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# A HISTORICAL REVIEW OF THE BIRD POPULATIONS OF THE TAFF/ELY ESTUARY AND SURROUNDING AREAS

**A report from the British Trust for Ornithology to Cardiff Bay Development Corporation**

**by**

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## EXECUTIVE SUMMARY

1. This report aims to assess the long-term changes in the bird populations of the Taff/Ely estuary and surrounding areas. All the available data on the populations of waterfowl in the area have been examined, but reliable information was found to be scarce for the years before 1969. Since 1969, the Taff/Ely estuary has been systematically counted as part of the Birds of Estuaries Enquiry (BoEE). The estuary has received particularly good coverage throughout the BoEE.

2. It is possible to detect probable long-term changes in only a few species from the pre-1969 data, although qualitative contemporary information suggests that there was a substantial decline in the numbers of waterfowl wintering in the Cardiff area between 1900 and 1925. This decline coincided with the reclamation of large intertidal areas during the construction of Cardiff Docks. No quantitative data are available on the effects of this land claim on different bird species.

3. Since 1969, systematic data have been collected from both the Taff/Ely and from the rest of the Severn estuary. This report analyses these data and charts the population changes of all commonly occurring waterfowl species over a 21-year period. These changes are related to changes in the overall national populations during the same period. In very few cases was there found to be a close correlation.

4. BoEE data have also been used to examine changes in the importance of the Taff/Ely as part of the wider Severn by comparing the peak winter counts from each estuary. The ways in which each estuary is used are compared by examining the distribution by month of the peak annual count.

5.Prior to 1969, the only species for which long-term changes in populations can be detected from the available data are Wigeon (significant decrease from regular in large numbers to occasional in small numbers), Pintail (increased from rarity status to regular visitor in small numbers), Knot (increased to a peak in the 1960s, thereafter declined) and Bar-tailed Godwit (declined rapidly until 1950s, thereafter rapid increase).

6.Since 1969, results from the BoEE have shown that several species, particularly Oystercatcher and Turnstone, have increased in numbers on the Taff/Ely. Others, particularly Knot, have decreased, whilst the majority of species have remained relatively stable in numbers, despite often very large fluctuations between years resulting from movements of birds into or out of the count areas in response to weather conditions.

# 1 INTRODUCTION

The Taff/Ely estuary (`Cardiff Bay') and the nearby Orchard Ledges (Figure 1.1) are the last remnants of that section of the Severn Estuary which once extended from Penarth Head to the present position of the Cardiff central sewer (Ferns, 1987). Over half this intertidal area has been lost to land claim over the last two centuries (Figure 1.2). The construction of sea defences around the end of the 18th century and of a dredged channel to the Roath Basin both resulted in a loss of intertidal habitat. This loss was accelerated during the latter half of the 19th century, primarily due to the construction of the Roath and Queen Alexandra docks. This development resulted in the mudflats of the Taff and Ely estuaries becoming effectively separated from the rest of the previously continuous intertidal areas along the north Severn shore. Although Orchard ledges is intertidal, the use of land claim materials which did not consolidate quickly resulted in this area becoming covered with gravel. This area is now used as a feeding ground by only a few species of wader and one species of wildfowl (Evans *et al*. 1990, Donald & Clark 1991b).

The more recent encroachment of the hybrid saltmarsh cord grass (*Spartina anglica* C.E.Hubbard) on the northern and western shores of the Taff/Ely estuary has also deprived waterfowl of potential feeding areas, although the resulting saltmarsh forms an important roost site for many species (Donald & Clark, 1991a). Conditions suitable for the establishment and spread of *Spartina* may have arisen from the changed sediment regime resulting from the artificial isolation of this area. However, the encroachment of cord grass, which has been implicated in reducing the numbers of feeding Dunlin on several British estuaries (Goss-Custard & Moser 1988), appears to have stabilised on the Taff/Ely estuary.

Construction of the proposed tidal exclusion amenity barrage across the mouth of the Taff/Ely estuary will result in the permanent inundation of the last remaining intertidal areas west of Cardiff Docks and the subsequent loss of this area to the vast majority of the waterfowl which presently overwinter on the estuary. The gradual erosion of intertidal habitats in the Cardiff area by land claim and industry has been accompanied by the loss to wading birds of safe roost sites around the estuary, principally Cardiff West Moors and Penarth Moors, which was covered by a domestic refuse tip during the 1970s. Construction of the Butetown Link section of the Peripheral Distributor Road will remove further roost sites, and may reduce the overwintering populations of several species (Donald & Clark, 1991a).

To understand the significance of these potential losses it is useful to be aware of the long-term trends in the status and numbers of the bird species concerned. This report assesses the historical information available on the numbers of birds using the Taff/Ely estuary and attempts to identify long-term trends. The report draws information both from all the available data published prior to 1969 and from the results of the Birds of Estuaries Enquiry since its inception in 1969. An analysis of BoEE data shows not only how numbers of birds using the Taff/Ely estuary have changed over a twenty-year period but also how the importance of the Taff/Ely as part of the wider Severn estuary has changed over the same period. Two species of wader, Redshank and Dunlin, have achieved levels of national importance in the Taff/Ely. Further analysis of BoEE data shows how the national importance of each of these species has changed on the Taff/Ely over a twenty-year period.

## 2 ORNITHOLOGICAL RECORDING ON THE TAFF/ELY

It was not until 1969, the first year of the Birds of Estuaries Enquiry (BoEE), that the Taff/Ely (along with all Britain's other estuaries) began to be surveyed by ornithologists on a regular basis. Before 1962, the only sources of data are the annual `Ornithological Notes' of the Cardiff Naturalists' Society. These reports were summarised in Transactions of the Cardiff Naturalists' Society in 1900 and 1925, with a summary of all the available data up to 1966 being published as a book (Heathcote *et al*., 1967). Since 1962, the Glamorgan Annual Bird Report has regularly provided counts of most species commonly found on the Taff/Ely, although it is evident that in some years all the counts presented for the Taff/Ely were collected on just a single visit during the winter.

In all the early accounts, emphasis is placed on the recording of rarities and breeding records. It is interesting to note that, whilst great importance is attached to one or two breeding records of Redshank around the Taff/Ely, no mention is made of the wintering population of this species.

The lack of quantitative data on the numbers of waders and wildfowl wintering on the Taff/Ely estuary prior to 1962 means that an accurate long-term assessment of changes in populations or distributions is impossible, although for certain species it is possible to make generalisations about their long-term population trends. However regular accurate counting has taken place since 1969, allowing an assessment to be made of any changes in the wintering populations of the Taff/Ely over a period of twenty years.

The only systematic survey of the wintering birds of the Taff/Ely saltmarsh is that by Kaletja (1984). However the use of the saltmarsh by roosting waterfowl has been documented (Donald & Clark, 1991a).

## 3 METHODS OF BoEE ANALYSIS

The Birds of Estuaries Enquiry (BoEE), which started in 1969, monitors the distribution and numbers of waders and wildfowl on all UK estuaries (and some non-estuarine sites) by a series of synchronised monthly counts. Counts are performed by teams of experienced local ornithologists who are familiar with their area and who often participate in the BoEE for many years. Counts are carried out around high tide when most birds are on regularly-used roost sites which are known to the counters. This allows more accurate counts to be made but does not allow an assessment of where the birds feed at low tide.

As well as monitoring the populations of birds on individual estuaries, BoEE data are used to calculate an annual national population index based upon counts made in January. This index charts the long-term changes in national populations of waders and wildfowl in Britain (Kirby *et al*. 1991). The counts are also used to assess national and international importance of individual estuaries for each species. If an estuary regularly holds 1% or more of the national population of a certain species, it is considered to be nationally important for that species. If an estuary **regularly** holds 1% or more of a distinct biogeographical population of a certain species, it is held to be of international importance for that species. In the case of waders in Britain, the relevant biogeographical population is the East Atlantic Flyway population (Smit & Piersma, 1989), whereas in the case of wildfowl it is the Western European population (Pirot *et al*., 1989). To determine whether an estuary **regularly** holds nationally or internationally important numbers of a particular species, the average winter peak count over the previous five winters is used rather than the peak winter count in each winter. Thus although an estuary may occasionally hold numbers of a particular species which exceed 1% of the national population of that species, the estuary would not be considered to be of national importance for that species unless the average

peak winter count over a five year period exceeded the 1% level. The levels of national and international importance of the Taff/Ely and Severn estuaries for the five winter periods 1986/7 to 1990/91 are given in Tables 1 & 2.

The following species accounts include analysis of the mass of data collected on the Taff/Ely and the wider Severn since 1969. Reference is also made to earlier counts where these are available.

The analysis presented in this report is designed to show changes in the numbers of birds using the Taff/Ely during the period 1969 to 1990 and to compare these with changes in the national population index. In order to allow an assessment of the extent to which the peak winter counts shown in the figures are likely to be representative of the actual numbers present throughout the winter, Table 3 shows the number of BoEE counts carried out each winter on the Taff/Ely. There is a maximum of five counts possible for each winter (*ie* one count per month from November to March). Peak winter counts must be regarded as likely underestimates of the true maximum number of birds present in all winters, but particularly in those when there were three or less counts carried out. It should be pointed out, however, that particularly good coverage has been achieved on the Taff/Ely right from the start of the BoEE.

Further analysis shows changes in the importance of the Taff/Ely as a part of the wider Severn estuary. This is done by calculating the peak winter count of each species on the Taff/Ely as a percentage of the peak winter count on the Severn in each year. Differences in the patterns of usage of the Taff/Ely and the Severn estuaries are examined by comparing the distribution by month of peak counts on the two estuaries.

BoEE data have shown that two species, Dunlin and Redshank, have reached levels of national importance on the Taff/Ely. Changes

in the national importance of the Taff/Ely for these two species can be assessed by referral to the five-year average winter peak counts from 1973 (the last of the first five years of the BoEE).

## 4 SPECIES ACCOUNTS

A list of all the species known to have occurred on and around the Taff/Ely estuary is given in Appendix 1, which includes notes on their abundance, seasonality, breeding status and distribution as well as notes on any changes over time in status where these are apparent from the available data. The more important species in the context of the Taff/Ely are considered further in the following species accounts. All references to bird populations before 1962 are taken from the *Proceedings of the Cardiff Naturalists' Society* or from the summary of these proceedings given by Heathcote *et al*. (1967). Records from 1962 to 1969 are taken from the *Glamorgan Annual Bird Report* (GABR) and from Ferns (1987). All data analysed from 1969 onwards are extracted from the BoEE data-base housed at the BTO Headquarters.

### 4.1 Shelduck

Most early references to this species refer to the numbers of breeding pairs. In 1900, the Cardiff Naturalists' Society reported that the species "formerly bred along the Penarth Road and Coopers Fields, Cardiff". The species no longer breeds around the estuary but the area still forms an important feeding area for the young reared by breeding birds on Flatholme. Indeed it seems likely that many of the Shelduck wintering on the Taff/Ely are local breeders (Donald & Clark, 1991b).

The earliest reference to wintering Shelduck on the Taff/Ely is from 1925, when they were apparently common. Counts of birds between 1962 and 1969 show that the wintering population of Shelduck on the Taff/Ely estuary varied between 200 and 400 birds, although occasionally higher numbers are reached. In March 1968, over 600 were present, "the highest count for 20 years" (GABR). Occasional very high counts are likely to be due to birds moving into the

Taff/Ely from other parts of the Severn which have been affected by storm erosion of more exposed mudflats after a series of gales (Clark, 1983; Clarke, 1988; Ferns, 1983). Figure 4.1.1 shows that the BoEE peak winter count of Shelduck on the Taff/Ely rose from low levels during 1969 to 1971 to between 200 and 400, with occasional higher and lower counts. During the early 1980s, numbers were higher on average than at any other time. This corresponds to a general increase in the National Index during these years, although an overall comparison of the peak winter count on the Taff/Ely and the National Index does not show a close correlation over the 21-year period. Further examination of the BoEE data shows that peak numbers of Shelduck on the Taff/Ely are usually reached in February or March (Figure 4.1.2). This may partly explain why there is so little correlation between the peak winter count and the National Index, which is based on January counts.

Of all the species examined by Clarke (1988), Shelduck showed the least variation in population over a 15-year period on the Taff/Ely. Further east on the north Severn shore, however, numbers of wintering Shelduck increased dramatically during the 1980s, from less than 100 birds between the Rhymney and the Usk to over 2,000. This increase is far greater than could be explained by the observed increase in the national population index over the same period. One possibility is that pollution has decreased following closure of much of the heavy industry once present on East Moors, although this is unlikely to explain the increases noted as far east as the Usk.

Numbers of Shelduck on the Taff/Ely have never reached levels of national importance, the qualifying level for which is 750 birds (Kirby *et al.*, 1991).

## 4.2 Wigeon

In 1900, the Cardiff Naturalists' Society wrote of this species that "It gathers in large numbers on the East Mud flats, Cardiff, in winter". During the 1920s, "quite large numbers of Wigeon came to the Cardiff mud-flats, both east and west" (Heathcote *et al.*, 1967). Numbers started falling sharply after this and, despite an exceptional count of 250 birds in February 1952, the species had almost vanished from the estuary by 1967. This species is now recorded only occasionally and in very small numbers (rarely more than ten birds) on the Taff/Ely estuary. The reasons for the decline of this species are unclear, but it is possible that sediment changes resulting from reclamation of intertidal areas may have rendered the estuary unsuitable for this species. The loss of surrounding grazing land may also have contributed to the decline of this predominantly herbivorous species.

### 4.3 Teal

This species was described by the Cardiff Naturalists' Society in 1900 as "common as a winter visitor", although the Taff/Ely was not specifically mentioned as a wintering site. Heathcote *et al.* (1967) stated that the Taff/Ely estuary was the most important site in Glamorgan for wintering Teal and quoted counts of 500 birds in 1962/63, 300 in 1963/64 and 250 in 1964/65. 250 birds were present in January 1967 (GABR). However, BoEE counts show that during the 1970s numbers of wintering Teal were considerably lower than during the 1960s with winter peak counts usually less than 100 birds (Figure 4.3.1). Numbers were higher during the 1980s, with winter peak counts of between 100 and 400. The Taff/Ely is still likely to hold the largest overwintering numbers of Teal of any site in Glamorgan. However, numbers of Teal which have been recorded from the estuary have never approached levels of national importance, the qualifying level for which is 1,000 (Kirby *et al.*, 1991).

Peak winter counts over the 21 years of the BoEE were recorded from all winter months, although the majority were recorded in December and February (Figure 4.3.2).

### 4.4 Mallard

This species was described as common by the Cardiff Naturalists' Society in 1900. Heathcote *et al*. (1967) considered the Taff/Ely to hold one of the two main winter concentrations of this species in the county of Glamorgan, the other being at the Burry estuary. Numbers of this species on the Taff/Ely were given as being between 100 and 300 birds. BoEE counts since 1969 indicate slightly lower numbers of between 50 and 150 birds, although higher counts were occasionally recorded (Figure 4.4.1). Numbers were lower than average during the late 1970s and early 1980s.

Peak counts of Mallard over the 21 years since the start of the BoEE were recorded most frequently between November and January (Figure 4.4.2).

Numbers of Mallard on the Taff/Ely have never approached levels of national importance, the qualifying level for which is 5,000 birds (Kirby *et al*., 1991).

### 4.5 Pintail

Until 1930, this species was considered something of a rarity in the Cardiff area. During the 1930s, however, the species was recorded more frequently on the Taff/Ely as numbers increased dramatically along the length of the north Severn shore. Numbers seen in the Taff/Ely estuary remain low, however, with less than 10 birds usually being seen in any winter, although 35 birds were seen in January 1985. This species, like many others, is seen more frequently in the Taff/Ely during severe winters.

The reasons for the dramatic increase in the numbers of this species recorded along the north Severn shore during the 1930s is not known. However it is interesting to note that this species was increasing at a time when numbers of Wigeon were decreasing.

### 4.6 Pochard

In 1900, the Cardiff Naturalists' Society wrote that Pochard "is a common visitor to the East Mud flats, Cardiff", presumably in winter. It was still considered common in 1925. Since then, numbers of this species on the Taff/Ely have fluctuated in response particularly to the weather but also in response to changes in the numbers wintering around the mouth of the Rhymney some 3km to the east. Hard weather during February 1963 brought over 600 birds to the Taff/Ely, exceeding, albeit briefly, the qualifying level for national importance (500 birds). 130 birds were recorded during December 1963 but the highest count made during the winter 1965/66 was only around 40 birds.

During the mid to late 1980s, large numbers of Pochard wintered around the mouth of the Rhymney. The arrival of these birds coincided with dramatic falls in numbers seen on adjacent inland reservoirs. Numbers recorded in the Taff/Ely rose as some of these birds moved into the estuary at high tide. In recent years, numbers of this species wintering around the Rhymney have fallen leading to a fall in the numbers entering the Taff/Ely estuary. The species is still regularly recorded in small numbers in winter, with counts of over 10 birds not uncommon.

### 4.7 Tufted Duck

Tufted Duck were recorded in large numbers on the "East Mud flats" in the late 19th century and were considered common in 1925. More recently they have declined, with usually less than 10 birds being recorded in any one winter. As

with the closely related Pochard, very large numbers may be recorded in severe weather. In February 1963, 500 birds were present and in February 1986, 236 birds were present. As was the case with Pochard, numbers of Tufted Duck increased dramatically during the 1980s around the Rhymney estuary but this did not lead to a dramatic increase in the numbers of this species being recorded on the Taff/Ely estuary.

### 4.8 Oystercatcher

No information is available on the numbers of Oystercatcher wintering on the Taff/Ely prior to the start of the BoEE in 1969, although the Cardiff Naturalists' Society described the species as a common breeder all along the coast of Glamorgan.

The patterns of usage of the Taff/Ely estuary by Oystercatcher have been well documented (Evans *et al*., 1990, Donald & Clark, 1991a, 1991b). Since this species does not usually roost on the Taff/Ely and is recorded in greatest numbers several hours before high tide, the peak winter count (made at high tide) is likely to underestimate the numbers of this species using the estuary. However, the dramatic increase in the National Index noted since 1970 is reflected to some extent by the peak winter counts made between 1969 and 1989 (Figure 4.8.1). Before 1979, numbers fluctuated between 0 and 40 birds, whereas after 1979 numbers rose to between 20 and 60 birds (Figure 4.8.2). In only three years (discounting possible over-estimates due to partial or missing counts on the rest of the Severn) did the peak winter count of this species on the Taff/Ely exceed 10% of the winter peak count on the whole Severn.

Peak annual counts of Oystercatcher on the whole Severn estuary are recorded primarily during autumn and spring, coinciding with peak migration times (Figure 4.8.3). This suggests

that the Severn is more important as a staging post for migrating birds rather than as an overwintering site. The distribution of peak annual counts on the Taff/Ely suggests a similar, but less pronounced, pattern. This pattern of usage must be viewed with caution, however, for the reasons given above.

### 4.9 Ringed Plover

This species was described as a common resident at the beginning of this century, with breeding recorded all along the Glamorgan coast. Breeding has declined over the years, although one or two pairs may still breed in Cardiff docks. The only count of wintering Ringed Plover on the Taff/Ely prior to 1969 is of a flock of 150-200 birds present in February 1963 during very hard weather. Since 1969, recorded numbers have fluctuated to such an extent that a comparison with the National Index shows no correlation (Figure 4.9.1). This species does not tend to roost on the Taff/Ely estuary at high tide, further complicating interpretation of BoEE data. The sporadic nature of this species' appearance on the Taff/Ely is thought to account for the absence of any clear seasonal pattern to the occurrence of peak annual counts (Figure 4.9.2). On the Severn as a whole it is clear that peak numbers of this species occur during autumn migration, particularly in August.

The sporadic use made by this species of the Taff/Ely estuary, no doubt exacerbated by the fact that this cryptic species is easily missed, has meant that its importance in relation to the Severn as a whole has fluctuated enormously. There is no apparent trend to such fluctuations (Figure 4.9.3).

### 4.10 Grey Plover

In 1900, the Cardiff Naturalists' Society described this species as "Not very common" in Glamorgan as a whole but went on to

state that "It is frequently seen in fair numbers on the East Mud flats, Cardiff, in winter". Small parties of a dozen birds or less were recorded during the late 1930s. In 1966, between 20 and 40 birds were present around the mouth of the Taff (GABR) and 22 were present in December 1968. BoEE counts show that despite a very pronounced long-term increase in the national population, numbers of birds wintering on the Taff/Ely have not risen significantly (Figure 4.10.1), although the species is now recorded annually. The highest recorded count was of 70 birds in December 1983. The winter peak count on the Taff/Ely has never exceeded 20% of the winter peak count on the Severn as a whole and the figure is usually far lower (Figure 4.10.2). The monthly distribution of peak annual counts (Figure 4.10.3) strongly suggests that this species occurs in largest numbers in winter rather than on spring or autumn passage. Results suggest also that peak numbers are reached on the Taff/Ely rather earlier than on the Severn as a whole, implying that the Taff/Ely may be a preferred overwintering site.

**4.11 Lapwing**

Although the decline in numbers of breeding Lapwings along the Glamorgan coast has been relatively well documented by Heathcote *et al*. (1967), there are no equivalent records for the numbers of wintering birds. During the severe weather in February 1963, up to 1500 birds were present on the Taff/Ely. BoEE counts carried out since 1969 show numbers to have fluctuated in a way which cannot be ascribed simply to winter temperatures (Figure 4.11.1). The majority of Lapwing wintering in Britain tend to winter inland on fields with large numbers moving to estuaries only during hard weather. Because of this, a comparison of winter peak counts on the Taff/Ely with changes in the National Index would be meaningless. The fluctuations are almost certainly related to movements of this species

around the Taff/Ely as well as to influxes of birds in hard weather. On high spring tides, Lapwing leave the estuary to roost further up the river Taff outside the BoEE count site. Thus although this species was recorded in very low numbers by BoEE counts during the winter 1980/81, a count in January 1981 away from high tide showed there to be 450 birds present. The winter peak count on the Taff/Ely has only once exceeded 10% of the winter peak count on the Severn as a whole, and the figure is generally very much lower (Figure 4.11.2). However it might be expected that the percentage would increase during particularly severe weather.

BoEE counts since 1969 show that both on the Taff/Ely and on the Severn as a whole, peak numbers of Lapwing are usually reached during the winter months (Figure 4.11.3).

**4.12 Knot**

In 1900 the Cardiff Naturalists' Society wrote of this species "They are seen every winter in small numbers on the Cardiff Mudflats". Although this pattern of usage is totally different from that found today, when very large numbers of this species are recorded very occasionally, Heathcote *et al*. (1967) assume "that this record is a reliable assessment of its then status". In 1925 there was apparently little change in its status. Up to 1940 it was apparently recorded only occasionally along the coast but from 1950 onwards began to appear more regularly and in larger numbers. In the 1960s there was a regular wintering population in the Taff/Ely which often reached 2-3,000 birds in December. Shortly after this, however, there is clear evidence that this species occurred progressively less frequently, although occasionally still in large numbers. BoEE counts show that these fluctuations do not coincide with trends in the National Index of this species (Figure 4.12.1). Work carried out on other estuaries (*eg*

Clark *et al.*, 1990) has shown that this species forms large mobile flocks in winter which move around and between estuaries. However, the apparently regular occurrence of this species on the Taff/Ely estuary before 1970 and the more sporadic arrivals since that year do strongly suggest that the estuary has become less attractive as a feeding ground in the last two decades. No large flocks of this species were recorded on the Taff/Ely during intensive fieldwork on the estuary between August 1990 and May 1991 (Donald & Clark, 1991b) despite particularly severe weather during February 1991.

It seems likely that the large flocks of Knot occasionally recorded in the Taff/Ely estuary represent a very high proportion of the total Severn wintering population. When the arrival of a large flock on the Taff/Ely coincides with a BoEE count, it can be seen that the winter peak count on the Taff/Ely represents a very high proportion of the winter peak count on the Severn as a whole (Figure 4.12.2).

This species has frequently, but not regularly, exceeded the qualifying level for national importance of 2200 birds.

**4.13 Curlew Sandpiper**

At the end of the last century this species was considered to be a regular winter visitor in small numbers to the Taff/Ely estuary. However, doubts must be cast on this status given that the BoEE has shown this species to be an extreme rarity in Britain during the winter. The species is today an occasional autumn migrant to the estuary in very small numbers.

**4.14 Dunlin**

This is the commonest species found wintering on the Taff/Ely estuary and, with the exception of the occasional flock of Knot, appears to have always been so. In 1900 the Cardiff

Naturalists' Society described the species as a very common winter visitor to Glamorgan but did not mention any specific sites other than to say that examples of two races of this species had been shot on the "Cardiff East mud". During the four years up to 1967, Heathcote *et al*. (1967) considered the normal winter peak for this species to be between 2,000 and 3,000 birds but cited some counts of up to 6,000. During the very cold weather early in 1963, up to 8,000 birds were present on the Taff/Ely estuary and in 1966, 10,000 birds were seen flying west past Lavernock Point. Such a movement is typical for birds leaving the Taff/Ely estuary around high tide for the high tide roost at Sully Island. Another count of 10,000 birds was made on the estuary in December 1979. In 1968 there was a peak count of around 3,000 birds on the estuary although it was noted that "numbers varied considerably according to the state of the tide". Since 1969, BoEE counts have shown the peak winter count of Dunlin on the Taff/Ely to fluctuate between 2,000 and 6,000 birds with occasional higher and lower counts (Figure 4.14.1). Numbers wintering on the Taff/Ely do not reflect the fall in the National Index which occurred during the mid-1970s.

There has been no apparent trend to changes in the importance of the Taff/Ely in relation to the Severn as a whole, with the Taff/Ely winter peak count usually falling between 5% and 15% of the Severn winter peak count (Figure 4.14.2).

Numbers of Dunlin wintering on the Taff/Ely have regularly exceeded the qualifying level for national importance of 4,300 birds. The estuary was nationally important during the mid-1970s and again during the mid-1980s (Figure 4.14.3). Since the start of the BoEE, the estuary has always held over 0.7% of the total British wintering population of this species. At the time of writing the

estuary falls just short of national importance for this species.

Highest numbers of this species on the Severn as a whole are usually recorded during January, whereas on the Taff/Ely there is no clear monthly peak (Figure 4.14.4).

**4.15 Bar-tailed Godwit**

Bar-tailed Godwit were apparently common in winter at the end of the last century. Numbers appeared to decline after this to the extent that the first post-war record was not until 1950. Since then the species has increased along the whole of the Glamorgan coast as well as on the Taff/Ely. It is now a regular passage migrant in flocks of usually less than 20 birds, with fewer winter records. The reasons for the apparent decline in the numbers of Bar-tailed Godwit during the first half of this century are not known.

**4.16 Whimbrel**

Heathcote *et al*. (1967) considered that the status ascribed to this species at the end of the 19th Century, that of a common passage migrant, still held true. Recent BTO fieldwork (Evans *et al*., 1990; Donald & Clark, 1991b) suggests that this species now occurs in rather smaller numbers than those recorded by the previous authors.

**4.17 Curlew**

Early records describe this species as being a common winter visitor to Glamorgan but do not give any indication of the numbers present on the Taff/Ely. In 1967, Heathcote *et al*. wrote that "Winter flocks, usually *c*. 100 or under, exceptionally larger, may be met with in many places on the coast from the Taff-Ely estuary to Worms Head ....". In January 1966, 200 birds were present on the estuary, the highest count recorded.

BoEE counts show that, since 1969, the peak winter count has shown little fluctuation over time, with an average of slightly over 100 birds. This is despite considerable fluctuations in the National Index (Figure 4.17.1), suggesting that the estuary is particularly attractive to this species. Despite this, numbers recorded on the Taff/Ely represent a small proportion of those seen on the Severn as a whole. With the exception of 1975, the winter peak count on the Taff/Ely was always less than 10%, and usually less than 5%, of the winter peak count on the Severn as a whole (Figure 4.17.2).

There is no clear pattern to the monthly distribution of peak annual counts (Figure 4.17.3), although autumn peak annual counts were more numerous than winter peak annual counts on both the Taff/Ely and the Severn as a whole.

The wintering population of Curlew on the Taff/Ely estuary has never approached levels of national importance, the qualifying level for which is 910 birds.

**4.18 Redshank**

In 1900, this species was described by the Cardiff Naturalists' Society as a common winter visitor to the mudflats and saltmarshes of the Glamorgan coast, although there was no specific reference to the Taff/Ely estuary. By 1967, the wintering population of this species in the Taff/Ely estuary was thought to average between 300 and 500 birds (Heathcote *et al.*, 1967), although larger flocks, some over 1,000 birds, were recorded several times during the 1960s. The Taff/Ely has apparently always held the largest wintering flock of Redshank to be found anywhere in Glamorgan.

The peak winter counts of Redshank on the Taff/Ely have shown considerable fluctuation since 1969 (Figure 4.18.1), with

between 250 and 1250 birds present. These fluctuations do not follow trends in the National Index over the same period. Similar fluctuation is seen in the relative importance of the Taff/Ely Redshank population as a proportion of the wintering population on the Severn as a whole (Figure 4.18.2). The winter peak count on the Taff/Ely varied between 10% and 60% of the winter peak count on the Severn as a whole.

The high numbers of this species wintering on the Taff/Ely estuary during the early 1980s led to the estuary achieving levels of national importance around this period (Figure 4.18.3). Although this level was not sustained, the fact that the 5-year averages since 1981 have all been higher than any of those recorded prior to that year suggests that there has been a long-term rise in the numbers of this species recorded on the Taff/Ely.

BoEE data shows that peak annual counts are most often recorded between October and February on both the Taff/Ely and on the Severn as a whole (Figure 4.18.4).

**4.19Turnstone**

At the end of the last century, this species was apparently common, with birds seen on the "Cardiff East mud" throughout the year, although numbers are not available for the Taff/Ely until the start of the BoEE counts in 1969. These show that before 1982, numbers of Turnstone in the Taff/Ely varied between 0 and 40, with less than 20 in most years (Figure 4.19.1). Numbers increased rapidly after this year however, with peak winter counts between 40 and 110 birds. This coincided with a general increase in the National Index of this species from 1982, although fluctuations in the National Index before this year were not matched by fluctuations in the peak winter count.

The rapid increase in numbers of this species wintering on the Taff/Ely is reflected in a comparison of the winter peak count on the Taff/Ely with that on the Severn as a whole (Figure 4.19.2). Before 1982, the winter peak count on the Taff/Ely was generally less than 5% of the winter peak count on the whole Severn estuary whereas after that year the proportion rose to between 12% and 27%. There can be little doubt that the numbers of this species using the Taff/Ely in winter have increased significantly since 1982.

Peak annual counts of Turnstone have been recorded in almost every month of the year on both the Taff/Ely and the whole Severn, although the majority of recorded peaks fell between September and April (Figure 4.19.3).

## 5 DISCUSSION AND CONCLUSIONS

Appendix 2 summarises the known or assumed changes in the wintering populations of the commonest species since 1900.

It is likely that the extensive reclamation of intertidal mudflats around Cardiff during the latter half of the 19th century and the first quarter of the 20th century led to a reduction in the numbers of waterfowl present in winter. In 1900, the Cardiff Naturalists' Society wrote:

> "Around the estuaries of some of the tidal rivers, large areas of mud flats attract great numbers of waders and other sea fowl, and on the Cardiff Mud-flats, ..... many of our most picturesque sea birds may be seen in great abundance."

Just 25 years later, following accelerated reclamation of intertidal areas, the same Society wrote that:

> "the mudflats and saltmarshes around the port of Cardiff, owing to the extension of the city, no longer attract the large numbers of wildfowl and waders which formally visited them in winter. These still, however, to a certain extent, frequent the Monmouthshire marshes and flats east of the Rhymney river, consequently a few stragglers still occur on the Glamorgan foreshore".

However, the unfortunate practice of Victorian naturalists of recording their observations with the aid of a gun rather than a pen means that there are no reliable counts of waterfowl using the Taff/Ely estuary before construction of the Roath and Queen Alexandra docks, making a quantitative assessment of the changes brought about by subsequent land claim impossible. Whether the absence of such observations, together with reference to "a few

stragglers", means that the activities of the port or the pollution of the estuary caused birds to desert the area during the first quarter of the 20th century cannot be firmly established from the available data. Such a situation, however, seems unlikely, although the enormous amount of shipping using Cardiff and Penarth Docks during that period may have led to lower numbers of birds using the estuary than are found today. Examination of the available data has shown that certain species, particularly Wigeon and Bar-tailed Godwit, certainly declined during the first half of the 20th century, whereas others, such as the Pintail, almost certainly increased. For the majority of species it is not possible to assess the changes in populations before regular systematic counting began in 1969.

Since 1969, regular counting has revealed much about the annual fluctuations in the numbers of waterfowl wintering on the Taff/Ely estuary. For the majority of species, the large fluctuations between years make it impossible to determine whether there is any gradual long-term trend, although severe declines or rapid increases should be readily apparent over a 21-year period. The large between-year fluctuations may result from a variety of reasons. There is a considerable amount of evidence to show that many species move into the Taff/Ely from other areas around the Severn or from further afield during particularly severe weather or after storm erosion of sediments elsewhere (*eg* this report, Clark, 1983; Ferns, 1983, 1987; Evans *et al*., 1990; Donald & Clark, 1991a,b). This is undoubtedly responsible for some of the observed between-year variability, but several other factors are also involved. The hight of high tide on BoEE count days may determine whether a flock of birds roost on the Taff/Ely or move elsewhere (Donald & Clark, 1991a) and thus whether or not they are counted. Roosting flocks may be disturbed from their usual roost sites and be missed by the counter, although this is unlikely to happen often since BoEE counters are extremely familiar with their count areas. The breeding success of the previous summer also influences the

numbers of waterfowl present in the wintering population, as do changes in the distribution and abundance of invertebrate prey species.

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Without the hard work and dedication of the volunteer BoEE counters who have counted the Taff/Ely and surrounding areas since 1969 it would have been impossible to assess the changes in numbers that have taken place. Thanks are also due to Mr. S. Woolfall and Miss K. Greenwood for much help with the initial literature searches and data analyses. Miss S. Foulger provided much valuable assistance during the preparation of this report.

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| Species | Mean Peak Winter Count | % British Population | % European population |
|---|---|---|---|
| Oystercatcher | 38 | 0.01 | - |
| Lapwing | 114 | 0.01 | 0.01 |
| Ringed Plover | 45 | 0.20 | 0.09 |
| Grey Plover | 19 | 0.09 | 0.01 |
| Turnstone | 66 | 0.15 | 0.09 |
| Curlew | 94 | 0.10 | 0.03 |
| Redshank | 615 | 0.82 | 0.41 |
| Knot | 281 | 0.13 | 0.08 |
| Dunlin | 4193 | 0.98 | 0.30 |

**Table 1** The National and International Importance of the Taff/Ely Estuary for Waders, 1986/87 to 1990/91. (Data for wildfowl species not available at time of publishing).

| Species | Mean Peak Winter Count | % British Population | % European Population |
|---|---|---|---|
| Shelduck | 2833 | 3.80 | 1.10 |
| Oystercatcher | 692 | 0.25 | 0.08 |
| Lapwing | 2904 | 0.29 | 0.15 |
| Ringed Plover | 265 | 1.15 | 0.53 |
| Grey Plover | 1039 | 4.95 | 0.69 |
| Turnstone | 421 | 0.94 | 0.60 |
| Curlew | 3300 | 3.63 | 0.94 |
| Black-tailed Godwit | 21 | - | - |
| Bar-tailed Godwit | 55 | 0.09 | 0.05 |
| Redshank | 2693 | 3.59 | 1.80 |
| Knot | 3188 | 1.45 | 0.91 |
| Dunlin | 49198 | 11.44 | 3.51 |

**Table 2**The National and International Importance of the Severn Estuary for Waders and Shelduck, 1986/87 to 1990/91. (Data for other wildfowl species notavailable at time of publishing).

| Year | Nov | Dec | Jan | Feb | Mar |
|---|---|---|---|---|---|
| 1969 | 0 | 1 | 0 | 1 | 1 |
| 1970 | 1 | 1 | 1 | 1 | 1 |
| 1971 | 1 | 1 | 1 | 1 | 1 |
| 1972 | 1 | 1 | 1 | 1 | 1 |
| 1973 | 1 | 1 | 1 | 1 | 1 |
| 1974 | 1 | 1 | 1 | 1 | 1 |
| 1975 | 1 | 0 | 1 | 1 | 0 |
| 1976 | 1 | 1 | 1 | 0 | 0 |
| 1977 | 1 | 1 | 1 | 1 | 1 |
| 1978 | 1 | 1 | 1 | 1 | 1 |
| 1979 | 1 | 1 | 1 | 1 | 1 |
| 1980 | 0 | 1 | 1 | 0 | 1 |
| 1981 | 1 | 0 | 1 | 0 | 1 |
| 1982 | 0 | 1 | 0 | 1 | 1 |
| 1983 | 1 | 1 | 1 | 1 | 1 |
| 1984 | 1 | 1 | 1 | 1 | 1 |
| 1985 | 1 | 1 | 1 | 1 | 1 |
| 1986 | 1 | 1 | 1 | 1 | 1 |
| 1987 | 1 | 1 | 1 | 1 | 1 |
| 1988 | 1 | 1 | 1 | 1 | 1 |
| 1989 | 1 | 1 | 1 | 1 | 1 |
| 1990 | 1 | 1 | 1 | 1 | 1 |

**Table 3** The number of BoEE counts available for the Taff/Ely estuary. The year represents the first year of each winter (*eg* 1990 refers to winter 1990/91).

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# Appendix 1

This Appendix lists all bird species known to have been seen on the open water, mudflats, saltmarsh and banks of the Taff/Ely estuary up to October 1991. Data are extracted from the reports of the Cardiff Naturalists' Society, from the Glamorgan Annual Bird Report, from Ferns (1987), from Kaletja (1984) and from observations made by BTO staff. The following abbreviations are used:

Abundance:
**a - abundant (more than 200 always present)**
**c - common (up to 200 always present)**
**r - regular (occurs regularly in small numbers)**
**o - occasional (occurs rarely in small numbers)**
**v - vagrant (occurs very rarely or has occured only once)**
**e - likely or known to have escaped from captivity**

Season:
**y - usually occurs all year round**
**w - usually occurs in winter only**
**s - usually occurs in summer only**
**p - usually occurs only as a passage migrant**

Breeding:
**f - formerly bred but does no longer do so, or breeds infrequently**
**b - breeds regularly**

Note: if a species occurs in different numbers at different times of year, the abundance and season codes are placed together in parentheses. For example, {aw}{rs} indicates that the species is abundant in winter and regular in summer.

Species order follows Voous (1973).

| SPECIES | STATUS | NOTES |
|---|---|---|
| Black-throated Diver | v | One old record |
| Great Northern Diver | v | One record |
| Little Grebe | v | Very few records |
| Great Crested Grebe | ow | Few winter records |
| Red-necked Grebe | v | One old record |
| Slavonian Grebe | v | One old record |

| | | |
|---|---|---|
| Black-necked Grebe | v | One old record |
| Manx Shearwater | v | 30 birds after gales in September 1981 |
| Storm/Leach's Petrel | v | One record of one of these species |
| Cormorant | cy | Up to 50 birds in winter, fewer in summer |
| Shag | v | Only one known record |
| Bittern | v | One shot at "Cardiff West Marshes" in 1877 |
| Grey Heron | rw | Up to 10 roosting in saltmarsh at low tide |
| White Stork | v/e | One on 23/8/72 may have been an escape |
| Mute Swan | ow | Occasional small family parties, usually winter |
| Whooper Swan | v | Rare winter visitor, late 19th century |
| Bewick's Swan | v | A party of 8 birds, November 1923 |
| Bean Goose | v | One record, March 1961 |
| White-fronted Goose | v | One in March, 1974 |
| Greylag Goose | v | Rare visitor |
| Canada Goose | o | Occasional small flocks |
| Barnacle Goose | v/e | One in May 1985 was probably an escape |
| Brent Goose | ow | A few recent records |
| Ruddy Shelduck | e | Two records, almost certainly escapes |
| Shelduck | {aw}{rs} f | See entry in main text |
| Wigeon | rw | See entry in main text |
| Gadwall | ow | A few recent records |
| Teal | cw f | See entry in main text |
| Mallard | cw f | See entry in main text |
| Pintail | ow | See entry in main text |
| Garganey | v | Two in August 1977 |
| Shoveler | ow | A few recent records |
| Pochard | rw | See entry in main text |
| Tufted Duck | rw | See entry in main text |
| Scaup | ow | Up to 5 birds; rare |
| Eider | v | Very few records |
| Long-tailed Duck | v/e | One in September 1991 may be an escape |

| | | |
|---|---|---|
| Common Scoter | v | Five in July 1981 |
| Velvet Scoter | v | One in November 1968 |
| Goldeneye | ow | A few recent records |
| Red-breasted Merganser | ow | A few records |
| Goosander | ow | Most records from late 19th century |
| Ruddy Duck | v/ow | A few records |
| Osprey | v | One in September 1981 |
| Hen Harrier | v | A few old records |
| Montagu's Harrier | v | One over Penarth Moors in September 1959 |
| Sparrowhawk | oy | Occasionally seen over saltmarshes |
| Buzzard | v | A few records of birds flying over |
| Kestrel | ry | Common in the docks area |
| Peregrine | rw | More frequent in recent years |
| Sora Rail | v | One record (in 1888) of this American species |
| Coot | v/ow | Rare winter visitor |
| Oystercatcher | {cw}{rp} | See entry in main text |
| Avocet | v | Two in December 1990 |
| Ringed Plover | {rw}{rp} f | See entry in main text |
| Grey Plover | rw | See entry in main text |
| Lapwing | {cw}{rp} f | See entry in main text |
| Knot | rw | See entry in main text |
| Sanderling | op | Very few records. 23 in May 1973 |
| Little Stint | v | Apparently commoner in late 19th century |
| Curlew Sandpiper | op | See entry in main text |
| Dunlin | {aw}{rp} | See entry in main text |
| Ruff | v | Two records, total of eight birds |
| Jack Snipe | ow | Probably under-recorded |
| Snipe | {rw}{op} | Fairly common winter visitor |
| Black-tailed Godwit | {ow}{rp} | Increasingly regular in small numbers |
| Bar-tailed Godwit | {rw}{rp} | See entry in main text |
| Whimbrel | op | See entry in main text |

| | | |
|---|---|---|
| Curlew | {cw}{cp} | See entry in main text |
| Spotted Redshank | v | Very few records |
| Redshank | {aw}{rp} f | See entry in main text |
| Greenshank | op | Very few records |
| Green Sandpiper | {ow}{rp} | Occasional bird wintering in saltmarsh |
| Wood Sandpiper | v | Very few records |
| Common Sandpiper | {ow}{rp} | Up to 15 birds on autumn passage |
| Turnstone | {cw}{rp} | See entry in main text |
| Great Skua | v | A few old records |
| Pomarine Skua | v | One old record |
| Arctic Skua | v | One or two old records |
| Mediterranean Gull | oy | Recorded in most years, mainly winter/spring |
| Little Gull | v | One old record |
| Sabine's Gull | v | One in September 1981 |
| Black-headed Gull | ay | A maximum count of 20,000 in January 1985 |
| Ring-billed Gull | v | A few recent winter and spring records |
| Common Gull | {cw}{cp} | Probably increasing |
| Lesser Black-backed Gull | {aw}{cy} | A maximum count of 700 in October 1972 |
| Herring Gull | ay | Lower numbers in summer |
| Iceland Gull | ow | A very rare winter visitor |
| Glaucous Gull | v/ow | A very rare winter visitor |
| Great Black-backed Gull | {cw}{ry} | Up to 100 birds in winter |
| Kittiwake | o | Very few records |
| Sandwich Tern | v | One record of two birds, May 1985 |
| Common/Arctic Tern | op | Few records |
| Little Tern | v | One record only |
| Black Tern | v | One record only, October 1977 |
| White-winged Black Tern | v | Two birds (one shot), March 1891 |
| Little Auk | v | One reported in January 1991 |
| Feral Pigeon | ry | Also frequent flocks of racing pigeons |
| Woodpigeon | ry | Often seen on saltmarshes at low tide |

| | | |
|---|---|---|
| Collared Dove | ry | A few birds usually present |
| Cuckoo | rp | Migrants often in docks alongside the estuary |
| Short-eared Owl | v/ow | Very rarely see over saltmarshes in winter |
| Swift | cp | A common migrant over the estuary |
| Kingfisher | v/ow | Rare winter visitor |
| Skylark | {cw}{rp} b | A few pairs breed in docks alongside estuary |
| Swallow | cp | A common migrant over the estuary |
| House Martin | rp | A regular migrant over the estuary |
| Meadow Pipit | {cw}{rp} b | A few pairs breed in docks alongside estuary |
| Rock Pipit | cw | Common around edges of estuary in winter |
| Yellow Wagtail | op f | Formerly bred on Penarth Moors |
| Grey Wagtail | ow | A scarce winter visitor |
| Pied Wagtail | cy b | A few pairs breed around edges of estuary |
| Wren | ry b | A few pairs breed around edges of estuary |
| Dunnock | oy | May breed around edges of estuary |
| Robin | rw | May breed around edges of estuary |
| Black Redstart | ow | Very few recent records |
| Whinchat | op | Occasional migrant |
| Stonechat | ow | Rare winter visitor |
| Northern Wheatear | op | Occasional migrant |
| Blackbird | ow | May breed around edges of estuary |
| Redwing | op | Occasional flocks of migrants |
| Common Whitethroat | rs b | A few pairs breed in docks alongside estuary |
| Chiffchaff | rs b | A few pairs breed in docks alongside estuary |
| Willow Warbler | rs b | A few pairs breed in docks alongside estuary |
| Spotted Flycatcher | op | Occasional migrant in docks alongside estuary |
| Great Grey Shrike | v | One old record |
| Magpie | ry | Always present in small numbers |
| Carrion Crow | ry | Often seen on open mudflats |
| Starling | {aw}{cy} | May breed around edges of estuary |
| House Sparrow | cw | Feeds in saltmarsh in winter |

| | | |
|---|---|---|
| Chaffinch | cw | Feeds in saltmarsh in winter |
| Brambling | rw | Feeds in saltmarsh in winter |
| Greenfinch | cw | Feeds in saltmarsh in winter |
| Goldfinch | cw | Feeds in saltmarsh in winter |
| Linnet | cw | Feeds in saltmarsh in winter |
| Reed Bunting | cw | Feeds in saltmarsh in winter |
| Snow Bunting | ow | Rare winter visitor |

# Appendix 2

This appendix summarises the known or probable changes to wintering populations of waders and wildfowl on the Taff/Ely between 1900 and 1969 and between 1969 and 1989.

| Species | 1900 to 1969 | 1969 to 1989 |
|---|---|---|
| Shelduck | Thought to be generally stable | Generally stable before 1980, increase since 1980 |
| Wigeon | Rapid decrease from apparently high numbers in 1900 | Only occasional visitor |
| Teal | Apparent decrease in early 1960s | Decreased during 1970s, thereafter rapid increase |
| Mallard | Not known but possibly decreasing | Probably lower numbers than before 1969 |
| Pintail | Increased from rarity status to regular visitor, early 1930s | No apparent change in small numbers recorded |
| Pochard | No known long-term change but large annual fluctuations | No apparent long-term change but annual fluctuations |
| Tufted Duck | General long-term decline but large annual fluctuations | No apparent long-term change but annual fluctuations |
| Oystercatcher | Not known | General increase in response to rising National Index |
| Ringed Plover | Not known | Not known |
| Grey Plover | Not known | Recorded more regularly, possible slight increase |
| Lapwing | Not known | Low numbers 1976-1982, otherwise no apparent trend |
| Knot | General increase to peak in 1960s | Decrease from peak in 1960s but much fluctuation |
| Curlew Sandpiper | Apparent decrease, although old records doubtful | Too rare for assessment |
| Dunlin | No apparent long-term changes, always common | Relatively stable with no apparent long-term trend |
| Bar-tailed Godwit | Decline through 1900 to 1950, thereafter increased | Not known |
| Whimbrel | Not known | Possible decline |
| Curlew | No apparent long-term trend | Numbers stable, possibly higher than pre-1969 levels |
| Redshank | No apparent long-term trend | Numbers fairly stable with slight peak in early 1980s |
| Turnstone | Not known | Rapid increase since 1982 |