

## River Corridor Survey of Bulstake Stream

One of the most comprehensive studies in the area was a river corridor survey carried out on the Bulstake stream in September 1997, on behalf of the Environment Agency, Thames Region. Parts of this study relevant to the West Oxford Nature Plan are reproduced here, and are acknowledged as the work of Angela Walker, and the property of the EA. This section of the Bulstake Stream, which is just over 1.5 km in length, runs through New Botley on the western side of Oxford. It flows from a weir at the upstream end at SP 500065 to just downstream of the confluence of the Seacourt and Bulstake Streams at SP 499054. The survey was carried out on 30<sup>th</sup> September 1997.

### Adjacent Habitats

The adjacent land predominantly is a mixture of industrial sites, housing, arable land, allotments and grassland. Some of the grassland is in the form of amenity areas, which are largely improved and closely mown. A few horse paddocks are present and these include semi-improved but species-poor fields at the downstream end, in length 3, where the sward is uneven and there are numerous patches of dandelion (*Taraxacum agg.*), creeping buttercup (*Ranunculus repens*), ribwort (*Plantago lanceolata*) and ragwort (*Senecio jacobaea*). Although not botanically rich, these fields may attract a variety of common invertebrates, such as the cinnabar moth.

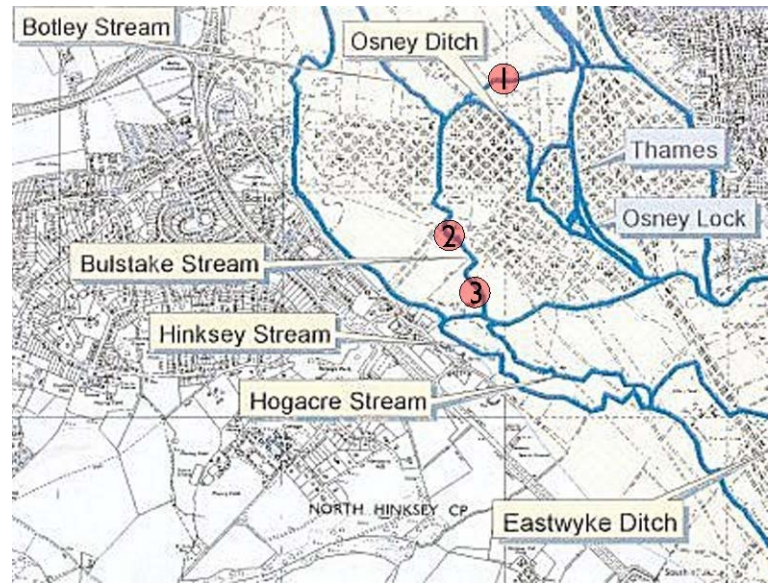


Figure 23: Location of the three survey sites along Bulstake Stream

There are small areas of broad leaved woodland, some planted, on the right bank in length 3. A strip of mixed trees and shrubs runs at right angles to the channel to meet the Seacourt Stream. This is the richest area of woodland. A narrow strip of planted trees runs along the right bank at the upstream end of this length and there is a small corner of planted trees at the confluence with the Seacourt Stream. Species present in these areas include crack willow (*Salix fragilis*), white willow (*Salix alba*), grey willow (*S. cinerea*), alder (*Alnus glutinosa*), pedunculate oak (*Quercus robur*), ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*) and hazel (*Corylus avellana*). The left bank is fenced at the upstream end of length 3 between the two bridges, and there is a row of trees and shrubs between the fence and the riverbank. Crack willow, alder and elder (*Sambucus nigra*) are the most common species. There is also a small clump of white willow and ash on the left of the river in length 2.

### Banks

The banks are mostly between 1.5 and 2 m in height and fairly steep. There are a few shallow slopes and wide banks but these are dry. The bank flora is poor and dominated by non-riparian species, particularly nettle (*Urtica dioica*), cleavers (*Galium aparine*) and hedge bindweed (*Calystegia sepium*), with patches of hogweed (*Heracleum sphondylium*), hop (*Humulus lupulus*), creeping thistle (*Cirsium arvense*), white dead-nettle (*Lamium album*), false oat-grass (*Arrhenatherum elatius*) and cock's-foot (*Dactylis glomerata*). There are large patches of great willow-herb (*Epilobium hirsutum*) and the invasive alien Indian balsam (*Impatiens glandulifera*). Along the lower 0.5 m where the soil is moist occasional clumps of common comfrey (*Symphytum officinale*), hemp-agrimony (*Eupatorium cannabinum*), water figwort (*Scrophularia auriculata*), meadowsweet (*Filipendula ulmaria*), purple

loosestrife (*Lythrum salicaria*), redshank (*Persicaria maculosa*) and marsh woundwort (*Stachys palustris*) occur. There are also several good stands of reed canary-grass (*Phalaris arundinacea*) and reed sweet-grass (*Glyceria maxima*) on the lower part of some of the shallow banks. Parts of the left bank in length 3 have been poached bare by the horses. Where the banks are most shaded there are patches of ivy (*Hedera helix*), ground ivy (*Glechoma hederacea*), nettle and other shade tolerant species. There are a good number of trees along the banks in all lengths, with most banks shaded either by trees on the banks themselves or nearby. The most open banks are in length 1 alongside the recreation ground on the left, along the right in the fields either side of Binsey Lane and on the left in length 3, downstream of the second footbridge. The most common species are crack willow, ash, elder and hawthorn. Alongside the amenity areas and gardens there are a few ornamental species and varieties such as cherry (*Prunus sp.*) and horse chestnut (*Aesculus hippocastanum*).

### Margins

There is a mixture of shaded and open margin5 with discontinuous fringes dominated by the tall monocotyledons, notably reed sweet-grass, branched bur-reed (*Sparganium erectum*) and to a lesser extent common club-rush (*Schoenoplectus lacustris*). There are a few small stands of yellow iris (*Iris pseudacorus*), bulrush (*Typha latifolia*) and greater pond-sedge (*Carex riparia*). Between these there are clumps of great yellow-cress (*Rorippa amphibia*), bittersweet (*Solanum dulcamara*), marsh woundwort, gypsywort (*Lycopus europaeus*) and water forget-me-not (*Myosotis scorpioides*) plus occasional plants of water dock (*Rumex hydrolapathum*). At Binsey Bridge in length 1 there are wide shoals of silt with reed canary-grass, reed sweet-grass, great yellow-cress and other plants. Upstream of Botley Bridge there is a small silt shoal covered in great hairy willow-herb near the left margin.

### Channel

Two short reaches could not be surveyed because of difficult access. These are the downstream end of length 1 and part of length 2, between high fences surrounding housing and industrial sites. The channel has been straightened and re-sectioned but has a few bends or meanders at the downstream end of length 2 and in length 3. The channel appears to have been over-deepened but retains or has re-created some variation in depth, with a shallow reach at the upstream end of the section, a small riffle in length 2, a run at the footbridge in length 3 and three pools plus other deep glides. The flow is fairly slow throughout, apart from at the riffle, the run and in the shallow upstream reach. The substrate is basically gravel with a varying thickness of silt and the gravel is rarely exposed. The aquatic flora is not rich. The upstream end of length 1 is dominated by branched bur-reed. At Binsey Bridge large stands of reed sweet-grass and branched bur-reed are encroaching into the channel from the margins and reed sweet-grass is again encroaching downstream of the footbridge in length 3. Elsewhere there are large beds of yellow water-lily (*Nuphar lutea*) and arrowhead (*Sagittaria sagittifolia*) with occasional unbranched bur-reed (*Sparganium emersum*) and common club-rush. There are a few beds of spiked water-milfoil (*Myriophyllum spicatum*) and water-starwort (*Callitriche sp.*) and at the run in length 3 there is a good bed of water-crowfoot (*Ranunculus sp.*) In Oxfordshire spiked water-milfoil is uncommon and arrowhead is declining. Several large beds of fringed water-lily (*Nymphoides peltata*) occur, particularly in length 3. This is a nationally scarce species and one which is rare in the county, but it has probably been introduced.



**Figure 24:** Top end of Osney Ditch where it joins Bulstake Stream, close to survey site 1.

**Table 8:** A selection of the most commonly encountered plant species of riverbank and channel in the 1997 River Corridor Survey of Bulstake Stream (Walker, 1997). Abbreviations refer to the presence of plant species on the maps of the three stretches of Bulstake Stream surveyed that are shown further on in this report.

<b>Scientific Name</b>	<b>Common Name</b>	<b>Abbreviation</b>
<i>Acer campestre</i>	Field Maple	Acam
<i>Acer pseudoplatanus</i>	Sycamore	Apse
<i>Alnus glutinosa</i>	Alder	Aglu
<i>Agrostis stolonifera</i>	Creeping Bent	Asto
<i>Alisma plantago-aquatica paq</i>	Water-plantain	Apaq
<i>Apium nodiflorum</i>	Fool's Water-cress	Anod
<i>Arrhenatherum elatius</i>	False Oat-grass	Aela
<i>Berula erecta</i>	Lesser Water-parsnip	Bere
<i>Bidens tripartita</i>	Bur-marigold	Btri
<i>Butomus umbellatus</i>	Flowering-rush	Bumb
<i>Callitriche sp.</i>	Water-starwort	Callit
<i>Caltha palustris</i>	Marsh-marigold	Cpal
<i>Carex acutiformis</i>	Lesser Pond-sedge	Cacu
<i>Carex pendula</i>	Pendulous Sedge	Cpen
<i>Carex remota</i>	Remote Sedge	Crem
<i>Carex riparia</i>	Greater Pond-sedge	Crip
<i>Conium maculatum</i>	Hemlock	Cmac
<i>Corylus avellana</i>	Hazel	Cave
<i>Crataegus monogyna</i>	Hawthorn	Cmon
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	Dces
<i>Dipsacus fullonum</i>	Teasel	Dful
<i>Elodea canadensis</i>	Canadian Waterweed	Elcan
<i>Elodea nuttallii</i>	Nuttall's Waterweed	Enut
<i>Epilobium hirsutum</i>	Great Willowherb	Ehir
<i>Eupatorium cannabinum</i>	Hemp-agrimony	Ecan
<i>Fallopia japonica</i>	Japanese Knotweed	Fjap
<i>Filipendula ulmaria</i>	Meadowsweet	Fulm
<i>Fraxinus excelsior</i>	Ash	Fexe
<i>Galium aparine</i>	Cleavers	Gapa
<i>Glyceria nitans</i>	Floating Sweet-grass	Gflu
<i>Glyceria maxima</i>	Reed Sweet-grass	Gmax
<i>Impatiens capensis</i>	Orange Balsam	Icap

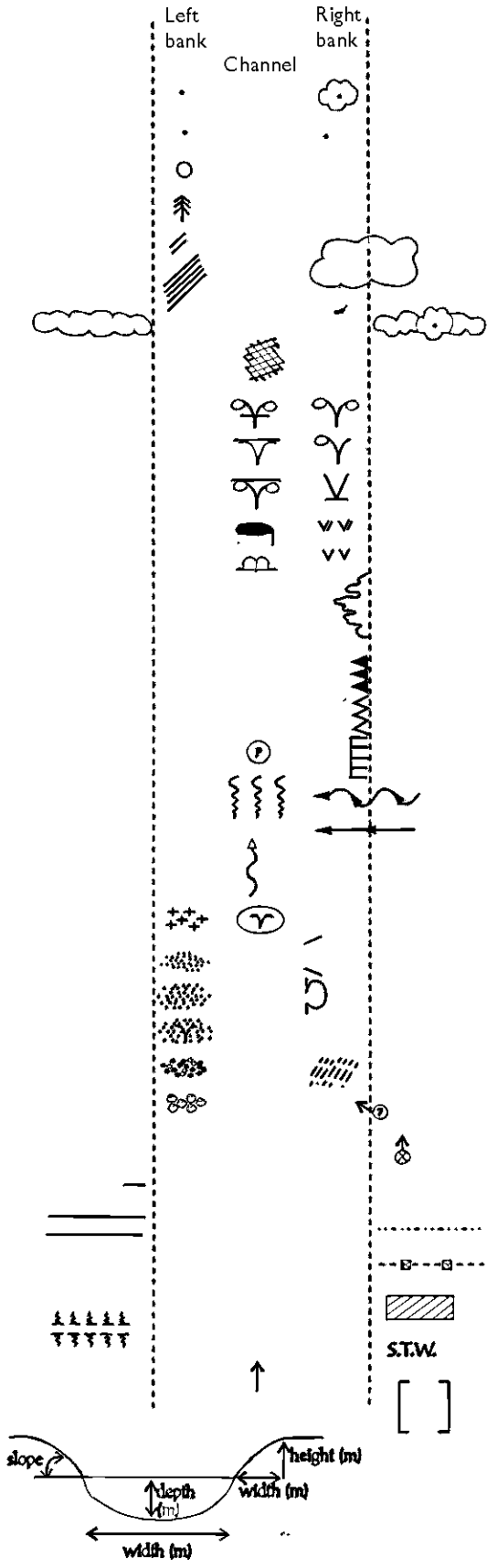
<i>Impatiens glandulifera</i>	Indian Balsam	Igla
<i>Iris pseudacorus</i>	Yellow Iris	Ipse
<i>Juncus effusus</i>	Soft-rush	Jeff
<i>Juncus innexus</i>	Hard Rush	Jinf
<i>Lemna minor</i>	Common Duckweed	Lrnin
<i>Lycopus europaeus</i>	Gypsywort	Leur
<i>Lythrum salicaria</i>	Purple-loosestrife	Lsal
<i>Mentha aquatica</i>	Water Mint	Maqu
<i>Myosotis scorpioides</i>	Water Forget-me-not	Msco
<i>Myosoton aquaticum</i>	Water Chickweed	Myaqu
<i>Myriophyllum spicatum</i>	Spiked Water-milfoil	Mspi
<i>Nuphar lutea</i>	Yellow Water-lily	Nlut
<i>Oenanthe crocata</i>	Hemlock Water-dropwort	Ocro
<i>Persicaria amphibium</i>	Amphibious Distort	Pamp
<i>Persicaria hydropiper</i>	Water-pepper	Phyd
<i>Persicaria maculosa</i>	Redshank	Pmac
<i>Petasites hybridus</i>	Butterbur	Phyb
<i>Phalaris arundinacea</i>	Reed Canary-grass	Paru
<i>Phragmites australis</i>	Common Reed	Paus
<i>Potamogeton crispus</i>	Curled Pondweed	Pcri
<i>Potamogeton lucens</i>	Shining Pondweed	Pluc
<i>Potamogeton natans</i>	Broad-leaved Pondweed	Pnat
<i>Potamogeton pectinatus</i>	Fennel Pondweed	Ppec
<i>Prunus spinosa</i>	Blackthorn	Pspi
<i>Quercus robur</i>	Pedunculate Oak	Qrob
<i>Ranunculus aquatilis</i>	Common Water-crowfoot	Raqu
<i>Ranunculus penicillatus</i>	Stream Water-crowfoot	Rpen
<i>Ranunculus sp.</i>	Water-crowfoot	Ran sp.
<i>Ranunculus sceleratus</i>	Celery-leaved Buttercup	Rsce
<i>Rorippa amphibia</i>	Great Yellow-cress	Ramp
<i>Rorippa nasturtium-aquaticum</i>	Water-cress	Rnaq
<i>Rosa canina agg.</i>	Dog Rose	Rcan
<i>Rubus fruticosus agg.</i>	Bramble	Rfru
<i>Rumex hydrolapathum</i>	Water Dock	Rhyd
<i>Sagittaria sagittifolia</i>	Arrowhead	Ssag

<i>Salix alba</i>	White Willow	Salb
<i>Salix caprea</i>	Goat Willow	Scap
<i>Salix cinerea</i>	Grey Willow	Scin
<i>Salix fragilis</i>	Crack-willow	Sfra
<i>Sambucus nigra</i>	Elder	Snig
<i>Schoenoplectus lacustris</i>	Common Club-rush	Slac
<i>Scrophularia auriculata</i>	Water Figwort	Saur
<i>Solanum dulcamara</i>	Bittersweet	Sdul
<i>Sparganium emersum</i>	Unbranched Bur-reed	Seme
<i>Sparganium erectum</i>	Branched Bur-reed	Sere
<i>Stachys palustris</i>	Marsh Woundwort	Spal
<i>Symphytum officinale</i>	Common Comfrey	Soff
<i>Typha latifolia</i>	Bulrush	T1at
<i>Urtica dioica</i>	Common Nettle	Udio
<i>Veronica anagallis-aquatica</i>	Blue Water-speedwell	Vana
<i>Veronica beccabunga</i>	Brooklime	Vbec
<i>Veronica catenata</i>	Pink Water-speedwell	Vcat

After '*New Flora of the British Isles*', 1991. c. A Stace. Cambridge University Press.

# Symbols used on River Corridor Maps (A.M. Walker, 1997)

- Broadleaf tree, overhanging
- fallen
- Sapling
- Conifer
- Shrub, single
- Dense shrubs
- Hedgerow
- Reed/sedge on bank/margin
- Emergent dicots
- Submerged monocots
- Submerged dicots
- Floating level plants
- Bryophytes
- Bridge for road or track
- Footbridge
- Lock
- Weir
- Pool
- Riffle
- Run
- Mud
- Sand
- Bare gravel or shingle
- Vegetated gravel or shingle
- Cobbles
- Boulders
- Fence
- Gate
- Road or track
- Railway
- Flood bank
- Direction of flow
- Channel cross section



- Mature broadleaf tree
- Exposed tree roots
- P + symbol = pollarded tree
- (P) + symbol = tree needs pollarding
- C + symbol = coppiced tree
- Woodland + symbol for type
- Exposed tree roots
- Emergent monocots
- Tall herbs/ruderals dominant
- Mixed tall grass and herbs
- Tall grasses dominant
- Short grasses
- Mown bank vegetation
- Slumping bank
- Solid earth cliff
- Soft earth cliff
- Artificial bank
- Spring/flush
- Inflowing stream
- Shelf or berm
- Island with vegetation
- Outfall
- Inlet
- Stock bay/drink
- Dredgings/spoil
- Photograph
- Direction of survey/ bank used
- Footpath
- Power lines
- Building
- Sewage works
- Land use category
- Defined name/ Phase I code

Bulstake Stream - Survey Stretch 1



Bulstake Stream - Survey Stretch 2

