



Purbeck Seabird Survey 2013



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Summary

The breeding seabirds of Purbeck are facing a bleak future. Monitoring results from 2013 indicate that seven of the nine species present have declined since 2012. In five cases this is a clear continuation of an ongoing decline, which is often severe. Two species show wide fluctuations which make overall recent trends hard to identify; only one species appears to be holding its own. Both of the species whose numbers remained relatively constant in 2013 have also experienced long-term declines.

Counts of breeding seabirds have been carried out on the Purbeck coast since the mid 1960s. This report presents data from the 2013 survey, and does so in the context of trends over the last 50 years. For a full discussion of previous Purbeck trends please see Lake *et al.* (2011).

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, and only four species now occur west of St Aldhelm's Head.

The guillemot population remains the largest, currently at around 555 individuals, and the puffin population the smallest at probably just two breeding pairs. There are just over 150 breeding pairs of herring gulls; all other species have populations within the ranges of about 20-70, except great black-backed gull, which although increased since a low point in 2011, has a population of 13 breeding pairs.

The 2013 monitoring data shows declines in the number of breeding fulmar, shag, herring gull, great black-backed gull, razorbill, guillemot and puffin since 2012; a particularly big decrease was seen in guillemot numbers (33%), which may be related to the polyisobutene (PIB) pollution events reported in south west England in January-February and April 2013. Raven predation and poor weather early in the breeding season may have contributed to low numbers, compounded by the underlying issues of food shortage due to the impact of climate change on the marine food chain and the impacts of human activities. The cormorant population remained at the 2012 level (after notable declines in 2012) and the kittiwake population increased by two pairs.

In most cases the decrease in numbers appears to be a continuation of a long term decline (see Table 1). Cormorants declined markedly throughout the C20th century. Razorbill and guillemot populations declined throughout the same period, but then increased until the mid 2000s, and have subsequently fluctuated. Fulmars and kittiwakes both increased to a peak in the second half of the C20th century, and have since declined. Shags increased throughout the second half of the C20th, but subsequent fluctuations make an overall trend difficult to identify. Herring gull numbers have declined since the 1960s, but remained more stable in recent years. Greater black-backed gulls remained stable until about 2000, and have since declined. The tiny puffin colony remains in a precarious state, and given the lack of sub-adults at the colony, it seems unlikely that the colony will persist beyond the demise of the current occupants.

Population changes in Purbeck are generally in line with national trends, but often declines have started sooner or progressed more rapidly. They generally show wider fluctuations (which is to

some extent expected as the UK trends are averaged over many sites). The declines in the fulmar and kittiwake populations have been steeper than those seen nationally. Cormorants have declined steadily in contrast to the national trend, which shows more fluctuation. However the shag population in Purbeck show more variability than nationally; having increased to 2000 then declined sharply and fluctuated since. Herring gulls also show greater fluctuations, possibly with less of an overall decline, while greater black-backed gulls show a similar decline but with more fluctuations. Guillemots increased in line with national trends, but peaked higher (with reference to the start year) and have fluctuated more widely since. Similarly, the increase in the razorbill population mirrored the national trend, but with much larger fluctuations. UK trend data for 2013 are not yet available, but RSPB monitoring data from Scotland show significant declines in auk populations.

Productivity was monitored for cormorants and kittiwakes. Cormorant productivity, which generally fluctuates, increased to the highest level recorded since monitoring began in 2000. Productivity at the kittiwake colony remains very poor, and shows a decline from 2012 (when it improved slightly in contrast to the national trend).

Table 1 Summary of breeding seabird population changes in Purbeck.

Species	Change since 2012	% change since peak (post 1964)	Peak year	Comparable monitoring data available since:	Long term trend
Fulmar	-3 (-15%)	-68	2001	2001	Colonised in 1940s, peaked in 1980s, declining
Cormorant	0	-77	1990	1964	Declined to 1960s, increased to 1990, declined severely since
Shag	-6 (-15%)	-48	1992 & 2006	1964, partial	Increased rapidly in 2nd half of C20th, subsequent wide fluctuations suggest overall decline
Herring gull	-2 (-1%)	-10	2005	2001	Considerable decline 1960s - 1980s, currently roughly stable
Great black-backed gull	-1 (-8%)	-37	2006	2001	Fluctuating, apparent decline since 2000
Kittiwake	+2 (-8%)	-91	1981	1957	Rapidly increased throughout 1960s & 1970s, equally rapid decline, which slowed in the 2000s
Guillemot	-282 (-33%)	-39	2006	1964	Large declines up to mid C20th, increase to peak in 2006, fluctuating since
Razorbill	-5 (-11%)	-28	2005	1964	Large declines up to mid C20th, fluctuating increase to peak in 2006, fluctuating since
Puffin	-1 (-33%)	-98	1969	1964	Large declines up to mid C20th which stabilised at current very low level around 1990

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Acknowledgements

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1. Introduction

- 1.1 This report summarises the latest in a series of surveys (see Lake *et al* 2011) of the breeding seabirds of the Purbeck Coast (Ballard Down to White Nothe). This stretch of coast is notable along the south coast of the UK 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. Most are amber listed; the herring gull is red listed (Eaton *et al.* 2009).
- 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 ecological interest.

2. Methods

Population census

- 2.1 Two boat trips were carried out on the 27th May and 7th June. On the second trip weather constraints meant it was only possible to go as far as St Aldhelm's Head. Methods follow census methods recommended by (Walsh *et al.* 1995).
- 2.2 All observations of apparently occupied sites/nests of fulmar, cormorant, shag, kittiwake, herring gull and greater black-backed gull were marked on enlarged photographs of the coast. Numbers of auks on known nesting ledges were counted, and records made of loafing birds. Colonies were marked on enlarged photographs as above.
- 2.3 Maximum counts are given for Ballard Down, where two counts were possible. The final figures for kittiwakes and the two eastern-most cormorant colonies at Ballard were taken from land-based surveys carried out for productivity monitoring (see sections 2.6 and 2.8).

Estimates of breeding puffin numbers

- 2.4 The number of puffins on the water and cliff ledges was noted on the boat surveys. However, surveys were undertaken during the day, when puffin numbers tend to be at their lowest as birds are either out at sea or out of view within the breeding crevices. Evening counts from the tourist bird-watching boat trips used in previous years were not possible as the trips were not run this year. Records from local birders via an online discussion forum were therefore also taken into account.
- 2.5 The number of breeding pairs was estimated as in previous years (see Lake *et al.* 2011) by counting the number of birds seen arriving with fish. From the angle at which any birds carrying fish enter the coves, and given the very limited number birds present, it is possible to estimate the number of likely nest sites.

Productivity monitoring (guillemots, cormorants and kittiwakes)

Cormorant productivity

- 2.6 Cormorant productivity was monitored at three colonies at Ballard which were visible from the cliff top. The sites were visited on 17th and 26th June 2013. Although a larger number of

monitoring visits are recommended (because cormorant breeding is asynchronous), careful timing of the two visits possible meant that we are reasonably confident that all nests and chicks were counted. Viewpoints are described in Table 2 to facilitate relocating them accurately in future years. Note that colony numbering is consecutive and therefore differs from 2012.

Table 2. Locations of viewpoints for cormorant colonies at Ballard.

Site	Grid ref. of viewpoint	Description of viewpoint
C1 Pinnacle South Cliff (part)	SZ 05095 81809 (+/-10m)	Tip of headland opposite the Pinnacle (the pointy, westernmost stack below Ballard Cliffs),
C1 Pinnacle South Cliff (part)	SZ 05212 81979 (+/-10m)	After headland opposite the Pinnacle follow coast path past large scrub patch, continue to patch of bracken - viewpoint just beyond where cliff sticks out. Extreme caution needed.
C2 South of Pinnacle	SZ 05095 81809 (+/-10m)	Tip of headland opposite the Pinnacle
C3 Under scrub	SZ 05048 81797 (+/-10m)	Tip of headland opposite the Pinnacle
C3 Gorse	SZ 0491 81510 (+/-20m)	Cliff edge just south of prominent gorse bush. Extreme caution needed.

2.7 Methods followed those recommended by Walsh et al. (1995), with the exception that only two visits were possible. On the first visit, a photographic record was made of the entire colony, and each nest subsequently numbered. The state of the nest, the nest contents, and whether a bird appeared to be incubating was noted. Where present, chicks were recorded as small, medium, large or juvenile. On the second visit the number and size of chicks was re-recorded. Well –feathered, healthy young which disappeared between visits were assumed to have fledged. Productivity was calculated as the total number of young fledged divided by the number of nests where birds were definitely or probably incubating.

Kittiwake productivity monitoring

2.8 Monitoring was carried out from Blackers Quarry as in previous years. Monitoring methods follow those of Walsh et al. 1995. All apparently occupied nests (AONs) observed on 26th May 2012 were plotted on a stitched photograph encompassing the whole cave. The photographic record was used on the subsequent visits on 16th July 2013 to record the contents of each nest. The colony was not counted during the boat-based census (see 2.1).

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. These are largely drawn from the two boat surveys, but are supplemented with records from land-based surveys where appropriate. Summary results are presented in Table 3. All records are maximum counts. Survey sections follow those used historically, and are given in Lake *et al.* 2011.

Table 3. Breeding seabirds records on the Purbeck Coast, 2013.

	Fulmar	Cormorant	Shag	Herring gull	Great black-backed gull	Kittiwake	Guillemot	Razorbill	Puffin
Handfast Point – Ballard Down	3	30		18	6				
Durlston Head - Lighthouse	3		0	5	3		144	10	
Anvil Point - Ragged Rocks	6		2	13	2		29		
Blacker’s Hole - Reforn			5	6		27	105	17	
White Ware - Little Hedbury			10	11			20		2? (7 individuals)
Seacombe - Winspit	0		5	46					
Crab Hole - Buttery Corner	7		12	14	1		257	14	
Gad Cliff - Worbarrow	0	21	3	8					
Mupe rocks - Fossil Forest				17					
Stair Hole - Scratchy Bottom	1		3	6					
Swyre Head - White Nothe	0	22		5	0				
TOTAL	20	73	40	151	13	27	555	41	2

Estimate of number of breeding puffins

3.2 The maximum number of puffins seen at any one time was seven. The possible number of breeding pairs was thought to be two, based on the number of birds seen flying into Bird Cove with fish during the boat-based survey, and from Scratch Ass quarry above (Trev Haysom, pers. comm.).

Results of productivity monitoring

Cormorant productivity

3.3 Results of the cormorant productivity monitoring are presented in Table 4 Results of cormorant productivity monitoring in 2013 at Ballard Down. At Pinnacle South Cliff, the number of AONs had risen by one to 12. Productivity was again higher than in the previous year. 20 chicks were hatched from 11 nests (at one the chicks were out of sight on the second visit, so this was not included). One nest was abandoned, by the second visit, and one chick was still small- medium, but was assumed likely to hatch.

Table 4 Results of cormorant productivity monitoring in 2013 at Ballard Down.

Colony	No. of nests monitored	Total no. of chicks observed	No. of chicks at or near to fledging	Productivity (average no. of chicks per AON)
C1 Pinnacle South Cliff	10	20	20	1.8
C2 South of Pinnacle	10	17	17	1.7
C3 Under scrub patch	2	5	4	2
C4 Gorse	2	6	6	2

- 3.4 Eleven pairs nested just south of Pinnacle South Cliff (an increase of two pairs), at a site first used in 2012. Productivity was greatly increased here, with 17 chicks counted, of which nine were fledged or large.
- 3.5 Three pairs were again monitored at C3 “Gorse” another colony new 2012. Six large chicks were present at the last count.
- 3.6 Three pairs nested at a new site just south of the southern Pinnacle colony (C4 “Under scrub”. Of these two could be seen well enough to monitor, and four medium-large chicks were present.
- 3.7 Only one nest was observed south of the fault, in the traditional colony site, and its position meant monitoring was not possible due to poor visibility.
- 3.8 Overall productivity was 1.8, a substantial increase from 2012, and the highest since monitoring began in 2000.

Kittiwake productivity

- 3.9 A mid-season survey on 25th June found 27 well-built and attended nests with six chicks, plus two “trace” nests. All 27 nests remained at the second survey on 16 July, but only three chicks were recorded. Two were medium large and therefore considered likely to fledge, one was small, and considered to have a 50% chance of fledging (see Walsh et al. 1995). Overall productivity was therefore 0.09, a substantial decline from 2011, when 12 chicks were observed.

Table 5. Results of kittiwake productivity monitoring in 2013 at Blackers Hole.

AONs	Large chicks likely to fledge	Medium chicks (1/2 estimated to fledge)	Productivity (average no. of chicks per AON)
27	2	1	0.09

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 2013 survey. Please refer to Lake *et al.* 2011 for context on each species, more information on historic records (including data constraints), and discussion of the current status of populations in relation to their historical distribution and size.
- 4.2 The UK indices of abundance (JNCC 2011)¹ used here are slightly different from those used previously. The indices are published each year by JNCC and vary slightly each year as they are refined using data not previously available (Roddy Mavor, pers. comm.). However, the overall trends generally remain the same.

Fulmar

After colonising Purbeck in the 1940s, fulmars increased to peaks of over 170 individuals in the 1980s. Since then numbers have declined overall despite short-term increases, and the current number of AONs is the lowest recorded. This trend broadly reflects that of the UK overall, which shows a fluctuating decline, but shows a steeper decline.

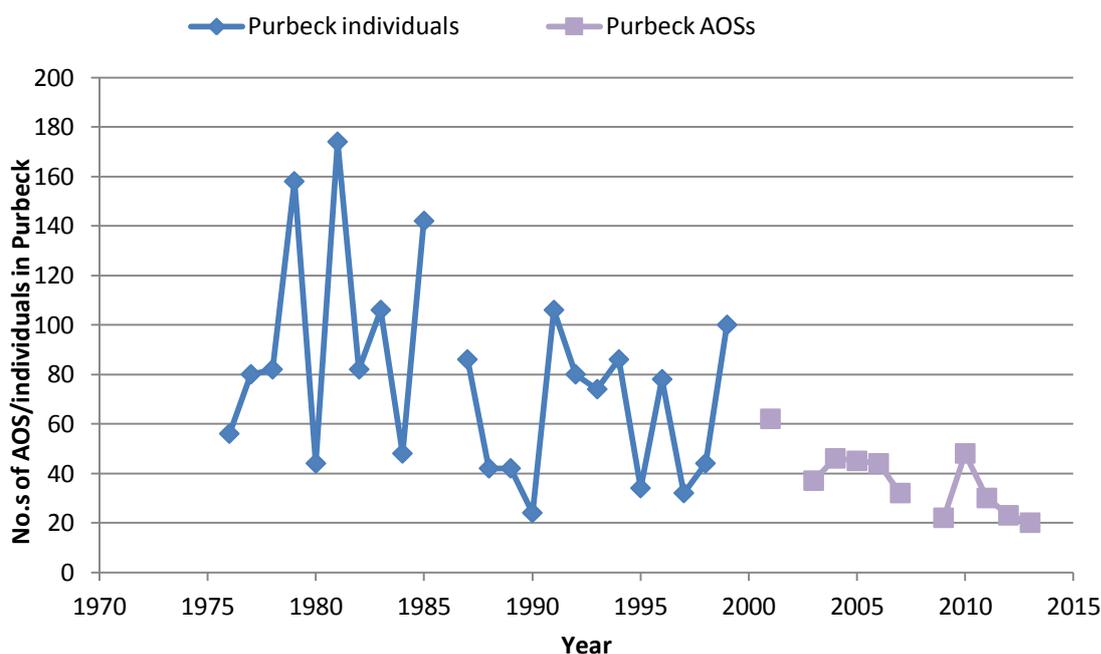


Figure 1. Changes in the numbers of individuals (Durlston Head – Buttery Corner) and, later, the numbers of apparently occupied nest sites (Handfast Point – White Nothe) of fulmar.

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).

- 4.3 Since the first record of fulmars on the Purbeck coast in 1943 (Haysom 1977), numbers increased to a peak of 142 individuals in the early 1980s. Since then, the overall trend has been a decline, with peaks and troughs from year to year. Numbers stayed low at Ballard following a decline in 2011, and different nest sites were used. Numbers have often fluctuated at Durlston, and 2013 saw one of the lowest totals recorded here (just three AONs). However, further west the numbers of AONs increased with six new sites used. There were again no records on the Seacombe and Winspit cliffs. The small colony at Buttery Corner decreased nine AONs to seven. At Gad Cliff, the nest seen in 2012 was absent. Further west, two AONs were lost from Dungy Head, with one remaining at a traditional site just to the west. There were no records at Bat Head. The 2013 numbers are the lowest on record since monitoring of AONs began.
- 4.4 The Purbeck trend is similar to that of the UK as a whole (see Figure 2). 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 are now declining. The decline in Purbeck has been steeper. The UK wide decline has been attributed to a reduction 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.

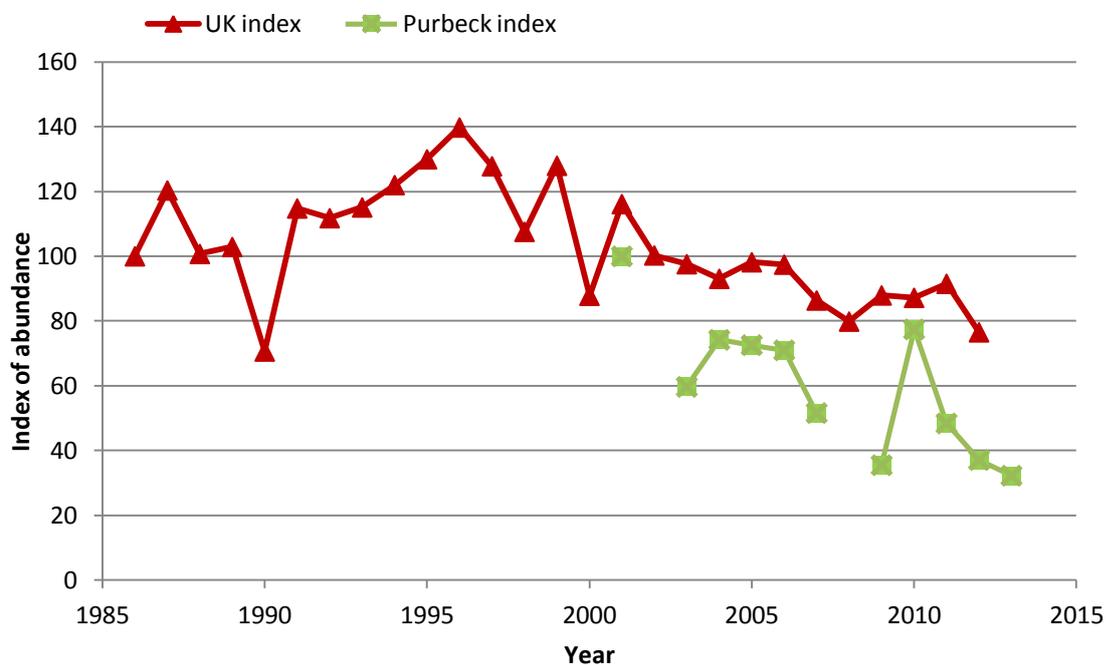


Figure 2. Changes in the UK and Purbeck indices of abundance (note differing start dates).

Cormorant

There are three main colonies of cormorant in Purbeck: Ballard, Gad Cliff and White Nothe. Overall, from the late 1960s numbers increased to a peak in the early 1990s, since when a decrease of 77% has resulted in a total of 73 birds in 2012, the lowest on record. The number remained at this low level in 2013. This decline is more severe than that seen in England as a whole, and started earlier. Trends in abundance vary between colonies. Until 2012, the White Nothe colony showed more resilience than those at Ballard and Gad Cliff, which have declined steadily. However, both the White Nothe and Gad Cliff colonies declined by almost 50% in 2012, a trend which saw a very small reversal in 2013 with an increase of two or three AONs at each site. Productivity has fluctuated markedly and, after a particularly poor year in 2012, reached the highest level since monitoring began in 2013 (but see data constraints below).

- 4.5 Cormorants declined in Purbeck throughout the 20th Century. However, the Gad Cliff colony remained fairly stable (ranging between about 80-110 AONs) until the early 1990s; since then it has declined steadily. Records for the White Nothe population are patchier. A similar peak and decline has been followed by a gradual increase until recently when numbers have fluctuated more widely. Birds appear to switch between the two sub-colonies present (T. Haysom, pers. comm.). In contrast, at Ballard numbers leapt from 11 in 1974 to 127 in 1992, and then have declined steadily, although numbers here are still higher than in the 1970s. Overall, numbers have declined by 78% between the peak in the early 1990s and 2012, but remained constant in 2013.
- 4.6 Following the fragmentation of the Fault colony in 2012, only one nest was recorded here in 2013. However the colonies at Pinnacle seemed stable, with a third small sub-colony becoming established nearby.
- 4.7 After the decline of almost 50% at Gad Cliff in 2012, numbers increased again slightly in 2013, with three additional nests in traditional locations. Similarly White Nothe had a slight increase of two nests. Some movement between the two sub-colonies was also apparent, with a number of birds apparently moving to the easternmost site.

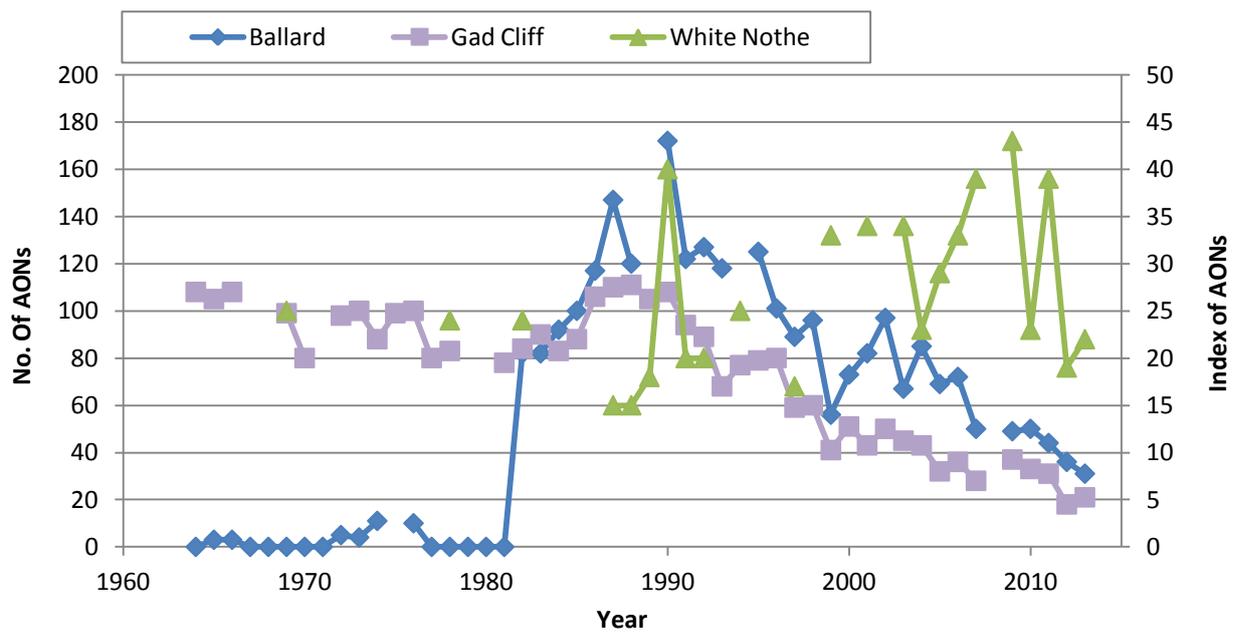


Figure 3. Numbers of apparently occupied cormorant nests at different locations in Purbeck compared to the UK index of abundance.

- 4.8 In the UK as a whole, the abundance index for cormorants (which includes inland as well coastal breeders – a different subspecies) increased from 1986 to 1995. Since then it has decreased, with a temporary increase in the early 2000s. Because of significant regional variation in the abundance index (declines are particularly severe in Northern Scotland), Figure 3 shows the trend for the total Purbeck population for the years in which these data are available compared to the English index of abundance. The Purbeck population decreased while the English index was still increasing, and has decreased further. The upturn in numbers nationally since 2011 has not been seen in Purbeck.
- 4.9 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.

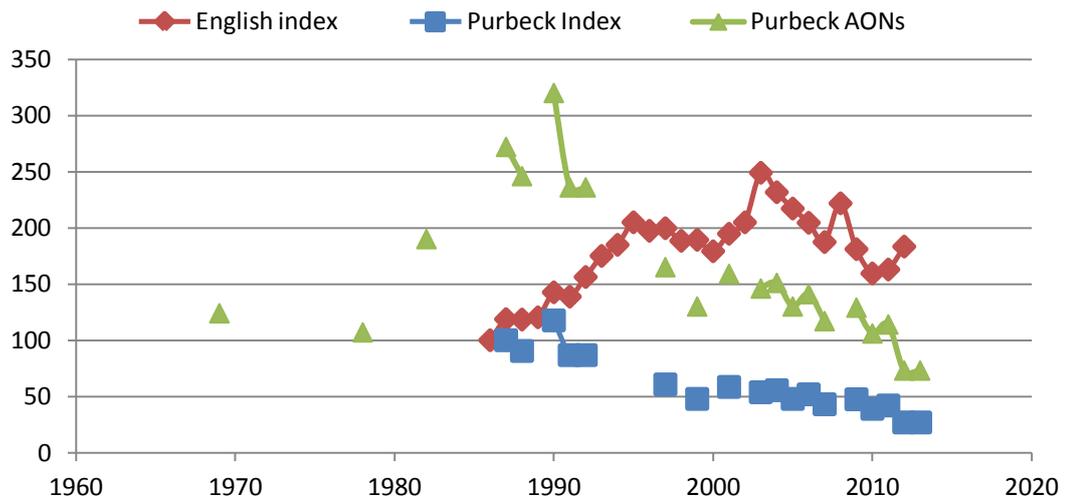


Figure 4. Total Purbeck AONs and UK indices of abundance. Only years with full data from Ballard – White Nothe have been included.

Cormorant productivity

4.10 Over the UK as a whole, productivity has declined since 1988, but has increased in the last few years. At Ballard, where productivity has been monitored since 2001, annual variability makes an overall trend less clear - there was a peak in 2004 (which was nonetheless lower than the national average) and another similar peak in 2009 (by which time it was greater than the national average). Productivity then declined to its lowest point in 2012, but rose to its highest level at 1.8 chicks per AON in 2013. However it should be noted that the small number of visits undertaken meant that chicks which had not yet fledged were included in the productivity calculation, which may therefore be an overestimate. The reasons for the national trends are unknown (JNCC 2011). In Purbeck there was considerable variation between colonies (0.56 to 1.72) in 2012, when the distribution of colonies also changed. This variability was absent in 2013 with all colonies, particularly the smallest, doing well.

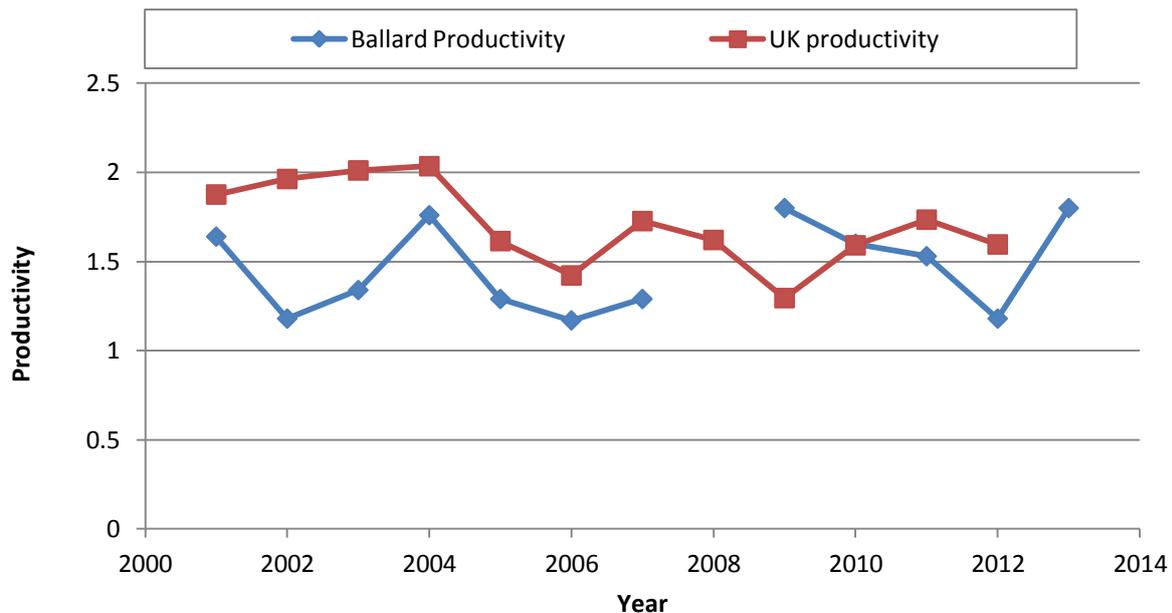


Figure 5. Productivity at Ballard compared to average UK productivity.

Shag

The number of breeding shags appears to have increased significantly in the early 20th century until the 1970s, since when the population has remained fairly stable but with significant annual fluctuations. The decline seen over the last three years remains just within the range of this fluctuation, but may indicate the start of a more long-term decline in line with UK trends (although these have been affected by slow recovery from wrecks on the east coast).

- 4.11 Shag records were sparse in Purbeck until the latter half of the 20th century. Since 1965 numbers appeared to have increased rapidly to a peak in the early 1970, as the cliffs between Crab Hole and Buttery Corner were colonised (Haysom 1993). This was followed by decline to a low point in 1980, and a gradual rise (with much variability) to a larger population size in the 1990s and 2000s.
- 4.12 Since 2010 the Purbeck population has declined, but is still just within the range of variability generally shown in Purbeck since 1970. The decline was due to decreases between Durlston and St. Aldhelm's Head until 2013, when a marked decrease was seen also west of St Aldhelm's Head, where numbers halved. Although records of AONs were lost from all sections, new nest sites were also observed within areas traditionally used by this species.

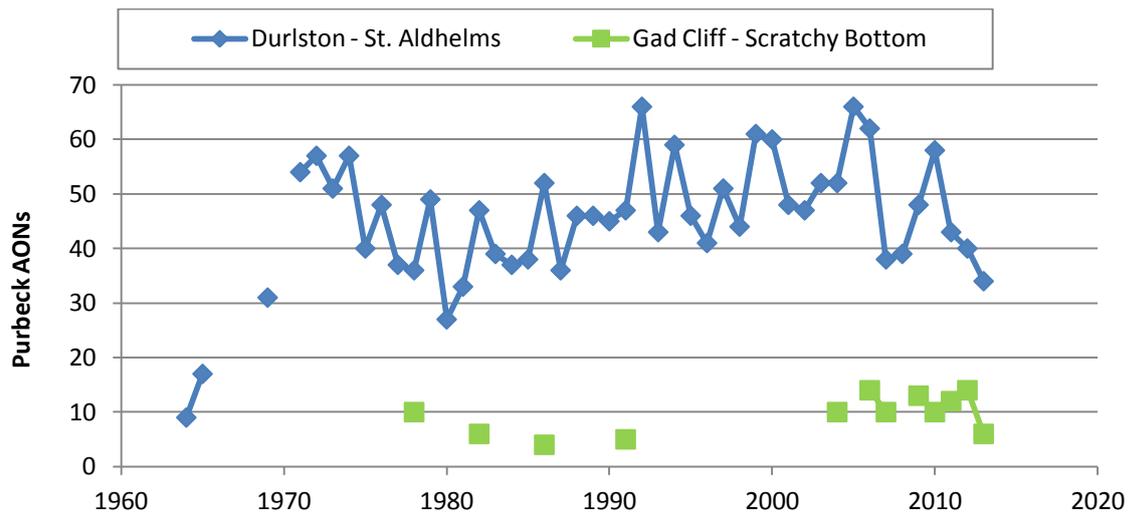


Figure 6. Changes in numbers of apparently occupied nests of shag in two stretches of the Purbeck coast compared to the UK index of abundance.

- 4.13 Overall, the changes in numbers of nesting shags in Purbeck have not reflected national trends, with the population continuing to increase gradually at least until the mid 2000s, then fluctuating widely. 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), and a subsequent slow recovery. (Note the initial steep rise in the index up to 1987 shown in Figure is due to many adults choosing not to breed in 1986, resulting in low numbers at colonies that year).
- 4.14 The tendency for adults occasionally not to breed every year may be one reason for the variability in the Purbeck population. However recent fluctuations may represent the start of a more long-term decline in line with the UK trend. The shag is amber 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 2009).

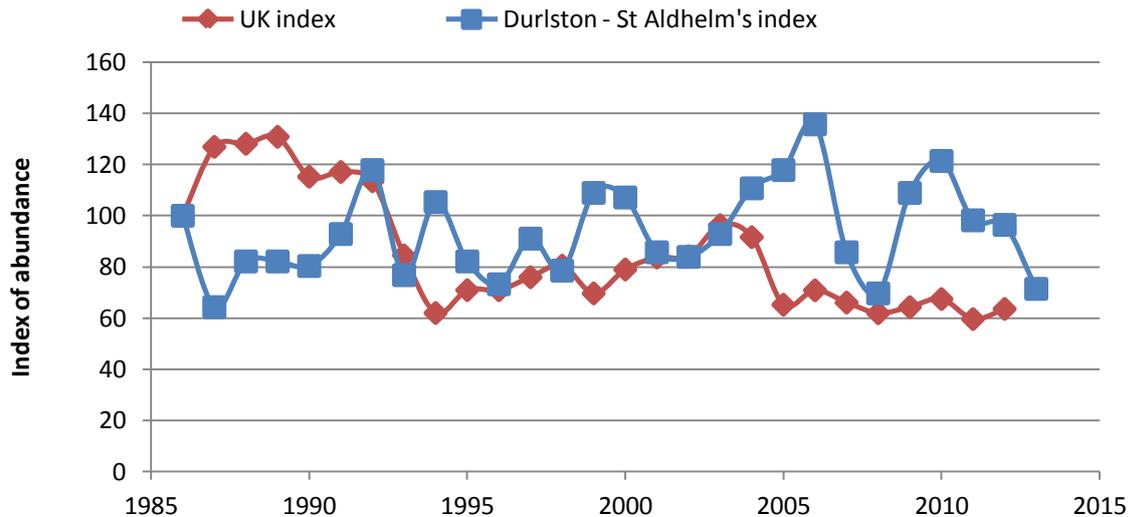


Figure 7. Changes in the UK and Purbeck (partial) indices of abundance. Only years with full data from Ballard – White Nothe have been included.

Herring gull

There has been a marked decline in the herring gull population in Purbeck over the last 50 years, which has been more severe than the UK trend. Fluctuations since have been similar to the UK trend, showing an increase and subsequent decrease, levelling out after 2000. The 2012 recovery from a sharp decline in 2011 was maintained in 2013, although there was significant movement of birds between sections of the coastline.

- 4.15 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). However, after 1985 numbers in Purbeck fluctuated, showing an overall rise until about 2000, and a subsequent decline, levelling out after 2000 and mirroring the overall UK trend (see Figure). Recovery from the sharp decline seen in 2011 (see Figure) was maintained and numbers remain around the 2000 level. 2013 saw various changes in nesting sites, with most sections seeing some changes; a notable increase in numbers in the Seacombe area, and relatively high losses in percentage terms from Ballard Down, Durlston and Gad Cliff.
- 4.16 The herring gull is red listed in the UK due to a long-term decline in the population (Eaton *et al.* 2009).

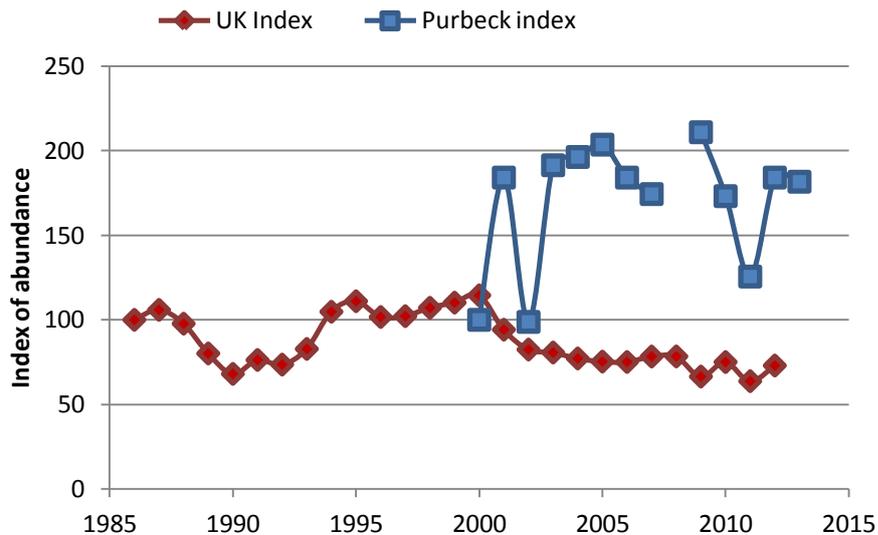


Figure 8. Purbeck and UK indices of abundance. Note the different monitoring start date. Only years with full data from Ballard – White Nothe have been included.

Great black-backed gull

The great black-backed gull population in Purbeck appeared to remain steady between at least the early 1990s until 2000. Since then an overall decline mirrors that of the UK index of abundance, but shows wider fluctuations. Numbers in 2013 were similar to 2012, with a decrease at Ballard Down compensated for by an increase between Durlston and St. Aldhelm’s Head.

4.17 The small Purbeck population appears to have remained fairly stable with between one and six AONs recorded between Durlston and St. Aldhelm’s Head, and, until 2011 between eight and twelve AONs at Ballard. A dip to four AONs in 2011 was followed by an increase back up to nine pairs in 2012 and eight in 2013. Patchy records from Gad Cliff – White Nothe suggest a population of one or two pairs until 2007. Since then there have been no pairs recorded, except one in 2012. Numbers increased between Durlston and St. Aldhelm’s Head, with two new nests at Durlston; one near the mile indicator posts and one at Bird Cove, compensating for a decline at Ballard Down. Note that the large percentage changes seen in Figure 9 involve small numbers of nests.

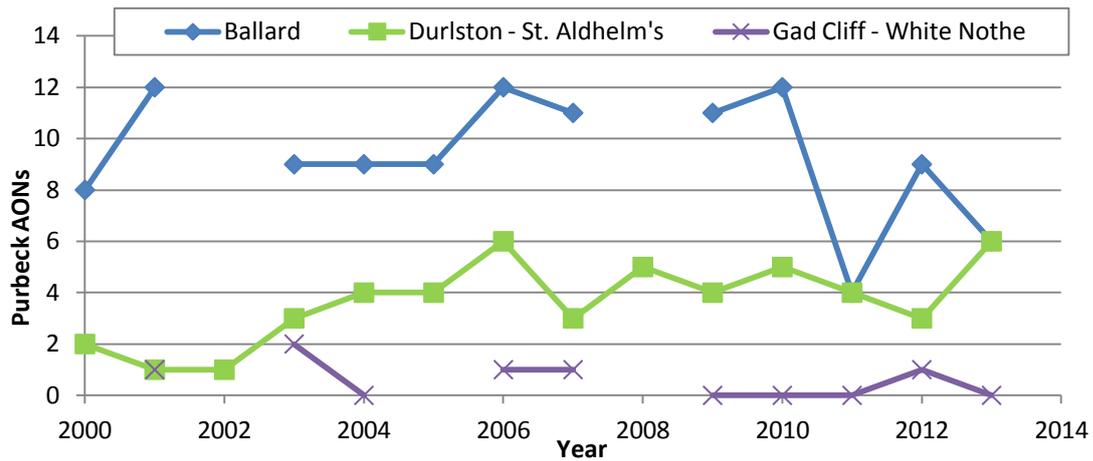


Figure 9. Numbers of apparently occupied nests at three Purbeck survey locations compared to the UK index of abundance. Note the low numbers on the Purbeck AON axis.

- 4.18 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%.
- 4.19 The Purbeck trend since 2000 (when systematic surveying began) fluctuates more than the UK trend, but the overall downward UK trend appears to be reflected in Purbeck (see Figure

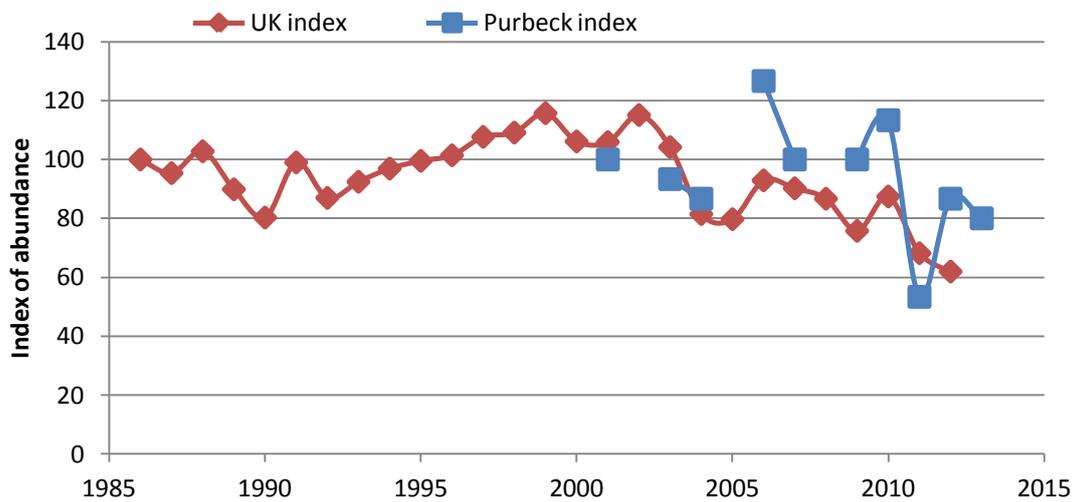
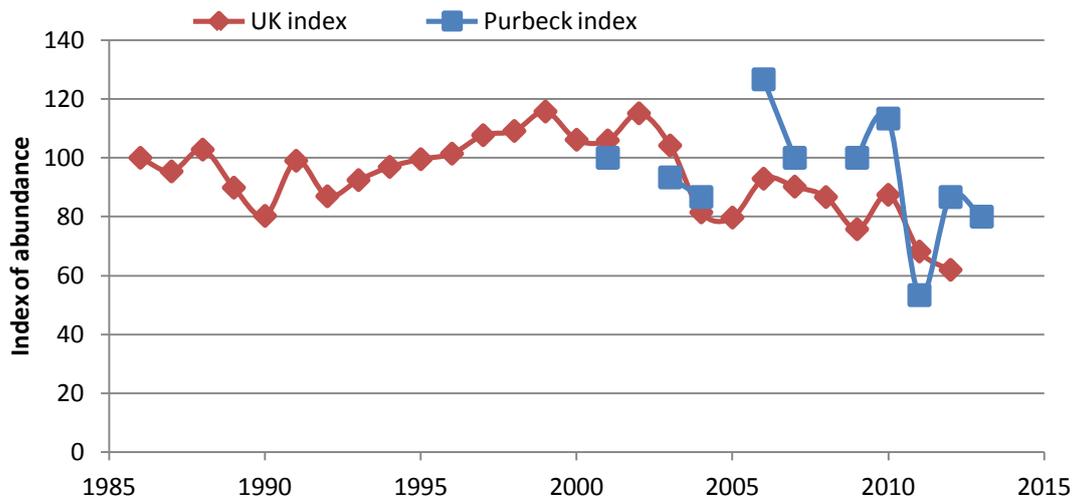


Figure Purbeck and UK indices of abundance. Note the different monitoring start date. Only years with full data from Ballard – White Nothe have been included

4.20

4.21 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 2009).

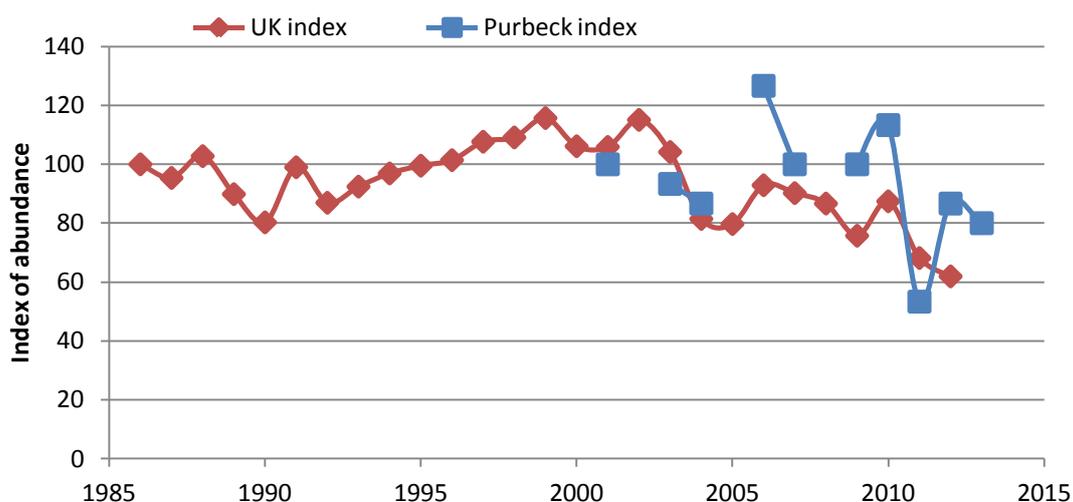


Figure 10. Total numbers of great black-backed gulls recorded in Purbeck compared to the UK index (which refers to 1986). Note that the Purbeck data points have been joined where counts are absent.

Kittiwake

Following rapid expansion throughout the 1960s and 1970s the kittiwake population in Purbeck has rapidly declined. Although the rate of decline has slowed in the last 10 years, the only remaining colony, at Blackers Hole, reached the smallest since the peak in the 1980s in 2012. 2013 saw a very slight upturn. The decline was initially more rapid than the national trend, but after a slight increase in the mid 2000s, then mirrored the UK decline. Kittiwake productivity remains very low compared to the national figure. It seems unlikely that the Blackers Hole colony will persist in the longer term unless productivity improves substantially.

- 4.22 Kittiwakes are known to have been present around Durlston in the 1880s (see Lake *et al.* 2011). This site remained the only colony until the late 1960s/early 1970s, when Sutton Rock, Bird Rock, Blackers Hole and Crab Hole were colonised and the total numbers of apparently occupied nests reached 139. By 1980 the overall population peaked near 300 AONs. After this, all colonies declined rapidly, and since the mid-1990s. Only the Blackers Hole colony has persisted, however it too is in overall decline, despite an increase in the mid 2000s. The future of the colony remains bleak given the poor productivity recorded in recent years.
- 4.23 Changes in the Purbeck population mirror the UK trend (see Figure) although the population may have peaked earlier and the decline occurred more rapidly until it slowed in the 21st century. Kittiwakes are amber listed (Eaton *et al.* 2009) due to the decline and degree of localisation of the breeding population.

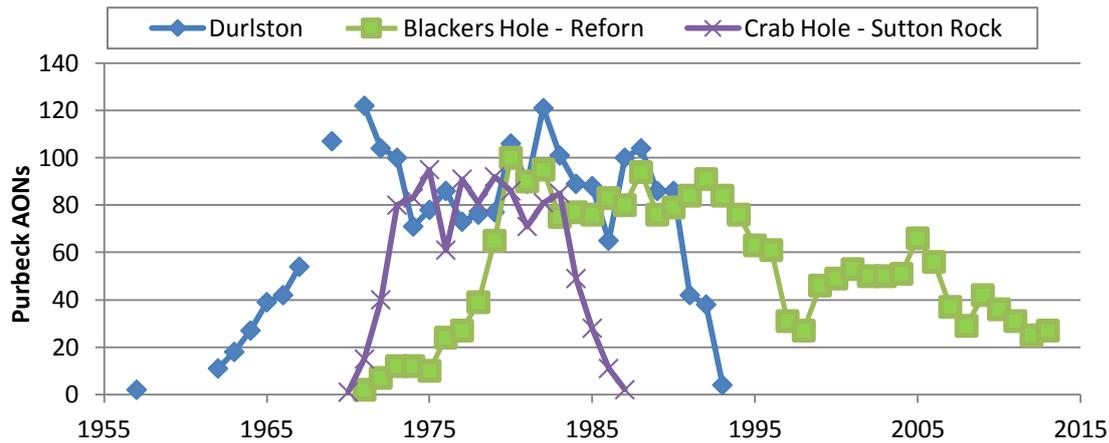


Figure 11. Changes in numbers of apparently occupied nests of kittiwakes in Purbeck

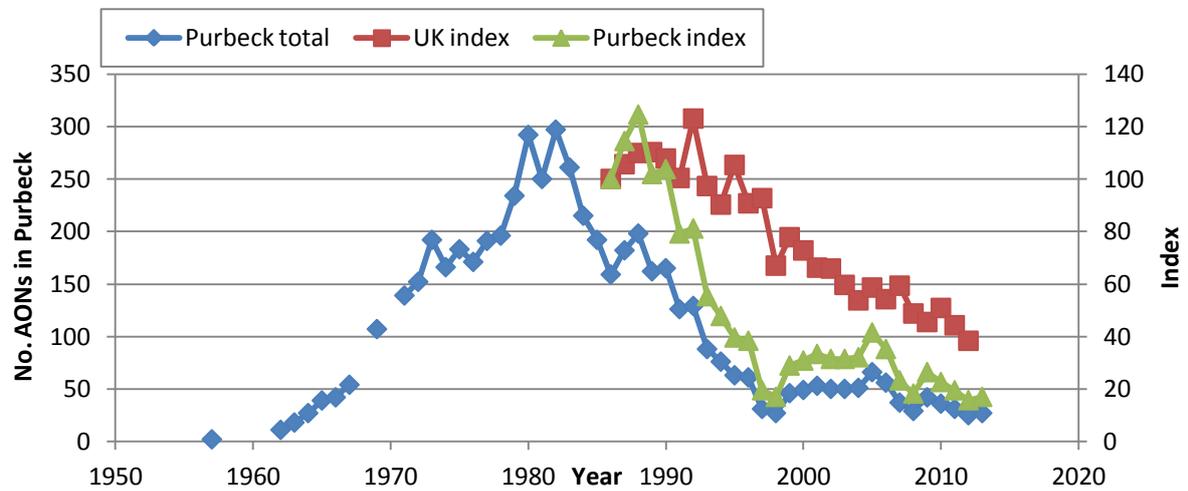


Figure 12. Changes in numbers of apparently occupied nests of kittiwakes in Purbeck and in Purbeck and UK indices of abundance from 1985.

Kittiwake productivity at Blackers Hole

Productivity has been monitored at Blackers Hole in most years since 1991 (see Lake et al. 2011 for data sources). Productivity has been variable, increasing to a peak of over 1.2 in the mid 1990s (just after the demise of the two other Purbeck colonies), then following a fluctuating trend that decreased overall. Patchier data from 2004 onwards show a sharp decline until 2011, when productivity was zero. Although it increased in 2012 (in contrast to the national trend), it declined again to 0.09 in 2013. Productivity in Purbeck was higher than the national average at its peak, but has since declined more rapidly and to a lower level.

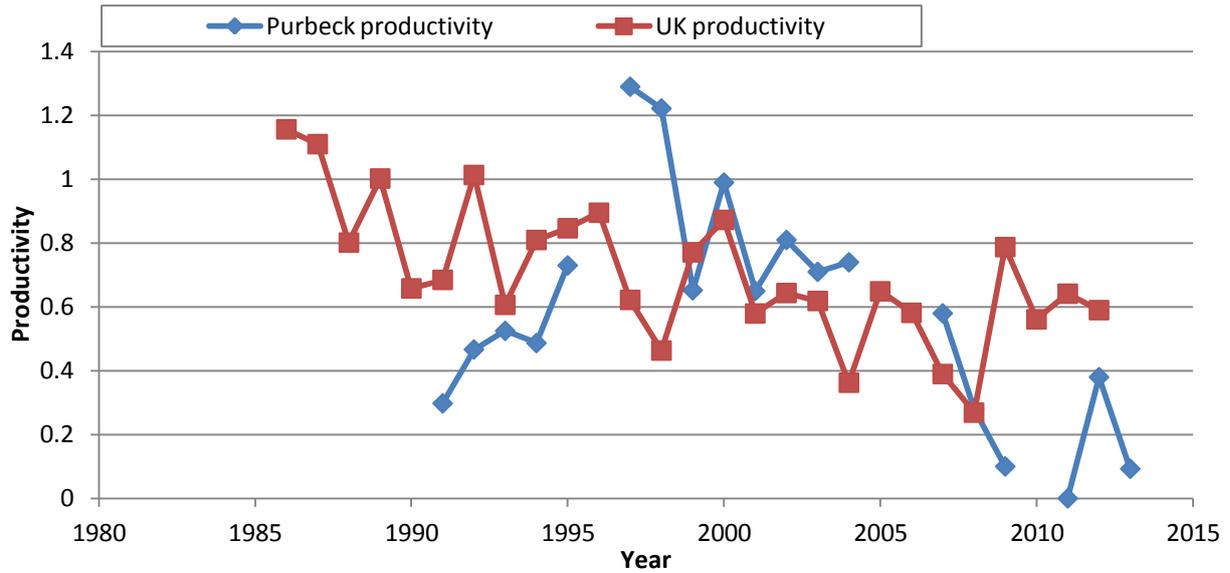


Figure 13. Productivity (expressed as total number of fledglings/total number of AONs) in Purbeck compared to the UK figure.

Guillemots

After large declines up to the mid-20th century, guillemot numbers in Purbeck stabilised in the 1970s and increased throughout the 1980s and 1990s. The Purbeck colonies have followed a similar trend to that shown by the UK index of abundance, peaking in 2006 at around 900. Wide fluctuations mask the overall trend since then, but despite a peak in 2012, numbers were low in 2013, mainly due to a substantial decline at the Durlston colony. UK productivity is decreasing overall, suggesting that future declines may be expected.

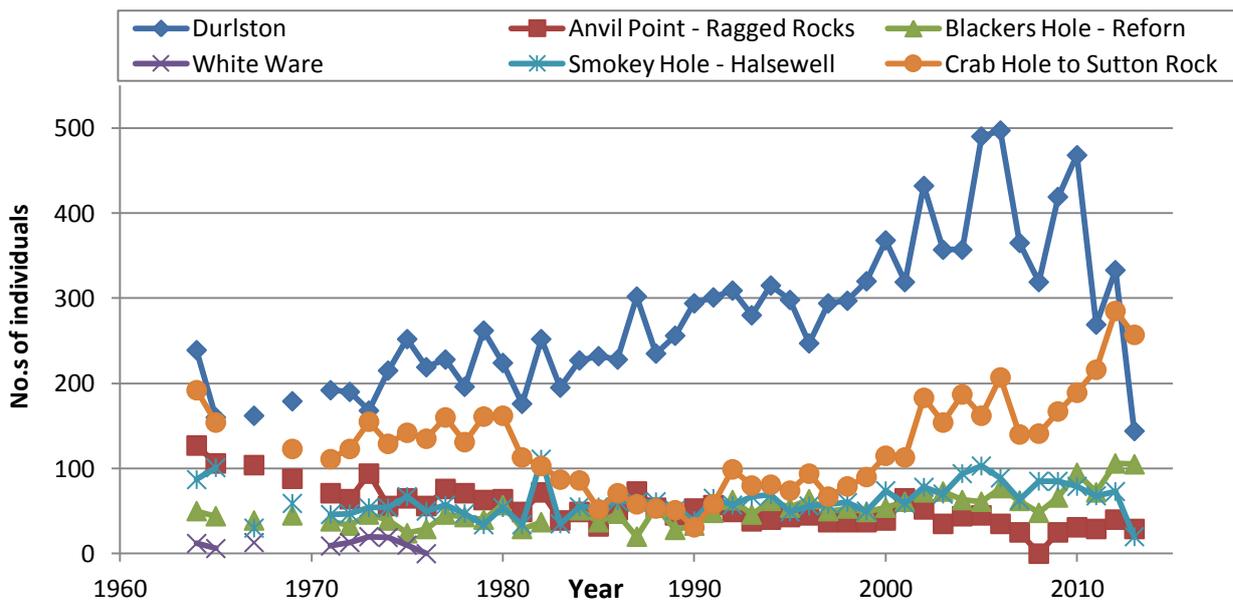


Figure 3. Changes in numbers of guillemot individuals at breeding colonies in Purbeck since 1965.

Purbeck guillemot population

4.24 The number of guillemots in Purbeck declined from an estimated 2500-3500 in the 1930 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. However, since the mid 2000s, numbers at Durlston have fluctuated widely, with the lowest number ever recorded seen in 2013 (144) despite an increase in 2013 (see Figure 3). The sub-colony known as “Main Ledge” was entirely deserted. A slight increase at Crab Hole did little to compensate for the dramatic decline at Durlston, and the overall numbers (at 555) are comparable to those of the relatively stable period between 1970 and 1990. Polyisobutene (PIB) pollution caused the death of at least 2400 birds off the coast of SW England in early 2013². While this total may have included birds from the Purbeck colonies, ringing return suggested that most birds were non-breeders, and that population impacts would be seen in demographic structure rather than breeding numbers (Rob Robinson, pers. comm.). In addition, poor weather at the start of the breeding season may have contributed to the low numbers nesting at Durlston, which was also subject to heavy predation from a pair of resident ravens in 2012.

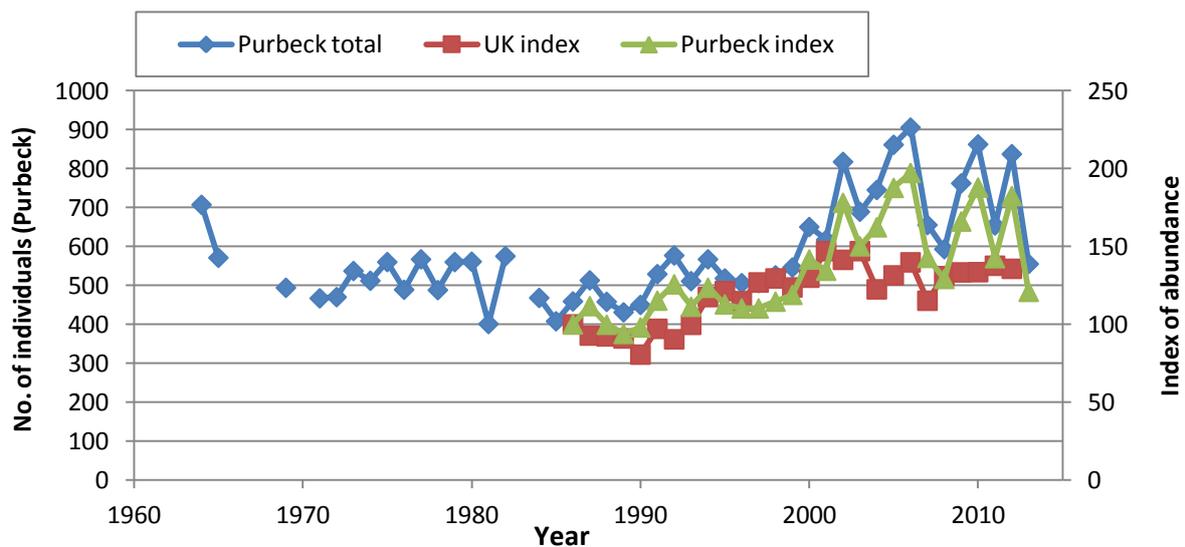


Figure 4. Changes in the total number of individuals recorded at breeding ledges in Purbeck compared to the UK index of abundance.

4.25 Changes in the Purbeck population broadly correlated with changes in the national index of abundance until the more recent fluctuations in Purbeck which do not correlate with the relatively stable national trend over the last five years. However, observed low UK productivity combined with low return rate at sampled colonies suggests that 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.* 2009).

² http://www.dorsetwildlifetrust.org.uk/marine_pollution_incident

4.26 Productivity data from the Durlston breeding ledges was not available in 2013.

Razorbills

Razorbills declined substantially in Purbeck between 1880 and the 1960s when systematic counts began. The overall population continued to decline, with the loss of several colonies, until the 1970s. The remaining small population then remained fairly steady then fluctuated from the late 1980s until increases in the 2000s brought it back up to numbers similar to those last recorded in 1965. A population crash followed, but numbers have since regained an intermediate level (41 in 2013 in three main locations). This is broadly in line with the UK index of abundance, although fluctuations are greater. A decline in the UK population is expected on the basis of poor UK productivity levels, and the current Purbeck decline may be part of this.

4.27 Razorbills were considered to be breeding on the Purbeck in great numbers (more than guillemots) in the 1880s (see Lake et al. 2011 for more details). By 1932, only 130 birds were recorded which 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 two crashes, roughly a decade apart, were followed by recoveries to higher peaks. Recovery from the most recent crash in the late 2000s has not been so rapid, and the population has climbed back to an intermediate level. The colony at Sutton Rock doubled to 14 individuals in 2013, despite ongoing use of fishing nests nearby in which razorbills have been drowned (Trev Haysom, pers. comm.). However, numbers elsewhere have dropped. The two birds recorded at Bird Rock 2012 (the first since 1974) were not present in 2013, but a bird was seen in Bird Cove, where they nested formerly. In 2013 birds were again concentrated at three main locations: Durlston, Blackers Hole to Reform, and Sutton Rock.

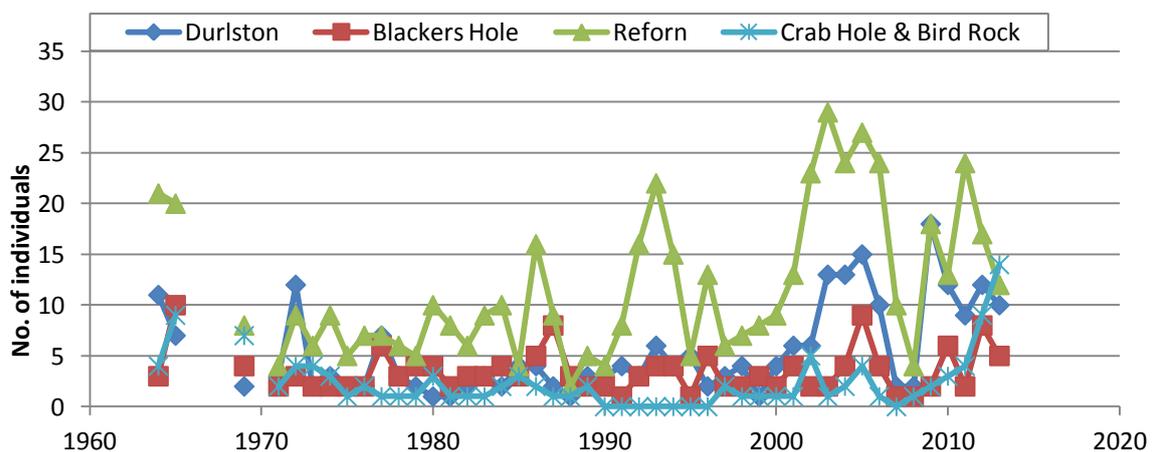


Figure 16. Changes in individual razorbill counts at main colonies between 1965 and 2013.

4.28 The Purbeck population has shown large fluctuations since the 1950s (although note that the small size of the population means a small change in numbers results in a large percentage change) (see figure 16). These fluctuations make it difficult to identify an overall trend, but the 2013 total remains around double that of the 1980s and 1990s, though significantly lower than pre 1960s. The trend is broadly similar to the national trend

but with much more exaggerated fluctuations, largely due to the three crashes and subsequent recoveries. The current decline may be part of another population crash, or may indicate the population is stabilising at a lower level. 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 decline is predicted (JNCC 2011). Razorbill is amber listed in Birds of Conservation Concern due to its degree of localisation (Eaton *et al.* 2009).

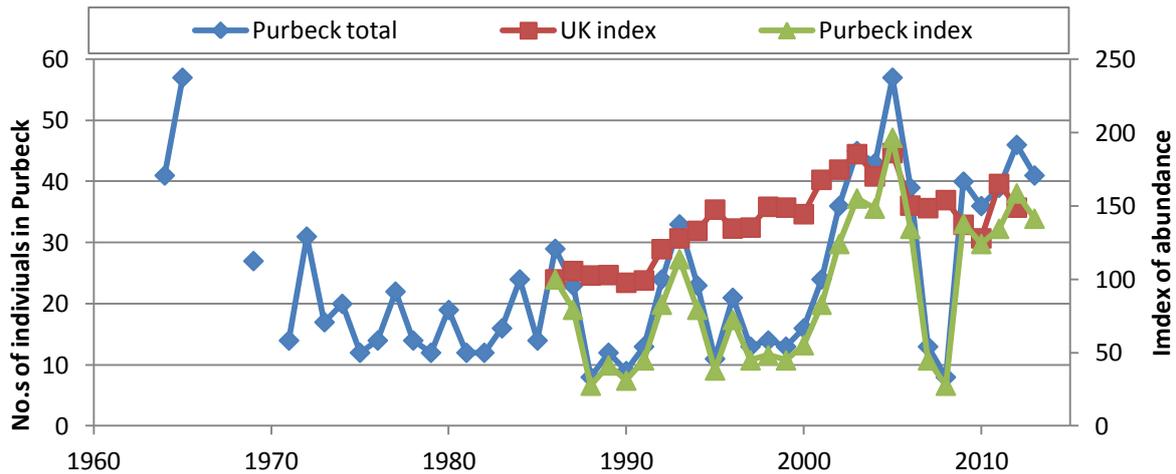


Figure 5. Changes in the counts of individual razorbills and the UK and Purbeck indices of abundance.

Puffins

The puffin population of Purbeck declined dramatically in the 20th century. By the time the population steadied in the 1990s, the estimated number of breeding pairs was about three. The population remained at this level until 2013, when only two pairs were observed. The number of individuals counted has fluctuated markedly between years, but appears to be declining overall. 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 of a small number of large colonies has shown declines in numbers, survival and productivity.

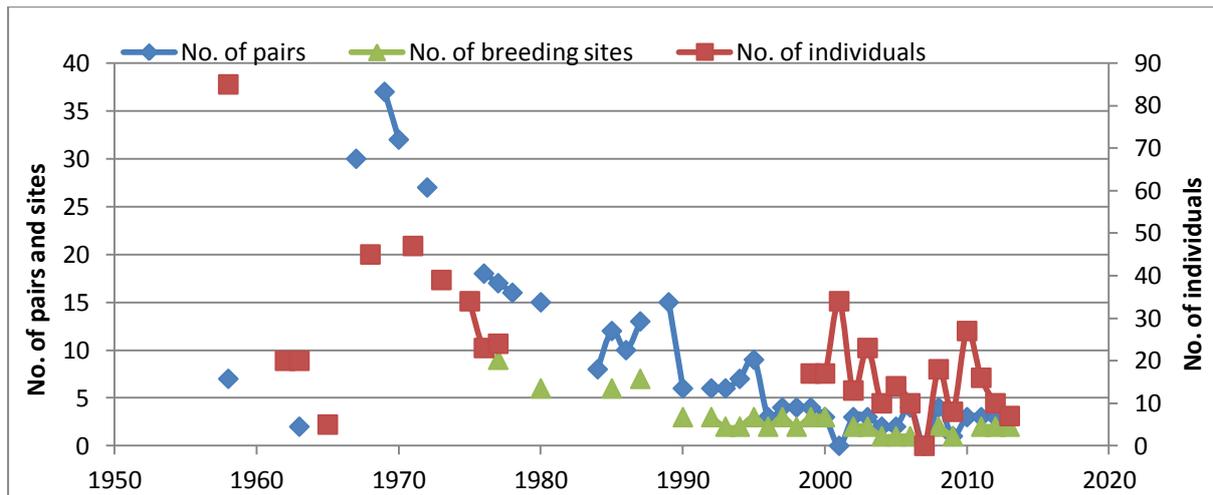


Figure 18. Numbers of individuals, breeding pairs and breeding sites in Purbeck between 1958 and 2013 (note the different scale for no. of individuals).

- 4.29 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, since when it has stabilised at around three breeding pairs, although only two were recorded in 2013. The numbers of breeding sites has correspondingly declined to two (adjacent) sites at Bird Cove and Scratch Ass Cove. No juvenile birds have been observed in recent years.
- 4.30 In 2011 and 2012, data from the boat-based survey were supplemented by observations from weekly sight-seeing boats and from the cliff top. These boat trips did not take place in 2013, and funding restrictions meant that cliff-top observations were not possible. The 2013 figure is therefore not considered to be as robust as those of previous years, and the apparent decline should be interpreted with caution. Nonetheless, the future of this colony must be precarious.
- 4.31 The downward trend in puffin numbers in Purbeck does not reflect the overall increase suggested by UK census returns between 1969 and 2002. UK-wide data are not available on more recent trends, but monitoring results from two large colonies show subsequent declines. Productivity has fluctuated but appears to have been lower since the 1990s. However, caution should be used in drawing wider geographical conclusions from these data. Puffins are amber listed due to their degree of localisation and categorisation as a species of European Conservation Concern (Easton et al. 2009).

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