SECTION 8: WIDER ECOLOGY, BIOLOGY AND BIODIVERSITY

Rivers and their associated ecological corridors are widely recognised as hotspots for biodiversity. Even in its modified state, the Wandle supports a range of wildlife and is an important part of the wider landscape. This wildlife is also an important attraction for local people who enjoy bird watching, fishing, photography and the opportunity to connect with the natural world.

Plant species may be naturally established, translocated by the wind or movement of animals or birds, deliberately introduced by river enhancement schemes, or accidentally spread by people (for instance by emptying garden ponds into wetlands or the Wandle itself). Similarly, animals may be either naturally established, deliberately reintroduced (eg water voles) or released as invasive non-native species (eg terrapins).

8.1: UK BAP Species

"We like it that water voles, eels and trout are being encouraged to return to the Wandle."

- from Ketso community and stakeholder workshops

The UK Biodiversity Action Plan (UK BAP) was published in 1994, as the UK Government's response to the Rio de Janeiro Convention on Biological Diversity (CBD) of 1992.

The UK was the first country to produce a national biodiversity action plan to identify the priority species and habitats which were the most threatened and in need of conservation action. The original species lists in the UK Biodiversity Action Plan (UK BAP) were updated in 2007, and have now been succeeded by the UK Post-2010 Biodiversity Framework, published in July 2012. However, the UK BAP lists of priority species and habitats remain important focal points for conservation management, and have been used to draw up country-level statutory lists of priority species for England, Scotland, Wales and Northern Ireland (JNCC).

At the time of writing this Catchment Plan, the Wandle provides habitat for several UK Biodiversity Action Plan (BAP) species. The Catchment Plan partners hope that future river restoration and other improvements will permit natural or anthropogenic reintroduction of several more. A current assessment of the Wandle's BAP species is presented below:

Current species	**Measures for improvement**
European eel *(Anguilla anguilla)*	Habitat and fish passage improvements
Trout *(Salmo trutta)* (both migratory and non-migratory life forms)	Habitat and fish passage improvements
Potential future species	**Measures to improve potential for natural recolonisation**
Otter *(Lutra lutra)*	Fish population improvements
Salmon *(Salmo salar)*	Sporadic individuals have been reported. Widespread fish passage improvements would be needed to enable free migration from the Thames throughout the Wandle
Sea trout *(Salmo trutta)*	Removal or modification of weirs and other obstructions to enable free migration from the Thames throughout the Wandle
Potential future species	**Measures for improvement to enable reintroduction**

Water vole *(Arvicola terrestris)*	Last reliably reported on the Wandle at Wilderness Island in the 1980s (Steel and Coleman, 2012). Widespread habitat and connectivity improvements are needed: work is being undertaken to create backwaters and soft river margins, and remove large weirs and culverts, enabling establishment of interconnected meta-populations for long-term sustainability. Water vole reintroduction may also be threatened by predation from brown rats in the river corridor
White-clawed crayfish *(Austropotamobius pallipes)*	None present: Smee records absence from the upper Wandle in the 1870s, and his attempts at introduction were unsuccessful (Smee, 1872). Habitat and water quality improvements would be required before any further introductions

Fig 8a: A summary of the Wandle's BAP species

Further reading:

London Wildlife Trust (2009) *A Water Vole Reintroduction Feasibility Study for the River Wandle*

8.2: Other species of interest

"We like watching herons, grey wagtails, egrets and moorhens, and especially kingfishers flashing past. Viewing hides along the river would help more people to appreciate the wildlife without disturbing it."

- from Ketso community and stakeholder workshops

The River Wandle provides habitat for several rare species which are not listed under UK BAP but are still considered to be of conservation interest:

- Bullhead *(Cottus gobio)* is listed in Annex II of the EC Habitats Directive as a species of European conservation interest from a conservation point of view. Bullhead are abundant in the upper Wandle, particularly in the Carshalton water body.

- The flatworm *Bdellocephala punctata* is the largest of Britain's flatworm species. It is geographically wide-ranging in Britain across a number of distinct distribution types, but is nationally uncommon and often scarce in the habitats it does inhabit. *Bdellocephala punctata* has been recorded at Goat Bridge in LB Sutton, Morden Hall Park in LB Merton and on the Carshalton water body.

- Little egret (*Egretta garzetta garzetta)* disappeared from Britain until the 16th century, and only began to recolonise from France and the Netherlands in the late 1980s. Individuals are frequently sighted on both Wandle water bodies, and may start breeding (Steel and Coleman, 2012).

Further species of interest include:

- Aquatic plants: the river reflects a typical progression of macrophytes, from communities which favour smaller, faster flowing watercourses in the headwaters, to those associated with slower-flowing and more nutrient rich environments in its lower reaches. Notable

species include classic CB communities in the Carshalton headwaters (including brook water crowfoot and water cress) and hemlock water dropwort at Spencer Road Wetlands.

- Birds: iconic species including kingfishers (*Alcedo atthis*) and grey and yellow wagtails are present on the Wandle: until recently, Beddington Farmlands also hosted a nationally important population of tree sparrows (*Passer montanus*). Reed warblers and reed buntings have also been recorded breeding along the river (Steel and Coleman, 2012). In exceptionally cold weather, birds may migrate from Beddington Farmlands to the warmer microclimate provided by the Wandle at Watermeads.

- Bats: a number of species are associated with the Wandle, including Daubenton's and pipistrelles. Beddington Farmlands is also one of the best sites in London for bats, including noctules, Leisler's and Nathusius' (Steel and Coleman, 2012).

In addition to the BAP species listed in Section 8.1, the following species is currently being introduced:

- Mayfly *(Ephemera danica)* is present on almost all chalkstreams, but has rarely been recorded on the Wandle, and is believed to have become locally extinct during the Industrial Revolution.

  With appropriate biosecurity measures and consent from Natural England, approximately 7 million *danica* eggs were harvested from the Hampshire Avon at West Amesbury in June 2014. After incubation and monitoring up to the penultimate stage of development, these were introduced to the Culvers Island area of the Wandle c3 weeks later: monitoring will be undertaken by the Wandle Piscators' Riverfly monitoring project (pers comms. Cyril Bennett and William Tall, 2014).

8.3: Invasive non-native species (INNS)

"We don't like seeing the river being taken over by Himalayan balsam and floating pennywort. We need to know more about invasive species and how to control them."

- from Ketso community and stakeholder workshops

Invasive non-native species (INNS) are usually defined as plants or animals which cause unacceptable damage after being spread by humans, deliberately or unintentionally, beyond the areas where they naturally evolved.

In their new habitats, which they have often reached via anthropogenic trade, transport, travel or tourism, INNS thrive where the natural environment has already been unbalanced by urban development and other human activities. Free from their co-evolved enemies, competitors and parasites, they multiply and spread rapidly along landscape features such as roads, railway lines, footpaths and rivers, outcompeting native species and sometimes re-engineering whole landscapes and ecosystems (Pike, 2014).

Although not specifically assessed for WFD purposes, INNS already present a wide range of very real threats to the ecology of rivers like the Wandle. As such they may contribute to, or even cause, WFD deterioration or failure and are considered within mitigation measures by the EA. A current assessment of river-related INNS and their potential threats to the Wandle's WFD status is presented below:

INNS	Carshalton water body	Croydon - Wandsworth water body	Specific location(s)	Threat to WFD status	Control measures

Aquatic, emergent or riparian plants					
Canadian pondweed *(Elodea canadensis)*		Present	Throughout	WFD: Macrophytes	Clear by hand
Floating pennywort *(Hydrocotyle ranuculoides)*	Present	Present	Wilderness Island downstream	WFD: Macrophytes	Spray with glyphosate or hand clear
Himalayan balsam *(Impatiens glandulifera)*	Formerly present, now cleared	Present	Almost cleared above Beddington Park; pervasive downstream	WFD: Fish (siltation)	Clear by hand
Giant hogweed *(Heracleum mantegazzianum)*	Present	Present	Intermittently throughout	WFD: Fish (siltation) plus human health	Dig up (cut tap root) or spray with glyphosate
Japanese knotweed *(Fallopia japonica)*		Present	Intermittently throughout	WFD: Macrophytes	Inject with glyphosate
Nuttall's waterweed *(Elodea nuttallii)*		Present		WFD: Macrophytes	Clear by hand
Parrot's feather *(Myriophyllum aquaticum)*		Present	Spring pond in Beddington Park (plus Mapleton Rd, Wandsworth?)	WFD: Macrophytes	Shade out
Water fern *(Azolla filiculoides)*		Present	Morden Hall Park garden centre channel	WFD: Macrophytes	Clear by hand or introduce *Stenopelmus rufinasus* weevil
Birds and insects					
Canada goose *(Branta canadensis)*	Present	Present	Intermittently throughout	Water quality: eutrophication	Trap or prick / oil eggs
Chinese mitten crab *(Eriocheir sinensis)*		Present	Merton Abbey Mills downstream	WFD: Fish / Invertebrates	No known control
Imminent threats					
American signal crayfish *(Pacifastacus leniusculus)*	Not yet recorded	Not yet recorded		WFD: Fish / Invertebrates	Stringent biosecurity: no known control
Australian swamp stonecrop (New Zealand pygmyweed) *(Crassula helmsii)*	Not yet recorded	Not yet recorded		WFD: Macrophytes	Shade out

Mink *(Neovison vison)*	Not yet recorded	Not yet recorded in 1-year monitoring programme c2008	Potential spread from from Barnes wetland via Thames	WFD: Fish	Monitoring and trapping
Ponto-Caspian shrimp *(Dikerogammarus villosus, Dikerogammarus haemobaphes)*	Not yet recorded	Not yet recorded		WFD: Fish / Invertebrates	Stringent biosecurity: no known control
Topmouth gudgeon *(Pseudorasbora parva)*	Not yet recorded	Not yet recorded		WFD: Fish / Invertebrates	Stringent biosecurity: rotenone poisoning
Quagga mussel *(Dreissena bugensis rostriformis)*	Not yet recorded	Not yet recorded		WFD: Fish / Invertebrates	Stringent biosecurity: no known control except physical clearance
Zebra mussel *(Dreissena polymorpha)*	Not yet recorded	Not yet recorded		WFD: Fish / Invertebrates	Stringent biosecurity: no known control except physical clearance

Fig 8b: INNS which may threaten the Wandle's WFD status

From a point of view of potential WFD status deterioration on the Wandle, the following may be worth noting:

- INNS generally: comparison of current information to the *Wandle Catchment RCS Survey* (Green, 1996) suggests that many INNS have spread significantly through the Wandle catchment in recent years, and new INNS have arrived. Some control measures have been implemented by the EA and volunteers, but these efforts need to be maintained and extended to avert likely progressive deterioration.

  The Wandle Catchment Plan's Fish TAG regards Chinese mitten crabs (CMC) and American signal crayfish (ASC) as the greatest potential threats to the Wandle's fish populations. CMC are already present on the river and can migrate upstream via eel passes: control may be possible at distinct times of migration, but these are also likely to coincide with downstream eel migration (September – November) and upstream movement by elvers (April – May). ASC would be unable to reach the Wandle independently but there is a serious risk of deliberate anthropogenic introduction. Other crayfish species are known to exist in Greater London (eg Louisiana red swamp crayfish *Procambus clarkii*).

- Himalayan balsam (HB): a recent study suggests that HB infestation may promote significant soil loss in riparian areas. HB overshades native vegetation before dying back

in the winter, leaving soil exposed to erosion by precipitation and fluvial flow: as a result, for every HB-infested kilometer of river bank up to 10 tonnes of nutrient-rich sediment may be deposited in rivers every year (Greenwood and Kuhn, 2013).

Volunteers have already cleared HB from the Carshalton water body and are now addressing the Croydon-Wandsworth water body, working downstream year on year.

- Canadian pondweed: there is strong anecdotal evidence that CB communities on the Wandle, particularly *Ranunculus*, are being replaced by *Elodea canadensis*, most likely as a consequence of increased nutrient concentrations and reduced flow. Further evidence is needed to confirm this. Canadian pondweed was recorded around Carshalton Ponds and the Grove in 1974 (Twilley and Wilks, 1974), and may have been present before this time.

  Floating pennywort (FP): since its probable first appearance at Wilderness Island (Carshalton) c1999 (Derek Coleman, 2014) FP has spread very rapidly to colonise all downstream reaches of the Wandle. At least £150,000 has already been spent by the EA on emergency clearance of FP for flood risk management purposes, while voluntary organisations like the Wandle Trust, London Wildlife Trust (Wilderness Island group) and Morden Hall Park Angling Club are struggling to keep backwater fish refugia clear of this rapidly-spreading INNS.

In order to protect the Wandle from the spread of existing INNS and incursions by new species, biosecurity guidelines should be heavily promoted to all river users: in particular, GBNNSS's Check-Clean-Dry and Be Plant Wise campaigns.

<u>Further information required:</u>

Further research into the impact of *Elodea canadensis* on CB communities (especially *Ranunculus*)

<u>Further reading:</u>

Environment Agency and Wandle Trust: *Invasive Non-Native Species Action Plan*

Francis, ed (2012) *A Handbook of Global Freshwater Invasive Species*

Green (1996) *Wandle Catchment RCS Survey*

Greenwood and Kuhn (2013) *Does the invasive plant, Impatiens glandulifera, promote soil erosion along the riparian zone? An investigation on a small watercourse in northwest Switzerland*

Pike (2014) *A Pocket Guide to Balsam Bashing and How to Tackle Other Invasive Non-Native Species*

Wandle Forum Landscape and Biodiversity Group (2010) *Wandle Invasive Non-Native Species Plan*