POOLE HARBOUR STUDY GROUP

IMPORTANT BIRDS OF POOLE HARBOUR

BRYAN PICKESS JOHN UNDERHILL-DAY

Poole Harbour Study Group: Publication No. 2

Important Birds of Poole Harbour

Bryan P. Pickess and John C. Underhill-Day

Published April 2002

ISBN 0-9542349-0-1

Reference as:

Pickess, B. P. & Underhill-Day, J.C. (2002).
Important Birds of Poole Harbour.
Poole Harbour Study Group, Wareham.

Published By:

The Poole Harbour Study Group,
Syldata, Arne, Wareham, Dorset. BH20 5BJ

This project was sponsored by

RSPB

DORSET County Council

ENGLISH NATURE

Cover Design: Kevin Cook Fieldwork Ecological Services

Cover Photographs: Kevin Cook*:*
Avocet, Oystercatcher, Black-headed Gull,
Common Tern, Brent Goose and Shelduck

Maps: Dorset Environmental Records Centre
Binding: Purbeck District Council

CONTENTS

Appendices

Location and Site Maps

Distribution Maps of selected species

Seven year annual low water peak WeBS count in Poole Harbour during 1991/92 – 1997/98, with trends

Species showing increases in peak population

Species showing stable peak populations

Species showing decreases in peak population

Foreword

The Poole Harbour Study Group was founded in April 1997 to promote interest in the natural environment of the Harbour and its wildlife. The Group is a non-political, independent body and is open to all who are interested in carrying out or furthering scientific study and survey in Poole Harbour. During its short life, the Group has sponsored a study and report on the Harbour reedbeds, promoted a database of published and unpublished papers and articles, and sponsored a conference to review past and present research on the Harbour.

This is the second of a series of reports on the wildlife of Poole Harbour (the next will cover the wild flowers and plant communities) and is intended for planners, conservationists, consultants and anyone else who needs or wants to know about the numbers, distribution and trends in the nationally and internationally important bird populations within the Harbour.

This report gives an historical summary and details the changes in the use of the Harbour by the important bird species in recent years. It plots the changing fortunes of rare and common species alike, including, for example, the increases in wintering Avocets and Red-breasted Mergansers, decreases in breeding Herring Gulls and the arrival of a breeding species new to Britain, the Little Egret. The report describes the marvellous array of key bird species which the Harbour supports and which give pleasure to so many people. It is also a timely reminder of the need to monitor these populations constantly and provide the best information available.

I hope that this report will be read widely and used to inform wise decisions by those in whose hands the future of the Harbour lies.

Professor Vincent May

Chairman
Poole Harbour Study Group

Important Birds of Poole Harbour and their status

Introduction

Poole Harbour is defined for the purposes of this report, as the tidal waters, islands and saltings of the Harbour together with the fringing reed beds, lowland wet grasslands, Little Sea, Harbour entrance and the adjacent sea area. In total an area of approximately 4250 ha. (Map 1)

Poole Harbour and its environs, has long been recognised nationally as being of high biological importance. In 1964, the Harbour was designated under The National Parks and Countryside Act 1949, Section 23, as a Site of Special Scientific Interest (SSSI). Its importance was further recognised in "A Nature Conservation Review" in which it was listed as a Grade 1 Site (Ratcliffe 1977). The Harbour also meets the criteria for designation as a Special Protection Area (SPA) under the European Community Directive, and as a wetland of international importance under the RAMSAR Convention. Both of these proposals were finally ratified on 31st March, 1999. In addition, the southern and western side of the Harbour are included in the Purbeck Heritage Coast and within the Dorset AONB.

The inter-tidal marshes and mudflats provide an important food resource for passage and wintering wildfowl and waders, as well as for several breeding species. At or just above the high spring tide level around the Harbour are other important habitats, such as beds of reed (*Phragmites*), sallow carr, and scrubby grasslands. In addition, especially around the southern and western parts of the Harbour there are extensive areas of lowland wet grassland, with drainage dykes and ditches. These grassland areas were originally embanked from the tidal areas of the Harbour for agriculture and, together with other agricultural lands close to the Harbour, are important feeding or roosting sites for a number of species. Within the Harbour area, the variety of different habitats contributes significantly to its biodiversity and to its support of nationally and internationally important bird populations.

The species selected for inclusion in this report have been chosen because they fall into one or more of the following categories:

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)
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 and Kirby 1995)
3) Species whose annual peak population represents over 5% of the Harbour's total waterfowl and wader population.
4) Species which are Red and Amber Listed by Gibbons *et al* (1996).
5) Species which are globally threatened (Tucker & Heath 1994).
6) Species whose breeding population in the Harbour represents over 1% of the total U.K. breeding population.

In total 32 species meet one or more of these criteria. Tables 1 and 2 show the selected species under their appropriate categories. In the chapters which follow, individual accounts for all the selected species are given, including their past and present status, population size and distribution in the Harbour. Current distribution maps have been produced for all the selected waterfowl and waders, based on data gathered during 1991-1998 for the low water WeBS counts. Table 3 lists all the waterfowl and waders that are regularly recorded during WeBS counts.

In 1949, to gain a better understanding of the distribution of wildfowl and waders using Poole Harbour, it was divided into 23 sections for counting and each of these was given individual codes (Map 2). (Bull 1953). There was regular winter monthly coverage during the 1960's, the monthly counts being forwarded for inclusion in the then National Wildfowl Counts survey. In 1969, this survey became the Birds of Estuary Enquiry (BoEE) and the count areas were rationalised. The new survey resulted in the creation of an additional count section at the western end of Harbour (W7) and the following sections sub-divided into smaller units, (W2) into three sections; (NC3) into four

sections and (NE3) into 3 sections. For recording purposes, the Harbour is now divided into 31 sections (Map 3).

Table 1 **Wildfowl and Waders present in Poole Harbour in Internationally, Nationally and Locally Important numbers (1991-1998).**

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

Species	Period of occurrence
Shelduck	Winter/Passage
Black-tailed Godwit	Winter/Passage

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

Species	Period of occurrence
Slavonian Grebe	Winter
Black-necked Grebe	Winter
Cormorant	Passage/Winter
Little Egret	Passage/Winter
Dark-bellied Brent Goose	Winter
Pintail	Winter
Teal	Winter
Shoveler	Winter
Pochard	Winter
Goldeneye	Winter
Red-breasted Merganser	Winter
Avocet	Winter
Dunlin	Winter
Curlew	Passage/Winter
Redshank	Passage/Winter

Species no longer occurring in nationally important numbers through recent revision of (WeBS) index

Species	Period of occurrence
Grey Plover	Winter

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

Species	Period of occurrence
Wigeon	Winter
Oystercatcher	Winter
Lapwing	Winter

Table 2 Red and Amber Listed species present in Poole Harbour

Red Listed Species breeding in Poole Harbour

Species	No of nesting pairs	% of U.K. Population
Reed Bunting	< 100 ?	< 1.0%

Amber Listed Species breeding in Poole Harbour

Species	No of nesting pairs	% of U.K. Population
Little Egret	9-11	> 95.0%
Water Rail	5-10?	< 1.0%
Lapwing	1-6	< 0.1%
Mediterranean Gull	2 - 8	> 4 .0 - 15.0%
Herring Gull	< 10	< 1.0%
Sandwich Tern	140+	> 1.0%
Cetti's Warbler	29-35	> 6.0%
Bearded Tit	2-10	> 2.5%

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

Species	Mean (1991-98)	% of U.K. Population
Aquatic Warbler	10	unknown

Red Listed for historical decline of U.K. breeding population (1800-1995).

Formally bred in Poole Harbour (1949-1962), now a regular passage migrant and winter visitor.

Species	passage	winter visitor
Marsh Harrier	Annual	Annual - regularly 1/2

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

Species	No of nesting pairs	% of U.K. Population
Black-headed Gull	5000+	3.4%
Common Tern	130+	1.0%

Table 3 **The main wildfowl and wader species in Poole Harbour counted by WeBS (1991-1998)**

Bold = Nationally and Internationally Important Species
Underlined = Species not occurring in Nationally or Internationally Important numbers but representing over 5% of WeBS total for Harbour

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

Combined Total = 57 Species (17 Nationally and Internationally Important)

Sources and Analysis of Data

For each of the 32 selected species there is an individual account. The data are presented under two main headings, 'Past Status', which deals with information covering the 20th Century up to, and including 1990, and 'Current Status' covering the years 1991-1998. The selected species mostly fall into one of two groups, those that use the Harbour area for breeding and those that use it as a migration refuelling stop or as a place to spend the winter.

The status, where relevant, of a species in the earlier part of the 20th Century is based on '*A revised list of the birds of Dorset*' (Blathwayt 1933), but in some instances his comments are imprecise with regard to Poole Harbour and are open to interpretation.

Passage and Wintering

It was not until the winters of 1949-1952 that the first survey of the wildfowl and waders of Poole Harbour was carried out (Bull 1953). No further detailed fieldwork was undertaken until the commencement of a 7 year study of wildfowl in the winter of 1959 (Dixon 1967).

During the 1960's, the wildfowl of the Harbour were counted regularly on set monthly dates through the winter. The data gathered, besides being of county importance, was also passed to the National Wildfowl Counts organiser for inclusion into the national data set. These surveys began to provide tangible data on the winter status of wildfowl and waders using the Harbour.

From the autumn of 1969, the Harbour wildfowl and waders were counted at high tide on a set date each month during August to March. These records contributed to the national Birds of Estuary Enquiry (BoEE). Other data presented here, have been extracted from the annual Dorset Bird Reports, records held by the Royal Society for the Protection of Birds (RSPB) at Arne and the Dorset Wildlife Trust (DWT) at Brownsea Island. In addition, there were a number of surveys undertaken during the 1980's relating to the possible impacts upon wildfowl and wader populations in the Harbour of British Petroleum's development of its Purbeck Oil Field (Bradford & Woods 1982; Harvey & Bradford 1984; Collins 1985 & 1986; Gray 1985 and Pearson *et al.* 1991).

The national BoEE survey finished in 1991 and was replaced by the Wetland Bird Survey (WeBS); this seemed an appropriate starting point for the 'current status' period. The major difference between the two surveys is that counts are now undertaken at low water, not as previously, at high water. The (WeBS) 1991-1998 monthly count data have been summarised for each species in 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 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 each count area (Table 4) and the mean density of birds/ha $^{-1}$ is also given. From these WeBS data, depending upon the species, distribution maps for each species have been produced, showing either density per ha or percentage of Harbour population for each section (Map 3). 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.

Breeding

Most of the 'past' breeding status data have been drawn from Blathwayt (1933), Haysom (1967), Alexander (1969), Prendergast and Boys (1983), the annual Arne (RSPB), Brownsea Island (DWT) and Dorset Bird Reports. The 'current' breeding species data is primarily drawn from surveys undertaken through the 1990's (Cook 1996, 1998; Cook & Pickess 1994; McClure & Payne 1994; Price 1997; Wotton 1997; Wotton *et al.* 1998) and additional information from the Arne (RSPB) and Brownsea Island (DWT) reports and the annual Dorset Bird Reports.

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

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

South Central Harbour - prefix (SC)

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

Table 4 (Cont)

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

North East Harbour - prefix (NE)

Area No	Name and details	Area - ha
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

South East Harbour - prefix (SE)

Area No	Name and details	Area - ha
1	Brands Bay(E)	36
2	Brands Bay(W)	132
3	Littlesea	None
	Total ha $^{-1}$	152

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

Species Accounts

Slavonian Grebe (*Podiceps auritus*)

Status (Winter visitor October - mid-April)

WeBS - Qualifying Number for International threshold: **50**
WeBS - Qualifying Number for Great Britain threshold: **4**[1]

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

[1] A peak figure of 10 or more places the Poole Harbour environs in the top 10 wintering sites in U.K. (Cranswick *et al* 1999).
[2] Amber-listed because of 5 year mean of 0.2-300 breeding pairs in U.K. (Gibbons *et al.* 1996).

Wintering Population

Past Status

The Slavonian Grebe was considered by Blathwayt (1933) to be less common than the Black-necked Grebe. He gave no numbers for peak counts, but based on this comment, it was presumably below 40, the figure given for the latter.

Until the early 1970's, the Slavonian Grebe was described as being a regular winter visitor to the Harbour but seldom more than 10 were noted and just two counts of 30 in the past 20 years were recorded (Boys 1974).

During the 1970's peak numbers increased to a mean of almost 20 and in three of the winters, peaks of between 30-39 were recorded (Table 1). Although during this period the data are described as being from the Harbour, the record count of 39 in the winter of 1976 specifically mentions Studland Bay. Interestingly there was a record of 30 being present in the Harbour in December of that year! As with Black-necked Grebes there are indications that birds move back and forth with the tide in and

Table 1 **10 year peak winter counts of Slavonian Grebe in Poole Harbour (1970 - 1980), with 10 year mean and total** (Data from Dorset Bird Reports)

Year	Number	Month
1970/71	8	February
1971/72	30	January - March*
1972/73	15	February
1973/74	9	January - March*
1974/75	16	November, December
1975/76	39	January - March*
1976/77	15	January - March*
1977/78	13	December
1978/79	31	December
1979/80	20	March
	10 Year Total = 191	10 year Mean = 19

* Month of occurrence of peak count not given

out of the Harbour. The timing of peak counts varied between years but usually it was the January-March period, during which the highest numbers were most often recorded (Table 1).

Table 2 gives Slavonian Grebe peak annual counts and months of occurrence during 1980 - 1991. During the 1980's mean peak count was 22, a 16% increase over the previous 10 year period. Peak numbers were usually between 20 and 30 but there was evidence of a steady decline from the winter of (1987/88). How many Slavonian Grebes winter in the environs of Poole Harbour is not clear. What is now known, is that birds are not solely confined to the Harbour during the winter months. Over the winter of (1984/85) Collins (1985) noted that there was an apparent interchange between birds in Studland Bay and the Harbour. He also commented on the fact that birds tend to move into the Harbour when there are strong easterly winds. In the published data the location of the peak counts were often recorded as an amalgam of Poole Harbour, Studland Bay and Poole Bay. The highest count was in February 1981 when 42 were recorded in Studland Bay. The maximum peak annual count figures in Table 2, may not represent the true population level for the Harbour environs, it is probably higher because birds appears to move in and out of the Harbour, with the changing tides. The peak annual month of occurrence varied widely but it occurred on three occasions each in December and January during this 11 year period.

Table 2 **Peak winter counts of Slavonian Grebe in the environs of Poole Harbour (1980/81-1990/91)** (Data from Dorset Bird Reports)

Year	Peak Count	Month(s) of occurrence
1980/81	42	February
1981/82	23	December
1982/83	28	March
1983/84	18	January
1984/85	25	January
1985/86	27	January
1986/87	29	March
1987/88	16	December
1988/89	21	December
1989/90	13	November
1990/91	9	March
11 yr. total	243	Mean = 22

Current Status

The monthly Harbour WeBS counts for Slavonian Grebe for the seven year period (1991 - 1998) are shown in Table 3. In four of the seven years the peak count was above the key site level of 10 and in the other three years it was also above the national importance threshold level of four. The WeBS data shows that the population usually rapidly builds in December, peaks in January and then steadily declines.

There has only been a slight recovery in peak numbers since the decline that was noted towards the end of the 1990's. A comparison of the mean peak during 1980-1991 with the peak during 1991-1998, shows the current mean population to be 35.0% below the previous mean level during the earlier period. Table 4 shows a comparison between the WeBS counts and the non-WeBS Counts. It is interesting to note that most of the non-WeBS peak totals are assignable to Studland Bay, Shell Bay or Poole Bay, with none from inside the Harbour.

The difference in the two sets of data show that peak counts outside the Harbour are about 42.0% above those recorded at low water WeBS counts in the Harbour. It is surprising that the month of peak count was the same in only three out of the seven years. Whether wind direction in Poole Bay and

Studland Bay has a bearing on whether birds stay in or go out of the Harbour at low water needs further investigation.

Table 4 Comparison of maximum WeBS (within Poole Harbour) and non-WeBS (outside Poole Harbour) annual winter counts of Slavonian Grebe 1991-1998, with mean and total for each. (Dorset Bird Reports & WeBS Counts)

Year	WeBS Counts Nos. & Month(s)	Maximum non-WeBS Counts Nos. & Month(s)	Difference (WeBS to Non-WeBS)
1991/92	6 December, January	13 December, January	+ 7
1992/93	10 December, January	10 December, January	-
1993/94	8 February	12 December	+ 4
1994/95	15 January	17 February	+ 2
1995/96	13 November	16 February	+ 3
1996/97	10 December	11 December	+ 1
1997/98	9 March	22 January	+ 13
Total	71	101	+ 30
Mean	10.1	14.3	+4.3

Distribution

How the wintering population of Slavonian Grebe uses the Harbour, is still not fully understood. The distribution of Slavonian Grebes at low water WeBS counts is shown in Table 5. From this it is clear that birds are seldom recorded at low water away from the deep water of South Deep Channel. This winds through the south and south-west area of the Harbour from its mouth to the north-west side of Green Island (Brands Bay (SE1 & 2), Goathorn, Green and Furzey Islands (south side) (SC1) and Fitzworth, including Green Island NW side (SC4)

Table 3 Slavonian Grebe

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

Species of National Importance

1% National Threshold Figure = 4 (but maxima of 10 or more defines Key U.K. Sites).
Months in which figure reached Key U.K. Site level is shown in **Bold**

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	-	-	-	-	-	-	-	-	-
September	-	-	-	-	-	-	8	8	1
October	-	-		-	-	-	4	4	-
November	2	-	-	2	**13**	1	1	19	3
December	3	**10**	6	7	**11**	**10**	6	53	8
January	6	**10**	3	**15**	**12**	4	7	57	8
February	2	-	**8**	9	**8**	2	1	30	4
March	-	-	2	-	3	1	9	**15**	2
Autumn/Winter Total	13	20	19	33	47	18	36	186	26

Table 5 Slavonian Grebe

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is not relevant for this species.

7 year mean Poole Harbour population (Aug - Mar) = 27*

*** Counts are so small and occurrence at most sites are irregular that the data can only provide limited information**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998			2			2		4	1	9
Annual Mean										
Annual Range										
% of annual mean/ Poole Harbour mean										
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	538
Mean density/ha										

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998				2		1				3
Annual Mean										
Annual Range										
% of annual mean/ Poole Harbour mean										
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha										

Table 5 Slavonian Grebe (cont).

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 27

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998					32	4	3	42		81
Annual Mean										
Annual Range					8 - 11			1 - 16		1 - 16
% of annual mean/ Poole Harbour mean										
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha										

Section NE count areas	1	2	3(P)	3(B)	3(Bl)					Section total
Total counts 1991 - 1998										
Annual Mean										
Annual Range										
% of annual mean/ Poole Harbour mean										
Low water area (ha)	480	None.0	None	12.0	12.0					72
Mean density/ha										

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	46	47								93
Annual Mean										
Annual Range	9 - 17	1 - 13								1 - 17
% of annual mean/Poole Harbour mean										
Low water area (ha)	36.0	132.0	None							168
Mean density/ha										

Black-necked Grebe (*Podiceps nigricollis*)

Status (Winter visitor - October - early April)

WeBS - Qualifying Number for Great Britain threshold: **10**[1]

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

[1] Wintering population very small and populations of 10 or more considered as key U.K. sites (Cranswick *et al.* 1999).
[2] Amber-listed because of 5 year mean of 0.2-300 breeding pairs in U.K. (Gibbons *et al.* 1996).

Wintering Population

Past Status

The Black-necked Grebe was considered by Blathwayt (1933) to be a regular winter visitor along the coast in small numbers, and 'sometimes in flocks up to 40 in number'. In the Harbour until 1964, possibly 'the annual maxima of 40 or more' had shown little change over the decades (Prendergast & Boys 1983). There was a major oiling incident in the Harbour in 1964, which adversely effected the wintering Black-necked Grebe population (Ranwell & Hewett 1964). As a result the maximum winter population was more than halved and by 1990 maximum counts had not recovered to their pre-1964 numbers.

Table 1 shows the peak winter counts for the Harbour area during 1981-1991. In only three of those years did the peak count rise above 20 and the mean peak count for the 10 years was only 18.5. The highest peak counts were recorded usually before mid-winter, which suggests that some birds might just be passing through. However, Black-necked Grebes are often very difficult to locate and to count accurately, especially when in loose small parties that are constantly diving. A further complication in assessing the number of birds using the Harbour, is evidence that they move between the Harbour and the sea. With two-way movements it is possible that some birds are missed and that the population in the environs of Poole Harbour could be larger than records suggest.

Black-necked Grebes are seldom recorded before November and have usually departed by the first week of April. Invariably the late winter birds are moulting and some reach full summer plumage before departing.

Table 1 **Peak winter counts of Black-necked Grebe in Poole Harbour (1981-91)**
(Data from Dorset Bird Reports)

Year	Peak Count	Month(s) of occurrence
1981/82	**16**	January
1982/83	**15**	December
1983/84	**11**	December
1984/85	**14**	February
1985/86	**13**	February
1986/87	**32**	December
1987/88	**17**	March
1988/89	**27**	November
1989/90	**25**	January
1990/91	**15**	November and December
Total	**185**	
Mean	**18.5**	

Current Status

How the wintering population of Black-necked Grebes uses the Harbour is still not fully understood. At low water WeBS counts there are frequently no birds recorded in the Harbour. Table 2 shows that few birds are recorded on the low water WeBS counts, which only very occasionally reach the U.K. key sites figure of 10. The published data is difficult to interpret, as some of the Harbour peaks probably refer to counts at high water. Peak counts are now available for the environs of Poole Harbour (Poole Bay, Shell Bay and Studland Bay), which add further complications to the analysis (Cranswick et al. 1999, Dorset Bird Reports). Due to birds moving in and out of the Harbour with the

Table 3 **Comparison of Peak WeBS and non-WeBS winter counts of Black-necked Grebe in the environs of Poole Harbour during 1991-1998.**
(Dorset Bird Reports & WeBS Counts)

	Peak non-WeBS Counts		Peak WeBS Counts	
Year	**Nos.**	**Month(s)**	**Nos.**	**Month(s)**
1991/92	**11**	December/February	**2**	February
1992/93	**12**	November/December/ February	**2**	January
1993/94	**17**	November	**3**	December
1994/95	**16**	February	**16**	February
1995/96	**12**	November/February	**15**	February
1996/97	**30**	February	**7**	December
1997/98	**17**	December	**12**	January
Total	**115**		**57**	
Mean	**16**		**8**	

tides, it is difficult to be sure just how many birds are present in the Poole Harbour area at any one time. If the non-WeBS peak count figure is taken as being the minimum peak population level for the Harbour environs, then in each of the seven years (1991-1998), the annual peak count figures were all above the key U.K. sites threshold level (Table 3). The data presented in Table 3 quite clearly shows Poole Harbour and its environs as being one of the key U.K. sites for wintering Black-necked Grebe.

Distribution

The distribution of the Black-necked Grebe as recorded on WeBS counts during the period (1991-1998) is shown in Table 4. No conclusive facts can be gathered from these records, other than that the records are from areas with deeper water channels at low tide and that the main shipping channel is not favoured.

Table 2 Black-necked Grebe

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

Species of National Importance

1% National Threshold Figure = **1** (but maxima of **10** or more defines Key U.K. Sites).
Months in which figure reached Key U.K. Site level is shown in **Bold**

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	-	-	-	-	-	-	-	-	-
September	-	-	1	1	-	-	-	2	-
October	-	1	1	-	-	-	-	2	-
November	-	-	-	-	-	-	-	-	-
December	1	-	3	3	-	7	1	15	2
January	1	2	-	-	5	1	**12**	21	3
February	2	-	-	**16**	**15**	-	-	33	5
March	-	-	1	**11**	2	-	-	14	2
Autumn/winter Total	4	3	6	31	22	8	13	86	12

Table 4 Black-necked Grebe

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is not relevant to this species.

7 year mean Poole Harbour population (Aug - Mar) = 12.4*

*** The small Harbour population is concentrated in a few deep water areas at low water, away from these, its occurrence is very irregular and usually single birds.**

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	-	-	-	-	2	-	-	2	1	5
Annual Mean	-	-	-	-	0.3	-	-	0.3	0.1	0.7
Annual Range	-	-	-	-	2	-	-	1	1	1 - 2
Annual mean/Poole Harbour annual mean	-	-	-	-	2.3%	-	-	2.3%	1.1%	5.7%
Low water area (Ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	538
Mean density/ha										

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	-	-	-	2	2	15				19
Annual Mean	-	-	-	0.3	0.3	2.1				2.7
Annual Range	-	-	-	2	1	1 - 11				1 - 11
Annual mean/Poole Harbour annual mean	-	-	-	2.3%	2.3%	17.3%				21.9%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha										

Table 4 Black-necked Grebe (cont).

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 12.4

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	-	-	-	-	-	31	-	-		31
Annual Mean	-	-	-	-	-	4.4	-	-		4.4
Annual Range	-	-	-	-	-	1 - 13	-	-		1 - 13
% of annual mean/ Poole Harbour mean	-	-	-	-	-	35.7%	-	-		35.7%
Low water area(ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha										

Section NE count areas	1	2	3(P)	3(B)	3(Bl)					Section total
Total counts 1991 - 1998	-	-	-	2	1					3
Annual Mean	-	-	-	0.3	0.1					0.4
Annual Range	-	-	-	1	1					1
% of annual mean/ Poole Harbour mean	-	-	-	2.3%	1.1%					3.4%
Low water area (ha)	480	None.0	None	12.0	12.0					72
Mean density/ha										

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	12	16	1							29
Annual Mean	1.7	2.3	0.1							4.1
Annual Range	12	1 - 4	1							1 - 12
% of annual mean/ Poole Harbour mean	13.8%	18.4%	1.1%							33.3%
Low water area (ha)	36.0	132.0	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: **130**

Past Status

Blathwayt (1933) comments that the Cormorant is 'numerous about the coast at all seasons' but gives no other indication of the population, other than an estimate of 200 breeding pairs on Gad Cliff.

The first estimate of the Harbour's population is given by Boys (1974). He mentions autumn and winter counts in excess of 200 and an exceptional count of 409. Regular dawn and dusk fly-in and fly-out counts were made by Godfrey between 1972-1982 (in Collins 1985). These records showed that in the autumn the population was at its highest in November (mean 189 and maximum count 308) and then steadily declined through the winter until March (mean 111 and maximum count 161).
Collins (1985) undertook similar counts during 1984/85 which mirrored Godfrey's observations, The one noticeable difference was that the maximum monthly counts had become appreciably higher with a November peak of 419 and a March peak of 233. In 1984 Harvey and Bradford (1984) undertook a single fly-out count on 15th November and recorded 451 birds.

Current Status

Cormorants can be found in all months of the year in the Harbour. During the late spring and summer period maximum counts are frequently of over 100 birds (Dorset Bird Reports). Adults during the breeding season are noted feeding in the Harbour and then flying the shortest route out over land towards the nesting colony at Gad Cliff, on the Purbeck coast (B. P. Pickess. pers. obs.).
The numbers are already beginning to increase in July (Dorset Bird Reports), and the continuing rise in numbers using the Harbour as winter advances is shown by the WeBS counts.

During the WeBS count period (1991-1998) the mean peak count was 379 within a range of 284 - 471 (Table 1). The mean peak represents 2.9% of the British population. Being such large and obvious birds, very few are likely to be missed at the low water counts and probably the counts do give a very accurate indication of the number of Cormorants present in the Harbour,

Table 1 shows there is a clear annual pattern of occurrence. There is a marked autumn passage through the Harbour, which now usually peaks in September or occasionally October. Numbers then fall away in November and continue to steadily decline throughout the rest of the winter. In March numbers again begin to increase, probably due to birds passing through on return passage, as they head for their breeding areas.

Although no figures are available as to age ratios of adults:immatures observed, many of the autumn birds are probably immatures. Occasional autumn observations from Arne would suggest that about 33% of birds noted are immatures (B.P. Pickess pers. obs.). The variation in numbers from year to year may be a reflection of each years breeding success.

The origins of the birds in the Harbour in the autumn are probably a combination of Dorset breeding birds and from the limited ringing recoveries, birds dispersing from colonies in South-west England, South-east Ireland and Wales. The reason for the steady decline during the winter is unclear. It is possible that these autumn dispersing birds just use the Harbour as a staging post on their way to winter quarters, probably in France and Spain. The birds that remain to winter in the Harbour could be local Dorset breeding birds.

Using the annual total for the 1991/92 period September-March (the same period used for this species national WeBS analysis) as a 100% base figure, percentage annual change has been compared. After a 13% rise in 1992/93 the population has fluctuated below the base figure. A low point was reached in 1996/97 when the total count was below 17% of the 1991/92 figure. However, in 1997/98 there was a large increase in both autumn passage and wintering birds, which returned the population level to within 5% of the 1991/92 base.

As the Harbour's low water WeBS counts did not commence until 1991, a direct comparison with the national trends cannot be made. However, apart from a similar national peak in 1995/96, they do not follow a similar pattern to the national trends (Cranswick *et al.* 1999).

The Cormorant is possibly the only species of bird using the Harbour over which there has been past contention because of a perceived conflict of interests with fishermen. Although Cormorant numbers declined during the period 1992-19/97, it is not clear whether this was related to Harbour's fish stocks, or a reflected changes in of breeding success.

A high Cormorant population in the Harbour probably reflects an abundant supply of food. If, after the 1998/99 season the population does not continue to increase, but declines again, this would be a matter for concern. The question of Cormorants and fishing is currently under review (Kirby et al. 1996),

Current Distribution

The distribution and density of this species in the Harbour during the period 1991-1998, is given in Table 2. Map 4 shows each section of harbour and the percentage of the Harbour's Cormorant population found in each.

During the autumn and winter months at high water, birds can be encountered almost anywhere in the Harbour. At low water birds tend to gather and haul out at favoured locations, usually exposed promontories. The preferred low water site however, is the Brownsea Island lagoon (NE2) where over 33.0% of the Harbour's population may be found. A further 34.0% are found in flocks distributed around the Harbour, the main concentrations being at Keysworth (W5) 8.1% and in Mid-Harbour south (SC3) 5.2%, Five other sites each hold between 3.5%-4.6% of the population viz. Holes Bay (NC3 (SW & SE). Parkstone (NE3)(B), West Goathorn (SC1) and Brand's Bay (SE2),

Table 1 Cormorant

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

Species of National Importance

1% National Threshold Figure = **130** - Months in which figure reached is shown **Bold**

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	**281**	**288**	**166**	**150**	**471**	**151**	**183**	1690	241
September	**377**	**380**	**229**	**278**	**382**	**375**	**229**	2250	321
October	**237**	**322**	**368**	**247**	**213**	**364**	**397**	2148	307
November	**264**	**279**	**247**	**284**	**168**	**152**	**195**	1589	227
December	**174**	**163**	**207**	**201**	**211**	87	**209**	1252	179
January	**108**	**175**	86	**131**	**136**	65	**168**	869	124
February	85	126	93	**145**	129	45	**139**	762	109
March	**166**	**149**	**117**	88	124	87	84	815	117
Autumn/Winter Total	1692	1882	1513	1524	1834	1326	1604	11375	1625

Table 2 Cormorant

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 – 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 1625

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	16	229	921	218	124	263	68	207	245	2291
Annual Mean	2.3	32.7	131.6	31.1	17.7	37.6	9.7	29.6	35.0	327
Range	1 - 2	1 - 13	1 - 42	1 - 33	1 - 8	1 - 38	1 - 10	1 - 21	1 - 20	1 - 38
% of annual mean/ Poole Harbour mean	0.1%	2.0%	8.1%	1.9%	1.1%	2.3%	0.7%	1.8%	2.1%	20.1%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	488
Mean density/ha	0.09	1.02	1.71	0.26	0.20	0.32	0.22	2.47	2.90	(0.67)

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	26	85	514	394	165	301				1485
Annual Mean	3.7	12.1	73.4	56.3	23.6	43.0				212
Range	1 - 3	1 - 8	1 - 30	1 - 25	1 - 19	1 - 43				1 - 43
% of annual mean/ Poole Harbour mean	0.2%	0.7%	4.5%	3.5%	1.5%	2.6%				13.0%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	0.13	0.38	1.15	0.64	2.95	3.58				0.95

Table 2 Cormorant (cont)

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 1625

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	25	37	738	64	435	591	43	518		2451
Annual Mean	3.6	5.3	105.4	9.1	62.1	84.4	6.1	74.0		350
Range	1 - 11	1 - 9	1 - 127	1 - 6	1 - 33	1 - 90	1 - 4	1 - 124		1 - 127
% of annual mean/ Poole Harbour mean	0.2%	0.3%	6.5%	0.1%	3.8%	5.2%	0.4%	4.5%		21.5%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	0.15	0.02	3.29	0.13	0.77	4.22	1.02	1.68		0.99

Section NE count areas	1	2	3(P)	3(B)	3(Bl)					Section total
Total counts 1991 – 1998	47	3810	133	521	34					4545
Annual Mean	6.7	544.3	19.0	74.4	4.8					650
Range	1 - 10	4 - 327	1 - 12	1 - 33	1 - 10					1 - 327
% of annual mean/ Poole Harbour mean	0.4%	33.5%	1.1%	4.6%	0.3%					39.9%
Low water area (ha)	40.0	8.0	None	12.0	12.0					72
Mean density/ha	0.17	-	-	6.20	0.40					(9.02)

Section SE count areas	1	2	3							Section total
Total counts 1991 – 1998	57	416	140							613
Annual Mean	8.1	59.4	20.0							87
Range	1 - 26	1 - 25	1 - 10							1 - 26
% of annual mean/ Poole Harbour mean	0.5%	3.6%	1.2%							5.4%
Low water area (ha)	36.0	132.0	None							168
Mean density/ha	0.22	0.45	-							(0.51)

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: **1250**
WeBS - Qualifying Number for Great Britain threshold: **10**

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

* As it is now establishing as a breeding species it should now become Amber-listed in the U.K.

Past Status

The Little Egret was first recorded in Dorset in 1940, with a second record in February 1946, in Poole Harbour (Boys 1974), It was then over 20 years before there was another record for the Harbour in May 1967, which was followed by up to three birds summering in 1970. (Boys 1974),

After 1970 there were occasional records in some years and since 1987, Little Egrets have been recorded annually. Between 1988-90 the number of birds recorded each year began to increase and there was a noticeable influx in the July/August period, probably of immature birds (B. P. Pickess pers. obs.). There was a maxima of four birds in the summer of 1988, six birds in 1989 and 16 in 1990, with at least one bird staying on to winter in all three years (Dorset Bird Reports).

Current Status

During the 1990's the number of Little Egrets in the Harbour has steadily increased and birds are now present throughout the year. Since 1994, on WeBS count days, numbers have been in double figures with noticeable peaks in September and October. After November numbers slowly decline.

An autumnal influx of birds into the Harbour was first noted in 1992 and this trend has continued to the present time. The largest numbers of birds are present in the Harbour during the July-October period. This influx is well illustrated by the WeBS counts (Table 1). During the autumn of 1994, birds were discovered roosting at Little Sea (SE3), which showed that there were more birds present in the Harbour environs than the WeBS counts indicated. This difference may be because some birds can be difficult to locate, especially if they are feeding in deep runnels and other birds may not be in the Harbour at the time of the WeBS count because they are feeding along the Harbour's tributaries. The difference between mean peak count for the four years for the roost and the WeBS counts shows a surprising deficit of 44% in the WeBS counts! This implies that from the mid-1990's, the WeBS figure is probably an under estimate. The peak counts for the Little Sea roost are shown in Table 2

Table 2 **Peak Counts of Little Egrets roosting at Little Sea 1994-1997**

Year	Number	Peak Month
1994	85	September
1995	110	August
1996	107	September
1997	98	September

Current Distribution

At low water on WeBS counts the Little Egrets are widely distributed throughout the Harbour at low densities (Table 3). The majority of the population is associated with the southwest area of the Harbour, however, with just under 60% being found between SC1-6; NE2 and SE1-3. Map 5 shows the percentage distribution of the Harbour's Little Egrets on WeBS counts.

Breeding Status

With the steady population increase from 1993, it came as no surprise when in 1996, the first Little Egrets to successfully breed in Britain nested on Brownsea Island. In that year two pairs were known to have bred, raising 3 young and in the following year five pairs reared 12 young (Cook 1998). In 1998 it was thought that between 9 and 11 pairs nested (Dorset Bird Report 1998).

Origins of establishing population

Since the 1950's there has been a steady movement of Little Egrets north-westwards along the Atlantic seaboard of France and in 1960 breeding took place in Brittany. By the early 1990's their range had expanded and by 1993, breeding had extended to Normandy (Spiroux 1995). The details of the range expansion and establishment of Little Egrets in Northwest France is summarised by Lock & Cook (1998).

The rapid increase of records in Poole Harbour in the 1990's has probably been as a result of dispersing young birds from the Brittany colonies. A recently discovered fact that could have assisted rapid colonisation, is that, unlike many other heron species, young egrets can breed in their first year (Hafner *et. al* 1998).

The factors that may determine the eventual size of the Harbour population are not, as yet, predictable. If winters remain mild, then the population should continue to increase. It has been shown in Brittany that even after prolonged cold spells resulting in high mortality, the population, once established, has not appeared to have been effected and there has been an increase in the numbers of breeding Little Egrets (Lock & Cook 1998).

Table 1 Little Egret

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

Species of National Importance

1% National Threshold Figure = **10** - Months in which figure reached is shown **Bold**

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	2	**11**	5	**23**	**68**	**13**	**29**	151	22
September	6	**12**	8	**42**	**56**	**57**	**60**	241	34
October	1	**7**	**24**	**13**	**41**	**47**	**46**	179	25
November	**4**	1	**21**	**35**	**40**	**35**	**18**	154	22
December	1	9	3	**20**	**18**	**20**	**19**	90	13
January	1	5	8	**26**	**28**	**13**	**35**	116	17
February	2	6	**14**	**21**	**14**	**10**	**16**	83	12
March	1	4	**12**	**16**	**13**	**17**	**22**	85	12
Autumn/Winter Total	18	55	95	196	278	212	245	1099	157

Table 3 Little Egret

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 157

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	-	16	43	18	17	53	23	26	19	215
Annual Mean	-	2.3	6.1	2.6	2.4	7.6	3.3	3.7	2.7	30.7
Range	-	1 - 3	1 - 4	1 - 4	1 - 2	1 - 9	1 - 2	1 - 6	1 - 3	1 - 9
% of annual mean/ Poole Harbour mean		1.5%	3.9%	1.7%	1.5%	4.8%	2.1%	2.4%	1.7%	19.6%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	488
Mean density/ha	-	0 .07	0.10	0.02	0.03	0.07	0.08	0.31	0.23	0.62

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	22	12	43	31	8	34				150
Annual Mean	3.1	1.7	6.1	4.4	1.1	4.9				21.4
Range	1 - 2	1 - 2	1 - 4	1 - 5	1 - 2	1 - 3				1 - 5
% of annual mean/ Poole Harbour mean	2.0%	1.1%	3.9%	2.8%	0.7%	3.1%				13.6%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	0.11	0.05	0.10	0.05	0.14	0.41				0.10

Table 3 Little Egret (cont).

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 157

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	10	15	66	50	120	54	72	83		470
Annual Mean	1.4	2.1	9.4	7.1	17.1	7.7	10.3	11.9		67.1
Range	1 - 2	1 - 2	1 - 9	1 - 11	1 - 12	1 - 9	1 - 17	1 - 9		1 -17
% of annual mean/ Poole Harbour mean	0.9%	1.4%	6.0%	4.5%	10.9%	4.9%	6.6%	7.6%		42.8%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	0.05	0.04	0.29	0.10	0.21	0.38	0.29	0.27		0.19

Section NE count areas	1	2[A]	3(P)	3(B)	3(BI)					Section total
Total counts 1991 - 1998	1	52	1	-	15					69
Annual Mean	0.1	7.4	0.1	-	2.1					9.9
Range	1	1 - 9	1	-	1 - 5					1 - 9
% of annual mean/ Poole Harbour mean	0.1%	4.7%	0.1%	-	1.4%					6.3%
Low water area (ha)	48.0	None	None	12.0	12.0					72
Mean density/ha	-	-	-	-	0.18					0.03[A]

* single records. [A] All records refer to Brownsea Island lagoon (SE2) and counts excluded from mean density figure.

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	51	98	48							197
Annual Mean	7.3	14.0	6.9							28.1
Range	1 - 19	1 - 14	1 - 9							
% of annual mean/ Poole Harbour mean	4.6%	8.9%	4.4%							17.9%
Low water area (ha)	36.0	132.0	None							168
Mean density/ha	0.20	0.11	-							0.13*

* Figure only for mean density/ha of SE1 & 2.

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

Status Winter visitor - October to March

WeBS - Qualifying Number for International threshold: **3000**
WeBS - Qualifying Number for Great Britain threshold: **1000***

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

* The National threshold figure has now been up-rated from 900 to 1000 (Kirby 1995).
[1] Amber listed because > 20% of N.W. European non-breeding population in U.K. (Gibbons et al. 1996).
[2] SPEC3 listed because of species unfavourable conservation status (wintering population only) (Tucker & Heath 1994).

Past Status

The British wintering populations of Dark-bellied Brent Geese declined during the 1930's, a decline attributed to the rapid loss of its main food, eel-grass *Zostera* sp. Poole Harbour's *Zostera* declined too, and with it, the Dark-bellied Brent Geese population. The species had been described as 'frequent' in Poole Harbour by Blathwayt (1933), but because of the demise of the main food source, numbers greatly declined from the 1930's. When a winter survey of Poole Harbour was undertaken between 1949-1952 the peak count was only 18 (Bull 1953). The decline continued and Dixon (1967), reporting on the winter period between 1959-65, commented that, 'the Brent Goose that was once common, now only arrives in two's and three's as an occasional vagrant'.

In the following 30 years the status of the Dark-bellied Brent Goose in the Harbour steadily improved. By 1968 there was a wintering peak of over 50, increasing to over 100 by 1973 and reaching up to 550 by 1983 (Boys 1974 and Prendergast & Boys 1983). In 1986 the population had doubled to 1200 and became of national importance (Collins 1986a).

Current Status

The wintering population begins to arrive in October and remains until March. Table 1 shows that during the seven year winter WeBS count period (1991/92-1997/98) the month of the peak count varied from year to year - December (2), January (2) and February (3). With a seven year mean peak of 1506, the Harbour supports 1.5% of the British wintering population. Why the timing of peak numbers varies from year to year is uncertain. During this period there have not been any severe winter periods, so other factors, such as availability of food supplies elsewhere, may be influencing the timing of arrivals in the Harbour.

As *Zostera* is no longer abundant since the 1930 crash (Bromby 1983), it must now form only a minor food item for the geese. Charman (1979) has shown in Essex and Kent, that after arrival, the geese preferentially graze out the *Zostera*, then turn to the *Enteromorpha* sp., before grazing adjoining agricultural fields. This feeding pattern is similar to Poole Harbour, except that *Enteromorpha* sp. and *Ulva* are currently the most important food sources. The Harbour geese now spend much of their time on the agricultural lands that adjoin the Harbour on its western side. Here grass leys are the main attraction for the geese. This changed food resource possibly holds the key to the maintenance of the population over the last seven winters. There have been some minor issues in the past with goose grazing and affected farmers, but currently it does not appear to be causing problems.

Current Distribution

The distribution and density of this species in the Harbour for the seven year period is given in Table 2. Map 6 shows the population mean density at low water (ha^{-1}) for each section of harbour. The areas most favoured by the geese are the sections SC and SE, which are associated with the adjacent farmland. Here over the seven year period of the WeBS counts, these two sections have held over 83% of the Harbour population. There is a smaller population (9.5%), which is located in the NE

section. There are very few areas of the Harbour where the geese do not visit from time to time but then, usually only in small numbers.

Table 1 Dark-bellied Brent Goose

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

Species of National Importance

1% National Threshold Figure = 1000 - Months in which figure reached is shown **Bold**

Year Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	-	-	-	-	-	-	16	16	2
September	-	1	-	-	-	107	-	108	15
October	75	273	52	-	11	203	158	772	110
November	957	849	751	893	843	**1004**	621	5918	846
December	**1370**	753	**1059**	**1282**	648	**1644**	853	7609	1087
January	**1381**	**1278**	960	**1529**	**1292**	**1444**	**1427**	9311	1330
February	**1711**	**1049**	**1486**	**1118**	**1460**	489	**1449**	8762	1252
March	429	**1210**	940	280	991	**1138**	702	5690	813
Autumn/Winter Total	5923	5413	5248	5102	5245	6029	5226	38186	5455

Table 2 Dark-bellied Brent Goose

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 5455

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 – 1998	-	44	1373	62	-	468	96	100	285	2430
Annual Mean	-	6.3	196.4	8.8	-	66.8	13.7	14.3	40.7	347
Range	-	1 - 22	1 - 414	1 - 48	-	1 - 141	1 - 55	1 - 51	2 - 200	1 - 414
% of annual mean/ Poole Harbour mean	-	0.1%	3.6%	0.2%	-	1.0%	0.3%	0.3%	0.7%	6.4%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	488
Mean density/ha	-	0.19	3.06	0.07	-	0.57	0.31	1.19	3.39	0.71

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 – 1998	-	-	2*	-	100	151				253
Annual Mean	-	-	-	-	14.3	21.6				36
Range	-	-	-	-	2 - 27	1 - 27				1 - 27
% of annual mean/ Poole Harbour mean	-	-	-	-	0.3%	0.4%				0.7%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	-	-	-	-	1.78	1.80				0.03

* Only a single record

Table 2 Dark-bellied Brent Goose (cont)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 5455

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 – 1998	6238	2843	122	530	6526	707	3601	5023		25590
Annual Mean	891.1	406.1	17.4	75.7	932.3	101.0	514.4	717.6		3656
Range	7 - 1150	1 - 800	9 - 46	3 - 201	2 -580	5 - 241	2 - 453	4 - 495		1 - 1150
% of annual mean/ Poole Harbour mean	16.3%	7.5%	0.3%	1.4%	17.1%	1.8%	9.4%	13.2%		67.0%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	37.1	9.22	0.54	1.05	11.65	5.05	14.28	16.30		10.38

Section NE count areas	1	2[A]	3(P)	3(B)	3(Bl)					Section total
Total counts 1991 – 1998	575	216	238	1859	754					3642
Annual Mean	82.1	30.8	34.0	265.6	107.7					520
Range	1 - 52	1 - 127	5 -120	6 - 250	1 - 114					1 - 250
% of annual mean/ Poole Harbour mean	1.5%	0.6%	0.6%	4.8%	2.0%					9.5%
Low water area (ha)	48.0	None	None	12.0	12.0					72
Mean density/ha	1.71	-	-	22.13	8.97					6.86[A]

[A] All records refer to Brownsea Island lagoon (SE2) and counts excluded from mean density figure.

Section SE count areas	1	2	3							Section total
Total counts 1991 – 1998	566	5705	-							6271
Annual Mean	80.8	815.0	-							896
Range	4 - 113	3 - 332	-							4 - 332
% of annual mean/ Poole Harbour mean	1.5%	14.9%	-							16.4%
Low water area (ha)	36.0	132.0	None							168
Mean density/ha	2.24	6.17		-						5.33

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: **750**

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

* The International threshold has been up-rated from **2500** to **3000** (Kirby 1995).
[1] U.K. listed because of holding > 20% of European breeding population in U.K. and > 50% of U.K. non-breeding population present in 10 or fewer sites (Gibbons et al. 1996).

Breeding and Summering Population

The general statement made by Blathwayt (1933) describing the Shelduck as having its headquarters in Dorset in the Poole Harbour district, 'where many breed', is still true today.

There are problems, however, in trying to assess the size of the Harbour's breeding population. The number of broods of ducklings seen is usually a good guide to success in wildfowl breeding studies, but, where Shelduck ducklings are concerned, they frequently, from a young age, join a crèche. It is not uncommon in June, to find a pair of adults in charge of a crèche, with up to 25 or more ducklings. Examination of the crèche will show that there are usually several different sizes of ducklings present, the product of different pairs.

As a result of crèching only a rough estimate can be given of the number of pairs producing young in the Harbour. Most years probably at least 30 pairs produce young (Dorset Bird Reports). In 1989 at Arne there was a record crèche of 110 ducklings with just one pair of adults (B.P. Pickess pers. obs.).

Counting adults during June and early July is confusing. In the same area of the Harbour there can be a mixture of adults with broods, adults in charge of crèches, and presumed failed breeding pairs and non-breeding birds. Most birds are to be found on the quieter western side of the Harbour, away from the main areas of pleasure craft traffic. During the period 1950-1970, there were up to 30 breeding pairs recorded annually and the population increased during the 1970's to between 50 – 70 pairs (Prendergast and Boys 1983). In 1985 Collins (1986), in his detailed survey of the Harbour, thought that between 50-70 pairs were present. A survey on 10th July, 1994 of the whole Harbour produced 274 adults and 169 juveniles in 20 groups, which included five crèches of 15-25 juveniles each (McClure and Payne, 1994).

Table 1 presents a long series of data from the Arne Peninsula for the 28 year period 1968-1995 with peak counts of adults and numbers of broods of ducklings recorded each year in June and July (except 1995). These data would suggest that there is considerable variation in adult peak numbers in both months. Unfortunately, these figures do not necessarily reflect the breeding success each year, so they must be treated with some caution.

At Arne the number of broods noted each year varied between 10 and 30, with the 27 year mean being 22 broods. The number of broods recorded each year from 1969 to 1989 fluctuated between 25-30, except in two very poor years (1982 and 1983), since 1990 there have been signs that the breeding population is declining and in both 1993 and 1994, no more than 15 broods were noted.

Table 1 **Shelduck Peak Counts of Adults and number of broods of ducklings recorded 1968-1995 off the Arne Peninsula**
(Data from RSPB Arne Nature Reserve Annual Reports)

Year / Month	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
June - ads.	150	200	100	100	125	200	200	150	200	560	150
July - juvs.	20	25	25	40	70	125	30	150	50	150	100
No. broods	10+	20+	20+	20+	20+	25+	25+	>25	30+	25+	25+
Year / Month	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
June - ads.	100	N/C	250	130	350	50	120	60	50	175	100
July - juvs.	300	40	10	100	39	70	170	62	44	10	100
No. broods	30+	30+	30+	30+	<10	10+	25+	25+	25+	25+	25+
Year / Month	1990	1991	1992	1993	1994	1995					
June - ads.	200	125	151	70	124	38					
July - juvs.	125	130	40	10	51	N/C	N/C = no count				
No. broods	20+	20+	20+	< 15	15+	N/C					

These data probably reflect the annual breeding success and population trends in the Harbour. The figures from Arne suggest that the breeding/summering population is declining. This decline could be due to increased summer boat traffic, predation of nests by Foxes, or other unidentified causes. Without further survey work the current status and trends in the breeding/summering population of Shelduck in the Harbour is unclear.

Wintering Population

Shelduck are noted for their autumn moult migration, principally to the German Waddensea (Prater 1981). In July the great majority leave the Harbour and at dusk flocks can be seen heading off east (Alexander 1969). From mid-July only a few adults and the juveniles remain in the Harbour. In October adults begin to return from their moult, and then numbers steadily rise to reach a peak, usually in January or February.

Past Status

The seasonality of the species was noted by Blathwayt (1933), who described their presence as 'Apparently scarce or absent from September until hard weather sets in'. He made no mention of winter numbers but his account would suggest that Shelduck were not uncommon.

Bull (1953) gives the first real account of the pattern of autumn and winter movements of Shelduck to and from the Harbour. He showed that a build-up begins in November and reaches a peak in February. The maximum count in February 1952 was about 650 but the two previous years only peaked at around 300.

Table 2 shows the total counts and means for the six year period (1959/60 to 1964/65) taken from Dixon (1967). By 1960, the peak wintering population had already more than doubled since Bull's estimate for 1953. In January and February 1960 there were counts of over 1000 birds. During the very severe winters of 1961/62 and 1962/63, there were some exceptionally high counts of over 1200 in January and March 1962, and 2097 in February 1963. The pattern of occurrence in the 1960's was however, little changed from that of the early 1950's (Dixon 1967)

Table 2 **Poole Harbour 6 Year total monthly counts and means (1959/60 - 1964/65) of Shelduck (after Dixon 1967)**

Month	Total Monthly Count 1959/60-19664/65	Mean of Monthly Counts
September	327	54.5
October	682	113.7
November	1329	221.5
December	3397	566.2
January	5448	908.0
February	6608	1101.3
March	4337	722.8

It is uncertain whether the whole of this increase in numbers can be attributed to a genuine increase in population. It is probable that part of the increase is due to improved observer coverage of the Harbour.

Winter peak numbers continued to increase through the 1970's and 1980's, as shown in Table 3. During this period covering over 20 years, the peak Harbour count was usually in January (14 years), with February (five) and one year in March.

Table 3 **Poole Harbour Peak Annual Count of Shelduck for 1969/70 - 1978/79 and 1981/82 -1990/91, with 10 year Totals, Means and Month of occurrence** (Data from Dorset Bird Reports)

Winter Period	Peak Month	Winter Period	Peak Month
1969/70	2913 (Feb)	**1981/82**	2100 (Jan)
1970/71	2582 (Jan)	**1982/83**	1572 (Jan)
1971/72	1783 (Jan)	**1983/84**	1341 (Jan)
1972/73	2240 (Feb)	**1984/85**	2891 (Jan)
1973/74	2063 (Jan)	**1985/86**	1956 (Jan)
1974/75	2011 (Jan)	**1986/87**	3590 (Jan)
1975/76	2688 (Jan)	**1987/88**	1665 (Feb)
1976/77	2027 (Jan)	**1988/89**	2230 (Feb)
1977/78	1717 (Mar)	**1989/90**	2179 (Feb)
1978/79	1304 (Jan)	**1990/91**	3309 (Jan)
Total	**21328**	Total	**22833**
10 Year Mean	**2133**	10 Year Mean	**2283**

During the whole period there were only three winters which experienced severe weather, in both January 1979 and January 1984, there was an exodus of birds from the Harbour, but in January 1982 an influx occurred.

Current Status

The WeBS data in Table 4 show the low adult population in August with the build up of numbers in September mostly due to the inclusion of the year's immature birds. It is not until October that numbers begin to increase as adult birds return from their moult. Although the mean peak for the seven winter period occurred in January, the annual month of peak does show some variation. Table 5 shows that the peaks over the seven years occurred in January (three) and in February and March (two

each). Table 5 also shows that the seven year peak mean is rising and has increased to 3176, which is almost a 40% increase over the 1980's mean of 2283.

Table 5 **Poole Harbour Peak Annual Count of Shelduck for 1991/92 - 1997/98 with 7 year Total, Mean and Month of occurrence**
(data from WeBS counts)

Winter Period	Peak Month
1991/92	2382 (Mar)
1992/93	2801 (Mar)
1993/94	2982 (Jan)
1994/95	3177 (Jan)
1995/96	3575 (Feb)
1996/97	4650 (Jan)
1997/98	2662 (Feb)
Total =	22229
7 Year Mean =	3176

The annual WeBS method for calculating national trends in the Shelduck population uses the combined Jan/Feb counts to produce the indices (Kirby 1995). The same method has been used to calculate the Harbour's Shelduck trend using the first year of WeBS counts as the base line. Table 6 shows how the Harbour's population has fared from year to year. During the seven winters the annual index has always been at least 24% above the base of 100% ,and in 1997 was nearly twice as high. The national wintering population over the past 35 years has been relatively stable (Cranswick et. al 1999), suggesting that the Harbour population is increasing at the expense of other wintering sites. Why the Harbour's population is increasing is unclear, especially as there have been no periods of extended severe weather in these seven years, but it may be linked to food availability?

Table 6 **Poole Harbour Annual Shelduck Indices 1991/92 - 1997/98**
(Combined counts of January and February (after Kirby 1995)
(100% base line figure = winter 1992)

Winter Period	January/February combined count	Annual Percentage change over base
1991/92	4069	100%
1992/93	5335	+31%
1993/94	5065	+24%
1994/95	6500	+60%
1995/96	6058	+49%
1996/97	7995	+96%
1997/98	5047	+24%

Many Shelduck rest up during high water on the fields 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.

The number of birds at peak qualifying for International recognition has been increased to 3000, and in only four of the seven years, was this figure exceeded (Kirby 1995). January 1997 was notable for recording the highest ever count in the Harbour of 4650 birds, which represents nearly 1.6% of the Great Britain population.

Distribution

The distribution and density of this species in the Harbour for the seven year period (1991/92-1997/98) is given in Table 6. Map 7 shows the mean August-March population at low water ha^{-1} for each section of harbour. From this it can be seen that at low water Shelduck are distributed almost throughout the Harbour.

The main densities of Shelduck are found in the least disturbed areas of the Harbour. Those areas with the most mud exposed at low water do not necessarily hold the greatest densities of birds. The reason for this is unclear. In general there are few birds at low water in the eastern side of the Harbour, particularly in those areas affected by the major shipping lane (NE1, NE2, NE3 and SE1). There are also low densities in (W1, W2 and NC2) which border onto recreation and commercial areas, and have extensive small boat usage.

Table 4 Shelduck

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

Species of International Importance

1% International Threshold Figure = **3000** Months in which figure reached is shown in **Bold**
1% National Threshold Figure = **750** Months in which figure reached is shown **Bold**

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	146	148	80	139	186	76	122	897	128
September	196	167	193	133	160	156	245	1250	178
October	367	714	295	192	666	267	245	2746	392
November	**1048**	**1342**	**1008**	**997**	**1728**	**1020**	**1135**	8278	1183
December	**1741**	**1380**	**1531**	**1488**	**1911**	**2920**	**1619**	12590	1799
January	**1983**	**2611**	**2982**	**3177**	**2483**	**4650**	**2385**	20271	2896
February	**2086**	**2724**	**2080**	**2323**	**3575**	**3345**	**2662**	18795	2685
March	**2382**	**2801**	**2066**	**1977**	**2753**	**1699**	**2048**	15726	2247
Autumn/Winter Total	9949	11887	10235	10426	13462	14133	10461	80553	11508

Table 7 Shelduck

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 11508

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 – 1998	168	824	9226	4110	4656	4066	1038	82	151	24321
Annual Mean	24.0	117.4	1318.0	587.1	665.1	580.8	148.3	11.7	21.6	3474
Range	2 - 77	2 - 173	2 - 1230	2 - 347	1 - 398	2 - 294	2 - 336	1 - 16	1 - 50	1 - 1230
% of annual mean/ Pool Harbour mean	0.2%	1.0%	11.5%	5.1%	5.8%	5.0%	1.3%	0.1%	0.2%	30.2%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	488
Mean density/ha	0.90	5.40	20.59	4.89	7.55	5.00	3.37	0.97	1.80	7.12*

* Excludes birds in (W7) - non-tidal

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	1097	930	2855	2368	91	811				8152
Annual Mean	156.7	132.8	407.8	338.3	13.0	115.8				1164
Range	1 - 96	1 - 113	2 - 189	1 - 205	1 - 55	2 - 80				1 - 205
% of annual mean/ Pool Harbour mean	1.4%	1.1%	3.5%	2.9%	0.1%	0.1%				10.0%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	5.59	4.15	6.37	3.84	1.62	9.65				4.26

Table 7 Shelduck (cont).

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 11508

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	1916	2687	2722	6196	7961	2645	4283	2883		31293
Annual Mean	273.7	383.8	388.8	885.1	1137.3	337.8	611.8	411.8		4470
Range	1 - 647	4 - 410	1 - 350	1 - 680	4 - 926	8 - 658	2 - 510	2 - 429		1 - 680
% of annual mean/ Pool Harbour mean	2.4%	3.3%	3.4%	7.7%	9.9%	3.3%	5.3%	3.6%		38.9%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	11.40	8.72	12.15	12.29	14.21	18.89	16.99	9.35		12.69

Section NE count areas	1	2[1]	3(P)[2]	3(B)	3(Bl)					Section total
Total counts 1991 - 1998	26*	3248	17	1	299					3591
Annual Mean	3.7	463.7	2.4	-	42.7					513
Range	11 - 15	2 - 280	1 - 14	-	1 - 56					1 - 280
% of annual mean/ Pool Harbour mean	<0.1%	4.3%	<0.1%	-	0.4%					5.0%
Low water area (ha)	48.0	None	None	12.0	12.0					72
Mean density/ha	0.08	n/a	n/a	-	3.5					0.66[a]

* Only recorded in 1996 [1] Brownsea Island (NE2) non-tidal lagoon [2] Poole Park (3(P) no mud exposed at low water

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	284	12878	36							13198
Annual Mean	40.6	1839.7	5.1							1885
Range	2 - 74	6 - 623	1 - 50							1 - 623
% of annual mean/ Pool Harbour mean	0.3%	16.0%	<0.1%							16.4%
Low water area (ha)	36.0	132.0	None*							168
Mean density/ha	1.37	13.93	n/a							11.22

* Littlesea (SE3) - non-tidal

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: **280***

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

* The National threshold figure has recently been up-rated from 250 to 280 and the International threshold figure reduced from 700 to 600 (Kirby 1995).
[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 present in 10 or fewer sites (Gibbons *et al.* 1996).
[2] European listed as 'vulnerable' because of declining breeding and wintering populations (Tucker & Heath 1994).

Breeding and Summering Population

During the 1970's and 1980's the occasional bird was recorded during the breeding season but in 1978 a pair summered on Brownsea Island (NC2). The only proven breeding recorded in the Harbour was in 1983 when a ? with 3 half-grown ducklings was seen at Arne (W8) (B. P. Pickess pers. obs.).

Wintering Population

Past Status

The Pintail was described by Blathwayt (1933) as a regular winter visitor in small numbers to Dorset. He mentions that there were many in Poole Harbour during hard weather in 1929.

In the 1950's numbers seldom passed 100+, but there is an exceptional record of 200 on 5th February 1954. During the 1960's numbers increased and counts of between 100-300 were fairly regular from 1961 onwards (Boys 1974).

The peak counts for the 21 year period (1970-1991) are shown in Table 1. In nine out of the 21 years the peak count was above the 1% national threshold level. There was an exceptionally high count of 525 in the (1970/71) winter, which represented over 2.1% of the U.K. population.

Table 1 **Peak winter count of Pintail and month of occurrence for the 21 year period (1970/71-1990/91) in Poole Harbour**

(1% National Importance = 250) (Data from Dorset Bird Reports)

Year	No.	Month	Year	No.	Month
1970/71	525	Jan			
1971/72	324	Jan	1981/82	452	Jan
1972/73	456	Jan	1982/83	163	Nov
1973/74	184	Feb	1983/84	117	Jan
1974/75	224	Jan	1984/85	290	Feb
1975/76	256	Dec	1985/86	291	Jan
1976/77	290	Feb	1986/87	243	Jan
1977/78	190	Dec	1987/88	156	Feb
1978/79	170	Dec	1988/89	155	Feb
1979/80	124	Feb	1989/90	92	Jan
1980/81	119	Feb	1990/91	307	Jan
21 Year Total = 5183			21 Year Mean = 244.7		

During this 21 year period there were two other exceptionally high counts, each of just over 450, in (1972/73) and (1981/82). Of the nine counts above the 1% threshold figure, five were in January, two in February and one in December. Throughout this period, irrespective of the numbers occurring, the winter peak count was normally in the January/February period. The mean peak count for the 21 year period was 245, which is just below the 1% national importance figure of 250.

Current Status

Table 2 shows the seven year WeBS count period (1991-1998), giving monthly totals, together with totals and means for each month over the period. The general level of peak counts of Pintail in the Harbour of Pintail has not changed appreciably over the past 28 years. As numbers nationally have risen, as reflected by the 12% rise in the national threshold figure (Kirby 1995), the Harbour's population has also slightly risen, changing the status from just below the 1% threshold (250), to just above it (280). The counts at high water (BoEE), and at low water (WeBS), have given very similar results, so the population increase is unlikely to be due to different counting methods. Although the mean peak count for Pintail was 286, the Harbour population does not reach the national 1% threshold every year, in the past seven years it has peaked at above 1% in four.

In autumn a few birds begin to arrive in September and numbers then steadily build to a peak in January or February, before falling rapidly in March. Usually a few wintering birds linger into mid-April and occasionally birds may be recorded during the summer.

Distribution

The monthly low water WeBS distribution and density of the Pintail in the Harbour for the seven year period (1991-1998) are shown in Table 3. Map 8 shows the percentage of the Harbour's population present in each section at low water.

From Map 8 it can be seen that the Pintail is either absent or only present in small numbers in the northern and eastern parts of the Harbour. Most of these sections, which the birds avoid, contain the main deeper water channels, where there is frequent disturbance by water-borne traffic and where only limited areas of mud are exposed at low water. The Pintail are concentrated in four sections on the south-west side of the Harbour. In three sections, Newton Bay (SC2), Fitzworth (SC4) and Brands Bay (SE2) there are large expanses of mud flats at low water. The fourth site, Little Sea (SE3), although not tidal, has shallow well vegetated fringes to the lake, which are seldom disturbed at times of low water. These four sections between them hold over 75% of the Harbour's Pintail population.

Table 2 Pintail

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

Species of National Importance

1% National Threshold Figure = **280** Months in which figure reached is shown in **Bold**

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	-	-	-	-	-	-	-	-	-
September	-	30	9	7	39	40	28	153	21.8
October	17	42	95	24	149	75	88	490	70.0
November	123	131	186	186	208	99	11	944	134.9
December	130	148	126	231	231	276	211	1353	193.3
January	**286**	83	158	162	243	**375**	164	1471	210.1
February	50	173	109	88	**301**	**281**	**451**	1453	207.6
March	87	91	81	8	201	43	246	757	108.1
Autumn/Winter Total	693	698	764	706	1372	1189	1199	6621	945.8

Table 3 Pintail

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 946

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	-	24	235[1]	540	-	20	-	3[2]	2[2]	824
Annual Mean	-	3.4	33.6	77.1	-	2.8	-	-	-	118
Annual Range	-	2 - 17	2 - 118	1 - 146	-	1 - 5	-	-	-	1 - 146
% of annual mean/ Poole Harbour mean	-	0.4%	3.5%	8.1%	-	0.3%	-	-	-	12.4%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	488
Mean density/ha	-	0.11	0,52	0.64	-	0.02	-	-	-	0.24

[1] Only recorded in 1998 (Jan - Mar) [2] Only single records

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	3[1]	7	-	2[2]	-	24				36
Annual Mean	-	1.0	-	-	-	3.4				5
Annual Range	1 - 2	1 - 3	-	2	-	1 - 6				1 - 6
% of annual mean/Poole Harbour mean	-	0.1%	-	-	-	0.4%				0.5%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	-	-	-	-	-	0.28				(0.02)

[1] Only two records [2] Only a single record

Table 3 **Pintail** (cont)

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 946

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	23[1]	35	372	128	1657	113	800	-		3128
Annual Mean	3.3	5.0	53.1	18.3	236.7	16.1	114.3	-		446
Annual Range	1 - 22	2 - 18	2 - 206	1 - 47	2 - 198	1 - 70	1 - 6	-		
% of annual mean/ Poole Harbour mean	0.3%	0.5%	5.6%	1.9%	25.0%	1.7%	12.1%	-		47.2%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	0.14	0.11	1.66	0.25	2.96	0.80	3.17	-		1.27

1 Only two records

Section NE count areas	1	2	3(P)	3(B)	3(Bl)					Section total
Total counts 1991 - 1998	-	9[1]	-	-	-					9
Annual Mean	-	1.3	-	-	-					1
Annual Range	-	3 - 6	-	-	-					
% of annual mean/ Poole Harbour mean	-	0.1%	-	-	-					0.1%
Low water area (ha)	48 0	None	None	12.0	12.0					72
Mean density/ha	-	-	-	-	-					(0.01)

1 Only two records in 1992

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	-	1071	1553							2624
Annual Mean	-	153.0	221.8							375
Annual Range	-	1 - 111	1 - 203							
% of annual mean/ Poole Harbour mean	-	16.2%	23.4%							39.6%
Low water area (ha)	36.0	132.0	None							168
Mean density/ha	-	1.16	-							(2.23)

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: **100***

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

* The National threshold figure has now been up-rated from 90 to 100 (Kirby 1995).
[1] Amber listed because > 20% of N.W. European non-breeding population in U.K. (Gibbons *et al.* 1996).

Breeding Population

Past Status

Breeding by Shoveler around Poole Harbour is of very rare occurrence. Blathwayt (1933) only refers to a single record of breeding in the Poole area in 1926. There is no further record, until young were seen in the Harbour in 1956 (Prendergast and Boys 1983).

No further evidence of breeding was noted until 1982, when 10 eggs were laid in a nest on Brownsea Island (NC2) but the female deserted the nest. In 1985 there was a summering record from the Keysworth area (W5) but no evidence of breeding. There was proof of breeding in 1987, when a female with seven ducklings was seen at Arne in Salterns Marsh (B. P. Pickess pers. obs.)

Current Status

There has been no evidence of breeding or attempted breeding between 1991-1998 in the Harbour environs.

Wintering Population

Past Status

Little information can be gathered from Blathwayt (1933) other than that it was a winter visitor to the County. No mention was made of Poole Harbour. Numbers were probably small, as 50 at Sherborne were described as a large number.

Bull (1953) states 'Shoveler does not come in large numbers' and that 'A few come in October but more are seen after Christmas'. He also mentioned that Shoveler stay late in the Harbour, with maximum flocks of 50 on the 1st April, 1951, and 46 on the 23rd March 1952. Surprisingly, during the whole of the period 1959-1965, Dixon (1967) only mentions two records, but rather confusingly, records them in his summary as being regular and present between September and March!

Over the 25 year period 1966 to 1990, peak counts of Shoveler have varied considerably from year to year. During 1966 - 1970 the annual peak was always reached in December but only produced between 23 and 52 birds.

From 1972/73 to 1983/84 the winter peak numbers were higher than those recorded in the 1950-1970 period, in some years being more than 300% above the highest peak count during the earlier period. At this higher level the Harbour population became of national importance. Although December had been the peak month of occurrence in the past, in seven of these 12 years, January and February produced the highest counts. Some of this increase could have been as a result of severe winter

conditions elsewhere displacing birds, which moved into Poole Harbour. This may only be part of reason for the dramatic increase, however, there could be other causes. This period of population increase was not solely a Poole Harbour feature but was also reflected in the national trends (Salmon 1983), The peak winter count and the month of occurrence between 1970/71 and 1990/91 is shown in Table 1

Table 1 **Peak winter count of Shoveler and month of occurrence for the 21 year period (1970/71-1990/91) in Poole Harbour** (1% National Threshold figure = 90)

Year	No.	Month	Year	No.	Month
1970/71	42	Dec	**1981/82**	86	Jan
1971/72	36	Nov	**1982/83**	216	Feb
1972/73	55	Feb	**1983/84**	136	Dec
1973/74	184	Feb	**1984/85**	36	Dec
1974/75	87	Dec	**1985/86**	72	Nov
1975/76	82	Jan	**1986/87**	65	Jan
1976/77	213	Feb	**1987/88**	59	Feb
1977/78	215	Dec	**1988/89**	20	Feb
1978/79	157	Dec	**1989/90**	100	Feb
1979/80	204	Jan	**1990/91**	49	Dec
1980/81	34	Dec			

For the remainder of the period 1984/85 to 1990/91 numbers declined to around the lower or just above the level that occurred at the beginning of the 1970's, with only the 1989/90 winter producing a peak of a 100 birds.

During this period the most favoured localities are given as Brownsea Island (NE2) and Little Sea (SE3) in the Dorset Bird Reports.

Current Status

During the period under review 1991/92-1997/98 the number of Shoveler have continued to fluctuate, but have returned to the mid 1970 to early 1980's population levels. In five of the seven years 1991-1998 the peak winter count was above the revised 1% National Importance figure of 100 (Table 2). January was the peak month in five of the seven years, together with December and February. In January 1993 there was a count of 263, which is a record for the Harbour.

In most sites in the UK, the peak usually occurs in the autumn, unlike Poole Harbour, where the peak is usually in January (Cranswick et al. 1999).

Distribution

The low water distribution and density of this species in the Harbour for the seven year period is given in Table 3. Map 9 shows the percentage of the Harbour's population in each section. The traditional favoured locations of Little Sea (SE3) and Brownsea Island (NE2) hold over 78% of the population. These low water WeBS count have uncovered a third important area for Shoveler in (NC1), where over 13% of the Harbour's population was present.

Overall, at low water, the Harbour's Shoveler population is confined to three favoured areas and is seldom recorded away from these. Of these, Little Sea (SE3) holds over 66.0% of the Harbours population.

Table 1 Shoveler

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

Species of National Importance

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

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	2	8	-	-	-	-	-	10	1.4
September	-	1	-	1	6	-	-	8	1.1
October	7	10	10	1	11	20	-	59	8.4
November	29	39	19	**14**	13	32	25	171	24.4
December	53	43	29	88	51	64	70	398	56.8
January	68	**171**	**263**	83	**156**	52	**103**	896	128.0
February	36	70	80	**114**	49	30	47	426	60.9
March	55	64	61	22	16	23	32	273	39.0
Autumn/Winter Total	250	406	462	323	302	221	277	2241	320.0

Table 3 Shoveler

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 320

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	-	-	24	6*	5*	9	8*	-	29	83
Annual Mean	-	-	3.4	-	-	1.3	-	-	4.1	11
Annual Range	-	-	2 - 8	-	-	2 - 3	-	-	2 - 19	2 - 19
% of annual mean/ Poole Harbour mean	-	-	1.1%	-	-	0.4%	-	-	1.3%	(3.6%)
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	488
Mean density/ha	-	-	0.05	-	-	0.01	-	-	0.34	0.02

* only single records

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	3*	-	-	-	-	301				304
Annual Mean	-	-	-	-	-	4.1				43
Annual Range	3	-	-	-	-	2 - 50				
% of annual mean/ Poole Harbour mean	-	-	-	-	-	13.4%				13.4%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	-	-	-	-	-	3.58				0.19

* only a single record

Table 3 Shoveler (cont)

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 320

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	4*	-	39	28	-	29	-	-		100
Annual Mean	-	-	5.6	4.0	-	4.1	-	-		13
Annual Range	-	-	1 - 11	2 - 16	-	1 - 15	-	-		1 - 16
% of annual mean/ Poole Harbour mean	-	-	1.7%	1.2%	-	1.3%	-	-		4.1%
Low water area (Ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	-	-	1.22	0.05	-	0.05	-	-		0.04

* only a single record

Section NE count areas	1	2[A]	3(P)	3(B)	3(BI)					Section total
Total counts 1991 - 1998	-	268	2*	-	-					270
Annual Mean	-	38.3	-	-	-					38
Annual Range	-	1 - 39	-	-	-					1 - 39
% of annual mean/ Poole Harbour mean	-	12.0%	-	-	-					12.0%
Low water area (Ha)	48.0	None	None	12.0	12.0					72
Mean density/ha	-	-	-	-	-					-

* only a single record [A] All records refer to Brownsea Island lagoon (SE2) and counts excluded from mean density figure.

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	-	-	1486							1486
Annual Mean	-	-	212.3							212
Annual Range	-	-	1 - 261							1 - 261
% of annual mean/ Poole Harbour mean	-	-	66.3%							66.3%
Low water area (Ha)	36.0	132.0	None							168
Mean density/ha	-	-	-							-

Wigeon (*Anas penelope*)

Status (Winter visitor).

WeBS - Qualifying Number for Great Britain threshold: **2800***

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

* The National threshold has been up-rated from 2500 to 2800 (Kirby 1995).
[1] U.K. listed because of holding over 20% of N.W. European wintering population (Gibbons et al. 1996).

Past Status

The Wigeon was described by Blathwayt (1933) as abundant along the coast but he gave no indication of population size. The loss of its main food source *Zostera* from the Harbour during the early 1930's, must have had a marked impact upon this species (Bromby 1983).

Numbers during the 30 years leading up to the 1980's were probably best summed up by Prendergast and Boys (1983), 'The Poole Harbour maxima are normally in the range 500-1000'. In the early 1950's Bull, (1953) records a maximum count of 600 in January. Over the six winter period 1959-1965, Dixon (1967) considered that there had been a decline in the winter population since Bull, but he did record, maximum counts of between 520-575 in three of those years and 847 in one.

Table 1 shows the peak number and month of occurrence of Wigeon in Poole Harbour for the 10 year period (1981-1991). Several of the winters up to 1986/87 had periods of severe weather, which were responsible for the very high counts, as birds moved into the Harbour from elsewhere. This illustrates the importance of the Harbour for this species during periods of adverse winter weather.

Table 1 **Winter peak count of Wigeon in Poole Harbour for the 10 Year Period (1981/82 - 1990/91)** (Data fro Dorset Bird Reports)

Year	Peak Count	Month
1981/82	7500	January
1982/83	796	November
1983/84	650	December
1984/85	2000	January
1985/86	1374	January
1986/87	2500	January
1987/88	529	February
1988/89	466	January
1989/90	453	January
1990/91	739	November
10 year Total = 17007		10 year mean = 1700.7

Current Status

During the seven year WeBS count period (1991-1998), the mean peak count for Wigeon was 1107 within a range of 649 - 1516 (Table 2). This mean represents 0.4% of the British population. Whilst these figures would suggest a considerable reduction in the peak count over the previous 10 year period, there has been no very prolonged period of severe weather during the seven years. If the exceptional peak from the hard winter of 1981/82 is excluded (Table 1), the mean peak count 1982-

1990 is 1056, whilst for the period 1991-1998 (Table 2) it is 1107. This suggests that the population is slowly increasing.

Numbers steadily build from October and peak in January. The spring departure is extended, suggesting that either the Harbour's wintering birds are late to depart, or, that as birds leave, others replace them on passage from elsewhere.

Current Distribution

The distribution and density of Wigeon at low water in the Harbour for the seven year period (1991-1998) is shown in Table 3. In Map 10 shows the distribution of Wigeon at low water, expressed as a seven year mean percentage for each section of the Harbour.

Almost half of the population (47%) is located in the western part of the Harbour (W1 - W7), although Lytchett Bay (W3) does not appear to hold any Wigeon at low water. A further (30%) are located at Brownsea (NE2), Brands Bay (SE2), Little Sea (SE3) and the Fitzworth area (W4). The remainder are scattered in the quieter parts of the Harbour, although numbers are small.

Table 2 Wigeon

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

1% National Threshold Figure = **2800** Species does not occur in nationally important numbers

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	-	-	-	-	-	15	-	15	2
September	77	65	47	3	217	449	154	1012	145
October	162	382	386	154	600	754	319	2757	394
November	520	409	670	713	1200	709	534	4755	679
December	667	456	297	654	816	1236	1092	5218	745
January	347	576	1516	1393	848	893	742	6315	902
February	451	649	494	433	552	459	820	3858	551
March	469	433	366	104	573	250	280	2475	354
Autumn/Winter Total	2693	2970	3776	3454	4806	4765	3941	26405	3772

Table 3 Wigeon

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 3772

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	56	134	4085	908	2	5868	1297	77	26	12451
Annual Mean	8.0	19.1	583.6	129.7	-	838.3	185.3	11.0	3.7	1779
Annual Range	5 - 31	1 - 81	2 - 440	1 - 319	-	2 - 604	4 - 372	2 - 30	1 - 25	1 - 604
% of annual mean/ Poole Harbour mean	0.2%	0.6%	15.5%	3.4%	-	22.2%	4.9%	0.3%	0.1%	47.2%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0		438
Mean density/ha	0.16	0.59	9.12	1.08	-	7.2	4.21	0.92		4.06

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	475	83	63	171	45	1370				2207
Annual Mean	67.9	11.9	9.0	24.4	6.4	195.7				315
Annual Range	1 - 62	2 - 42	1 - 39	2 - 65	4 - 17	1 - 200				1 - 200
% of annual mean/ Poole Harbour mean	1.8%	0.3%	0.2%	0.6%	0.2%	5.2%				8.4%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	2.43	0.37	0.14	0.28	0.80	16.31				1.41

Table 3 Wigeon (cont).

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 3772

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	34	321	1149	574	2171	375	739	207		5570
Annual Mean	4.9	45.9	164.1	82.0	310.1	53.6	105.6	29.6		796
Annual Range	1 - 25	1 - 58	1 - 410	2 - 127	2 - 269	2 - 61	2 - 91	2 - 123		1 - 410
% of annual mean/ Poole Harbour mean	0.1%	1.2%	4.3%	2.2%	8.2%	1.4%	2.8%	0.8%		21.0%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	0.20	1.04	5.13	1.14	3.88	2.68	2.93	0.67		2.26

Section NE count areas	1	2	3(P)	3(B)	3(BI)					Section total
Total counts 1991 - 1998	-	1533	-	-	11					1544
Annual Mean	-	219.0	-	-	1.6					221
Annual Range	-	1 - 154	-	-	4 - 7					1 - 154
% of annual mean/ Poole Harbour mean	-	5.8%	-	-	-					5.8%
Low water area (ha)	48	None	None	12.0	12.0					72
Mean density/ha	-	-	-	-	0.13					

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	60	2315	2258							4633
Annual Mean	8.6	330.7	322.6							662
Annual Range	2 - 58	2 - 366	2 - 264							2 - 366
% of annual mean/ Poole Harbour mean	0.2%	8.8%	8.6%							17.6%
Low water area (ha)	36.0	132.0	None							168
Mean density/ha	0.24	2.50	-							

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: **1400***

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

* The National threshold figure has now recently been up-rated from 1000 to 1400 (Kirby 1995).
[1] Amber listed because of > 20% of N.W. European wintering population in U.K.(Gibbons *et al.* 1996).

Breeding Population

Past and Current Status

Since the time of Blathwayt (1933), who described the Teal as 'breeds sparingly around Poole Harbour', there has been little change. Alexander (1969) said 'a few breed irregularly round Little Sea, on Brownsea, and probably at other points in marsh land near the harbour'. During survey work for the BTO's 'The Atlas of Breeding Birds in Britain and Ireland' undertaken between 1968-72, breeding was recorded in three of the four 10km squares that incorporate Poole Harbour, SY98, SY99 and SZ08 and breeding possibly also occurred in SZ09 (Boys 1974).

Ten years later, Prendergast and Boys (1983) suggested that the Teal's Dorset breeding status had remained unchanged since the 'Breeding Bird Atlas' and stated that 'breeding is largely confined to the Poole Harbour area'.

Data gathered since the 1980's shows that the Teal's breeding status in Poole Harbour remains unchanged. Most years there is at least one report of a female with ducklings. In addition there are several summering males and females noted in most years but with no proof of nesting (Dorset Bird Reports). It is possible that these summering birds are in fact failed breeders. Predation of eggs has been recorded by Haysom (1967), who mentions the finding of 'a "crowed" egg' at Arne. At Little Sea the odd failed nest has been found but the reasons for failure are unknown (R. Cox pers. comm.). Since 1982, broods of ducklings have been recorded in 10 out of the 16 years. Table 1 shows the location and years of recorded successful production of ducklings, with at least three broods recorded in 1987 and 1995.

Table 1 **Production of Teal duckling broods in Poole Harbour 1982-1997. Year and Locations marked with an X.** (Dorset Bird Reports: 1982-1997)

Year / Location	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97
Arne	X	X				X					X	X	X	X		
Brownsea					X	X								X	X	
Lytchett Bay				X												
Little Sea		X		X		X						X		X		
Total	1	2	-	2	1	3	-	-	-	-	1	2	1	3	1	-

Passage and Wintering Population

Past Status

Other than mentioning that it is a winter visitor, Blathwayt (1933) gave no indication as to numbers present. The winter surveys undertaken during the 1949-53 period produced a maximum count of just over 550 birds. Over the three autumn and winter periods, numbers fluctuated considerably, but in all three years there was a noticeable drop in numbers during October, presumably through departure of passage birds. In November numbers increased as the winter population began to arrive (Bull 1953).

Surveys of the Teal population of the Harbour during the autumns and winters of 1959-1965 did record a drop in numbers in October, but numbers increased to peak in November or December. The very severe winters of 1961/62 and 1962/63 occurred during this survey, In 1961/62 there was an exceptionally high count (1210) in December, which was attributed to birds displaced by reclamation work in Holland (Dixon 1967). The severe cold weather in January 1962 resulted in an exodus of birds from the Harbour with a peak of only 127 recorded, but very large numbers were recorded in February (884) and March (906), as the weather improved. These high numbers were probably due to the arrival of displaced birds from continental Europe and elsewhere in the U.K. The winter weather was even more severe in 1963 and resulted in the reverse of the 1962 situation. In January there were high numbers present (443) but as the cold weather worsened, numbers rapidly declined during February, and in March, only 33 birds were located (Dixon 1967).

Dixon (1967), had noted that the winter numbers of Teal were increasing in the Harbour. This increase continued, and the importance of Poole Harbour for this species was recognised by Prater (1981), who showed that between 1969-75, the Harbour held an average peak of 1065 birds, which represented about 1.4% of the British wintering population. During the next five year period 1975-1980 the mean peak count rose to 1653 (Dorset Bird Reports).

During the latter part of the 1980's the winter peak numbers steadily declined. Table 2 shows the monthly peak counts between 1986-1991, the mean annual peak count for the five years was only 730. The explanation for this decline may be partially related to a slow rate of recovery by the population from the impacts of the severe winter conditions experienced during the first half of the 1980's, but it is unlikely that this is the only reason.

Table 2 **Poole Harbour BoEE counts (August- March) of Teal during 5 year period 1986/87-1990/91 at high water - together with annual totals and 7 year totals and means for each month.** (Dorset Bird Reports 1986-1991)

1% National Importance Figure = 1000 Months

Year / Month	1986/87	1987/88	1988/89	1989/90	1990/91	5 year Total	5 year Mean
August	22	34	76	68	40	249	50
September	190	104	160	355	145	945	191
October	978	56	341	508	150	2033	407
November	390	190	387	412	200	1579	316
December	630	320	862	500	259	2571	514
January	450	442	911	260	812	2875	575
February	278	205	882	410	532	2307	461
March	457	156	553	299	301	1766	353
5 Year Total	3395	1516	4172	2812	2439	14334	2867

Current Status

During the seven year WeBS count period (1991-1998) there are signs of an increase in mean peak counts. The seven year mean was 5542, which is 68% higher than recorded for the five winters 1986-1991 (2867). Table 3 also shows the monthly counts and the variation in numbers from year to year. It should be noted that with the raising of the threshold figure to 1400, the Harbour does not now hold nationally important numbers every year.

The WeBS counts being undertaken at low water probably give a very accurate estimate of the Harbour's Teal population, as the birds feed over the exposed mud. It is possible therefore, that past counts may have been under estimates, as at high water, birds were difficult to count in the *Spartina* marshes.

Distribution

The distribution and density of this species in the Harbour for the seven year period (1991-1998) is shown in Table 4. Map 11 shows the population mean density/ha at low water for each section of harbour.

There are few sections of the Harbour where Teal are not recorded at low water, but they are seldom found in the most disturbed sections, or those sections with very limited areas of exposed mud.

The most important areas of the Harbour for feeding Teal are the upper two sections of Holes Bay (NC3) (NW) and (NE), Middlebere Lake (SC8) and Arne Bay (SC6), In addition, although not tidal, the Brownsea Island lagoons (NE2) hold a significant 7.4% of the Harbour's Teal population at low water. All of these sections are more or less undisturbed, although some shooting does occur in Middlebere Lake (SC3).

In the 1960's Holes Bay was apparently not noted for its numbers of wildfowl and was considered by Dixon (1967), for unknown reasons, to 'contain very few wildfowl'. In the 1990's the upper two sections alone held almost 20.0% of the Harbour's Teal population. That this area should now be so favoured, is unlikely to be due to the absence of winter wildfowling. The more likely reason, certainly in NC3 (NE), is the result of the Fleetsbridge Sewage Works discharge of warmer and enriched water, resulting in an increased food resource.

Table 3 Teal

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

Species of National Importance

1% National Threshold Figure = **1400**- Months in which figure reached is shown **Bold**

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	7	129	8	183	218	4	10	559	79.9
September	286	398	109	317	735	543	448	2836	405.1
October	468	660	917	279	703	780	517	4324	617.7
November	661	751	853	1094	1056	664	388	5467	781.0
December	1374	656	632	983	**1661**	**2297**	894	8497	1213.9
January	954	754	**1399**	964	997	1183	614	6865	980.7
February	638	861	560	622	1307	713	972	5673	810.4
March	785	809	639	430	1035	221	652	4571	653.0
Autumn/Winter Total	5173	5018	5117	4872	7712	6405	4495	38792	5541.7

Table 4 Teal

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 5542

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	45	503	383	857	2364	68	2[1]	10[2]	10[3]	4242
Annual Mean	6.4	71.8	54.7	112.4	337.7	9.7	-	-	-	606
Annual Range	4 – 25	1 - 135	1 - 100	2 - 169	2 - 290	1 - 27	2	2 - 8	10	2 - 290
% of annual mean/ Poole Harbour mean	0.1%	1.3%	1.0%	2.0%	6.1%	0.2%	-	-	-	10.9%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	538
Mean density/ha	0.13	2.24	0.85	0.94	3.84	0.08	-	-	-	0.89

[1] Only a single record [2] Only two records both in 1997 [3] Only a single record

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	2949	4544	1326	261	-	1173				10253
Annual Mean	421.3	649.1	189.4	37.3	-	167.6				1465
Annual Range	4 – 200	1 - 309	2 - 140	2 - 53	-	1 - 116				1 - 309
% of annual mean/ Poole Harbour mean	7.6%	11.7%	3.4%	0.7%	-	3.0%				26.4%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	15.05	20.28	2.96	0.42	-	13.97				6.54

Table 4 Teal (cont)

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 5542

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	2979	2719	3885	2694	2579	1263	1387	131		17637
Annual Mean	425.6	388.4	555.0	384.4	364.4	180.4	198.1	18.7		2519
Annual Range	6 – 320	3 - 195	3 - 350	1 - 364	1 - 278	6 - 280	3 - 130	2 - 31		1 - 364
% of annual mean/ Poole Harbour mean	7.7%	7.0%	10.0%	6.9%	6.6%	3.3%	3.6%	0.3%		45.4%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	17.73	8.83	17.34	5.34	4.55	9.02	5.50	0.42		7.16

Section NE count areas	1	2	3(P)	3(B)	3(Bl)					Section total
Total counts 1991 - 1998	-	2861	-	-	3*					2864
Annual Mean	-	409.1	-	-	-					409
Annual Range	-	4 - 228	-	-	-					
% of annual mean/ Poole Harbour mean	-	7.4%	-	-	-					7.4%
Low water area (ha)	48.0	None	None	12.0	12.0					72
Mean density/ha	-	-	-	-	-					-

* Only a single record

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	14	2039	1743							3796
Annual Mean	2.0	291.3	249.0							542
Annual Range	4 - 10	3 - 296	2 - 538							
% of annual mean/Poole Harbour mean	<0.1%	5.2%	4.5%							9.8%
Low water area (ha)	36.0	132.0	None							168
Mean density/ha	0.05	2.21	-							(3.23)

Pochard (*Aythya ferina*)

Status (Winter visitor: - September - March)

WeBS - Qualifying Numbers for International threshold: **3500**
WeBS - Qualifying Numbers for Great Britain threshold: **440***

Species of Conservation Concern U.K. Amber-listed Species (Winter)[1]
European Listed: SPEC 4[2]

* The National threshold figure was recently lowered from 500 to 440 (Kirby 1995).
[1] Amber listed because of > 20% of N.W. European wintering population in U.K. and > 50% of population occurring in 10 or fewer sites (Gibbons *et al.* 1996).
[2] SPEC4 listed because species has a favourable conservation status but concentrated in Europe (Tucker & Heath 1994).

Past Status

Blathwayt (1933) described the bird in Dorset as 'sometimes very numerous in winter near the coast' but does not give numbers or localities. From this it seems that the Pochard was a numerous wintering duck and that it may be taken that Poole Harbour is included in the reference to the 'near coast'.

In his winter study of 1949-1952 Bull (1953) gave an indication of the Harbour population. During this period Little Sea (SE3) was the favoured location for Pochard, with parties of ca.30 regularly seen. He makes the comment that, the Harbour population 'may have declined in recent years'.

In the seven year period 1959-1965 numbers were still low until the severe winters of 1961/62 and 1962/63 (Dixon 1967). During these two winters numbers greatly increased. The winter peak in 1961/62 was 415 (February) but in 1962/63 a high count of 559 in January was surpassed in February, with a count of 2801. After 1963, numbers declined but were still much above the pre-1961 level. Little Sea (SE3) was still the favoured locality for this species, with up to 100 birds regularly present and occasionally as many as 400 (Prendergast and Boys 1983).

During the 1980's, Little Sea remained the headquarters for the species. The Harbour population steadily increased and peaked at 1800 in 1985 (December). From the mid-1980's until 1991, the annual peak was about 1100. Poole Park occasionally held significant numbers but usually only during periods of cold weather e.g. 377 in December 1988, 130 in December 1989 and 73 in January 1987. In severe cold weather, birds disperse in flocks around the tidal waters of the Harbour.

Current Status

During the WeBS count period (1991/2 to 1997/8) the mean peak for Pochard was 734; range 298 - 1386 (Table 1). The mean peak represents 1.7% of the British population. In the winters of 1992/93 and 1997/98, the population did not reach national threshold levels.

Over the seven year period the peak count month varied but was normally January (4), or December (2) and once February. The peak winter population has fluctuated considerably with the highest 1386 in 1996/97, and the lowest peak total for the seven years of 298 the following winter. The reasons for this variation are unclear. During this time, there have been no prolonged severe winter periods locally. Extreme weather in areas away from the Harbour seems the most likely factor, causing hard weather movements and increasing the importance of the Harbour during such times.

Current Distribution

The low water distribution and density of this species in the Harbour for the seven year period is given in Table 2. Map 12 shows each section of the harbour and the percentage of the Harbour's population in each. As in the past, Little Sea (SE3) remains the centre of the Harbour's population. During the 1991-1998 period Little Sea (SE3) has held a mean of 93.4% of the Harbour's population, with small but regular satellite populations on Brownsea Island (NE2) (2.0%) and Poole Park (NE3(P) 2.4%.

Table 1 Pochard

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

Species of National Importance

1% National Threshold Figure = **440** - Months in which figure reached is shown **Bold**

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	-	-	-	-	-	-	-	-	-
September	12	24	8	6	11	4	8	73	10
October	1	103	22	8	8	39	11	192	28
November	121	108	142	34	407	216	94	1122	160
December	**869**	438	**570**	389	**478**	**874**	265	3883	555
January	**1026**	337	**505**	**477**	**622**	**1386**	298	4651	664
February	421	164	70	-	**946**	359	190	2150	307
March	-	6	-	-	260	2	4	272	39
Autumn/Winter Total	2450	1180	1317	914	2732	2880	870	12343	1763

Table 2 Pochard

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 1763

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	15*	-	-	3*	-	-	9*	11*	-	38
Annual Mean	-	-	-	-	-	-	-	-	-	5
Annual Range	-	-	-	-	-	-	-	-	-	-
% of annual mean/ Poole Harbour mean	-	-	-	-	-	-	-	-	-	0.3%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	488
Mean density/ha	-	-	-	-	-	-	-	-	-	-

* Only single records

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	26*	208	-	1*	-	3*				238
Annual Mean	-	29.7	-	-	-	-				34
Annual Range	26	3 - 173	-	1	-	3				3 - 173
% of annual mean/ Poole Harbour mean	-	1.7%	-	-	-	-				1.9%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	-	0.93	-	-	-	-				0.15

* Only single records

Table 2 Pochard (cont).

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 1763

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	-	-	-	-	2*	-	-	-		2
Annual Mean	-	-	-	-	-	-	-	-		
Annual Range	-	-	-	-	-	-	-	-		
% of annual mean/ Poole Harbour mean	-	-	-	-	-	-	-	-		
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	-	-	-	-	-	-	-	-		

* Only a single record

Section NE count areas	1	2[A]	3(P)	3(B)	3(BI)					Section total
Total counts 1991 - 1998	-	242	296	-	1*					539
Annual Mean	-	34.6	42.9	-	-					77
Annual Range	-	2 - 67	1 - 65	-	-					1 - 67
% of annual mean/ Poole Harbour mean	-	2.0%	2.4%	-	-					4.4%
Low water area (ha)	48.0	None	None	12.0	-					72
Mean density/ha	-	-	-	-	-					-[A]

* Only a single record [A] All records refer to Brownsea Island lagoons (SE2) and Poole Park (SE3(P) counts excluded from mean density figure.

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	-	-	11526							11526
Annual Mean	-	-	1646.6							1647
Annual Range	-	-	2 - 1199							2 –1199
% of annual mean/ Poole Harbour mean	-	-	93.4%							93.4%
Low water area (ha)	36.0	132.0	None							168
Mean density/ha	-	-	-							-

Goldeneye (*Bucephala clangula*)

Status (Winter visitor:- October - March)

WeBS - Qualifying Number for International threshold: **3000**
WeBS - Qualifying Number for Great Britain threshold: **170***

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

* The National threshold figure has now been up-rated from 150 to 170 (Kirby 1995).
[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 (Gibbons *et al.* 1996).

Wintering Population

Past Status

The Goldeneye has long been known as a frequent winter visitor to the Harbour, Although Blathwayt (1933) gave no indication of winter numbers, Bull (1953), recorded 150 in January 1949, and over 50 early in the 1950's. During 1959-1965, there was an increase in winter numbers starting with the severe winter of 1963 (Dixon 1967) with exceptional counts of 205 in February 1963 and 103 in February 1965. Boys (1973) concluded that the Harbour held 50-150 birds each winter, with more during severe conditions. A record of 500 is given for February 1963 and 300 in December 1970.

Between 1969/70 and 1983/84 winter peak counts were mostly between 60 and 80, and above 100 on only four occasions (range 100-115). Usually, the winter peaks were in either January or February and were probably weather related. Winter Goldeneye in the Harbour are difficult to count accurately as 50% or more of the birds can be diving at any one moment (B. P. Pickess pers. obs.). Maximum recorded figures are therefore likely to be under estimates. An additional counting problem was revealed when Collins (1985), discovered that the Lower Wytch area (SC3) was being used as a nocturnal roost. He found that in mid-winter there were 130-150 birds present and in November-December found up to 60 Goldeneye roosting on Little Sea (SE3) (Collins 1985). These observations suggested that the Harbour's population was higher than previous estimates. In the six years to 1990/91 all the peak daylight counts increased, with peaks of more than 100 birds in either January or February. In three years the population was of national importance. Large single counts were also recorded with 330+ in February 1989 and 208 in January 1988 and February 1991.

Current Status

The monthly Harbour WeBS counts for Goldeneye for the seven period (1991/92 - 1997/98) are shown in Table 1. In five of the seven years the peak count was above the national importance threshold level and in February 1998 there was an exceptional count of 405.

In the past, birds were widely scattered at high water and were difficult to count accurately. Now that WeBS counts take place at low water, fewer birds are likely to be missed as they are then restricted to the deep water channels. Mid-winter counts are now much higher than those in the 1980's, with peak counts of usually over 200. This population increase may in part be a reflection of the more accurate counting, as well as a genuine increase in the winter population. There is a need to confirm whether the mid-winter nocturnal roost in the Lower Wytch area (SC3), discovered in 1984, is still used.

Distribution

The low water distribution and percentage density of Goldeneye on WeBS counts in the Harbour for the seven year period 1991/92 - 1997/98 is shown in Table 2. It can be seen from Map 13 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 of the Harbour at Holton (W2(W); West Goathorn (SC1);

Mid-Harbour South (SC3); East Fitzworth (SC4); South Haven (SE1) and Brands Bay (SE2). There are very few birds in the area of the deep water shipping lane at low water.

Table 1 Goldeneye

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

Species of National Importance

1% National Threshold Figure = 170 - Months in which figure reached is shown **Bold**

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	-	-	-	-	-	-	-	-	-
September	-	-	-	-	-	-	-	-	-
October	-	14	1	-	-	-	1	16	2
November	71	43	50	111	**204**	115	133	727	104
December	122	75	60	84	140	**232**	106	819	**117**
January	94	**213**	132	131	**184**	**174**	**281**	1209	173
February	107	140	63	**201**	**220**	105	**405**	1241	177
March	97	110	94	20	161	93	88	663	95
Autumn/Winter Total	**491**	595	400	547	909	719	1014	4675	668

Table 2 Goldeneye

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 668

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	-	8	26	97	34	503	119	190	153	1130
Annual Mean	-	1.1	3.7	13.8	4.8	71.8	17.0	27.1	21.8	161
Range	-	2 - 6	2 - 12	1 - 55	1 - 7	1 - 101	1 - 36	1 - 110	1 - 69	1 - 110
% of annual mean/ Poole Harbour mean	-	0.2%	0.5%	2.1%	0.7%	10.8%	2.5%	4.1%	3.3%	24.2%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	488
Mean density/ha	-	0.03	0.06	0.11	0.05	0.62	0.39	2.26	1.82	0.32

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	1*	66	63	95	112	240				577
Annual Mean	-	9.4	9.0	13.6	16.0	34.3				82
Range	1	2 - 20	1 - 11	1 - 25	1 - 35	1 - 69				1 - 69
% of annual mean/ Poole Harbour mean	-	1.4%	1.3%	2.0%	2.4%	5.1%				12.3%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	-	0.92	0.14	0.15	15.25	2.86				0.37

* Only a single record

Table 2 **Goldeneye** (cont).

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 668

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	-	14	44	185	363	403	44	618		1671
Annual Mean	-	2.0	6.3	26.4	51.9	57.6	6.3	88.3		239
Range	-	2 - 9	1 - 12	2 - 65	1 - 53	1 - 120	1 - 14	1 - 56		1 - 120
% of annual mean/ Poole Harbour mean	-	0.3%	0.9%	3.9%	7.8%	8.6%	0.9%	13.2%		35.6%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	-	0.04	0.20	0.36	0.65	2.88	0.17	2.00		0.68

Section NE count areas	1	2	3(P)	3(B)	3(Bl)					Section total
Total counts 1991 - 1998	37	-	31	29	116					213
Annual Mean	5.3	-	4.4	4.1	16.6					30
Range	1 - 16	-	2 - 10	1 - 8	1 - 21					1 - 21
% of annual mean/ Poole Harbour mean	0.8%	-	0.7%	0.6%	2.4%					4.5%
Low water area (ha)	48.0	None	None	12.0	12.0					72
Mean density/ha	0.11	-	-	0.34	1.38					(0.42)

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	456	562	66							1084
Annual Mean	65.1	80.3	9.4							155
Range	2 - 41	2 - 86	1 - 13							1 – 86
% of annual mean/ Poole Harbour mean	9.7%	12.0%	1.4%							23.1%
Low water area (ha)	36.0	132.0	None							168
Mean density/ha	1.81	0.61	-							(0.92)

Red-breasted Merganser (*Mergus serrator*)

Status (Winter visitor - October - April)

WeBS - Qualifying Numbers for International threshold: **1250***
WeBS - Qualifying Numbers for Great Britain threshold: **100**

* The International threshold has been up-rated from 1000 to 1250 (Kirby 1995).

Wintering Population

Past Status

The information given by Blathwayt (1933) suggests that the species was a regular winter visitor 'off Poole Harbour' but whether birds also wintered within the Harbour is unclear. Bull (1953) gave a winter maximum of about 50 birds in the Harbour and was the first person to record the habit of a dusk fly-out from the Harbour to roost on the sea. In the early to mid 1960's a survey by Dixon (1967) suggested that the wintering population had increased considerably to 120/150 birds since Bull (1953).

Numbers continued to increase. In the early 1970's it was discovered that birds were entering the Harbour at dawn and leaving at dusk (D. Godfrey in Collins 1985). It was thought that the number of birds spending the day in the Harbour was a good approximation of the total wintering population. Counts during the 1972-82 period showed that November was the peak winter month for the species with a mean fly-out/fly-in of 228 birds (29 counts) and that numbers then declined through the winter, with still 140 birds (60 counts) in February (D. Godfrey in Collins 1985). However, during 1984/85 Collins (1985) discovered that not all the Harbour's birds flew out to sea at dusk. He found that in Lower Wytch (SC3) area that there was a roost, which in January and February held a mean of 227 birds. He estimated that the peak winter Harbour population was about 350 birds. During the six winters 1985/6 - 1990/91 the peak mean count was 344 (Dorset Bird Reports) which ranked Poole Harbour the 5th most important estuary in the U.K. for this species (Kirby et al. 1991). With the discovery of a Harbour roost, it is therefore possible that the earlier estimates of past wintering populations were too low.

Current Status

Table 1 shows that during the seven years WeBS count period (1991- 1998) for the Harbour, the annual winter peak counts have continued to slowly rise. The 5 year mean (1986/87-1990/91) was 301 but seven years later it had risen to 405, which now ranks the Harbour as the 3rd most important estuary in the U.K. for this species (Cranswick et al. 1999; Kirby et al. 1991). The current steady rise in numbers would appear to be genuine, although part of the increase may be attributed to a change in census timing. Up to 1990/91 all BoEE counts were undertaken at high water in the Harbour but from 1991/92 onwards they have been carried out at low water. At high water birds are more difficult to locate in some areas of the Harbour, so is probable that some of this apparent increase may be due to past under-recording.

A few birds usually arrive in September but the build-up normally occurs from mid-October and in most years peaks in November, or occasionally December. After this peak, numbers then decline but increase again during February and March, with the last birds often not leaving until May. The two peaks would suggest that the Harbour is used as an important staging post for autumn and spring passage birds moving to and from other wintering sites. .

A similar pattern of timing of peaks and movements is noted from along the Hampshire coast (Clarke & Eyre 1993). Interestingly, further west in the Fleet, the peak count is not usually reached until

December but the peak spring passage is also in March (Dorset Bird Reports). It seems possible that many of the birds found in Poole Harbour in November, are those that winter further along the coast in the Fleet and Portland Harbour.

Current Distribution

The monthly counts for the WeBS count period 1991 - 1998 for the Harbour are given in Table 2. It can be seen from Map 14 that birds are widely distributed throughout the Harbour at low water, mostly in small groups. The only significant concentrations are in the deep water channels of Mid-Harbour South (SC3) (11.2%), West Goathorn (SC1) (11.3%) and Brands Bay (SE2) (15.7%). Four other deep water channel areas hold over 5.0% each, Giggers (W4) (5.3%), Mid-Harbour -north (NC1) (5.7%), East Fitzworth (SC4) (5.7%) and South Haven (SE1) (6.9%).

It is assumed that the major proportion of the wintering population still roosts within the harbour in the sheltered waters of Mid-Harbour South (Lower Wytch) and in the area to the east of Long and Round Island (SC3 & SC4) (Collins 1985). Data gathered from dusk counts of birds leaving the Harbour mouth during the winter period of 1989/1990 suggested that most remained in the Harbour to roost (Aspinall & Tasker 1990).

Table 1 Red-breasted Merganser

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

Species of National Importance

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

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	-	-	**1**	-	11	-	-	12	2
September	1	-	-	1	1	-	-	3	-
October	2	**161**	45	-	36	62	20	326	47
November	**389**	**380**	**240**	**249**	**310**	**329**	**365**	2262	323
December	**315**	**190**	**206**	**375**	**428**	**333**	**292**	2139	305
January	**221**	**273**	**181**	**374**	**448**	**226**	**355**	2078	297
February	**174**	**360**	**183**	**322**	**347**	**176**	**481**	2043	292
March	**223**	**211**	**366**	**234**	**288**	**303**	**502**	2127	304
Autumn/Winter Total	1325	1575	1222	1555	1869	1429	2015	10990	1570

Table 2 Red-breasted Merganser

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 1570

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	-	149	152	581	131	150	189	322	385	2059
Annual Mean	-	21.3	21.7	83.0	18.7	21.4	27.0	46.0	55.0	294
Annual Range	-	1 - 22	1 - 25	2 - 80	1 - 56	1 - 46	2 - 24	1 - 112	1 - 56	1 – 112
% of annual mean/ Poole Harbour mean	-	1.3%	1.4%	5.3%	1.2%	1.4%	1.7%	2.9%	3.5%	18.7%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	488
Mean density/ha	-	0.66	0.34	0.69	0.21	0.18	0.61	3.83	4.58	0.60

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	5	21	461	256	220	633				1596
Annual Mean	0.7	3.0	65.8	36.6	31.4	90.4				228
Annual Range	1 - 3	1 - 7	1 - 58	1 -28	1 - 36	1 - 48				1 – 58
% of annual mean/ Poole Harbour mean	<0.1%	0.2%	4.2%	2.3%	2.0%	5.7%				14.5%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	0.02	0.09	1.03	0.41	3.92	7.53				1.01

Table 2 Red-breasted Merganser (cont).

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 1570

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	22	84	310	171	629	1234	163	1243		3856
Annual Mean	3.1	12.0	44.3	22.4	89.8	176.3	23.3	177.6		551
Annual Range	22	1 - 17	1 - 37	1 - 34	2 - 176	1 - 162	1 - 45	2 - 92		1 - 176
% of annual mean/ Poole Harbour mean	0.2%	0.8%	2.8%	1.5%	5.7%	11.2%	1.5%	11.3%		35.0%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	0.13	0.27	1.38	0.31	1.12	8.81	0.65	4.04		1.56

Section NE count areas	1	2	3(P)	3(B)	3(Bl)					Section total
Total counts 1991 - 1998	364	2	31	285	310					992
Annual Mean	52.0	-	4.4	40.7	44.3					142
Annual Range	4 - 38	2	1 - 7	1 - 57	1 - 35					1 - 57
% of annual mean/ Poole Harbour mean	3.3%	-	0.3%	2.6%	2.8%					9.0%
Low water area (ha)	48.0	None	None	12.0	12.0					72
Mean density/ha	1.08	-	-	9.00	2.44					(1.97)

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	760	1727	-							2487
Annual Mean	108.6	246.7	-							355
Annual Range	3 - 36	3 - 120	-							3 - 120
% of annual mean/ Poole Harbour mean	6.9%	15.7%	-							22.6%
Low water area (Ha)	36.0	132.0	None							168
Mean density/ha	3.02	1.87	-							2.11

Oystercatcher (*Haematopus ostralegus*)

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

WeBS - Qualifying Number for Great Britain threshold: **3600**

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

* 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 (Gibbons *et al.* 1996).

Breeding Population

Past Breeding Status

The description given as 'breeds somewhat sparingly in the Poole Harbour District' by Blathwayt (1933) is as true today, as it was some 70 years ago. Nesting is normally confined to the Harbour islands, where presumably nests cannot be predated, especially by foxes, or destroyed or disturbed by humans. Attempted nesting on mainland sites rarely succeeds in producing young.

Although the only regularly reported breeding site in the Harbour has been Brownsea Island, Oystercatchers have also used the other islands but because of limited access, were seldom recorded. In 1965, eight pairs were recorded on Brownsea Island, this low number probably showing that the population had not yet recovered from the severe winter of 1962/63 (Haysom 1967). However, by 1967 the breeding population of Brownsea had risen to 16 pairs (Alexander 1969).

Prendergast and Boys (1983) considered that the Harbour breeding population was 'probably under 20 pairs in most years'. In the 1980's, the number of Oystercatchers on Brownsea Island thought to be breeding varied between five pairs (1983) and 25 pairs (1985), giving an annual mean of 12 pairs.

Current Breeding Status

During the 1990's the only full survey of the distribution and size of the Harbour's breeding population was undertaken in 1994 (McClure and Payne 1994). This survey located breeding birds at four locations with six pairs (two pairs each on Long, Round and Green Islands), seven pairs on Furzey Islands and 12-20 pairs on Brownsea Island. The total Harbour population for 1994 was at least 25 pairs. The nine years mean (1990-98) for Brownsea Island has risen to 16 pairs, if similar increases have occurred elsewhere, the current breeding population of Oystercatcher is about 25 pairs.

Passage and Winter Population

Past Status

It was not until the 1949-1951 survey that there was any indication of the numbers of birds present in the Harbour, when winter peaks of 300 birds and summering flocks of a 100 were recorded (Bull 1953). Very little can be gleaned from the earlier comments of Blathwayt (1933) who just mentioned that Oystercatchers 'flocks in autumn and winter'.

During the 1950's the peak counts rose to over 500, increasing further in the 1960's and 70's, with an exceptional count of 1359 in January 1976 (Prendergast and Boys 1983).

The study undertaken by Collins (1985) reported that the peak winter population was in excess of 1000 birds in 1985/6 and thought this was probably normal. His data was in agreement with Harvey and Bradford (1984) who had concluded that earlier Harbour counts were probably underestimates. Although, these conclusions were probably in part correct, it is interesting to note that at the same time the well-studied Oystercatcher population of the Exe Estuary, Devon, was also experiencing an increase in their wintering population (S.E.A. le V. dit Durell pers. comm.)

The wintering Oystercatchers in Britain originate from several different breeding areas. Most of those that are present in the west of Britain are from the Scottish/Faeroes/Icelandic populations and those on the east side mainly from Norway's eastern North Sea population (Ward 1990). Ward also suggested that the majority of British wintering birds are site faithful and also that the mid-winter influx in the Harbour is as a result of arrivals of birds from the eastern North Sea. The recoveries of birds ringed either in the Harbour, and controlled on their breeding grounds or vice versa, show that the Harbour's Oystercatchers originate from all these mentioned areas (Ward 1990). The bulk of the wintering population would seem to arrive in November and peak in December or January with maximum counts of between 1200-1400 during the 1980's.

Apart from the breeding adults there are a varying number of, usually immature birds, summering in the Harbour. The maximum annual counts for 11 of the 12 years (1986-1997) during the months May -July are shown in Table 1. From this, the mean summering population was between 202-347 birds although in some years the higher figures noted for April and July probably indicate the late departure or early arrival of wintering or passage birds.

Table 1 **The Monthly Peak Counts of Oystercatcher in Poole Harbour during 11 of the 12 years 1986-97 between April and July together with the 11 year mean.** (Data from Dorset Bird Reports)

Year	April	May	June	July
1986	10	222	166	180
1987	130	186	64	215
1988	300	300	150	370
1989	200	280	200	360
1990	400	190	100	200
1991	260	110	162	295
1992	260	140	150	221
1993	283	180	220	130
1994	n/c	n/c	n/c	n/c
1995	107	170	200	536
1996	600	194	195	309
1997	477	180	254	358
Totals	3417	2223	1941	3814
11 year mean	311	202	177	347

The origin of the birds present in the Harbour in March and April is unknown. Most of the wintering birds were thought by Ward (1990) to have departed by the end of March, and although the population is dropping at this time, it is probably augmented by passage birds.

In the autumn the first passage birds probably arrive in July, numbers build up through August, peak in September and then fall away in October. During the 1980's the peak counts for September ranged between 700-1100 birds.

Current Status

The low water monthly Harbour WeBS counts for Oystercatcher for the seven year period (1991-1998) are shown in Table 2. Counts made at low water are probably more accurate that the earlier BoEE high water counts which relied upon roost counts. At around high water some birds would undoubtedly have been missed, as Oystercatchers are known to frequent agricultural pastures and playing fields in the areas surrounding of the Harbour.

The seven year WeBS data accords well with previous conclusions of the pattern of occurrence by Oystercatchers in the Harbour. The September passage peak is confirmed, with the mean peak winter population in January in four of the seven years (Table 2). The maximum peak counts at both autumn passage and winter have risen considerably. Autumn peak passage counts are now in the range 838-1543 (700-1100 during 1980's) and the winter peaks counts in the range 1034-1771 (1200-1400 during 1980's).

Although Poole Harbour does not hold nationally important numbers of Oystercatchers in winter, it does hold one of the largest wintering populations along the south coast (Collin 1975, Clark and Eyre 1993)

Distribution

The distribution and mean density of Oystercatchers at low water WeBS counts in the Harbour during the seven year period (1991-1998) is given in Table 3. The 7 year mean August-March population per ha of exposed mud at low water in each section of the Harbour is shown on Map 15. The seven year mean as a percentage of the mean Harbour population for each section is shown in Map 16.

At low water Oystercatchers are found throughout the Harbour. A comparison of their distribution, as expressed as density per ha (Map 15) and as a percentage of the mean seven year population (Map 2), shows different sections of the Harbour as being the most important. These apparent differences between density and percentage, are probably more a reflection as to the amount of mud that is exposed in each section at low water. Area (NE3(B) has only 12 ha of exposed mud at low water but supports over 6.5% of the Harbour's mean wintering Oystercatcher population. It would seem improbable that at low water this feeding area is so rich in invertebrates that it is able to sustain a density of nearly 50 birds/ha^{-1}, so there may be some other factors involved.

A further puzzle is why at low water there should be over 3% of the Harbour Oystercatcher population still on Brownsea Island where they roost but do not feed.

Table 2 Oystercatcher

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

1% National Threshold Figure = 3600 (Species does not occur in nationally important numbers.)

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	964	1095	489	280	553	713	666	4760	680
September	1254	1543	832	1215	1021	1445	1225	8535	1219
October	887	1216	1363	838	1239	1514	1183	8240	1177
November	1408	1479	1535	1133	1345	992	494	8386	1198
December	1272	667	918	1231	1331	1423	1455	8297	1185
January	1726	1103	1771	1450	1034	1416	1446	9946	1421
February	1495	1166	1427	762	1212	1070	1278	8410	1202
March	954	728	1045	596	841	699	809	5672	810
Autumn/Winter Total	9960	8997	9380	7505	8576	9272	8556	62246	8892

Table 3 Oystercatcher

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 8892

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	18*	281	3322	4458	652	6673	4009	953	1190	21556
7 year Mean	2.6	40.1	474.6	636.9	93.1	953.3	572.7	136.1	170.0	3079
Range	18	1 - 80	3 - 275	1 - 368	3 - 118	5 - 377	1 - 554	1 - 89	1 - 100	1 - 554
% of annual mean/ Poole Harbour mean	<0.03%	0.5%	5.3%	7.2%	1.1%	10.7%	6.4%	1.5%	1.9%	34.6%
Low water area (Ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	538
7 year Mean density/ha	0.05	1.25	7.41	5.30	1.06	8.22	13.01	11.34	14.16	5.72

* A single record

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	98	484	1168	2518	933	2757				7958
7 year Mean	14.0	69.1	166.9	359.7	133.3	393.9				1137
Range	1 - 16	1 - 33	1 - 74	1 - 177	1 - 116	8 - 150				1 -177
% of annual mean/ Poole Harbour mean	0.2%	0.8%	1.9%	4.0%	1.5%	4.4%				12.8%
Low water area (Ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	0.50	2.16	2.61	4.09	16.7	32.82				3.14

Table 3 Oystercatcher (cont.)

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 8892

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	413	1226	2623	2646	4382	2825	1664	2748		18527
7 year Mean	59.0	171.5	374.7	378.0	626.0	403.6	237.7	392.6		2647
Range	1 - 173	1 - 183	1 -300	3 - 273	5 - 369	2 -450	1 - 140	1 - 420		1 - 450
% of annual mean/ Poole Harbour mean	0.7%	2.0%	4.2	4.3%	7.0%	4.5%	2.7%	4.4%		29.8%
Low water area (Ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	2.46	3.98	11.71	5.25	7.83	20.18	6.60	8.92		7.52

Section NE count areas	1	2[A]	3(P)	3(B)	3(BI)					Section total
Total counts 1991 - 1998	2767	1842	395	4068	765					9837
7 year Mean	395.3	263.1	56.4	581.1	109.3					1405
Range	5 - 228	1 - 400	6 - 47	1 - 400	5 - 228					1 - 400
% of annual mean/ Poole Harbour mean	4.4%	3.0%	0.6%	6.5%	1.2%					15.7%
Low water area (Ha)	48.0	None	None	12.0	12.0					72
Mean density/ha	8.24	-	-	48.42	9.11					15.86[A]

[A] All records refer to Brownsea Island lagoon (SE2) and counts excluded from mean density figure.

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	1109	3215								4324
7 year Mean	158.4	459.3								618
Range	1 - 180	4 - 161								1 - 180
% of annual mean/ Poole Harbour mean	1.8%	5.2%								7.0%
Low water area (Ha)	36.0	132.0	None							168
Mean density/ha	4.40	3.48								3.68

Avocet (*Recurvirostra avosetta*)

Status (Increasing passage migrant and winter visitor) *

WeBS - Qualifying Numbers for International Threshold: **700**
WeBS - Qualifying Number for Great Britain Threshold: **10**

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

* Two pairs hatch young on Brownsea island in 1999
[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(Gibbons *et al.* 1996).
[2] SPEC3 listed because of species with unfavourable conservation status (wintering population only) (Tucker & Heath 1994).

Past Status

Until the end of the 1970's, the Avocet was a scarce winter visitor in very small numbers to the Harbour. By the mid-1970's the increasing wintering population became of National Importance status reaching a maxima of 21 by 1978 (Prendergast & Boys 1983, Dorset Bird Reports). The annual peak counts during 1980's fluctuated but the trend was upwards and a count of 69 in February 1989 on Brownsea Island was a Harbour record (Dorset Bird Report).

Current Status

The monthly counts for the seven years of the WeBS count period 1991- 1998 for the Harbour are given in Table 1. During the winter of 1990/91 the population peaked at 127 but by the 1994/95 winter it had rapidly risen to 584. During the 1997/98 winter the population passed the International Importance Threshold of 700. The peak winter counts for the 12 year winter period of 1986-1998 is shown in (Fig. 1). Poole Harbour now holds the major concentration of wintering Avocets along the south coast of Britain. The peak of 550 reached in the winter of 1995/96 represented 28.0% of the Great Britain population (Cranswick, et al. 1997), although the origin of the wintering birds is uncertain.

Current Distribution

The low water distribution and density of this species in the Harbour for the seven year period is given in Table 2. Map 17 shows each section of the harbour and the mean percentage of the Harbour's population during 1991-1998.

The headquarters of the Harbour's population is centred on the large brackish lagoon on the east side of Brownsea Island (NE2). Birds sometimes move out from the lagoon to feed in other parts of the Harbour, the most favoured area of which are the mud flats of the Wytch Lake/Fitzworth area (SC4, 5 & 7). Outside the preferred feeding areas they are only occasionally noted and usually in small numbers.

As the population steadily increases it has been noticeable that the first wintering birds now start to arrive as early as July, building up through August and by mid-September numbers are approaching 200. During the period of rapid population increase there has been no apparent pattern to the winter population peak. During the seven year review period the peak count has been November (3), January (2), December (1) and February (1).

N.B. 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 (Kevin Cook pers. comm.).

Table 1 Avocet

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

Species of National Importance

1% International Importance Threshold = 700 - Month in which figure reached is shown **Bold**
1% National Threshold Figure = 10 - Months in which figure reached is shown **Bold**

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	-	-	**16**	**9**	**47**	**16**	**33**	121	17
September	-	**40**	**61**	**50**	**187**	**191**	**160**	689	98
October	**24**	**173**	**142**	**270**	**130**	**290**	**291**	1320	189
November	**130**	**147**	**396**	**492**	**505**	**472**	**702**	2844	406
December	**81**	**209**	**97**	**502**	**460**	**520**	**585**	2454	351
January	**144**	**259**	**316**	**584**	**550**	**238**	**461**	2552	365
February	**13**	**290**	**343**	**575**	**434**	**250**	**480**	2385	341
March	2	**38**	**152**	**20**	**101**	-	**38**	351	50
Autumn/Winter Total	394	1156	1523	2502	2414	1977	2650	12716	1817

Table 2 Avocet

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	-	-	1*	1*	-	24*	16*	-	40*	82
Annual Mean	-	-			-	3.4	2.3	-	5.7	12
Range	-	-	1	1	-	1 - 23	16	-	40	1 - 40
% of annual mean/ Poole Harbour mean	-	-			-	0.2%	0.1%	-	0.3%	0.6%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	488
Mean density/ha	-	-	-	-	-	0.03	0.05	-	0.47	0.02

* Only recorded in 1995/6

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	-	1**	2*	-	2**	4**				9
Annual Mean	-	-	-	-						-
Range	-	1	-	-	2	1 - 3				1 - 3
% of annual mean/ Poole Harbour mean	-	-	-	-						-
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	-	-	-	-	-	-				

* a single record in 1993 ** Only recorded in 1996

Table 2 **Avocet** (cont).

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 1817

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	32	603	25	3153	644	165	9	-		4627
Annual Mean	4.0	86.1	3.6	450.4	92.0	23.6	1.3	-		661
Range	1 - 23	1 - 260	2 - 8	2 - 410	158 -281	1 - 130	1 - 8	-		1 - 410
% of annual mean/ Poole Harbour mean	0.2%	4.7%	0.2%	24.8%	5.1%	1.3%	<0.1%	-		36.4%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	0.16	1.96	0.11	6.26	0.87	1.18	0.04	-		0.52

Section NE count areas	1	2[A]	3(P)	3(B)	3(BI)					Section total
Total counts 1991 - 1998	-	7981	-	-	-					7981
Annual Mean	-	1140.1	-	-	-					1140
Range	-	2 - 520	-	-	-					2 - 520
% of annual mean/ Poole Harbour mean	-	62.8%	-	-	-					62.8%
Low water area (ha)	48.0	None	None	12.0	12.0					72
Mean density/ha	-	-	-	-	-					0.02[A]

[A] All records refer to Brownsea Island lagoon (SE2) - counts excluded from mean density figure.

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	-	17*	-							17
Annual Mean	-	2.4	-							2
Range	-	17	-							17
% of annual mean/ Poole Harbour mean	-	0.1%-	-							0.1%
Low water area (ha)	36.0	132.0	None							168
Mean density/ha	-	0.02	-							0.02

* a single record in 1994

Grey Plover (*Pluvialis squatarola*)

Status (A passage migrant and winter visitor)

WeBS - Qualifying Number for International threshold: **1500**
WeBS - Qualifying Number for Great Britain threshold: **430***

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

* The National threshold figure has now been up-rated from 210 to 430 (Prys-Jones *et al.* (1994).
[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 (Gibbons *et al.* 1996).

Wintering Population

Past Status

The Grey Plover was described in the early 1930's, as a not uncommon winter visitor along the coast but 'Perhaps better known as a passage migrant'. No indication is given as to the numbers involved in winter or on passage. (Blathwayt 1933)

In the early 1950's Bull (1953) records that the peak winter population in the Harbour occurs in January and reaches a peak of between 50-60 birds.

The peak annual counts of Grey Plover wintering in the Harbour during the 1960's and into the mid-1970's remained small, within the range 30-70. There were, however, exceptional counts recorded on Brownsea Island (NE2), with 150+ on 28th February 1967 and 103 in December 1972. The peak mean for the 10 year period (1965/66-1974/75) was only 65. In the next 10 year period (1975/76-1984/85), the mean peak had risen to 227 and the Harbour population became of national importance. This steep rise in the mean peak population level represented an increase of over 250%!

At key areas in the nearby Solent, similar increases were reported (Tubbs 1991; Clark and Eyre 1993). This rapid increase was not just a Poole Harbour or Solent phenomenon, as at the same time the U.K. wintering population had also quadrupled (Salmon et al. 1987). Over the six year period (1985/86-1990/91) the mean peak rose to 275, a 21% increase over the previous 10 year period. Since the initial 1% national importance figure given by Prater (1981) as 100 birds, the Harbour's population has been above this qualifying level. The peak winter count usually occurred in January but occasionally it was in December or February.

There is both a spring (April-May) and autumn (August-September) passage through the Harbour, but until the mid-1970's the numbers recorded usually amounted to reports of small parties of just two or three birds. From the mid-1970's until 1991, like the wintering population, both peaks of spring passage (range 5-121) and autumn passage (range 11-41), showed marked increases. Peak figures for spring passage showed much greater year to year variation than those for autumn passage. The highest spring passage count was of 121 birds in April 1986.

Current Status

Table 1 shows the monthly low water WeBS counts for the period 1991/2 to 1997/8. The mean peak has continued to rise, increasing by a further 13% over the six year period 1985/86-1990/91. The Harbour seven year peak mean is now 312; Since the 1992/93 winter the 1% national importance threshold figure has been doubled, resulting in the Harbour's wintering Grey Plover population no longer meeting the 1% national importance criterion (Cayford & Waters 1996). Although the

Harbour's mean winter peak has continued to rise, it now only represents 0.7% of the Great Britain threshold figure. As the national population continues to increase it is likely that the Great Britain threshold will be further revised upwards (Davidson 1998).

The month of maximum abundance has not changed very much compared with the previous 10 years. The winter build up begins in November and the population has nearly trebled by its peak, which is reached in either January or February (Table 1).

During the seven year period (1992-1998), the peak spring and autumn passage numbers have shown a marked decline, when compared with the previous 10 years. The reason for the decline is unclear without knowledge of the wintering destinations of these passage birds. It is suggested that during a mild winter, the U.K. Grey Plover population has a more easterly centre of distribution (Cranswick *et al.* 1999). If there is a population shift occurring, this may explain why there could be a reduction of passage birds. Except for a record of 73 in April 1993, the peak range in spring is now between (0-25) and the autumn (5-26).

Distribution

The distribution and density of Grey Plover recorded at low water WeBS counts for the period 1991/92 - 1997/98 is shown in Table 2, while Map 18 shows each numbered section of the Harbour and the mean August-March population at low water ha^{-1}.

Although Grey Plover are widely distributed at low water in the Harbour, nearly 70% of the population are located in just four sections. In the west of the Harbour the most favoured areas are Giggers (W4) and Holton Bay (West) (W2(W), which between them, hold 21% of the low water population. In the south-west of the Harbour the two key areas are Fitzworth (SC4) and Brands Bay (SE2 (W), which respectively hold 24% and 26% of the population. These four key sections contain some of the largest expanses of exposed mud in the Harbour at low water. Although this would suggest that Grey Plover in the Harbour have a preference for the large open expanses of mud, for some reason Holes Bay (NC3(SE) is not favoured. It could be that this section of the Harbour, because of its very soft mobile muds, is unsuitable for this species (Gray 1985).

Table 2 Grey Plover

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

Species of National Importance

1% National Threshold Figure = **430** Months in which figure reached is shown in **Bold**

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	-	15	-	1	8	-	-	24	3
September	4	20	12	4	12	5	8	65	9
October	10	58	116	26	4	25	18	257	37
November	171	149	83	56	115	87	34	695	99
December	138	77	117	72	148	262	95	909	130
January	252	341	212	231	388	294	259	1977	282
February	300	251	253	227	**476**	339	205	2051	293
March	33	119	212	77	66	35	31	573	82
Autumn/Winter Totals	908	1030	1005	694	1217	1047	650	6551	935

Table 2 Grey Plover

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 936

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	6**	7	27	590	1*	831	87	3	3	1555
Annual Mean	0.8	1.0	3.8	84.3	-	118.7	12.4	-		222
Annual Range	6	1 - 5	4 - 16	1 - 207	1	1 - 152	1 - 25	1 - 2	1 - 2	1 - 207
% of annual mean/ Poole Harbour mean	<0.1%	<0.1%	0.4%	9.0%	-	12.8%	1.3%	-	-	23.9%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	538
Mean density/ha	-	0.03	0.06	0.70	-	1.02	0.28	-	-	0.41

* only recorded in 1991 - ** only recorded in 1993

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	-	-	7	4	3*	56				70
Annual Mean	-	-	1	-	-	8				10
Annual Range	-	-	1 - 5	1 - 2	3	1 - 34				1 - 34
% of annual mean/ Poole Harbour mean	-	-	0.1%	<0.1%		0.9%				1.1%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				232
Mean density/ha	-	-	0.02	0.01	-	0.66				0.04

* only recorded in 1996

Table 2 Grey Plover (cont).

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 936

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	45	280	191	282	1338	249	415	147		2947
Annual Mean	6.4	40.0	27.3	40.3	191.1	35.6	59.3	21.0		421
Annual Range	1 - 21	1 - 51	2 - 56	1 - 111	1 - 214	1 - 83	1 -58	1 - 44		1 - 214
% of annual mean/ Poole Harbour mean	0.7%	4.3%	3.0%	4.4%	20.7%	3.8%	6.4%	2.3%		45.5%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	0.27	0.90	0.85	0.56	2.39	1.78	1.64	0.47		1.19

Section NE count areas	1	2[A]	3(P)	3(B)	3(Bl)					Section total
Total counts 1991 - 1998	5**	89	-	1*	16					111
Annual Mean	0.7	12.7	-	-	2.3					16
Annual Range	1 - 3	1 - 61	-	-	1 - 6					1 - 61
% of annual mean/ Poole Harbour mean	<0.1%	1.4%	-	-	0.2%					1.7%
Low water area (ha)	48.0	None	None	12.0	12.0					72
Mean density/ha	0.01	-	-	-	0.25					0.04[A]

[A] All records refer to Brownsea Island lagoon (SE2) and counts excluded from mean density figure. * Only recorded in 1993 ** Only recorded in 1997

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	85	1712	-							1868
Annual Mean	12.1	244.6	-							267
Annual Range	1 - 40	1 - 97	-							1 - 97
% of annual mean/ Poole Harbour mean	1.3%	26.1%	-							28.5%
Low water area (ha)	36.0	132.0	None							168
Mean density/ha	0.34	1.85	-							1.58

On beach side (not in harbour) but included in count only for 1991.

Lapwing (*Vanellus vanellus*)

Status (Common winter visitor, passage migrant and small declining 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 *

Gibbons *et al.* 1996). * Amber listed because > 20% of East Atlantic Flyway non-breeding population in U.K. (

Breeding Population

Past Breeding Status

Probably in the past the Lapwing was a widespread and common nesting bird on the heaths, arable and lowland wet grassland areas bordering the Harbour. During the 1960's it was recorded as breeding in suitable habitats adjacent to the western side of the Harbour (Dorset Bird Report 1967, Haysom 1967 and Alexander 1969).

Breeding was noted occasionally during the 1970's and 1980's. The size of the breeding population was not known but it seems to have been declining and was probably never more than 15 pairs.

Current Breeding Status

During the 1990's, breeding was not recorded in every year. **Table 1** shows the number of pairs and the locations where breeding was known to have taken place during (1991-1998). This data would suggests that the Harbour's breeding population is only just maintaining itself.

Table 1

Minimum number of pairs of Lapwings present during the breeding season around Poole Harbour (1991-1998)
(Data from Dorset Bird Reports & Price (1997)

Year	Locations	Minimum nos. of pairs
1991	Keysworth 14 pulli ringed.	4+
1992	No records	-
1993	No records	-
1994	Bestwall 1 pair and chick	1
1995	Lytchett Bay 4 pairs, Arne 1 pair, Bestwall 1 pair	6
1996	Lytchett Bay 1/2 pairs	1+
1997	Lytchett Bay 5 pairs, Wytch Moor 1 pair	6
1998	Bestwall 2/3 pairs	2+

The reasons for the decline are probably mainly linked to changes in agricultural practices, including improved drainage and increased use of fertilisers. These changes have produced faster growing

swards, enabling livestock to be turned out earlier in the spring and allowing silage crops to be cut in May. As a result, the meadows are less suitable for nesting because eggs and chicks are put at risk by trampling cattle and early cutting of silage. In addition, the winters have been mild in recent years, allowing the grass to grow earlier and making some meadows less attractive to Lapwing for nesting by mid-March.
The breeding population of this Amber listed species needs to be monitored annually, as it is possible that Lapwings could soon become extinct as a breeding species in the Harbour environs.

Wintering Population

Use of the Harbour by Lapwing

The wintering population of Lapwings associated with the Harbour principally use the adjacent agricultural lands for feeding. It is generally only at low water that birds come to the mud flats and although some limited feeding is observed, they generally gather as resting flocks. Why birds should leave their feeding grounds and rest on the estuary mud flats is unclear but it is obviously advantageous to the Lapwings.

Past Status

The Lapwing was a well known passage and winter visitor in Dorset with flocks of a 1000+ not being unusual although Poole Harbour was seldom mentioned (Prendergast and Boys 1983). The distribution of wintering Lapwing in the Harbour environs in the past was probably similar to the current situation, in that the main flocks are found in those sections adjacent to their feeding areas. The few published records referring to wintering birds in the 1980's, are all from the areas where they are currently recorded.

Current Status

The monthly Harbour WeBS counts for Lapwing for the seven year period (1991-1998) are shown in Table 2. These low water figures mostly reflect the size of the wintering Lapwing population that is present in the environs of the western side of the Harbour (Map 19). These figures probably include some birds moving back and forth from the wet grasslands in the lower parts of the river valleys.

Lapwing begin to return to the Harbour in late July/early August and then steadily build to peak in January. Numbers fall rapidly through February and most have departed by mid-March. The numbers recorded each autumn/winter period vary considerably. The reason for these fluctuations is unclear, but our wintering birds may be continental, and their numbers are a reflection of breeding success and current winter conditions.

The maximum wintering population found in the Harbour environs seldom reaches more than 0.3% of the national threshold but in January 1994 it peaked at just over 10454 (0.5%). The birds present at low water, although well below the national importance threshold, may nevertheless constitute as much as 15% of the wader population present in the Harbour at low water.

Distribution

The distribution and mean density of Lapwing at low water in the Harbour during the seven year period (1991-1998) is shown in Table 3. Map 19 shows each numbered section of harbour and the 7 year mean percentage of the Harbour population at low water. This shows that at low water, Lapwings are distributed in those parts of the Harbour adjoining open farmland.

Table 2 Lapwing

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

1% National Threshold Figure = **20,000** Species does not occur in nationally important numbers.

Year Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	30	162	185	151	210	111	73	922	132
September	241	476	40	524	335	300	298	2214	316
October	193	71	2721	12	1128	759	338	5222	746
November	191	5911	814	3737	204	36	1066	11959	1709
December	105	6005	1394	4583	584	4666	3432	20769	2967
January	1200	4807	10454	4418	5907	1782	3301	31869	4553
February	2158	1040	1569	1364	2920	1838	4912	15801	2257
March	315	35	61	5	45	87	-	548	78
Autumn/Winter Total	4433	18507	17238	14794	11333	9579	13432	89304	12758

Table 3 Lapwing

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 12758

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	12602	31717	12847	5453	7209	1746	96	326*	2	71998
Annual Mean	1800.1	4531.0	1835.3	779.0	1030.0	249.4	13.7	46.6	-	10285
Annual Range	1 – 5000	2 - 4000	6 - 2400	2 - 1200	1 - 1300	1 - 578	30 - 36	1 - 325	2	1 - 5000
% of annual mean/ Pool Harbour mean	14.1%	35.5%	14.4%	6.1%	8.1%	1.9%	0.1%	0.4%	-	80.6%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	538
Mean density/ha	36.00	141.59	28.67	6.49	11.70	2.15	0.31	3.88	-	19.11

* only 2 records

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	54	1	-	14*	-	2				71
Annual Mean	7.7	-	-	2.0	-	-				10
Annual Range	1 – 18	-	-	3 - 11	-	-				1 - 18
% of annual mean/ Pool Harbour mean	<0.1%	-	-	-	-	-				<0.1%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	0.27	-	-	0.02	-	-				0.04

* only 2 records

Table 3 Lapwing (cont).

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 12758

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	11078	1082	1	2104	1327	7*	989	24		16612
Annual Mean	1582.6	154.6	-	300.6	189.6	1.0	141.3	3.4		2373
Annual Range	4 - 1350	29 - 440	-	2 - 800	2 - 400	3 - 4	4 - 150	2 - 12		2 - 1350
% of annual mean/ Pool Harbour mean	12.4%	1.2%	-	2.3%	1.5%	-	1.1%	-		18.6%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	65.94	3.51	-	4.17	2.37	0.05	3.92	0.1		6.74

* only 2 records

Section NE count areas	1	2	3(P)	3(B)	3(Bl)					Section total
Total counts 1991 - 1998	-	-	-	-	1					1
Annual Mean	-	-	-	-	-					-
Annual Range	-	-	-	-	-					
% of annual mean/ Pool Harbour mean	-	-	-	-	-					-
Low water area (ha)	48	None	None	12.0	12.0					72
Mean density/ha	-	-	-	-	-					-

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	1	1086	-							1087
Annual Mean	-	155.1	-							155
Annual Range	-	1 - 256	-							1 - 256
% of annual mean/ Pool Harbour mean	-	1.2%	-							1.2%
Low water area (ha)	36.0	132.0	None							168
Mean density/ha	-	1.17	-							0.92

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]

* The National threshold figure has now been up-rated from 4300 to 5300 (Prys-Jones, 1994).
[1] Amber-listed because > 20% of East Atlantic Flyway non-breeding population in U.K. and > 50% of non-breeding population occurring in 10 or fewer sites (Gibbons *et al.* 1996).
[2] SPEC3 listed because of species unfavourable conservation status (wintering population only) (Tucker & Heath 1994).

Past Status

Blathwayt (1933) described the Dunlin as 'the commonest "wader" on the coast, sometimes seen in flocks of over 1000 birds'. He makes no specific mention of Poole Harbour, but it seems probable that the Dunlin was a regular passage and winter visitor. Bull (1953) recorded that during the autumn passage 'flocks of up to 100 occur in all parts of the Harbour'. He also notes that the wintering population arrives in November/December, and then confines itself to the eastern part of the Harbour, in South Haven (SE1); Brands Bay (SE2); Sandbanks (NE1) and Parkstone (NE3). The winter peak in each of the three winters 1950-1952 was in January, with 1350 recorded in January 1951.

As coverage increased in the late 1960's, Dunlin were found to occur in varying numbers in all months of the year, with flocks of between 1000-3000 in the Harbour during December to February (Boys 1974). During the 1970's, wintering numbers increased with a peak count of between 2000-4000. There were two exceptional peaks of 4332 in February 1971 and 5401 in February 1976.

For the early 1980's the Harbour's peak numbers cannot be determined from the published data because only information for key sites is given. Maxima for individual sites were never over 2000, and the data suggests that at peak, numbers in the Harbour were probably within those recorded during the 1970's. Fortunately, from the winter of 1984/85, the peak counts for the Harbour were once again available (Collins 1985; Dorset Bird Reports). During the winters 1984-1991 the peak count was between 2600-5625, apart from for the 1985/86 winter, which produced the highest known Harbour count of 6575 in February. Another high count was recorded in February 1989 of 5625 birds. Over the seven years, the peak count occurred once in January and three times in December and February.

During winter 1984-85, an interesting study was undertaken by Collins (1985) on the movement and feeding behaviour of key birds in the Harbour, including Dunlin. This showed how these highly mobile birds utilised the Harbour at different states of the tide. At high water he found that the Harbour's Dunlin population was split in two , with a southern group, based in Brand's Bay (SE2) and east Fitzworth (SC4), and a northern group centred in Holes Bay (NC3). As the tide turns, the southern group mostly moved westwards, feeding as the mud is exposed and moving as far as Wareham Channel, before making the return journey. The northern group began to feed as the mud is exposed, but soon small groups drifted off, heading over Hamworthy to Lytchett Bay (W3), and by low water very few remained. At Lytchett Bay the peak count was after low water and birds remained until nearly all the mud was covered by the incoming tide. Collins (1985) also noted that during a cold spell, when Lytchett Bay (W3) was covered in ice, birds did not leave Holes Bay at low water. Goss-Custard and Durell (1983) found that in Holes Bay (NC3) Dunlin numbers peaked before high water but declining numbers were present for an hour afterwards. It is unclear whether birds interchange between the two populations or that the two groups operate independently of each other.

There was also a specific study of Dunlin populations in the Harbour, during the winters 1986-1989 (Pearson *et al.* 1991). Four sites were monitored, Brands Bay (West and East), Sandbanks and Holton Bay, with the objective of establishing if the then current oil development activities by BP in the Harbour were affecting Dunlin numbers. The study concluded that there was no apparent connection between the observed fluctuations of Dunlin numbers and BP's construction activities in the Harbour .

Dunlin can usually be seen in the Harbour in all months of the year and can appear almost anywhere there, especially on passage. Both a spring (April-May) and autumn (August- October) passage of Dunlin is recorded through the Harbour. In some years the spring numbers are higher than the autumn, but it is not predictable. During the 1980's passage numbers were usually between 250-650 birds, but occasionally, as in April 1985, there were 1500+ birds. In 1986, counts of 1000+ in May and 2000+ in August were noted.

The breeding origin of Poole Harbour's wintering Dunlin, indicated by ringing recoveries and controls, is northern Scandinavia and western Russia (Ward 1989), where they belong to the race *Calidris alpina alpina*. The limited ringing data suggest that the birds occurring on passage belong to the race *C. c. schinzii*, which breed in Britain, South-west Greenland, Iceland, around the Baltic to the Netherlands, and a third race *C. c. arctica*, which come from north-east Greenland (Ward 1989).

Current Status

Whether the change from monthly counts at high water to the current WeBS counts undertaken at low water accounts for the apparent continued increase in the peak counts, is unclear. However, these small waders can easily be missed roosting on the saltings, so probably in the past they have been under recorded in the Harbour at high water. A roosting flock, just outside the Harbour at Studland, produced a County record count of 8300 on the 24th November 1991, It is likely that this large gathering was probably entirely of Poole Harbour birds. During the 1991-1998 winters, the peak count has been between 5300-6500, which is above the 1% national threshold figure.

Table 1 shows that the peak month during 1991-1998, was either January or February. The current data suggests that though the Harbour population fluctuates from year to year, there is no trend and annual peaks are now about 6000 birds. The Harbour appears to differ from many other sites in the U.K. where winter peaks have recently declined, possibly because of severe weather (Cranswick *et al.* 1999).

There is an indication that at passage times during 1991-1998 a small decline has occurred in the number of birds using the Harbour. The passage peak range is now between 200-550 birds. During the whole period only one large count has been recorded, in itself exceptional, of 2501 birds on 22nd September, 1996.

Distribution

The distribution and density of this species in the Harbour for the seven-year period is given in Table 2. Map 20 shows each numbered section of the Harbour and the mean August-March density/ha at low water within six categories. Map 20 shows that at low water Dunlin are distributed, almost throughout the Harbour. Map 21 shows the distribution of the Dunlin in the Harbour at low water, when expressed as a percentage of the seven-year mean.

If Maps 20 and 21 are compared, they give rather different indications of the distribution and importance of the various sections of the Harbour for Dunlin. These differences occur because the Dunlin is a widespread bird in the Harbour, found in large numbers and each division of the Harbour varies in the amount of mud that is exposed at low water. As a result, some sections may have a similar percentage of the harbour population but because of differing areas of exposed mud their density (ha^{-1}) varies widely. For example both the Blue Lagoon (NE3(Bl) and Newton Bay (SC2) have 1.5% each of the Harbour's population, but one has a bird density of 27.92 (ha^{-1}) whilst the other has

only 8.99 (ha^{-1}). It would seem therefore that for Dunlin, the Harbour distribution is best illustrated by using Map 21, which expresses distribution as a percentage of the mean population.

Table 1 Dunlin

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

Species of National Importance

1% National Threshold Figure = **5300** - Months in which figure reached is shown **Bold**

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	68	477	73	104	46	178	229	1175	168
September	168	429	223	93	351	2501	210	3975	568
October	584	174	774	169	573	723	188	3185	455
November	2020	3744	1618	1350	3918	1945	1387	15982	2283
December	5124	3468	3686	4091	5107	**5817**	4957	32250	4607
January	3871	**5458**	**6222**	**5376**	**6424**	**5918**	**6355**	39624	5660
February	**5618**	5273	4323	**5963**	4996	**6347**	**5925**	38445	5492
March	469	1279	3365	491	3095	492	879	10070	1439
Autumn/Winter Total	17922	20302	20284	17637	24510	23921	20130	144706	20672

Table 2 Dunlin

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 – 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 20672

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	3*	4846	7966	20389	6636	19689	1952	-	33	61514
Annual Mean	-	692.2	1138.0	2912.7	948.0	2812.7	275.0	-	4.7	8788
Range	3	1 - 1900	16 -2000	3 - 2640	55 -1000	1 - 2100	3 - 440	-	5 - 18	1 - 2100
% of annual mean/ Poole Harbour mean	-	3.3%	5.5%	14.1%	4.6%	13.6%	1.3%	-	<0.1%	42.5%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	538
Mean density/ha	-	21.63	17.78	24.27	10.77	24.24	6.25	-	0.39	13.90

* Only a single record

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	705	7831	1451	2074	66	160				12287
Annual Mean	100.7	1118.7	207.3	292.4	9.4	22.8				1755
Range	1 - 159	1 - 873	1 - 220	1 - 760	4 - 41	1 - 80				1 - 873
% of annual mean/ Poole Harbour mean	0.5%	5.4%	1.0%	1.4%	<0.1%	0.1%				8.5%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	3.60	34.96	3.24	3.32	1.17	1.90				7.19

Table 2 Dunlin (cont)

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 20672

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	1279	5113	2836	5860	9640	850	2265	431		28274
Annual Mean	182.7	730.4	405.1	837.1	1337.1	121.4	323.6	61.6		4039
Range	1 - 540	2 - 950	1 - 584	1 - 670	14 -1500	1 - 250	1 - 260	3 - 102		1 - 1500
% of annual mean/ Poole Harbour mean	0.9%	3.5%	2.0%	4.1%	6.5%	0.6%	1.6%	0.3%		19.5%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	7.61	16.6	12.66	11.63	16.71	6.07	8.99	1.40		10,21

Section NE count areas	1	2[A]	3(P)	3(B)	3(BI)					Section total
Total counts 1991 - 1998	5467	1055	101*	2115	2346					11084
Annual Mean	781.0	150.7	14.4	302.1	335.1					1583
Range	2 - 800	1 - 341	1 - 100	1 - 450	1 - 400					1 - 800
% of annual mean/ Poole Harbour mean	3.8%	0.7%	<0.1%	1.5%	1.6%					7.7%
Low water area (ha)	48.0	None	None	12.0	12.0					72
Mean density/ha	16.27	-	-	25.17	27.92					19.93[A]

* Only two records both in 1992 [A] All records refer to Brownsea Island lagoon (SE2) and counts excluded from mean density figure.

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	690	30856	-							32796
Annual Mean	98.6	4408.0	-							4685
Range	2 - 670	3 - 2900	-							2 - 2900
% of annual mean/ Poole Harbour mean	0.5%	21.3%	-							21.8%
Low water area (ha)	36.0	132.0	None							168
Mean density/ha	19.17	33.40	-							26.28

Redshank (*Tringa totanus*)

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

WeBS - Qualifying Number for International threshold: **1500**
WeBS - Qualifying Number for Great Britain threshold: **1100**

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

* Amber-listed because > 20% of East Atlantic Flyway non-breeding population in U.K. (Gibbons *et al.* 1996).
[1] SPEC2 listed because of species unfavourable conservation status (wintering population only) (Tucker & Heath 1994).

Breeding Population

Past Breeding Status

Apparently, the Redshank began breeding in east Dorset only in the latter part of the 19th century (Blathwayt 1933). There is no indication of the size of the Poole Harbour breeding population until after the severe winters of the early 1960's, when the population was probably severely reduced. In southern Britain the Redshank is considered to be sedentary (Prater 1981), and the birds that breed around the Harbour probably remain throughout the year, which would explain the low breeding population levels noted in the mid-1960's. Surveys of Purbeck in 1964 & 1965 could only locate 6 breeding pairs but they did not include the north-west and northern salt-marshes (Haysom 1967). During the latter part of the 1960's, the breeding population was still possibly recovering from the severe effects of the winters of 1961/62 and 1962/63. Alexander (1969) commented that the population was larger than the surveys suggested because the inaccessibility of some areas of the Harbour meant that the survey was not comprehensive. This assumption was probably correct, as following the establishment of the RSPB nature reserve at Arne in 1966, no fewer than 6 pairs were located in just this one area (B.P. Pickess pers. obs.). This would suggest that, at that time, the population of the southern part of Poole Harbour might have been between 10-12 pairs.

If the annual breeding population of Redshank for the Arne Peninsula (1966-1990) is taken as a mirror of the general Harbour population, then it took 11 years to increase to a stable level following from the severe winters in the early 1960's (Table 1).

Table 1

The number of Redshank breeding territories on the saltings of Arne Nature Reserve 1966 - 1975

Year	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
No. of territories	6	6	9	6	6	8	10	12	12	12

Following the increase to 12 pairs at Arne, the breeding population remained very stable and even the prolonged cold spells at the beginning of both 1985 and 1986 did not impact upon the Arne Peninsula's breeding population.

The importance of Poole Harbour, as the major breeding location not only in Dorset but also in south-west England, was surprisingly not fully recognised by Prendergast and Boys (1983). In 1985 it was found that the salt-marshes at Keysworth held the fifth highest breeding density of Redshank in

Britain of 95 nests/km^2 (Collins, 1986a). As a result of this survey it was estimated that the Harbour breeding population in 1985 was between 50-100 pairs.

Current Breeding Status

During the 1990's two further surveys were undertaken. In 1994, at least 103 territories were located in early June by McClure and Payne (1994) and in 1997 at least 85 pairs were found by Price (1997). Currently, the saltmarsh breeding population represents about 0.5% of the U.K. total (Brindley *et al.* 1998). The 1990's surveys and the 1985 survey by Collins (1986a) have all shown how important are the saltmarshes in the South-west and Western parts of the Harbour to breeding Redshank. This is not unexpected, as these areas represent the most inaccessible and undisturbed parts of the Harbour.

Nationally the saltmarsh breeding Redshank population has shown a marked downward trend between the two national surveys of 1985 and 1996, declining by 23% (Brindley *et al.* 1998). Whether the Harbour population reflects the National trend is uncertain because of insufficient earlier data. Between the 1994 and 1997 surveys, however, the Harbour population declined by 13% (18 territories).

The density of breeding Redshanks is dependent upon the character of the sward. The level of stocking is the principal factor affecting Redshank numbers and heavily grazed marshes hold low densities of Redshank (Norris *et al.* 1998). In 1985 Swineham Point (W6) held at least 5 pairs of Redshank but none in 1993. The reason for this population demise may be associated with cessation of livestock grazing of the marshes sometime after 1985. In 1993 the area was described as having 'little recent grazing and was being encroached by reeds *Phragmites australis*', resulting in a sward of coarse vegetation, unsuitable for breeding Redshank (McClure and Payne 1994). In 1997 there were again 3 pairs present and it was noted that some light grazing had been resumed (Price 1997).

Further surveys are needed to monitor the Harbour's population. If Poole Harbour is to remain the most important breeding site in south-west England, there will be a need to ensure that the appropriate livestock grazing regimes are maintained. However, not all saltmarsh grazing is controllable, for example, several marshes in the Harbour are being heavily grazed by herds of wild Sika Deer *Cervus nippon* (B. P. Pickess pers. obs.). One factor which is beyond control is that the Redshank, like other species nesting on the saltings are vulnerable, especially in late May, to having their nests flooded out at times of very high spring tides, Fortunately Redshanks will lay replacement clutches. If world sea levels rise in the future, initially, this might present nesting problems for this species on saltmarshes.

Passage and Wintering Populations

Past Status

In the 1930's Blathwayt (1933) described the Redshank as resident but only as 'probably a winter visitor'. He did however mention that large flocks of 200 birds had been noted on autumn passage. Certainly from the late 1940's the species has been regularly recorded in Poole Harbour on passage and wintering. Bull (1953) noted total peak wintering counts of up to 600 and flocks of 100 or, occasionally, even 200.

As the Harbour became more regularly watched from the early 1960's, peak total counts of over a 1000 birds were frequently noted during the winter (Boys 1973; Prendergast and Boys 1983; Collins 1985; Dorset Bird Reports 1960-1990).

During the 1980's the month of peak count each year during the passage period August-October showed some variation. If the peak passage month was August or September, then numbers were much higher than in those years that peaked in October. It is possible that in those years when

numbers peaked early, this reflected performance during the previous breeding season. In years when autumn peak numbers were lower, the winter peak population showed a similar trend. During 1981-1990, the winter peak count always occurred in February (Dorset Bird Reports 1981-1990). An indication of the origins of some of the Redshank wintering in the Harbour based on the limited ringing recovery data, shows that birds are mostly from breeding grounds in southern England, with some birds coming from east and north-west England (Ward 1989).

Current Status

The monthly counts for the seven years of the WeBS count period 1991-1998 for the Harbour are given in Table 2. Although the Harbour's passage and wintering population numbers vary from year to year, in all years the population is always above the 1% Great Britain Importance threshold during at least part of the winter.

Table 3 shows the month in which the peak count for passage (Aug-Oct) and wintering birds (Nov-Mar) was recorded during 1991-1998 and a winter index figure for December to February during the same period. As in the 1980's, September was the peak passage month in five of the seven years, and in the two years that the peak was in October the winter peak in January was also much lower than the previous year's peak figure. Until a longer series of data are available, only an indication of Harbour trends can be given. These current data suggest that the population has increased after the 1995/96 winter. When the winter index for Poole Harbour is compared with the National winter index for the same period 1991-1998, they show similar trends (Cranswick, et al. 1999).

Table 3 Months in which Peak WeBS count of passage (Aug-Oct) and wintering (Nov-Mar), Redshank were recorded in Poole Harbour 1991- 1998 together with total winter counts and Trend Index

Year	91/92	92/93	93/94	94/95	95/96	96/97	97/98
Passage (Aug - Oct) Peak Month	**1271** (Sept)	**1629** (Sept)	**950** (Oct)	**1130** (Sept)	**1088** (Oct)	**1137** (Sept)	**868** (Sept)
Winter (Nov - Mar) Peak Month	**1302** (Jan)	**1433** (Jan)	**1172** (Jan)	**1356** (Jan)	**1111** (Jan)	**1028** (Jan)	**1239** (Jan)
Winter Index (Dec - Feb) total	3221	3151	2685	3659	2415	2633	2902
1991/92 = 100	100	98	84	114	75	82	90

A noticeable change recorded in all seven years is that January, not February, as in the 1980's, is now the month of peak occurrence. There are several possible explanations for this, not least a succession of mild winters throughout the 1990's resulting in fewer birds being displaced through cold weather. The lack of severe conditions may also have encouraged the Harbour's normal wintering population to begin to leave the estuary earlier. These suggestions may only be part of the answer, because the January peak counts were generally higher than those in February, during the 1980's.

Current Distribution

The distribution and density of this species in the Harbour for the seven year period is given in Table 4. Map 22 shows each numbered section of the Harbour and the mean August-March density/ha^{-1} at low water.

The Redshank is described as being very shy, restless and noisy (Witherby et al. 1943). The sections of the Harbour with the highest feeding densities are also the least disturbed, but this can be only one of the reasons why they are favoured feeding areas for the Redshank.

The most important feeding area in the Harbour is Holes Bay (NC3). Here, on average, over 44% of the Harbour's population may be found at low water. The importance of Holes Bay for Redshank had been recognised earlier by Gray (1986). The reason why Redshank and some other waterfowl favour Holes Bay may be due to the discharge of enriched and warmer water into the head of the Bay from the Fleetsbridge sewage treatment plant. Similar wildfowl associations have been noted in Langstone Harbour, on the mud flats below the Budds Farm sewage works discharge (Cranswick *et.al.* 1995).

This enriched and warmer water could possibly benefit the Redshank in a number of ways. With increased nutrients, the mud might support higher densities of its principle prey items, the amphipod crustacean *Corophium volutator,* the annelid worm *Nereis diversicolor* and the mollusc *Hydrobia ulva* (Cramp 1983). In June 1991, invertebrates were sampled from 31 mud flat sites about 1 m above low water mark in NC3 (White 1991). Eighteen samples were taken from NE section of NC3, which was directly affected by the discharged water and seven from the uncontaminated NW section. These showed that both *C. volutator* and *H. ulva* occurred patchily and at low densities, with means of 37 and 28 per 0.1^2 m, respectively.

The annelid worm *N. diversicolor* occurred at all sample sites, but with a significantly higher mean density in the NE section ($\bar{x}$ = 311 per 0.1^{m2}), than the NW section ($\bar{x}$ = 211 per 0.1^{m2} $P < 0.05$), helping to explain the higher densities of Redshank in the NE section (Table 4). White (1991) suggests the reason for the high density of *N. diversicolor* is due to the worm's tolerance of heavy metals, enabling it to out compete other organisms.

It is probable that in (NC3) the heavy metals contaminated *N. diversicolor* is the principal prey item of the Redshank. The higher winter water temperatures of the mud flats on a retreating tide would ensure the availability of prey items for longer than elsewhere in the Harbour, during adverse weather. It is known that at below 4°C, *C. volutator* becomes inactive and Redshank, which normally hunts by sight, cannot locate them (Goss-Custard 1977) but here, because of the species low density, it may not be an important prey resource.

The other key low water feeding locations in the western section of the Harbour are (W2)(E); (W2)(W); (W5) and Lytchett Bay (W3). Together these sections hold 19% of the Harbour's Redshank population, The undisturbed bays and creeks of the whole of the South Central Section are also important with (22%) and Brands Bay (SE2) (10%).

All these sections of the Harbour, although quiet, are unlike Holes Bay, because they do not receive the 'benefits' of enrichment from a sewage treatment plant, and densities are lower. The remaining 5% are scattered throughout the other sections of the Harbour, with just over 1% being located in (SE3)(Bl).

Table 2 Redshank

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

Species of National Importance

1% National Threshold Figure = **1100** - Months in which figure reached is shown **Bold**

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	999	**1166**	923	891	502	911	678	6070	867
September	**1271**	**1629**	393	**1130**	1021	**1137**	868	7449	1064
October	659	**1412**	950	318	1088	1003	804	6234	891
November	747	1023	**1172**	**1220**	**1111**	683	301	6257	894
December	932	561	815	**1352**	939	825	661	6085	869
January	**1302**	**1433**	1098	**1356**	607	1028	**1239**	8063	1152
February	987	**1157**	772	951	869	780	1002	6538	934
March	895	797	1086	495	666	432	847	5218	745
Autumn/Winter Total	7792	9178	7209	7713	6803	6799	6420	51914	7416

Table 4 Redshank

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 7416

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	29	507	1569	122	4765	2561	833	189	9	10584
Annual Mean	4.1	72.4	224.1	17.4	680.7	365.8	115.0	27.0	1.3	1512
Annual Range	1 - 25	1 - 147	1 - 162	1 - 50	1 - 366	1 - 401	1 - 250	1 - 85	1 - 2	1 - 401
% of annual mean/ Poole Harbour mean	<0.1%	1.0%	3.0%	0.2%	9.2%	4.9%	1.6%	0.4%	<0.1%	20.4%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	538
Mean density/ha	0.15-	2.26	3.50	0.14	7.73	3.15	2.61	2.25	0.11	3.10

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	3815	6156	9741	3031	289	31				23063
Annual Mean	545.0	879.4	1391.6	433.0	41.3	4.4				3295
Range	4 - 757	3 - 210	2 - 498	2 - 207	1 -220	1 - 5				1 - 757
% of annual mean/ Poole Harbour mean	7.3%	11.9%	18.8%	5.8%	0.5%	<0.1%				44.4%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	19.46	27.48	21.74	4.92	5.16	0.36				14.71

Table 4 **Redshank** (cont.)

Distribution at low water of wildfowl and waders (from monthly WeBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

(7 year mean Poole Harbour population (Aug - Mar) = 7416)

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	248	889	2106	1464	2051	1098	2694	743		11293
Annual Mean	35.4	127.0	300.8	209.1	239.0	156.8	384.8	106.1		1613
Annual Range	1 - 52	1 - 93	1 - 396	1 - 118	3 - 138	3 - 100	2 - 220	2 - 75		1 - 396
% of annual mean/ Poole Harbour mean	0.5%	1.7%	4.1%	2.8%	3.9%	2.1%	5.2%	1.4%		21.7%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	1.47	2.89	9.40	2.90	2.99	4.35	10.68	2.41		4.58

Section NE count areas	1	2[A]	3(P)	3(B)	3(BI)					Section total
Total counts 1991 - 1998	285	307	76	338	611					1617
Annual Mean	40.7	43.8	10.8	48.3	87.3					231
Annual Range	1 - 50	1 - 39	5 - 27	1 - 20	1 - 57					1 - 57
% of annual mean/ Poole Harbour mean	0.5%	0.6%	0.1%	0.7%	1.2%					3.1%
Low water area (ha)	40.0	8.0	None	12.0	12.0					72
Mean density/ha	1.02	5.47	-	4.02	7.27					2.59[A]

[A] All records refer to Brownsea Island lagoon (SE2) and counts excluded from mean density figure.

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	187	5167	3*							5357
Annual Mean	26.7	738.1								765
Annual Range	1 - 86	2 - 203	3							1 - 203
% of annual mean/ Poole Harbour mean	0.4%	9.9%	-							10.3%
Low water area (ha)	36.0	132.0	None							168
Mean density/ha	0.74	5.59	-							4.55

* Only a single record

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: **700***
WeBS - Qualifying Number for Great Britain threshold: **70***

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

* The National threshold figure has now been up-rated from 50 to 70 (Prys-Jones *et al* 1994).

[1] Red-listed because of historical 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 0.2-300 breeding pairs in U.K., mostly L. limosa and >50% of U.K. non-breeding population Limosa L. islandica. in 10 or fewer sites (Gibbons *et al.* 1996).

[2] SPEC2 listed because of species unfavourable conservation status concentrated in Europe (Tucker & Heath 1994).

Origins of Poole Harbour's Birds

During the severe winter conditions in January and February of 1963, many of the Harbour's wintering birds died. Among the various waders found dead were 19 Black-tailed Godwits. From an examination of these corpses, twelve (5?? 7??) were found to belong to the Iceland race of Black-tailed Godwit *Limosa limosa islandica*. The other seven individuals, for various reasons, were not determinable to race but a further two (??) were also probably of this race (Ash 1964 and Ash & Sharpe 1964). The deaths of these unfortunate birds, had given the first indication, of the origin of the Black-tailed Godwits wintering in the Harbour. It is now known that most of the wintering Black-tailed Godwits in Britain and Ireland are part of the Icelandic population (Prater 1975). There has been a single ringing recovery of an Icelandic bird in Poole Harbour. A pullus ringed in Iceland on 18th June, 1978 was controlled on 29th January 1979, presumably a Harbour wintering bird,

The total breeding population of *Limosa l. islandica* has been calculated to be between 10,000-30,000 pairs (Piersma 1986). The breeding population is still increasing, so the qualifying Great Britain threshold figures are likely to be raised (Davidson 1998). Currently Poole Harbour is the fourth most important site for wintering Black-tailed Godwit in the U.K.(Cranswick *et al.* 1999)

Past Status

Although Blathwayt (1933) did not mention Poole Harbour specifically, (except for a shooting incident), it seems likely that the Black-tailed Godwit occurred on spring and autumn passage in the Harbour. His general impression was that this once scarce species had, by the 1930's become 'more frequent and almost regular in places'. The periods of occurrence were from mid-March to early May and from mid-August to end of September. The numbers recorded on passage were not given but they were probably small. From the mid-1930's numbers must have increased, as there are records for Poole Harbour of 100 in August 1935 and 400 in March 1942 (Prendergast and Boys 1983).

It was apparent from the wildfowl and waders survey of Poole Harbour during 1949-52, that the Black-tailed Godwit was already established in the Harbour, as a winter visitor. Bull (1953) stated that the Harbour was now 'the winter resort of a large flock numbering 500-600 birds'. With a better understanding now, of how the species uses the Harbour, an interpretation of Bull's figures suggests that the wintering population was between 300-400 birds, as his largest counts fall in the spring passage period.

Until the current set of low water WeBS counts began in 1991, a clear picture of the numbers of Black-tailed Godwits wintering in the Harbour had been difficult to assess. Even in the 1960's, the

county bird report editor Clafton (1970), was having problems interpreting the available records. From the winter 1969/1970, data was gathered monthly for the Birds of Estuary Enquiry (BoEE) between August and March at high water. Unfortunately, it proved impossible to co-ordinate the time of the count at each location and at some locations, counts were carried out a day later than others! To add a further complication to the general analysis, random counts at other times of the month could produce higher figures than those on BoEE counts. It is only since 1984, starting when Collins (1985) carried out his co-ordinated counts in the Harbour, and the subsequent BoEE counts were similarly recorded, that a more accurate indication of the Harbour population is possible. Collins (1985) discovered that birds were highly mobile within the Harbour, so it is probable that before this, there was some duplication by counters. It is therefore advisable to treat some maximum counts prior to 1984, with some caution.

An examination of the Black-tailed Godwit data available between 1969/1970 and 1990/91 for the Harbour, shows that birds can be present throughout the year and that they occur in four more or less distinct time periods. In most years there was a small summering (June-July) population present, of usually 25-50 birds, presumably non-breeding first-year birds, as most are in a transitional plumage (B. P. Pickess pers. obs.). During autumn (August-October), passage numbers steadily build to usually over 400 by September. In some years the autumn passage probably began in late July. November usually sees a drop in the total number of Black-tailed Godwits present in the Harbour because most of the passage birds have departed and wintering birds have only just begun to arrive. The wintering (November-February) population sometimes reaches a peak in January, but more often it is February. During the 18 year period 1969/1970-1986/87 the peak count had been in the range 250-700, but during the four winters 1987/88-1990/91 peak numbers increased to 780-1331. Three of these peaks occurred in February and one in January. The count of 1331 on 24th February 1990 set a new county record. During the spring (March-May), passage the peak count is frequently higher than the winter peak. Throughout this 23 year period all peak yearly counts were above the qualifying 1% national importance level. Table 1 shows the years when the passage and wintering numbers were at or above international qualifying level. From these data, there is an indication that the wintering population declined between (1976/77-1981/82 and 1984/85) to below the international qualifying level, with maximum counts only in the range (250-350).

Current Status

The monthly Harbour WeBS counts for Black-tailed Godwit for the seven period 1991/92-1997/98 are shown in Table 1. The general pattern of occurrence, has not changed, but the month of winter peak is now December, not February, as in the past. The number of birds using the Harbour has greatly increased from the 1980's in all four seasons. The reasons for these increased numbers appears to be; 1) the change to low later WeBS counts making it probable that all the Harbour population is now recorded; and more significantly, 2) the increase in the population of *Limosa l. islandica* (Davidson 1998).

The Harbour's wintering population (November-February) is now internationally important between December and February, and occasionally in November (Table 2). During autumn (August-October), passage numbers have also increased, and frequently in September and October are of international importance.

The spring (March-May) passage and summering (June-July) peak counts are shown in Table 3. During spring passage most of the monthly peaks in March and April are above the 1% international importance threshold. Once the peak has passed the numbers drop rapidly and counts in May are usually smaller than those recorded in June. It is difficult to be certain whether some of these May birds are on passage or intend to summer. The increased number of Black-tailed Godwits using the Harbour has resulted in some very high counts, mostly in March. In 1995 a count of 2046 was the highest recorded for the county and amounted to almost 3% of the international threshold figure.

Table 1 Black-tailed Godwit

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

Species of International Importance

1% International Importance Figure = 700 Months in which figure reached is shown in **Bold**
1% National Importance Figure = 70 Months in which figure reached is shown **Bold**

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	505	641	287	281	445	**746**	631	3536	505
September	**827**	770	389	661	**764**	**1369**	590	5370	767
October	155	576	**1350**	584	**889**	**1371**	603	5528	790
November	555	**886**	**931**	**1120**	**1097**	203	183	4975	711
December	**749**	**1014**	**1447**	**1074**	**1160**	**1319**	**1295**	8058	1151
January	**853**	664	**1239**	**1058**	922	919	**1079**	6734	962
February	**1120**	**830**	**935**	324	**1194**	**1316**	**1895**	7614	1088
March	**1280**	**1423**	635	**2046**	**1079**	**1771**	**1729**	9963	1423
Autumn/Winter Total	6044	6804	7213	7148	7550	9014	8005	51778	7397

Table 2 **Years and Months when Poole Harbour held populations of Black-tailed Godwits at or above the 1% International Importance level (1969-1991).** (Data from Dorset Bird Reports)

1% International Importance level = **400**

Year	Autumn	Year	Winter	Year	Spring
1969	-	**1969/70**	-	**1969**	-
1970	-	**1970/71**	(388 Feb)	**1970**	-
1971	-	**1971/72**	-	**1971**	-
1972	-	**1972/73**	530 Jan, 699 Feb	**1972**	(386 Mar)
1973	-	**1973/74**	529 Feb	**1973**	700 Mar, 500 April
1974	459 Sept	**1974/75**	470 Jan	**1974**	492 Mar
1975	423 Oct	**1975/76**	652 Jan, 580 Feb	**1975**	456 Mar, 500 April
1976	430 Sept	**1976/77**	-	**1976**	470 Mar, 460 April
1977	430 Sept, 400 Oct	**1977/78**	442 Jan	**1977**	-
1978	434 Oct	**1978/79**	-	**1978**	442 Mar, 460 April
1979	420 Oct	**1979/80**	-	**1979**	420 Mar
1980	-	**1980/81**	-	**1980**	628 April
1981	-	**1981/82**	-	**1981**	453 April
1982	440 Sept	**1982/83**	500 Jan, 450 Feb	**1982**	400 Mar, 455 April
1983	440 Oct	**1983/84**	430 Nov	**1983**	460 Mar, 500 April
1984	400 Oct	**1984/85**	-	**1984**	403 April
1985	425 Sept	**1985/86**	450 Dec, 558 Feb	**1985**	700 Mar, 675 April
1986	999 Oct	**1986/87**	400 Dec & Jan, 569 Feb	**1986**	700 Mar and April
1987	557 Oct	**1987/88**	400 Dec, 550 Jan, 874 Feb	**1987**	842 April, 875 Mar

1% International Importance level increased to 700

Year	Autumn	Year	Winter	Year	Spring
1988	-	**1988/89**	(694 Dec), 780 Feb	**1988**	900 Apl, 958 Mar
1989	-	**1989/90**	1331 Feb	**1989**	1200 Apl, 1090 Mar
1990	-	**1990/91**	979 Jan	**1990**	800 Mar
				1991	1236 Mar

Table 3 **Peak Spring Passage and Summering Numbers of Black-tailed Godwit in Poole Harbour (1992-1998)** (Data from WeBS counts)

Months in which the 1% International Importance Threshold is reached in **Bold**

	Spring Passage			Summering	
Year	March	April	May	June	July
1992	1280	610	170	70	90
1993	**1423**	**906**	50	5	101
1994	635	**1290**	65	120	220
1995	**2046**	**1150**	66	77	82
1996	**1079**	**1590**	110	6	118
1997	**1771**	**1409**	21	120	120
1998	**1729**	**711**	160	12	70

During these seven years the peak numbers summering has varied considerably but generally continues the upward trend that commenced in the mid- 1980's. In some summers the population is above the 1% nationally importance threshold. This increase in summering birds might be expected in light of the general growth of the breeding population (Davidson 1998).

Distribution

The distribution and density of Black-tailed Godwit in the Harbour for the seven year period (1991/92-1997/98) are given in Table 4. Map 23 shows the population mean density/ha^{-2} at low water for each section of harbour.

At low water feeding Black-tailed Godwits can be widely distributed around the Harbour, although the eastern shores of Sandbanks (NE1), Parkstone (NE3(B) and (NE3(Bl) are seldom visited. The current distribution has changed very little over the decades, although the numbers of birds have greatly increased since 1988. The key low water feeding areas in the Harbour are Swineham (W6), Giggers (W4), Holes Bay (NC3(NE), Arne Bay (SW6) and Newton Bay (SW2). It is interesting to note that, possibly with the exception of Swineham, which does have some small boat traffic, all other key sites are undisturbed at low water. The principal factor favouring these key sites however, must be food availability, with lack of disturbance being an additional benefit. When tides are rising and falling, Black-tailed Godwit flocks can be very mobile, moving from one area to another, as the mud is progressively exposed through the Harbour. This progression at low water allows for maximum feeding use of the mud flats during the Harbour's unique tidal cycle. These feeding movements from area to area had long been suspected, but it was not until the winter of 1984/85 that they were documented (Collins 1985).

The ability of the Harbour to be able to absorb increasing numbers of Black-tailed Godwit in all seasons would suggest that there is a surplus of invertebrate food available to be exploited. How long Black-tailed Godwit numbers can continue to increase, only time will tell

.

Table 4 Black-tailed Godwit

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 7396

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	900	5878	3171	9510	2018	1661	300	97	284	23819
Annual Mean	128.6	839.7	453.0	1358.6	288.3	237.3	42.8	13.8	40.6	3403
Range	6 - 301	1 - 1200	2 - 224	4 - 970	3 - 316	1 - 195	2 - 112	1 - 65	1 - 70	1 -1200
% of annual mean/ Poole Harbour mean	1.7%	11.4%	6.1%	18.4%	3.9%	3.2%	0.6%	0.2%	0.5%	46.0%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	538
Mean density/ha	2.53	26.24	7.08	11.32	3.28	2.04	0.97	1.15	3.38	6.32

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	929	4260	3377	746	49*	349				9710
Annual Mean	132.7	608.6	482.4	106.6	7.0	49.8				1387
Range	1 - 207	2 - 955	1 - 765	1 - 156	9 - 40	- 150				1 - 995
% of annual mean/ Poole Harbour mean	1.8%	8.2%	6.5%	1.4%	0.1%	0.7%				18.7%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				224
Mean density/ha	4.74	19.02	7.54	1.21	0.87	4.15				6.19

* Only a single record

Table 4 Black-tailed Godwit (cont)

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 7397

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	692	882	3580	1467	2090	774	3417	986		13888
Annual Mean	98.8	126.0	511.4	209.6	298.6	110.6	488.1	140.8		1984
Range	1 - 269	1.- 250	1 - 770	2 - 400	1 - 245	1 - 225	1 - 590	2 - 82		1 - 770
% of annual mean/ Poole Harbour mean	1.3%	1.7%	6.9%	2.8%	4.0%	1.5%	6.6%	1.9%		2.7%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	4.12	2.86	15.98	2.91	3.73	5.53	13.56	3.20		5.64

Section NE count areas	1	2[A]	3(P)	3(B)	3(Bl)					Section total
Total counts 1991 - 1998	11	720	2	2	15					750
Annual Mean	1.6	102.8	-	-	2.1					107
Range	1 - 5	1 - 120	1	1	1 - 7					1 - 120
% of annual mean/ Poole Harbour mean	<0.1%	1.4%	-	-	<0.1%					1.4%
Low water area (ha)	48.0	None	None	12.0	12.0					72
Mean density/ha	0.03	-	-	-	0.17					0.05[A]

[A] All records refer to Brownsea Island lagoon (SE2) and counts excluded from mean density figure.

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	80	3529	-							3609
Annual Mean	11.4	504.1	-							515
Range	2 - 45	2 - 1445	-							2 - 1445
% of annual mean/ Poole Harbour mean	0.1%	6.8%	-							6.9%
Low water area (ha)	36.0	132.0	None							168
Mean density/ha	1.61	3.85	-							3.06

Curlew (*Numenius arquata*)

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

WeBS - Qualifying Number for Great Britain threshold: **1200***

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

* The National threshold figure has now been up-rated from 910 to 1200 (Prys-Jones *et al.* (1994).
[1] Amber-listed because > 20% of European breeding population in the U.K. and > 20% of East Atlantic Flyway non-breeding population in U.K. (Gibbons *et al.* 1996).
[2] SPEC3 listed because of species unfavourable conservation status (wintering population only) (Tucker & Heath 1994).

Past Status

Blathwayt (1933) described the Curlew as 'sometimes very numerous' in winter in Poole Harbour but he gave no indication as to numbers. It was not until surveys were undertaken during the 1950-1952 period that that some numbers were given when Bull (1953) noted that the peak autumn passage and wintering populations ranged between 700-1400 birds. He also commented that the wintering population was more or less constant, except during times of severe weather, and that 'considerable flocks of non-breeding birds are frequently seen in May and June'. He noted that at times of high water, birds disperse to adjacent farmlands and could be missed.

From the data gathered since the early 1950's it is now known that the Curlew was present in the Harbour throughout the year, although principally as a passage migrant and winter visitor,

During the following 20 years the peak passage and wintering population was around 1000 birds, occasionally with exceptional counts of 1400 and 1900 (Prendergast and Boys 1983). Collins (1986), detailing surveys of the Harbour in 1985/86, recorded peaks of 1350 in August and 1200 in October, after which numbers declined, but rose again to 1200 in February 1986. Table 1 shows the monthly BoEE counts during 1986-1991, in which the peak counts during autumn passage (Aug-Oct) were reached in October in four of the five years with numbers reaching over 1200 in 1986 and 1990 (Dorset Bird Reports).

The exceptionally high winter count in January 1991 was almost certainly due the arrival of birds displaced from elsewhere in the U.K, as a result of a period of very cold weather, which lasted into mid February. As can be seen from Table 1, there are considerable fluctuations in the annual figures, which should be treated with some caution. Some of the lowest counts were possibly undertaken at high water, resulting in the undercounting problem suggested by Bull (1953) (see above). In addition, if count days occur in very inclement weather, birds are more likely to be missed in the *Spartina* marshes as they squat amongst the grass.

Table 1 Curlew

Poole Harbour BoEE counts (Aug - Mar) during autumn/winter 1986-/91 at high water, together with totals and overall totals and means for each month. (Dorset Bird Reports 1986-1991)

1% National Importance Figure = **910** Months in which figure reached shown in **bold**

Year	1986/87	1987/88	1988/89	1989/90	1990/91	5 year monthly Total	5 year monthly Mean
August	600	400	406	400	400	2206	441
September	**952**	190	884	300	596	2922	585
October	**1210**	750	700	459	**1248**	4367	874
November	413	472	722	556	**1219**	3382	675
December	630	**1139**	**1412**	344	536	4061	812
January	403	**1207**	**1302**	200	**1553**	4665	933
February	**1285**	418	**1040**	**1431**	**1104**	5278	1056
March	252	751	**952**	822	**943**	3720	744
Autumn/Winter Total	5745	5327	7418	4512	7599	30601	6120

Current Status

There are only limited data available on the size of the Harbour's summering population of Curlew, which suggest that numbers are small. Observations during 1991-1997 from the extensive mud flats around the Arne Peninsula (W 4, SC 6, 7 & 8), showed that the numbers of birds occurring in May were small, seldom reaching double figures, with a seven year mean of only seven individuals. Numbers begin to increase in June (mean peak 95) as some, (presumably unsuccessful), breeding birds, return to the Harbour. Autumn passage does not really get under way until early July when the number of birds rises steeply, as the breeding grounds are vacated (mean peak 382) (Arne N.R. Annual Reports). Table 2 shows the continued build up of numbers in August (mean peak 863), reaching a mean peak of 1283 in September and a falling away in October (mean peak 1088),

Table 2 shows how the wintering population builds-up from November and continues to increase to a peak in January (mean peak 1565). The population then slowly declines but remains above the autumn passage (mean peak 1358) into March. This may be because spring passage birds stop off in the Harbour on their way to the breeding grounds.

Table 2 Curlew

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

Species of National Importance

1% National Threshold Figure = **1200** - Months in which figure reached is shown in **Bold**

Year / Month	1991/2	1992/3	1993/4	1994/5	1995/6	1996/7	1997/8	7 Year Monthly Total	7 Year Monthly Mean
August	887	1128	669	684	**1258**	713	699	6038	863
September	**1339**	**1203**	624	**1305**	1184	**1784**	**1540**	8979	1283
October	612	**1420**	849	288	**1424**	**1492**	**1534**	7619	1088
November	1125	**1574**	**1342**	**1429**	**1326**	979	674	8449	1207
December	**1223**	715	1002	**1425**	**1137**	**1652**	**1464**	8618	1231
January	**1768**	**1912**	**1770**	**1723**	794	**1393**	**1594**	10954	1565
February	**1403**	**1448**	**1913**	**1246**	**1428**	1134	**1783**	10355	1479
March	**1672**	**1319**	**1364**	1151	1068	**1317**	**1612**	9503	1358
Autumn/Winter Total	10029	10719	9533	9251	9619	10464	10900	70515	10074

Until 1995 there were only limited data available on the size of the Harbour's population during April when passage should still be in progress. In 1996 and 1997 WeBS counts were undertaken in mid-April, and unsurprisingly these found large numbers of birds still present in the Harbour with 674 and 489 respectively. Table 3 shows the seasonal use of Poole Harbour by the Curlew.

Table 3 **Curlew**

Seasonal use of Poole Harbour

Summering	May - June
Autumn Passage	July - October
Wintering	November - February
Spring Passage	March - April

The current data show that at peak count, the Harbour's Curlew population represents between 1 - 1.5% of the national population. The peak winter counts usually occur in January or February (range 1700-1900). Table 4 shows the 1991/92 WeBS total count figure (Aug-Mar) as the 100% base line, with percentage population changes from year to year. A comparison of the mean total count 1986-1991 of 6120 (Table 1), with the mean total count 1991-1996 of 10074 (Table 2), shows that the Harbour population has increased by almost 65%. It is clear from Table 4 that the annual population fluctuation is modest. In the U.K. between 1991-1998 the winters have not produced any extended periods of severe weather, it is therefore unlikely that the Harbour increase is weather related. A factor that might be responsible for part of the increase is a change in the counting method. Since 1991 the Harbour WeBS counts have been carried out at low water, as where previously, the BoEE data was gathered at high water. At low water almost all of the Harbour's Curlew population will probably be out on the mud flats feeding, which allows for more accurate counts to be made. Although the change to low water counts may be responsible for some of the increase in numbers, there would appear, nevertheless, to have been a genuine unexplained increase in Curlew numbers in the Harbour during the 1990's.

Table 4 **Curlew**

Poole Harbour 1991-1998 total WeBS counts (Aug-Mar) showing the variation between years, using the 1991/92 total as the base line (100%).

Year	Total Aug-Mar	Difference +/- (1991/92)	Difference as a %
1991/92	10029	-	100
1992/93	10719	690 +	+ 6.9
1993/94	9533	496 -	- 4.9
1994/95	9251	778 -	- 7.8
1995/96	9619	410 -	- 4.1
1996/97	10464	438 +	+ 4.3
1997/98	10900	871 +	+ 8.7

Distribution

The distribution and density of this species in the Harbour for the seven year period is given in Table 5. Map 24 shows the population mean density/ha^{-1} at low water for each section of Harbour.

Although at low water Curlew may be encountered in almost every compartment, the major concentrations are on the western side of the Harbour. The Curlew is amongst the shyest and most

wary of waders (Witherby et al. 1943) and it is therefore not surprising that the highest feeding densities are recorded from the least disturbed western sections of the Harbour. The major concentrations are located on the extensive mud flats adjacent to the confluence of the rivers Frome and Piddle, comprising sections (W4) Giggers, (W5) Keysworth and (W6) Swineham. The sections associated with the Wytch Channel (SC3, SC4, SC5 and SC6) are also very important feeding areas. These two key areas might also be of importance to Curlew as they are adjacent to, or only a short distance from, agricultural land in and around the river valleys, where birds can find roosting and feeding at times of high water.

Table 5 Curlew

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

Total numbers in each section and within each count area of Poole Harbour 1991-1998, annual mean and range. The percentage of the mean whole Harbour population during 1991-1998 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 is shown.

7 year mean Poole Harbour population (Aug - Mar) = 10074

Section W count areas	7	6	5	4	3	2(W)	2(E)	2	1	Section total
Total counts 1991 - 1998	637	3550	8556	8970	889	6464	2367	176	245	31839
Annual Mean	91.0	507.1	1222.3	1281.4	127.0	923.4	338.1	25.1	35.0	4550
Range	1 - 180	1 - 250	2 - 516	5 - 365	1 - 73	20 - 236	5 - 290	1 - 21	1 - 50	1 - 516
% of annual mean/ Poole Harbour mean	0.9%	5.0%	12.1%	12.7%	1.3%	9.2%	3.3%	0.2%	0.3%	45.1%
Low water area (ha)	50.0	32.0	64.0	120.0	88.0	116.0	44.0	12.0	12.0	488
Mean density/ha	1.82	15.84	19.09	10.67	1.44	7.96	7.68	2.09	2.91	2.91

Section NC count areas	3(NW)	3(NE)	3(SW)	3(SE)	2	1				Section total
Total counts 1991 - 1998	639	1533	2351	2466	64	405				7458
Annual Mean	91.3	219.0	335.8	352.3	9.1	57.8				1065
Range	1 - 68	1 - 118	1 - 149	4 - 114	1 - 27	1 - 100				1 - 149
% of annual mean/ Poole Harbour mean	0.9%	2.2%	3.3%	3.5%	0.1%	0.6%				10.6%
Low water area (ha)	28.0	32.0	64.0	88.0	8.0	12.0				232
Mean density/ha	3.26	6.84	5.24	4.00	1.13	4.81				4.59

Table 5 **Curlew** (cont).

Distribution at low water of wildfowl and waders (from monthly WEBS counts Aug - Mar) in Poole Harbour during 1991 - 1998

7 year mean Poole Harbour population (Aug - Mar) = 7397

Section SC count areas	8	7	6	5	4	3	2	1		Section total
Total counts 1991 - 1998	831	3931	2414	5404	5629	1716	834	1359		22094
Annual Mean	118.7	361.6	344.8	772.0	804.1	245.1	119.1	194.1		3156
Range	1 - 178	1 - 227	11 - 175	6 - 292	2 - 380	1 - 250	2 - 42	10 - 78		1 - 380
% of annual mean/ Poole Harbour mean	1.2%	5.6%	3.4%	7.7%	8.0%	2.4%	1.2%	1.9%		31.3%
Low water area (ha)	24.0	44.0	32.0	72.0	80.0	20.0	36.0	44.0		352
Mean density/ha	4.94	12.76	10.77	10.72	10.05	12.25	3.30	4.41		8.96

Section NE count areas	1	2	3(P)	3(B)	3(BI)					Section total
Total counts 1991 - 1998	484	186	-	27	362					1059
Annual Mean	69.1	26.6	-	3.8	51.7					151
Range	1 - 25	1 - 70	-	1 - 10	2 - 21					1 - 70
% of annual mean/ Poole Harbour mean	0.7%	0.3%	-	<0.1%	0.5%					1.5%
Low water area (ha)	40.0	8.0	None	12.0	12.0					72
Mean density/ha	1.72	3.72	-	0.31	4.30					2.09

Section SE count areas	1	2	3							Section total
Total counts 1991 - 1998	252	7813	-							8065
Annual Mean	36.0	1116.1	-							1152
Range	1 - 20	21 - 313	-							1 - 313
% of annual mean/ Poole Harbour mean	0.3%	11.1%	-							11.4%
Low water area (ha)	36.0	132.0	None							168
Mean density/ha	1.00	8.45	-							6.85

Water Rail (*Rallus aquaticus*)

Status (Breeding resident, passage migrant and winter visitor)

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

* Amber listed because of moderate contraction of breeding range in U.K. in past 25 years (Gibbons *et al* 1996).

Past Breeding Status

Because of the Water Rail's secretive nature, it is very difficult to census. In the late 1960's Little Sea (SE3) alone was considered to hold a population of eight to ten pairs (Alexander 1969), which suggests a much larger population for the Harbour as a whole. Probably the Water Rail could be described as a regular but scarce breeding species.

Current Breeding Status

Currently, the breeding status of the Water Rail is probably little changed from past years. The favoured breeding areas are around the Harbour fringes, where the beds of Reed *Phragmites australis* and swamp are present. These reedbeds, although mostly tidal, usually have freshwater draining into them, via the rivers and streams entering the Harbour, or from seepage off the adjacent land to the reedbeds. Most suitable areas in the Harbour have Water Rails present (Price and Pickess 1996).

Currently it is only possible to guess at what is the likely size of the Harbour's breeding Water Rail population but it is probably larger than records would suggest. The population could be currently in excess of 20 pairs but additional birds from the continent may boost this population in winter (Flegg & Glue 1973). There is a need for a more accurate census of the Harbour's breeding population of this Amber listed species.

Black-headed Gull (*Larus ridibundus*)

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

A breeding species of National Importance (British Breeding Population = **147,000 pairs**)[1]

Poole Harbour Percentage of British Breeding Population = 3.4%

[1] (Gibbons *et al* 1993).

Breeding Population

Past Status

Breeding within the Harbour environs has been recorded since about 1877. A colony first established at Little Sea, and then spread to Rempstone Pond, where several thousand pairs bred. The Rempstone site was deserted in the 1920's for the *Spartina* marshes in the Harbour (Blathwayt 1933). Aspinall et al (1993) documented the history of the Black-headed Gull in the Harbour until the early 1990's.

From the data available, it seems the number of nesting Black-headed Gulls in the Harbour varied considerably until the 1970's. How much of this variation was due to excessive gathering of eggs for human consumption is uncertain but it is a likely cause of the population fluctuations. During the 1940's there were 1000-2000 pairs on the *Spartina* islands in Holton Bay (W2(W). These birds apparently moved to Brownsea Island (NC2) in 1948 and about 1000 pairs were present there.

This move was possibly due to persecution in Holton Bay. Birds disappeared from Brownsea Island in the mid-1950's, returning for awhile in the 1960's but with only 250 pairs (Aspinall *et al* 1993). In the 1970's the colony was back on the Holton Bay islands but they regularly had their eggs taken or nests washed out by exceptionally high Spring Tides in mid-May (B. P. Pickess pers. obs.).

From 1981 a licence was necessary to collect Black-headed Gull eggs under the 1981 Wildlife and Countryside Act. In Poole Harbour, licences were applied for and issued for limited collecting of eggs. It was not possible, however, to regulate the activity. Probably due to the combination of licensed and unlicensed egg collecting on the Holton Bay islands, part of the colony moved in 1984 to the private and undisturbed Round Island (SC4).

In 1985 it was estimated that there were between 1000-2000 pairs each on the Holton Bay islands and on Long/Round Islands (Collins 1986). Birds continued to nest at both sites throughout the late 1980's. On Brownsea Island breeding occurred throughout the 1980's, with 150-250 pairs each year 1980-1982, but less than 100 pairs thereafter. During the latter part of the 1980's the harbour's breeding population was between 3000-4000 pairs

Current Status

In 1990, at the commencement of the breeding season, Mediterranean Gulls were discovered in the Holton Bay colony, so the issued egg collecting licences were withdrawn. Because Mediterranean Gulls now nest annually, no licences for collecting of Black-headed Gull's eggs have subsequently been issued. With the discovery of the nesting Mediterranean Gulls, a surveillance operation was mounted annually over the Holton Bay Black-headed Gull colony. Following this surveillance work, organised by the RSPB, an approximate annual estimate of the number of nesting pairs of Black-headed Gull in the Harbour can be given for the period 1991-1998 (Table 1)

Table 1 **The number and location of the Black-headed Gull colonies in Poole Harbour (1990-1998)** (Data from Cook & Pickess (1993), RSPB surveillance reports and Dorset Bird Reports)

Year	Holton Bay (W2(W)	Round Island (SC4)	Brownsea Island (NC2)
1991	4000+	1100	42
1992	4000+	740	120
1993	5000+	-	100+
1994[1]	5000+	100	120+
1995	5000+	-	120+
1996[2]	6000+	-	200+
1997	5000+	-	220
1998[3]	5000+	-	150

Nesting recorded at other locations.

[1] 650+ pairs on Fitzworth *Spartina* islands and seven pairs on Furzey Island
[2] three pairs on Green Island
[3] 30 pairs on Furzey Island

Unfortunately, the surveillance of the colonies has not always prevented many of the eggs laid in early April, from illegally being taken in some years. When culprits have been caught, they have been prosecuted. Even court cases and publicity did not prevent the whole colony in Holton Bay being totally collected out between early April and 20th April, 1996.

Table 1 shows that the Harbour breeding populations is now relatively stable at 5000+ pairs and centred on the two large *Spartina* islands in Holton Bay. There is also a regular small nesting population on Brownsea Island lagoon whose numbers fluctuate between about 100-200 pairs.

At times of stress to the main nesting colony through disturbance and illegal egg collecting, many pairs may relocate to other islands in the Harbour. In the past Round Island has been the favoured displacement location but they return to Holton Bay islands the following year. The presence of the Mediterranean Gulls since 1991 and the resultant withdrawal of licences and surveillance have undoubtedly resulted in much less disturbance to the main Black-headed Gull colony.

If this colony in Holton Bay is kept free of human disturbance, the major threat is from the very high spring tides in mid-May. These high spring tides have been known to wash out the whole colony, although some replacement nesting usually occurs afterwards.

At 5000+ pairs the Harbour holds a population of national importance, representing about 3.4% of the British breeding population, and 6.5% of the British coastal breeding population (Walsh and Tusker 1993).

Mediterranean Gull (*Larus melanocephalus*)

Status (Rare breeding species and occasionally noted outside breeding season).

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

A breeding species of National Importance (British Breeding population in 1997 = <50 pairs)[1]

Poole Harbour Percentage of British Breeding Population = between 4.0 - 15%

* Amber-listed because of 5 year mean of 0.2-300 breeding pairs in U.K. (Gibbons *et al.* 1996).
[1] (Ogilvie 1999).

Past Status

The Mediterranean Gull was not recorded in Dorset until 1958, since when it has been observed annually in small numbers. Surprisingly there were few records from the Poole Harbour area, suggesting that it was only a rare visitor (Prendergast and Boys 1983). However, this may give a false indication of its frequency of occurrence, as there are many 1000's of Black-headed Gulls using the Harbour and the occasional Mediterranean Gull would have been difficult to locate.

Past Breeding Status

The first breeding by Mediterranean Gulls, in the Harbour was an unsuccessful nesting attempt in the tern and Black-headed Gull colony on Brownsea Island (NE2) in 1977, and again in 1978, 1980 and 1981 (Cook and Pickess 1993). The species might have again attempted to nest in the Harbour in 1985, when a pair were seen around the Holton Bay (W2(W) Black-headed Gull colony, and an adult was at the Round Island (SC4) colony in April (Collins 1985).

It was not until 1990 that it was thought that nesting might be occurring in the Harbour, when it was discovered that there were several adults birds around the main Black-headed Gull colony in Holton Bay. Following the 1981 Wildlife and Countryside Act it became necessary to be licensed to collect Black-headed Gull eggs and in Poole Harbour, licences were issued for limited collecting of eggs. The issue of licences did not, however, prevent unlicensed egg collectors from continuing illegally. When Mediterranean Gulls started nesting in the Black-headed Gull colony, egg-collecting activity directly threatened these Red Data Species (Batten *et al.* 1990). Due to this threat, all egg-collecting licences were withdrawn and as Mediterranean Gulls now nest annually in the Harbour, no licences for collecting of Black-headed Gull's eggs have subsequently been issued.

In 1990, four pairs were located nesting in the Holton Bay colony, and a further two pairs were discovered in the Black-headed Gull colony on Round Island. Breeding success was not known, but a juvenile seen at Hatch Pond, near Fleetsbridge on the 18th July, suggested a local origin (Cook and Pickess 1993).

Current Breeding Status

Following the discovery of the nesting Mediterranean Gulls in 1990, a surveillance operation has been mounted annually, organised by the RSPB staff at Arne, over-looking the Holton Bay Black-headed Gull colony. Other breeding sites have also been monitored. Table 1 shows the minimum number of nesting pairs of Mediterranean Gulls during 1990 and 1999. As the Mediterranean Gull nests are scattered among the Black-headed Gull's nests, they are exceedingly difficult to locate, and in some years, it is possible that not all the pairs were located.

Table 1 **Minimum number of breeding pairs of Mediterranean Gulls in Poole Harbour (1990-1999)** (Data from Gull Surveillance Reports (1995-99), Cook & Pickess (1994) and McClure & Payne (1994).

Year	Number of Pairs	
1990	6	
1991	3	Total Minimum number
1992	2	of breeding pairs (1990-1999)
1992	5	**= 40 pairs**
1994	2	
1995	2	10 Year Annual Mean
1996	6	**= 4 pairs**
1997	8	
1998	3	
1999	3	

The breeding success of the Harbour's Mediterranean Gulls is uncertain, although juveniles have been noted around the Harbour from late summer, it is uncertain whether these are of local provenience.

In 1997, the possible number of U.K. breeding pairs was between 33-53, located in 24 sites (Ogilvie 1999). This figure would suggest that in that year Poole Harbour may have held between 15% and 25% of the U. K. population. The 10 year mean of 4 pairs in the Harbour (Table 1), as a percentage of the maximum British estimate for 1997 of 53, still represents over 7% of the U.K. population. The Harbour is therefore one of the key nesting sites for Mediterranean Gulls in the U.K.

The future for this species in the Harbour appears assured, provided that the main Black-headed Gull colony in Holton Bay is left free from human disturbance. As with the Black-headed Gulls, the major threat to the Mediterranean Gulls is from their nests being washed out by the very high spring tides of mid-May.

The origin of the Poole Harbour breeding birds is uncertain. The occurrence in the Weymouth area during the 1990's of Mediterranean Gulls colour ringed, in the Netherlands, would suggest that this is the most likely place of origin for the birds colonising the Harbour (Read 1994 and Dorset Bird Reports 1994-98). As yet, there have been no records of Mediterranean breeding birds in Dorset. However, an unfledged colour ringed bird marked on the 12th July 1994 in a colony in the Ukraine, reached Radipole at Weymouth by the 18th August, a journey of more than 2600 km in less than 32 days (Peart 1995)!

Outside the breeding season, during the latter part of the 1990's, there has been a noticeable increase in records of Mediterranean Gulls from the Harbour. There have been three sightings of colour ringed birds from the Harbour environs between September and December, all of Dutch origin. Whether the Harbour's breeding population will increase further is uncertain but the potential is there.

Herring Gull (*Larus argentatus*)

Status (Breeding resident, migrant and winter visitor)

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

* Amber listed because of moderate decline in U.K. breeding population in past 25 years (Gibbons *et al* 1996).

Past Breeding Status

During the 1960's up to 500 breeding pairs were present on Brownsea Island (Haysom 1967, Alexander 1969). In 1971, the Brownsea Island colony reached 930 pairs but declined to 100 by 1978 (Prendergast and Boys 1983). Up to the mid- 1980's there is only mention of occasional nesting on Brownsea Island and then only a maximum of 12 pairs in 1981. From 1986 there is no record of nesting in Poole Harbour and in the Dorset Bird Report for 1989, there is the first mention of the realisation that breeding Herring Gulls had declined elsewhere along the Dorset coast. The decline was real, in the space of less than 20 years the Harbour's breeding population had crashed from over 900 pairs to the point of extinction.

Current Breeding Status

In the current period there has been very little improvement in the Herring Gull's status, as a Poole Harbour breeding species. For the first time, in 1991 several Herring Gulls nesting on buildings around Poole. The number of birds attempting to nest is uncertain, as they are not viewed with any great pleasure and are usually dissuaded from nesting. Perhaps because of these efforts to prevent nesting, only five pairs were reported in 1997, all of them on dwellings at Sandbanks.

The reason for the sharp decline in breeding population is uncertain. Despite their Amber listed status, however it is unlikely that they will be welcomed, as birds nesting on buildings are possessive and unsociable to *Homo sapiens*.

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 = 14,000 pairs)[2]

Poole Harbour Percentage of British Breeding Population = > 1.0%

* Amber listed because over 50% of U.K. breeding population is in 10 or fewer sites.
[1] SPEC2 listed because of major declines in key European breeding populations.
[2] (Gibbons *et al* 1993)

Past Breeding Status

Until the discovery of an infertile egg on Brownsea Island in 1972, there had been no proof that the Sandwich Tern had ever bred or attempted to breed in Dorset. Each spring Sandwich Terns were regularly present in the Harbour, but probably did not attempt to nest because of a lack of suitable, undisturbed places to establish a colony.

The then Dorset Naturalists' Trust leased part of Brownsea Island in 1963, including the lagoon, as a nature reserve from the National Trust. One of the aims was to encourage the spring passage terns to stay and nest on purpose built tern islands in the lagoon. The first islands were built in 1964 with further islands added from the mid-1980's (Cook 1996).

In 1973, 25 pairs of Sandwich Terns nested on the islands in the Brownsea Lagoon and produced at least 13 chicks. There was no nesting in the following two years, but terns have nested in the Harbour every year since 1976 - 1990, except 1984, when ca. 75 pairs moved to Round Island but no breeding was proved. Successful breeding has only been recorded on Brownsea Island. Over the years, the number of breeding pairs has slowly increased, with 100 pairs in 1986 and 131 pairs in 1990 (Cook 1996).

Current Breeding Status

During the 1990's the number of breeding pairs of Sandwich Terns has continued to increase (Cook 1996). Since 1996 the breeding population has just pasted the 1% national importance figure of 140 pairs (Avery 1993). Table 1 shows the number of pairs and fledged young produced between 1991-1998 on Brownsea Island. During this eight year period at least 550 young have been fledged from the Lagoon. For seven years, when the number of fledged young was known, there was a mean of almost 77 young per annum (a mean of 0.65 per nesting pair). Undoubtedly, the Dorset Wildlife Trust's achievement with its breeding terns can certainly be described as a conservation success story.

Table 1 **The number of breeding pairs of Sandwich Tern and young fledged in the eight years (1991-1998) on Brownsea Island** (Data from Dorset Bird Reports and Cook (1996)

Year	Number of Nesting Pairs	Number of Young Fledged
1991	75+	44
1992	82	66
1993	117	92
1994	75+	?
1995	107	91
1996	139	74
1997	152	71
1998	150+	100+
Total	897	538
8 year	mean = 112 pairs	7 year mean = 77 young fledged

It is most unlikely that the Sandwich Tern will be able to find other suitable areas to colonise in the Harbour. Its future as a nesting bird in Poole Harbour will continue to be dependent upon the provision and maintenance of tern islands in the Brownsea Lagoon by the Dorset Wildlife Trust, which is both costly and labour consuming.

Sandwich Terns are known to be fickle nesting birds. Despite all efforts to attract and retain them, they can, for no apparent reason, desert long favoured nesting sites. Sandwich Terns hunt for their principal food Sand Eels *Ammodytes* sp. over the Hook Sands in Poole Bay (Aspinall and Tasker 1990). If this favoured feeding area was damaged through commercial over-fishing, or through excessive use by pleasure craft, it could have serious implications for the Harbour's breeding Sandwich Terns.

Common Tern (*Sterna hirundo*)

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

A breeding species of National Importance (British Breeding population = 12,900 pairs) [1]

Poole Harbour Percentage of British Breeding Population = < 1.5 %

[1] (Gibbons *et al* 1993).

Past Breeding Status

Although the Common Tern was described by Blathwayt (1933) as a common summer resident, no mention is made of breeding occurring in Poole Harbour. The first record of breeding in Poole Harbour was in 1951, but after that no further reports until 1963, when breeding took place on Brownsea Island (Boys 1984).

With the exception of 1974, Common Terns have bred every year since 1963 on Brownsea Island. When, in 1963 the then Dorset Naturalists' Trust leased part of Brownsea Island, as a nature reserve from the National Trust, there were only six pairs of Common Tern breeding on the Lagoon. To encourage nesting terns there, the first purpose built tern islands were constructed in 1964 and further islands have been added from the mid-1980's (Cook 1996).

The Brownsea Island Common Tern breeding population has steadily risen through the 1980's. These increases can be attributed to the enlargement of existing islands and creation of additional islands. In 1986 the population was a 100+ pairs, and by 1990, it had just passed the 1% national importance threshold figure of 130, with 131 pairs. The number of young fledged each year varied considerably and predation by Sparrow hawks, Magpies and larger gulls was sometimes recorded. The highest number of young fledged was 70 in 1967; 90 in 1987 and 80 in 1988 (Cook 1996).

Current Breeding Status

During the 1990's the number of breeding pairs of Common Tern continued to increase (Cook 1996). Table 1 shows the number of pairs, and fledged young produced, during 1991-1998 on Brownsea Island. From 1994 the breeding population has been above the 1% national importance threshold figure of 130 pairs (Sears 1993). In 1998 there were 189 pairs present, which represents almost 1.5% of the national population. In six of the eight years the number of fledged young were recorded, and at least 430 young were fledged from the Lagoon in these years giving a mean of 71.3 fledged young per annum and a mean of 0.5 fledged young per pair. The Dorset Wildlife Trust's achievement with its breeding terns can certainly be described as a conservation success story.

Table 1 **The number of breeding pairs of Common Tern and the recorded fledged young in the eight years (1991-1998) on Brownsea Island** (Data from Dorset Bird Reports and (Cook 1996)

Year	Number of Nesting Pairs	Number of Young Fledged
1991	105	50
1992	135	59
1993	126	104
1994	141	?
1995	157	100
1996	160	97
1997	173	18
1998	189	?
Total	1180	428
8 year mean = 147.5 pairs		6 year mean = 71.3 young fledged

When the large freshwater gravel pit at Swineham with its islands is completed, it could provide another suitable site for the establishment of a breeding colony of Common Tern in the Harbour. For the foreseeable future, however, the Harbour's breeding population will continue to be dependent upon the provision and maintenance of tern islands in the Brownsea Lagoon by the Dorset Wildlife Trust.

Aquatic Warbler (*Acrocrphalus paludicola*)

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

Species of Conservation Concern: U.K. Red Listed Species[1]
European Listed SPEC1[2]

[1] Red-listed in the U.K. because of its globally threatened status (SPEC 1) (Gibbons *et al.* 1996)
[2] SPEC1 listed because of being a species of Global Conservation Concern (Tucker & Heath 1994).

National Status

The Aquatic Warbler is now recognised as a globally threatened species (Tucker and Heath 1994). In the U.K. the Aquatic Warbler is a scarce but regular autumn passage migrant (Lewis 1996). On autumn passage they seem to show a preference for beds of tall herbaceous vegetation e.g. Reed *Phragmites australis* and Sea Club-rush *Bolboschoenus maritimus*, but this may reflect extensive mist-netting of such habitats in the autumn, when most of the Aquatic Warblers trapped are juveniles (Lewis 1996). Because Aquatic Warblers are difficult to locate visually in Reed beds or sedge scrub, it is possible that this threatened species is more common than records would suggest. For the present, the importance of the Reed beds on the south coast of England's to the Aquatic Warblers during autumn passage is uncertain, but records suggest they may be very important.

Poole Harbour Status

Past Status

The first Dorset record of Aquatic Warbler was in 1953 (Boys 1974). It was not until 1976 that the first Poole Harbour record was reported on Brownsea Island on the 26th July (Prendergast and Boys 1983). Up to 1990 there were only two further records from the Poole Harbour area, a second record from Brownsea Island on 29th July, 1977 and a bird trapped in Lytchett Bay on 22nd August, 1983.

Current Status

Between 1991 and 1997, 77 Aquatic Warblers were trapped and ringed in the extensive Reed beds at Keysworth during the late summer in August and September. Table 1 shows the number of birds trapped annually. Surprisingly no birds were trapped in 1998. The annual mean for the eight year period (1991-1998) is 10 birds per annum. With other large expanses of Reed bed in the Harbour, especially at Swineham, Arne Moors, Lytchett Bay and Salterns Marsh/Slepe Moor, the number of Aquatic Warblers using the Harbour each autumn passage could be considerably greater.

Table 1 **Number of Aquatic Warblers trapped at Keysworth during 1991-1998**
(Data from Lewis (1996) and Dorset Bird Reports)

Year	Number caught	Year	Number caught
1991	20	**1995**	5
1992	13	**1996**	4
1993	7	**1997**	11
1994	17	**1998**	None
8 Year Total = 77		8 year Mean = 10	

The limited data available suggest that the Harbour Reed beds may play an important rôle, as an autumn migration staging post for this globally threatened species. If more is to be learnt about the Harbour's importance to this species, concerted efforts will need to be made in late summer, to mist-net the other major Reed beds in the Harbour, preferably simultaneously.

Cetti's Warbler (*Cettia cetti*)

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

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

* Amber listed although the U.K. population is now above the 300 pairs breeding threshold for Amber status, it is still considered vulnerable during severe winter weather (Gibbons *et al.* 1996).

Past Breeding Status

The Cetti's Warbler is a recent colonist to the U.K. The first British record was only in 1961 from Titchfield Haven, Hampshire (Suffern and Ferguson-Lees 1964). Subsequently the species has colonised many suitable areas in southern Britain (Bibby 1993). Around Poole Harbour Cetti's Warbler favours the wet fringes where Reed *Phragmites australis* occurs, usually in association with scattered bushes of Sallow *Salix* sp. and patches of Bramble *Rubus* sp.

The first record for the Harbour area was in 1977 when a bird wintered on Brownsea Island, remaining until 14th April 1978. In the following years, singing males were reported annually in the Wareham area. By 1983, numbers had steadily increased and no fewer than 12 singing males were located between Wytch and Lytchett Bay, including seven in the Wareham area. When breeding first occurred in the Harbour or how many birds were involved, is unknown. It is now known that male Cetti's Warbler can be polygynous with up to three females in a territory (Bibby 1982). It is therefore probable that the actual number of breeding females is likely to be greater than the number of singing males recorded.

As the Cetti's Warbler became a familiar bird in the western area of the Harbour, fewer records were submitted, which has resulted in inadequate information about changes in population size towards the end of the 1990's. However, the locations from which singing males were recorded all occurred from the western side of the Harbour between Wytch and Lytchett Bay. The Wareham area received the best coverage, in most years it usually produced seven singing males during the breeding season.

Current Breeding Status

Until the National Census in 1996, it was unclear as to just how many Cetti's Warbler territories there were in Poole Harbour. During the first half of the 1990's, although there were records from the western area of the Harbour, they were very incomplete. From these data the only conclusion that could be drawn was that the species appeared to be holding it's own. Whether there was a decline in the Harbour population in 1993, similar to that which had occurred in Christchurch Harbour is unclear. What is clear, is that had there been a decline in the Harbour's Cetti's Warbler population, they had more than recovered by the time of the 1996 survey.

The National Survey in 1996 based on the presence of singing males, located 574 individuals in the U.K. (Wooton et al. 1998). The survey of the potential breeding areas in the Harbour surprisingly produced between 29-35 singing males, all were around the western side of the Harbour (Wooton 1997). The Harbour total represents almost 6% of the national and 34% of the Dorset population (Wooton 1997, Wooton et al. 1998).

The future for the Cetti's Warbler in the Harbour looks assured, provided that there are no exceptionally severe winters in the future. There is still apparently suitable breeding habitat unoccupied around the Harbour, so further population increases could be expected. The Harbour, with its generally more favourable winter conditions than counties to the east of Dorset, may be important for the future survival of the Cetti's Warbler. Severe winter conditions could exterminate populations elsewhere to the east, so the Harbour could provide a nucleus from which lost sites could be re-colonized.

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 = 2.5%

* U.K. listed because over 50% of breeding population is in 10 or fewer sites (Gibbons *et al* 1996).
[1] (Gibbons *et al* 1993).

Past Status

The Bearded Tit, a species associated with extensive beds of Reed *Phragmites australis* was not recorded in Poole Harbour until 1965 when up to 30 were noted (Dorset Bird Report 1965). It was recorded occasionally between 1966-1968 (Alexander 1969) but from 1969 through to 1990 it has been recorded in all years. The only clues to the origin of the Harbour's birds are from ringing controls. During the eruption in the autumn of 1972, several ringed birds were seen in the flocks present in the Salterns Marsh reed beds at Arne. In December two birds were controlled, the first, a bird of the year, had been ringed on 8/10/1972 in Holland and a second had been ringed in the previous autumn at Radipole (B. P. Pickess pers. obs.). It is probable that our Dorset Bearded Tit population has been established from autumn erupting birds from Holland (O'Sullivan 1976). Although they had been breeding at Weymouth since 1967, it was not known whether the Radipole ringed bird was Dorset bred or a colonist from Holland.

Past Breeding Status

Breeding was first recorded in Poole Harbour in 1974, when two/three pairs were found feeding fledged young (Dorset Bird Report 1975). Subsequently, up to five pairs have bred most years through to 1990 and in those years when there were no records, they possibly nested undetected. Although there are 20 Reed beds of over 0.75 ha around the Harbour, most of them, because of their small size and periodic tidal flooding, would not be suitable for nesting Bearded Tits (Price and Pickess 1996), Breeding was only recorded with regularity from three of the Harbour's largest Reed beds, at Arne Moors, Keysworth and Lytchett Bay.

Present Breeding Status

Over the current period (1991-98) the small breeding population of around five pairs has maintained itself. However, when a concerted effort was made in 1996 to visit all the Harbour's Reed beds during the breeding season, over 10 pairs were located (Price & Pickess 1996). Breeding birds were only found in the three sites regularly used in the past during the 1996 survey, which suggests there might be some factors limiting the availability of suitable nesting sites around the Harbour. The favoured breeding sites have always been the largest Reed beds in the Harbour,

There was further evidence of movement between Poole Harbour and Weymouth, when a Lytchett Bay bird ringed on 19th July 1997 was controlled a year later at Radipole on 18th July (Dorset Bird Report 1998).

If the Reed beds are maintained and where practical managed or enlarged, then the Bearded Tit should remain part of the Harbours breeding avifauna. Whilst the size and quality of the Reed beds is probably the most important limiting factor, Bearded Tit populations can also be seriously affected by periods of severe winter weather (O'Sullivan 1976). Currently the Harbour probably supports between 2% and 3% of the U.K. breeding population (Bibby 1993).

Reed Bunting (*Emberiza schoeniclus*)

Status (breeding, passage and winter visitor)

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

A breeding species of National Importance (estimated British Breeding population = 220,000 prs)[1]

Poole Harbour Breeding Population = < 100 pairs

* Red listed because over 50% decline in the U.K. breeding population in past 25 years (Gibbons *et al.* 1996).
[1] (Gibbons *et al* 1993).

Past Breeding Status

Although there are no data available on the size of the breeding population in the past, it was probably widespread in suitable locations. The favoured nesting areas usually being associated with the drier beds of Reed *Phragmites australis*, or in rank grassy vegetation and scrub that borders the Harbour.

Current Breeding Status

There appears to have been very little change in suitable breeding habitat available to the Reed Bunting, over the past decades. Whether the fortunes of the Harbour's breeding population has mirrored the decline of the species nationally, is unknown. It is difficult at present to estimate of the size and distribution of the Harbour's breeding Reed Bunting population without a census being undertaken, but it is tentatively suggested that the Harbour's breeding population is probably < 100 pairs.

There does seem to be a need for more data to be gathered about the Harbour's breeding population of this Red Listed species. The BTO's national Waterways and Common Birds Surveys data for breeding Reed Bunting, during 1997 and 1998, show a continuing but slow decline. Birds tend to move away from their breeding areas after nesting, and it is possible that the main reasons for the decline are associated with winter food supplies, rather than changes in breeding habitat.

Conclusions

This report recognises that 32 species of birds currently recorded in Poole Harbour are of international and national importance. Of these, 16 are passage or wintering wildfowl and waders, each of which, at their annual peak, represents over 1.0% of the United Kingdom's population of that species. There are nine Red and Amber listed species, seven of which are breeding species. In addition there are two further nesting species, each of which represents over 1% of the national breeding population. Finally, there are three species of wader, which, at peak winter numbers, each contribute over 5% to the Harbour's total wildfowl and wader population.

The wildfowl and wader distribution maps show, as might be expected, that some species are widespread at low water, e.g. Shelduck, Goldeneye and Redshank, whilst others are concentrated in particular areas, e.g. Pochard (Littlesea SE3), Avocet (Brownsea Island NE2). Table 1 shows the distribution of the 18 key passage and wintering species by count section, giving the mean percentage of the total population and the total of mean percentages for each count section, and the total of each section expressed as a percentage of all 18 species combined.

It is clear from Table 1 that every section of the Harbour, supports at least several species at 1% or above of their total Harbour population, but that some sections do not support over 1% of the combined population of 18 key species. Seven sections each hold under 1% of the total Harbour population but seven sections each hold over 5% of the key species, which amounts to over 52% of total population. Not surprisingly, these seven sections, each supporting over 5% of the population are all located in the southern or western part of the Harbour.

It is probable that the current WeBS count data gives a more accurate indication of the size of the passage and wintering populations in the Harbour, than the figures obtained through the past BoEE counts. At low water, approximately 1300 ha of mud is exposed, and most estuary birds are visible. The WeBS counting method initially recorded some species in greater numbers than previously, and it seemed probable that these increases were an artefact of the new counting method. With seven years data now available for comparison, it is apparent that the rising trends of some species are genuine (Figures 1 - 18). Table 2 gives the trends in peak counts of each of the 18 key species, and shows that nine of these are steadily increasing in number, five are stable and four are showing steady declines. As these peak trends are drawn from only seven years of data, they should only be taken as indicative of the longer term population trends.

Table 2 **Seven Year Trends of Peak Counts of 18 Selected WeBS Count Species in Poole Harbour 1991/92 - 1997/98**

Increasing	Population Stable	Decreasing
Little Egret	Dark-bellied Brent Goose	Shoveler
Shelduck	Lapwing	Oystercatcher
Wigeon	Cormorant	Redshank
Pintail	Pochard	Curlew
Teal	Grey Plover	
Goldeneye		
Red-breasted Merganser		
Avocet		
Dunlin		
Black-tailed Godwit		

Of the 10 species whose numbers have been increasing, the steepest rise has been that of the Avocet, the numbers of which, since the winter of 1997/98, have been peaking at above the 1% international threshold of 700 (Fig 13). Poole Harbour remains the third most important wintering site for Red-

Table 1 **The distribution, by section of Poole Harbour, of the key species of waterfowl and waders based on the low water WeBS counts data gathered during 1991/92-19997/98, showing the percentage mean for each species and the total mean persentage of the Harbour population of key species present in each section**

SECTION	WEST (W)									NORTH CENTRAL (NC)						SOUTH CENTRAL (SC)								NORTH EAST (NE)					SOUTH- EAST (SE)			TOTAL
	7	6	5	4	3	2	2	2	1	3	3	3	3	2	1	8	7	6	5	4	3	2	1	3	3	3	2	1	1	2	3	
SPECIES						(W)	(E)			(NW)	(NE)	(SW)	(SE)											(P)	(B)	(BI)						%
Cormorant	*	2	8	2	1	2	1	2	2	*	1	4	3	1	3	*	*	6	*	4	5	*	5	1	5	*	34	*	*	4	1	97
Brent Goose		*	4	*		1	*	*	1					*	*	16	8	*	1	17	2	9	13	1	5	2	1	2	1	15		99
Shelduck	*	1	12	5	6	5	1	*	*	1	1	4	3	*	*	2	3	3	8	10	3	5	4	*		*	4	*	*	16	*	97
Wigeon	*	1	16	3		22	5	*	*	2	*	*	1	*	5	*	1	4	2	6	1	3	1				6		*	9	9	99
Pintail		*	4	8		*					*				*	*	1	6	2	25	2	12					*			16	23	99
Teal	*	1	1	2	6	*				8	12	3	1		3	8	7	10	7	7	3	4	*				7		*	5	4	99
Shoveler			1			1			1						13			2	1		1						12				66	98
Pochard											2													2	2						93	99
Goldeneye		*	1	2	1	11	2	4	3		1	1	2	2	5		*	1	4	8	9	1	13	1	1	2		1	10	12	1	99
Red-breasted Merganser		1	1	5	1	1	2	3	3	*	*	4	2	2	6	*	1	3	1	6	11	1	11	*	3	3		3	7	16		97
Avocet						*	*		*							*	5	*	25	5	1	*					63			*		99
Oystercatcher	*	*	5	7	1	11	6	1	2	*	1	2	4	1	4	1	2	4	4	7	5	3	4	1	7	1	3	4	2	5		98
Grey Plover	*	*	*	9		13	1					*	*		1	1	4	3	4	21	4	6	2			*	1	*	1	26		97
Lapwing	14	36	14	6	8	2	*	*		*			*			12	1		2	2		1							1		99
Dunlin		3	5	14	5	14	1		*	*	5	1	1	*	*	1	3	2	4	7	1	2	*	*	2	1	1	4	*	21		98
Black-tailed Godwit	2	11	6	18	4	3	1	*	*	2	8	6	1	*	1	1	2	7	3	4	1	7	2			*	1	*	*	7		98
Curlew	1	5	12	13	1	9	3		*	1	2	3	4	*	1	1	6	3	8	8	2	1	2		*	*	1	1	*	11		99
Redshank	*	1	3	*	9	5	2	*	*	7	12	19	6	1	*	*	2	4	3	4	2	5	1	*	1	1	1	*	*	10		99
Section Total	17	62	93	94	43	100	25	10	12	21	45	47	28	7	42	43	46	58	79	143	53	60	58	6	26	10	135	15	21	174	197	1770
Section totals as % of Harbour mean of Key species	0.9	3.4	**5.1**	**5.2**	2.4	**5.5**	1.4	0.5	0.6	1.2	2.5	2.6	1.5	0.4	2.4	2.4	2.6	3.2	4.4	**7.9**	2.9	3.3	3.2	0.3	1.4	0.6	**7.5**	0.8	1.2	**9.7**	**10.9**	98.3

* = Section holding <1.0% of Harbour mean of Key Species **Bold** = Sections holding > 5% of Harbour mean of Key Species

breasted Merganser in the U.K. and peak numbers are still slowly rising (Fig 11). Black-tailed Godwit numbers have also shown a steady rise and at peak, the Harbour may possibly hold over 1% of the world population of the Icelandic race (Fig 18).

Five species are maintaining relatively stable populations in the Harbour. Of particular note is the Dark-bellied Brent Goose because, during the late 1960's, only a maximum of 50 birds were in the Harbour, whereas now, the peak population is 1500 birds (Fig 3).

Although over seven years, Lapwing numbers have been stable, which possibly reflects wintering conditions outside the Harbour area, numbers of Lapwing at the beginning of the seven year period were low. Subsequently, these climbed steeply, reaching a peak during 1993/94 (Fig 15), but then declined and annual peak numbers have now stabilised.

There are four species that are showing declining trends in peak populations. The Shoveler population in the Harbour is small and seems prone to considerable variation from year to year but the decline appears genuine (Fig 6). There are three declining wader species, Oystercatcher, Redshank and Curlew (Figs 12, 17 & 19), and all give cause for concern. These three species are numerous and widely distributed around the Harbour, and probably because of this, their declines are not so readily apparent from casual observations.

In the Harbour area there are extensive areas of saltings, *Spartina* islands and reed beds, willow carr and wet grasslands where a number of nationally important species breed.

Of the important passage and wintering birds, only the Redshank is also noted for its Harbour breeding population. The nesting Redshank are mostly associated with the saltmarshes but a few also nest in the lowland wet grassland areas. Poole Harbour holds the largest estuarine breeding Redshank population in SW England.

The Harbour holds about 6% of the U.K. population of breeding Black headed Gulls, mostly nesting on *Spartina* islands, where the colonies are free from mammalian predation. Within the Black-headed Gull colonies, a few pairs of the rare, amber listed, Mediterranean Gull nest. Poole Harbour may have up to 15% of the U.K. breeding population of this species. One of the major surprises is the massive decline of the now amber listed Herring Gull. In the 1970's over 900 pairs nested on Brownsea Island, all have gone. Currently there are probably under 10 pairs nesting around the Harbour and all of these are on houses and buildings adjacent to the Harbour.

Brownsea Island is notable, because of the conservation efforts by the Dorset Wildlife Trust on their nature reserve, for it's nationally important breeding populations of both Sandwich and Common Terns. In 1999, the first nesting of Avocet occurred in Dorset, when two pairs hatched young, but were unfortunately unsuccessful in rearing them. The nature reserve has been long noted for it's Grey Heron *Ardea cinerea* colony, but in 1996 it became the first nesting site for Little Egrets in the U.K. The colony appears to be flourishing and by 1999, the population had risen to 23 pairs.

The areas of carr principally around the west and northwestern areas of the Harbour are important for nesting Cetti's Warbler. At the last national census in 1996, upwards of 35 singing males were recorded, which represents 6% of the U.K. breeding population (Wotton 1997). The reed beds around the Harbour support a small population of around 10 pairs of Bearded Tits, which represents about 2.5% of the U.K. breeding population.

Both the red listed Reed Bunting and the amber listed Water Rail nest around the Harbour but the size of their breeding populations is unknown, although it is unlikely that either would reach the 1% level.

The status of the globally threatened Aquatic Warbler is unclear, but the reed and rush beds in the Harbour would appear to be important to this species during autumn passage.

The anomaly in the Amber list is the Marsh Harrier, a bird that in the 1950's and early 60's nested around the Harbour but for reasons that are not clear, although still regularly seen, has not recolonized the Harbour.

Discussion

The production of a report on the key birds of Poole Harbour raises numerous questions, to which there are, currently, no satisfactory answers. The Harbour is divided into 31 sections but they are not equal in size or in the amount of exposed mud. A large expanse of mud at low water does not necessarily appear to increase the number of birds using that section and small expanses can support high densities. Why such variation? Is it due to the quality of the mud and the resulting invertebrate communities that can live there or is it that some areas of the Harbour get more disturbed than others, as a result of human activities on beaches, bait digging, wind surfing or boating. This needs further research.

The Harbour's once expansive beds of *Spartina* are steadily declining because of dieback, and correspondingly the intertidal mud flats are expanding. It is possible that the recent upward peak trends of several species e.g. Shelduck, Teal, Dunlin, Black-tailed Godwit (Figs. 2, 5, 9 & 10), could be due to an increased invertebrate population in these re-established mudflats. If this were the case, then the declines in Redshank and Curlew (Figs. 18 & 19), may not be food related. There is a need for invertebrate research into the colonization of these re-created areas of mud.

No recent work has been undertaken to verify whether the Harbour high water wildfowl and wader roosting sites identified by Collins (1985, 1986) are still important. It is known, however, that the key roost sites on Brownsea Island lagoon, in Arne Bay, Fitzworth Point and Brands Bay are still in use, although it is uncertain whether the former important winter roost for Red-breasted Merganser, Goldeneye and small grebes in the shallow waters to the east of Round and Long Islands (SC3 & SC4) are still used. If there have been changes, where have they occurred and why?

Several important species nest on the saltings adjoining the mainland or on *Spartina* islands. What impact will the effect of sea level rise have on these Harbour nesting birds? Spring tides in the later part of May in some years wash out all the salting and *Spartina* nesting birds. Fortunately, some of the affected birds relay. Whilst birds are generally safe from predators such as Fox *Vulpes vulpes* on the *Spartina* islands, this is not so on the saltings. Since the early 1990's, there has been a large increase in the population of Sika Deer *Cervus nippon* on the saltings around Poole Harbour. These deer spend a lot of time grazing on the saltings and may occur in herds of up to a 100 animals. With these numbers, it is possible that species such as Redshank could have their nests trampled. Deer also make many tracks through the *Phragmites* reed beds, which are all too evident. This intensive use could results in potential nest destruction of reed nesting species such as Water Rail, Bearded Tit and Reed Warbler. The considerable disturbance caused by the deer crashing through the reed beds could also affect the chances of colonisation of the area by sensitive species such as Marsh Harrier or Bittern.

The only location where many species can nest, unaffected by the Harbour's tidal regime, is the lagoon on Brownsea Island but even here, there are problems. Avian predators such as Great-black-backed Gull *Larus marinus*, HerringGull *L. argentatus* and even Sparrow Hawk *Accipiter nisus* have been known to take young tern chicks (Kevin Cook pers. comm.). Neither is the lagoon free of mammalian problems. The effects of disturbance caused by Sika Deer wading through the lagoon and the possible attentions of the alien North American Mink *Mustela vison* are uncertain. It is not known what effect these factors of sea level rise, predation, trampling and disturbance will have, or are already having, on the success of breeding waders, gulls and terns in the Harbour

Being a south western estuary, Poole Harbour benefits by normally having much less severe winters than the estuaries of northern and eastern Britain. These milder winter conditions have been considered in the past to be an important feature of the Harbour because, when estuaries elsewhere in the U.K. have been frozen up, Poole Harbour is still open and able to receive displaced wildfowl and waders. During the 1990's, there have been only a limited number of severe weather occurrences, and then only of short duration. In the event of prolonged severe winter conditions occurring in the future, further studies might indicate just how important the Harbour is to wildfowl and waders at such times.

Acknowledgements

A current understanding of the birds which use the harbour during passage and winter would not be possible, were it not for the intrepid and unsung band of counters, who in all weathers, undertake the monthly WeBS (and before that, the BoEE counts) counts during the autumn and winter. A debt of gratitude is acknowledged to all those unnamed counters, whose dedicated work has thrown so much light on the numbers and distribution of waterfowl in the Harbour. We would also like to thank Steve Smith, the (WeBS) co-ordinator, for the provision of the count data for Poole Harbour.

We are also grateful to all those birdwatchers, too numerous to name individually, who during the past five decades have provided regular observations of birds in Poole Harbour, without whom this report would have been far less complete.

We would like to thank Kevin Cook and John Stobart for their advice and help.

The Study Group would like to thank the RSPB for contributing towards the costs of preparing this report and the RSPB, Dorset County Council and English Nature for jointly funding the cost of production.

References

Alexander, H. G. (1969). Birds of Purbeck. Purbeck Ornithological Club. Dorset.

Ash, J. S. (1964). Observations in Hampshire and Dorset during the 1963 cold spell. *British Birds* **57**: 221-41.

Ash, J. S. and. Sharpe G. I (1964). Post-mortem and pesticide examinations of birds in the cold spell of 1963. *Bird Study* **11**: 227-239.

Ashby, V. (Editor) (1996-1997). *Dorset Birds* 1995-1996. Dorset Bird Club Aspinall, S. and Tasker, M.L. (1990). Coastal Birds of East Dorset. Nature Conservancy Council. Peterborough.

Aspinall, S. J., Taverner, J. H. & Wiseman, E. J. (1993). History of Black-headed Gull colonies in Hampshire and neighbouring counties. *British Birds*. **88**: 103-114.

Avery, M. (1993). Sandwich Tern. In: Gibbons, D. W, Reid, J. B. and Chapman, R. A. (Editors) The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991. Poyser. London.

Batten, L. A., Bibby, C. J., Clement, P., Elliott, C. D. and Porter, R. F. (Editors) (1990). Red Data Birds in Britain. Poyser. London.

Bibby, C. J. (1992). Polygyny and the breeding ecology of the Cetti's Warbler *Cettia cetti*. *Ibis* **124**: 288-3011

Bibby, C. J. (1993). Cetti's Warbler. In: Gibbons, D. W,, Reid, J. B. and Chapman, R. A. (Editors). The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991. T & A.D. Poyser. London.

Bibby, C. J. (1993). Bearded Tit. In: Gibbons, D. W., Reid, J. B. and Chapman, R. A. (Editors) The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991. Poyser. London.

Blathwayt, F. L. (1933), A revised list of the birds of Dorset *Proceedings of Dorset Natural History and Archaeological Society*. **55**: 165-209.

Boys, J. V. (1974-80). (Editor) *Dorset Bird Reports* 1973-1979 *Proceedings of Dorset Natural History and Archaeological Society* **96-101**.

Boys, J. V. (1974), Check List of the Birds Of Dorset 1972. Dorset Natural History and Archaeological Society. Dorset.

Bradford, R. and Woods, B. (1982). Brands Bay, Wintering Bird Study. *Ecological Report* **12**. Dorset Oil Field Ecological Advisory Group.

Brindley, E., Norris, K., Cook, T., Babbs, S., Brown F. B., Massey, P., Thompson, R. and Yaxley, R. (1998). The abundance and conservation status of redshank *Tringa totanus* nesting on saltmarshes in Great Britain. *Biological Conservation*. **86**: 289-297.

Bromby, A. T. (1983). Poole Harbour. In: Prendergast, E . D. V. and Boys, J. V. (Editors). The Birds of Dorset. David & Charles, Newton Abbot.

Bull, A. J. (1953). The Wildfowl and Waders of Poole Harbour. *Proceedings of Dorset Natural and History and Archaeological Society*. **74**: 149-170.

" " (Editor) (1989-1990). *Dorset Birds* 1988-89. New Dorset Bird Club.

Cade, M. (Editor) (1986-1988). *Dorset Bird Reports* 1985-87. New Dorset Bird Club.

Cade, M. (Editor) (1989-1990). *Dorset Birds* 1988-89. New Dorset Bird Club.

Cade, M. (Editor) (1994-1995). *Dorset Birds* 1993-1994. Dorset Bird Club.

Cayford, J. T. & Waters, R. J. (1996). Population Estimates for waders Charadrii wintering in Great Britain, 1987/88-1991/92. *Biological Conservation* **77**: 7-17

Chapman, A. F. (1977). Marsh Harriers iin Poole Harbour, Dorset, 1943 to 1962. *Proceedings of Dorset Natural History and Archaeological Society*. **99**: 84-86.

Charman, K. (1979). Feeding Ecology and Energetics of the Dark-bellied Brent Goose (*Branta bernicla bernicla*) in Essex and Kent In: (Jefferies, R. L. and Davy, A. J. (Editors).Ecological Processes in Coastal Environments. Blackwell. Oxford

Clafton, F. R.(Editor) (1968-74). *Dorset Bird Report* 1969-73. *Proceedings of the Dorset Natural History and Archaeological Society* **89-94**

Clarke, J. M. & Eyre, J. A. (1993). Birds of Hampshire. Hampshire Ornithological Society. Hampshire.

Collins, D. R. (1985). Poole Harbour, RSPB Ornithological Survey - First Stage Winter/Spring 1984/5. Unpublished report to RSPB.

Collins, D. R. (1986). Poole Harbour, RSPB Ornithological Survey 1984-86. Unpublished report to RSPB.

Combridge, P. and Parr, C. (1992) Influx of Little Egrets in Britain and Ireland in 1989. *British Birds* **85**: 16-21.

Cook, K. (1996). Common and Sandwich Terns on Brownsea Island. *Dorset Birds 1995*: 150-152. Dorset Bird Club, Dorset.

Cook, K. (1998). Little Egrets breeding on Brownsea Island: The first breeding record for Britain. *Dorset Birds 1997*: 168-169. Dorset Bird Club, Dorset.

Cook. K. and Pickess. B. (1994). A brief history of the breeding Mediterranean Gulls in Poole Harbour. *Dorset Birds 1992:* 149-150. Dorset Bird Club. Dorset.

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.A., Waters, R.J., Evans. J, and Pollitt, M.S. (1995). The Wetland Bird Survey 1993-94: *Wildfowl and Wader Counts*. BTO, WWT, RSPB & JNCC, Slimbridge.

Cranswick, P. A., Waters, R. J., Musgrove, A.J. and Pollitt, M. S. (1997). The Wetland Bird Survey 1995-96: *Wildfowl and Wader Counts*. BTO, WWT, RSPB & JNCC, Slimbridge.

Cranswick, P., Pollitt, M., Musgrove. A. and Hughs, B. (1999). *The Wetland Bird Survey 1997-98*, Wildfowl and Wader Counts. BTO, WWT, RSPB & JNCC.

Davidson, N. C. (1998) Compiling estimates of East Atlantic Flyway wader populations wintering in coastal Europe in the early 1990's: A summary of the 1996 WSG wader population workshop. *Wader Study Group Bulletin* **86**: 18-25.

Dixon, B (1967). Wildfowl in Poole Harbour. *Proceedings of the Dorset Natural History and Archaeological Society*. **88**: 76-83.

Flegg, J. M. & Glue, D. E. (1973). A Water Rail Study. *Bird Study* 20: 69-79.

Gartshore, N. (1997). Gull Surveillance 1997. Unpublished report to RSPB.

Gartshore, N. (1998). Gull Surveillance 1998. Unpublished report to RSPB.

Gibbons, D., Avery, M., Baillie, S., Gregory, R., Kirby, J., Porter, R., Tucker, G. and Williams, G. (1996). Bird Species of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man: revising the Red Data List. *RSPB Conservation Review*. **10**: 7-18.

Goss-Custard, J. D. (1977). Responses of Redshank, *Tringa totanus*, to the absolute and relative densities of two prey items. *Journal of Animal Ecology*. **46**: 867-875.

Goss-Custard, L.J. and le V dit Durell, S.E.A. (1983). Holes Bay: Ornithological Survey of the mudflats. NCC/NERC Contract Report.

Gray, A. J. (1985). Poole Harbour Ecological Sensitivity Analysis of the Shoreline. ITE. Huntingdon.

Green, G. P. (Editor) (1981-1985).*Dorset Bird Reports* 1980 -1984 a supplement of the *Proceedings of The Dorset Natural History and Archaeological Society*. **102-107.**

Hafner, H., Kayser, Y., Boy, V., Fasola, M., Julliard, A-C., Pradel, R. and Cezilly, F. (1998). Local survival, natal dispersal, and recruitment in Little Egrets *Egretta garzetta*. *Journal of Avian Biology* **29**: 216-227.

Harvey, P. and Bradford, R. (1984). Wintering Birds (1983-84). Ecological Report No. 15. Dorset Oil Field Ecological Advisory Group.

Haysom, W. T. (1967). A Survey of Breeding Birds of Purbeck 1965. *Proceedings of Dorset Natural History and Archaeological Society*. **88**: 84-92.

Holt, M. and Heathcote, C. (1999). Gull Surveillance 1999. Unpublished report to RSPB.

Kirby, J. S. (1995). Winter population estimates for selected waterfowl species in Britain. *Biological Conservation*. **73**: 189-198.

Kirby, J.S., Ferns, J.R., Waters. R.J. and Prys-Jones. R.P (1991). *Wildfowl and Wader Counts 1990-91*. The Wildfowl and Wetland Trust.

Kirby, J., Holmes, J.. & Sellers, R. M. (1996). Cormorants *Phalacrocorax carbo* As fish predators: An appraisal of their conservation and Management in Great Britain. *Biological Conservation* **75**: 191-199.

Lewis, I. (1996). The Aquatic Warbler in Dorset. *Dorset Birds 1995*: 145-149. Dorset Bird Club, Dorset.

Lock, L. and Cook, K. (1998). The Little Egret in Britain: a successful colonist. *British Birds*. **91**: 273-280.

McClure, R. and Payne, D. (1994). Poole Harbour 1994 Breeding Gulls, Terns, Redshank and Shelduck. In: Fairgrieve, R.E. (Editor). Poole Harbour Aquatic Management Plan *Harbour Survey 1994*. Report to the Poole Harbour Steering Group.

Moule, G.W.H. (Editor) (1966-67) *Dorset Bird Report in Proceedings of Dorset Natural History and Archaeological Society*. **87-88**.

Norris, K., Brindley, E., Cook, A., Babbs, S., Brown, F.B. and Yaxley. R. (1998). Is the density of redshank *Tringa totanus* nesting on saltmarshes in Great Britain declining due to changes in grazing management? *Journal of Applied Ecology*. **35**: 621-634.

Ogilvie, M. A. (1999). Rare breeding birds in the United Kingdom in 1997. *British Birds* **92**: 389-428.

O'Sullivan, J. M. (1976). Bearded Tits in Britain and Ireland 1966-1974. *British Birds* **69**: 473-489.

Pearson, B., Goss-Custard, J. D. and Daniels, R. E. (1991). Dunlin Numbers in Poole Harbour. Report to BP Exploration. ITE Furzebrook.

Peart, R. H. (1995). Report on Bird Ringing in Dorset in 1994. *Dorset Birds 1994*: 120.

Piersma, T. (1986). Breeding waders in Europe: A review of population size estimates and a bibliography of information sources. *Wader Study Group Bulletin* **48**, Supplement.

Prater, A. J. (1981). Estuary Birds of Britain and Ireland. T & D Poyser. Carlton.

Prendergast, E. D. V and Boys, J. V. (1983). The Birds of Dorset. David & Charles, Newton Abbot.

Price, R. (1997) A Survey of Saltmarsh communities within Poole Harbour, Dorset for breeding waders and gulls (1997). Unpublished report to RSPB.

Price, R. and Pickess, B. (1996). A Preliminary Survey of Reedbeds around Poole Harbour, Dorset (1996). Unpublished Report to RSPB.

Prys-Jones, R. P., Underhill, L. G. & Waters, R. J. (1994). Index numbers of waterbird populations. II. Coastal wintering waders in the United Kingdom 1970/71-1990/91. *Journal of Applied Ecology*, **31**: 481-492.

Ranwell, D. S and Hewett, D (1964). Oil Pollution in Poole Harbour and its effects on birds. *Bird Notes*, **31**: 192-197.

Ratcliffe, D. A. (1977). A Nature Conservation Review. Cambridge University Press. Cambridge.

Read, P. S. (1994). A summary of Dorset records of foreign ringed Black-headed and Mediterranean Gulls. *Dorset Birds 1993*: 139-147.

Salmon, D. G. (1983). *Wildfowl and Wader Counts 1982-83*. The Wildfowl Trust, Slimbridge.

Salmon, D. G., Moser, M. E. and Kirby, J. S. (1987) Wildfowl and Wader Counts 1985-86. The Wildfowl Trust, Slimbridge.

Sears, J. (1993). Common Tern. In: Gibbons, D. W., Reid, J. B. and Chapman, R. A. (Editors). The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991. T & A.D. Poyser. London.

Smith, S. (Editor) (1998-99). *Dorset Bird Report* 1997-98. Dorset Bird Club.

Spiroux, P. (1995). Première nidification de l'aigrette garzette en Normandie. *Le Cormoran* **9**(42): 151-158.

Suffern, C. and Ferguson-Lees, I. J. (1964). Cetti's Warbler in Hampshire. *British Birds* **57**: 365-366.

Taylor, R. J. (Editor) (1991-1993). *Dorset Birds* 1990-1992.

Tubbs, C. R. (1991). The population biology of Grey Plovers *Pluvialis squatarola* in the Solent, southern England. *Wader Study Group Bulletin* **61**: 15-21.

Tucker, G. M. and Heath, M. F. (1994). Birds in Europe: their conservation status. BirdLife International. Cambridge.

Underhill-Day, J. C. (1985). The food of the Marsh Harrier *Circus aeruginosus* in East Anglia. *Bird Study* **32**: 199-206.

Underhill-Day, J. C. (1998). Breeding Marsh Harrier in the United Kingdom, 1983-95. *British Birds* **91**: 210-218.

Walsh, P. M and Tasker, M. L. (1993). Black-headed Gull. In: Gibbons, D. W., Reid, J. B. and Chapman, R. A. (Editors) The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991. Poyser. London.

Walters, R.J., Cranswick, A.J., Musgrove, A.J. and Pollitt, M.S. (1998). *The Wetland Bird Survey 1996-97*: Wildfowl and Wader Counts. BTO, WWT, RSPB & JNCC.

Ward, R. (1990). The migration patterns and origins of Poole Harbour's intertidal waders. *Dorset Birds 1989*. New Dorset Bird Club.

White, S. J. (1991). The Effects of Effluent from Poole Sewage Treatment Works upon the Intertidal Macrofauna of Holes Bay, Poole Harbour. N.R.A. Biology Unit, Catchment Control. Unpublished report

Witherby, H. F., Jourdain, F. C. R., Ticehurst, N. F. and Tucker, B. W. (1943). The Handbook of British Birds. Vol. IV. Witherby. London.

Wotton, S. (1997). The Status of the Cetti's Warbler in Dorset 1996. *Dorset Birds 1996*: 164-166.

Wotton, S., Gibbons, D.W., Dilger, M. and Grice, P.V. (1998). Cetti's Warblers in the UK and the Channel Islands in 1996. *British Birds* 91: 77-89.

Map 1 **Location Map of Poole Harbour**

Map. 2 **Original sub-divisions of Poole Harbour (after Bull 1953)**

SE 1 — South Haven
SE 2 — Brands Bay
SE 3 — Littlesea
NE 1 — Sandbanks
NE 2 — North Brownsea
NE 3 — Parkstone
SC 1 — West Goathorn
SC 2 — Newton Bay
SC 3 — Mid-Harbour South
SC 4 — East Fitzworth
SC 5 — Wytch
SC 6 — Arne Bay
SC 7 — Lower Middlebere
SC 8 — Upper Middlebere
NC 1 — Mid-Harbour North
NC 2 — Hamworthy
NC 3 — Holes Bay
W 1 — North Arne
W 2 — Holton
W 3 — Lytchett Bay
W 4 — Giggers
W 5 — Keysworth
W 6 — Swineham

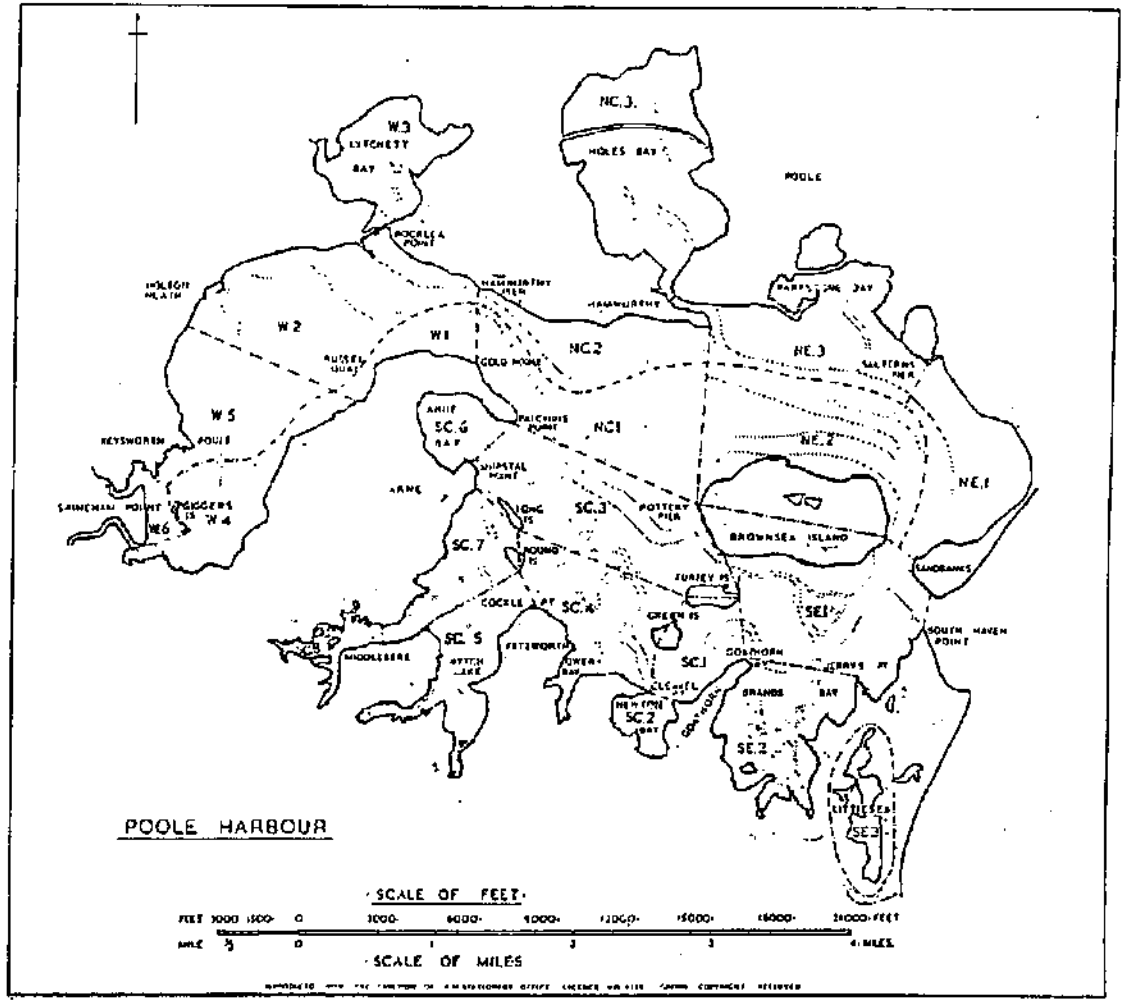

Fig. 1 Little Egret - Peak Annual Low Water WeBS Counts in Poole Harbour during 1991/92 - 1997/98, with trendline

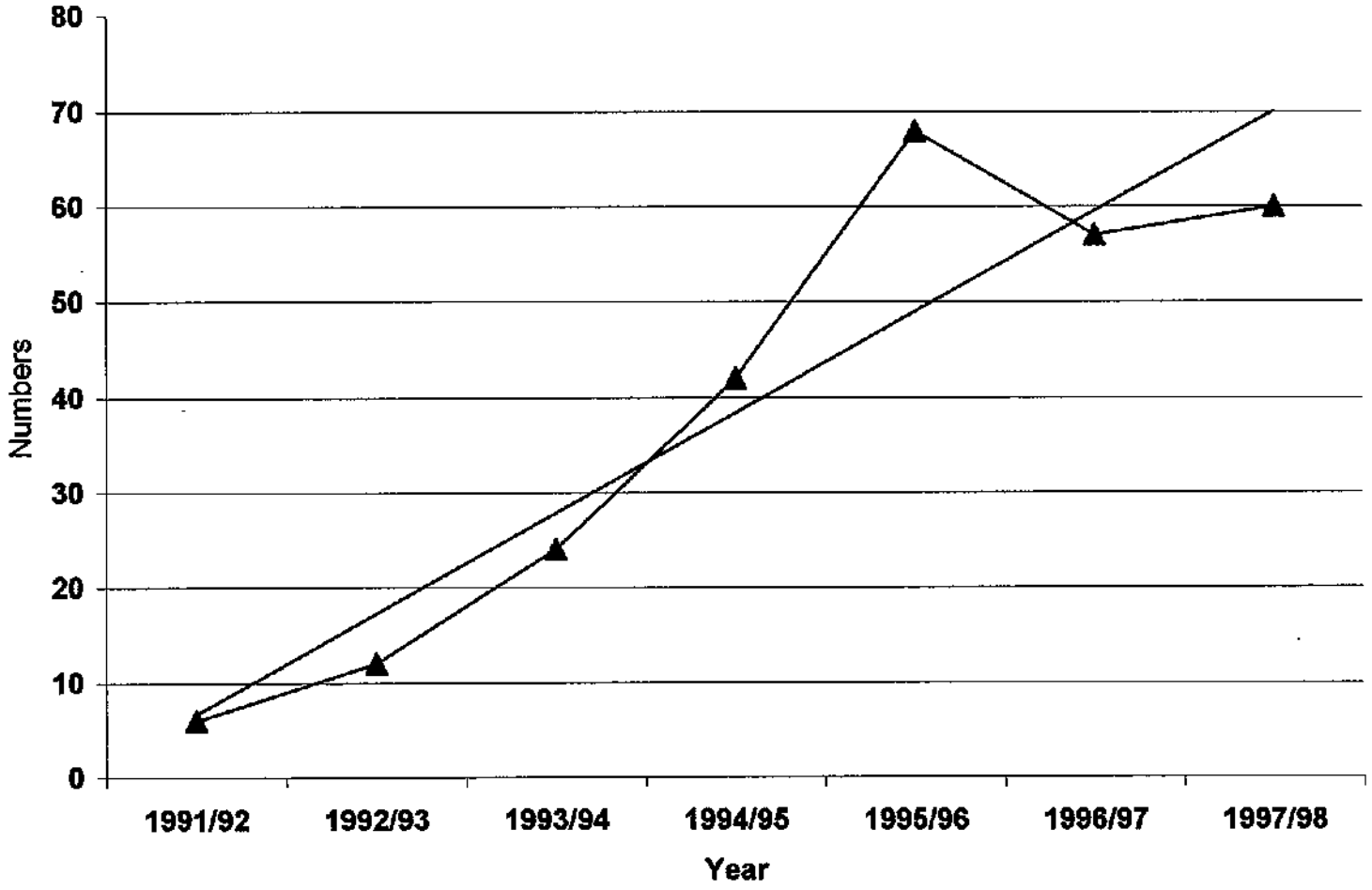

Fig. 2 Shelduck - Peak Annual Low Water WeBS Count in Poole Harbour during 1991/92 - 1997/98, with trendline

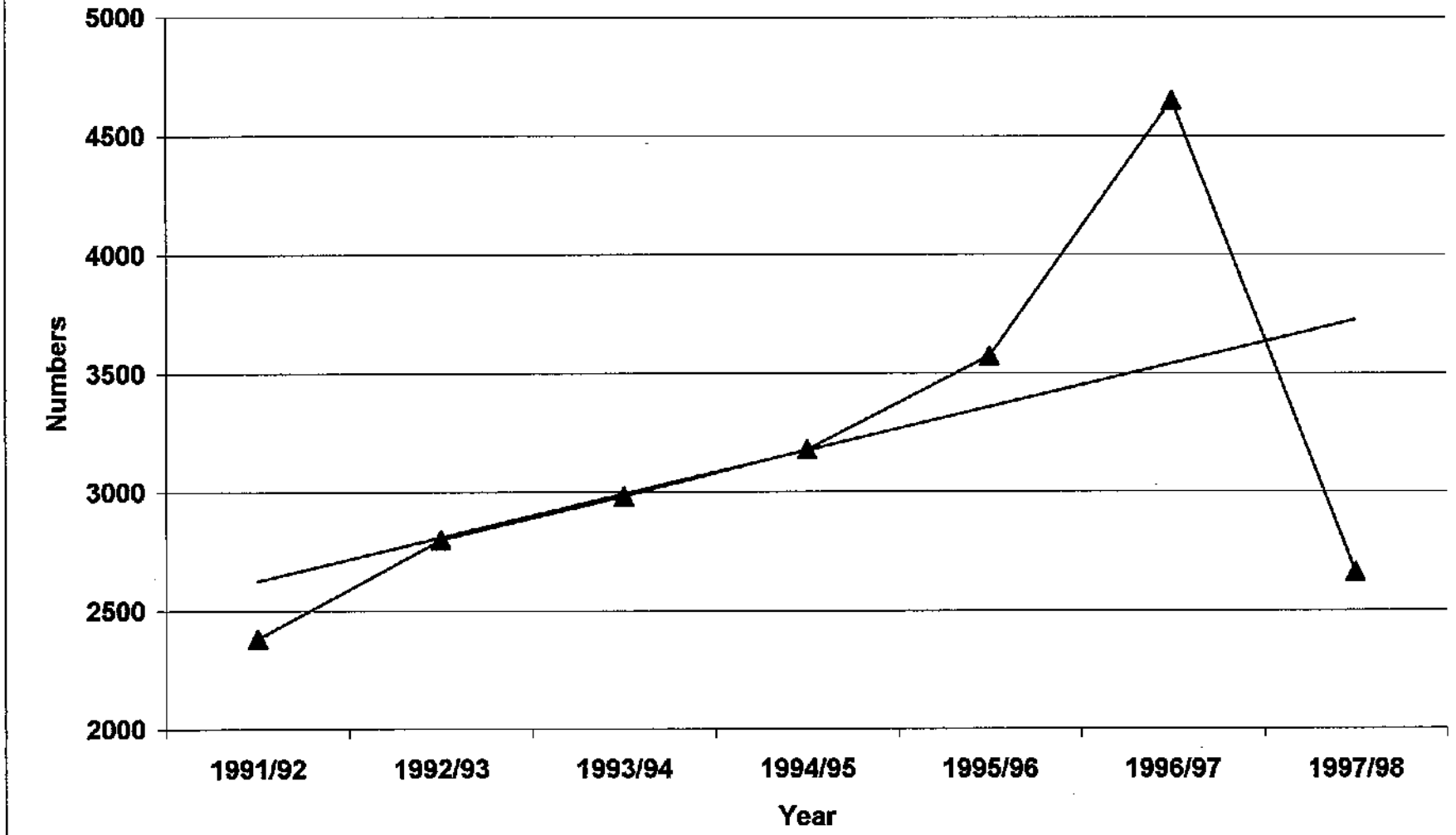

Fig. 3 Wigeon - Peak Annual Low Water WeBS Counts in Poole Harbour during 1991/92 - 1997/98, with trendline

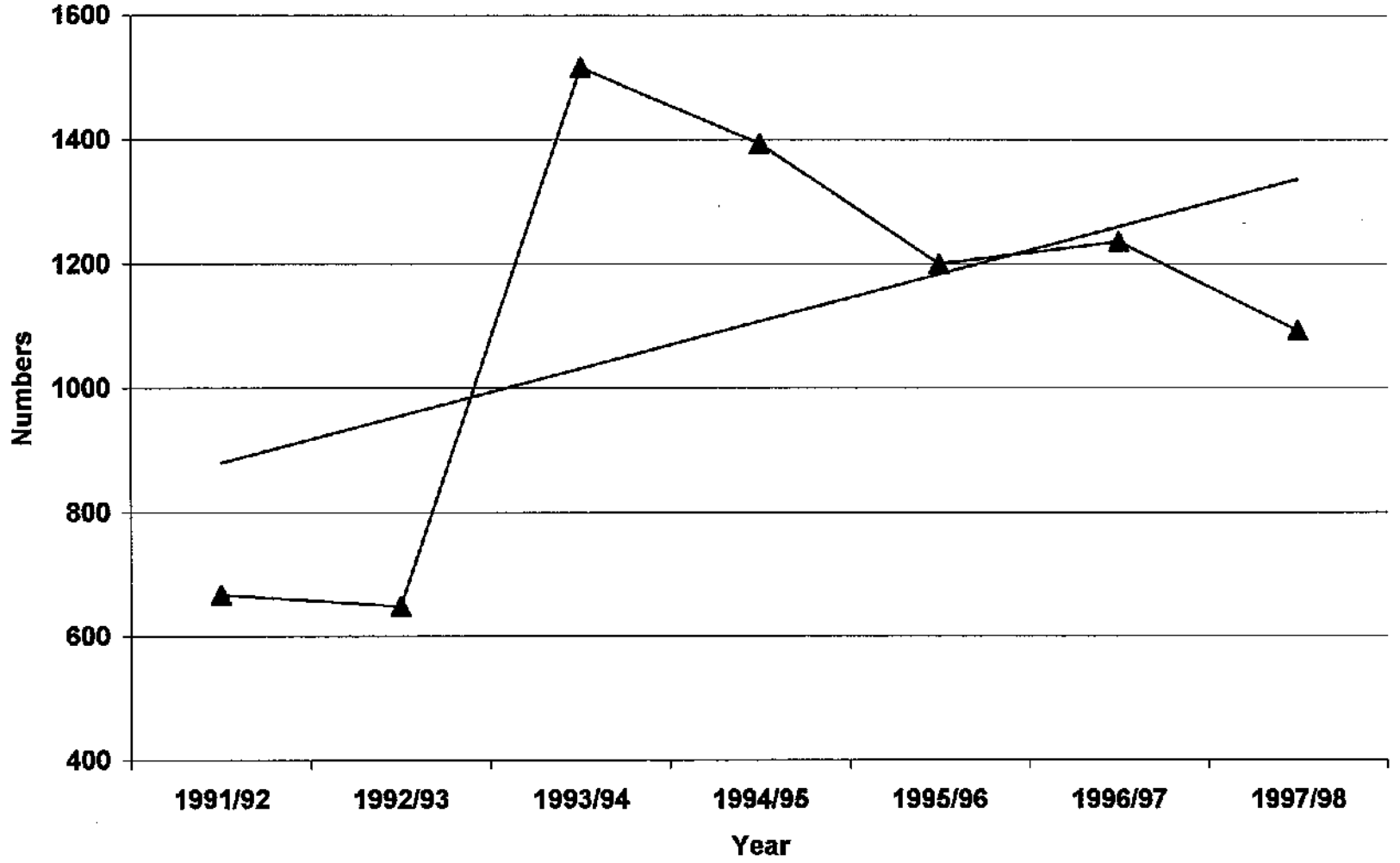

Fig 4. Pintail - Peak Annual Low Water WeBS Counts in Poole Harbour during 1991/92 - 1997/98, with trendline

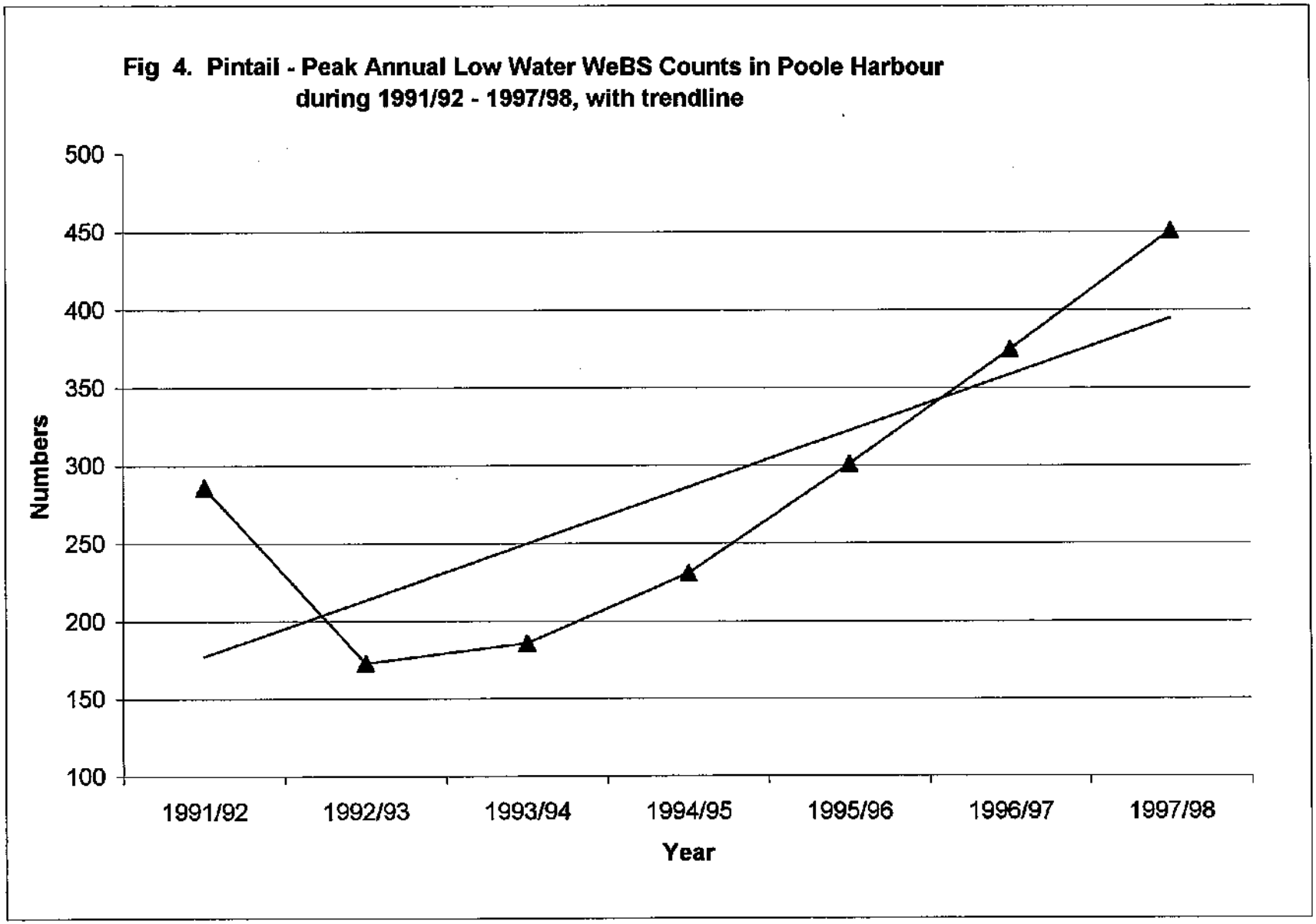

Fig. 5 Teal - Peak Annual Low Water WeBs Counts in Poole Harbour during 1991/92 - 1997/98, with trendline

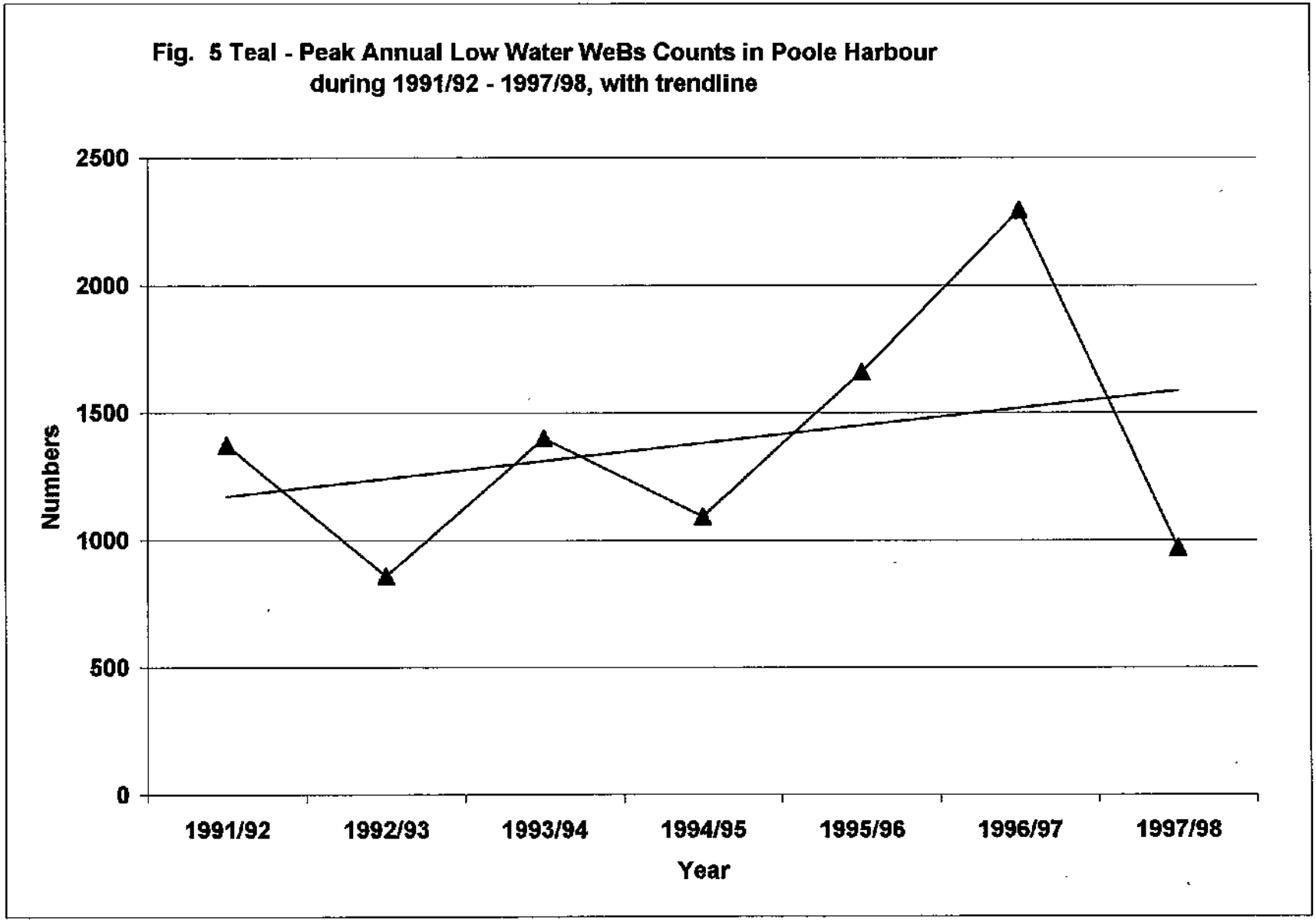

Fig. 6 Goldeneye - Peak Annual Low Water WeBS Counts in Poole Harbour during 1991/92 - 1997/98, with trendline

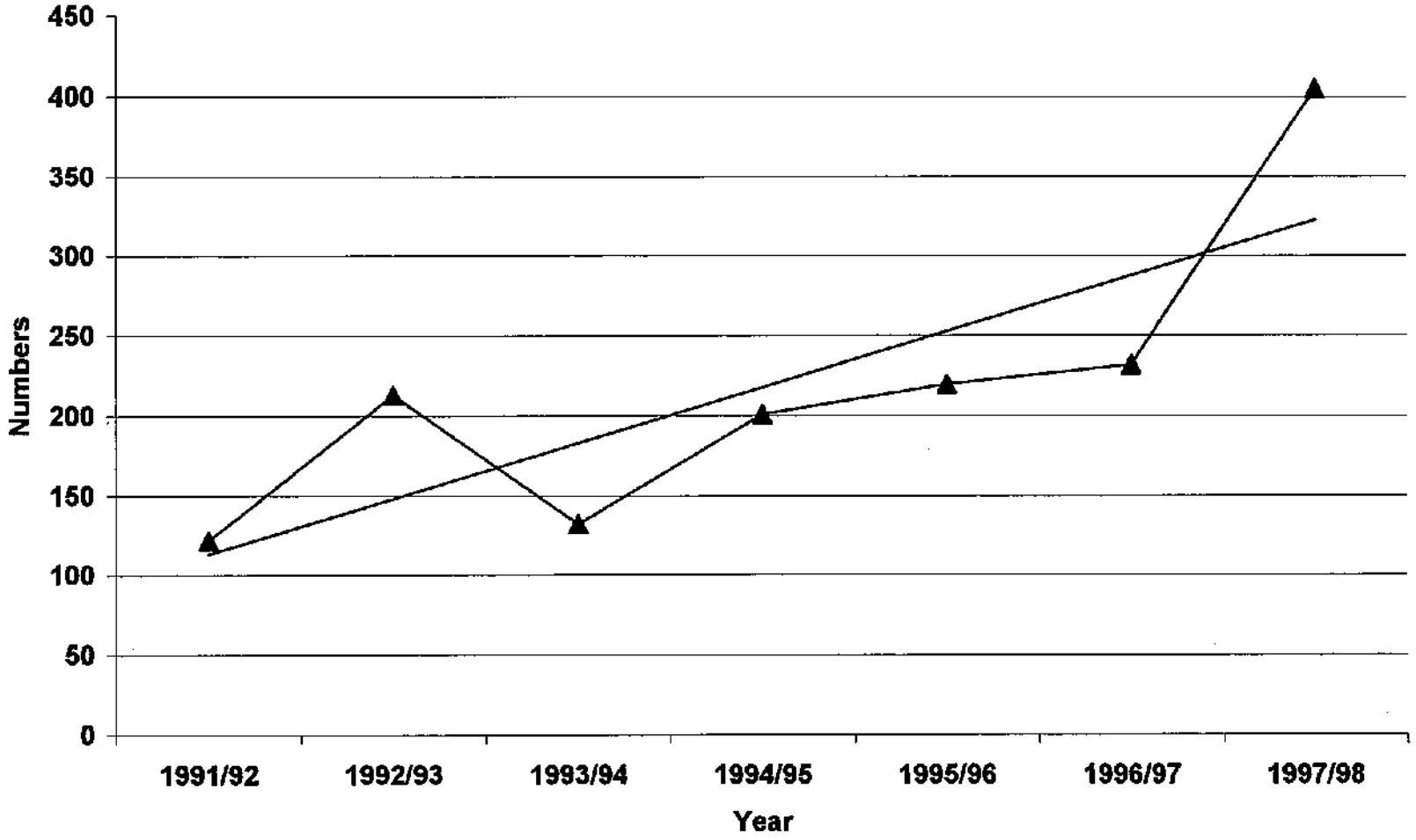

Fig. 7 Red-breasted Merganser - Peak Annual Low Water WeBS Counts in Poole Harbour during 1991/92 - 1997/98, with trendline

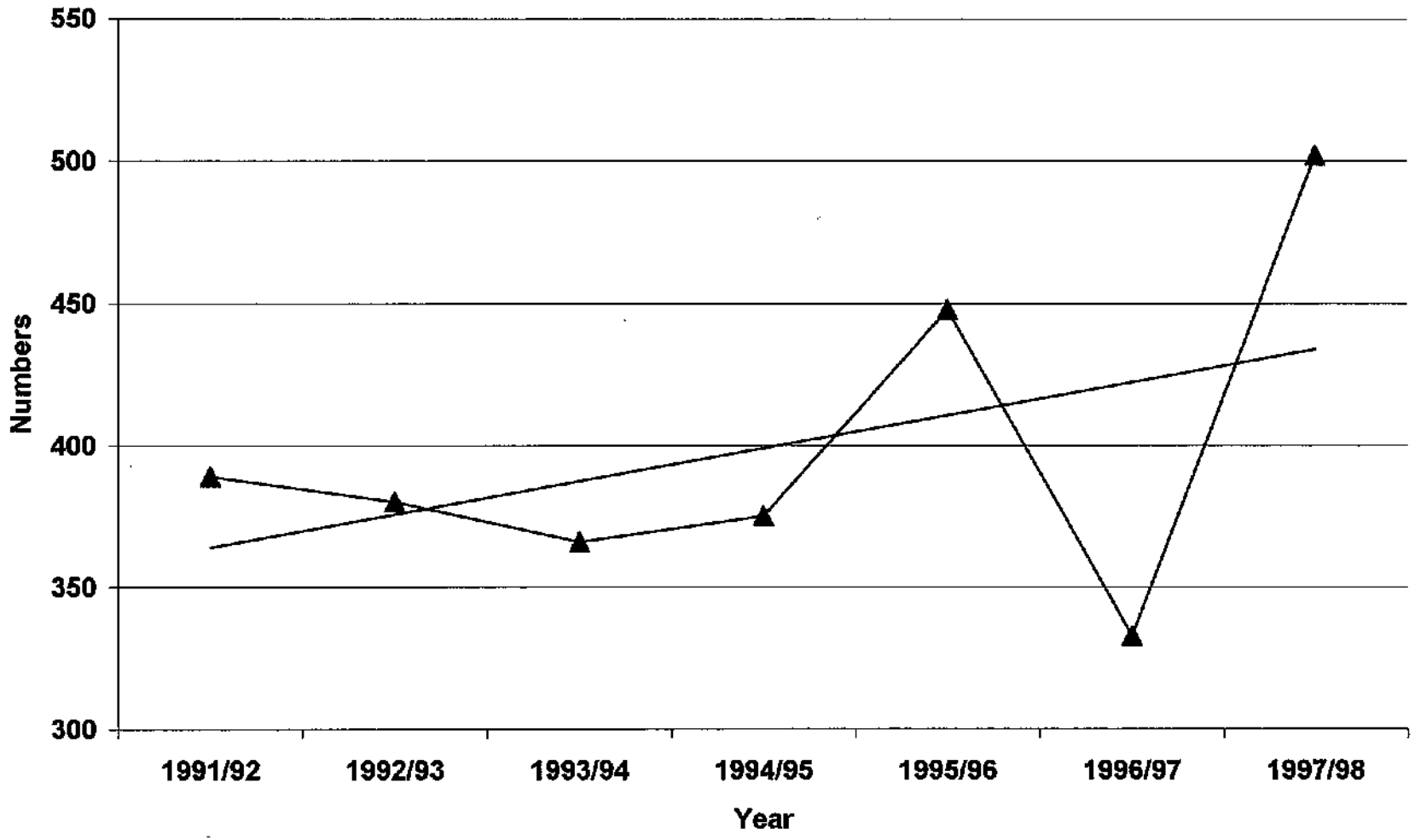

Fig. 8 Avocet - Peak Annual Counts in Poole Harbour during 1986/87 - 1997/98, with trendline (Data Dorset Bird Reports)

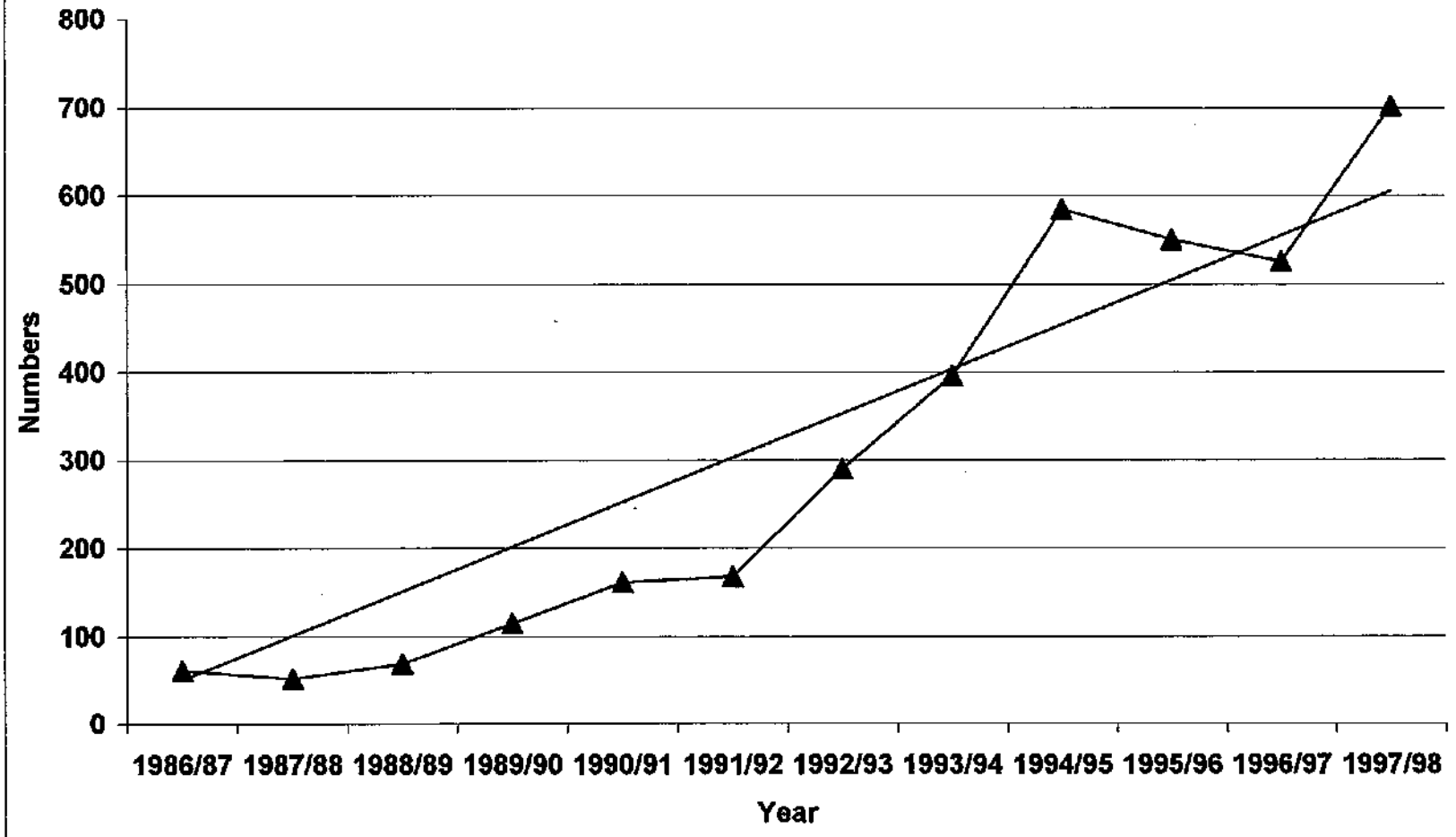

Fig. 9 Dunlin - Peak Annual Low Water WeBS Counts in Poole Harbour during 1991/92 - 1997/98, with trendline

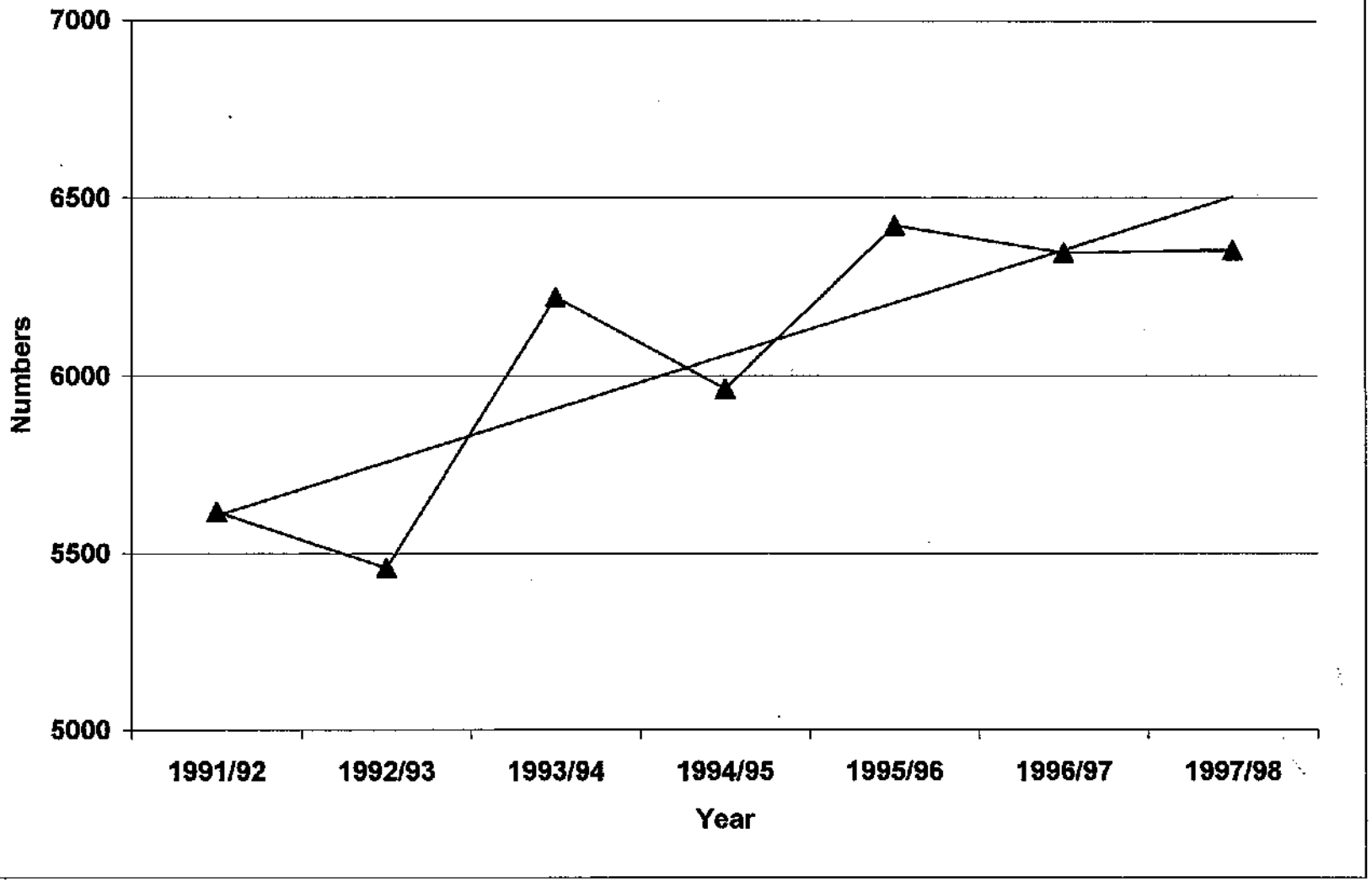

Fig. 10 Black-tailed Godwit - Peak Annual Low Water WeBS Counts in Poole Harbour during 1991/92 - 1997/98, with trendline

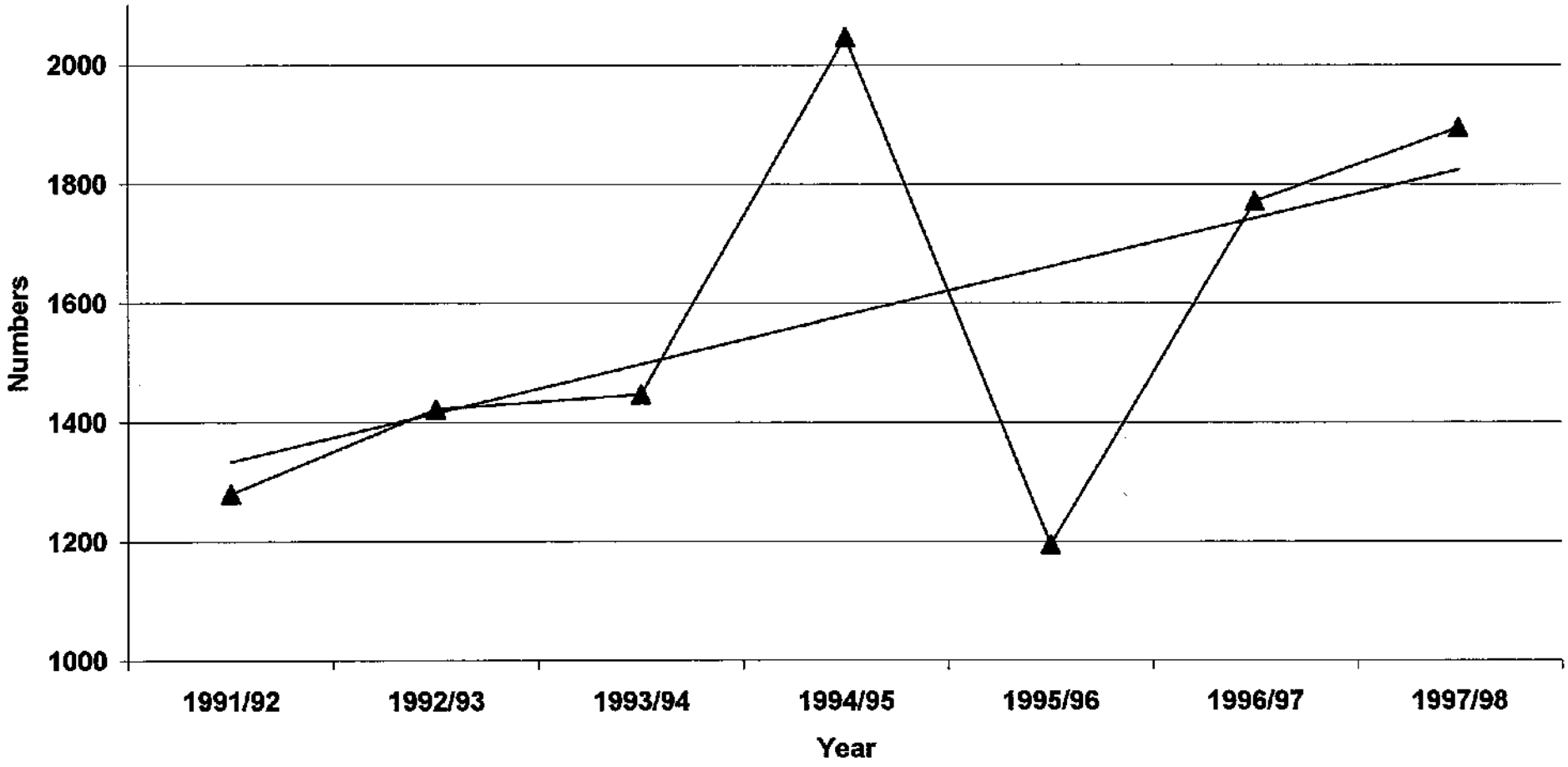

Fig. 11 Cormorant - Peak Annual Low Water WeBS Counts in Poole Harbour during 1991/92 - 1997/97, with trendline

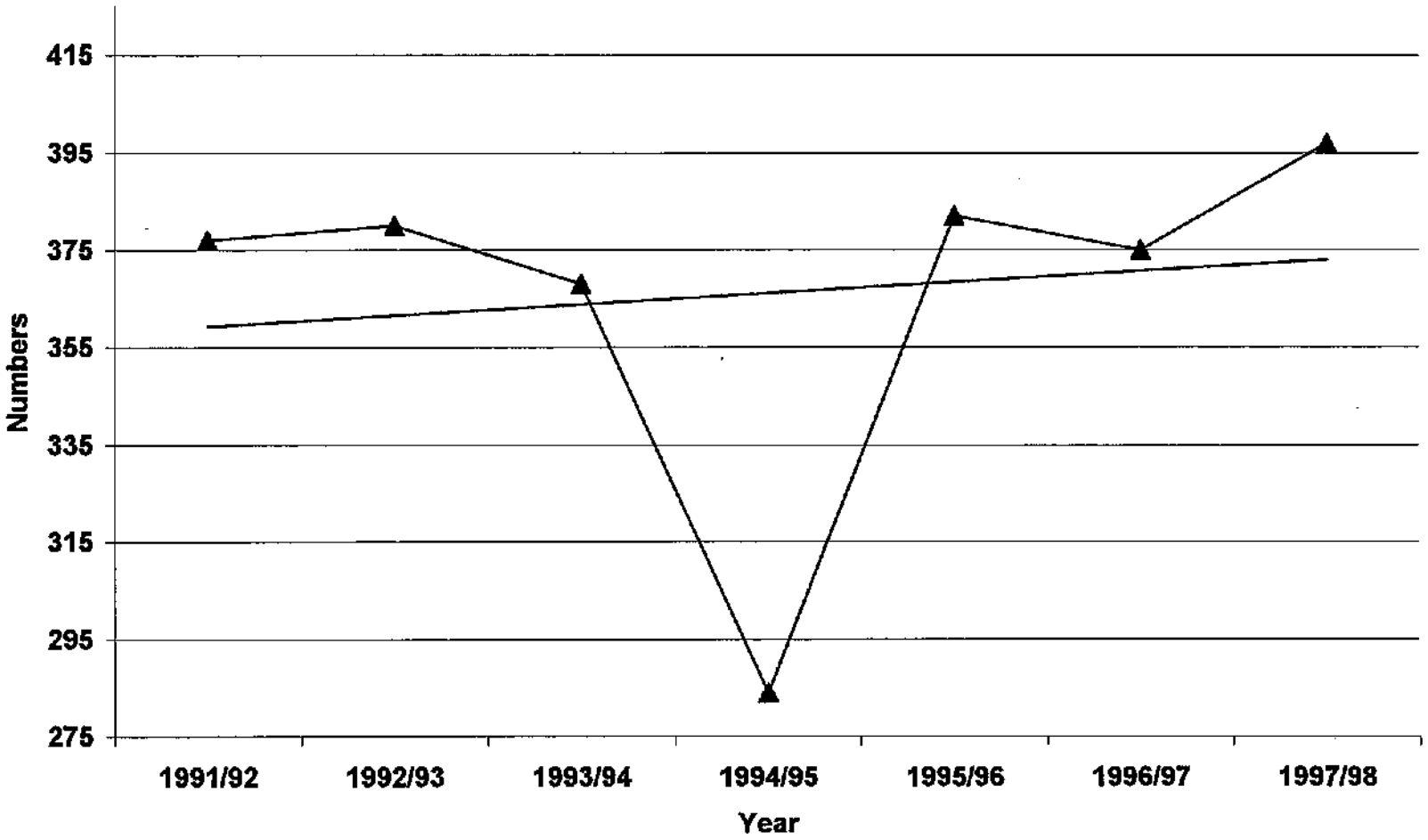

Fig. 12 Dark-bellied Brent Goose - Peak Annual Low Water WeBS Counts in Poole Harbour during 1991/92 - 1997/98, with trendline

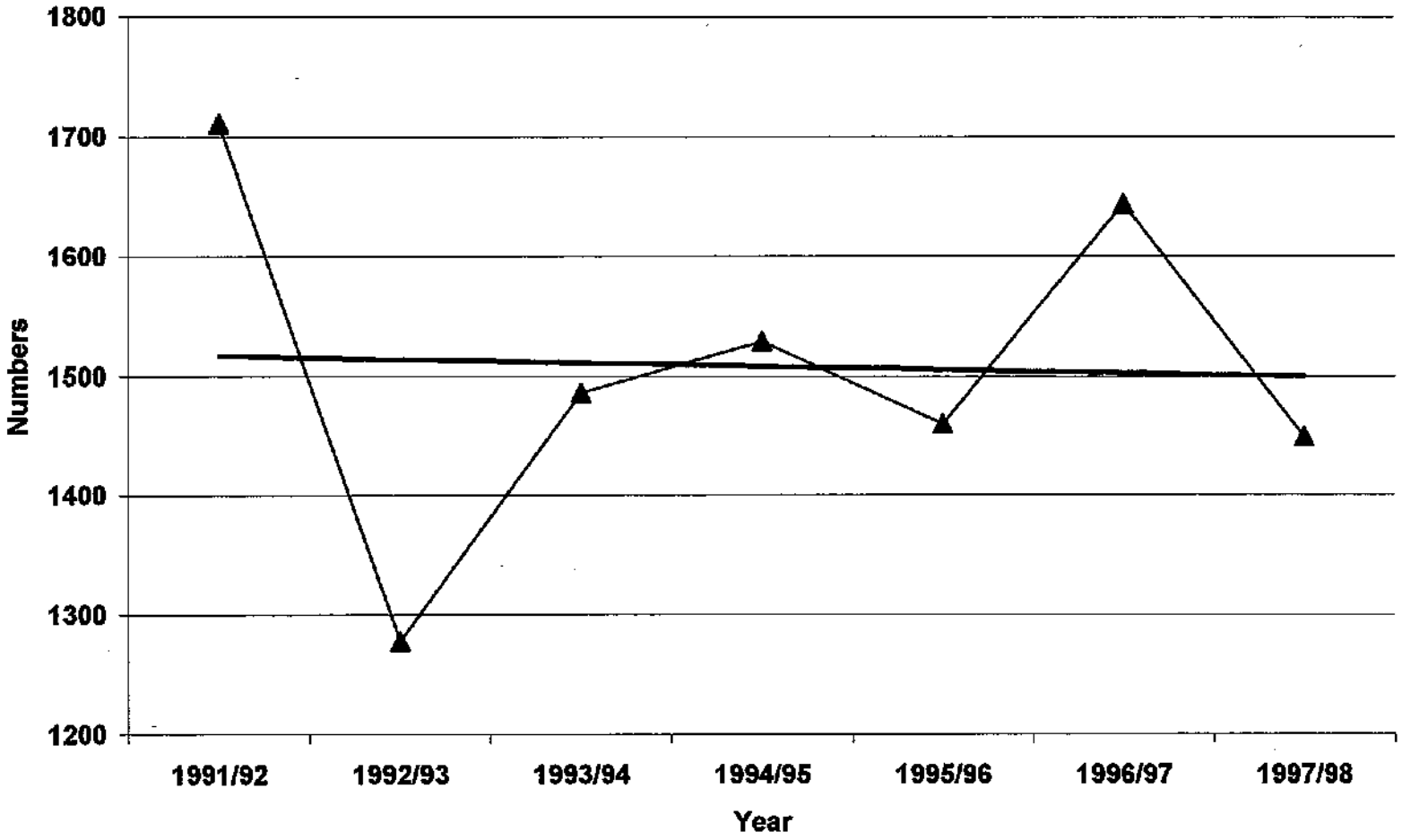

Fig 13. Pochard - Peak Annual Low Water WeBS Count in Poole Harbour during 1991/92 - 1997/98, with trendline

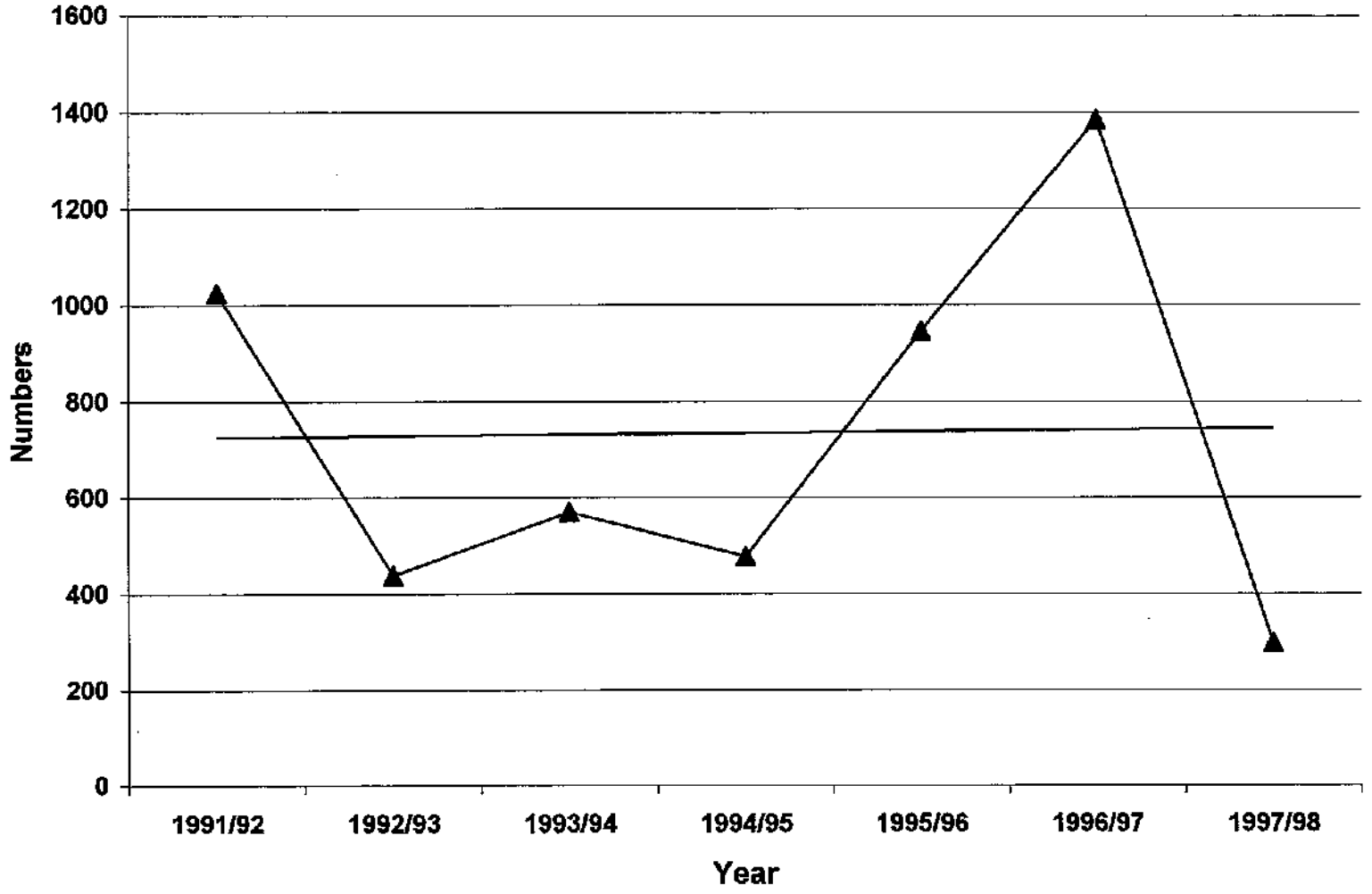

Fig. 14 Lapwing - Peak Annual Low Water WeBS Counts in Poole Harbour during 1991/92 - 1997/98, with trendline

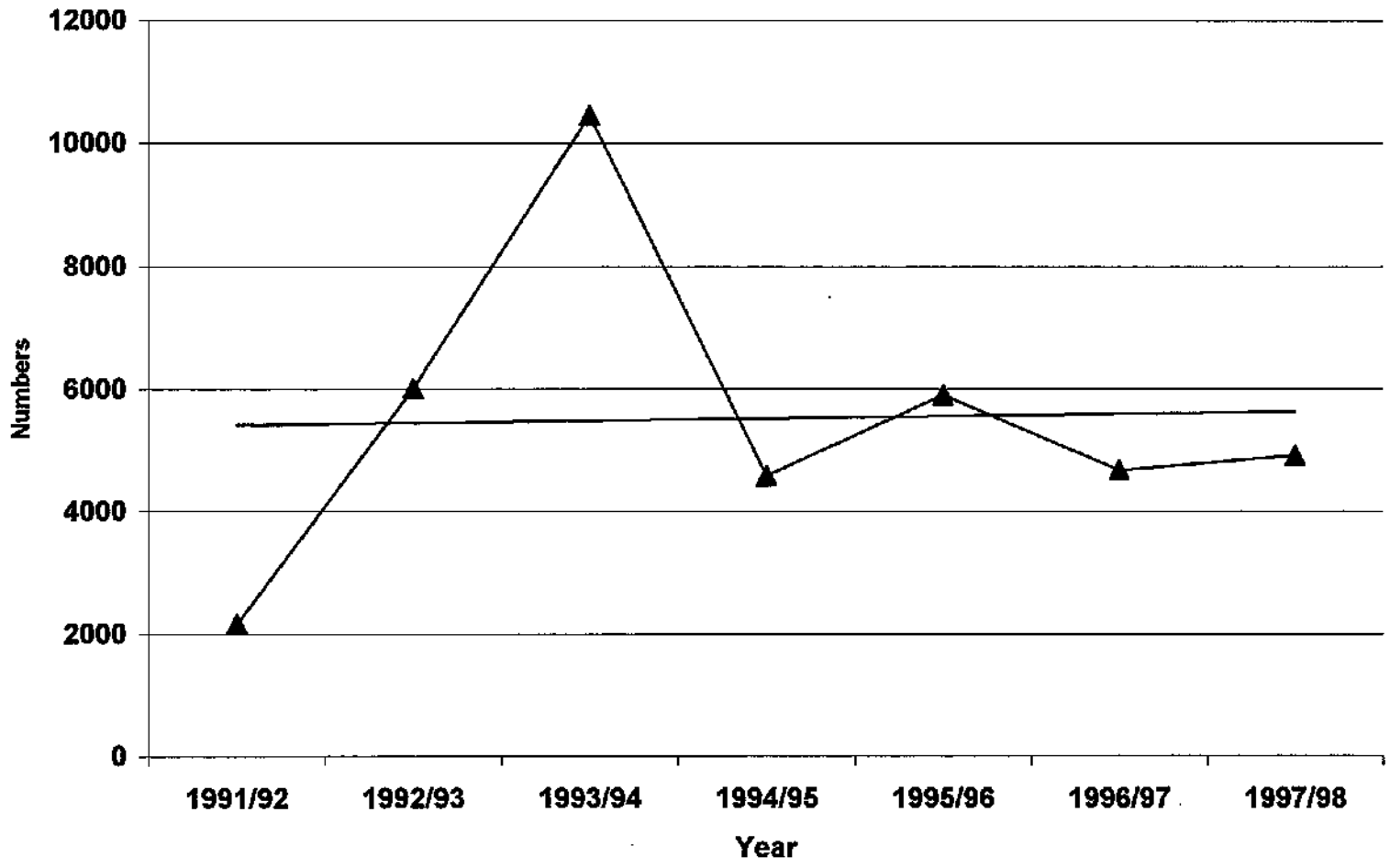

Fig. 15 Grey Plover - Peak Annual Low Water WeBS Countsin Poole Harbour during 1991/92 - 1997/98, with trendline

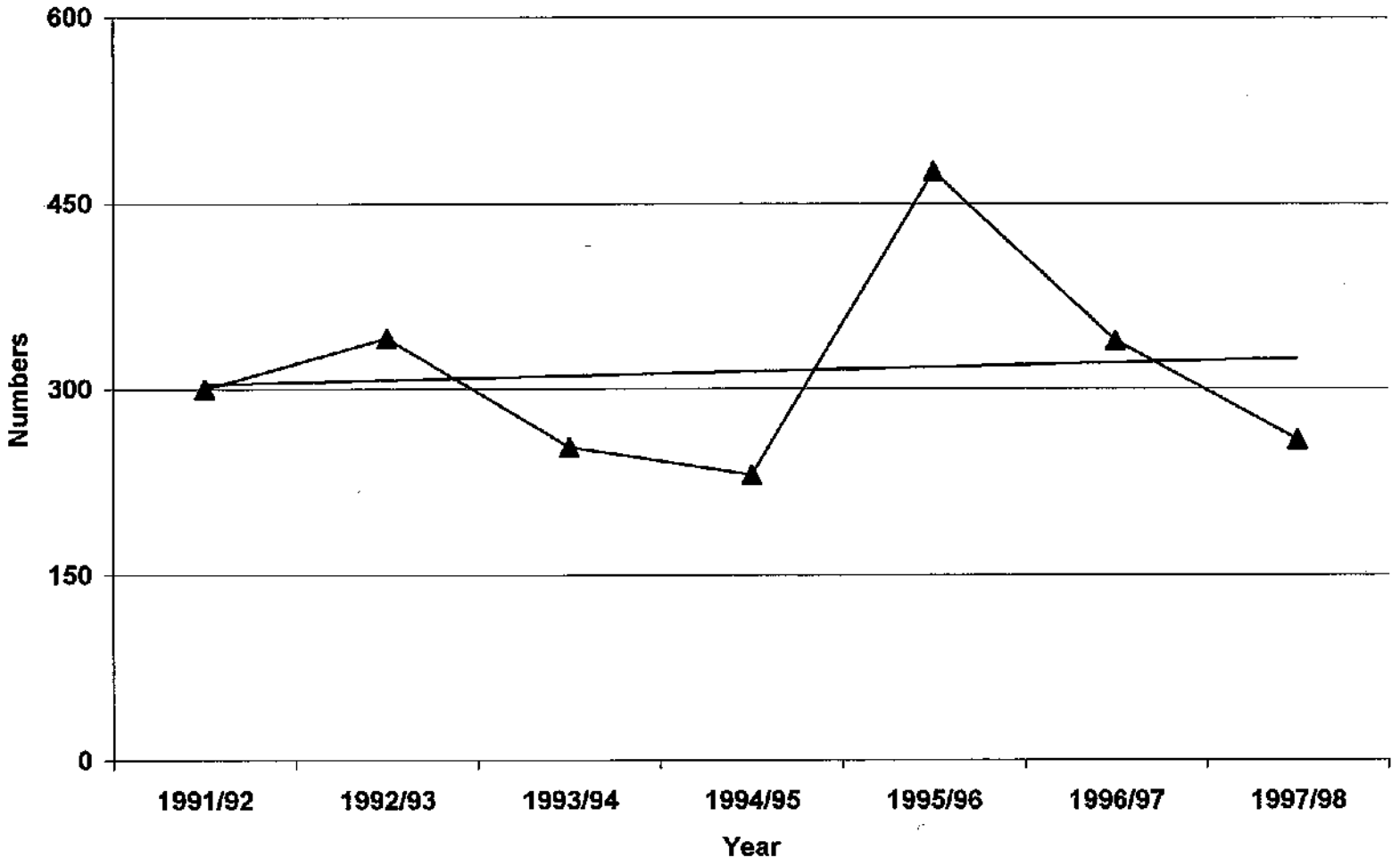

Fig.16 Shoveler - Peak Annual Low Water WeBS Counts in Poole Harbour during 19901/92 -1997/98, with trendline

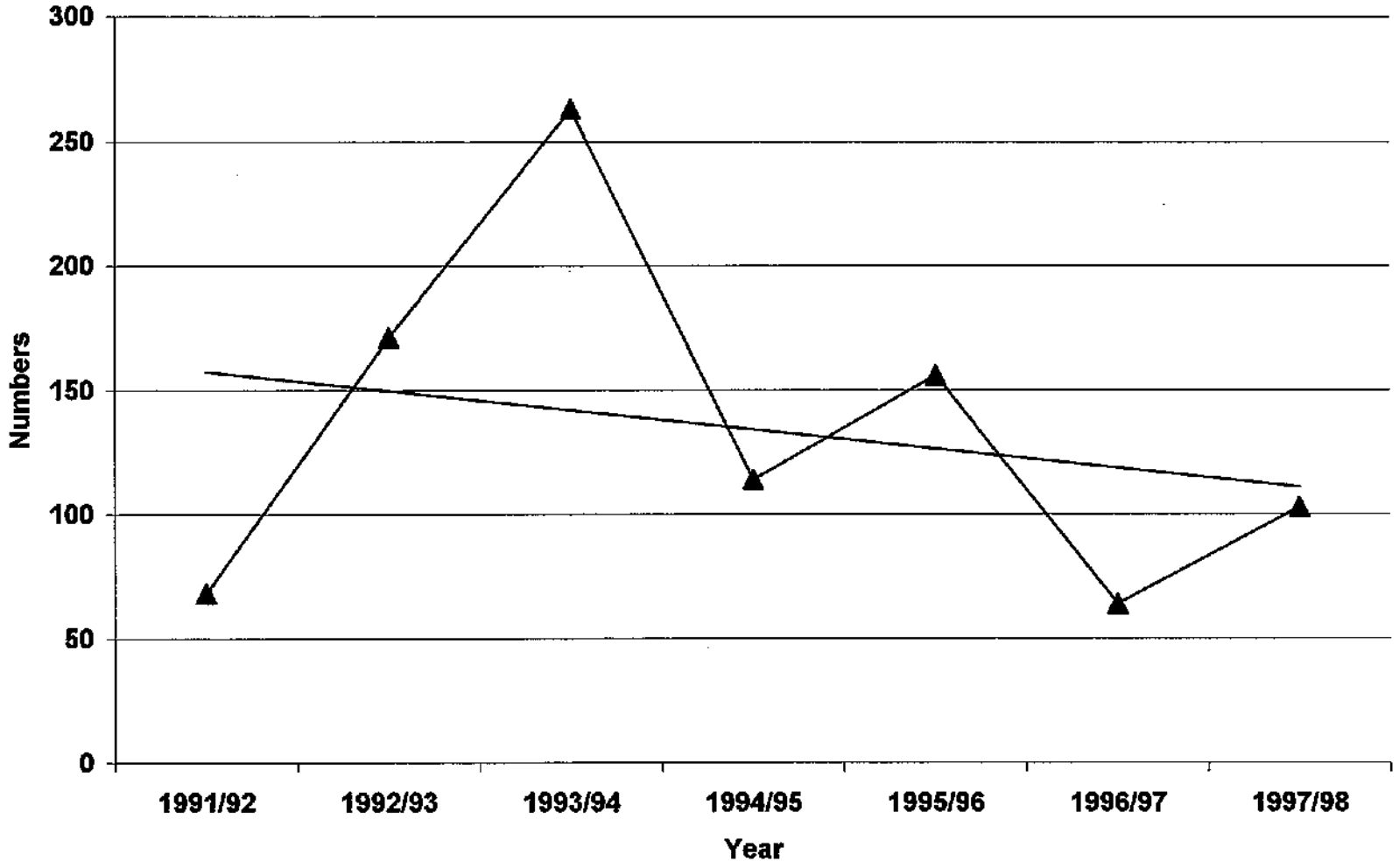

Fig. 17 Oystercatcher - Peak Annual Low Water WeBS Counts in Poole Harbour during 1991/92 - 1997/98, with trendline

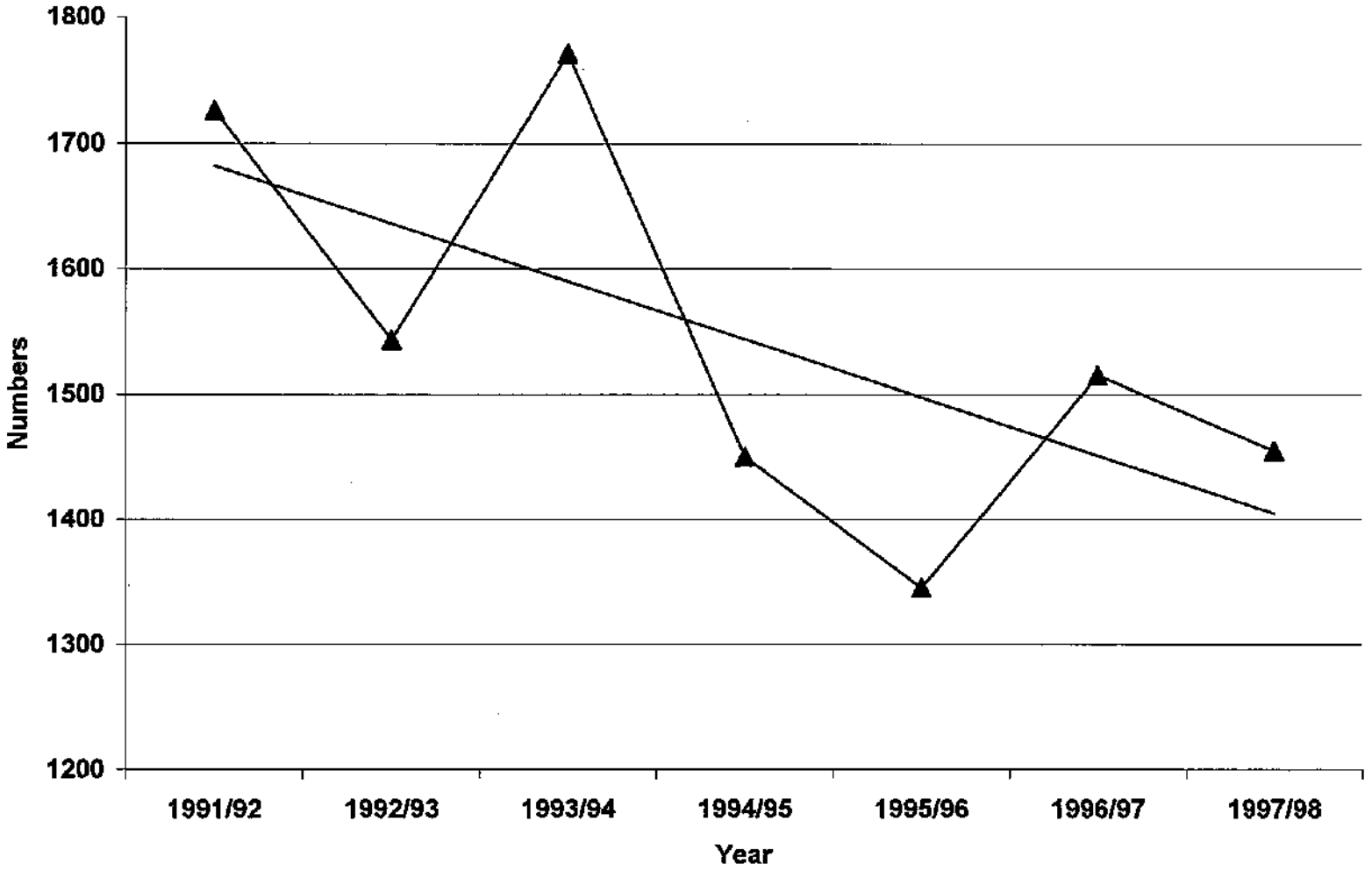

Fig. 18 Redshank - Peak Annual Low Water WeBS Counts in Poole Harbour during 1991/92 - 1997/98, with trendline

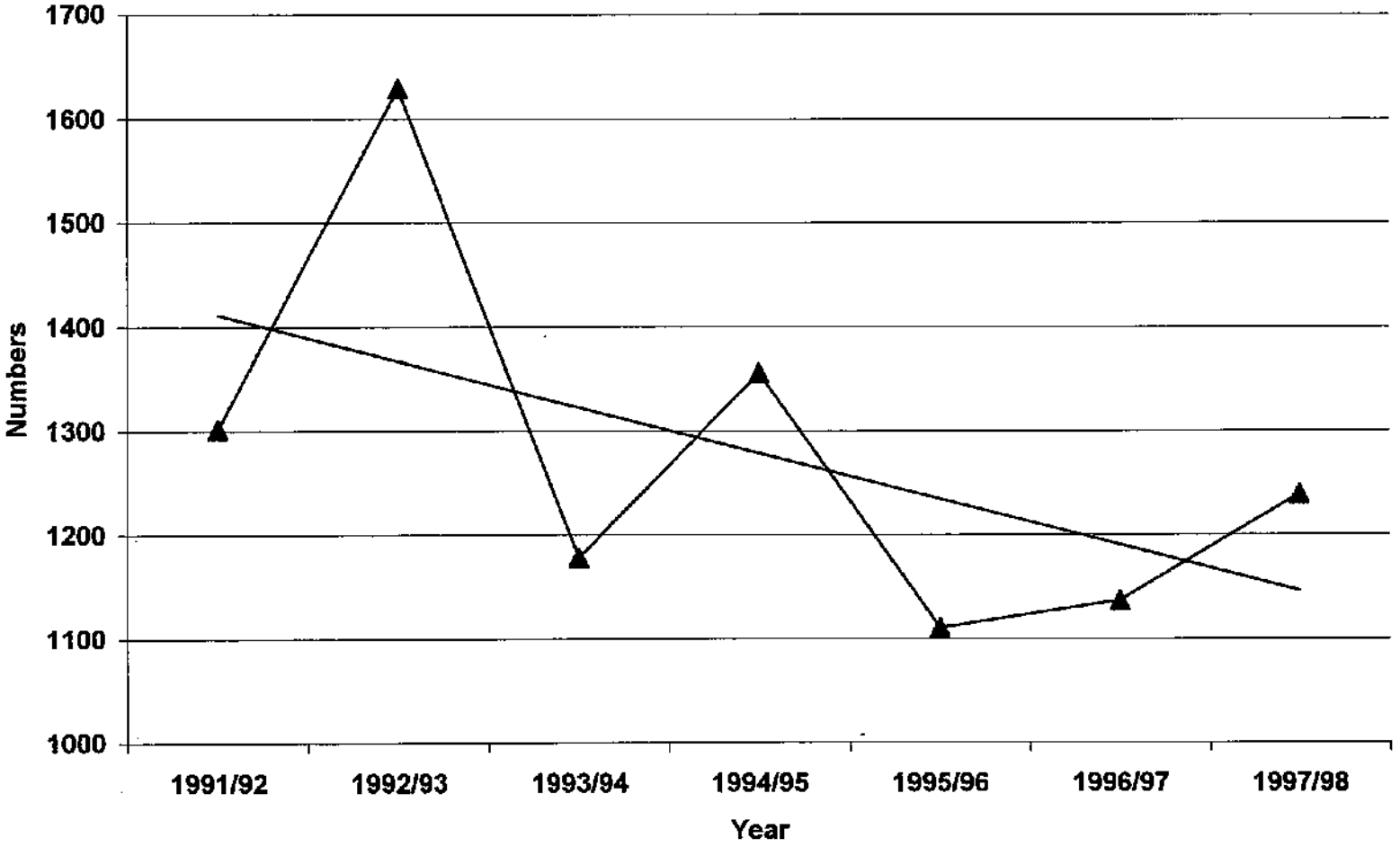

Fig. 19 Curlew - Peak Annual Low Water WeBS Counts in Poole Harbour during 1991/92 - 1997/98, with trendline