalaris Sp. erectum Occasional Butomus
Hawthorn
Ranunculus
Alder
Hawthorn
Hawthorn
Ranunculus
Pot. pect.
Phalaris
Sycamore
C. willow
Crack willow, elder
C. willow + elder
C. willow
Young crack willow
Sp. erectum, Cx. riparia
Ranunculus + Frequent Pot. pect.
PHOTO 5/2
Hawthorn
Bramble
Phalaris
Hawthorn
C. willow
Sycamore
Hawthorn hedge
C. willow
Phalaris + occasional Sp. erectum
Osier
C. willow
Phalaris + Gly. max. Occasional Sp. erectum, Cx. acutif.
Steeper banks
to 85°
②
1-1.5m
①
Ranunculus
Pot. perfoliatus

② Locally dominant: Urtica, Ep. hirsutum, Rubus.
Occasional: Filipendula, Scrophularia, Symphytum

① Occasional: thin fringe of tall emergents + wetland marginals eg Solanum, Stachys.

LENGTH 4


Grazed and lightly poached banks
0·3-0·5m
① Marginal stands of:
Phalaris, Gly. max, Cx. riparia.
Common: Rorippa amph, Solanum.
② Grazed + lightly poached:
(mixed margins).
Locally dominant: Phalaris, Cx. riparia, Mentha, Rorippa amphibia, Nasturtium off.
Common: Equisetum pal., Urtica, Scrophularia, Epilobium, Callitriche, Lemna minor, Stachys, Agrostis stol., Apium, Filipendula, Berula.
Occasional: J. effusus, Iris, Rx. hydro, Cx. pseudocyperus, Scutellaria, Veron. beccabunga, Elodea, Eupatorium cann., Deschampsia, Polyg. amphib.
Crack willow
Phalaris
S. erectum
Cx. acutiflorus
R. penicillatus
Fontinalis
occasional
Sp. emersum
Crack willows
Ranunculus
Crack willow
Phalaris, Sp. erectum, occasional Iris, Rorippa + Eupatorium
Ranunculus + Pt. pectinatus
Steep banks
60cm-1m
Phalaris, Sp. erectum
Ranunculus, Fontinalis
Grazed emergents + marginals locally dominated by:
Phalaris, Gly. max., Cx. rip, Iris, wetland herbs
Crack willow
Cx. riparia
Crack willow
C. willow
Bramble
Crack willow
Glyceria, Phalaris, occ. Butomus.
C. willow
Mixed stands dominated by: Phalaris, Sp. erectum, Cx. acutiflorus
Ranunculus
Phalaris + occasional Iris
Crack willow
Crack willow (pollards)
Phalaris, Sp. erectum
① Marginal stands.
Locally dominant: Phalaris, Sp. erectum, Rorippa, Solanum, Mentha.
Occasional: Iris
② Upper bank:
Locally dominant: Ep. hirsutum, Phalaris, Urtica.
Common: Filipendula, Scrophularia, Eupatorium.
Occasional: Barbarea vulgaris
Stands dominated by: Gly. maxima, Phalaris, Sp. erectum.
Occasional: Schoenoplectus lacustris
PHOTO 4/1
Moat
C. willow
Sycamore
Ash
Crack willow (pollard)
Goat willow
PHOTO 4/2
Wooded bank
Maple + poplar
Ash, elm, hazel
Ash
Sycamore
Ash
Ranunculus
Woodland
Poplar
Ash
Hawthorn
Sycamore
Moat
① Sparse vegetation:
Occasional: Mentha aquat., Urtica, Solanum, Rorippa, Ep. hirsutum

5.5 Length 5. East arm: Ditch inlet (GR 43603 20949) to ditch inlet (GR 43621 20904)

Land-use. The east bank of the river was bordered by improved grassland and arable fields. The west bank was bordered by rank grassland.

Bank structure. Banks were typically 1-1.5m high, but bank slopes varied considerably as the river ran through a series of meanders, alternating between steep banks (locally vertical earth cliffs) and the lower angles of pointbar sequences.

Shade. Shading was relatively light, with trees scattered or in small clumps lining approximatly 5-10% of the channel margins. Trees were mainly willow species (Salix fragilis, S.viminalis, S.cinerea), sycamore (Acer pseudoplatanus), hawthorn (Crataegus monogyna and occasional alder (Alnus glutinosa) and ash (Fraxinus excelsior).

Vegetation. The vegetation structure and community alternated around meander bends as the bank angle changed. Point bars supported extensive stands of tall emergents, particularly Phalaris arundinacea (reed canary-grass), Glyceria maxima (reed sweet-grass), Carex acutiformis (lesser pond-sedge) and locally Carex riparia (greater pond-sedge). Sparganium erectum (branched bur-reed) was common at the channel edge with stands of wetland herbs such as Rorippa amphibia (great yellow-cress), Solanum dulcamara (bittersweet) and Mentha aquatica (water mint).

Sagittaria sagittifolia (arrowhead) and Butomus umbellatus (flowering-rush) were occasionally recorded in the northern half of the length growing submerged within the channel and within emergent vegetation at waters edge (see Appendix 2).

The steeper banks had variable cover of ruderals and wetland species including Epilobium hirsutum (great willowherb), Eupatorium cannabinum (hemp-agrimony), Filipendula ulmaria (meadowsweet) and Urtica dioica (common nettle) with, locally, a thin fringe of the common emergents and marginals at the waters edge (see Profile overpage).

The submerged plant community was dominated by Ranunculus penicillatus (stream water-crowfoot) which was abundant throughout the length. Potamogeton pectinatus (fennel pondweed) was frequently co-dominant in the southern half of the length. Potamogeton perfoliatus (perfoliate pondweed) was also frequent in the northern half of the length. Fontinalis antipyretica (willow moss) was occasional to frequent throughout. Callitriche sp. (starwort), Elodea canadensis (Canadian pondweed) and Lemna minor (common duckweed) were occasional in slacks at the channel margins.

PHOTOGRAPH 1 Looking westwards across improved pasture (to the right) with one of the two dry, on-ditch ponds in the foreground (left).

PHOTOGRAPH 2 Looking eastwards across the arable fields with the wooded ditch line on the horizon.

LENGTH 2. WEST ARM

PHOTOGRAPH 2/1 Channel margins fringed by tall emergents Glyceria maxima (Reed Sweet-grass) and Sparganium erectum (Branched Bur-reed) with Epilobium hirsutum (Great Willowherb) and Urtica dioica (Common Nettle) dominant on the banks. Potamogeton lucens (shining pondweed) and Potamogeton perfoliatus (Perfoliate pondweed) common in the channel.

PHOTOGRAPH 2/2 Shaded margins bodering allotments locally restricting the development of channel marginal and bank vegetation. Ranunculus penicillatus (Stream water-crowfoot) common on gravel and cobble riffles in the chanel.

LENGTH 3. WEST ARM

PHOTOGRAPH 3/1 West bank (left) with mixed stands of wetland herbs and marginal emergents bordering urban areas. East bank supporting more extensive stands (Sparganium erectum (Branched Bur-reed) and Carex riparia (Greater Pond-sedge)).

PHOTOGRAPH 3/2 Margins supporting stands of emergents with wetland herbs at waters edge (Nasturtium officinale (Green Water-cress), Solanum dulcamara (Bittersweet), Stachys palustris (Marsh Woundwort)) and on bank (mainly Epilobium hirsutum (Great Willowherb), Urtica dioica (Common Nettle)). R.penicillatus (Stream water-crowfoot) abundant in the channel.

LENGTH 4. EAST ARM

PHOTOGRAPH 4/1 East (right) margin bordered by relatively unimproved pasture. Margins lightly poached by cattle, with a relatively diverse wetland herb flora including a number of species not recorded in other lengths. Ranunculus penicillatus (Stream water-crowfoot) abundant in the channel.

PHOTOGRAPH 4/2 East margin (left) heavily shaded by secondary woodland surrounding an overgrown moat. Steep west bank. Ranunculus penicillatus (Stream water-crowfoot) very abundant on a gravel riffle in the channel.

PHOTOGRAPH 5/1 Point bar on west (left) bank with low angles, colonised by emergent stands dominated by Phalaris arundinacea (Reed Canary-grass), with Glyceria maxima (Reed Sweet-grass), Sparganium erectum (Branched Bur-reed) and low growing herbs such as Rorippa amphibia (Great Yellow-cress) locally frequent.

PHOTOGRAPH 5/2 Bank bordered by mixed stands of marginal and bankside herbs with Nasturtium officinale (Green Water-cress) common at the waters edge. E.hirsutum (Great Willowherb) and U.dioica (Common Nettle) dominating upper banks. R.penicillatus (Stream water-crowfoot) and Potamogeton pectinatus (Fennel Pondweed) co-dominant in channel.

APPENDIX 6.1 WETLAND SPECIES RECORDED

SPECIES NAME	COMMON NAME
Agrostis stolonifera	Creeping Bent
Alopecurus geniculatus	Marsh Foxtail
Angelica sylvestris	Wild Angelica
Apium nodiflorum	Fool's Water-cress
Barbarea vulgaris	Winter-cress
Berula erecta	Lesser Water-parsnip
Butomus umbellatus	Flowering-rush
Callitriche sp.	Starwort
Carex acutiformis	Lesser Pond-sedge
Carex pendula	Pendulous Sedge
Carex pseudocyperus	Cyperus Sedge
Carex riparia	Greater Pond-sedge
Deschampsia caespitosa	Tufted Hair-grass
Elodea canadensis	Canadian pondweed
Epilobium hirsutum	Great Willowherb
Equisetum palustre	Marsh Horsetail
Eupatorium cannabinum	Hemp-agrimony
Filipendula ulmaria	Meadowsweet
Fontinalis antipyretica	Willow moss
Glyceria fluitans	Floating Sweet-grass
Glyceria maxima	Reed Sweet-grass
Hypericum tetrapterum	Square-stalked St John's wort
Iris pseudacorus	Yellow Flag
Juncus effusus	Soft Rush
Juncus inflexus	Hard Rush
Lemna minor	Common Duckweed
Lycopus europaeus	Gipsywort
Lythrum salicaria	Purple-loosestrife
Mentha aquatica	Water Mint
Myosotis scorpioides	Water Forget-me-not
Nasturtium officinale	Green Water-cress
Phalaris arundinacea	Reed Canary-grass
Phragmites australis	Common Reed
Polygonum amphibium	Amphibious Bistort
Potamogeton lucens	Shining pondweed
Potamogeton pectinatus	Fennel Pondweed
Potamogeton perfoliatus	Perfoliate pondweed
Ranunculus penicillatus subsp. pseudofluitans var. pseudofluitans	Stream water-crowfoot
Rorippa amphibia	Great Yellow-cress
Rumex hydrolapathum	Water Dock
Sagittaria sagittifolia	Arrowhead
Schoenoplectus lacustris	Common Club-rush
Scrophularia auriculata	Water Figwort
Scutellaria galericulata	Skullcap
Solanum dulcamara	Bittersweet
Sparganium emersum	Unbranched Bur-reed
Sparganium erectum	Branched Bur-reed
Stachys palustris	Marsh Woundwort
Symphytum officinale	Common Comfrey
Typha latifolia	Bulrush
Urtica dioica	Common Nettle
Veronica beccabunga	Brooklime

Latin and English equivalents from Dony et.al. (1986) The English names of wild flowers. BSBI. 2nd edition.

APPENDIX 6.2 STATUS AND OCCURRENCE OF LOCAL AND LOCALLY COMMON SPECIES

BUTOMUS UMBELLATUS (Flowering-rush)

National status and distribution: Rather local, rare in Wales and not native in Scotland. In ditches, ponds and canals, and at margins of rivers.

Occurrence in surveyed section: Occasional on the west arm of the Windrush in length 1 and 2 between GR 43593 20964 and 43600 20930 and on the east arm in lengths 4 and 5 between GR 43598 20972 and 43609 20923. Growing as an emergent plant near the margins in gently flowing water up to 1m deep on muddy sediments. Also growing submerged on sandy substrates in moderatly fast flowing water up to 1.5m deep.

SAGITTARIA SAGITTIFOLIA (Arrowhead)

National status and distribution: Rather local. Scattered throughout England and rarer in the north and parts of Wales. In shallow water in ponds, canals and slow flowing rivers on muddy substrata.

Occurrence in surveyed section: Found rarely in both arms of the Windrush around GR 43597 20949 and 43603 20935. Only small and submerged plants were recorded. Other plants may be evident later in the year.

CAREX PSEUDOCYPERUS (Cyperus Sedge)

National status and distribution: Local in England to N.lancs. By slow flowing rivers, in ditches, ponds, and stagnant water in woods.

Occurrence in surveyed section: A single small clump recorded on a grazed river bank partly shaded by a pollarded willow near the top of length 3 at GR 43598 20993.

POTAMOGETON LUCENS (Shining pondweed)

National status and distribution: Locally common in south and east England. Lakes, ponds, canals and small streams on nutrient rich inorganc substrata.

Occurrence in surveyed section: Common in length 2 on the west arm of the Windrush between GR 43597 20949 and 43598 20917. Typically growing in mid channel on sandy (often rather organic rich) sediments.

RORRIPA AMPHIBIA

National status and distribution: Locally frequent from Somerset and Kent northwards to Lankashire and NE Yorkshire. Local in marginal sedge-swamp by eutrophic streams, ditches and pools with very variable water levels.

Occurrence in surveyed section: Common at the stream margins and more occasionally mixed in with tall emergent stands on the stream banks.

National status and distribution of species from: A.R. Clapham, T.G. Tutin and and D.M. Moore (1987) Flora of the British Isles. CUP. 3rd edition.

CONTENTS

1. INTRODUCTION

This report describes a river corridor survey of the River Windrush at Witney. The survey was undertaken from the point where the river divides into two arms (4359 2099) to the point where each arm passes beneath the A40 (4359 2086) and (4364 2087). The total length of channel surveyed was about 3km. In addition an area of floodplain was surveyed in the area bounded by the ditch running from 43610 20952 to 43645 20877.

The river corridor survey was carried-out following the standard methods recommended in 'Surveys of Wildlife in River Corridors (Draft Methodology)' (NCC, 1985).

2. METHODS

Field maps were prepared of each 500m length of the river. The base maps provided were redrawn (the original channel width was doubled) to increase the clarity of the maps. Maps were modified in the field to take account of recent changes in channel shape. Conventions for vegetation mapping followed NCC recommendations. In addition, bank structure and vegetation compsition were described for representative sections of the river and annotated on the maps.

The plants recorded were those listed on the Nature Conservancy Council wetland plant species list. Plants were identified to species level in the field where possible, being taken back to the laboratory for clarification where necessary. Submerged macrophytes were collected with a grapnel where the river could not be waded. Callitriche sp. were not identified to species level because suitable flowering material was not available at the time of the survey.

3. GENERAL DESCRIPTION OF THE WETLAND VEGETATION OF THE RIVER WINDRUSH IN THE SURVEY AREA

3.1 Introduction

The River Windrush in the survey area supported a moderately species-rich wetland flora with 52 species recorded, including 11 aquatic species (see Appendix 1 for list of species). The flora included 3 local and 2 locally common species.

3.2 Marginal and emergent wetland plants

41 species of marginal and emergent wetland plant were recorded in the survey area, a moderately species-rich assemblage. The abundance of marginal and emergent plants varied from moderate to good.

Most lengths supported marginal and emergent vegetation that was broadly similar in species-richness, abundance and species composition. However, individual lengths varied in the distribution of their marginal stands (eg fringing both banks or concentrated onto point bars in meandering sections).

One area, the grazed and slightly poached banks of Length 4, supported a wider variety of marginal and emergent species than all other areas. This area was adjacent to relatively unimproved pastures grazed by cattle. The combination of less intensive land-use and grazing (which prevented tall emergents from dominating the marginal flora) allowed a richer community to develop (see also Section 3.6 below).

3.3 Typical composition of the marginal/emergent community

On the upper banks Epilobium hirsutum (great willowherb) and Urtica dioica (common nettle) were the most abundant wetland species. Symphytum officinale (comfrey), Eupatorium cannabinum (hemp-agrimony) and Filipendula ulmaria (meadowsweet) were also widespread and common.

On the lower banks and at the waters edge the abundance of wetland species varied considerably according to bank slope. Steep banks were generally fringed by only a thin or discontinuous fringe of tall emergent and wetland herb species. More gently sloping margins generally supported more extensive mixed and monodominant stands of emergents. Three emergents species, Phalaris arundinacea (reed canary-grass), Glyceria maxima (reed sweet-grass) and Sparganium erectum (branched bur-reed), were common throughout the lengths surveyed. Carex acutiformis (lesser pond-sedge) and Carex riparia (greater pond-sedge) were locally dominant on the margins of both arms of the river, especially in the more southerly lengths.

A number of wetland herbs were common, growing as single species stands or in mixed stands with the dominant emergent species. The most abundant of these were Rorippa amphibia (great yellow-cress), Solanum dulcamara (bittersweet) Nasturtium officionale (Green water-cress), Stachys palustris (marsh woundwort) and Mentha aquatica (water mint). Occasional to frequent species included Apium nodiflorum (Fool's Water-cress), Berula erecta (Lesser Water-parsnip), Myosotis scorpioides (water forget-me-not) and Rumex hydrolapathum (Water Dock).

3.4 Aquatic plants: species richness and composition of the community

11 aquatic species were recorded, including 2 local species. The most abundant aquatic was Ranunculus penicillatus (stream water-crowfoot) which occurred frequently to abundantly throughout the lengths surveyed, particularly in faster flowing sections. Three Potamogeton species were also recorded, P.pectinatus (fennel pondweed), P.lucens (shining pondweed) and P.perfoliatus (perfoliate pondweed). P.pectinatus was locally co-dominant with R.penicillatus in the eastern arm and occasionally in the west arm of the river, favouring shallow gravel substrates. P.lucens was locally dominant to abundant in the eastern arm and P.perfoliatus was an occasional in both arms.

Callitriche sp. (starwort), Elodea canadensis (Canadian pondweed) and Lemna minor (common duckweed) were frequently recorded in low abundance in marginal vegetation and slack water areas at the channel edge. Callitriche sp. and Sparganium emersum (unbranched bur-reed) also formed occasional submerged stands in fast flowing sections. Small submerged plants of Sagittaria sagittifolia (arrowhead) were recorded in Lengths 2 and 5. Further stands of this species might be evident later in the year.

3.5 Local and locally common marginal, emergent and aquatic species

Three local species and two locally common species were recorded (see Appendix 6.2 for status and distribution). None of the species recorded were listed by Palmer and Newbold (1983) as being in need of special protection in the Thames catchment.

3.6 Variations in the vegetation of the survey area

The marginal wetland communities were generally similar in species composition and diversity throughout the survey area, only Length 4 standing out as having a noticeably richer marginal community than other areas (see Section 3.2 above). Length 4 supported a number of species absent from, or uncommon in, other lengths (see description of Length 4) and was also the only area where the local sedge Carex pseudocyperus (cyperus sedge) was recorded.

Unlike the marginal/emergent communities the, aquatic communities changed noticeably downstream. In particular, the aquatic community was most diverse in a 300m band running east-west across both arms of the river between the footbridge at the southern end of Lengths 1 and 4 (GR 43599 20966) and Farm Mill (middle of Lengths 2 and 5, 43598 20922).

Species largely restricted to this zone included all the local and locally common aquatic species recorded in the survey. Potamogeton perfoliatus (perfoliate pondweed) was present in this section in both arms (see Appendix 2). Potamogeton lucens (shining pondweed) was locally very abundant in the west arm only and Sagittaria sagittifolia (arrowhead) was present very occasionally in both arms. Butomus umbellatus (flowering-rush) was present in both arms and mostly limited to this area though there were a few plants upstream. The factors causing this change in aquatic vegetation were unclear. However, substrate composition may be important as substrates appeared to be finer in this area with sand instead of the gravels and cobbles more typical of other areas.

5.1 **LENGTH 1. West Arm: River divergence (GR 43590 20995) to drain inlet (GR 43598 20949)**

Land-use. The west bank of the river was separated from the urban areas of Witney by a strip of woodland 10-50m wide. The east bank was separated from the east arm of the Windrush by areas of rank or mown amenity grassland.

Bank structure. Along most of the length the more shaded west bank was relatively low in height and angle (0.5-1m, 10-30 degrees). The east bank was typically higher (1-1.5m) and frequently very steep (60-90 degrees). Bank structure at the very south of the length was more variable.

Shade. The West bank, was typically moderatly to heavy shaded by the adjacent woodland belt. The east bank was much more open with many of the bordering trees set back from the bank, so not casting shade on the channel.

Vegetation The generally steep east bank typically supported only a thin fringe of wetland emergents and herb species. Some stands of tall emergents were developed in the channel, particularly Sparganium erectum (branched bur-reed) Phalaris arundinacea (reed canary-grass) and Glyceria maxima (reed sweet-grass).

The west bank generally had much lower bank slopes and typically supported more extensive emergent stands. The abundance of upper bank species on the west margin was frequently inhibited by shade from overhaning trees, although locally this encouraged the occurrence of species such as Carex pseudocyperus (cyperus sedge) which were not found in other lengths of the river. Small stands of Butomus umbellatus (flowering-rush) were recorded in the downstream part of the length, south of the footbridge at GR 43592 20965.

Aquatic vegetation was dominated by Ranunculus penicillatus (stream water-crowfoot) which was common throughout the length, although not as abundant as in most other lengths. Fontinalis antipyretica (willow moss) was frequent. Potamogeton lucens (shining pondweed) was abundant at the very south of length mixed with occasional Potamogeton perfoliatus (perfoliate pondweed) but neither were recorded upstream of the footbridge. Callitriche sp. (starwort) and Elodea canadensis (Canadian pondweed) were locally frequent, especially downstream of the bifurcation at north of the length where they had colonised muddy sediments near the channel margins.

5.2 Length 2. West Arm: Drain inlet (GR 43598 20949) to ditch inlet (GR 43596 20902)

Land-use. At the nothern end of the length the west bank was fringed by a belt of woodland separating it from the urban areas of Witney. Southwards this gave way to allotments and then waste ground. The east bank was bordered by a strip of rank grassland occupying the area between the two Windrush channels.

Bank structure. Bank heights varied between 0.5-2m. Profiles varied along the length from approximatley 20 degrees to either near vertical or steep two-stage banks.

Shade. Shade was generally moderate with 10-20% of the banks typically overhung. In the area bordering the allotments (south of bridge at GR 43598 20921) heavy shade locally restricted the development of marginal plants.

Vegetation. Shallow-angled banks supported mixed and monodominant stands of the typical emergents: Phalaris arundinacea (reed canary-grass), Glyceria maxima (reed sweet-grass) Sparganium erectum (branched bur-reed). Carex acutiformis (lesser pond-sedge) and Carex riparia (greater pond-sedge) were locally dominant on the 'step' of two-stage banks. At the southern end of the length the west bank locally supported stands of Typha latifolia (bulrush) and Phragmites australis (common reed), both species which were very uncommon in other lengths.

Wetland herbs typical of the river (see Section 3 and overpage) were freqent within tall emergent stands at the waters edge and mixed with grasses and ruderals on the upper bank.

Stream water-crowfoot (Ranunculus penicillatus) was abundant in the open channel throughout the length. Potamogeton lucens (shining pondweed) was frequent and locally dominant above the bridge at 43598 20921. It was frequently mixed with the less abundant Potamogeton perfoliatus (perfoliate pondweed). Callitriche sp. (starwort) and Sparganium emersum (unbranched bur-reed) formed occasional submerged stands in fast flowing sections. Callitriche sp. was also recorded with Elodea canadensis (Canadian pondweed) and Lemna minor (common duckweed) in marginal vegetation and slack water areas at the channel edge.

Sagittaria sagittifolia (arrowhead) and Butomus umbellatus (flowering-rush) were occasionally recorded in the northern half of the length, growing submerged in the channel (see Appendix 2).

5.3 Length 3. West Arm: Ditch inlet (GR 43596 20902) to A40 Road bridge (GR 43594 20866)

Land-use. The east bank was bordered by an area of overgrown pasture 100-200m wide, separating the east and west arms of the Windrush. In the north of the length the west bank was borderd by urban surfaces. Downstream, the west bank was bordered by an area of rank grassland/wasteground separating the river from the new buildings of the Wittan Park industrial estate.

Banks. The banks were generally steep (typically 30-80 degrees) particularly in the upstream half of the length. The height of both banks varied between 0.5 and 2m.

Shade. The west bank was little shaded throughout the length. The east bank was approximatly 20% shaded, mainly by crack willow (Salix fragilis) and hawthorn (Crataegus monogyna) on the bank top.

Vegetation. Stands of tall marginals formed a semicontinous band 0.5-8m wide along both banks through most of the length. Phalaris arundinacea (reed canary-grass), Glyceria maxima (reed sweet-grass) and Sparganium erectum (branched bur-reed) were the main dominants. Carex acutiformis (lesser pond-sedge), Carex riparia (greater pond-sedge) and Phragmites australis (common reed) were locally common.

Wetland herbs typical of the river (see Section 3 and overpage) were again frequent at the channel edge and amongst stands of taller dominants. An old stock bay at GR 43595 20880 supported secies such as Myosotis scorpioides (water forget-me-not), Veronica beccabunga (brooklime) and Mentha aquatica (water mint) which were otherwise uncommon in the length.

Stream water-crowfoot (Ranunculus penicillatus) was abundant in the open channel throughout length. Fontinalis antipyretica (willow moss) was frequent. Potamogeton pectinatus (fennel pondweed) was locally co-dominant with R. penicillatus towards the south end of the length.

5.4 LENGTH 4. East Arm: River divergance (GR 43590 20995) to ditch inlet (GR 43603 20949)

Land-use. The northern half of the east bank (above the foot bridge at GR 43599 20967) was bordered by relatively unimproved, cattle grazed pasture. Downstream of the bridge this turned to improved pasture and then to secondary woodland (developed on an old moated site that is part of the Manor Farm Museum). The west bank was typically bordered by rank grassland.

Bank structure. Along most of the length the east bank was low angled and, where grazed, lightly poached. Excepting point bar sequences, the west bank was generally steep, frequently 60-90 degrees and 0.6-1.m high

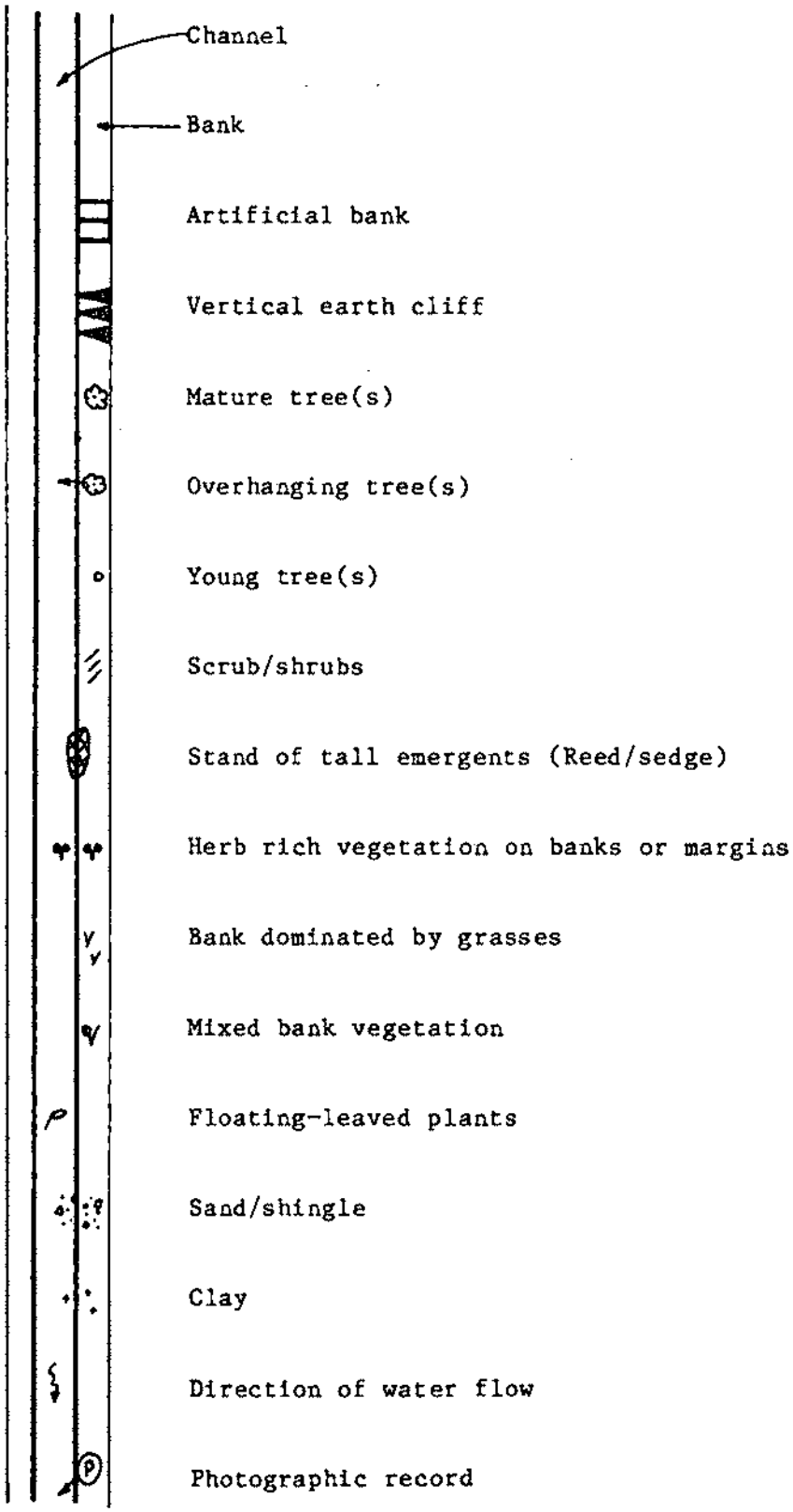
Shade. Secondary woodland bordering the moat shaded part of the east bank at the downstream end of the length, but most banks were unshaded except for a few scattered (often pollarded) willows.

Vegetation. The grazed eastern margins of the northern half of the length supported a 1-3m fringe of typical tall emergent species with occasional Schoenoplectus lacustris (common club-rush) and Butomus umbellatus (flowering-rush) present at the channel edge. The lightly poached and grazed edge behind this waterside fringe (see overpage) supported a relatively rich marginal wetland flora including a number of species rare or absent in other lengths. These included Carex pseudocyperus (cyperus sedge), Scutellaria galericulata (skullcap), Hypericum tetrapterum (square-stalked St John's wort), Polygonum amphibium (amphibious bistort) and Equisetum palustris (marsh horsetail).

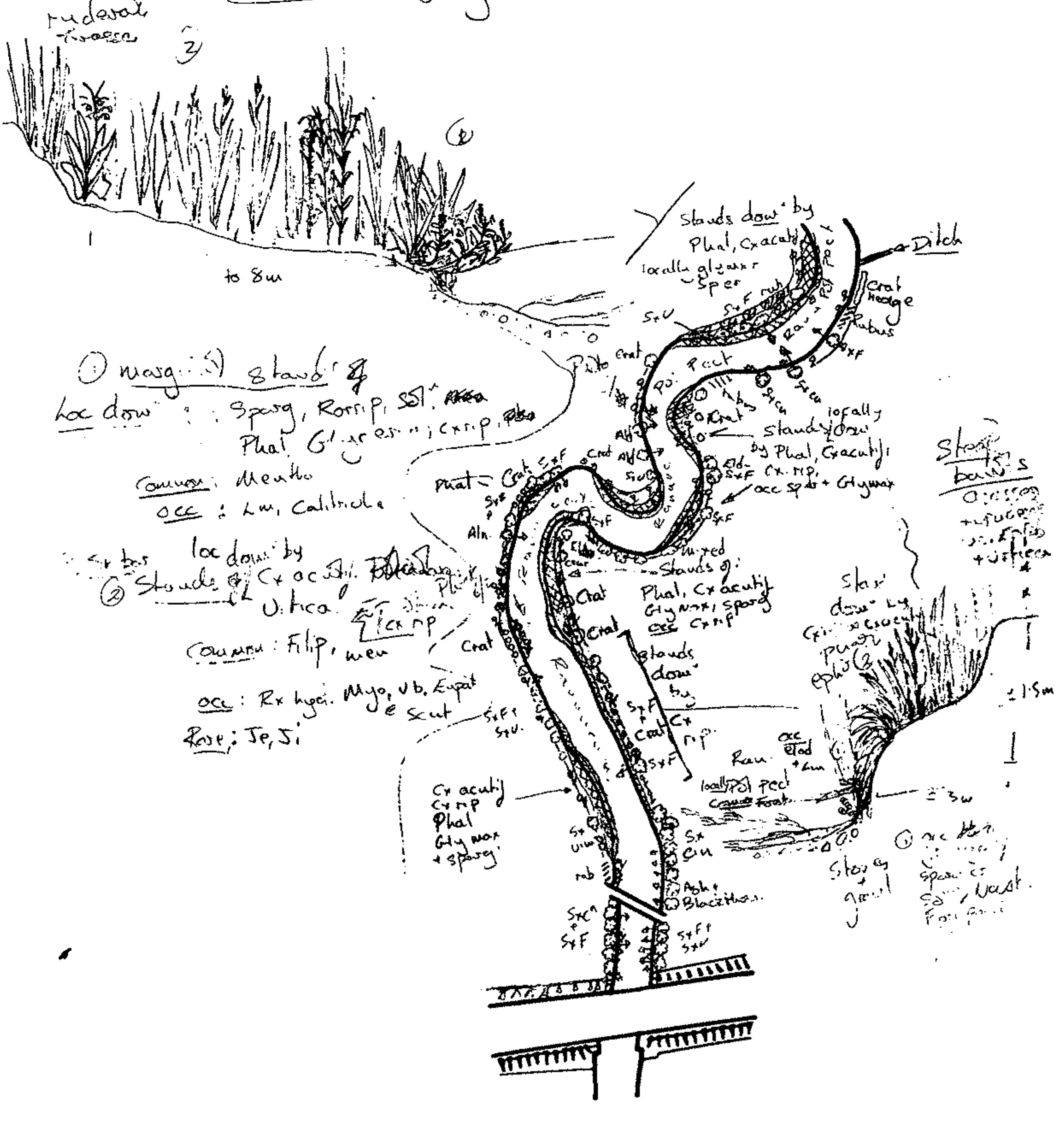
Other margins generally supported thin to locally good stands of mixed emergents and marginal species. The south-east bank abbutting the moat was heavily shaded with little marginal or bankside vegetation.

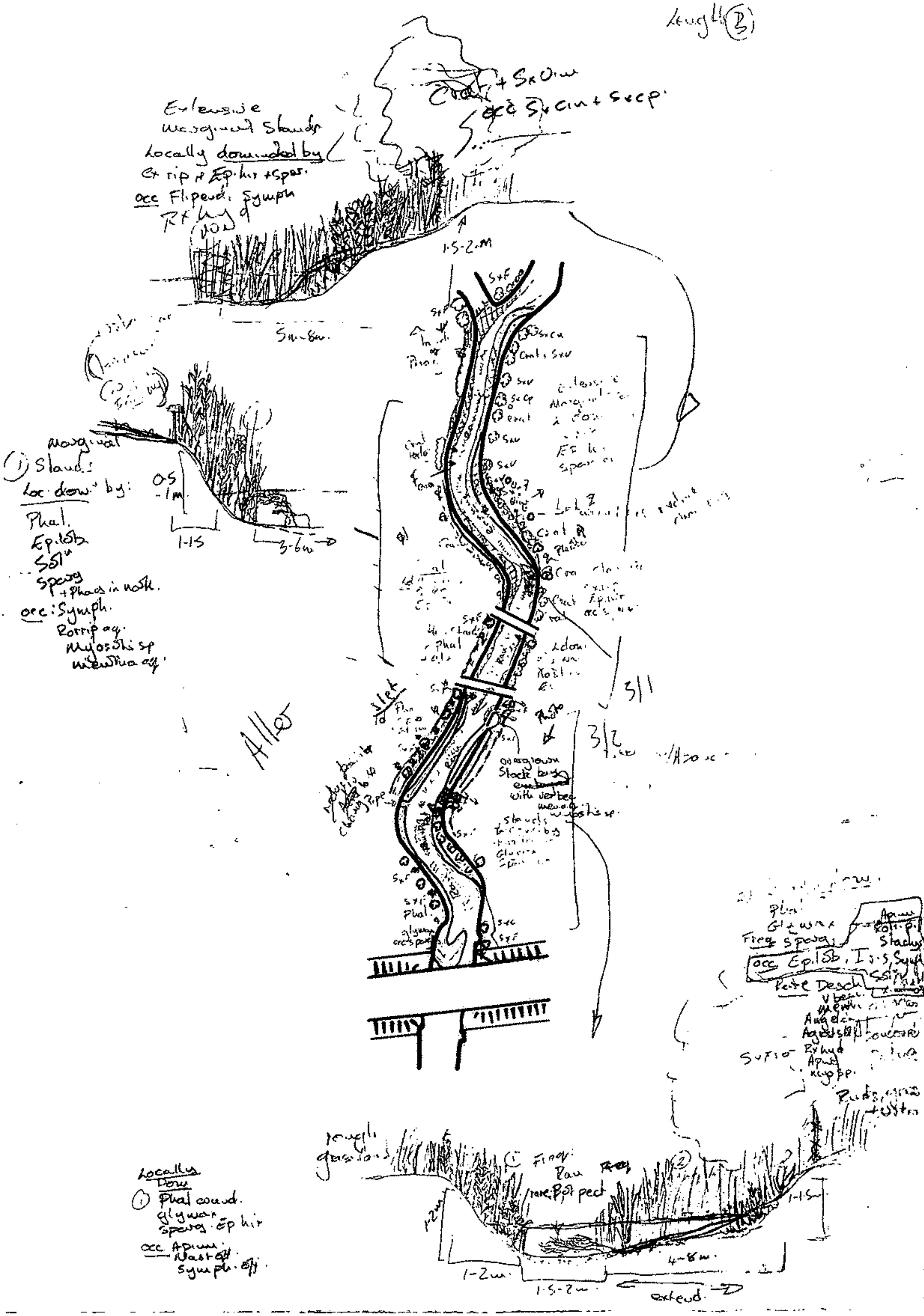
The submerged plant community was dominated by Ranunculus penicillatus (stream water-crowfoot) which was common throughout the length. Potamogeton pectinatus (fennel pondweed) was locally co-dominant, particularly in shallow riffle areas in the northern half of the length. Fontinalis antipyretica (willow moss) was common on hard substrates (eg stones and cobbles) in the channel. Elodea canadensis (Canadian pondweed), Callitriche sp. (starwort) and Lemna minor (common duckweed) were locally frequent particularly within the flooded, poached edges of the grazed north-east margin (see Profile overpage).

APPENDIX 6.3 KEY TO MAP SYMBOLS



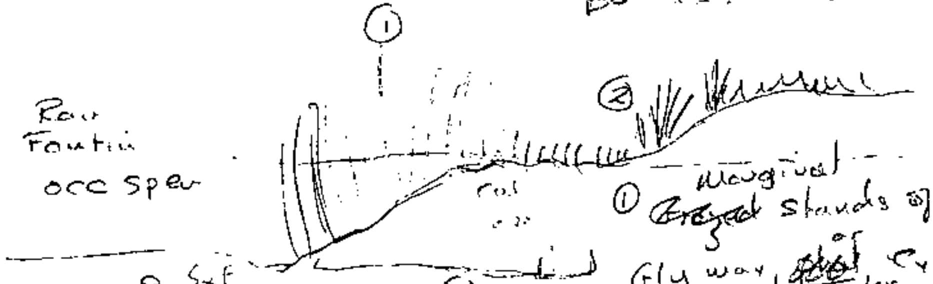
Point bar vegetation





Extensive
marginal stands
locally dominated by
occ
1.5-2.M
Marginal
Stands
loc. dom by:
Phal.
1-1S
3-6m
Allot
overgrown
with
3/1
3/2
rough
grassland
Locally
Dom
Phal
occ
1-2m
1.5-2m
4-8m
1-1.5m
extend

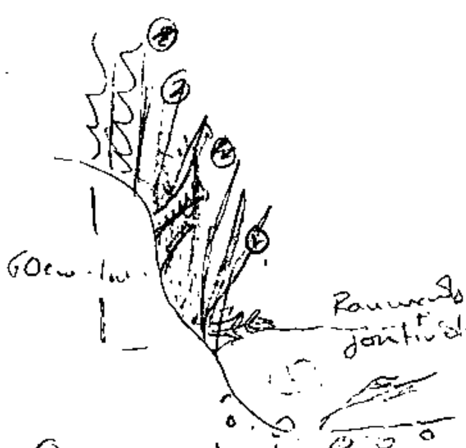
Grazed + lightly poached banks. length



① Marginal stands of phal
Gly max, Phal, Cx rip
Common Z. amph + SSI

② Grazed + lightly poached
mixed margins;
loc dom: Phal, Cx rip, mentha
Z. amph, most of
Common: Eq pal, Scroph, Epilob, Calth, Lemna minor, Stachys, Agrostis, Alopec, Filip, Apium nodiflorum
occ Se, Iris, R. hyd, Cx pseudocyp
Scutellaria, Ub, Epilob, Eupat
deschampsia
Polyg. amph

Steep banks

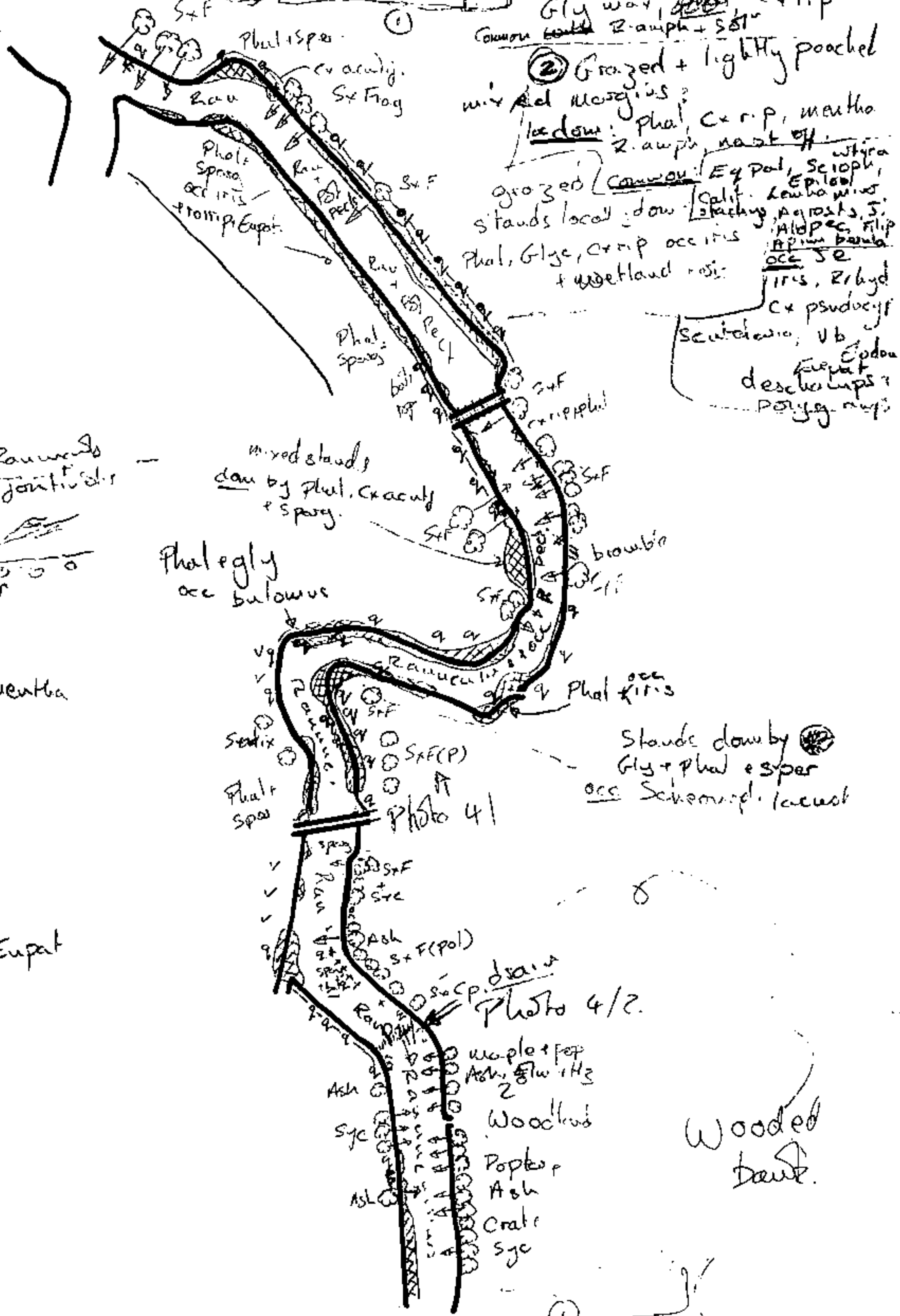


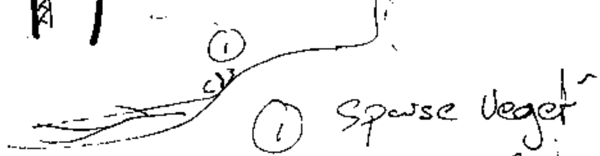
① Marginal stands

loc. dom Phal, Sparg
occ Rorrip, SSI, mentha
Iris

② Upper bank:
loc dom Epil hirsutum, phal
Urtica

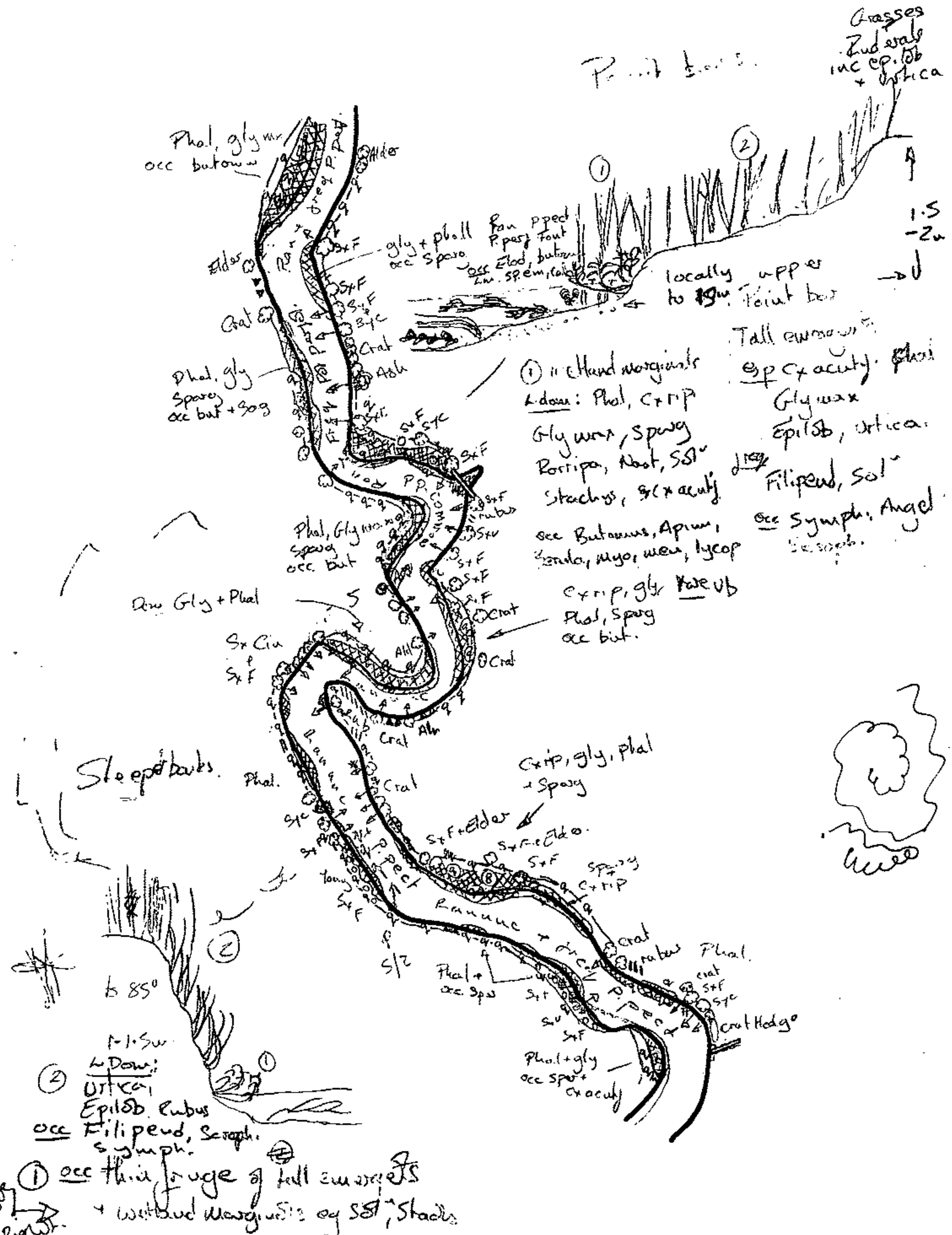
Com Filipend, Scroph, Eupat
occ Barbarea vulg.



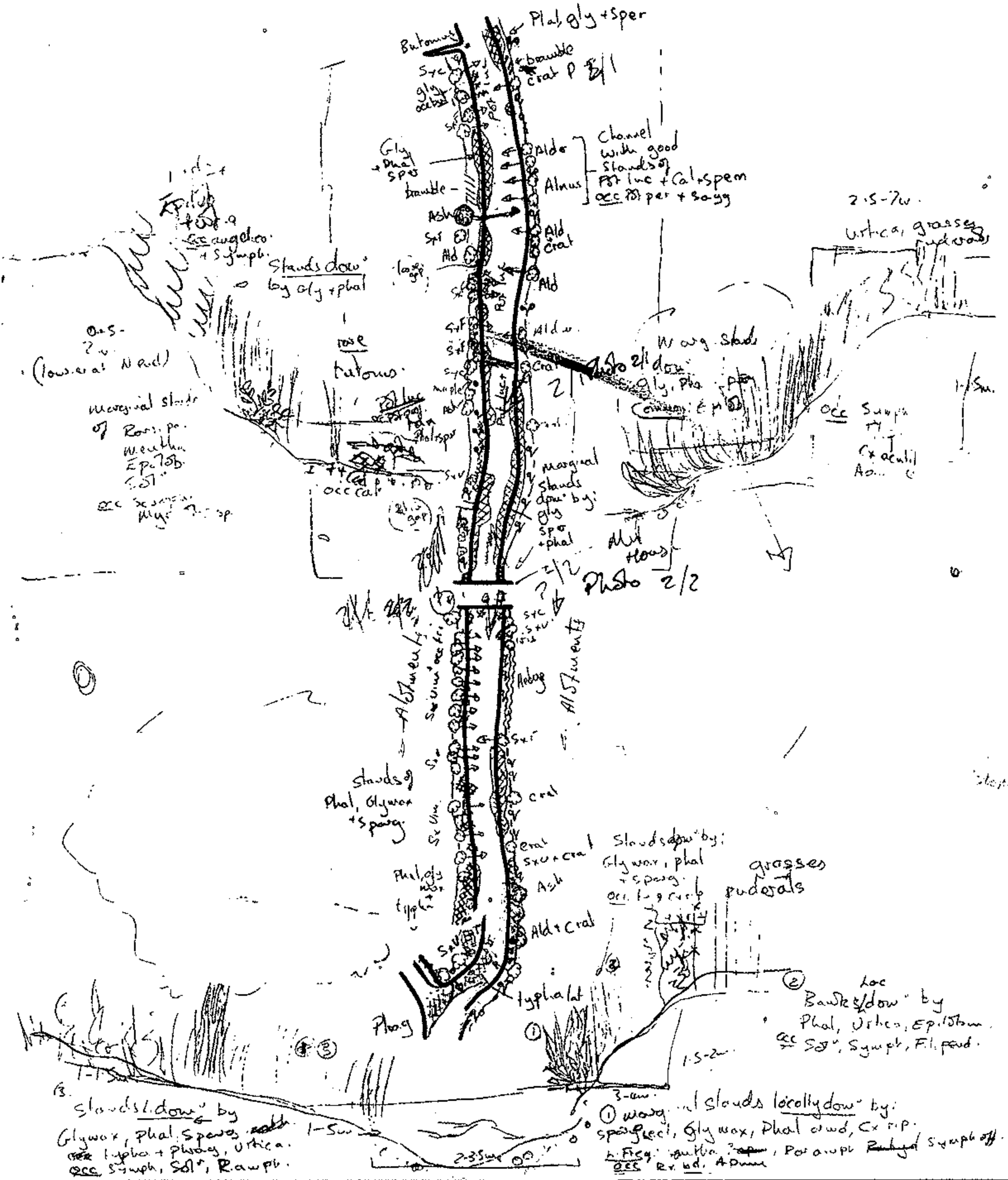


① Sparse veget^n
occ Mentha Urtica
SSI
Rorrip
Epil

Length 5

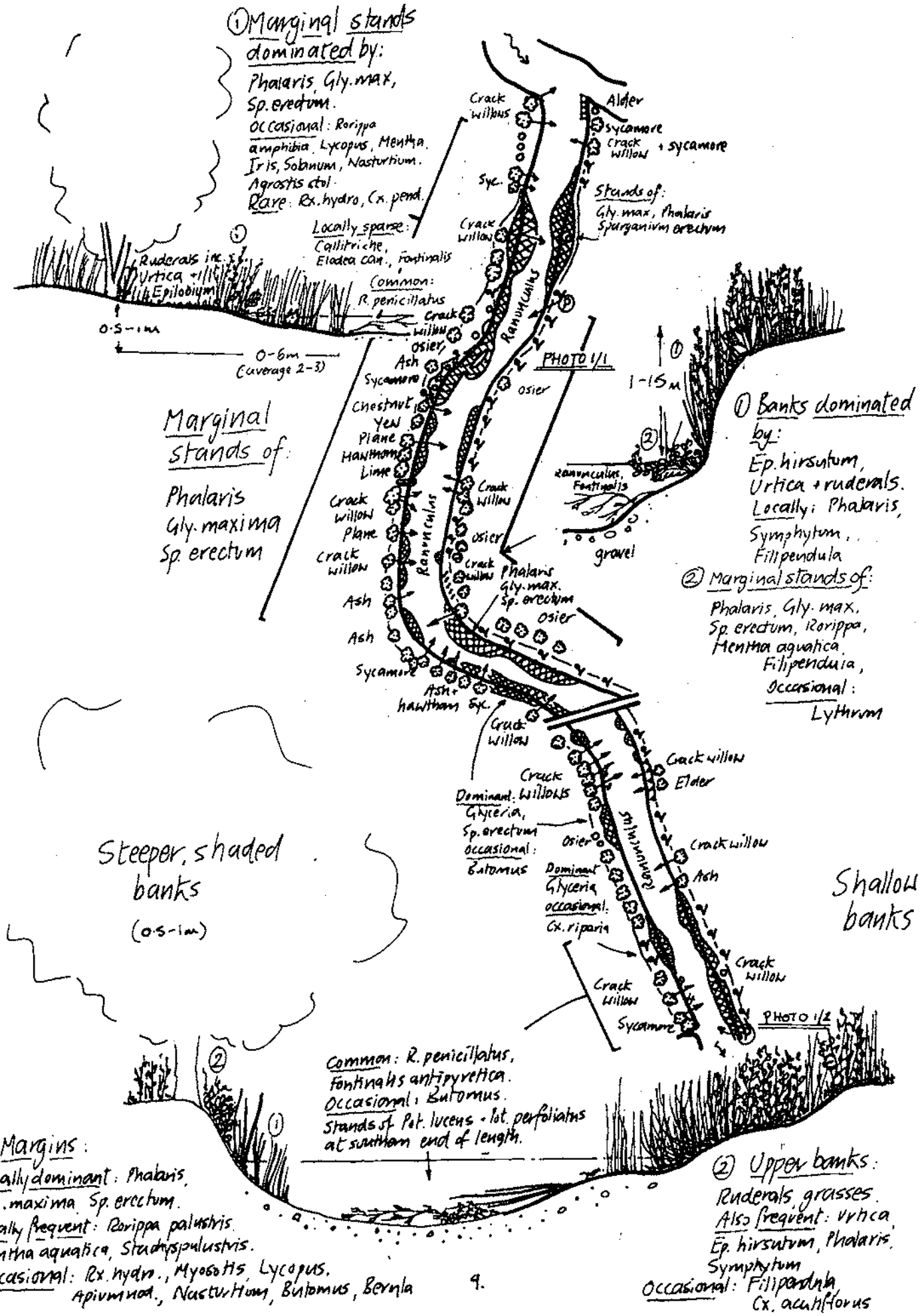

Grasses
incl Epilob
+ Urtica
Point bar
1.5
-2m
locally upper
to 19m. Point bar
Phal, glywax
occ butom
Alder
Elder
Crat
Ash
S+F
Phal, gly
Sparg
occ but + Sag
① wetland marginals
Ldom: Phal, Cx rip
Gly wax, Sparg
Rorripa, Nast, Sol
Stachys, Cx acut
occ Butomus, Apium,
Tall emergents
sp Cx acuty. Phal
Gly wax
Epilob, Urtica.
Filipend, Sol
occ Symph. Angel
Cx rip, gly, Rare ub
Phal, Sparg
occ but.
Sx Cin
Sx F
Crat
Aln
Steep banks.
Phal.
Cx rip, gly, phal
+ Sparg
S+F+Elder
Sparg
Cx rip
Crat
rubus
Phal.
Crat Hedge
Phal + gly
occ Spa +
Cx acut
to 85°
1-1.5m
② Ldom:
Urtica
Epilob. Rubus
occ Filipend, Scroph.
symph.
① occ thin fringe of tall emergents
+ wetland marginals eg Sol, Stachs
Right

length 2

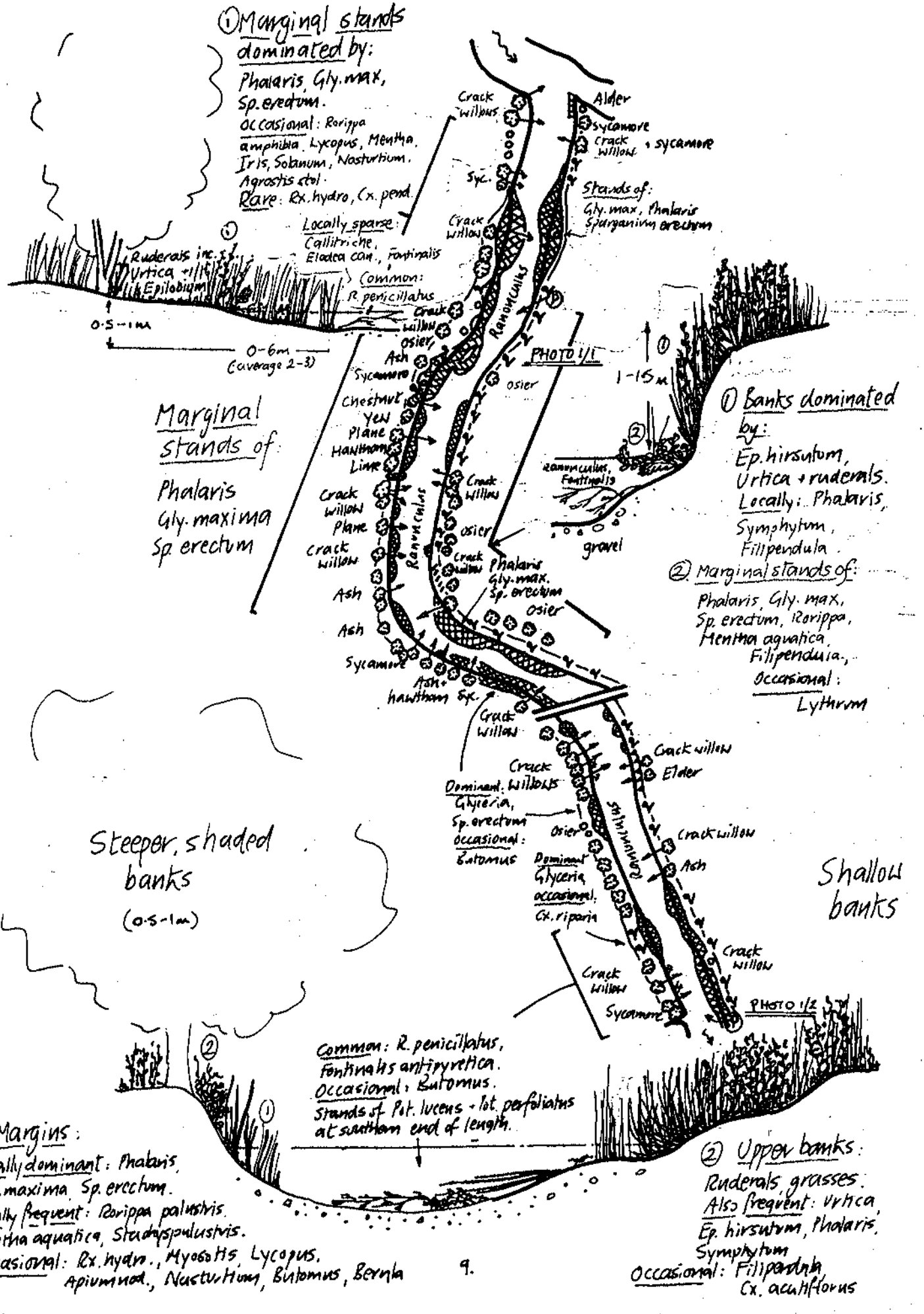


Phal, gly + sper
Butomus
bramble
Chanel with good stands of
Alnus
2.5-7m
Urtica, grasses, ruderals
Stands dom by Gly + phal
rose
butomus
Photo 2/1
Marginal stands of
occ cal
Marginal stands dom by: gly spa + phal
Photo 2/2
stands of Phal, Glywax + Sparg
cral
Ash
Ald + Cral
typhalat
Phrag
grasses ruderals
Stands dom by: Glywax, phal + sparg
Banks dom by Phal, Urtica, Epilobium
occ Sol, Symph, Fil.pend.
stands dom by Glywax, Phal, Sparg, Urtica
occ Symph, Sol, R.awpt
1-5m
2-3.5m
3-4m
1.5-2m
1-1.5m
marginal stands locally dom by: sparg, Gly wax, Phal arund, Cx rip

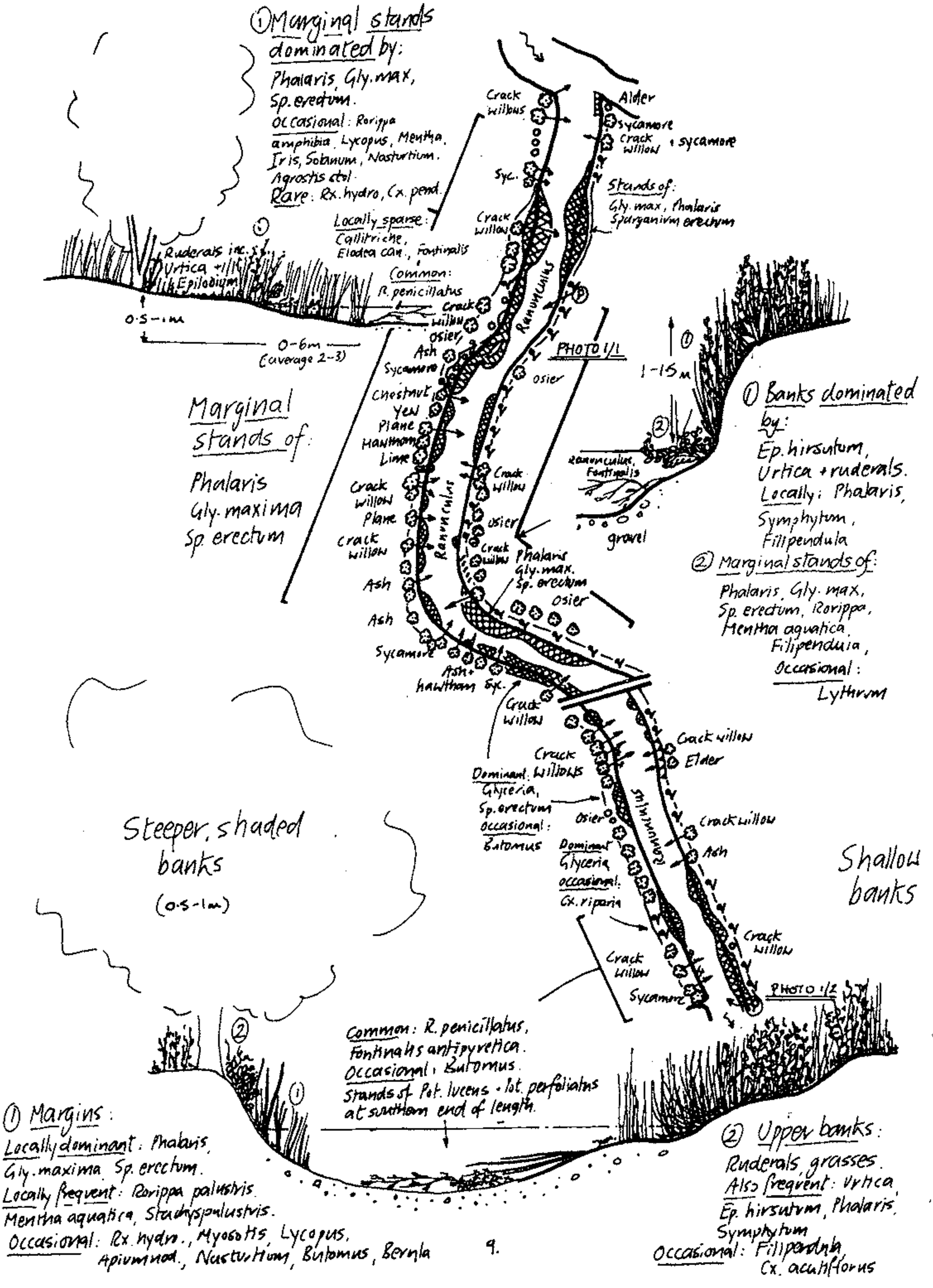
LENGTH 1


① Marginal stands dominated by:
Phalaris, Gly. max, Sp. erectum.
Occasional: Rorippa amphibia, Lycopus, Mentha, Iris, Solanum, Nasturtium, Agrostis stol.
Rare: Rx. hydro, Cx. pend.
Locally sparse: Callitriche, Elodea can., Fontinalis
Common: R. penicillatus
Ruderals inc. Urtica + Epilobium
0·5–1m
0–6m (Coverage 2–3)
Marginal stands of:
Phalaris
Gly. maxima
Sp. erectum
Crack willow
Alder
Sycamore
Crack willow + sycamore
Syc.
Stands of:
Gly. max, Phalaris
Sparganium erectum
Ranunculus
PHOTO 1/1
Ash
Sycamore
Chestnut
Yew
Plane
Hawthorn
Lime
osier
1–1·5m
① Banks dominated by:
Ep. hirsutum, Urtica + ruderals.
Locally: Phalaris, Symphytum, Filipendula
Ranunculus Fontinalis
gravel
② Marginal stands of:
Phalaris, Gly. max, Sp. erectum, Rorippa, Mentha aquatica, Filipendula,
Occasional: Lythrum
Phalaris Gly. max. Sp. erectum
Ash + hawthorn Syc.
Crack willows
Dominant: Glyceria, Sp. erectum
occasional: Butomus
Elder
Dominant Glyceria
occasional: Cx. riparia
Steeper, shaded banks
(0·5–1m)
Shallow banks
PHOTO 1/2
Common: R. penicillatus, Fontinalis antipyretica.
Occasional: Butomus.
Stands of Pot. lucens + lot. perfoliatus at southern end of length.
① Margins:
Locally dominant: Phalaris, Gly. maxima Sp. erectum.
Locally frequent: Rorippa palustris, Mentha aquatica, Stachys palustris.
Occasional: Rx. hydro., Myosotis, Lycopus, Apium nod., Nasturtium, Butomus, Berula
② Upper banks:
Ruderals, grasses.
Also frequent: Urtica, Ep. hirsutum, Phalaris, Symphytum
Occasional: Filipendula, Cx. acuminiformis

LENGTH 1

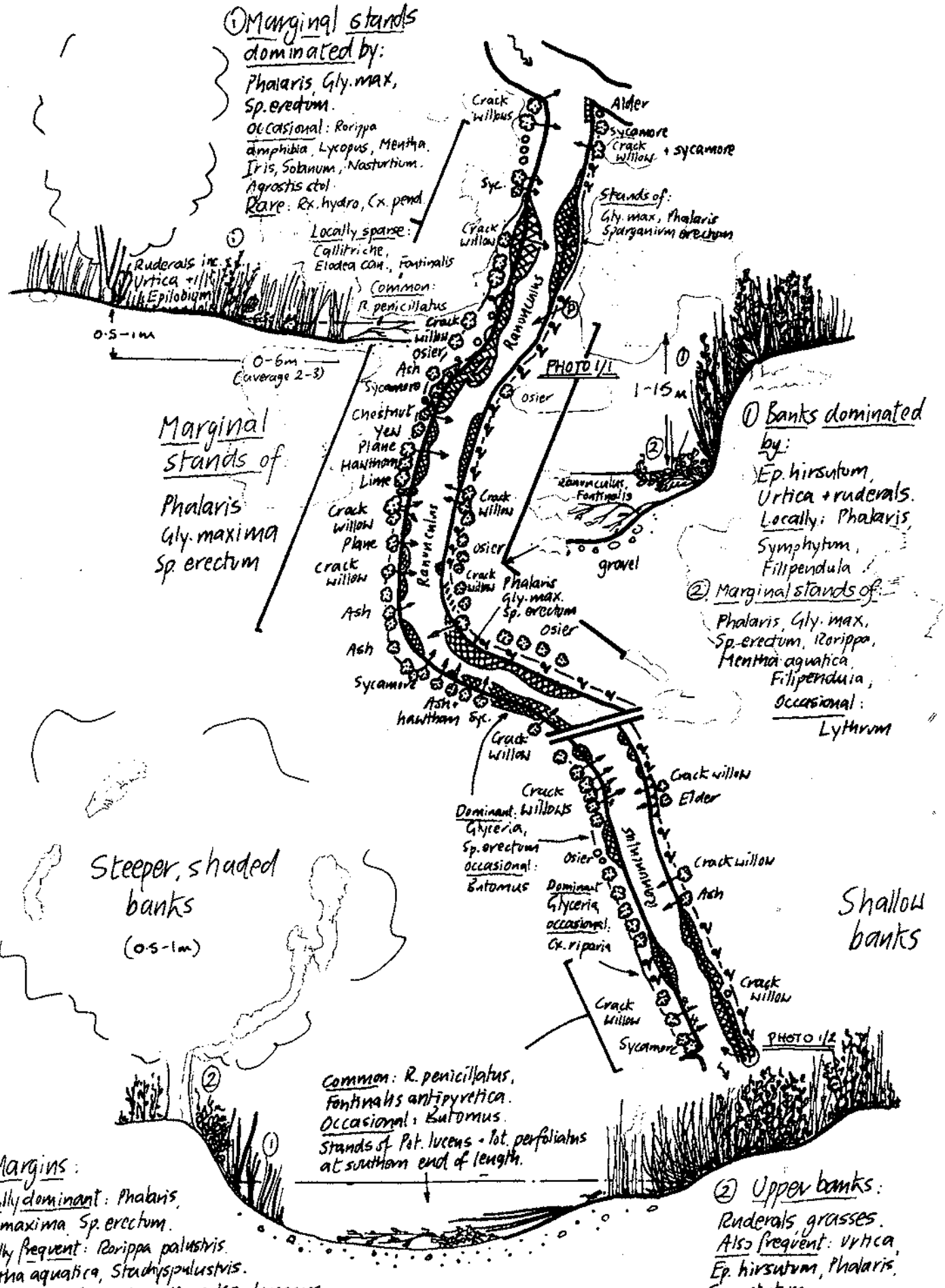

① Marginal stands dominated by:
Phalaris, Gly. max, Sp. erectum.
Occasional: Rorippa amphibia, Lycopus, Mentha, Iris, Solanum, Nasturtium, Agrostis stol.
Rare: Rx. hydro, Cx. pend.
Locally sparse: Callitriche, Elodea can., Fontinalis
Common: R. penicillatus
Ruderals inc. Urtica + Epilobium
0.5-1m
0-6m
Coverage 2-3
Marginal stands of:
Phalaris
Gly. maxima
Sp erectum
Crack Willow
Alder
Sycamore
Crack Willow + sycamore
Syc.
Stands of:
Gly. max, Phalaris
Sparganium erectum
Crack Willow
Ranunculus
PHOTO 1/1
osier
Ash
Sycamore
Chestnut
Yew
Plane
Hawthorn
Lime
Crack Willow
Plane
Crack Willow
Ash
Ash
Sycamore
Ash + hawthorn Syc.
Crack Willow
Phalaris
Gly. max.
Sp. erectum
1-15m
① Banks dominated by:
Ep. hirsutum, Urtica + ruderals.
Locally: Phalaris, Symphytum, Filipendula.
② Marginal stands of:
Phalaris, Gly. max, Sp. erectum, Rorippa, Mentha aquatica, Filipendula.,
Occasional: Lythrum
gravel
Ranunculus Fontinalis
Steeper, shaded banks
(0.5-1m)
Dominant: Crack Willows
Glyceria, Sp. erectum
occasional: Butomus
Crack willow
Elder
Crack willow
Ash
Crack willow
Sycamore
Dominant Glyceria
occasional: Cx. riparia
Shallow banks
PHOTO 1/2
Common: R. penicillatus, Fontinalis antipyretica.
Occasional: Butomus.
Stands of Pot. lucens + lot. perfoliatus at southern end of length.
① Margins:
Locally dominant: Phalaris, Gly. maxima Sp. erectum.
Locally frequent: Rorippa palustris, Mentha aquatica, Stachys palustris.
Occasional: Rx. hydro., Myosotis, Lycopus, Apium nod., Nasturtium, Butomus, Berula
② Upper banks:
Ruderals, grasses.
Also frequent: Urtica, Ep. hirsutum, Phalaris, Symphytum
Occasional: Filipendula, Cx. acutiflorus

LENGTH 1

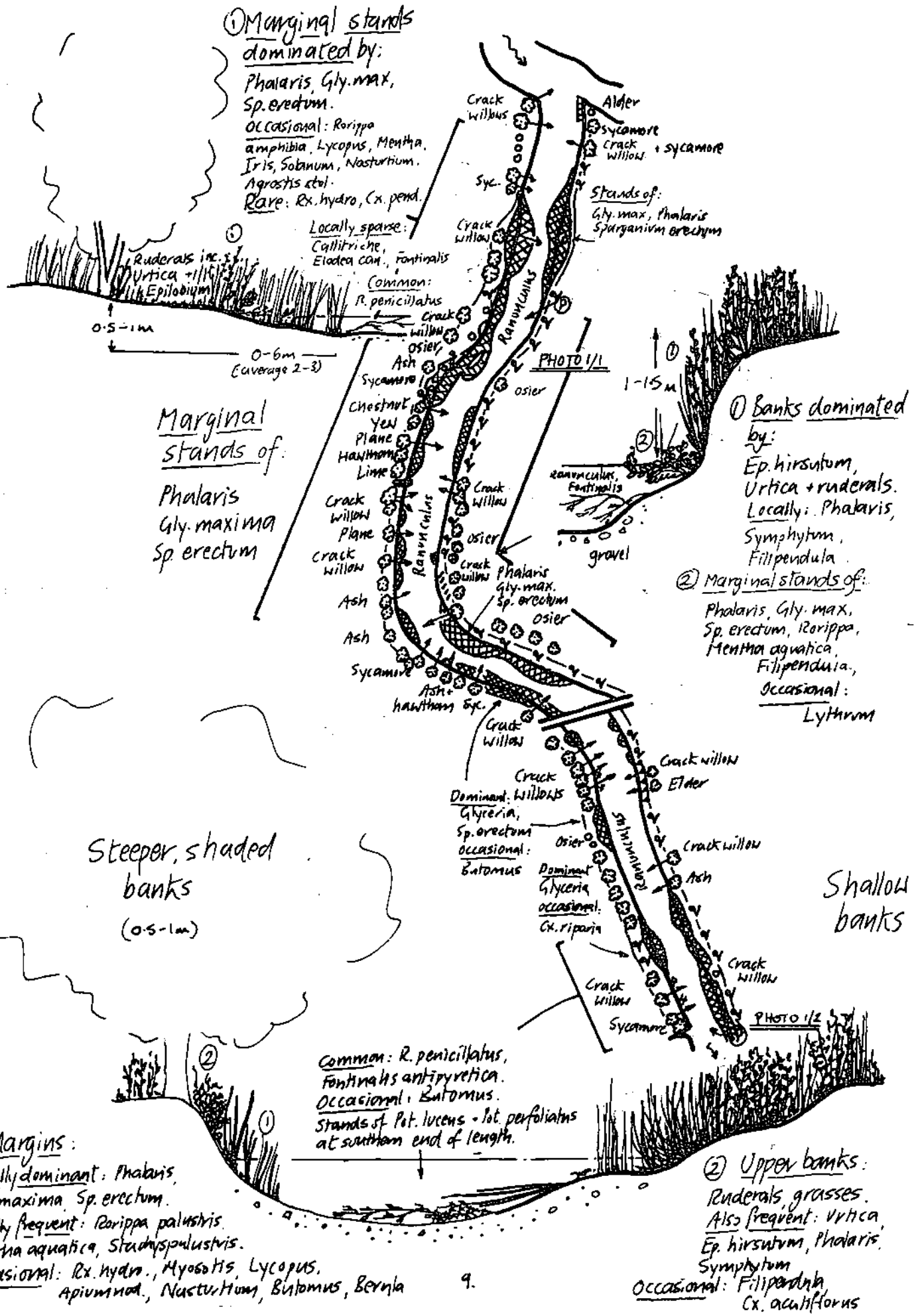


① Marginal stands dominated by:
Phalaris, Gly. max, Sp. erectum.
Occasional: Rorippa amphibia, Lycopus, Mentha, Iris, Solanum, Nasturtium, Agrostis stol.
Rare: Rx. hydro, Cx. pend.
Locally sparse: Callitriche, Elodea can., Fontinalis
Common: R. penicillatus
Ruderals inc. Urtica + Epilodium
0.5-1m
0-6m (average 2-3)
Marginal stands of: Phalaris, Gly. maxima, Sp. erectum
Crack willows
Alder
Sycamore
Crack willow + sycamore
Syc.
Stands of: Gly. max, Phalaris, Sparganium erectum
Crack willow
Ranunculus
osier
Ash
Sycamore
Chestnut
Yew
Plane
Hawthorn
Lime
PHOTO 1/1
1-1.5m
① Banks dominated by: Ep. hirsutum, Urtica + ruderals. Locally: Phalaris, Symphytum, Filipendula
ranunculus, Fontinalis
gravel
② Marginal stands of: Phalaris, Gly. max, Sp. erectum, Rorippa, Mentha aquatica, Filipendula, Occasional: Lythrum
Phalaris Gly. max. Sp. erectum
Ash + hawthorn
Syc.
Crack willow
Elder
Dominant: Willows Glyceria, Sp. erectum, occasional: Butomus
Dominant Glyceria occasional. Cx. riparia
Steeper, shaded banks (0.5-1m)
Shallow banks
PHOTO 1/2
Common: R. penicillatus, Fontinalis antipyretica. Occasional: Butomus. Stands of Pot. lucens + Pot. perfoliatus at southern end of length.
① Margins: Locally dominant: Phalaris, Gly. maxima, Sp. erectum. Locally frequent: Rorippa palustris, Mentha aquatica, Stachys palustris. Occasional: Rx. hydro., Myosotis, Lycopus, Apium nod., Nasturtium, Butomus, Berula
② Upper banks: Ruderals, grasses. Also frequent: Urtica, Ep. hirsutum, Phalaris, Symphytum. Occasional: Filipendula, Cx. acutiflorus

LENGTH 1


① Marginal stands dominated by:
Phalaris, Gly. max, Sp. erectum.
Occasional: Rorippa amphibia, Lycopus, Mentha, Iris, Solanum, Nasturtium, Agrostis stol.
Rare: Rx. hydro, Cx. pend.
Locally sparse: Callitriche, Elodea can., Fontinalis
Common: R. penicillatus
Ruderals inc. ss. Urtica + Epilobium
0·5–1m
0–6m
Coverage 2–3
Marginal stands of
Phalaris
Gly. maxima
Sp. erectum
Crack willow
Alder
Sycamore
Crack willow + sycamore
Syc.
Stands of:
Gly. max, Phalaris
Sparganium erectum
Ranunculus
PHOTO 1/1
1–15m
osier
Ash
Sycamore
Chestnut
Yew
Plane
Hawthorn
Lime
Crack willow
Plane
crack willow
Ash
Ash
Sycamore
Ash + hawthorn
Syc.
Ranunculus Fontinalis
gravel
① Banks dominated by:
Ep. hirsutum, Urtica + ruderals.
Locally: Phalaris, Symphytum, Filipendula
② Marginal stands of:
Phalaris, Gly. max, Sp. erectum, Rorippa, Mentha aquatica Filipendula,
Occasional: Lythrum
Phalaris
Gly. max.
Sp. erectum
Crack willow
Dominant: Willows
Glyceria, Sp. erectum
occasional: Butomus
Crack willow
Elder
Crack willow
Ash
Dominant Glyceria
occasional: Cx. riparia
Crack willow
Crack willow
Sycamore
PHOTO 1/2
Steeper, shaded banks
(0·5–1m)
Shallow banks
Common: R. penicillatus, Fontinalis antipyretica.
Occasional: Butomus.
Stands of Pot. lucens + Pot. perfoliatus at southern end of length.
① Margins:
Locally dominant: Phalaris, Gly. maxima Sp. erectum.
Locally frequent: Rorippa palustris, Mentha aquatica, Stachys palustris.
Occasional: Rx. nydro., Myosotis, Lycopus, Apium nod., Nasturtium, Butomus, Berula
② Upper banks:
Ruderals grasses.
Also frequent: Urtica, Ep. hirsutum, Phalaris, Symphytum
Occasional: Filipendula, Cx. acuti florus

LENGTH 1


① Marginal stands dominated by:
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Occasional: Rorippa amphibia, Lycopus, Mentha, Iris, Solanum, Nasturtium, Agrostis etal.
Rare: Rx.hydro, Cx.pend.
Locally sparse: Callitriche, Elodea can., Fontinalis
Common: R. penicillatus
Ruderals inc. s.f. Urtica + Epilobium
0·5-1m
0-6m (coverage 2-3)
Marginal stands of: Phalaris Gly.maxima Sp.erectum
Crack willows
Alder
Sycamore
Crack willow + sycamore
Syc.
Stands of: Gly.max, Phalaris Sparganium erectum
Crack willow
Ranunculus
PHOTO 1/1
Ash
Sycamore
Chestnut
Yew
Plane
Hawthorn
Lime
Crack willow
Plane
crack willow
Ash
Ash
Sycamore
Ash + hawthorn Syc.
osier
Crack willow
Phalaris Gly.max. Sp.erectum
1-1·5m
① Banks dominated by: Ep.hirsutum, Urtica + ruderals.
Locally: Phalaris, Symphytum, Filipendula
Ranunculus, Fontinalis
gravel
② Marginal stands of: Phalaris, Gly.max, Sp.erectum, Rorippa, Mentha aquatica, Filipendula.
Occasional: Lythrum
Crack willow
Elder
Dominant: Willows Glyceria, Sp.erectum
Occasional: Butomus
Crack willow
Ash
Dominant Glyceria
Occasional: Cx. riparia
Crack willow
Crack willow
Sycamore
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② Upper banks:
Ruderals, grasses.
Also frequent: Urtica, Ep. hirsutum, Phalaris, Symphytum
Occasional: Filipendula, Cx. acutiflorus

5.1 LENGTH 1. West Arm: River divergence (GR 43590 20995) to drain inlet (GR 43598 20949)

Land-use. The west bank of the river was separated from the urban areas of Witney by a strip of woodland 10-50m wide. The east bank was separated from the east arm of the Windrush by areas of rank or mown amenity grassland.

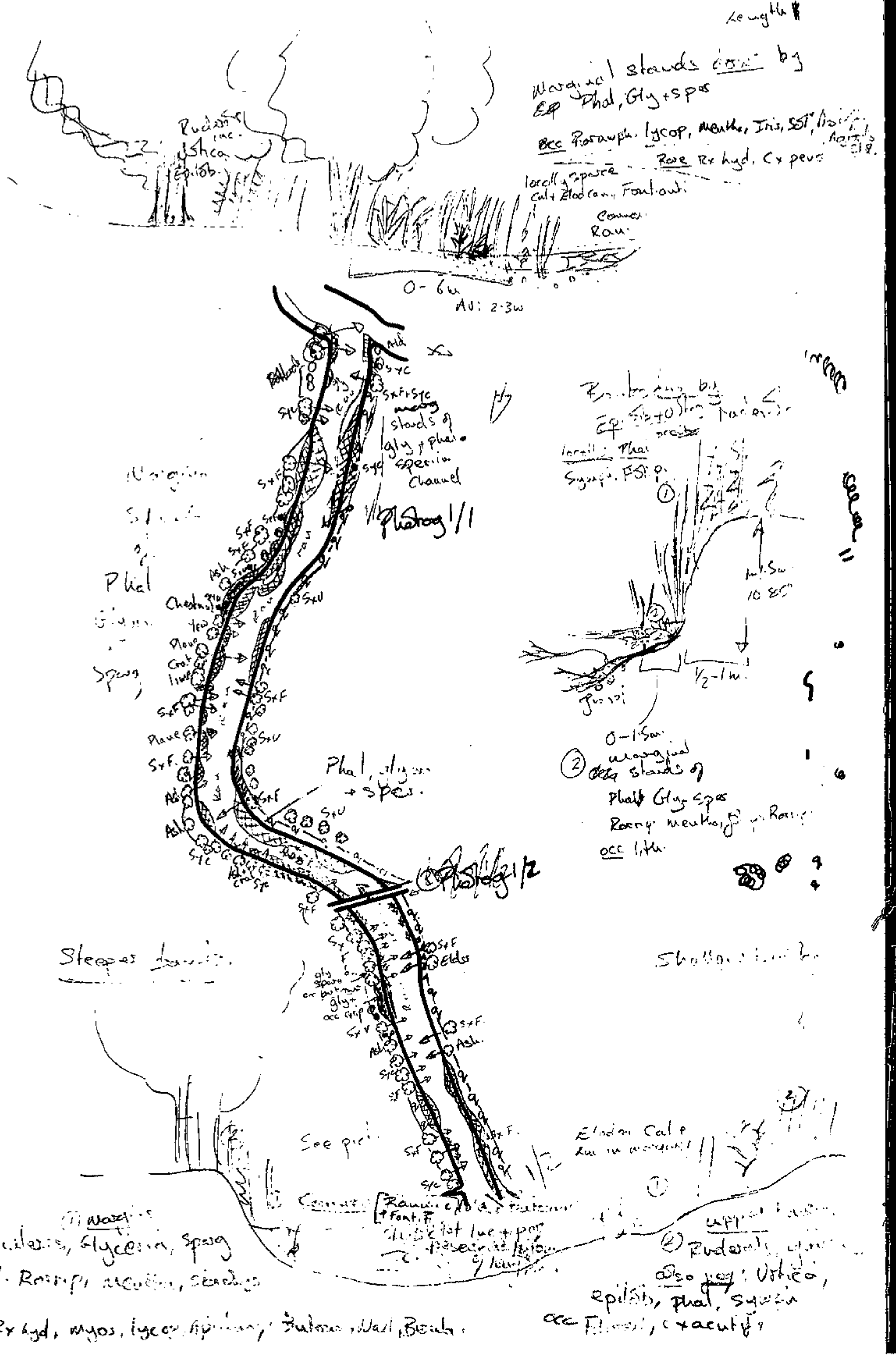
Bank structure. Along most of the length the more shaded west bank was relatively low in height and angle (0.5-1m, 10-30 degrees). The east bank was typically higher (1-1.5m) and frequently very steep (60-90 degrees). Bank structure at the very south of the length was more variable.

Shade. The West bank, was typically moderatly to heavy shaded by the adjacent woodland belt. The east bank was much more open with many of the bordering trees set back from the bank, so not casting shade on the channel.

Vegetation The generally steep east bank typically supported only a thin fringe of wetland emergents and herb species. Some stands of tall emergents were developed in the channel, particularly Sparganium erectum (branched bur-reed) Phalaris arundinacea (reed canary-grass) and Glyceria maxima (reed sweet-grass).

The west bank generally had much lower bank slopes and typically supported more extensive emergent stands. The abundance of upper bank species on the west margin was frequently inhibited by shade from overhaning trees, although locally this encouraged the occurrence of species such as Carex pseudocyperus (cyperus sedge) which were not found in other lengths of the river. Small stands of Butomus umbellatus (flowering-rush) were recorded in the downstream part of the length, south of the footbridge at GR 43592 20965.

Aquatic vegetation was dominated by Ranunculus penicillatus (stream water-crowfoot) which was common throughout the length, although not as abundant as in most other lengths. Fontinalis antipyretica (willow moss) was frequent. Potamogeton lucens (shining pondweed) was abundant at the very south of length mixed with occasional Potamogeton perfoliatus (perfoliate pondweed) but neither were recorded upstream of the footbridge. Callitriche sp. (starwort) and Elodea canadensis (Canadian pondweed) were locally frequent, especially downstream of the bifurcation at north of the length where they had colonised muddy sediments near the channel margins.



Length
Marginal stands dom by
Phal, Gly + Spar
Occ Ranunculus, lycop, Mentha, Iris, SST
Rare Rx hyd, Cx pend
locally sparse Call + Elod can, Font anti
Common Ran
Rudosal inc. Urtica Epilob.
0 - 6m
Av: 2.3m
18
Ash
Syc
S+F+Syc
marg stands of gly + phal + spar in channel
Marginal stands of Phal Gly + Sparg
Photog 1/1
Chestnut
Yew
Plane
Croat
Lime
S+F
S+U
Phal, Glycer + Spar.
Photog 1/2
Locally Phal
0-1.5m
1/2-1m
② marginal stands of Phal, Gly, Spar
Rorripa, mentha
occ lith.
Steeper banks
Shallower banks
Elder
gly sparse
See pic
Elodea Call
Comm Ranunc
① Marginal Ldom: Phalaris, Glyceria, Sparg
Loc freq. Rorripa, mentha, seedlings
occ Rx hyd, myos, lycop, Apium, Butomus, Nast, Berula.
Upper bank
② Rudosals
Also freq: Urtica, epilob, phal, Symph
occ Filipend, Cx acutif

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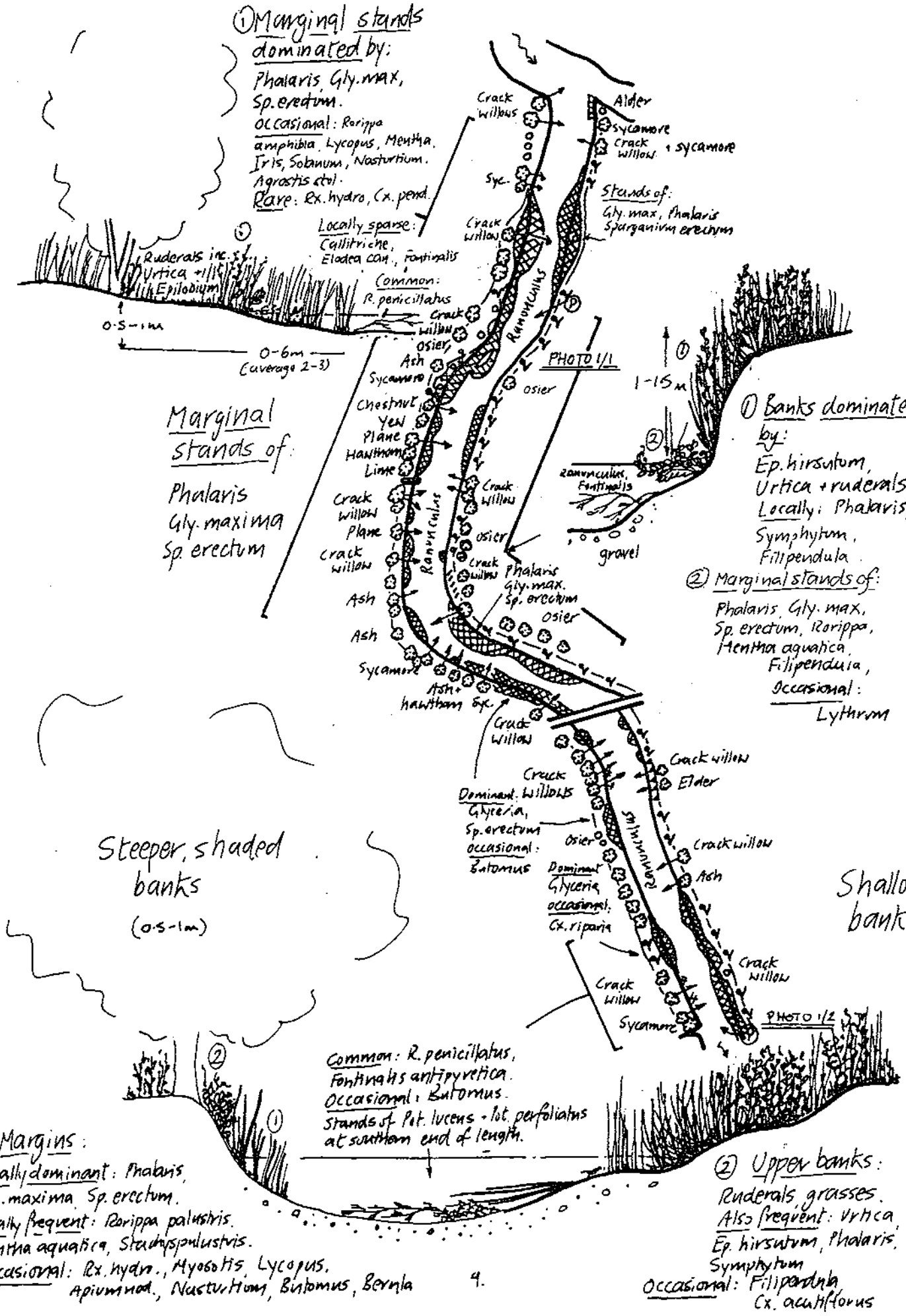
LENGTH 1


① Marginal stands dominated by:
Phalaris, Gly. max, Sp. erectum.
Occasional: Rorippa amphibia, Lycopus, Mentha, Iris, Sobnum, Nasturtium, Agrostis stol.
Rare: Rx. hydro, Cx. pend.
Locally sparse: Callitriche, Elodea can., Fontinalis
Common: R. penicillatus
Ruderals inc. s.f. Urtica + Epilobium
0·5-1m
0-6m (Coverage 2-3)
Crack Willows
Alder
Sycamore
Crack willow + sycamore
Syc.
Stands of: Gly. max, Phalaris Sparganium erectum
Crack willow
Ranunculus
PHOTO 1/1
Crack willow
Osier
Ash
Sycamore
Chestnut
Yew
Plane
Hawthorn
Lime
Marginal stands of:
Phalaris
Gly. maxima
Sp. erectum
Crack willow
Plane
Crack willow
Ranunculus
Crack willow
Osier
Crack willow
Phalaris
Gly. max.
Sp. erectum
Osier
Ash
Ash
Sycamore
Ash + hawthorn Sp.
Crack willow
1-15m
① Banks dominated by:
Ep. hirsutum, Urtica + ruderals.
Locally: Phalaris, Symphytum, Filipendula.
Ranunculus, Fontinalis
gravel
② Marginal stands of:
Phalaris, Gly. max, Sp. erectum, Rorippa, Mentha aquatica, Filipendula,
Occasional: Lythrum
Crack willow
Crack willow
Elder
Dominant: Willows
Glyceria, Sp. erectum
occasional: Butomus
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Osier
Dominant Glyceria
occasional: Cx. riparia
Crack willow
Ash
Crack willow
Crack willow
Sycamore
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Also frequent: Urtica, Ep. hirsutum, Phalaris, Symphytum
Occasional: Filipendula, Cx. acutiformis

BMS

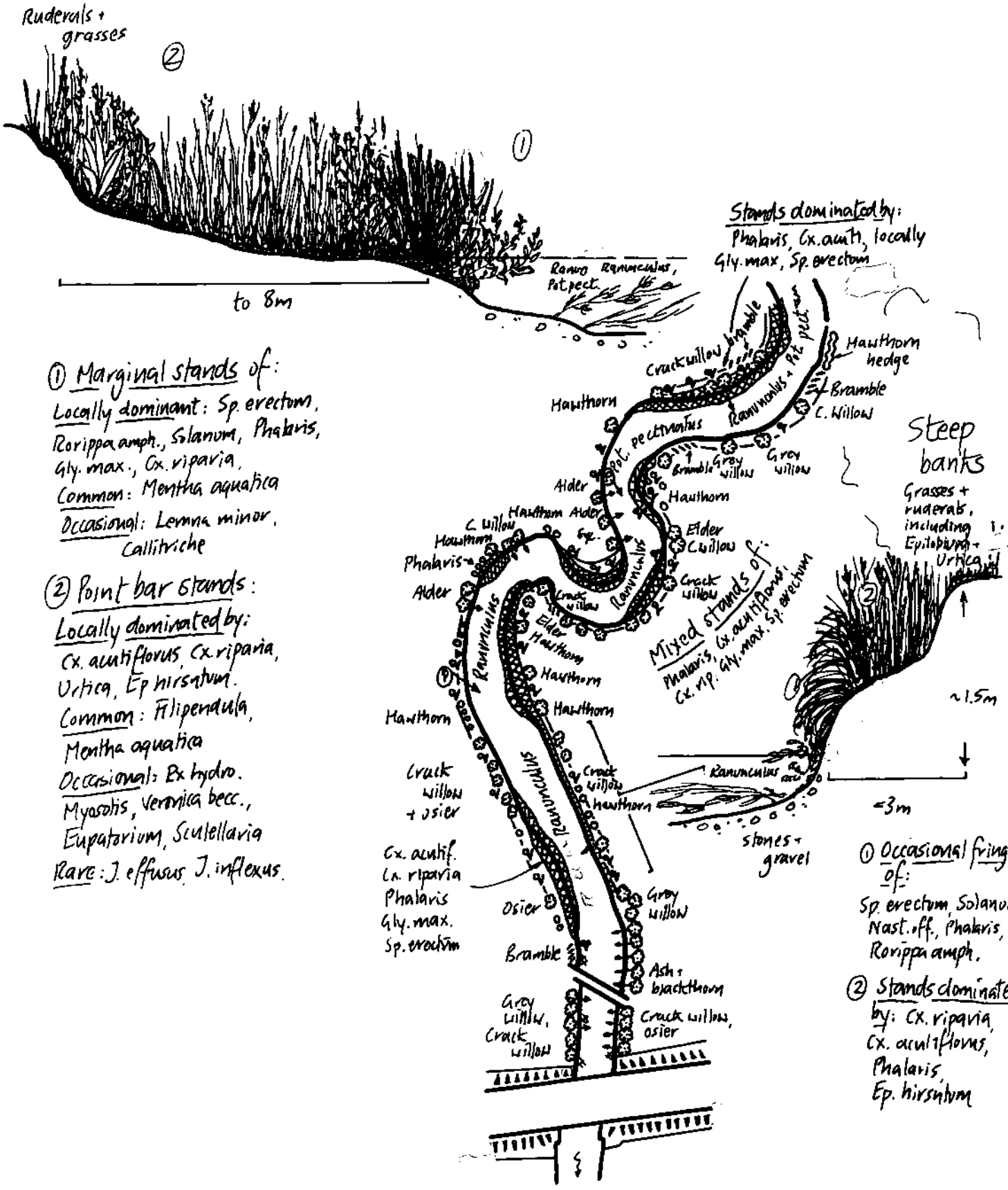
Band Action.

RIVER SERIES Amazon extra strong manilla

LENGTH 6

LENGTH 6

Point bar vegetation



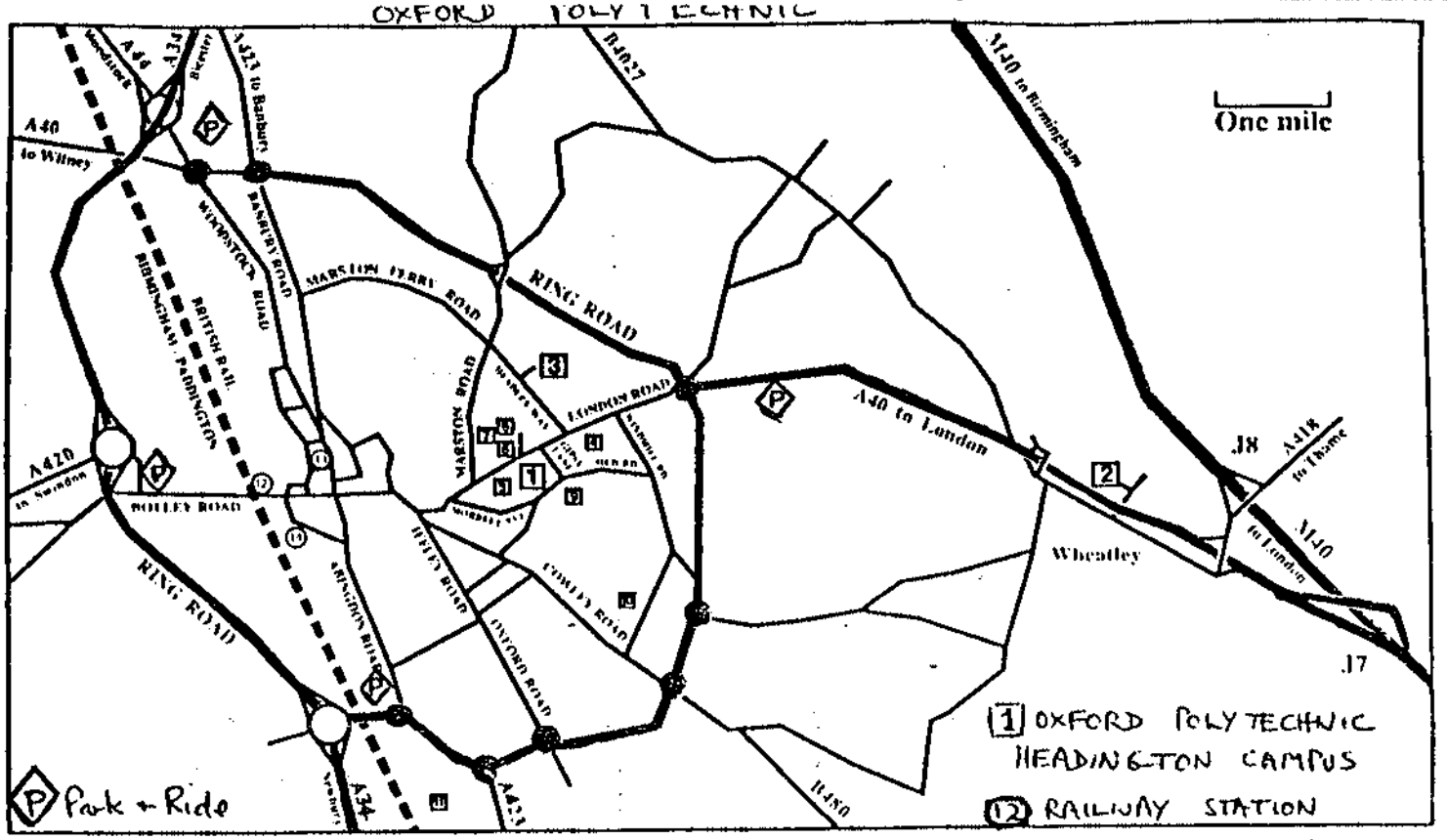
① Marginal stands of:
Locally dominant: Sp. erectum, Rorippa amph., Solanum, Phalaris, Gly. max., Cx. riparia,
Common: Mentha aquatica
Occasional: Lemna minor, Callitriche

② Point bar stands:
Locally dominated by:
Cx. acutiflorus, Cx. riparia, Urtica, Ep hirsutum.
Common: Filipendula, Mentha aquatica
Occasional: Ex hydro. Myosotis, Veronica becc., Eupatorium, Scutellaria
Rare: J. effusus, J. inflexus.

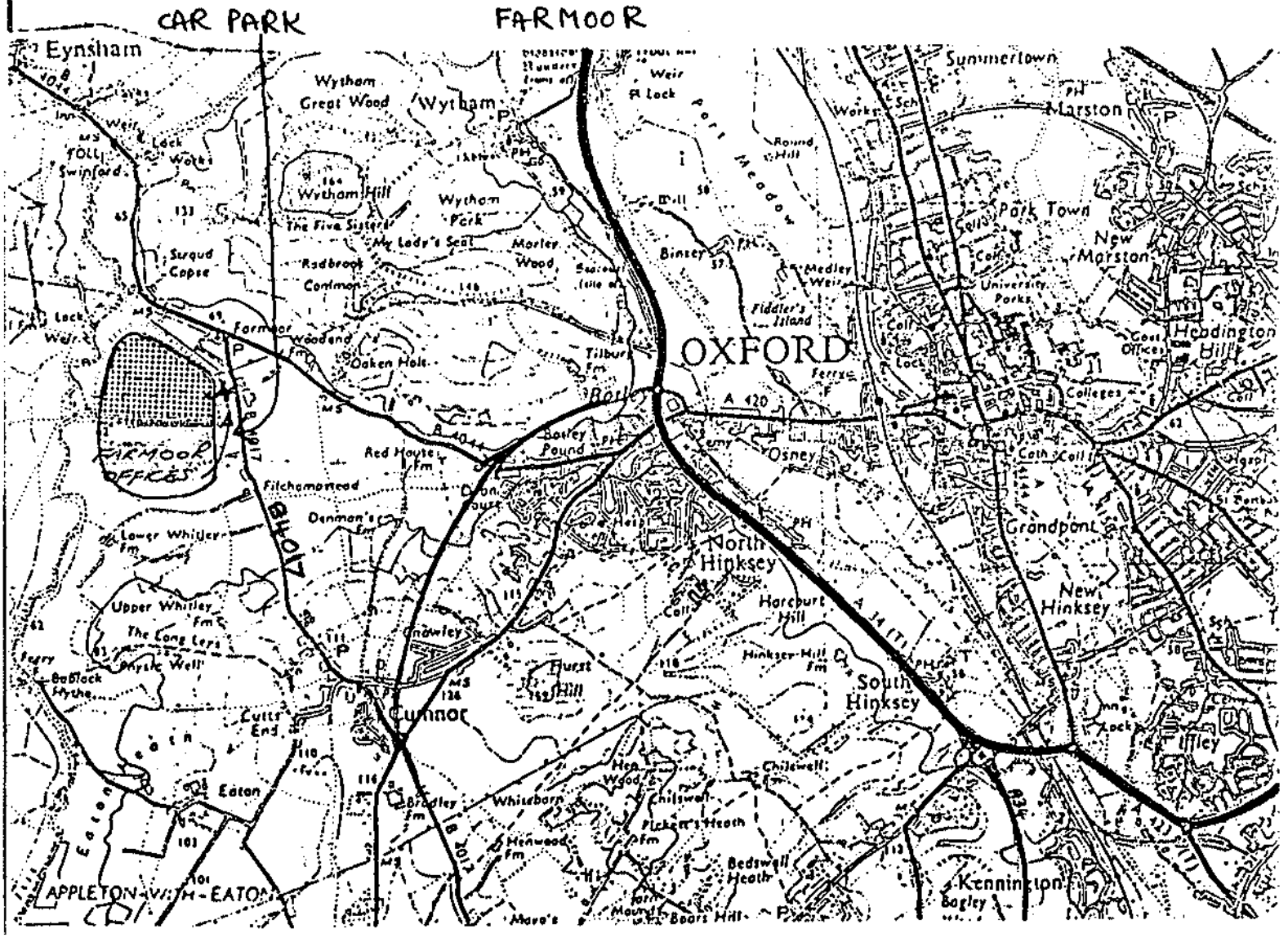
① Occasional fringe of:
Sp. erectum, Solanum, Nast. off., Phalaris, Rorippa amph.

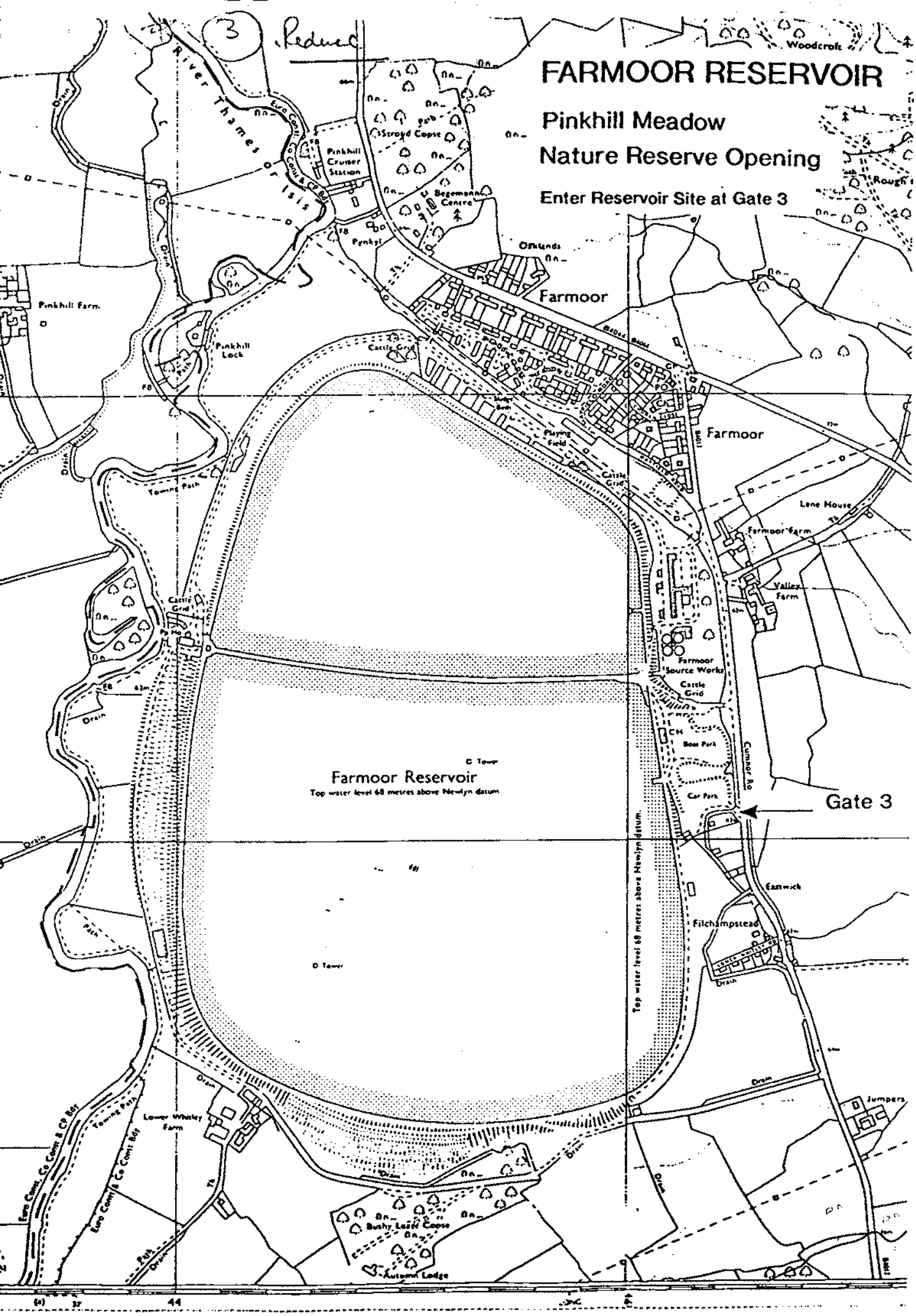
② Stands dominated by: Cx. riparia, Cx. acutiflorus, Phalaris, Ep. hirsutum

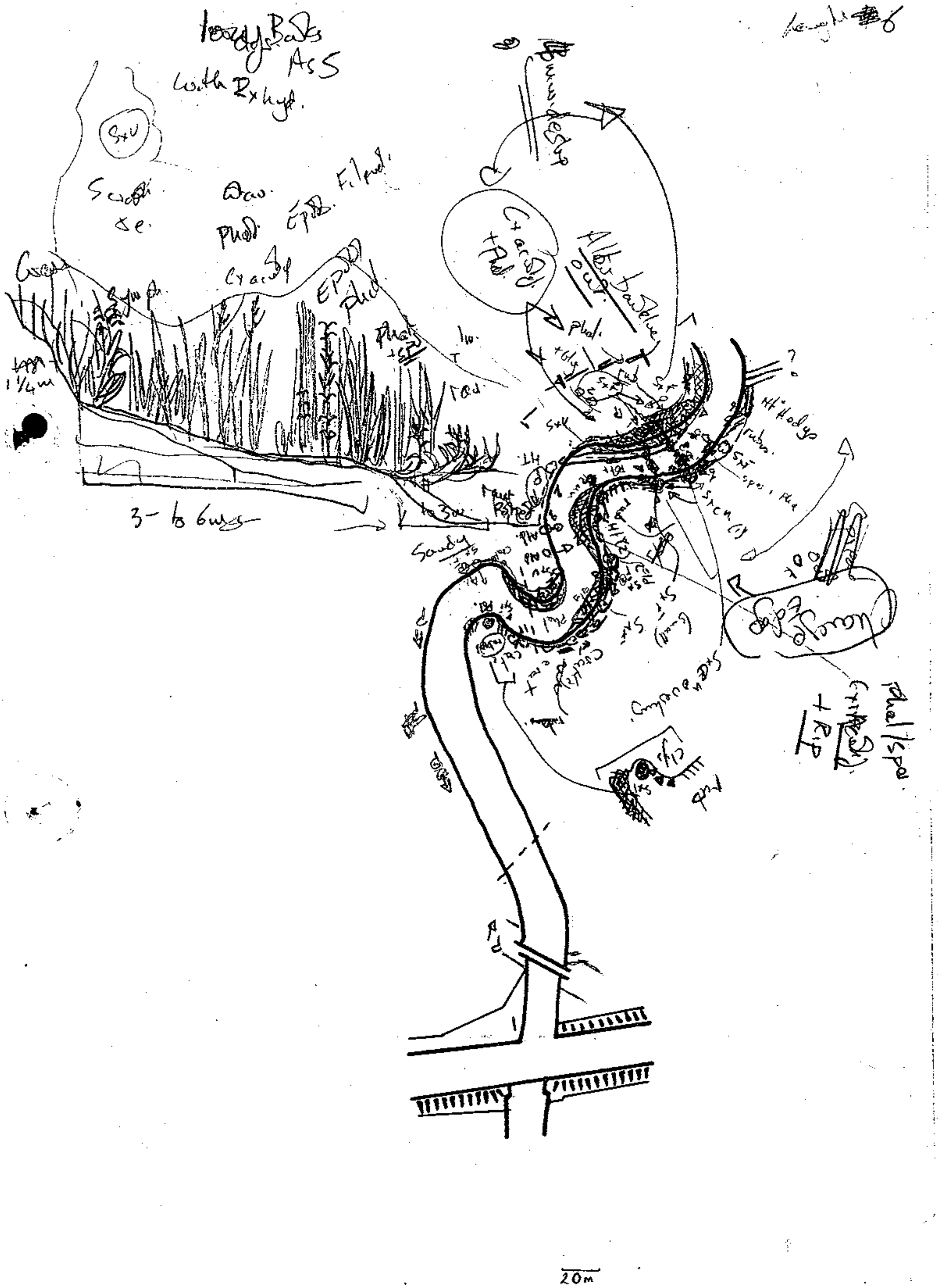
OXFORD POLYTECHNIC

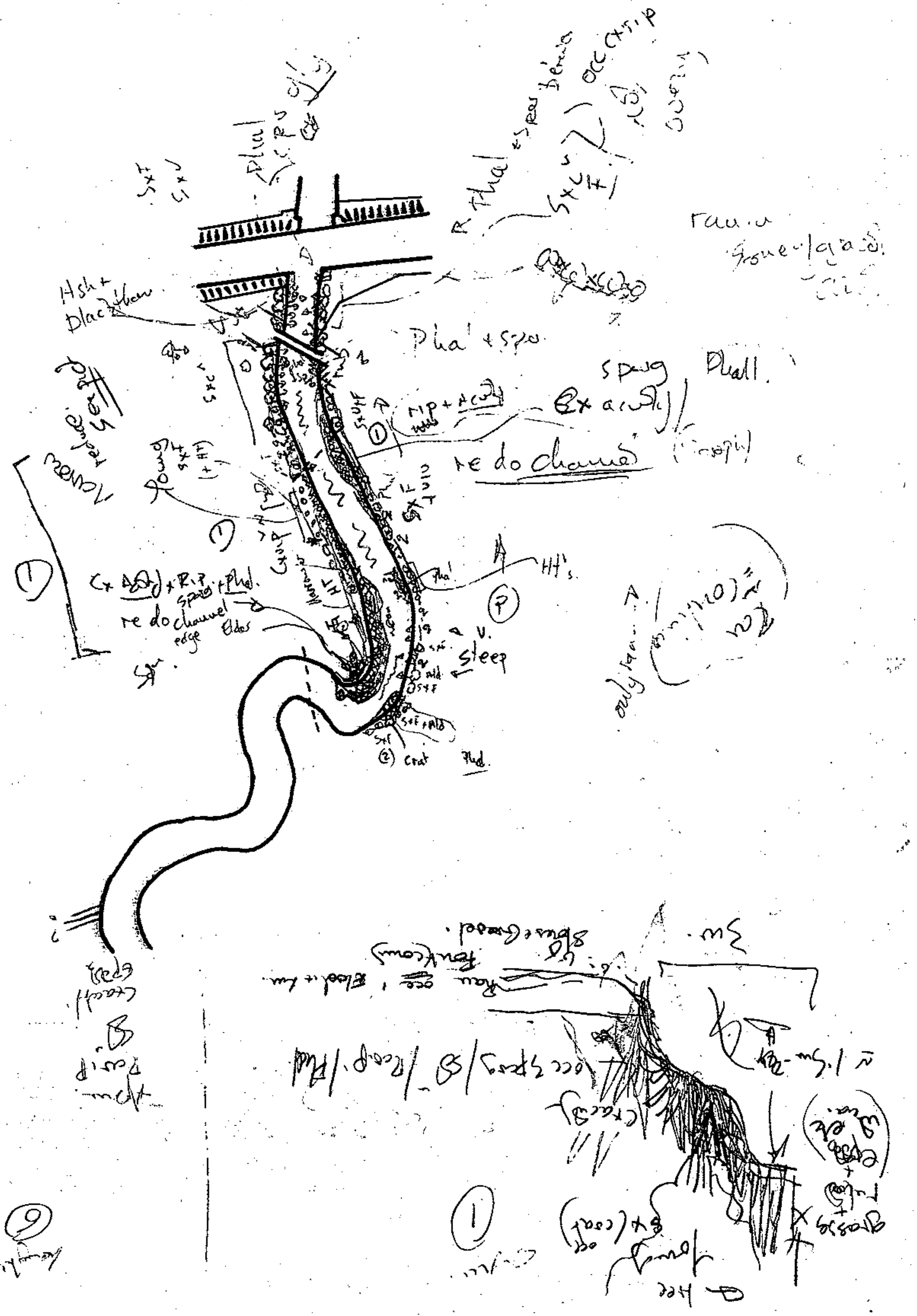


There is no Parking at the Polytechnic. Parking in streets around is possible though difficult. Best way from railway station is taxi.

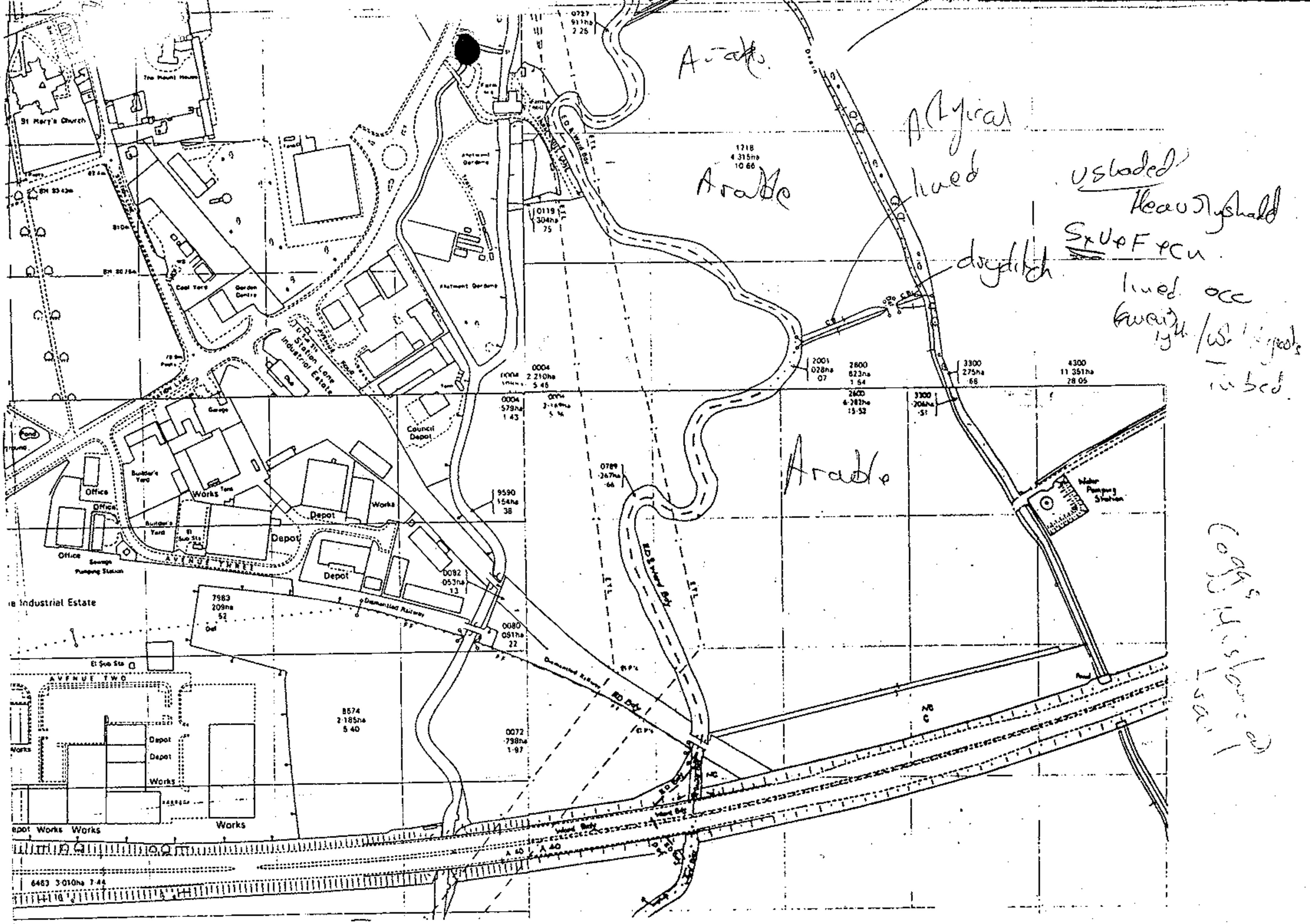



3 Reduced
FARMOOR RESERVOIR
Pinkhill Meadow
Nature Reserve Opening
Enter Reservoir Site at Gate 3
River Thames or Isis
Pinkhill Cruiser Station
Begemann Centre
Farmoor
Pinkhill Farm
Pinkhill Lock
Towing Path
Cattle Grid
Playing Field
Lane House
Farmoor Farm
Valley Farm
Farmoor Source Works
Boat Park
Car Park
Cumnor Rd
Gate 3
Farmoor Reservoir
Top water level 68 metres above Newlyn datum
Eastwick
Filchampstead
Jumpers
Lower Whitley Farm
Bushy Leaze Copse
Autumn Lodge
Woodcroft


Sandy
20m



Hsh + blackthorn
Pha' + spo
re do channel
re do channel edge
Elder
V. steep
HH's



St Mary's Church
The Mount House
Allotment Gardens
Coal Yard
Garden Centre
Station Lane Industrial Estate
Garage
Council Depot
Builder's Yard
Works
Office
Depot
Sewage Pumping Station
AVENUE THREE
AVENUE TWO
Industrial Estate
Dismantled Railway
Water Pumping Station
El Sub Sta
Pond
A 40
1718 4 315ha 10 66
0004 2 210ha 5 46
2600 6 282ha 15 53
4300 11 351ha 28 05
7983 209ha 52
8574 2 185ha 5 40
0072 798ha 1 97
0080 091ha 22
0092 053ha 13
9590 154ha 38
6483 3 010ha 7 44
Arable

TODOs

30

Finish Maps in rough. — 3hrs.
Maps - top Copy 8hrs. 11

Rough write up of lengths. 4hrs 13

Neat write up of lengths 8

Sp list(s) — 2hrs.

Local sp 3 hrs.

General write up of plants. 4 hrs

Intro + methods — 3hrs.

Summary 2hrs.

Conservn Value 2hrs.

Lengths map. 1hr.

Assoc Flood Plane. map 3hrs

Sat.
Mount photos + title 3hrs.
+ Put on maps. (mw)

ID plants. + put in 3hrs.

Titles of maps. → (mw)

Printing
P/copy

Slow

Contents 1hr.

26

Plan Tomorrow

rough write up: 9 – 11
Rough maps: 6 – 8.00

10 Plants

maps:

Sort outline of Report. 11 – 100
Intro + Methods

Sp list: 2 – 4
local sp: 4 +

6 – 12. maps Neat

Thus
write up - neat. lengths
General write up
Mount photos + P/copy

Red.

Windrush 9-11 June. Windrush Sunday 21

NATIONAL POND SURVEY Wetland plant list

SUBMERGED AND FLOATING PLANTS

Apium inundatum
Aponogeton distachyos
Azolla filiculoides
Callitriche hamulata
Callitriche hermaphroditica
Callitriche obtusangula
Callitriche platycarpa
Callitriche stagnalis
Callitriche truncata
Callitriche sp. (undetermined)
Ceratophyllum demersum
Ceratophyllum submersum
Crassula helmsii
Elatine hexandra
Eleogiton fluitans
Elodea canadensis
Elodea nuttallii
Groenlandia densa
Hippuris vulgaris
Hottonia palustris
Hydrocharis morsus-ranae
Isoetes lacustris
Juncus bulbosus
Lagarosiphon major
Lemna gibba
Lemna minuscula
Lemna minor
Lemna polyrhiza
Lemna trisulca
Littorella uniflora
Lobelia dortmanna
Menyanthes trifoliata
Myriophyllum alterniflorum
Myriophyllum spicatum
Myriophyllum verticillatum
Nuphar lutea
Nymphaea alba
Nymphoides peltata
Oenanthe fluviatilis
Potamogeton alpinus
Potamogeton berchtoldii
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)
Ranunculus aquatilis
Ranunculus baudotii
Ranunculus circinatus
Ranunculus fluitans
Ranunculus hederaceus
Ranunculus omiophyllus
Ranunculus peltatus
Ranunculus penicillatus
Ranunculus trichophyllus
Sagittaria sagittifolia
Sparganium angustifolium
Sparganium emersum
Sparganium minimum
Stratiotes aloides
Subularia aquatica
Utricularia australis
Utricularia intermedia
Utricularia vulgaris
Wolffia arrhiza
Zannichellia palustris

Bryophytes:
Fontinalis antipyretica
Riccia fluitans
Ricciocarpus natans
Sphagnum sp.

Algae:
Chara sp.
Nitella sp.
Tolypella sp

EMERGENT AND OTHER WETLAND PLANTS

Achillea ptarmica
Acorus calamus
Agrostis stolonifera
Alisma lanceolatum
Alisma plantago-aquatica
Alopecurus aequalis
Alopecurus geniculatus
Anagallis tenella
Andromeda polifolia
Angelica archangelica
Angelica sylvestris
Apium nodiflorum
Baldellia ranunculoides
Barbarea intermedia
Barbarea stricta
Barbarea vulgaris
Berula erecta
Bidens cernua
Bidens tripartita
Blysmus compressus
Butomus umbellatus
Calamagrostis canescens
Calamagrostis epigejos
Caltha palustris
Cardamine amara
Cardamine pratensis
Carex acuta
Carex acutiformis
Carex curta
Carex demissa
Carex diandra
Carex disticha
Carex elata
Carex flacca
Carex hostiana
Carex laevigata
Carex lasiocarpa
Carex lepidocarpa
Carex limosa
Carex nigra
Carex otrubae
Carex panicea
Carex paniculata
Carex pendula
Carex pseudocyperus
Carex pulicaris
Carex riparia
Carex rostrata
Carex spicata
Carex vesicaria
Catabrosa aquatica
Cicuta virosa
Cirsium dissectum
Cirsium palustre
Cladium mariscus
Conium maculatum
Crepis paludosa
Cyperus longulus
Dactylorhiza fuchsii
Dactylorhiza incarnata
Dactylorhiza majalis:
ssp. praetermissa
ssp. purpurella
Deschampsia caespitosa
Drosera rotundifolia
Egeria densa
Eleocharis acicularis
Eleocharis multicaulis
Eleocharis palustris
Eleocharis quinqueflora
Eleocharis uniglumis
Equisetum fluviatile
Equisetum palustre
Epilobium adenocaulon
Epilobium hirsutum
Epilobium lanceoloides
Epilobium obscurum
Epilobium palustre
Epilobium parviflorum
Epilobium tetragonum
Epipactis palustris
Erica tetralix
Eriophorum angustifolium
Eriophorum latifolium
Eriophorum vaginatum
Eupatorium cannabinum
Filipendula ulmaria
Galium boreale
Galium palustre
Galium uliginosum
Geum rivale
Glyceria declinata
Glyceria fluitans
Glyceria maxima
Glyceria plicata
Hydrocotyle vulgaris
Hypericum elodes
Hypericum tetrapterum
Impatiens capensis
Impatiens glandulifera
Impatiens noli-tangere
Iris pseudacorus
Isolepis cernua
Isolepis setacea
Juncus acutiflorus
Juncus articulatus
Juncus bufonis agg.
Juncus compressus
Juncus conglomeratus
Juncus inflexus
Juncus subnodulosus
Juncus effusus
Lotus uliginosus
Lychnis flos-cuculi
Lycopus europaeus
Lysimachia nemorum
Lysimachia nummularia
Lysimachia vulgaris
Lythrum portula
Lythrum salicaria
Mentha aquatica
Mimulus guttatus
Mimulus luteus
Molinia caerulea
Montia fontana
Myosotis laxa
Myosotis scorpioides
Myosotis secunda
Myosoton aquaticum
Myrica gale
Narthecium ossifragum
Nasturtium microphyllum
Nasturtium officinale
Oenanthe aquatica
Oenanthe crocata
Oenanthe fistulosa
Oenanthe lachenalii
Osmunda regalis
Parnassia palustris
Pedicularis palustris
Petasites hybridus
Phalaris arundinacea
Phragmites australis
Pilularia globulifera
Pinguicula vulgaris
Polygonum amphibium
Polygonum hydropiper
Polygonum lapathifolium
Polygonum persicaria
Potentilla erecta
Potentilla palustris
Pulicaria dysenterica
Ranunculus flammula
Ranunculus lingua
Ranunculus sceleratus
Rhynchospora alba
Rorippa amphibia
Rorippa palustris
Rorippa sylvestris
Rumex hydrolapathum
Rumex maritimus
Rumex palustris
Sagina procumbens
Sagittaria sagittifolia
Schoenoplectus lacustris
ssp lacustris
ssp tabernaemontani
Schoenus nigricans
Scrophularia auriculata
Scutellaria galericulata
Senecio aquaticus
Senecio fluviatilis
Sium latifolium
Solanum dulcamara
Sparganium erectum
Stachys palustris
Stellaria alsine
Stellaria palustris
Symphytum officinale
Thalictrum flavum
Thelypteris palustris
Tofieldia pusilla
Tricophorum cespitosum
Triglochin palustris
Typha angustifolia
Typha latifolia
Urtica dioica
Valeriana dioica
Veronica anagallis-aquatica
Veronica beccabunga
Veronica catenata
Veronica scutellata
Viola palustris

Trees and shrubs:
Alnus glutinosa
Frangula alnus
Populus sp.
Salix sp.

Other Wetland species (eg rare species or hybrids)

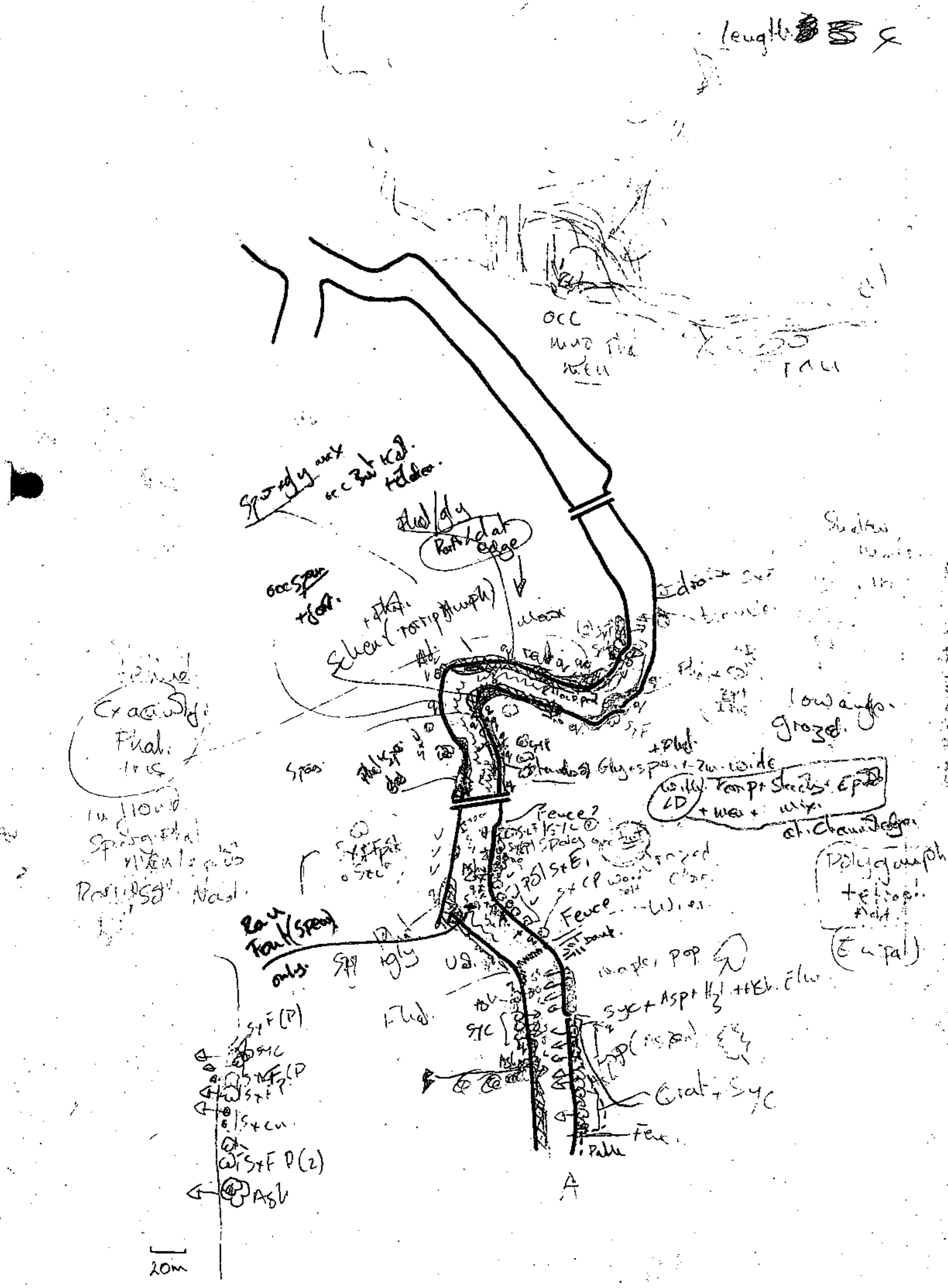
Total = 47

Name of Pond:

Date:

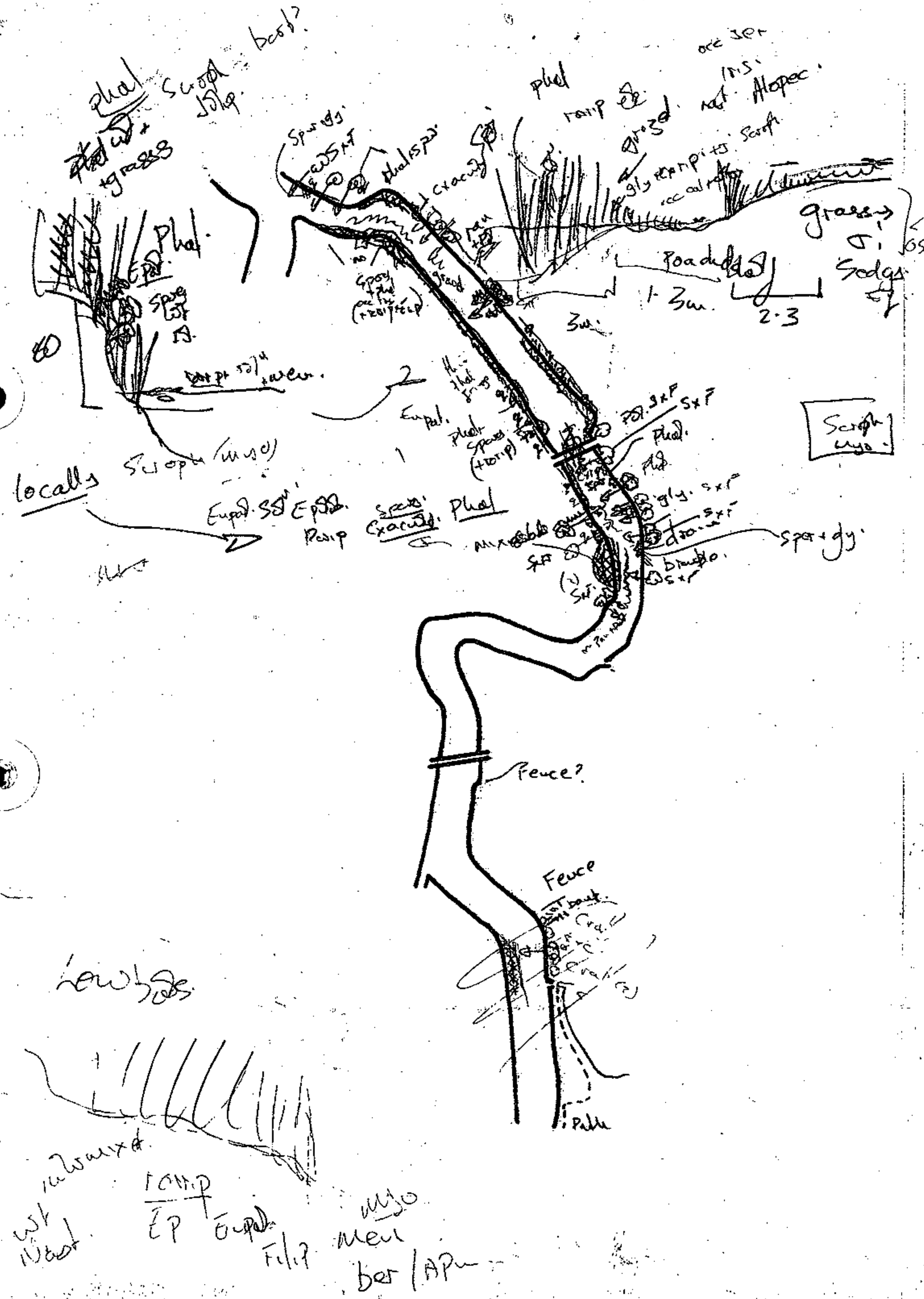
North Arrow:

Scale:



OCC
Fence?
Fence
low angle grazed
maple, pop
Grat + Syc
Syc
A
20m

length 4



Phal
Phal.
grass
Road
1-3m
2·3
3m
Scroph myo.
locally
Eupat.
Alopec
Fence?
Fence
Path
Men

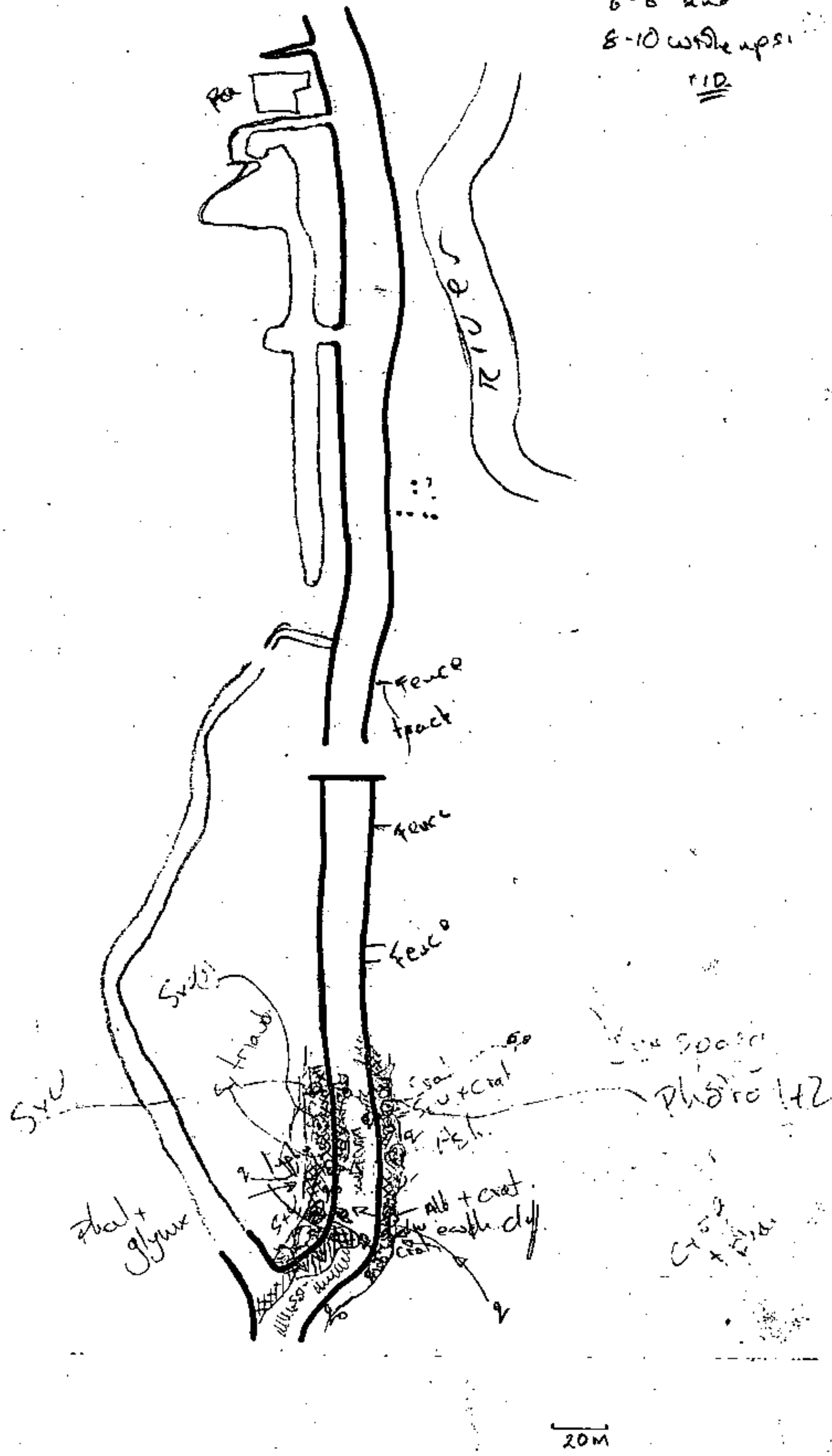
130-230 top ½ of length

length 2

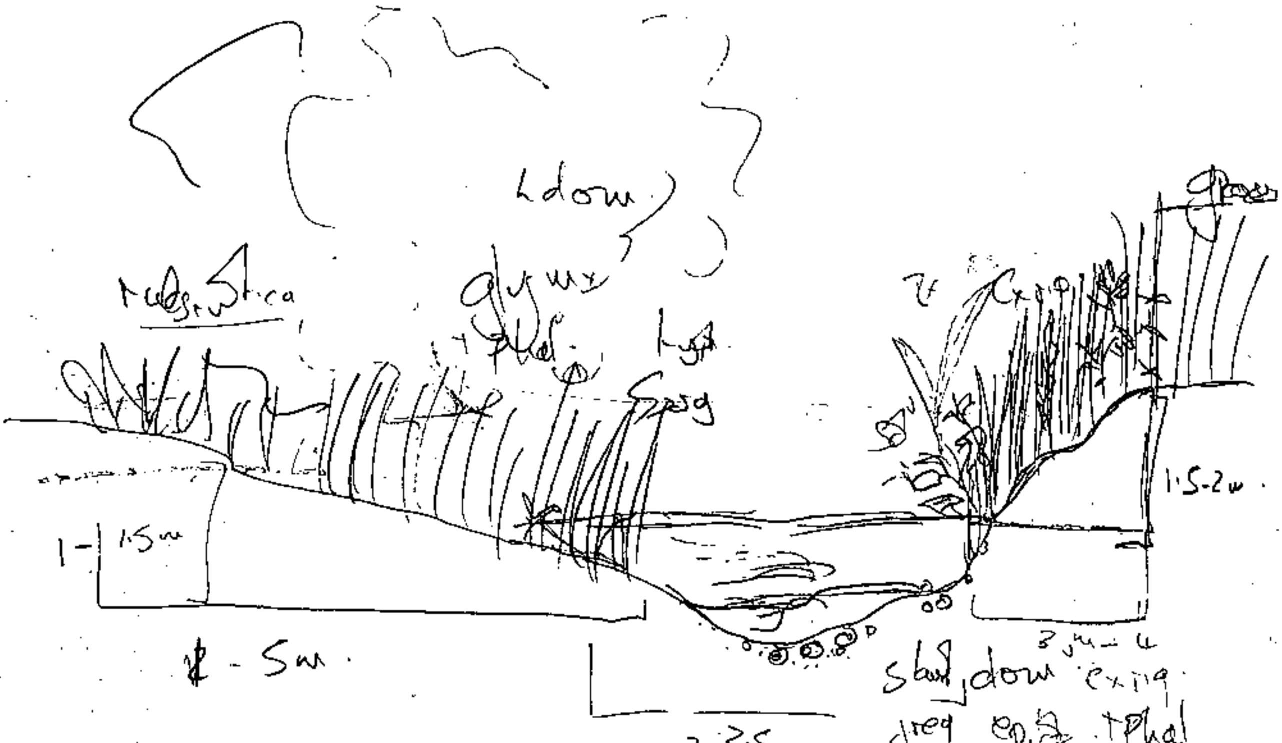
230-400 Home + Sausage

epid.
dip.
Plud.

4-6 1st
6-8 2nd
8-10 with ups
+10



L2?



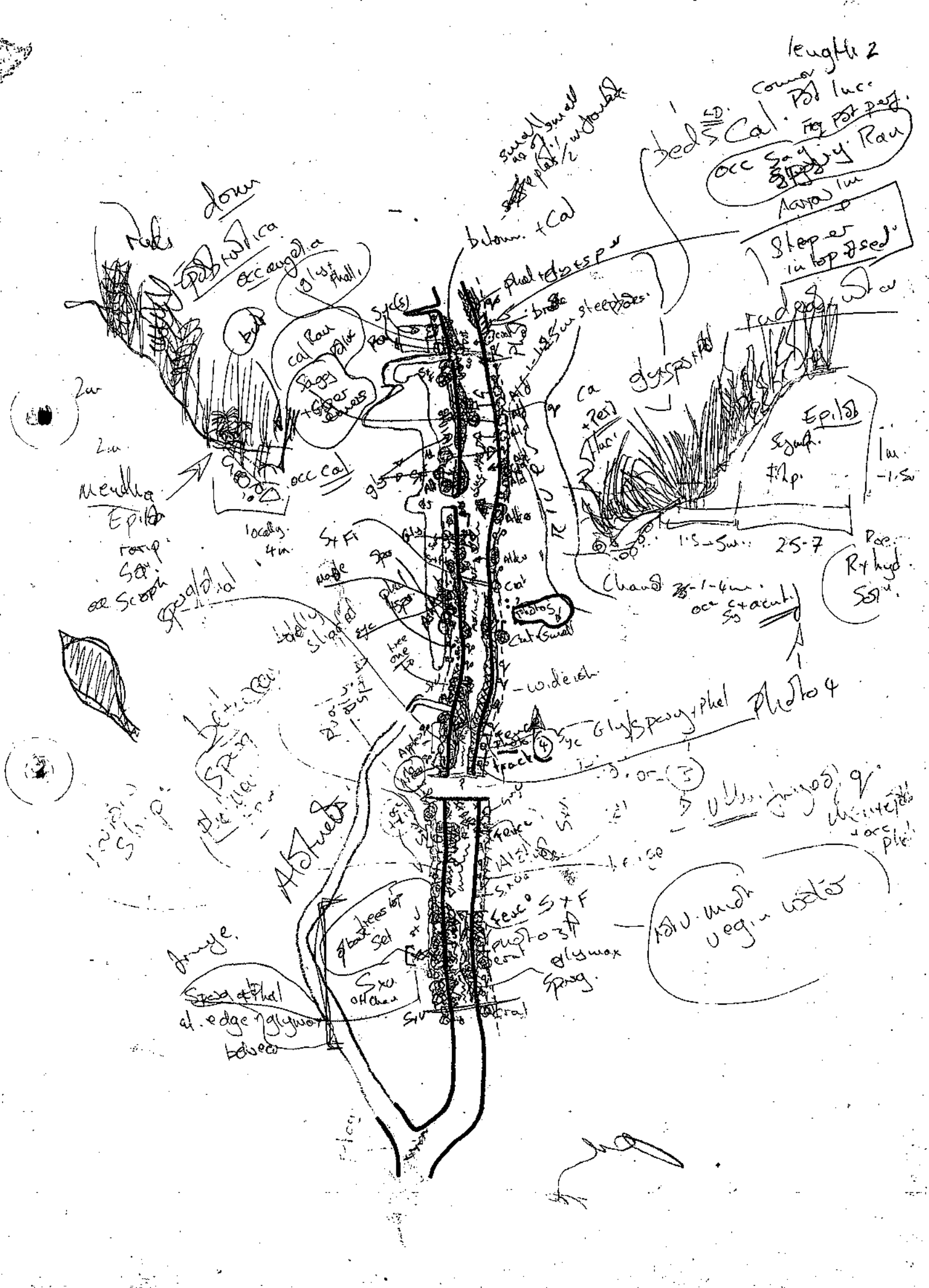
sbank dom 3m-4 exting
freq. epi... Phal.
SSTm
Wlica
Symph.
Filiped.

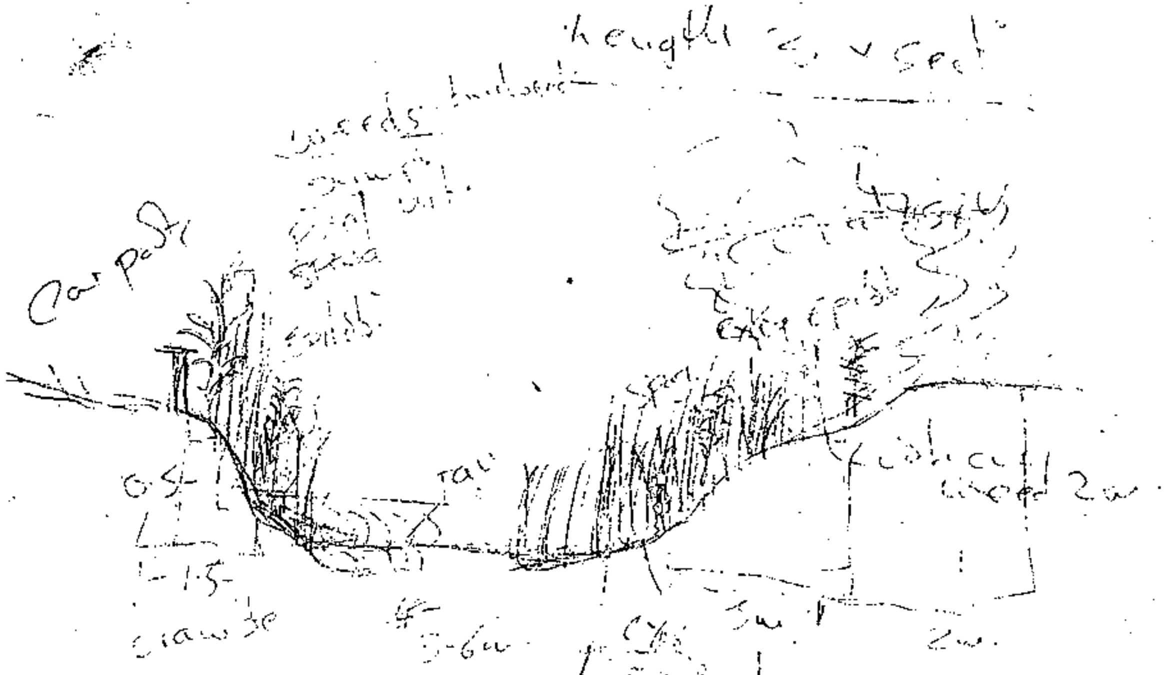
also SSTm.
Ranfl
Wlica
Symph

Exhyd
Rorampl
Menth
?Apm

Plan

Mon → 2 lengths + [illegible] up. +10.
Tue
Wed.
Thu.





locally
S8
+ Epilo.
hol.

Rang

I
bag
a
D cur.

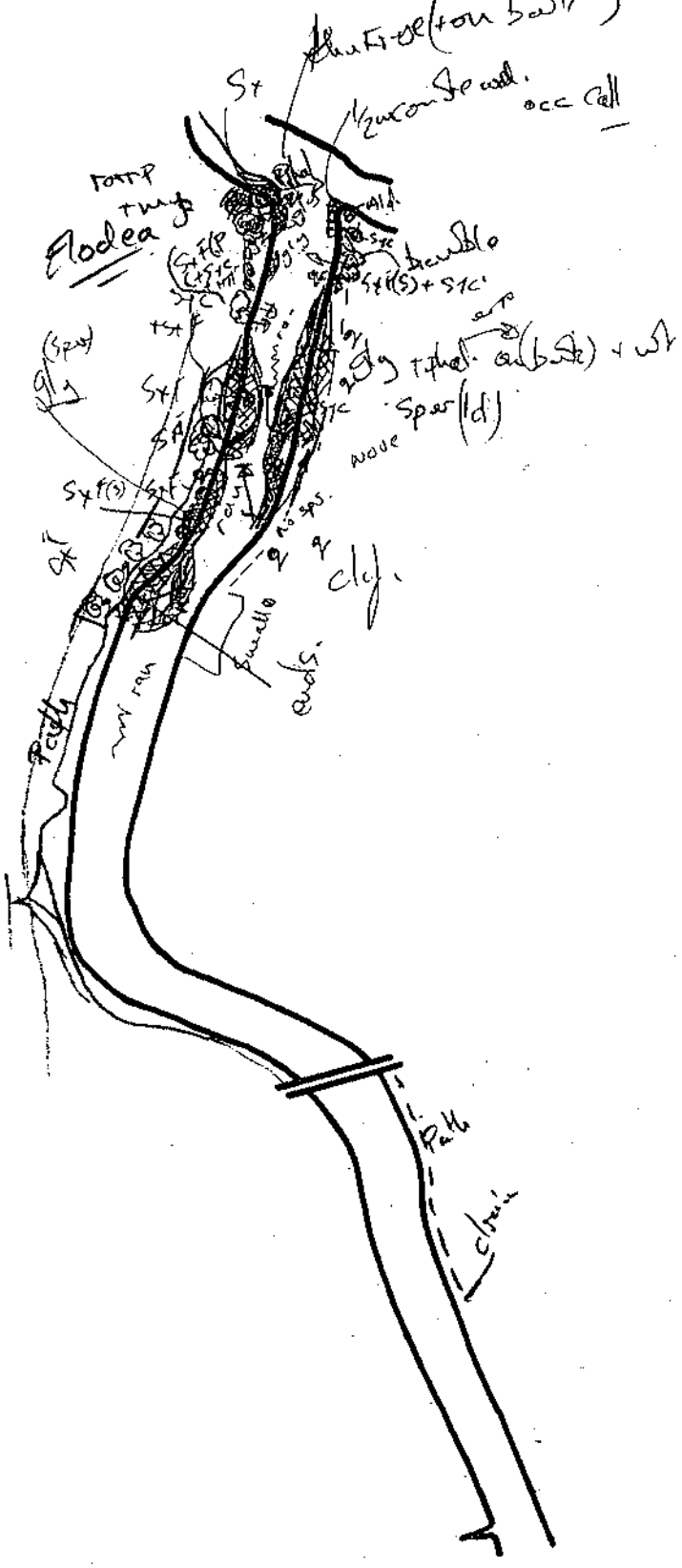
Cyno
Epil locally
Spring clean
Fil. pend.
Symph.

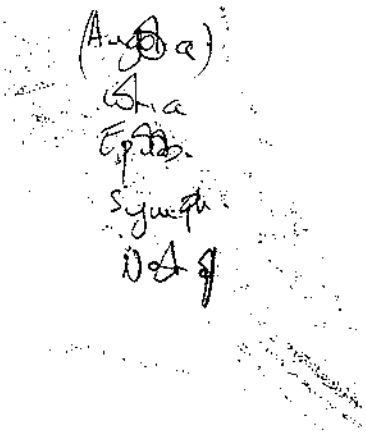
remember Map of 2.1

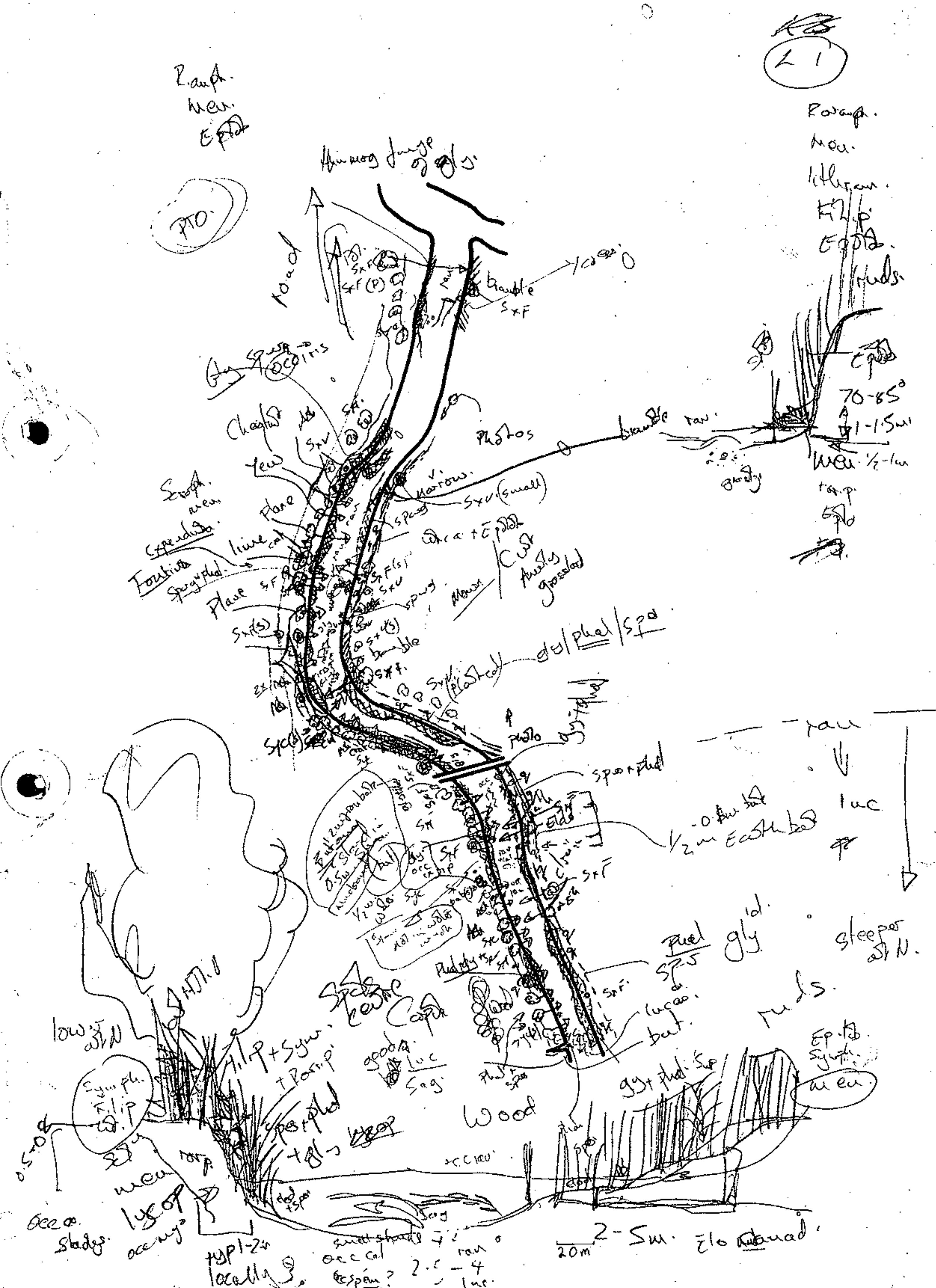
Write Tue list.

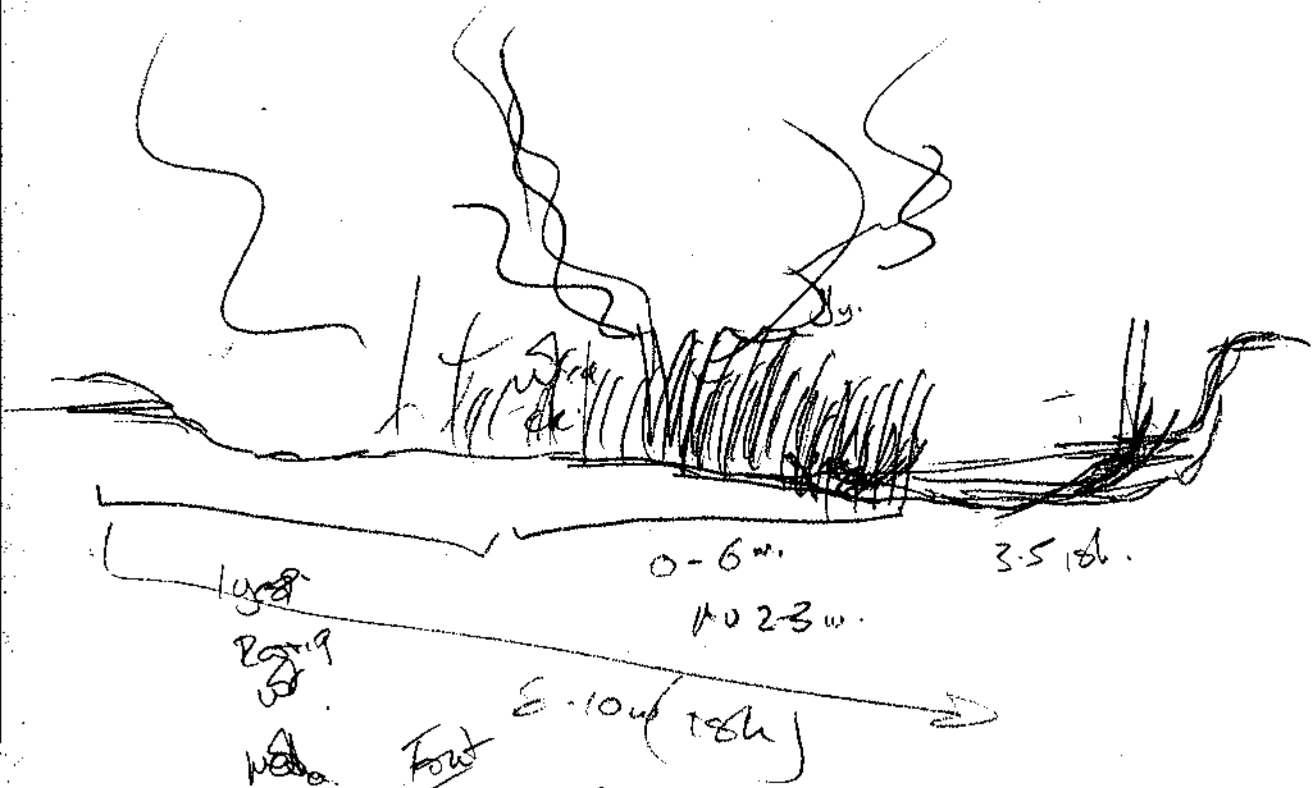
Plan

Mon:	maps ok rough writeups	10 plants	
Tue:	maps ok + rough write	photos in	
Wed:	collect photos	top copy writeup 6 hrs.	topcopy maps 6 hrs. + 58
Thur:	General summaries etc + title photos + collation		
Fri.			

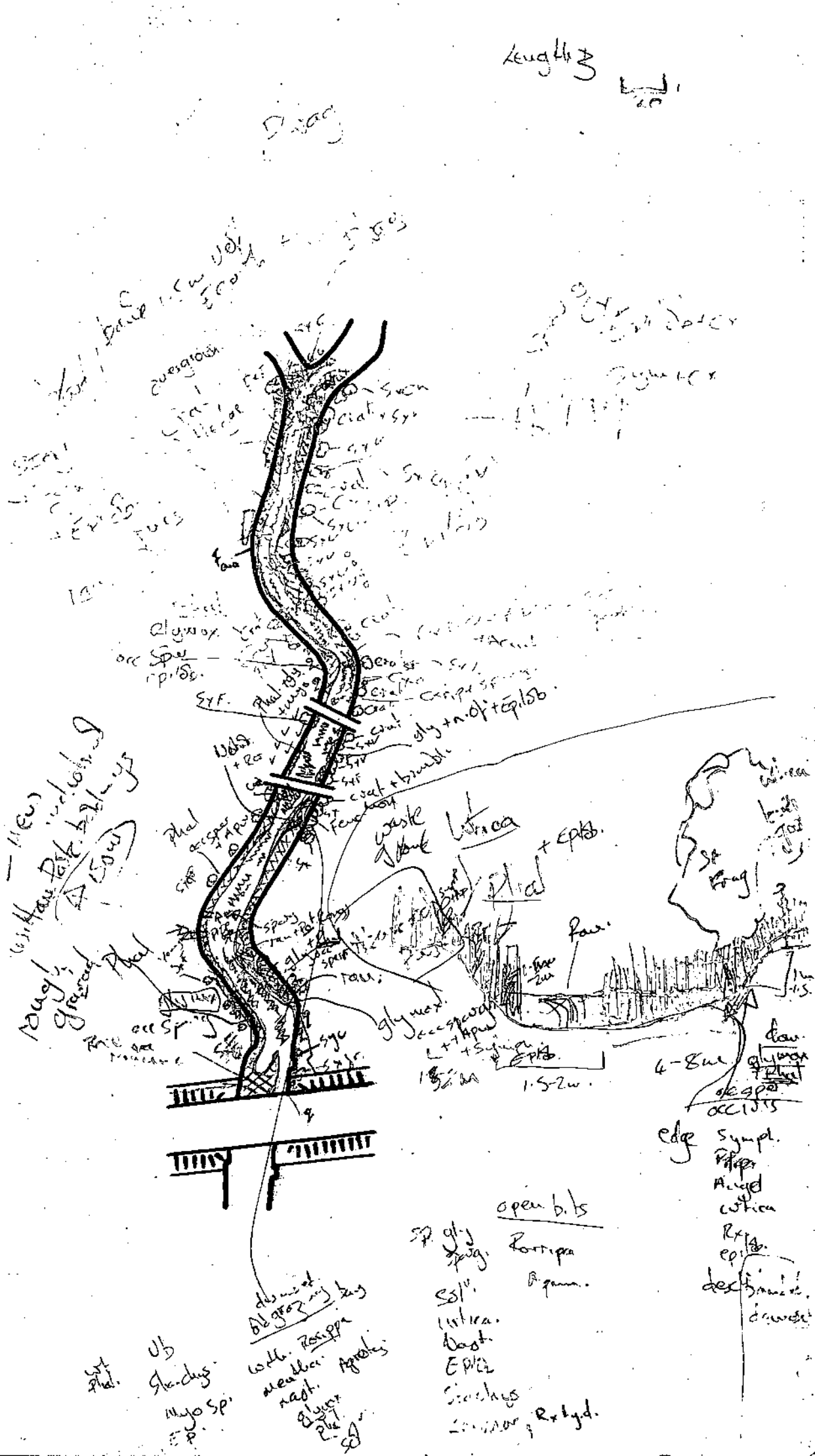

Elodea
Path
Rail
chain

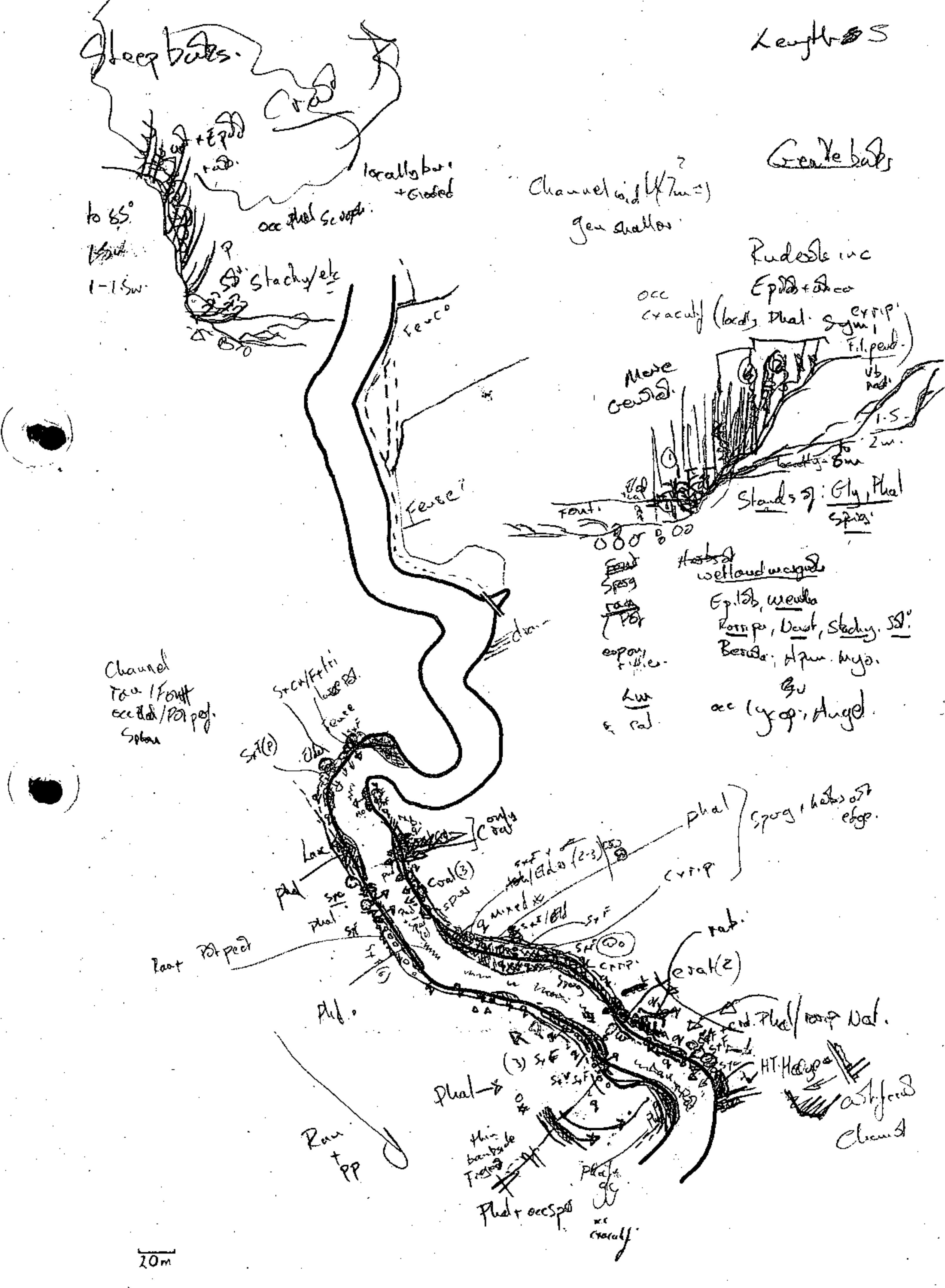



L 1
PTO
road
photos
photo
Wood
ruds.
steeper on N.
70-85°
1-1.5m
20m
2-5m.



Fout
occ Cod
Panic
Cyperus
grasses. 11'5'
S81'
2×high
[illegible]





Steep banks
Gentle banks
locally bare + Grazed
Channel wid
gen shallow
to 85°
1-1.5m
Stachys etc
occ Phal
More
Stands of: Gly, Phal
Fence?
wetland margin
Rorippa, Veronica, Stachys
Channel
Coal (3)
Phal
mixed
Phal
Ran + PP
Phal + occ Spa
thin bankside
HT Hedge
20m

Date 5th June 1991

NRA

Fax Number (0734) 393301
National Rivers Authority
Thames Region

Pond Action,
c/o School of Biological & Molecular Sciences,
Oxford Polytechnic,
Gipsy Lane,
Headington,
Oxford.

Your Ref : ----
Our Ref : C/90/5(20)/DT/RB
Please Reply to : Mr D Topping
Direct No : 535784

For the attention of Dr J Biggs

Dear Sir

RIVER CORRIDOR SURVEY, COGGES LINK ROAD, WITNEY

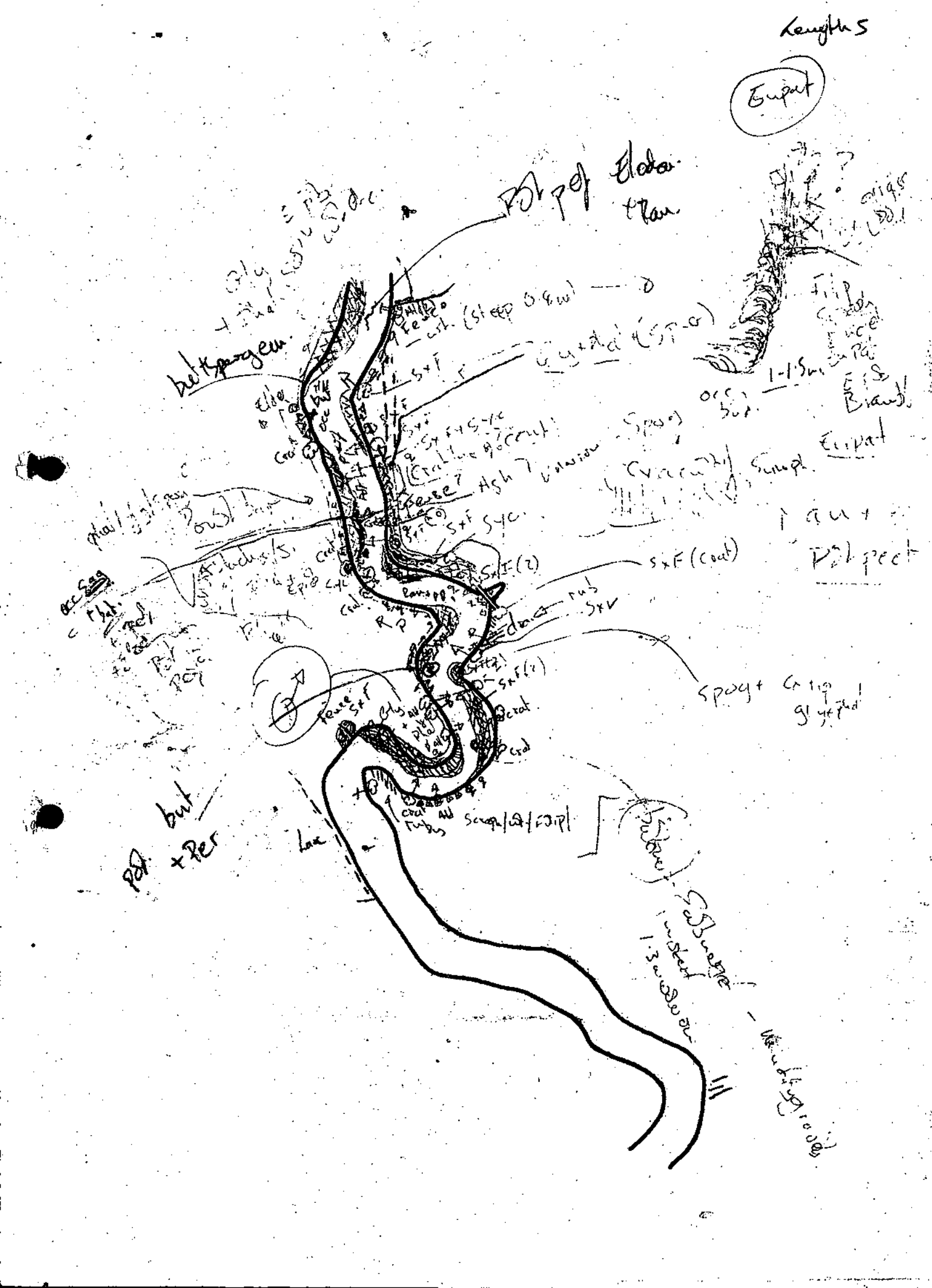
I confirm that your quotation dated 4th June 1991 in the sum of £1631.25 plus at cost disbursements is acceptable and that the report is required by 14th June 1991.

I will send 1 ~~2~~ copies each of the 1:2500 scale OS Maps today by post (5th June).

Please therefore put the work in hand at your earliest convenience. Should you have any further queries, please do not hesitate to contact myself or Dr Brookes.

Yours faithfully

for Principal Planning Engineer (Reading)



URGENT FAX MESSAGE FROM NRA - THAMES REGION

TO :
ADDRESS: Pond Action

TELEPHONE NO.: FAX NO.:

FROM: Dr Andrew Brookes
ADDRESS: NRA

TELEPHONE NO.: FAX NO.:
DATE:

MESSAGE

Please provide (1) quote for work
(2) confirmation date
[illegible]

Many thanks
Andrew Brookes

Total number of pages sent (including this page) 3
If you have not received any of the accompanying pages, or find that any are illegible, please call the sender on the above number.

NRA

draft

[illegible]: I have left a message on Dr Biggs answerphone asking for a date to fill in below. [illegible] OK? [illegible] I'll be back [illegible] 30/5/90.

29 May 1991

Pond Action
c/o School of Biological and Molecular Sciences
Oxford Polytechnic
Gipsy Lane
Headington, Oxford.

Attn Dr J. Biggs

Dear Sir,

River Corridor Survey, Witney.

I confirm the recent conversation between yourselves and Dr. Andrew Brookes regarding this survey.

The site to be covered is the East and West Arms of the River Windrush at Witney, from the bifurcation at 4355 2099 to the crossings of the A40 at 4359 2086 and 4361 2086; including the flood plain bounded by the ditch running from 4361 2096 to 4364 2087 to the east. The west arm of the Windrush has a narrow flood path associated [illegible] it to the west of [illegible] main channel clearly defined by the raised road, [illegible]. The [illegible] O.S. map extract shows these features

The survey is to be carried out in accordance with the document, 'Surveys of Wildlife in River Corridors (Draft Methodology)' published by the Nature Conservancy Council, and including appendices. Photographic contact ~~poines~~ points of areas of interest should be taken at 200 m intervals approximately. Their locations should be noted on a plan accompanying a report on the survey, and 5 copies are to be provided, typed and bound, A4 size.

The survey is to be carried out at your earliest convenience and the report submitted by ([ ]). A single invoice should be submitted with the reports covering all fees, costs and disbursements duly itemised, quoting job reference 'Cogges Link Road - River Corridor Survey 7202 F2'.

A Brookes

Yours sincerely,

David, we need a quote for this work

359

[illegible]opping

wpfiles\DT\C90/5/20

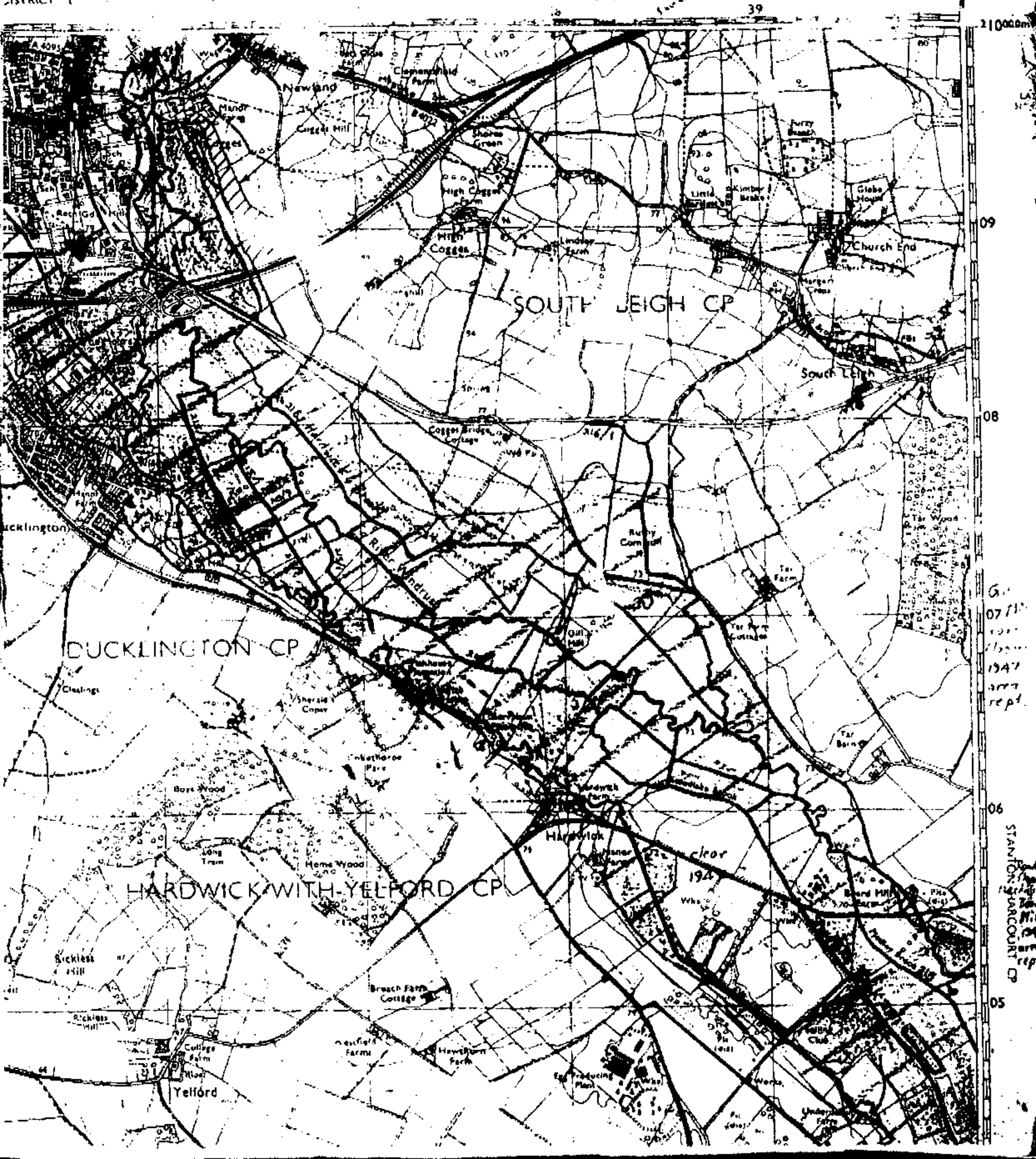
23/05/91 17:02 ID. 117 P003/003

For Witney downstream to Bypass see Flooding file with RBW.

Details on SP30NE/16/12

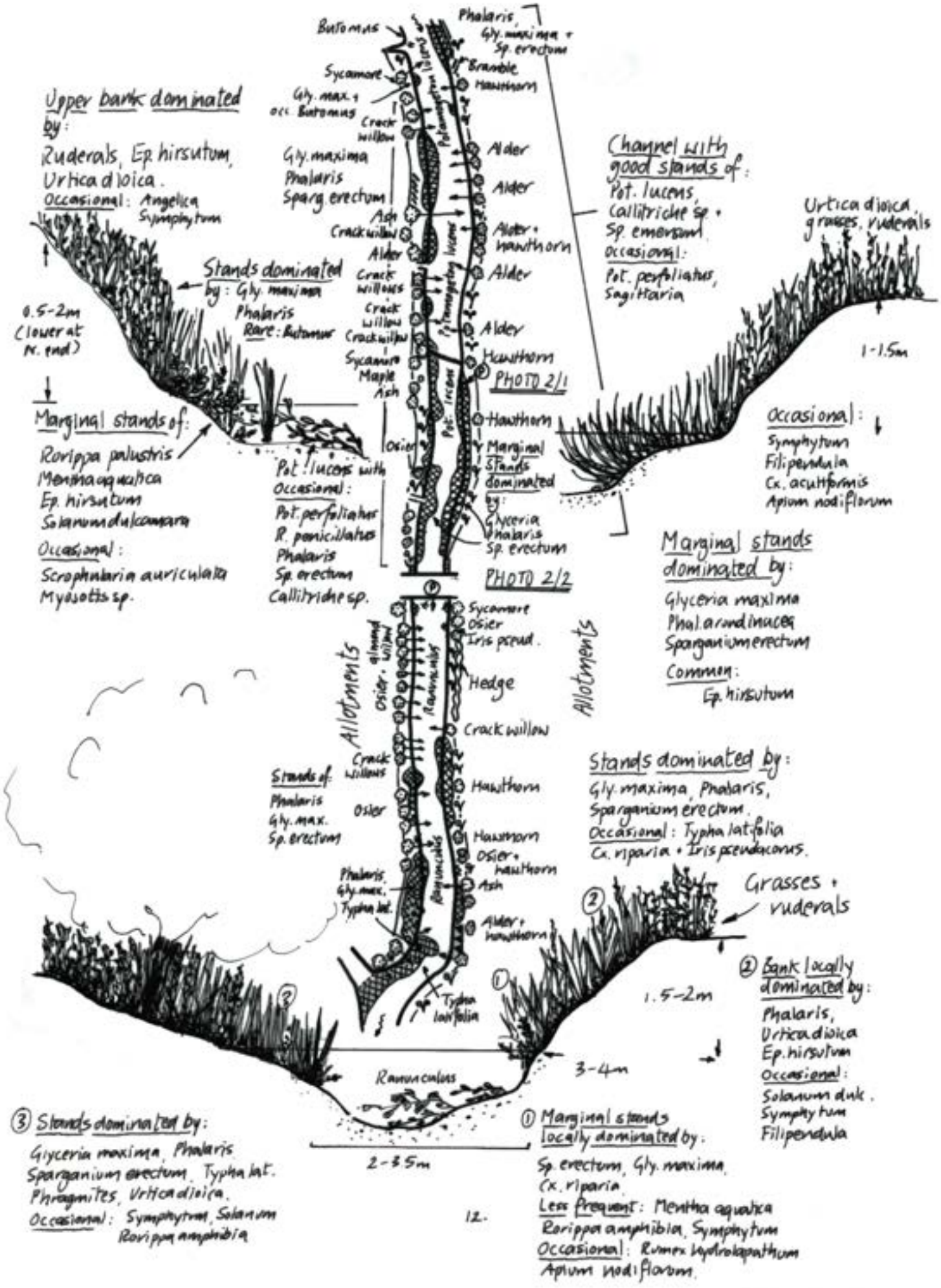
SHEET SP 20/3

DISTRICT I

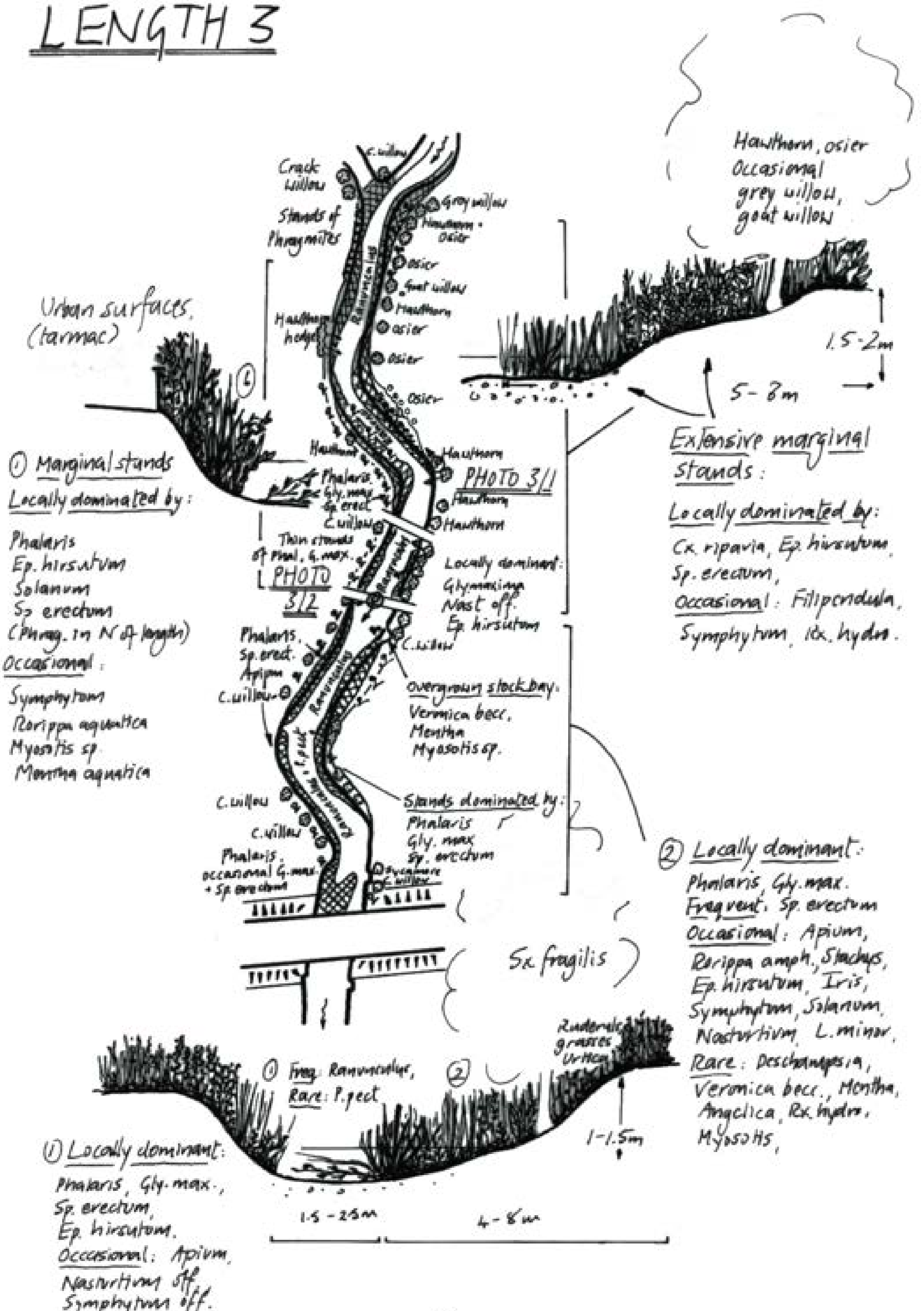


39
09
08
07
06
05
Newland
Cogges Hill
Shores Green
Furzy Brake
Glebe House
High Cogges Farm
High Cogges
Church End
SOUTH LEIGH CP
South Leigh
Cogges Bridge Cottage
Tar Wood
Rushy Common
River Windrush
Tar Farm
Tar Farm Cottages
DUCKLINGTON CP
Claylings
Tar Barn
Boys Wood
Hardwick
clear
1947
Home Wood
HARDWICK-WITH-YELFORD CP
STANTON HARCOURT CP
Bickless Hill
Breach Farm Cottage
College Farm
Yelford
Westfield Farms
Hawthorn Farm
Egg Producing Plant
Works

LENGTH 2


Upper bank dominated by:
Ruderals, Ep. hirsutum, Urtica dioica.
Occasional: Angelica, Symphytum
0.5-2m (lower at N. end)
Stands dominated by: Gly. maxima, Phalaris
Rare: Butomus
Marginal stands of:
Rorippa palustris
Mentha aquatica
Ep. hirsutum
Solanum dulcamara
Occasional:
Scrophularia auriculata
Myosotis sp.
Butomus
Sycamore
Gly. max. + occ. Butomus
Crack willow
Gly. maxima
Phalaris
Sparg. erectum
Ash
Crack willow
Alder
Crack willows
Crack willow
Crack willow
Sycamore
Maple
Ash
Osier
Pot. lucens with
Occasional:
Pot. perfoliatus
R. penicillatus
Phalaris
Sp. erectum
Callitriche sp.
Phalaris, Gly. maxima + Sp. erectum
Bramble
Hawthorn
Alder
Alder
Alder + hawthorn
Alder
Alder
Hawthorn
PHOTO 2/1
Hawthorn
Marginal Stands dominated by:
Glyceria
Phalaris
Sp. erectum
PHOTO 2/2
Channel with good stands of:
Pot. lucens,
Callitriche sp. +
Sp. emersum
Occasional:
Pot. perfoliatus,
Sagittaria
Urtica dioica, grasses, ruderals
1-1.5m
Occasional:
Symphytum
Filipendula
Cx. acutiformis
Apium nodiflorum
Marginal stands dominated by:
Glyceria maxima
Phalaris arundinacea
Sparganium erectum
Common:
Ep. hirsutum
Allotments
Allotments
Sycamore
Osier
Iris pseud.
Hedge
Crack willow
Hawthorn
Hawthorn
Osier + hawthorn
Ash
Alder + hawthorn
Stands of:
Phalaris
Gly. max.
Sp. erectum
Crack willows
Osier
Phalaris, Gly. max., Typha lat.
Typha latifolia
Ranunculus
Stands dominated by:
Gly. maxima, Phalaris, Sparganium erectum.
Occasional: Typha latifolia
Cx. riparia + Iris pseudacorus.
Grasses + ruderals
1.5-2m
3-4m
2-3.5m
② Bank locally dominated by:
Phalaris,
Urtica dioica
Ep. hirsutum
Occasional:
Solanum dulc.
Symphytum
Filipendula
③ Stands dominated by:
Glyceria maxima, Phalaris
Sparganium erectum, Typha lat.
Phragmites, Urtica dioica.
Occasional: Symphytum, Solanum
Rorippa amphibia
① Marginal stands locally dominated by:
Sp. erectum, Gly. maxima,
Cx. riparia.
Less frequent: Mentha aquatica
Rorippa amphibia, Symphytum
Occasional: Rumex hydrolapathum
Apium nodiflorum.

LENGTH 3


Crack willow
Stands of Phragmites
C. willow
Grey willow
Hawthorn, osier
Osier
Goat willow
Hawthorn
Osier
Hawthorn hedge
Osier
Osier
Urban surfaces. (tarmac)
Hawthorn, osier
Occasional grey willow, goat willow
1.5-2m
5-8m
① Marginal stands
Locally dominated by:
Phalaris
Ep. hirsutum
Solanum
Sp erectum
(Phrag. in N of length)
Occasional:
Symphytum
Rorippa aquatica
Myosotis sp.
Mentha aquatica
Hawthorn
Hawthorn
PHOTO 3/1
Hawthorn
Hawthorn
Phalaris
Gly. max
Sp. erect.
C. willow
Thin stands of Phal. G. max.
PHOTO 3/2
Locally dominant:
Glymaxima
Nast off.
Ep. hirsutum
Extensive marginal stands:
Locally dominated by:
Cx. riparia, Ep. hirsutum, Sp. erectum,
Occasional: Filipendula, Symphytum, Rx. hydro.
Phalaris.
Sp. erect.
Apium
C. willow
C. willow
Overgrown stock bay.
Veronica becc.
Mentha
Myosotis sp.
C. willow
C. willow
Stands dominated by:
Phalaris
Gly. max
Sp. erectum
Phalaris, occasional G. max. + Sp. erectum
Sycamore C. willow
② Locally dominant:
Phalaris, Gly. max.
Frequent. Sp. erectum
Occasional: Apium, Rorippa amph., Stachys, Ep. hirsutum, Iris, Symphytum, Solanum, Nasturtium, L. minor.
Rare: Deschampsia, Veronica becc., Mentha, Angelica, Rx. hydro, Myosotis,
Sx. fragilis
Ruderals, grasses, Urtica
① Freq. Ranunculus, Rare: P. pect
②
1-1.5m
① Locally dominant:
Phalaris, Gly. max.,
Sp. erectum,
Ep. hirsutum.
Occasional: Apium, Nasturtium off, Symphytum off.
1.5-2.5m
4-8m

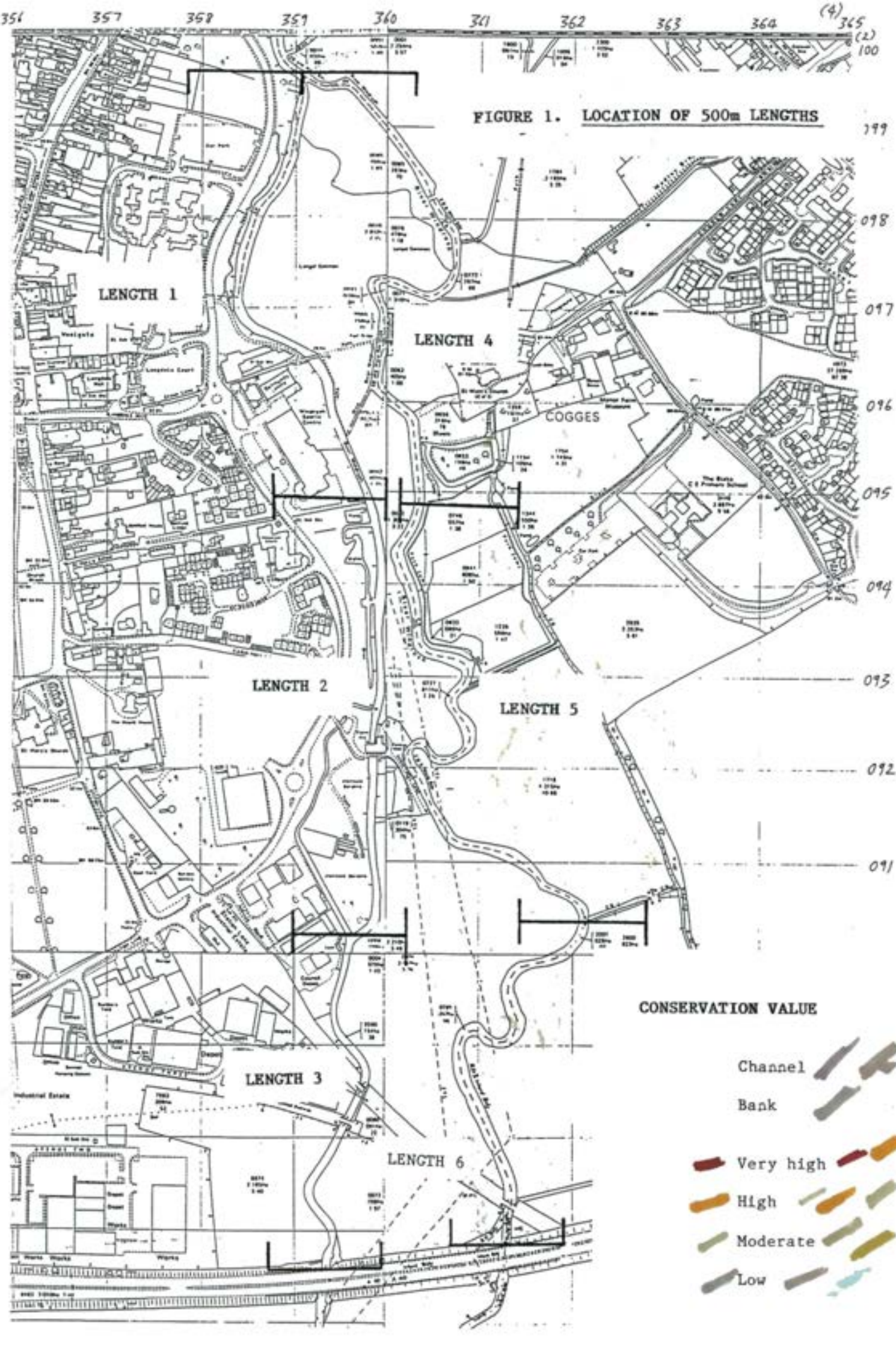
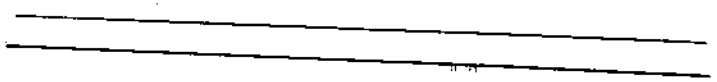
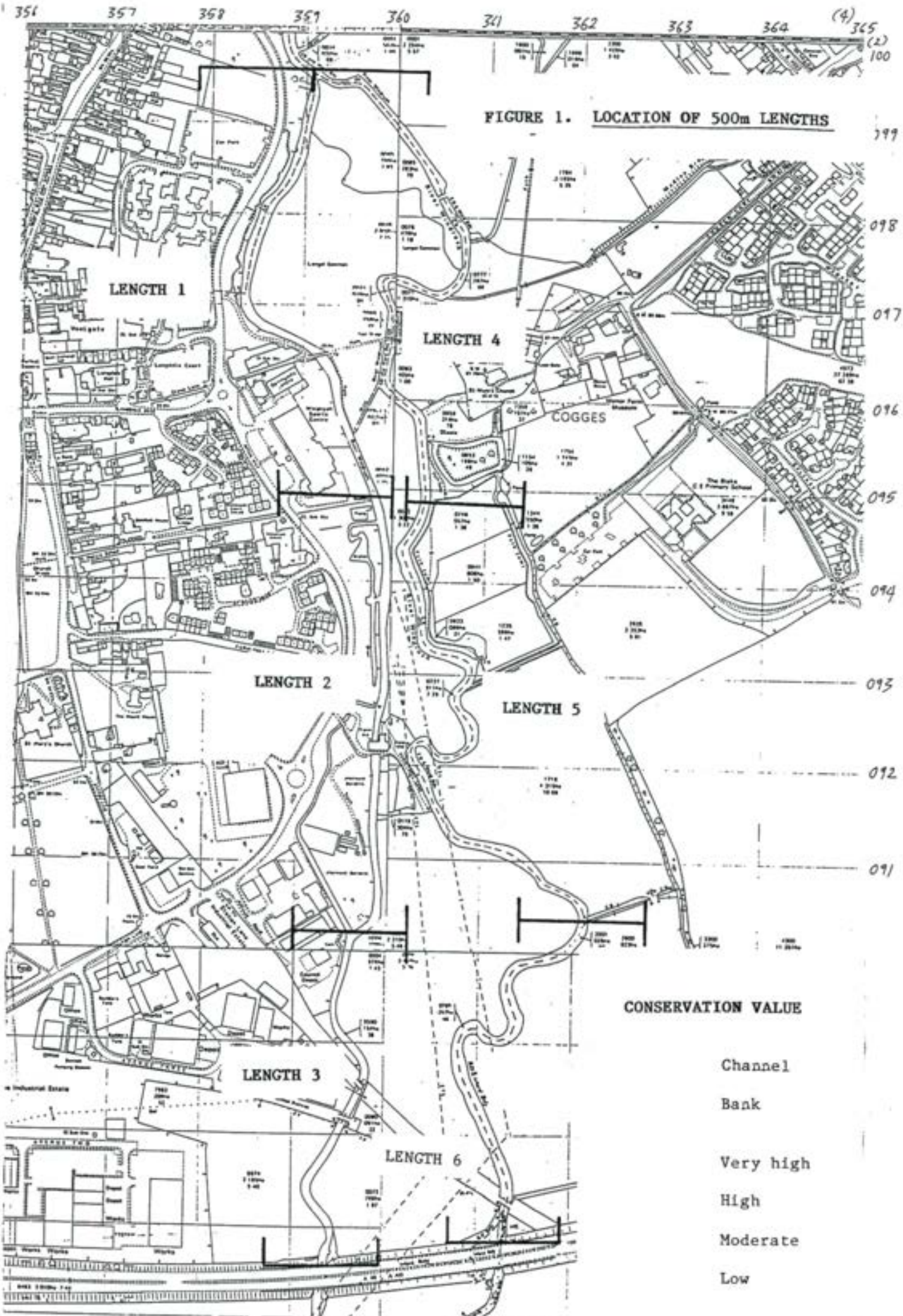


FIGURE 1. LOCATION OF 500m LENGTHS





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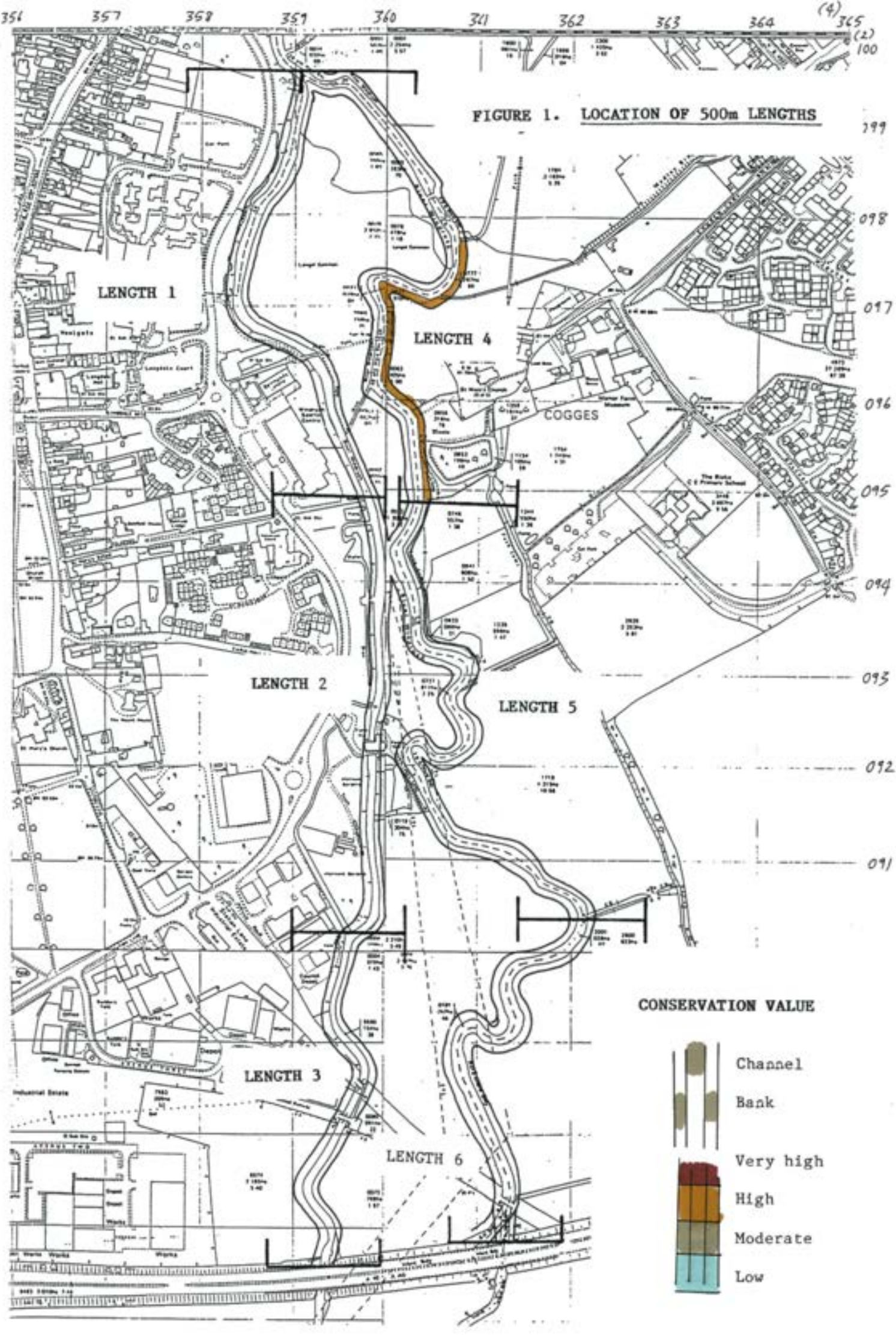


FIGURE 1. LOCATION OF 500m LENGTHS
LENGTH 1
LENGTH 2
LENGTH 3
LENGTH 4
LENGTH 5
LENGTH 6
COGGES
CONSERVATION VALUE
Channel
Bank
Very high
High
Moderate
Low

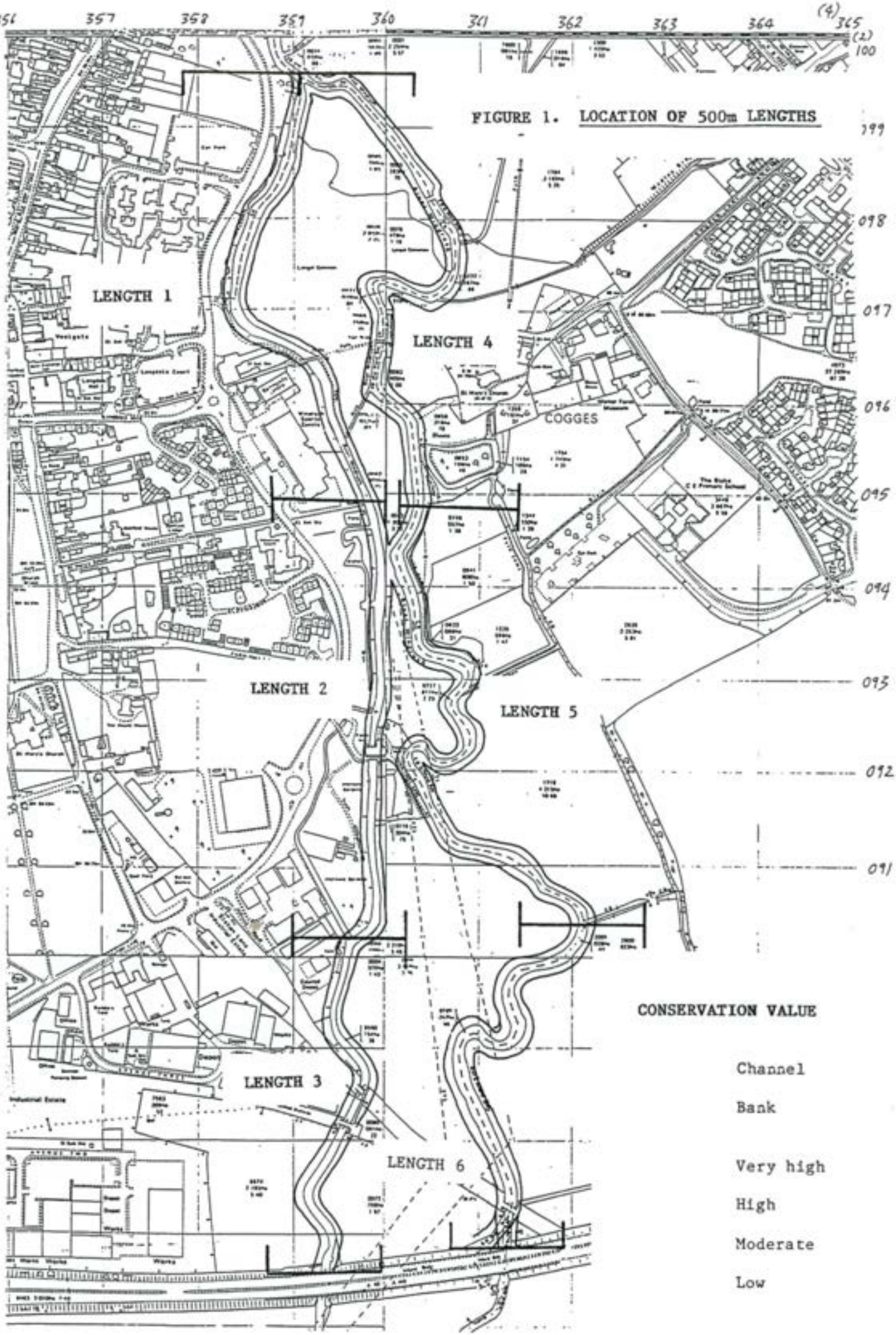


FIGURE 1. LOCATION OF 500m LENGTHS

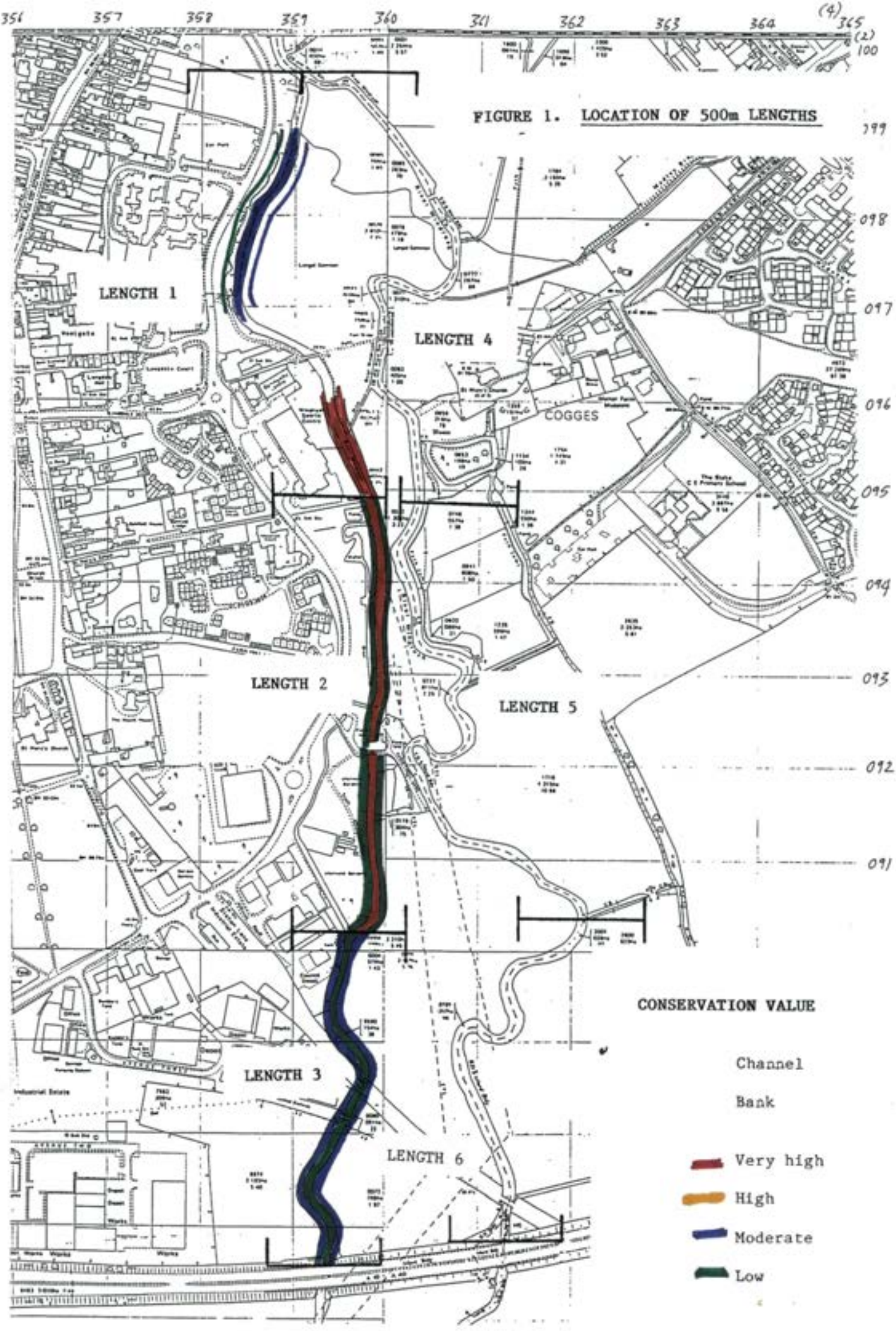
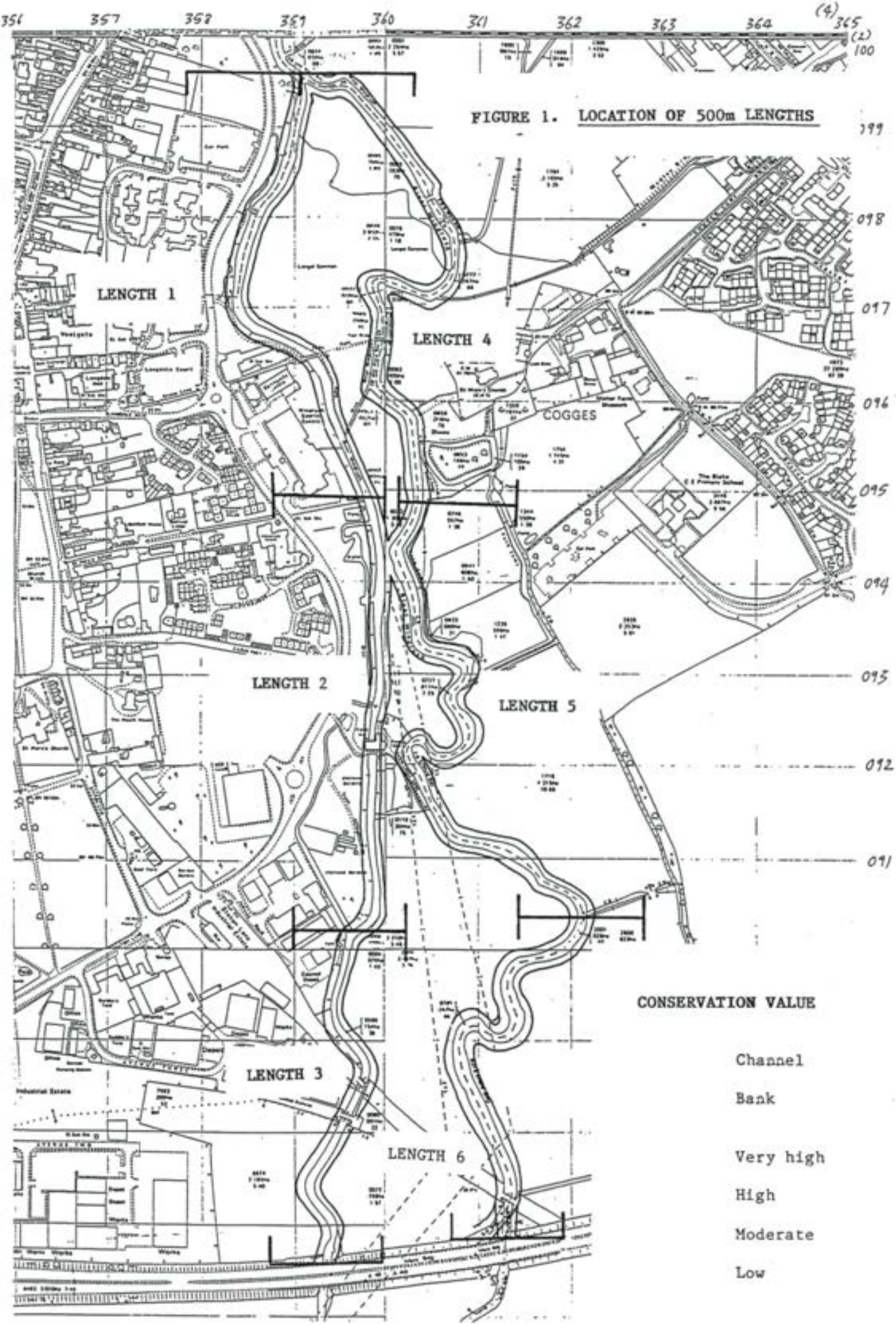


FIGURE 1. LOCATION OF 500m LENGTHS
LENGTH 1
LENGTH 2
LENGTH 3
LENGTH 4
LENGTH 5
LENGTH 6
COGGES
CONSERVATION VALUE
Channel
Bank
Very high
High
Moderate
Low



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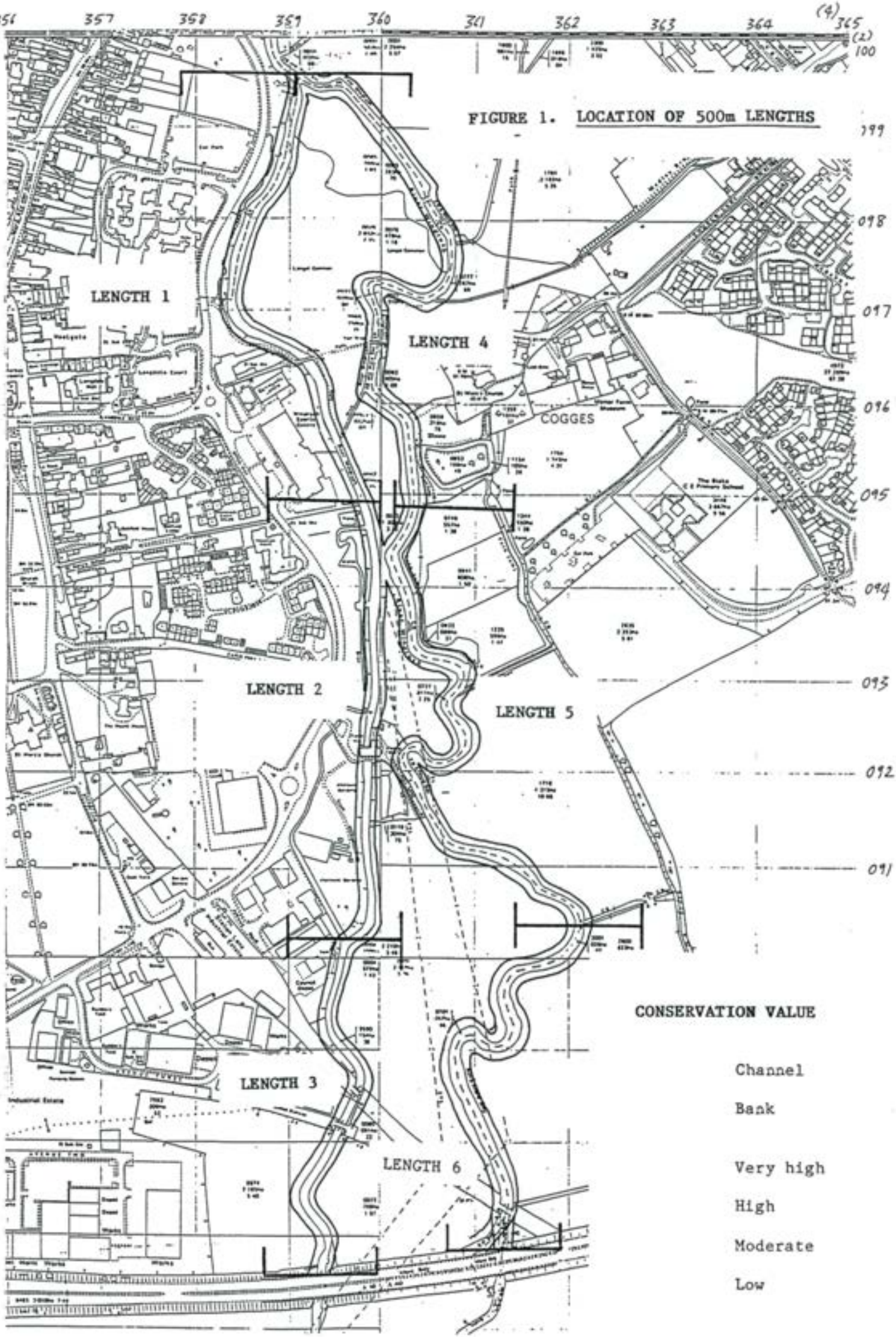
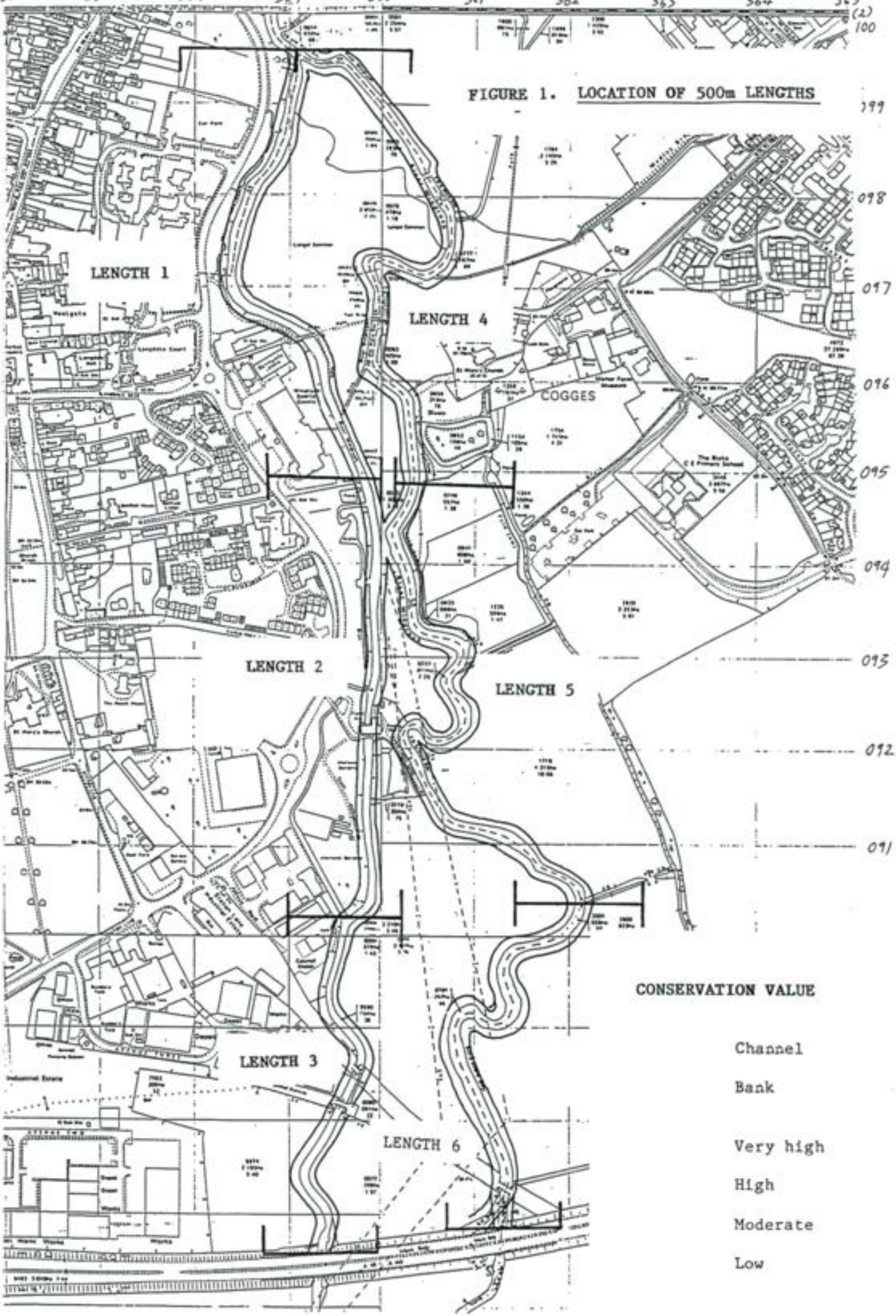


FIGURE 1. LOCATION OF 500m LENGTHS



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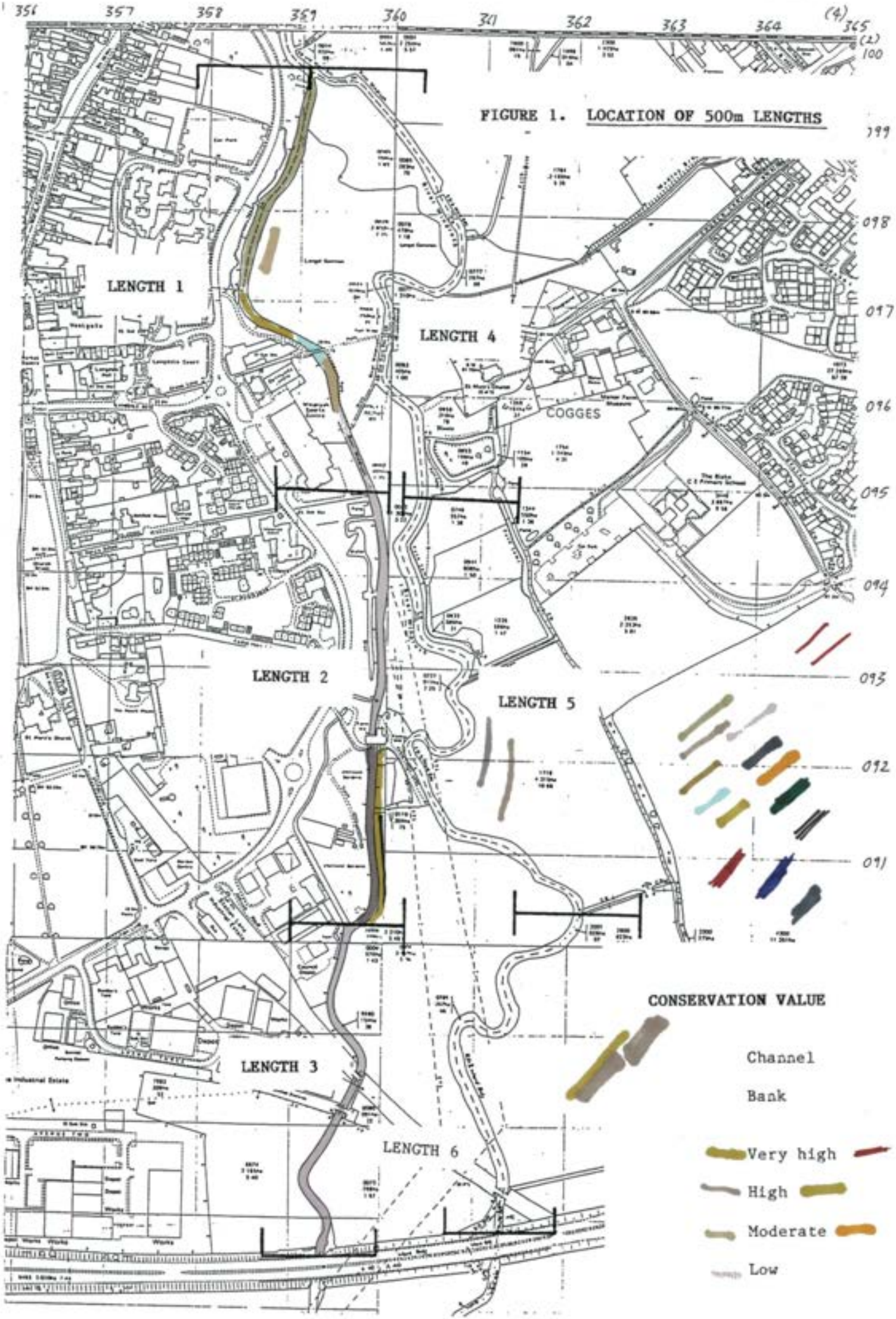


FIGURE 1. LOCATION OF 500m LENGTHS
LENGTH 1
LENGTH 2
LENGTH 3
LENGTH 4
LENGTH 5
LENGTH 6
COGGES
CONSERVATION VALUE
Channel
Bank
Very high
High
Moderate
Low

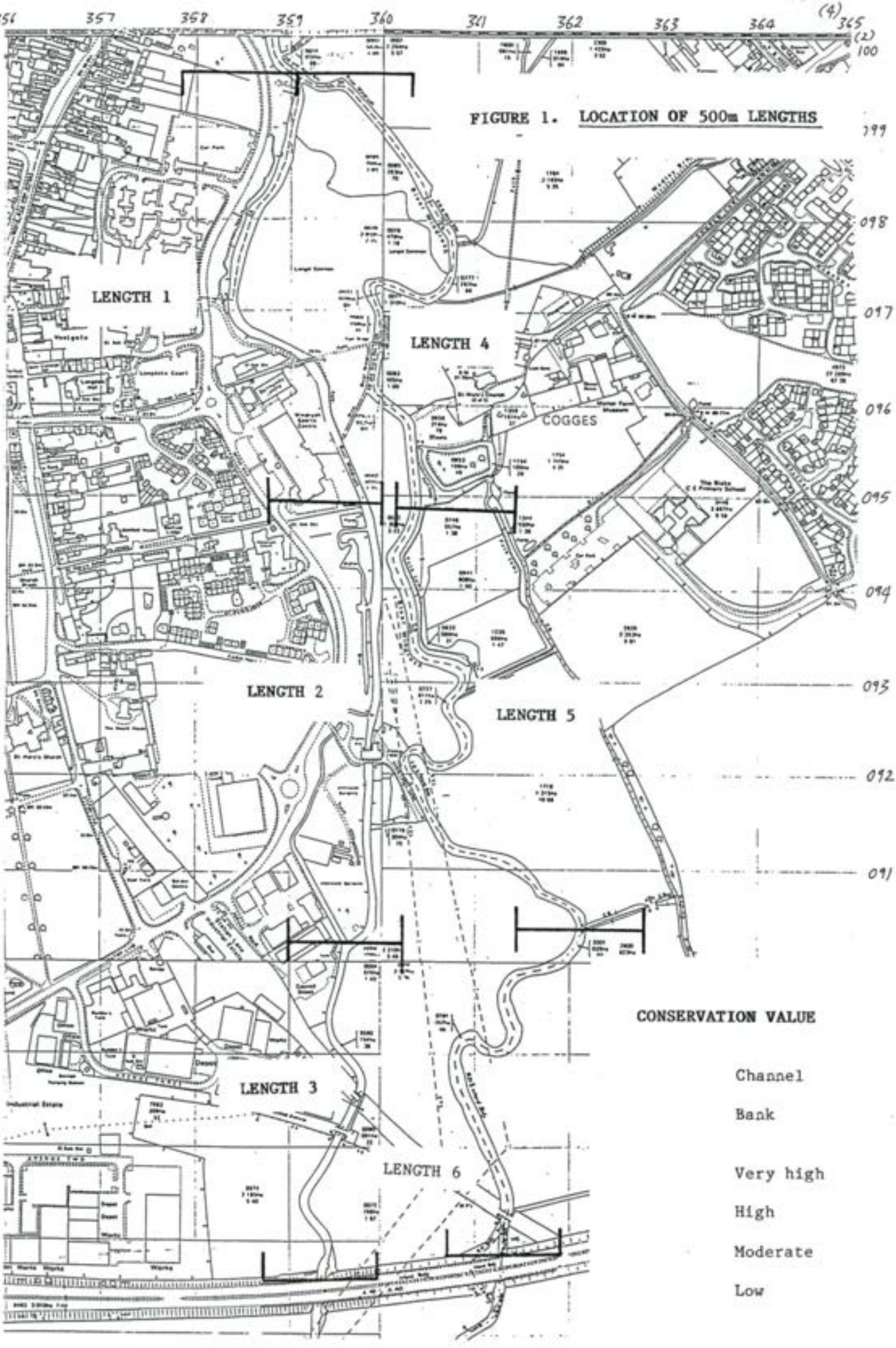
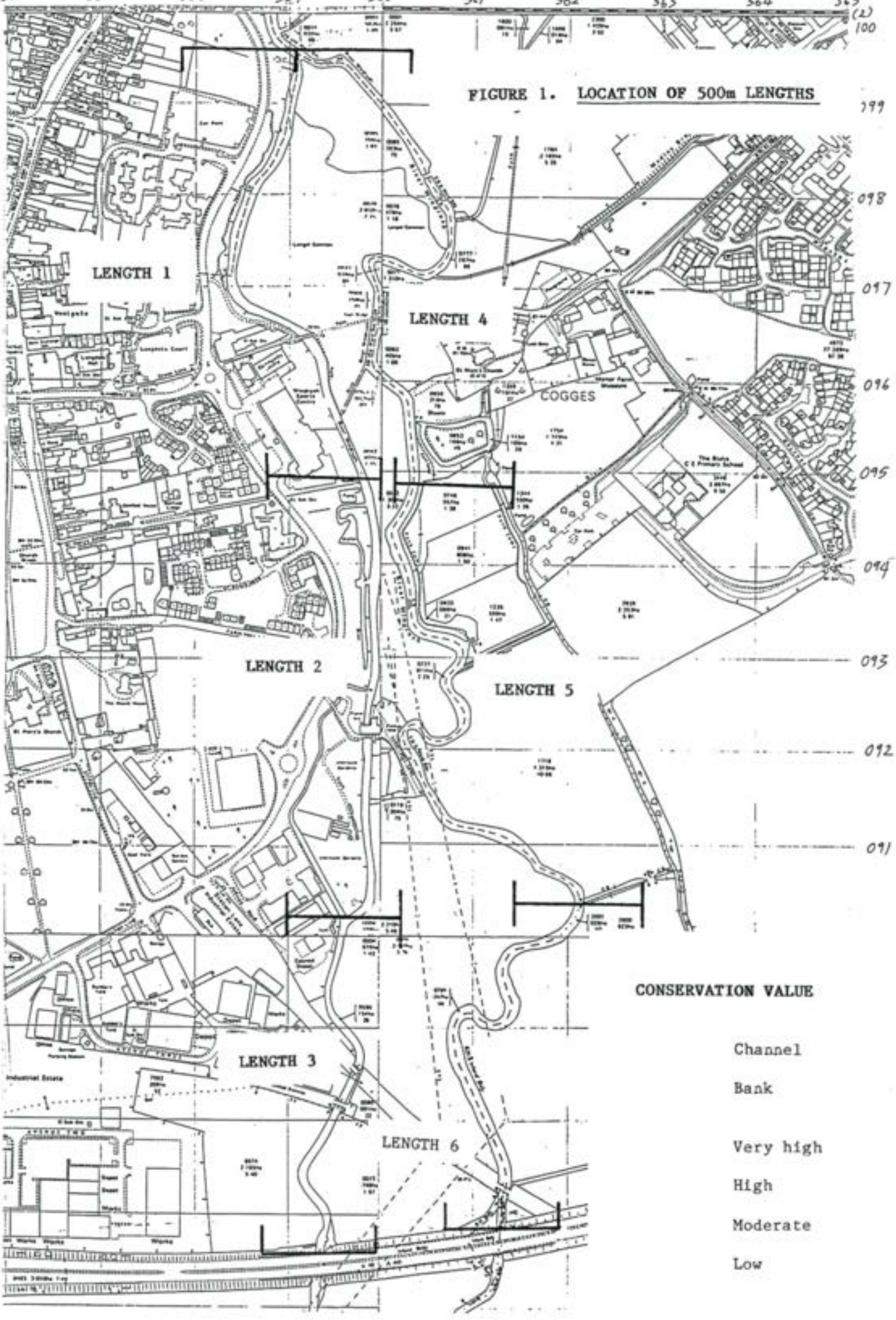


FIGURE 1. LOCATION OF 500m LENGTHS



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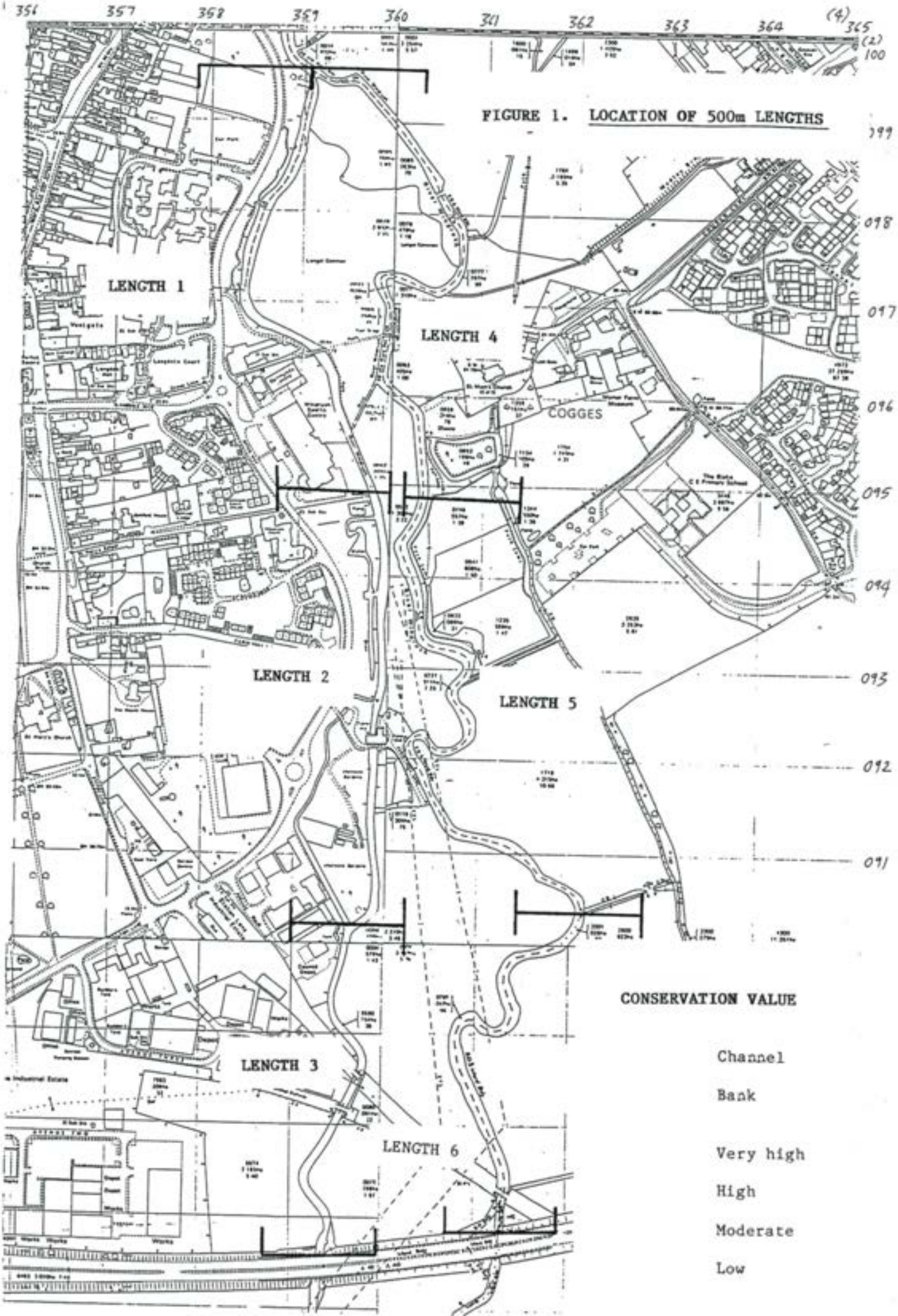

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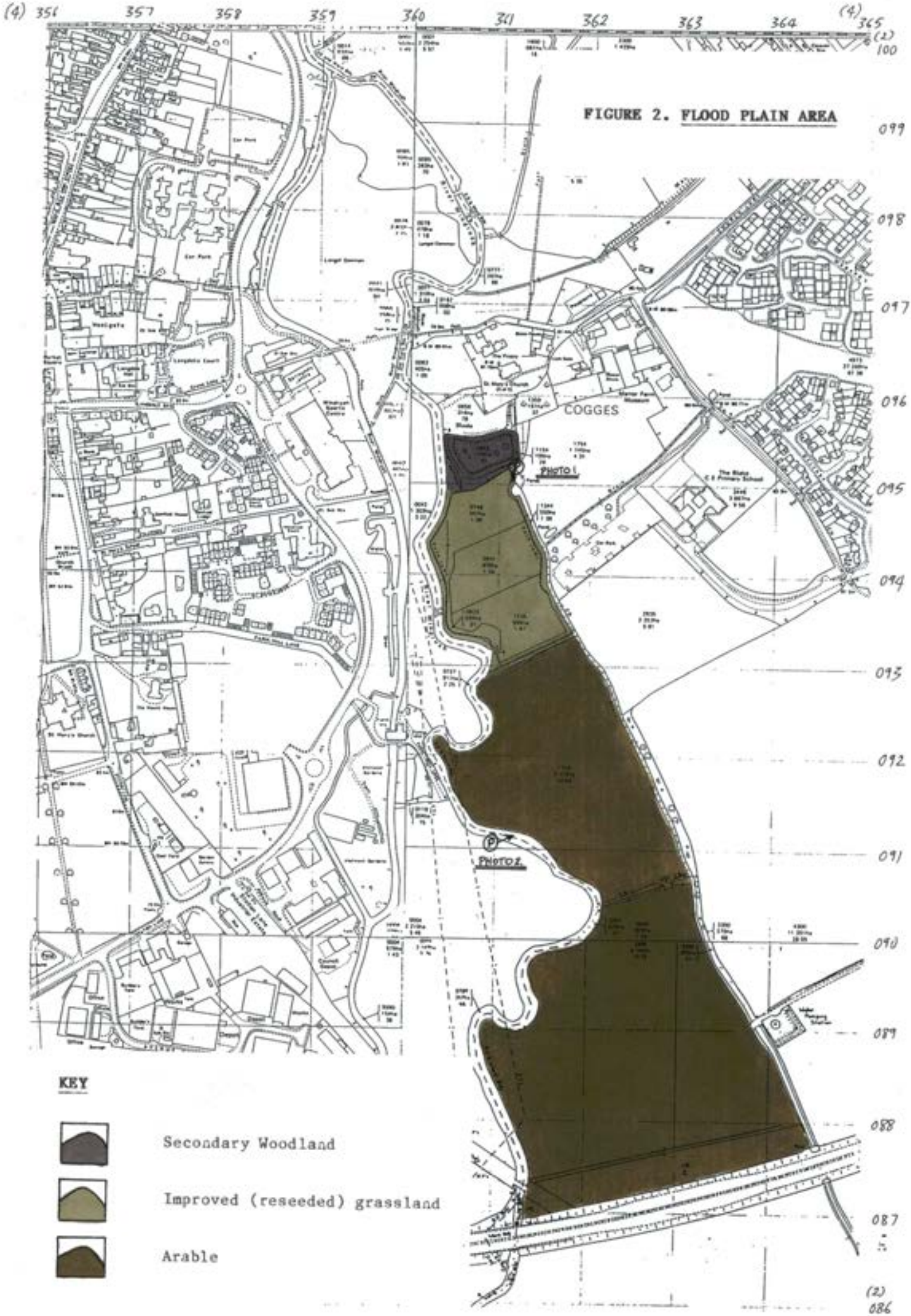

FIGURE 2. FLOOD PLAIN AREA