



Lisvane Reservoir SSSI Wintering Waterfowl Condition Assessment

Dwr Cymru Welsh Water

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Executive Summary

A condition assessment of the overwintering waterbird interest features of the Lisvane Reservoir SSSI, Cardiff, has been carried out using the Common Standards Monitoring (CSM) approach that is applied by statutory bodies across the UK. The condition assessment has used historic and recent Wetland Bird Survey (WeBS) counts for the site. In the absence of published conservation objectives for the site, the application of the CSM approach using historic and recent WeBS data was determined as the most suitable method to apply.

The Lisvane Reservoir SSSI interest features are:

- Mallard
- Teal
- Tufted Duck
- Pochard
- Coot
- Diver species
- Grebe species

The citation also lists 'passage migrants' but no information is provided in the SSSI citation as to what species might constitute the 'passage migrants' and they were excluded from the assessment.

A baseline against which the assessment could be conducted was derived from historic WeBS data. In accordance with the CSM approach when data is not available from the time of notification, this was the historic minimum population size for the earliest 5 year run of published summary data, this being 1993/94 and 1995/96 to 1998/99. Account was also taken of the aspirational targets published in the SSSI Site Management Statement (SMS).

The condition assessment using the historic minimum population size (in accordance with the CSM approach) concluded that Lisvane Reservoir SSSI is in favourable condition for the interest features Mallard, Teal, Tufted Duck, Pochard, Diver spp and Grebe spp but in unfavourable condition for Coot

The assessment using the more precautionary approach than that required by CSM of the historic mean population size was that the site is in favourable condition for the interest features Mallard, Teal, Diver spp and Grebe spp, in favourable condition in some recent years for Pochard but in unfavourable condition for Tufted Duck and Coot.

When assessed against the semi-quantitative and aspirational measures of the SMS, the site achieves those for Great Crested Grebe and for Tufted Duck in some recent years. Those aspirations are not achieved for Mallard, Teal and Great Northern Diver. Those aspirational targets for Mallard and Pochard could be considered unrealistic given the wide scale changes that are occurring to these populations across north-west Europe.

Coot, which has a stable UK wide population, is the only species to have been assessed as in unfavourable condition in all five recent winters by the measure of comparison with the historic

minimum population size. This suggests that site, local or regional effects, rather than wide scale changes, might be the cause of the failure to achieve favourable condition for this species.

An assessment of the current wintering waterbird populations against the current SSSI criteria has identified that neither any of the current individual species populations nor the waterbird assemblage satisfies the current SSSI criteria.

1. Introduction

1.1 Background

Dwr Cymru Welsh Water (DCWW) commissioned APEM to undertake a condition assessment of the over-wintering bird population of the Lisvane Reservoir SSSI.

The objective of a condition assessment is to determine if the features of the SSSI (in this case overwintering and passage birds) are in favourable condition, that is achieving any targets (such as numbers or area) set for them at the time of notification.

This assessment is a desk study based on existing bird data and has not involved the collection of new field data.

The immediately adjacent Llanishen and Lisvane Reservoir Embankments SSSI has as its interest feature a diverse assemblage of grassland fungi, including over 25 species of waxcap *Hygrocybe spp.* This SSSI and its waxcap populations are not considered in this report but are addressed in APEM, 2017.

1.2 The generic methodology for condition assessment

The methodology for assessing the condition of any SSSI in Great Britain was established by the Common Standards Monitoring (CSM) approach (<http://jncc.defra.gov.uk/page-3521>) with specific guidance provided on the approach to birds that are SSSI interest features (JNCC, 2004).

At the core of the methodology is the concept of assessing each notified feature of a SSSI individually and assessing each feature against a 'conservation objective' that has been set for it. Conservation objectives are developed by identifying the key 'attributes' which make up or support the feature and setting targets for each of these attributes. In the assessment each attribute is then measured and compared against the target value set. If all the targets are met, that individual feature is in favourable condition.

In the particular case of the application of the method to birds that are interest features (JNCC, 2004), the targets for bird attributes are set to allow for natural fluctuation, creating limits for acceptable change for the feature. This approach recognises that the size of a bird population will fluctuate naturally and, in the case of over-wintering waterbird species, relatively widely from one season to the next as numbers using a site can depend, for instance, on weather conditions in other parts of their range. In order that these normal fluctuations are not misinterpreted as declines or increases in a population and a condition status erroneously arrived at, the targets for population size are set to take account of the way in which a population is likely to change naturally.

For a condition assessment the target for an over-wintering bird population size at a site is set according to one of two approaches:

- i. based on the known natural fluctuation at the site level for a species, or
- ii. a generic threshold system.

These are described separately below, the description being drawn from JNCC (2004).

Site level known natural fluctuation approach

Population size targets based on known natural fluctuations are derived from a consistent time series of bird counts. Ideally the counts should be from the time of notification of the SSSI when it might be presumed that the bird population at the site was in favourable condition. The time series should be a minimum of five counts each from a different relevant season (i.e. in the case on wintering waterfowl from the winter). The counts do not necessarily have to come from consecutive seasons but it should be five counts from within a period of no more than seven years. If counts are not available from the time of notification, the first suitable series of good quality data should be used. The minimum population size recorded during the five counts is taken as the target for maintaining the population. If the population considered during a condition assessment (taken from either a single count or a mean of counts) falls below this size then that feature is in unfavourable condition. In the absence of such time series data the generic threshold approach should be adopted. In the circumstance that fluctuations in the time series of bird counts is not considered to result from natural phenomena (e.g. inter-annual changes in regional weather conditions) but rather some non-natural reason (e.g. the effects of human disturbance) then the generic threshold approach should be used.

Generic threshold approach

The generic threshold approach works by comparing population sizes at a site at different times and deriving the scale of change, expressed as a proportion of the initial population. If this change represents an absolute loss of 25% or more of a breeding population or 50% or more of a non-breeding population then the feature is assessed as being in unfavourable condition.

1.3 Application of the methodology to Lisvane Reservoir SSSI

A search of the Natural Resources Wales (NRW) website (<https://naturalresources.wales>) did not identify that conservation objectives, feature attributes, attribute targets or limits of acceptable change had been published for the Lisvane Reservoir SSSI. The published documents for the Lisvane Reservoir SSSI listed as a result of a search on the 'designated sites' page (<https://naturalresources.wales/conservation-biodiversity-and-wildlife/find-protected-areas-of-land-and-seas/designated-sites-search>) were (including Welsh language equivalents):

- The SSSI citation
- The boundary map
- The list of operations requiring consultation
- The Site Management Statement "Your Special Site and its Future"

None of these contained the specific, quantitative information on objectives and targets required for a condition assessment. The absence of such information was confirmed in an email from NRW (S. Revill, 15/03/2017).

These documents also do not contain a quantitative record of what were the waterbird populations at the time of notification or were the basis for the notification and nor do they make any explicit statement about the criteria that were satisfied to justify notification e.g. species regularly exceeding regionally or nationally important wintering populations or supporting a sufficient range and numbers of non-breeding species to be an important assemblage.

The Site Management Statement (SMS) refers to the reservoir being “*capable of supporting several hundred Mallard and Teal, and up to a hundred Tufted Duck and Pochard*”. There is no explanation of how these population figures have been derived.

An earlier Wales-wide review of the bird interest features of Welsh SSSIs (Vanstone *et al.*, 2012) interpreted the duck numbers given in the SMS quoted above as the number of individuals wintering at the time of notification but cautioned these were “*not thought to be exact figures*”.

In the absence of pre-existing attribute targets for a condition assessment it has been necessary to derive such quantitative measures from the historical counts of waterbirds at Lisvane Reservoir from the time that the site was notified. This would be in accordance with the CSM approach and specifically the ‘site level known natural fluctuation approach’.

Similarly those derived attribute targets can be compared to current counts of waterbirds at Lisvane Reservoir and, following the CSM approach, an assessment made of the degree of change between the two periods.

The systematic and consistent source of waterbird counts that can be used to ensure such comparisons are valid over the extended time period between notification and now is the Wetland Bird Survey (WeBS) managed by the British Trust for Ornithology (BTO) and carried out by volunteers. This systematic information can be supplemented by observations made by local birdwatchers but that latter data set, whilst being larger, does not provide like-for-like observations for a comparison over an extended time period as it will be subject to varying levels of effort over time.

The system that currently analyses WeBS data for long term changes in non-breeding waterbirds at the site level - the BTO WeBS Alerts system (Cook *et al.*, 2013) - has not analysed the counts from Lisvane Reservoir SSSI.

2. Lisvane Reservoir waterbird populations

2.1 Lisvane Reservoir SSSI waterbird interest features

The Lisvane Reservoir SSSI has as its interest features a number of overwintering and passage birds. The species that are listed in the citation (the complete citation is reproduced in Appendix 1) are:

- Mallard
- Teal
- Tufted Duck
- Pochard
- Coot

The citation also lists some groups of species rather than individual species. These are:

- Divers
- Grebes
- passage migrants

There are no quantitative statements made about the populations of the species or species groups. No information is provided in the SSSI citation as to what species might constitute the 'passage migrants'.

The Lisvane Reservoir SSSI Site Management Statement *Your Special Site and its Future* (CCW, undated)) does refer to some of these species in a quantitative manner, specifically:

"... several hundred Mallard and Teal"

"... up to a hundred Tufted Duck and Pochard"

It also refers to:

"... small numbers of ... Great Northern Diver and Great Crested Grebe"

The Lisvane Reservoir SSSI Site Management Statement also names two other waterbird species that are not named within the SSSI citation:

- Goldeneye
- Goosander

These two waterbird species are fish eating diving ducks (members of the sub-family of ducks *Merginae*) and not divers or grebes. They are not considered further in this condition assessment.

2.2 Waterbird counts around and since the period that the SSSI was notified

The Lisvane Reservoir SSSI was notified in 1972 and re-notified in 1982. On the basis of the CSM approach set out in JNCC (2004) described above, annual summary WeBS data (<http://app.bto.org/webs-reporting/>) for Lisvane Reservoir was inspected to identify if any winter counts for the relevant species were available for the five year periods preceding 1972 and 1982. The time series for the published WeBS data starts in the winter of 1993/94 (prior to that waterbird counts for the site were included within a 'parent' site that included Roath Park Lake, Cardiff).

As a result the 'ideal' approach to determining a population size target could not be taken and instead the alternative of using "*the first suitable series of good quality data*" was applied. The first five winters of summary WeBS data are 1993/94 and 1995/96 to 1998/99, there being a gap in 1994/95. These counts for the relevant species are presented in Table 1. The counts for the individual species of diver and grebe recorded have been summed to give Diver spp and Grebe spp totals. Appendix 2 lists the individual diver and grebe species records that form these totals. In the absence of information about the species that might constitute 'passage migrants' it is not possible to establish a historic baseline.

Table 1 Historic WeBS counts for waterbirds listed in the SSSI citation

Waterbird species	1993/94	1995/96	1996/97	1997/98	1998/99
Mallard	23	62	26	23	31
Teal	0	0	7	0	0
Tufted Duck	163	221	187	53	114
Pochard	10	31	28	5	88
Coot	137	247	343	90	89
Diver spp	0	0	0	0	0
Grebe spp	8	16	26	18	24

This historic data has been evaluated to provide a number of metrics relating to the fluctuating waterbird counts over the five year data series – the minimum value, the mean value and the maximum value for each species / species group. This is presented in Table 2.

Table 2 Minimum, mean and maximum values of the 5 year run of historic WeBS counts

Waterbird species	Minimum	Mean	Maximum
Mallard	23	33	62
Teal	0	1	7
Tufted Duck	53	148	221
Pochard	5	32	88
Coot	89	181	343
Diver spp	0	0	0
Grebe spp	8	18	26

The CSM approach is to take the minimum population size recorded during the five counts as the target for maintaining the population. For Teal and the Diver spp group this would make the target zero. Whichever metric is chosen for the Diver spp group the target is zero, as it would

be for any other five year period as the WeBS summary data set contains no Diver spp records between 1993/94 and 2014/15. Since it is not known how representative is the 5 year run of data extracted from the historic WeBS data it is judged that consideration should also be given to the mean value presented in Table 2.

2.3 Waterbird counts over the period 2010/11 – 2014/15

The most recent 5 year series of systematic waterbird counts available is the WeBS counts for the five non-breeding periods (2010/11 – 2014/15). This count series was obtained from the British Trust for Ornithology (BTO) acting on behalf of the data holders¹.

Table 3 presents the peak count in each 'winter' (the months of September to March inclusive) for each of the non-breeding periods (2010/11 – 2014/15) for each of the target species / species groups. Appendix 3 contains the monthly counts for the individual species from which these peak counts were obtained and the diver and grebe species records from which the totals were obtained.

Table 3 WeBS peak winter counts for waterbirds listed in the SSSI citation

Waterbird species	2010/11	2011/12	2012/13	2013/14	2014/15
Mallard	87	45	116	44	20
Teal	10	27	12	42	44
Tufted Duck	73	74	110	99	98
Pochard	15	24	37	36	44
Coot	53	86	32	30	85
Diver spp	0	0	0	0	0
Grebe spp	30	21	22	26	39

It is a comparison of these recent figures with the historic baseline constructed from comparable WeBS counts dating back to the 1990's that constitutes the Lisvane Reservoir SSSI condition assessment.

¹ Data were supplied by the British Trust for Ornithology, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee (the last on behalf of the statutory nature conservation bodies: Natural England, Natural Resources Wales and Scottish Natural Heritage and the Department of Agriculture, Environment and Rural Affairs, Northern Ireland) in association with the Wildfowl and Wetlands Trust.

3. The Lisvane Reservoir SSSI waterbird condition assessment

3.1 Assessment against the historic baseline 'minimum' figures

The CSM approach to condition assessment is to compare the recent count(s) and a baseline established at or prior to the time that the relevant SSSI was notified or alternatively a baseline established from the first suitable series of good quality data. In this case counts from the time of notification are not available and a historic baseline has been established from WeBS data for the period 1993/94 and 1995/96 to 1998/99. The CSM approach is to take the minimum population size from this baseline period and to conclude that if that population is exceeded over the more recent period then the relevant feature can be assessed as being maintained. If the population size attribute of the interest feature has been maintained then the interest features can be assessed as in favourable condition. In Table 4 a comparison is made for each species/ species group between the historic baseline minimum population size and the population of the recent period that is being assessed. Where the minimum population size is equalled or exceeded the cell is coloured green.

Table 4 Comparison of the historic minimum population size and the recent population for waterbirds listed in the SSSI citation

Waterbird species	Minimum population size	Winter peak population				
Time period	1990's	2010/11	2011/12	2012/13	2013/14	2014/15
Mallard	23	87	45	116	44	20
Teal	0	10	27	12	42	44
Tufted Duck	53	73	74	110	99	98
Pochard	5	15	24	37	36	44
Coot	89	53	86	32	30	85
Diver spp	0	0	0	0	0	0
Grebe spp	8	30	21	22	26	39

The baseline minimum population size is equalled or exceeded in all recent years for Teal (recognising that the baseline is zero), Tufted Duck, Pochard, Diver spp (recognising that the baseline is zero) and Grebe spp. The baseline minimum population size is equalled or exceeded in four of the last five recent years for Mallard. The baseline minimum population size is not achieved in any of the five recent years for Coot.

When assessed against the historic minimum population size, in accordance with the CSM approach, the Lisvane Reservoir SSSI is judged to be in favourable condition for the interest features Mallard, Teal, Tufted Duck, Pochard, Diver spp and Grebe spp but in unfavourable condition for Coot.

3.2 Assessment against the historic baseline 'mean' figures

A waterbird population from the time of notification (1972) or re-notification (1982) is not known, but the minimum population from the 1990's applied above may not represent an appropriate baseline for the condition assessment if there had been a period of condition deterioration. To provide an additional test of condition the mean, as opposed to minimum, population from the period 1993/94 and 1995/96 to 1998/99 has been applied. In the same manner as above,

Table 5 presents a comparison for each species/ species group between the historic baseline mean population size and the population of the recent period that is being assessed. Where the mean population size is equalled or exceeded the cell is coloured green.

Table 5 Comparison of the historic mean population size and the recent population for waterbirds listed in the SSSI citation

Waterbird species	Mean population size	Winter peak population				
Time period	1990's	2010/11	2011/12	2012/13	2013/14	2014/15
Mallard	33	87	45	116	44	20
Teal	1	10	27	12	42	44
Tufted Duck	148	73	74	110	99	98
Pochard	32	15	24	37	36	44
Coot	181	53	86	32	30	85
Diver spp	0	0	0	0	0	0
Grebe spp	18	30	21	22	26	39

The baseline mean population size is equalled or exceeded in all recent years for Teal (recognising that the baseline is one), Diver spp (recognising that the baseline is zero) and Grebe spp. The baseline mean population size is equalled or exceeded in three of the last five recent years for Pochard and in four of the last five recent years for Mallard. The baseline mean population size is not achieved in any of the five recent years for Tufted Duck and Coot.

When assessed against the historic mean population size, a more precautionary approach than that required by CSM, the Lisvane Reservoir SSSI is judged to be in favourable condition for the interest features Mallard, Teal, Diver spp and Grebe spp, in favourable condition in some recent years for Pochard but in unfavourable condition for Tufted Duck and Coot.

3.3 Assessment against the semi-quantitative description of the Site Management Statement

An alternative to the CSM approach is to assess the current populations of the relevant water bird species/ species groups against the population figures that have been published in the SMS, notwithstanding that these do not constitute formal SSSI conservation objectives. The population figures in the SMS are worded in both a semi-quantitative ("*several hundred*", "*up to a hundred*" and "*small numbers*") and an aspirational fashion ("*how we would like to see*" and "*capable of supporting*"). The evidence base from which they were derived was not published or referenced in the SMS. To allow an assessment the semi-quantitative populations have to be converted into a single figure or a defined range. This has been carried out based on expert judgement and presented in Table 6. The SMS makes no reference to any population size for Coot.

Table 6 The derivation of baseline waterbird populations from the SSSI SMS text

Waterbird species	Description in SMS	Derived population
Mallard	<i>several hundred</i>	>200
Teal	<i>several hundred</i>	>200
Tufted Duck	<i>up to a hundred</i>	75 - 99
Pochard	<i>up to a hundred</i>	75 - 99
Great Northern Diver	<i>small numbers</i>	1 - 9
Great Crested Grebe	<i>small numbers</i>	1 - 9

In the same manner as above, these populations derived from the SMS can be compared to the population identified as occurring in recent winters. This comparison is presented in Table 7 for each species. Where the SMS derived population is equalled or exceeded the cell is coloured green.

Table 7 Comparison of the SMS derived population size and the recent population for waterbird species

Waterbird species	SMS derived population	Winter peak population				
Time period		2010/11	2011/12	2012/13	2013/14	2014/15
Mallard	>200	87	45	116	44	20
Teal	>200	10	27	12	42	44
Tufted Duck	75 - 99	73	74	110	99	98
Pochard	75 - 99	15	24	37	36	44
Great Northern Diver	1 - 9	0	0	0	0	0
Great Crested Grebe	1 - 9	14	9	10	10	7

The SMS derived population size is equalled or exceeded in all recent years for Great Crested Grebe. The SMS derived population size is equalled or exceeded in three of the last five recent years for Tufted Duck. The SMS derived population size is not achieved in any of the five recent years for Mallard, Teal, Pochard or Great Northern Diver (noting that WeBS counts have not recorded Great Northern Diver on any counts between 1993/94 and 2014/15).

When assessed against the semi-quantitative and aspirational measures of the Lisvane Reservoir SSSI Site Management Statement, the site achieves what is sought by NRW for Great Crested Grebe and for Tufted Duck in some recent years. Those aspirations are not achieved for Mallard, Teal and Great Northern Diver.

4. Discussion

4.1 The evidence base for the condition assessment

The methodology

The Lisvane Reservoir SSSI has no published conservation objectives or numeric targets for its waterbird populations and no published statement about the criteria that were satisfied to justify notification. As a result the condition assessment has not been undertaken against objectives set by NRW or its predecessors. The baseline populations for the condition assessment reported in this document have been derived using the published methodology (JNCC, 2004) and as such should correspond to those that would be derived by a UK statutory nature conservation body. The comparison between baseline and present populations has been carried out following the published methodology (JNCC, 2004) and as such should correspond to that which would be carried out by a UK statutory nature conservation body. It is considered that the methodology applied is the best available and most suited to the circumstance of the absence of published conservation objectives.

The waterbird data

The baseline and current waterbird populations used have been drawn from the data collected for WeBS. This data set has been selected because it is that recommended in the published methodology (JNCC, 2004), it is collected systematically and it has been collected over a long time period. More frequent systematic counts are available for some recent years (e.g. as reported in Gilmore *et al.*, 2014 and Gilmore *et al.*, 2015). More frequent recording is more likely to detect short term peaks in bird numbers. A consequence is that this will inflate peak count and mean peak count numbers which would then provide an invalid comparison with the long term data set from WeBS that is based on monthly recording. In order to maintain a consistent dataset that is comparable over the long term, the WeBS data has been applied throughout the condition assessment. It is considered that WeBS provides the most suitable evidence base for the condition assessment.

The WeBS data set applied in the condition assessment provides no records of any Diver spp throughout the period assessed. This means that both the baseline population and the recent population is zero. This makes the result of the condition assessment, technically, favourable but this result has no biological meaning. Diver species on inland waterbodies attract the attention of birdwatchers and it might be expected that if there were regular occurrences of Diver spp that happened by chance not to occur on WeBS count days then those sightings would still be reported. The supplement to the Birds of Cardiff (Gilmore, 2013) reports on bird observations over the period 2005 to 2012 and includes Lisvane Reservoir within its geographical coverage. This publication lists no diver records of any species at Lisvane Reservoir over that period. There is not an evidence base from which a condition assessment of the Diver spp interests feature of the SSSI can be reliably developed or carried out.

4.2 Wide scale changes in waterbird numbers that might be reflected at Lisvane Reservoir

The wintering waterbird populations at Lisvane Reservoir do not exist in isolation. The range of species and numbers of each species using the reservoir in any one winter will be affected by breeding success over the summer, mortality on autumn passage, weather conditions at alternative wintering locations and weather conditions in south Wales. Over the long term, annual productivity and survival will affect the total population and any such population changes will affect the numbers wintering at Lisvane Reservoir. Such annual and population effects are likely to affect different species to varying degrees and timescales. With regard to wintering waterfowl such effects have in particular been investigated in relation to climate change

(Lehikoinen *et al.*, 2013) and the potential implications for protected sites (Pearce-Higgins *et al.*, 2011). The overall picture is that recent warming has led European wintering waterbirds to shift the use of wintering sites to the north-east, closer to their breeding grounds (the phenomenon of short-stopping). WeBS counts from across the UK are drawn together and reported in Frost *et al.*, (2016) including the long term trend over the 25 year period 1988/89 to 2013/14. Table 8 reproduces these long term trends, where available, for the species that are interest features of Lisvane reservoir SSSI.

Table 8 Long term trends in wintering waterbirds from UK wide monitoring

Waterbird species	25 year trend 1988/89 to 2013/14
Mallard	-40%
Teal	+52%
Tufted Duck	+10%
Pochard	-65%
Coot	+1%
Great Crested Grebe	+15%

These UK wide trends indicate that there is the potential for negative changes at Lisvane Reservoir to be driven by more widespread effects in the case of Mallard and Pochard. In addition, it means that the aspirational targets in the SMS for Mallard and Pochard could be considered unrealistic given the more widespread changes that are occurring to these populations. Coot, which has a stable UK wide population, is the only species to have been assessed as in unfavourable condition in all five recent winters by the measure of comparison with the baseline minimum population size. This suggests that site, local or regional effects, rather than wide scale changes, might be the cause of the failure to achieve favourable condition.

4.3 Current waterbird populations at Lisvane Reservoir in relation to the current criteria for SSSI notification

As identified in Section 1.3, the published information about the Lisvane Reservoir SSSI does not include any explicit statement about the criteria that were satisfied to justify its notification. As a result it is not possible to determine if the interest features of the SSSI continue to meet the designation criteria that were set at the time of its initial notification (1972) and re-notification (1982).

It is possible to compare the current wintering waterbird populations, as identified by the most recent five year period of WeBS counts, with the current criteria for SSSI notification for wintering waterbirds (Drewitt *et al.*, 2015).

The current criteria for SSSI notification for wintering waterbirds include sites that regularly support:

- 1% or more of the GB population of a species listed in Annex I of the EU Birds Directive.
- 1% or more of the biogeographical population of a regularly occurring migratory species.
- Over 20,000 waterbirds.
- 1% or more of the total British non-breeding population of any native species (population as defined in Musgrove *et al.*, 2013).

- 1% or more of the total British non-breeding population regularly in severe weather conditions, even if not in most years (cold weather refuges).

Table 9 lists the five year peak mean for the winters 2010/11 to 2014/15 (months of September to March inclusive) for each wintering waterbird from the WeBS data supplied by the BTO and the relevant populations for the SSSI criteria. Where the mean was a fraction of one the number presented has been rounded up to one. Where a particular species has not been observed on a WeBS count over the last five winters then it is excluded from the table (rather than enter a zero count). Non-native species (e.g. Canada Goose and Greylag Goose) and summer migrants that were observed on WeBS counts have been excluded from this table. Where a species is not considered to be migratory then no population figure is given in that column. The total waterbird assemblage figure presented is the sum of the species peak means listed. The SSSI criterion that has been omitted is that for cold weather refuges.

Table 9 Current 5 year peak mean native waterbird populations at Lisvane Reservoir in comparison to current SSSI criteria

Waterbird species	Lisvane Reservoir five year peak mean	Annex 1 species 1% GB population	Migratory species 1% biogeographical population	1% GB population
Mute Swan	2			740
Mallard	62		45,000	6,800
Teal	27		5,000	2,100
Wigeon	1		15,000	4,400
Gadwall	1		600	250
Pintail	1		600	290
Shoveler	3		400	180
Tufted Duck	91		12,000	1,100
Pochard	31		3,000	380
Long-tailed Duck	1		16,000	110
Goldeneye	1		11,400	200
Little Grebe	17			160
Great Crested Grebe	10		3,500	190
Slavonian Grebe	1	11	55	11
Black-necked Grebe	1		2,100	n/a
Cormorant	8		1,200	350
Little Egret	1	45	1,300	45
Grey Heron	2			610
Moorhen	3			3,200
Coot	57		17,500	1,800
Black-headed Gull	166		20,000	22,000
Common Gull	5		16,400	7,000
Lesser Black-backed Gull	248		10,200	1,200
Herring Gull	31		10,200	7,300
Great Black-backed Gull	1		4,200	760
Kingfisher	1	50		50
Total waterbird assemblage	773			

None of the current individual species populations nor the waterbird assemblage satisfies the current SSSI criteria.

5. Conclusions

This condition assessment of the populations of specific waterbird species that are interest features of the Lisvane Reservoir SSSI has concluded that:

- In the absence of published conservation objectives, the application of the CSM approach using historic and recent WeBS data is the most suitable method to apply.
- Lisvane Reservoir SSSI is in favourable condition for the interest features –
 - Mallard
 - Teal
 - Tufted Duck
 - Pochard
 - Diver spp
 - Grebe spp

But in unfavourable condition for Coot, when the assessment is against the historic minimum population size (in accordance with the CSM approach)

- The assessment using the more precautionary approach than that required by CSM of the historic mean population size was that the site is in favourable condition for the interest features Mallard, Teal, Diver spp and Grebe spp, in favourable condition in some recent years for Pochard but in unfavourable condition for Tufted Duck and Coot.
- When assessed against the semi-quantitative and aspirational measures of the Lisvane Reservoir SSSI Site Management Statement, the site achieves what is sought by NRW for Great Crested Grebe and for Tufted Duck in some recent years. Those aspirations are not achieved for Mallard, Teal and Great Northern Diver. Those aspirational targets for Mallard and Pochard could be considered unrealistic given the changes that are occurring to these populations across north-west Europe.
- Coot, which has a stable UK wide population, is the only species to have been assessed as in unfavourable condition in all five recent winters by the measure of comparison with the historic minimum population size. This suggests that site, local or regional effects, rather than wide scale changes, might be the cause of the failure to achieve favourable condition for this species.

A comparison of the current SSSI criteria with the current wintering waterbird populations has identified that none of the current individual species populations nor the waterbird assemblage satisfied the current SSSI criteria.

6. References

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Appendix 1: SSSI citation details

Sourced from:

https://naturalresources.wales/media/658720/SSSI_1067_Citation_EN00166a8.pdf

**CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES**

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

CARDIFF

LISVANE RESERVOIR

Date of Notification: 1972, 1982

National Grid Reference: ST 189822

O.S. Maps: 1:50,000 Sheet number: 171
1:25,000 Sheet number: ST 18

Site Area: 8.1 ha

Description:

A stream-fed reservoir which makes a useful refuge on the northern outskirts of Cardiff for birds including overwintering mallard, teal, tufted duck, pochard and coot; occasional divers and grebes and many passage migrants.

Appendix 2: Historic WeBS counts for divers and grebes

Waterbird species	1993/94	1995/96	1996/97	1997/98	1998/99
<u>Diver spp</u>					
Great Northern Diver	0	0	0	0	0
Red-throated Diver	0	0	0	0	0
Black-throated Diver	0	0	0	0	0
Diver spp total	0	0	0	0	0
<u>Grebe spp</u>					
Little Grebe	4	9	10	5	11
Great Crested Grebe	4	7	16	13	12
Red-necked Grebe	0	0	0	0	0
Slavonian Grebe	0	0	0	0	1
Black-necked Grebe	0	0	0	0	0
Grebe spp total	8	16	26	18	24

Appendix 3: Monthly WeBS counts 2010/11 – 2014/15 for the target species

Mallard

Mallard monthly counts	2010/11	2011/12	2012/13	2013/14	2014/15
March	12	12	4	12	20
February	11	5	94	13	19
January	3	13	12	44	9
December	2	8	116	39	7
November	87	18	27	14	15
October	14	6	12	24	7
September	22	45	35	25	7
Peak count in each 'winter'	87	45	116	44	20

Teal

Teal monthly counts	2010/11	2011/12	2012/13	2013/14	2014/15
March	0	2	12	9	8
February	0	3	0	32	44
January	0	0	0	33	2
December	10	4	0	42	41
November	0	27	3	32	24
October	0	4	0	17	36
September	0	4	0	0	1
Peak count in each 'winter'	10	27	12	42	44

Tufted Duck

Tufted Duck monthly counts	2010/11	2011/12	2012/13	2013/14	2014/15
March	20	28	13	52	91
February	39	26	72	28	98
January	55	48	110	99	58
December	0	41	102	59	26
November	60	46	4	11	22
October	46	74	49	39	65
September	73	48	46	37	93
Peak count in each 'winter'	73	74	110	99	98

Pochard

Pochard monthly counts	2010/11	2011/12	2012/13	2013/14	2014/15
March	4	6	37	2	2
February	15	21	32	15	44
January	2	24	11	21	32
December	0	5	22	36	23
November	1	5	5	5	2
October	12	8	6	0	9
September	0	2	0	1	7
Peak count in each 'winter'	15	24	37	36	44

Coot

Coot monthly counts	2010/11	2011/12	2012/13	2013/14	2014/15
March	17	22	10	23	40
February	13	21	8	30	50
January	18	29	6	5	43
December	27	16	6	13	60
November	38	28	8	12	62
October	39	82	6	4	62
September	53	86	32	3	85
Peak count in each 'winter'	53	86	32	30	85

Diver and grebe species

Divers & Grebes Peak counts	2010/11	2011/12	2012/13	2013/14	2014/15
<u>Diver spp</u>					
Great Northern Diver	0	0	0	0	0
Red-throated Diver	0	0	0	0	0
Black-throated Diver	0	0	0	0	0
Diver spp total	0	0	0	0	0
<u>Grebe spp</u>					
Little Grebe	16	11	12	16	31
Great Crested Grebe	14	9	10	10	7
Red-necked Grebe	0	0	0	0	0
Slavonian Grebe	0	1	0	0	0
Black-necked Grebe	0	0	0	0	1
Grebe spp total	30	21	22	26	39