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Purbeck seabird survey 2018

Sophie Lake

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Summary

This report presents data from the 2018 breeding seabird counts between Old Harry and St. Aldhelm's Head. Counts have been carried out on the Purbeck coast since the mid-1960s and data are presented in the context of trends over the last 50 years.

Seabirds breeding on the Purbeck coast include Fulmar, Cormorant, Shag, Herring Gull, Great Black-backed Gull, Kittiwake, Guillemot, Razorbill and Puffin. None of the populations is large. The Guillemot population remains the biggest, with over 1000 individuals counted on the breeding ledges in 2018, and the Puffin population is the smallest at just two to three breeding pairs. Species such as Razorbill, Guillemot and Puffin are thought to have been considerably more abundant in the first half of the 20th century, while Fulmar colonised, and Kittiwake increased markedly, during the second half of the 20th century before declining. For a full discussion of previous Purbeck trends please see Lake *et al.* (2011). Results from the 2018 monitoring indicate that:

- **The Guillemot and Razorbill populations are at the highest level recorded since 1965.**
- **The 2018 data indicate a continuing decline for Cormorant, Kittiwake and Great Black-Backed Gull – all three populations are at their lowest since recording began.**
- **Shag, Fulmar and Herring Gull numbers continue to fluctuate and populations of all three are currently well below the maximum count.**
- **The tiny Puffin population remains in a precarious state with two-three breeding pairs recorded and no sub-adults at the colony. The total number of adults see was the lowest recorded.**

UK trends are not currently available for 2016 - 2018. See Lake (2017) for a summary comparison of Purbeck and national trends up to 2015.

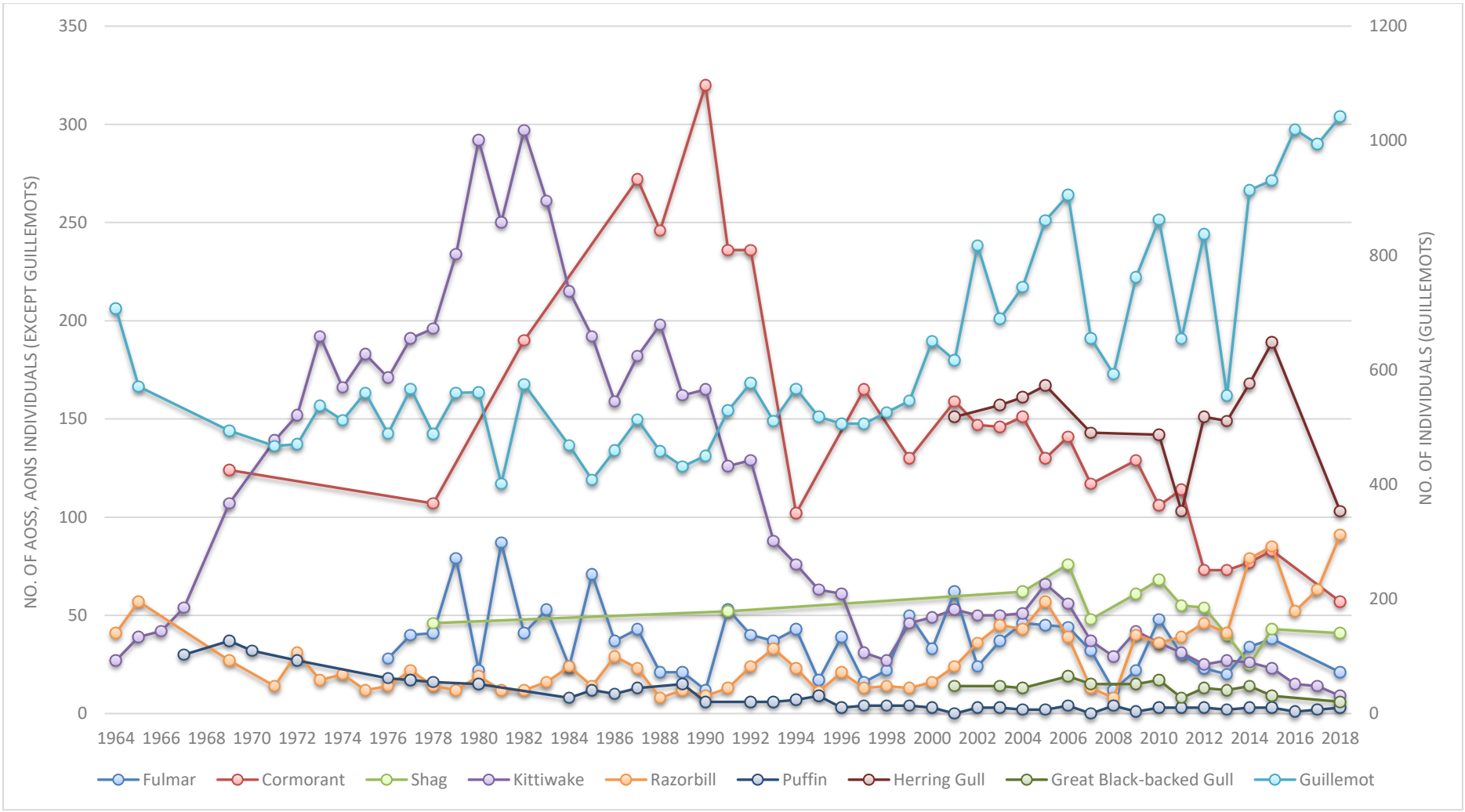

Figure 1: Summary of breeding seabird population changes in Dorset Counts are of apparently occupied nests/sites for all species except Guillemots and Razorbill (all individuals on breeding ledges) and puffins (breeding pairs). (Note that Fulmar and Shag counts before 2000 may not be complete).

Table 1 Summary of breeding seabird population changes in Purbeck. * indicates species for which the last full survey was in 2015 - for the remainder the last full survey was in 2017.

Species	2018 total	Change since last survey (% decline)	Change since peak count (% decline)	Peak year	Peak count	Comparable monitoring data available since:	Long term trend
*Fulmar	21	-17 (-44.8%)	-66 (-75.9%)	1981	87	2000	Colonised in 1940s, peaked in 1980s followed by an overall decline although with temporary upturns in 2010 & 2015, now at lowest level.
*Cormorant	57	-26 (-31.4%)	-263 (-82.2%)	1990	320	1964	Declined to 1960s, increased to 1990, then declined to lowest level in 2018.
*Shag	41	-2 (-4.7%)	-35 (-46.1%)	2006	76	1964, partial	Increased rapidly in 2nd half of C20th, subsequent wide fluctuations suggest overall decline despite upturn in 2015
Kittiwake	9	-5 (-35.8%)	-288 (-97%)	1982	297	1957	Rapidly increase throughout 1960s & 1970s, declined equally rapidly, stabilised in early C20th before steadily declining again
Guillemot	1042	48 (4.9%)	0 (0%)	2018	1042	1964	Large declines up to mid C20th, relatively stable until 2000 then fluctuating increase to peak in 2018
Razorbill	91	28 (44.5%)	0 (0%)	2018	91	1964	Large declines up to mid C20th, fluctuating increase following a low point in 2008 to peak in 2018
Puffin	3	1 (50%)	-34 (-91.9%)	1969	37	1967	Large declines up to mid C20th which stabilised at a very low level around 1990
*Herring gull	103	-86 (-45.6%)	-86 (-45.6%)	2015	189	2001	considerable decline 1960s - 1980s, relatively stable throughout early C20th, recent sharp decline
*Great black-backed gull	6	-3 (-33.4%)	-13 (-68.5%)	2006	19	2001	Fluctuating decline since 2001, currently at lowest level

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Contents

Acknowledgements

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1. Introduction

1.1 This report summarises the latest in a series of surveys (see Haysom 1977, 1993; Lake *et al.* 2011; Lake 2017) of the breeding seabirds of the Purbeck Coast. This stretch of coast is notable along the south coast of England in that it supports nine species of breeding seabird: Fulmar, Kittiwake, Cormorant, Shag, Great Black-backed Gull, Herring Gull, Guillemot, Razorbill, and Puffin. Eight of these species are birds of conservation concern, the only exception being Cormorant - Kittiwake, Puffin, and Shag are now red listed together with Herring Gull, while Guillemot, Razorbill, Great Black-backed Gull and Fulmar are amber listed (Eaton *et al.* 2015).

1.2 The South Dorset Coast is designated as a Site of Special Scientific Interest, Special Area of Conservation, and Jurassic Coast World Heritage Site for its wildlife and environmental interest (although breeding seabirds are not a designated feature).

2. Methods

Population census

2.1 Two boat trips were carried out, on May 29st and June 12th 2018 between 08:00 and 14:00 hours. The first survey was completed between Old Harry Rocks and White Nothe. Access constraints due to MoD activity meant it was only possible to go from Old Harry Rocks to St Aldhelm's Head during the second survey.

2.2 Methods follow those recommended by Walsh *et al.* (1995). All observations of apparently occupied sites (AOSs) or occupied nests (AONs) of Fulmar, Cormorant, Shag, Kittiwake, Herring Gull and Great Black-backed Gull were marked on enlarged photographs of the coast. Numbers of auks on known nesting ledges were counted and colonies were marked on enlarged photographs as above.

2.3 The number of Puffins on the water and cliff ledges was noted on the boat survey. However, the survey was undertaken during the day, when Puffin numbers tend to be at their lowest as birds are either out at sea or out of sight within the breeding crevices. Records from local birders via an online discussion forum and any other records received were therefore also taken into account together with counts undertaken from the land by Trev Haysom, Sophie Lake, Durwyn Liley and Ilay Cooper throughout June. The number of breeding pairs was estimated as in previous years (see Lake *et al*. 2011) by counting the number of birds observed arriving with fish. From the angle at which any birds carrying fish enter the coves, and given the very limited number of birds present, it is possible to estimate the probable number of nest sites.

2.4 The number of Kittiwake and Herring Gull AONs at Blackers Hole and Blackers Quarry respectively were recorded by Ilay Cooper who regularly carried out land-based counts. These figures were used as they are likely to be more accurate than the boat-based counts. The approach of using land-based accounts to supplement the boat survey has been used

previously, as both were counted during Kittiwake productivity monitoring (not carried out in 2018).

3. Results

Results of boat surveys

3.1 All apparently occupied nests/sites and colonies are marked in the series of photographs supplied in the accompanying photo Annex. Summary results are presented in Table 2. Survey sections follow those used historically, and are given in Lake *et al.* 2011. Peak counts are given from the June count (with the exception of puffin - see methods), which unusually was higher than the May count – possibly due to poor weather in on the May survey day. Supplementary data from land-based counts resulted in a count of nine rather than eight Kittiwakes at Blackers Hole, and 12 Herring Gulls at Blackers Quarry, which were not seen from the boat.

Estimate of number of breeding Puffins

3.2 The possible number of breeding pairs was thought to be two to three, (based on the number of birds seen flying with fish into Bird Cove from the land. Six puffins were seen on the boat survey; the maximum number reported by local birders was also six.

Table 2. Breeding seabird records on the Dorset Coast, 2018 (2017 data in brackets for comparison where available). Counts are of apparently occupied nests or sites (AONs/AOSs) for all species except Guillemot and Razorbill, for which counts are of individuals at breeding sites. "0" is recorded at sites where birds have been present at some point since 2011 but were not recorded since 2015 (the date of the last full survey)

	Fulmar	Cormorant	Shag	Herring gull	Great black-backed gull	Kittiwake	Guillemot	Razorbill	Puffin
Handfast Point – Ballard Down	**3** (2)	**20** (34)	2 (0)	**13** (10)	**4** (3)				
Durlston Head - Lighthouse	**5** (10)		**0** (2)	**1** (1)	**0** (1)		**279** (297)	**35** (20)	
Anvil Point - Ragged Rocks	**0**		**0** (1)	**2** (4)	**0** (0)		**74** (70)	0 (2)	
Blacker's Hole - Reforn	0		**2** (1)	**13** (0)	**0** (0)	**9** (14)	**250** (141)	**33** (24)	
White Ware - Little Hedbury			**10** (5)	**7** (3)	**0** (1)		**89** (109)	**4** (2)	**2-3 pairs, 6 individuals** (2 pairs, 6 individuals)
Seacombe - Winspit	**0**		**10** (6)	**23** (22)	**0** (0)				
Crab Hole - Buttery Corner	**7** (5)		**11** (10)	**3** (1)	**1** (0)		**450** (377)	**19** (17)	
St Aldhelm's Head	**1** (0)				**1** (0)				
Gad Cliff	**0**	**11**+	**3**+	**2**+					
Mupe Rocks - Fossil Forest -Scratchy Bottom	**4**+		**3**+	**32**+					
Swyre Head – White Nothe	**1**+	**26**+		**7**+					
DORSET TOTAL	**21**	**57**	**41**	**103**	**6**	**9** (14)	**1042** (994)	**91** (63)	**2-3** (2)

+ Previous survey was in 2015 for sections west of St Aldhelm's Head, therefore Dorset total for previous survey not given here.

4. Discussion – comparison with previous years and UK trends

4.1 Data from 1965 onwards were compiled and discussed in Lake *et al.* 2011. Here we update the dataset with the results of the 2018 survey. Note that the previous two surveys did not cover the sections west of St Aldhelm's Head (see Lake *et al.* 2011 for place names) so for species nesting west of this point, comparison is given with 2015 data. For the remainder (the auks), comparisons are given with the 2017.

4.2 The UK indices of abundance (JNCC 2011)[1] used are for 2010 – 2015. These indices show the relative change in population size, assigning a score of 100 to the population at the start date of the monitoring. The Seabird Monitoring Programme Steering Group (in agreement with Natural England) put the analysis and publication of the annual SMP report on hold for two years in order to support the seabird census (which was lacking resources) and national data will therefore not be available until 2019. Contextual information on UK declines has been retained for readers who have not seen previous years' reports, but indicated by the use of *grey italics*, enabling readers familiar with the text to skip information repeated between years. Please refer to Lake *et al.* 2011 for further context on each species and more information on historic records (including data constraints).

Fulmar

After colonising Dorset in the 1940s, the number of breeding Fulmar increased to a peak in the 1980s. Since then numbers have declined overall (despite short-term increases). In 2018, the number of AOSs was the lowest ever recorded for the coast despite an upturn in 2014-15. This trend has broadly reflected that of the UK overall, which shows a fluctuating decline.

4.3 Fulmars breed between Ballard Down and White Nothe. Following the first record of Fulmars breeding on the Purbeck coast in 1943 (Haysom 1977), numbers increased to a peak in the early 1980s. Since then, the overall trend has been a decline, with peaks and troughs from year to year. The decline in 2018 followed an apparent upturn in 2014-15. A small increase at Buttery Corner and west of St Aldhelm's was insufficient to make up for the decrease at Durlston. The number at Ballard Down remained very low and nest site remained the same as those used in previous years.

[1] The UK indices of abundance (JNCC 2011) are compiled as part of the JNCC seabirds monitoring programme and earlier surveys in 1969-70 (Operation Seafarer), 1985-88 (Seabird Colony Register) and 1998-2002 (Seabird 2000).

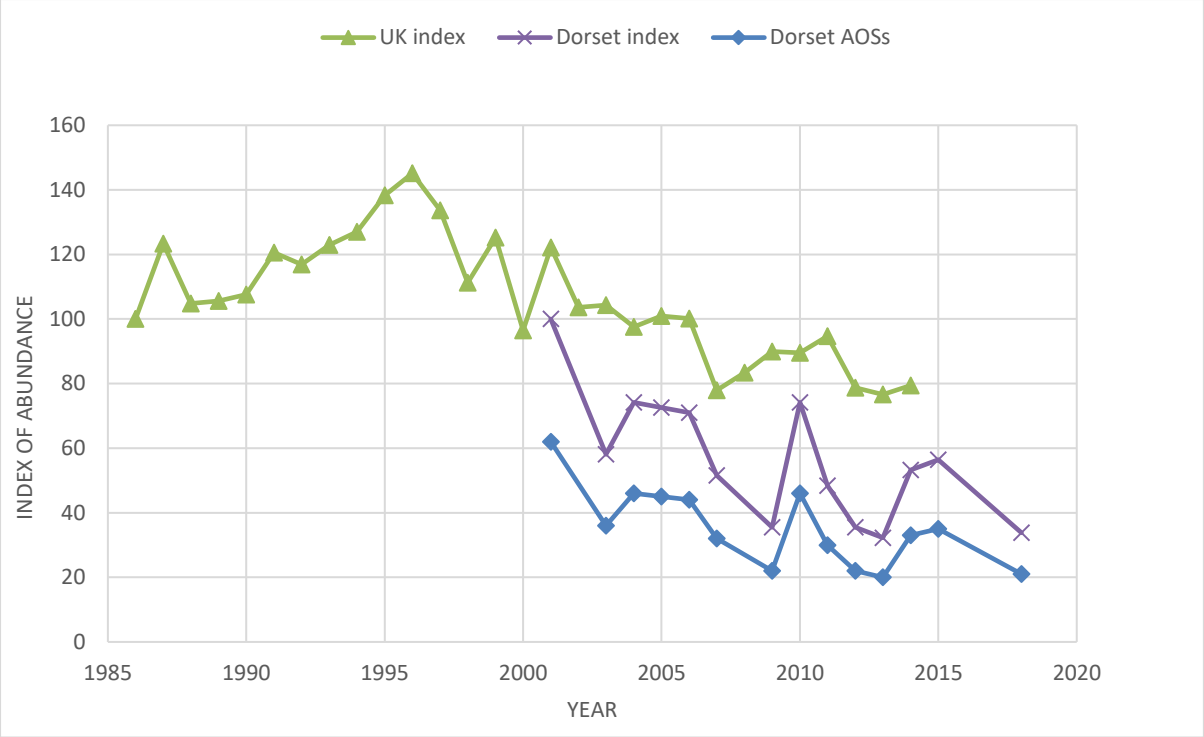

Figure 2. Changes in the numbers of apparently occupied breeding sites (AOSs) for Fulmar together with Dorset and UK indices of abundance.

4.4 *The Dorset Coast trend is similar to that of the UK as a whole (see Figure 2), although more variable due to the low counts. A spectacular increase in the number and distribution of Fulmars in the UK and north Atlantic throughout the 20th century ceased in the last 20 years, and numbers then declined, with the suggestion of a small recent upturn. The decline in Purbeck has been steeper.*

4.5 *The increase in Fulmar numbers in Europe is thought to have been driven by changes in food availability due to changes in temperature in the seas and to commercial fisheries, and to a reduction in human predation (Thompson 2004). Subsequent declines in the UK have been attributed to changes in the North Sea whitefish industry, resulting in a decrease in offal; and declines in sand eel populations in the North Sea and zooplankton in the Atlantic, possibly due to climate change. Large numbers are also caught and accidentally killed by long-line fishing in the Norwegian Sea and North Atlantic. The Fulmar is amber listed due to the decline and degree of localisation of the breeding population.*

Cormorant

The three Cormorant colonies have declined from a peak in 1990 (320) to less than 20% of this figure in 2018. In recent years there was a slight increase between 2012 and 2015 but a subsequent decline has left the population at its lowest level since the population expansion 35 years ago.

4.6 The White Nothe colony has remained relatively stable (with notable fluctuations) over the last 49 years at around 25 nests in contrast, the colonies at Ballard Down and Gad Cliff. The number of Cormorants at Ballard Down leapt from 11 in 1974 to 172 in 1990, and then has declined steadily, although numbers here are still higher than in the 1970s before the population expansion. The Gad Cliff colony has declined steadily since recording began, except for an upturn in the late 1980s. Sub-colonies continue to rotate between locations, particularly at Ballard.

4.7 *Because of significant regional variation in the abundance index (declines are particularly severe in Northern Scotland), Figure 3 shows the trend for the Dorset population for the years in which these data are available compared to the English index of abundance for coastal cormorants (to 2015). The Dorset index decreased while the English index was still increasing, and the Dorset population has also decreased further. The upturn in numbers nationally after 2011 was reflected in Dorset in 2014-5, but numbers dropped again in 2016.*

4.8 *Nationally, increases in abundance up to 1995 are likely to have been facilitated by increased legal protection instigated under the Wildlife and Countryside Act 1981. Factors responsible for recent declines are likely to include increased mortality from licensed and unlicensed shooting, as well as possible changes in food availability (JNCC 2011). Poor weather during the breeding season in 2012 and early in the breeding season in 2013 may have impacted on the Purbeck population, particularly at Ballard Down.*

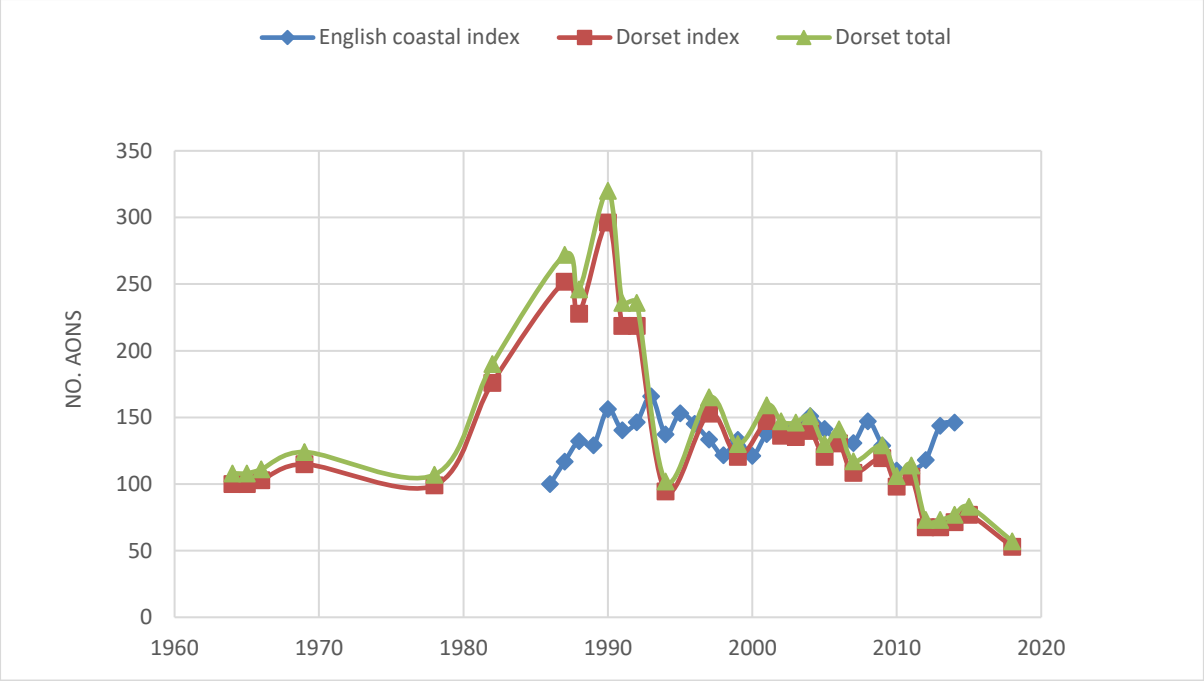

Figure 3. Total Dorset AONs and English (coastal populations only) and Dorset indices of abundance.

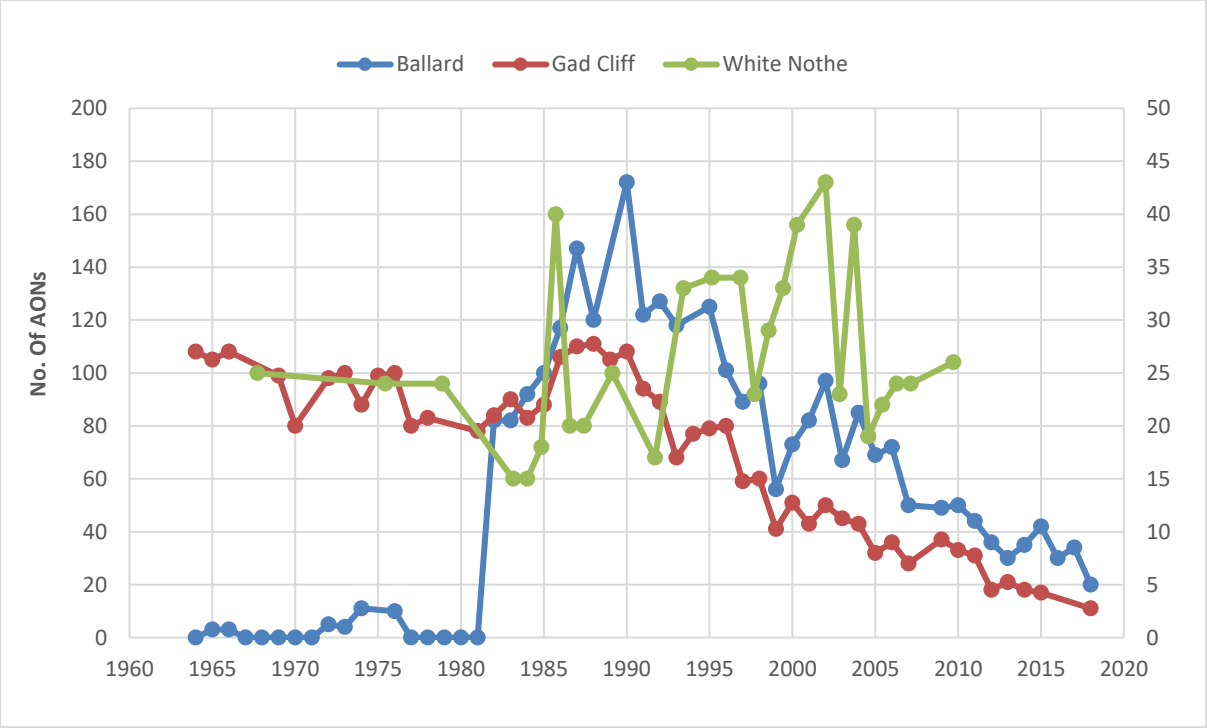

Figure 4. Numbers of AONs at the three Dorset colonies.

Shag

The number of breeding Shags in Dorset is thought to have increased significantly in the early 20th century until the 1970s. Between the 1970s and 2010 the population remained fairly stable but with significant annual fluctuations. Since then the overall trend appears to be one of decline, despite an upturn in 2017 and the return of breeding Shags east of Durlston Lighthouse in 2018. UK trends indicate a long-term decline (but note that national trends have been affected by slow recovery from wrecks on the east coast).

Breeding Shags generally occur along the coast between Ballard Down and Scratchy Bottom. Shag records were sparse in Dorset until the latter half of the 20th century. Between Durlston and St. Aldhelm's Head (the survey section for which there is the most complete data set), numbers increased rapidly until 1970, then increased much more slowly and with fluctuations until 2010. Comparison between Figure 5 and Figure 6 suggests that data gaps conceal the degree of fluctuation in the total data set, from which several years are missing. Since 2010 population has declined overall and in 2018 the count of 21 birds was the second lowest recorded. Numbers between Durlston and St. Aldhelm's were the lowest – there has been a proportionally greater loss of nests east of St Aldhelm's, particularly at Durlston Head. However, 2018 saw the return of two nests to Ballard Down, where they had been absent since 2009.

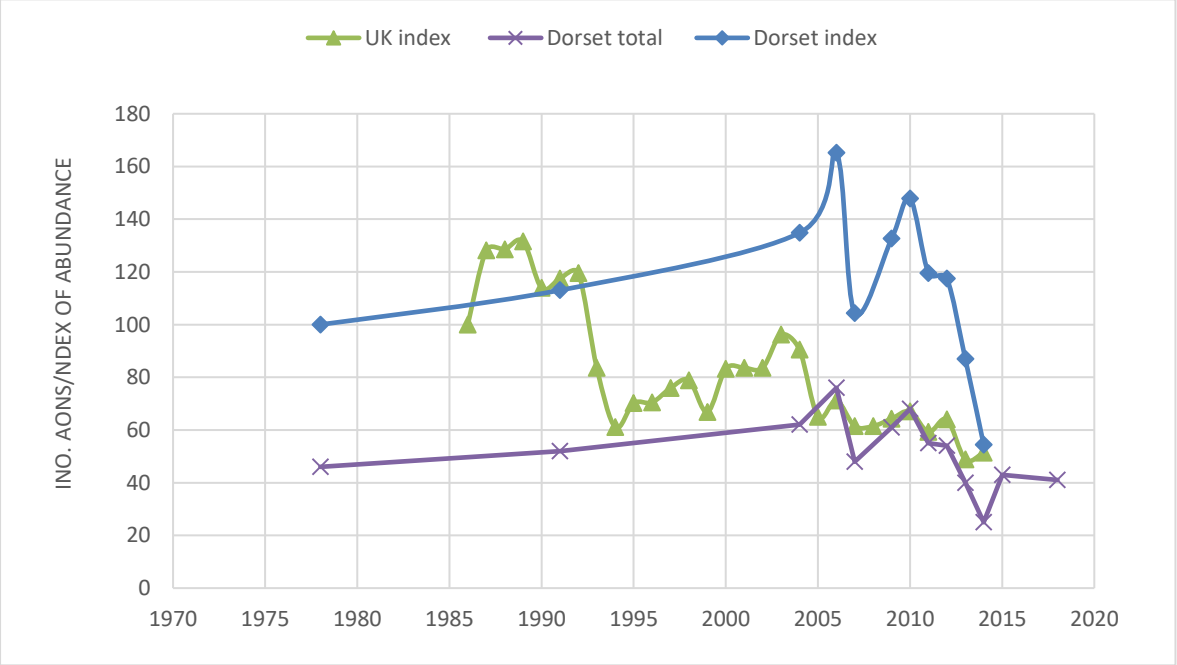

Figure 5. Numbers of apparently occupied nests of Shag and the Dorset index of abundance compared to that for the UK (note that early counts may not have included Ballard Down).

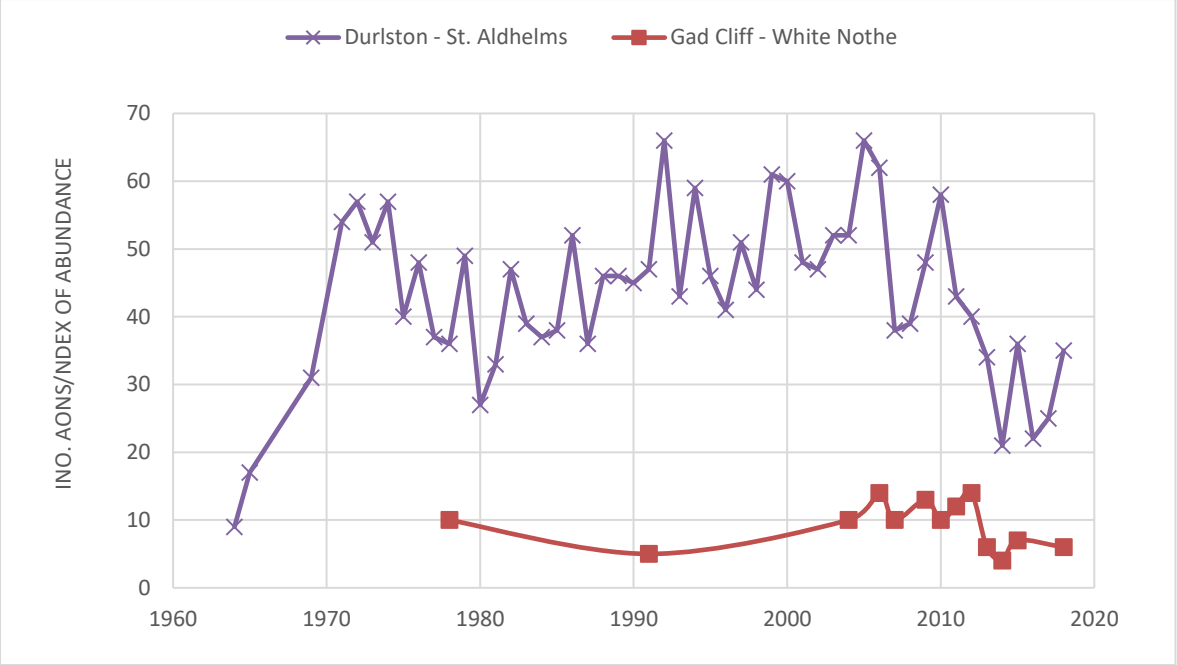

Figure 6. Numbers of apparently occupied nests of Shag between Durlston and St. Aldhelm's and between Gad Cliff and White Nothe (limited data). Counts from Ballard Down are not presented as it may not have been included each year.

4.9 *The changes in numbers of nesting Shags in Dorset have not closely reflected national trends but both show an overall decline with fluctuations. The tendency for adults not to breed every year may be one reason for the variability. The Shag is red listed due to declines in the breeding population, and the international importance of both breeding and non-breeding populations in the UK (Eaton et al. 2015).*

4.10 *In the UK overall, the Shag population increased slightly from the late 1960s to the mid-1980s (possibly due to increased legal protection e.g. under the Wildlife and Countryside Act 1981 and reduced persecution (JNCC 2011)) but then gradually decreased, with an abrupt crash in 1994 and again in 2005 due to a wreck (mass mortality event) caused by food scarcity during a period of prolonged onshore gales on the east coast (Harris & Wanless 1996) (Note the initial steep rise in the index up to 1987 shown in Figure 5 is due to many adults choosing not to breed in 1986, resulting in low numbers at colonies that year).*

Herring gull

There is thought to have been a marked decline in the Herring Gull population in Dorset in the second half of the twentieth century. Since 2000, fluctuations have been broadly similar to the UK trend with a fluctuating decline. A small upturn in 2015 and 2016 had been followed by a steeper decline and the population in 2018 was the smallest recorded.

4.11 Records for the whole survey area are only available from 2000. The patchy records available for Purbeck suggest a decline (77% between 1965 and 1989) considerably more severe than the national decline (43% between the late-1960s and mid-1980s). More systematic monitoring was introduced in 2000, by which time the population had recovered a little. However, a slow decline ensued, mirroring the overall UK trend (see Figure 9) until 2012 when numbers starting increasing. In 2015 189 nests were recorded, the most since 2000 (note that this is still around half of the number recorded in Purbeck in 1969). Numbers then reduced rapidly and by 2018 had returned to the low point (103 nests) previously reached in 2011. There was however a local increase at Blackers Hole (note that the record of 12 AONs here was based on counts from the land by Ilay Cooper – none were recorded during the boat-based surveys).

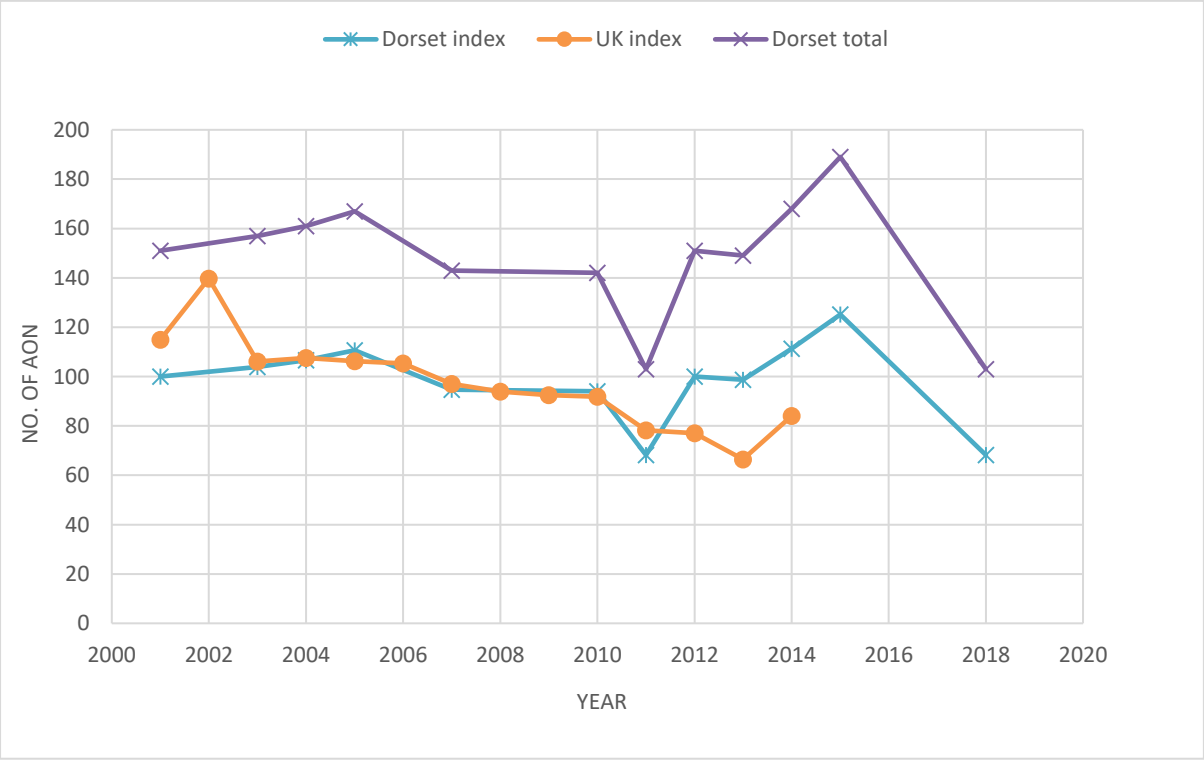

Figure 7. Number of apparently occupied nests of Herring Gull and Dorset and UK indices of abundance (UK monitoring started in 1986). Nb UK index is based on coastal populations only.

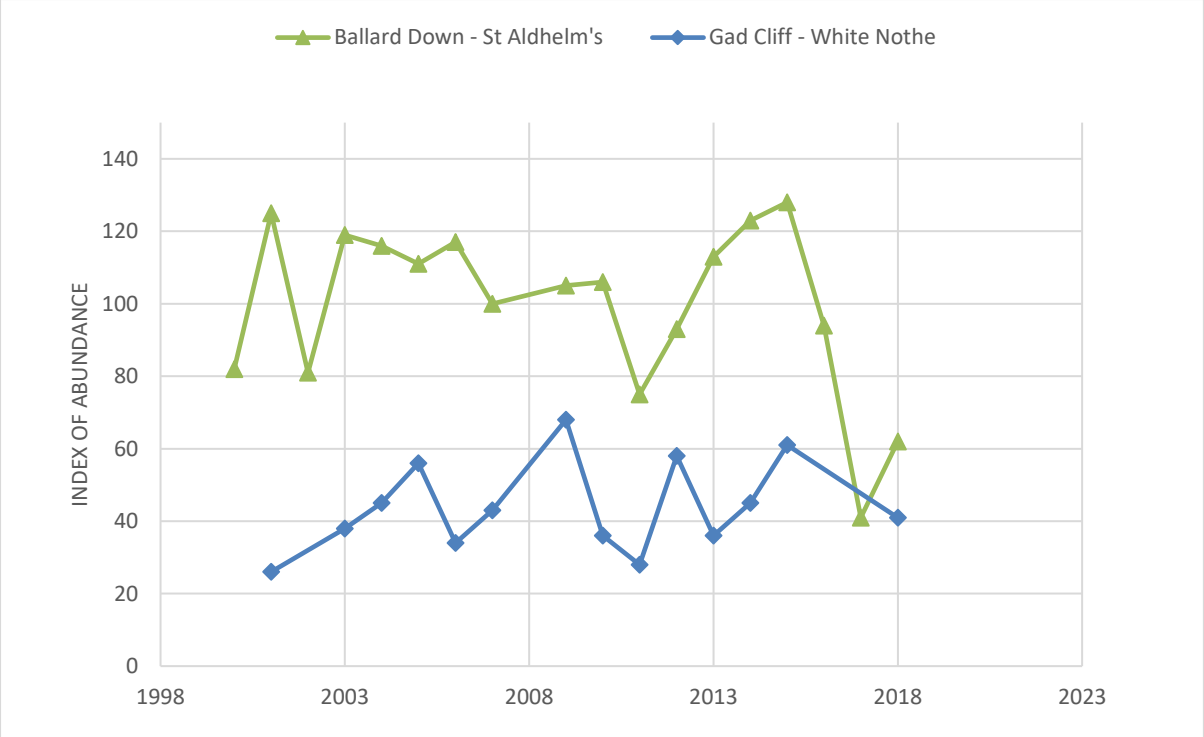

Figure 8. Number of apparently occupied nests of Herring Gull and Purbeck and UK indices of abundance (UK monitoring started in 1986). Nb UK index is based on coastal populations only.

4.12 The Herring Gull is red listed in the UK due to a long-term decline in the population (Eaton et al. 2015).

Great Black-backed Gull

The small Great Black-backed Gull population remained fairly steady between 2000 (when systematic recording began) and 2014. However, 2015 saw the beginning of a decline which has reduced the population from 18 at its peak in 2007 to just six apparently occupied nests in 2018. In the past, the population along this stretch of coast appeared more resilient than that further west (which was not surveyed in 2016 or 2017).

4.13 The small Dorset population shows a fluctuating decline. The small overall reduction by eight nests is nonetheless a large proportion of the population. There is generally some movement of nest locations between years: 2016 saw the loss of three nest locations from Ballard Down but two new ones at Buttery Corner; 2017 saw birds returning to three nest locations at Ballard, but the loss of all other nests except for one at Durlston and a new nest site at White Ware (east of Dancing Ledge). 2018 saw four nests at Ballard Down, one west of Winspit and one at a new site at St Aldhelm's Head.

4.14 The UK trend shows a decline between 2000 and 2006. During this time the Dorset population appeared more resilient. However, subsequent declines resulted in the two indices converging again in 2015.

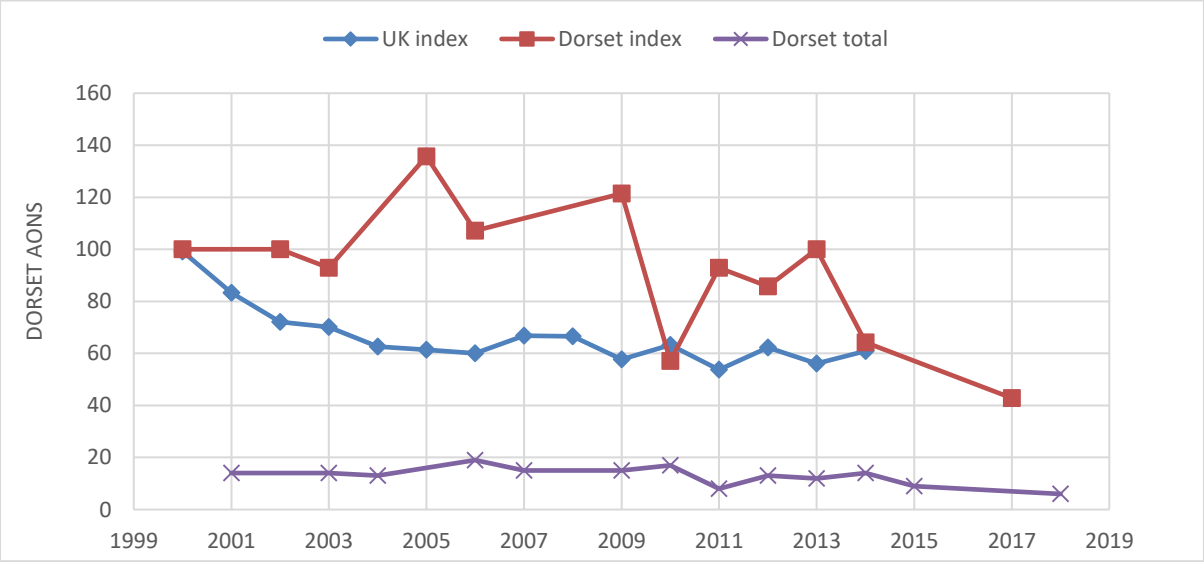

Figure 9. Numbers of apparently occupied nests and the UK and Dorset indices of abundance.

4.15 The 20th century saw widespread expansion of the Great Black-backed Gull breeding range and numbers. The abundance of Great Black-backed Gulls decreased a little between the first census of their numbers in 1969/70 and 2000. Between 1986 and 2010, abundance peaked in 1999 at 115% of the 1986 reference level, but has since decreased by around 20%.

4.16 Great Black-backed Gulls are currently listed as amber in the Birds of Conservation Concern due to a non-breeding population decline (Eaton et al 2015).

Kittiwake

Following rapid expansion throughout the 1960s and 1970s, the Kittiwake population in Purbeck declined almost as rapidly. Although the rate of decline has slowed during the last 10 years, in 2018 the only remaining colony (at Blackers Hole) was the smallest it has been since 1962 and it appears that breeding has again failed totally. At the current rate of decline, it is unlikely that there will be Kittiwakes attempting breeding at Blackers Hole within two years.

4.17 Kittiwakes are known to have been present around Durlston in the 1880s (see Lake *et al.* 2011), but only two were recorded by 1957. This site remained the only colony until the late 1960s/early 1970s, when four more sites were colonised and by 1980 the overall population peaked at nearly 300 AONs. After this, all the colonies declined rapidly, and since the mid-1990s, only the Blackers Hole colony has persisted.

4.18 The Blackers Hole colony is also in decline (despite a brief increase in the mid-2000s) and in 2018 reached its lowest level since 1962 at 9 nests. No chicks were seen.

4.19 Changes in the Purbeck population mirror the UK trend (see Figure 8) although the population may have peaked earlier and the decline occurred more rapidly until it slowed in the 21st century.

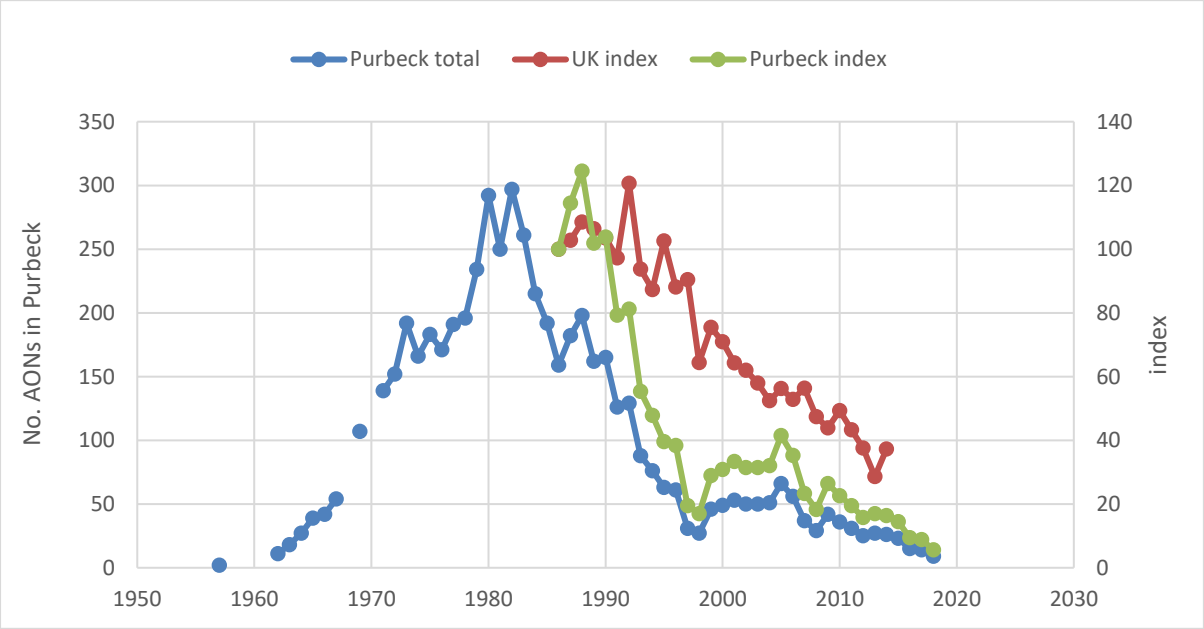

Figure 10. Changes in numbers of apparently occupied nests of Kittiwakes in Purbeck and Purbeck and UK indices of abundance from 1985.

4.20 Nationally, declines in productivity have been related to declines in sand eel abundance and, in some regions, are negatively correlated with surface sea temperature (Frederiksen et al. 2004). Kittiwakes are particularly vulnerable to food shortages as they are surface feeders, and only able to reach prey on or near the surface. Kittiwakes are red listed (Eaton et al. 2015) due to the decline and degree of localisation of the breeding population.

Guillemot

After large declines up to the mid-20th century, Guillemot numbers in Purbeck stabilised in the 1970s and increased overall throughout the 1990s and 2000s then more rapidly from 2014 and are now at their highest since the mid-1960 at about one third of the 1930 figure. The Purbeck colonies have followed a similar trend to that shown by the UK index of abundance, although fluctuating more widely. It is noted that UK productivity is decreasing overall, and may lead to future declines. Recent productivity in Dorset in not known.

4.21 The Guillemot population is found between Durlston and St. Aldhelm's. The number of Guillemots in Purbeck declined from an estimated 2,500-3,500 in the 1930s to about one quarter of this (around 700) in the 1970s (see Lake *et al.* 2011 for more details). After this the overall population began to increase, mainly at the Durlston colony, but also between Crab Rock and Sutton Rock from the early 2000s. In 2018 the population reached a peak at 1142, the highest since declines in the mid-20th century (and reversing the small downturn seen in 2017).

4.22 There is considerable variation between colonies. Since the mid-2000s, numbers at Durlston have fluctuated widely (see Figure 11) but now appear to be steadily declining. Here, the lowest numbers since 1960 were recorded in 2013 (144), when the sub-colony known as "Main Ledge" was entirely deserted probably due to heavy predation from a pair of resident Ravens. The declines at Durlston have been more than compensated for by increases elsewhere, particularly between Crab Hole and Sutton rock, increases which resumed in following a slight decrease in 2017.

4.23 Changes in the Purbeck population correlate broadly with changes in the national index of abundance, although showing more fluctuations (see Figure 12).

4.24 The reasons for the national increase are not known, although the recent levelling out may be due to density-dependent effects on breeding success (with competition for space and food becoming critical). Observed low UK productivity, thought to be due to food shortages combined with low return rates at sampled colonies, suggests that, should productivity decline further, future declines may be likely nationally (JNCC 2011). Guillemot is amber listed in Birds of Conservation Concern due to its degree of localisation (Eaton et al. 2015).

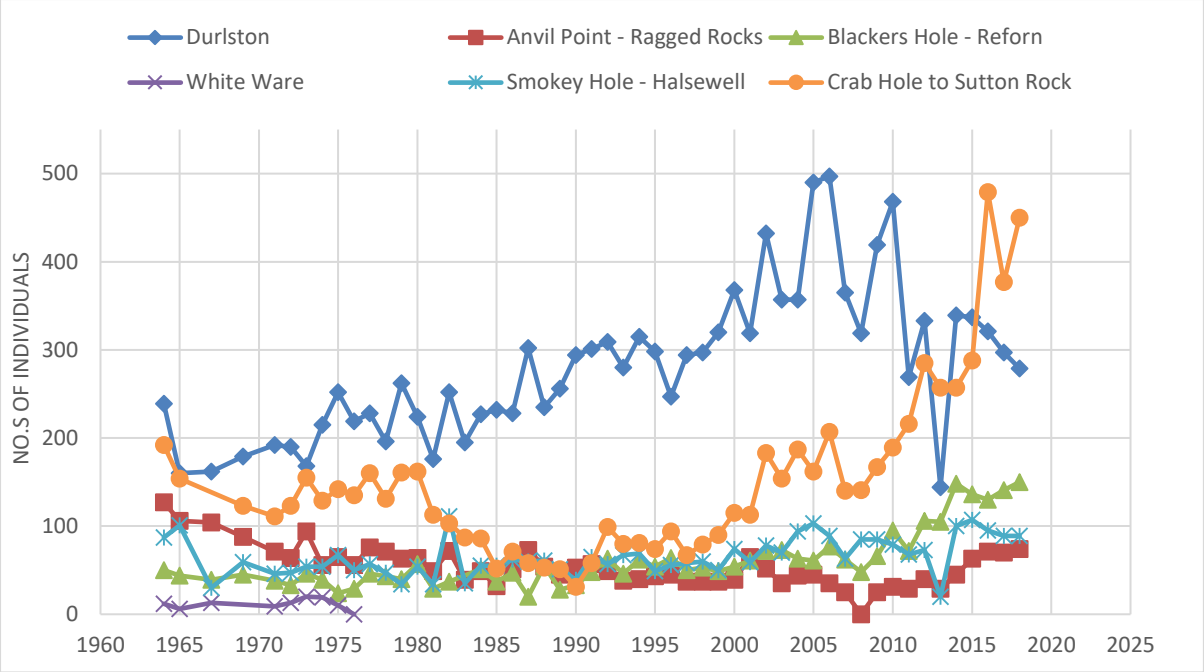

Figure 11. Changes in numbers of Guillemot individuals at breeding colonies in Purbeck since 1965.

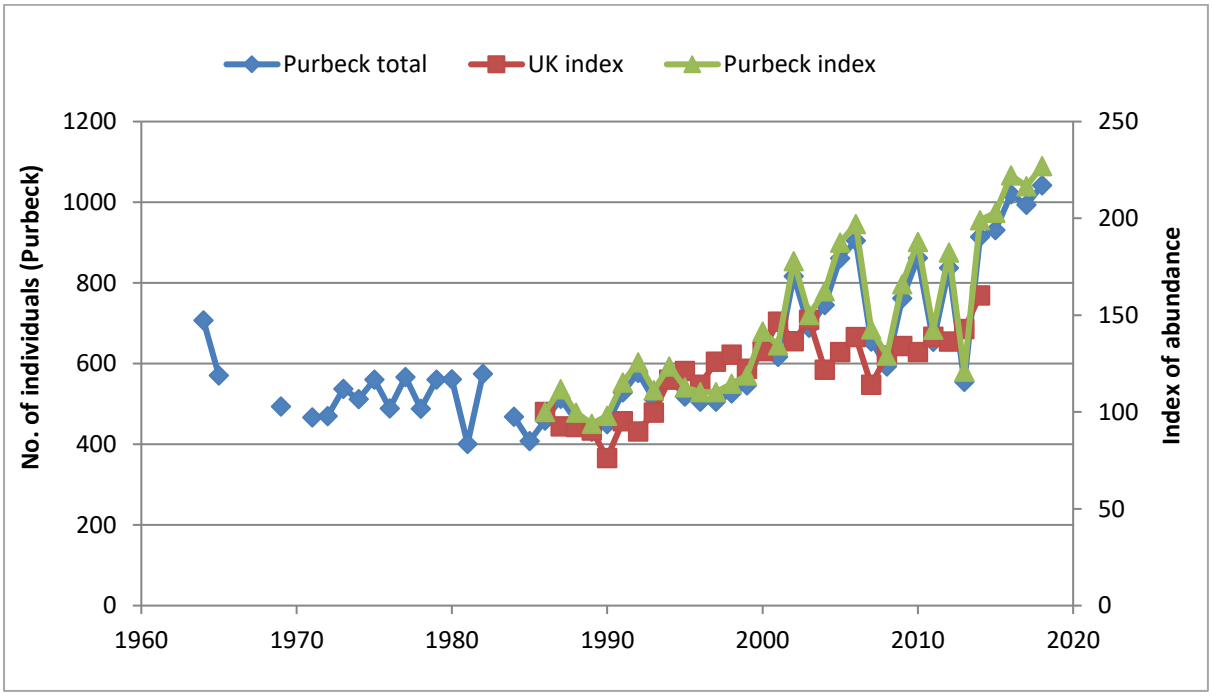

Figure 12. Changes in the total number of individuals recorded at breeding ledges in Purbeck compared to the UK index of abundance.

Razorbill

Razorbills declined substantially in Purbeck between 1880 and the early 1960s (when systematic counts began). The overall population continued to decline before stabilising in the 1970s, then fluctuating widely until increases in the 2000s and 2010s brought it back up to numbers similar to those last recorded in 1965. A 60% decrease in 2016 was at least partially reversed in 2017 and numbers are at the highest since systematic recording began. Fluctuations have been greater than those seen in the UK index of abundance. A decline in the UK population is expected on the basis of poor UK productivity levels.

4.25 Razorbill breeds between Durlston and St. Aldhelm's. Razorbills were considered to be breeding on the Purbeck Coast in greater numbers than Guillemots in the 1880s (see Lake *et al.* 2011 for more details). However, by 1932, only 130 birds were recorded and this fell further to 58 by 1967 and just 14 by 1970, by which time many colonies had disappeared altogether. The population then fluctuated but remained steady overall until the late 1980s, after which three crashes, each roughly a decade apart, were followed by recoveries to higher peaks. Substantial increases in 2014 and 2018 in particular mean that the total count is now at the highest since systematic recording began in 1964.

4.26 The Purbeck population has shown large fluctuations since the 1950s largely due to the three crashes and subsequent recoveries (although note that the small size of the population means a small change in numbers results in a large percentage change) (see Figure 14). These fluctuations can obscure overall trends, but there appears to be an overall upward trend which is steeper than the fluctuating upward trend in the UK as a whole.

4.27 *As with Guillemots, it has been suggested that the levelling out seen in the UK index in the 2000s may be due to density dependent mechanisms (JNCC 2011). UK Razorbill productivity has declined steadily since 1993 (possibly due to food shortages), and unless this trend reverses, a continuing overall decline is predicted (JNCC 2011). Razorbill remains amber listed in Birds of Conservation Concern due to its degree of localisation (Eaton et al. 2015).*

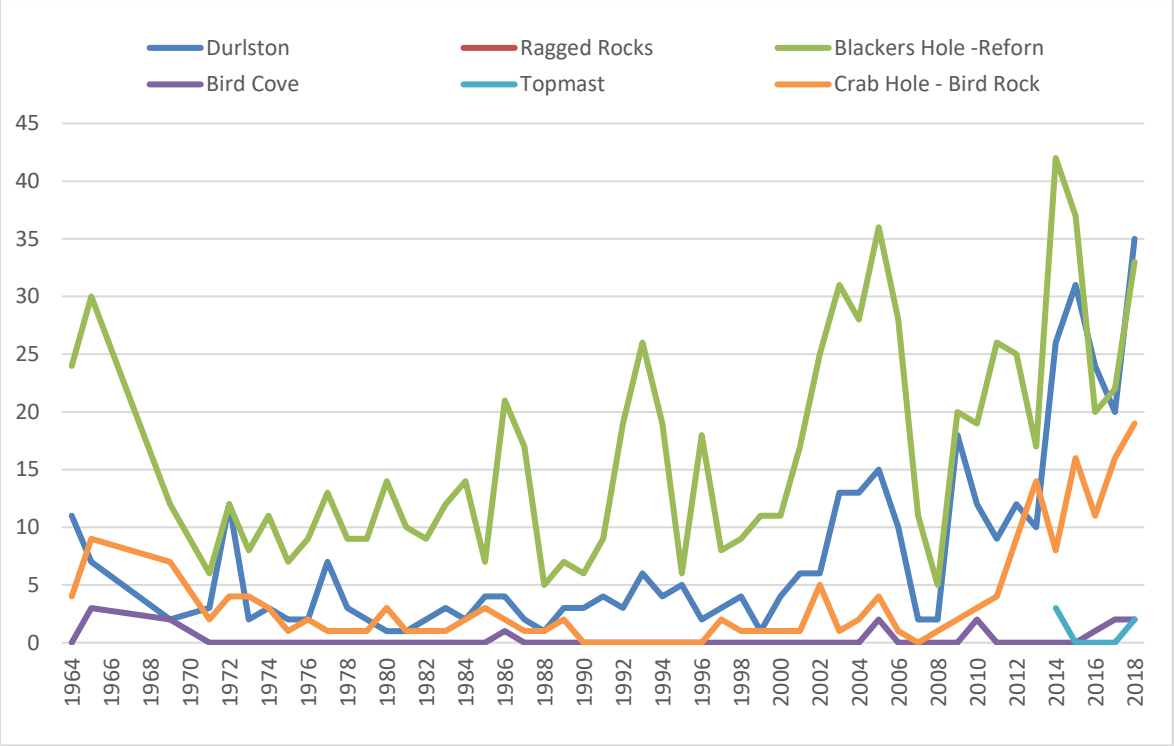

Figure 13. Changes in counts of individual Razorbills at main colonies between 1965 and 2018.

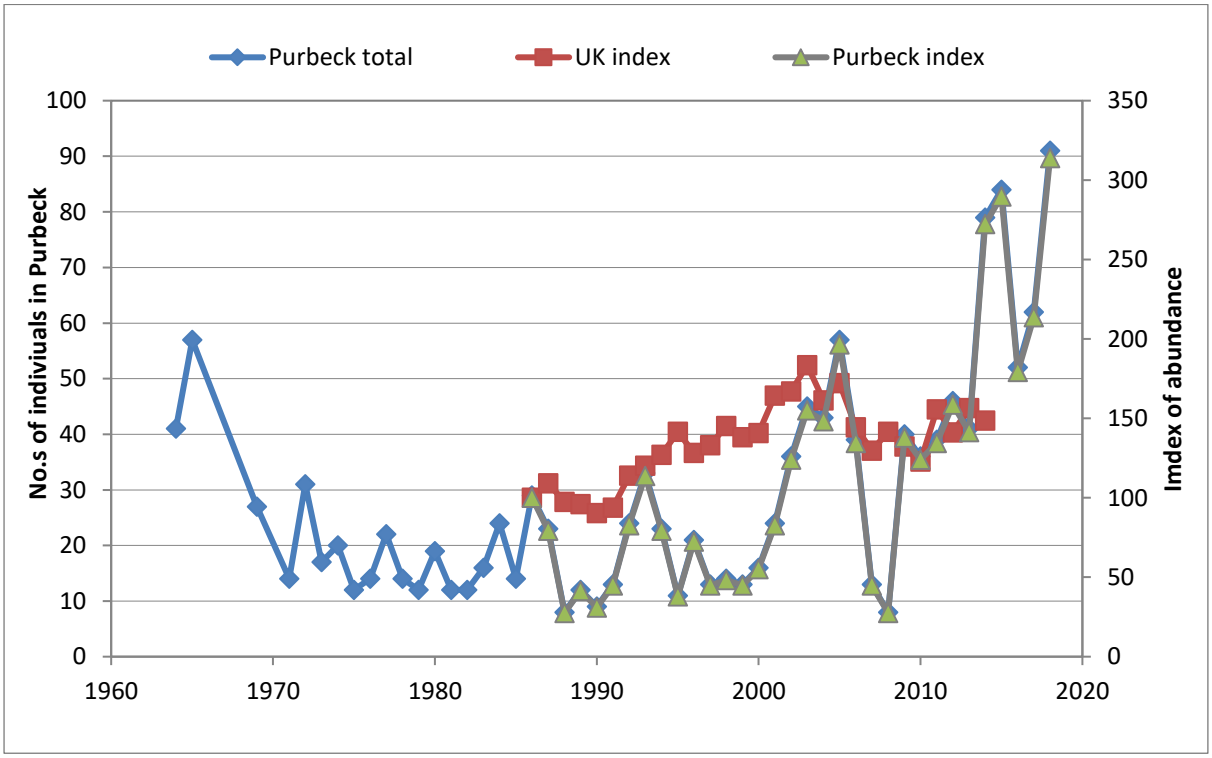

Figure 14. Changes in the counts of individual Razorbills and the UK and Purbeck indices of abundance.

Puffins

The puffin population of Purbeck declined severely in the 20th century. By the time the population steadied in the 1990s, the estimated number of breeding pairs was about three and has fluctuated between one and three since then. In contrast, the national trend was of a significant increase in the last quarter of the 20th century. More recent national data are not available, but monitoring at a small number of large colonies has shown declines in numbers, survival and productivity. Two-three breeding pairs and six individuals were recorded in Purbeck in 2018.

4.28 Puffins were thought to be abundant in Purbeck at least until 1939 (see Lake *et al.* 2011) but by 1958 there were only 85 individuals recorded, dropping to 23 in 1975. The population subsequently declined much more slowly until the mid-1990s, after which it stabilised at around two-three breeding pairs. Adults carrying fish were observed arriving at two, possible three, nesting locations in 2018. No more than six birds were seen at any one time together. No juvenile birds have been observed in recent years and the future of this colony remains precarious.

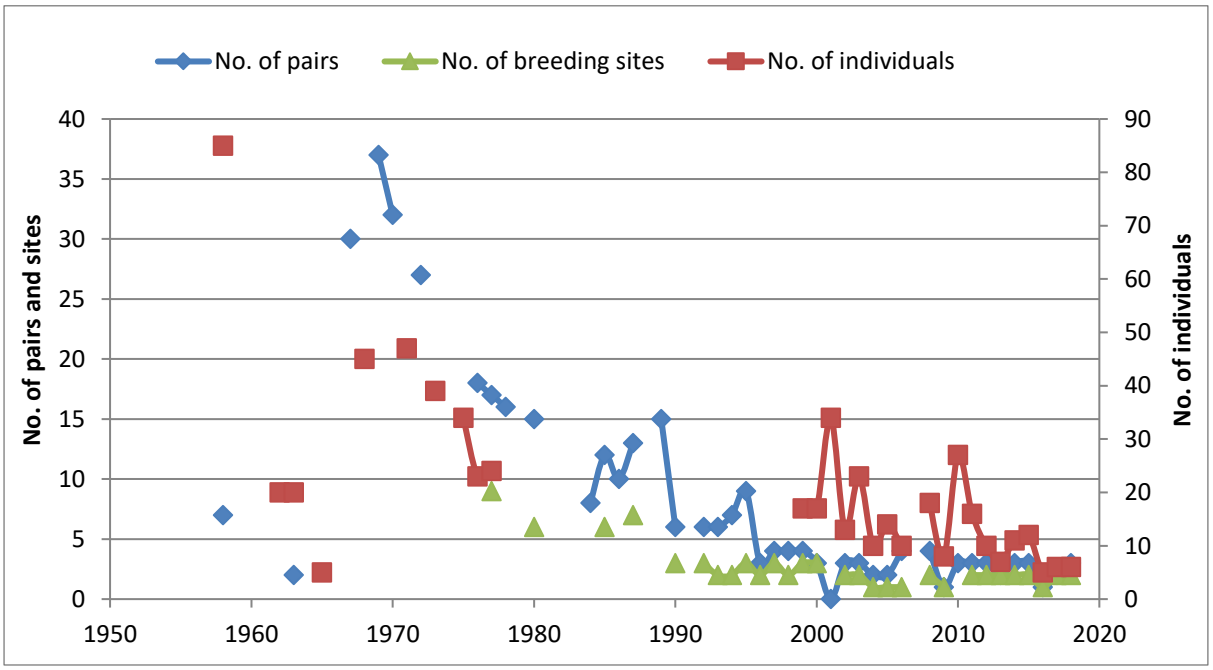

Figure 15. Numbers of individuals, breeding pairs and breeding sites in Purbeck between 1958 and 2018 (note the different scale for no. of individuals).

4.29 The downward trend in Puffin numbers in Purbeck does not reflect the overall increase suggested by UK census returns between 1969 and 2002. However, although UK-wide data are not available for more recent years, monitoring results from two large colonies show subsequent declines. Productivity has fluctuated but appears to have been lower since the 1990s. Caution should be used in drawing wider geographical conclusions from these data. On Lundy Island, where conditions for Puffins have improved through the eradication of rats, numbers have increased from just five individuals 2006t over 300 in 2016. Puffins are amber

listed due to their degree of localisation and categorisation as a species of European Conversation Concern (Easton et al. *2009).*

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