FOOTPRINT ECOLOGY

Initial review of the effectiveness of the Bird Aware Solent strategy

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Summary

Bird Aware Solent deliver mitigation to address recreational impacts (associated with new housing growth) on wintering birds that are the qualifying features for 3 Special Protection Areas (SPAs) around the Solent. This report has been commissioned by Bird Aware Solent and brings together various data and information to summarise the level of housing growth, mitigation implementation, bird numbers and distribution, visitor use and how the Bird Aware Solent Partnership is perceived. The report considers the effectiveness of the Partnership, considers the lessons learnt from the first 5 years and will be used by Bird Aware Solent and partners to inform how mitigation might need to change or adapt in the future. The report is structured to follow particular questions set by Bird Aware Solent.

Changes in housing

In January 2016 there were 515,881 residential dwellings within the 5.6km zone of influence and in January 2022 there were 538,214. This reflects an increase of 22,333 dwellings (4.3%).

The total number of dwellings that have been granted planning permission and have contributed towards mitigation was 29,437 at the end of March 2020, markedly higher than the postcode data above. It would seem therefore that many of the dwellings that have contributed to mitigation are yet to be completed and/or occupied. The potential impact of the growth to date is therefore yet to manifest.

Changes in visitor numbers in relation to housing

Data from a range of sources consistently indicate a marked increase in access over the period covered in this review, but there are marked variations in the figures and lots of uncertainty. Vehicle counts are perhaps the most reliable and indicate a 26% increase from 2016/17 to 2021/22. This is markedly higher than the 4.3% increase in housing.

Changes in visitor distribution and behaviour over time

The increases in visitor use are not concentrated in one area but instead data from both the vehicle counts and rangers show a patchy distribution of change, with some sectors showing a marked increase while there has been relatively little change at adjacent sectors.

Data show that a range of activities have increased, notably kitesurfing, kayaking, paddleboarding, walking (without a dog) and dog walking. While the number of dog walkers (and dogs) have increased, the proportion of dogs now kept on a lead has increased.

Numbers of visitors undertaking potentially disturbing activities and change over time

The presence of people in the countryside, regardless of activity, will have the potential to cause disturbance and the overall volume of people and levels of recreation use are therefore certainly a relevant consideration and target for mitigation. Nonetheless, there are certain circumstances or types of event that pose particular risks and we highlight dog walking, bait collection, paddleboarding, kayaking, photography, windsurfing, kitesurfing, fast moving watercraft, wildfowling and air-borne events. There is evidence that most of these activities have increased over the 5 years, both nationally and on the Solent, with unknown trends for some activities simply reflecting a lack of comparable data.

Changes in bird numbers over time

WeBS data reveal declines for most of the qualifying wintering waterbird species across the three SPAs, and these extend over many years (i.e. before Bird Aware Solent started). Chichester and Langstone Harbours SPA is the site with the most species in decline and where the declines have been the most severe. For most species, the declines generally fit with the national picture whereby the distribution of wintering waterbirds across Europe has shifted due to climate change. However, the WeBS alerts (based on data from up to and including 2016/17) indicate that some declines (Shelduck, Teal and Shoveler in Chichester and Langstone Harbours and Dunlin in Portsmouth Harbour) do not match regional or national trends.

The one species where numbers appear to have increased in recent years is Sanderling at Chichester and Langstone Harbours SPA where numbers have increased since 2016/17.

The number of counts conducted during 2020/21 was impacted by Covid, which means potentially slightly less confidence regarding the most recent bird data used in this report.

Changes in bird numbers in relation to changes in access

We have generated a series of maps to show bird changes by sector. Those WeBS sectors with a high number of species declining (i.e. with a negative percentage change 2016/17 to 2020/21 are:

- Sector 20422 Chichester Harbour (Central) - West Chidham (13 species declining);
- Sector 18402 Newtown Estuary (12 species declining);
- Sector 20435 Chichester Harbour (West)- S.Hayling (Tournerbury and Mill Rythe) (11 species declining);
- Sector 17403 Pylewell (11 species declining);
- Sector 17426 Gosport Shore (11 species declining);
- Sector 20434 Chichester Harbour (West)- S.Hayling (Black Pt to Mengham Rythe) (11 species declining).

Most of the qualifying wintering waterbird species across the three European sites have declined. There was no evidence that the WeBS sectors with more species declining in them are those that have had the most housing change or have had more new houses within 5.6km. There was also no evidence for individual species that the larger declines had occurred where there had been more housing growth within 5.6km. This does not necessarily mean that disturbance and housing growth is not implicated in the declines as a range of factors such as national declines due to climate change will make any clear pattern hard to detect.

Level of mitigation that has been implemented

Mitigation over the five years (2017/18-2021/22) has included:

- 3,046 visits conducted by rangers (7,476 hours of ranger time);
- 39,846 visitors engaged by rangers during site visits;
- Attendance at 174 community events (engaging with over 7,055 people);
- Social media outreach (over 2500 followers on Twitter, Facebook and Instagram);
- Range of site-specific projects such as access infrastructure to make locations more resilient;
- Enhancement of existing greenspaces to create alternative visitor destinations away from the coast.

Bird Aware Solent has also received widespread recognition in a number of awards, reflecting a national profile. The mitigation measures are broadly similar to those of other mitigation schemes around the country, however other schemes do include more alternative greenspace provision and there is marked variation in the size of the ranger team in each scheme.

The success of mitigation measures in changing behaviour

We estimate that current ranger provision would need to be 100x higher to achieve continuous coverage (during daylight through the winter) of all sections of the coast at all times, or 53x higher if it were to achieve complete coverage of the 47 sectors that are identified by Bird Aware Solent as those of high or medium priority.

Rangers can manage to speak to around 7 people per hour as a maximum at the busiest sites and the average is around 5 visitors per hour. We estimate current provision might allow engagement with around 7,900 individuals visiting the coast in a typical year, which is perhaps around 4% of visitors to the coast over the winter.

While ranger time is focussed and targeted to key locations and times, this is a relatively small percentage. There is evidence to show that rangers have made a difference on the Solent such that more waders are present and fewer birds flushed when rangers are present. There is relatively little evidence to indicate how much ranger coverage is necessary or optimal, however the current level of coverage is too low.

There is evidence that SANGs around the Solent are working to deflect visitor use, for example the Alver Valley is estimated to draw around 1,300 visits a week that would otherwise have taken place at the coast. Data from other parts of the country also provides evidence that SANGs can be effective in a coastal environment. The draw of SANGs is however relatively small – i.e. visitors tend to live in close proximity.

Proportionality of mitigation in relation to the increase in disturbance associated with new development

In order for mitigation to be proportionate to the increase in housing, we estimate it would perhaps need to address around a 7% increase in access compared to the levels of recreation in 2016/17, approximately equivalent to around 960,000 visits per winter, made by around 14,770 individuals.

The level of current ranger provision enables around 10,000 visitor interactions per winter and this may involve interactions with 7900 individual visitors. 10,000 interactions is sufficient to achieve interact with 1% of the additional visits associated with new housing. The number of ranger hours spent on site visits is roughly equivalent to 30 minutes of ranger time per winter per new dwelling that has given planning permission. Direct comparison with other European sites indicates the ranger provision per dwelling on the Solent is comparatively low.

SANGs and site-specific projects are hard to equate to the proportional increase in housing, nonetheless these are also delivered at a lower rate on the Solent compared to other mitigation schemes.

How the is Partnership perceived

We determined how the Partnership is perceived through a range of stakeholder workshops and interviews. A relatively small number of invited individuals engaged with the process however, potentially increasing the prominence of some of the stronger views held by those individuals that did engage.

The ranger team are well known and respected, but the wider work of the Partnership is less well recognised by both the public and stakeholder organisations. It is however highly visible to the developer community and its' approach is welcomed by the statutory nature conservation organisation. The Partnership is perceived as well run, with both its branding and messaging identified as being of high value. It is also recognised as having a good online presence, and the value of the ranger team in cementing long-term relationships with site users is also highlighted.

Stakeholder dialogue also highlighted a lack of clarity concerning the current role of the ranger team with respect to problem behaviours and the lack of enforcement when they occur. The small size of the ranger team, and the perceived limitations this places on its effectiveness, were also highlighted, alongside concerns regarding selective engagement with site users. Other Partnership issues include narrow focus on wintering birds, the conflicting

requirements of different site designations, a reticence to augment the ranger team with volunteers, the problems posed by emerging threats, limited educational outreach, signage, communication and cross-working with stakeholder organisations, and the overall effectiveness, long-term sustainability, and legacy of the Partnership.

Suggestions made by stakeholders for the future include updating the Solent Recreation Mitigation Strategy and the broadening of its focus, greater integration by the Partnership with other stakeholders, an increase in targeted messaging and knowledge sharing, and an aspiration to develop a greater range of mitigation-related infrastructure projects.

We found no evidence from a check of visitor survey responses and twitter posts of negative views from the public relating to Bird Aware Solent. Visitor survey results show some concern among visitors to the coast about the impacts from local development, growing numbers of visitors and disturbance to birds.

These various findings are placed in context. We highlight that Bird Aware Solent has been ground-breaking and has set an example that many other mitigation schemes have followed. This has been achieved with limited resources and coverage compared to those now in place in other schemes. Some recommendations are made for further consideration.

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1. Introduction

Overview

1.1 This report, commissioned by Bird Aware Solent, brings together data and information relating to the Bird Aware Solent Strategy and cover's the strategy's first period of operation. Bird Aware Solent deliver mitigation address recreational impacts associated with new housing growth around the Solent. The review brings together various data and information to summarise the level of housing growth, mitigation implementation, bird numbers and distribution, visitor use and how the Bird Aware Solent Partnership is perceived. The report considers the effectiveness of the Partnership, considers the lessons learnt from the first 5 years and will be used by Bird Aware Solent and partners to inform how mitigation might need to change or adapt in the future.

The Solent

1.2 This report focuses on the Solent shoreline between Hurst Castle and Chichester Harbour (see Map 1), including the north shoreline of the Isle of Wight, a length of shoreline totalling some 250km.

Importance for nature conservation

1.3 The shoreline is of exceptional importance for wildlife and is protected through a range of designations. There are 3 Special Protection Areas (SPAs) that are the primary focus of this report and support the bird interest: the Solent & Southampton Water SPA[1], Chichester and Langstone Harbours SPA[2] and Portsmouth Harbour SPA[3]. These are shown in Map 1 and the qualifying features, which include wintering waterbirds and breeding terns and a gull are summarised in Table 1.

[1] For citation and conservation objectives see: http://publications.naturalengland.org.uk/publication/6567218288525312

[2] For citation and conservation objectives see http://publications.naturalengland.org.uk/publication/5789102905491456

[3] For citation and conservation objectives see http://publications.naturalengland.org.uk/publication/4857883850178560

Map 1: The 3 SPAs and a 5.6km buffer of these site. Background red shading indicates housing density.

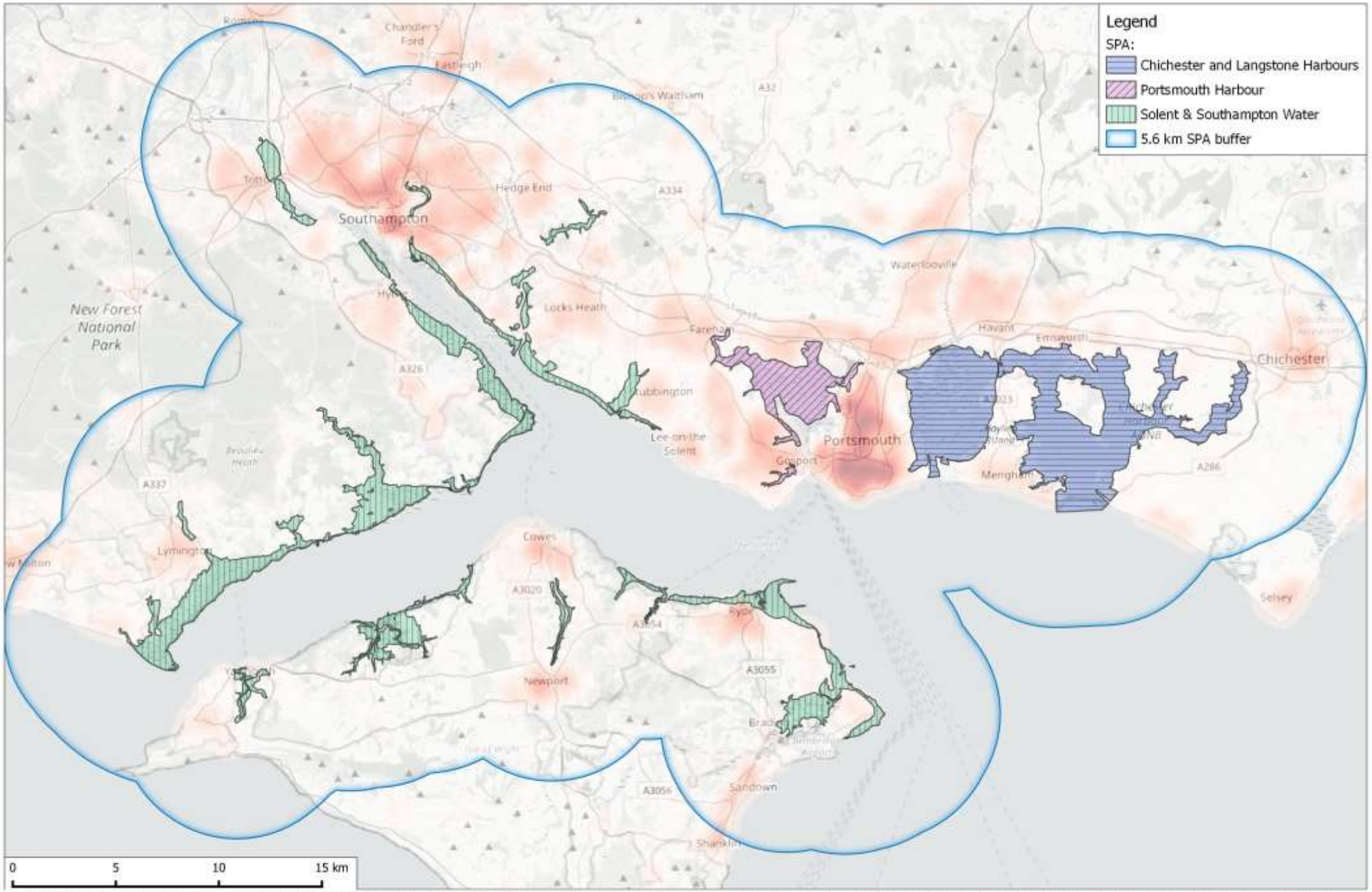

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Table 1: Qualifying features of the three SPA sites. Adapted from the site summary details spreadsheet on the JNCC website[4]

Feature	Latin	Chichester and Langstone Harbours SPA	Portsmouth Harbour SPA	Solent and Southampton Water SPA
Wildfowl (wintering)				
Shelduck	*Tadorna tadorna*	✓		
Brent Goose	*Branta bernicla bernicla*	✓	✓	✓
Wigeon	*Anas penelope*	✓		
Teal	*Anas crecca*	✓		✓
Pintail	*Anas acuta*	✓		
Shoveler	*Anas clypeata*	✓		
Red-breasted Merganser	*Mergus serrator*	✓	✓	
Waders (wintering)				
Bar-tailed Godwit	*Limosa lapponica*	✓		
Black-tailed Godwit	*Limosa limosa islandica*		✓	✓
Redshank	*Tringa totanus*	✓		
Dunlin	*Calidris alpina alpina*	✓	✓	
Curlew	*Numenius arquata*	✓		
Grey Plover	*Pluvialis squatarola*	✓		
Ringed Plover	*Charadrius hiaticula*	✓		✓
Turnstone	*Arenaria interpres*	✓		
Sanderling	*Calidris alba*	✓		
Assemblage				
Wintering waterbird assemblage		✓		✓
Breeding gulls and terns				
Mediterranean Gull	*Larus melanocephalus*			✓
Sandwich Tern	*Sterna sandvicensis*	✓		✓
Common Tern	*Sterna hirundo*	✓		✓
Little Tern	*Sterna albifrons*	✓		✓
Roseate Tern	*Sterna dougallii*			✓

1.4 While the three SPAs are the main focus of this report, there are also Special Areas of Conservation and Ramsar sites that reflect the Solent's international

[4] See https://hub.jncc.gov.uk/assets/a3d9da1e-dedc-4539-a574-84287636c898

importance for habitats and other species besides birds. Relevant SACs include:

- Solent & Isle of Wight Lagoons SAC[5] which qualifies for coastal lagoons;
- Solent Maritime SAC[6] which qualifies for a range of coastal habitats including vegetated shingle, saltmarsh, shifting sand dunes and also for the Desmoulin's Whorl Snail *Vertigo moulinsiana*.

1.5 While Ramsar sites include:

- Chichester and Langstone Harbours[7];
- Portsmouth Harbour[8];
- Solent and Southampton Water[9].

Impacts of development

1.6 The shoreline is heavily populated and includes urban centres such as Southampton and Portsmouth. Much of the existing development is focussed around the coast and future housing growth is likely to also focus on the coastal strip. High levels of housing (and other development) in close proximity leads to challenges to protect and enhance the nature conservation interest. The coast has a strong draw for recreation and the Solent draws people for a wide range of recreation activity that range from walking, dog walking, bird watching and other terrestrial activities to sailing, water sports and other activities based in or on the water (Caals et al., 2020; Fearnley et al., 2010; Liley & Panter, 2018). It has long been recognised that there is a challenge to provide for access, accommodate the increasing population and levels of development while maintaining and enhancing the conservation interest. Disturbance to birds is a particular concern.

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[5] See http://publications.naturalengland.org.uk/publication/5646122018144256 for conservation objectives and further information
[6] See http://publications.naturalengland.org.uk/publication/5762436174970880 for conservation objectives and further information
[7] See https://jncc.gov.uk/jncc-assets/RIS/UK11013.pdf for the Ramsar Information Sheet and further information
[8] See https://jncc.gov.uk/jncc-assets/RIS/UK11055.pdf for the Ramsar Information Sheet and further information
[9] See https://jncc.gov.uk/jncc-assets/RIS/UK11063.pdf for the Ramsar Information Sheet and further information

Legislative context

1.7 There is strict legislative protection afforded to SPAs, which are 'European sites' and part of the national site network. This protection extends to local authority plans. Following a series of studies around 2009[10] and advice from Natural England, the relevant local authorities started to implement a strategic approach to mitigation to ensure new housing could proceed without adverse effects to the integrity of the relevant European sites.

Bird Aware Solent

1.8 During 2014, the Solent local authorities and other partners[11] came together as the 'Solent Recreation Mitigation Partnership' (subsequently rebranded as Bird Aware Solent) to draw up, implement and monitor an Interim Solent Recreation Mitigation Strategy to ensure that the additional recreational activity will not result in additional bird disturbance and thus harm to the SPAs. The mitigation measures in that interim strategy comprised a team of rangers to reduce disturbance by influencing the behaviour of visitors, and initiatives to encourage responsible dog walking.

1.9 In December 2017, a long-term mitigation Strategy was endorsed by the Partnership for Urban South Hampshire (now known as the Partnership for South Hampshire) and this is now operating throughout the Partnership area. Mitigation measures are funded through developer contributions which are collected for all new development within a 5.6km radius of the 3 SPAs (see Map 1).

Need for review

1.10 This report has been commissioned 5 years after the long-term mitigation strategy was endorsed to undertake a review of all the available data and assess whether the Partnership is making progress in the implementation of mitigation. The report is needed to highlight the lessons learnt from the first

[10] These were the Solent Disturbance and Mitigation Project and included an initial desk-based study (Stillman et al., 2009), followed by on-site visitor fieldwork (Fearnley et al., 2010); ornithological fieldwork (Liley et al., 2010); a postal household survey (Fearnley et al., 2011) and detailed modelling drawing on the other reports (Stillman et al., 2012)

[11] Natural England, Royal Society for the Protection of Birds, Hampshire & Isle of Wight Wildlife Trust, Chichester Harbour Conservancy.

5 years and will inform how mitigation might need to change or adapt in the future.

1.11 Over the 5-year period covered by this review there have been a range of factors that have influenced access patterns and how people use the countryside for recreation. The Covid pandemic has had marked effects on how people use their local greenspace (Kleinschroth & Kowarik, 2020; Natural England & Kantar Public, 2021) and there has been a marked increase in dog ownership associated with the pandemic (Morgan et al., 2020). Paddleboards are increasingly popular and their portability and ease of launching open access into new areas. Climate change also affects access and recreation use (Coombes & Jones, 2010; Simpson, 2013), with milder weather and more variable conditions likely to mean access patterns are less predictable.

1.12 There is also an ecological crisis and marked declines in a range of species within the UK (Hayhow et al., 2019; House of Commons Environmental Audit Committee, 2022). Bird species such as Curlew are among the most pressing bird conservation priorities in the UK and it is therefore necessary to understand how bird numbers and their distribution have changed.

Report structure

1.13 The review is structured according to a series of specific questions, with each forming a discrete section of the report. The questions are based on an original list in the specification for the work from Bird Aware Solent and have been refined following initial discussion.

- How have housing numbers changed over time?
- How have visitor numbers to the SPAs changed over time in relation to housing?
- How have visitor distribution and behaviour changed over time?
- How have the numbers of visitors undertaking potentially disturbing activities changed over time?
- How have bird numbers (SPA interest) changed over time?
- Do any changes in bird numbers relate to changes in access?
- What level of mitigation has been implemented?
- Are mitigation measures successful in changing visitor behaviour?
- Are mitigation measures proportionate to the increase in disturbance associated with new development?
- How is the Partnership perceived?

1.14 For each relevant section we draw on a range of data and reports that are referenced and explained in the relevant section.

2. How have housing numbers changed over time?

Data sources used

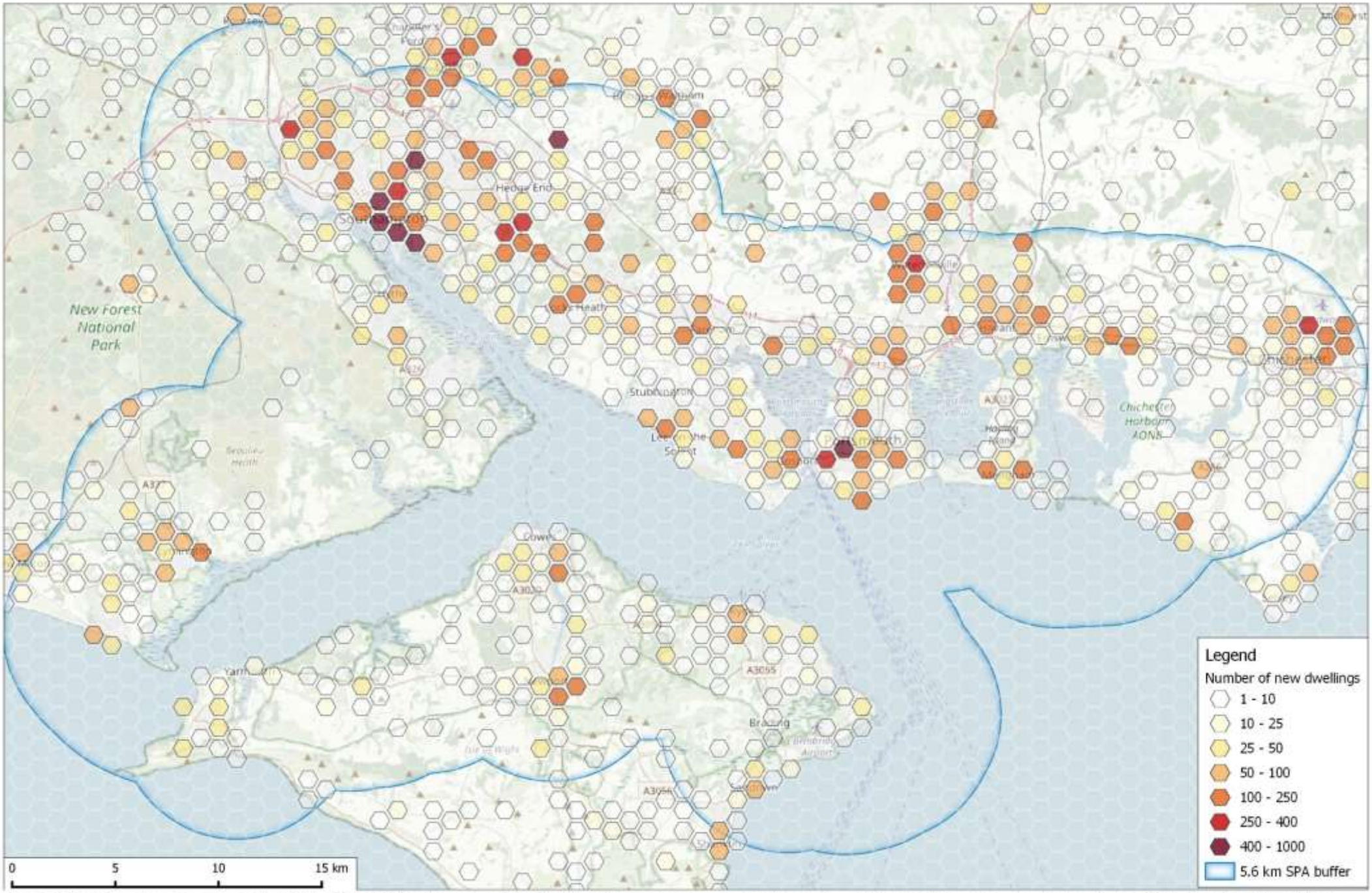
2.1 National postcode data with the number of residential delivery points provides a standard dataset with data available by year and held by Footprint Ecology. We supplement these postcode data with data on planning permissions granted and Annual Local Enterprise Partnership (LEP) returns, provided by Bird Aware Solent.

Overall housing change

2.2 In January 2016 there were 515,881 registered residential dwellings within the 5.6km buffer. In January 2022 there were 538,214, an additional 22,333 dwellings and a percentage increase of 4.3%.

2.3 Map 2 shows the number of new dwellings categorised using 1km hexagonal grid. The highest discrete cell values, each with more than 500 new dwellings were: city centre Portsmouth (1 cell), Southampton (2 cells) and Boorley Green, Hedge End (1 cell).

Map 2: The change in the number of dwellings between 2016 and 2022 categorised using a 1 km hexagonal grid.



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Change within the zone of influence, by local authority

2.4 Housing change within 5.6km is summarised by local authority in Table 2. The three authorities with the most change have been Southampton, Eastleigh and Chichester.

Table 2: Housing change (2016-2022) within the 5.6km buffer, by local authority. The top three values in each column (red, bold) and bottom three values (blue, bold) are highlighted.

Local Authority	Number of dwellings in Jan 2016	Number of dwellings in Jan 2022	Number of new dwellings	Percentage increase
Arun District	**0**	**0**	**0**	**0**
Chichester District	31,740	34,170	**2,430**	8%
City of Portsmouth	**87,103**	**89,489**	2,386	3%
City of Southampton	**104,407**	**108,913**	**4,506**	4%
East Hampshire District	**928**	**1,122**	**194**	**21%**
Eastleigh District	29,131	32,297	**3,166**	**11%**
Fareham District	49,018	50,568	1,550	3%
Gosport District	37,185	38,111	926	**2%**
Havant District	48,502	50,270	1,768	4%
Isle of Wight	**58,368**	**60,275**	1,907	3%
New Forest District	55,267	56,445	1,178	**2%**
Test Valley District	7,151	**7,710**	**559**	8%
Winchester District	**7,081**	8,844	1,763	**25%**
Total	**515,881**	**538,214**	**22,333**	**4.3%**

Change by Bird Aware Sectors

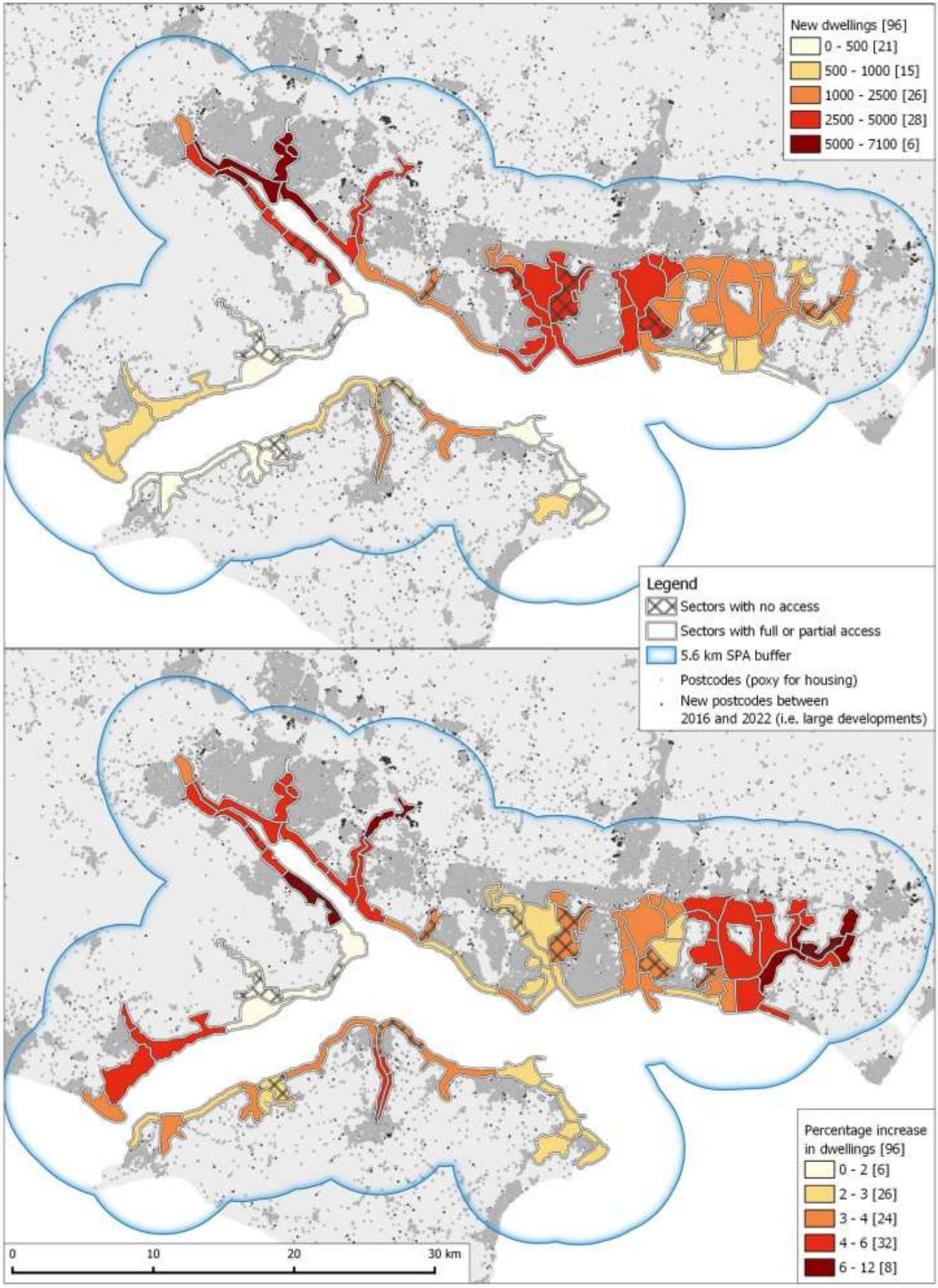
2.5 The coastline is divided into a total of 96 sectors by Bird Aware Solent. These are prioritised by the Bird Aware team with respect to the amount of ranger time. The amount of housing change (2016-2022) was extracted for each sector. In order to address the effect of open water we trimmed the buffers so that they did not encompass any areas beyond 500m of open coastal waters. This created an exclusion area of part of Southampton Water, the mouth of Chichester Harbour and The Solent.

2.6 Individual values by sector are given in Appendix 1 and shown in Map 3. Some of the largest increases in new dwellings were recorded in Southampton, with the two highest increases at the sectors between Itchen to Northam Bridge (SWIN 6,977 new dwellings over 6 years) and Northam Bridge to Riverside Park, (SWIS, 7,072). The two largest relative percentage

increases were at Botley to Curbridge (SWBU) and the last sector closest inland to Fishbourne (CHFI), both with a 7.9% increase.

2.7 Around Chichester Harbour there were some large percentage increases given relatively low housing. The smallest increases relative to the already high volume of housing were around Portsmouth Harbour.

Map 3: The number and percentage increase in dwellings between 2016 and 2022 by sector.



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Planning permissions and local authority data

2.8 Table 3 give the total number of dwellings that were given planning permission on the basis of a contribution to Bird Aware Solent. The number of new dwellings were very high in the early stages, peaking at 6,180 in 2016/17. However annual totals have decreased steadily, with the lowest in the financial year 2020/21 (under 2,000 dwellings), due in part to the coronavirus pandemic.

2.9 Overall, the total of dwellings contributing stood at 29,437 at the end of March 2020. This represents an increase of 5.7% on the 515,881 registered residential dwellings within the 5.6km buffer in 2016.

2.10 The postcode data for the period to 2022 gives an overall level of change of 22,333 dwellings within 5.6km, it would therefore seem that many of the dwellings that have contributed to mitigation are yet to be completed and/or occupied. The full potential impact of the growth is therefore yet to manifest, and while this will always be the case, it may have implications for later parts of the review (e.g. regarding effectiveness).

2.11 The largest numbers of new dwellings contributing to the mitigation have come from city or town local authorities, namely: Eastleigh (7,257 dwellings, 25% of the total dwellings), Southampton (5,993, 20%), Portsmouth (4,167, 14%) and Chichester (part only, 3,454, 12%). These match the overall increases shown from postcode housing data in Map 2.

Table 3: Total number of dwellings granted planning permission and subject to a developer contribution to Solent recreation disturbance mitigation, by financial year.

	2014/15 (and earlier)	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	Total across years	Relative % of all planning permission dwellings
Chichester (part)	375	526	841	402	1,050	141	70	49	3,454	12%
East Hampshire (part)	34	109	1	2	14	0	1	0	161	1%
Eastleigh	1,898	504	1,453	2,193	124	654	127	304	7,257	25%
Fareham	172	82	132	146	211	23	86	203	1,055	4%
Gosport	33	180	49	69	95	68	83	102	679	2%
Havant	198	265	384	240	271	422	283	349	2,412	8%
Isle of Wight (part)	43	117	547	149	295	165	152	127	1,595	5%
New Forest District (part)	207	99	112	185	172	196	132	231	1,334	5%
New Forest NPA (part)	1	5	32	17	14	31	49	10	159	1%
Portsmouth	577	692	362	485	227	42	632	1,150	4,167	14%
Southampton	588	601	2,157	476	359	690	277	845	5,993	20%
South Downs NPA (part)	0	1	0	3	0	0	0	0	4	0%
Test Valley (part)	1	649	67	3	13	2	0	11	746	3%
Winchester (part)	1	13	43	179	19	130	14	22	421	1%
Total	**4,128**	**3,843**	**6,180**	**4,549**	**2,864**	**2,564**	**1,906**	**3,403**	**29,437**	**100%**
Cumulative total	**4,128**	**7,971**	**14,151**	**18,700**	**21,564**	**24,128**	**26,034**	**29,437**		

Key points: Changes in housing

In January 2016 there were 515,881 residential dwellings within the 5.6km zone of influence and in January 2022 there were 538,214. This reflects an increase of 22,333 dwellings (4.3%).

The total number of dwellings that have been granted planning permission and have contributed towards mitigation was 29,437 at the end of March 2020, markedly higher than the postcode data above. It would seem therefore that many of the dwellings that have contributed to mitigation are yet to be completed and/or occupied. The potential impact of the growth to date is therefore yet to manifest.

3. How have visitor numbers to the SPAs changed over time in relation to housing?

Overview

3.1 The number of recreation visits made to the Solent shoreline was recently estimated to be in the region of 13 million over a winter season (Panter & Saunders, 2020). In this section we use a range of data to consider how visitor numbers have changed over time and how such changes relate to the levels of housing change summarised in the previous section.

Data sources used

3.2 We draw on a range of different data sources to derive estimates of visitor change:

- Passive counters (automated counters at 10 locations);
- On-site visitor surveys (counts of people passing at 10 locations);
- Rangers data, with counts from the times rangers are out on site;
- Vehicle counts (counts of all parked vehicles at parking locations along the coast);
- Vantage point counts (counts of people on the shoreline made as part of the vehicle counts);
- MENE/the People and Nature Survey which is a national survey with a sample of households across the country and run by Natural England (data can be filtered for specific geographic areas).

Passive counter results

3.3 Counters are an ideal mechanism to show changes in visitor footfall over time. The data are however limited in that they reflect only a small number of very specific locations and there have also been ongoing issues within the counter data, particularly over the winter.

3.4 10 counter locations (11 individual counters, one location with two counters for people and bikes respectively) have data from November 2019 to March 2022. This period includes covid and is characterised by notable errors, leading to some extreme values. For analysis, we compared the median from the first 5 months to the last 5 months to derive a change value for each counter. The median value was used as there were some extreme values. This gave an overall 23% increase in access across the time.

On site visitor surveys

3.5 On site visitor surveys have been conducted in the winter of 2019/20 (Caals et al., 2020), winter of 2017/18 (Liley & Panter, 2018) and winter of 2009/2010 (Fearnley et al., 2010). These surveys consisted of onsite interviews with site users and counts of people passing were also made. These data have limited potential to give a meaningful measure of change as they are simply based on a total of just 16 hours (spread evenly between weekdays and weekends, and across at least two dates) and relate to a specific point in space. However, they provide another mechanism for examining change in access.

3.6 Data are summarised in Table 4 which also includes the level of housing growth around each point. These data are very variable and show little in the way of a consistent pattern across survey locations. This is likely to be a result of the influence of weather and other factors (such as local path conditions) influencing the visitor use on the given day of the surveys. The data show a median level of change from 2017/18 to 2019/20 of a 51% increase in visitor numbers. Counts had decreased at 2 locations very slightly (by -2%) and gone up often markedly at all others. There was no indication that the largest changes had occurred at the sites with the most new housing.

Table 4: Total people tallied passing from 16 hours surveying on each of the 3 counts, with change over time examined and related to change in housing in a 5.6 km radius.

	2009/10 count	2017/18 count	2019/20 count	Visualised change over time	% change between 2009/10 and 2019/20	% change between 2017/18 and 2019/20	% increase 2016-2022 housing
1. Calshot	169	222	265		57%	19%	0.6%
2. Eling	454	123	120		-74%	-2%	4.1%
3. Weston	255	212	314		23%	48%	5.9%
4. Hook	216	76	151		-30%	99%	3.8%
5. Salterns	129	93	168		30%	81%	2.6%
6. Hilsea	359	133	1615		350%	1114%	2.9%
7. Langstone	65	42	68		5%	62%	4.2%
8. Hayling	151	275	270		79%	-2%	2.1%
9. Itchenor	206	169	192		-7%	14%	7.7%

10. Newtown IOW	129	41	63		-51%	54%	5.8%
Median value					**14%**	**51%**	**4.0%**

Rangers' observation data

3.7 Bird Aware rangers complete a survey on SNAP software following every site visit. The ranger data provides a very large reliable dataset, although any comparisons between years have to account for variation in survey effort at individual sections.

3.8 A simple metric of the number of people per hour seen each year is given in Table 5. This generally shows an overall increase in access. However, this is also very variable, and conflated by covid. A decrease in access is evident in the winter prior to covid and there are increases in the winter during and immediately after pandemic.

Table 5: Ranger visit data summarised by winters to give an annual estimate of the average number of people per hour seen.

	2017/18	2018/19	2019/20	2020/21	2021/22
Total number of visits by rangers	466	729	871	324	656
Total number of hours	1,111	1,777	2,239	754	1,595
Total number of visitors present	16,868	33,968	32,071	21,846	34,343
Number of visitors per hour	**15.2**	**19.1**	**14.3**	**29.0**	**21.5**
% increase from 2017/18 'baseline'	**n/a**	**26%**	**-6%**	**91%**	**41%**

Vehicle counts

3.9 Vehicle counts at set parking locations; formal, informal, and roadside locations, have been conducted for several years across the Solent coastline as a proxy for the levels of access on the SPA. These were conducted for the first time in 2016/17 (Panter & Liley, 2017), again in 2018/19 (Panter & Caals, 2019) and for a brief period in the first winter during covid 2020/2021 (which was ultimately cut short due to the pandemic, Panter & Caals, 2021) and then most recently in 2021/22 (Caals, & Panter, 2022).

3.10 The counts involve 6 transects undertaken simultaneously and together these cover around 334km and count nearly 10,000 parking spaces spread over 180 parking locations. The counts take place 12 times over the period November-March.

3.11 Whilst a proxy for visitor numbers per se, the counts provide a reliable metric for change over time. The remit of parking locations has remained consistent, the counts cover the whole coast and there are multiple counts for each year. The only issue with the data relate to car park closures which are a variable feature within the dataset.

3.12 Table 6 gives the average number of vehicles across count years. These overall totals suggest an increase in access of between 8% (median) and 26% (mean) from the first count to last count.

Table 6: Comparison over time of the total number of motor vehicles across the whole transect (all parking locations). Means are given ±1 standard error ('SE').

	2016/17	2018/19	2020/21	2021/22
Number of transects	12	12	3	12
Mean (±SE) vehicles across parking locations	1,967 ± 145	2,335 ± 465	2,257 ± 353	2,478 ± 403
Median vehicles across parking locations	1,891	1,715	2,539	2,040
Max vehicles across parking locations	3,031	7,082	2,676	5,824
Median % increase from 2016/17 'baseline'	**n/a**	**-9%**	**34%**	**8%**
Mean % increase from 2016/17 'baseline'	**n/a**	**19%**	**15%**	**26%**

3.13 The average number of vehicles per parking location by year are shown in Figure 1. These reflect an increase over time.

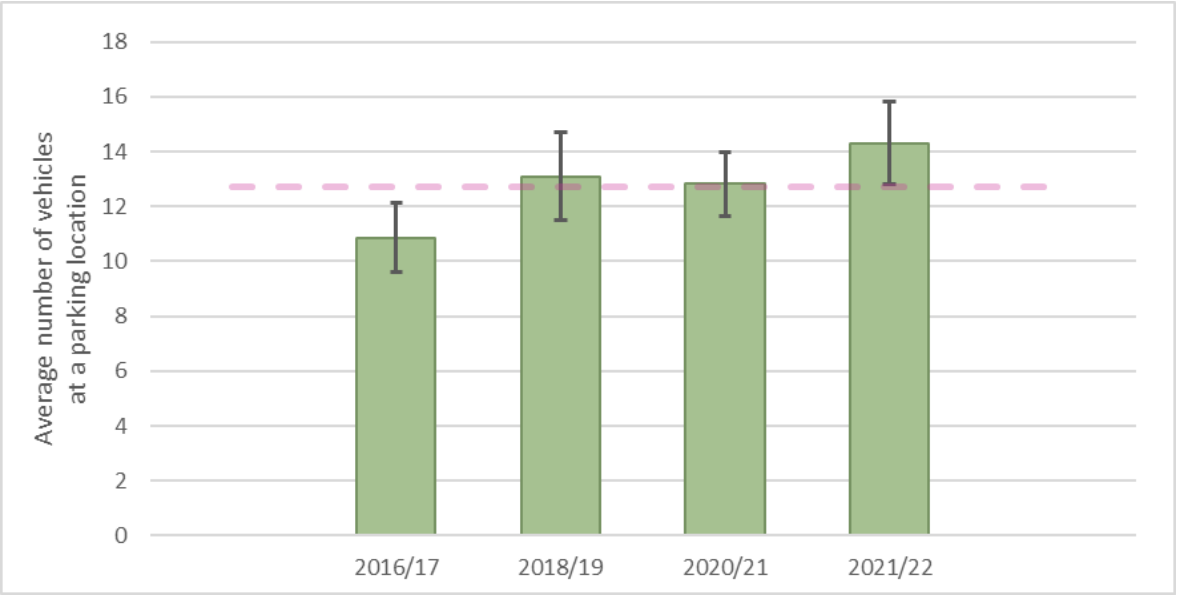

Figure 1: Average number of vehicles recorded at parking locations each year. Error bars show standard error across all parking locations. Dashed line shows the overall mean across all parking locations and years.

Vantage point surveys

3.14 Vantage point observations recording the number of people visible within set areas at selected parking locations are conducted as part of the driving transects. These typically involve counts of people visible on a given beach or shoreline. These suggest large increases in access (Table 7).

Table 7: Total number of people recorded across the coastline on an averaged transect. The two most common activities, walking with and without a dog are given separately.

	2016/17	2018/19	2020/21	2021/22
n	12	12	3	12
People walking without dogs	67.9	116.3	236.3	192.3
People walking with dogs	52.2	72.9	157.7	111.8
All people (any activity)	165.8	262.3	506.7	362.7
% increase from 2017/18 'baseline'	**n/a**	**58%**	**206%**	**119%**

MENE/PANS

3.15 Monitor of Engagement with the Natural Environment (MENE) ran from 2009-19 and has been superseded by the People and Nature Survey (PANS). Local authority level data from PANS will not be available until 3 years of data have been collected (currently anticipated to be end of 2023).

3.16 Some of these data were recently pooled to estimate visits to the Solent (Panter & Saunders, 2020). Revisiting these analysis on the % of interviewees who visited beach/coast in the previous week from surveys in winter from the local authority data was limited by small sample sizes. However, this suggested an increase of 4% over a 5 year period between the surveys completed in 2013/14 and 2018/19.

Overall change

3.17 We have used a range of data sets and these consistently indicate an increase in access, corresponding to the national picture. Data are summarised by SPA in Table 8 and the table also gives the % change in housing (within a 5.6km radius). The table gives very varied figures with little clear consistency between SPA sites. The results suggest the overall increase in access (potentially 26% across all 3 SPAs, using the most reliable count method, that of vehicle counts) is considerably larger than the increase in housing (4.3%). This would suggest that housing increase is not the sole driver of access change.

Table 8: Overall summary of visitor access metrics in relation to housing change and shown for the individual SPAs. Only the first values and last values only considered for each metric to give a percentage change. The reliability column reflects our degree of confidence in the figures for each method.

Metric	Date range	Reliability	Solent & Southampton Water	Portsmouth Harbour	Chichester and Langstone Harbours	Across all 3 SPAs
HOUSING CHANGE	**2016-22**		**4.3%**	**3.2%**	**4.4%**	**4.3%**
Tally	2009-20	*	-25%	265%	26%	51%
Counters	2019-22	*	-11%	1,014%	9,963%	23%
Rangers	2017-22	**	40%	27%	28%	49%
Vantage Points	2016-22	**	140%	852%	97%	119%
Vehicle counts	2016-22	***	18%	33%	45%	26%

National context

3.18 A single headline figures for the national context trends in access is not readily accessible, hampered by different survey mechanisms and covid.

3.19 One useful national headline figure is that the number of outdoor-related activities has increased by 30% between 2011 and 2016 (Office for National Statistics, 2021). Much of this reported increase has been driven by a 50% increase in outdoor visits in urban setting, but the two second highest increases were 'Coastal margin' and 'Marine' settings, with a 15% increase.

3.20 The MENE data can again offer a national picture[12]. Data from 2009-2019 suggest more people are visiting the natural environment per week, with an estimated 1.3 visits per week to the natural environment in 2009/2010 increasing to 1.7 visits per week in 2018/19. Furthermore, overall estimated annual visits increased from around 2.7 billion to 3.9 billion – a 47% increase in visitors. Interestingly the average distance travelled to visit has declined slightly, with those travelling by car decreasing from a typical distance of 15 miles to 10 miles.

3.21 Post MENE, the subsequent PANS data was summarised with complex data collected from social media analytics during the pandemic (Natural England & Kantar Public, 2021). This analysis shows that visits remained relatively consistent after the initial shock of the pandemic. Urban greenspaces were the most consistently visited, however, the coastal sites showed the greatest change. The data suggest low access levels in spring 2020, but peaking in the summer and remaining high through the winter compared to 2019 baseline data.

Key points: Changes in visitor numbers in relation to housing

Data from a range of sources consistently indicate a marked increase in access over the period covered in this review, but there are marked variations in the figures and lots of uncertainty. Vehicle counts are perhaps the most reliable and indicate a 26% increase from 2016/17 to 2021/22. This is markedly higher than the 4.3% increase in housing.

[12] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/828552/Monitor_Engagement_Natural_Environment_2018_2019_v2.pdf

4. How have visitor distribution and behaviour changed over time?

Data sources used

4.1 We draw on the following data sources:

- Rangers' SNAP data
- Vantage point surveys and car park counts
- Coastal surveys

Distribution

Vehicle counts

4.2 The parking locations were assigned to Bird Aware Solent sectors and the multiple parking location counts pooled for the sector. Each sector had an average of 3 parking locations. Only 54 of the 96 sectors had one or more parking locations within them (i.e. 42 have no parking provision) and 21 of the 54 sectors, had just one parking location.

4.3 We then used the repeated transect data to determine change per sector over time. For each sector we calculated a correlation coefficient, which are shown in Map 4. Correlation coefficients range from -1 to 1, with negative values indicating a negative change (i.e. number of vehicles decreasing over time). Values close to 0 reflect those where there is not a good fit or clear pattern, whereas values close to -1 or +1 reflect a steady, consistent and year-by-year change. Map 4 shows 12 of the 54 sectors (22%) recorded a reduction in the number of vehicles recorded from the surveys over time. 17 sectors (31%) had coefficients of 0.6 or more, reflecting a clear increase and 25 sectors (46%) had a correlation of 0.5 or more. The strongest positive correlations were at SWWS (Weston Shore to Netley) and IWFV (Fort Victoria).

4.4 The Map shows no clear pattern whereby particular SPAs or extensive parts of the coast have consistently shown a similar change. The greatest percentage change in vehicles counted per section (comparing the averages for the first year to the last year), was at Bosham to Nutbourne (CHBN), with a 500% increase (but note this only involved a change of an average of 0.08 vehicles to 0.5 vehicles) and Port Solent (PHPS, 289% increase, 1.5 to 5.8 vehicles). The greatest actual change in the average number of vehicles was recorded at the Portsmouth, Southsea and Eastney (PHSS) section with

change of 85.1 vehicles between 2016/17 and 2021/22 surveys, followed by East Head (CHEH) with 75.1 vehicles.

Ranger counts

4.5 Rangers log the number of people seen as part of their visit, using a standard count method that includes anyone passing the ranger. These counts, adjusted by the number of ranger hours, can be used to calculate a visitors per hour figure which can be used to compare between sites and years. It should be noted however that the Rangers target their time at sectors so as to coincide with a manageable flow of visitors, and as rangers gain experience and local knowledge, changes in visitor numbers could reflect different decisions by the ranger team as to when to visit and where to stand.

4.6 The increase or decrease in the number of people typically seen were compiled over years for each sector. A correlation for each sector determined if there had been an overall increase or decrease in people seen. Sectors are categorised by these correlations in Map 5. Positive correlations mean the values for a given sector increased over time. Just over a third (28, 37%) had a correlation coefficient of over 0.5, indicating a clear consistent increase. Around a third of the sectors, 24 of the 76 (32%), showed a negative correlation and therefore typically had seen a reduction in the number of people over time.

4.7 The two largest increases in terms of the overall number of visitors from the first year to the last year was at Cowes (IWCO), 52.5 people per hour and Stokes Bay (SWSB), 43 people per hour. Both of these are relatively infrequently visited and therefore did have fewer counts than other sectors.

4.8 It is important to note that the changes in access recorded from the ranger counts and from the vehicle counts were not correlated. There were several locations with large increases in access according to one of these datasets, but large decreases according to the other dataset. These differences probably reflect the different recording methods, as clearly the vehicle counts only use counts of cars and many people will access sites on foot or by bike, while the ranger counts will only reflect those people actually seen by rangers, a function of where the ranger focussed their time during their visit.

Map 4: Sections categorised by the change in access over time recorded from vehicle counts. Values range from -1 to 1 to indicate increase or decrease.

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Map 5: Sections categorised by the change in access over time recorded from ranger SNAP data. Values range from -1 to 1 to indicate increase or decrease.

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Behaviour

Vantage Point observations

4.9 The vantage point observations, conducted as part of the driving transects provide data on visitor behaviour. These involve counts of people visible along a stretch of shore or beach and are undertaken during the driving transects.

4.10 The vantage points record the number of dogs, and whether the dogs are on or off lead at the moment of the observation. The number of dogs seen has generally increased over time, although largely in line with the number of people seen. The percentage of dogs off lead has generally decreased over time, with almost 9% more dogs on lead based on the vantage point counts.

Table 9: Total number of dogs recorded from vantage points across the coastline averaged per transect.

	2016/17	2018/19	2020/21	2021/22
n	12	12	3	12
Average number of dogs per transect	37.5	59.8	125.0	81.8
% change in dogs per transect from 2017/18 'baseline'	**n/a**	**+59%**	**+233%**	**+118%**
% dogs off lead	67.8%	62.6%	59.5%	58.9%
% dogs on lead	32.2%	37.4%	40.5%	41.1%
% change in dog off lead 2017/18 'baseline'	**n/a**	**-5.2%**	**-8.3%**	**-8.9%**

4.11 Table 10 summarises data for all activities recorded on the vantage point counts. The correlation coefficients give the change in the values across all 4 counts using the average number of each count unit recorded on a transect (as given for 2021/2 in the table). The strongest correlation was observed in the numbers of people seen bait digging, from an average of 1.7 in the first year steadily increasing to an average of 2.3 in the most recent year. It should be noted that some of the percentage change figures are extremely large, for example for kitesurfing (3200% change). Such large percentages are typically derived from very low actual counts, in the case of kitesurfing there was just 1 counted in the first survey season (across all 12 transects) compared to 33 in the most recent. A difference of just 1 or 2 kitesurfers in the first year would have made a marked difference and highlights the problems associated with count data when events are infrequently

encountered. It is also important to note that changes, particular in weather in just one year, can make a substantial difference for the data. Also, the data recording has changed, along with changes in activities, for example, swimming was not consistently recorded in the initial counts, but is now formally recorded and anecdotally does appear to be an increasing activity. While there has therefore clearly been a marked increase in activities such as kitesurfing (and kayaking, paddleboarding and swimming) the percentage change figures should perhaps be treated with some caution.

4.12 The final column in the table shows the change in the relative abundance of each activity within its respective count unit. As already noted the number of dogs off lead is 9% fewer, based on the relative abundance in the first survey year compared to the last survey year. Other notable changes include the 15% increase in kitesurfing, 29% reduction in anglers and the 10% increase in walkers without dogs.

Table 10: Activities recorded in the vantage point counts and change over time. The correlation coefficient is based on 4 years and negative values indicate a decrease. The percentage change is based on the average number of events counted per transect in the first year compared to the average number per transect in the final year. The final column calculates the proportion of each activity relative to other similar activities (other 'marine' activities, dogs and other 'terrestrial' activities to highlight those activities which have increased or decreased greater to other activities).

	Average number seen in 2021/2 survey	Correlation coefficient across the 4 survey years	Percentage increase in average per transect between oldest count and newest count	Percentage change in the relative abundance of activites
Boat count				
Boats (non-commercial)	35.9	0.6	142%	n/a
'Marine' count				
Angling/fishing	5.3	0.0	-16%	-29%
Swimming	3.0	n/a	n/a	n/a
Kitesurfing	2.8	0.4	3200%	15%
Bait digging	2.3	0.9	40%	-3%
Windsurfing	2.3	0.3	4%	-8%
Kayaking/canoeing	1.1	0.2	1200%	5%
Paddleboarding	0.8	0.4	200%	2%
Water skiing	0.3	0.6	n/a	1%
Dog count				

Dogs - off lead	48.2	0.65	90%	-9%
Dogs - on lead	33.7	0.73	179%	9%
'Terrestrial' count				
Walking (without dogs)	192.3	0.8	183%	10%
Dog walking	111.8	0.7	114%	-1%
Sitting (not in cars)	13.8	-0.9	-44%	3%
Cycling	9.3	0.4	67%	2%
Jogging	6.0	0.4	16%	-1%
Bird/wildlife watching	3.3	-0.2	-27%	-2%
Horse riding	0.1	-0.6	-89%	0%
Other activities	8.2	-0.9	-67%	-10%
Total people	444.5	0.7	119%	n/a

Key points: Changes in visitor distribution and behaviour over time

The increases in visitor use are not concentrated in one area but instead data from both the vehicle counts and rangers show a patchy distribution of change, with some sectors showing a marked increase while there has been relatively little change at adjacent sectors.

Data show that a range of activities have increased, notably kitesurfing, kayaking, paddleboarding, walking (without a dog) and dog walking. While the number of dog walkers (and dogs) have increased, the proportion of dogs now kept on a lead has increased.

5. How have the numbers of visitors undertaking potentially disturbing activities changed over time?

5.1 In this section we consider whether certain activities pose a greater disturbance risk and the evidence as to which are changing over time.

Comparing across activities

5.2 The presence of people in the countryside, regardless of activity, will have the potential to cause disturbance.

5.3 It is important to recognise that disturbance impacts vary and disturbance is not just birds taking flight/fleeing when someone approaches. Disturbance can involve chronic avoidance of areas (for example birds keeping away from areas that are busy, such as close to footpaths), as in the Oystercatchers studied by Van der Kolk *et al.* (2022) that were shown through GPS tracking to avoid a roost site that was subject to high levels of human activity during the tourist season/when recreation levels were high. Furthermore, there is evidence that the presence of people can have physiological impacts (such as increased stress, elevated heart rate) on birds even if there is no obvious change in the behaviour of the birds (Arlettaz et al., 2015; Ellenberg et al., 2013; Tarjuelo et al., 2015). The implications of such physiological impacts could have detrimental individual and population-level effects in the long term.

5.4 With people potentially perceived by the birds as predators and a danger (see Beale & Monaghan, 2004 for discussion), it follows that all activities and visitors are relevant. The overall volume of people and levels of recreation use are therefore certainly a relevant consideration and target for mitigation.

5.5 Nonetheless, there are certain circumstances or types of event that pose particular risks. In general, we would highlight any event that:

- Poses a direct threat to birds (for example directly approaching birds);
- Involves fast moving or erratic/unpredictable behaviour;
- Involves people accessing areas where birds are (e.g. accessing areas of intertidal or close to roosts);
- Takes place in otherwise unvisited areas;

- Includes large groups of people or numbers of people (i.e. potentially perceived as a greater threat);
- That displaces visitors or results in changes in how people access and use the coast.

5.6 We would highlight the following types of activity as ones that are likely to have particular risks in terms of disturbance. The list has been drawn using evidence in the literature, our experience and the results of bird disturbance studies around the Solent (Liley et al., 2010; Liley & Panter, 2017; Saunders, & Liley, 2022):

- Dog walking (particularly dogs off-leads);
- Bait collection or collection of shellfish that takes people out onto intertidal areas;
- Paddleboards and kayaks;
- Photography (particularly bird photography);
- Windsurfing, kitesurfing;
- Fast moving and noisy activities such as RIBs, Personal water craft ('PWC') and water skiing;
- Wildfowling;
- Air-borne events/activities (including drones as well as micro-lights, helicopters, planes etc).

Evidence for change

5.7 There is evidence that most of these activities have increased over the 5 years, both nationally and on the Solent, with unknown trends for some activities simply reflecting a lack of comparable data (see Table 11).

Table 11: Evidence for change in the numbers of visitors undertaking potentially disturbing activities nationally and on the Solent. 'Unknown' indicates where there is a lack of information.

Activity	National picture	Solent specific	References
Dog walking	Increase in ownership following Covid; dog population has risen from 8.3 million in 2011 to between 10.2 million in 2022 and 13 million in 2022. 27% of adults owned a dog in 2022 and 59% of new owners aged between 16-34.	Increase (see Table 10)	PDSA, YouGov (2022), UK Pet Food[13] &PFMA [14]
Bait/shellfish collection	Unknown	Increase (see Table 10)	
Paddleboards	Increasing. RNLI data show lifeboat launches to paddleboard incidents went up 64% in 2021. Searches for "paddle boarding" increased by around 300% in 2021 when compared to 2019 – other water sports do not show the same increase.	Increase (see Table 10)	RNLI data from website[15]; Wilson (2022), Google Trends data[16]
Kayaks	British Marine report a marked increase in people taking up kayaking for the first time in 2020/21. Sports England data suggest participation in canoeing increased to 2018/19 (up to 4.8% of population) with a subsequent drop to 3.1% (2020/21). British Marine report a marked	Increase (see Table 10)	Sports England Active Live data[17]; Wilson (2022)

[13] See https://www.ukpetfood.org/information-centre/statistics.html
[14] See https://pfma.carbonit.co.uk/news/pfma-releases-latest-pet-population-data
[15] See https://rnli.org/news-and-media/2022/july/07/rnli-release-paddleboard-kayak-and-canoe-rescue-statistics
[16] See https://www.aquaplanetsports.com/blog/2021/10/19/searches-for-paddle-boarding-up-300-in-2021-compared-to-2019/
[17] See https://activelives.sportengland.org/Result?queryId=6842

Activity	National picture	Solent specific	References
	increase in people taking up kayaking for the first time in 2020/21.		
Bird photography	Bird photography has certainly increased in popularity due to the advances in camera equipment and affordability of equipment.	No photographers specifically recorded in disturbance study in 2016/17; whereas 26 logged in 2021/22 (accounting for <1% of access) however note that 2 surveys are not directly comparable.	Anecdotal information online[18]; Liley & Panter (2017); Saunders & Liley (2022)
Windsurfing	Sports England data suggest participation in general water sports increased to 2018/19 (up to 9.6% of population) with a subsequent drop to 6.1% (2020/21).	Increase (see Table 10)	Sports England Active Live data[19]
Kitesurfing	Sports England data suggest participation in surfing (including kitesurfing) increased from 2015/16 to 2017/18 and has remained roughly stable since	Increase (see Table 10)	Sports England Active Live data[20]
RIBs	UK boat ownership has increased 2018-2020	Just 3 (<1% of all access events recorded) RIBs/small boats on outboard motor logged in disturbance study in 2016/17; whereas 138 logged in 2021/22 (1% of access) – however note that the 2 surveys are not directly comparable.	Wilson (2022); Liley & Panter (2017); Saunders & Liley (2022)
Personal water craft	Unknown	Unknown.	
Water skiing	Unknown	Increase (see Table 10)	
Wildfowling	Trend unknown. BASC has more than 150,000[21] current members		

[18] E.g. https://www.pauljepson.com/the-changing-face-of-british-bird-watching/
[19] See https://activelives.sportengland.org/Result?queryId=6842
[20] See https://activelives.sportengland.org/Result?queryId=6842
[21] E.g. https://www.linkedin.com/company/basc/?originalSubdomain=uk

Activity	National picture	Solent specific	References
Drones	Increasing but little information on changes in recreational use.	Unknown	House of Commons Science and Technology Committee (2019)
Other airborne events	Unknown	Unknown	

Key points: Numbers of visitors undertaking potentially disturbing activities changed over time

The presence of people in the countryside, regardless of activity, will have the potential to cause disturbance and the overall volume of people and levels of recreation use are therefore certainly a relevant consideration and target for mitigation. Nonetheless, there are certain circumstances or types of event that pose particular risks and we highlight dog walking, bait collection, paddleboarding, kayaking, photography, windsurfing, kitesurfing, fast moving watercraft, wildfowling and air-borne events. There is evidence that most of these activities have increased over the 5 years, both nationally and on the Solent, with unknown trends for some activities simply reflecting a lack of comparable data.

6. How have bird numbers (SPA interest) changed over time?

6.1 The British Trust for Ornithology's Wetland Bird Survey (WeBS) involves monthly counts (around high tide) by volunteers and has been running for decades. It provides the means to monitor bird numbers and change over time. In this section we use WeBS data to consider changes in bird numbers.

BTO WeBS Alerts

6.2 Analysis of WeBS data are undertaken by the BTO through the system called WeBS alerts which uses the data to determine national, regional and site-specific (i.e. SPA-level) trends. These mean that alerts can be triggered for sites with marked declines. The alerts are categorised as medium (a decline of 25-50%) or high (a decline above 50%) and the most recent alerts (Woodward et al., 2019) cover the period from 1991/92 to 2016/17 (i.e. largely before the period covered by this review). Alerts are triggered separately for the short-term (5 years), medium-term (10 years), long term (up to 25 years) and since a baseline (which is different for each SPA).

6.3 By comparing site-specific declines with regional or national trends it is possible to identify changes that are site specific. Issues such as climate change and birds changing their migration patterns are unlikely to be site-specific whereas water quality could be more site specific. It is important to note that housing and access levels have risen across southern England and therefore disturbance could be site specific or effect birds at a more regional level.

6.4 WeBS alerts are summarised by SPA below, drawn from the BTO website[22]. The percentage declines for each species assessed are also given in Appendix 2. These alerts reflect widespread and often marked declines for many species, with many of the declines extending back over the long-term.

[22] Which see for further details and background. Accessed November 2022; https://app.bto.org/webs-reporting/alerts.jsp

Chichester and Langstone Harbours SPA

6.5 Alerts have been triggered for 10 out of the 15 SPA wintering bird species assessed and also for the wintering waterbird assemblage:

- High alerts: Shelduck, Ringed Plover, Bar-tailed Godwit, Sanderling;
- Medium alerts: Shoveler, Teal, Red-breasted Merganser, Grey Plover, Ringed Plover, Curlew, Bar-tailed Godwit, Sandling, Dunlin and the wintering waterbird assemblage.

6.6 Most of the alerts (and all the high alerts) are for the long term or since baseline periods. Red-breasted Merganser (-26% decline) and Sanderling -31% decline) were the only species to have alerts trigged in the short-term (i.e. from 2011/12 to 2016/17). The declines for Shelduck, Shoveler and Teal appear to be driven by site-specific pressures.

Portsmouth Harbour SPA

6.7 Alerts have been triggered for 3 of the 4 species assessed:

- High Alerts: Red-breasted Merganser, Dunlin;
- Medium Alerts: Dark-bellied Brent Goose, Red-breaster Merganser and Dunlin.

6.8 The only species without any alerts is therefore Black-tailed Godwit. Short-term declines are triggered for both Red-breasted Merganser (-26%) and Dunlin (-47%). Declines for Dunlin may be exacerbated by site-specific pressures and do not match other sites in the region.

Solent & Southampton Water SPA

6.9 Alerts have been triggered for 3 species and the wintering water bird assemblage:

- High alerts: Ringed Plover;
- Medium alerts: Dark-bellied Brent Goose, Black-tailed Godwit.

6.10 The only species with a short-term alert is Black-tailed Godwit (-25%). None of the declines appear to be site-specific.

Species plots (more recent WeBS data)

6.11 While the WeBS alerts only cover the period to 2016/17, more recent WeBS data are available, covering the period from 2016/17 through to the winter

2020/21 and results (to 2019/20) are also summarised in the annual WeBS reports produced by the BTO (see Frost et al., 2021).

6.12 Site totals (taken from Frost *et al.* 2021) are shown in Figure 2 by year. These data cover the period 2015/16 to 2019/20. The plots indicate declines in the overall numbers of birds over the period at Chichester Harbour, Langstone Harbour, Southampton Water, North west Solent and Newton Estuary. The declines are most marked at Chichester Harbour and over the period 2017/18 – 2019/20.

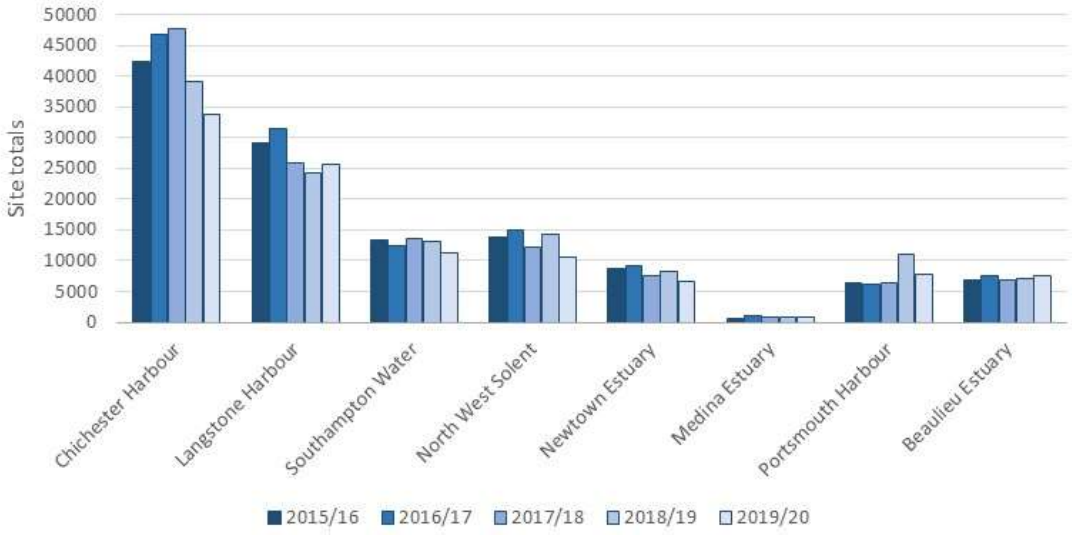

Figure 2: Site totals (summed counted maxima for each species, excluding gulls, terns and non-natives) from Frost *et al*. (2021).

6.13 The WeBS data are summarised in a series of plots for individual species, by SPA and for all sectors combined in Appendix 3, these plots include the data from 2020/21.

6.14 The plots show the combined totals for a given month for all WeBS sectors within the SPA and for all sectors combined. We have assigned WeBS sectors that are outside the SPA (e.g. south side of Hayling Island) to the respective SPA that is relevant.

6.15 The plots show some marked fluctuations and – as might be expected – variations that are likely to reflect effects of different weather conditions, survey coverage and other such factors. Nonetheless, for some species declines are apparent and visible year on year, these are highlighted in Table 12. There are clear declines over the 5-year period for 12 species. In many cases (8 species) the visible declines in the plots coincide with WeBS alerts.

The only species for which there are no suggestions of declines (from the plots or from WeBS alerts) are Pintail, Bar-tailed Godwit and Turnstone. The only species where the plots show a clear increase is Sanderling at Chichester and Langstone Harbours SPA, where the WeBS alerts highlight a 31% decline for the short term (to 2016/17) where the more recent data shows a year-on-year increase 2016/17 to 2020/21.

Table 12: Summary of clear declines (or increases) evident from the plots in Appendix 3 (i.e. year on year change). Grey shading reflects species that are qualifying features of the relevant SPA. "-ve" or "+ve" indicates a clear change (decline or increase) year by year over the 5 years 2016/17 – 2020/21. Brackets indicate apparent change but not as clear-cut. * indicates a site/species combination where WeBS alerts have also triggered medium or high alerts over any time period.

Feature	Chichester and Langstone Harbours SPA	Portsmouth Harbour SPA	Solent and Southampton Water SPA
Wildfowl (wintering)			
Brent Goose	**-ve**	*	*
Pintail			
Red-breasted Merganser	**-ve***	**-ve***	**-ve**
Shelduck	**(-ve*)**	**-ve**	
Shoveler	**-ve***		
Teal	**-ve***		
Wigeon			**-ve**
Waders (wintering)			
Bar-tailed Godwit			
Black-tailed Godwit			**-ve***
Curlew	*		
Dunlin	**-ve**	*	*
Grey Plover	**-ve***		**-ve**
Redshank			**-ve**
Ringed Plover	*		*
Turnstone			
Sanderling	**+ve***		
Assemblage			
Wintering waterbird assemblage	**-ve**		

Impacts of Covid on WeBS data

6.16 Inevitably the pandemic will have influenced the number of counts undertaken, however the main lockdown period in 2020 was after the main part of the winter and it is therefore most likely that the 2020/21 winter would have been impacted. The number of counts made during each winter for a selection of species across the whole area are summarised in Figure 3, which also shows those counts where the coverage was assigned by the surveyor as poor[23]. It can be seen there is relatively little impact of Covid apart from the 2020/21 winter when the number of counts is down by around 20%.

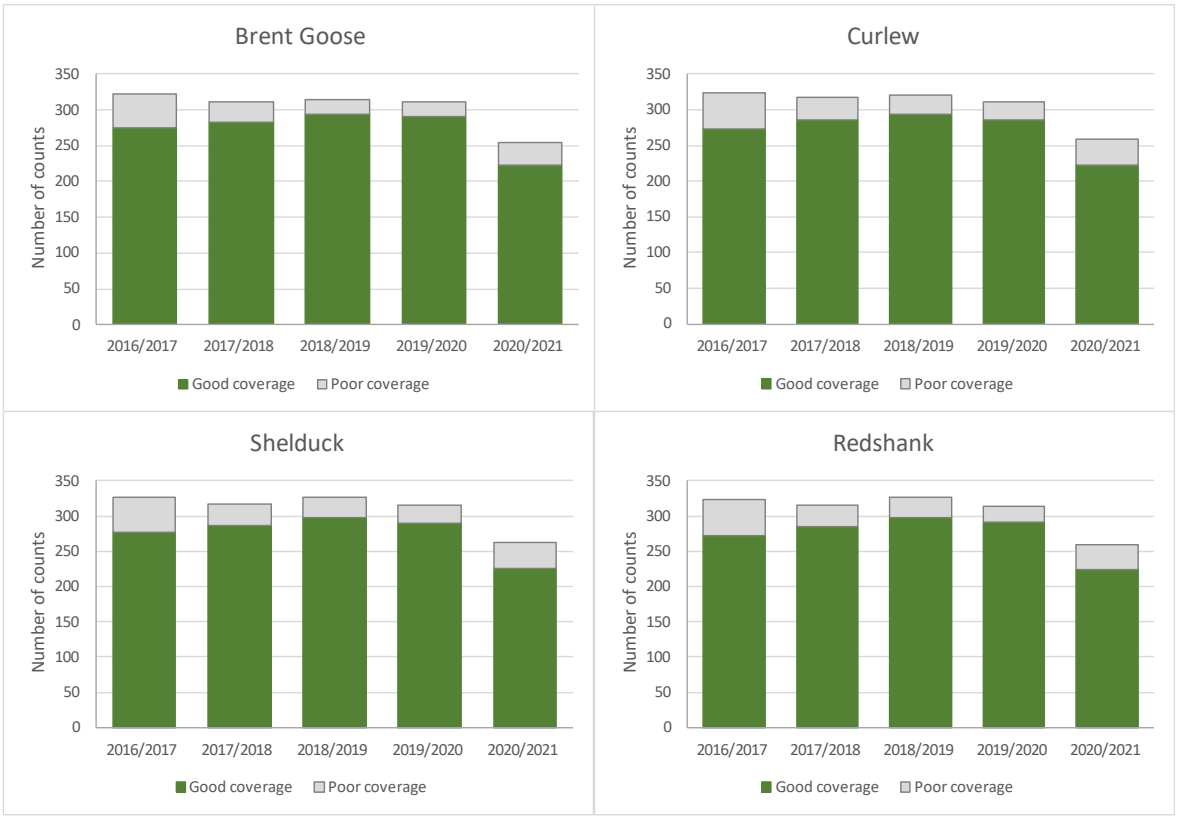

Figure 3: Number of counts by winter for selected species, by quality of coverage

[23] Poor coverage might be a result of poor visibility, limited access or similar on the day

Key points: Changes in bird numbers over time

WeBS data reveal declines for most of the qualifying wintering waterbird species across the three SPAs, and these extend over many years (i.e. before Bird Aware Solent started). Chichester and Langstone Harbours SPA is the site with the most species in decline and where the declines have been the most severe. For most species, the declines generally fit with the national picture whereby the distribution of wintering waterbirds across Europe has shifted due to climate change. However, the WeBS alerts (based on data from up to and including 2016/17) indicate that some declines (Shelduck, Teal and Shoveler in Chichester and Langstone Harbours and Dunlin in Portsmouth Harbour) do not match regional or national trends.

The one species where numbers appear to have increased in recent years is Sanderling at Chichester and Langstone Harbours SPA where numbers have increased since 2016/17.

The number of counts conducted during 2020/21 was impacted by Covid, which means potentially slightly less confidence regarding the most recent data used in this report.

7. Do any changes in bird numbers relate to changes in access?

7.1 In this section we use the WeBS data at the sector level (i.e. particular parts of the Solent coast) to check whether any of the declines relate specifically to those areas with more housing growth or increases in visitor numbers.

Changes in bird numbers at the sector level

7.2 The WeBS data are mapped in Appendix 4. For each species we show the % change in the WeBS data (comparing the maximum count from 2016/17 to the maximum in 2020/21). On the percentage change maps the red and orange colours reflect sectors with a marked decrease over the period. The lower maps show the distribution in 2020/21, with the maximum count for each species within each sector mapped.

7.3 It is important to note that the percentage change on a sector with small numbers of birds can be quite marked, even if the absolute change is quite small. For example, a change from 4 birds to 2 birds is a small absolute change but would represent a decrease of 50%. The lower map therefore provides context for the top map, highlighting which sectors are most important for the each species.

7.4 Those WeBS sectors with a high number of species declining (i.e. with a negative percentage change 2016/17 to 2020/21 are:

- Sector 20422 Chichester Harbour (Central) - West Chidham (13 species declining);
- Sector 18402 Newtown Estuary (12 species declining);
- Sector 20435 Chichester Harbour (West)- S.Hayling (Tournerbury and Mill Rythe) (11 species declining);
- Sector 17403 Pylewell (11 species declining);
- Sector 17426 Gosport Shore (11 species declining);
- Sector 20434 Chichester Harbour (West)- S.Hayling (Black Pt to Mengham Rythe) (11 species declining).

Changes in housing

7.5 We extracted the change in housing and amount of housing growth (2016 – 2021) within 5.6km of each WeBS sector using national postcode data. The choice of 5.6km reflects the zone of influence used for the mitigation strategy and the distance within which most local day visitors originate.

7.6 All WeBS sectors had some degree of housing change within the 5.6km and the percentage change ranged from 0.4% - 6.8%, with an average of 3.6%. As such there is little variation in the degree of change across the study area. In other words there is little scope to compare between areas with no change and areas with high change.

7.7 There was no evidence that the WeBS sectors with more species declining in them are those that have had the most housing change or have had more houses within 5.6km (Figure 4). Similarly, plots of change per sector for individual species and housing change revealed no consistent pattern such that the larger declines had occurred where there had been more housing growth within 5.6km (Figure 5).

7.8 To some extent the lack of clear relationship is not unexpected. Mitigation has of course been in place and has been targeted to the locations where there are the greatest risks from disturbance. The birds have been declining for many years and there are a range of factors influencing these changes – issues such as water quality, short stopping (i.e. birds not travelling so far to over-winter due to climate change), coastal squeeze or changing prey distributions may serve to mask the impacts from housing/recreation (yet do not mean that recreation is not a cause for concern or a risk for the future). Furthermore, the birds are mobile and will use multiple sectors and the overlap between birds and people will vary between sectors – such that some sectors even have little or no access.

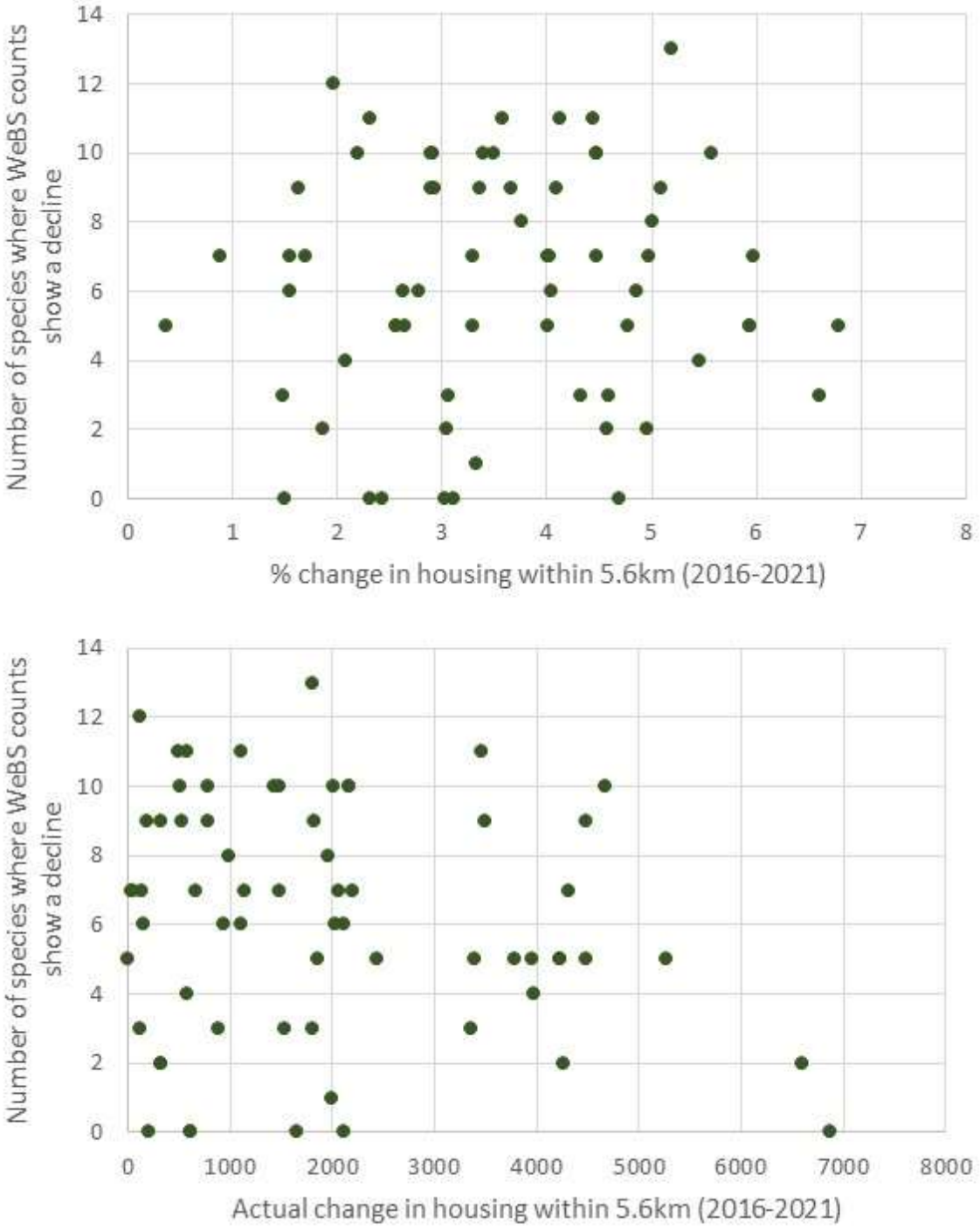

Figure 4: Scatterplots showing the number of declining species per WeBS sector (maximum count 2016/17 compared to maximum 2020/21) and % change in housing within 5.6km (top) and the actual volume of housing change (bottom) over the same period.

Figure 5: Changes in the numbers of selected species per WeBS sector (change being the difference between the maximum count over the winter 2020/21 and 2016/17) and change in housing (within 5.6km of each WeBS sector) over the same period.

Key points: Changes in bird numbers in relation to changes in access

We have generated a series of maps to show bird changes by sector. Those WeBS sectors with a high number of species declining (i.e. with a negative percentage change 2016/17 to 2020/21 are:

- Sector 20422 Chichester Harbour (Central) - West Chidham (13 species declining);
- Sector 18402 Newtown Estuary (12 species declining);
- Sector 20435 Chichester Harbour (West)- S.Hayling (Tournerbury and Mill Rythe) (11 species declining);
- Sector 17403 Pylewell (11 species declining);
- Sector 17426 Gosport Shore (11 species declining);
- Sector 20434 Chichester Harbour (West)- S.Hayling (Black Pt to Mengham Rythe) (11 species declining).

Most of the qualifying wintering waterbird species across the three European sites have declined. There was no evidence that the WeBS sectors with more species declining in them are those that have had the most housing change or have had more new houses within 5.6km. There was also no evidence for individual species that the larger declines had occurred where there had been more housing growth within 5.6km. This does not necessarily mean that disturbance and housing growth is not implicated in the declines as a range of factors such as national declines due to climate change will make any clear pattern hard to detect.

8. What level of mitigation has been implemented?

8.1 In this section we summarise the level of mitigation that has been delivered by Bird Aware Solent over since 2016/17. The section covers:

- Ranger time and other engagement;
- Site-specific projects;
- Suitable Alternative Natural Greenspace 'SANGs'.

Ranger time and other engagement

8.2 Key metrics relating to ranger time, events and social media are summarised by year in Table 13.

8.3 These show that over the five years (2017/18-2021/22) a total of 3,046 site visits have been conducted by the ranger team, totalling nearly 7,500 hours on-site. These annual figures show that the number of site visits undertaken peaked in 2019/20 at 871 (Figure 6) with a subsequent drop following the pandemic. The average number of people engaged with per hour also dropped in 2020/21, as a result of changes to working practices due to the pandemic[24] (Figure 6), otherwise the average has remained relatively level, at around 5 people per hour on-site for 3 years. The number of people engaged with on-site in a given year strongly correlates with the number of hours spent on site visits (Pearson Correlation Coefficient = 0.911, n=5, p=0.03), indicating that the level of engagement is directly in proportion to the amount of time rangers spend.

[24] Owing to Covid restrictions, Rangers were not permitted to approach coastal visitors and instigate engagement during the 2020/21 winter season. They were only permitted to engage with those who approached them and initiated the interaction.

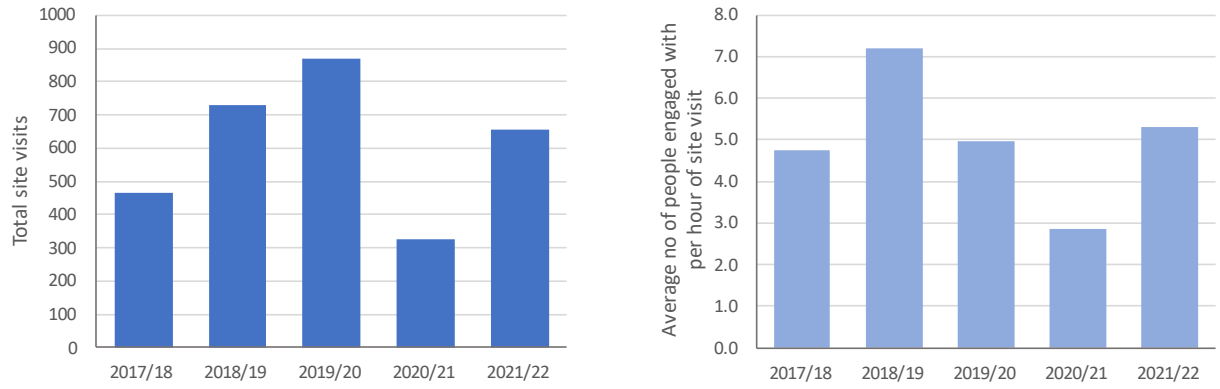

Figure 6: Number of site visits undertaken by year (left) and average number of people engaged with per site visit in each year (right)

8.4 Feedback from the more experienced Rangers indicates that the quality of engagement has increased with time. The Rangers have become better at preventing disturbance by directing people away from sensitive areas and having the confidence to speak to people after disturbance.

8.5 Bird Aware Solent have a Coastal Code to explain to visitors how to minimise disturbance. The code is promoted on the website and ensures Rangers have a consistent message as to how to behave. There is work ongoing to develop specific codes for activities such as water sports.

8.6 In addition, Bird Aware Solent has attended 174 community events and steadily built its social media following, with Twitter, Facebook and Instagram followers each now numbering over 2500 (Figure 9).

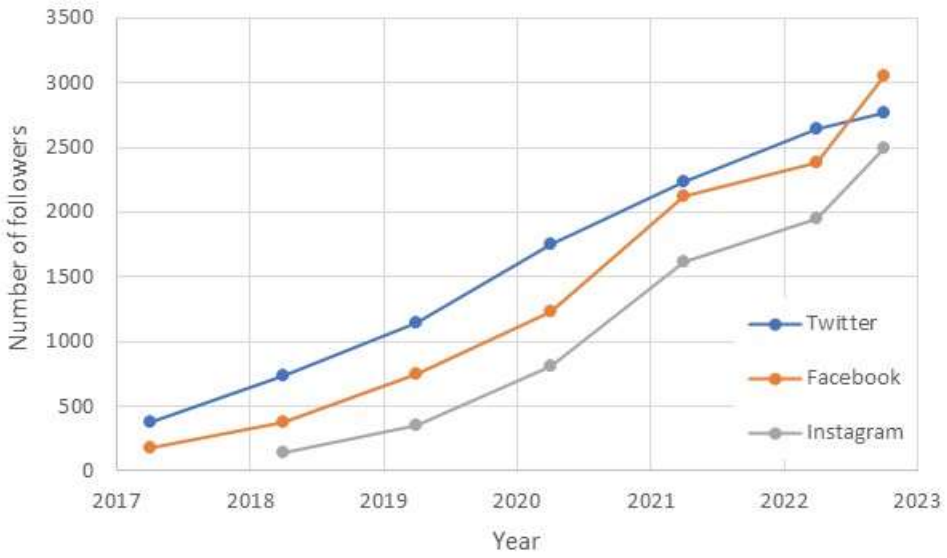

Figure 7: Social media engagement over time

Table 13: Overview of mitigation delivery. Figures drawn from data provided by Bird Aware Solent and also from the annual reports[25]

Metric	2017/18	2018/19	2019/20	2020/21	2021/22	Total
Total site visits (a)	466	729	871	324	656	3,046
Total number of hours on site visits (b)	1,111	1,777	2,239	754	1,595	7,476
Average duration of site visit (b/c)	2	2	3	2	2	2
Total number of visitors engaged with on site visits (c)	5,264	12,811	11,147	2,149	8,465	39,836
Total number of visitors present during visits (d)	16,868	33,968	32,071	2,1846	34,343	139,096
Average no. of people engaged with per site visit (c/a)	11.3	17.6	12.8	6.6	12.9	13.1
Average no. people engaged per hr (c/b)	4.7	7.2	5.0	2.8	5.3	5.3
Percentage of people engaged with (of the people seen on site) (c as a % of d)	31.2	37.7	34.8	9.8	24.6	28.6
Percentage of people that given "advice following bird disturbance"		0.02	1.3	0.4	1.6	
Percentage of people that given "specific direction to avoid bird disturbance"		8	10	14	11	
Percentage of visitors who were already aware of overwintering birds		73	49	59	46	
Percentage of visitors who were already aware of the issue of bird disturbance		53	31	36	37	
Community events attended	33	40	44	1	56	174
People engaged with at events	1,727	1,881	1,826	97	1,524	7,055
Twitter followers (March of year end)	733	1,139	1,749	2,239	2,642	

[25] See https://birdaware.org/solent/about-us/our-strategy/annual-reports/

Metric	2017/18	2018/19	2019/20	2020/21	2021/22	Total
Facebook followers (March of year end)	381	714	1,231	2,120	2,379	
Instagram followers (March of year end)	142	348	810	1615	1951	
Total staff employed (permanent, full-time equivalent)	0.6x Partnership Manager 1x Lead Ranger 2x Rangers 0.2 Comms Support	0.6x Partnership Manager 1x Lead Ranger 2x Rangers 0.2 Comms Support	0.6x Partnership Manager 1x Lead Ranger 3.8x Rangers 1x Comms Officer	0.6x Partnership Manager 0.8x Lead Ranger 3.8x Rangers 1 x Comms Officer	0.6x Partnership Manager 0.8x Lead Ranger 3.8x Rangers 1 x Dog Initiatives Officer 1 x Campaigns and Engagement Officer	
Seasonal rangers (Sept-March inclusive)	3	3	3	3	2.5	
Other key achievements	2 new gateway car parks at the Alver Country Park	Hosted 2nd Annual Mitigation Meet-up, sharing information with other mitigation strategies/staff around the country	First Great Solent Birdwatch; selected for pilot study by Natural England and Behavioural Insights Team, looking at influencing behaviours through signage	Behavioural insights training;	Dog initiative post, campaigns and engagement officer, works completed at 3 SANGs; Bird Aware website overhauled; leaflet restyled; coastal code rewritten.	
Total houses mitigated	4,549	2,864	2,564	1,904	3,403	15,284
Total developer contributions	£816,888	£812,178	£715,205	£1,494,020	£1,306,331	£5,144,622

Site-specific projects

8.7 Site-specific projects involve changes to access management or measures to make parts of the European sites more resilient in terms of disturbance. These are often specific in nature and involve partners or relevant bodies submitting proposals of potential projects, a selection of which are subsequently funded.

8.8 In 2018 relevant stakeholders and partners were invited to submit proposals for 'site specific projects'. A series of recommendations for the allocation of the funding were then endorsed by the Partnership for South Hampshire (PfSH) Joint Committee in July 2019, with the first round of funding starting in April 2020. The list has since been updated and includes the following projects:

- Shingle recharge of key winter roosting sites and associated wintering bird interpretation/ messaging (Langstone Harbour);
- Marina, Additional fencing, hedge-laying and signage at Apuldram Manor farm (Chichester Harbour)
- Bunny Meadows Footpath and Circular Footpath (Southampton Water)
- CHFI Fishbourne, Creation and extension of board walk and fencing at East Head (Chichester Harbour)
- Peartree Green Footpath upgrade (Southampton Water)
- Boardwalks at Fishbourne meadow (Chichester Harbour)
- Prinstead, Fencing and hedge planting at March farm spit (Chichester Harbour)
- Sand art and sculpture workshops at East Head – Visitor Engagement (Chichester Harbour)
- Shoreburs Greenway – NE section (Southampton Water)
- Itchen North, Access improvements at Itchen Valley Country Park (Southampton Water)

SANGs (Suitable Alternative Natural Greenspace)

8.9 The provision of alternative greenspaces is a further thread to the mitigation approach. Mitigation includes both the creation of entirely new spaces for recreation and enhancements to existing green infrastructure. Funding has included £1.3m from the Solent Local Enterprise Partnership in the form of Local Growth Deal funding. Key projects include:

- Alver Valley Country Park (Gosport) with enhancement in the form of two new gateways, expanding parking provision along with other improvements, completed in 2016.
- Shoreburs Greenway (Southampton), comprehensive refurbishment of existing greenspace including an all-weather path (work commenced in 2019/20);
- Warblington Farm (Havant), launched in 2020 and creating a bird refuge, providing mitigation in terms of nutrient neutrality as well as recreation thorough agreement with tenant farmer. Total area 60ha (to be delivered in 3 phases);
- River Hamble Country Park (Southampton) purchase of land to extend the Country Park and provide access to the River Hamble itself, lies within the Solent and Southampton Water SPA.

Awards and recognition

8.10 Looking more widely, the Bird Aware Solent project has provided a model that has been closely followed by other strategic mitigation schemes. It is one of the early schemes and also one of the largest (in terms of the geographic area, number of local authorities involved and number of staff). It has received widespread acclaim and recognition, reflected in a number of awards which highlight the national profile the project has achieved:

- Winner of the 2020 IEMA Award - Sustainability Campaign (Public Sector);
- Winner of 2020 International Green Apple Award - Environmental Best Practice;
- Highly Commended for 2020 CIEEM - Stakeholder Engagement;
- Highly Commended for 2020 DRUM Social Media Awards - Best Public Sector Social Media Strategy/Campaign;
- Shortlisted for St Andrews International Prize for the Environment 2020;
- Winner of the 2019 Planning Award - Planning for the Natural Environment;
- Winner of the 2018 RTPI South East Awards - Regional Award
- Winner of the 2018 RTPI South East Awards - Planning for the Natural Environment.

Comparison with other mitigation schemes

8.11 Bird Aware Solent is broadly similar to a number of other strategic mitigation schemes around the country, and these provide some useful context as to level of mitigation. It is however difficult to draw direct comparison with other mitigation schemes as the sites vary in size, shape, accessibility and recreation draw. Each scheme is tailored to ensure mitigation for the level of housing growth anticipated and the risks associated with that growth – which will be different at each site. Some have been running for much longer than others and have therefore had a longer time period to build up the necessary funds to employ a full team or expand to all the necessary mitigation envisaged.

8.12 Some selected examples of other mitigation schemes are given in Table 14 which also summarises the key elements of each approach, including the size of the ranger team, social media following etc. Many of these schemes have directly used Bird Aware Solent as a model and it can be seen there is much in common across them. Key differences relate to overall scale of SANG provision and some marked variations in the number of staff, for example the Northumberland coast project employs 3 rangers to cover 112km of open coast to address impacts from disturbance associated with allocations totalling around 750 dwellings within the zone of influence. The level of mitigation provision delivered by Bird Aware Solent is relatively low and this is considered in more depth in Section 10.

Table 14: Some selected examples of strategic mitigation schemes around the country and level of mitigation provision. Exclusion zone reflects the scale of any zone directly adjacent to European sites where there is a presumption against development (if any); ZOI refers to the zone of influence.

Area	Issues & sites addressed by mitigation strategy	'Exclusion zone'	ZoI	SANGs/GI	Wardening	Other mitigation measures	Monitoring measures	Social media following	Further details and notes
Dorset Heaths	Recreation and urbanisation; heathland SPA and 2 heathland SACs. Around 8000ha but work focussed at specific locations.	400m	5km	Heathland infrastructure projects (including SANG) for all development. Bespoke SANG for sites with around 50 dwellings or more.	Dedicated wardening team (Urban Heaths Partnership) and through local authorities; around 12 staff inc. project manager and Dorset Dogs posts.	Dog project, fire projects (including education and awareness raising) and variety of other projects	Automated counters, vehicle counts, interviews, bird monitoring.	Facebook: 86; Twitter: 229; Instagram: 1003;	Long-running scheme with joint SPD.
Thames Basin Heaths	Recreation and urbanisation; heathland SPA. Around 8000ha but work focussed at specific locations	400m	5km	Minimum of 8ha of SANGs per 1,000 residents	Thames Basin Heaths Partnership, currently c. 9 full time equivalents including Project Manager.	Dog Project, education work and dedicated education officer.	Automated counters, vehicle counts, interviews, fire records, bird monitoring.	Facebook: 1700; Twitter: 974; Instagram: 615;	Long-running scheme. Each local authority has produced their own SPD/mitigation in line with agreed strategic approach.
South-east Devon	Recreation and urbanisation; sand dune	400m around heath-land only	10km	Some SANG at strategic locations	4 staff (includes Project Manager and	Dog Project, bird refuges on estuary, patrol boat on estuary,	Targeted work on effectiveness of refuges;	Facebook: 568; Twitter: 864; Instagram: 560	3 local authorities, and various zones reflecting the

Area	Issues & sites addressed by mitigation strategy	'Exclusion zone'	ZoI	SANGs/GI	Wardening	Other mitigation measures	Monitoring measures	Social media following	Further details and notes
	SAC, heathland SPA/SAC and estuary SPA/Ramsar.				Devon Loves Dogs post)	codes of conduct.	some visitor survey work		relevant European sites.
North Kent	Recreation impacts for 3 coastal SPA/Ramsar sites. Around 120km shoreline?	No	6km	No	3 rangers	Dog Project, Codes of Conduct, Signage and Interpretation and Site-Specific Enhancements	Liley & Underhill-Day (2013)	Facebook: 882; Twitter: 1022; Instagram: 606	4 local authorities, each with slightly different approaches to developer contributions.
Essex Coast	Recreation impacts for 9 coastal SPA/Ramsar sites and 1 SAC	No	4.5-20.8km	No	Ranger team being built up over time, will include water-based ranger.	Education and communication, codes of conduct, habitat-based measures.	Visitor surveys, bird monitoring and vegetation monitoring	Facebook: 31; Twitter: 52; Instagram: 1481	11 local planning authorities
Northumbria Coast	Recreation impacts on shorebirds and dune grassland (1 SPA/Ramsar, 1 SAC and a range of SSSIs)	No	7km (all development); 7-10km (large sites only)	No	Currently 3 rangers for around 112km of coast	Social media, volunteers.	Bird monitoring and visitor monitoring, undertaken primarily by rangers.	Facebook: 1000; Twitter: 1030 Instagram: 1140	Run by Northumberland Council, relatively low levels of growth (strategy established on basis of 750 houses coming forward as allocations within the zone)

Key points: Level of mitigation that has been implemented

Mitigation over the five years (2017/18-2021/22) has included:

- 3,046 visits conducted by rangers (7,476 hours of ranger time);
- 39,846 visitors engaged by rangers during site visits;
- Attendance at 174 community events (engaging with over 7,055 people);
- Social media outreach (over 2500 followers on Twitter, Facebook and Instagram);
- Range of site-specific projects such as access infrastructure to make locations more resilient;
- Enhancement of existing greenspaces to create alternative visitor destinations away from the coast.

Bird Aware Solent has also received widespread recognition in a number of awards, reflecting a national profile. The mitigation measures are broadly similar to those of other mitigation schemes around the country, however other schemes do include more alternative greenspace provision and there is marked variation in the size of the ranger team in each scheme.

9. Are mitigation measures successful in changing visitor behaviour?

Overview

9.1 The mitigation measures form a package of inter-related measures that serve to raise awareness and influence behaviour, in terms of which sites people visit for recreation, where they go when they get there and what they do during their visit. This section considers how successful these measures have been.

9.2 This is important to consider, in part to check what changes might be necessary in the future to ensure mitigation measures are fit for purpose. The relevant test in the Habitats Regulations relates to ruling out harm. It is therefore necessary to have confidence that recreation impacts associated with new housing can be ruled out in the future and it will be necessary for relevant Habitats Regulations Assessments, whether at a Plan-level or a project-level, to demonstrate this.

9.3 While the mitigation measures are ultimately around providing protection for the non-breeding waterbirds, it is not necessary to look at bird data in this section as it is possible to rule out harm by looking solely at the visitor data. Given the range of factors and different issues potentially affecting bird numbers and distribution (such as habitat quality, prey abundance, climate etc), focussing on visitor behaviour is sensible.

Impact of rangers on visitor behaviour

9.4 The rangers do not have an enforcement role and they work to show people birds, highlight issues and influence behaviour through their messaging. In understanding the impact of rangers, it is necessary to understand the scale of ranger coverage. Some of the challenges are summarised in Figure 8. While the number of people visiting the coast is large, only a proportion of these will overlap in space and time with a ranger, and only a proportion of these will actually engage with the ranger (or see the ranger); some of these may engage with a ranger more than once. Of those that engage with a ranger, a proportion will modify their behaviour (either on that visit or future visits) as a result of the encounter.

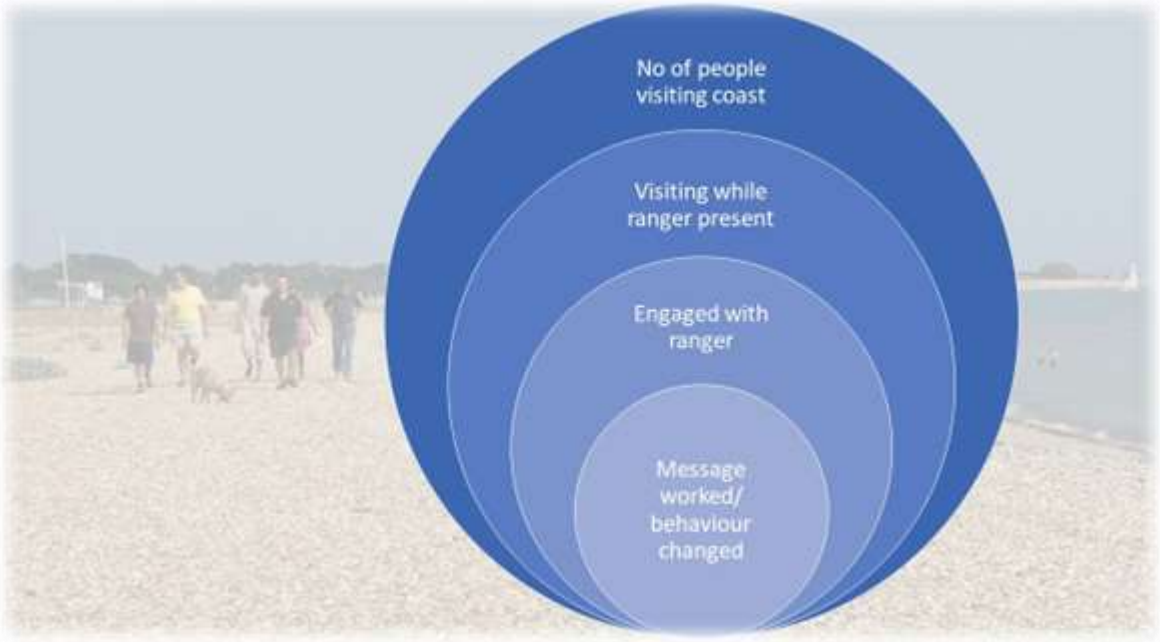

Figure 8: Graphic showing how rangers can only engage with a proportion of visitors to the coast

Numbers of people visiting the coast and reach of rangers

9.5 Over the winter period (October – March) there are potentially around 1800 hours of daylight. Given there are 96 sections of the coast this would suggest, to have a ranger present in every section for all daylight hours would require 172,800 hours of ranger time (over 100x the current level of coverage). These figures therefore indicate that the ranger coverage can focus on less than 1% of the coast at any given time.

9.6 Ranger time is rightly prioritised to particular sections of the coast, with the prioritisation reflecting the numbers of birds and overlap in space and time between people and birds (i.e. those locations with the most risk of disturbance issues). Visits are also timed to the relevant tide times. Ranger time is summarised according to priority and year in Table 15, which shows that around 90% of ranger time has been focussed on the sectors of medium and high importance. The data are also shown in Map 6.

Table 15: Total annual hours of ranger time at the different types of sections.

BAS priority	Number of sectors	2017/18	2018/19	2019/20	2020/21	2021/22	Total
High	9 (9)	352 (32)	729 (41)	797 (36)	297 (39)	674 (42)	**2849 (38)**
Medium	36 (38)	567 (51)	887 (50)	1239 (55)	427 (57)	797 (50)	**3917 (52)**
Low	24 (25)	127 (11)	159 (9)	188 (8)	30 (4)	91 (6)	**595 (8)**
No interest	27 (28)	64 (6)	11 (1)	15 (1)	0 (0)	34 (2)	**124 (2)**
Total	**96 (100)**	**1111 (100)**	**1786 (100)**	**2239 (100)**	**754 (100)**	**1595 (100)**	**7485 (100)**

9.7 If ranger effort were solely focussed to the 47 sectors that are identified as medium or high priority, then having a ranger in each of these sectors across all daylight hours by rangers would require 84,600 hours of ranger time, 53x the level of current ranger provision. While it might be possible to further target ranger time as some sectors might only need ranger coverage at certain tide states rather than across all daylight hours, this would result in little further overall reduction (for example there are just 4 sectors that are high or medium priority and are only visited at high tide).

9.8 Even while present on site, rangers can only engage with a limited number of people – there are only so many people that can be spoken to or that will see/pass the ranger. Many sections of the coast have multiple access points, car parks and paths which visitors can use. We know that typically rangers will speak to an average of 5 people per hour (see previous section and Figure 6). Drawing on the data collected per visit by the ranger team (Figure 9), it is further possible to show that this level does vary with how busy the location is, such that at the busiest sites the rangers might engage with around 7 people, which appears to represent the maximum (the graph reaches a plateau).

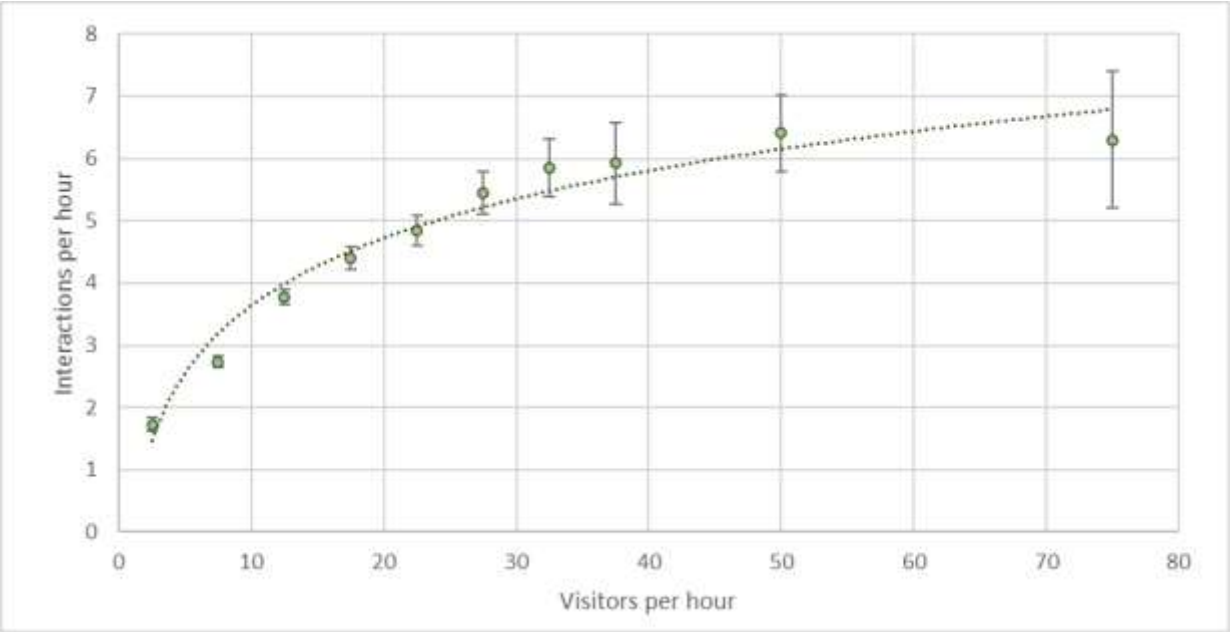

Figure 9: Relationship between the number of interactions per hour and number of visitors per hour. Note visitors per hour is an approximate count the data have been categorised into bins to generate mean and standard error. The data excludes ranger paired visits, to remove confusion when multiple rangers may have been intercepting visitors.

9.9 The number of people the rangers have engaged with over the review period is summarised in the previous section (Table 13). These data indicate that the rangers have engaged with nearly 40,000 visitors during the 5-year period and around 10,000 seems a reasonable annual figure (taking into account covid). Some of the 10,000 visitors will have spoken to a ranger before on a previous visit (and it is quite possible that such multiple encounters will have the best outcomes in terms of behaviour change).

9.10 The data collected by the rangers shows that, in 2021/22, the rangers achieved 3456 interactions that involved 8465 people. For 2706 of the interactions (4780 people) the Rangers had logged whether or not the people engaged with had spoken to a ranger before. A total of 1005 people (21%) had spoken to a ranger before (i.e. just over 1 in 5). If the Rangers achieve speaking to 10,000 people in a year, perhaps around 7900 (10,000 reduced by 21%) different individuals will be involved.

9.11 Comparing across years (Table 16), it would appear that the number of visitors that have spoken to a ranger has increased over time, albeit gradually. However, there is no evidence that the proportion of visitors that are aware of bird disturbance issues has increased – perhaps not surprising given the marked increase in visitors that has occurred over the period.

Table 16: Summary of the interactions with visitors over time. Note this does not include all interactions as this information is not logged for those involving multiple groups of visitors at the same time.

	Interacted group spoken to a Bird Aware Ranger before	Interacted group aware of overwintering shorebirds	Interacted group aware of bird disturbance issue	Interaction positive (visitor receptive to key message)
2017-2018	17%	71%	52%	70%
2018-2019	20%	73%	53%	89%
2019-2020	23%	52%	36%	95%
2020-2021	25%	63%	41%	96%
2021-2022	24%	50%	41%	96%

9.12 Visit estimates (from 2020) were around 13 million over the winter. Caals et al (2020) estimated that visitors interviewed in the winter typically make around 130 visits per year, which could mean around 65 visits over the winter. This would mean the 13 million visits could roughly equate to around 200,000 individuals. This would suggest that the current level of engagement in a year by the rangers – 7900 out of 200,000 people – is to reach around 4% of visitors.

9.13 The 4% coverage is clearly a very basic estimate and simply reflects how many people might be spoken to/engaged with once or more. It is broadly in-line with (but lower than) the figures reported by Caals *et al.* (2020) who found that 26% of all interviewees had heard of Bird Aware Solent, 19% of all interviewees had seen a ranger and 16% had spoken to a ranger. Similar figures come from direct observation of visitors while a ranger is present (Saunders, & Liley, 2022) that found around 56% of visitors passed within 100m of the ranger when they were onsite and 12% of visiting individuals/groups were seen to speak with a ranger on the days when rangers were present.

9.14 It should be noted that 21% is a relatively high proportion of repeat encounters and highlights that the rangers must be very specific and targeted in where they go and who they speak to. With 200,000 individuals visiting the coast over the winter and 10,000 interactions per winter, the probability of interactions with the same person twice in a winter would be around 0.0025 (i.e. 1 in 400) if the chance of encounter was entirely random.

9.15 The above figures indicate the level of ranger cover is low given the scale of visitor use, and this is shown in perspective in Figure 10.

Figure 10: Graphic representation of numbers of visits to the coast and scale of face-face engagement per year.

Map 6: Sections categorised by mean annual ranger hours spent at each. High and Medium priority sectors are highlighted.

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Evidence relating to level of engagement and effectiveness of face to face engagement

9.16 Clearly it is necessary to consider what level of engagement is necessary to be effective to influence behaviour, as for example it may require multiple encounters with a ranger for behaviour to be affected. This is much more complex to determine. There is a wide range of recreation activity that takes place and a wide range of types of visitor. Rangers tailor the messaging, approach and information to each visitor, meaning general statements or a specific value (e.g. a set number of minutes of engagement or encounters) are impossible to define. Different messaging, approaches and levels of engagement will also be relevant to some visitors compared to others, meaning a different number of interactions might be necessary with one type of visitor compared to another in order to influence their behaviour.

9.17 It is also difficult to tease apart the respective roles of different measures and information provision. For example, rangers will typically operate at locations where signage is present, there may be infrastructure (fences, paths, screens etc) and visitors will be influenced by other visitors, material they have seen on social media, the internet and by word of mouth from friends, relatives etc. Isolating the role of rangers is therefore very difficult.

9.18 There have been studies that test the effectiveness of rangers and face to face engagement. These include work on the Solent, commissioned by Bird Aware Solent (Liley & Panter, 2017; Saunders, & Liley, 2022). These studies involved direct observation of people and birds, with paired observations to compare periods with and without a ranger being present. Overall, the 2022 study found 1% of individuals/groups clearly changed their behaviour following an interaction with a ranger, for example putting their dog on a lead. However, it is clearly difficult to measure whether someone has changed their behaviour when observing from a distance and the 1% therefore doesn't necessarily reflect the influence of rangers. It will not always be apparent when people have modified their behaviour as a result of speaking to a ranger, as for example there is no way of telling if someone had changed the route they might have been taking. Some might also see a ranger ahead of them and change behaviour well in advance of any interaction. The 1% is therefore very much a minimum. The study found significantly more waders present when rangers were present and a smaller proportion of recreation events resulted in birds being flushed or any other behavioural change when a ranger was present – indicating that the

presence of rangers was changing visitor behaviour. Hayling Island Oysterbeds stood out as a particular location where the presence of a ranger made a marked difference, suggesting that such roost sites where birds are concentrated and where visitors can be intercepted as they approach could be key locations to target with ranger presence.

9.19 Another study from the Solent (Caals et al., 2020) involved visitor interviews at 10 locations around the Solent (with interviewees selected at random), and questions asked about the interviewees' awareness of habitats or species vulnerable to recreation impacts and also asked whether the interviewee had spoken to a ranger or not. Overall, approximately a quarter of interviewees, (26%) had heard of Bird Aware Solent, 19% had seen one of the rangers and 16% had spoken to one of the rangers. Interviewees' awareness of habitats or species vulnerable to the impacts of recreation was higher amongst those who had spoken to a ranger (34 interviewees, 77%) compared to those who hadn't spoken to a ranger (142 interviewees, 64%), although the differences were not quite significant (χ^2_1= 3.02, p=0.08).

9.20 Other studies (away from the Solent) include Marion and Reid (2007) who found that most of the visitor education efforts they evaluated did effectively alter visitor knowledge, behaviour and/or resource and social conditions in the intended direction. Medeiros *et al.* (2007) found that protective measures (signage and wardening) were key to protecting breeding terns and nesting success was 34x higher where such measures were in place. Similarly there is evidence (Brooke, 2010; Weston et al., 2012) to show that wardening as part of a package of measures is effective to protect breeding waders.

9.21 Work by the Behavioural Insights Team (Barker & Park, 2021) considered dog walkers and the potential to encourage dog walkers to choose paths through non-sensitive areas. They suggested that subtle signage and directional clues were likely to be promising approaches to nudge dog walkers to follow particular routes. They found that leaflets raised awareness and leaflets targeted towards dog walkers (with dog emphasis on the cover) were more likely to be picked up and be perceived positively. They highlighted that leaflets should be used in combination with physical interventions to change behaviour directly. Behavioural insights can also be used to optimise leaflet delivery.

9.22 Edwards and Knight (Edwards & Knight, 2006) tested various approaches with focus groups as part of their study on dog walkers and recommended

site managers used a variety of means to communicate with visitors and recommended personal contact.

9.23 These various studies serve to highlight the effectiveness of rangers as part of a package of interventions, but specific evidence on the level of provision and frequency of contact necessary to achieve desired outcomes is lacking.

SANGs

9.24 Visitor surveys were conducted at a selection of SANGs sites around the Solent in 2021/22 (Saunders, et al., 2022). These demonstrated the surveyed SANGs sites were working well to deflect visitors, with the data suggesting that visitor numbers had markedly increased at Shoreburs Greenway and Alver Country Park since previous surveys, the sites were drawing high numbers of dog walkers and many of the interviewees would clearly have visited the coast if the SANG had not been available to them. The study estimated that Alver Country Park alone was potentially deflecting in excess of 1,300 visits to the coast per week in the winter.

9.25 These results reinforce findings from other parts of the country and there are more examples of SANGs working to deflect visitors away from the coast (which might be considered to have a particular draw for visitors). Dawlish Countryside Park in Devon is an entirely new greenspace, created as a SANG to deflect access away from the Exe Estuary SPA/Ramsar. Recent visitor survey data (Caals et al., 2022) shows that the site is very well visited, particularly by dog walkers. When asked which single alternative location visitors at the SANG would have gone to instead, Dawlish Warren (the closest part of the SPA) was the most popular alternative (cited 19% of interviewees at the SANG). Nearly half (44%) of people interviewed visiting the Exe Estuary also visited Dawlish Countryside Park.

9.26 The results from the Solent SANGs surveys (Saunders, et al., 2022) do however highlight that SANGs catchments can often be quite small, i.e. visitors are local and the SANGs are therefore effective over a fairly limited area. At the Alver Valley, 75% of visitors lived within 3km of the interview location and for Shoreburs Greenway the equivalent figure was 0.7km. This does not mean these sites are not effective, as they are both located in areas with high densities of housing in the local area, it just shows their impact is very local. For reference, Caals *et al.* (2022) cite an equivalent 75% figure for Dawlish Countryside Park of 3.2km. It would seem likely that bigger, more strategic SANGs with more facilities may draw visitors from further afield.

Key points: The success of mitigation measures in changing behaviour

We estimate that current ranger provision would need to be 100x higher to achieve continuous coverage (during daylight through the winter) of all sections of the coast at all times, or 53x higher if it were to achieve complete coverage of the 47 sectors that are identified by Bird Aware Solent as those of high or medium priority.

Rangers can manage to speak to around 7 people per hour as a maximum at the busiest sites and the average is around 5 visitors per hour. We estimate current provision might allow engagement with around 7,900 individuals visiting the coast in a typical year, which is perhaps around 4% of visitors to the coast over the winter.

While ranger time is focussed and targeted to key locations and times, this is a relatively small percentage. There is evidence to show that rangers have made a difference on the Solent such that more waders are present and fewer birds flushed when rangers are present. There is relatively little evidence to indicate how much ranger coverage is necessary or optimal, however the current level of coverage is too low.

There is evidence that SANGs around the Solent are working to deflect visitor use, for example the Alver Valley is estimated to draw around 1,300 visits a week that would otherwise have taken place at the coast. Data from other parts of the country also provides evidence that SANGs can be effective in a coastal environment. The draw of SANGs is however relatively small – i.e. visitors tend to live in close proximity.

10. Are mitigation measures proportionate to the increase in disturbance associated with new development?

Overview

10.1 In previous sections we have identified that the level of housing has increased by 4.3% over the period 2016-2022 and, based on planning permissions, the level of change is 5.7% (with some of these yet to be built or occupied). Visitor numbers have increased to the coast disproportionately – vehicle counts are perhaps the most reliable metric and suggest a 26% increase.

10.2 These figures would suggest that, for mitigation to be proportionate to the increase in housing, it would perhaps need to address around a 7% increase in access compared to the levels of recreation in 2016/17[26].

10.3 We estimated around 13 million visits over the winter to the Solent coast in 2020 and we also estimate access levels to have increased by around 26% over the 5 year period covered in this review. Assuming the year-on-year change is equal, then we might expect around 13.7 million visits over the 2021/22 winter. Mitigation therefore needs to address impacts associated with around 960,000 visits (i.e. 7% of 13.7 million)[27]. This level of visits might be made by around 14,770 people[28].

Ranger time

10.4 In the previous section we estimated that rangers currently have around 10,000 interactions with visitors – potentially equivalent to speaking to around 7900 individuals per year during site visits (see para 9.9). This is a little over half of the people we have estimated might be making additional visits from new housing, and therefore means that the number of people

[26] We have calculated this figure based on the assumption that access levels have increased by 26% and there were 538,214 dwellings (from postcode data) within the zone of influence in 2022. Each dwelling might therefore relate to 0.000234% (i.e. 126/538,214). The number of houses that have been granted planning permission and require mitigation is 29,437, which multiplied by 0.000234 gives 6.9%.

[27] 960,000 visits would equate to 33 visits per new dwelling per winter, which seems reasonable

[28] Assuming 65 visits per year per person on average, see para 9.12

who are told about the birds at least once per year (and potentially given advice about disturbance) is equivalent to the additional increase in access associated with 50% of new housing. There is a further note of caution and caveat around how many interactions are necessary to enforce or influence behaviour change. Given there are potentially 960,000 visits to mitigate per winter and 10,000 ranger interactions per winter, the ranger provision reaches 1% of visits. Clearly this is a relatively low level of provision.

10.5 Another approach to considering the proportionality is to estimate the amount of ranger time currently provided per new dwelling. Over the 2021/22 winter the rangers spent 1595 hours undertaking site visits and 3403 new dwellings were granted planning permission. This is equivalent to less than 30 minutes ranger time per dwelling per winter. Given rangers have an average of 5 interactions per hour, this is equivalent to 2.5 ranger interactions.

10.6 It is also useful to compare to other mitigation strategies and the amount of ranger time spent per dwelling at other European sites. On the Thames Basin Heaths, ranger time on site has been estimated at around 5,000 hours per year[29] (Liley & Panter, 2020) and this is to mitigate around 3,000 dwellings per year (i.e. similar to the Solent). These figures suggest the level of ranger time deployed per new dwelling on the Thames Basin Heaths is around 3.5x than the Solent. On the Dorset Heaths, the amount of ranger time has been estimated at around 3000 hours per year (Panter et al., 2021) and the level of housing growth 2011-2021 within 5km has been around 13,500 dwellings, i.e. 1350 per year, again markedly higher (potentially 4x higher) than the Solent. While these two heathland sites are not necessarily directly comparable, the scale of difference is interesting to note, particularly as at both there is also a strict requirement for SANGs provision alongside SAMM.

[29] Estimated based on the Thames Basin Heaths Partnership employing a team of 6 wardens employed full-time and an additional senior warden/comms lead who is also full-time, but spends less time out on site undertaking ranger duties, plus a further 6 seasonal staff each year, during the spring/summer. This means that during the spring/summer there are over 12 full-time equivalent staff undertaking ranger duties and the time averaged across the year is over 9 full-time equivalents.

Area of SANG and other measures

10.7 In order for mitigation to be proportionate to the increase in housing, SANGs (if absorbing all new recreation use that might occur on the coast) would perhaps need to provide for around a 7% increase in access compared to the levels of recreation in 2016/17 (see para 10.2). SANG provision has largely focussed on enhancing existing sites (Alver Valley and Shoreburs Greenway) and SANG provision has not increased the amount of greenspace on or around the coast by 7%.

10.8 Drawing comparisons with other mitigation schemes, the level of SANG provision is low. While not all similar mitigation schemes include SANG (Cannock Chase is a current exception), the standard of 8ha per 1000 new residents used in the Thames Basin Heaths (see Joint Strategic Partnership Board, 2008 for background) is widely used across the country. On the Thames Basin Heaths this level of SANGs provision has meant the increase in greenspace for recreation has been in proportion to increases in housing.

10.9 The levels of SANG delivery on the Solent are therefore low and not comparable to other parts of the country, and this reflects some of the original concern around SANGs working in a coastal environment (e.g. Liley & Tyldesley, 2013).

10.10 It should also be noted that the mitigation on the Solent has extended to include a number of site-specific projects and access management measures around the coast. These are additional mitigation measures and hard to consider strategically in terms of their proportionality.

Key points: Proportionality of mitigation in relation to the increase in disturbance associated with new development

In order for mitigation to be proportionate to the increase in housing, we estimate it would perhaps need to address around a 7% increase in access compared to the levels of recreation in 2016/17, approximately equivalent to around 960,000 visits per winter, made by around 14,770 individuals.

The level of current ranger provision enables around 10,000 visitor interactions per winter and this may involve interactions with 7900 individual visitors. This means the ranger provision is sufficient to achieve a level of interaction of 1% of the additional visits associated with new housing. The number of ranger hours spent on site visits is roughly equivalent to 30 minutes of ranger time per winter per new dwelling that has given planning permission. Direct comparison with other European sites indicates the ranger provision per dwelling on the Solent is comparatively low.

SANGs and site-specific projects are hard to equate to the proportional increase in housing, nonetheless these are also delivered at a lower rate on the Solent compared to other mitigation schemes.

11. How is the Partnership perceived?

Overview

11.1 Bird Aware Solent were keen to examine how the Partnership was perceived by Partnership members, stakeholders, and associated organisations. The latter included Local Authorities, local/regional forums (e.g. the Solent Forum), non-statutory nature conservation organisations (e.g. the Hamble River Trust, RSPB, etc), and local/regional access and activity groups (e.g. Hampshire Ornithological Society (HOS), New Forest Dog Owners Group, etc).

11.2 The views of these individuals/organisations were collated via a series of facilitated events, including workshops and structured conversations on key topics. A short, pre-workshop, questionnaire was also made available online, with the answers provided used to inform the subsequent workshops. This questionnaire ensured any individuals/organisations unable to attend the workshops were still able to provide feedback.

11.3 Visitors to the coast were not included in the workshops, but any relevant views or details from questionnaire surveys conducted as part of the Bird Aware Solent monitoring were reviewed for information on the perceptions of visitors. These are provided at the end of this chapter.

Data collection

11.4 A total of 38 Partnership members, stakeholders, and associated organisation representatives were initially invited to attend one of four face-to-face workshops, held at different localities along the Solent coastline, between 25th October and 4th November 2022. Two of the workshops were ultimately held online (via Zoom) due to the main facilitator testing positive for Covid 19, with these two sessions recorded for later review.

11.5 Of the initial invitees, 15 attended the workshops, and further comment was received from an additional four individuals/organisations unable to attend on the day (mainly via completion of the online questionnaire). The questionnaire was also shared more widely by some individuals to gauge the views of their organisation's membership (i.e. HOS), to which a further six individuals responded.

11.6 Attendees/respondents were individually asked whether they were happy for their comments to be linked to them directly in subsequent reporting or would prefer their responses to be reported anonymously. A mixture of responses were received and so it was decided to report all feedback anonymously to avoid overemphasising any particular organisation or individual.

Summary of participant responses and viewpoints

11.7 Although structured, the conversations held were wide ranging and covered a broad span of topics aligned to the work of the Partnership. The discussion ranged from how the Partnership is perceived by the general public to the views of Partnership members on its internal processes. Focus was also placed upon what aspects of the Partnership workshop participants and respondents felt were working well, and which could be improved upon. Wider conversation was also had concerning the future of mitigation and access management along and inland of the Solent.

11.8 The received comments and feedback have therefore been summarised within the following categories:

- Partnership processes;
- Perceptions and awareness;
- Achievements;
- Perceived issues; and,
- Suggestions for the future.

11.9 Every attempt has been made to accurately convey the information presented verbally during the workshop sessions, but there is inevitably an element of paraphrasing within each of the following sections. Those views or comments that were raised repeatedly across sessions/individuals have also been identified.

11.10 It is important to note that only 50% of those initially invited to take part in the workshops responded (see paragraph 11.5). Those individuals who took the time to engage with the process therefore potentially comprised those who wished to express their stronger (and sometimes more negative) views on the work of the Partnership. Given the relatively small number of participants/respondents overall, it was therefore easier for such views to appear more prominent across the platform provided than within the wider population. Effort has therefore been made to identify where such views or comments have been expressed by single individuals.

11.11 Furthermore, several comments or views expressed by participants/respondents concerning the work of the Partnership were either factually inaccurate or incorrect. Such comments have been reported in the following sections for completeness however, alongside footnotes providing corrections to any such erroneous statements.

Partnership processes

11.12 A small number of workshop participants and respondents indicated that they couldn't comment on Partnership processes due to their lack of direct involvement in them.

11.13 Of those that did comment there was an indication that most people are happy with how the Partnership works, with multiple individuals identifying Bird Aware Solent as well run, organised, and professional. Individual respondents also stated that the Partnership ensured a smooth process for mitigation delivery, well bedded into Local Plan policies, and that the awarding of grants for infrastructure projects was very efficient. Monitoring by Bird Aware Solent was also identified as being well organised, with any relevant information being provided to both the PfSH Joint Committee and Monitoring Group well in advance of meetings, for example. The value of existing local knowledge within the Partnership was also recognised, as well as its helpful and constructive approach to working with partners.

11.14 A few minor process issues were also identified during the workshops, including the requirement for Local Authorities to report annually on funded projects which had been long completed. A handful of more negative and/or opposing views were also received, from a small number of participants. These included suggestions that the Partnership Board, whilst generally doing a good job, is risk averse, and that there is an unnecessary repetition of roles and personalities between the Board and relevant Local Authorities. Furthermore, Partnership processes were identified as being neither entrepreneurial nor fast-track, and one individual suggested that project funding decisions are slow and subjective, with long lead-in times. The same individual also suggested that Board papers are written in a very "pro-development" manner (i.e. promoting housing growth).

Perceptions and awareness

11.15 The majority of responses pertaining to perceptions and awareness related to the ranger team and their attendance at events, with suggestions that people tended to be less aware of the broader Partnership, its work, and

funding model. There was however recognition that such broader awareness raising is difficult, and that this will come with time as the Partnership matures. Conversely, it was indicated that the Partnership has good visibility within the development sector, although the non-compulsory development contribution is seen as another tax on developers (sometimes referred to as the "dog tax"). One representative also raised concerns from their organisation's members concerning the Partnership "in-perpetuity" fund with the perception that, despite large sums of money being collected, there is not enough money available to fund projects on the ground as so much is set aside to ensure long term delivery.

11.16 Multiple attendees/respondents described the ranger team as being passionate, approachable, observant, knowledgeable, and friendly. Less positive perceptions of the ranger team, and the work that they carry out, were however identified amongst the birdwatching community in particular. It was suggested that this is due to a lack of clarity or understanding concerning the role of the ranger team in interacting with or policing bad behaviour. There seemed to be some lack of understanding among attendees/respondents as to whether the ranger team sited themselves at localities to maximise interactions (i.e. where they can talk to the most people) or to target "problem" areas (i.e. where the most disturbance takes place). Clarity was also sought by a small number of respondents on the wider role of the Partnership, with respect to (e.g.) habitat restoration, Suitable Alternative Natural Greenspace (SANG) provision, etc, and the Partnership's collaboration with other organisations.

11.17 A particular issue was also raised with respect to Chichester Harbour, with a single respondent explaining that the protected landscape status of the area often provides challenges to their work with the Partnership. They explained that stakeholders within the area do not wish to see any further development locally, as they argue this will permanently change the character of the protected landscape. The respondent therefore often finds themselves in conflict with both the mitigation role of the Partnership and statutory nature conservation organisation when responding to development applications along the Solent coast. They therefore stated that the Partnership is ultimately a Section 106 management company rather than a conservation body. Bird Aware Solent do not however present themselves as a conservation body, and there are therefore some challenges around how Bird Aware Solent are perceived.

Achievements

11.18 It was suggested by multiple respondents that the ranger team are outstanding in the work that they do, are very knowledgeable, enthusiastic, and engaging, and that the Partnership ultimately produces a good "product". The Partnership was described as credible, with only a handful of developers having sourced their own, independent, mitigation. Furthermore, the statutory nature conservation organisation felt that a shift towards strategic mitigation (delivered through mechanisms like the Partnership) was a real bonus and more straightforward than dealing with development on a case-by-case basis.

11.19 The use of effective branding by the Partnership, and the dissemination of their core message on wintering birds and disturbance, were also consistently identified as important achievements by respondents, as well as the ranger team's regular attendance at events alongside informative displays. The Partnership was also described as having a good online presence, with its Facebook page and "carrot" approach to educational messaging being particularly commended. There were however also questions raised by some as to whether the use of online platforms by the Partnership ultimately lead to behavioural change on the ground (i.e. whether social media can work to reinforce key messages and extend Bird Aware Solent's reach).

11.20 Several respondents identified the key role of the ranger team in developing long-lasting relationships with site users, and how these in turn can cascade key messages (essentially creating a number of *de facto* volunteer rangers). The value of educational conversations between site users and the ranger team was also highlighted, and the effective targeting of novel engagement arenas (such as the Isle of Wight ferry) was highly commended. The recent installation of signage targeted at water sports enthusiasts/paddle-boarders at public launch points was also identified as a good example of the Partnership engaging with hard-to-reach groups.

11.21 Effective collaboration with other organisations was also cited by several respondents as a positive aspect of the Partnership, including constructive work carried out with local dog groups. The value of the ranger team as "eyes on the ground" and the additional benefit they bring in terms of data collection and general awareness was also recognised.

Perceived issues

11.22 Multiple respondents identified the relatively small size of the ranger team in comparison to the extent of the Solent coast and suggested (sometimes strongly) that the Partnership could never be effective in mitigating the impacts of recreation unless the number of rangers (and consequently the number of sites that they were able to cover) was increased. This was a view echoed by several HOS members who provided additional feedback. Some respondents also highlighted other, historic, volunteer-run conservation interventions at localities such as Hayling Island and were keen to stress the huge level of person-hour and media investment required for them to prove successful.

11.23 Concerns were also raised about the selection of sites that rangers targeted, infrequent visitation by rangers to specific sites, and the absence of rangers from sites during key time periods (including "peak" dog walking sessions in the early morning). One respondent also suggested that rangers should be seconded to specific Partnership organisations to focus upon site-specific issues. The perceived increase in dog ownership post-Covid, and the consequent requirement for increased levels of engagement with the dog walking community was identified as a necessity by some. The creation of the new Dog Initiatives Officer role was however recognised as a positive in this respect.

11.24 The formal use of volunteer rangers was identified by multiple respondents as a missed opportunity, with suggestions that the pool of local volunteer and recreation groups could be used to augment the existing ranger team. Fishermen were identified as an ideal group to engage with by some, due to their often-lengthy duration on site during unsociable hours. A few respondents suggested that the inclusion of community groups would also provide a feeling of local ownership within the Partnership. There was however recognition that the roll out of such a volunteer ranger program would require additional financial investment, resources, and training provision.

11.25 Several respondents suggested that the Partnership had too narrow a focus with respect to wintering birds and terrestrial recreation activities, including an overemphasis on dog walkers. The potential of a broader scope was therefore identified, including the mitigation of impacts upon coastal habitats and other coastal wildlife, and highlighting the issue of coastal squeeze. The requirement for an extension of the Partnership's work into

the summer period, to target important coastal sites for breeding waders and terns (e.g. Browndown), was also identified as a key issue by a number of respondents.

11.26 The ongoing disturbance to on- and offshore roosts, including those at Browndown and Portchester, from water-based activities (and paddle-boarding in particular), and the perceived inability of the ranger team to interact with those involved, was identified as a major issue by multiple respondents. The use of novel/inland launching points post-Covid was named as an issue for wader roosts on the Upper Hamble, and multiple respondents made a call for the ranger team to specifically target water sports enthusiasts at launching points. Bird Aware Solent have been working with water sports enthusiasts and has been expanding its' work in this area over the past winter, but relatively few stakeholders were aware or up to speed with these recent developments.

11.27 There was an assumption by several respondents that all rangers must now be deployed in pairs[30], leading to a reduction in the Partnership's resource and effectiveness. Several respondents also raised concerns that the ranger team were selectively engaging, subconsciously or not, with those site users who were already "well-behaved" and that more problematic site users were being ignored. There were suggestions that the rangers should prioritise engagement with problem behaviours/individuals, and that ideally such engagement should occur before any bad behaviour occurs. There was recognition that this would potentially necessitate conflict avoidance training for the ranger team.

11.28 The absence of enforcement was repeatedly identified as an issue, with suggestions that the current softer approach to engagement by the ranger team was ineffective in isolation. Several respondents suggested that fines, or legal threats to either dogs or property, were required for behaviour change to be seen on the ground, potentially enforced via byelaws and/or Orders. The creation of a separate Enforcement Officer role was identified as potentially beneficial by a small number of respondents, although others were concerned about conflating such a role with the outreach work that the ranger team already carry out.

11.29 Increasing the role, reach, and resourcing of education activities undertaken by the Partnership, often alongside partner organisations, was also identified

[30] This is not the case.

as a key issue. Stronger links with schools and youth groups, potentially on the back of the novel Natural History GCSE planned for 2025, were recommended, using a range of different media. Additional investment in education by the Partnership was identified as a win-win by several respondents, as the targeted messaging of children would potentially comprise another means of changing parents' behaviour.

11.30 Issues with the use of signage were identified by a large number of respondents, although responses were often mixed. A handful decried signage as a waste of time and money, but most called for a streamlining of existing signage along the Solent. They suggested that the current assemblage of multi-agency signage in place was both confusing for site users, creating an "environmental smudge" and leading to sign blindness, and contributing to countryside "clutter" (although the value of "repeater" signs was identified by some). There was however recognition that the location, design, and messaging of any novel/condensed signage was key, and that signs in isolation could never replace the need for other site-specific project work.

11.31 The maintenance of clear lines of communication between the Partnership and stakeholder organisations, and the provision of clear messaging to developers, were also noted as areas which could be improved upon. It was suggested by a small number of respondents that effective online communication with the Partnership was often difficult due to non-publicised staff turnover leading to changing points of contact. Two respondents also specifically identified occasions where they have contacted the Partnership/ranger team via e-mail to report problem behaviour and have never received a response of any kind, leading them to lose confidence in the scheme.

11.32 The establishment of a communication program that would include those absent from the online arena was also suggested by some, potentially comprising a biannual newsletter[31] or catch-up session. A few respondents also suggested that the Partnership website was hard to find/navigate, and that some developers have been confused by the explanations it provides concerning the differing payments required in respect to the "stand alone" and "in combination" effects of housing.

[31] For completeness, we note that Bird Aware Solent do already produce a newsletter.

11.33 The need for better engagement with other organisations was identified as an issue by some, with one individual also calling for the accurate recording of contributions made to mitigation activities by Partnership members in the absence of the ranger team. There was a suggestion that although the work that the Partnership carries out is excellent, it cannot do everything on its own, and that there is a need for a more strategic engagement approach. This would enable any work to be spread both geographically and amongst organisations and would foster the use of existing links between Partnership organisations and stakeholders/site user groups.

11.34 There were also concerns on the overall effectiveness of the mitigation carried out by the Partnership (in terms of behavioural change) and its long-term sustainability and legacy, particularly with respect to funding. Questions were raised concerning the accuracy of funding forecasts, including evidence from similar schemes in other countries, and what would happen at the end of the "in perpetuity" period. The relative merits of investment in infrastructure over development levies was also highlighted, including concerns about long-term maintenance. The need for a Sustainability Plan or succession programme was identified by a single respondent, with the suggestion that the Partnership would benefit by spreading its responsibilities across a range of other organisations[32].

11.35 A small number of additional issues were identified by individual respondents. These included the Partnership branding and ranger uniforms, which were described as somewhat police-like with a small logo that doesn't easily convey who the wearer represents. The respondent suggested that a larger and more prominent logo on the ranger uniform would have a greater impact, especially if accompanied by a strapline.

Suggestions for the future

11.36 It was suggested by some that an update of the Solent Recreation Mitigation Strategy is needed, potentially including a shift of focus. Such a shift would potentially incorporate the application of a triage process, including the sacrifice of some heavily disturbed areas to recreation and a boost to other important sites supporting (e.g.) high tide roosts. Such mitigation would potentially include removing access to specific locales alongside investment in the provision of high-quality alternative walking routes and infrastructure.

[32] Note that no specific organisations were mentioned, and that Bird Aware Solent already work with 19 Partner organisations.

The development of Codes of Conduct for key activities, such as paddle-boarding, was also identified as a priority[33].

11.37 Questions were also asked as to whether the Strategy could be delivered through existing agencies or via alternative routes, and whether developer contributions should be reduced for hotels and tourist accommodation. There was also a request that occupancy rates related to developer contributions were clearly displayed upon the websites of all Local Planning Authorities.

11.38 Some respondents called for greater integration between the Partnership and other key stakeholder groups, including closer working links with the Solent Forum and the Natural Environment Group (NEG). There was also a suggestion that specialists should be more involved at the Board level, and that the Partnership should identify their priorities more concisely and then communicate them effectively with the existing mitigation network. It was indicated that this should include the public, community figures, and decision makers, and that the Partnership would also potentially benefit from stronger links with enforcement agents such as the Hampshire Police Rural Crime Team. The forging of links with the Isle of Wight UNESCO World Biosphere Reserve was also identified as a positive.

11.39 Additional targeted messaging from the Partnership was also identified as being potentially beneficial, including direct, positive, communication with house buyers explaining how developer contributions were linked to the work of the Partnership. A regular email update/newsletter[34] and/or mailing list was also identified as being beneficial, in addition to continued social media presence and the use of a variety of other media to connect with a wider base. The latter included a larger number of presentations/stands at shows, and meetings with community and user groups (potentially via drop-in events). It was suggested that such events should also target the summer months and other busy periods. Several respondents observed that if communities are given enough information, then this can lead to an increase in community knowledge and consequently behavioural change.

11.40 Wider knowledge sharing by the Partnership with other stakeholders, and across partner organisation/Local Authority boundaries, was identified as a key recommendation by multiple respondents. It was suggested that this

[33] Note that codes of conduct for water sports are already being developed by Bird Aware Solent.
[34] Note that Bird Aware Solent do already produce a newsletter.

could include guidance from the ranger team on positive messaging and those methods they felt have been most effective in dealing with difficult and/or hard to reach user groups. It was further suggested that such an approach may be best suited to a workshop or other face-to-face event, and that the dissemination of common points of contact would also prove beneficial.

11.41 The added value provided by the data collection carried out by the ranger team was recognised and it was identified as important that they continue to record accurate monitoring data (e.g. number of interactions, etc). A desire for the ranger team to record both observed disturbance events and concentrations of feeding birds whilst out on site was also expressed by one respondent, alongside the promotion of bird ringing and colour ring reading/reporting by the public at coastal sites.

11.42 Finally, several respondents made suggestions concerning the wider remit of the Partnership and on-the-ground strategic mitigation across the Solent. Some would like to see the creation of a Visitor Centre, acting as a focal point where coastal users could meet rather than relying entirely on the ranger team's sporadic presence at coastal sites. There was a suggestion that the Partnership might like to consider if such an endeavour could potentially be carried out in conjunction with other stakeholders at a coastal venue. The creation of a new, landscape-scale, Country Park to the east of Southampton Water was also identified as a potential future mitigation requirement.

Public perception

11.43 The stakeholder workshops and dialogue described above involved partnership organisations rather than the general public. No specific engagement with the public was undertaken as part of this review. However we have checked visitor survey results and social media feeds for any insights into how the public perceive Bird Aware Solent.

Visitor survey results

11.44 267 interviews were undertaken by Caals et al (2020); 26% of interviewees had heard of Bird Aware Solent and 16% had spoken to a ranger. The surveys did not include a specific question on perceptions of Bird Aware Solent, however there was scope for the interviewer to log general comments and any feedback about the area where the interview took place and how it is managed for access. We have reviewed these general

comments (as set out in Appendix 3 and 4 in Caals et al.) for relevant points. None of the responses to either of the open question specifically mentioned Bird Aware Solent or the Rangers, and there was no specific feedback either positive or negative.

11.45 The responses do however highlight some key concerns and issues for visitors that are relevant. In response to an open question asking whether there were any changes the interviewee would like to see with regards to how the area is managed for access, 5 interviewees specifically mentioned concerns about disturbance (including from jet skis and dogs), 3 referred to the numbers of people and the coast becoming busier and 2 mentioned concerns relating to development and housebuilding. In answer to a further question relating to any further general comments or feedback, a further 5 interviewees specifically mentioned concerns about house building and implications in terms of more people and more disturbance. One further comment raised concern around dog walkers and the impacts on Brent Geese.

Social media

11.46 We reviewed twitter posts, extracting the last 100 posts that contained "#birdawaresolent" and the last 100 to contain "bird aware solent". The results were merged and used to generate word clouds that provide a reflection of the general themes and content. Figure 11 shows a word cloud based on all content. The posts included ones from Bird Aware Solent as well as tweets from partner organisations and members of the public. It can be seen that the general tone and content is positive and celebratory (as shown by words such as thank, highlight, beautiful and great).

11.47 As a further check of content we removed all tweets that were from Bird Aware Solent (n=69) and created a second word cloud (Figure 12). It can be seen that the same positive words feature and none of the posts extracted were negative.

11.48 These approaches are relatively simple and much more sophisticated mining of twitter feeds are possible (beyond the scope of this general review). Nonetheless the results suggest that strong and positive social media presence with no evidence of public hostility.

Figure 11: Word cloud based on twitter posts containing "#birdawaresolent" or "bird aware solent". The size of the words reflects the frequency with which they occur in the text. Websites, links to feeds, handles and other personal details have been removed. Word cloud generated by wordcloud.com.

Figure 12: Word cloud based on twitter posts containing "#birdawaresolent" or "bird aware solent", and the same data as in Figure 11, however any posts produced by Bird Aware Solent are excluded. The size of the words reflects the frequency with which they occur in the text. Websites, links to feeds, handles and other personal details have been removed. Word cloud generated by wordcloud.com.

Key points: How the is partnership perceived

We determined how the Partnership is perceived through a range of stakeholder workshops and interviews. A relatively small number of invited individuals engaged with the process however, potentially increasing the prominence of some of the stronger views held by those individuals that did engage.

The ranger team are well known and respected, but the wider work of the Partnership is less well recognised by both the public and stakeholder organisations. It is however highly visible to the developer community and its approach is welcomed by the statutory nature conservation organisation. The Partnership is perceived as well run, with both its branding and messaging identified as being of high value. It is also recognised as having a good online presence, and the value of the ranger team in cementing long-term relationships with site users is also highlighted.

Stakeholder dialogue also highlighted a lack of clarity concerning the current role of the ranger team with respect to problem behaviours and the lack of enforcement when they occur. The small size of the ranger team, and the perceived limitations this places on its effectiveness, were also highlighted, alongside concerns regarding selective engagement with site users. Other Partnership issues identified included a narrow focus on wintering birds, the conflicting requirements of different site designations, a reticence to augment the ranger team with volunteers, the problems posed by emerging threats, limited educational outreach, signage, communication and cross-working with stakeholder organisations, and the overall effectiveness, long-term sustainability, and legacy of the Partnership.

Suggestions made by stakeholders for the future include updating the Solent Recreation Mitigation Strategy and the broadening of its focus, greater integration by the Partnership with other stakeholders, an increase in targeted messaging and knowledge sharing, and an aspiration to develop a greater range of mitigation-related infrastructure projects.

We found no evidence from a check of visitor survey responses and twitter posts of negative views from the public relating to Bird Aware Solent. Visitor survey results show some concern among visitors to the coast about the impacts from local development, growing numbers of visitors and disturbance to birds.

12. Discussion and recommendations

Discussion

12.1 We have collated data and information to summarise the level of mitigation delivery, evidence of effectiveness and views of stakeholders.

12.2 The data suggest that access has increased markedly over the 5 years under review, and that this increase is disproportionate in relation to housing change within 5.6km of the coast. While there inevitably some uncertainty around the figures for visitor numbers (as determining trends in access across 250km of coast is a challenge), a marked increase in recreation use does fit with the national picture. There are potentially a range of factors driving the increase, for example national trends reflect increasing use of countryside sites for recreation[35] and we know dog ownership has increased following the covid pandemic (Morgan et al., 2020). Climate change may well also influence recreation use (Coombes & Jones, 2010, 2010). Furthermore the distribution of housing change will influence recreation use, as the closer people tend to live to sites the more likely they are to visit (Weitowitz et al., 2019). Housing growth particularly close to the coast may result in disproportionately more visits than that further away (even within the zone of influence).

12.3 The discrepancy between the increase in access and housing change is important as it highlights that housing growth is not the only driver of change and shows that the levels of future change in access may not necessarily be in proportion to changes in housing. HRAs and mitigation delivery therefore need to ensure the uncertainty is addressed.

12.4 There is also discrepancy between the levels of housing change evident from postcode data and the amount of development that has contributed to the mitigation scheme. This reflects the considerable time lag between

[35] People and nature survey data (https://www.gov.uk/government/statistics/the-people-and-nature-survey-for-england-year-2-annual-report-data-and-publications-april-2021-march-2022-official-statistics-main-findings/the-people-and-nature-survey-for-england-year-2-annual-report-data-and-publications-april-2021-march-2022-official-statistics-main-findings) show a marked increase in the proportion of adults that visited a green and natural space (in the past 14 days) in the second quarter of 2020 and then levels have remained high (or dipped slightly) since. 63% of adults had visited a green and natural space in the previous 14 days between April 2021 – March 2022

mitigation contribution and potential impact. This potentially provides a safety net in terms of delivery but highlights that the full scale of impact is not yet manifest. While the review focusses on a five-year period, clearly mitigation is a long term commitment with the full scale of impacts from growth yet to materialise.

12.5 The bird data indicate widespread declines in birds across all three SPAs, particularly Chichester and Langstone Harbours SPA. In Section 7 we considered whether the change in bird numbers related to the change in access. We used housing data and bird data and checked to see whether the widespread declines in wintering birds were more associated with those sectors where there has been a greater housing change. We used housing change in the analysis, rather than visitor numbers, as the housing data can be directly related to the WeBS data.

12.6 To some extent the lack of clear relationship was not unexpected. The birds have been declining for many years and there are a range of factors influencing these changes. The distribution and overall numbers of birds that the WeBS data reflect are therefore a legacy from a range of complex issues and span many years. Housing has increased around all sectors and across the UK. Furthermore, site specific factors at each location – such as the spatial overlap between birds and recreation use will vary. The birds are mobile and are likely to move between sectors over a winter and use different sectors at different tide states, potentially masking impacts at specific sectors. The relative contribution to the overall bird declines from recent house building and increased access is therefore hard to determine.

12.7 The lack of a clear relationship between the scale of bird decline and housing change could also indicate that Bird Aware Solent has been successful, as mitigation for disturbance has been in place and targeted to locations with particular disturbance risks. A range of other conservation initiatives (such as changes in land management) may have also had a beneficial effect. The results should certainly not be interpreted as showing that there is no impact from housing or recreation.

12.8 We have summarised the level of mitigation that has been achieved by Bird Aware Solent and partners and the totals for the 5 years under review are impressive. The project has received national recognition and the dialogue with stakeholders indicates the Project is respected and perceived to be making a difference, albeit with some areas where potential improvements or changes could be made in the future.

12.9 Drawing on the results of our review we make a number of broad recommendations which warrant consideration for the future updates of the mitigation strategy. These are set out below.

Increase ranger provision

12.10 The relatively low level of ranger coverage is a consistent theme from the review, with our estimates suggesting current ranger provision is currently enough to achieve less than 1% coverage of the coast and stakeholder feedback clearly highlighted low levels of coverage as a concern. Low levels of SANG provision to date places greater emphasis on the importance and reliance on rangers for mitigation delivery. There is therefore clear merit in expanding the Ranger team. This could be done in the short-term without the need to maintain such levels in-perpetuity. Looking longer-term, site-specific projects (such as creating safe roosts for waders, fencing roost sites, creating alternative routes, manipulating parking provision etc) are likely to mean fewer locations require the ranger coverage. SANGs are also likely to work more effectively as they become better known and promoted. Furthermore, once behaviour change has become established and responsible behaviour is the norm among visitors, then again rangers can become less of a focus in the strategy.

12.11 Identifying the optimum level of coverage is difficult, however as an example the level of ranger cover for the Thames Basin Heaths is 3.5x higher than the current level of provision on the Solent (see para 10.6). It may be necessary to adjust staffing levels and the team size in response to monitoring data. It would be beneficial for some experimental work to test different levels of coverage and implications for visitor behaviour, for example there may be merit in testing whether there are different outcomes from intensive ranger coverage at a location in a pulse, followed by low levels of coverage compared to the same level of cover evenly spread over time. If written up as case studies (see para 12.34) this could help ensure there is a clear record of what works and what hasn't been so successful.

Volunteers

12.12 Extending the reach of the ranger team through volunteering was identified by some of the stakeholders, with the suggestion that volunteers could act as ambassadors and potentially undertake tasks such as showing people birds, handing out information and so on. Some other bird disturbance mitigation projects involve extensive use of volunteers (e.g. Plovers in Peril

on the Norfolk coast), where volunteers help with both engagement and with monitoring. Involving volunteers in monitoring potentially helps to raise understanding and appreciation of the bird interest which can then feed through into the engagement with other visitors.

12.13 To date Bird Aware Solent has not been in a position to take on significant volunteer effort (due to a range of factors including the relative infancy of the Bird Aware project, need for the Rangers to gain experience and expertise and the pandemic). To date some volunteer engagement has been trialled, largely involving students looking for work experience or similar and accompanying rangers. There are some clear risks to working with volunteers and it is entirely sensible that they have not been used widely so far. Influencing people's behaviour is difficult and the ranger team are carefully selected and receive considerable training. Any volunteer network would require considerable effort to build, maintain and support, with training, rotas, equipment, transport and similar – meaning a need for greater staff input (e.g. a volunteer coordinator) to make sure it works. There may be a need to vet volunteers to minimise risks of reputational damage. As such, the potential use and role of volunteers requires careful review, consideration and resourcing. Volunteers certainly do not provide the panacea and means to expand the ranger team cheaply and quickly. It may be that it is best that the ranger team is increased in the short term and volunteers are best incorporated into the mitigation delivery in the medium term, when more of the infrastructure changes, SANGs etc are in place and consideration is given to reducing the ranger provision.

Maximising reach and effectiveness

12.14 With the relatively low level of current ranger provision, options to extend the reach and effectiveness of the rangers are relevant. The team already do much to maximise their visibility – for example through the branded vehicles, temporary signage, art work (sand sculptures), presence on ferries and the use of social media etc.

12.15 There may be further options or opportunities over time and any novel approaches to highlighting key messages to visitors should be taken. These could include web cameras, use of time lapse, direct work with user groups etc. Ranger time on site could also potentially be targeted further as the team builds on their experience and the monitoring data available. The experimental work suggested above (see para 12.11) would be useful in helping to define an optimum level of time and this may need to vary

between different types of sites (e.g. open beaches compared to intertidal mud). It may also be that there is merit in doing 'pulses' of visits to particular locations rather than evenly spreading visits over time and further data will be necessary to ascertain this.

12.16 Various pieces of evidence in this report indicate that Chichester Harbour would warrant more focus and effort, due to the numbers of birds, the range of qualifying features and the evidence for declines.

12.17 Some stakeholders questioned the effectiveness of social media in making a difference and the extent to which it might reinforce the messages of the rangers. There is growing evidence for the effectiveness of social media and relevant content (e.g. Arts et al., 2022; Šmelhausová et al., 2022) and this is likely to evolve and continue to grow over time. There would be merit in a dedicated piece of work to showcase the social media work by Bird Aware Solent and to mine relevant social media to analyse the content and responses of followers in depth. Such analysis could be used to demonstrate the effectiveness and to target future social media engagement.

Potential for 'harder' mitigation measures

12.18 The approach of Bird Aware Solent has to date been relatively soft, in terms of positive engagement and provision of new space for recreation. Rangers do not have enforcement roles and do not 'police' the coast. Positive messaging celebrating the wildlife and raising awareness are core to the work of the project.

12.19 Some other mitigation schemes have however incorporated enforcement for rangers. In Northumberland the Space for Shorebirds project[36] employs rangers in a similar way to Bird Aware Solent, with a focus on education and positive engagement. Nonetheless, the rangers have powers of enforcement and can issue fixed penalty notices relating to dogs on leads. To date these powers have not been exercised, no fixed penalty notices have been issued and the Northumberland rangers report that positive engagement and polite requests have worked (with the enforcement powers giving them greater confidence and the ability to take more decisive action if the need arose).

[36] See http://spaceforshorebirds.co.uk/

12.20 Looking to the long term there may be scope to introduce harder measures at the Solent, but direct enforcement in terms of the ability to issue fines or similar would require very careful review and consideration, potentially delivered under a different brand or by other organisations. It is critical that the reputation of Bird Aware Solent and the ability to engage positively with visitors is not put at risk. There is scope to potentially restrict access and limit visitor numbers more through other measures, such as fencing roosts or changing parking provision (e.g. reducing parking spaces or closing car parks at certain locations).

Widening of mitigation delivery to include breeding birds and coastal habitats

12.21 The original review of recreation impacts and issues that formed Part 1 of the Solent Disturbance and Mitigation Project (Stillman et al., 2009) identified risks from recreation to the breeding bird interest (Mediterranean Gull and terns) and to the coastal habitats (such as saltmarsh, coastal lagoons, vegetated shingle and sand dunes). Stillman *et al.* provide a literature review of impacts and also present evidence from stakeholder dialogue.

12.22 The initial mitigation strategy work (Liley & Tyldesley, 2013) also highlighted that further mitigation might be required with respect to the breeding bird interest and coastal habitats, yet the initial strategic focus was on wintering birds. This makes sense as the wintering bird interest is more ubiquitous (and therefore strategic in nature) while the breeding bird interest and SAC qualifying features are more localised. Nonetheless, the issues are real and stakeholder dialogue as part of this review has highlighted concern about the current strategy's focus on wintering birds. Other strategic mitigation schemes incorporate breeding birds and or coastal habitats alongside wintering birds (e.g. Dawlish Warren, the Suffolk Coast). With coastal squeeze and climate change, coastal habitats are potentially more vulnerable while breeding tern populations have been a focus for conservation effort in recent years as a result of widespread declines[37].

12.23 There is merit in extending mitigation delivery to include these issues as there is much overlap with the wintering bird interest. Visitors may be confused as to where there are breeding birds and where for example dogs

[37] For background of issues relating to habitat and breeding birds, see https://www.projectlote.life/

should be on lead during the summer and the winter. Signage and interpretation that is present all year should include reference to breeding birds. Providing messages and engagement year-round makes sense. Similarly, site specific projects and access infrastructure may benefit breeding birds too.

12.24 Given the more localised elements for the SAC qualifying features and breeding bird interest, there may be a need for mitigation costs to vary in different areas or the way developer contributions are collected to change. In the long term, however, recovery for the breeding bird interest would involve more widespread nesting and use of beaches, rather than birds being concentrated in the few islands and spits where access is limited or restricted, as such there is an argument that the issues are Solent wide. Further consideration and investigation is required as to the implications for the Bird Aware Solent team and how delivery is best achieved.

Infrastructure and SANGs

12.25 There is now better evidence on the efficacy of SANGs in a coastal environment and there is therefore scope for better integration of SANGs into the mitigation package and targeting of SANGs to deflect visitors away from key locations.

12.26 As highlighted in para 12.10 above, if access infrastructure and SANGs are effective in changing visitor use and deflecting access away from sensitive locations and there is sufficient alternative greenspace, the need for rangers will decrease, and therefore reduce the burden for in-perpetuity funding. If nature conservation and access were to be more segregated, for example such that there were sections of the coast with little or no access, where dogs off lead were focussed towards sites without bird interest (SANGs) and where water sports etc were clearly zoned and limited in their distribution, then risks from new housing and recreation would be virtually eliminated. There is therefore merit in a short to medium term focus on achieving SANGs and access infrastructure measures in the right places and ensuring coverage for the whole coast.

12.27 Careful planning, implementation and monitoring will be necessary to ensure measures are working and there will also be implications for long term financial planning in terms of the amount of money set aside for in-perpetuity funding.

Activities and priorities for mitigation

12.28 Dog walking should continue to be a clear priority for mitigation as dog ownership has increased, it poses a much greater risk compared to many other types of recreation (Banks & Bryant, 2007; McBlain et al., 2020; Murchison et al., 2016) and is one of the activities most likely to be undertaken by local residents (e.g. dog walking was the main activity for 61% of the interviewed groups in Caals et al., 2020).

12.29 Looking more widely, water sports and activities involving access onto the intertidal are also relevant. Activities such as kayaking, kitesurfing, windsurfing, paddleboarding and wild swimming are potentially more niche than dog walking, but also pose clear risks in terms of disturbance. It is difficult for rangers to potentially interact with such users, and a more tailored approach is required. These are clear areas for Bird Aware Solent to put more resources.

12.30 Bird Aware Solent have been working with stakeholders from the wind and paddle sport communities to create two new voluntary codes of conduct, one for windsports and one for paddlesports. These are among the first activity specific codes of conduct that are planned to be created in collaboration with stakeholders from relevant groups. The 2 new codes along with a water sports map that encourages use of launch points and routes that are less likely to disturb birds, will be launched in the spring 2023 as a project called 'Watersports With Wildlife'. This project will include new webpages, signage at some launch points (already in place), direct communication with clubs/hire companies and shops, and targeted social media. There are plans to repeat this process for other user groups as time and resources allow. These approaches need to be tried, honed and reviewed and represent an expansion and new direction.

12.31 Some of these activities are likely to continue to increase in popularity and take on greater prominence among visitors. Climate change (leading to different weather conditions), better wetsuits and more portable equipment (inflatable paddleboards), plus the growing popularity of activities such as wild swimming will mean greater ranger focus and effective means to engage and influence these user groups will be increasingly important.

Figure 13: Kayak passing roost on Hayling Island. Bird Aware Solent has worked directly with the Sailing Club in this instance to ensure protection for the roost. Ensuring adequate protection for all key roost sites and feeding areas around the Solent is however more challenging.

Role of Bird Aware Solent

12.32 Clearly the role of Bird Aware Solent is to deliver mitigation for new development. However, stakeholder dialogue revealed that there was some confusion regarding the role and responsibilities. This is perhaps not surprising given that there are a wide range of organisations involved in bird conservation/public engagement around the Solent and Bird Aware Solent works with a range of people including planners and developers that are not necessarily well informed of the role of different conservation bodies. Furthermore, the role of Bird Aware Solent is unusual and doesn't easily fit with preconceptions around bird protection organisations.

12.33 Bird Aware Solent cannot deliver all interventions relating to people and birds around the Solent and indeed cannot deliver all the necessary mitigation. Its effectiveness depends in part on close working and partnership across a range of bodies. As such there is potentially an opportunity to ensure the role of Bird Aware Solent is clearly communicated to stakeholders. It is also necessary for stakeholders to work with Bird Aware Solent to ensure consistent messaging, facilitate engagement and help widen its reach.

Information sharing and refining best practice

12.34 In the monitoring strategy it was recognised that there was a benefit to producing a series of case studies for specific locations to document the effectiveness of the rangers and how mitigation measures had worked to

change behaviour. It was anticipated that the results would help work out how best to target ranger time.

12.35 There is still a role for such case studies, and specifically to help ensure ranger time is optimised and the right level of coverage is achieved. We suggest the case studies are relatively brief and cover specific locations or sections of the coast. The case studies should document the site, the issues, various interventions (signage and interpretation, access infrastructure, ranger time etc) and describe how these were deployed and changed over time (e.g. conditions rangers visited in). Visitor behaviour and bird numbers/distribution should be described and basic data presented. There may be merit in some additional data collection, for example observing people or counting birds and disturbance events.

12.36 The case studies should work to build a small library documenting measures, success and failures. They should help inform future decision-making regarding levels of ranger provision and even the types of intervention (e.g. with respect to water sports). They should also work to provide a basis for other mitigation projects to refer to, as ultimately a wider knowledge base will be beneficial to all.

Flexibility to deal with uncertainty

12.37 The five years under review have been turbulent. Covid has influenced recreation patterns, house building and mitigation delivery while the climate and ecological emergencies are having impacts in terms of the species present, distributions, storminess and changing coastlines. Functionally-linked land may become increasingly important for the birds and addressing disturbance issues on land outside the SPAs may become more relevant over time.

12.38 Mitigation will need to adapt and respond to change. As such, ensuring funds can be mobilised and budgets changed to exploit emerging opportunities will be important. Flexible governance arrangements and strong partnerships will be essential moving forwards.

End points

12.39 Recreational disturbance is a complex issue and Bird Aware Solent has a challenging role to ensure mitigation across the entire Solent coast. While some of the coastline is clearly managed for nature and visitors are likely to be very aware they are entering a reserve, along most of the coast there is

little to indication that the area is important and protected for wildlife. A significant shift in mindset is required for people to appreciate the importance for birds and modify their behaviour accordingly. Bird Aware has been ground-breaking in many ways and has provided a mould for many other mitigation schemes around the country.

12.40 Limited resources are a recurrent theme from the review – given the scale of the coast, the volume of new development and levels of access. Bird Aware have achieved a wide reach, strong profile and there is a sense of momentum, with new projects and different engagement being rolled out (such as the work on water sports). These need time to grow and reach their potential.

12.41 We are in a climate and ecological emergency and the role of projects that promote positive environmental behaviours and better connections with the natural world is more and more imperative. Uncertainty has been a feature of the time covered in this review and looking to the future we can be reasonably confident that there will be increasing storminess and weather events, and that access patterns and bird populations may change in unexpected ways. With a changing political climate post Brexit, there may also be changes to legislation. Bird Aware Solent has a key role to play in nature recovery but its effectiveness will ultimately be ensured by its flexibility and close partnership working, with strong links across organisations.

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Appendix 1: Housing change by sector

The table below gives the amount of housing change for each of the Bird Aware Solent defined sectors. Housing change covers January 2016 to January 2022.

Sector code	Access	Priority	New dwellings	Percentage increase in dwellings
CHBH	No	No interest	1821	6.7
CHBI	Limited	No interest	885	4.9
CHBN	Yes	Low	920	5.0
CHBQ	Yes	Medium	930	5.6
CHBS	Yes	Medium	1074	6.7
CHCO	Yes	Medium	1544	5.8
CHEH	Yes	High	668	4.7
CHEM	Yes	High	2405	4.5
CHFI	Yes	Medium	1839	7.9
CHGP	Limited	Low	1316	4.9
CHMA	Yes	Low	1833	7.4
CHME	No	No interest	436	3.4
CHNO	Limited	Medium	2066	4.5
CHPR	Yes	High	1129	5.1
CHSE	Limited	Medium	464	4.0
CHSP	Yes	Medium	501	4.0
CHTI	Yes	Low	2173	5.3
CHWI	Yes	Medium	1082	6.0
CHWW	Yes	No interest	481	4.9
IWBE	Yes	Medium	185	2.5
IWBH	Yes	High	483	2.9
IWBM	Limited	Low	584	2.4
IWBO	Yes	No interest	166	2.6
IWCO	Limited	No interest	552	3.5
IWEC	No	No interest	737	3.4
IWFI	Limited	Low	1305	4.0
IWFO	Limited	Medium	226	2.7
IWFV	Yes	No interest	155	2.7
IWMD	No	No interest	133	2.0
IWME	Yes	Medium	1058	4.1
IWMW	Yes	Low	1045	4.1
IWNE	Yes	Medium	227	2.7
IWNW	Limited	No interest	70	3.9
IWPB	Limited	Low	427	2.5
IWRY	Yes	High	463	2.5
IWSD	Yes	Medium	433	2.5

Sector code	Access	Priority	New dwellings	Percentage increase in dwellings
IWTB	Yes	Medium	594	3.2
IWWH	Yes	No interest	997	4.0
IWWY	Limited	High	186	3.0
LHBM	Yes	Medium	3187	3.8
LHBT	Yes	Low	1939	2.1
LHFM	Yes	No interest	4647	3.5
LHHL	Yes	Low	4136	3.5
LHHS	Yes	Medium	684	2.0
LHML	Yes	Medium	3039	3.2
LHOB	Yes	High	2088	2.7
LHSC	Yes	Medium	2365	3.1
LHSM	Yes	Low	3036	3.9
LHWT	No	No interest	2900	3.1
NFBN	Limited	Low	202	1.7
NFBS	No	No interest	147	2.0
NFCA	Yes	Medium	142	1.7
NFCH	No	No interest	65	1.2
NFDI	No	No interest	4797	4.8
NFEL	Limited	Medium	4607	5.5
NFFA	No	No interest	3625	6.1
NFHS	Yes	Medium	595	3.5
NFHY	Yes	Low	4253	5.3
NFLE	Yes	Medium	65	1.1
NFLK	Yes	Medium	622	4.1
NFLR	Yes	No interest	657	4.5
NFLT	Yes	No interest	2295	3.3
NFMA	Limited	Low	5192	4.6
NFNO	Yes	Medium	57	1.0
NFPD	Limited	Medium	586	4.4
PHEL	Limited	Low	3429	2.5
PHFA	Yes	Low	1742	2.5
PHFL	No	No interest	3473	2.8
PHGC	Yes	Medium	2372	2.5
PHGL	Yes	Low	2879	2.8
PHHA	Limited	No interest	2926	2.6
PHHI	Yes	Low	3856	3.0
PHNB	No	No interest	4380	3.1
PHPH	Limited	Low	2957	2.6
PHPO	Yes	Medium	4024	2.7
PHPS	Yes	Low	3403	3.3
PHSS	Yes	Medium	3126	2.7

Sector code	Access	Priority	New dwellings	Percentage increase in dwellings
SWBM	Yes	High	2808	5.2
SWBR	Yes	Medium	1271	2.6
SWBU	Limited	Low	4054	7.9
SWCB	Yes	Low	6694	5.5
SWCH	Yes	Medium	1372	3.3
SWHC	Yes	Medium	3013	4.7
SWHE	Yes	Medium	3359	5.4
SWHH	Yes	High	1522	2.6
SWHL	Yes	Medium	1937	5.2
SWHW	Limited	Low	3825	5.6
SWIN	Yes	No interest	6977	5.1
SWIS	Limited	No interest	7072	5.1
SWLS	Yes	No interest	1289	2.4
SWMF	Yes	Medium	4207	6.0
SWRV	Yes	Low	4034	5.9
SWSB	Yes	Medium	2591	3.5
SWSC	Limited	No interest	6207	4.3
SWTH	No	No interest	1945	3.4
SWWS	Yes	Medium	6261	5.1

Appendix 2: Summary of WeBS Alerts data

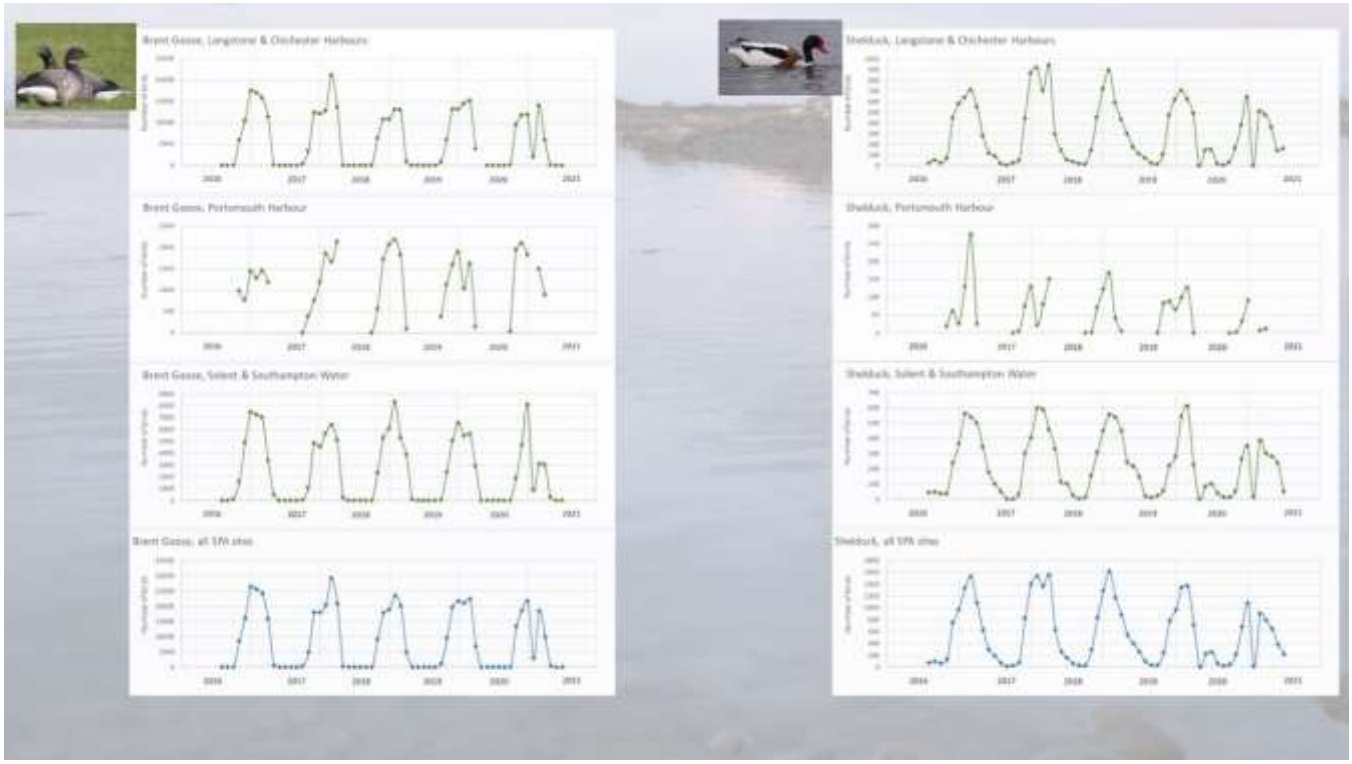
The table below is taken from the WeBS Report online and summarises the WeBS alerts for the relevant species for each SPA. Red shading indicates high alerts and orange shading indicates medium alerts. For full details, background and context see Woodward *et al.* (2019) and the BTO website[38]

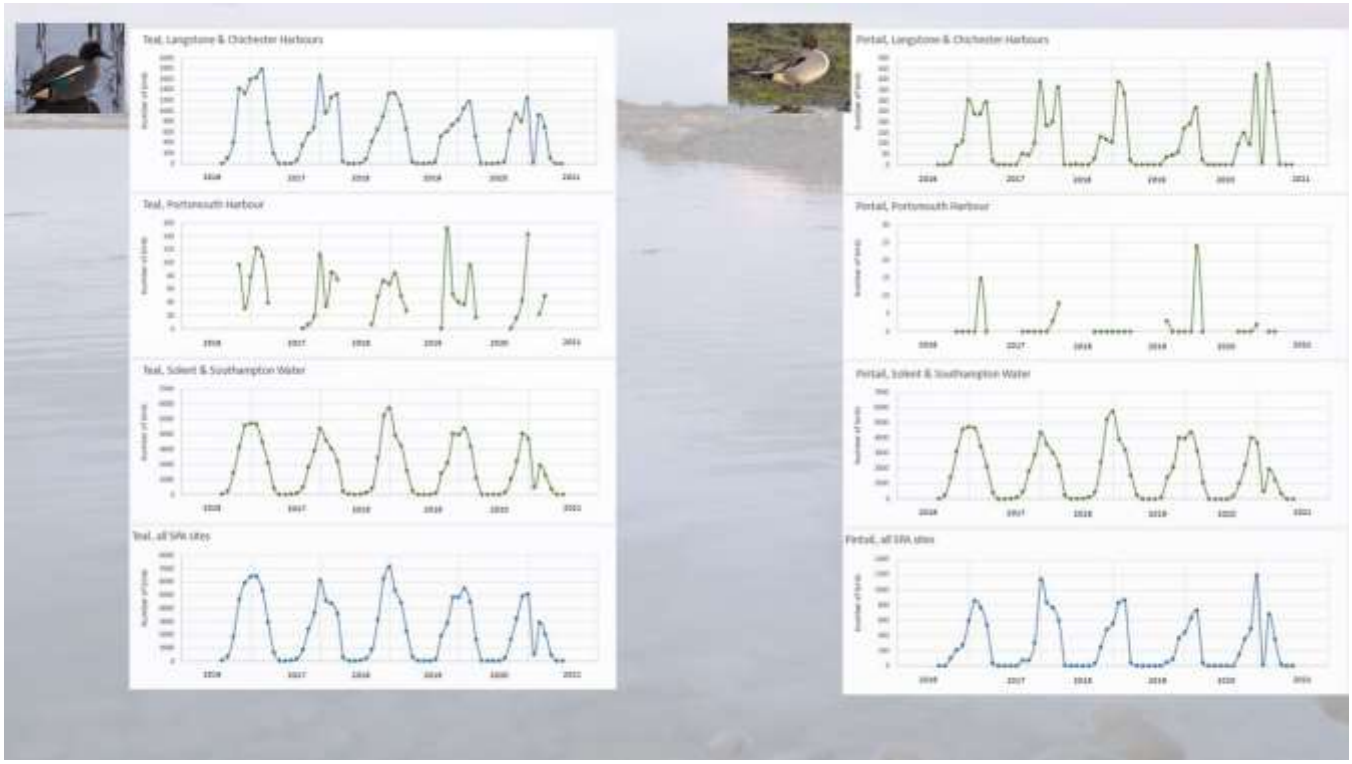
Species	% change short-term	% change medium-term	% change long-term	Baseline winter	% change since baseline
Chichester and Langstone Harbours SPA					
Brent Goose	22	-11	3	84/86	6
Pintail	12	-23	-13	84/86	2
Red-breasted Merganser	**-26**	-13	-6	84/86	39
Shelduck	-5	-18	-67	84/86	-73
Shoveler	-12	**-39**	**-34**	84/86	**-48**
Teal	-20	1	-16	84/86	**-44**
Wigeon	-20	15	73	84/86	58
Curlew	-12	**-26**	-2	84/86	**-31**
Dunlin	-20	-16	**-47**	84/86	**-49**
Grey Plover	-8	-13	**-47**	84/86	**-38**
Redshank	3	-3	17	84/86	-19
Ringed Plover	-8	**-41**	-74	84/86	-71
Sanderling	**-31**	**-38**	**-49**	84/86	-69
Turnstone	7	-10	18	84/86	12
Wintering waterbird assemblage	-9	-5	**-26**	84/86	**-31**
Portsmouth Harbour SPA					
Brent Goose	11	**-30**	-12	88/89	-3
Red-breasted Merganser	**-26**	**-35**	**-37**	88/89	-55
Black-tailed Godwit	37	2	228	88/89	23
Dunlin	**-47**	-58	-60	88/89	-60
Solent & Southampton Water SPA					
Brent Goose	15	**-30**	-18	94/95	-8
Teal	3	16	-11	94/95	3
Black-tailed Godwit	**-25**	-12	1	94/95	**-28**
Ringed Plover	6	-22	-52	94/95	-54
Wintering waterbird Assemblage	-5	-8	-15	94/95	**-29**

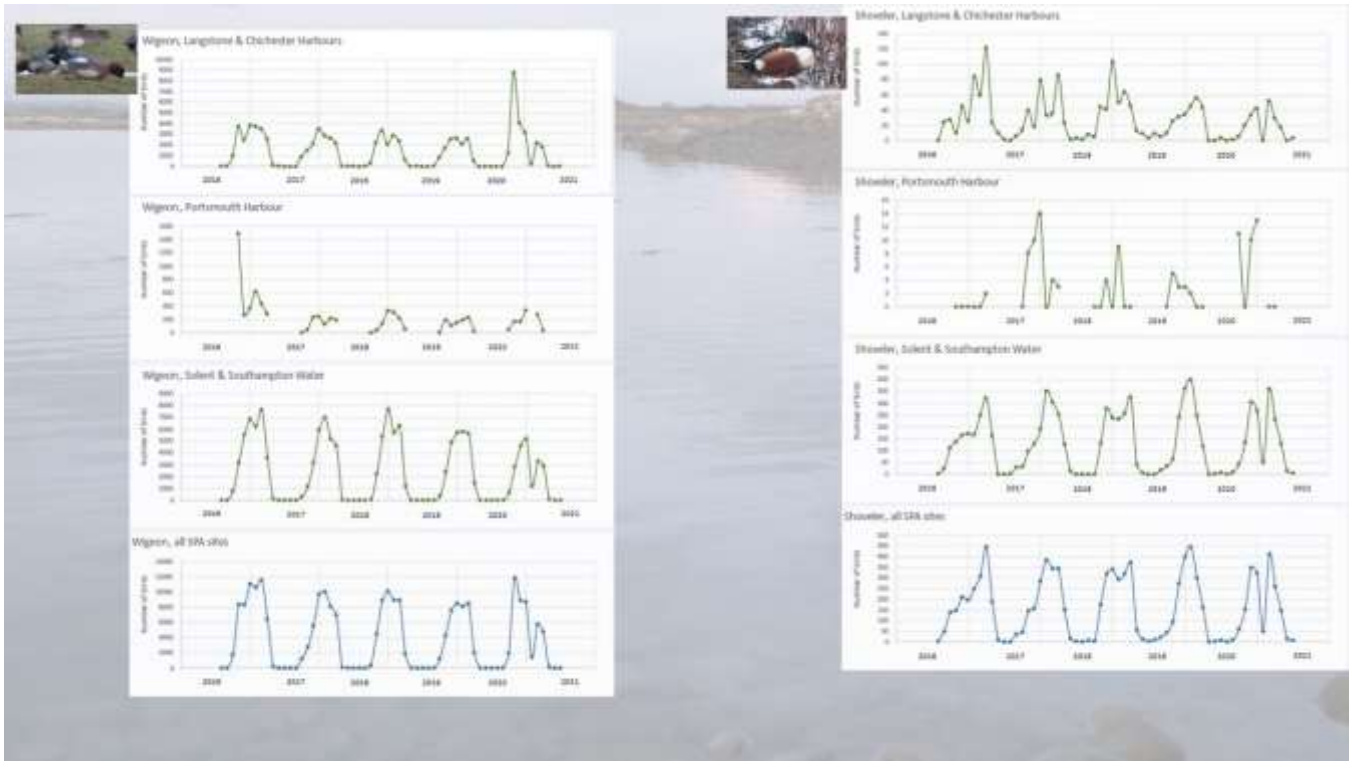
[38] https://app.bto.org/webs-reporting/alerts.jsp

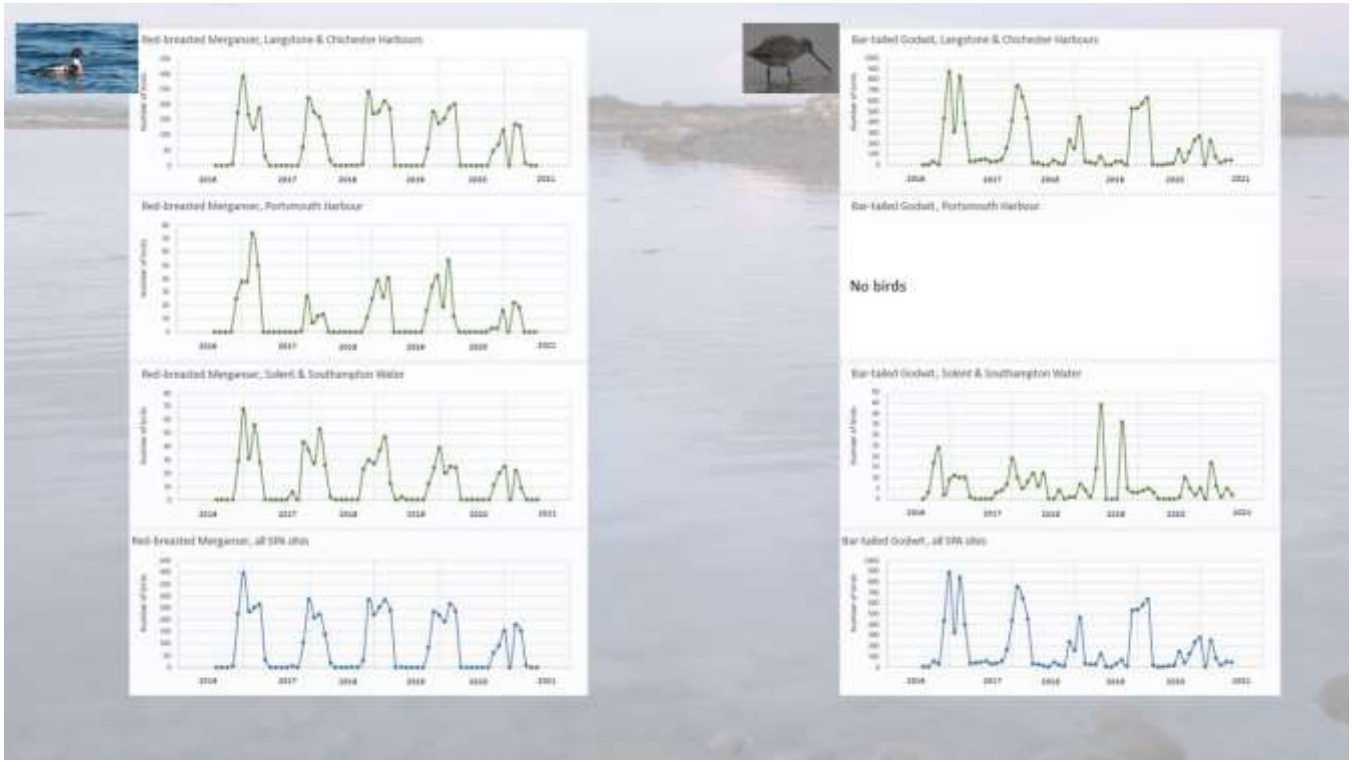
Appendix 3: Graphs of WeBS data

The plots in this appendix give the WeBS data for each SPA by species and month. Data are the totals across all sectors counted in the given month. Where WeBS sectors are outside an SPA or partly outside they have been included in the relevant SPA totals. The final graph shows the combined data for all the species included in the individual plots.

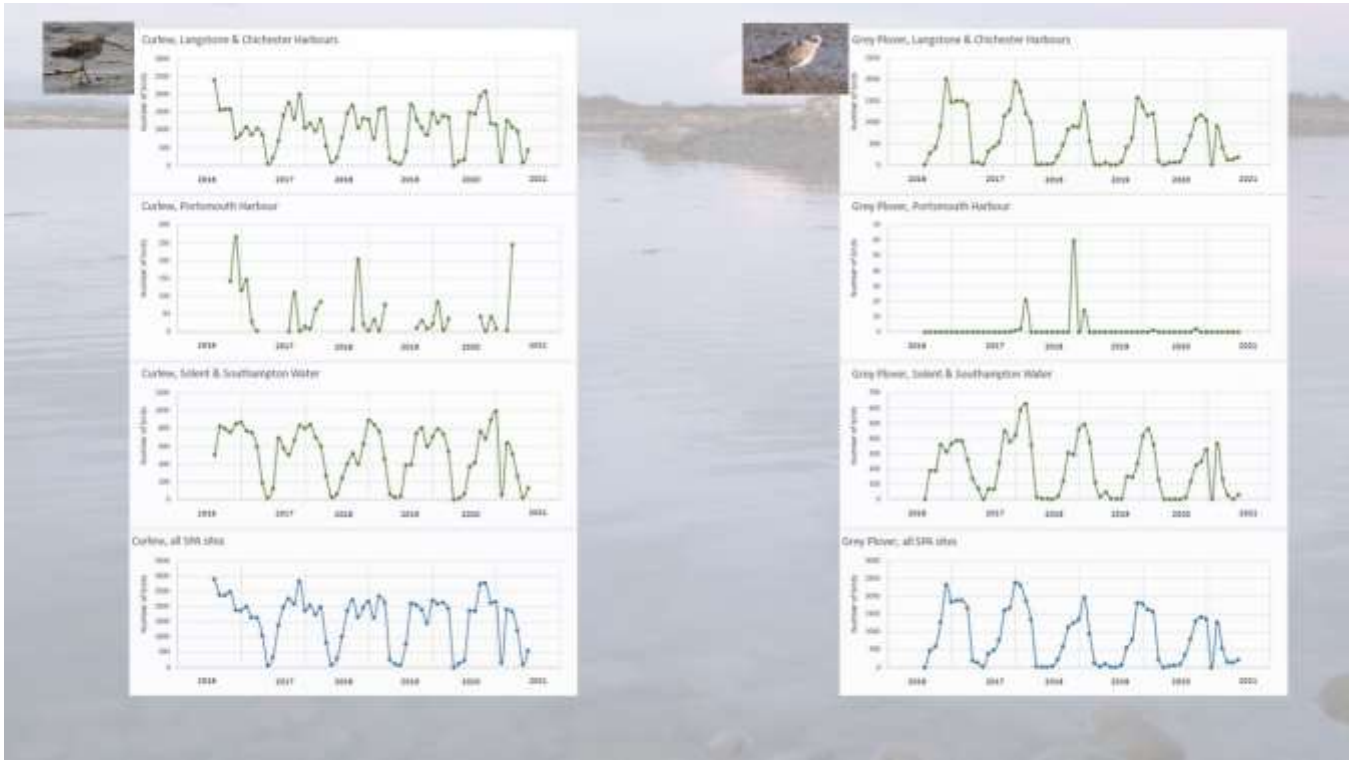


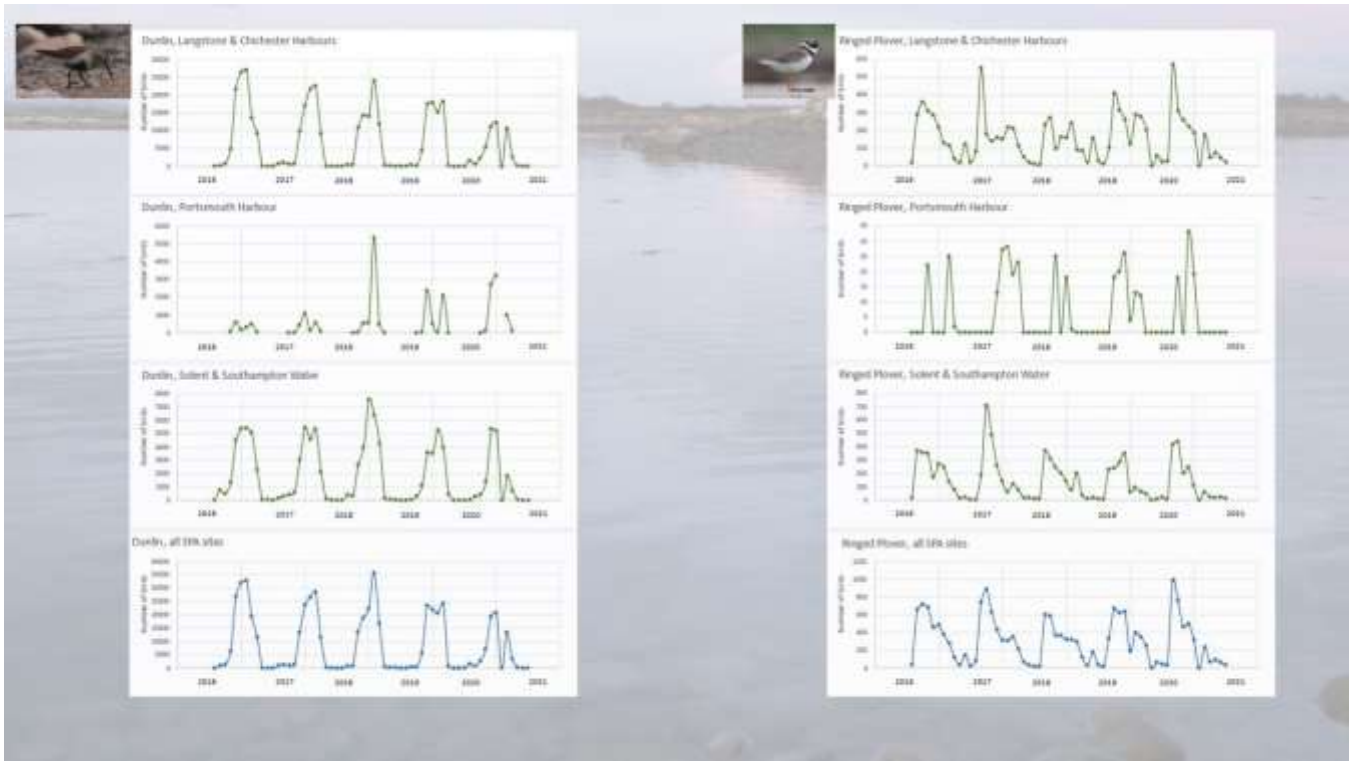

Teal, Langstone & Chichester Harbours
Teal, Portsmouth Harbour
Teal, Solent & Southampton Water
Teal, all SPA sites
Pintail, Langstone & Chichester Harbours
Pintail, Portsmouth Harbour
Pintail, Solent & Southampton Water
Pintail, all SPA sites

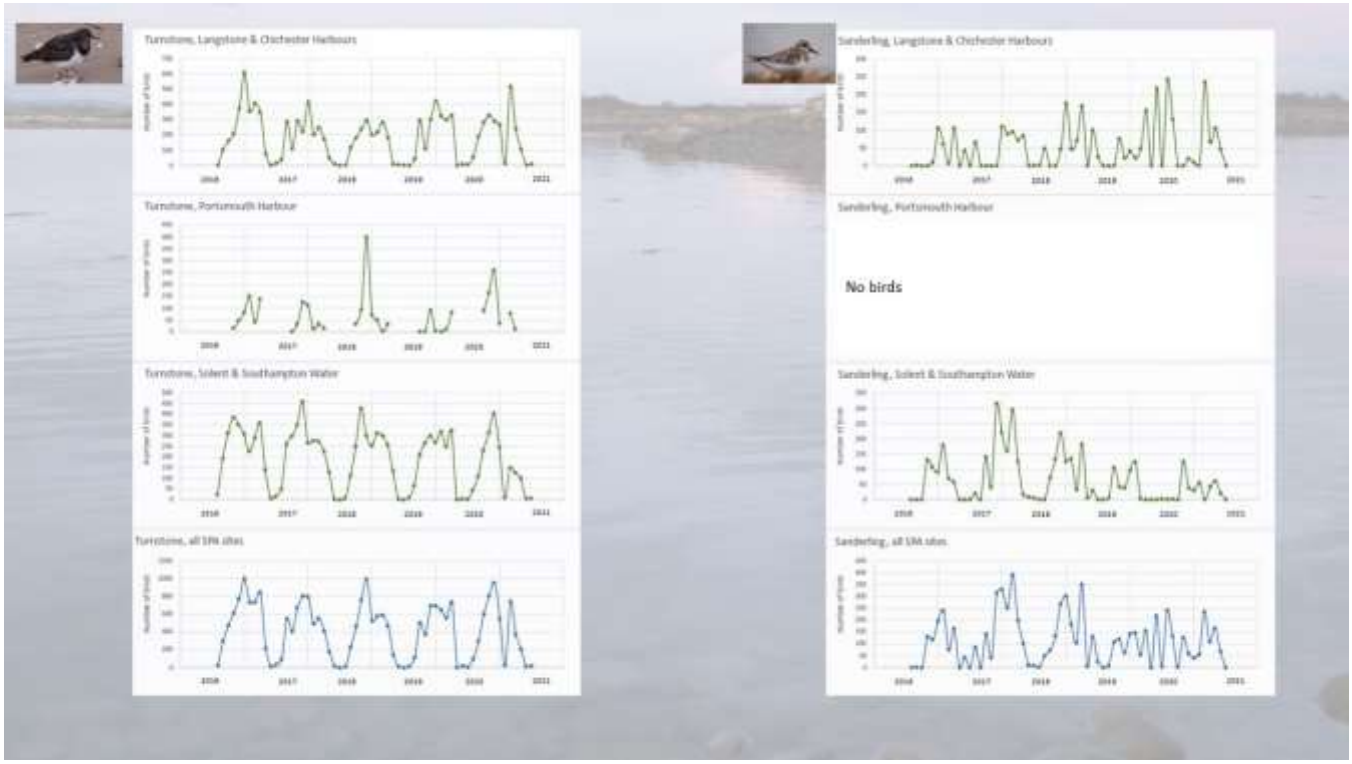

Wigeon, Langstone & Chichester Harbours
Wigeon, Portsmouth Harbour
Wigeon, Solent & Southampton Water
Wigeon, all SPA sites
Shoveler, Langstone & Chichester Harbours
Shoveler, Portsmouth Harbour
Shoveler, Solent & Southampton Water
Shoveler, all SPA sites

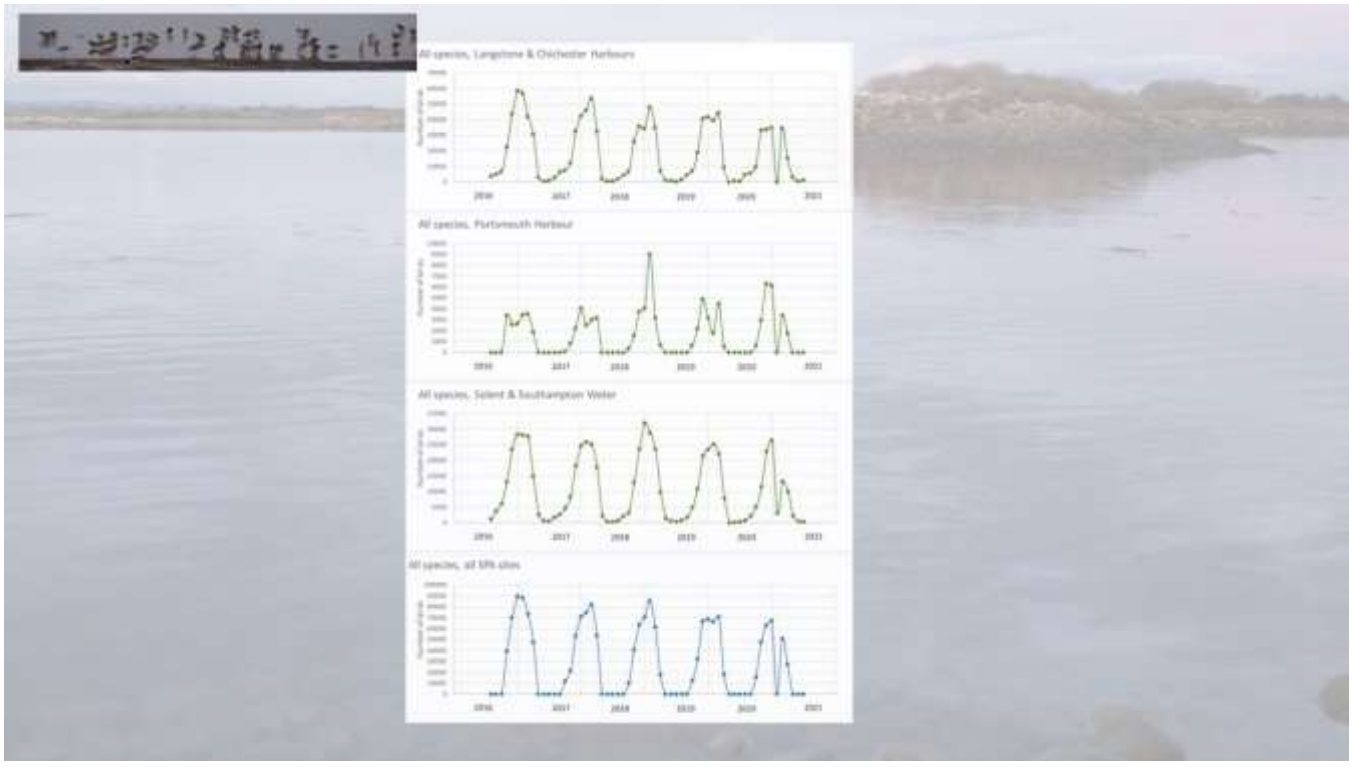

Red-breasted Merganser, Langstone & Chichester Harbours
Red-breasted Merganser, Portsmouth Harbour
Red-breasted Merganser, Solent & Southampton Water
Red-breasted Merganser, all SPA sites
Bar-tailed Godwit, Langstone & Chichester Harbours
Bar-tailed Godwit, Portsmouth Harbour
No birds
Bar-tailed Godwit, Solent & Southampton Water
Bar-tailed Godwit, all SPA sites

Black-tailed Godwit, Langstone & Chichester Harbours
Black-tailed Godwit, Portsmouth Harbour
Black-tailed Godwit, Solent & Southampton Water
Black-tailed Godwit, all SPA sites
Redshank, Langstone & Chichester Harbours
Redshank, Portsmouth Harbour
Redshank, Solent & Southampton Water
Redshank, all SPA sites


Curlew, Langstone & Chichester Harbours
Curlew, Portsmouth Harbour
Curlew, Solent & Southampton Water
Curlew, all SPA sites
Grey Plover, Langstone & Chichester Harbours
Grey Plover, Portsmouth Harbour
Grey Plover, Solent & Southampton Water
Grey Plover, all SPA sites


Dunlin, Langstone & Chichester Harbours
Dunlin, Portsmouth Harbour
Dunlin, Solent & Southampton Water
Dunlin, all SPA sites
Ringed Plover, Langstone & Chichester Harbours
Ringed Plover, Portsmouth Harbour
Ringed Plover, Solent & Southampton Water
Ringed Plover, all SPA sites


Turnstone, Langstone & Chichester Harbours
Turnstone, Portsmouth Harbour
Turnstone, Solent & Southampton Water
Turnstone, all SPA sites
Sanderling, Langstone & Chichester Harbours
Sanderling, Portsmouth Harbour
No birds
Sanderling, Solent & Southampton Water
Sanderling, all SPA sites

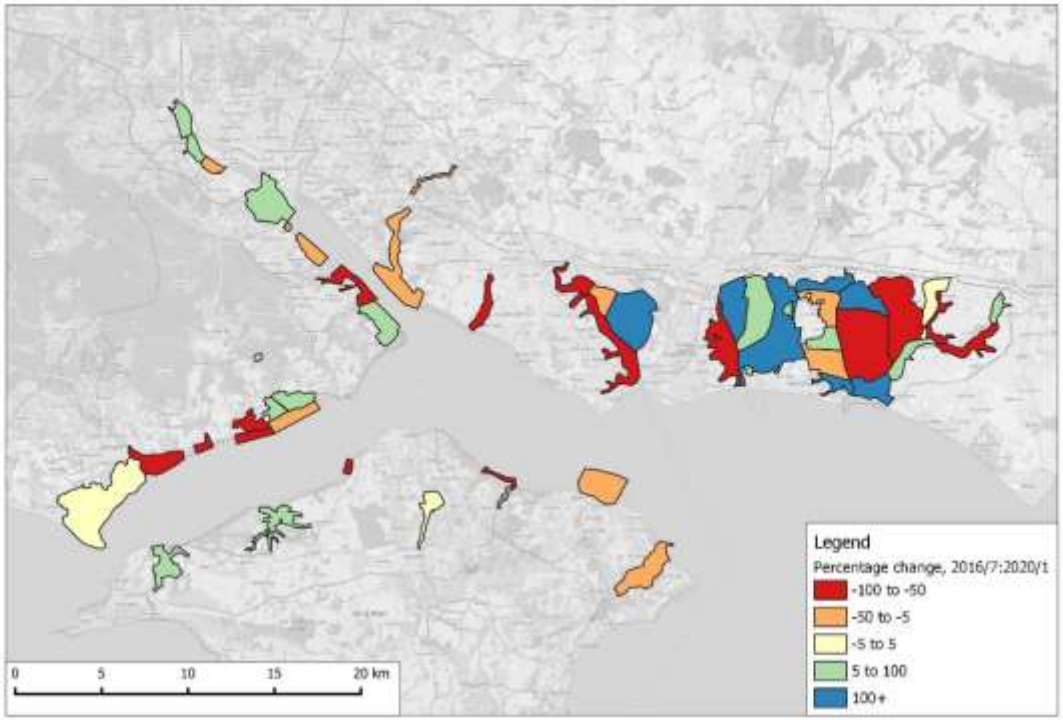

All species, Langstone & Chichester Harbours
All species, Portsmouth Harbour
All species, Solent & Southampton Water
All species, all SPA sites

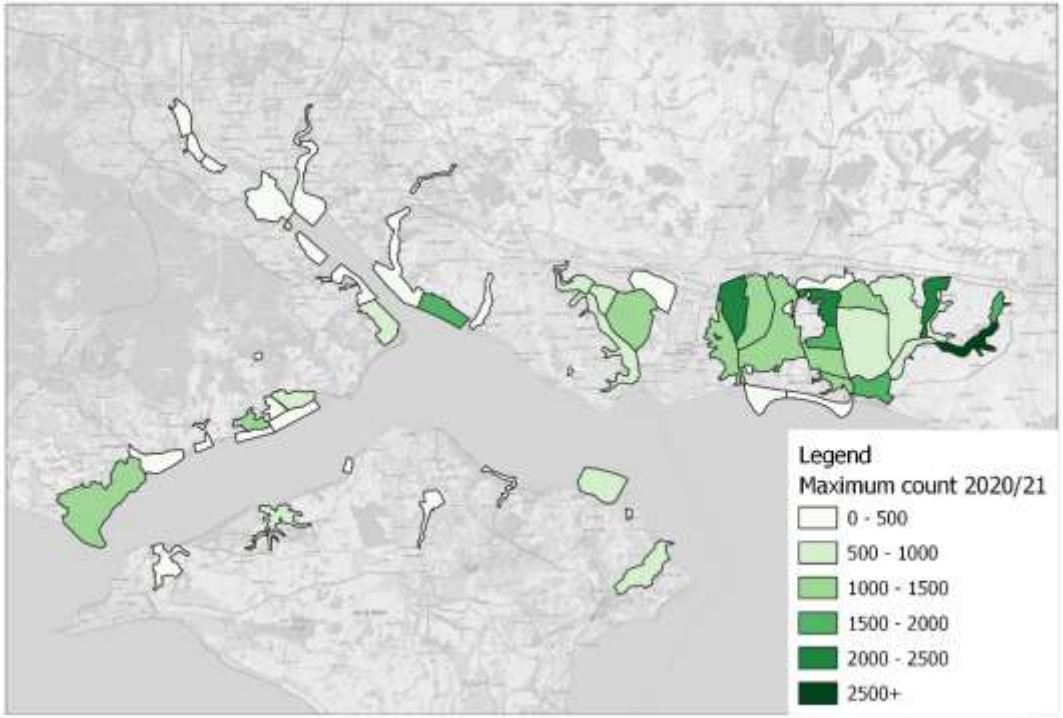
Appendix 4: Maps of WeBS data

The maps in this appendix show the WeBS data for each species. The top map for each species shows the percentage change from 2016/17 to 2020/21. Only WeBS sectors where the change can be calculated are included (zero values mean change cannot always be counted). Red and orange shading indicates those sectors where declines have occurred.

It should be noted that any change in the number of birds on sectors with relatively low counts will mean very marked percentage changes when the absolute change and number of birds involved is actually quite low. The lower maps therefore show the distribution of the same species, with the shading reflecting the number of birds counted for that sector – the maximum count from the 2020/21 season.

Brent Goose





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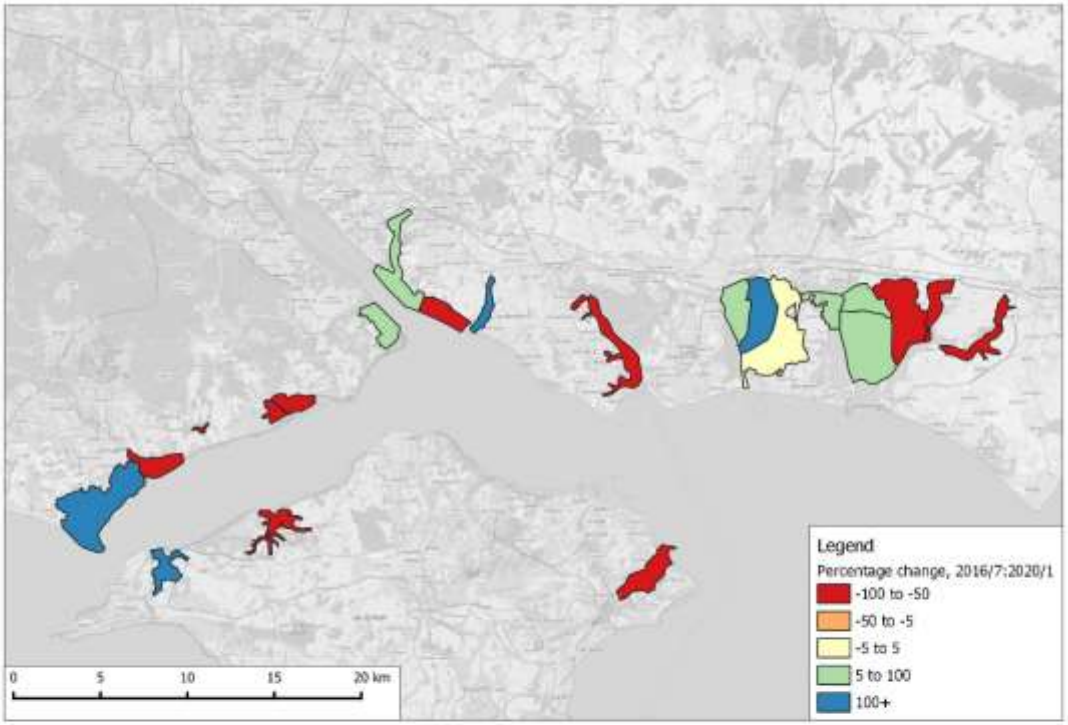
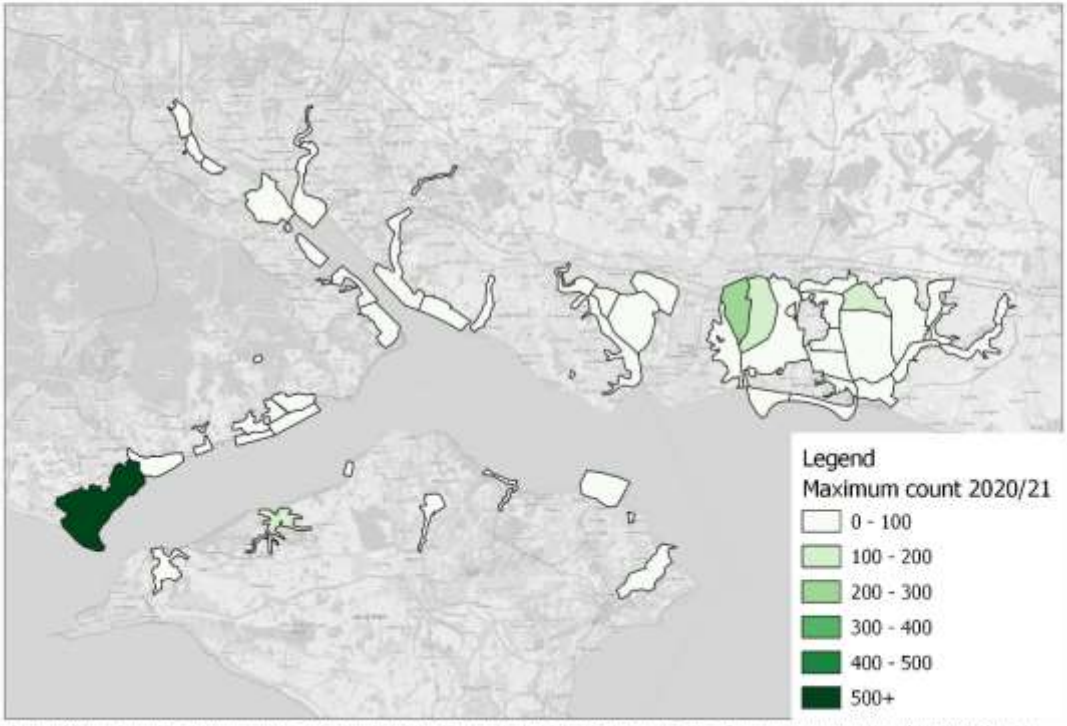
Pintail





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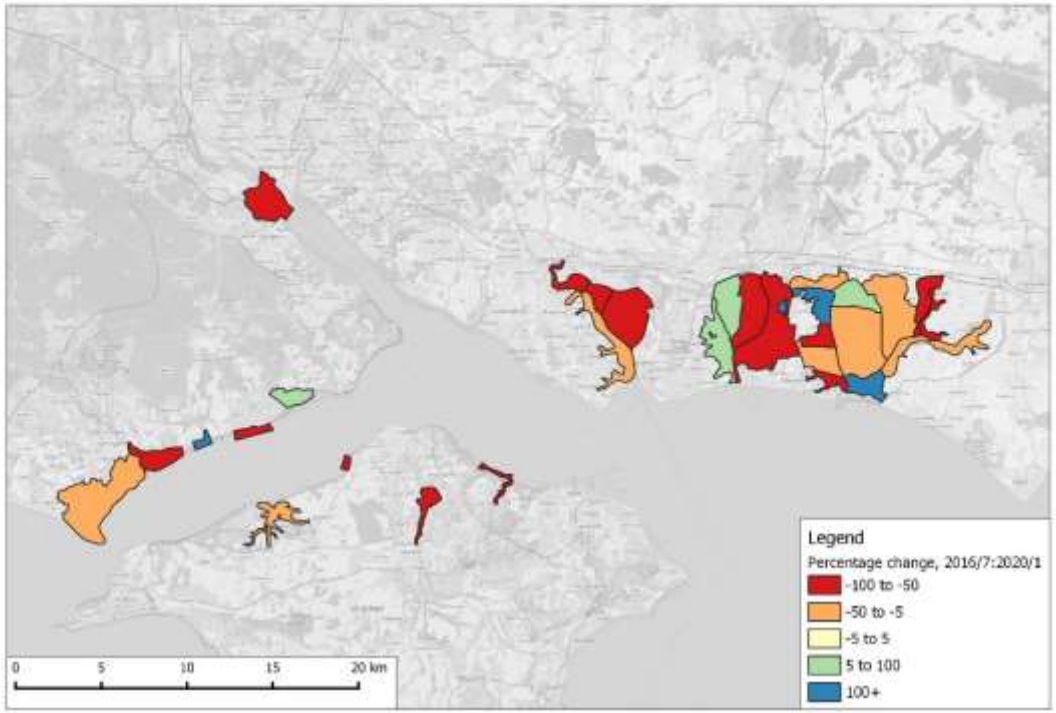
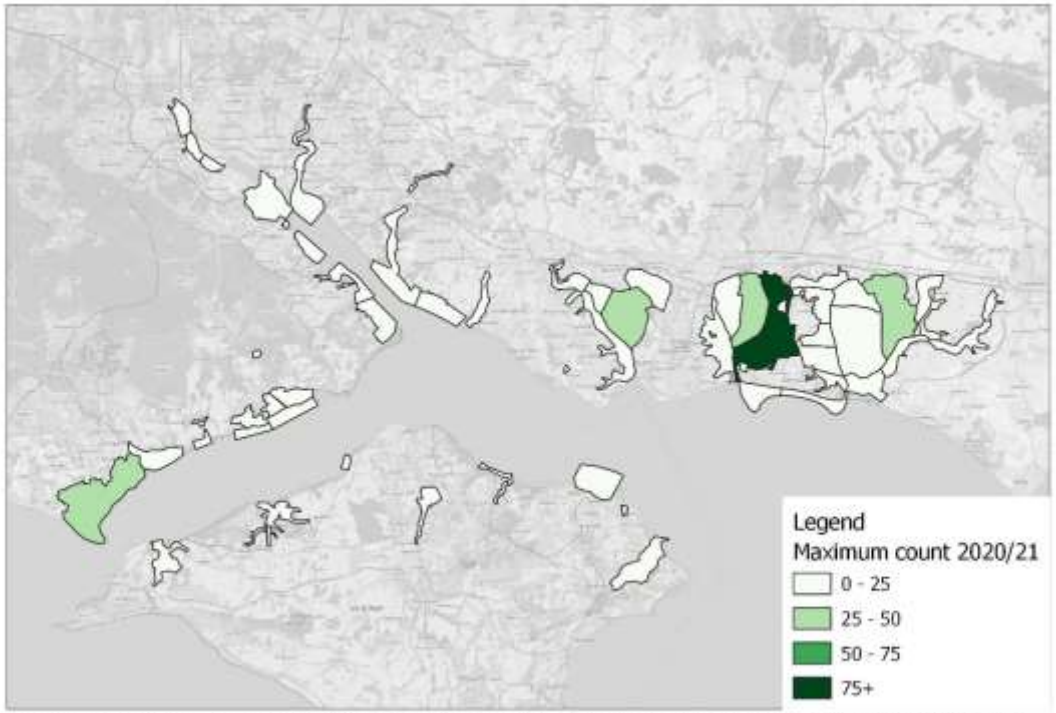
Red-breasted Merganser





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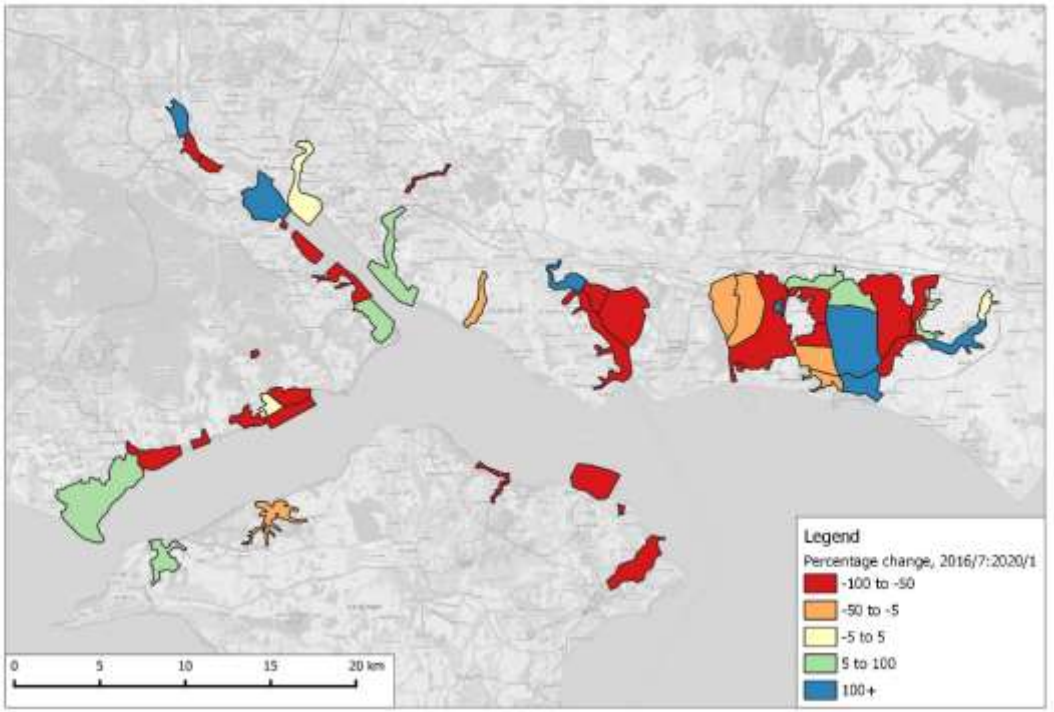
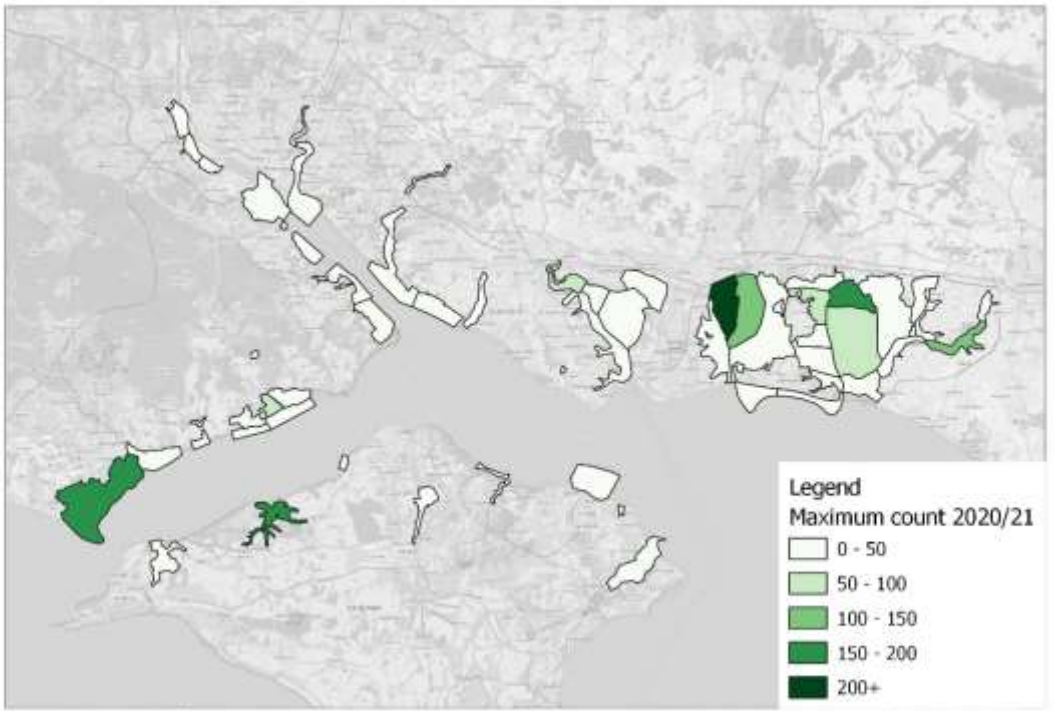
Shelduck





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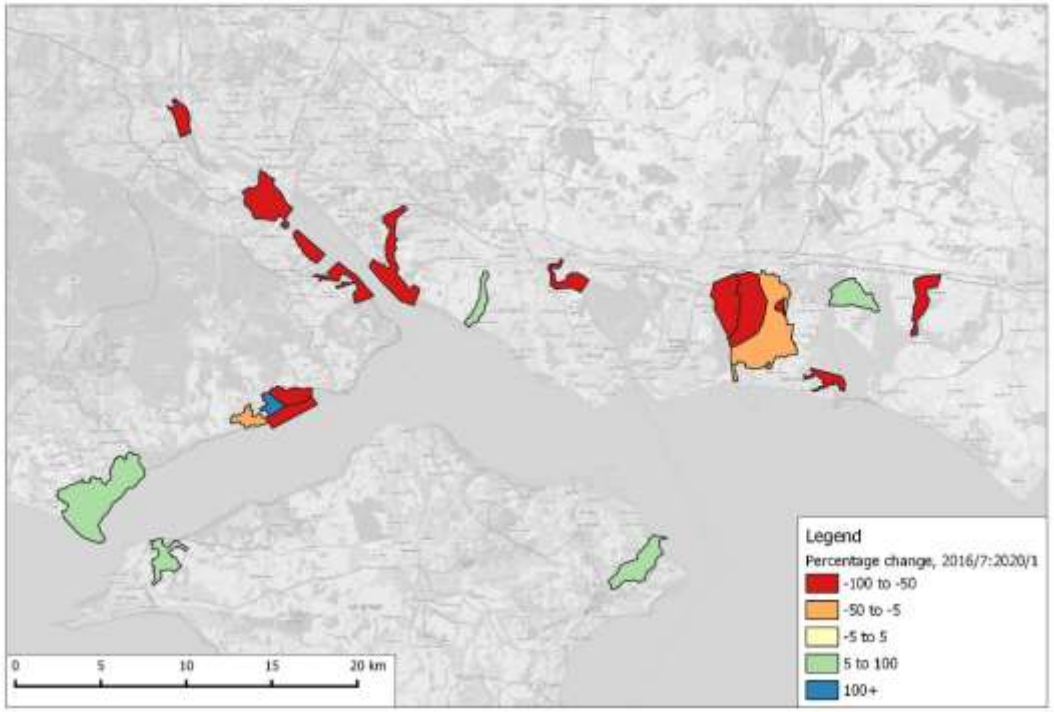
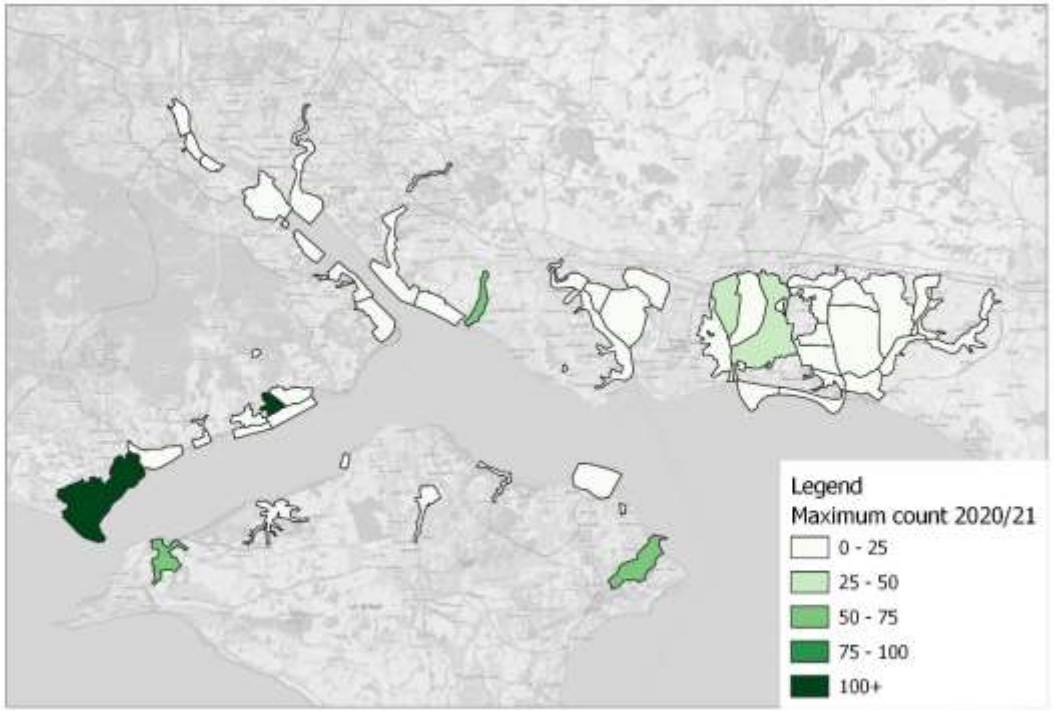
Shoveler





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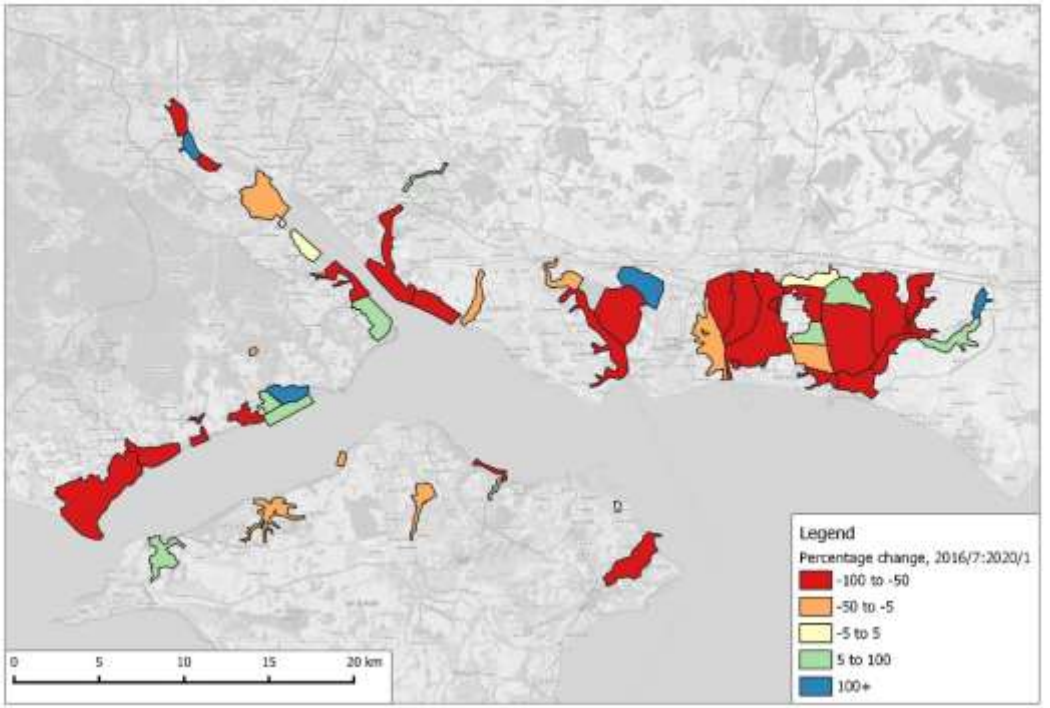
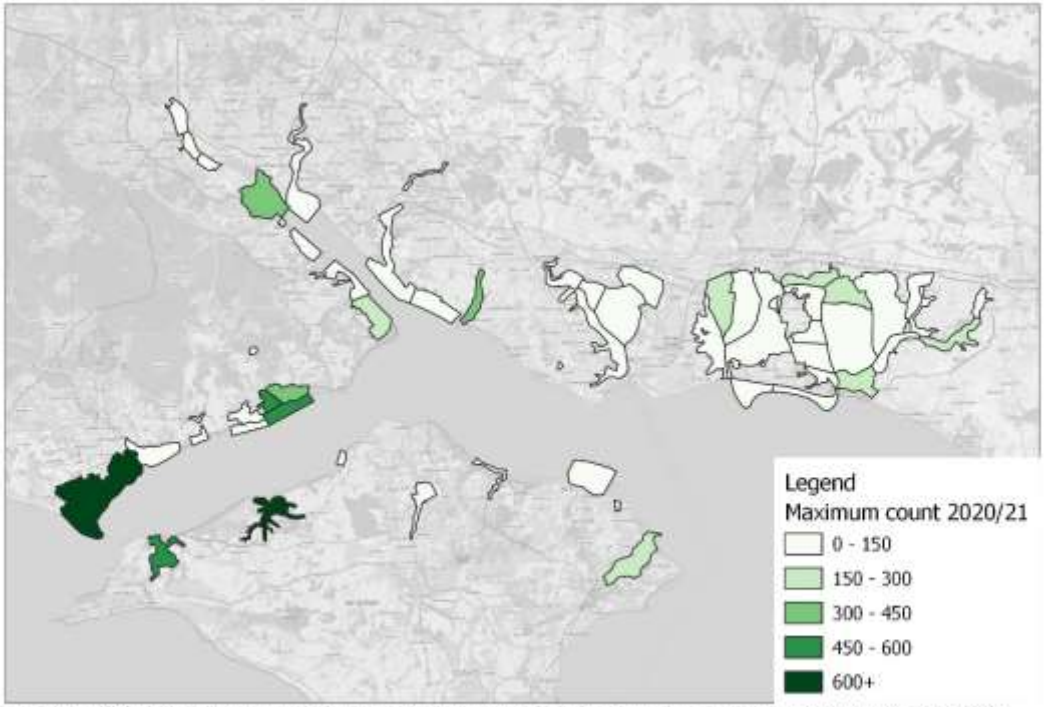
Teal





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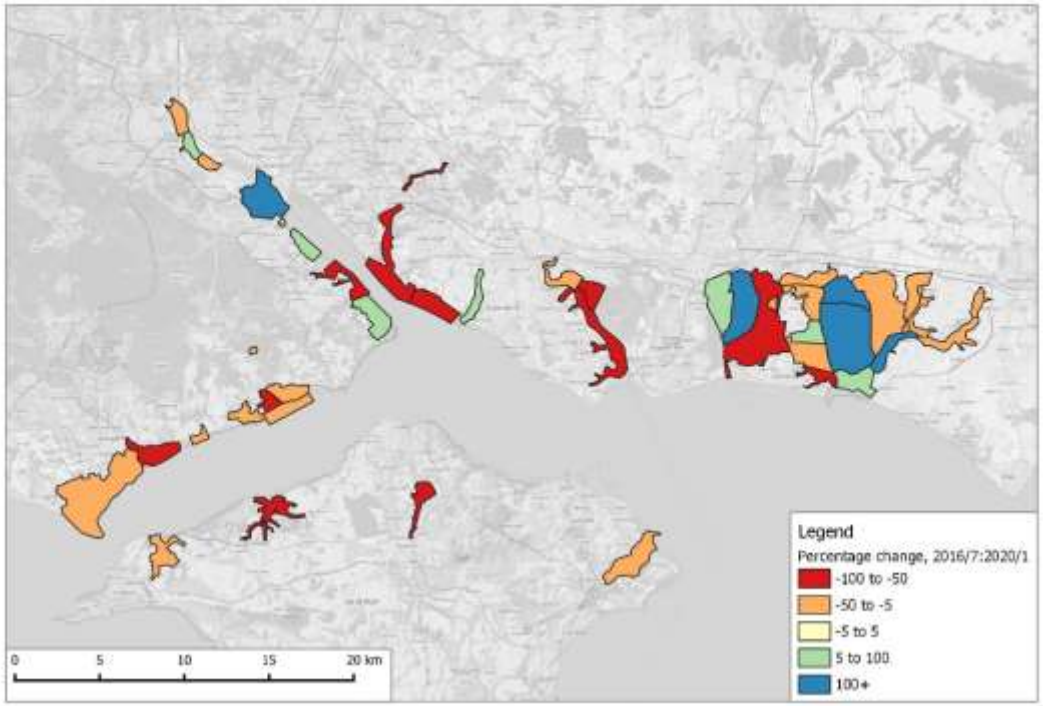
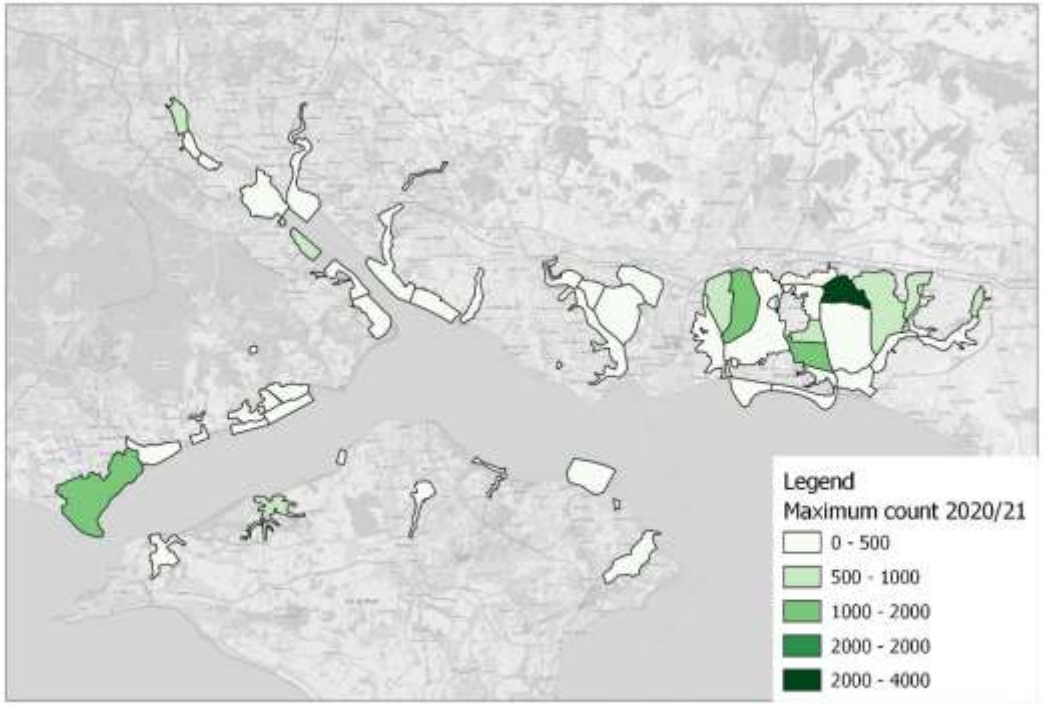
Wigeon





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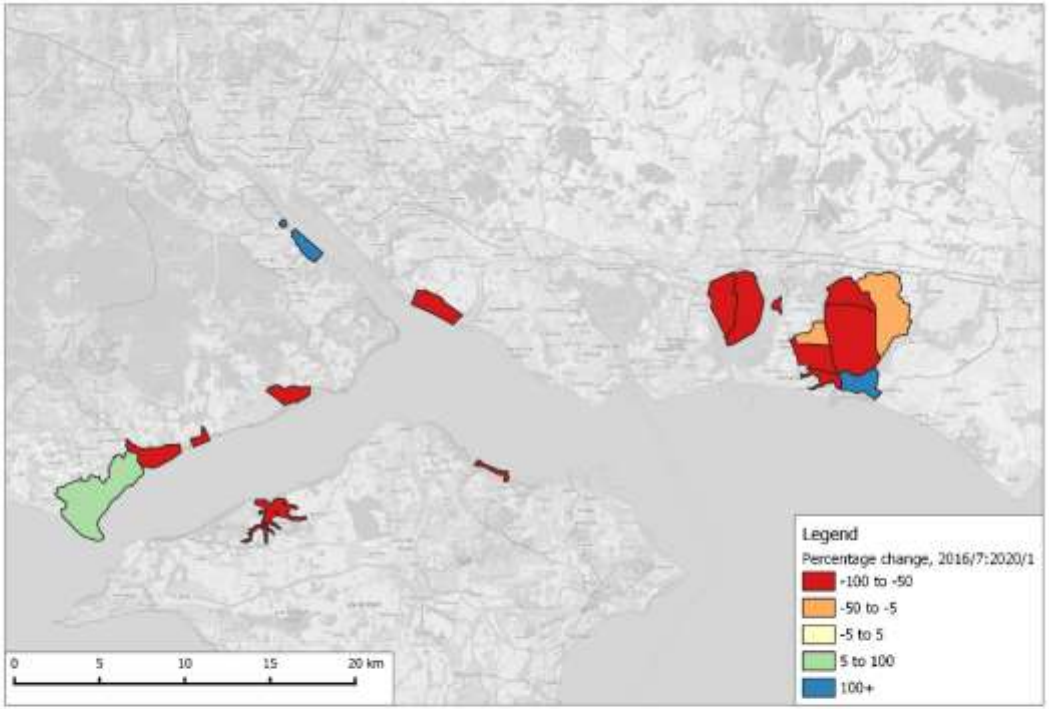
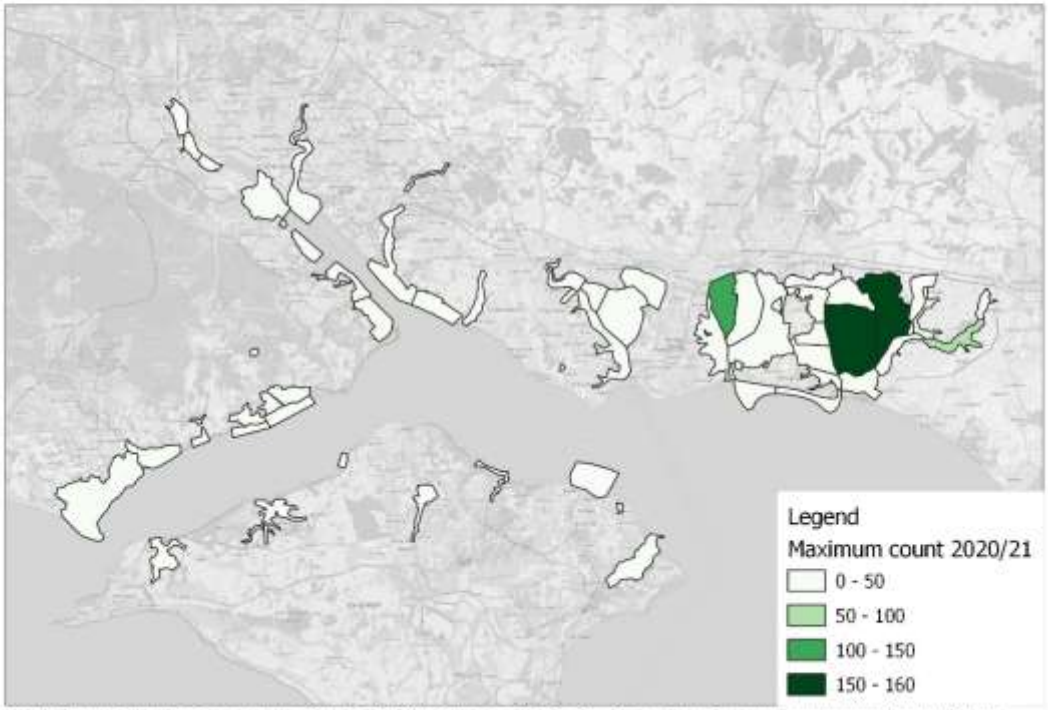
Bar-tailed Godwit





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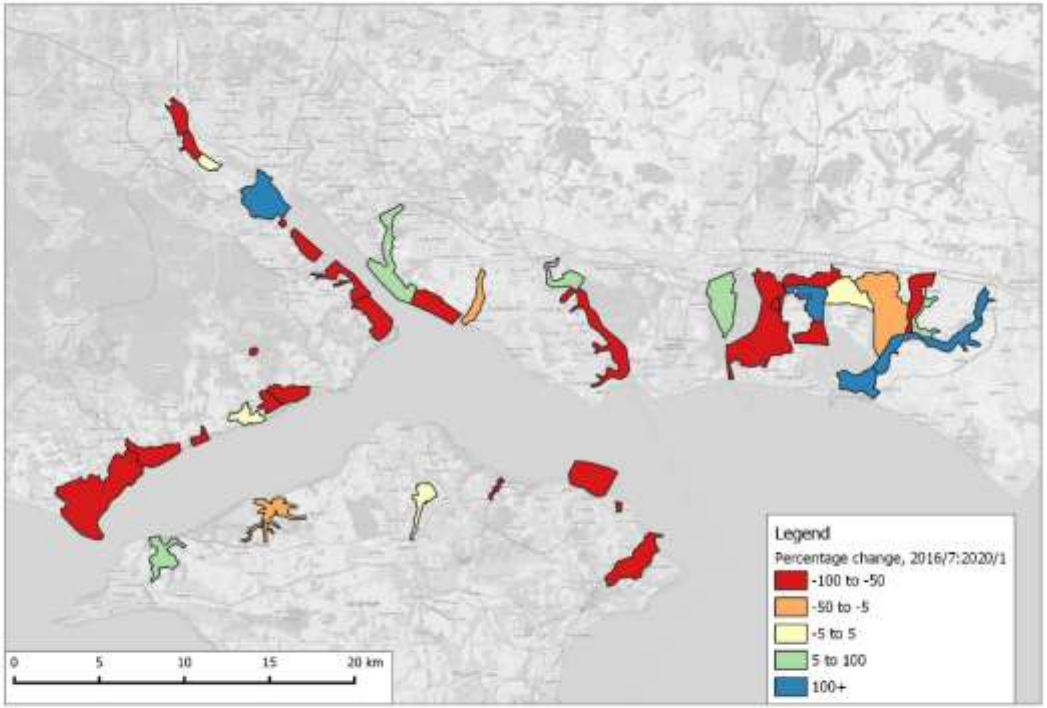
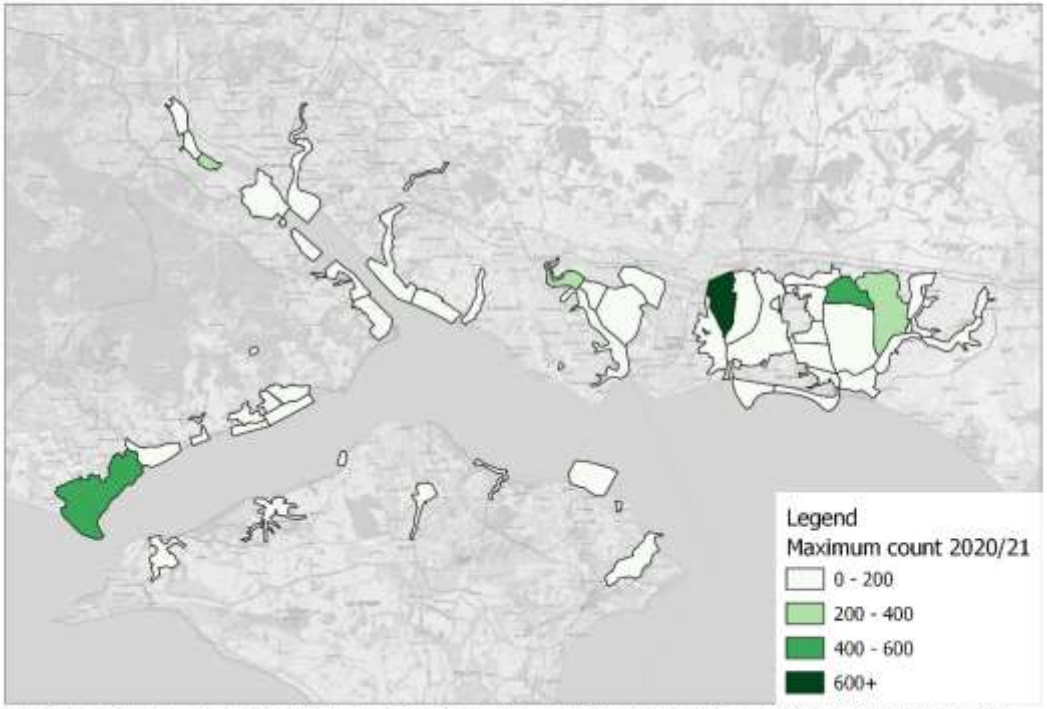
Black-tailed Godwit





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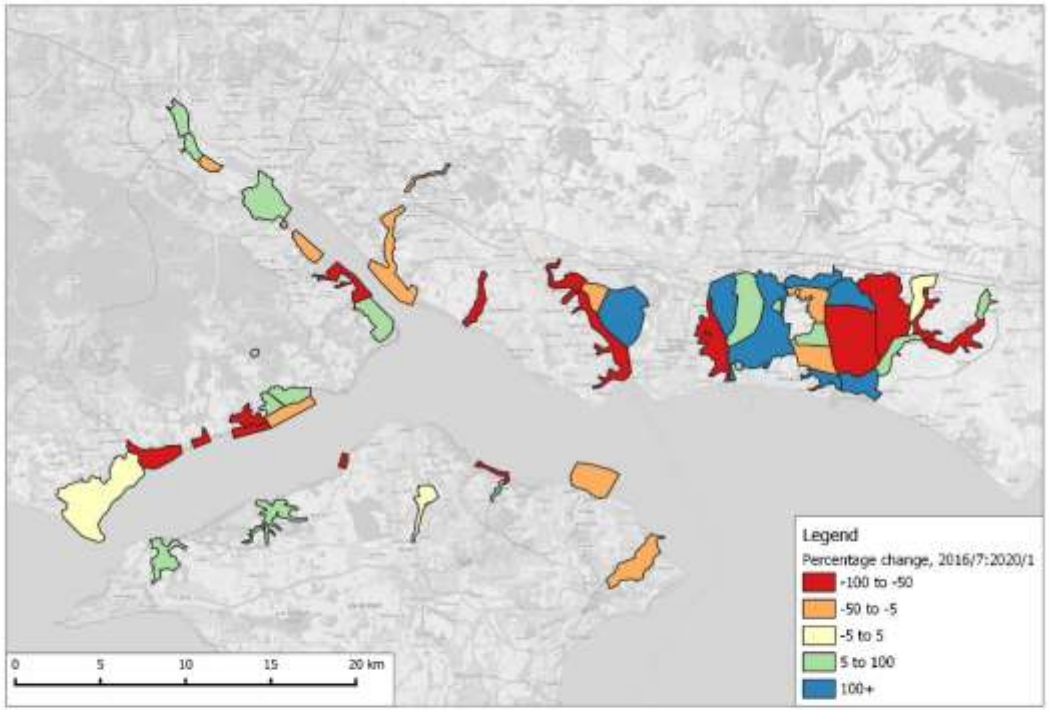
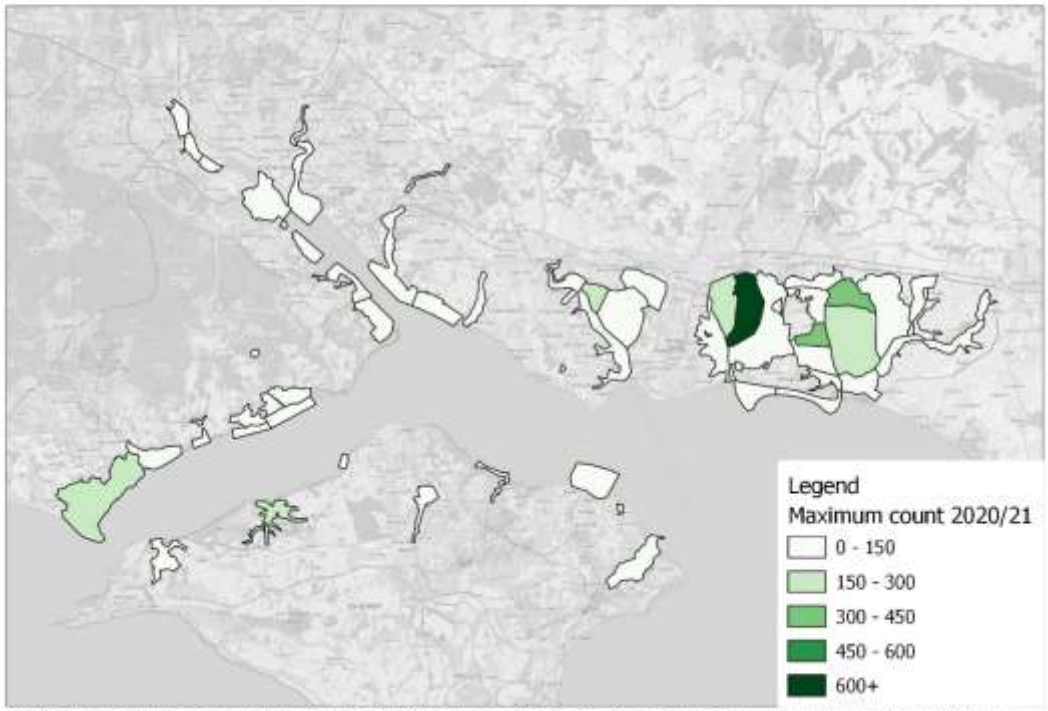
Curlew





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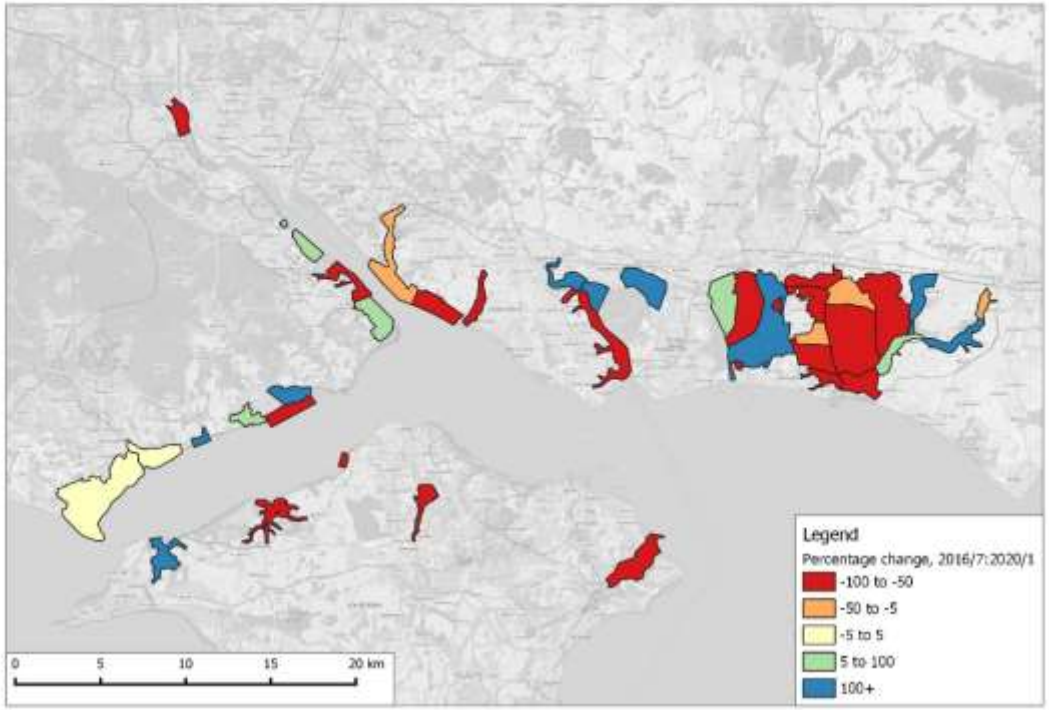
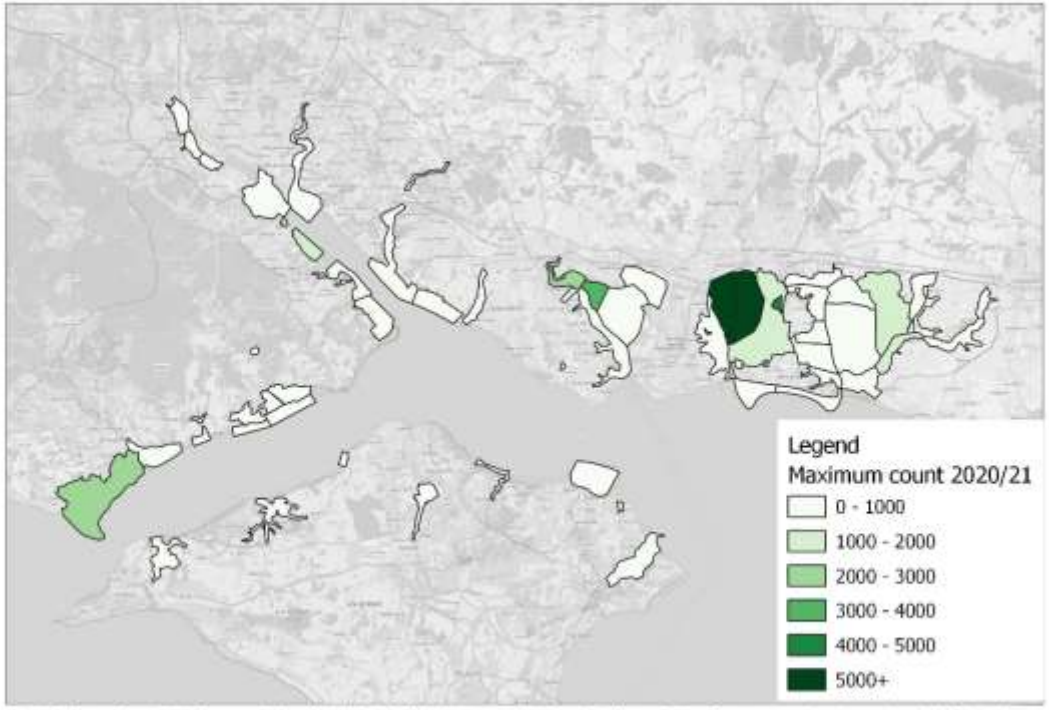
Dunlin





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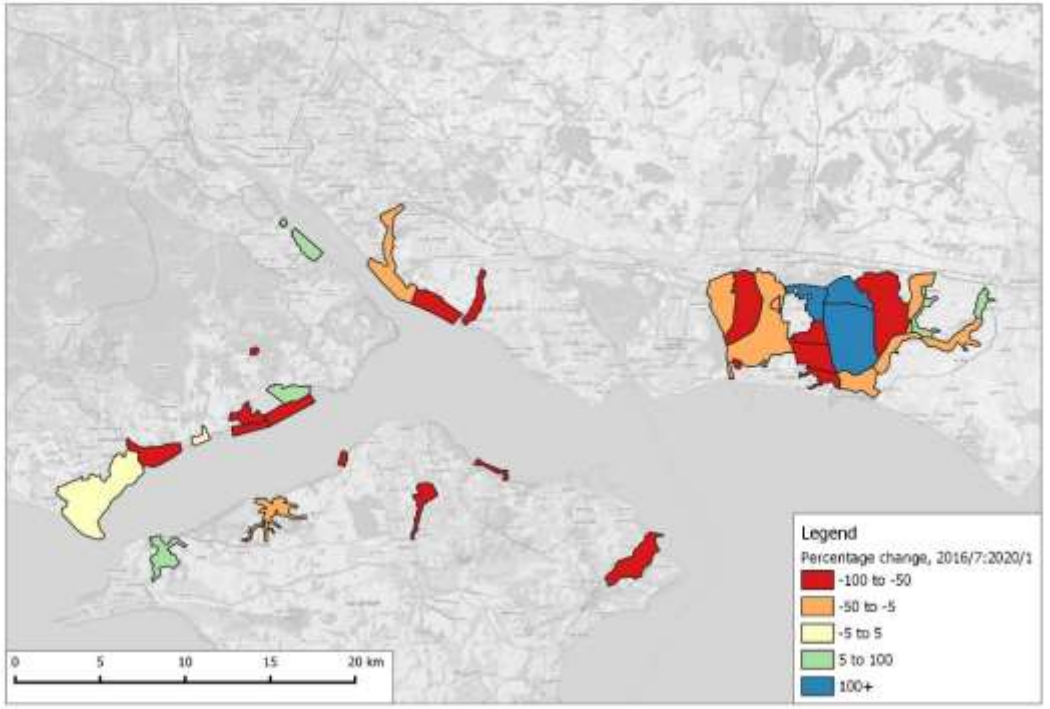
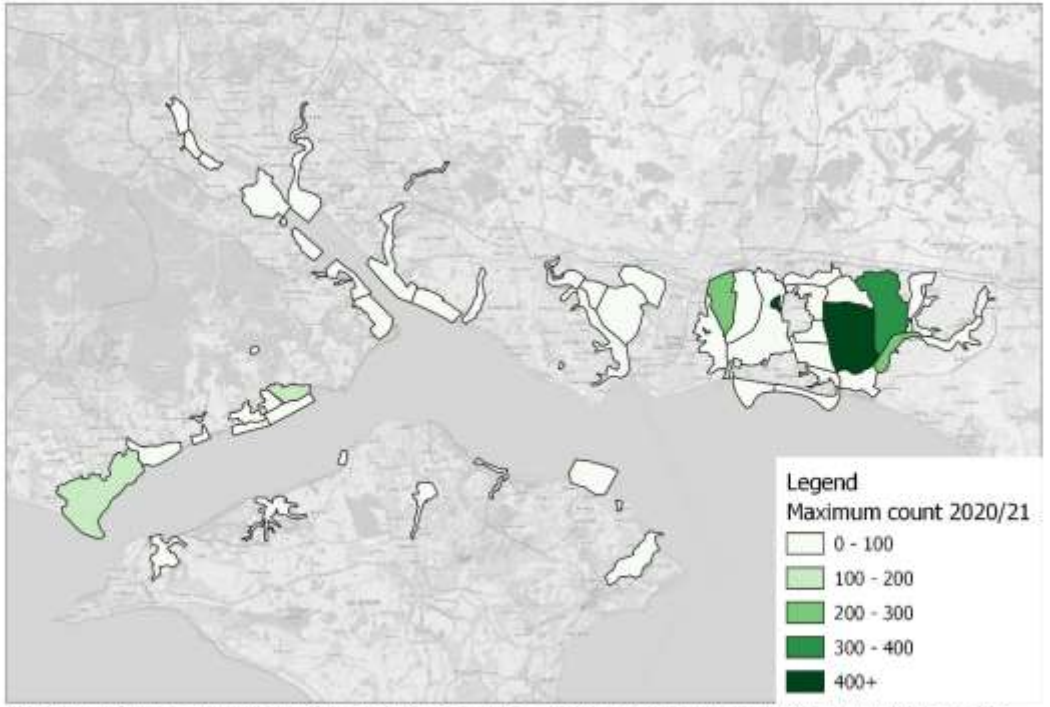
Grey Plover





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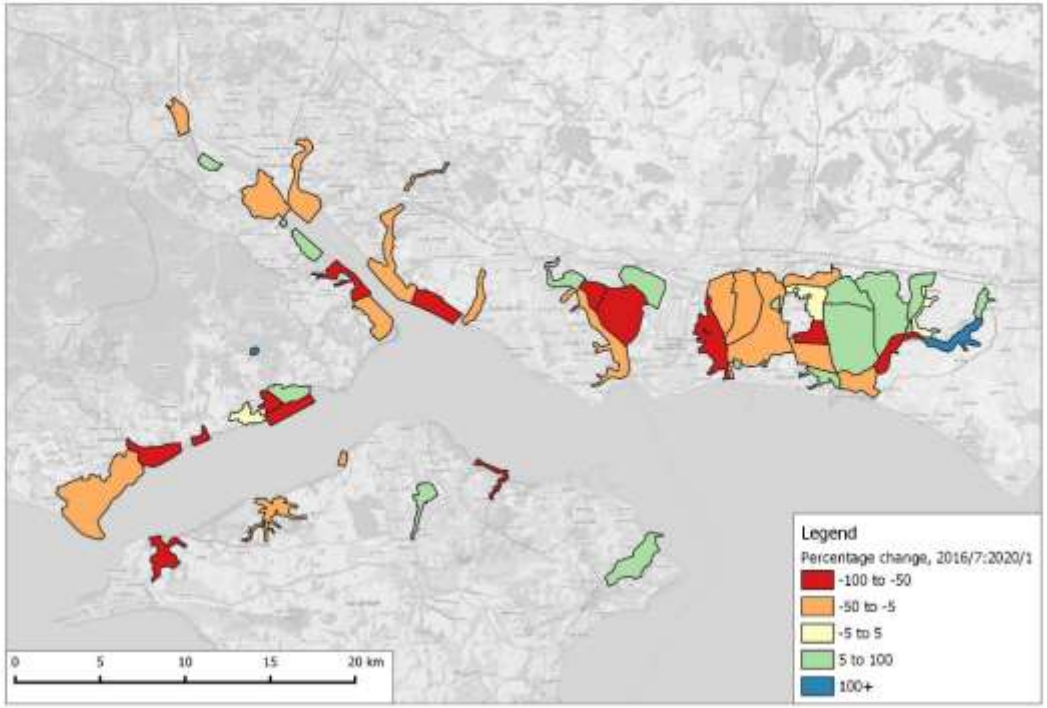
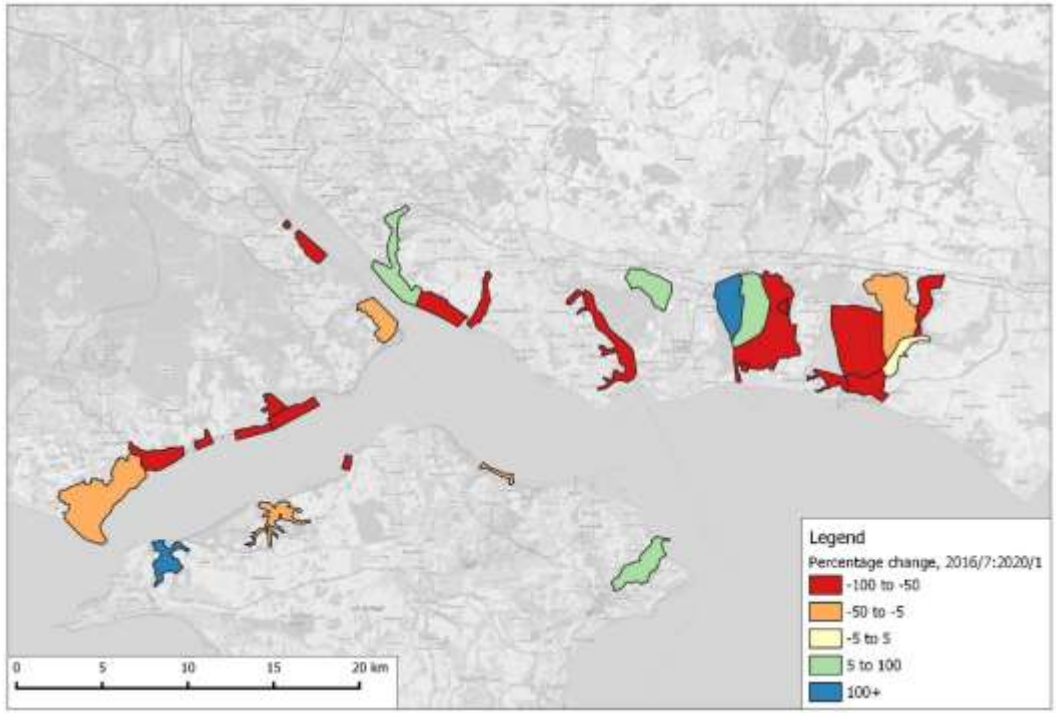
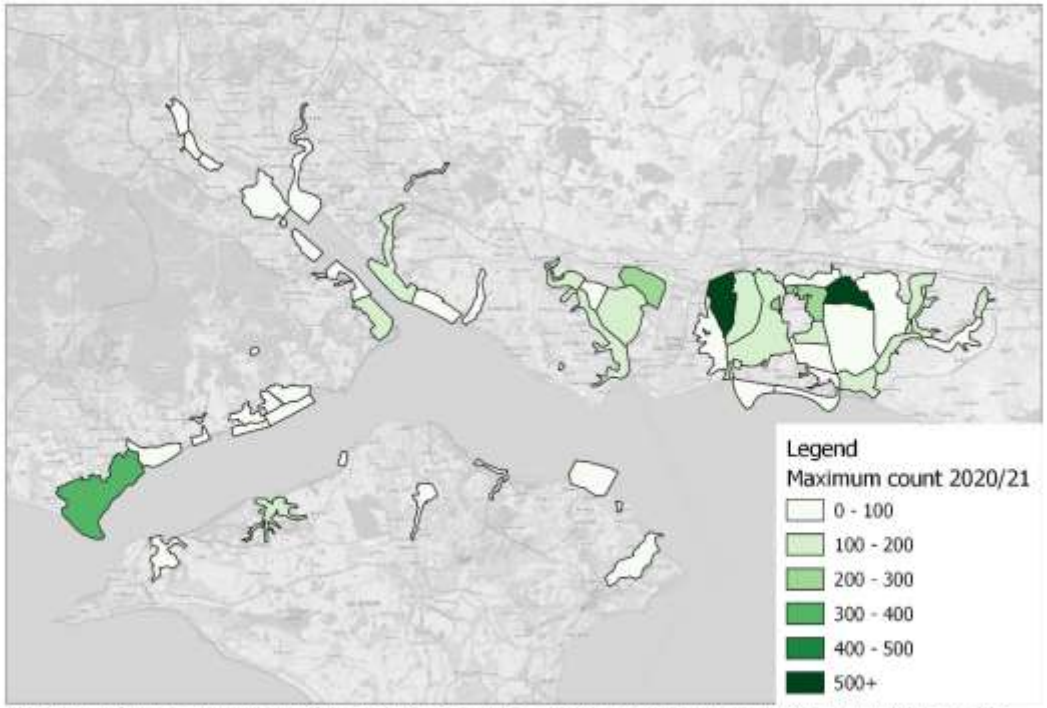
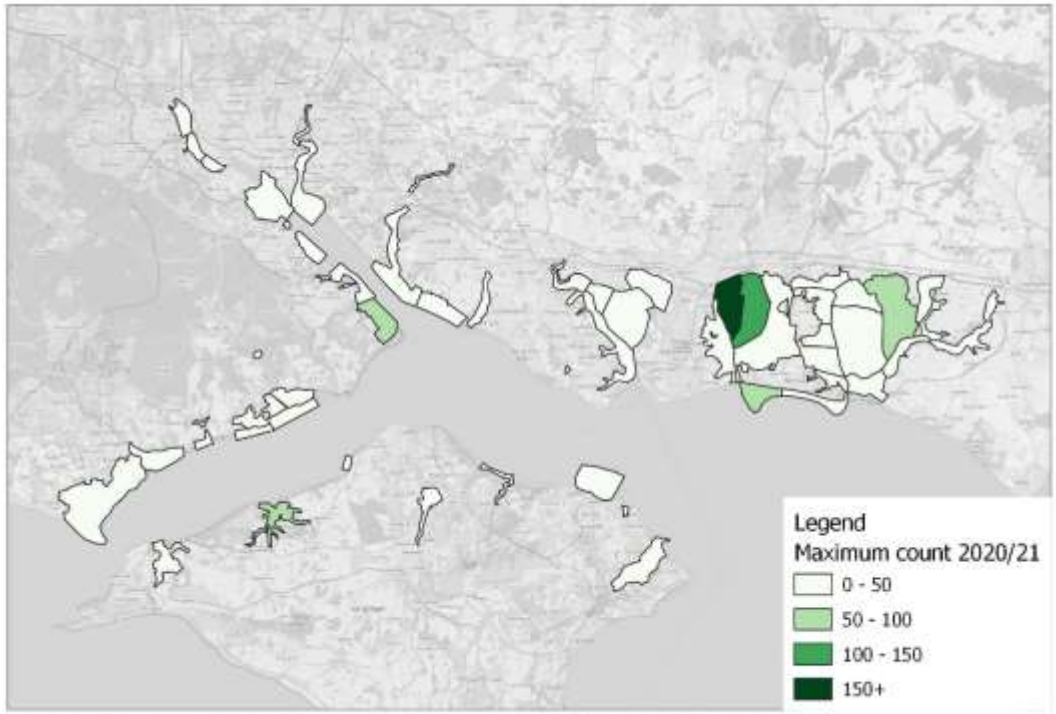
Redshank



Ringed Plover







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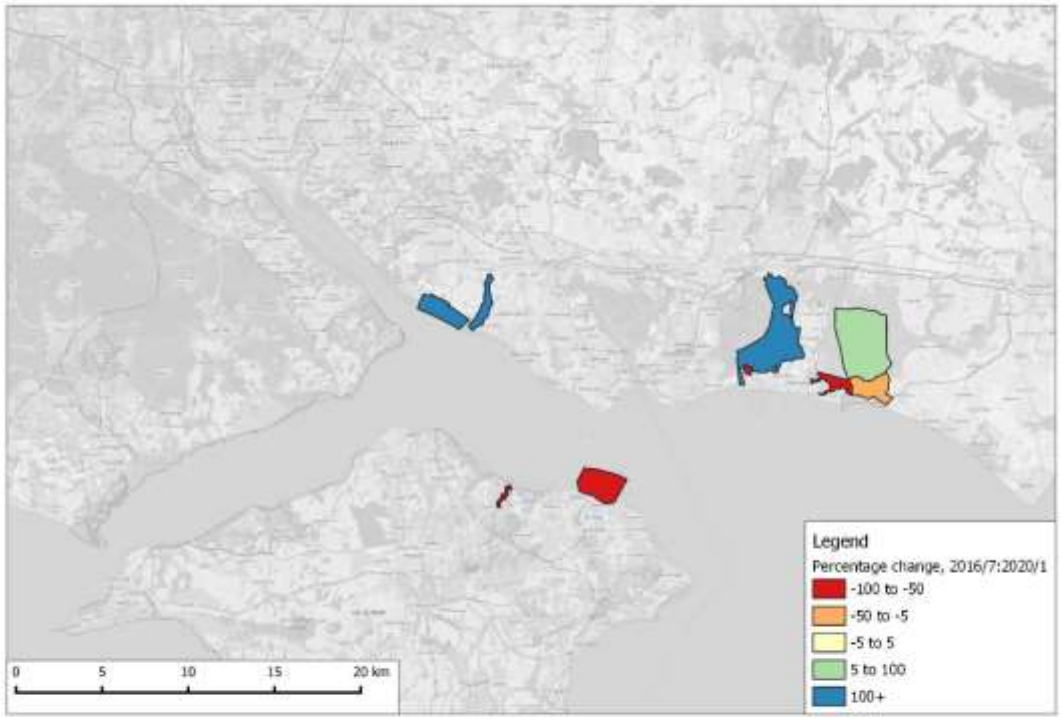
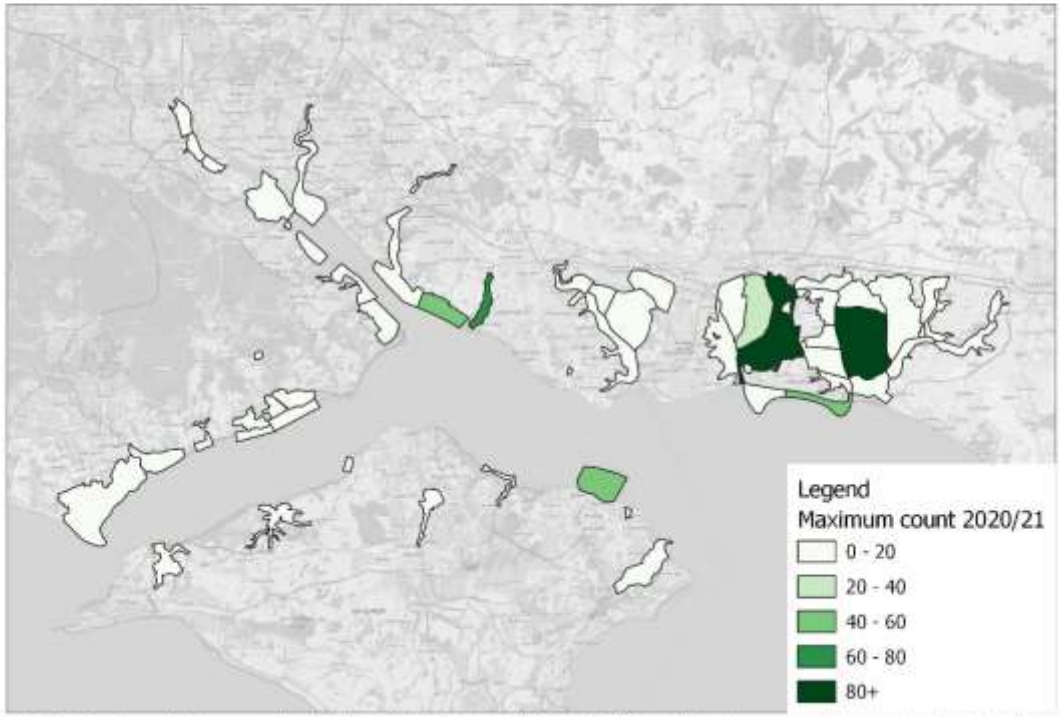
Sanderling





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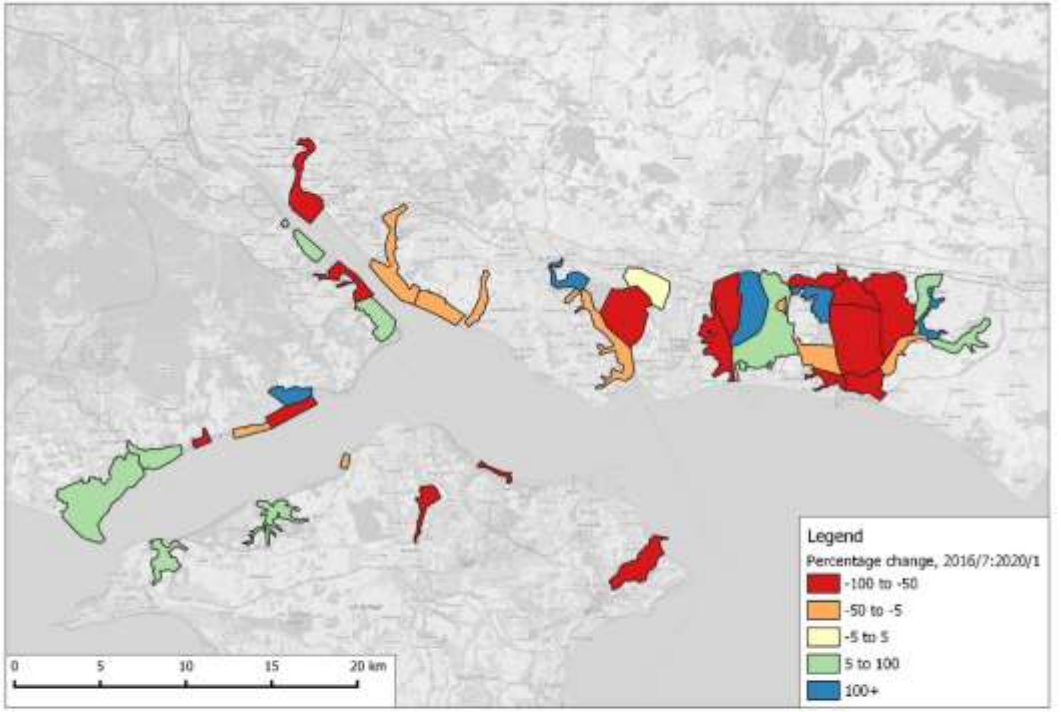
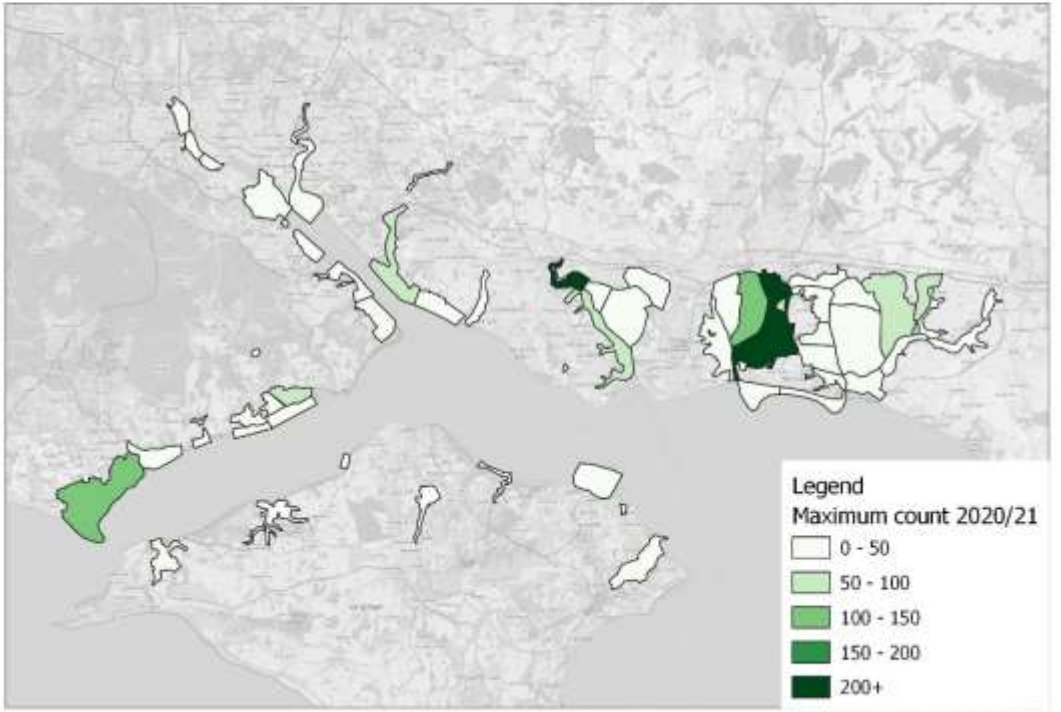
Turnstone





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