



DRAFT REVISED VERSION 2015

LAKES & RESERVOIRS

1. INTRODUCTION

This action plan covers all natural and man-made still waters larger than 1ha in size and overlaps with a number of other habitat action plans that cover wetland habitats. Ponds are the subject of a separate Local Biodiversity Action Plan (BAP). Local 'standing water bodies' (as opposed to flowing 'water courses') come in a great variety of sizes and configurations and include lakes and reservoirs.



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The [UK Ponds Biodiversity Action Plan](#) (BAP) defines ponds as 'permanent and seasonal standing water bodies less than 2ha in size' but in [Higher Level Stewardship](#) the upper limit of a pond is 1ha; for the purposes of this plan, a lake or reservoir is defined as any water body larger than 1ha in size. A more ecologically meaningful distinction might be that ponds tend to be dominated by shallow-water and edge habitats whereas a lake has a true open-water zone where submerged plants and algae predominate.

Many lakes and reservoirs have man-made origin either as ornamental features ([Coombe Pools](#)), for water storage ([Draycote Water](#) and [Shustoke Reservoir](#)), as flood defence features (e.g. balancing pools at places like [Claybrookes Marsh](#) and Baginton Lagoons) or as the flooded worked-out gravel pits and quarries. Some of the best ones, e.g. [Alvecote Pools](#) (a mosaic of ponds and lakes) and [Wyken Slough](#) have also developed accidentally following subsidence of land overlying coal mines.

Three reservoirs in Warwickshire are owned by the Canal & River Trust: Earlswood Waters associated with the Stratford on Avon Canal and the Napton and Calcutt Reservoirs on the Grand Union Canal.

Most local lakes and reservoirs are classified as 'eutrophic' (see [Eutrophic Standing Waters](#) for a description of the habitat), that is, having waters rich in mineral (especially phosphates and nitrates) and organic nutrients. This enrichment promotes a proliferation of plant life, particularly algae, which can reduce the dissolved oxygen content and cause the extinction of other organisms, with a tendency for large populations of algae to form in mid-summer which often makes the water green. It also leads to the formation of dark, anaerobic mud on their beds and a tendency to silt up quite quickly. Nutrient enrichment can result from farm run-off, road run-off and other sources of enriched water flowing into a water body and also polluted rain water. At low levels, such enrichment may not affect the ecological diversity (mildly eutrophic water bodies are typically very diverse), but at higher levels it results in acute pollution - 'eutrophication' - creating stagnant water bodies of much lower diversity, with a tendency to produce toxic blue-green algal blooms in hot summers and sometimes characterised by death of aquatic vegetation and surrounding shrubs. However, a few local water bodies may not be eutrophic, e.g. [Coleshill Pool](#), a designated [Site of Special Scientific Interest](#) (SSSI).

Lakes and reservoirs, where not too enriched, can support a large array of fully aquatic and emergent plants, including 'macrophytes' like water lilies, pondweeds, reeds, and reed-maces plus microscopic algae. Animals using the water body include fish, a wide range of waterfowl (e.g. ducks, swans, grebes, rails), herons, herptiles (frogs, newts, grass snake, *Natrix natrix*), many types of insect (notably dragonflies, midges, water beetles) and other invertebrates such as water snails, leeches and crustaceans (e.g. crayfish and smaller isopods). Some of these can require very specific parts of a water body or other specific conditions related to water depth, water quality, water body size, water level fluctuations (summer draw-down can benefit many species), plant abundances, the presence/absence of fish or other predators and low levels of disturbance.

The margins of water bodies are very important, and often the most diverse part of a water body. At the best examples, they are characterised by broad fringes of varied emergent and other marginal vegetation (including carr) and plentiful exposed wet mud. Many species of invertebrate have their larval stage located here, and many wetland birds nest in the cover of lake edges, both at ground level (e.g. wildfowl) or higher up (e.g. warblers and herons).

2.	OBJECTIVES*	TARGETS*
Associated Action Plans are: 'Rivers & Streams', 'Reed beds', 'Ponds', 'Scrub & Carr', 'Fen & Swamp', 'Quarries & Gravel Pits', 'Parks & Public Open Spaces', 'Bats', 'Otter', 'Water Vole', 'Snipe', 'Bittern', 'Great Crested Newt' and 'White-clawed Crayfish'		
PLEASE CONSULT THE ' GENERIC HABITATS ' ACTION PLAN IN CONJUNCTION WITH THIS DOCUMENT FOR OBJECTIVES COMMON TO ALL HABITAT PLANS		
A.	To achieve condition of 102 existing water bodies larger than 1ha that are currently in unfavourable condition, to favourable or recovering.	2026
B.	To achieve condition of land buffering water bodies.	2026
*Derived from Regional Spatial Strategy Phase 3 Technical Report (2009) and based on a minimum mapping unit of 0.25ha. Numerical targets have been incorporated into section 6. See Generic Habitats Plan for rationale for derivation of targets and definitions of favourable and unfavourable condition ('Habitats overview' in 'State of the Natural Environment' (NE,2008,p49).		

3. NATIONAL BAP OBJECTIVES & TARGETS:

Lakes and Reservoirs are on the current UK Biodiversity Action Plan (BAP) list of Priority Habitats published in 2007([Joint Nature Conservation Committee](#)). The targets and objectives for the [Eutrophic Standing Waters](#) BAP, updated in 2010-11, may be seen online.

4. CURRENT STATUS

The Habitat Biodiversity Audit (HBA,2012) figure for open standing water, including ponds, lakes, reservoirs, flooded gravel pits, water filled ditches and canals is 1930ha with 7422 standing water features.

The precise number of water bodies within the sub region is unknown, though the HBA (2012) gives a figure of 274 separate water bodies larger than 1ha, covering a total area of 1,262.59ha (figures should be treated as an approximation due to limitations of the available data). Provided the target for expansion is met, the number of separate water bodies will have increased by 1 site by 2026.

Draycote Water reservoir is the largest water body, at 240ha. Other large examples include the flooded gravel workings of the Tame and Blythe Valley (e.g. Dosthill Lake, a designated Local Wildlife Site (LWS) and the pools at [Kingsbury Water Park](#), [Middleton Hall](#) and [Packington Park](#)) and the lakes of [Brandon Marsh](#), other reservoirs such as Shustoke and Olton, ornamental lakes at sites including [Coombe Country Park](#), Packington, [Compton Verney](#) and [Arbury Park](#), subsidence pools at [Alvecote](#) and [Wyken Slough](#), a designated Local Wildlife Site (LWS) and old settling pools at Baginton. These collectively contain the bulk of standing freshwater in the subregion and have some regionally important bird populations that specifically require large, undisturbed water bodies for breeding, over-wintering or both.

4.1 Legal and Policy Status

A wide range of species and habitats are protected under international and domestic laws, including the [Wild Birds Directive](#) (1979), the [Wildlife and Countryside Act](#) (1981), the [Conservation Regulations](#) (1994) and [EC Habitats Directive](#) (1992). Protection of sites is afforded nationally through SSSI, [Special Areas of Conservation](#) (SAC) and [Local Nature Reserve](#) (LNR) statutory status. Other sites are offered recognition of their value through Local Wildlife Site status (LWS), Local Character Areas and identified Landscape Scale Areas. The [National Planning Policy Framework](#) (2012) chapter/section 11 states conditions with regard to any development negatively affecting biodiversity, including protected sites, ancient woodland and other irreplaceable habitats (paragraph 118). The Wildlife & Countryside Act and schedule 2 of the [Conservation of Habitats & Species Regulations 2010](#) make it an offence to intentionally kill, injure, take, possess, sell, buy or transport a range of species.

Some water bodies such as Alvecote Pools, Coombe Pools, Brandon Marsh, Claybrookes Marsh, Coleshill Pool and those at Middleton Hall and Ufton Fields are protected by SSSI status. Here, the factors leading to eutrophication need to be controlled as potentially damaging activities. The Middle Tame and Blythe Valleys were identified as a Biodiversity Enhancement Area (BEA) in the Government's [Regional Spatial Strategy for the West Midlands](#); this was abolished in 2010.

The [Environment Agency](#) has a duty to promote the conservation of flora and fauna associated with water. The EA has less direct influence on off-line water bodies, but work is being carried out on main rivers to eliminate the sources of excessive nutrients.

Local authorities have statutory duties towards nature conservation, and some water bodies are within sites under their control, such as some Local Wildlife Sites (LWSs) and Local Nature Reserves (LNRs). These bodies also have some responsibility for pollution control.

[Severn Trent Water](#) has a statutory duty to supply potable water to an area of 21,000 km² in the Midlands and Mid-Wales, via its reservoirs, locally Draycote, [Olton](#), and [Shustoke](#).

The [Reservoirs Act \(1975\)](#) provides a legal framework to ensure the safety of large raised reservoirs. The Act applies to reservoirs that hold at least 25,000 cubic meters of water above natural ground level. Safety legislation for reservoirs in the United Kingdom was introduced in 1930 after several reservoir disasters had resulted in loss of life. This Act was superseded by the Reservoirs Act 1975.

The [European Water Directive](#) (2003) provided an opportunity to plan and deliver a better water environment, focusing on ecology through river basin management planning. It helps to protect and enhance the quality of surface freshwater (including lakes, streams and reservoirs), ground waters, groundwater dependent ecosystems, estuaries and coastal waters out to one mile from low-water.

The [Canal & River Trust](#) is a charity that merged with The Waterways Trust in 2012 to bring together over 2,000 miles of historic canals, rivers and docks, three important waterways museums, the national waterways collection and national waterway archives.

4.2 Current Factors Affecting the Habitat

- **Eutrophication /enrichment caused by nitrates or phosphates** - primarily in sewage or fertiliser run-off, leading to excessive plant growth and algal blooms, followed by decay and shortage of dissolved oxygen. Algal blooms can also reduce light in the water body, limiting the development of aquatic plants and invertebrate populations.
- **Disease** - anaerobic conditions resulting from nutrient-loading of water bodies can encourage the development of the bacterial spores *Clostridium botulinum*. The toxins of the bacteria can be ingested by waterfowl and may cause the death of significant numbers of birds.
- **Other pollution** from organic matter, silt, heavy metals including historical pollution such as discharges from abandoned mines, metaldehyde, oil and grease, and domestic litter. Disturbance of sediment can lead to release of these pollutants, causing death of wildlife.
- **Introduction of invasive non- native plant species** such as water fern (*Azolla filicoides*) and Australian stonecrop / New Zealand pygmyweed (*Crassula helmsii*), can out-compete all other plants locally, leading to a loss of plant diversity.
- **Introduced non-native species of animals** can cause a range of problems. The North American mink (*Neovison vison*) is a factor in the decline of the water vole (*Arvicola amphibius*); crayfish plague from American signal crayfish (*Pacifastacus leniusculus*) threatens native white-clawed crayfish (*Austropotamobius pallipes*).
- **Unsympathetic management** e.g. large scale dredging of lakes, major re-profiling of margins, draining and refilling. Areas of marginal vegetation may be undervalued, as associated wildlife is typically elusive, and may be perceived as a place to dump rubbish.
- **In-filling** of waterbodies such as water-filled quarries, as a result of urbanisation.
- **Changes of water levels** caused by over / reduced abstraction of surface or ground water, by drainage (though natural, seasonal fluctuations can be beneficial) or by climate change can produce wide-ranging effects such as changes in the water quality, and in macrophytic, algal and invertebrate communities.

- **Changes in surrounding land-use** that alter the water table, change the pollution load or degrade or remove valuable adjacent habitat thus isolating waterbodies. The removal of waterside vegetation (which may be an effective barrier to particle matter, act as a sink for nutrients and is also important for wildlife) can increase soil erosion increasing water borne sediments and nutrients to the water. Other changes are field drainage, cessation of grazing, pesticide drift and loss to development.
- **Recreational and amenity pressures** such as boating, fishing and bank-side activities can cause turbidity, bank erosion, damage to water-side habitats, cutting of vegetation by propellers and disturb bird populations.
- **Stocking with certain fish**, e.g. carp and bream (*fam.Cyprinidae*) which uproot plants whilst feeding, increasing the turbidity of the water and depleting food resources for wildlife; great crested newt (*Triturus cristatus*) can be eliminated by fish predation.
- **Excessive bird levels** especially Canada geese (*Branta canadensis*) and other feral wildfowl damage and reduce marginal vegetation through trampling and compete with native wildfowl for nest sites. Their droppings can cause eutrophication and food given to them by humans can also contribute to eutrophication and attract brown rats, causing problems with egg predation.

5. LOCAL ACTION

- An accurate digitised database of water bodies in the sub-region has been established by the Habitat Biodiversity Audit (HBA) and is annually updated.
- Water level management plans for the benefit of wildlife on SSSI sites have been produced for all relevant SSSIs with surface waters and there will be no new wetland SSSIs proposed in the LBAP area.
- Enhancement of the Nook, an 8ha site in Bedworth secured on a long term lease by the Borough Council, included dredging, planting of 2200 native trees, reed bed creation for nesting birds, mud flats, seasonal flooding / grass areas for invertebrates and bund creation to improve the site for water voles. All done in close conjunction with the 'Friends of the Nook' community group and the local community.
- Ongoing mineral extraction is creating new water bodies e.g. RMC operations at Salford Priors, [Marsh Lane Bird Reserve](#) near Meriden.
- The [Environmental Stewardship Scheme](#) administered by Natural England offers funding for the creation of ponds and larger water bodies, and some new ones have been created (e.g. farmland near Mappleborough Green) .
- Detailed bird recording is long established at many key sites e.g. Brandon Marsh SSSI, Draycote reservoir, Tame and Blythe Valley sites, Coombe and [Seeswood Pool](#).
- [Middleton Lakes](#) - in 2007 the [Royal Society for the Protection of Birds](#) (RSPB) took over the former sand and gravel quarries at Middleton Hall from Hanson Aggregates and through restoration has created a 23ha range of wetland habitats.
- The implementation of Farm Waste Management Plans is part of the '[Cross Compliance](#)' checking for all farms receiving funding from Defra.

- The EA offers bio-security advice to clean fishing equipment and clothing after fishing and leave to dry through the '[Check Clean Dry](#)' campaign.
- Calcutt Reservoir – [Butterfly Conservation](#) has carried out mowing of banks in March & May cut then again in August and September/October (pers.comm.M.Slater 2014).

6. PROPOSED LOCAL ACTIONS

ACTION	Lead	Partners	By
PLEASE CONSULT THE ' GENERIC HABITATS ' ACTION PLAN IN CONJUNCTION WITH THIS DOCUMENT FOR ACTIONS COMMON TO ALL HABITAT PLANS			
Policy, Legislation & Protection			
PL1. Ensure that any site meeting the relevant criteria is considered for designation as an SSSI.	NE	RSPB EA WCC LAs WWT LWSP WMBC	ongoing
PL2. Continue to select all qualifying open water bodies as LWSs and enter onto database.	LWSP	HBA LOs	ongoing
PL3. Ensure that the protection of all water bodies is included in Local Development Frameworks, Neighbourhood Plans and any other relevant strategies, including targets for maintenance, achieving condition and expansion for each Local Authority.	WCC	NE LAs WWT	ongoing
PL4. Ensure that new minor or major developments result in net biodiversity gain through adherence to the mitigation hierarchy.	WCC	NE WWT LPAs NWBC NBBC	ongoing
Site / Species Safeguard & Management			
SM1. Maintain condition of all water bodies larger than 1ha found to be in favourable condition, by appropriate management, to include a range of water depths, and both submerged and marginal vegetation (see RM1).	LOs	WWT CRT LAs	ongoing
SM2. Achieve favourable condition of 32 existing water bodies larger than 1ha by 2018 and a further 70 by 2026, giving priority to those holding UK Biodiversity Action Plan Priority Species & Red Data Book species, e.g. silt removal to restore volume of water.	LOs	RSPB WWT CRT LAs	2018-2026
SM3. Encourage appropriate management of all	LWSP	NE EA	ongoing

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LWS water bodies to maintain condition or improve to good condition.		CRT WWT	
SM 4. Actively manage sites to remove/control non-native invasive species present in waterbodies.	LOs	NE EA CRT WWT	Ongoing
Advisory			
A1. Signpost Best Practice Guidelines to appropriate landowners via agri-environment schemes.	NE	WWT WCC	ongoing
Research & Monitoring			
RM1. Record lake and reservoir habitats (see SM2)	HBA	CRT WCC LOs	ongoing
RM2. Use habitat data and connectivity mapping to identify opportunities to provide habitat links between lakes and reservoirs and associated wetland habitat.	HBA	WWT LAs	ongoing
RM3. Continue 'Canada Geese Monitoring' and, following a review of the results, implement appropriate measures where required to resolve problems of eutrophication and loss of bank side vegetation, e.g. at Brueton Park, Solihull and Coombe Country Park.	CSG	WWT CCP WCC SMBC	ongoing
Communication, Publicity & Education			
CP1. Actively promote the 'Check Clean Dry' Campaign to protect native species from non-native species threats and diseases.	EA	WWT SRT TRT WCC LAs	ongoing

Abbreviations: **CCP** – Coombe Country Park, **CRT** – Canal & River Trust, **CSG** – Core Steering Group, **EA** – Environment Agency, **FCs** – Fishing Clubs, **HBA** – Habitat Biodiversity Audit partnership, **LA** – Local Authority, **LO** – Landowner, **LPAs** – Local Planning Authorities, **LWSP** – Local Wildlife Sites Project, **NE** – Natural England, **RSPB** – Royal Society for the Protection of Birds, **SMBC** – Solihull Metropolitan Borough Council, **SRT** – Severn Rivers Trust, **TRT** – Trent Rivers Trust, **WCC** – Warwickshire County Council, **WMBC** – West Midlands Bird Club, **WWT** – Warwickshire Wildlife Trust.

7. PROGRESS WITH ACTIONS

From 2015–2020 there will be a rolling programme of reporting on progress, of 10 action plans per year with an annual summary of results. Results will be entered onto the national Biodiversity Action Reporting System [BARS](https://bars.gov.uk/). Progress with this plan up to 2008 can be seen at www.warwickshirewildlifetrust.org.uk/LBAP2014.

8. BIBLIOGRAPHY

Kirby, P. (1992). [Habitat management for Invertebrates](#): a Practical Handbook. RSPB.

Olsen, Lars-Henrik. (2001). Small Freshwater Creatures. OUP.

Steel, J. (2002). Wildlife Ponds (Osmia publications).

Falk, S.J. (2009) [Warwickshire's Wildflowers](#). Provides habitat-specific species lists, and explanations of habitats from a botanical viewpoint.

Treweek Environmental Consultants (2009) Regional Spatial Strategy (R.S.S.) Phase 3 [Regional Habitats Targets Review](#), Technical Report pp.71-94, prepared for the W. Midlands Regional Assembly.

Lawton, J.H. (2010) [Making Space for Nature](#): a review of England's wildlife sites and ecological network. Report to Defra.

DEFRA (2011) [Biodiversity 2020](#): A strategy for England's wildlife and ecosystem services.

Dobson, M. et al. (2012) [Guide to Freshwater Invertebrates](#). Freshwater Biological Association. ISBN-13: 9780900386800

RSPB (2013) State of Nature – a stocktake of all our native wildlife by 25 wildlife organisations.

HBA (2013) The State of the Habitats of Warwickshire, Coventry and Solihull.

9. FURTHER INFORMATION

Habitat Biodiversity Audit (HBA) for Warwickshire, Coventry & Solihull – mapping data set and associated information. Phase 1 ([JNCC](#)) 1996-2002 and Phase 2 (Local Wildlife Sites) ongoing.

[Biodiversity Planning Toolkit](#) - a new online resource to help incorporate biodiversity and geodiversity into the planning system and new development.

[Amphibian & Reptile Groups of the UK](#) - the representative body for the network of over 60 dedicated Amphibian and Reptile Groups (ARGs) based in England, Scotland, Wales & N Ireland.

[Warwickshire Amphibian & Reptile Team](#) encourages people to learn about, protect and conserve these animals and their habitats. Activities include recording the distribution and population size of amphibians and reptiles, pond restoration, workshops and training days, talks and visits, providing advice on pond and habitat conservation and identifying threats to local habitats.

[Amphibian & Reptile Conservation](#) - a national wildlife charity committed to conserving amphibians and reptiles and saving the disappearing habitats on which they depend.

[Flora Locale](#) promotes the restoration of wild plants and habitats for the benefit of biodiversity, landscapes and people in town and countryside.

[Plantlife](#) - a charity which carries out plant species and habitat conservation, owns and manages nature reserves, campaigns, and raises awareness through education.

10. CONTACT

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