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FOR WILDLIFE

THE STATE OF THE THAMES 2021

Appendices

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APPENDIX I: BIRDS – WADERS AND WILDFOWL

COMMON NAME	BINOMIAL	GROUP
Arctic Tern	<i>Sterna paradisaea</i>	Wader
Avocet	<i>Recurvirostra avosetta</i>	Wader
Bar-tailed Godwit	<i>Limosa lapponica</i>	Wader
Black Tern	<i>Chlidonias niger</i>	Wader
Black-tailed Godwit	<i>Limosa limosa</i>	Wader
Cattle Egret	<i>Bubulcus ibis</i>	Wader
Common Sandpiper	<i>Actitis hypoleucos</i>	Wader
Common Snipe	<i>Gallinago gallinago</i>	Wader
Common Tern	<i>Sterna hirundo</i>	Wader
Curlew	<i>Numenius arquata</i>	Wader
Curlew Sandpiper	<i>Calidris ferruginea</i>	Wader
Dunlin	<i>Calidris alpina</i>	Wader
Eurasian Golden Plover	<i>Pluvialis apricaria</i>	Wader
Eurasian Oystercatcher	<i>Haematopus ostralegus</i>	Wader

COMMON NAME	BINOMIAL	GROUP
Green Sandpiper	<i>Tringa ochropus</i>	Wader
Greenshank	<i>Tringa nebularia</i>	Wader
Grey Heron	<i>Ardea cinerea</i>	Wader
Grey Phalarope	<i>Phalaropus fulicarius</i>	Wader
Grey Plover	<i>Pluvialis squatarola</i>	Wader
Jack Snipe	<i>Lymnocyptes minimus</i>	Wader
Knot	<i>Calidris canutus</i>	Wader
Lapwing	<i>Vanellus vanellus</i>	Wader
Lesser Yellowlegs	<i>Tringa flavipes</i>	Wader
Little Egret	<i>Egretta garzetta</i>	Wader
Little Ringed Plover	<i>Charadrius dubius</i>	Wader
Little Stint	<i>Calidris minuta</i>	Wader
Little Tern	<i>Sternula albifrons</i>	Wader
Moorhen	<i>Gallinula chloropus</i>	Wader

APPENDIX I: BIRDS – WADERS AND WILDFOWL CONTINUED...

COMMON NAME	BINOMIAL	GROUP	COMMON NAME	BINOMIAL	GROUP
Purple Sandpiper	<i>Calidris maritima</i>	Wader	Barnacle Goose	<i>Branta leucopsis</i>	Wildfowl
Redshank	<i>Tringa totanus</i>	Wader	Bewick's Swan	<i>Cygnus columbianus</i>	Wildfowl
Ringed Plover	<i>Charadrius hiaticula</i>	Wader	Black Swan	<i>Cygnus atratus</i>	Wildfowl
Roseate Tern	<i>Sterna dougallii</i>	Wader	Brent Goose	<i>Branta bernicla</i>	Wildfowl
Ruddy Turnstone	<i>Arenaria interpres</i>	Wader	Canada Goose	<i>Branta canadensis</i>	Wildfowl
Ruff	<i>Calidris pugnax</i>	Wader	Common Scoter	<i>Melanitta nigra</i>	Wildfowl
Sanderling	<i>Calidris alba</i>	Wader	Common Teal	<i>Anas crecca</i>	Wildfowl
Sandwich Tern	<i>Thalasseus sandvicensis</i>	Wader	Domestic Greylag Goose	<i>Anser anser</i>	Wildfowl
Spoonbill	<i>Platalea leucorodia</i>	Wader	Egyptian Goose	<i>Alopochen aegyptiaca</i>	Wildfowl
Spotted Redshank	<i>Tringa erythropus</i>	Wader	Eider (except Shetland)	<i>Somateria mollissima</i>	Wildfowl
Water Rail	<i>Rallus aquaticus</i>	Wader	Eurasian Wigeon	<i>Mareca penelope</i>	Wildfowl
Whimbrel	<i>Numenius phaeopus</i>	Wader	Gadwall	<i>Mareca strepera</i>	Wildfowl
Wood Sandpiper	<i>Tringa glareola</i>	Wader	Garganey	<i>Spatula querquedula</i>	Wildfowl
Bar-headed Goose	<i>Anser indicus</i>	Wildfowl	Goldeneye	<i>Bucephala clangula</i>	Wildfowl

APPENDIX I: BIRDS – WADERS AND WILDFOWL CONTINUED...

COMMON NAME	BINOMIAL	GROUP
Goosander	<i>Mergus merganser</i>	Wildfowl
Greater White-fronted Goose	<i>Anser albifrons</i>	Wildfowl
Long-tailed Duck	<i>Clangula hyemalis</i>	Wildfowl
Mallard	<i>Anas platyrhynchos</i>	Wildfowl
Mandarin Duck	<i>Aix galericulata</i>	Wildfowl
Maned Duck	<i>Chenonetta jubata</i>	Wildfowl
Mute Swan	<i>Cygnus olor</i>	Wildfowl
Northern Shoveler	<i>Spatula clypeata</i>	Wildfowl
Pink-footed Goose	<i>Anser brachyrhynchus</i>	Wildfowl
Pintale	<i>Anas acuta</i>	Wildfowl
Pochard	<i>Aythya ferina</i>	Wildfowl
Red-breasted Merganser	<i>Mergus serrator</i>	Wildfowl
Red-crested Pochard	<i>Netta rufina</i>	Wildfowl
Ruddy Duck	<i>Oxyura jamaicensis</i>	Wildfowl

COMMON NAME	BINOMIAL	GROUP
Ruddy Shelduck	<i>Tadorna ferruginea</i>	Wildfowl
Scaup	<i>Aythya marila</i>	Wildfowl
Shelduck	<i>Tadorna tadorna</i>	Wildfowl
Smew	<i>Mergellus albellus</i>	Wildfowl
Taiga/Tundra Bean Goose	<i>Anser fabalis</i>	Wildfowl
Tufted Duck	<i>Aythya fuligula</i>	Wildfowl
Velvet Scoter	<i>Melanitta fusca</i>	Wildfowl
Whooper Swan	<i>Cygnus cygnus</i>	Wildfowl

APPENDIX II: CALCULATING THE LIVING THAMES INDEX

WHAT IS THE LTI?

The Living Thames Index (LTI) is an adaptation of the Living Planet Index (LPI), which is calculated every two years for populations and species all over the world and presented in the biennial Living Planet Report. The Living Thames Index was used in the State of the Thames 2021 to analyse trends in bird populations in the Tidal Thames.

WHAT DOES THE LTI INDICATE?

LTI results are average trends in relative abundance. This means that – although the overall trend appears increasing or stable – some populations and species will have increased, whereas others have not increased as much or are even declining.

The number of species with positive trends (25) was greater than that with negative trends (18) producing an average increasing trend. The other 20 species showed stable trends.

WHERE DID THE DATA USED IN THE LTI COME FROM?

Data used for the LTI analysis in the Birds section of the State of the Thames 2021 were counts of 63 species of birds (only waders/wildfowl were included) from the BTO/Royal Society for the Protection of Birds (RSPB)/Joint Nature Conservation Committee (JNCC) Wetland Bird Survey (WeBS). WeBS is a partnership jointly funded by the BTO, RSPB and JNCC, in association with the Wildfowl and Wetlands Trust (WWT), with fieldwork conducted by volunteers. The dataset was reduced to include only survey sites in the Tidal Thames.

HOW WAS THE LTI CALCULATED?

The LTI was calculated based on population time-series of 63 species from the WeBS dataset. For each population, the rate of change from one year to the next was calculated. For this analysis, due to the relatively small area of the Tidal Thames, individuals of the same species

were considered to be part of one population. If the data available were from only a few, non-consecutive years, a constant annual rate of change in the population is assumed between each data year following the published LPI method outline by Collen *et al.* (2009). Where data were available from six or more years (consecutive or not) a curve was plotted through the data points using a statistical method called Generalized Additive Modelling (GAM). Average annual rates of change in populations of the same species were aggregated to the species level.

A STEP-BY-STEP GUIDE TO CALCULATING AN LTI

An LTI is calculated in multiple steps:

- **First, each population's size is modelled over time and the population size in any year compared to the population size in the previous year.** The original abundance values are logged, so that differences between years describe a relative rather than an absolute change. This means that we can combine information from populations with different measures of abundance and different numbers of individuals.
- **In each year, these interannual change values are averaged across all populations of a species to give an overall trend for that species.**
- **The species trends are then averaged to obtain an overall trend.** A type of average known as the geometric mean is used, which has been shown to be particularly suitable for assessing relative change in population sizes (Buckland *et al.* 2011, Santini *et al.* 2017).
- **These values are then turned into an index by setting the value to one in 1993 and relating each change to this baseline.** Confidence limits are calculated around these values which describe how certain we are about the index value in any given year relative to 1993. The baseline year and the cut-off year are chosen because not enough information is available before 1993 or after 2016 to produce a robust and meaningful index.

APPENDIX III: ORVAL LOCATIONS

TYPE	SPID	NAME	VISITORS
Beach	157090	<i>Shoeburyness</i>	376677.6
Beach	157480	<i>Southend Thorpe Bay</i>	853129.6
Beach	157266	<i>Southend Jubilee</i>	899352.7
Beach	157318	<i>Southend Three Shells</i>	896514.2
Beach	157219	<i>Southend Westcliff Bay</i>	1027432
Beach	157168	<i>Southend Chalkwell</i>	977435.3
Beach	156982	<i>Leigh Bell Wharf</i>	1020586
Beach	157069	<i>Canvey Island</i>	679663.5
Beach	157144	<i>Canvey Island - Thorney Bay</i>	714410.9
Beach	156902	<i>Allhallows</i>	215683.2
Beach	157114	<i>Shoebury East</i>	550931.2
Garden	36355	<i>Jubilee Gardens</i>	158138.1
Garden	36625	<i>Royal Botanic Gardens, Kew</i>	993140.8
Garden	36463	<i>Nazareth House</i>	42911.96

TYPE	SPID	NAME	VISITORS
Nature	847	<i>Shoeburyness Old Ranges</i>	119045.3
Nature	627	<i>Leigh</i>	205280.5
Nature	35860	<i>Thurrock Thameside Nature Park</i>	138890.6
Nature	35918	<i>RSPB Cliffe Pools Nature Reserve</i>	159670.9
Nature	1998	<i>Crossness</i>	82144.78
Nature	35963	<i>Greenwich Ecology Park</i>	56585.24
Nature	2181	<i>Battersea Park Nature Areas</i>	76532.16
Nature	36199	<i>The London Wetland Centre</i>	632124.8
Nature	1740	<i>Chiswick Eyot</i>	108110.9
Nature	1772	<i>Leg of Mutton Reservoir</i>	151199.2
Nature	1771	<i>Isleworth Ait</i>	98831.91
Nature	1780	<i>Ham Lands</i>	141420.5
Park	36714	<i>Gunners Park</i>	130220.9
Park	27907	<i>The Cliffs</i>	181029.1

APPENDIX III: ORVAL LOCATIONS CONTINUED...

TYPE	SPID	NAME	VISITORS
Park	27885	<i>Leigh Cliffs</i>	100555.9
Park	36966	<i>Smallgains Recreation Ground</i>	128564.4
Park	27891	<i>Labworth Recreation Ground</i>	62567.54
Park	27890	<i>Kismet Park</i>	42417.69
Park	9326	<i>Gordon Gardens</i>	400024.5
Park	27845	<i>Grays Beach Riverside Park</i>	308936.9
Park	27828		28821.1
Park	5335		99289.02
Park	24135	<i>Gallions Reach Park</i>	68025.59
Park	14272	<i>Royal Victoria Gardens</i>	343227.8
Park	14372		97851.82
Park	14356	<i>Thames Barrier Park</i>	214680.6
Park	14276		189890.2
Park	14341	<i>Lyle Park</i>	109528.8

TYPE	SPID	NAME	VISITORS
Park	35285	<i>East India Dock Basin</i>	119567.9
Park	14443	<i>Island Gardens</i>	85699.74
Park	14520		94874.53
Park	14490	<i>Upper Pepys Park</i>	156696.9
Park	14510	<i>Aragon Gardens</i>	110322.5
Park	14451	<i>Sir John McDougall Gardens</i>	114556.1
Park	14501	<i>Durand's Wharf</i>	108096.5
Park	3973	<i>King Edward Memorial Park</i>	143551.1
Park	14518		157197
Park	14447	<i>King Stairs Gardens</i>	191304.6
Park	14488	<i>Waterside Gardens</i>	134095.2
Park	14521	<i>Wapping Rose Gardens</i>	24597.88
Park	14460	<i>Hermitage Riverside Memorial Garden</i>	135523.6
Park	14458	<i>St John's Churchyard</i>	20065.13

APPENDIX III: ORVAL LOCATIONS CONTINUED...

TYPE	SPID	NAME	VISITORS	TYPE	SPID	NAME	VISITORS
Park	14463	<i>Hellings Street Open Space</i>	27400.8	Park	8499		142624.1
Park	31924	<i>Bernie Spain Gardens</i>	69836.03	Park	8498	<i>Stevenage Park</i>	19306.57
Park	31923	<i>Whitehall Garden</i>	176676.4	Park	8480	<i>Furnivall Gardens</i>	85602.34
Park	31974	<i>Victoria Embankment Gardens</i>	94060.14	Park	8463	<i>Duke's Meadows</i>	87279.05
Park	31981	<i>Victoria Tower Gardens</i>	279140.8	Park	8432	<i>Westly Ware</i>	106869.9
Park	31992	<i>Albert Embankment Gardens</i>	157892	Park	8393	<i>Syon Park</i>	1048458
Park	32025	<i>Pimlico Gardens</i>	154371.6	Park	36280	<i>Old Deer Park</i>	214804.8
Park	32049	<i>Battersea Power Station Pop-Up Park</i>	207834.9	Park	8402	<i>Cambridge Gardens</i>	93775.28
Park	37093	<i>Battersea Park</i>	1746520	Park	8439	<i>Bridge House Gardens</i>	97294.15
Park	32005	<i>Royal Hospital Grounds</i>	109547.8	Park	8425	<i>Buccleuch Gardens</i>	115204.3
Park	32028	<i>Sensory Gardens</i>	129561	Park	8394	<i>Marble Hill Park</i>	599117.2
Park	20866	<i>Wandsworth Park</i>	395816.8	Park	22604	<i>Champions Wharf</i>	119847.1
Park	36229	<i>Bishop's Park</i>	328299.1	Park	22558	<i>Radnor Gardens</i>	94168.91
Park	8486	<i>Leader's Green</i>	86539.4	Park	8424	<i>Manor Road Recreation Ground</i>	86048.49

APPENDIX III: ORVAL LOCATIONS CONTINUED...

TYPE	SPID	NAME	VISITORS
Path	4669		363450.8
Path	7466		1880838
Path	9875		655758.4
Path	4672		119692.2
Path	4796		68706.49
Path	7465		1067311
Path	4675		4132217
Path	9866		423091.4
Path	4677		1584436
Path	5278		159929.9
Path	9860		301982.3
Path	7496		262085
Path	7463		1449501
Path	4609		181897.3

TYPE	SPID	NAME	VISITORS
Path	4667		700776.4
Path	4601		147844
Path	4797		182947.6
Path	4118		290298.3
Path	4620		37065.74
Path	4628		29177.5
Path	4647		524988.2
Path	5276		1092476
Path	4599		515680.7
Path	4117		383767.8
Path	4598		197036.7

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