POOLE HARBOUR STUDY GROUP

Important Birds of Poole Harbour and their status (1998/99 - 2004/05)

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Introduction

The purpose of this report is to up date the finding in Pickess & Day (2002) of the same thirty-two species whose status they had assessed up to 1998, in Poole Harbour.

1. Criteria for species selection.

The species chosen were because they met one or more of the requirements laid down in a set of criteria, which is listed in Table 1. Some categories have now changed slightly or the criteria have been revised, these are included also in Table 1. This current report covers the wintering species up to 2004/05 and the status of breeding species, if possible, to the summer of 2006. For a description of Poole Harbour, together with its statutory designations should refer to Pickess & Day (2002) but the Harbour sub-divisions and numbering used in this report is given in (Map 1).

Table 1 Criteria for the selection of species considered for the report of 1991/92 - 1997/98 (Pickess & Underhill-Day (2002) with the 1998/99 - 2004/05 Criteria update.

	1991/92 - 1997/98 Criteria	1998/99 - 2004/05 Updated Criteria
1.	Passage and wintering waterfowl and wader species whose annual peak in the Harbour during 1991-1998 reached the 1% national or international threshold level of the Wetland Bird Survey (WeBS)	Passage and wintering waterfowl and wader species whose annual peak in the Harbour during 1998/99-2004/05 reached the 1% International or Great Britain threshold level of the Wetland Bird Survey (WeBS) (Kershaw & Cranswick 2003); Rehfisch et al. 2003)
2.	Species previously above the 1% threshold in the Birds of Estuaries Enquiry (BoEE), the forerunner to WeBS, (which replaced it in 1991), but now below the 1% threshold level in the revised national WeBS index (Prys-Jones *et al* 1994; Kirby 1995)	Species previously above the 1% threshold in the Birds of Estuaries Enquiry (BoEE), but who remain below the 1% threshold or species previously above the 1% threshold (1991-1998) but have now fallen below the current revised Great Britain WeBS index (Kershaw & Cranswick 2003; Rehfisch et al. 2003)
3.	Species whose annual peak population represents over 5% of the Harbour's total waterfowl and wader population.	Species whose annual peak population represents about 5% of the Harbour's total waterfowl and wader population.
4.	Species which are Red and Amber Listed (Gibbons *et al.* 1996).	Species which are Red and Amber Listed (Gregory *et al.* 2002).
5.	Species which are globally threatened (Tucker & Heath 1994).	Species which are globally threstened (BirdLife International 2004, IUCN 2004).
6.	Species whose breeding population in the Harbour represents over 1% of the total U.K. breeding population.	Species whose breeding population in the Harbour represents over 1% of the total U.K. breeding population.

2. Status and status changes that have occurred during the two 7 year periods 1991/92 - 1997/98 and 1998/99 - 2004/05.

In Table 2 is listed all the 32 species under the criteria that they met or currently meet. During the 1998/99 - 2005/06 period there has been some changes of status by a number of species through either increases or decreases due to qualifying 1% Great Britain threshold changing or because during the breeding and summer season, there has been population changes in the numbers of birds present in the Harbour. Table 2 shows the 32 species under their previous category heading and with their changed current status (1998/99 - 2004/05). Table 3 lists the wildfowl and waterbirds that are regularly recorded on low water WeBS counts.

Table 2 Wildfowl and Waders present in Poole Harbour in International, Great Britain and Harbour Importance numbers (1991/92-1997/98) and (1998/99 -2004/05).

Species occurring in Internationally Important numbers in Poole Harbour (WeBS)

Species	Period of occurrence	7-year period 1991/92-1997/98	Change	7-year period 1998/99 - 2004/05
Shelduck*	Winter/Passage	International Importance	↓	Great Britain Importance
Avocet	Winter/Passage#	Great Britain Importance	↑	International Importance
Black-tailed Godwit	Winter/Passage	International Importance	N/C	International Importance

* Also a Harbour breeding species # Had attempted to breed

Species occurring in Great Britain Important numbers in Poole Harbour (WeBS)

Species	Period of occurrence	7-year period 1991/92-1997/98	Change	7-year period 1998/99 - 2004/05
Dark-breasted Brent Goose	Winter	Great Britain Importance	N/C	Great Britain Importance
Shelduck	Passage/Winter	International Importance	↓	Great Britain Importance
Teal	Winter	Great Britain Importance	N/C	Great Britain Importance
Pintail	Winter	Great Britain Importance	N/C	Great Britain Importance
Shoveler	Winter	Great Britain Importance	N/C	Great Britain Importance
Pochard	Winter	Great Britain Importance	↓	Harbour Importance
Goldeneye	Winter	Great Britain Importance	↓	Harbour Importance
Red-breasted Merganser	Winter	Great Britain Importance	N/C	Great Britain Importance

Table 2 (cont)

Slavonian Grebe	Winter	Great Britain Importance	N/C	Great Britain Importance
Black-necked Grebe	Winter	Great Britain Importance	N/C	Great Britain Importance
Cormorant	Passage/Winter	Great Britain Importance	N/C	Great Britain Importance
Little Egret	Passage/Winter	Great Britain Importance	N/C	Great Britain Importance
Avocet	Winter	Great Britain Importance	↑	International Importance
Dunlin	Winter	Great Britain Importance	N/C	Great Britain Importance
Curlew	Passage/Winter	Great Britain Importance	N/C	Great Britain Importance
Redshank	Passage/Winter	Great Britain Importance	↓	Harhour Importance

Species whose mean peak population represents or approaches 5% of the Harbour total mean peak population

Species	Period of occurrence	7-year period 1991/92-1997/98	Change	7-year period 1998/99 - 2004/05
Wigeon	Winter	Harbour Importance	N/C	Harbour Importance
Oystercatcher	Winter	Harbour Importance	N/C	Harbour Importance
Grey Plover	Passage/Winter	Harbour Importance	N/C	Harbour Importance
Lapwing	Winter	Harhour Importance	↓	Harbour Importance

Red Listed Species breeding in Poole Harbour

Species	Number of Nesting pairs	% of UK population	Change	7-year period 1998/99 - 2004/05
Reed Bunting	< 100 ?	< 1.0%	Unknown	Declining?

Table 2 (cont)

Amber Listed Species breeding in Poole Harbour

	7-year period 1991/92 - 1997/98			7-year period 1998/99 - 2004/05	
Species	No of nesting pairs	% of UK population	Change	No of nesting pairs	% of UK population
Little Egret	9-11	> 95.0%	↑	47 - 55[1]	> 25.0%
Water Rail	5-10?	< 1.0%	↑	<275	> 1.0%?
Lapwing	1-6	< 0.1%	↑	1 - 15[2]	< 0.1%
Mediterranean Gull	2 - 8	4 .0 -	↑	50	> 15% - 20%
Herring Gull	< 10	< 1.0%	Unknown	<10	< 0.1%
Black-headed Gull	5000+	3.4%	↑	12,400*	> 6.5%
Sandwich Tern	140+	> 1.0%	↑	75-242#	> 1.3
Cetti's Warbler	29-35	> 6.0%	Unknown	<35 ♂♂	> 5.5%
Bearded Tit	2-10	> 2.5%	Unknown	2 -10	> 1.0%

[1] Maximum - 49 pairs on Brownsea and 5/6 pairs Arne (2005) [2] 15 pairs (2006) #213 pairs (2006) *2005 population

Red Listed Species of global concern (SPEC 1) occurring in Poole Harbour during autumn migration

Species	Mean (1991-1998)	% of UK population	Change	Mean (1999-2004)	% of UK population
Aquatic Warbler	10	unknown	↓	Only 6 records whole period	unknown

Red Listed for historical decline of U.K. breeding population (1800-1995) but now down graded to Amber List because of increased breeding population

Species	passage	winter visitor	7-year period 1998/99 - 2004/05
Marsh Harrier	Annual	Annual - regularly 1/2	No change in occurrences

Other Species with 1% or more of the British Breeding population in Poole Harbour

	7-year period 1991/92 - 1997/98			7-year period 1998/99 - 2004/05	
Species	No of nesting pairs	% of UK population	Change	No of nesting pairs	% of UK population
Common Tern	130+	1.0%	↑	183-244*	1.8%

* 248 pairs (2006)

Table 3 The main wildfowl and wader species in Poole Harbour counted by WeBS (1991-2005)

Bold = Great Britain or Internationally Important Species (1999/2005)
Underlined = Species not occurring in Nationally or Internationally Important numbers but representing about 5% of WeBS total for Harbour

Red-throated Diver	Canada Goose	Long-tailed Duck	**Dunlin**
Black-throated Diver	**Dark-bellied Brent Goose**	Goldeneye*	Curlew Sandpiper
Great Northern Diver	**Shelduck**	Smew	Little Stint
Slavonian Grebe	Mallard	**Red-breasted Merganser**	Green Sandpiper
Black-necked Grebe	Gadwall	Oystercatcher	Common Sandpiper
Little Grebe	**Pintail**	**Avocet**	Greenshank
Great Crested Grebe	**Shoveler**	Ringed Plover	Spotted Redshank
Red-necked Grebe	Wigeon	Grey Plover	Redshank*
Cormorant	**Teal**	Golden Plover	**Black-tailed Godwit**
Shag	Pochard*	Lapwing	Bar-tailed Godwit
Little Egret	Scaup	Knot	Whimbrel
Grey Heron	Tufted Duck	Sanderling	**Curlew**
Spoonbill	Eider	Purple Sandpiper	Snipe
Mute Swan	Common Scoter	Turnstone	Ruff
Bewick's Swan			

* Species during 1991-1998 period occurring in Great Britain important numbers bur currently no longer reaching the 1% threshold.

Combined Total = 57 Species (14 GB and Internationally Important) and (6 Species of Harbour importance).

3. Sources and Analysis of Data

The principal sources of data has been from the low water WeBS counts that have been undertaken by volunteers between September and March on set dates each month. Unfortunately, there are some changes that have occurred with the compilation of the gathered raw data, which does not appear to be solvable. It has been found that the data gathered for Parkstone (NE3), which used to be separated into three sub-sections, Poole Park (NE3(P); Baiters (NE3(B); and Blue lagoon (NE3(Bl) have now been amalgamated and most of the field data has not been traceable. This section (NE3) contains most of the Port of Poole, Poole quay frontage and marina, the much used public open grassland areas at Baiters, Poole Park with a tidal lagoon and lake, and round to the Blue Lagoon, which includes yacht marinas. This area is the most developed industrially in the Harbour, as well as probably receiving the largest concentration of public pressure. It is regrettable that the species data for the key area of Baiters cannot be separated for comparative purposes with the previous 7-year data set.

Of more concern is that of Holes Bay (NC3), which was divided into four sub-sections but for most of the past 7-years has also been amalgamated. This is one of the key sections of the Harbour for wintering birds, with at low water an area of exposed mud of 212 ha[1]. The inability to separate the bird data for the four sub-sections (NC3(NW), (NC3(NE), (NC3(SW), (NC3(SE) is unfortunate, as there is likely to be major disturbance of the area in the future with the construction of a new road bridge across the southern part of Holes Bay. This separated sub-section data would have been invaluable for studying the comparative impacts upon birds using Holes Bay, during and after completion of the bridge.

The union of a third Harbour section Holton (W2), that was formally divided into three sub-sections (W2), (W2)(E) and (W2)(W), has been amalgamated. This is another large area of 172 ha[1] at low tide. Possibly of the three amalgamations, this is of least concern because these sub-sections are all part of one large bay.,

In view of the continuing pressures placed upon the Harbour, the more detailed the data, the more value it is. It is unfortunate that these amalgamations have occurred but also it has been found that some of the monthly accounts of some sections of the Harbour are also incomplete. Some sections had not been counted for several months and there are two months where no counts were undertaken for the whole of the Harbour. As no data is known to be available for March 2000 or September 2003, a mean of the previous and following years corresponding month total has be used for indicative purposes and where used is shown in '*italics*'. However, as it is not possible to predict on those missing two months, where each species might have been located, the seven year mean used to show the percentage distribution in the Harbour of each species, has been derived by removing the missing months considered figures. Despite these short coming, the overall incomplete current 7-year data set is unlikely to affect the longer term 14-year trends, other than may be reducing slightly the angle of assent/decent.

Further information has been extracted from data in the annual Dorset Bird Reports (1998 - 2004), other publications and reports, and personal contacts. Since 2000, there has been increasing amount of data relating to the Harbour being published through the aegis of the Poole Harbour Study Group.

For each of the 32 selected species there is an individual account. The data are presented under two main headings:

1. Species where the primary data is based on WeBS low water counts and are or have been at or over the Great Britain or International 1% threshold, with additional information given, if they breed or summer in the Harbour. There are several species whose wintering population, although not of GB importance, nevertheless at mean peak approaches 5% of the Harbour total mean, and are considered as being of Harbour importance.

2. Species who are Globally threatened or Red or Amber Listed. Breeding species where at least 1% of the British breeding population are present in Poole Harbour and are considered as being of Harbour importance.

The 1998/99 - 2004/05 WeBS count data for each species has been summarised in a tabular form for each count area of Poole Harbour. These tables show the 7-year total number, mean and range for each species occurring within each count area of intertidal habitat recorded at low water. The mean total for each species is also expressed as a percentage of mean Harbour total population. The approximate area of exposed mud at low water in eacb count area and the mean density of birds/ha $^{-1}$ is also given (Table 4).

Table 4 Approximate area (ha) of mud exposed at low water Spring Tides in WeBS recording sections of Poole Harbour

West Harbour - prefix (W)

Area No	Name and details	Area - ha
1	Arne - north shore	12
2	Rockley*	12
2(E)	Holton Bay (East)*	44
2(W)	Holton Bay (West)*	116
3	Lytchett Bay	88
4	Giggers	120
5	Keysworth	64
6	Swineham	32
7	Bestwall	50
	Total ha $^{-1}$ 538	

* Insufficient data to treat sections individually, the site have been amalgamated and the figure of 172 ha $^{-1}$ has been used to calculate mean density

North Central Harbour - prefix (NC)

Area No	Name and details	Area - ha
1	Hamworthy	8
2	Mid- Harbour (N)	12
3(NW)	Holes Bay (North-west)*	32
3(NE)	Holes Bay (North-east)*	28
3(SW)	Holes Bay (South-west)*	64
3(SE)	Holes Bay (South-east)*	88
	Total ha $^{-1}$ 232	

* Insufficient data to treat sections individually, the site have been amalgamated and the figure of 212 ha $^{-1}$ has been used to calculate mean density

Table 4 (cont)

North East Harbour - prefix (NE)

Area No	Name and details	Area -
1	Sandbanks	48
2	Brownsea Island	None
3(P)#	Poole Park	None
3(B)#	Baiters (incl. NE2 (W) section)	12
3(Bl)#	Blue Lagoon (incl. NE2 (E) section)	12
	Total ha $^{-1}$ 72	

These three sites have been amalgamated into one section

South Central Harbour - prefix (SC)

Area No	Name and details	Area ha
1	Goathorn and Green Island/Furzey	44
2	Newton Bay	36
3	Mid-Harbour (south) (incl Furzey Island - north side)	20
4	Fitzworth (incl Green Island - north-west side)	80
5	Wytch Lake	72
6	Arne Bay	32
7	Lower Middlebere Lake	44
8	Upper Middlebere Lake	24
	Total ha $^{-1}$ 352	

South East Harbour - prefix (SE)

Area No	Name and details	Area - ha
1	Brands Bay(E)	56
2	Brands Bay(W)	132
3	Littlesea	None
	Total ha $^{-1}$ 188	

The approximate total area of mud exposed at low water on Spring Tides during WeBS counts = 1366 ha.

Each of the 32 species is given an individual account, showings its current status and relevant designation with sources referenced. The percentage population figures for the two 7-year periods are based on the maximum Great Britain figure for 1997/98 and 2004/05 respectively, as given by (Cranswick et al. 1999 and Banks et al. 2006). The Great Britain breeding populations are taken from a number of sources (Baillie, S.R. *et al.* 2006; BirdLife International 2004; Chown 2004; Gregory *et al.* 2002; Kershaw et al. 2003; Mavor et al. 2005; Mitchell et al (2004); Rehfisch et al. 2003; Robinson, R.A. 2005 and www.rspb.org.uk/birds 2007).

All except for two species that are associated with the WeBS data, have distribution maps been produced, showing either density per ha^{1} or percentage of Harbour population for each section (Maps 2 - 20). On all distribution maps, were relevant, the data for the non-tidal sections of the Harbour, Brownsea Lagoon (NC2) and Little Sea (SE3), are always shown as a percentage of the mean total. To enable a density comparison with the data set, the percentages are given alongside the 1998/99 - 2004/05 data on the maps. In the three sections Holton (W2), Holes Bay (NE3) and Parkstone (NE3), that had their sub-sections lumped, the previous figures have also been added together to give a better relationship with the current percentage data.

4. Individual species accounts.

Dark-bellied Brent Goose (*Branta bernicla bernicla*)

Status Winter visitor - October to March

WeBS - Qualifying Number for International threshold: **2200#**
WeBS - Qualifying Number for Great Britain threshold: **981#**

Species of Conservation Concern U.K. Amber Listed Species[1]
Europe Listed SPEC3 [2]

[#] The National threshold figure has slightly decreased from 1000 to 981 (Kershaw & Cranswick 2003)

[1] Amber listed because ≥ 20% of N.W. European non-breeding population in U.K and ≥ 50% of UK non-breeding population in 10 or fewer sites (Gregory *et al.* 2002).

[2] SPEC3 listed as a species not concentrated in Europe but with an Unfavourable Conservation Status (BirdLife International 2004).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): **1508 = 1.5% of G.B. population**
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): **1028 = 1.2% of G.B. population**

Past Status

The history and status of the wintering population of Dark-bellied Brent Goose in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 1 shows the monthly low water WeBS counts for Dark-bellied Brent Goose during the period 1998/99 to 2004/05. Comparing the 7 year mean of the 1991/92-1997/98 data set with the current set, shows a decline by >34%. Using the 1998/99 to 2004/05 peak count annual means, this shows a trend of a steady decline, and continuing (Fig 1). From the winter of 2001/02, the peak annual WeBS count has steadily declined, with a range of 599 - 868 (mean 707.2), which is >39.5% below the 1991-2001 range of 1278 - 1720 (mean 1459.4). The Dark-bellied Brent Goose is a conspicuous bird and unlikely to be missed on these low water WeBS counts. However, it is possible that some birds leave the Harbour at low water to feed in the *Zostra* beds in Studland Bay. Looking at the records in the Dorset Bird Reports, there are records of a 1000 birds in January, 2003 and 1200 in December 2003, counts much above the WeBS record for those months. It is possible that birds could be missed and the population is higher than the WeBS count would suggest. Nevertheless, even with the additional larger counts, the trend is still of a declining wintering population. The month of the peak count has varied from year to year in the current data set but four have been reached in December. With a seven year mean peak of 1028, the Harbour supports 1.2% of the overall declining Great British wintering population (Banks et al. 2006). Although Banks et al. (2006) records that there was a large increase in the Great Britain wintering population during 2004/05, this was not reflected in the Harbour population. The reasons for the decline in wintering numbers in the Harbour is unclear, there has not been any severe winters during this 7-year period, which suggests there are other factors, such as availability of food supplies elsewhere or low productivity, may be influencing timing of arrival and the numbers wintering birds in the Harbour.

Distribution

The distribution and density of Dark-bellied Brent Goose recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 2. Each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods is shown in Map 2.

Birds can be encountered anywhere in the Harbour during the winter months but they tend to be located more in the western side of the Harbour, than elsewhere. The first birds normally appear towards the end of October and most have gone by late March but a few remain usually into early April in most years. About 70% of the population are associated with only six sections of the Harbour, the percentage and sections are given in Table 3 for both 7-year periods. Although, they are in smaller numbers than in the 1991/98 period, the same sections are favoured but there is some variation in percentage present. The western part of the Harbour (W1 - W6) holds an additional 11% and the northern area (NC2-3 and NE1-2) a further 10%.

Table 4 Percentage population change of Dark-bellied Brent Goose between 1991/92-1997/98 and 1998/99-2004/05 at key sections in Poole Harbour

Location	1998/99-2004/05	1991/92-1997/98		1998/99-2004/05	1991/92-1997/98
Parkstone (NE3)	8.9%	7.4%	East Fitzworth (SC4)	11.0%	17.1%
West Goathorn (SC1)	15.2%	13.2%	Middlebere (SC8)	9.3%	16.3%
Newton Bay (SC2)	11.7%	9.4%	Brands Bay (SE 2)	13.4%	14.9%
			Total	69.6%	78.3%

There is a presumed association with the area around Baiters (NE3), which holds approaching 9% of the Harbour population and the nitrogenous grasslands. This area is used by local people, as a dog urinating and defecating locality. This may be the only positive thing about this usage by dogs here; it provides nutrient rich grass for the Dark-bellied Brent Geese!

Although there is very little *Zostera* present in the Harbour, there are large areas of *Enteromorpha* sp. and *Ulva*, but much of this would have declined in abundance by the time the geese arrive. All the west side of the Harbour populations are associated with the adjacent grassland habitats and probably without these, the wintering population would be much smaller. The Brands Bay (SE2) population may be to a certain extent dependent upon the Studland Bay *Zostra* beds and well as the nearby pastureland. Along with species such as Curlew, Lapwing and to a lesser extent Black-tailed Godwit, should these grassland habitats disappear, it is likely that these four species would be less able to maintain populations of Harbour, national or international importance. The National Trust or other sympathetic landowners own much of the grassland on which the geese feed and currently they geese do not appear to be causing problems.

Table 1 **Dark-breasted Brent Goose**

Poole Harbour WeBS counts (Sept - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 7 year mean (1991 - 1998)

Species of National Importance

1% National Threshold Figure = 981 Months in which figure reached is shown in **Bold**

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly Mean 1991/1998
September	4	-	-	-	-	-	-	4	< 1	15
October	260	355	122	43	21	184	299	1284	183	110
November	574	**1208**	399	599	532	272	694	4278	611	846
December	**1291**	**1354**	**1720**	288	356	868	325	6202	886	1087
January	**1120**	700	**1570**	414	581	820	757	5962	852	1330
February	880	660	893	578	606	433	245	4295	614	1252
March	872	571	*114*	134	595	255	470	3011	430	813
Autumn/Winter Total	5001	4848	4818	2056	2691	2832	2790	25036	3576	5453

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been shown in '*Italics*'

Removing the indicative number, the 'mean' becomes 3557 and this figure is used to calculate the percentage distribution for the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows a decrease of - 34.09%

Table 2 Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Dark-bellied Brent Goose **7 year mean Poole Harbour population (Sept - Mar) = 3557**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	-	-	1229	137				1201	28	2595
Annual Mean	-	-	175.6	19.6				171.6	4	370.8
Range	-	-	2 - 450	1 -119				61 - 205	1 - 14	1 - 205
% of annual mean/ Poole Harbour mean	-	-	4.93%	0.55%				4.82%	0.11%	10.41%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	526
Mean density/ha		1	2.74	0.16				1	0.33	0.7

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	152	8					421			581
Annual Mean	21.7	1.1					60.1			82.9
Range	4 - 107	1 - 7					1 - 184			1 - 184
% of annual mean/ Poole Harbour mean	0.61%	0.03%					1.69%			2.33%
Low water area (ha)	12	8	28	32	64	120	244			508
Mean density/ha	1.8	1					0.25			0.16

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	1173	736	2215							4124
Annual Mean	167.6	105.1	316.4							589.1
Range	1 - 86	5 - 295	2 - 301							1 - 301
% of annual mean/ Poole Harbour mean	4.71%	2.95%	8.90%							16.56%
Low water area (ha)	48	None	24							72
Mean density/ha	3.49	-	13.18							0.19*

* Excludes NE2 data (Brownsea Island Lagoon)

Table 2 Dark-bellied Brent Goose (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	3772	2933	634	2745	453	246	9	2311		13103
Annual Mean	538.8	419	90.6	392.1	64.7	35.1	1.3	330.1		1871.7
Range	7 - 420	60 - 1200	4 - 70	1 - 300	3 - 147	3 - 42	1 - 8	1 - 820		1 - 1200
% of annual mean/ Poole Harbour mean	15.15%	11.77%	2.55%	11.02%	1.82%	0.98%	0.03%	9.28%		52.60%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	12.25	11.64	4.53	4.9	0.9	1.03	0.03	13.75		5.32

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	1382	3349	7							4738
Annual Mean	197.4	478.4	1							676.8
Range	4 - 238	1 - 234	7							1 - 238
% of annual mean/ Poole Harbour mean	5.55%	13.44%	0.03%							19.02%
Low water area (ha)	36		None							168
Mean density/ha	5.48	3.62								5.53

* Excludes SC3 data (Little Sea)

Shelduck (*Tadorna tadorna*)

Status (Regular breeding and summering species, and a numerous passage and winter visitor).

WeBS - Qualifying Number for International threshold: **3000**[#]
WeBS - Qualifying Number for Great Britain threshold: **782**[#]

Species of Conservation Concern U.K. Amber Listed Species[1]

[#] The Great Britain threshold has been up-rated from 750 to 782 (Kershaw & Cramswick (2003)

[1] Amber listed because ≥ 20% of N.W. European non-breeding population in U.K and ≥ 50% of UK non-breeding population in 10 or fewer sites (Gregory *et al.* 2002).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): **3176 = 4.3% of G.B. population**
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): **2062 = 3.6% of G.B. population**

Breeding and Summering Population

Past Status

The history and status of the summering population of Shelduck in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Breeding Status

As commented in (Pickess & Underhill-Day 2002) there are problems with trying to assess the size of the Harbour's breeding population. Further more during the 1998 - 2004 breeding seasons there is often only reports of breeding but seldom an indication of the number of pairs involved and only occasional records of broods (Dorset Bird Reports). The limited details of ducklings noted suggests that their numbers are fewer that they were during the 1980's and 90's. Breeding during the current 7-year period has been regularly recorded from Arne (SC6/7/8), Brownsea Island (NE2) and Lytchett Bay (W3), and on two occasions single broods were record in Holes Bay (NC3) (Dorset Bird Reports). From the limited data available, it would suggest that the Harbour's breeding population is possibly declining slightly but still at least 30 pairs are attempting to breed annually.

There are a scattering of peak counts during the April - July period, but how much these numbers reflect the size of the breeding population is not clear. Are these May- July gatherings of Shelduck a reflection of breeding failure? Are the April-May groups comprising mostly of non-breeding birds because breeding pairs would be remaining around their nesting area. The limited data is presented in Table 1 but can only be taken as indicative of the minimum number of adults present in the Harbour because this will exclude the nesting birds.

Table 1 Maximum counts of Shelduck in Poole Harbour during April - July (1998-2004) (data from Dorset Bird Reports)

Year	Location	April	May	June	July
1999	Arne	180	100	-	-
2001	Arne	122	-	40	20
	Brownsea Island	164	124	81	31
	Lytchett Bay	48	85	20	-
2002	Arne	88	50		50
2003	Brownsea Island	-	137	84	
2004	Brownsea Island	-	68	-	24

Our current knowledge of the breeding status of the Shelduck in the Harbour is inadequate. A better understanding is required of the distribution and number of summering birds, and whether they are breeding or just summering. It would be valuable to know the current breeding distribution of the Shelduck and their productivity. Certainly in the past, it has been observed that if June is particularly wet, then there appears to be low productivity, presumably because duckling may get wet and chill (B .P. Pickess pers. obs.). Another factor concerning the Harbour birds, is that in the past nests were known to be predated by Foxes. Foxes are increasingly seen in the areas bordering the Harbour and my be affecting at least the local breeding population (B .P. Pickess pers. obs.). There is a need to know more about the numbers, distribution and breeding productivity of this species.

Wintering Population

Past Status

The history and status of the wintering population of Shelduck in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 2 shows the monthly low water WeBS counts for Shelduck during the period 1998/99 to 2004/05. Comparing the 7-year mean of the 1991/92-1997/98 data set with the current set, it shows a steady decrease by – 31.6%. Using the 1998/99 to 2004/05 peak count annual means, this also shows a trend of a steady decline, and continuing (Fig 2). In most years, the Harbour holds populations of GB importance between November and March. In the current 7-year period, the mean peak has fallen to 2062 but this represents 3.6% of the GB wintering population wintering population (Banks et al. 2006).

The general pattern of occurrence in the Harbour comparing the 1991/92- 1997/98 data set with the current 7-year data set suggests that wintering birds, although in declining numbers, are arriving and leaving earlier in, than in the past. In two years, the winter peak was reached in December but January (four winters) remains the principle month of peak occurrence. In Table 3, the annual peak counts since the 1969/70 winter are shown and the means for each 10-year period is given. Table 3 shows the annual population at peak is steadily rising from 1969/70 and climaxed during the mid-1990's, being 25% above the 1969/70 - 1978/79 mean. However, just in eight year it has steadily declined and is currently at a level below the 1969/70 - 1978/79 mean! The only south coast site where a comparable set of figures are available is Chicbester Harbour. Here, the peak was reached in the early 1990's, and since then numbers have declined even more sharply than in Poole Harbour (Underhill-Day 2006; Banks 2006). What is driving this decline is unclear but

the British index declined by 7.0% in 2004/05 winter, taking it to its lowest ever level (Banks et al. 2006).

During high water many of the Shelduck rest up on the fields and wet grassland bordering the Harbour and return to feed over the exposed mud, as the tide retreats. The WeBS counts being undertaken at low water probably give a very accurate estimate of the Harbour's population and it would seem unlikely that many birds are missed.

Table 3 Poole Harbour Peak Annual Count of Shelduck for (1969/70 to 2004/05) with 10 year Totals, Means and Month of occurrence (Data from Dorset Bird Reports and WeBS low water counts)

Winter Period	Peak Month	Winter Period	Peak Month	Winter Period	Peak Month	Winter Period	Peak Month
1969/70	2913 (Feb)	**1981/82**	2100 (Jan)	**1991/92**	2382 (Mar)	**2001/02**	2232 (Jan)
1970/71	2582 (Jan)	**1982/83**	1572 (Jan)	**1992/93**	2801 (Mar)	**2002/03**	2485 (Jan)
1971/72	1783 (Jan)	**1983/84**	1341 (Jan)	**1993/94**	2982 (Jan)	**2003/04**	2070 (Jan)
1972/73	2240 (Feb)	**1984/85**	2891 (Jan)	**1994/95**	3177 (Jan)	**2004/05**	1387 (Jan)
1973/74	2063 (Jan)	**1985/86**	1956 (Jan)	**1995/96**	3575 (Feb)	**Total**	**8174**
1974/75	2011 (Jan)	**1986/87**	3590 (Jan)	**1996/97**	4650 (Jan)	**4-year**	
1975/76	2688 (Jan)	**1987/88**	1665 (Feb)	**1997/98**	2662 (Feb)	**Mean**	**2044**
1976/77	2027 (Jan)	**1988/89**	2230 (Feb)	**1998/99**	2318 (Dec)		
1977/78	1717 (Mar)	**1989/90**	2179 (Feb)	**1999/2000**	2192 (Dec)		
1978/79	1304 (Jan)	**1990/91**	3309 (Jan)	**2000/01**	1748 (Feb)		
Total	**21328**		**22833**		**28487**		
10 Year Mean	**2133**		**2283**		**2849**		

Distribution

The distribution and density of Shelduck recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 4. Each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods is sbown in Map 3.

At low water Shelduck are distributed throughout the Harbour but over 70.0% are located in only seven sections (Table 4) . Comparison with the previous 7-year data set shows that the favoured sections remain the same, although the percentages in each has changed a little (Table 4). Over 40.0% are located in just three sections, Keysworth (W5), Holes Bay (NC3) and Brands Bay (SE2). Interestingly, even with a diminishing Harbour population, the same key sites are still favoured. As previously noted at low water there are very few birds to be found in the areas affected by the major shipping lane (NE1, NE2, NE3 and SE1).

Table 5 Percentage population change of Shelduck between 1991/92-1997/98 and 1998/99- 2004/05 at key sections in Poole Harbour

Location	1998/99-2004/05	1991/92-1997/98		1998/99-2004/05	1991/92-1997/98
Keysworth (W5)	13.5%	11.5%	Wytch (SC5)	6.3%	7.7%
Giggers (W4)	8.8%	5.1%	Arne Bay (SC6)	6.8%	3.4%
Holes Bay (SC3)	10.4%	8.9%	Brands Bay (SE2)	16.5%	16.0%
East Fitzworth (SC4)	8.1%	9.9%	Total	70.4%	62.5%

Table 3 **Shelduck**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and the 7 year mean (1991 - 1998)

Species of National Importance

1% National Threshold Figure = 782 Months in which figure reached is shown in **Bold**

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7Year Monthly mean 1991/1998
September	123	29	47	44	*120*	195	175	733	105	178
October	488	480	169	164	121	385	586	2393	342	392
November	**1050**	**2151**	484	**1394**	193	506	**959**	6737	962	1183
December	**2318**	**2192**	419	**1909**	744	**1846**	**844**	10272	1467	1799
January	**2090**	**2068**	**1682**	**2232**	**2485**	**2070**	**1387**	14014	2002	2896
February	**1867**	**2024**	**1748**	**1315**	**1301**	**1304**	**1211**	10770	1539	2685
March	**1725**	**1821**	***1647***	**1473**	**1165**	**916**	**857**	9604	1372	2247
Autumn/Winter Total	9661	10765	6196	8531	6129	7222	6019	54523	7789	11380

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the two indicative figures, the 'mean' becomes 7536 and this figure is used to calculate the percentage distribution for the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows a decrease of - 31.55%

Table 4 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for eacb count area in shown

Shelduck **7 year mean Poole Harbour population (Sept - Mar) = 7536**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	54	348	7124	4614	2469			1772	292	16673
Annual Mean	7.7	49.7	1017.7	659.1	352.7			253.1	41.7	2381.7
Range	5 - 30	1 - 60	4 - 375	1 - 403	4 - 150			2 - 351	2 - 57	1 -375
% of annual mean/ Poole Harbour mean	O.10%	0.66%	13.50%	8.75%	4.68%			3.36%	0.55%	31.60%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	526
Mean density/ha	0.15	1.55	15.9	5.5	4			1.47	3.47	4.53

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	15	4					5476			5495
Annual Mean	2.1	0.7					782.3			785.1
Range	1 - 7	2					2 - 451			1 -451
% of annual mean/ Poole Harbour mean	0.03%	<0.01%					10.38%			10.41%
Low water area (ha)	12	8	28	32	64	120	244			508
Mean density/ha	0.17	0.08					3.21			1.54

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	44	2012	376							2432
Annual Mean	6.3	287.4	53.7							347.4
Range	1 - 4	1 - 190	2 - 54							1 - 190
% of annual mean/ Poole Harbour mean	0.08%	3.81%	0.71%							4.60%
Low water area (ha)	48	None	24							72
Mean density/ha	0.13		2.23							0.83*

* Excludes NE2 data (Brownsea Island Lagoon)

Table 4 Shelduck (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	1695	1528	1637	4273	3305	3571	2126	779		18914
Annual Mean	242.1	218.3	233.8	610.4	472.1	510.1	303.7	111.3		2701.8
Range	16 - 231	5 - 248	2 - 303	2 - 324	2 - 240	1 - 254	3 - 209	1 - 99		1 - 303
% of annual mean/ Poole Harbour mean	3.21%	2.90%	3.10%	8.10%	6.27%	6.77%	4.03%	1.47%		35.86%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	5.5	6.06	11.7	7.36	6.55	15.94	6.9	4.64		7.67

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	120	8691	11							8822
Annual Mean	17.1	1241.6	1.6							1260.3
Range	1 - 25	9 - 625	1 - 7							1 - 625
% of annual mean/ Poole Harbour mean	0.23%	16.48%	0.02%							16.73%
Low water area (ha)	36	132	None							168
Mean density/ha	0.47	9.41	-							7.49*

* Excludes SC3 data (Little Sea)

Wigeon (*Anas penelope*)

Status (Winter visitor).

WeBS - Qualifying Number for International threshold: 15000[#]
WeBS - Qualifying Number for Great Britain threshold: 4060[#]

Species of Conservation Concern U.K. Amber-listed Species[1]

[#] The GB threshold figure has increased from 2800 to 4060 and the International threshold from 2800 to 4060 (Kershaw & Cranswick 2003)

[1] Amber listed because ≥ 20% of N.W. European non-breeding population in U.K and ≥ 50% of UK non-breeding population in 10 or fewer sites (Gregory *et al.* 2002).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): 1108 = 0.3% of G.B. population
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): 1164 = 0.3.% of G.B. population

Past Status

The history and status of the wintering population of Wigeon in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 1 shows the monthly low water WeBS counts for Wigeon during the period 1998/99 to 2004/05. Comparing the 7-year mean of the 1991/92-1997/98 data set with the current set, it shows a marked increase by + 35.6%, since the low point reached during the winter of 1998/99. Using the 1998/99 to 2004/05 peak count annual means, this shows a steady upward trend, and continuing (Fig 3). Although its winter population is considerably below the 1% GB threshold, Wigeon are an important constituent of the Harbour's waterfowl population.

The general pattern of occurrence in the Harbour comparing the 1991/92 - 1997/98 data set with the current 7-year data set shows the month of peak occurrence is still December (four years) but during the 1998/99 - 2004/05 winters the peak counts also occurred twice in November and once in January. Previously it had occurred only once in November but twice in January and once in February. Birds begin to arrive during September and numbers build, now usually peaking before January and then steadily declining through to March (Table 1). There has been a steady rise in the number of Wigeon wintering in the Harbour since 1999/2000. A peak was reached in 2003/04, with the highest number recorded in the Harbour for at least the past 12 years of 2412 in December, which is more than double the 7-year mean. The steady rise and the marked decline during the 2004/05 winter, was also mirrored in the trends of the GB population (Banks et al. 2006).

Wigeon are the principal quarry species in the Harbour. There are only limited shooting records available for Poole Harbour for 1999/2000 - 2001/02. During these three seasons, 180 were shot in 1999/2000, 73 in the 2001/02 and 337 in 2001/02, unfortunately, these records do not detail when or where the birds were taken (Crown Foreshore Wildfowling return reports). These returns do not include any additional birds that may have been shot by private estates that border the Harbour, so the bag figures could be higher. The 337 taken in the 2001/02 season, represents almost 35.5% of Harbour peak population for that winter and in 1999/2000, it represented 26.2% of the peak number! However, there is no evidence to suggest that numbers of Wigeon are declining in the Harbour, because of hunting pressure.

Distribution

The distribution and density of Wigeon recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 2. Each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods is shown in Map 4.

At low water, Wigeon can be widespread in the Harbour but 80.2% are to be located in only seven sections. Comparison with the previous 7-year data set shows that the favoured sections remain the same, although there are large percentage differences in some sections (Table 3). It is interesting to note that where percentage increases have occurred, it is in the 'shooting free zones' and the declines in the areas that are shot over. The Wigeon distribution at low water appears to be an indication as to the principal feeding areas adjacent to the Harbour, which are generally the wet grasslands. The wet grasslands associated with the Wareham Channel appear to be the most favoured, yet in the whole of this area, there is not a 'no shooting free zone'. The reasons for the huge percentage increase by 750.0% in Holes Bay (NC3) is a little puzzling.

Table 3 Percentage population change of Wigeon between 1991/92-1997/98 and 1998/99- 2004/05 at key sections in Poole Harbour

Location	1998/99-2004/05	1991/92-1997/98	Location	1998/99-2004/05	1991/92-1997/98
Keysworth (W5)	7.7%	15.5%	East Fitzworth (SC4)	6.8%	8.2%
Holton (W2)	19.2%	27.2%	Arne Bay (SC6)	13.2%	4.3%
Holes Bay (NC3)	21.7%	2.9%	Brands Bay (SE2)	5.5%	8.8%
Brownsea (NE2)	6.1%	5.8%	Total	80.2%	72.7%

Possibly, when birds begin to arrive in September, they might be initially attracted to the areas of mud covered with *Ulva lactuca*; however most of this algae has died down by November (Pinn & Jones 2006). Nevertheless, the numbers of Wigeon steadily build and a peak is reached in January but on what or where they are feeding, is unclear, especially as there is little or no suitable grazing around Holes Bay (NC3). Morrison (2006) found that at low water in December and January, almost all of the birds present are associated with the sides of the drains on the north of the railway, which is also a 'shooting free zone'. The presence of Wigeon here may be because it is a safe low water refuge and when tides flood, they leave to feed elsewhere in the Harbour.

The population increase in the Arne Bay (SC6) by over 300.0% may be more easily explained than Holes Bay (NC3) because it is almost certainly associated with the increased Sika Deer (*Cervus nippon*) grazing pressure, which has resulted in all the rough grassland saltings on Patchins Point being grazed and returning the area to a mosaic of upper saltmarsh communities, with grasses, including *Puccinellia maritima and Spartina anglica* (Edwards 2004). Patchins Point is now in a more favourable condition for Wigeon.

Table 1 **Wigeon**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 7 year mean (1991 - 1998)

Species of Harbour Importance

1% National Threshold Figure = 4060

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	47	144	45	171	*224*	276	144	1051	150	145
October	353	208	146	341	248	758	573	2627	375	394
November	605	373	474	681	1029	1639	1597	6398	914	679
December	535	686	790	949	587	2412	1088	7047	1007	745
January	333	637	777	805	887	1861	1674	6974	996	902
February	315	414	680	605	298	1194	607	4113	588	551
March	165	182	*199*	216	272	90	432	1556	222	245
Autumn/Winter Total	2353	2644	3111	3768	3545	8230	6115	29766	4252	3661

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the two indicative figures, the 'mean' becomes 4191 and this figure is used to calculate the percentage distribution for the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows a decrease of + 16.14%

Table 2 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Wigeon **7 year mean Poole Harbour population (Sept - Mar) = 4191**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	22	10	2272	476	542			5625	29	8976
Annual Mean	3.1	1.4	324.6	68	77.4			803.6	4.1	1282.2
Range	3 - 19	2 - 8	5 - 420	1 - 109	2 - 162			4 - 829	1 -25	1 - 420
% of annual mean/ Poole Harbour mean	0.07%	0.03%	7.74%	1.62%	1.85%			19.17%	0.10%	30.58%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	526
Mean density/ha	0.06	0.04	6.07	0.56	0.88			4.7	0.34	22.44

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	450	8					6364			6822
Annual Mean	64.3	1.1					909.1			974.5
Range	1 - 175	8					13 - 872			1 - 872
% of annual mean/ Poole Harbour mean	1.53%	0.03%					21.70%			23.26%
Low water area (ha)	12	8	28	32	64	120	244			508
Mean density/ha	5.36	0.14					4.06			1.92

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	41	1795	23							1859
Annual Mean	5.8	256.4	3.3							265.5
Range	18 - 23	2 - 179	5 - 9							1 - 179
% of annual mean/ Poole Harbour mean	0.14%	6.12%	0.08%							6.34%
Low water area (ha)	48	None	24							72
Mean density/ha	0.12		0.14							0.13*

* Excludes NE2 data (Brownsea Island Lagoon)

Table 2 Wigeon (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	170	328	234	1994	676	3972	436	63		7873
Annual Mean	24.3	46.8	34.7	284.8	96.6	567.4	62.3	9		1125.9
Range	5 - 73	7 - 76	2 - 66	1 - 144	2 - 121	6 - 513	1 - 69	3 - 24		1 -513
% of annual mean/ Poole Harbour mean	0.58%	1.12%	0.83%	6.80%	2.30%	13.53%	1.48%	0.21%		26.86%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	0.55	1.3	1.74	2.93	1.34	17.33	1.41	0.37		

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	-	2499	1419							3918
Annual Mean	-	358	203							561
Range	-	2 - 248	1 - 402							1 - 402
% of annual mean/ Poole Harbour mean	-	8.54%	4.84%							13.38%
Low water area (ha)	36	132	None							168
Mean density/ha	-	2.7								2.13*

* Excludes SC3 data (Little Sea)

Teal (*Anas crecca*)

Status (Scarce breeding species, common winter visitor and passage migrant).

WeBS - Qualifying Number for International threshold: 4000#
WeBS - Qualifying Number for Great Britain threshold: 1920#

Species of Conservation Concern U.K. Amber-listed Species [1]

The GB threshold figure has increased from 1400 to 1920 (Kershaw & Cranswick 2003)
[1] Amber listed because of ≥ 20% of N.W. European wintering population in U.K. (Gregory *et al.* 2002).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): 1380 = 1.0% of G.B. population
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): 1832 = 1.2% of G.B. population

Past Breeding Status

The history and status of the Teal in Poole Harbour up to 1998 is given in Pickess & Underhill-Day (2002).

Current Breeding Status

Since 1998, the Teal's breeding status around Poole Harbour is unchanged, it remains a rare (< 5 pairs) but annual breeding species.

Teal are very secretive when breeding and their presence is only likely to noted in well watched locations. Breeding has been recorded in all years, except 2002, on Brownsea Island. For the first time in 2002, breeding was reported from Ham Common (Dorset Bird Reports). It is probable that several broods go unrecorded each year from sites such as Arne and Little Sea.

Past Wintering Status

The history and status of the wintering population of Teal in the Poole Harhour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 1 shows the monthly low water WeBS counts for Teal during the period 1998/99 to 2004/05. Comparing the 7-year mean of the 1991/92-1997/98 data set with the current set, it shows a marked increase by + 35.6%. Using the 1998/99 to 2004/05 peak count annual means, this shows a steady but erratic upward trend, and continuing (Fig 4). The British annual index in the past few years has shown similar large fluctuations but the underlying trend depicts healthy numbers (Banks et al. 2006). Teal are the second most numerous wintering duck in the Harbour but over the 14-year period they have not always at peak count reached the 1% GB threshold. In the current 7-year period, the mean peak has risen to 1832 and at this level is supporting 1.2% of the GB wintering population (Banks et al. 2006).

The general pattern of the month of peak occurrence in the Harbour comparing the 1991/92 - 1997/98 data set with the current 7-year data set shows little change, with December and January producing the highest counts. The overall numbers of Teal wintering in the Harbour has increased.

Teal are the principal quarry species in the Harbour. There are only limited shooting records available for Poole Harbour for 1999/2000 - 2001/02. During these three seasons, 217 were shot in 1999/2000; 150 in the 2001/02 and 415 in 2001/02, unfortunately, these records do not detail when or where the birds were taken (Crown Foreshore Wildfowling return reports). These returns do not include additional birds that may have been shot by private estates that border the Harbour, so the bag figures could be higher. The 415 shot in 2001/02 season represents almost 25.0% of Harbour peak population for that winter! However, there is no evidence to suggest that numbers of Teal are declining in the Harbour, as a result of hunting pressure.

Distribution

The distribution and density of Teal recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 2. Each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods is shown in Map 6.

At low water, Teal can be widespread in the Harbour but almost 77.0% are to be located in only six sections. Comparison with the previous 7-year data set shows that the favoured sections remain the same, but without exception, the percentage in each has increased (Table 3). There are now over 25.0% of the wintering population present in Holes Bay and in Upper Middlebere (SC8), the percentage has doubled to almost 15.0%. The Teal distribution at low water may be an indication as to the principal safe feeding areas in the Harbour. As yet, there are no 'shooting free zones' associated with Wareham Channel and this might explain why Teal numbers are generally very low in an area where it might be expected to hold much larger populations. The apparent benefits of 'shooting free zones' is illustrated by the fact that, with the exception of Lytchett Bay (W3), all the concentrations of Teal are adjacent to or in, as is the case with Brownsea (NE2), such agreed 'wildfowling free' areas. The large declines recorded in sections adjacent to the Fitzworth Peninsula, Middle Harbour South (SC2), Newton Bay (SC3), East Fitzworth (SC4) & Wytch (SC5) could be possibly because of shooting pressure.

Table 3 Percentage population change of Teal between 1991/92-1997/98 and 1998/99- 2004/05 at key sections in Poole Harbour

Location	1998/99-2004/05	1991/92-1997/98	Location	1998/99-2004/05	1991/92-1997/98
Lytchett Bay (W3)	7.4%	6.1%	Arne Bay (SC6)	10.7%	10.0%-
Holes Bay (NC3)	26.6%	23.6%	Lower Middlebere (SC7)	7.5%	7.0%
Brownsea (NE2)	10.0%	7.4%	Upper Middlebere (SC8)	14.6%	7.7%
			Total	76.8%	61.8%

Table 1 **Teal**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 7 year mean (1991 - 1998)

Species of National Importance

1% National Threshold Figure = 1920 Months in which figure reached is shown in **Bold**

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	437	252	499	441	*560*	679	620	3488	498	405
October	535	744	265	643	1543	1435	1188	6353	908	617
November	891	771	504	906	1441	1552	1806	7871	1124	781
December	1623	1209	609	1667	1711	**2083**	1137	10039	1434	1214
January	830	1321	1814	1428	**2235**	1842	1776	11246	1607	981
February	780	1057	**2086**	247	577	1708	455	6910	987	810
March	473	696	*625*	553	1467	831	1292	5937	848	653
Autumn/Winter Total	5569	6050	6402	5885	9534	10130	8274	51844	7406	5461

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the two indicative figures, the 'mean' becomes 7237 and this figure is used to calculate the percentage distribution for the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows an increase of + 35.61%

Table 2 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Teal **7 year mean Poole Harbour population (Sept - Mar) = 7237**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	35	26	356	1203	3926			79	-	5625
Annual Mean	5	3.7	50.9	171.8	560.8			11.3	-	803.5
Range	1 - 10	3 - 7	2 - 44	1 - 306	3 - 320			2 - 52	-	1 - 320
% of annual mean/ Poole Harbour mean	0.07%	0.05%	0.70%	2.37%	7.74%			0.15%		11.08%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	526
Mean density/ha	0.1	0.11	0.79	1.43	6.37			0.06	-	1.53

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	11	-					13486			13497
Annual Mean	1.7	-					1926.5			1928.2
Range	2 - 6	-					9 - 1252			2 - 1252
% of annual mean/ Poole Harbour mean	0.02%	-					26.62%			26.64%
Low water area (ha)	12	8	28	32	64	120	244			508
Mean density/ha	0.13	-					11.2			3.8

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	-	5068	354							5422
Annual Mean	-	724	50.6							774.6
Range	-	21 - 250	1 - 249							1 - 250
% of annual mean/ Poole Harbour mean	-	10.00%	0.69%							10.69%
Low water area (ha)	48	None	24							72
Mean density/ha	-		2.1							5.57*

* Excludes NE2 data (Brownsea Island Lagoon)

Table 2 Teal (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	96	393	460	870	2336	5417	3818	7419		20809
Annual Mean	13.7	56.1	65.7	124.2	333.7	773.8	545.5	1059.8		2972.5
Range	3 - 57	4 - 92	3 - 140	2 - 200	1 - 374	2 - 460	2 - 365	3 - 540		1 - 540
% of annual mean/ Poole Harbour mean	0.18%	0.77%	0.90%	1.71%	4.61%	10.69%	7.53%	14.64%		41.03%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	0.31	1.55	3.28	1.55	4.63	24.18	12.39	44.15		8.44

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	14	2825	2466							5305
Annual Mean	2	403.6	352.3							757.9
Range	1 - 7	10 - 264	6 - 566							1 - 566
% of annual mean/ Poole Harbour mean	0.03%	5.57%	4.86%							10.46%
Low water area (ha)	36	132	None							168
Mean density/ha	0.05	3.05								2.41*

* Excludes SC3 data (Little Sea)

Pintail (*Anas acuta*)

Status (Winter visitor, occasionally summering and has bred)

WeBS - Qualifying Number for International threshold: **600**[#]
WeBS - Qualifying Number for Great Britain threshold: **279**[#]

Species of Conservation Concern U.K. Amber Listed Species[1]
European Listed SPEC3[2]

[#] Kershaw & Cranswick (2003)

[1] Amber listed because five-year mean population size of 1-300 breeding pairs in U.K; ≥ 20% of N.W. European non-breeding population in U.K and ≥ 50% of UK non-breeding population in 10 or fewer sites and . (Gregory *et al.* 2002).

[2] SPEC3 listed as a species not concentrated in Europe but with an Unfavourable Conservation Status (BirdLife International 2004).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): **286 = 1.2% of G.B. population**
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): **309 = 1.2% of G.B. population**

Past Status

The history and status of the wintering population of Pintail in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 1 shows the monthly low water WeBS counts for Pintail during the period 1998/99 to 2004/05. Comparing the 7-year mean of the 1991/92-1997/98 data set with the current set, it shows a slight increase by 2.1%. Using the 1998/99 to 2004/05 peak count annual means, this shows a trend of a steady rise, and continuing (Fig 5) but over the whole period, the Pintail numbers have fluctuated considerably. During the 14-year period, in five years the peak annual count has not reached the 1% GB importance threshold. In the current 7-year period, the mean peak has risen to 309 but the Harbour population remains unchanged in supporting 1.2% of the overall slightly declining Great British wintering population (Banks et al. 2006).

The general pattern of occurrence in the Harbour comparing the 1991/92- 1997/98 data set with the current 7-year data set shows the month of peak occurrence is now earlier, usually either December or January, were previously it was January or February. The overall numbers of Pintail wintering in the Harbour has increased.

Pintail are a quarry species. There are only limited shooting records available for Poole Harbour for 1999/2000 - 2001/02. Eleven were shot in the 2000/01 season and 26 in the 2001/02 season, unfortunately, the records do not detail when or where the birds were shot (Crown Foreshore Wildfowling return reports). These returns do not include additional birds that may have been shot hy private estates that border the Harbour, so the hag figures could be higher. The 26 shot in 2001/02 season represent 6.1% of Harbour peak population.

Distribution

The distribution and density of Pintail recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 2. Each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods is shown in Map 6.

At low water, Pintail can be widespread in the Harbour but almost 90% are to be located in only seven sections. Comparison with the previous 7-year data set shows that the favoured sections remain the same, although the percentage in each has changed (Table 3). The major percentage population shifts have occurred in Wareham Channel (W4 & W5) and Arne Bay (SC6) were the numbers have more than douhled. Conversely, Fitzworth/Newton Bay (SC2 & SC4) have declined by over a third and both Brands Bay (SE2) and Littlesea (SE3), although showing declines, between them it has been less than 10.0%. Why the increasing wintering population now favoured the western part of the Harbour or why Newton Bay (SC2) and Fitzworth (SC4) should experience such large declines, is currently not clear.

Table 3 Percentage population change of Pintail between 1991/92-1997/98 and 1998/99- 2004/05 at key sections in Poole Harbour

Location	1998/99-2004/05	1991/92-1997/98		1998/99-2004/05	1991/92-1997/98
Keysworth (W5)	17.1%	3.5%	Arne Bay (SC6)	13.1%	5.6%
Giggers (W4)	9.1%	8.1%	Brands Bay (SE2)	15.4%	16.2%
Newton Bay (SC2)	1.5%	12.1%	Littlesea (SE3)	20.8%	23.4%
East Fitzworth (SC4)	12.4%	25.0%	Total	89.4%	93.9%

Table 1 **Pintail**

Poole Harhour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and the 7 year mean (1991 - 1998)

Species of National Importance

1% Great Britain threshold figure = 279 Months in which figure reached is shown in Bold

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7Year Monthly mean 1991/1998
September	28	30	56	40	*33*	25	16	228	32	22
October	35	32	52	94	18	127	18	376	54	70
November	111	151	**300**	142	136	2	106	948	135	135
December	**292**	133	81	**424**	22	268	**338**	1558	223	193
January	146	198	149	**419**	263	**316**	256	1747	250	210
February	160	227	**296**	38	119	156	225	1221	174	208
March	101	91	*96*	100	146	19	134	687	98	108
Autumn/Winter Total	873	862	1030	1257	737	913	1093	6765	966	946

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the two indicative figures, the 'mean' becomes 948 and this figure is used to calculate the percentage distribution for the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows a decrease of + 2.11%

Table 2 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Pintail **7 year mean Poole Harbour population (Sept - Mar) = 948**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	-	65	1133	602	20	-	-	258	31	2109
Annual Mean	-	9.3	161.8	86	2.8	-	-	36.8	4.4	301.1
Range	-	2 - 48	4 - 140	1 - 144	20	-	-	2 - 50	31	1 - 144
% of annual mean/ Poole Harbour mean	-	0.98%	17.06%	9.07%	0.30%	-	-	3.88%	0.47%	31.76%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	538
Mean density/ha	-	0.29	2.53	0.72	0.03	-	-	0.21	0.36	0.56

Section W count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	8	-	-	-	-	-	163			171
Annual Mean	1.1	-	-	-	-	-	23.3			24.4
Range	8	-	-	-	-	-	2 - 72			2 - 8
% of annual mean/ Poole Harbour mean	0.12%	-	-	-	-	-	2.46%			2.58%
Low water area (ha)	12	8	28	32	64	88	212			232
Mean density/ha	0.09	-	-	-	-	-	0.09			0.11

Section W count areas	1	2	3							Section total
Total counts 1998 - 2005	-	8	-							8
Annual Mean	-	1.1	-							1.1
Range	-	1 - 7	-							1.7
% of annual mean/ Poole Harbour mean	- -	0.12%	0							0.12%
Low water area (ha)	48	None	24							72
Mean density/ha	-	-	-							-

Table 2 Pintail (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section W count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	57	96	28	822	53	870	20	-		1946
Annual Mean	8.1	13.7	4	117.4	7.6	124.3	2.9	-		278
Range	7 - 50	2 - 29	28	3 - 88	1 - 30	1 - 150	5 - 8	-		1 - 150
% of annual mean/ Poole Harbour mean	0.86%	1.45%	0.42%	12.39%	0.80%	13.11%	0.30%	-		29.33%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	0.18	0.1	0.03	1.5	0.11	3.88	0.66	-		5.53

Section W count areas	1	2	3							Section total
Total counts 1998 - 2005	-	1019	1383							2402
Annual Mean	-	145.6	197.6							343.2
Range	-	1 - 229	2 - 152							1 - 229
% of annual mean/ Poole Harbour mean	-	15.36%	20.84%							36.20%
Low water area (ha)	36	132	None							168
Mean density/ha	-	1.5								0.86*

* Excludes SC3 data (Little Sea)

Shoveler (*Anus clypeata*)

Status (Winter visitor - October - March and a very infrequent breeder)

WeBS - Qualifying Number for International threshold: **400**[#]
WeBS - Qualifying Number for Great Britain threshold: **148**[#]

Species of Conservation Concern U.K. Amber Listed Species [1]

[#] The GB threshold figure has increased from 100 to 148 (Kershaw & Cranswick 2003)
[1] Amber listed because ≥ 20% of N.W. European non-breeding population in U.K. (Gregory *et al.* 2002).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): **134 = 1.3% of G.B. population**
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): **117 = 1.1% of G.B. population**

Past Status

The history and status of the wintering population of Shoveler in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 1 shows the monthly low water WeBS counts for Shoveler during the period 1998/99 to 2004/05. Comparing the 7-year mean of the 1991/92-1997/98 data set with the current set, it shows a slight decline by – 1.8%. Using the 1998/99 to 2004/05 peak count annual means, this shows a trend of a steady decline, and continuing (Fig 6). Numbers at peak vary considerably from winter to winter (range 46 - 218) with generally a high-count winter being followed by a low-count winter. Only in three winters did the Harbour population reach the 1% GB threshold. Generally, the WeBS counts produced the highest numbers for Shoveler in the Harbour. However, in January 2001, a count of 240 was recorded on Littlesea (SE3), where the peak WeBS for the winter of 2000/01 was 218 (November). Again, during the first part of 2003/04 winter there were non-WeBS counts of 100 (October), 90 (November) and 120 (December), all above the peak of 88 (January) recorded for that winter's WeBS (Dorset Bird Reports). Whether it can be concluded that the Harbour supports higher numbers of Shoveler than low water WeBS counts would suggest, needs a more detailed recording of this species. Shoveler are occasionally encountered in the ditches and ponds in the wet grasslands bordering the Harbour and increasing numbers are appearing on the new Swineham G.P. (B.P. Pickess pers. obs.), it is possible that these are birds that may not always be present at low water WeBS counts.

As noted previously by Pickess & Underhill-Day (2002), the Harbour peak count is reached usually in January, and this remains unchanged during the 1998/99 to 2004/05 period, unlike most other GB sites which peak usually in the autumn (Banks et al. 2006).

Shoveler are a quarry species. There are only limited shooting records available for Poole Harbour for 1999/2000 - 2001/02. Although it is a relatively scarce duck in the Harbour, eight were shot in 1999/2000 season, three in 2000/01 season and 15 in the 2001/02 season, unfortunately, the records do not detail when or where the birds were taken (Crown Foreshore Wildfowling return reports). These returns do not include additional birds that may have been shot by private estates that border the Harbour, so the bag figures could be higher. The 8 taken in 1999/2000 and 15 during the 2001/02 season represent (15.71%) and (21.1%) of the Harbour populations at peak. Interestingly, the larger bags were taken in the winters when the Harbour

population was in a trough year.

Distribution

The distribution and density of Shoveler recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 2. Each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods is shown in Map 7.

At low water, Shoveler may be recorded in most sections of the Harbour but during the 1998/99 - 2004/05 period the favoured sections, with the exception of Littlesea (SE3), were generally different to the sections favoured during the 1991/92 - 1997/98 period. The principle sections holding Shoveler during the two 7-year periods is given in Table 3. The centre of the Harbour population remains Littlesea (SE3), which now holds (51.7%), a decline by (22.0%). Only two other sections held significant numbers, Lower Middlebere (SC7) (21.2%) and Wytch (SC5) (11.6%). During the current 7-year period (91.1%) of the Shoveler were located at low water in just four sections of the Harbour .

Table 3 Percentage population change of Shoveler between 1991/92-1997/98 and 1998/99- 2004/05 at key sections in Poole Harbour

Location	1998/99-2004/05	1991/92-1997/98	Location	1998/99-2004/05	1991/92-1997/98
Mid-Harbour N (NC1)	-	13.4%	Lower Middlebere (SC7)	21.2%	-
Brownsea (NE2)	6.6%	12.0%	Littlesea (SE3)	51.7%	66.3%
Wytch (SC5)	11.6%	1.2%	Total	91.1%	83.9%

Table 1 **Shoveler**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 14 year mean (1991 -2005)

Species of Great Britain Importance

1% Great Britain Threshold Figure = 148 - Months in which figure reached is shown in **Bold**

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	-	13	26	8	*8*	7	16	78	11	1
October	11	46	53	18	7	8	18	161	23	8
November	60	45	**218**	32	26	12	37	430	61	24
December	71	43	4	55	**198**	61	44	476	68	59
January	**161**	51	**158**	24	92	88	46	620	89	128
February	2	26	104	71	64	67	19	353	50	61
March	10	2	*7*	11	6	10	37	83	12	39
Autumn/Winter Total	315	226	570	219	401	253	217	2201	314	320

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the two indicative figures, the 'mean' becomes 312 and this figure is used to calculate the percentage distribution for the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows a decrease of - 1.87%

Table 2 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Shoveler **7 year mean Poole Harbour population (Sept- Mar) = 312**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	2	33	19	6				10		70
Annual Mean	0.3	4.7	2.7	0.9				1.4		10
Range	2	1 - 13	4 - 15	1 - 4				4 - 6		1 - 15
% of annual mean/ Poole Harbour mean	0.09%	1.51%	0.87%	0.27%				0.46%		3.20%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	538
Mean density/ha	0.01	0.15	0.07	0.01				0.01		0.02

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005							7			7
Annual Mean							1			1
Range							1 - 3			1 - 3
% of annual mean/ Poole Harbour mean							0.32%			0.32%
Low water area (ha)	12	8	28	32	64	120	244			232
Mean density/ha							0.01			0.01

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	4	144	29							177
Annual Mean	0.6	20.6	4.1							25.3
Range	4	2 - 38	1 - 5							1 - 38
% of annual mean/ Poole Harbour mean	0.18%	6.60%	1.32%						0.081	8.10%
Low water area (ha)	48	None	24							72
Mean density/ha	0.01		0.17							0.06*

* Excludes NE2 data (Brownsea Island Lagoon)

Table 2 Shoveler (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005			1	5	253	12	462	56		789
Annual Mean			0.1	0.2	36.1	1.7	66	8		112.1
Range			1	1 - 2	2 - 34	2 -4	1 - 131	1 - 29		1 - 131
% of annual mean/ Poole Harbour mean			0.05%	0.23%	11.58%	0.55%	21.15%	2.56%		36.12%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha			0.01	0.01	0.5	0.05	1.5	0.33		0.32

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005		14	1129							1143
Annual Mean		2	161.3							163.3
Range		1 - 11	3 - 131							1 - 131
% of annual mean/ Poole Harbour mean		0.64%	51.69%							52.33%
Low water area (ha)	36	132	None							168
Mean density/ha		0.02								0.96+

* Excludes SC3 data (Little Sea)

Pochard (*Aythya ferina*)

Status (Winter visitor: - September - March)

WeBS - Qualifying Numbers for International threshold: **3500**[#]
WeBS - Qualifying Numbers for Great Britain threshold: **595**[#]

Species of Conservation Concern U.K. Amber-listed Species (Winter)[1]
European Listed: SPEC 2[2]

[#] The National threshold figure has now been up-rated from 440 - 595 (Kershaw & Cramswick (2003)

[1] Amber listed because of ≥ 20% of N.W. European wintering population in U.K. (Gregory *et al.* 2002).

[2] SPEC2 listed because of species concentrated in Europe and with an Unfavourable Conservation Status (BirdLife International 2004).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): **734 = 1.7% of G.B. population**
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): **372 = 1.2% of G.B. population**

Past Status

The history and status of the passage and wintering population of Pochard in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 1 shows the monthly low water WeBS counts for Pochard during the period 1998/99 to 2004/05. Away from WeBS counts, there are only two records of large counts, presumably both on Littlesea (SE3), of 303 in December 2001 and 420 in February 2003 (Dorset Bird Reports). Even if the qualifying national importance threshold had not been raised, the Harbour population would have only reached the previous qualifying level, once. The trend over the 14-year 1991/92 to 2004/05 period using the peak count annual means shows the population declining significantly (Fig 7). This steady decline is mirrored in the GB trend and 2004/05 annual index was the second lowest since 1970/71 (Banks et al. 2006). Comparing the 7-year mean of the 1991/92-1997/98 data set with the current set, it shows a halving of the wintering population with a decline by >51.4%.

The general pattern of occurrence in the Harbour has not changed, with birds not arriving until November and most have departed by March. The 7-year mean monthly peaks in both sets of data are similar with the peak counts occurring in either January or February. The numbers recorded on the March counts were very low and in three years no birds were recorded.

Note should be made that during this current 7-year period, there has been no time when the winter weather has been severe enough for Littlesea (SE3) to be iced over (R. Cox pers. comm.). When larger numbers of Pochard occur in the Harbour, it is usually associated with inland waters freezing over and the displaced birds appearing in the Harbour. The decline in numbers in the Harbour is most likely to be associated with the continuing run of generally mild winters and probably a reflection of the overall decline in the GB wintering population.

Distribution

The distribution and density of Pochard recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 2. Each numbered section of the Harbour and the mean September-March

population at low water ha^{-1} for both 7-year periods is shown in Map 8.

As in the past, Little Sea (SE3) remains the centre of the Harbour's population, holding nearly 96%. Pochard are very occasionally recorded in small groups, seldom more than 20 birds and rather randomly around the Harbour. The most likely regular locations to encounter the species away from Littlesea (SE3) is either on Brownsea Island (NE2) or Poole Park (NE3).

Table 1 **Pochard**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and the 7 year mean (1991 - 1998)

Species of Harbour Importance

1%Great Britain Threshold Figure = 595

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7Year Monthly mean 1991/1998
September		12	7		*4*	9		32	4	10
October		47	25	23		5	23	123	18	28
November	79	255	74	182	52	15	171	828	118	160
December	244	230	180		3	165	235	1057	151	555
January	242	363	50	523	70	364	448	2060	294	664
February	7	121	359	333	269	397	327	1813	259	307
March					15	7	69	91	13	39
Autumn/Winter Total	572	1028	695	1061	413	962	1273	6004	857	1763

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the indicative figure, the 'mean' is unchanged at 857 and this figure is used to calculate the percentage distribution for the species.

Comparison between the 'means' of 1991/98 and 1998/2005 data sets shows a decrease of - 51.39%

Table 2 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in sbown

Pochard **7 year mean Poole Harbour population (Sept - Mar) = 857**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	-	60	28	-	-			-	-	88
Annual Mean	-	8.6	4	-	-			-	-	12.6
Range	-	6 - 21	28	-	-			-	-	6 -28
% of annual mean/ Poole Harbour mean	-	1.00%	0.47%	-	-			-	-	1.47%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	488
Mean density/ha	-	0.27	0.06	-	-	-	-	-	-	0.03

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	-	-	-	-	-	-	47			47
Annual Mean	-	-	-	-	-	-	6.7			6.7
Range	-	-	-	-	-	-	1 - 12			1 - 12
% of annual mean/ Poole Harbour mean	-	-	-	-	-	-	0.78%			0.78%
Low water area (ha)	12	8	28	32	64	120	244			508
Mean density/ha	-	-	-	-	-	-	0.03			0.01

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	-	57	36							93
Annual Mean	-	8.2	5.1							13.3
Range	-	1 - 18	1 - 26							1 - 26
% of annual mean/ Poole Harbour mean	-	0.95%	0.60%							1.55%
Low water area (ha)	48	None	24							72
Mean density/ha	-		2.12							0.07*

* Excludes NE2 data (Brownsea Island Lagoon)

Table x Pochard (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	-	-	-	-	-	-	-	-		
Annual Mean	-	-	-	-	-	-	-	-		
Range	-	-	-	-	-	-	-	-		
% of annual mean/ Poole Harbour mean	-	-	-	-	-	-	-	-		
Low water area (ha)	44	36	20	80	72	32	44	24		
Mean density/ha	-	-	-	-	-	-	-	-		

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	22	-	5747							5769
Annual Mean	3.1	-	821							824.1
Range	22	-	4 - 507							4 - 507
% of annual mean/ Poole Harbour mean	0.37%	-	95.80%							96.18%
Low water area (ha)	36	132	None							168
Mean density/ha	0.09	-	-							0.01*

* Excludes NE2 data (Brownsea Island Lagoon)

Goldeneye (*Bucephala clangula*)

Status (Winter visitor:- October - March)

WeBS - Qualifying Number for International threshold: **4000#**
WeBS - Qualifying Number for Great Britain threshold: **249#**

Species of Conservation Concern: U.K. Amber Listed Species[1]

The National threshold figure has now been up-rated from 170 - 249 (Kershaw & Cranswick (2003)

[1] Amber-listed because of 5 year mean of 0.2-300 breeding pairs in U.K. and > 50% of U.K. non-breeding population in 10 or fewer sites (Gregory *et al.* 2002).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): **218 = 1.3% of G.B. population**
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): **189 = 1.5% of G.B. population**

Past Status

The history and status of the passage and wintering population of Goldeneye in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 1 shows the monthly low water WeBS counts for Goldeneye during the period 1998/99 to 2004/05. With the raising of the qualifying GB importance threshold, in only one winter was this reached. The trend over the 14-year 1998/99 to 2004/05 period using the peak count annual means suggest that the population is stable (Fig 8). The Harbour peak population does not appear to mirror the national trend, which rose during the first 7-year period but has decline during the second 7-year period (Banks et al. 2006). However, comparing the 7-year mean of the 1991/92-1997/98 data set with the current set, this shows a decline by >18.6%.

The general pattern of occurrence in the Harbour has not changed, with birds not arriving until November and most have departed by March. The 7-year mean monthly peaks are identical in both sets of data, with the February mean only slightly higher than the January figure.

At low water WeBS counts, very few birds present in the Harbour are likely to be missed. Possibly the most accurate counts would be to simultaneously count the two known nocturnal roosts in the Harbour at Little Sea (SE3) and off Round Island in Lower Wytch (SC3). During the winter of 2002/03, both these roosts were surveyed (Morrison 2004). On 13th January 2003, there was a maximum count of ca. 240 birds attending the Lower Wytch (SC3) roost and interestingly at the January WeBS count, 246 birds were noted. However, at the Little Sea (SE3) roost in November 2002, the maximum count was 152, which was treble the WeBS count for that month. Dependent upon weather conditions, birds may use either site to roost. It is possible that birds may move between roosts during the night, should the weather change (Morrison 2004). These observations would suggest birds prefer to roost in the open Lower Wytch (SC3) hut particularly during adverse weather conditions, choose the more protected Little Sea (SE3), .

Distribution

The distribution and density of Goldeneye recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 2. Each numbered section of the Harbour and the mean September-March

population at low water ha^{-1} for both 7-year periods is shown in Map 9.

Map 9 shows that birds are widely distributed throughout the Harbour at low water, mostly in small groups, but with larger numbers in the deeper water quiet areas (Table 3). Comparing the two data sets showed that, the same eight sections of the Harbour were favoured and in both periods held 80.0% of the population at low water but there has been also some re-distribution of the birds between sections. As noted during the 1991/92-1997/98 survey period, there were very few birds present in the areas of the deep water shipping lane off Sandbanks (NE1) & North Brownsea (NE2) at low water.

Table 3 Percentage population change of Goldeneye between 1991/92-1997/98 and 1998/99-2004/05 at key sections in Poole Harbour

Location	1998/99-2004/05	1991/92-1997/98		1998/99-2004/05	1991/92-1997/98
Holton (W2)	8.7%	17.4%	Middle Harbour (SC3)	13.9%	8.6%
Holes Bay (NC3)	5.8%	4.7%	East Fitzworth (SC4)	11.8%	7.8%
Parkstone (NE3)	3.7%	7.0%	South Haven (SE1)	11.9%	9.7%
West Goathorn (SC1)	8.5%	13.2%	Brands Bay (SE 2)	15.6%	12.0%
			Total	79.9%	80.4%

Table 1 **Goldeneye**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 14 year mean (1991 -2005)

Species of Great Britain Importance

1% Great Britain Threshold Figure = 249 - Months in which figure reached is shown in **Bold**

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly Mean 1991/1998
September	-	-	-	-	-	-				-
October	1	40	-	-	-	12	1	54	8	2
November	32	109	19	123	53	1	108	445	64	104
December	157	203	98	129	93	88	90	858	122	117
January	182	105	155	103	246	92	113	996	142	173
February	113	**265**	71	146	206	169	161	1131	162	177
March	98	48	*43*	38	55	-	30	312	45	95
Autumn/Winter Total	583	770	386	539	653	362	503	3796	543	668

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the indicative figure, the 'mean' becomes 536 and this figure is used to calculate the percentage distribution for the species.

Comparisons between the 'means of 1991/98 and 1998/2005 data sets shows a decrease of - 18.56%

Table 2 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Goldeneye **7 year mean Poole Harbour population (Sept - Mar) = 536**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	2	2	71	8	34			326	69	512
Annual Mean	0.3	0.3	10.1	1.1	4.8			46.6	9.8	73.1
Range	2	1	2 - 22	4	1 - 6			1 - 24	2 - 48	1 - 48
% of annual mean/ Poole Harbour mean	0.05%	0.05%	1.89%	0.21%	0.91%			8.71%	1.82%	13.64%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	526
Mean density/ha	<0.01	<0.01	0.16	<0.01	0.05			0.27	0.83	0.14

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	89	16					218			323
Annual Mean	12.7	2.3					31.1			46.1
Range	1 - 38	1 - 8					1 - 21			1 - 38
% of annual mean/ Poole Harbour mean	2.37%	0.43%					5.80%			8.60%
Low water area (ha)	12	8	28	32	64	120	244			508
Mean density/ha	1.06	0.29					0.13			0.09

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	68	34	261							363
Annual Mean	9.7	4.8	37.3							51.9
Range	2 - 18	13 - 21	1 - 32							1 - 32
% of annual mean/ Poole Harbour mean	1.81%	0.90%	6.96%							9.67%
Low water area (ha)	48	None	24							72
Mean density/ha	0.2	-	1.55							0.65*

* Excludes NE2 data (Brownsea Island Lagoon)

Table 2 Goldeneye (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	319	45	523	444	21	52	23			1427
Annual Mean	45.6	7	74.7	63.4	3	7.4	3.3			204.4
Range	1 - 48	3 - 16	1 - 120	1 - 80	1 - 9	1 - 15	1 - 12			1 - 120
% of annual mean/ Poole Harbour mean	8.50%	1.29%	13.94%	11.83%	0.56%	1.38%	0.61%			38.11%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	1.04	0.19	3.74	0.79	0.04	0.23	0.07			0.58

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	446	586	137							1169
Annual Mean	63.7	83.7	19.6							167
Range	1 - 35	1 - 71	1 - 107							1 - 107
% of annual mean/ Poole Harbour mean	11.89%	15.61%	3.65%							31.15%
Low water area (ha)	36	132	None							168
Mean density/ha	1.77	0.63								0.88*

* Excludes SC3 data (Little Sea)

Red-breasted Merganser (*Mergus serrator*)

Status (Winter visitor - October - April)

WeBS - Qualifying Numbers for International threshold: **1700**[#]
WeBS - Qualifying Numbers for Great Britain threshold: **98**[#]

[#] The International threshold has been up-rated from 1250 to 1700 and the National threshold reduced by 2 (Kershaw & Cramswick (2003)

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): 400 = 9.4% of G.B. population
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): 400 = 12.4% of G.B. population

Past Status

The history and status of the passage and wintering population of Red-breasted Merganser in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 1 shows the monthly low water WeBS counts for Red-breasted Merganser during the period 1998/99 to 2004/05. The Red-breasted Merganser occurred in the Harbour in nationally important number from November to March, in all seven years. Poole Harbour is the second most important wintering area for the species in GB, followed closely by Portland Harbour/Fleet. The trend over the 14-year 1991/92 to 2004/05 period using the peak count annual means, shows the population to be steady but from the mid-1990's, the peak annual numbers have shown a pattern of a peak being followed by a trough (Fig 9). A sharp drop in wintering numbers has occurred, commencing in the winter of 2000/01, has subsequently been maintained at this reduced level. The British annual index rose in 2004/05 (Banks et al. 2006) but this rise was not mirrored in the Harbour population where the 2004/05 peak count was the lowest for 14 years. Comparing the 7-year mean of the 1991/92-1997/98 data set with the current set, it shows there has be a decline in the wintering population by –17.7%. The Harbour's population at peak mean, for both 7-year sets of data is unchanged at (400) but the current period, as a representation of the GB populations, has increased by almost 25%.

The general pattern of occurrence in the Harbour has changed little, with birds starting to arrive during mid-October and departing through March but a small number lingering into April. The month in which the 7-year annual mean peak occurred was variable, being once in November, February and March, and twice in December and January.

Unfortunately, there is incomplete data to make comparisons with the population at the other main Dorset wintering site further west along the coast in Portland Harbour and the Fleet (Dorset Bird Reports). From the data available, their pattern of occurrence is similar but the suggestion by Pickess & Day (2002) that the Harbour is used as an important staging post for autumn and spring passage birds moving to and from other wintering sites, remains unresolved.

Distribution

The distribution and density of Red-breasted Merganser recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 2. Each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods is shown in Map 10.

At low water, birds are widely distributed around the Harbour, mostly in small groups but the major concentrations are to be found in in the deep water channels. Table 3 shows that there is considerable variation between the two data sets but over 75% of the Harbour population occurs in these ten sections.

Table 3 Percentage population change of Red-breasted Merganser between 1991/92-1997/98 and 1998/99- 2004/05 at key sections in Poole Harbour

Location	1998/99-2004/05	1991/92-1997/98		1998/99-2004/05	1991/92-1997/98
Keysworth (W5)	6.7%	1.4%	Parkstone (NE3)	5.2%	5.7%
Holton(W2)	8.2%	6.0%	Mid-Harbour South (SC3)	13.7%	11.2%
Holes Bay (NC3)	5.3%	6.8%	East Fitzworth (SC4)	6.2%	5.7%
West Goathorn (SC1)	7.0%	13.3%	South Haven (SE1)	13.2%	6.9%
Sandbanks (NE1)	7.1%	3.3%	Brands Bay (SE2)	10.0%	15.7%
			Total	82.6%	76.0%

During the winter of 2002/03 the known winter roost in the Harbour off Round Island (SC3) for Red-breasted Merganser, was found to be still active with over 280 in attendance in November but numbers declined after the New Year, with never more than 50 birds present (Morrison 2004). At dusk, birds were noted leaving the Harbour, presumably to roost on the sea but no detailed account of numbers was taken (Morrison 2004). Mid-harbour south (SC3) appears to be the main roost area for the Harbour birds, at least in the first part of the winter. It is not clear why some birds leave the Harbour at dusk, it is thought that probably roosting on the sea is the principal reason, although to what extent does the prevailing tidal or weather conditions influence the decision, by some birds, to vacate the Harbour?

Table 1 **Red-breasted Merganser**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 7 year mean (1991 - 1998)

Species of Great Britain Importance

1% Great Britain Threshold Figure = 100 - Months in which figure reached is shown in **Bold**

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	-	2	-	-	-	-	-	2		-
October	32	89	20	0	0	52	68	261	37	47
November	**184**	**366**	**184**	**324**	**253**	**126**	**315**	1752	250	323
December	**309**	**466**	**205**	**417**	**122**	**147**	**244**	1910	273	305
January	**369**	**309**	**298**	**167**	**469**	**381**	**235**	2228	318	297
February	**199**	**400**	**336**	**103**	**201**	**281**	**152**	1672	239	292
March	**385**	**124**	***134***	**144**	**144**	**159**	**120**	1210	173	304
Autumn/Winter Total	1478	1756	1177	1155	1189	1146	1134	9035	1290	1568

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the indicative figure, the 'mean' becomes 1271 and this figure is used to calculate the percentage distribution for the species.

Comparison between the 'means' of 1991/98 and 1998/2005 data sets shows a decrease of - 17.73%

Table 2 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Red-breasted Merganser **7 year mean Poole Harbour population (Sept - Mar) = 1271**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	-	114	597	292	119			730	139	1991
Annual Mean		16.3	85.3	41.7	17			104.3	19.8	284.4
Range	-	1 - 43	4 - 74	3 - 66	1 - 15			1 - 77	1 - 73	1 - 77
% of annual mean/ Poole Harbour mean	-	1.28%	6.71%	3.28%	1.34%			8.21%	1.56%	22.38%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	538
Mean density/ha	0	0.51	1.34	0.35	0.19			0.61	0.02	0.53

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	138	71					472			681
Annual Mean	19.7	10.1					50.7			80.5
Range	1 - 26	1 - 16					2 - 57			1 - 57
% of annual mean/ Poole Harbour mean	1.55%	0.79%					5.31%			7.65%
Low water area (ha)	12	8	28	32	64	88	212			232
Mean density/ha	1.64	1.26					0.21			0.34

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	642	129	471							1242
Annual Mean	91.7	18.4	67.3							177.4
Range	1 - 72	1 - 56	1 - 47							1 - 72
% of annual mean/ Poole Harbour mean	7.10%	1.43%	5.22%							13.75%
Low water area (ha)	48	None	24							72
Mean density/ha	1.91		2.8							2.21*

* Excludes NE2 data (Brownsea Island Lagoon)

Table 2 Red-breasted Merganser (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	625	48	1221	550	68	340	85	-		2937
Annual Mean	89.3	6.8	174.4	78.6	9.7	48.6	12.1	-		419.5
Range	1 - 15	1 - 15	4 - 111	1 - 70	1 - 12	1 - 97	1 - 11	-		1 - 111
% of annual mean/ Poole Harbour mean	7.02%	0.54%	13.72%	6.18%	0.76%	3.82%	0.95%	-		32.99%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	2.03	0.19	8.72	0.98	0.13	1.52	0.27	-		1.19

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	1178	891	-							2069
Annual Mean	168.3	127.3	-							295.6
Range	1 - 79	2 - 111	-							1 - 111
% of annual mean/ Poole Harbour mean	13.24%	10.01%	-							23.25%
Low water area (ha)	36	132	None							168
Mean density/ha	4.68	0.96								1.76

Slavonian Grebe (*Podiceps auritus*)

Status (Winter visitor October - mid-April)

WeBS - Qualifying Number for International threshold: **35**[#]
WeBS - Qualifying Number for Great Britain threshold: **7**[#]

Species of Conservation Concern U.K. Amber Listed Species[1]
Europe Listed SPEC3 [2]

[#] The GB threshold figure has now been up-rated from 4 to 7 and the International threshold reduced from 50 to 35 (Kershaw & Cranswick (2003)

[1] Amber-listed because of 5 year mean of 1-300 breeding pairs in U.K. and Rapid (50%) decline in UK breeding population over previous 25 years. (Gregory *et al.* 2002).

[2] Now listed SPEC3, as a species not concentrated in Europe but with an Unfavourable Conservation Status (BirdLife International 2004).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): 10 = 3.2%of G.B. population
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): 5 = 2.3% of G.B. population

Wintering Population

Past Status

The history and status of the wintering population of Slavonian Grebe in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 1 shows the monthly low water WeBS counts for the period 1998/99 to 2004/05 for the small and declining Slavonian Grebes population. Comparing the 7-year mean of the 1991/92-1997/98 data set with the current set, it shows a decline by – 60.4%. The 14-year trend of annual peak counts indicates that the population trend is of a steady decline and continuing (Fig 10). At low water WeBS counts, there are frequently no birds recorded in the Harbour, which suggest that they may vacate the Harbour. The Slavonian Grebe poses a similar quandary as with the Black-necked Grebe, what are the interactions between the wintering populations outside the Harbour in Shell Bay and Studland Bay, with those in the Harbour? Currently this is unresolved and not helped by there being a diminishing Harbour and Shell Bay/Studland Bay populations. The GB wintering population is small and the WeBS data for the 2004/05 winter suggests that numbers recorded were about average for recent years (Banks et al. 2006)

The Dorset Bird Reports include the monthly peak counts for both the Harbour and Shell Bay/Studland Bay areas (1998/99-2004); these are presented in Table 2. Adding together, the yearly total of peak counts for the two sites gives a good indication of the pattern of occurrence. Birds begin to appear in October and steadily increase and reach a peak during January before declining, with an occasional bird being recorded in April.

With the presence of just seven birds being required to qualify as the threshold figure, this was reached in only three years inside the Harbour but in four of the six years that data is available for the Shell /Studland Bay area. The Slavonian Grebes numbers at the threshold represent over 3% of the G B maximum wintering population (Banks et al. 2006). The data presented in Table 1 shows that even at these declining levels Poole Harbour and its environs, is still a key GB location for wintering Slavonian Grebe.

Table 2 Maximum monthly counts of Slavonian Grebe in Poole Harbour and adjoining Shell/Studland Bay (1998/99 - 2004/05) (data from Dorset Bird Reports)

Year	Location	Oct	Nov	Dec	Jan	Feb	Mar	Total
1998/1999	Studland/Shell Bay	3	4	11	3			21
	Poole Harbour	-	-	5	9[10]	-[2]	2[6]	16
1999/2000	Studland/Shell Bay	-	-	-	4	3	2	9
	Poole Harbour	-	3	3	2[4]	3	1	12
2000/2001	Studland/Shell Bay	-	-	1	7	2	1	11
	Poole Harbour	-	2	1[5]	7	3	-	13
2001/2002	Studland/Shell Bay	-	1	6	7	4	2	20
	Poole Harbour	-	-	-	1	5	-	6
2002/2003	Studland/Shell Bay	-	4	6	5	3	2	20
	Poole Harbour	1	5[6]	1	7	4	-	18
2003/2004	Studland/Shell Bay	2	3	4	3	5		17
	Poole Harbour	-	2[3]	1	3	-	-	6
2004/2005	Studland/Shell Bay	1	2	5				8
	Poole Harbour	-	-[1]	1	-	-	-	1
	Total	9	24	45	58	32	10	178

[ ] = additional records of larger counts recorded outside of WeBS counts but are not included in the totals (Dorset Bird Reports)

Distribution

The distribution and density of Slavonian Grebe recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 3. With few exception of single birds, all the WeBS records are confined to the deeper water channels on the SW side of the Harbour that are linked with the South Deep Channels (SE1, SE2 and SC 3), as they were during (1991/92-1997/98) period. Very little can be gathered from the WeBS data other than the deep quieter water areas associated with the (South Deep) is favoured and the main shipping channel is avoided.

Table 1 **Slavonian Grebe**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 7 year mean (1991 - 1998)

Species of Great Britain Importance

1% Great Britainl Threshold Figure = 7 - Months in which figure reached is shown in **Bold**

Year / Month	1998/99	1999/00	2000/01	2001/02	200203	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	-	-	-	-	-	-	-			1
October	-	-	2	-	1	-	-	3	0.4	-
November	-	3	-	-	5	2	-	10	1.4	3
December	5	3	1	-	1	1	1	12	1.7	8
January	**9**	2	7	1	7	3	-	29	4.1	8
February	-	3	3	5	4	-	-	15	2.1	4
March	2	1	-	-	-	-	-	3	0.4	2
Autumn/Winter Total	16	12	13	6	18	6	1	72	10.1	26

Comparisons between Means of 1991/98 and 1998/2005 data sets shows a decrease of - 60.38%

Table 3 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Slavonian Grebe **7 year mean Poole Harbour population (Sept - Mar) = 10.1**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	-	2	-	1	-	-	-	4	-	7
Annual Mean	-	0.28	-	0.14	-	-	-	0.57	-	0.99
Range	-	1	-	1	-	-	-	4	-	1 - 4
% of annual mean/ Poole Harbour mean	-	2.83%	-	1.41%	-	-	-	5.65%	-	9.89%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	526
Mean density/ha										

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	-	-	-	-	-	-	1			1
Annual Mean	-	-	-	-	-	-	0.14			0.14
Range	-	-	-	-	-	-	1			1
% of annual mean/ Poole Harbour mean	-	-	-	-	-	-	1.41%			1.41%
Low water area (ha)	12	8	28	32	64	120	244			508
Mean density/ha										

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	1	-	-							1
Annual Mean	0.14	-	-							0.14
Range	1	-	-							1
% of annual mean/ Poole Harbour mean	1.41%	-	-							1.41%
Low water area (ha)	48	None	24							72
Mean density/ha										

Table 3 Slavonian Grebe (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	3	3	8	5	5	-	-	-		24
Annual Mean	0.43	0.43	1.14	0.71	0.71	-	-	-		3.42
Range	1 - 2	3	1 - 3	1 - 4	5	-	-	-		1 - 5
% of annual mean/ Poole Harbour mean	4.24%	4.24%	11.31%	7.07%	7.07%	-	-	-		33.94%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha										

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	32	7	-							39
Annual Mean	4.57	1	-							5.57
Range	1 - 6	1 - 3	-							1 - 6
% of annual mean/ Poole Harbour mean	45.26%	9.89%	-							55.15%
Low water area (ha)	36	132	None							168
Mean density/ha										

Black-necked Grebe (*Podiceps nigricollis*)

Status (Winter visitor - October - early April)

WeBS - Qualifying Number for International threshold: 2800[#]
WeBS - Qualifying Number for Great Britain threshold: 5[#]

Species of Conservation Concern U.K. Amber Listed Species[1]

Poole Harbour 7 year peak mean: 4.9 = 6% of G.B. wintering population

[#] The International threshold has been raised from 1000 to 2800. Where 1% of the British or all-Ireland population is less than 50 birds, 50 is normally used as a minimum qualifying level (Kershaw & Cramswick 2003). A count of 5 has been chosen as a qualifying level.

[1] Amber-listed because of five-year mean of population 1-300 breeding pairs in U.K. (Gregory *et al.* 2002).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): 8.1 = 16.9% of G.B. population
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): 4.9 = 6.1% of G.B. population

Wintering Population

Past Status

The history and status of the wintering population of Black-necked Grebe in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 1 shows the monthly low water WeBS counts for the period 1998/99 to 2004/05 for the small and declining Black-necked Grebes population. Comparing the 7 year mean of the 1991/92-1997/98 data set with the current set, sbows a decline by over 63%. The 14-year trend of annual peak counts indicates that the population trend is of a steady decline and continuing (Fig 11). At low water WeBS counts, there are frequently no birds recorded in the Harbour, which suggest that they may vacate the Harbour. How the wintering population of this species use the Harbour, is not understood. As to wbat interactions there are between the wintering populations outside the Harbour in Shell Bay and Studland Bay is very difficult to ascertain. During a survey of this species in the winter of 2005/06, birds were regularly seen in Shell Bay, mostly in the shallower parts on the W side of the shipping channel. Occasionally, birds were noted in the shipping channel close to the Harbour mouth but once they dived in this area, it is difficult to relocate them; they just seem to disappear (B.P. Pickess pers.obs.). These observations raise the question of whether these birds had just come out of the Harbour or may be about to go in? An observation to support the suggestion that birds move between the Harbour and the sea occurred on the 10th February 2006, when eight birds were seen between Brownsea Island and the Harbour mouth, which coincided with a low count in Shell Bay (Liley et al. 2006).

The Dorset Bird Reports include the monthly peak counts for both the Harbour and Shell Bay/Studland Bay areas (1998/99-2004); these are presented in Table 2. Adding together, the yearly total of peak counts for the two sites gives a good indication of the pattern of occurrence. Birds begin to appear in October and steadily increase and reach a peak during December/January period before declining, in some years birds remain into April.

With the presence of just five birds being required to qualify as the threshold figure, this was reached in five years (only in two years at WeBS counts) inside the Harbour but every year in the Shell Bay/Studland area. The Black-necked Grebes of Shell Bay/Studland may represent as much as 20% of the Great Britain maximum wintering population but for unknown reasons, this area is not counted as part of the WeBS Survey (Banks et al. 2006). The data presented in Table 1 clearly sbows the importance of Poole Harbour and its environs as being

one of the key Great Britain sites for wintering Black-necked Grebe.

Table 2 Maximum monthly counts of Black-necked Grebe in Poole Harbour and adjoining Shell/Studland Bay (1998/99 - 2004/05) (data from Dorset Bird Reports)

Year	Location	Oct	Nov	Dec	Jan	Feb	Mar	Apl	Total
1998/1999	Studland/Shell Bay	3	10	21	6	8	-		48
	Poole Harbour	-	3	4	5	1	1		14
1999/2000	Studland/Shell Bay	3	5	13	8	7	-		36
	Poole Harbour	2	6	2	4	1			15
2000/2001	Studland/Shell Bay	-	10	15	10	14	8	4	61
	Poole Harbour	-	-	2	6	4	1	1	14
2001/2002	Studland/Shell Bay	-	7	14	24	8	3		56
	Poole Harbour	-	-	-	1	3	-	-	4
2002/2003	Studland/Shell Bay	-	3	21	10	12	8	-	54
	Poole Harbour	1	1	2	7	6	-	-	17
2003/2004	Studland/Shell Bay	4	9	17	20	15	3	1	69
	Poole Harbour	1	1	1	5	5	-	-	13
2004/2005	Studland/Shell Bay	1	10	22					33
	Poole Harbour	2	-	-					2
	Total	17	65	134	106	84	24	6	436

Distribution

The distribution and density of Black-necked Grebe recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 3. With few exception of single birds, all the WeBS records are confined to the deeper water channels on the SW side of the Harbour that are linked with the South Deep Channel (SE1, SE2 and SC 3), as they were during (1991/92-1997/98) period. Very little can he gathered from the WeBS data other than the deep water area of (South Deep) is favoured and that the main shipping channel is avoided.

Table 1 **Black-necked Grebe**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 7 year mean (1991 - 1998)

Species of Great Britain Importance

1% Great Britain Threshold Figure = 1 (but maxima of 5 or more defines Key U.K. Sites). Months in which figure is reaches is shown **Bold**

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	-	-	-	-	-	-	-	-	-	-
October	-	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	1	1	0.14	-
December	-	-	2	-	-	1	2	5	0.71	2
January	2	-	**5**	1	2	3	2	15	2.14	3
February	-	1	-	3	**6**	-	-	10	1.43	5
March	-	-	-	-	-	-	-	-	-	2
Autumn/Winter Total	2	1	7	4	8	4	5	31	4.42	12

Comparisons between Means of 1991/98 and 1998/2005 data sets shows a decrease of - 63.33%

Table 3 Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Black-necked Grebe **7 year mean Poole Harbour population (Sept - Mar) = 4.4**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	-	-	-	-	-	-	-	-	-	-
Annual Mean	-	-	-	-	-	-	-	-	-	-
Range	-	-	-	-	-	-	-	-	-	-
% of annual mean/ Poole Harbour mean	-	-	-	-	-	-	-	-	-	-
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	526
Mean density/ha										

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	-	1	-	-	-	-	-			1
Annual Mean	-	0.14	-	-	-	-	-			0.14
Range	-	1	-	-	-	-	-			1
% of annual mean/ Poole Harbour mean	-	3.24%	-	-	-	-	-			3.24%
Low water area (ha)	12	8	28	32	64	120	244			508
Mean density/ha										

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	-	-	-							
Annual Mean	-	-	-							
Range	-	-	-							
% of annual mean/ Poole Harbour mean	-	-	-							
Low water area (ha)	48	None	24							72
Mean density/ha										

Table 3 Black-necked Grebes (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	1	1	11	-	-	1	-	-		14
Annual Mean	0.14	0.14	1.6	-	-	0.14	-	-		2.02
Range	1	1	1 - 6	-	-	1	-	-		1 - 6
% of annual mean/ Poole Harbour mean	3.24%	3.24%	36.54%	-	-	3.24%	-	-		46.26%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha										

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	13	3								16
Annual Mean	1.86	0.43								2.29
Range	1 - 4	1 - 2								1 - 4
% of annual mean/ Poole Harbour mean	42.20%	9.74%								51.94%
Low water area (ha)	36	132	None							168
Mean density/ha										

Cormorant (*Phalacrocorax carbo carbo*)

Status (Present throughout the year)

WeBS - Qualifying Numbers for International threshold: **1200**[#]
WeBS - Qualifying Numbers for Great Britain threshold: **230**[#]

Species of Conservation Concern: U.K. Amber Listed Species[1]

[#] The National threshold figure has been increase from 130 to 230 (Kershaw & Cranswick 2003)
[1] Amber-listed because the U.K. hold ≥ 20% of East Atlantic Flyway population and ≥ 50% of U.K breeding population present in 10 or fewer sites but not a rare breeder (Gregory *et al.* 2002).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): **379.= 2.8% of G.B. population**
Poole Harbour 7 year WeBS count peak mean (1998 - 2005): **437 = 2.5% of G.B. population**

Past Status

The history and status of the wintering population of Cormorant in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

The endemic subspecies of Cormorants *P. carbo carbo* can be found in all months of the year in the Harbour.

Summering

Maximum counts outside the WeBS counts period are shown in Table 1. Numbers are at their lowest during the breeding season (May -June) (mean 51) but from July they steadily increase (mean 151) and substantially in August (mean 266). The pattern of occurrence is similar to that recorded previously during 1991-1998 (Pickess & Under-hill Day 2002).

Table 1 Maximum number of Cormorants recorded April - August in Poole Harbour 1998 - 2004 (Dorset Bird Report)

	1998	1999	2000	2001	2002	2003	2004	mean
April	N/c	30	85	65	120	N/C	89	60
May	24	10	110	N/C	53	86	79	60
June	44	7	84	42	40	N/C	N/C	43
July	200	30	146	147	177	101	257	151
August	112	60	334	354	323	413	N/C	266

N/C = No count

Unfortunately, these figures do not indicate the composition of the birds as to whether they are immatures or adults. Counts have been made of nesting birds at two Purbeck colonies during an 18-year period (1986-

2004), with Gad Cliff (16 year) and Ballard Cliffs (14 years). The overall trend of nesting pairs has been

downwards from the peak during the early 1990's but currently appears to be fairly stable at just over a 100 pairs. At the Ballard Cliffs colony, productivity of 1.6 fledged young per nest was recorded in 2004 (Mavor et al. 2005). In a Great Britain context, the Purbeck population of *P. c. carbo* represents 1.5% of the national breeding population (Mitchell et al. 2004). In August, whilst, the number of fledged young and adults might be equivalent to the Purbeck breeding population, it is very unlikely that all are local birds. Until counts separating the adults from immatures are undertaken during the summer months, the current data could be very misleading. Certainly, adults are seen feeding in the Harbour during the summer (B. Pickess pers. obs.) but are they local breeding birds? It is probable that most are of local provenance but if so, are they finding all their food in the Harbour or just some of it, and how important is the Harbour food resource to them?

In view of past local conflicts concerning these birds, it might be important to know where our birds originate. Already there is increasing concern about inland breeding Cormorants, away from Dorset, most of whom are of the rapidly expanding continental subspecies *P. c. sinensis* (Mavor et al. 2005, Newsom et al. 2007).

Wintering

Table 2 shows the monthly low water WeBS counts for the period 1998/99 to 2004/05. During this 7-year period of WeBS counts, only on two occasions between September and November was the harbour peak population below the national importance threshold figure. Numbers generally decline in December and remain below the national importance threshold figure. The wintering population trend over the 14-year period 1991-2005 shows a slow rise but with some wide fluctuations in peak numbers (Fig 12). The national trend over the same period has also slowly risen, with the pattern of occurrence similarly showing a steady decline after the autumn peak (Banks et al. 2006).

As with summering birds, it would be of interest to know the adults to immatures ratio of the wintering population that are present. Adults of the subspecies *P. c. sinensis* have been seen occasionally in the Harbour during the winter, usually from the 'Bird Boat' tours round the Harbour (B. P. Pickess pers. obs.). Unfortunately, the sighting of this race appear to go unrecorded, as over this 7-years period there are only three published records in the Dorset Bird Reports. With the population expansion of the continental subspecies *P. c. sinensis* into Great Britain, there is a need to know whether sighting of this race are becoming more frequent in the Harbour. Already licences are being sanctioned in the UK for culling Cormorants and in 2005 licences for the culling of 3000 Cormorants was issued (Guardian Unlimited 21/08/05). These licences have been issued to placate inland anglers. The perceived Cormorant 'culprits' would appear principally, to comprise of the immigrant subspecies *P. c. sinensis*, not our native more coastal and Amber Listed *P. c. carbo*.

Distribution

The distribution and density of Cormorants recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 3. Each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods is show in Map 11.

During the autumn and winter months at high water, birds can be encountered anywhere in the Harbour. At low water, birds tend to gather and haul out at favoured locations, usually exposed promontories. The Brownsea Island lagoon (NE2) is still the favoured location and held almost 50% of the Harbour's population. Only four other locations held over 5% of the population, Keys worth (W5) (5.8%); Holes Bay (NC3) (6.4%); the Baiters complex (NE3) (5.6%) and East Fitzsworth (SC4) (5.9%).

Table 2 **Cormorant**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 14 year mean (1991 -2005)

Species of Great Britain Importance

1% Great Britain Threshold Figure = 230 Months in which figure reached is shown in **Bold**

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	**254**	141	**332**	**425**	***419***	**412**	**431**	2414	345	321
October	**440**	**246**	**265**	**592**	**558**	**359**	**376**	2836	405	307
November	**258**	**298**	**244**	**359**	**265**	166	**300**	1890	270	227
December	186	**245**	64	**228**	98	92	198	1111	159	179
January	79	87	111	91	89	146	137	740	106	124
February	108	72	67	85	56	107	32	527	75	109
March	98	72	*115*	157	81	100	149	772	110	117
Autumn/Winter Total	1423	1161	1198	1937	1566	1382	1623	10290	1470	1384

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the two indicative figures, the 'mean' becomes 1394 and this figure is used to calculate the percentage distribution for the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows an increase of + 6.21%

Table 3 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Cormorant **7 year mean Poole Harbour population (Sept - Mar) = 1394**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	7	110	570	143	120			398	81	1429
Annual Mean	1	15.5	81.3	20.4	17.1			56.8	11.6	203.7
Range	1 - 3	1 - 15	2 - 40	1 - 31	1 - 12			1 - 40	1 - 11	1 - 40
% of annual mean/ Poole Harbour mean	0.07%	1.12%	5.84%	1.46%	1.23%			4.08%	0.83%	14.63%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	538
Mean density/ha	0.02	0.49	1.27	0.17	0.19			0.33	0.96	

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	136	224					628			988
Annual Mean	19.4	32					89.7			141.1
Range	1 - 45	2 - 11					1 -26			1 - 45
% of annual mean/ Poole Harbour mean	1.39%	2.30%					6.43%			10.12%
Low water area (ha)	12	8	28	32	64	88	212			232
Mean density/ha	1.62	4					2.57			

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	116	4822	544							5482
Annual Mean	16.6	688.6	77							782.2
Range	1 - 9	1 - 455	1 - 79							1 - 445
% of annual mean/ Poole Harbour mean	1.19%	49.40%	5.57%							56.16%
Low water area (ha)	48	None	24							72
Mean density/ha	0.35		0.05							

Table 3 Cormorant (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	188	19	327	583	18	353	17	3		1508
Annual Mean	26.9	2.7	46.7	83.3	2.6	50.4	2.4	0.4		215.4
Range	1 - 40	1 - 3	1 - 60	1 - 145	1 - 5	1 - 128	1 - 2	1 -2		1 - 145
% of annual mean/ Poole Harbour mean	1.93%	0.19%	3.35%	5.97%	0.18%	3.61%	0.17%	0.03%		15.43%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	0.61	0.07	2.34	1.04	0.04	1.57	0.05	0.02		

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	205	92	33							330
Annual Mean	29.3	13.1	4.7							47.1
Range	1 - 30	1 - 10	1 - 3							1 - 30
% of annual mean/ Poole Harbour mean	2.10%	0.94%	0.34%							3.38%
Low water area (ha)	36	132	None							168
Mean density/ha	0.81	0.1								

Little Egret (*Egretta garzetta*)

Status (This once national rarity has now colonised the Harbour and is present throughout the year. Breeding commenced in 1996.)

WeBS - Qualifying Number for International threshold: **1300#**
WeBS - Qualifying Number for Great Britain threshold: **30#**

Species of Conservation Concern U.K. Amber Listed Species *

Where 1% of the British or all-Ireland population is less than 50 birds, 50 is normally used as a minimum qualifying level (Kershaw & Cramswick 2003). A count of 30 has been chosen as a qualifying level.

* Amber-listed because of five-year mean population size of 1 -300 breeding pairs in U.K. (Gregory *et al.* 2002).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): 38 = 9.0% of G.B. population
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): 114 = 4.1% of G.B. population

Past Status

The history and status of the wintering population of Little Egret in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Breeding Status (1996 - 2006)

Since the first breeding in Great Britain by Little Egret on Brownsea Island in 1996 (Cook 1998), the species has nested around the Harbour annually. Table 1 shows the number of pairs and the locations where breeding bas occurred during the past 11 years.

The establishment as a breeding bird progressed steadily but reached a plateau of between 41-46 pairs during the first five year of the 21st century and in 2004 a small colony began to establish at Arne. In 2005 disaster struck the Brownsea Island colony, which was recording its the highest numbers of 49 pairs, when all the young were taken from the nests by a pair of Ravens (*Corvus corax*). The colony was deserted during 2006 (C. Thain per. comm.)

Table 1 **Minimum number of pairs of Little Egret breeding pairs around Poole Harbour (1996-2006)** (Data from Dorset Bird Reports & RSPB unpublished data)

Year	Brownsea Island	Arne	Year	Brownsea Island	Arne
1996	2 pairs	-	2002	42 pairs	-
1997	5 pairs	-	2003	41 pairs	-
1998	9-11 pairs	-	2004	44 pairs	3 pairs
1999	23 pairs	-	2005	49 pairs*	5/6 pairs[1]
2000	46 pairs	-	2006	None	5/6 pairs[1]
2001	45 pairs	-			

* Highest number of pairs recorded but all nest failed because young completely predated by a pair of Ravens
[1] N. Gartshore (pers. comm.)

This Amber listed species requires annual monitoring of its hreeding population.

Wintering Population

The history and status of the wintering population of Little Egret in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

The monthly Harbour WeBS counts for Little Egret for the 7-year period (1999-2005) are shown in Table 2. The 14-year trend using the 1991/92 to 2004/05 peak count annual means, shows a steady and continuing increase (Fig 13). It is difficult to be certain that the low water WeBS figures represent the actual numbers of Little Egrets present in the environs of the Harbour. Birds appear very mobile and can be encountered almost any time during the day beside streams, ditches and in fields with cattle in the areas surrounding the Harbour (B. Pickess pers. Obs.). These 'obvious white birds' can also be overlooked in deep creeks at low water. It is probable that the early wintering population is larger than the WeBS data would suggest. Musgrove (2002) commented on the marked differences between core counts (WeBS) and birds recorded coming to a roost in trees around Littlesea and Brands Bay. In October, the peak count of roosting birds was 142 but only 48 were noted on WeBS, similarly 150 coming to roost in December 2000 but only 43 recorded on WeBS (Dorset Bird Reports). These and other records indicate that at low water not all of the 'resident' birds are actually in the Harbour sections at the time of the counts.

In most years, the population in August has risen to over 60 birds (adults and young), with a maximum count of 93 in 2004 (Dorset Bird Reports). With the addition of locally bred and dispersing young from other British and continental localities arriving in the Harbour in late summer, the peak population is usually reached in September. Numbers slowly decline through the winter, with wandering birds reaching the upper parts of the river valleys in the county (Dorset Bird Reports). Almost certainly, the initial Harbour population came from and probably still receives immigrant dispersing young birds from the northward expanding French Atlantic coast populations, which by 1995 had reached Nord-Pas-de-Calais (Voisin et al. 2005).

Since the establishment of Little Egrets in the Harbour, there has not been any long periods of severe winter weather. How such weather would affect the Harbour Little Egrets can only be speculation but in western France, during periods of severe weather, it caused only temporally population declines before recovering (Voisin et al. 2005).

Distribution

The distribution and density of Little Egrets recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 3, while Map 12 shows each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods.

Table 4 Percentage population change of Little Egret between 1991/92-1997/98 and 1998/99-2004/05 at key sections in Poole Harbour

Location	1998/99-2004/05	1991/92-1997/98		1998/99-2004/05	1991/92-1997/98
Keysworth (W5)	14.9%	3.9%	East Fitzworth (SC4)	7.9%	10.9%
Holton (W2)	16.0%	9.3%	Arne Bay (SC6)	7.1%	6.0%
Holes Bay (NC3)	14.0%	9.8%	Brands Bay (SE 2)	6.6%	8.9%
			Total	62.5%	48.8%

The pattern of winter usage of the Harbour by Little Egret has changed little comparing the two 7-year WeBS data sets (Table 3). With rising numbers in the Harbour, it is not surprising that birds have been recorded from all sections. The most favoured sections of the Harbour used during 1991-1998, are not dissimilar to the current 7-year period but with variable percentages, these are given in Table 4. The only difference being that an increased percentage of the Harbour population is located now in these six sections.

Unfortunately, there is no recent data with regard roosting sites or numbers. There would appear to be a need to locate the current roost sites and number of birds attending, which is more likely to indicate accurately the size of the Harbour population, rather than the core WeBS counts used at present.

Table 2 **Little Egret**

Poole Harbour WeBS counts (Sept - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 7 year mean (1991 - 1998)

Species of Great Britain Importance

1% Great Britain Threshold Figure = 10 Months in which threshold reached is shown in **Bold**

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	**61**	**67**	**122**	**100**	*140*	**179**	**113**	782	112	34
October	**45**	**48**	**97**	**118**	**136**	**47**	**75**	566	81	25
November	**46**	**49**	**61**	**84**	**99**	**41**	**116**	496	71	22
December	**38**	**58**	**43**	**77**	**101**	**52**	**62**	431	62	13
January	**34**	**41**	**50**	**45**	**93**	**75**	**59**	397	56	17
February	**19**	**36**	**41**	**52**	**55**	**63**	**32**	298	42	12
March	**50**	**25**	*26*	**28**	**52**	**37**	**31**	249	36	12
Autumn/Winter Total	293	324	440	504	676	494	488	3219	460	135

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the two indicative figures, the 'mean' becomes 436 and this figure is used to calculate the percentage distribution for the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows an increase of + 240.74%

Table 3 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Little Egret **7 year mean Poole Harbour population (Sept - Mar) = 436**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	9	71	455	110	78			488	17	1228
Annual Mean	1.3	10.1	65	15.7	11.1			69.7	2.5	175.4
Range	1 - 3	1 - 7	2 - 28	1 - 1-	1 - 8			1 - 78	1 - 3	1 - 78
% of annual mean/ Poole Harbour mean	0.30%	2.30%	14.90%	3.60%	2.40%			16.00%	0.58%	40.08%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	538
Mean density/ha	0.03	0.32	1.02	0.13	0.13			0.41	0.21	0.32

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	31	14					426			471
Annual Mean	4.4	2					60.9			67.3
Range	1 - 6	1 - 2					1 - 21			1 - 21
% of annual mean/ Poole Harbour mean	1.02%	0.46%					13.96%			15.44%
Low water area (ha)	12	8	28	32	64	120	244			264
Mean density/ha	0.37	0.25					0.25			0.25

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	7	57	66							130
Annual Mean	1	8.1	9.4							18.5
Range	1 - 2	1 - 7	1 - 4							1 - 7
% of annual mean/ Poole Harbour mean	0.23%	1.86%	2.15%							4.24%
Low water area (ha)	48	None	24							72
Mean density/ha	0.02		0.39							0.13*

* Excludes NE2 data (Brownsea Island Lagoon)

Table 3 Little Egret (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	105	85	108	240	94	216	59	68		975
Annual Mean	15	12.1	15.4	34.3	13.4	30.9	8.4	9.7		139.2
Range	1 - 14	1 -- 5	1 - 13	1 - 32	1 - 10	1 - 29	1 - 7	1 - 11		1 - 32
% of annual mean/ Poole Harbour mean	3.44%	2.78%	3.53%	7.86%	3.07%	7.09%	1.92%	2.22%		31.91%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	0.34	0.34	0.77	1.72	0/19	0.96	0.19	0.4		0.39

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	62	202	4							268
Annual Mean	6.9	28.9	0.6							36.4
Range	1 - 6	1 - 23	1 - 2							1 - 23
% of annual mean/ Poole Harbour mean	1.58%	6.62%	0.13%							8.33%
Low water area (ha)	36	132	None							168
Mean density/ha	0.24	0.22								0.21*

* Excludes SC3 data (Little Sea)

Oystercatcher (*Haematopus ostralegus*)

Status (Present throughout the year - a breeding, passage and winter visitor)

WeBS - Qualifying Number for Great Britain threshold: **3200**[#]

Species of Conservation Concern U.K. Amber Listed Species *

[#] Rehfisch et al. (2003) The National threshold figure has now been reduced from 3600 to 3200

* Amber-listed because the U.K. hold ≥ 20% of East Atlantic Flyway population; ≥ 50% of U.K. non-breeding population present in 10 or fewer sites and ≥ 20% of the European breeding population in the UK (Gregory 2002).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): **1543 = 0.6% of G.B. population**
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): **1507 = 0.6% of G.B. population**

Breeding Population

Past Breeding Status

The history and status of breeding Oystercatcher in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Breeding Status (1999 - 2004)

The Harbour breeding population of Oystercatcher appears to have change very little from the 1991-97 period, with the stronghold still being Brownsea Island, where between 15 - 28 pairs are recorded annually. The only other records are of 2 adults with 2 juveniles at Parkstone Yacht Club (NE3) on 4th June 2003 and 2 pairs on Green Island (SC1) in 2004, who possibly had their nests washed out by high tides (Dorset Bird Reports). The current Harhour breeding population is about 25 pairs., usually all on Brownsea Island but probably most years a few additional pairs may nest on the private islands and go unrecorded.

Wintering Population

Past Status

The history and statos of the wintering population of Oystercatcher in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 1 shows the monthly low water WeBS counts for the period 1998/99 to 2004/05. Comparing the 7-year mean of the 1991/92-1997/98 data set with the current set, shows a decline by - 4.9%. The 14-year trend using the 1991/92 to 2004/05 peak count annual means, shows a steady and continuing decline (Fig 14). The British index has also been showing a slight decline but overall the underlying trend is fairly stable (Banks et al. 2006).

The general pattern of occurrence in the Harbour has changed, when compared with the previous 1991/92-

1997/98 data set. Numbers are much lower now in September that previously but steady rises in October and peaking in January, before falling away in February and March.

Distribution

The distribution and density of Oystercatcher recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 2. Each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods is shown in Map 13.

At low water Oystercatchers may be encountered almost anywhere in the Harbour. Comparing the current data set with the 1991/92-1997/98 data set, the same six sections still hold about 50% of the Harbour population, although the percentage in each section has changed (Table 3).

Table 3 Percentage population change of Oystercatcher between 1991/92-1997/98 and 1998/99-2004/05 at key sections in Poole Harbour

Location	1998/99-2004/05	1991/92-1997/98		1998/99-2004/05	1991/92-1997/98
Keysworth (W5)	10.8%	5.4%	East Fitzworth (SC4)	9.4%	7.9%
Giggers (W4)	6.3%	7.2%	Wytch (SC5)	8.9%	4.2%
Holton (W2)	8.4%	18.6%	Arne Bay(SC6)	8.9%	4.2%
			Total	52.7%	47.5%

At high water, birds tend to gather at favoured roost locations, usually on sandy promontories around the Harbour. The most important roost sites being at Arne Spit (SC6), Long Island (SC7), Green Island (SC1), Baiters (NE3) and Brownsea lagoon (NE2) (Morrison 2004). A number of key roost sites can be associated with low water feeding area i.e. Arne Spit/Long Island with Arne Bay and East Fitzworth/Wytch with Green Island. However, despite the large area that forms the Wareham Channel (W2, W4 & W5) which supports >25% of the Harbour's birds, it is more or less devoid of suitable large isolated sandy/gravely promontories for high water roosting. Presumably, birds have little option but to roost away from this general Wareham Channel area. The most likely, and nearest roost sites, are at Patchins Point (NC1) and Arne Bay (SC6) but some birds might go as far as the Brownsea Island lagoon (NE2).

Table 1 **Oystercatcher**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 7 year mean (1991 - 1998)

Species of Harbour Importance

1% Great Britain Threshold Figure = 3200

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	1062	1153	936	603	*786*	970	1167	6677	854	1219
October	1604	1576	1255	1196	1196	905	906	8638	1234	1177
November	1409	1647	1230	1406	1126	807	1075	8700	1243	1198
December	1242	2034	1521	1283	765	1004	1466	9315	1331	1185
January	1487	1444	1357	1429	1214	1281	1378	9590	1370	1421
February	1160	1190	985	804	837	1224	1162	7362	1051	1202
March	852	552	*612*	673	624	460	611	4384	626	810
Autumn/Winter Total	8816	9596	7284	7394	6548	6651	7765	54666	7709	8212

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the two indicative figures, the 'mean' becomes 7610 and this figure is used to calculate the percentage distribution for the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows a decrease of - 4.90%

Table 2 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Oystercatcher **7 year mean Poole Harbour population (Sept - Mar) = 7610**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	-	283	5762	3374	737			4448	691	15295
Annual Mean	-	40.4	823.1	482	105.3			635.4	98.7	2184.9
Range	-	1 - 110	2 - 450	1 - 195	1 - 83			6 - 276	1 - 70	1 - 276
% of annual mean/ Poole Harbour mean	-	0.53%	10.81%	6.33%	1.38%			8.35%	1.30%	28.70%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	526
Mean density/ha	-	1.26	12.86	4.02	1.2			3.69	8.22	4.15

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	1772	114					3997			5883
Annual Mean	253.1	16.3					571			840.4
Range	10 - 100	1 - 14					7 - 227			1 - 227
% of annual mean/ Poole Harbour mean	3.32%	0.21%					7.50%			11.03%
Low water area (ha)	12	8	28	32	64	120	244			508
Mean density/ha	21.09	2.04					2.34			1.65

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	4515	2474	2748							9737
Annual Mean	645	353.4	392.6							1391
Range	14 - 241	1 - 478	4 - 359							1 - 478
% of annual mean/ Poole Harbour mean	8.47%	4.64%	5.16%							18.27%
Low water area (ha)	48	None	24							72
Mean density/ha	13.43		10.36							14.41*

* Excludes NE2 data (Brownsea Island Lagoon)

Table 2 Oystercatcher (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	1555	567	2693	5019	2918	4717	2255	169		19893
Annual Mean	222.1	81	384.7	717	416.8	673.8	322.1	24.1		2841.8
Range	14 - 163	3 - 62	10 - 143	8.289	3 - 207	4 - 245	4 - 217	1 - 69		1 -289
% of annual mean/ Poole Harbour mean	2.91%	1.06%	5.05%	9.42%	5.48%	8.85%	4.23%	0.32%		37.32%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	5.05	2.25	4.95	8.96	5.78	21.06	7.32	1		8.07

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	998	2200								3198
Annual Mean	142.6	314.3								456.9
Range	1 - 54	2 - 121								1 - 121
% of annual mean/ Poole Harbour mean	1.87%	4.13%								6.00%
Low water area (ha)	36	132	None							168
Mean density/ha	3.96	2.38								2.72

Avocet (*Recurvirostra avosetta*)

Status (Potential breeding species, increasing passage migrant and winter visitor and occurring in numbers of International Importance)

WeBS - Qualifying Numbers for International Threshold: **730**[#]
Qualifying Number for Great Britain Threshold: **35**[#]

Species of Conservation Concern U.K. Amber Listed Species[1]
European Listed: Non -SPEC[2]

[#] Rehfisch et al. (2003)

[1] Amber-listed because ≥ 50% of breeding population occurring in 10 or fewer sites and ≥ 50% of non-breeding population occurring in 10 or fewer sites (Gregory *et al.* 2002) .

[2] Now listed as Non SPEC from SPEC3. A species concentrated in Europe but now with a Favourable Conservation Status (BirdLife International 2004).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): 455 = 28% of max G.B. population[3]
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): 1248 = 25% of max G.B. population[4]

[3] (Pollett et al.. 2000)

[4] (Banks et al. 2006)

Breeding

In spring of 1999 the first known breeding attempt in the Harbour was recorded from the Lagoon on Brownsea Island. Two pairs hatched young but they all disappeared within days of hatching, the cause unknown (Williams 2000).

In 2002 during May and June two or three birds were present on the Brownsea Lagoon but there was no evidence of nesting. In 2003 a pair attempted to nest but were unsuccessful (Dorset Bird Reports for 2002 & 2003).

There have been no further attempts at nesting but it must only be a matter of time before the first successful breeding is recorded.

Wintering Population

Past Status

The history and status of the wintering population of Avocet in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 1 shows the monthly low water WeBS counts for the period 1998/99 to 2004/05. During the five winters of the present century, the Avocet peak counts in three to five months of each winter have held populations of International Importance. The large numbers recorded annually places the Harbour as the most import site in Britain for wintering Avocets. The annual peak counts exceed 1000 birds and most years it rises up to 1500 birds. The February 2002 count produced a record of 1862 birds, this is probably the

highest recorded count in the UK and represented just over 30% of the UK wintering population.
Comparing the 7-year mean of the 1991/92-1997/98 data set with the current set, shows a rise by over 145%. Using the 1998/99 to 2004/05 peak count annual means, this shows a trend of a steady increase, and continuing upwards (Fig 15). The trend upwards that has occurred in Poole Harbour has been replicated in many of the eastern English sites since the beginning of the 1990's (Banks et al. 2006).

Where do these increasing numbers of Avocets originate? At the end of the 20th century 29,496 Avocet pairs were counted in Western Europe and the population is considered stable (Hötker & West 2005). From ringing recoveries, it suggests that a high proportion of UK wintering Avocets are of continental origin coming from Belgium, Holland and Germany. This century, colour ringed Avocets wintering in Poole Harbour have been identified as originating from breeding colonies in Norfolk and Schleswig-Holstein, Germany (West 2005). Although the 14-year trend (Fig 15) indicates a continuing rise in the wintering population, will the Harbour be able to support increasing numbers or has it already reached its maximum? Only time will indicate the carrying capacity of the Harbour.

The pattern of returning birds is unchanged from the previous seven years but in increasing numbers. Birds begin to arrive in July and frequently over 100 are present during August. There is a noticeable increase during September to the upper 200's but there was an exception count of 649 in 2004. Most of the wintering birds have departed by March. During the 7-year period, the month of peak count was variable being October (once), November (twice), December (once), January (twice) and February (once). Why there should be this variation between annual peaks is not known. How much the Harbour numbers might be a reflecting of birds passing through on passage, to or from other wintering locations or related to food availability, remains unanswered.

Current Distribution

Tbe distribution and density of Avocet recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 2, while Map 14 shows each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods.

With the increasing number of Avocets in the Harbour, it is not surprising that small numbers have been recorded in most sections of the Harbour. The favoured areas of the Harbour used during 1991-1998, remain currently the same, although the percentage held of the population has changed. Brownsea Island lagoon (NE2) remains the headquarters of the Harbour population. A comparison of percentage population change with numbers of birds present, can be misleading. An overall 28% decline has occurred on the Brownsea Island lagoon (NE2), which formally held 62.8 % of the Harbour population and now 45.3% but in numerical terms, the actual number of birds present on the lagoon has risen by nearly 74%. As a percentage increase, Middlebere/Coombe Bay (SC7) has risen from 4.7% to 19.4% (+ 311%) but only a slight increase in Wytch Lake (SC5) 24.8% to 26.4% (+ 7%). The other favoured area, East Fitzsworth (SC4), which formally held 5% of the Harbour population, now has less than 2% (- 67%).

Table 1 **Avocet**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 7 year mean (1991 - 1998)

Species of International Importance

1% International Threshold Figure = 730 Months in which figure reached is shown in **Bold**
1% Great Britain Threshold Figure = 35

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	278	98	28	257	*276*	294	649	1880	268	98
October	310	**836**	138	534	**788**	463	**864**	3933	562	189
November	**834**	**823**	**741**	**1195**	560	**1150**	**915**	6218	888	406
December	571	**811**	518	**753**	**869**	**1244**	**1081**	5847	835	351
January	672	616	**765**	**889**	**1007**	**768**	**1459**	6176	882	365
February	246	492	**1491**	**1862**	**772**	611	**947**	6421	918	341
March	61	16	*55*	94	68	43	132	469	67	50
Autumn/Winter Total	2972	3692	3736	5584	4340	4573	6047	30944	4420	1800

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the two indicative figures, the 'mean' becomes 4373 and this figure is used to calculate the percentage distribution for the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows an increase of + 145.55%

Table 2 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harhour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Avocet **7 year mean Poole Harbour population (Sept - Mar) = 4373**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005		6	467	67	60			7	4	611
Annual Mean		0.8	66.7	9.6	8.6			1	0.6	87.2
Range		1 - 5	4 - 312	1 - 53	1 - 35			1 - 3	2	1 - 312
% of annual mean/ Poole Harbour mean		0.02%	1.53%	0.22%	0.19%			0.02%	0.01%	1.99%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	526
Mean density/ha		0.02	1.04	0.08	0.1			0.01	0.05	0.16

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	-	2	-	-	-	-	437			439
Annual Mean	-	0.3	-	-	-	-	62.4			62.7
Range	-	2	-	-	-	-	1 - 199			1 - 199
% of annual mean/ Poole Harbour mean	-	0.01%	-	-	-	-	1.42%			1.43%
Low water area (ha)	12	8	28	32	64	120	0.25			508
Mean density/ha	-	0.04	-	-	-	-				0.12

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	-	13863	-							13863
Annual Mean	-	1980.4	-							1980.4
Range	-	1 - 957	-							1 - 957
% of annual mean/ Poole Harbour mean	-	45.29%	-							45.29%
Low water area (ha)	48	None	24							72
Mean density/ha	-		-							-

Table 2 Avocet (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	-	14	389	507	8126	342	5926	266		15570
Annual Mean	-	2	55.6	72.4	1160.8	48.6	846.6	38		2224.3
Range	-	1 - 3	5 - 45	3 - 310	43 - 550	1 - 130	1 - 794	1 - 146		1 - 794
% of annual mean/ Poole Harbour mean	-	0.04%	1.27%	1.66%	26.54%	0.37%	19.36%	0.87%		50.11%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	-	0.05	2.78	0.9	16.12	1.52	19.24	1.58		6.32

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	77	49	-							126
Annual Mean	11	7	-							18
Range	1 - 76	1 - 44	-							1 - 76
% of annual mean/ Poole Harbour mean	0.25%	0.16%	-							0.41%
Low water area (ha)	36	132	None							168
Mean density/ha	0.31	0.05	-							0.11

Grey Plover *(Pluvialis squatarola)*

Status (A passage migrant and winter visitor)

WeBS - Qualifying Number for International threshold: **2500#**
WeBS - Qualifying Number for Great Britain threshold: **530#**

Species of Conservation Concern: U.K. Amber-listed Species[1]

The International threshold has been increased and the National threshold has now been up-rated from 430 to 530 (Rehfisch et al. (2003)

1 Amber-listed because the U.K. hold ≥ 20% of East Atlantic Flyway population and ≥ 50% of U.K. non-breeding population present in 10 or fewer sites (Gregory *et al.* 2002).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): 315
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): 283

Wintering Population

Past Status

The history and status of the wintering population of Grey Plover in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 1 shows the monthly low water WeBS counts for the period 1998/99 to 2004/05. The mean peak has steadily declined over the 7-year period, excepting in February 2001, when there was an exceptional count of 755. Comparing the 7-year mean of the 1991/92-1997/98 data set with the current set, shows a decline by >36%. Using the 1998/99 to 2004/05 peak count annual means, this shows a trend of a steady decline, and continuing (Fig 16). The British index has also been showing signs of a declining wintering Grey Plover population over the past eight years (Banks et al. 2006). This national decline would suggest that the Harbour's fall in numbers is not solely because of local factors. Additional to the national decline, it is possible that the species is also affected, like the Lapwing, because more birds are remaining during the winter months in eastern Britain (Austin & Rehfisch 2005; Gillings et al. 2006).

Whilst the only consistent data is from the WeBS counts, there are some published additional large counts away from WeBS counts but months of occurrence are only given (Dorset Bird Reports). These large counts, which are at variance with the WeBS counts for that particular month, would suggest that the Harbour population might fluctuate considerably within any one month. Unfortunately, without the dates of occurrence, these records could be separated by as much as two weeks either side of the WeBS count. It is possible that sometimes birds may be missed on WeBS counts but it is an obvious wader that is very unlikely to be overlooked. Table 2 gives some of the larger numbers recorded from the Brownsea Island lagoon and at two unlisted sites, together with the WeBS count for that month.

The pattern of their winter presence in the Harbour has changed little comparing the two 7-year data sets. In general, a few birds arrive during October, then numbers build in November and reach a peak in either January or February, before departing in March (Table 2).

Table 2 Large counts of Grey Plover recorded from Brownsea Island lagoon and unspecified sites outside WeBS counts dates with corresponding WeBS total for the month of occurrence (data from Dorset Bird Reports)

Year	Count and Month	WeBS count	Year	Count and Month	WeBS count	Year	Count and Month	WeBS count
1998	320 (Dec)#	226	2002	288(Jan)	176	2003	330 (Jan)	281
1999	500 (Feb)*	599	2002	160.(Feb)	88	2003	250.(Mar)	22
1999	201 (Mar)#	44	2002	145.(Dec)	130	2003	119.(Nov)	0

No location given * This very large single count included in the WeBS figure given.

Distribution

The distribution and density of Grey Plover recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 3, while Map 15 shows each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods.

Grey Plover are widely distributed at low water in the Harbour, usually in small numbers but over 63% are concentrated in just three sections (SC4, SC7 & SE2) and three further sections each bold over 5% (W3, SC2 & SC5). Even though the wintering population has diminished, its favoured locations remain similar to those of the pervious 7-year period. The major change in section usage has been in Warebam Channel. Previously this area held over 23% of the Harbour population, it now supports just under 12%. Section (W4) has been deserted and (W2) has declined by 75% but (W3) is used by nearly 6% of the population. It is possible with a declining population, that some birds, formally in the less favoured areas, may have moved to occupy areas that have become available in the key locations. The only increases in occurrence bave been of 5% in (SC4) and 10% in (SC7) but the reason for these changes is unclear.

Table 1 **Grey Plover**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 7 year mean (1991 - 1998)

Species of Harbour Importance

1% Great Britain Threshold Figure = 530 Months in which figure reached is shown in **Bold**

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	14	3	-	5	*3*	-	2	27	4	9
October	22	12	12	1	12	17	19	95	14	37
November	84	207	16	53	24	-	56	440	63	99
December	226	92	69	89	130	95	70	771	110	130
January	196	76	200	176	281	76	170	1175	168	282
February	91	245	**744**	88	51	137	33	1389	198	293
March	44	70	*43*	15	22	2	57	253	36	82
Autumn/Winter Total	677	705	1084	427	520	327	407	4150	593	932

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the two indicative figures, the 'mean' becomes 4104 and this figure is used to calculate the percentage distribution for the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows a decrease of - 36.37%

Table 2 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within tbe intertidal habitat for each count area in shown

Grey Plover **7 year mean Poole Harbour population (Sept - Mar) = 586**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	-	39	46	232	-	-	-	148	10	475
Annual Mean	-	5.6	6.6	33.1	-	-	-	21.1	1.4	67.8
Range	-	1 - 35	46	1 - 186	-	-	-	1 - 111	1 - 4	1 - 186
% of annual mean/ Poole Harbour mean	-	0.95%	1.12%	5.65%	-	-	-	3.60%	0.24%	11.56%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	526
Mean density/ha	-	0.17	0.1	0.27	-	-	-	0.12	0.09	0.13

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	32	-	-	-	-	-	53			85
Annual Mean	4.6	-	-	-	-	-	7.6			12.2
Range	1 - 12	-	-	-	-	-	3 - 25			1 -25
% of annual mean/ Poole Harbour mean	0.78%	-	-	-	-	-	1.29%			2.07%
Low water area (ha)	12	8	28	32	64	120	244			508
Mean density/ha	0.38	-	-	-	-	-	0.03			0.02

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	1	8	23							32
Annual Mean	0.1	1.1	3.3							4.5
Range	1	1 - 2	1 - 5							1 - 5
% of annual mean/ Poole Harbour mean	0.03%	0.19%	0.56%							0.78%
Low water area (ha)	48	None	24							72
Mean density/ha	<0.01		0.14							0.05*

* Excludes NE2 data (Brownsea Island Lagoon)

Table 2 Grey Plover (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	124	253	178	1055	232	89	582	2		2515
Annual Mean	17.7	36.1	25.4	150.7	33.1	12.1	83.1	0.3		358.5
Range	1 - 67	4 - 128	1 - 52	2 - 135	1 - 33	1 - 13	1 - 152	2		1 - 152
% of annual mean/ Poole Harbour mean	3.23%	6.16%	4.34%	25.72%	5.65%	2.17%	14.18%	0.05%		61.50%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	0.4	1	1.27	1.88	0.46	0.38	1.89	0.01		1.02

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	37	960	-							997
Annual Mean	5.3	137.1	-							142.4
Range	1 - 8	1 - 92	-							1 - 93
% of annual mean/ Poole Harbour mean	0.90%	23.40%	-							24.30%
Low water area (ha)	36	132	None							168
Mean density/ha	0.14	1.04	-							0.84

Lapwing (*Vanellus vanellus*)

Status (Winter visitor in declining numbers, passage migrant and a small unstable breeding population)

WeBS - Qualifying Number for International threshold: **20000**[#]
WeBS - Qualifying Number for Great Britain threshold: **20000**[#]

Species of Conservation Concern U.K. Amber Listed Species *
European Listed SPEC2[1]

[#] The GB and International thresholds have remained unchanged (Rehfisch et al. 2003)

[*] Amber listed because ≥ 20% of East Atlantic Flyway non-breeding population in U.K. and Rapid (≥ 50%) decline in UK breeding population over previous 25 years (Gregory *et al.* 2002)

[1] SPEC2 listed because population being concentrated in Europe and with Unfavourable Conservation Status (BirdLife International 2004).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): = 5527
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): = 1684

Breeding Population

Past Breeding Status

The history and status of the Lapwing in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Breeding Status (1999 - 2006)

During the period 1999-2006, breeding has been recorded on meadows adjacent to the Harbour in every year. Table 1 shows the number of pairs and the locations where breeding was known to have occurred.

Table 1 **Minimum number of pairs of Lapwings present during the breeding season around Poole Harbour (1999-2005)**
(Data from Dorset Bird Reports & RSPB unpublished data)

Year	Locations	Minimum total number of pairs
1999	Greenlands Farm, Studland	1
	French's Farm Lytchett	1
2000	NT - Middlebere Farm	1
2001	RSPB - Arne Moors	3
2002	RSPB - Arne Moors	3
2003	RSPB - Arne Moors	3
2004	RSPB - Arne Moors	3
2005	RSPB - Arne Moors	11
2006	RSPB - Arne Moors	15

With cattle grazing controls being instigated at the RSPB Arne Moors N.R., conditions are being created for Lapwing to nest. Without these actions, it is probable that the Lapwing would no longer he a Harbour breeding species. From this nucleus, it should enable an expansion of the breeding population to occur, once other adjacent wet grasslands are returned to favourable condition.

A feature of the past seven years has been a succession of mild winters, which has resulted in the grass growing season commencing before the beginning of the nesting season in mid-March. As a result, in other potential nesting locations, the grass height is already too long to be suitable for breeding.

This Amber listed specie's breeding population around the Harbour requires annual monitoring and sympathetic understanding of its breeding requirements. Concerted efforts on the Arne Moors illustrates what has to be done, if the Lapwing is to remain a Harbour breeding species. The declines in the Harbour environs population is not an isolated case, as during the late 1980's and through the 1990's Dorset's farmland population has declined by 51% (Walker et al. 1999).

Past Status

The history and status of the passage and wintering population of Lapwing in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Wintering

The winter population is considerably below the 1% GB threshold but the Lapwing is an important constituent of the Harbour's waterfowl population. Table 2 shows the monthly low water WeBS counts for the period 1998/99 to 2004/05. These low water counts probably reflect the size of the wintering population that is present in the environs of the western side of the Harbour.

During the 7-year period, the annual counts have considerably declined. This is reflected in comparing the seven years means of 1991-1998, with those of 1998 - 2005, this shows an alarming decline by 75.5% (Table 2). This decline was beginning to become apparent during the late 1990's and as shown in Fig 17, using the peak annual count, the downward trend bas been gathering pace over the past 10 years. Poole Harbour is not alone in recording steady declining winter numbers, other sites in S.W. England have been experiencing similar trends. It is suggested that the reason for this S.W. England decline is that overall winter temperature has risen in the east of Britain since the 1990's and with less severe winters, more birds are now remaining in eastern Britain (Austin & Rehfish 2005; Gillings et al. 2006). There may be some more subtle reasons for this population shift, as Poole Harbour's total peak counts rose sharply during 2004/05, mirroring many other sites in Great Britain, which also had above average counts (Banks et al. 2006).

Distribution

The distribution and density of Lapwing recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 3. Each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods is shown in Map 16. Although the overall wintering population has drastically declined, the distribution pattern is very similar with those of the previous 7-year period. Whilst there has been some sectional shifting with the east of the Harbour (W2 - W7), this general area, as previously, held just over 80.0% of the Harbour population. This only other site where significant numbers occurred was at Upper Middlebere (SC8), which held a further 10.0% of the wintering population.

As noted by Morrison (2004), this plover does not roost within the Harbour and his daylight observations suggest that there appeared to be little interchange between the wintering flocks. Outside of the WeBS counts, the largest flocks recorded seldom reached more than a 1000 birds, all at known traditional wintering areas of Lytchett Minster, Bestwall and Middlebere Farm (Dorset Bird Reports).

Use of the Harbour by Lapwing

The wintering population of Lapwings use the agricultural lands on the western side of the Harbour for feeding and roosting. Lapwing are usually only seen in the Harbour during the low water periods and gather as resting flocks. Birds may move some distance between feeding and resting on the estuary. One regular wintering flock on fields to the north of the A35 at Lytchett Minster, travel over 1 km to rest on the mud flats in Lytchett Bay (W3) at low water (B.P. Pickess pers. obs.). Why birds should leave their feeding grounds and fly to the estuary mud flats, where they are seldom seen feeding and whether they move there at every low tide, is not known?

Table 2 **Lapwing**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 7 year mean (1991 - 1998)

Species of Harbour Importance

1% Great Britain Threshold Figure = 20000

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	94	55	16	55	*29*	3	8	260	37	316
October	79	108	344	205	79	-	78	893	128	746
November	85	799	248	295	322	420	1209	3378	482	1709
December	3046	276	348	183	261	292	2434	6840	977	2967
January	1151	268	2626	611	1478	106	1247	7487	1070	4553
February	247	113	985	20	629	797	30	2821	403	2257
March	32	9	*5*	-	5	6	260	317	45	78
Autumn/Winter Total	4734	1628	4572	1369	2803	1624	5266	21996	3142	12626

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the two indicative figures, the 'mean' becomes 3137 and this figure is used to calculate the percentage distribution for the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows a decrease of - 75.15%

Table 3 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Lapwing **7 year mean Poole Harbour population (Sept - Mar) = 3137**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	3109	3168	4831	593	5879	-	-	132	-	17712
Annual Mean	444.1	452.6	690.1	84.7	839.8	-	-	18.8	-	2530.1
Range	2 - 1225	4 - 900	5 - 1100	30 - 378	1 - 639	-	-	12 - 70	-	1 - 1100
% of annual mean/ Poole Harbour mean	14.16%	14.43%	22.00%	2.70%	26.77%	-	-	0.60%	-	80.66%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	526
Mean density/ha	8.88	14.14	10.78	0.71	9.54	-	-	0.11	-	4.81

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	-	-	-	-	-	-	194			194
Annual Mean	-	-	-	-	-	-	27.7			27.7
Range	-	-	-	-	-	-	1 - 115			1 - 115
% of annual mean/ Poole Harbour mean	-	-	-	-	-	-	0.88%			0.88%
Low water area (ha)	12	8	28	32	64	120	244			508
Mean density/ha	-	-	-	-	-	-	0.11			0.05

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	-	5	-							5
Annual Mean	-	0.7	-							0.7
Range	-	1 - 4	-							1 - 4
% of annual mean/ Poole Harbour mean	-	0.02%	-							0.02%
Low water area (ha)	48	None	24							72
Mean density/ha	-		-							-

Table 3 Lapwing (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	1	389	-	640	486	1	-	2319		3836
Annual Mean	0.1	55.6	-	91.4	69.4	0.1	-	331.3		547.9
Range	1	1 - 254	-	4 - 120	1 - 200	1	-	3 - 485		1 - 485
% of annual mean/ Poole Harbour mean	<0.01%	1.77%	-	2.91%	2.21%	<0.01%	-	10.56%		17.45%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	<0.01	1.54	-	1.14	0.96	<0.01	-	13.5		1.55

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	-	215	-							215
Annual Mean	-	30.7	-							30.7
Range	-	1 - 80	-							1 - 80
% of annual mean/ Poole Harbour mean	-	0.98%	-							0.98%
Low water area (ha)	36	132	None							168
Mean density/ha	-	0.23	-							

Dunlin (*Calidris alpina*)

Status (Passage Migrant and Winter Visitor)

WeBS - Qualifying Number for International threshold: **14000**[#]
WeBS - Qualifying Number for Great Britain threshold: **5300**[#]

Species of Conservation Concern - **U.K. Amber Listed Species**[1]
Europe Listed SPEC3 (winter)[2]

[#] Rehfisch et al. (2003) The National threshold figure has now been up-rated from 1200 to 1500 [#]

[1] Amber-listed because ≥ 20% of East Atlantic Flyway non-breeding population in U.K.; ≥ 50% of non-breeding population occurring in 10 or fewer sites; Moderate (25%-49%) decline in UK breeding population over previous 25 years and ≥ 50% f breeding population occurring in 10 or fewer sites but not rare breeder (Gregory *et al.* 2002)

[2] SPEC3 listed as a species not concentrated in Europe but with an Unfavourable Conservation Status (BirdLife International 2004).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): **6055 = 1.3% of G.B. population**
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): **6239 = 1.9% of G.B. population**

Past Status

The history and status of the passage and wintering population of Dunlin in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Wintering

Table 1 shows the monthly low water WeBS counts for the period 1998/99 to 2004/05. During this 7-year period of WeBS counts, only in two winters was there no counts above the national importance threshold figure. The 14-year trend of annual peak counts indicates that the population is continuing to rise (Fig 18) but the annual total counts over the same 14-year period, show in line with the British index, a continuing decline (Banks et al. 2006). This decline is also apparent if the two 7-year data sets are compared, and this shows an overall decrease by 12.3% (Table 1).

The peak counts during the current 7-year period, as during the 1991/92-1997/98 period, occurred usually in either January or February. There was an exceptionally large count in January 2005 of 7026, which was 2.1% of maximum GB population. The pattern of presence in the Harbour is little changed between the two data sets but it suggests that birds are vacating the Harbour earlier, with a marked 18% decline in the February numbers (Table 1).

If August/September and March/April are taken as the passage period , comparing the two WeBS data sets for September and March, shows that passage numbers appear to be declining (Table 1). In the autumn, the July-August maximum range bas also declined (200-400), where previously it was (200-550) (Dorset Bird Reports; Pickess & Under-hill Day 2002).

Distribution

The distribution and density of Dunlin recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 2. Each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods is shown in Map 17.

Dunlin are distributed at low water, almost throughout the Harbour but there can be considerable variation in numbers. Shown in Table 3 is the sections of the Harbour where the major concentrations of birds occurred during the two 7-year periods. Numbers have varied considerably, except for Brands Bay (SE2), which has remained unchanged.

Table 3 Percentage population change of Dunlin between 1991/92-1997/98 and 1998/99-2004/05 at key sections in Poole Harbour

Location	1998/99-2004/05	1991/92-1997/98		1998/99-2004/05	1991/92-1997/98
Giggers (W4)	30.0%	5.5%	East Fitzworth (SC4)	8.3%	6.5%
Keysworth (W5)	8.2%	14.1%	Wytch (SC5)	7.1%	4.1%
Holton (W2)	1.2%	14.9%	Lower Middlebere (SC7)	9.3%	3.5%
Holes Bay (NC3)	3.5%	9.3%	Brands Bay (SE 2)	22.7%	22.3%
			Total	90.0%	80.2%

As noted during previous 7-year period, with the exception of Holes Bay (NC3), the key sections are all on the W side of the Harbour. The reasons for the marked decline in Holes Bay is uncertain but it is interesting that Morrison (2006) recorded very few Dunlin during his study on the impact of bait digging upon feeding wildfowl and waders. Most of the Dunlin recorded appear to have been seen beside creeks and not out on the open mud. Could the presence of bait diggers deter Dunlin from feeding in the general area? Caldow et al. (2006) mention in recent studies that in Holes Bay *Hydrobia* spp. have increased but *polychaete* worms have fluctuated dramatically. These worms and molluscs are major prey items for Dunlin (Cramp et al. 1983). The variable densities of the favoured prey items from year to year, could be a reason why the numbers of Dunlin fluctuate around the Harbour..

Table 1 **Dunlin**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 7 year mean (1991 - 1998)

Species of Great Britain Importance

1% Great Britain Threshold Figure = 5600 Months in which figure reached is shown in **Bold**

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	525	47	201	323	*307*	290	37	1730	247	568
October	634	1024	255	383	74	181	328	2879	412	455
November	4495	2644	692	3752	931	84	2195	14793	2113	2283
December	5001	4274	3578	**6940**	2915	4226	3138	30072	4296	4607
January	**6816**	4194	4455	**6807**	**5976**	5376	**7026**	40650	5807	5660
February	**6145**	**6688**	4852	3139	4884	3680	2143	31531	4504	5492
March	890	630	*559*	488	301	370	1031	4269	610	1439
Autumn/Winter Total	24506	19501	14592	21832	15388	14207	15898	125924	17989	20504

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the two indicative figures, the 'mean' becomes 17697 and this figure is used to calculate the percentage distribution for the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows a decrease of - 12.26%

Table 2 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Dunlin **7 year mean Poole Harbour population (Sept - Mar) = 17967**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	203	619	37679	10272	2267	-	-	1515	30	52585
Annual Mean	29	88.4	5382.7	1467.4	323.8	-	-	216.4	4.3	7512
Range	3 - 200	1 - 350	2 - 4000	2 - 1500	1 - 300	-	-	3 - 460	30	1 - 4000
% of annual mean/ Poole Harbour mean	0.16%	0.49%	29.96%	8.17%	1.80%	-	-	1.20%	0.02%	41.80%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	526
Mean density/ha	0.58	2.76	84.1	12.23	3.68	-	-	1.26	0.36	14.28

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	17	-	-	-	-	-	4352			4369
Annual Mean	2.4	-	-	-	-	-	621.7			624.1
Range	3 - 10	-	-	-	-	-	1 - 797			1 - 797
% of annual mean/ Poole Harbour mean	0.01%	-	-	-	-	-	3.46%			3.47%
Low water area (ha)	12	8	28	32	64	120	244			508
Mean density/ha	0.83	-	-	-	-	-	2.55			1.23

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	750	208	2619							3577
Annual Mean	107.1	29.7	374.1							510.9
Range	1 -144	1 - 94	1 - 600							1 - 600
% of annual mean/ Poole Harbour mean	0.60%	0.16%	2.08%							2.84%
Low water area (ha)	48	None	24							72
Mean density/ha	2.23		12.91							6.68*

* Excludes NE2 data (Brownsea Island Lagoon)

Table 2 Dunlin (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	576	1660	1372	10408	8888	1792	11680	44		36420
Annual Mean	82.2	237.1	196	1486.8	1269.7	256	1668.6	6.3		5202.7
Range	1 - 230	18 - 1230	1 - 230	12 - 1000	8 - 650	6 - 340	2 - 1430	4 - 32		1 - 1230
% of annual mean/ Poole Harbour mean	0.45%	1.32%	1.09%	8.27%	7.07%	1.42%	9.29%	0.03%		28.94%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	1.87	6.58	9.3	18.58	17.63	8	37.93	0.26		14.78

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	1040	28590	-							29630
Annual Mean	148.6	4084.3	-							4232.9
Range	1 - 330	2 - 1800	-							1 - 1800
% of annual mean/ Poole Harbour mean	0.82%	22.73%	-							23.55%
Low water area (ha)	36	132	None							168
Mean density/ha	4.13	30.94	-							25.19

Black-tailed Godwit (*Limosa limosa islandica*)

Status (Present throughout the year: Passage Migrant and Winter Visitor, with some Summering)

WeBS - Qualifying Number for International threshold: **350** (*islandica*)[#]
WeBS - Qualifying Number for Great Britain threshold: **150**[#]

Species of Conservation Concern - U.K. Red-listed Species[1]
European Listed SPEC 2[2]

[#] The International threshold for *Limosa l. islandica* has been decreased from 700 to 150 and the Great Britain threshold has been up-rated from 70 to 150 (Rehfisch et al. 2003)

[1] Red-listed because of breeding decline during 1800-1995 but this designation refers principally to the nominate race of Black-tailed Godwit *Limosa limosa*. The Black-tailed Godwit further qualifies under Amber-listing because of 5 year mean of 1-300 breeding pairs in U.K., mostly *L. limosa* and >50% of U.K. non-breeding population *Limosa l. islandica*, in 10 or fewer sites and the U.K. hold ≥ 20% of East Atlantic Flyway population (Gregory 2002).

[2] SPEC2 listed because of species concentrated in Europe and with an Unfavourable Conservation Status (BirdLife International 2004).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): 1579 = 9.3% of G.B. population
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): 1856 = 5.2% of G.B. population

Wintering Population

Past Status

The history and status of the wintering population of Avocet in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 1 shows the monthly low water WeBS counts for the period 1998/99 to 2004/05. During this 7-year period of WeBS counts, only on four occasions was the count below the International Importance threshold figure. The Harbour passage and wintering populations, in line with other major sites in the UK, have continued to rise during this 7-year period (Banks et al. 2006). The 14-year trend of annual peak counts indicates that the population is continuing to rise (Fig 19) The population increase is resulting from the steadily rising breeding population in Iceland, which is now expanding into poorer quality habitats (Gunnarsson et al. 2006). The adult breeding population of Iceland was estimated to be 37500 individuals between 1999 - 2002 and if immature birds are included, the winter population is estimated at 47000 individuals (Gunnarsson et al. 2005). The exception peak count in February 2004 of 3095 birds in the Harbour may have represented over 6% of the Icelandic population.

The general pattern of occurrence can be divided into three sections, Wintering (September-February); Passage (Marcb-April and July-September) and Summering (May-June). However, it is difficult to assign birds recorded during the 'grey' overlapping periods. The months of peak counts have varied during 1998/99 to 2004/05 period, with two each occurring in November and January, and three in February. With the increasing number of ringed, mostly colour ringed, birds being observed in the Harbour, confirm their Icelandic breeding origins. More interestingly, these sightings give some indication as to bow mobile these birds may be. A number of the sightings are during passage time and possibly the Harbour is being used as a staging post, as these individuals have been or are later recorded along the Solent in Hampshire and Sussex coast, whilst two have been noted in Holland, and another in Flanders, Belgium. Other birds recorded bave

been ringed at sites along the Solent and one in Brittany, France (Dorset Bird Reports). These records would suggest that there may be some interchange between local wintering sites. Black-tailed Godwits also appear to be locally mobile and utilize flood plain grasslands, when flooded. This type of bebaviour may explain why, as occurred on the January 2003 WeBS count, when the Harbour was almost devoid of Black-tailed Godwits but there was at the same time a large increase in numbers occurring in the flooded valley of the River Avon Valley some 17 km to the NE of Poole Harbour. This illustrates the importance to this species of these alternative temperary flooded grasslands for feeding, associated with their wintering estuaries. This may possibly be one of the reasons why Poole Harbour, with its associated wet grassland, is a favoured wintering locality for this species.

The number of summering birds each year in the Harbour varies, usually larger numbers occurring in May than June. Some of these late birds may refer to non-breeding passage migrants. It is probable that the larger numbers encountered in some years in July are early returning birds from the breeding grounds. The maximum number of passage and summering birds (1998-2004) is given in Table 2.

Table 2 The maximum number of Black-tailed Godwits recorded in Poole Harbour during April - August (1998-2004) (Dorset Bird Reports)

	1998	1999	2000	2001	2002	2003	2004
April	711	1535	950	95	595	780	650
May	160	237	53	N/C	83	150	166
June	12	99	13	14	7	3	144
July	70	25	310	52	54	130	434
August	655	415	550	230	460	710	500

N/C = no counts

Distribution

The distribution and density of Black-tailed Godwit recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 3. Each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods is shown in Map 15.

With large numbers present during the winter, it is not surprising that Black-tailed Godwit are recorded from almost every sector of the Harbour at low water. Their density at low water, with the exception of W4, is very different to the 1991/92-1997/98 data set. The large flocks of birds appear to congregate at patches of mud, presumably where high densities of their main preferred food Polychaete Worms occur. The patch is exploited until presumably the food resource is depleted, then move to another patch. This movement might explain these population shifts around the Harbour and the density differences between the two data sets. The main concentrations now occur in Giggers (W4) 20.5%; Keysworth (W5) 18.5%; Holes Bay (NC3) 24.5%; Brownsea (NE2) 9.75% and Arne Bay (SC6) 5%. These five sections held nearly 80% of the Harbour population. With the except of NE2, all these sites are in areas of fine silt and have medium to high biomass (mg/sq/m) of the Polychaete Worm *Hediste diversicolor* (Thomas et al. 2004).

Generally, at low water feeding birds are little disturbed and can move back and forth with tides. Interestingly, in Holes Bay (NC3), where currently bait digging at low water and bait dragging occurs at high water, Black-tailed Godwits were noted feeding in the same areas that were exploited for bait (Morrison 2006). It was also observed that when feeding Black-tailed Godwits were disturbed by bait

diggers, they would fly a minimum of 150 m before settling and would unlikely to be able to return to their original feeding patch during that cycle of the tide (Morrison 2006).

The Harbour currently appears to be able to absorb the increasing numbers of Black-tailed Godwits in all seasons; this suggests that there is still a surplus of invertebrate prey to be exploited. A sobering predictions made concerning the impact of rising sea level upon the Harbours shorebirds, suggests that species such as Black-tailed Godwit will increasing become dependent upon the bordering flooded wet grasslands for feeding, if numbers are to be maintained (Durell et al. 2006).

Table 1 **Black-tailed Godwit**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 7 year mean (1991 - 1998)

Species of International Importance

1% International Threshold Figure = 350
1% Great Britian Threshold Figure = 150

Months in which figure reached is shown in **Bold**

Year / Month	1998/99	1999/00	2000/01	2001/02	200203	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	568	744	592	701	*810*	918	1201	5534	791	767
October	946	645	956	1096	983	1463	818	6907	986	790
November	926	1183	1145	1398	1229	197	1048	7126	1018	711
December	979	1255	495	1915	382	2008	1488	8522	1217	1151
January	731	2020	122	1708	15	2135	1732	8463	1209	962
February	1596	1262	50	2115	1042	3095	1300	10460	1494	1088
March	1431	1537	*1206*	874	1089	2328	878	9343	1335	1423
Autumn/Winter Total	7177	8646	4566	9807	5550	12144	8465	56355	8050	6892

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the two indicative figures, the 'mean' becomes 7489 and this figure is used to calculate the percentage distribution for the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows an increase of + 16.8%

Table 3 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Black-tailed Godwit **7 year mean Poole Harbour population (Sept - Mar) = 7763**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	1	905	10600	10921	2388			488	3	25306
Annual Mean	0.1	129.3	1514.3	1560.1	341.1			69.7	0.4	3615
Range	1	1 - 102	28 - 860	5 - 1041	1 - 256			1 - 172	3	1 - 1041
% of annual mean/ Poole Harbour mean	<0.01%	1.66%	19.51%	20.09%	4.40%			0.89%	0.01%	46.56%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	526
Mean density/ha	< 0 01	4.04	23.66	12.93	3.83			0.4	<0.01	6.85

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	44						13445			13489
Annual Mean	6.3						1920.7			1927
Range	44						2 - 2054			2 - 2054
% of annual mean/ Poole Harbour mean	0.08%						24.74%			24.82%
Low water area (ha)	12	8	28	32	64	120	244			508
Mean density/ha	0.52						7.52			3.62

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	8	5119	141							5268
Annual Mean	1.1	731.3	20.1							752.5
Range	2 - 6	1 - 834	1 - 92							1 - 834
% of annual mean/ Poole Harbour mean	0.01%	9.42%	0.26%							9.69%
Low water area (ha)	48	None	24							72
Mean density/ha	0.02		0.83							0.29*

* Excludes NE2 data (Brownsea Island Lagoon)

Table 3 Black-tailed Godwit (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	161	199	1256	1025	1741	2676	1450	229		8737
Annual Mean	23	28.4	179.4	146.4	248.7	382.3	207.1	32.7		1248
Range	18 - 40	4 - 110	1 - 395	4 - 370	1 - 335	1 - 900	1 - 320	1 - 131		1 - 900
% of annual mean/ Poole Harbour mean	0.30%	0.37%	2.31%	1.88%	3.20%	4.92%	2.67%	0.42%		16.07%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	0.52	0.78	8.95	1.83	3.54	11.89	4.7	1.36		3.54

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	6	1135								1141
Annual Mean	0.8	162.1								162.9
Range	2 - 3	1 - 215								1 - 215
% of annual mean/ Poole Harbour mean	0.01%	2.09%								2.10%
Low water area (ha)	36	132	None							168
Mean density/ha	0.02	1.23								0.97

Curlew (*Numenius arquata*)

Status (Present throughout the year: passage migrant and winter visitor, with some summering)

WeBS - Qualifying Numbers for International threshold: **4200**[#]
WeBS - Qualifying Number for Great Britain threshold: **1500**[#]

Species of Conservation Concern: U.K. Amber Listed Species[1]
Europe Listed SPEC2[2]

[#] Rehfisch et al. (2003) The National threshold figure has now been up-rated from 1200 to 1500

[1] Amber-listed because the U.K. hold ≥ 20% of East Atlantic Flyway population and ≥ 20% of European breeding population in U.K (Gregory *et al.* 2002).

[2] SPEC2 (previously listed as SPEC3) but now up-graded because species is concentrated in Europe with an Unfavourable Conservation Status (BirdLife International (2004).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): **1769 = 1.9% of G.B. population**
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): **1762 = 2.3% of G.B. population**

Past Status

The history and status of the summering, passage and wintering population of Curlew in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Summering and passage

It is not very easy to interpret the spring passage and summering data as no indications of when the maximum count in each month occurred (Table 1). The limited data suggests than spring passage is all but over by April and a peak of fewer than 50 birds is normal. If the May numbers are taken as indicative of the summering population, then even with an exceptional count of 54 in 1999, the mean is still only 11.8.

Table 1 The maximum number of Curlew recorded in Poole Harbour during April - August (1998-2004) (Dorset Bird Reports)

	1998	1999	2000	2001	2002	2003	2004	Mean
April	25	206	15	9	44	40	6	50.7
May	2	54	2	1	12	2	10	11.8
June	429	38	7	2	150	60	50	91.1
July	280	548	1709	14	300	200	200	464.4
August	1036	570	1300	800	500	300	50	650.8

The June data is clouded by two very large counts, which could be attributable to early returning, possibly failed breeding and non-breeding birds, from their nesting grounds. Return passage generally commences in July, with large roosting flocks being seen in the saltings or on Brownsea Island lagoon (NE2). The

exceptionally large flock of 1709 Curlew (above Nationally Important threshold) was recorded in July from Brownsea Island. Numbers continue to increase through September but numbers fall away during October (Table 2). A similar pattern of occurrence was noted when compared to the previous (1991/2-1998/89) data set.

Wintering

The pattern of winter usage of the Harbour by Curlew has changed little comparing the two 7-year WeBS data sets (Table 3). However, comparing the 7-year mean of the population size, the current set shows a decline by nearly 4% but the 14-year trend (Fig 20) indicates a small but erratic upward trend. The Harbour's upward trend is not dissimilar to the overall national picture, which too is showing an upward trend (Banks et al. 2006).

After falling numbers in October, they begin to increase and build, reaching a peak either in December or January (Table 2). Only in January is the 7-year mean monthly total above the national importance threshold, where during the 1991/92-1998/99 period, it was reached in six of the seven months. This apparent difference is because the national importance threshold has been increased by 300. Had this figure be used for the previous data set, then only January would have passed the required threshold. The national winter population during 2004/05 increased by 7% (Banks et al. (2006). This national rise was also reflected in the Harbour population, comparing with the previous winters WeBS total mean, a huge rise by almost 46% was recorded !

Curlews, like Black-tailed Godwits are locally mobile and spend a lot of time feeding in the grasslands of flood plain of the River Stour and those adjoining the SW side of the Harbour. It cannot be emphasised enough just how important are these terrestrial habitats. Durell et al. (2006), who noted the large numbers of Curlew and Black-tailed Godwit present in the Harbour put this down to being 'due as much to suitable terrestrial habitats as to the quality of the intertidal habitats.'

Distribution

The distribution and density of Curlew recorded at low water WeBS counts for the period 1998/99-2004/05 is shown in Table 2, while Map 19 shows each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods.

At low water, Curlew are widespread in the Harbour. The major concentrations again occurred in the same seven sections of the Harbour, as in the previous data set but in slightly different proportions (Table 4). The key sections, with the exception of Holes Bay (NC3), are all on the west side of the Harbour and adjacent to terrestrial habitat.

Table 4 Percentage population change of Curlew between 1991/92-1997/98 and 1998/99-2004/05 at key sections in Poole Harbour

Location	1998/99-2004/05	1991/92-1997/98		1998/99-2004/05	1991/92-1997/98
Giggers (W4)	12.8%	12.7	East Fitzworth (SC4)	10.6%	8%
Keysworth (W5)	14.1%	12.1%	Wytch (SC5)	9.6%	7.7%
Holton (W2)	12%	12.7%	Brands Bay (SE 2)	9.5%	11.1%
Holes Bay (NC3)	10.2%	9.9%			
			Total	78.8%	74.2%

Table 2 **Curlew**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 7 year mean (1991 - 1998)

Species of Great Britain Importance

1% Great Britain Threshold Figure = 1500 Months in which figure reached is shown in **Bold**

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	976	1253	1101	749	*834*	918	1260	7091	1013	1283
October	1218	1051	919	1249	848	887	894	7066	1009	1088
November	1309	1174	992	**1552**	1348	644	**2472**	9491	1356	1207
December	1294	**1642**	1257	**1573**	1221	1404	**1998**	10389	1484	1231
January	**1508**	**1569**	1407	1194	**1941**	1314	**1599**	10532	1505	1565
February	1112	**1712**	1472	1101	1377	1176	**2238**	10188	1455	1479
March	1183	1028	*995*	960	1212	811	1005	7194	1028	1358
Autumn/Winter Total	8600	9429	8143	8378	8781	7154	11466	61951	8850	9211

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the two indicative figures, the 'mean' becomes 8588 and this figure is used to calculate the percentage distribution for the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows a decrease of - 3.91%

Table 3 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Curlew **7 year mean Poole Harbour population (Sept - Mar) = 8588**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	99	686	8493	7679	597			7206	484	25244
Annual Mean	14.1	98	1213	1097	85.2			1029.4	69.1	3605.8
Range	1 - 28	1 - 108	6 - 1500	77 - 336	2 - 35			1 - 333	1 - 300	1 -1500
% of annual mean/ Poole Harbour mean	0.16%	1.14%	14.12%	12.78%	1.00%			11.99%	0.81%	42.00%
Low water area (ha)	50	32	64	120	88	116	44	5.98	12	526
Mean density/ha	0.28%	3.06	18.95	9.14	4.97				5.76	6.85

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	102	20					6142			6264
Annual Mean	14.6	2.8					877.4			894.8
Range	1 - 13	1 - 10					16 - 505			1 - 505
% of annual mean/ Poole Harbour mean	0.17%	0.03%					10.22%			10.42%
Low water area (ha)	12	8	28	32	64	120	244			508
Mean density/ha	1.27	0.35					3.6			1.76

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	369	147	378							894
Annual Mean	52.7	21	54							127.7
Range	2 - 16	1 - 45	1 - 29							1 - 45
% of annual mean/ Poole Harbour mean	0.61%	0.24%	0.63%							1.48%
Low water area (ha)	48	None	24							72
Mean density/ha	1.09		2.25							1.48*

* Excludes NE2 data (Brownsea Island Lagoon)

Table 3 Curlew (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	1099	584	1285	6401	5747	2751	3213	304		21384
Annual Mean	157	83.4	183.6	914.4	821	393	459	43.4		3054.8
Range	11 - 76	5 - 71	1 - 111	19 - 288	8 - 288	2 - 260	9 - 223	1 - 58		1 - 288
% of annual mean/ Poole Harbour mean	1.83%	0.97%	2.14%	10.64%	9.56%	4.58%	5.34%	0.51%		35.56%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	3.57	2.32	9.18	11.43	11.4	12.28	10.43	1.88		8.68

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	165	5731								5896
Annual Mean	23.6	818.7								842.3
Range	1 -20	1 - 238								1 - 238
% of annual mean/ Poole Harbour mean	0.27%	9.53%								9.80%
Low water area (ha)	36	132	None							168
Mean density/ha	0.65	6.1								5.01

Redshank (*Tringa tortanus*)

Status (Present throughout the year - breeding, passage migrant and winter visitor)

WeBS - Qualifying Number for International threshold: **1300**[#]
WeBS - Qualifying Number for Great Britain threshold: **1200**[#]

Species of Conservation Concern U.K. Amber Listed Species *
European Listed: SPEC2[1]

[#] Rehfisch et al. (2003) The GB threshold figure has now been increased from 1100 to 1200 and the international threshold figure from 1500 to 1300.

[*] Amber listed because ≥ 20% of East Atlantic Flyway non-breeding population in U.K. and Moderate (25%-49%) decline in UK breeding population over previous 25 years (Gregory *et al.* 2002)

[1] SPEC2 listed because population being concentrated in Europe and with Unfavourable Conservation Status (BirdLife International 2004).

Poole Harbour 7 year WeBS count peak mean (1991 - 1998): **1278 = 1.5% of G.B. population**
Poole Harbour 7 year WeBS count peak mean (1998 - 2004): **908 = 1.0% of G.B. population**

Past Breeding Status

The history and status of the Redshank in Poole Harbour up to 1998 is given in Pickess & Underhill-Day (2002).

Current Breeding Status

Pickess and Under-hill Day (2002) highlighted the need to monitor the breeding population of the Harbour on a regular basis, especially as Poole Harbour is the most important breeding site in south-west England. In 1997, when the last survey was undertaken, at least 85 pairs were located on the salt marshes (Price 1997). A repeat breeding survey was carried out in 2004 (Cook 2004).

The results of this 2004 survey showed that there had been a 19% decline over the 8 years since 1997, with the population now at only 69 pairs. Since the 1994 survey (11 years), the population has declined by a alarming 33%! Rather unexpectedly, the 2004 survey showed that west side of the Harbour between Brand's Bay (SE2) to Swineham (W6), the populations had increased by five pairs to 51 pairs, since 1997. However, between Keysworth (W5) and Holes Bay (NC3), there had been over a 50% decline from 38 pairs, to now only 18 pairs, with Lytchett Bay the worst effected area. Currently, the deeline is considered to be associated mostly with the deterioration of the quality of the saltmarsh breeding habitat but also some human disturbance. The principle causes of the deterioration either appear to be through a cessation of cattle grazing or increased grazing pressure by the roaming bands of Sika Deer *Cervus nippon*. The concerns about the impact of the Sika Deer upon the breeding Redshank population has been previously mentioned by Pickess & Under-hill Day (2002), Pickess (2005) and as Diaz et al. (2005) has shown, heavy grazing results in change in vegetation structure and the removal of grass tussocks, very important to nesting Redshank.

Whilst the 2004 survey has shown that the breeding population is declining, there is possibly some encouraging news. With cattle grazing controls being instigated upon the RSPB Arne Moors N.R., not only are conditions being made suitable for Lapwing to nest but Redshanks appear to be also taking advantage of the managed wet grasslands (per. comm. M. Singleton). Table 1 shows the number of pairs recorded during the breeding season on the Arne Moors N.R. As grazing control has improved, the Redshank appears to be finding the conditions more suitable. Whether their productivity is any more successful than those on the

saltings, is unknown. As yet the origins of these birds is unclear, are they additional birds to the Harbour population or displaced birds from the saltmarshes, impacted upon by the Sika Deer?

Table 1 Numbers of pairs of Redshank thought to be breeding on RSPB Arne Moors Nature Reserve 1999- 20006 (per. comm. M. Singleton)

Year	1999	2000	2001	2002	2003	2004	2005	2006
No. of pairs	1	3	2	0	0	0	8	9

With a declining Harbour breeding population, it is vital that the factors are known that are driving this decline. It is possible that the cause is not associated with breeding but unknown factors affecting adults at other time of year. However, the most likely cause is going to be breeding season related. There is a dearth of information regarding productivity of the Harbour's breeding Redshank because it is very difficult to locate chicks, as they can manage to melt into the vegetation and it is only the behaviour of the adults, which suggest the presence of young. Several reasons can be suggested that may be responsible such as human disturbance, poor survival of young due to both avian and mammalian predators, trampling of nests and chicks by deer, chick food availability, and failure to lay replacement clutches, any one or a combination of these factors could be affecting their breeding success.

If Poole Harbour is to remain the most important breeding site in S.W. England, there will be a need to, where possible, ensure that the appropriate livestock grazing regimes are maintained but unfortunately, not all saltmarsh grazing is controllable. If, through global warming sea levels rise in the future, initially this might present nesting problems for this species on saltmarshes. Currently, at very high spring tides, Redshank nests are vulnerable to being washed out.

Further surveys are needed to monitor the Harbour's population, probably every five years.

Wintering

Past Status

The history and status of passage and wintering population of Redshank in the Poole Harbour area up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 2 shows the monthly low water WeBS counts for the period 1998/99 to 2004/05. Comparing the 7-year mean of the 1991/92-1997/98 data set with the current set, shows there has been a decline by – 17.7%. The 14-year trend using the 1991/92 to 2004/05 peak count annual means, shows a steady and continuing decline (Fig 21). The British index however has only shown slight variations and the overall trend is stable (Banks et al. 2006). The Harbour no longer holds at peak, populations of GB importance, nevertheless at peak, it still supports 1.0% of the GB population.

If the GB population is stable, why should Poole Harbour's wintering numbers have halved since the

1999/2000 winter? Currently, there is no certain explanation but numbers recorded during the August - September passage period are considerably lower, when compared with the 1991-1998 data. The winter numbers are also generally very much lower than during the 1990's. With a succession of mild winters it is possible, like Lapwing (Gillings. et al. 2006), that because there has not been any prolonged severe winters weather, fewer birds are moving to southwest England.

The general pattern of winter occurrence in the Harbour has not changed, when compared with the previous 1991/92-1997/98 data set, with January holding the highest numbers and then falling away in February and March (Table 2).

Current Distribution

The distribution and density of Redshank recorded at low water WeBS counts for the period 1998/99 - 2004/05 is shown in Table 3. Each numbered section of the Harbour and the mean September-March population at low water ha^{-1} for both 7-year periods is show in Map 20.

At low water Redshank may he encountered almost anywhere in the Harbour. Comparing the current data set with the 1991/92-1997/98 data, the most favoured sections now support about 70.0% of the Harbour population, where previously it was just over 74.0% (Table 4). Why there should be considerable

Table 4 Percentage population change of Redshank between 1991/92-1997/98 and 1998/99-2004/05 at key sections in Poole Harbour

Location	1998/99 - 2004/05	1991/92 - 1997/98		1998/99 - 2004/05	1991/92 - 1997/98
Lytchett Bat (W3)	11.2%	9.2%	Wytch (SC5)	7.5%	2.8%
Holton (W2)	4.6%	6.9%	Lower Middlebere (SC7)	8.6%	1.7%
Holes Bay (NC3)	32.3%	43.8%	Brands Bay (SE2)	12.0%	9.9%
			Total	70.2%	74.3%

percentage changes in sections between the two 7-year periods is not clear but fluctuations in food species density may be a cause (Caldow et al. 2006) but disturbance from humans is an unlikely cause for reduced numbers in Holes Bay (NC3) (Morrison 2006). These favoured sections are generally associated with the areas of fine silts in the Harbour, where high densities of preferred food, such as *Hediste diversicolor* (Ragworm), other small annelid worms, mollusca like *Hydrobia ulva* and *Scrobicularia plana* may occur (Durell et al. 2004). The most important feeding area in the Harbour continues to be Holes Bay (NC3), here over 32.0% of the Harbour's population may be found at low water. The nutrient enriched area adjacent to the sewage outflow in the north-east sector and the outfall below the railway line on the east side of Holes Bay are centres for Redshank feeding activity at low water (Morrison 2006). The other key low water Redshank feeding locations are all on the western side of the Harbour, with Lytchett Bay (W3) and Brands Bay (SE2) each holding over 10% of the population.

Table 2 **Redshank**

Poole Harbour WeBS counts (Aug - Mar) during (1998 - 2005), together with autumn/winter annual totals and totals and means for each month over whole period and 7 year mean (1991 - 1998)

Species of Harbour Importance, formally of Great Britain Importance

1% Great Britain Threshold Figure = 1200 Months in which figure reached is shown in **Bold**

Year / Month	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	7 Year Monthly Total 1998/2005	7 Year Monthly Mean 1998/2005	7 Year Monthly mean 1991/1998
September	766	459	228	23	*137*	250	192	2032	290	1064
October	**1274**	748	469	581	618	113	316	4119	588	891
November	1090	938	476	792	708	424	608	5036	719	894
December	960	1100	616	794	412	654	635	5171	739	869
January	1091	1012	769	678	653	888	627	5718	817	1152
February	820	853	691	344	759	494	284	4245	606	934
March	965	620	*497*	373	692	503	769	4419	631	745
Autumn/Winter Total	6966	5730	3746	3562	3979	3326	3431	30740	4390	6549

No counts were made on either March 2000 or September 2003, to compensate, the mean of the counts each side of the missing month has been used and are shown in *'Italics'*

Removing the two indicative figures, the 'mean' becomes 4300 and this is used to calculate the percentage distribution of the species.

Comparisons between Means of 1991/98 and 1998/2005 data sets shows a decrease of - 17.69%

Table 3 **Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005**

Total number in each section and within each count area of Poole Harbour 1998 - 2005, annual mean and range. The percentage of the mean whole Harbour population during 1998 - 2005 found in each count area of intertidal habitat at low water and the mean density of birds/ha within the intertidal habitat for each count area in shown

Redshank **7 year mean Poole Harbour population (Sept - Mar) = 4300**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1998 - 2005	3	225	803	29	3356	-	-	1372	55	5843
Annual Mean	0.4	32.1	114.7	4.1	479.4	-	-	196	7.8	834.5
Range	1	1 - 50	1 - 216	1 - 24	3 - 183	-	-	1 - 234	1 - 150	1 - 216
% of annual mean/ Poole Harbour mean	<0.01%	0.75%	2.66%	0.10%	11.15%	-	-	4.56%	0.18%	19.40%
Low water area (ha)	50	32	64	120	88	116	44	160+ (12)	12	526
Mean density/ha	<0.01	1	1.79	0.03	5.45	-	-	1.14	0.65	1.58

Section NC count areas	1	2	3 (NW)	3 (NE)	3 (SW)	3(SE)	3			Section total
Total counts 1998 - 2005	57	-	-	-	-	-	9730			9787
Annual Mean	8.1	-	-	-	-	-	1390			1398.1
Range	1 - 12	-	-	-	-	-	13 - 385			1 - 385
% of annual mean/ Poole Harbour mean	0.19%	-	-	-	-	-	32.32%			32.51%
Low water area (ha)	12	8	28	32	64	120	244			508
Mean density/ha	0.67	-	-	-	-	-	5.7			2.75

Section NE count areas	1	2	3							Section total
Total counts 1998 - 2005	100	455	741							1296
Annual Mean	14.3	65	105.8							185.1
Range	1 - 13	1 - 38	2 - 37							1 - 38
% of annual mean/ Poole Harbour mean	0.33%	1.51%	2.46%							4.30%
Low water area (ha)	48	None	24							72
Mean density/ha	0.3		4.38							1.67*

* Excludes NE2 data (Brownsea Island Lagoon)

Table 3 Redshank (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Sept - Mar) in Poole Harbour during 1998 - 2005

Section SC count areas	1	2	3	4	5	6	7	8		Section total
Total counts 1998 - 2005	555	834	1086	1536	2249	924	2602	107		9893
Annual Mean	79.3	119.1	155.1	219.4	321.3	132	371.7	15.3		1413.2
Range	1 - 53	2 - 95	1 - 123	1 - 120	3 - 216	3 - 102	3 - 177	1 - 30		1 - 216
% of annual mean/ Poole Harbour mean	1.84%	2.77%	3.60%	5.10%	7.47%	3.07%	8.64%	0.35%		32.84%
Low water area (ha)	44	36	20	80	72	32	44	24		352
Mean density/ha	1.8	3.31	7.75	2.74	4.33	4.12	8.45	0.64		4.01

Section SE count areas	1	2	3							Section total
Total counts 1998 - 2005	169	3604								3773
Annual Mean	24.1	514.8								538.9
Range	1 - 16	26 - 293								1 - 293
% of annual mean/ Poole Harbour mean	0.56%	11.97%								12.53%
Low water area (ha)	36	132	None							168
Mean density/ha	0.67	3.9								3.2

Marsh Harrier (*Circus aeruginosus*)

Status (Uncommon passage migrant and winter visitor, bred 1949-1962 in Poole Harbour)

Species of Conservation Concern U.K Amber Listed Species*

A breeding species of National Importance (British Breeding Population = 360 breeding ♀♀ (2005)[1]

* Now down rated to Amber listed because of historical population decline during 1800-1995, but recovering: population has more than doubled over previous 25 years and five-year mean population size of 1 - 300 breeding pairs in UK (Gregory, et al. 2002).

[1] (pers. comm. J. Underhill-Day).

Past Breeding Status

The history and status of the Marsh Harrier in Poole Harbour up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

The results of the 2005 national survey of breeding Marsh Harrier shows that it is now well established and widely distributed in suitable locations in the UK (J. Underhill-Day pers. comm.). Because of its rapidly increasing GB breeding population, it has been down rated from Red to Amber listed.

With the rapidly expanding GB breeding population, it is difficult to understand why the status of this species in and around Poole Harbour is little changed from that of the 1991-1998 period. What is more surprising is that although previously it had been a breeding species in Harbour, there has been no evidence that the species is showing the slightest interest in returning to the reed beds to nest. The reasons for the shunning of the Poole Harbour extensive reed beds is difficult to understand. What are the missing ingredients that are required for Marsh Harrier to return to breed?

It is recorded regularly in the Harbour environs each year, as a passage and winter visitor but seldom more than one or two birds at any one time.

Mediterranean Gull *(Larus melanocephalus)*

Status (Rare but increasing breeding species and regularly noted outside breeding season).

Species of Conservation Concern U.K. Amber Listed Species*

A breeding species of National Importance (British Breeding population in 2004 = > 150 pairs)[1]

Poole Harbour Percentage of British Breeding Population = > 15%[2]

* Amber-listed because of five-year mean population size of 1 -300 breeding pairs in U.K. (Gregory *et al.* 2002).
[1] Mavor et al. (2005).
[2] This is a provisional figure because there is a steadily increasing British population , it is probable that the current Harbour population (2006), even with a large increase may represent >20% of the British breeding population

Breeding Population

Past Breeding Status

The history and status of the Mediterranean Gull in Poole Harbour up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Recent records would suggest that the Mediterranean Gull appears to be now established as a breeding species in the Harbour, nesting within the Black-headed Gull colony in Holton Bay. In Table 1 is shown the minimum number of pairs thought to be nesting in the Harbour from 1998 to 2006. In 2003 and 2004, a pair held territory on the Brownsea Island lagoon but did not nest. Before 2004, the Harbour population was probably between 3 - 5 pairs. During the breeding seasons of 2002 & 2003, there were maximum counts of up to nine adults. In August 2003, several juveniles were seen and almost certainly were fledged from Harbour breeding birds. In 2004 and 2005, the population increased to 10 pairs or more. During a survey in 2006 of the Black-headed Gull colony in Holton Bay, no fewer than 50 nests of Mediterranean Gull were located (P. Wood pers. comm.). A suggested reason for this rapid increase is thought to be due to dispersing birds from the now extinct, once large, Black-headed Gull colony at Needs Orr in Hampshire, where Mediterranean Gull were known to nest (P. Wood pers. comm.).

Table 1 The minimum number of pairs of Mediterranean Gull nestiug in Poole Harbour between 1998 - 2006

Year	No of pairs	Year	No of pairs
1998	3	2003	5
1999	3	2004	10
2000	5	2005	10
2001	3	2006	50
2002	4		

With the Harbour's population at 50 pairs, it is uncertain as to what percentage this now currently represents of the UK breeding population. Even with the steadily increasing UK population, Poole Harbour may still hold between 15 - 25 % of the total UK breeding population.

The continuation of the Mediterranean Gull as a breeding species would appear to be dependent upon keeping the Black-headed Gull colony in Holton Bay free of human disturbance during the nesting season. In the past, illegal egg collecting of Black-headed Gulls eggs may have resulted in the taking of some Mediterranean Gull eggs. Fortunately, the Mediterranean Gull is known to lay a replacement clutch, after loss (Cramp 1983). This replacement ability may account for its success in its established and has benefited in recent years, when probably no eggs have been illegally collected. Should the nesting Black-headed Gulls in Holton Bay vacate the colony on the *Spartina* islands in the future; it is probable that the Mediterranean Gulls would also leave.

Black-headed Gull (*Larus ridibundus*)

Status (Breeding species in large numbers, passage migrant and winter visitor)

Species of Conservation Concern - U.K. Amber Listed Species*

A breeding species of National Importance (British Breeding Population = **190,000** pairs)[1]

Poole Harbour Percentage of British Breeding Population (2006) = 6.52%
Poole Harbour Percentage of EU Breeding Population (2006) = 1.1%[2]
Poole Harbour Percentage of World Breeding Population (2006) = 0.5%[3]

* Now up-rated to Amber list because Moderate 25%-49% decline in UK breeding population over previous 25 years and over 50% of U.K. breeding population is in 10 or fewer sites (Gregory *et al.* 2002).
[1] (www.rspb.org.uk/birds (2007)
[2] Birdlife international (2004)
[3] Mitchell et al (2004)

Breeding Population

Past Breeding Status

The history and status of the Black-headed Gull in Poole Harbour up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

Table 1 shows the known breeding sites and the numbers of pairs present during the period 1998 - 2006, in the Harbour. The large colony on the *Spartina* islands in Holton Bay continues to be the principal breeding location for this species, with a small colony present on the Brownsea Island lagoon. During the late 1990's a small colony briefly attempted to establisb on Furzey Island. The past problems of disturbance during the nesting season because of illegal egg collecting, currently appears to be under control. Mediterranean Gulls nest within the Holton Bay colony and have recently increased in numbers.

Until 2004, as shown in Table 1, the Harbour breeding population was stable at 5000+ pairs but in 2004, there was an unexpected doubling of breeding pairs (P. Woods pers comm.). In 2006, a further large increase occurred with at least 12,230 nests recorded (P. Woods pers. comm.). The most likely reason for this rapid increase is thought to be due to the extinction of the large colony in Hampshire at Needs Orr (P. Woods pers. comm.). This increase appears to bave only occurred in the main colony on the Holton Bay *Spartina* islands. At the 2006 population level of >12400 pairs, the Harbour holds over >6.6% of UK; 1.1% of EU and 0.5% of the world breeding population of this species (www.rspb.org.uk/birds (2007); Birdlife International (2004); Mitchell, et. al (2004). Currently, the Harbour's breeding population is of both national and international importance.

Table 1 The number and location of the Black-headed Gull colonies in Poole Harbour (1998 - 2006) (Data from RSPB Arne, Dorset Bird Reports, P. Woods & C Thain (pers. comm.)

Year	Holton Bay (W2(W)	Furzey Island (SC3)	Brownsea Island (NC2)	Hamworthy Lake
1998	5000+	30	150	
1999	1566*	35	175	
2000	5000+	-	199	
2001	N/C	-	30	1
2002	5000+	-	128	1
2003	5000+	-	107	
2004	10,000+	-	152	
2005	10,000+	-	213	
2006	12,230+	-	172	

* This count would appear to be unusually small, without knowing the time of year when undertaken, this figure should be treated with caution

With this sudden, more than doubling of the breeding population, additional, as yet unanswerable questions arise as to: (a). What impact will this have on breeding productivity? (b). Will the population be sustainable at the current level? (c). What impact will there be upon prey items, especially in the Harbour environs? Only time will answer these questions.

As long as the Holton Bay colony is kept free of human disturbance during the nesting season and currently, illegal egg collecting is not a problem, then there remains one major threat to the future of this colony, that of rising sea level. Already, in some years, the whole nesting colony is washed out during very high spring tides but there is replacement laying. If these inundations become more frequent, then the colony may desert. Fortunately, there is higher ground available on the islands of Poole Harbour, so it is unlikely that the species would disappear as nesting species from the Harbour.

Herring Gull (*Larus argentatus*)

Status (Breeding resident, migrant and winter visitor)

Species of Conservation Concern U.K. Amber Listed Species*

Poole Harbour Percentage of British Breeding Population = insignificant

* Amber listed because of moderate (25-49%) decline in U.K. breeding population over previous 25 years and ≥ 50% of UK breeding population in 10 or fewer sites (Gregory *et al.* 2002).

Past Breeding Status

The history and status of the Herring Gull in Poole Harbour up to 1998 is given in Pickess & Underhill-Day (2002).

Current Breeding Status

In the period 1999 - 2005, there has been very little improvement in the Herring Gull's status, as a Poole Harbour breeding species. Areas where nesting may occur are on the buildings around the northern and eastern side of the Harbour from Holes Bay to Sandbanks. In some years, a few (< 5) attempt to nest around the Brownsea Island lagoon. Despite its Amber listed status, it is unlikely to be welcomed as a nesting bird, as they are possessive and unsociable to *Homo sapiens*. On several building efforts are made to discourage or prevent nesting.

The number attempting to nest most years is probably < 30 pairs but success is not known.

Sandwich Tern (*Sterna sandvicensis*)

Status (Spring and autumn passage migrant, and regular breeding species)

Species of Conservation Concern - U.K. Amber Listed Species*
European Listed SPEC2[1]

A breeding species of National Importance (British Breeding population = 12,000 pairs)[2]

Poole Harbour Percentage of British Breeding Population = > 1.3%

* Amber listed because ≥ 50% of U.K. breeding population is in 10 or fewer sites (Gregory *et al.* 2002).

[1] SPEC2 listed because population being concentrated in Europe and with Unfavourable Conservation Status (BirdLife International 2004).

[2] (Mitchell *et al* 2004)

Past Breeding Status

The history and status of the Sandwich Tern in Poole Harbour up to 1998 is given in Pickess & Underhill-Day (2002).

Current Breeding Status

The long established and increasing nesting colony (since 1973) on the lagoon on Brownsea Island reached 174 pairs in 1999. Table 1 shows the number of pairs, and fledged young produced, during 1999-2006 at the colony. In 1999 due to disturbance, probably by Sika Deer *Cervus nippon*, only 10 young were fledged. Sandwich Terns can be fickle nesters and for the following two years, 2000 and 2001, the colony was deserted. However, in 2001 recently fledged birds appeared on the Brownsea Island lagoon on 22nd July, suggesting that they might have been raised locally in the Harbour. In 1984, the Brownsea site was also vacated and the colony nested on Round Island. In 2002, birds returned to nest but breeding success was poor due to a combination of avian predation and poor weather. Subsequently, they have nested each year and the colony reached a peak of 242 pairs in 2005. Since 2002, when the colony re-established, annual productivity has been maintained at a mean of 0.7 per nesting pair, which is just above the mean of 0.64 per nesting pairs given for Britain and Ireland (1986-2003) (Mavor *et al.* 2005). If a mean of the 2003 - 2006 population of 156 is used, this suggests that the Harbour supports > 1.3% of the British breeding population.

The population trend for the 16 years, 1991 - 2006 is shown in Fig. 22. The overall trend is upward but because of the two years when nesting did not take place, the trend prediction has resulted in showing it to be generally below the actual numbers present during the 16 year period.

The primary food observed being fed to the Sandwich Tern chicks is Sand Eels *Ammodytes* sp. (C. Thain pers. comm.). The main areas where the prey items are caught are the Middle Ship Channel area off Brownsea Island and the Hook Sands area in Poole Bay (Aspinall & Tasker 1990, Jensen *et. al.* 2005). The impact that trawl netting in the Middle Ship Channel may have during the spring and summer upon the Sandwich Terns, is unknown. More information is required concerning the future sustainability of the fishery and its possible impact upon the success of this Nationally Important breeding population of Sandwich Tern.

The warning expressed by Pickess & Underhill-Day (2002), that the Harbour's breeding Sandwich Terns population could be seriously damaged through commercial over-fishing or excessive use by pleasure craft, remains unchanged.

Table 1 The number of breeding pairs of Sandwich Tern and young fledged in the eight years (1999-2006) on Brownsea Island (Data from Dorset Bird Reports and C. Thain (pers. comm.)

Year	Number of Nesting Pairs	Number of Young Fledged	Cause of poor productivity
1999	174	10+	Possibly trampled by Sika Deer
2000	-	-	Failed to settle and breed
2001	-	-	Failed to settle and breed[1]
2002	75	25	Predation and poor weather
2003	194	ca. 190	
2004	211	181	
2005	242	120	
2006	213	135	
Total	1109	661	

[1] There is a possibility that the colony could have nested undetected elsewhere in the Harbour, as 21 fledged young appeared on 22/07/01

6-year mean (1999, 2002-06) - 185 pairs p.a. **110** young fledged p.a. = **0.59** young fledged per pair

Common Tern (*Sterna hirundo*)

Status (Spring and autumn passage migrant, and regular breeding species)

A breeding species of National Importance (British Breeding population = 12,000 pairs)[1]

Poole Harbour Percentage of British Breeding Population = < 1.8 %

[1] Robinson, R.A. (2005) Bird Facts: profile of birds couriering in Britain and Ireland (v1.1, Jan 2006) BTO Research Report 407, BTO. Thetford. (Http://www.bto.org./bird facts)

Past Breeding Status

The history and status of the Common Tern in Poole Harbour up to 1998 is given in Pickess & Underhill-Day (2002).

Current Breeding Status

During the period 1999-2006, the number of breeding pairs of Common Tern continued to increase and reached a peak of 248 pairs in 2006. The colony, for reasons unknown, was deserted in 2001 but recently fledged birds appeared back on the Brownsea Island lagoon on 1st July, suggesting that they might have been raised locally in the Harbour. Table 1 shows the number of pairs, and fledged young produced during 1999-2006 on the lagoon on Brownsea Island. The 7-year mean (1999-2000, 2002-06) of 216 pairs, represents 1.8% of the national breeding population but at the 2006 level of 248 pairs it is > 2% of the national breeding population. However, production of fledged young bas been poor, with a 7-year mean of only 0.32 per pair. The reasons for this are several, predation of chicks by Heron, larger gulls, crows and rats, trampling of nests by Sika Deer (*Cervus nippon*) and

Table 1 The number of breeding pairs of Common Tern and young fledged in the 8 years (1999-2006) on Brownsea Island (Data from Dorset Bird Reports and C. Thain (pers. comm.)

Year	Number of Nesting Pairs	Number of Young Fledged	Cause of poor productivity
1999	192	>10	Better than Sandwich Tern
2000	191	>82	Predation by Great Black-backed & Yellow-legged Gulls
2001	Failed to settle and breed	-	Failed to settle and breed[1]
2002	183	10	Predation by crows, gulls and rats, as well as poor weather
2003	207	170	
2004	246	> 100	Predation by rats and poor weather,
2005	244	25	Trampling by Cormorants
2006	248	88	Predation by Herons, trampling by Cormorants and Sika Deer
Total	1511	485	

[1] There is a possibility that the colony could have nested undetected elsewhere in the Harbour, as fledged young appeared on 1/07/2001 on the Brownsea Lagoon.

7-year mean (1999-2000, 2002-06) **216** pairs p.a. 69 young fledged p.a. = **0.32** young fledged per pair

roosting Cormorants, and periods of poor weather. Despite the many problems, over these seven years, the colony has managed to produce >475 young.

The population trend for the 16 years, 1991-2006 is shown in Fig. 23. Overall, the trend mirrors the actual steady population increase but at just below the recorded figures because of the failure to breed in 2001.

The Brownsea Island lagoon remains the only known nesting location in the Harbour. It is unfortunate that the now completed freshwater gravel pit at Swineham, which was completed during 2006, a little more consideration had been given to the provision and location of gravel islands. The few islands that have been created soon become vegetated and the opportunity to create some bare shingle islands has been lost. There was the potential for the establishment of a further breeding colony of Common Tern in the Harbour. Because the failure to provide suitable islands, it is likely that for the foreseeable future, Poole Harbour's breeding Common Tern population will continue to be dependent upon the provision and maintenance of tern islands in the Brownsea Island Lagoon by the Dorset Wildlife Trust. It may still be possible to attract these terns to nest at the pit by providing some specially prepared tethered rafts in the middle of the pit. Terns are in need of safe nesting sites away from disturbance by humans, their vehicles and dogs, and most wild mammalian predators.

Cetti's Warbler (*Cettia cetti*)

Status (An uncommon but increasing resident, since the 1980's)

Species of Conservation Concern U.K. Green Listed Species*

Poole Harbour Percentage of British Breeding Population = > 5.5%

* No longer Amber listed as breeding population in UK now over 300 pairs (Gregory et al. 2002)). Population now >550 pairs (www.rspb.org.uk/birds (2007)

Past Breeding Status

The history and status of this recent colonist up to 1998 is given in Pickess & Underhill-Day (2002), it showed that the Harbour population then represented > 6% of the UK population.

Current Breeding Status

Although there has not been a national survey since 1996 (Wooton et al. 1998), records since 1999 from regularly recorded parts of the western Harbour show little change (Table 1). These data would suggest that overall, the population is stable and probably in the region of 30 - 35 singing ♂♂. The ♂ Cetti's Warbler is polygynous and may have up to 3 ♀♀ in a territory (Bibby 1982). It is possible that the total Harbour population in the spring is between 100 - 125 individuals.

Table 1 The number of singing males recorded during the breeding season at two sites in Poole Harbour 1999 - 2005

Location	1999	2000	2001	2002	2003	2004	2005
Lytchett Bay #	5-7	5	5-6	6	8	7	n/a
Bestwall N.R.*	3	3/4	3	2/3	3	3/4	3

Data from Dorset Bird Reports

* B. P. Pickess pers. obs

Whilst the population appears to show little change since 1996, there is apparently suitable breeding habitat remaining unoccupied around the Harbour. Why there has not been a population expansion is unclear, especially as all the winters since 1999 have been mild but may be the Harbour breeding population is nearing saturation level. It is suggested by Robinson et al. (2007) that the Britisb population may be approaching its maximum size under current conditions. Provided that there is not any exceptionally severe winters in the future, the Cetti's Warbler population in the Harbour looks assured. As previously expressed by Pickess & Under-Hill Day (2002), the Harbour with its generally more favourable winter conditions could play an important part in the future UK survival of the Cetti's Warbler, should severe winter conditions exterminate populations elsewhere, especially in eastern England. The Harbour would provide a nucleus from whicb lost sites could be re-colonized.

Aquatic Warbler (*Acrocrphalus paludicola*)

Status (Scarce Passage Migrant - end of July - early October)

Species of Conservation Concern:

U.K. Red Listed Species[1]
UK BAP
European Listed SPEC1[2]

[1] Red-listed in the U.K. because of its globally threatened status (SPEC 1) and ≥ 50% of UK non-breeding population in 10 or fewer sites (Gregory 2002)

[2] SPEC1 listed because of being a species of Global Conservation Concern (BirdLife International 2004, IUCN 2004).

International Status

The Aquatic Warbler is recognised as a globally threatened species (ICUN 2004). It is probable that the European population of <4000 pairs, could represents as much as 24% of the world breeding population (BirdLife International (2004).

UK Status

The Aquatic Warbler is a scarce but regular autumn passage migrant in the southern counties of England (Lewis 1996). Were it not for extensive mist-netting operations at several coastal reed bed sites along the south English coast, our knowledge of the presence of this species would be scant indeed. Trapping information would suggest most are juveniles (Lewis 1996). Aquatic Warblers are difficult to locate visually in reed beds or sedge scrub, it is possible that it is more common and widespread than records would suggest. The views expressed by Pickess & Underhill-Day (2002) that 'the importance of the south coast of England's reed beds to the Aquatic Warblers on autumn passage is uncertain but records suggest they may be very important' is unchanged.

Poole Harbour Status

Past Status

The history and status of the Aquatic Warbler up to 1998 is given in Pickess & Underhill-Day (2002).

Current Status

During the seven year period 1998 - 2004 there has been a paucity of records and possibly partly reflecting the cessation of ringing operations at Keysworth after 2001 (Table 1). However, records during the same period from elsewhere in Dorset have also been scarce, comprising only 13 records, of which six were trapped (Dorset Bird Reports 1998-2004).

Table 1 **Number of Aquatic Warblers recorded around Poole Harbour during 1998-2004** (Data Dorset Bird Reports)

Year	Number caught/seen	Year	Number caught/seen
1998	None	2002	1 (seen)
1999	None	2003	1 (seen)
2000	4 (caught)	2004	None
2001	None		
Total	**6**		

The reduction in autumn records may possibly be due to unfavourable autumn weather conditions but it is as likely to be because of a reduction of ringing effort in suitable locations during the peak passage time during August. There is still ample habitat of reed bed and tall herbaceous vegetation e.g., Reed *Phragmites australis* and Sea Club-rush *Bolboschoenus maritimus*, especially on the west side of the Harbour. There are large expanses of reed bed at Swinebam, Arne Moors, Lytchett Bay and Salterns Marsh/Slepe Moor, so it is possible the number of Aquatic Warblers using the Harbour each autumn passage could be considerably more than the few records indicate. Certainly, during the period under review, many of these favoured marshy sites have been affected to a lesser or greater degree by the impact of grazing and trampling from the large roaming herds of Sika Deer *Cervus nippon.* Whether these animals have an impact is unknown.

Although the data is currently limited, it would still suggest that the Harbour reed beds and marshes might play an important role, as an autumn migration staging post, for this globally threatened species. There is a need for concerted efforts to be made during August, to mist-net the major reed beds in the Harbour, preferably simultaneously.

Bearded Tit (*Panurus biarmicus*)

Status (A scarce resident, passage migrant and winter visitor)

Species of Conservation Concern U.K. Amber Listed Species*

A breeding species of National Importance (British Breeding Population = 400 pairs) [1]

Poole Harbour Percentage of British Breeding Population = > 1%

* Amber listed because ≥50% of U.K breeding population in 10 or fewer sites, but not a rare breeder (Gregory *et al* 2002).
[1] (www.rspb.org.uk/birds (2007)

Past Breeding Status

The history and status of the Bearded Tit in Poole Harbour up to 1998 is given in Pickess & Underhill-Day (2002).

Present Breeding Status

The breeding status of the Bearded Tit appears little changed from the 1991-1998 period. It is still a rare breeding species and confined to the Harbour's largest reed beds at Arne Moors, Keysworth, Holton and Lytchett Bay. Generally, the main reed beds are seldom visited during the breeding season, so the true picture of the Harbour's population is unclear but it is probably still < 10 pairs.

It is known, excepting for 2001 and 2004, that at least one pair bas nested annually in the Lytchett Bay reed beds. A pair with young was recorded from the Holton Heath reed beds in 2004 and at least 2 pairs were seen in the Arne reed beds during the breeding season in 2001. These limited records would suggest that the small Harbour population is maintaining itself but at a low density. It is also possible that tidal reed beds of the Harbour are not optimum habitat and there is a risk of nest flooding on the high May spring tides in some years.

A spring/early summer reed bed census is required to get an indication of the current size and distribution of the Harbour's breeding population.

Reed Bunting (*Emberiza schoeniclus*)

Status (breeding, passage and winter visitor)

Species of Conservation Concern - U.K. Red Listed Species*
UK BAP Species
British Breeding population = 192,00 - 211,00 prs[1]

Poole Harbour Breeding Population = > 100 pairs (possibly ca. 0.5% of U.K. Population)

* Red listed because Rapid (≥ 50%) decline in U.K. breeding population over previous 25 years (Gregory *et al* 2002).
[1] (Baillie, S.R. *et al.* 2006)

Past Breeding Status

The history and status of the Reed Bunting in Poole Harbour up to 1998 is given in Pickess & Underhill-Day (2002).

Current Breeding Status

Although the size of the current breeding population is unknown, Cook (2004) whilst undertaking a Harbour Redshank survey in 2004 recorded 54 ♂♂ in various parts of the Harbour. As this Redshank survey required visiting probably less than 50% of the potential Reed Bunting habitat around the Harbour, it would suggest that the population is in excess of 100 territories. At this population level, it is probable that the Harbour supports about 0.5% of UK breeding population.

Of recent concern is the impact that the large herds of Sika Deer (*Cervus nippon*), especially around the western side of the Harbour, might have on nesting sites of Reed Bunting. There is a possibility that the favoured nesting areas associated with the drier beds of Reed *Phragmites australis*, emergent grass or herbaceous scrub that borders the marshes are being heavily grazed and trampled. This deer action my reduce the amount of suitable nesting areas, as well as increase the likelihood of nests being destroyed. Furthermore, such intensive grazing could reduce the abundance of invertebrates necessary for feeding young.

Currently in England, the much reduced breeding population is showing signs of stabilizing around the low level reached during the mid-1990s but the long-term trend suggests there will be a continuing moderate decline. A further point of concern is an apparent decline in nestling productivity, probably linked to invertebrate availability during breeding season (Baillie, S.R. *et al.* 2006).

At present, there is no information as to the exact size or distribution of the Harbour's breeding population of this Red Listed species. Tentatively a figure of over a 100 pairs has been used, as a population indicator but there is need to produce a definitive figure. Pickess (2005) recommended the need to census the Harbour population of Reed Bunting, to establish a base line for a better understanding of population size and distribution. Without this information, no indication as to the national importance of the Harbour's population can be evaluated and whether the population is mirroring the National trend.

5. Conclusion.

The same selected 32 species of birds identified in the 1991/92 - 1997/98 report by Pickess & Day (2002), all currently meet one or more of the criteria as laid down in Table 1 and remain an important constituents of the Poole Harbour avifauna. There have been however some changes in status of several species and these are shown in Table 5.

Table 5 Changes in the Poole Harbour status of the 32 species of wildfowl and waterbirds in listed categories comparing the data set of (1991/92 - 1997/98) with those of (1998/99 - 2004/05)

Category	7-year period 1991/92-1997/98	Change	7-year period 1998/99 - 2004/05
Internationally Important	2	**unchanged**	2
Great Britain Important	15	↓ 3	12
Harbour Important	4	↑ 3	7
Red Listed - Breeding	1	**unchanged**	1
Amber Listed - Breeding[1]	6	↑ 1	7
Breeding - over 1% GB population	2	↓ 1	1
Red Listed - Passage Migrant	1	**unchanged**	1
Amber Listed - Passage & Winter	1	**unchanged**	1

[1] Cetti's Warbler has been included but the GB population has now passed the 300 pairs threshold and looses it Amber status but it remains of Harbour importance.

Over the current 7-year period, in line with the GB trend, Shelduck numbers have declined and are now below the internationally important threshold. However, the Avocet peak numbers have steadily risen in the Harbour and may be higher than anywbere else in GB. Also increasing steadily has been the passage and wintering Icelandic Black-tailed Godwit, whose peak numbers on one occasion passed 3000, which represented possibly 6% of the Iceland's population (Gunnarsson et al. 2005).

There bave been changes among the Great Britain important species due to either revision of the GB 1% threshold or probably because of the series of mild winters that are being experienced in eastern Britain, since the turn of the century. Of particular concern is the Redshank, its numbers have rapidly declined and comparison between the two 7-year data sets shows a decline by almost 18.0 %. However, this decline is not indicated in the British index where the numbers appear to be steady and show little variation (Banks 2006). It is not clear whether this decline is just a Poole Harbour phenomenon or like Lapwings and Grey Plover because of milder winters, they are not moving south-west and remaining in eastern England (Austin & Rehfish 2005; Gillings et al. 2006).

The largest decline in any of the species occurring in the Harbour has been with the Lapwing population. In the past, its numbers made up often more than 10.0% of the Harbour's WeBS low water wader total. Since the turn of the century, wintering numbers have declined by over 75.0%! The reason for these declining numbers is almost certainly attributable to the current run of milder winters and birds in the east are just not moving south-west (Austin & Rehfish 2005; Gillings et al. 2006). This is a species that needs to be looked at more closely, especially their wintering areas that border the Harbour.

It is assumed that for the same reasons that wintering Lapwing have declined, Grey Plover have followed suit, as over the same period they have decreased by 16 0%. Concern was expressed in the previous report about the declining Curlew numbers, during the current 7-year period, although the peak counts have been erratic, they showed signs of stabilizing from around the turn of the century. The overall population has declined by 4.0%

during the past 7-years, but the 14-year trend suggests a slight upward movement. This is a species that its Harbour numbers might be governed not only by food availably on the mud flats but the prevailing condition of the wet grasslands bordering the Harbour.

The peak numbers of Dunlin continue to rise and now reaches annually around 7000. Over the past 7-year period there bas been an increase of over 12.0% in the annual total mean count. Why there sbould be this continuing rise in numbers in the Harbour is not easy to explain, considering that the GB annual index has been declining and reacbed its lowest point for 17 year (Banks et al. 2006). Whether there is any relationship with a possible increase in invertebrate prey, as a result of eroding *Spartina* marshes that is leaving increased expanses of mud at low water, does needs further investigation.

The decline noted in the 1991 - 1998 period of the wintering Oystercatcher population continues. Over the past 7-year period it has decreased by a further 5%. Why this should be is a little surprising, especially as the GB population trend is thought to be fairly stable (Banks et al. 2006).

Three species of wintering geese and ducks are showing diminishing populations, Dark-bellied Brent Goose, Pochard and Goldeneye, all could be related to the run of milder winters but there are probably other factors. Since the winter of 2001/02, the Dark-bellied Brent Goose has shown a marked decline in the Harbour and for the 7-year period showed a drop of over 34.0%. It is probable that some of this decline is also attributable to a succession of poor breeding seasons (Banks et al. 2006). Pochard numbers have declined markedly by over 50% during the past 7-years but large numbers in the past have been usually associated with long spells of severe winter weather. During the same period Goldeneye numbers have declined by nearly 20%.

Although not approaching GB importance threshold, Wigeon numbers in the Harbour have steadily increased and show a 16.0% rise during the past 7-year period. Teal have shown a much larger increase by over 35.0%. The Harbour appears to be increasingly important for both these species. Rising slowly is Pintail numbers but the smaller population of Shoveler vary erratically from year to year.

The Little Egret is now very much a feature of the Harbour and numbers continue to increase but how mucb this is due to production of local born young or immigrants from western France is not known.

Of all the wintering key species, it is only Red-breasted Merganser whose population trend is stable. Currently Poole harbour is the second most important wintering site for the species in Great Britain.

There has been just over a 6.0% rise in the 7-year peak mean for Cormorants and still rising slowly. Whether this rise is as a result during the early winter of immigration of the continental race *P. c. sinensis* is not clear but there appears to be an increase of sightings of adults of this race in the Harbour (B. P. Pickess pers. Obs.).

The percentage distribution of these 19 key wintering species at low water WeBS is shown in Table 6. All sections support several species and at least one species at 1% or above of their total Harbour population, but some sections in total do not support even 1% of the combined population of the 19 key species.

In Table 7 is shown the comparison between the two 7-year sets of data of the 10 key sections in the Harbour. Where as previously Holes Bay (NC3) was not listed as one of the top 10 sections, had its four sections bas been combined, it would have qualified. Already, Holton (W2) had a section that was above the selected 5% level but amalgamation of the other two sections increased the total percentage by 27%.

Table 6 The distribution, by section of Poole Harbour, of key species of waterfowl and waders based on the low water WeBS count data gathered during 1998/99-2004/05, showing the percentage mean for each species and total mean percentage of the Harbour population of key species present in eacb section

Section	West (W)							North Central (NC)			North East (NE)			South Central (SC)								South East (SE)			Total
Species	7	6	5	4	3	2	1	1	2	3	1	2	3	1	2	3	4	5	6	7	8	1	2	3	%
Cormorant	*	1.1	5.8	1.5	1.2	4.1	*	1.4	2.3	6.2	1.2	4.4	5.6	1.9	*	3.4	6	*	3.6	*	*	2.1	**	*	97
Little Egret	*	2.3	14.9	3.6	2.4	16	*	1	*	13.9	*	1.8	2.1	3.4	2.7	3.5	7.8	*	7.1	1.8	2.2	1.6	6.6	*	99.9
Brent Goose			4.9	*		4.8	*	*	*	1.7	4.7	3	8.9	15.1	11.8	2.6	11	1.8	1	*	9.3	5.6	13.4	*	99.6
Shelduck	*	*	13.5	8.8	4.7	3.4	*	*	*	10.4	*	3.8	*	3.2	2.9	3.1	8.1	6.5	6.8	4	1.5	*	16.5	*	97
Wigeon	*	*	7.7	1.6	1.9	19.2	*	1.5	*	21.7	*	6.1	*	*	1.1	*	6.8	2.3	13.2	1.5	*		8.5	4.5	97.6
Pintail			17.6	9.1	*	3.9	*	*		2.5		*		*	1.5	*	12.4	*	13.1	*			15.4	20.8	96.3
Teal	*	*	*	2.4	7.7	*		*		26.6		10	*	*	*	*	1.7	4.6	10.7	7.5	14.6	*	5.6	4.9	96.3
Shoveler	*	1.5	*	*		*				*	*	6.6	1.3			*	*	11.6	*	21.2	2.6		*	51.7	96.5
Pochard		1	*							*		1	*									*		95.9	97.9
Goldeneye	*	*	1.9	*	*	8.7	1.8	2.4	*	5.8	1.8	*	7	8.5	1.3	13.9	11.8	*	1.4	*		11.9	15.6	3.6	99.9
R-b Merganser		1.3	6.7	3.3	1.3	8.2	1.6	1.6	*	5.3	7.1	1.4	5.2	7	*	13.7	6.2	*	3.8	1		13.2	10	*	97.9
Oystercatch		*	10.8	6.3	1.4	8.4	1.3	3.3	*	5.5	8.5	4.6	5.2	2.9	1.1	5.1	9.4	6.5	8.9	4.2	*	1.9	4.1		98.4
Avocet		*	1.5	*	*	*	*		*	1.4		45.3			*	1.3	1.7	26.6	*	19.4	*	*	*		97.2
Grey Plover		*	1.1		5.7	3.6	*	*		1.3	*	*	*	3.2	6.1	4.3	25.7	5.7	2.2	14.2	*	*	23.4		96.5
Lapwing	14.2	14.4	2.2	2.7	26.8	*				*		*		*	1.8		2.9	2.2	*		10.6		5.1		98.6
Dunlin	*	*	3.0	8.2	1.8	1.2	*	*		3.5	*	*	2.1	*	1.3	1.1	8.3	7.1	1.4	9.3	*	*	22.7		98
Black-t Godwit	*	1.7	18.7	20.7	4.5	*	*	*		24.5	*	9.8	*	*	*	2.4	2	3.3	5.1	2.8	*	*	2.2		97.7
Curlew	*	1.1	14.1	12.8	1	1.2	*	*	*	10.2	*	*	*	1.8	1	2.1	10.6	9.6	4.6	5.9	*	*	9.5		95.7
Redshank	*	*	2.7	*	11.2	4.6	*	*		9.3	*	1.5	2.5	1.8	2.8	3.6	5.1	9.5	3.1	8.6	*	*	1.2		99.3
Section Total	14	25	174	81	72	98	5	11	2	173	24	144	40	49	36	60	138	97	86	101	41	37	167	182	1857
Section Total as a % of Harbour mean of Key species	0.6	1.3	9.4	4.4	3.9	5.3	0.3	0.6	0.1	9.3	1.3	7.8	2.2	2.6	1.9	3.3	7.4	5.2	4.6	5.4	2.2	2	9	9.8	99.9

* = Section holding <1.0% of Harbour Mean of Key Species

Bold = Sections holding > 5% of Harbour mean Key Species

Table 7 A comparison of the top 10 sections of Poole Harbour holding over 5% of total of 19 key species at WeBS low water counts during (1991/92 - 1997/98) and (1998/99 - 2004/05)

Section	1998/99 - 2000/05	1991/92 - 1997/98	Section	1998/99 - 2000/05	1991/92 - 1997/98
Keysworth (W5)	9.4%	5.1%	East Fitzworth (SC4)	7.4%	8.3%
Giggers (W4)	4.4%	5.2%	Wytch (SC5)	5.2%	4.4%
Holton (W2)	5.3%	7.4%	Lower Middlebere (SC7)	5.4%	2.6%
Holes Bay (NC3)	9.3%	7.8%	Brands Bay (SE2)	9.0%	9.7%
Brownsea (NE2);	7.8%	7.5%	Little Sea (SE3)	9.8%	10.9%
			Total	73.0%	68.9%

Comparing the two data sets, six sections each held over 7.0% of the Harbour population. Brands Bay (SE2) and Little Sea (SE3), still holding a large percentages of the wintering population but both showed some decline. In Wareham Channel there appears to be a switching around of sections, with Keysworth (W5) now the most favoured, holding 9.4%. The Holes Bay (NC3) percentage increased but other sections have only shown slight gains or losses, except for Lower Middlebere (SC7) where numbers have doubled. The overall reasons for the shift in distribution may be more attributable to the sections being associated with the main feeding areas, rather that they are located in 'shooting fee zones'. Little Sea (SE3) remains the top section in the Harbour, it is undisturbed and not surprisingly, the total comprises all waterbirds. Why there is a doubling in the percentage now favouring Lower Middlebere (SC7) may be partly because it is a shooting free zone' but must only be part of the reason.

At peak over the 14-year wintering period 1991/92 - 2004/05, nine species have shown upward trends, nine species downward trends but only one species is suggesting stability (Table 8).

Table 8 14-Year Trends of Peak Counts of 19 Selected WeBS Count Species in Poole Harbour 1991/92 - 2004/05

Increasing	Population Stable	Decreasing
Little Egret		Dark-bellied Brent Goose
Wigeon	Red-breasted Merganser	Shelduck
Pintail		Shoveler
Teal		Pochard
Cormorant		Goldeneye
Avocet		Oystercatcher
Dunlin		Lapwing
Curlew		Grey Plover
Black-tailed Godwit		Redshank
9 Species	1 Species	9 Species

Interestingly, despite the large declines in Lapwing numbers, the total numbers of key species using the harbour during the winter months has changed very little, as shown by Underhill-Day (2008). The Lapwing loss has been compensated by the higher numbers of especially Teal, Avocet, Dunlin and Black-tailed Godwit. Not included in Table 8 are the two small grebes, both occurring in very small numbers but at peak, their wintering populations are of GB importance. Both are showing steady declines but the Slavonian Grebe more sharply than the Black-necked Grebe. The relationship between the winter small grebe populations in Shell and Studland Bays with those inside the Harbour is still not satisfactorily resolved (Lilly et al. 2006).

All the Amber listed breeding birds have shown increases in populations, some significantly. The breeding Little Egrets have meet with some misfortune on Brownsea (NE2) through avian predation but they appear to be establishing, certainly one more colony in the Harbour area.

The breeding survey of Water Rails during 2003 showed just how large the population is around the Harbour reed beds and probably is of UK importance (Chown 2004).

The breeding Lapwing population was almost extinct by the end of the last century but due to conservations effort, a nucleus has been established on Arne Moors. More worrying was that a breeding survey undertaken of Redshank during 2003, showed their numbers to be still declining (Cook 2004). Poole Harbour holds the largest breeding population in the south-west.

The major population leaps have been with UK colonizing Mediterranean Gull and the indigenous Black-headed Gull, now Amber listed. It is most likely that with the recent demise of the once, very large Needs Orr nesting Black-headed Gull colony in Hampshire, that many of the birds have moved to Poole Harbour. The Harbour population of Black-headed Gulls has doubled and the Mediterranean Gull more than quadrupled. The Brownsea colonies of Sandwich Tern and Common Tern have gone from strength to strength both holding over 1% of the British breeding population.

No surveys have been undertaken of either Cetti's Warbler or Bearded Tit but their populations are thought be little changed since the late 1990's. The size of the Harbour's Red listed breeding population of Reed Bunting remains an unknown quantity.

The numbers recorded of the globally threatened Aquatic Warblers have declined. However, they are very secretive birds and the small number recorded may be as much because of the reduced ringing effort in the Harbour, rather than fewer birds passing through in the autumn.

Marsh Harriers still regularly occur but there is no evidence of intentions to breed. Currently, with increasing numbers of breeding birds elsewhere in Britain, it is a little puzzling why it has not returned to nest in the Harbour area. Now that there are over 300 territories in the UK, this species will loose its Red Listed status.

6. Discussion and Recommendations

In producing a report concerning the key birds of Poole Harbour inevitably it will raises numerous questions, to which there are, often no satisfactory answers. It has become apparent that there are numerous gaps in our knowledge concerning the distribution and usage by birds in and around Poole Harbour. Further, there is also a need to be able to respond to the continuing various developments and usage threats that may have implications to waterfowl, waterbirds and the breeding populations of international, national and Harbour importance.

Probably mostly for climatic reasons, the wintering populations of some wildfowl and waterbirds have shown changes in their numbers during the 7-year period. The most marked has been the very large drop in the number of Lapwing visiting the Harbour. If the continuation of mild winters persists, it is likely that other species will be following the Lapwing and Grey Plover and their numbers will decline in the Harbour. Up to now the void, that mainly the Lapwing has created, has been filled by other regular Harbour species. Should more birds remain in eastern England to winter, it is probable that the overall Harbour wintering population will decline.

The work of Thomas et al. (2004) has given an indication and a better understanding of the distribution of invertebrate prey for birds in the Harbour. Studies in Holes Bay (NC3) illustrate the changing nature of the sediments and their responding invertebrate prey densities (Bowles & English 2005). Some changes in usage within the Harbour may be because of fluctuations in prey density and could suggest why some areas of mud flat sometimes appear to be under exploited.

Little is known about how birds use the Harbour during the night. It is possible, that birds may visit and feed in sites which are generally unavailable through disturbance in daylight hours. Probably in areas illuminated by the lights of Poole, particularly Hole Bay (NC3), Parkstone (SE3) and Sandbanks (SE1), where most of the mud flats at low water, should be visible enough for birds to feed. Possibly the rest of the Harbour would be similarly illuminated during the periods of the full moon. To establish whether the mud flats of the Harbour are utilized in such a manor, it would be an invaluable piece of research, particularly in view of the pressures being continually placed upon Poole Harbour and should be viewed as of high priority.

With the unfortunate amalgamation of the Holes Bay WeBS data and the pending construction of a bridge across the southern part of Holes Bay (NC3), more studies are needed to record at both low and high water, the birds using the lower parts of the bay. This data would allow compression to be made of the impact before, during and after bridge construction.

The once large expanses of *Spartina* marshes in the Harbour are now steadily eroding; further invertebrate research is needed to understand the re-colonization of these reappearing mud flats. It is possible that the increasing population of Dunlin may be related to these potentially new feeding areas?

The *Spartina* marshes are also important for safe roosting sites for most of the Harbour's waterbirds at high tide (Morrison 2004). With the continuing loss of these marshes and the probability of rising sea level, there are going to be fewer undisturbed locations available, where birds can roost. It will be important to understand where these displaced birds are relocating in the Harbour and the disturbance problems they might be facing, the 2002/03 roosting survey should be repeated every five years.

Over the Crown foreshore, wildfowling takes place during the appropriate season. There is an end of season bag return to the Crown Commissioners but it only gives the species and the number taken. To gain a better understanding of where birds are taken in a particular season, it would be useful to know the date (probably just the month would suffice) and just the WeBS compartment concerned (not location). As the current information available does not give these details, it makes the fact that a total seasons bag of a particular species e.g. in 2001/02 the 415 Teal taken represented at peak, 25% of the Harbour population and 21% of the small Harbour population of Shoveler, which might be considered excessive. There would seem to be a need to know time scales and the sections where birds are taken. This information would give a more realistic impression of the distribution

of wildfowl shooting (Harbour and land based) and whether there is a relationship with the distribution of birds at low water WeBS counts with shooting pressure at high water.

Currently the Cormorant is an 'Amber' listed species but licences elsewhere in the UK are being issued for culling this species (Newsom et al. 2007). The problem causing this 'apparent' need to cull is primarily concerned with inlands fisheries, both commercial and amenity, where the rapidly expanding continental rare *P.c. sinensis* is involved. Should licences be sort to cull Cormorants locally, before any consideration is given, there is a need to know what percentage of the Harbour population comprises our indigenous race *P. c. carbo* or the immigrant *P.c. sinensis*. My personal casual observations in the Harbour would suggest that sightings of adult *P.c. sinensis* are more frequent now, than they were 20 years or more ago.

Almost certainly, grasslands adjacent to the Harbour are a contributing factor in maintaining good passage and wintering populations of both Curlew and Black-tailed Godwit. Just how important these area are for these species is not clear. There is certainly a gap in the knowledge concerning the significance of these areas, particularly as the Black-tailed Godwit population is of international importance. The studies necessary could be incorporated in a wider ranging remit, to include species such as also feeding Dark-bellied Brent Goose and Lapwing. The wintering Lapwing around the Harbour appears to be associated with particular areas adjacent to the Harbour. These areas should be identified and monitored, especially as the population is rapidly declining.

Poole Harbour is the second most important wintering site in Great Britain for Red-breasted Merganser, with Portland Harbour/Fleet area the third most important (Banks et al. 2006). It is still unclear just how much interchange there might be between populations, a more detailed and related study of both sites is required. The bulk of the Harbour wintering population still roost in the Harbour but birds are also observed leaving the Harbour towards dusk and birds are seen returning in the morning (Morrison 2004). It is suggested by Smith (2002) that one of the reasons for these birds flying out at dusk is to feed, rather than just roost on the sea. If this is a possible reason, it may be that the Bournemouth illuminations assist their night fishing. Considering the importance of the wintering population nationally, this feature of the Red-breasted Merganser evening behaviour require some further observations. Is it a nightly event, what percentage of the population stay to roost in the Harbour or does this exodus occur only in certain weather or tidal conditions?

The Harbour holds nationally important breeding populations of both Amber listed Mediterranean and Black-headed Gull; these should be regularly monitored, possibly every three years. With this sudden, more than doubling of the Black-headed Gull population, will the Harbour be able to support such a large population?

The declining Redshank population should be regularly surveyed, especially with the potential for sea rise and from the impact of Sika Deer. The survey should probably be undertaken every five years.

The Dorset Wildlife Trust on Brownsea Island already monitor annually both species of nesting tern. There is a potential for expanding the Common Tern population since the creation of a large gravel pit at Swineham. Regrettably, the islands that have been left are not very suitable for nesting terns but consideration should be given to providing some floating tern islands in the middle of the pit.

There will probably be national surveys of both Bearded Tit and Cetti's Warbler due before the next 7-year review is produced, so possibly additional survey work is not necessary.

Some thought should be given to surveying the breeding Reed Bunting population. As a Red listed species, it is surprising that so little is known as to its actual status around the Harbour. This lack of knowledge should be remedied.

The Harbour supports a population of breeding Shelduck, which have been in the past surveyed but little is known of their current numbers, breeding success or distribution. Their breeding status does require updating.

Reed beds are important for a number of breeding species. There is a need to update and carry out a condition assessment since the last survey in 2000 (Cook 2001). The chief cause of change is the impact by the large herds of Sika Deer present around the western side of the Harbour. It is known that this current high grazing pressure has resulted in damage to many reed beds and the loss of several small reed beds around the Harbour.

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8 References

Aspinal, S. and Tasker, M. L. (1990). Coastal Birds of east Dorset. Nature Conservancy Council.

Austin, E.A. and Rehfisch, M.M. (2005) Shifting non breeding distribution of migratory fauna in relation to climatic change. *Global Change Biology.* **11**: 31-38.

Baillie, S.R., Marchant, J.H., Crick, H.Q.P., Noble, D.G., Balmer, D. E.,Coombes, R.H., Downie, I.S., Freeman, S.N., Joys, A.C., Leech, D.I., Raven, M.J. Robinson, R.A. Thewlis, R.M. (2006) Breeding Birds in the Wider Countryside: their conservation status 2005. BTO Research Report No.435. BTO. Thetford. WWW.bto.org/birdtrends

Banks A., Collier, M., Austin, G., Hearn, R. and Musgrove, A. Waterbirds in the UK 2004/05. (2006) The Wetland Bird Survey. BTO/WWT/RSPB/JNCC. Thetford

Bibby, C. J. (1982). Polygyny and the breeding ecology of the Cetti's Warbler *Cettia cetti. Ibis* **124**: 288-3011

BirdLife International (2004). Birds in the European Union: a status assessment. Wageningen, The Netherlands: BirdLife International.

Bowles, F. and English, P. (2005) Sediment Quality and Benthic Invertebrates in Holes Bay. In: Humphreys, J. and May, V. (Editors). The Ecology of Poole Harbour. Elsevier. Amsterdam.

Caldow, R., McGrorty, S., West, A., Durell, S.E.A. Le V. dit., Stillman R. & Anderson, S. (2006) Macro-invertebrate Fauna in the Intertidal Mudflats. In: Humphreys, J. and May, V. (Editors). The Ecology of Poole Harbour. Elsevier. Amsterdam.

Chown, D. (2004). Important Breeding Birds of Poole Harbour. Pt. 1 Water Rail. Poole Harbour Study Group. Wareham.

Cook, K. (1998). Little Egrets breeding on Brownsea Island: The first breeding record for Britain. *Dorset Birds* 1998:169-169. Dorset Bird Club, Dorset

Cook, K. (2001). Poole Harbour Reedbed Survey 2000. Poole Harbour Study Group, Wareham.

Cook. K. (2004). Important Breeding Birds of Poole Harbour. Pt. 2 Redshank. Poole Harbour Study Group. Wareham.

Cramp, S. (Chief Editor) (1983). Handbook of Birds of Europe, the Middle East and North Africa. Volume III. (Waders to Gulls). Oxford University Press. Oxford.

Cranswick, P., Pollitt, M., Musgrove, A. and Hughes, B.(1999). The Wetland Bird Survey 1997-98:

Cranswick, P., Pollitt, M., Musgrove, A. and Hughes, B.(1999). The Wetland Bird Survey 1997-98: *Wildfowl and Wader Counts*. BTO/WWT/RSPB/JNCC, Slimbridge.

Diaz, A., Pinn, E and Hannaford, J. (2005) Ecological Impact of Sika Deer on Poole Harbour Saltmarshes. In: Humphreys, J. and May, V. (Editors). The Ecology of Poole Harbour. Elsevier. Amsterdam.

Durell, S.E.A. Le V. dit., Stillman, R.A., Caldow., R.W.G., McCrorty, S., West A.D., and Humphreys, J. (2006) Modelling the effect of environmental change on shorebirds: A case study of Poole Harbour, UK. *Biological Conservation*. **131**: 459-474.

Edwards, B. (2004) The Vegetation of Poole Harbour. Poole Harbour Study Group. Wareham.

Gilbert, G., Gibbons, D.W. and Evans, J. (1998). Bird Monitoring Methods: a manual of techniques for key UK species. RSPB.

Gillings, S., Austin, R.J. and Sutherland, W.J. (2006). Distribution shifts in wintering Golden Plover *Pluvialis apricaria* and Lapwing *Vanellus vanellus* in Britain. *Bird Study* **53**: 274-284.

Gregory, R.D., Wilkinson, N.I., Noble, D.G., Robinson, J.A., Brown, A.F., Hughes, J., Procter, D., Gibbons, D.W. and Galbraith, C.A. (2002). The population status of birds in the United Kingdom, Channel Islands and the Isle of Man: An analysis of conservation concern 2002-2007. *British Birds*. **95**: 410-448

Gunnarsson, T.G., Gill, J.A., Potts, P.M., Atkinson, P.W., Crouger, R.E., Gelinaud, G., Gardarsson, A. &
Sutherland, W.J. (2005). Estimating population size in Black-tailed Godwits *Limosa limosa islandica* by colour marking. *Bird Study* **52**: 153-158.

Gunnarsson, T.G., Gill, J.A., Petersen, A., Appleton, G.F. & Sutherland, W.J. (2005). A double buffer effect in a migratory shorebird population. *Journal of Animal Ecology*.**75**: 1119-1127

Hötker, H. & West, R. (2005). Population size, population development and habitat use by Avocet in Western Europe at the end of the 20th century. *Wader Study Group Bulletin* **107**: 57-65.

IUCN (2004) The 2004 IUCN Red List of threatened species (www.redlist.org)

Jensen. A., Carrier, I. and Richardson, N. (2005). Marine Fisheries of Poole Harbour. In: Humphreys, J. and May, . (Editors). The Ecology of Poole Harbour. Elsevier. Amsterdam.

Kershaw, M. & Cramswick, P.A. (2003) Numbers of wintering waterbirds in Great Britain and the Isle of Man (1994/1995-1998/1999): I, Wildfowl and selected waterbirds). *Biological Conservation* **111**: 91-104.

Lewis, I. (1996). The Aquatic Warbler in Dorset. *Dorset Birds* **1995**: 145-149. Dorset Bird Club, Dorset.

Liley, D., Pickess, B. & Underhill-Day, J. (2006). The numbers and distribution of black-necked grebes and other waterbirds at Studland., Poole Harbour Study Group. Wareham.

Mavor, R.A., Parsons, M., Heubeck, M. and Schmitt, S. (2005). Seabird numbers and breeding success in Britain and Ireland 2004. Peterborough, JNCC. (UK Nature Conservation, No.29.)

Mitchell, P,L., Newton, S.F., Radcliffe N. and Dunn, R.E. (2004). Seabird populations of Britain and Ireland: results of the Seabird 2000 census. Poyser, London.

Morrison,.S.J. (2004) Wader & waterfowl roost survey of Poole Harbour. Poole Harbour Study Group. Wareham.

Morrison, S. J. (2006) Holes Bay Survey: Effects of Bait Digging on feeding bebaviour of Wildfowl and waders Winter 2005/06. Unpublished report to Englisb Nature, Slepe Farm, Warebam.

Musgrove, A.J. (2002) The non-breeding status of Little Egret in Britain. *British Birds* **95**: 62-80.

Newson, S.E., Marchant, J.H., Ekins, G.R. & Sellers, R.M. (2007) The status of inland breeding Great Cormorant in England. *British Birds* **100**: 289-299

Pickess, B. (2005) The Important Birds of: Poole Harbour: Population Changes Since 1998 . In: Humphreys, J. and May, V. (Editors). The Ecology of Poole Harbour. Elsevier. Amsterdam.

Pickess, B.P. & Underhill-Day, J.C. (2002). Important Birds of Poole Harbour. Poole Harbour Study Group. Warebam.

Pinn, E. & Jones, M. (2006). Macroalgal Mat Development and Associated Changes in Infaunal Biodiversity. . In: Humphreys, J. and May, V. (Editors). The Ecology of Poole Harbour. Elsevier. Amsterdam.

Pollitt, M., Cranswick, P., Musgrove, A., Hall, C., Hern, R., Robinson, J. & Holloway, S. (2000) The Wetland Bird Survey 1998-99 Wildfowl and Wader Counts. BTO/WWT/RSPB/JNCC. Slimbridge

Price, R. (1997) A Survey of Saltmarsh communities within Poole Harbour, Dorset for breeding waders and gulls (1997). Unpublished report to RSPB

Rehfisch, M.M., Austin, G.E., Armitage, M.J.S., Atkinson, P.W., Holloway, S.J., Musgrove, A.J. & Pollitt, M.S. (2003) Numbers of wintering waterbirds in Great Britain and the Isle of Man (1994/1995-1998/1999): II, Coastal waders (Charadrii). *Biological Conservation* **112**: 329-341.

Robinson, R.A. (2005) Bird Facts: profile of birds occurring in Britain and Ireland (v1.1, Jan 2006) BTO Research Report 407, BTO. Thetford. (Http://www.bto.org./bird facts)

Robinson, R.A., Freeman, S.N., Balmer, D.E. & Grantham, M.J (2007) Cetti's Warbler *Cettia cetti*: analysis of an expanding population. *Bird Study.* **54**: 230-235

Smith, S (2003). Poole Harbour in the 1990s, Ten Years on and Counting. *Dorset Bird Report* **2002**: 192- 201

Thomas, N.S., Caldow,R.W.G., McGrorty, S., dit Durell,S.E.A. lev., West,A.D. and Stillman, R.A. (2004) Bird Invertebrate prey availability in Poole Harbour. Poole Harbour Study Group. Wareham.

Underhill-Day, J.C. (2008). A condition assessment of Poole Harbour European Marine Site. Poole Harbour Study Group. Wareham.

Voisin, C., Godin, J. & Fleury, A. (2005). Status and behaviour of Little Egret wintering in western France. *British Birds*. **98**: 468-475.

Walker, J., Day, J. and Lock. L. (1999) Dorset Farmland Bird Survey. Unpublished RSPB Report. Exeter.

Williams, C. (2000) The Status of the Avocet in Poole Harbour. *Dorset Bird Report* **1999**: 180-182. Dorset Bird Club, Dorset.

West, R. (2005) Pied Avocets wintering in Britain 1947 - 2001. *Study Group Bulletin* **107**: 54-56.

Wooton, S., Gibbons, D.W., Dilger, M. and Grice, P. V. (1998) Cetti's Warblers in the United Kingdom and the Channel Islands in 1996. *British Birds,* **91**: 77-89.

www.rspb.org.uk/birds (2007)

Appendix I.

Trends in selected species (1998/99 - 2004/05)

14-year trends of WeBS species.

15-year trends of Breeding species (1991 - 2006)

Fig 1 Peak annual low water WeBS count (Sept - Mar) of Dark-bellied Brent Goose in Poole Harbour 1991/92 - 2004/05, with trend

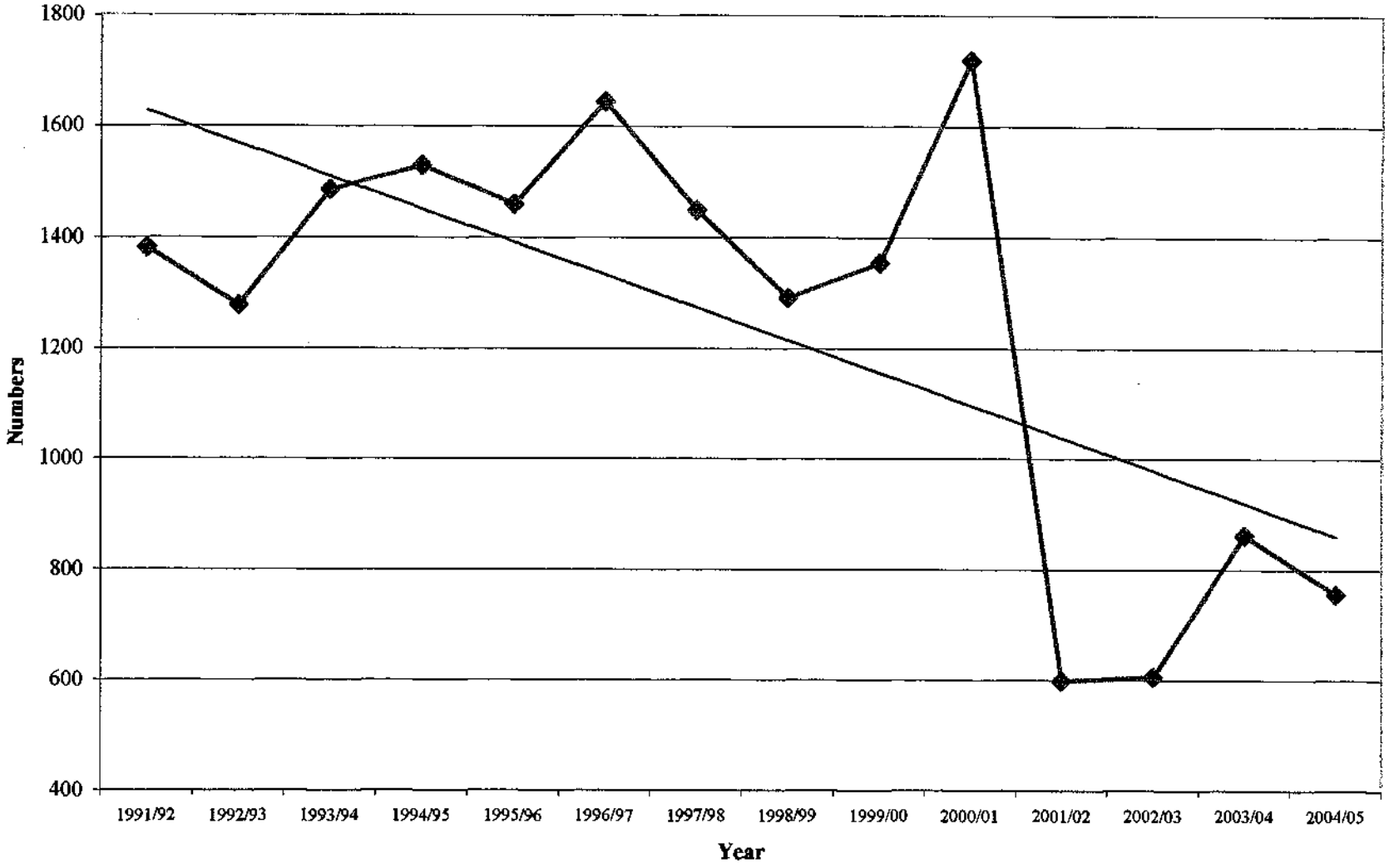


Fig 2 Peak annual low water WeBS count (Sept - Mar) of Shelduck in Poole Harbour 1991/92 - 2004/05, with trend

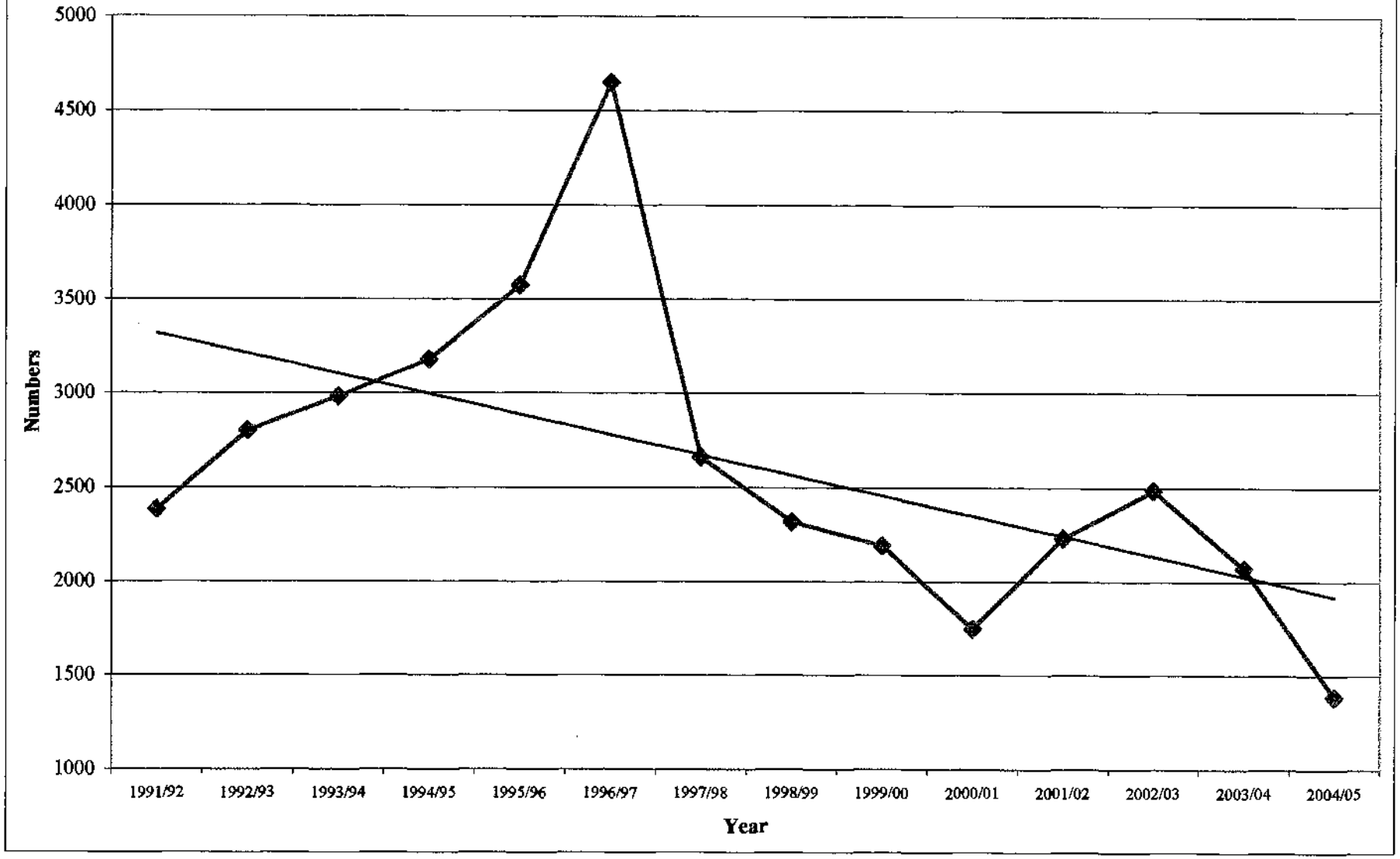


Fig 3 Peak annual low water WeBS count (Sept - Mar) of Wigeon in Poole Harbour 1991/92 - 2004/05, with trend

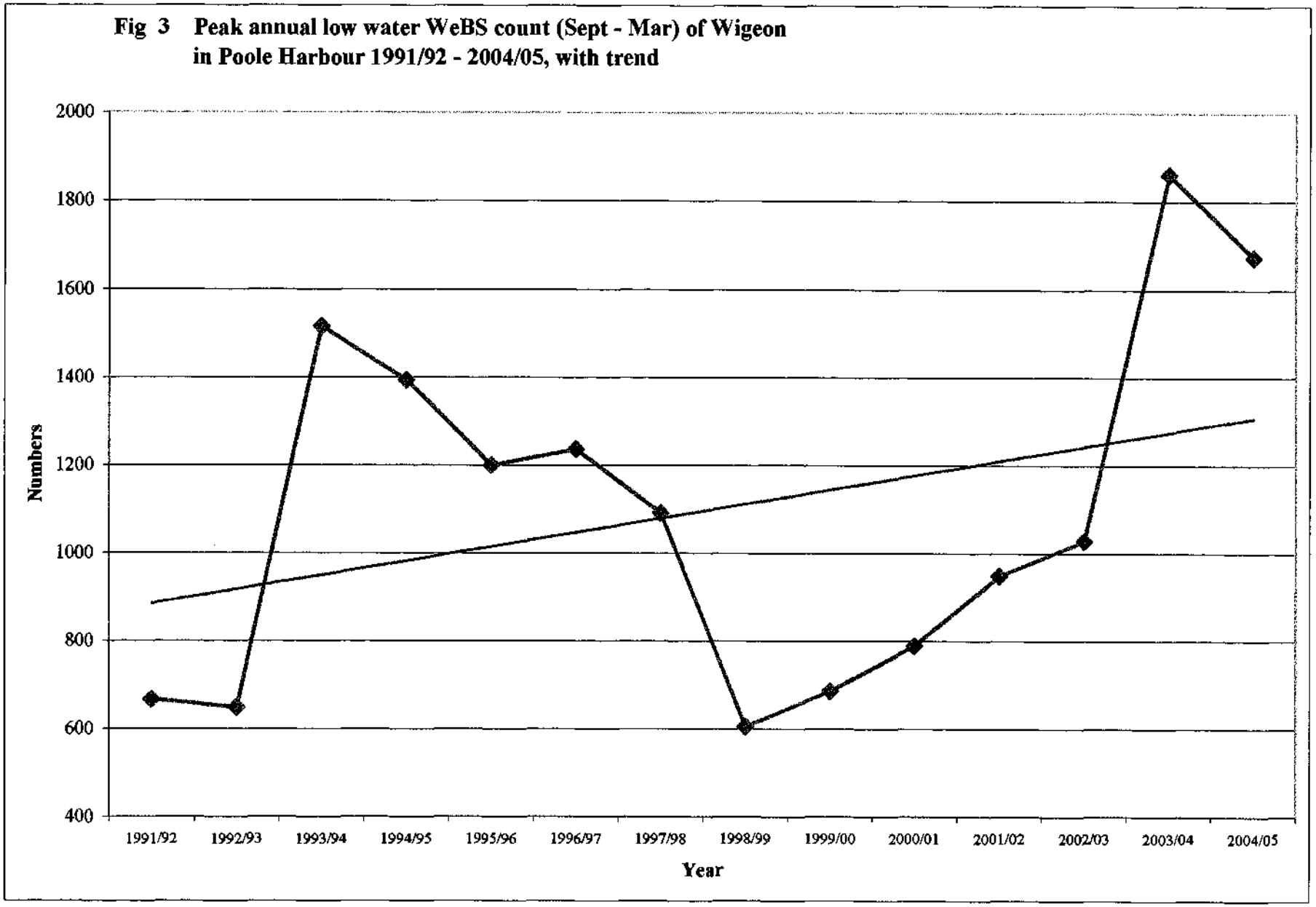


Fig. 4 Peak annual low water WeBS count (Sept - Mar) of Teal in Poole Harbour 1991/92 - 2004/05, with trend

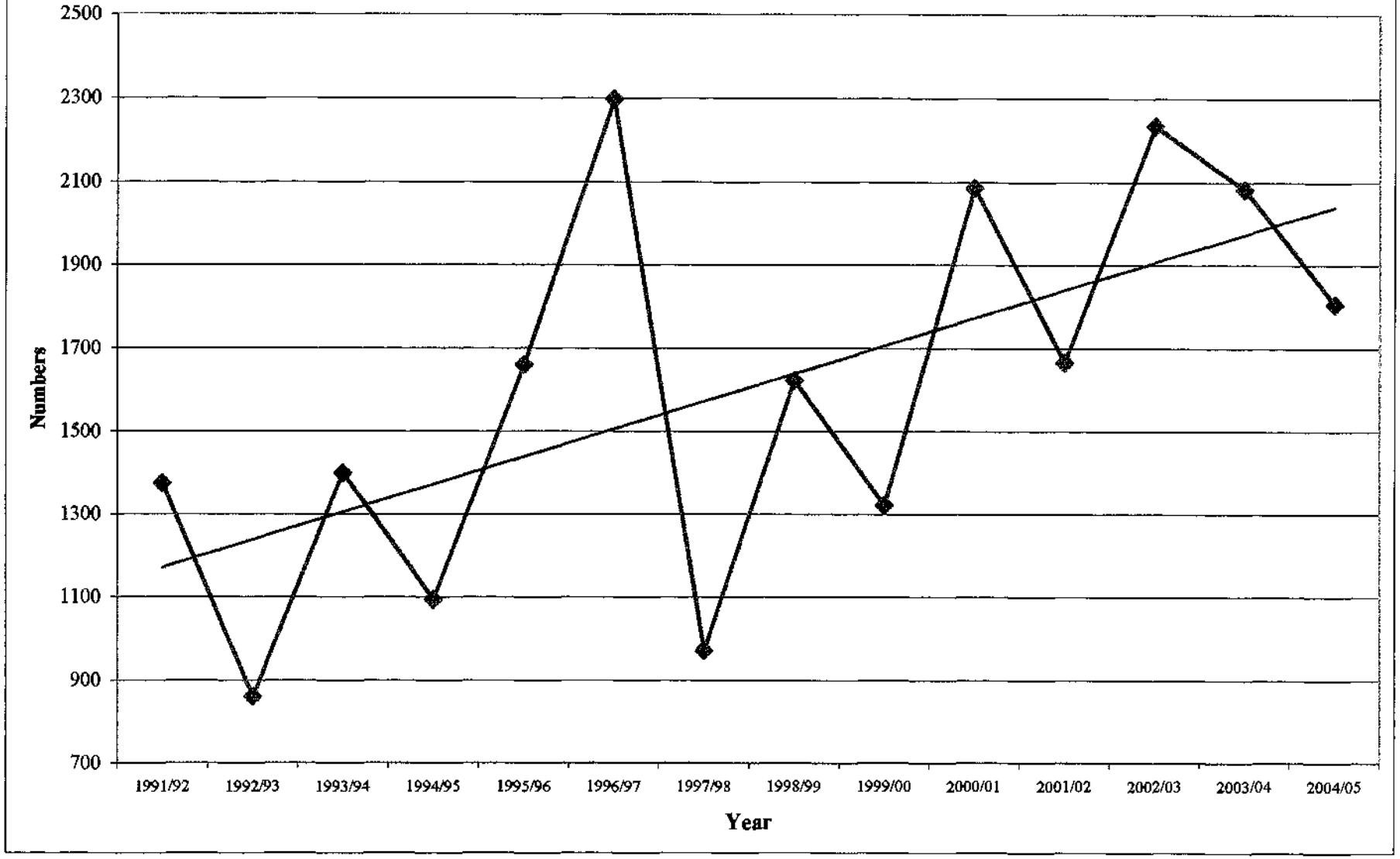


Fig 5 Peak annual low water WeBS count (Sept - Mar) of Pintail in Poole Harbour (1991/92 - 2004/05, with trend

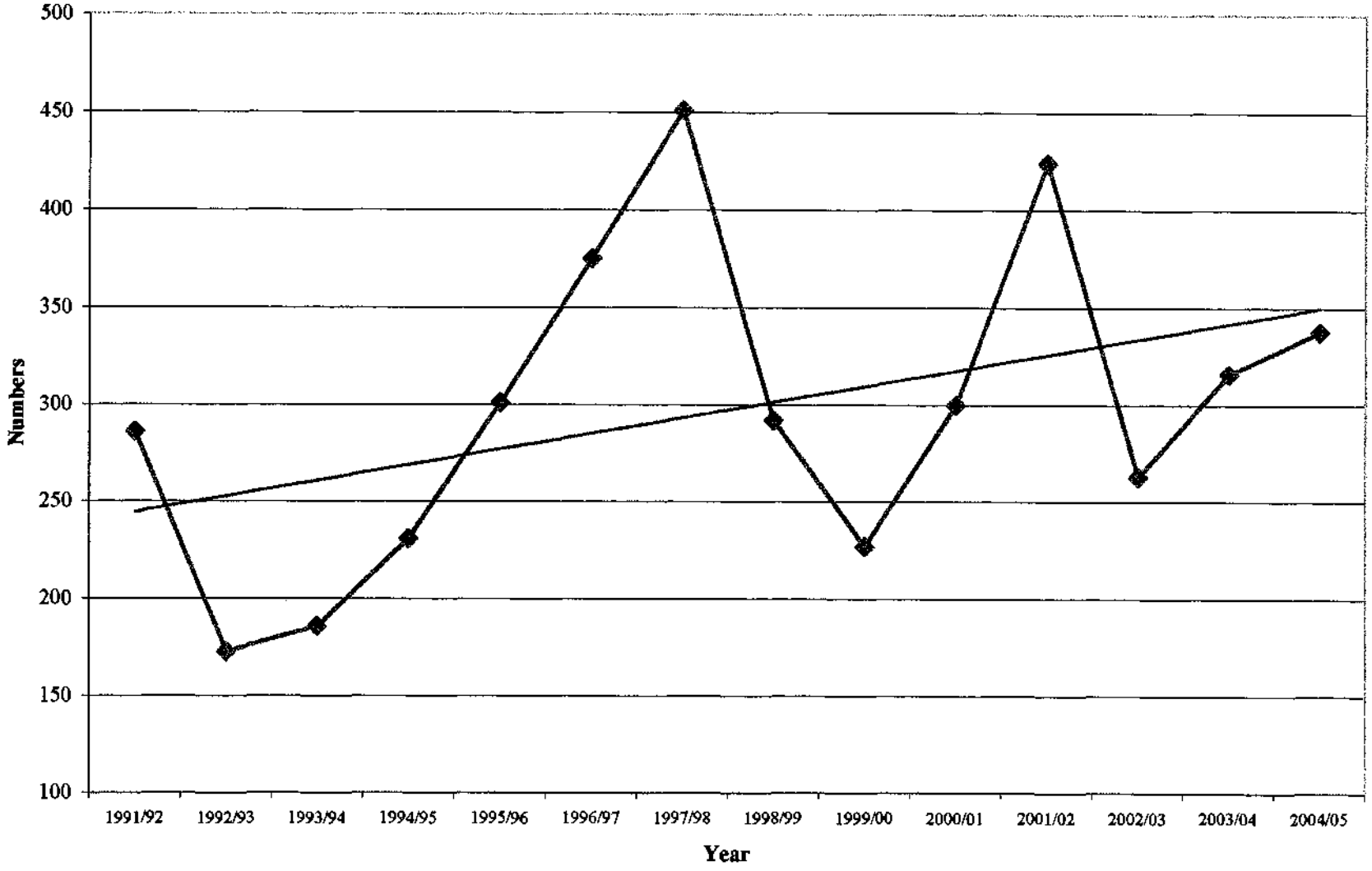


Fig 6 Peak annual low water WeBS count (Sept - Mar) of Shoveler in Poole Harbour 1991/92 - 2004/05, with trend

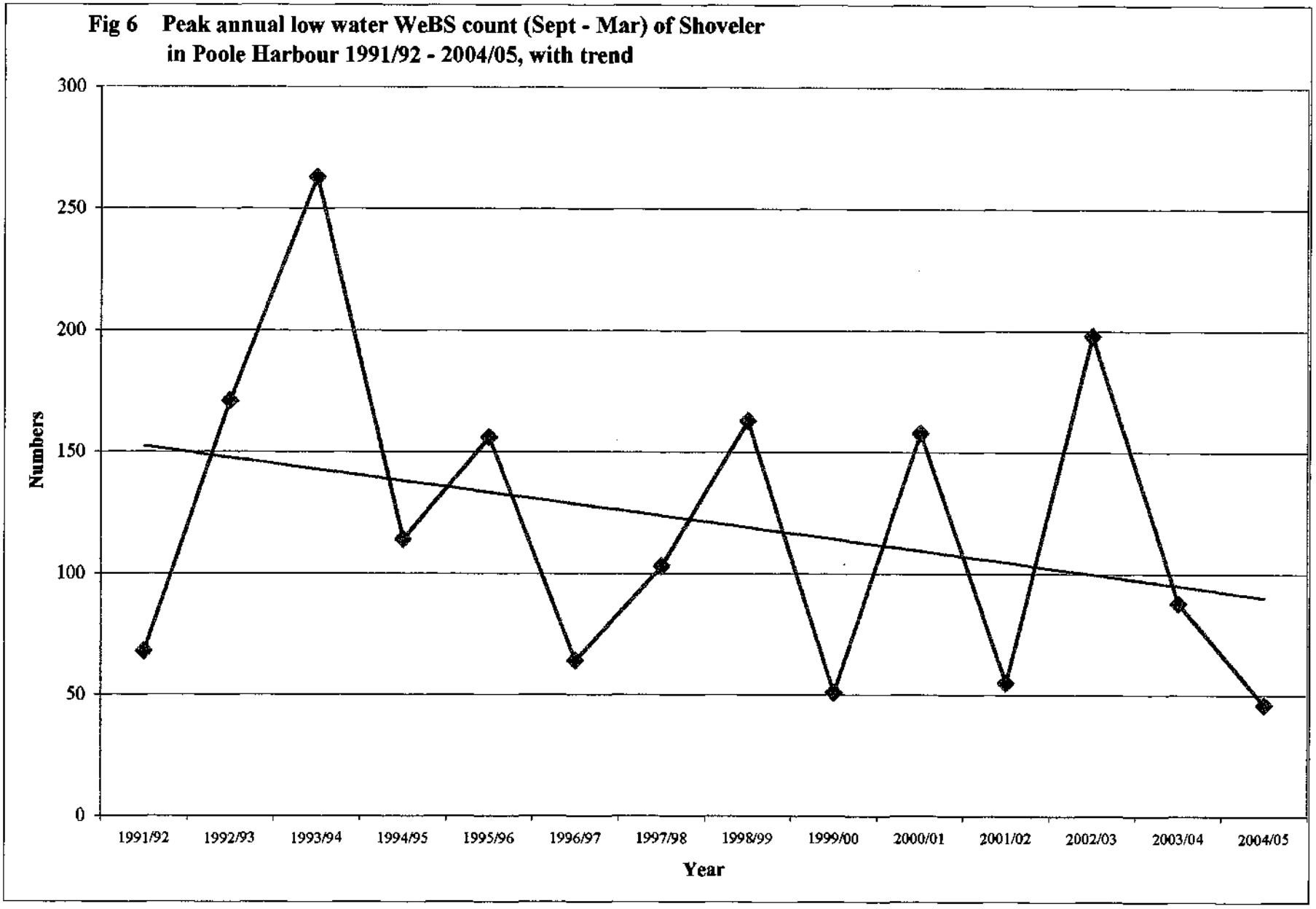


Fig 7 Peak low water WeBS counts (Sept - Mar) of Pochard in Poole Harbour 1991/92 - 2004/05, with trend

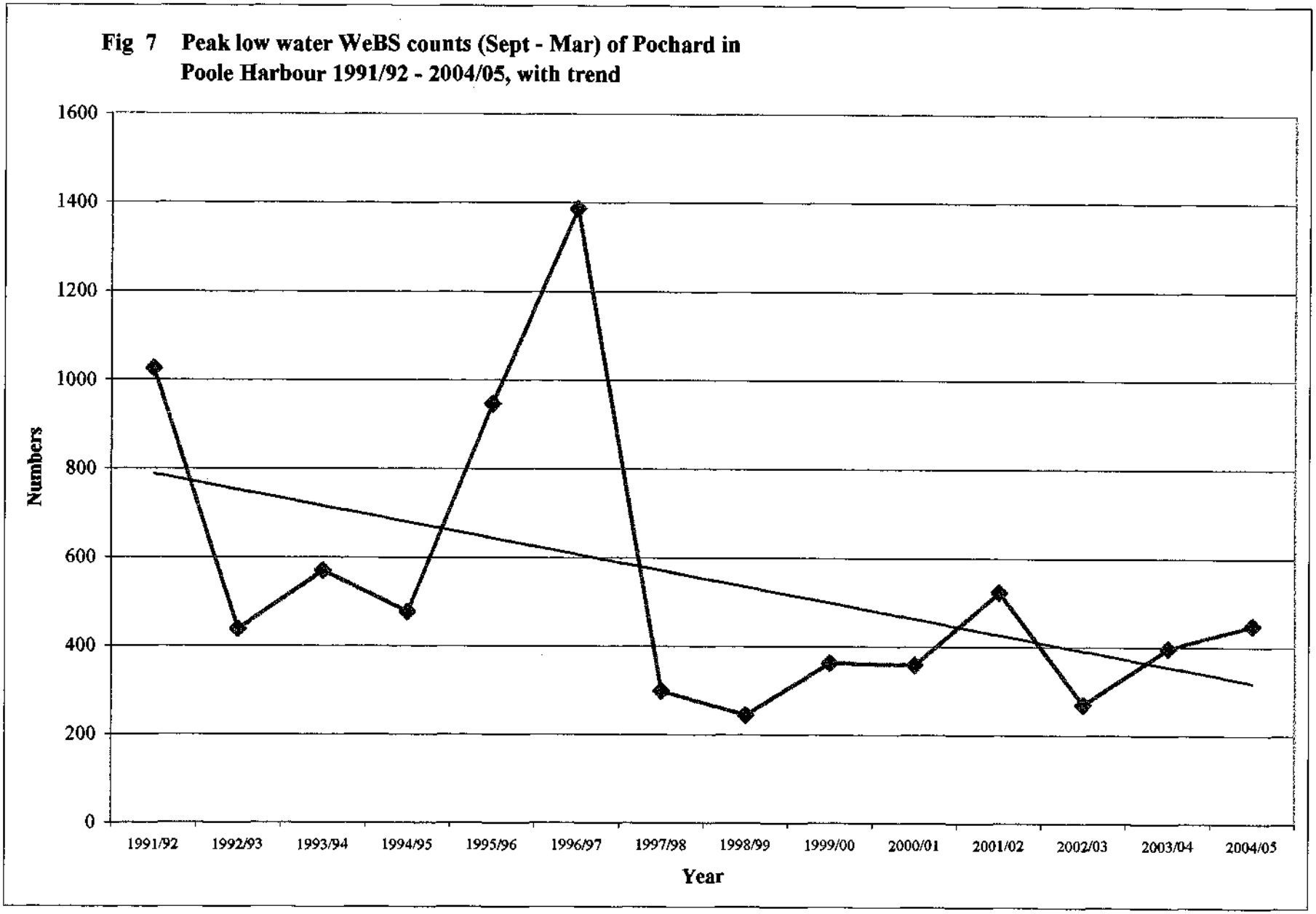


Fig 8 Peak low water WeBS count (Sept - Mar) of Goldeneye in Poole Harbour 1991/92 - 2004/05, with trend

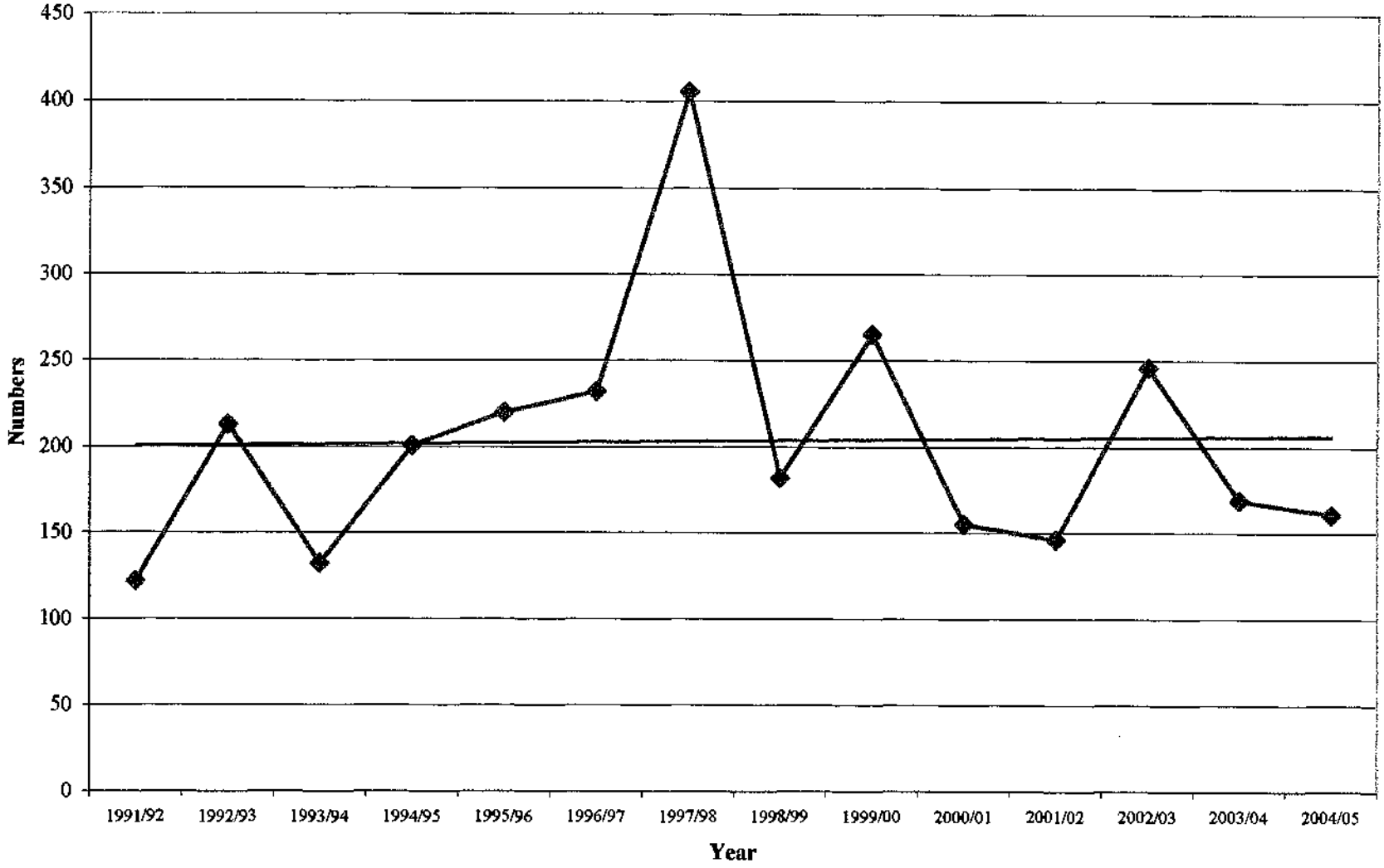


Fig 9 Peak low water WeBS count (Sept - Mar) of Red-breasted Merganser in Poole Harbour 1991/92 - 2004/05, with trend

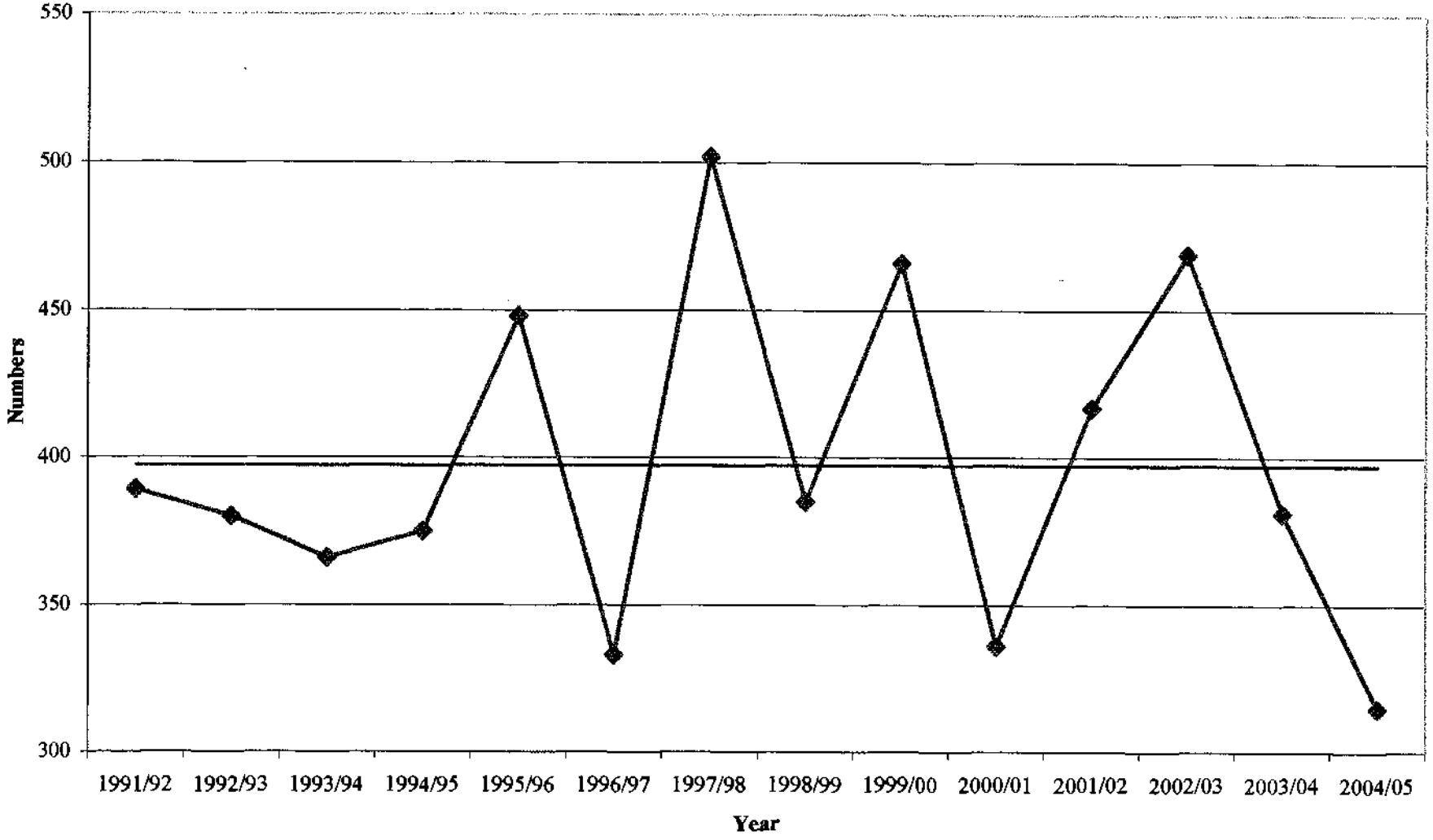


Fig 10 Peak annual low water WeBS count (Sept - Mar) of Slavonian Grebe in Poole Harbour 1991/92 - 2004/05, with trend

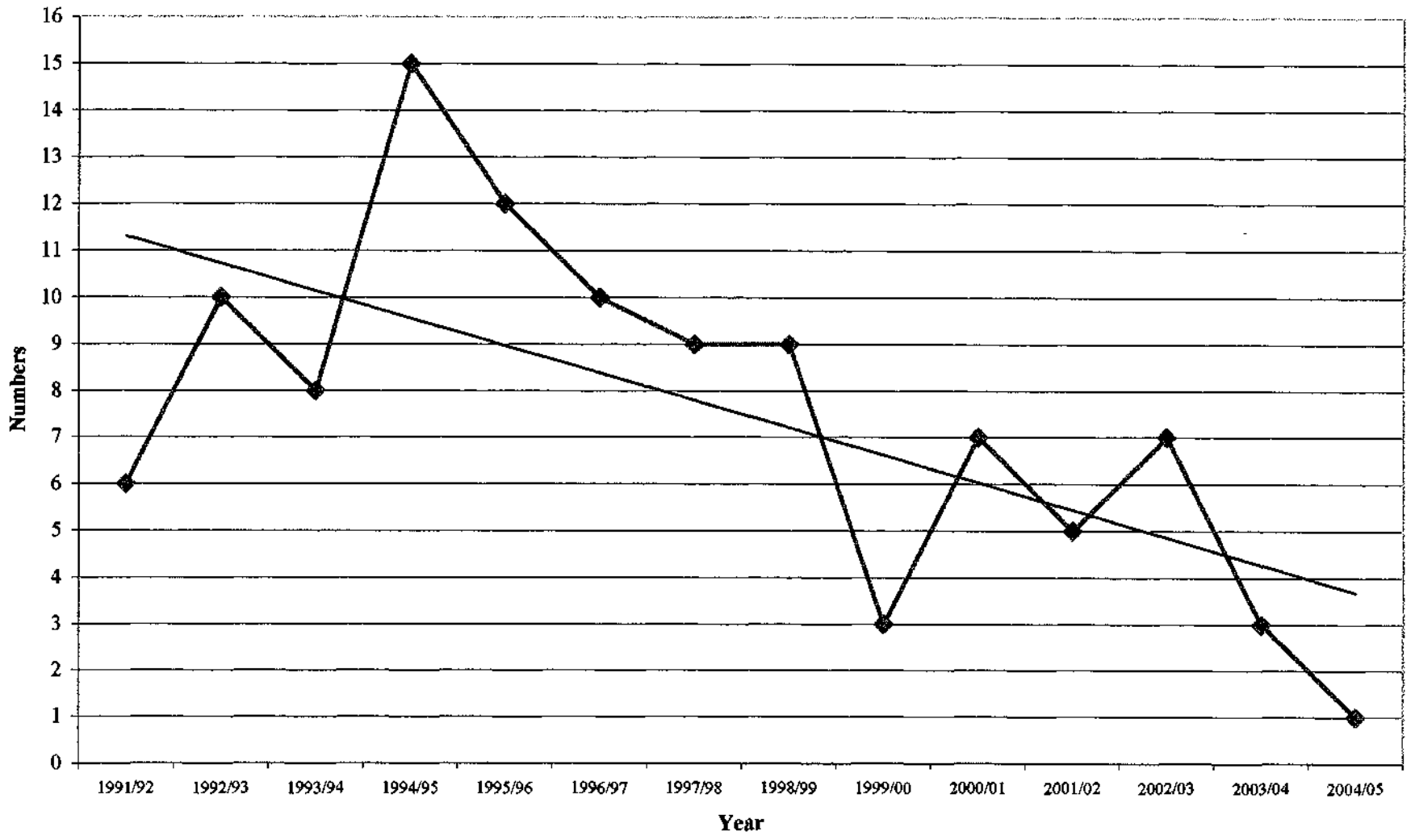


Fig 11 Peak annual low water WeBS count (Sept - Mar) of Black-necked Grebe in Poole Harbour 1991/92 - 2004/05, with trend

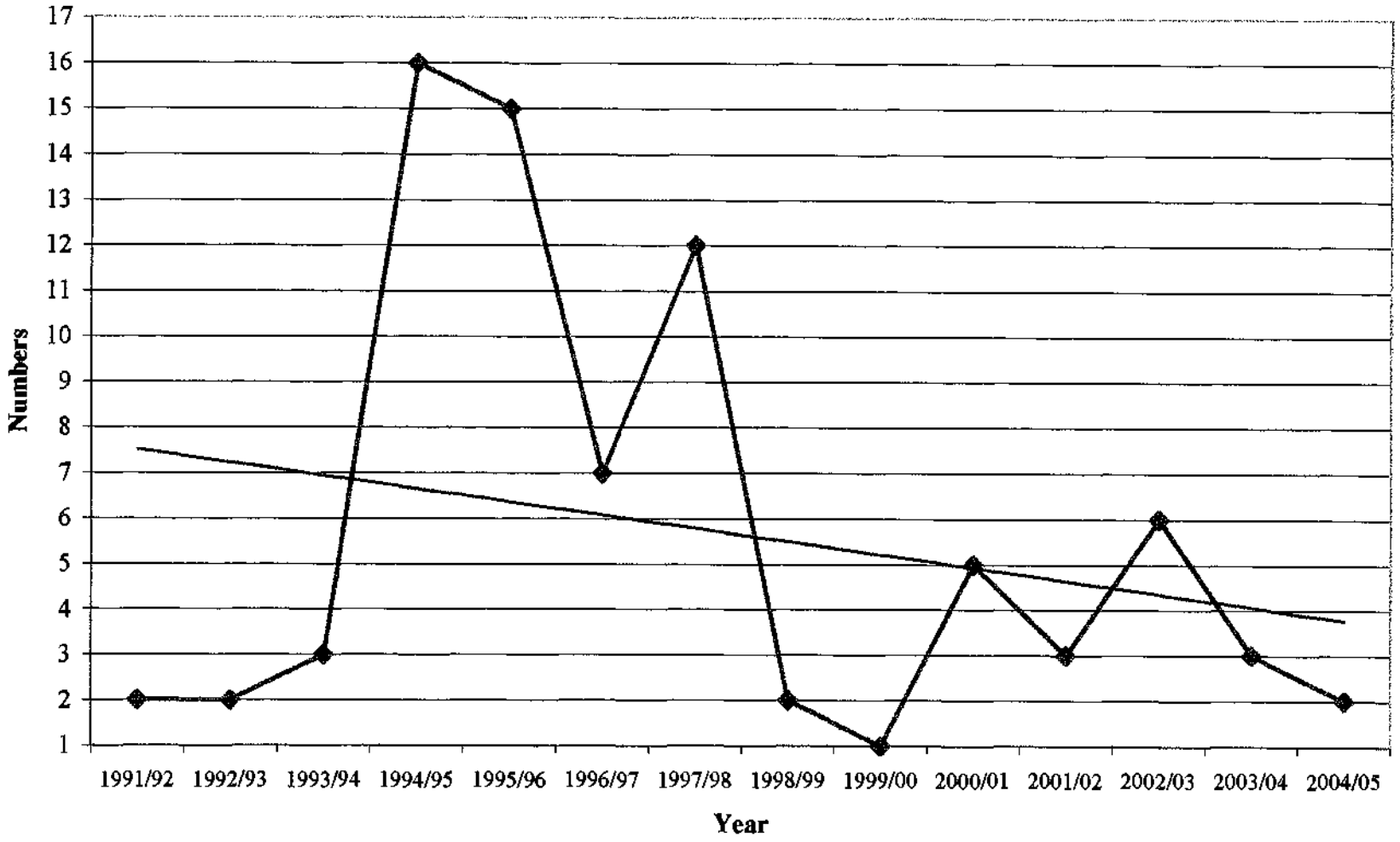


Fig 12 Peak annual low water WeBS count (Sept - Mar) of Cormorant in Poole Harbour 1991/92 - 2004/05, with trend

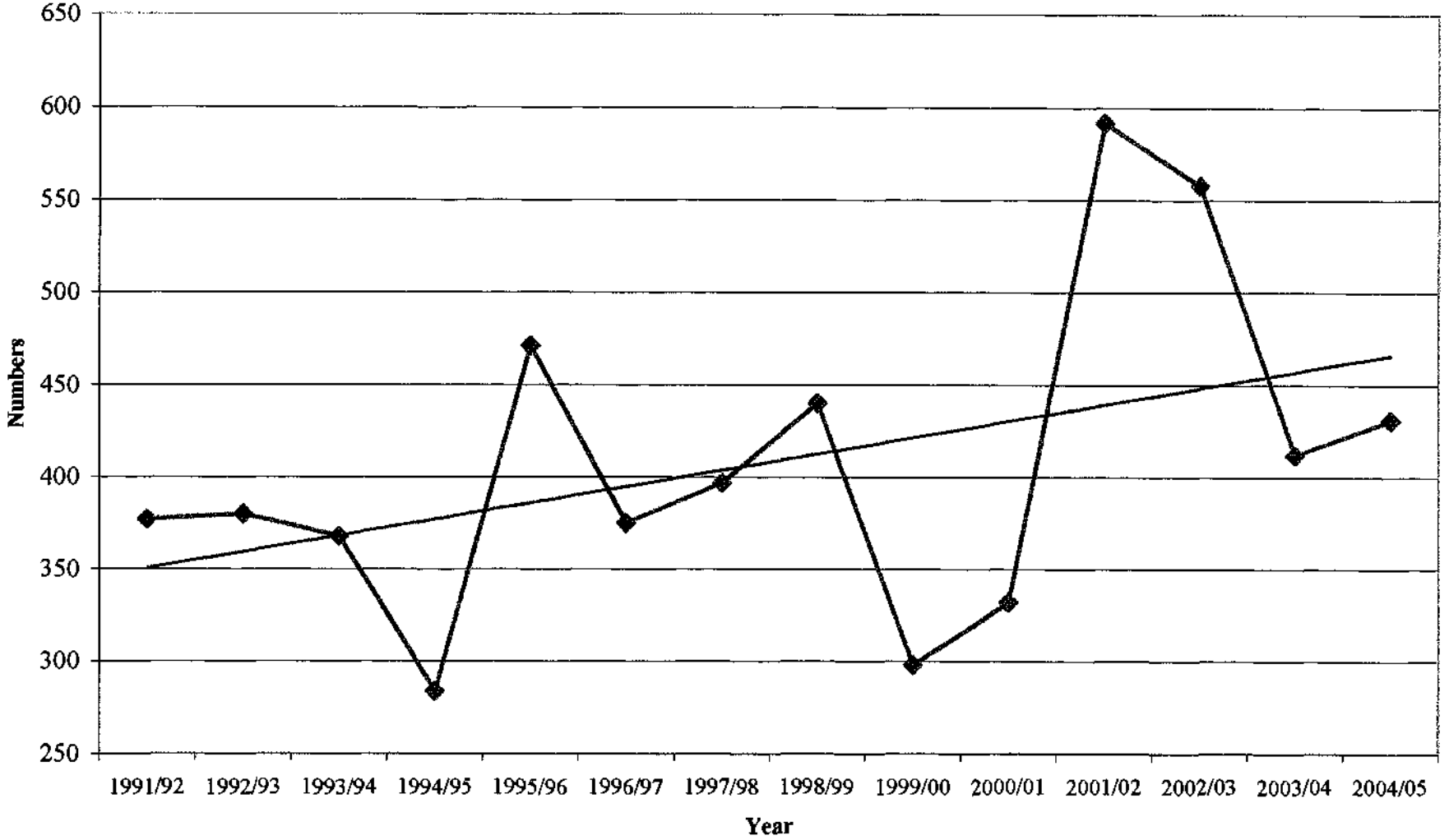


Fig 13 Peak annual low water WeBS count (Sept - March) of Little Egret in Poole Harbour 1991/92 - 2004/05, with trend

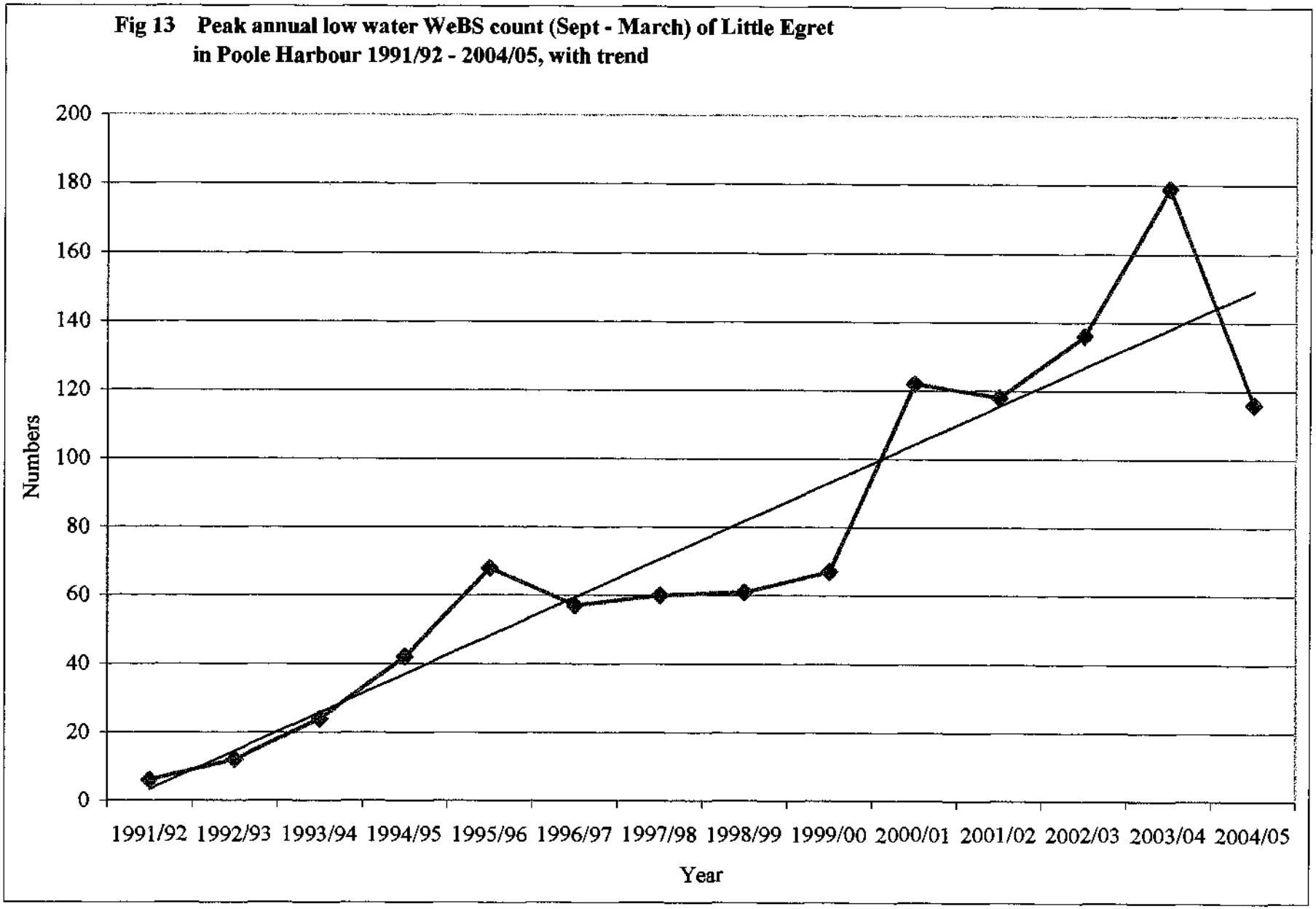


Fig 14 Peak annual low water WeBS count (Sept - Mar) of Oystercatcher in Poole Harbour 1991/92 - 2004/05, with trend

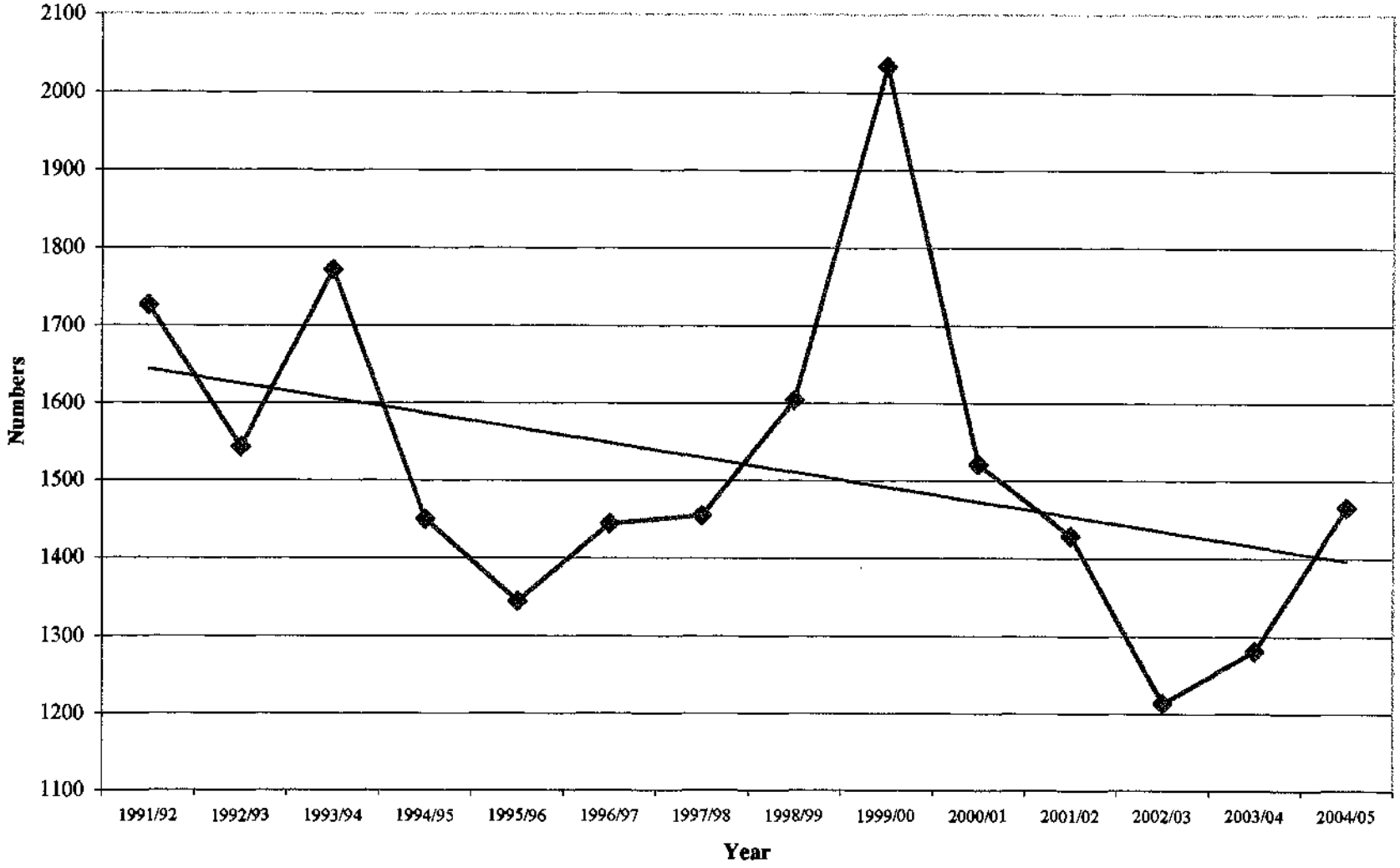


Fig. 15 Peak annual low water WeBS count (Sept - Mar) of Avocet in Poole Harbour 1991/92 - 2004/05, with trend

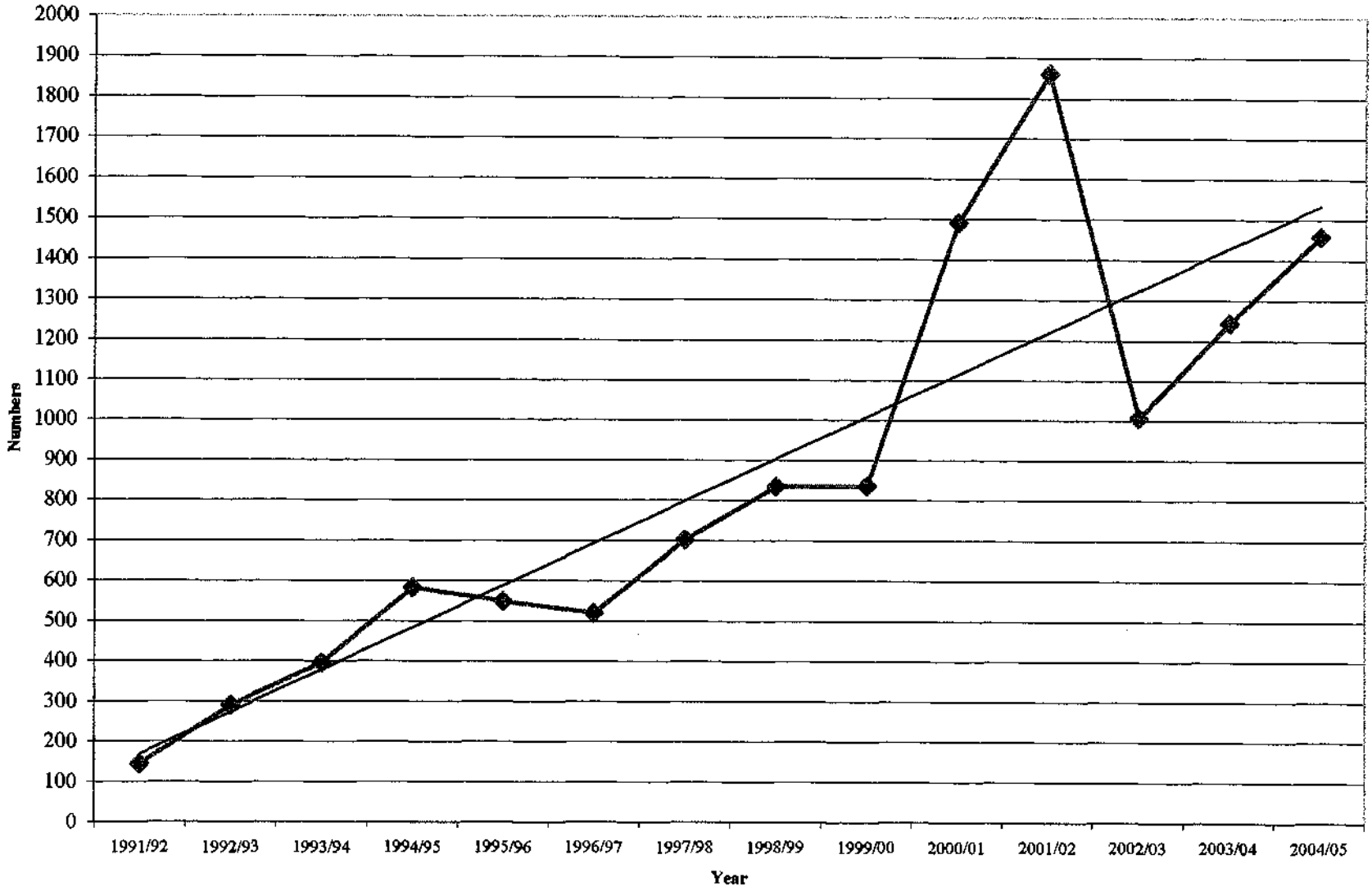


Fig. 16 Peak annual low water WeBS count (Sept - Mar) of Grey Plover in Poole Harbour 1991/92 - 2004/05. with trend

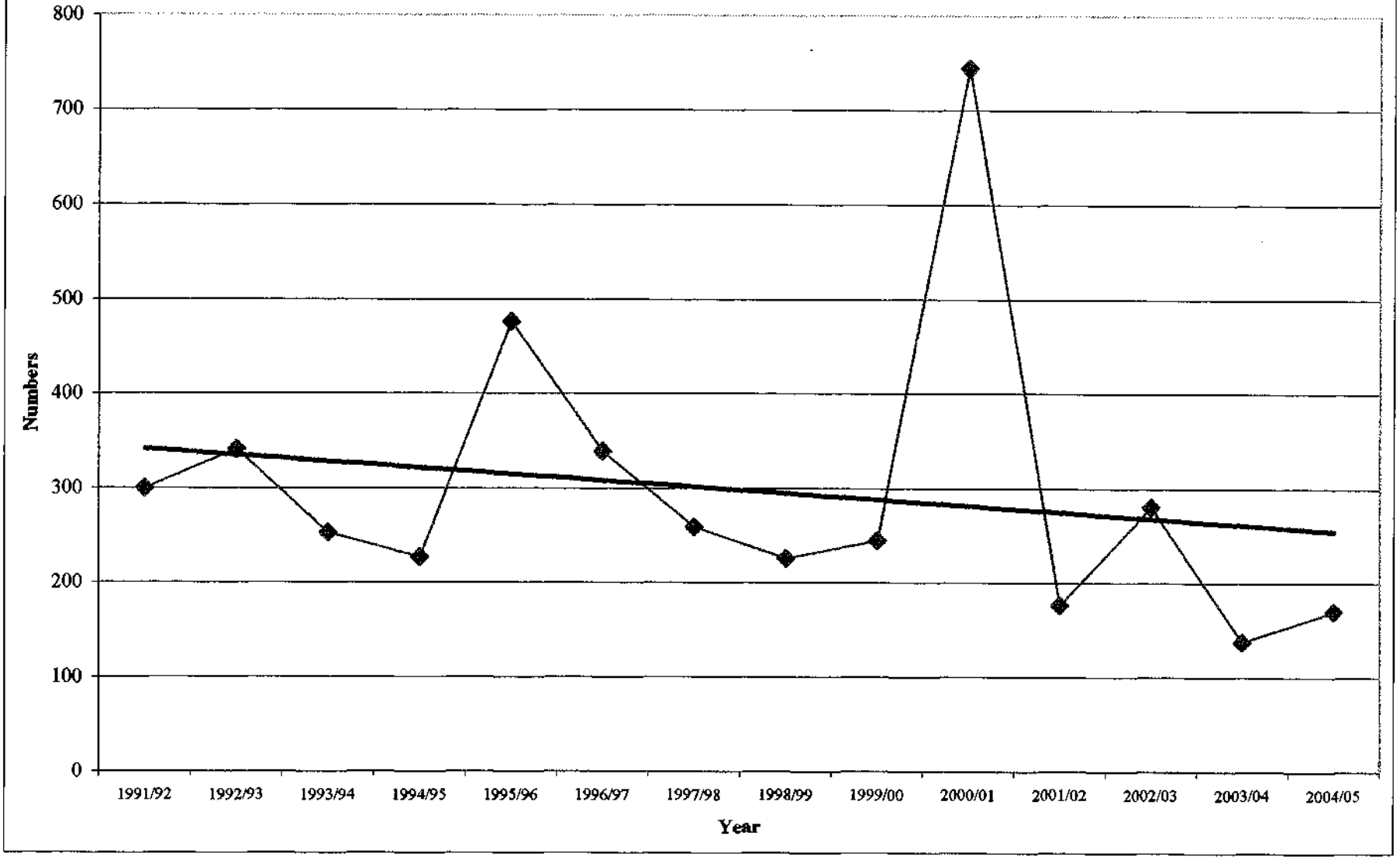


Fig. 17 Peak annual low water WeBS count (Sept - Mar) of Lapwing in Poole Harbour 1991/92 -2004/0, with trend

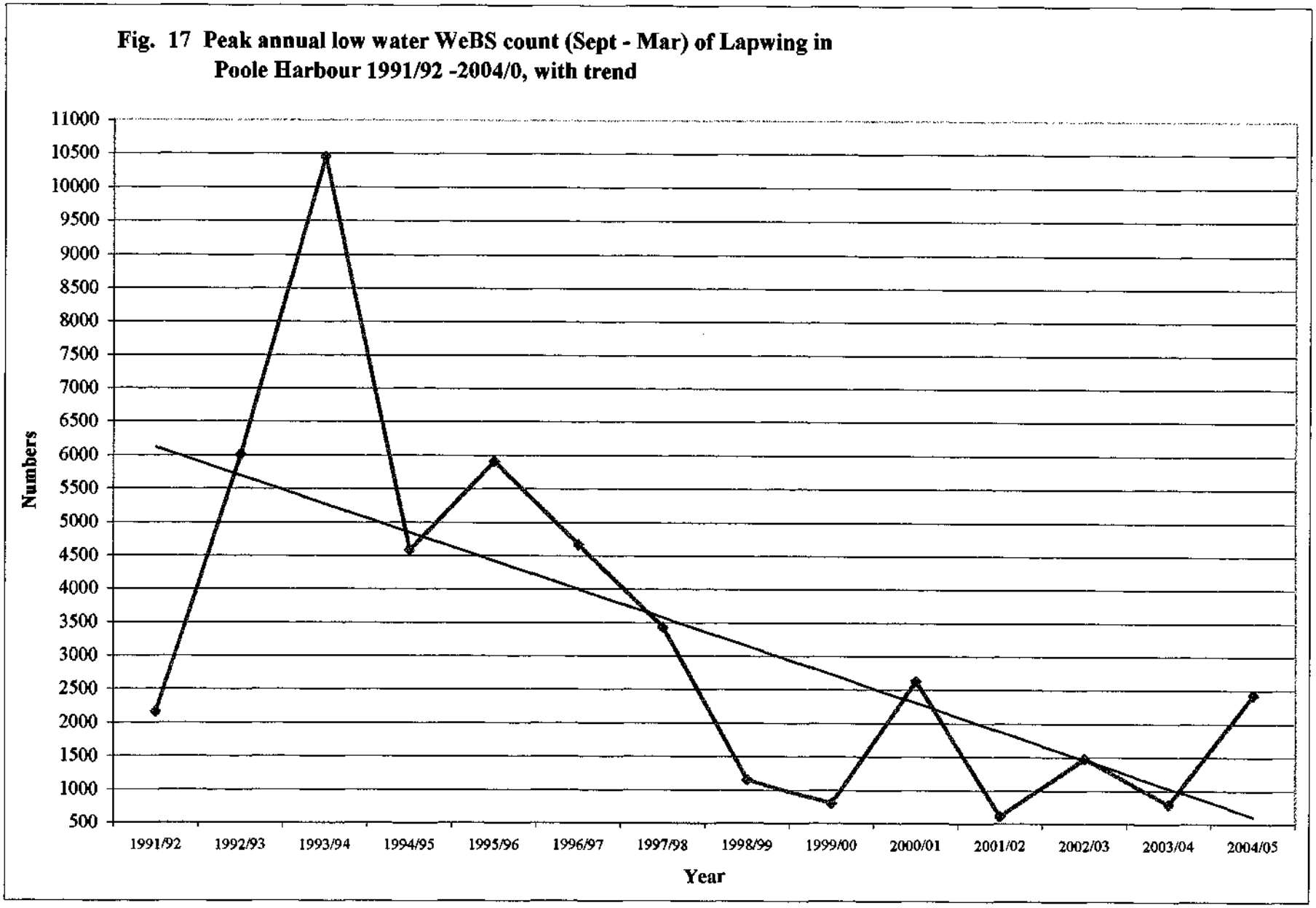


Fig 18 Peak annual low water WeBS count (Sept - Mar) of Dunlin in Poole Harbour 1991/92 - 2004/05, with trend

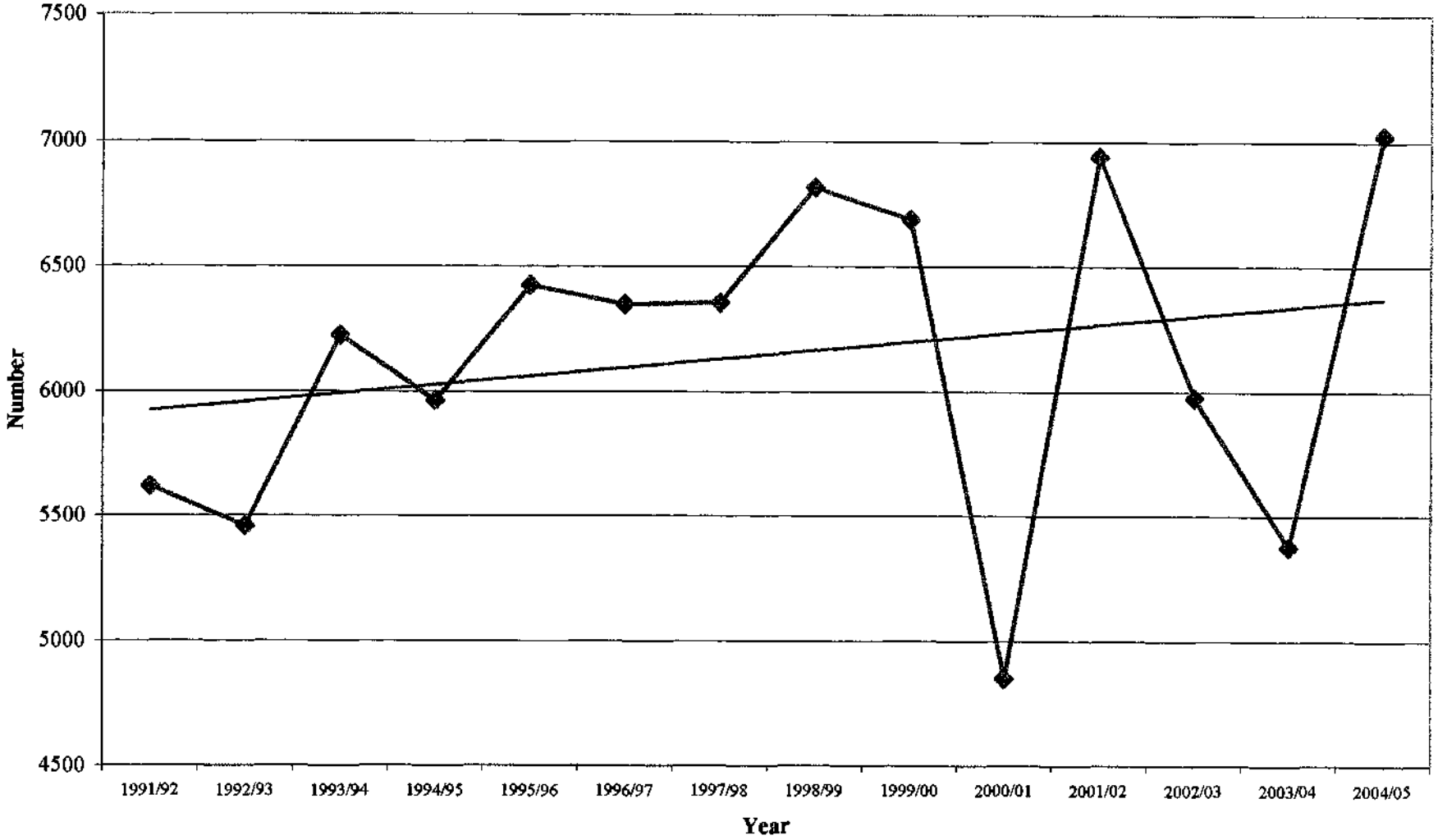


Fig. 19 Peak annual low water WeBS count (Sept - Mar) of Black-tailed Godwit in Poole Harbour 1991/92 - 2004/05, with trend

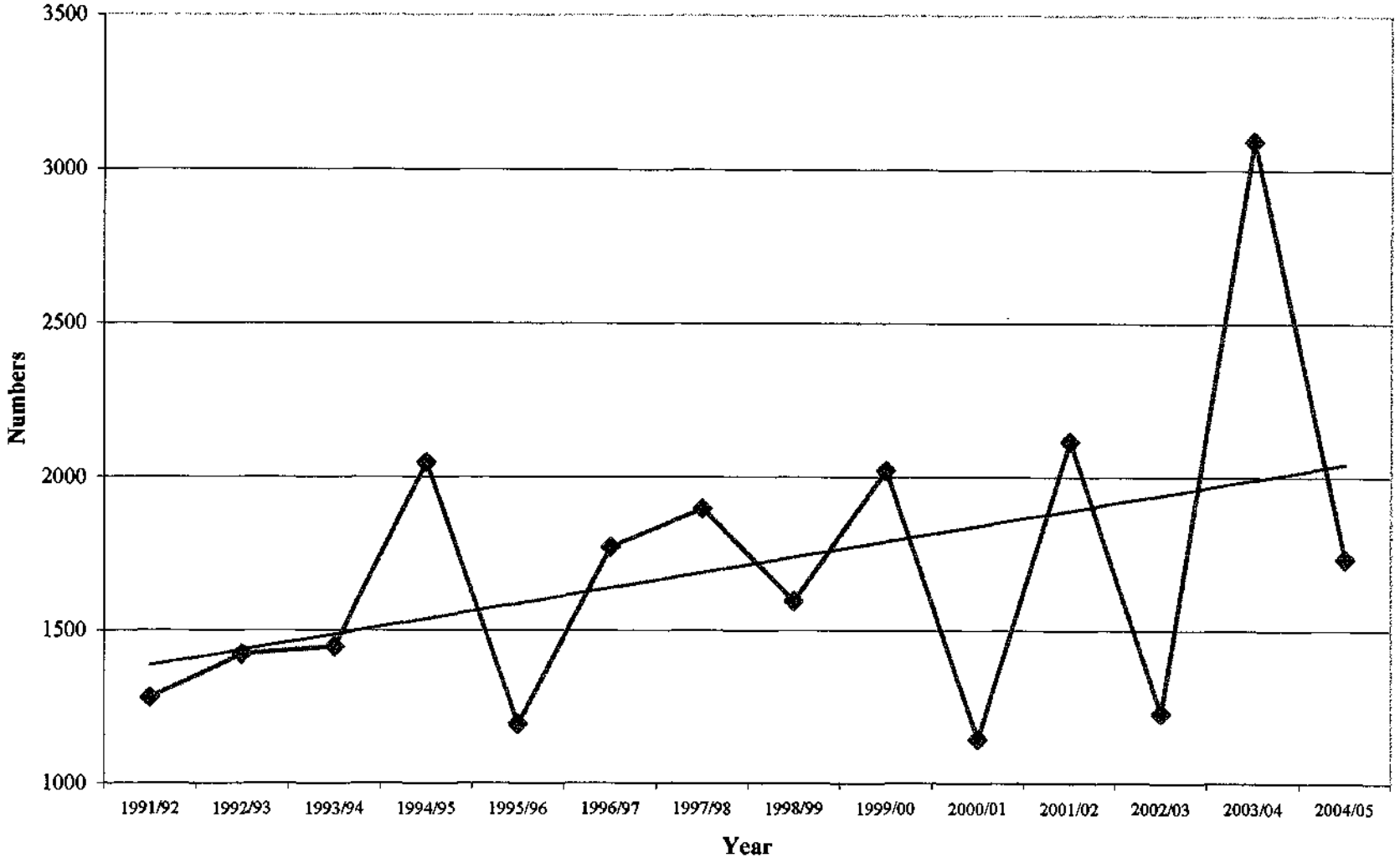


Fig 20 Peak annual low water WeBS count (Sept - Mar) of Curlew in Poole Harbour 1991/92 - 2004/05, with trend

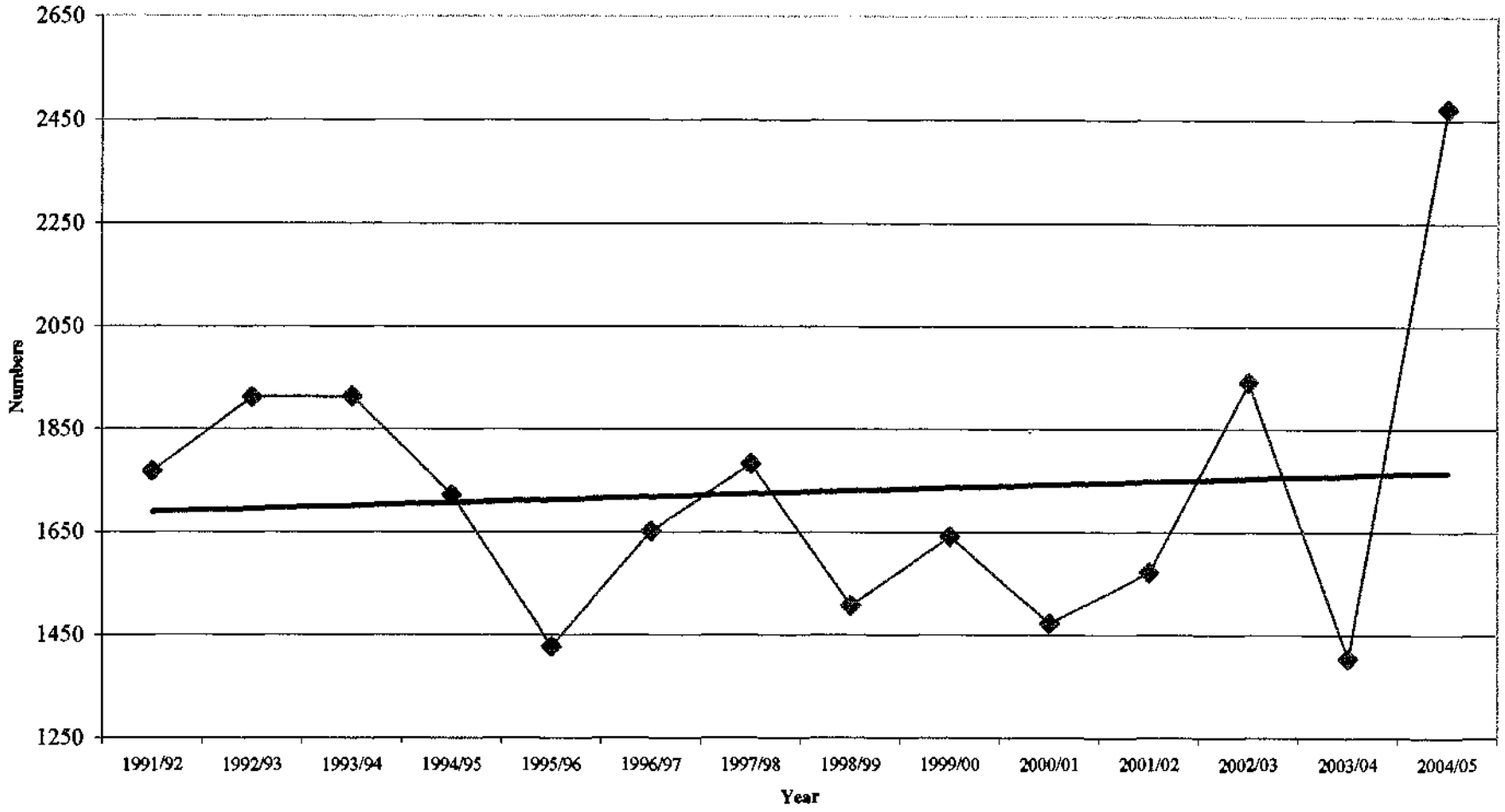


Fig 22 The number of pairs of nesting Sandwich Tern in Poole Harbour 1991 - 2006, with trend

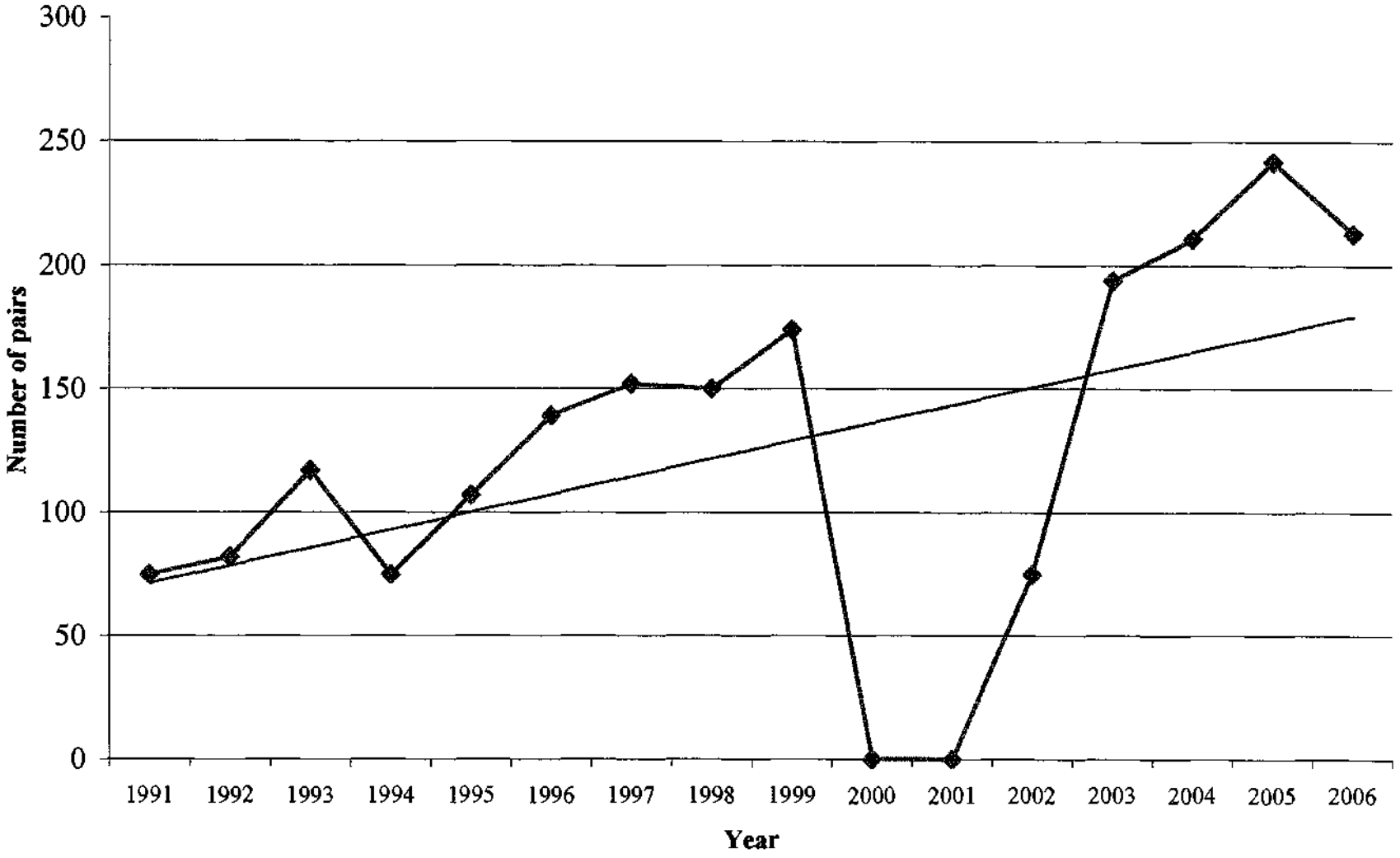
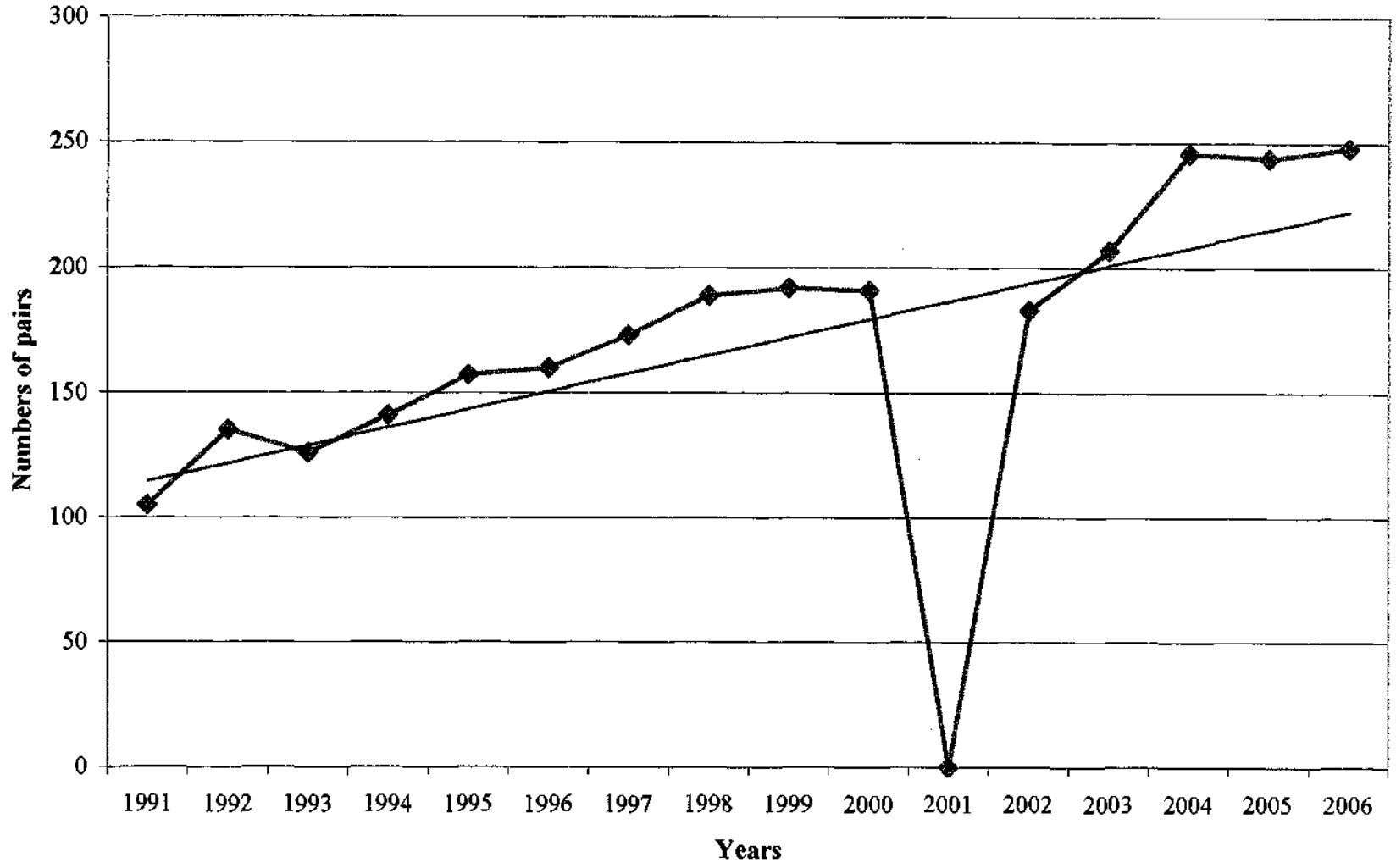


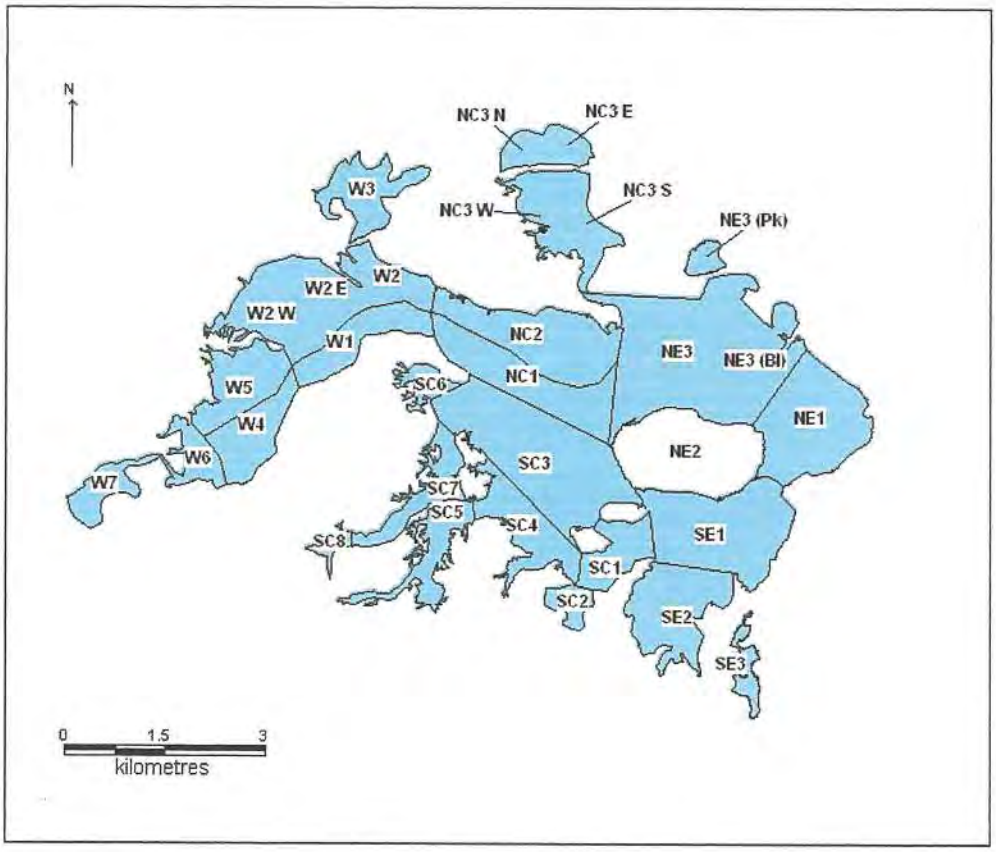
Fig 23 The number of pairs of nesting Common Tern in Poole Harbour 1991 - 2006, with trend



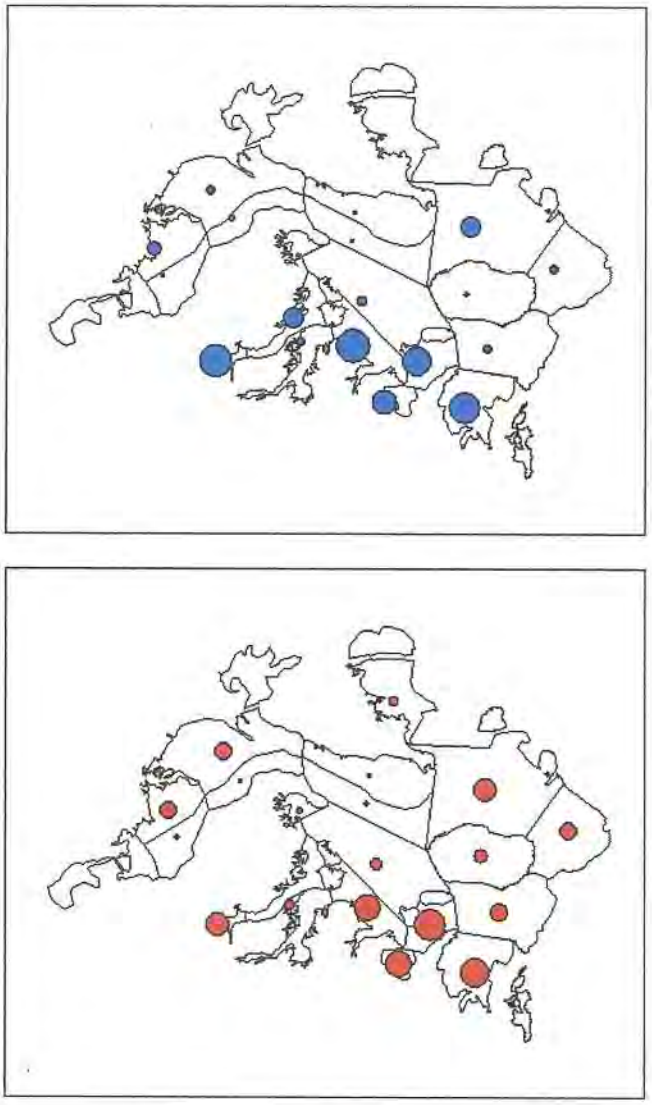
Appendix II.

Sectional Map of Poole Harbour and Comparison between two 7-year data sets (1991/92 - 1997/98 and 1998/99 - 2004/05) of the percentage distribution of 19 WeBS species in all sections of Poole Harbour.

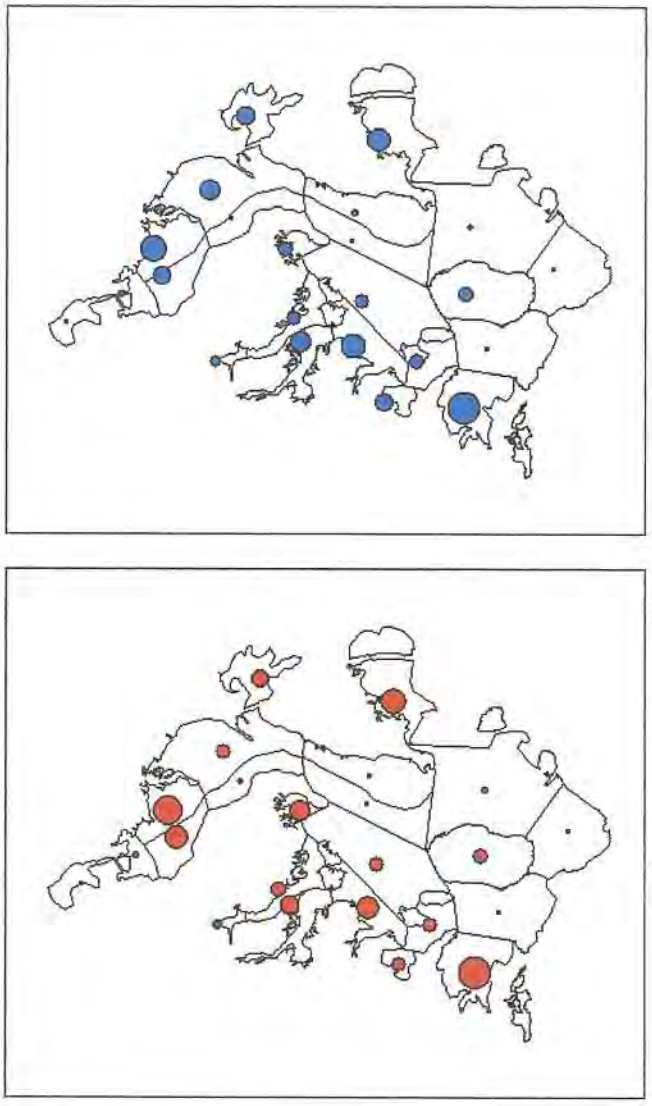
Map 1: Poole Harbour WeBS Counts Sections



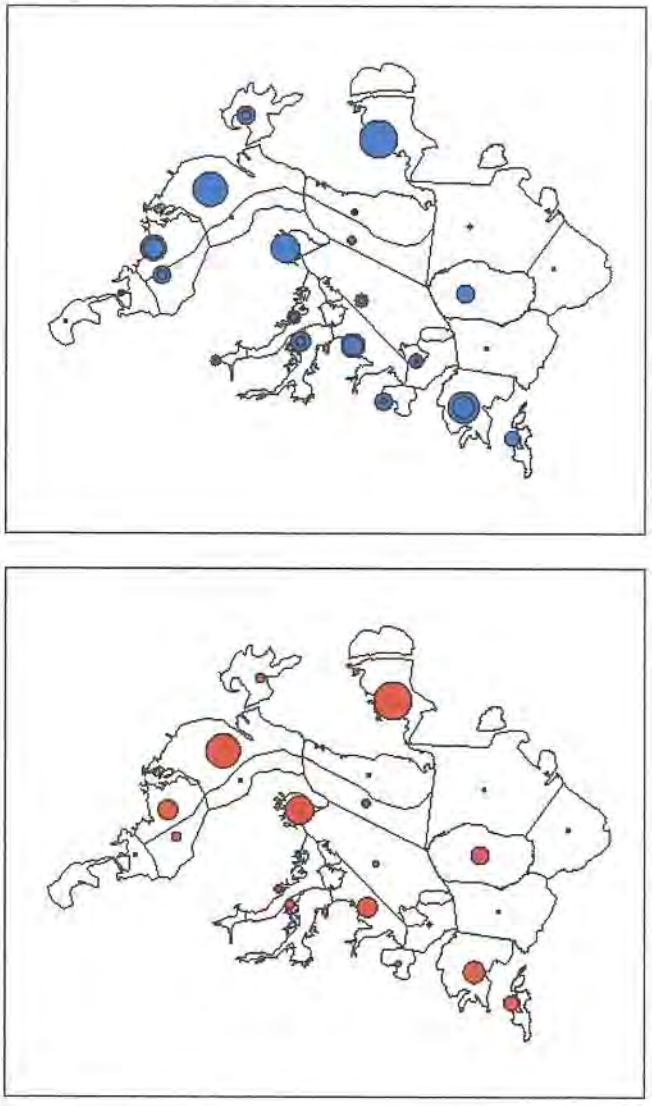
Map 2: Dark-bellied Brent Goose



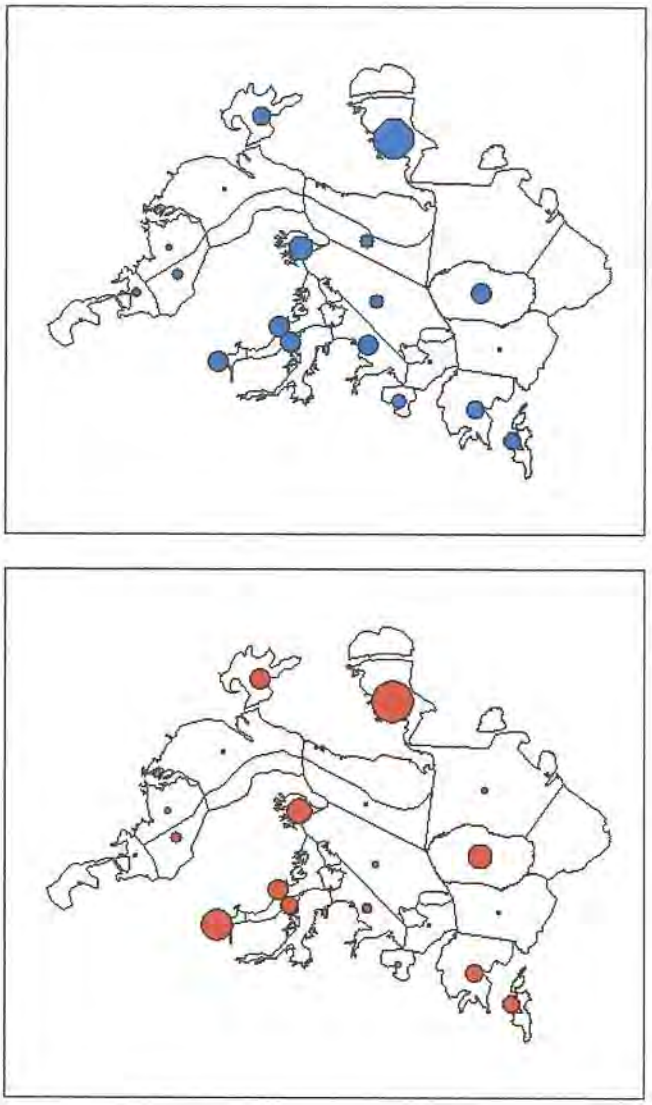
Map 3: Shelduck



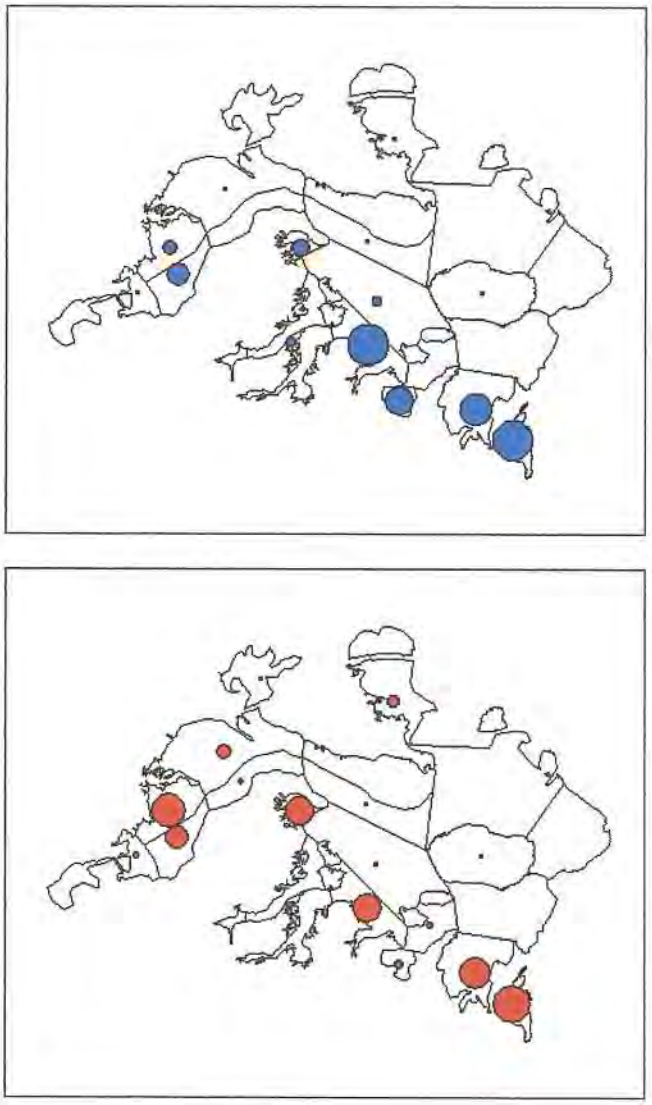
Map 4: Wigeon



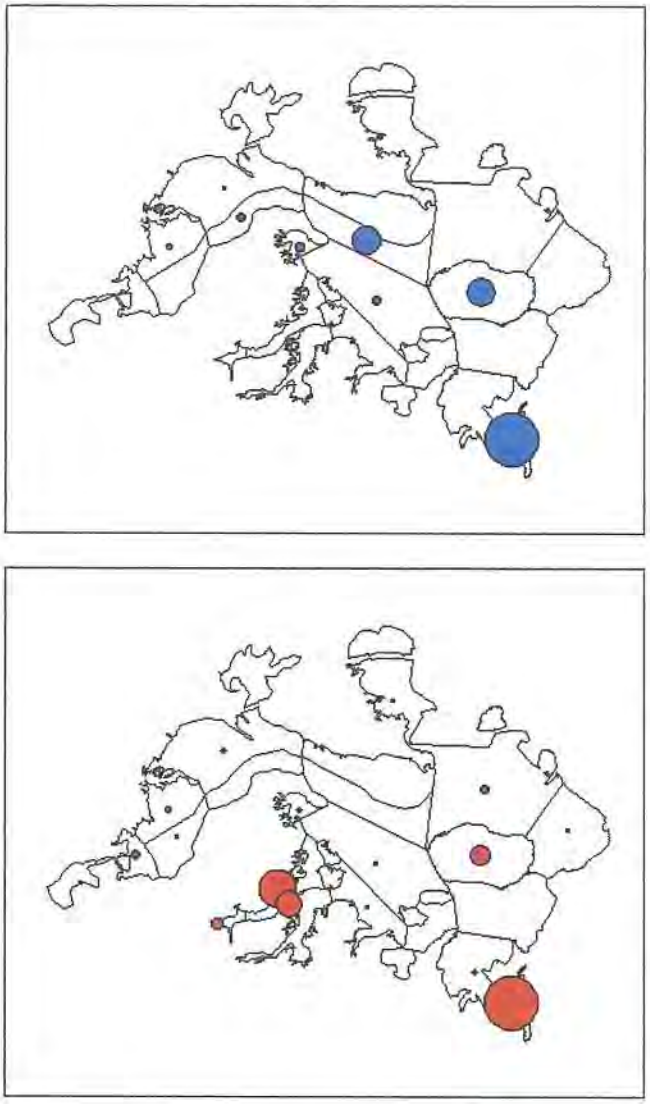
Map 5: Teal



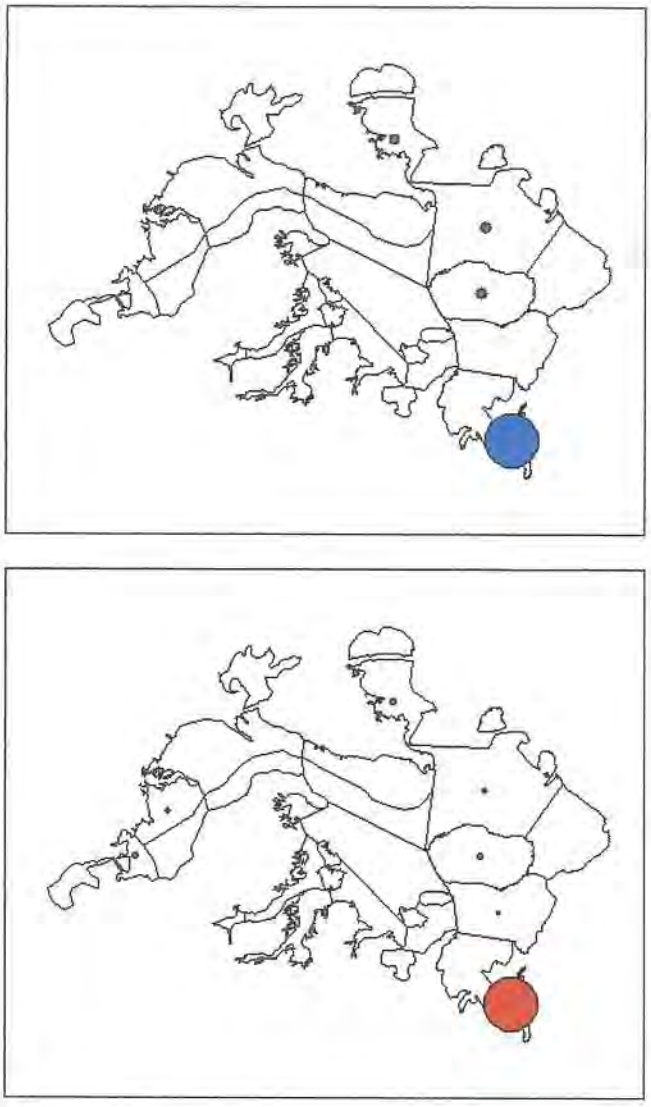
Map 6: Pintail



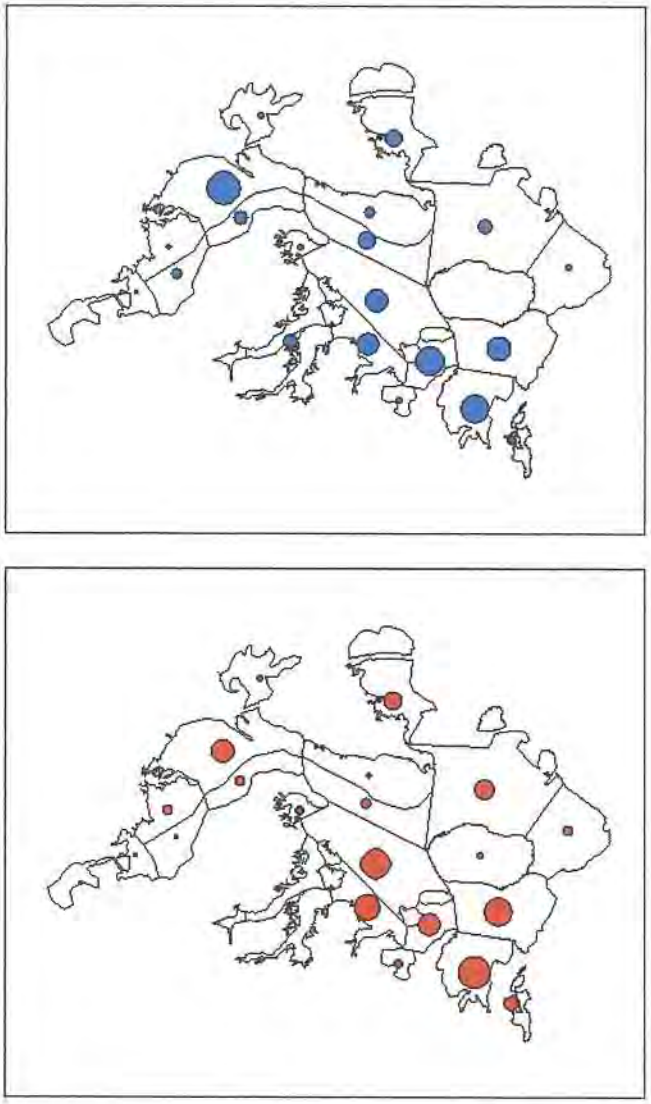
Map 7: Shoveler



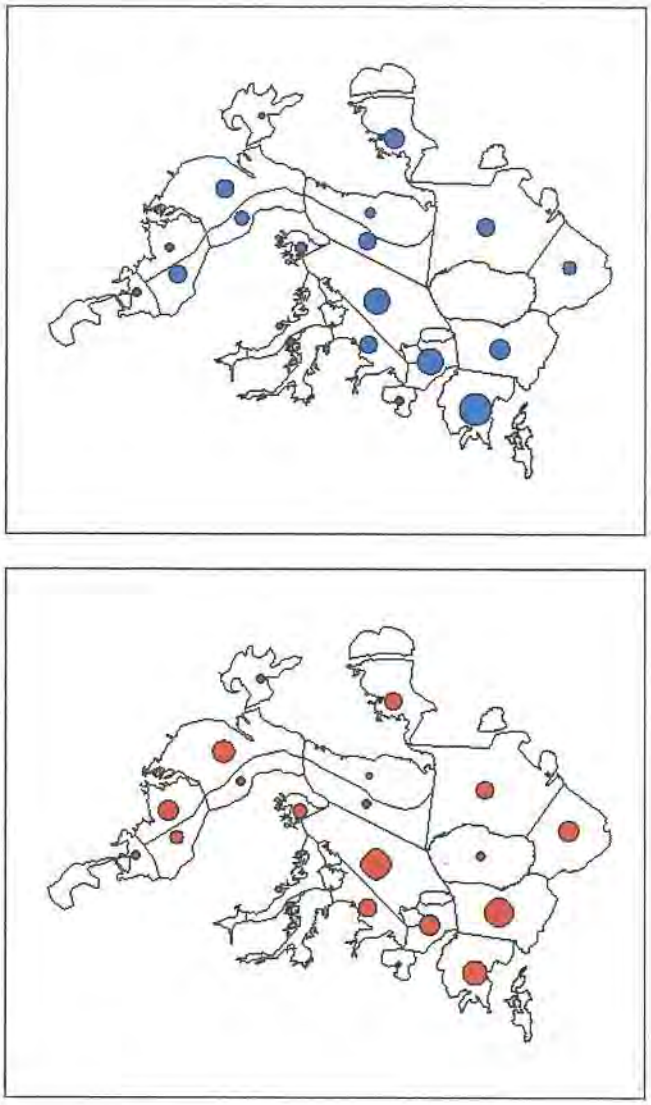
Map 8: Pochard



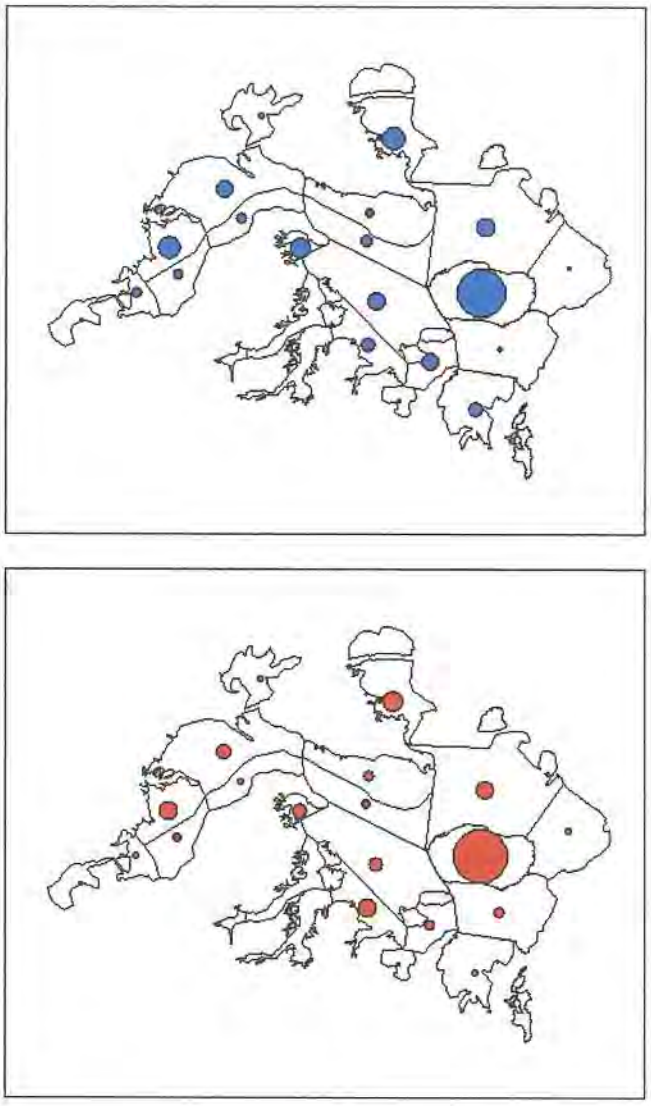
Map 9: Goldeneye



Map 10: Red-breasted Merganser



Map 11: Cormorant



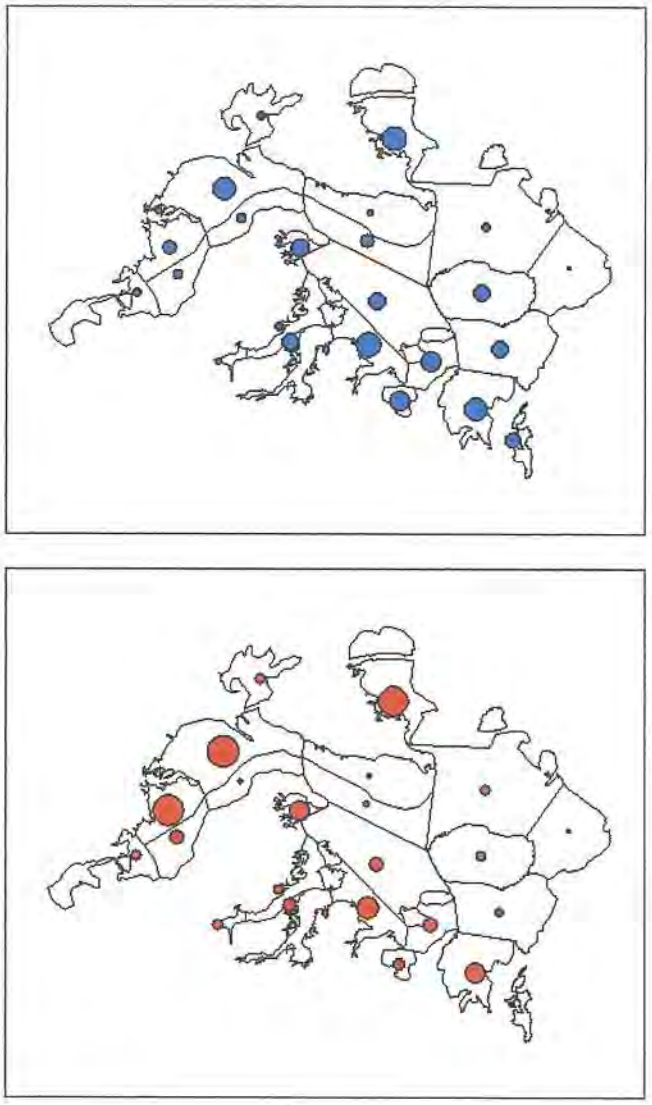
Blue = 1991/2-1997/8; Red = 1998/99-2004/5

25

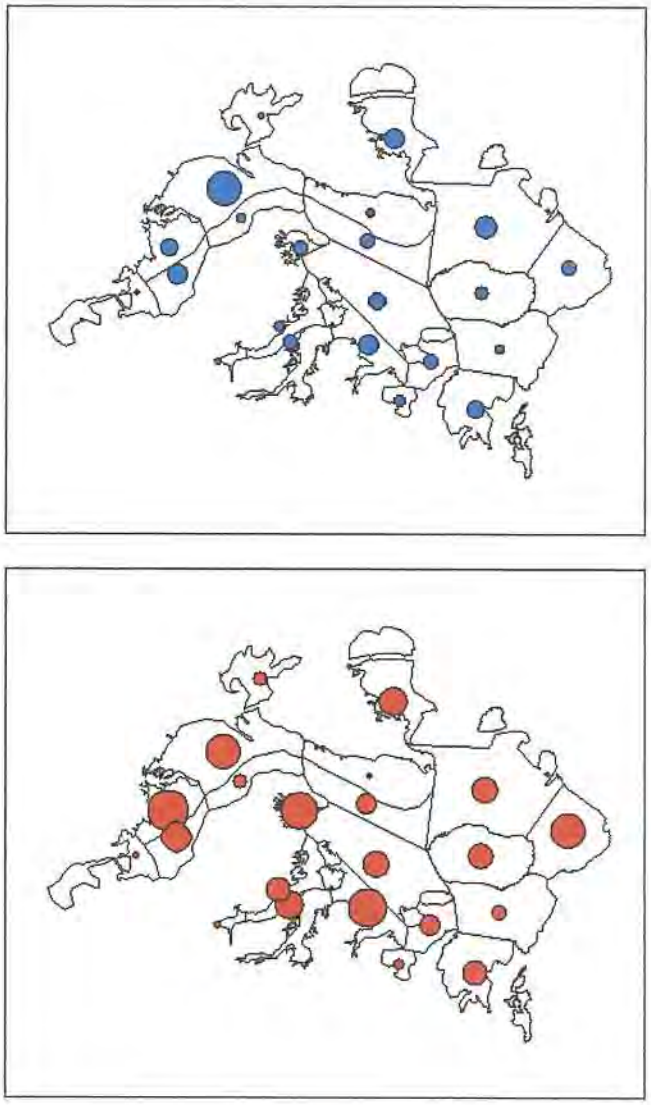
12.5

2.5

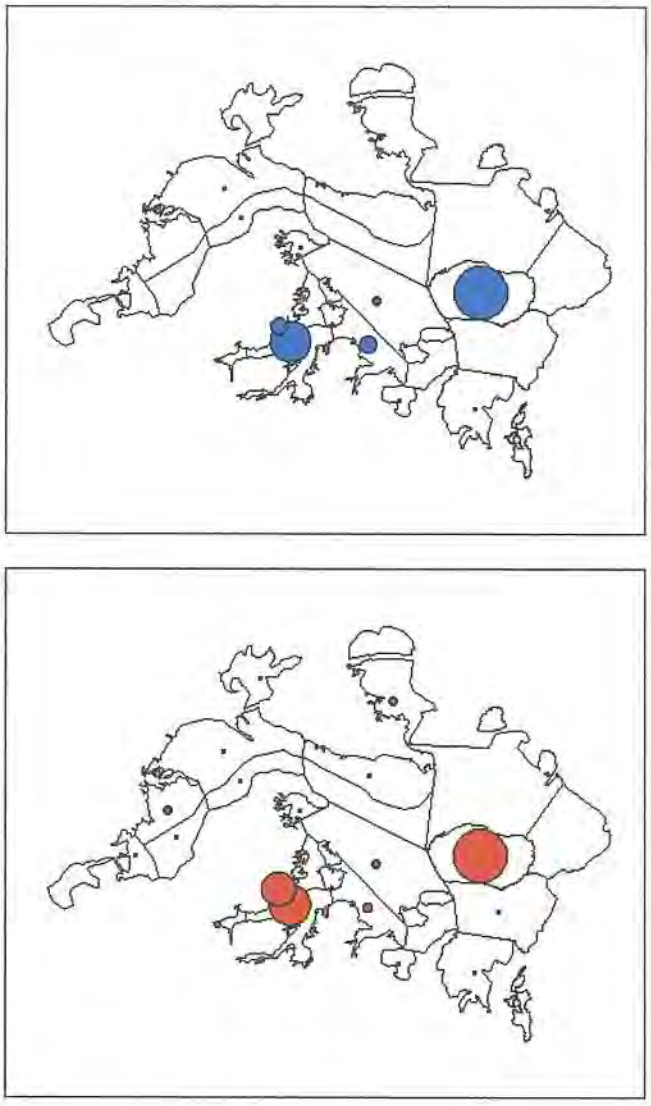
Map 12: Little Egret



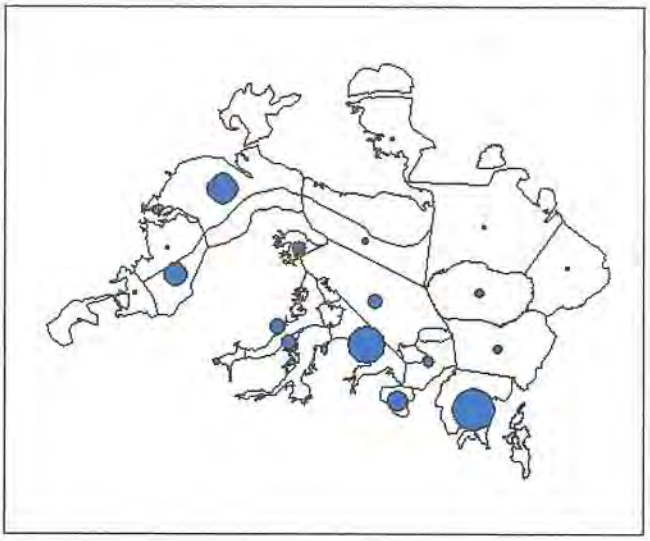
Map 13: Oystercatcher

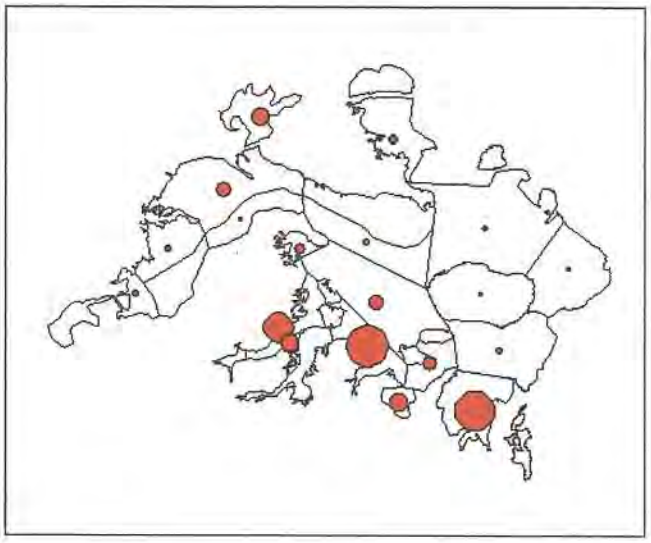


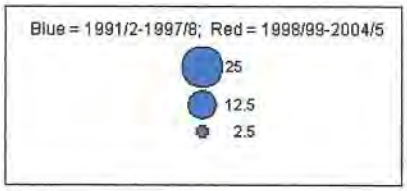
Map 14: Avocet



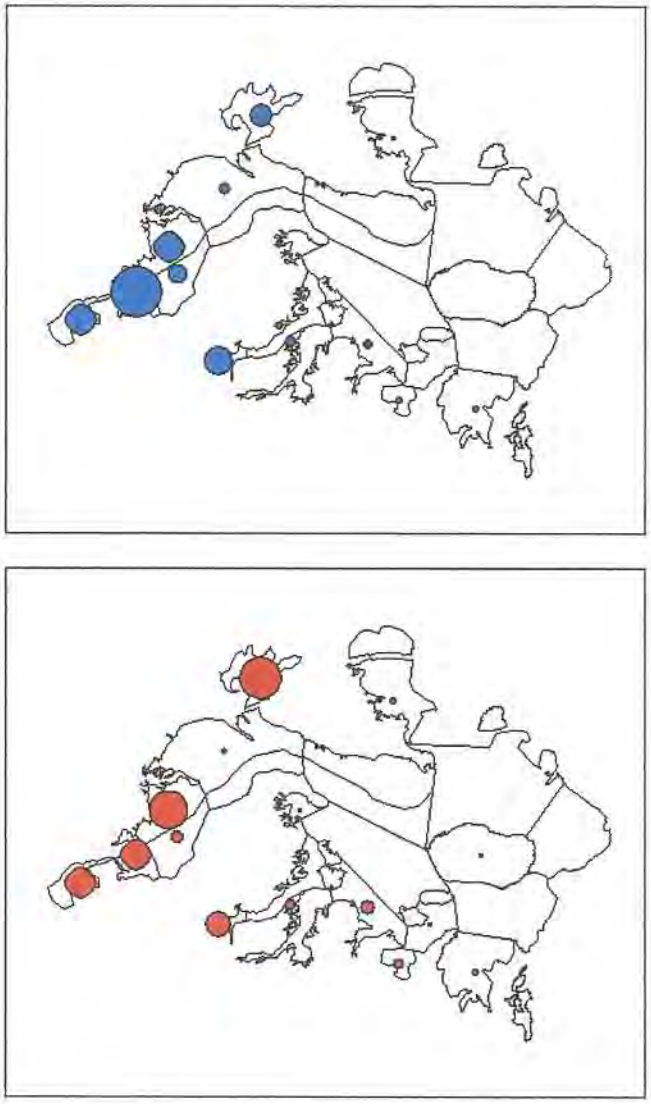
Map 15: Grey Plover



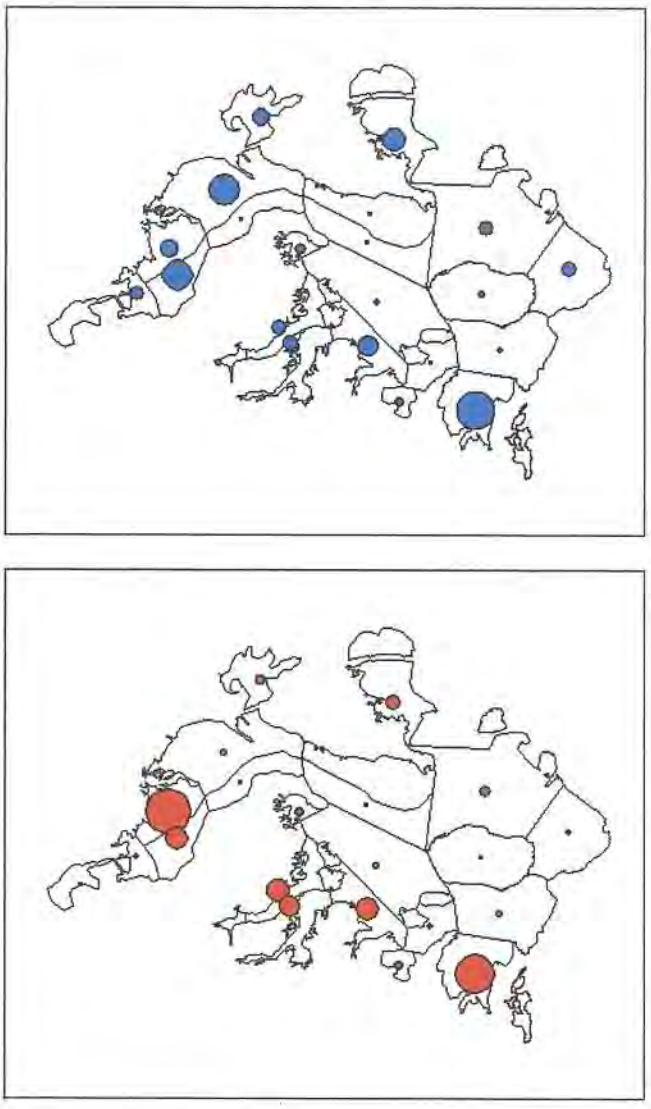




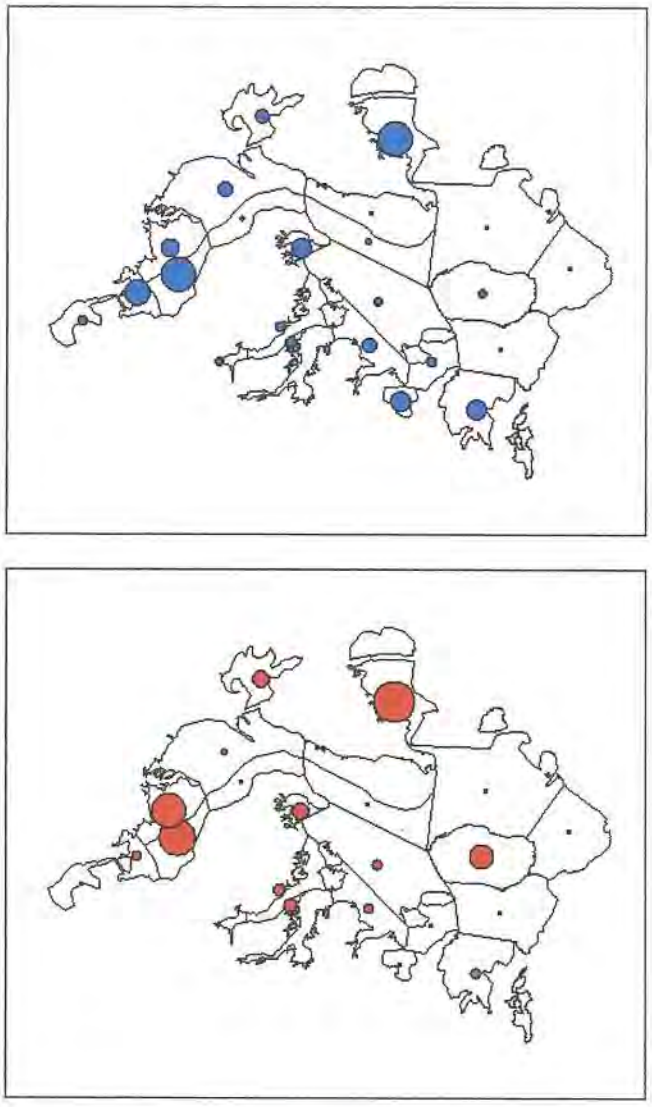
Map 16: Lapwing



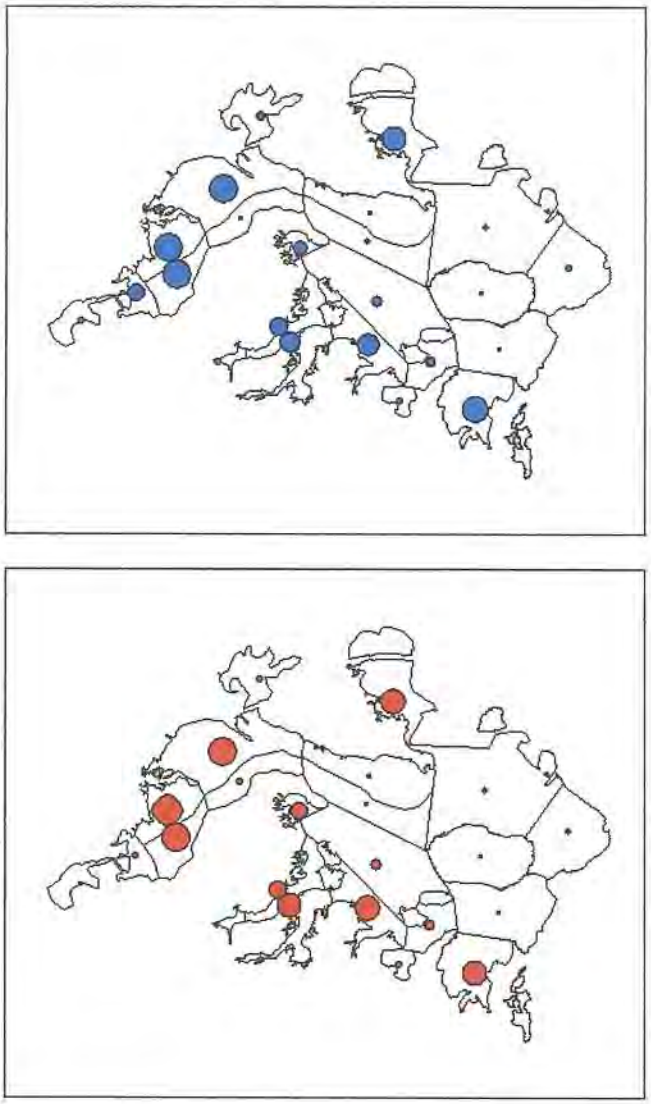
Map 17: Dunlin



Map 18: Black-tailed Godwit



Map 19: Curlew



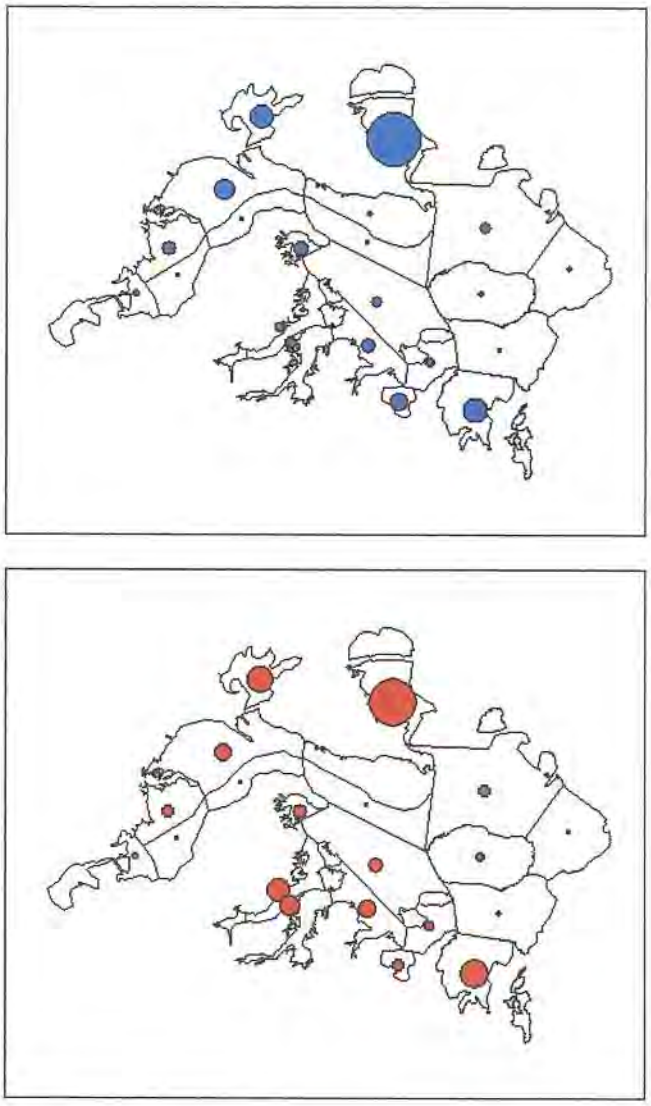
Blue = 1991/2-1997/8; Red = 1998/99-2004/5

25

12.5

2.5

Map 20: Redshank



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