



## **European Site Conservation Objectives: Supplementary Advice on Conserving and Restoring Site Features**

**South West London Waterbodies Special Protection Area (SPA)  
Site code: UK9012171**



*Kempton Park Reservoir, one of the component parts of the SPA in winter 2008. © Natural England.*

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## **About this document**

This document provides Natural England's supplementary advice for the European Site Conservation Objectives relating to South West London Waterbodies SPA. This advice should therefore be read together with the SPA Conservation Objectives available [here](#).

**This supplementary advice replaces and updates a previous draft version dated 6 January 2017.**

You should use the Conservation Objectives, this Supplementary Advice and any case-specific advice given by Natural England, when developing, proposing or assessing an activity, plan or project that may affect this site.

This Supplementary Advice to the Conservation Objectives presents attributes which are ecological characteristics of the designated species and habitats within a site. The listed attributes are considered to be those that best describe the site's ecological integrity and which, if safeguarded, will enable achievement of the Conservation Objectives. Each attribute has a target which is either quantified or qualitative depending on the available evidence. The target identifies as far as possible the desired state to be achieved for the attribute.

The tables provided below bring together the findings of the best available scientific evidence relating to the site's qualifying features, which may be updated or supplemented in further publications from Natural England and other sources. The local evidence used in preparing this supplementary advice has been cited. The references to the national evidence used are available on request. Where evidence and references have not been indicated, Natural England has applied ecological knowledge and expert judgement. You may decide to use other additional sources of information.

In many cases, the attribute targets shown in the tables indicate whether the current objective is to 'maintain' or 'restore' the attribute. This is based on the best available information, including that gathered during monitoring of the feature's current condition. As new information on feature condition becomes available, this will be added so that the advice remains up to date.

The targets given for each attribute do not represent thresholds to assess the significance of any given impact in Habitats Regulations Assessments. You will need to assess this on a case-by-case basis using the most current information available.

Some, but not all, of these attributes can also be used for regular monitoring of the actual condition of the designated features. The attributes selected for monitoring the features, and the standards used to assess their condition, are listed in separate monitoring documents, which will be available from Natural England.

These tables do not give advice about SSSI features or other legally protected species which may also be present within the European Site.

**If you have any comments or queries about this Supplementary Advice document please contact your local Natural England adviser or email [HDIRConservationObjectivesNE@naturalengland.org.uk](mailto:HDIRConservationObjectivesNE@naturalengland.org.uk)**

## About this site

### European Site information

<b>Name of European Site</b>	South West London Waterbodies Special Protection Area (SPA)
<b>Location</b>	Berkshire, Surrey, Greater London
<b>Site Maps</b>	The designated boundary of this site can be viewed <a href="#">here</a> on the MAGIC website
<b>Designation Date</b>	22 September 2000
<b>Qualifying Features</b>	See section below
<b>Designation Area</b>	825.1 ha
<b>Designation Changes</b>	n/a
<b>Feature Condition Status</b>	Details of the feature condition assessments made at this site can be found using Natural England's <a href="#">Designated Sites System</a>
<b>Names of component Sites of Special Scientific Interest (SSSIs)</b>	Kempton Park Reservoirs SSSI, Knight and Bessborough Reservoirs SSSI, Thorpe Park No 1 Gravel Pit SSSI, Wraysbury No 1 Gravel Pit SSSI, Wraysbury Reservoir SSSI, and parts of Staines Moor SSSI, and parts of Wraysbury and Hythe End Gravel Pits SSSI
<b>Relationship with other European or International Site designations</b>	The boundary of this SPA coincides with South West London Waterbodies Ramsar site <a href="https://rsis.ramsar.org/ris/1038">https://rsis.ramsar.org/ris/1038</a>
<b>Other information</b>	<a href="#">Natura 2000 Standard Data Form</a> for South West London Waterbodies SPA

### Site background and geography

The South West London Waterbodies SPA comprises a series of embanked water supply reservoirs and former gravel pits which support a range of man-made and semi-natural still, open-water habitats. The complex is situated to the west of London on the broad floodplain of the River Thames.

The waterbodies vary in character from highly artificial, concrete-lined reservoirs used for public water supply to long-established lakes derived from former sand and gravel pits surrounded by mature habitats including scrub, grassland and woodland. All of the waterbodies are fed by water derived from the River Thames, either directly via groundwater flowing through alluvial sands and gravels or via pumped supply.

The SPA is part of a much larger complex of water bodies with a range of different characteristics, and ducks utilising the waterbodies in the SPA also use some of these alternative sites. The lakes and reservoirs have varying levels of public use. Some are closed to the public, but most have long-established recreational use. The uses include sailing, canoeing, water-skiing, fishing, birdwatching, diver training and open water swimming.

The complex is situated in the [Thames Valley National Character Area](#) (NCA). Most of the complex is situated in a semi-urban setting on the outer fringes of London but in some cases the landscapes surrounding the waterbodies are predominantly semi-natural. Some have an air of relative tranquillity despite the close proximity of major transport links but noise and air pollution are significant issues in the

area. The complex is part of a wider 'network' of waterbodies spread over a wide area and birds utilising the lakes and reservoirs in the SPA may be dependent upon this wider resource at certain times.

## **About the qualifying features of the SPA**

The following section gives you additional information about this SPA's qualifying features. These are the individual species of wild birds listed on Annex I of the European Wild Birds Directive, and/or the individual regularly-occurring migratory species, and/or the assemblages (groups of different species occurring together) of wild birds for which the SPA was classified for.

### **Qualifying individual species listed in Annex I of the Wild Birds Directive (Article 4.1)**

During the non-breeding season the SPA regularly supports:

- Internationally important numbers of **Gadwall *Anas strepera***

When classified, the SPA supported 710 individuals (5 year peak mean 1993/94-1997/98 based on WeBS data supplied by BTO) which represents 2.4% of the North West European population. Once a rather scarce winter visitor, Gadwall are now distributed widely across the UK, using both inland and coastal wetlands. The birds present in the UK during the winter are derived from UK breeding birds, along with birds that have bred in Fennoscandia, central and eastern Europe and western Russia.

Gadwall favour shallow water bodies which are naturally eutrophic (nutrient-rich) with low levels of human disturbance, and tend to utilise lakes with an 'open' landscape character i.e. low levels of dense fringing vegetation of scrub or reed-beds. The Gadwall is a 'dabbling' duck feeding primarily on aquatic vegetation, including macrophytes and filamentous algae. Invertebrates may also be eaten as a minor part of the diet. They frequently demonstrate a degree of 'kleptoparasitic' behaviour in that they will feed on aquatic and semi-aquatic plants ('macrophytes') brought to the surface by other duck species and more usually coot. Water quality and chemistry are therefore important aspects in habitat suitability as factors such as high levels of turbidity or siltation may render sites or parts of sites unsuitable if macrophyte beds are affected.

The different types of water body provide a range of habitat features which are of value for Gadwall at different times. For example, areas of good quality feeding habitat are of particularly high value immediately after migration in order to quickly replenish energy reserves whilst the larger reservoirs provide valuable open water habitat for social behaviour.

The general population trend exhibited by Gadwall is one of significant increase since the 1960s. In the local context numbers of Gadwall recorded in the SPA have shown a general increase in numbers but with apparent population declines recorded at some component sites. There is evidence that this is the result of a re-distribution of birds in the region rather than a real reduction in population, i.e. they are utilising other water bodies in the Thames valley and wider region (Banks, Austin & Rehfishch 2004). Gadwall (and Shoveler) are known to have relatively low fidelity to particular sites and will readily move to other water bodies depending on circumstances. There also appear to be changes in Gadwall migration and distribution patterns on a larger scale with larger numbers aggregating in areas such as Breckland, the Midlands and the north of England.

At the time of writing the UK total wintering population is estimated to be 25,000 individuals (BTO estimate), with a continuing but slowing trend of increasing numbers (20% increase between 2002/3 and 2012/13). Data indicate that the overall European population trend remains one of increasing numbers. The population is reported to have increased by about 2.5% over the period 1966 to 2010 and the species is currently listed in the category Least Concern in the IUCN Red List of Threatened Species.

- Internationally important numbers of **Shoveler *Anas clypeata***

When classified, the SPA supported 853 individuals (5 year peak mean 1993/94-1997/98 based on WeBS data supplied by BTO) which represented 2.1% of the NW and central European population.

Shoveler are quite widely distributed across southern England in winter, using both freshwater and inter-tidal (brackish) areas. The birds present in the UK during the winter are derived from both UK breeding birds and large numbers of birds arriving from breeding populations in Scandinavia, central Europe and Russia.

Large numbers of Shoveler may also migrate to the UK during periods of freezing conditions in the Baltic and Wadden Sea areas. Birds tend to start arriving at the end of September and will generally disperse to breeding areas in March to early April.

Like Gadwall, Shoveler favour similar types of inland waterbodies such as lakes and reservoirs with extensive shallows including beds of silt and submerged macrophytes. Like Gadwall they favour waterbodies with shallow margins/areas and where at least parts have an open, tree-less landscape character. They feed by filtering invertebrates and zooplankton from surface and shallow water, and from the lake bed/silt using their broad bill. They typically feed in areas with beds of macrophytes at shallow depth as these areas are often particularly rich in invertebrate food. A much larger proportion of their diet is made up by invertebrates and so is higher in calorific value than the predominantly plant food taken by Gadwall. Plant matter may also make a very minor part of Shoveler diet.

Shoveler may spend less time feeding as winter progresses than Gadwall. Unlike Gadwall they utilise different lake and reservoir types at different times of day for different types of behaviour and may show changes in site preference as winter progresses. Numbers of birds using the complex appear to have remained relatively stable since the classification of the SPA but there is evidence of changing patterns of utilisation of waterbodies.

Wintering numbers recorded in the UK demonstrate a steady and continuing increase (+69% over 25 years since 1987) with an estimated total UK wintering population of 18,000 individuals at time of writing (BTO estimate). This is a large proportion of the overall northern European population and hence is of international significance. It has been suggested that increasing winter temperatures may be favouring this species by reducing the frequency of exceptionally cold spells with ice formation on inland water bodies. Such events previously prompted birds to fly south of the UK. The overall northern European population is also considered to be increasing (at the time of writing). The Shoveler is currently listed in the category Least Concern in the IUCN Red List of Threatened Species. However, there are indications that the global population may be declining (Birdlife International).

## **References**

BANKS, A.N., AUSTIN, G.E. & REHFISCH, M.M 2004. South West London Waterbodies SPA – Wildfowl Population Analysis. BTO Research Report 361. Available at [https://www.bto.org/sites/default/files/shared\\_documents/publications/research-reports/2004/rr361.pdf](https://www.bto.org/sites/default/files/shared_documents/publications/research-reports/2004/rr361.pdf)

## Site-specific seasonality of SPA features

The table below highlights in grey those months in which significant numbers of each mobile qualifying feature are most likely to be present at the SPA during a typical calendar year. This table is provided as a general guide only.

Unless otherwise indicated, the months shown below are primarily based on information relating to the general months of occurrence of the feature in the UK. Where site-based evidence is available and has been used to indicate below that significant numbers of the feature are typically present at this SPA outside of the general period, the site-specific references have been added to indicate this.

Applicants considering projects and plans scheduled in the periods highlighted in grey would benefit from early consultation with Natural England given the greater scope for there to be likely significant effects that require consideration of mitigation to minimise impacts to qualifying bird features during the principal periods of site usage by those features. The months which are *not* highlighted in grey are not ones in which the features are necessarily absent, rather that features may be present in less significant numbers in typical years. Furthermore, in any given year, features may occur in significant numbers in months in which typically they do not. Thus, applicants should not conclude that projects or plans scheduled in months not highlighted in grey cannot have a significant effect on the features. There may be a lower likelihood of significant effects in those months which nonetheless will also require prior consideration.

Any assessment of potential impacts on the features must be based on up-to-date count data and take account of population trends evident from these data and any other available information. Additional site-based surveys may be required. Non-breeding water bird monthly maxima data gathered for this site through the Wetland Bird Survey ('WeBS') may be available upon request from the [British Trust for Ornithology](http://www.bto.org.uk).

Feature	Season	Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Site-specific references where available
Gadwall	Non-breeding	Winter													Based upon WeBS data supplied by BTO
Shoveler	Non-breeding	Winter													Based upon WeBS data supplied by BTO

### Guide to terms:

**Breeding** – present on a site during the normal breeding period for that species

**Non-breeding** - present on a site outside of the normal breeding period for that species (includes passage and winter periods).

**Summer** – the period generally from April to July inclusive

**Passage** - the periods during the autumn and spring when migratory birds are moving between breeding areas and wintering areas. These periods are not strictly defined but generally include the months of July – October inclusive (autumn passage) and March – April inclusive (spring passage).

**Winter** - the period generally from November to February inclusive.



**Table 1: Supplementary Advice for Qualifying Features: A051. *Anas strepera* Gadwall (Non-breeding)**

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
<p><b>Supporting habitat (both within and outside the SPA): extent and distribution</b></p>	<p>Extent and distribution of supporting non-breeding habitat</p>	<p>Maintain the extent and distribution of suitable habitat (either within or outside the site boundary) which supports Gadwall for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing, feeding)</p> <p>Estimated baseline habitat extents for the SPA as a whole are:</p> <p>open water: 699.2 ha grassland: 41 ha (although not all of this will be suitable for Gadwall)</p>	<p>‘Suitable habitat’ means open water and terrestrial habitats which are required by birds to survive. Gadwall require terrestrial habitats which provide opportunities for birds to rest up out of water such as areas of short vegetation including grassland, rush pasture or areas of waterside scrub. Such areas are of greatest value where they have low levels of disturbance and risk of predation. These habitats should be in close vicinity to areas of open water and should be easily accessible directly from the water – Gadwall generally do not move more than a few metres from the water’s edge when roosting unlike many other ducks,</p> <p>Gadwall need to feed throughout the winter period to maintain condition. They are primarily herbivorous, feeding on submerged aquatic plants and plant material brought to the surface or margins by other species, including coot. Therefore lakes with extensive shallow areas with beds of submerged aquatic vegetation are an important habitat requirement.</p> <p>The reservoirs in this SPA are less favoured (than the gravel pits) by Gadwall but can be important as refuge and resting sites. Some of the concrete reservoirs in the SPA have little aquatic vegetation and hence are of little value to Gadwall for feeding. However, some have extensive beds of algae around their margins and can sometimes be of importance to Gadwall for feeding (Briggs 2007). Conserving or restoring the extent of supporting habitats and their range will be key to maintaining the site's ability and capacity to support the wintering Gadwall population.</p> <p>The information available on the extent and distribution of supporting habitat used by the feature is approximate and based upon interpretation of aerial photos. The dynamic nature of parts of the habitat complex means that there will inevitably be a degree of variation in the overall extent of open water.</p> <p>This objective seeks to ensure that there is no overall loss of supporting habitat (or decline in its value for Gadwall) as a result of factors other than natural processes. It is important to bear in mind that critical areas of supporting habitat (or ‘functionally-linked land’) may also be present outside the boundary of the classified SPA.</p>	<p>Figures for habitat extent are calculated from the <i>Webmap</i> tool using latest Ordnance Survey mapping.</p> <p>More detailed information for each component part of the SPA may be available from Natural England.</p> <p>BRIGGS, B. 2007. The Use of Waterbodies in South-West London by Gadwall and Shoveler: Implications for Nature Conservation, D.Phil thesis Wolfson College, University of Oxford. Available at <a href="http://www.environmentbank.com/docs/Brian-Briggs-DPhil.pdf">http://www.environmentbank.com/docs/Brian-Briggs-DPhil.pdf</a></p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
<p><b>Supporting habitat (both within and outside the SPA): function/ supporting process</b></p>	<p>Water quality/quantity</p>	<p>Ensure water quality and quantity is maintained to a standard which provides the necessary conditions to support Gadwall during the non-breeding season.</p>	<p>For Gadwall, maintaining the quality and quantity of water supply in relation to the supporting open water habitat will be critical throughout the wintering period, although it is recognised that the species does have fairly wide habitat tolerance levels, and can use sites across a range of water quality measures.</p> <p>Poor water quality may significantly reduce habitat quality by reducing the health of macrophyte beds and hence availability of plant food. It is generally desirable to prevent deterioration in water quality of the individual waterbodies from their baseline, but it is noted that water quality at individual sites will have fluctuated over time both before, and since designation due to a number of factors, including episodes of flooding. The crucial habitat features will include the availability of food rather than good water quality per se.</p> <p>Raised nutrient levels could potentially be detrimental, whether this is over a prolonged period or a temporary 'spike' with impacts such as algal and diatom blooms, promotion of the growth of epiphytic algae and increased turbidity. In general, a move away from clear water dominated by macrophytes, and towards turbid water dominated by phytoplankton, would be likely to be damaging.</p> <p>Water quality will be determined by a range of factors including the quality of groundwater supply, water quality in feeder streams, the quantity of aquatic plants present, the amount of mixing taking place in the water column and the amount of disturbance of accumulated sediment taking place, as well as inputs from surrounding vegetation (particularly trees) and nutrients in rainfall. Activities which are likely to promote disturbance and re-suspension of silt beds will be undesirable.</p> <p>Water supply and management of water levels are also important considerations. Significant fluctuations in water level in a waterbody may render macrophyte beds unavailable to Gadwall for feeding if higher than average, and conversely, if lower than average may result in the loss of macrophyte beds through exposure of shallow, marginal areas.</p> <p>Chemical or physical pollutants which negatively impact the natural flora or fauna of the waterbodies are likely to be damaging to the value of the site as a habitat for Gadwall.</p>	



Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
<b>Supporting habitat (both within and outside the SPA): function/supporting process</b>	Conservation measures	Maintain management or other measures (whether within and/or outside the site boundary as appropriate) necessary to maintain the structure, function and/or the supporting processes associated with non-breeding Gadwall and its supporting habitats.	<p>Active and ongoing conservation management is often needed to protect, maintain or restore habitat suitability for Gadwall, particularly the favoured terrestrial habitats such as grassland and rush pasture, including bankside/shore habitat.</p> <p>Other measures may also be required, and in some cases, these measures may apply to areas outside of the designated site boundary in order to achieve this target.</p> <p>Further details about the necessary conservation measures for this site will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or management agreements.</p> <p>Conservation management required at this SPA is likely to include rotational management of scrub, maintenance of high groundwater levels to prevent loss of wetland habitat and management of emergent vegetation to prevent loss of shallow water areas. Control of the spread of invasive non-native species may also be required.</p>	NATURAL ENGLAND 2014 Site Improvement Plan: South West London Waterbodies SPA. <a href="http://publications.naturalengland.org.uk/publication/6662064386867200?category=6149691318206464">http://publications.naturalengland.org.uk/publication/6662064386867200?category=6149691318206464</a>
	Air quality	Maintain the concentrations and deposition of air pollutants at or below the site-relevant Critical Load or Level values given for the supporting habitats of this feature on the Air Pollution Information System ( <a href="http://www.apis.ac.uk">www.apis.ac.uk</a> ).	<p>The structure and function of habitats which support this SPA feature may be sensitive to changes in air quality. Exceeding critical values for air pollutants may result in changes to the chemical status of water bodies, accelerating or damaging plant growth, altering vegetation structure and composition and thereby affecting the quality and availability of feeding or roosting habitat.</p> <p>Critical Loads and Levels are thresholds below which such harmful effects on sensitive UK habitats will not occur to a noteworthy level, according to current levels of scientific understanding. There are critical levels for ammonia (NH<sub>3</sub>), oxides of nitrogen (NO<sub>x</sub>) and sulphur dioxide (SO<sub>2</sub>), and critical loads for nutrient nitrogen deposition and acid deposition. It is recognised that achieving this target may be subject to the development, availability and effectiveness of abatement technology and measures to tackle diffuse air pollution, within realistic timescales. There are currently no critical loads or levels for other pollutants such as Halogens, Heavy Metals, POPs, VOCs or Dusts. These should be considered as appropriate on a case-by-case basis. Ground level ozone is regionally important as a toxic air pollutant but flux-based critical levels for the protection of semi-natural habitats are still under development.</p>	More information about site-relevant Critical Loads and Levels for this SPA is available by using the 'search by site' tool on the Air Pollution Information System ( <a href="http://www.apis.ac.uk">www.apis.ac.uk</a> ).

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>At this SPA, the scale of any potential impacts is likely to vary depending on factors such as flow rate, type and quantity of inflow (where relevant), water depth and amount of mixing between water layers. The level of risk may vary across a single lake body or gravel pit complex, as well as across a larger complex of waterbodies.</p> <p>Surveys of the site indicate that there are substantial variations in water quality and water chemistry, and that this can vary between season and from year to year. Shallow areas where the majority of water supply is derived from rainfall may be at particular risk of adverse impacts.</p> <p>Adverse impacts arising from raised nutrient levels could include increased abundance of green algae (to the detriment of macrophytes), increased propensity for algal/diatom blooms, and increased sedimentation. Nutrient accumulation in the sediment of water bodies may lead to a gradual change in the composition of aquatic plant communities and composition of invertebrate fauna, resulting in reduced suitability for Gadwall.</p>	
<b>Non-breeding population</b>	Population abundance	Maintain the size of the non-breeding Gadwall population at a level which is consistently above 710 individuals (calculated as a 5-year peak mean), whilst avoiding deterioration from its current level as indicated by the latest peak mean count or equivalent.	<p>This will sustain the site's population and contribute to a viable local, national and bio-geographic population.</p> <p>Due to the mobility of birds and the dynamic nature of population change, the target value given for the abundance of this feature is considered to be the <i>minimum</i> standard for conservation/restoration measures to achieve.</p> <p>This minimum value may be revised where there is evidence to show that a population's abundance has significantly changed as a result of natural factors or management measures and has been stable at or above a new level over a considerable period (generally at least 10 years). The values given here may also be updated in future to reflect any strategic objectives which may be set at a national level for this feature.</p> <p>Given the likely fluctuations in numbers over time, any impact assessments should focus on the current abundance of the site's population, as derived from the latest known or estimated level established using the best available data. This advice accords with the obligation to avoid deterioration of the site or significant disturbance of the species for which the site is classified, and seeks</p>	<p>Bird count data is based upon an amalgamation of WeBS counts for individual sites in the SPA. The latest data can be requested via the BTO website: <a href="https://www.bto.org/volunteer-surveys/webs/data">https://www.bto.org/volunteer-surveys/webs/data</a></p> <p>BANKS, AN, AUSTIN GE &amp; REHFISCH MM (2004) South West London</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>to avoid plans or projects that may affect the site giving rise to a risk of deterioration.</p> <p>Similarly, where there is evidence to show that a feature has historically been more abundant than the stated minimum target and its current level, the ongoing capacity of the site to accommodate the feature at such higher levels in future should also be taken into account.</p> <p>Maintaining or restoring bird abundance depends on the suitability of the site. However, factors affecting suitability can also determine other demographic rates of birds using the site including survival (dependent on factors such as body condition which influences the ability to breed or make foraging and/or migration movements) and breeding productivity. Adverse anthropogenic impacts on either of these rates may precede changes in population abundance (e.g. by changing proportions of birds of different ages) but eventually may negatively affect abundance. These rates can be measured or estimated to inform judgements of likely impacts on abundance targets.</p> <p>Unless otherwise stated, the population size will be that measured using standard methods such as peak mean counts. This value is also provided recognising there will be inherent variability as a result of natural fluctuations and margins of error during data collection.</p>	<p>Waterbodies SPA – Wildfowl Population Analysis. BTO Research Report 361.</p> <p>BRIGGS, B. 2007. The Use of Waterbodies in South-West London by Gadwall and Shoveler: Implications for Nature Conservation, D.Phil thesis Wolfson College, University of Oxford.</p>
<p><b>Supporting habitat (both within and outside the SPA): minimising disturbance</b></p>	<p>Disturbance caused by human activity</p>	<p>Restrict the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that the Gadwall feature is not significantly disturbed</p>	<p>The nature, scale, timing and duration of some human activities can result in the disturbance of birds at a level that may substantially affect their behaviour, and consequently affect the long-term viability of the population.</p> <p>Such disturbing effects can for example result in changes to feeding or roosting behaviour, increases in energy expenditure due to increased flight, and desertion of supporting habitat or whole sites (both within or outside the designated site boundary). This may undermine successful feeding and/or roosting, and/or may reduce the availability of suitable habitat as birds are displaced and their distribution within the site contracts. Disturbance associated with human activity may take a variety of forms including noise, light, sound, vibration, trampling, and presence of people, animals and structures.</p> <p>Research indicates that intermittent, noisy activities such as the use of powered craft, shooting and use of motor vehicles close to shore result in more instances of disturbance and cases of ducks moving to an alternative site than</p>	<p>WWT WETLANDS ADVISORY SERVICE 2003, An Assessment of the Effects on Over-wintering Ducks of Recreation at the Wraysbury and Thorpe Park Pits within the South West London Waterbodies SPA. Report to English Nature.</p>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>'quiet' activities such as angling from the shore and presence of dog walkers.</p> <p>Where sites currently have low levels of recreational disturbance it may be particularly important to avoid any increase in recreational use as such sites may be critical refuge areas for ducks in the local context. Where sites currently have high levels of recreational disturbance it may be particularly important to seek to reduce or limit the impacts by temporal or spatial restrictions.</p>	
<b>Supporting habitat (both within and outside the SPA): function/ supporting process</b>	Water depth	Maintain the current extent of available littoral zone (the shallow standing water capable of supporting submerged plant growth <2m depth) [not applicable to the water supply reservoirs in the SPA]	<p>Gadwall requires extensive areas of water in which to feed. They feed on beds of macrophytes close to the water surface by swimming with their head under the water. They will also dive to reach shallow beds of macrophytes but only to a depth of &lt;0.3 metres. However, they will also take weed brought to the surface by other birds such as coot.</p> <p>Gadwall can utilise areas of water to about 2 metres in depth where other birds are feeding. Gadwall will also feed around the margins of waterbodies where detached weed has accumulated. Critical factors are therefore the availability of extensive areas of shallow water with suitable conditions for the development of beds of macrophytes, i.e. largely unshaded and with firm substrate, where there are low levels of recreational disturbance. The availability of margins suitable for feeding and with low levels of disturbance is also important. There are likely to be locations within the SPA where there is high potential to enhance the quality of, and increase the extent of the littoral zone.</p>	
	Food availability within supporting habitat	Maintain a high cover/abundance of food plants* preferred by Gadwall	<p>The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of food may adversely affect the population. It is important that areas of high quality food supply are maintained with suitable surrounding habitat conditions for Gadwall, i.e. have areas of shallow water which are unshaded or only lightly shaded, and an absence of extensive beds of tall emergent vegetation such as reedbeds or floating plants such as water-lilies.</p> <p>*Gadwall frequently forage on common and abundant macrophytes such as <i>Elodea</i> and <i>Ceratophyllum</i>, as well as filamentous green algae. A key aspect of the food source is that sufficient plant material persists in the water and is thus available to Gadwall through the winter. Gadwall will feed on charophytes (<i>Chara</i>, <i>Tolypella</i>, <i>Nitella</i> spp); these aquatic plants have been found in surveys at some sites within the South-west London waterbodies, but they require good</p>	POND ACTION 1990. Datchet, Wraysbury, Staines and Chertsey Flood Study – Aquatic Biology, Baseline Survey Report.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>water quality with high clarity and low nutrient levels and are not thought to be as frequent in the diet at this site as the commoner macrophytes.</p> <p>A wide range of factors influence the extent and diversity of lake vegetation. Critical factors include water chemistry (particularly nutrient levels), water levels, water clarity, sedimentation rate, the presence of bottom-feeding fish such as carp, and aquatic plant ('weed') management. Water temperature may also be influential, for example by stimulating algal blooms. At those lakes vulnerable to influx of floodwater the sudden increase in nutrient levels and deposition of silt can have highly damaging effects on lake vegetation, but may equally result in flushes of macrophyte growth and a resultant increase in food availability. It is also important to note that the relative suitability of lakes or parts of lakes is likely to change over time as a result of natural successional processes and intervention may be required to maintain habitat suitability, for example by maintaining appropriate water depth, promoting the early stage of succession or controlling the spread of floating vegetation.</p>	
<b>Version Control</b> Advice last updated: 29 Jan 2018				
<b>Variations from national feature-framework of integrity-guidance:</b> Not applicable				

**Table 2: Supplementary Advice for Qualifying Features: A056. *Anas clypeata* Northern Shoveler (Non-breeding)**

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
<b>Supporting habitat (both within and outside the SPA): extent and distribution</b>	Extent and distribution of supporting non-breeding habitat	<p>Maintain the extent and distribution of suitable habitat (either within or outside the site boundary) which support Shoveler for all necessary stages of the non-breeding/wintering period (moulting, roosting, loafing and feeding).</p> <p>Estimated baseline habitat extents for the SPA as a whole are:                      Open water 699.2 ha                      Grassland: 41 ha (although not all of this will be suitable for Shoveler)</p>	<p>‘Suitable habitat’ means both open water (shallow for foraging, and shallow and deeper water for roosting) and terrestrial habitats which are required by birds to survive.</p> <p>Shoveler sometimes use areas of terrestrial habitat where birds can roost communally. Preferred areas for roosting are areas of damp grassland, rush pasture or marshes with short vegetation, usually within close proximity to favourite feeding areas (and easily accessible directly from the water), which provide both a degree of cover and ability to see potential predators.</p> <p>Conserving or restoring the extent of supporting habitats and their range, and preventing any decline in their quality or value for Shoveler, will be key to maintaining the site’s ability and capacity to support the SPA population. The information available on the extent and distribution of supporting habitat used by the feature may be approximate depending to the nature, age and accuracy of data collection. This objective may also apply to supporting habitat (or ‘functionally-linked land’) which also lies outside the site boundary.</p> <p>Of particular importance is the maintenance of availability of alternative large water bodies within a short flying distance of the component parts of the SPA. Studies suggest that ‘sub-populations’ of Shoveler may utilise a variety of water bodies within a local ‘complex’, in this case one around the Wraysbury-Staines area, another in the Thorpe Park - Queen Mary Reservoir area and another around the Queen Elizabeth 2, Knight, Bessborough, Kempton Park and Island Barn Reservoirs (Briggs 2007).</p>	<p>BRIGGS B (2007)</p> <p>Figures for baseline habitat extent are based upon baseline estimates calculated at the time of SPA classification.</p> <p>More detailed information for each component part of the SPA may be available from Natural England.</p>
<b>Supporting habitat (both within and outside the SPA): function/ supporting process</b>	Water quality/quantity	Ensure water quality and quantity is maintained to a standard which provides the necessary conditions to support non-breeding Shoveler.	Shoveler requires maintenance of reasonably good water quality as they are dependent upon the availability of an abundance and diversity of aquatic invertebrates and zooplankton, which will predominantly be found within submerged macrophyte beds in the littoral zones. It is recognised that the species does have fairly wide habitat tolerances, and can use sites across a range of water quality measures. It is generally desirable to prevent deterioration in water quality of the individual waterbodies from their baseline, but it is noted that water quality at individual sites will have fluctuated over time both before, and since designation due to a number of factors, including episodes of flooding. The crucial habitat features will include the availability of food rather than good water quality per se.	



Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>Maintenance of water quality and water supply in relation to the supporting open water habitat will be an important aspect of habitat suitability. Poor water quality has the potential to adversely affect the composition of the zooplankton and aquatic invertebrate fauna through influences such as increased turbidity or promotion of toxic blue-green algal blooms. In general, a move away from clear water dominated by macrophytes, and towards turbid water dominated by phytoplankton, would be likely to be damaging by reducing available food resource.</p> <p>Water quality will be determined by a range of factors including the quality of groundwater supply, water quality in feeder streams, the quantity of aquatic plants present, the amount of mixing taking place in the water column and the amount of disturbance of accumulated sediment taking place, as well as inputs from surrounding vegetation (particularly trees) and nutrients in rainfall. Activities which are likely to promote disturbance and re-suspension of silt beds will be undesirable. Water supply and management of water levels are also important considerations. Significant fluctuations in water level in a waterbody may render food sources unavailable to Shoveler if higher than average, and conversely, if lower than average may result in the loss of macrophyte beds through exposure of shallow, marginal areas.</p> <p>Chemical or physical pollutants which negatively impact the natural flora or fauna of the waterbodies are likely to be damaging to the value of the site as a habitat for Shoveler.</p>	
<b>Supporting habitat (both within and outside the SPA): function/supporting process</b>	Conservation measures	Maintain management or other measures (whether within and/or outside the site boundary as appropriate) necessary to maintain the structure, function and/or the supporting processes associated with non-breeding Shoveler feature and its supporting habitats.	<p>Active and ongoing conservation management is needed to protect, maintain or restore both the open water and terrestrial habitat features supporting Shoveler at this site. Other measures may also be required, and in some cases, these measures may apply to areas outside of the designated site boundary in order to achieve this target.</p> <p>Further details about the necessary conservation measures for this site will typically be found within, where applicable, supporting documents such as Natura 2000 Site Improvement Plan, Site Management Strategies or Plans, the Views about Management Statement for the underpinning SSSI and/or</p>	NATURAL ENGLAND 2014. Site Improvement Plan: South West London Waterbodies <a href="http://publications.naturalengland.org.uk/publication/66620643868672">http://publications.naturalengland.org.uk/publication/66620643868672</a>

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>management agreements.</p> <p>Management required at this site will include rotational management of scrub including bankside trees to prevent succession to woodland, maintenance of water levels, maintenance of high groundwater levels to prevent loss of wetland habitat, and management of emergent vegetation to prevent loss of shallow water areas.</p> <p>Control of the spread of non-native species may also be required. Zebra mussel <i>Dreissena polymorpha</i> has been known at this site for a long period and may be a valuable food source for Shoveler. However, the more invasive quagga mussel <i>Dreissena rostriformis</i> only recently became established at the site. This species poses a threat to the ecology of the waterbodies by out-competing other invertebrates and reducing faunal diversity. It can also alter aquatic plant communities by promoting blooms of blue-green algae. The highly invasive plant New Zealand pygmyweed <i>Crassula helmsii</i> is abundant in some locations in the SPA. The effects of this plant on habitat suitability for Shoveler are not clear but it is likely to be detrimental because of its ability to out-compete other aquatic plants in shallow water.</p> <p>Grazing may be important in certain areas to maintain favoured areas of short grassland, for example the non-SPA part of Staines Moor SSSI.</p>	<p><a href="http://00?category=6149691318206464">00?category=6149691318206464</a></p> <p>NON-NATIVE SPECIES SECRETARIAT, 2016. Non-native species alert – Quagga mussel <a href="http://www.nonnativespecies.org/alerts/index.cfm?id=5">http://www.nonnativespecies.org/alerts/index.cfm?id=5</a></p>
<b>Supporting habitat (both within and outside the SPA): function/ supporting process</b>	Air quality	Maintain concentrations and deposition of air pollutants to at or below the site-relevant Critical Load or Level values given for the supporting habitats of this feature on the Air Pollution Information System ( <a href="http://www.apis.ac.uk">www.apis.ac.uk</a> ).	See the supporting/explanatory notes for this attribute in Table 1 above.	More information about site-relevant Critical Loads and Levels for this SPA is available by using the 'search by site' tool on the Air Pollution Information System ( <a href="http://www.apis.ac.uk">www.apis.ac.uk</a> ).
<b>Non-breeding population</b>	Population abundance	Maintain the size of the non-breeding Shoveler population at a level which is consistently above 853 individuals (based on	See the supporting/explanatory notes for this attribute in Table 1 above.	Bird count data is based upon an amalgamation of WeBS counts for

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
		a 5 year peak mean), whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.		individual sites in the SPA. The latest data can be requested via the BTO website: <a href="https://www.bto.org/volunteer-surveys/webs/data">https://www.bto.org/volunteer-surveys/webs/data</a>  BANKS, A.N., AUSTIN G.E. & REHFISCH, M.M. (2004). South West London Waterbodies SPA – Wildfowl Population Analysis. BTO Research Report 361.
<b>Supporting habitat (both within and outside the SPA): disturbance</b>	Disturbance caused by human activity	Restrict the frequency, duration and/or intensity of disturbance affecting roosting, foraging, feeding, moulting and/or loafing birds so that the Shoveler feature is not significantly disturbed	<p>The nature, scale, timing and duration of some human activities can result in the disturbance of birds at a level that may substantially affect their behaviour, and consequently affect the long-term viability of the population.</p> <p>Such disturbing effects can for example result in changes to feeding or roosting behaviour, increases in energy expenditure due to increased flight, and desertion of supporting habitat (both within or outside the designated site boundary where appropriate). This may undermine successful feeding and/or roosting, and/or may reduce the availability of suitable habitat as birds are displaced and their distribution within the site contracts. Disturbance associated with human activity may take a variety of forms including noise, light, sound, vibration, trampling, presence of people, animals and structures.</p> <p>Research indicates that intermittent, noisy activities such as the use of powered craft, shooting and use of motor vehicles close to shore result in more instances of disturbance and cases of ducks moving to an alternative site than</p>	BRIGGS B (2007). The Use of Waterbodies in South-West London by Gadwall and Shoveler: Implications for Nature Conservation, DPhil thesis Wolfson College, University of Oxford.

Attributes		Targets	Supporting and Explanatory Notes	Sources of site-based evidence (where available)
			<p>'quiet' activities such as angling from the shore and presence of dog walkers.</p> <p>There is some evidence that Shoveler are more sensitive to recreational disturbance than Gadwall, and are less likely to become habituated to and tolerant of regular low level disturbance. Where sites currently have low levels of recreational disturbance it may be particularly important to avoid any increase in recreational use as such sites may be critical refuge areas for ducks in the local context.</p>	
<b>Supporting habitat (both within and outside the SPA): function/ supporting process</b>	Water depth	Maintain the extent and availability of standing water at optimal depth, typically <0.3 m deep [not applicable to the water supply reservoirs in the SPA]	<p>Shoveler require extensive areas of shallow water in which to feed. They feed at and just below the surface by swimming with their head under the water sweeping their bill through beds of macrophytes and filtering out small invertebrates, zooplankton and possibly, to a lesser extent, plant seeds.</p> <p>The availability of extensive beds of macrophytes in open shallow water where there are low levels of recreational disturbance is therefore of critical importance. They will also utilise muddy lake margins. There are likely to be locations within the SPA where there is high potential to enhance the quality of, and increase the extent of, the littoral zone of value to Shoveler.</p>	
	Connectivity with supporting habitats	Maintain the safe passage of Shoveler moving between roosting and feeding areas	<p>Shoveler are reported to be vulnerable to collisions with overhead power cables and other aerial structures. The ability of ducks to safely and successfully move to and from feeding and roosting areas is critical to their fitness and survival during the non-breeding season.</p> <p>This objective will apply both within the site boundary and where birds regularly move to and from off-site habitat where this is relevant.</p>	MALCOLM, J. M. 1982. Bird collisions with a power transmission line and their relation to botulism at a Montana USA wetland. <i>Wildlife Society Bulletin</i> 10(4): 297-304.
	Food availability within supporting habitat	Maintain a high cover/abundance of those food plants and invertebrate fauna preferred by Shoveler	<p>The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population.</p> <p>As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population. It is important that areas of high quality food supply are maintained in areas of low disturbance, with suitable surrounding habitat conditions for Shoveler i.e. areas of shallow water which are unshaded or only</p>	BRIGGS, B, 2007. The Use of Waterbodies in South-West London by Gadwall and Shoveler: Implications for Nature

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			<p>lightly shaded, and an absence of extensive beds of tall emergent vegetation such as reed-beds. Extensive cover of floating plants such as water-lilies is also undesirable.</p> <p>Shoveler primarily feed on small invertebrates, zooplankton and floating plant seeds filtered from amongst beds of macrophytes near the surface. The development of such beds will be promoted by a range of factors including high water clarity, lack of shading, maintenance of low nutrient levels, and presence of firm substrate. So aspects such as sedimentation rate, the presence of bottom-feeding fish such as carp, and aquatic plant ('weed') management can be important influences.</p> <p>Invertebrates associated with macrophyte beds may be preferred food items such as gastropod molluscs (pond snails), bivalves, caddisfly larvae, damselfly larvae, midge larvae, diving beetles and leeches.</p> <p>Food plants may include emergent and marginal <i>Cyperaceae</i> species producing floating seed such as <i>Eleocharis palustris</i>, <i>Carex acutiformis</i> and macrophytes forming dense submerged beds such as <i>Elodea canadensis/nuttallii</i>, <i>Potamogeton pectinatus</i>, <i>Zannichellia palustris</i>, <i>Lemna trisulca</i>, <i>Chara/Nitella/Tolypella</i> spp, <i>Myriophorum spicatum</i>.</p> <p>Water temperature may also be influential, for example by stimulating algal blooms. At those lakes vulnerable to influx of floodwater the sudden increase in nutrient levels and deposition of silt can potentially have highly damaging effects on lake vegetation, although it could also potentially result in localised increase in macrophyte beds which could result in increased invertebrates and zooplankton. It is also important to note that the relative suitability of lakes or parts of lakes is likely to change over time as a result of natural successional processes and intervention may be required to maintain habitat suitability, for example by maintaining appropriate water depth, promoting the early stage of succession or controlling the spread of floating vegetation.</p>	<p>Conservation, DPhil thesis Wolfson College, University of Oxford.</p>
<p><b>Version Control</b>            Advice last updated: January 2018</p>				
<p><b>Variations from national feature-framework of integrity-guidance:</b> Not applicable</p>				

