



BTO Research Report No. 301

**The Numbers and Status of
Waterbirds using Cardiff Bay
from 1999/2000 to 2001/2002**

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EXECUTIVE SUMMARY

1. This report provides a summary of data concerning the numbers and status of waterbirds using wetland habitats within Cardiff Bay since the closure of the Cardiff Bay Barrage. The report thus covers three years - 1999/2000 (November 1999 to March 2000), 2000/01 (April 2000 to March 2001) and 2001/02 (April 2001 to March 2002).
2. Two principal sources of data have been used. BTO counts, undertaken monthly between August and May each year, provide information for 1999/2000, 2000/01 and 2001/02. Wetland Bird Survey (WeBS) data provide further information for 2000/01 and 2001/02. Supplementary information from local and Welsh bird reports is used to complete the species list of waterbirds with the rarer species that have been present in the Bay but that may not have been encountered by the monthly BTO and WeBS counts.
3. Data from all available records show that a minimum of 14 species of wildfowl, 10 waders, 10 gulls, one tern and nine other waterbird species have occurred in Cardiff Bay over the period from November 1999 to March 2002. Information is provided for each of these on peak annual and mean winter numbers using the Bay.
4. Eighteen species were recorded in numbers of 10 or more by BTO and/or WeBS counts and their numbers and status are discussed in greater detail.
5. The present waterbird community of Cardiff Bay is dominated by predominantly freshwater and open water species – primarily grebes, Cormorant *Phalacrocorax carbo*, Mute Swan *Cygnus olor*, diving and dabbling ducks and Coot *Fulica atra*. As a result of its coastal location, the Bay also attracts gulls, particularly towards dusk when the open water is used for roosting. The Bay is additionally still used as a high tide roost site by small numbers of Shelduck and the waders – Dunlin *Calidris alpina*, Curlew *Numenius arquata* and Redshank *Tringa totanus* – that were numerous prior to barrage-closure.
6. Trends in species' populations could be determined for 15 of the 18 species whose status is discussed in detail. Six of these have shown increases over the last three years: Great Crested Grebe *Podiceps cristatus*, Mute Swan, Teal *Anas crecca*, Pochard *Aythya ferina*, Tufted Duck *A. fuligula* and Coot. Coot and Pochard were the most numerous of these species, peaks of 110 and 350 respectively being recorded in 2001/02.
7. A further three species had stable populations over the three years: Mallard *Anas platyrhynchos*, and two fish-eating species – Cormorant and Goosander *Mergus merganser*.
8. In contrast, populations of Shelduck and five species of wader – Lapwing *Vanellus vanellus*, Dunlin, Curlew, Redshank and Turnstone *Arenaria interpres* – which had fallen sharply with the change from estuarine to freshwater conditions associated with barrage-closure, have shown continued declines over the last three years.
9. Three species of gull – Black-headed Gull *Larus ridibundus*, Lesser Black-backed Gull *L. fuscus* and Herring Gull *L. argentatus* – were also numerous at Cardiff Bay over the three year study period.
10. The populations of the majority of the waterbird species using Cardiff Bay are small in comparison to Welsh or British populations. However, Welsh Bird Report data suggest that the numbers of one species, Lesser Black-backed Gull, may be of national importance and, therefore, that Cardiff Bay may be worthy of SSSI or SPA designation.

1. INTRODUCTION

This report summarises data concerning the numbers and status of waterbirds using wetland habitats within Cardiff Bay from 5 November 1999 (immediately following the closure of the Cardiff Bay Barrage) until 31 March 2002. The report thus covers three years - 1999/2000 (November 1999 to March 2000), 2000/01 (April 2000 to March 2001) and 2001/02 (April 2001 to March 2002).

The report follows the definition of waterbirds used by the Wetland Bird Survey (WeBS) and thus includes information concerning grebes, cormorants, herons, wildfowl, rails, waders, kingfishers, gulls and terns.

2. METHODS

The data presented come from two principal sources. The Wetland Bird Survey (WeBS) monitors non-breeding waterbirds in the UK. The scheme uses monthly 'Core Counts' undertaken by volunteers to annually identify population sizes, determine trends in numbers and to identify important sites for waterbirds. Both inland freshwater and coastal wetlands are covered by the scheme, the latter primarily monitored at high tide when birds are congregated at roosts. The WeBS counts at Cardiff Bay are undertaken at high tide, though only cover the non-breeding seasons (i.e. autumn and winter) and do not include counts of gulls or terns. All counts undertaken during the years 2000/01 (April 2000 to March 2001) and 2001/02 (April 2001 to March 2002) are used in this report.

Data are secondly taken from the surveys undertaken by the BTO as part of their long-term monitoring project of the birds of Cardiff Bay that has been running since 1989. Since barrage-closure, four counts of the Bay have been undertaken every month of the year with the exception of June and July. Two of the counts each month are undertaken at high tide and two at low tide, so as to determine the extent to which the Bay is still used as a high tide roost site by birds that feed on intertidal areas outwith the Bay. Counts of grebes, herons, rails and kingfishers were only undertaken from April 2001 and cormorants, gulls and terns only from October 2001, though the presence or absence of these species was recorded in previous years.

Data from both these sources are used to provide annual peaks and winter (November to March) means for each species. The numbers and status of those recorded at least once in numbers of 10 or more by either BTO or WeBS counts are discussed in detail. Trends in the numbers of these species over the three years since barrage-closure are indicated at the start of each species' account as either stable, increasing or decreasing. No trends in numbers could be ascertained for gulls.

These numbers are put into context using data from the Wetland Bird Survey Report for 1999-2000 (Musgrove *et al.* 2001). This report provides information on the peak numbers of each species recorded by WeBS in Great Britain and Wales for the year from April 1999 to March 2000 – though it should be noted that these figures are only minima and do not necessarily represent a census of the total population. For gulls, information on population estimates is also taken from the 1993 Winter Gull Roost Survey (Burton *et al.* 2002a).

The WeBS report additionally provides threshold values that are used to identify sites of national or international importance during the non-breeding seasons. A wetland site is considered internationally important for a species if it regularly holds at least 1% of the individuals in a population of that species. Britain's wildfowl, for example, belong to the northwest European population (Pirot *et al.* 1989) and the waders to the east Atlantic flyway population (Smit & Piersma 1989). A wetland site in Britain is considered nationally important for a species if it regularly holds 1% or more of the estimated British population of that species. The thresholds for national importance are quoted so as to determine the relative importance of Cardiff Bay for each species. If a species potentially occurs in the Bay in nationally important numbers, this is signified at the start of the species' account. Species for which the Severn Estuary – of which Cardiff Bay is considered part by WeBS – is nationally or internationally important are noted.

Following the Guidelines for the Selection of Biological 'Sites of Special Scientific Interest' (SSSIs) (NCC 1989), an area may be selected for notification as a SSSI if it supports 1% or more of the British population of a species in either the breeding season or outside of the breeding season (non-breeding). The Selection Guidelines for Special Protection Areas (SPAs) (JNCC 1999) also allow for the selection of areas that support nationally important populations of rare or vulnerable species (listed in Annex I to the EC Birds Directive) in any season.

The SPA guidelines additionally allow for the selection of areas that support assemblages of more than 20,000 individual waterbirds or seabirds in any season. All Annex I and migratory species,

within these defined assemblages, that regularly occur on the site are qualifying species, but to identify the main component species those with nationally important populations are highlighted, along with those with internationally important populations and species whose populations exceed 2,000 individuals.

In addition to BTO and WeBS count data, information from the county records collated by the Glamorgan Bird Club (for 2001 and 2002), from Welsh Bird Reports for 1999 and 2000 (Shrubb & Green 2000, Green 2001) and from Vaughan Grantham (county ecologist for Cardiff County Council) has been used in this report to complete the species list of waterbirds with the rarer species that have been present in the Bay but that may not have been encountered by the monthly BTO and WeBS counts. The latter also provided information concerning species breeding in the Bay.

3. RESULTS

Data from all available records show that a minimum of 14 species of wildfowl, 10 waders, 10 gulls, one tern and nine other waterbird species have occurred in Cardiff Bay over the period from November 1999 to March 2002 (Table 3.1). Excluding gulls and terns, BTO surveys recorded a total of 28 species of waterbirds and an annual mean of 21.0 over these three years. In comparison, the less frequent WeBS counts recorded a total of 21 waterbird species and an annual mean of 17.0 over 2000/01 and 2001/02.

Peak annual and mean winter numbers of waterbirds recorded by BTO counts in 1999/2000, 2000/01 and 2001/02 and by WeBS counts in 2000/01 and 2001/02 are shown in Table 3.2 and Figures 3.1a-o

The following accounts for species recorded in numbers of 10 or more by BTO or WeBS counts are in systematic order.

3.1 Great Crested Grebe *Podiceps cristatus* **Increasing**

Great Crested Grebes were rarely recorded at Cardiff Bay prior to barrage-closure and only a single bird was recorded by BTO surveys in 1999/2000, when the Bay was still affected by periodic drawdowns. In the two years since the cessation of drawdowns in September 2000 and the change to freshwater conditions, however, numbers have risen and the species has become firmly established in the Bay.

BTO counts recorded Great Crested Grebes in every month during which surveys were undertaken at Cardiff Bay from April 2001 to March 2002. A peak of 17 was recorded on 18 March and an average of 7.4 over the winter months.

WeBS counts recorded peaks of five and 11 Great Crested Grebes in 2000/01 and 2001/02 respectively and means of 1.0 and 6.0 over the respective winters.

These figures are small in comparison to the size of the total Welsh and British non-breeding populations. WeBS recorded a peak of 349 Great Crested Grebes in Wales in 1999/2000 and a peak of 9,190 in Great Britain. The 1% threshold for identifying sites of national importance for Great Crested Grebes in Great Britain during the non-breeding seasons is 100.

Great Crested Grebes successfully bred in the Bay in 2001 (and again in 2002). A minimum of two broods of young grebes was noted in late summer during BTO surveys.

3.2 Cormorant *Phalacrocorax carbo* **Stable**

Cormorants have been recorded at Cardiff Bay each year since barrage-closure (and were recorded every year preceding that by the BTO surveys). Their presence seems to have been unaffected by the change from saline to freshwater conditions. Numbers have shown no notable change over the last two years.

BTO counts recorded Cormorants at Cardiff Bay in every month surveyed during 2001/02, with a peak of 42 birds recorded in December and an average of 13.2 over the winter months.

WeBS counts recorded peaks of 26 and 31 Cormorants in 2000/01 and 2001/02 respectively and means of 23.8 and 19.8 over the respective winters.

The Welsh Bird Reports for 1999 and 2000 (Shrubb & Green 2000, Green 2001) additionally indicate that there was a peak of 21 Cormorants in the winter of 1999/2000, numbers rising to 41 in October 2000.

Again, these figures are small in comparison to the size of the total Welsh and British non-breeding populations. WeBS recorded a peak of 885 Cormorants in Wales in 1999/2000 and a peak of 16,243 in Great Britain. The 1% threshold for identifying sites of national importance for Cormorants in Great Britain during the non-breeding seasons is 130.

3.3 Mute Swan *Cygnus olor*

Increasing

Few Mute Swans were recorded at Cardiff Bay prior to barrage-closure. Since the change to freshwater conditions, however, they have become much more common. After an initial increase over the first two years following barrage-closure, numbers have stabilised.

BTO counts found that Mute Swans were most common at Cardiff Bay in the autumn and spring. Although none were recorded in the winter of 1999/2000, peaks of 18 and 14 were recorded in the subsequent two Septembers. Averages of just 0.8 and 2.2 birds were recorded in the respective winters of 2000/01 and 2001/02.

WeBS counts recorded peaks of nine and 12 Mute Swans in 2000/01 and 2001/02 respectively and means of 3.8 and 1.5 over the respective winters.

A peak of 19,616 Mute Swans was recorded in Great Britain as a whole by WeBS in 1999/2000 and a peak of 569 in Wales. The 1% threshold for identifying sites of national importance for Mute Swans in Great Britain during the non-breeding seasons is 260.

Two pairs of Mute Swans started nest building in early spring 2002, but subsequently lost these first nests as a result of high water levels on 30 April (V. Grantham, pers. comm.).

3.4 Shelduck *Tadorna tadorna*

Decreasing

Shelduck were one of the most common waterbird species at Cardiff Bay prior to barrage-closure (BTO counts recorded a peak of 307 in the winter of 1998/99). The species also occurs in internationally important numbers on the Severn Estuary as a whole (Musgrove *et al.* 2001). Many fewer have used the Bay since closure, however, and numbers have fallen over the last two years.

BTO counts recorded peaks of 39, 61 and 36 Shelduck at Cardiff Bay in 1999/2000, 2000/01 and 2001/02 respectively. Numbers tended to be greater at high tide as birds used the Bay as a roost site while their intertidal feeding areas were covered. Means of 12.0, 25.7 and 4.4 were recorded at high tide over the respective three winters. At low tide, the equivalent means were just 3.4, 2.3 and 1.6.

WeBS counts (which were also undertaken at high tide) recorded peaks of 47 and 17 Shelduck in 2000/01 and 2001/02 respectively and means of 19.8 and 1.5 over the respective winters.

These figures are small in comparison to the size of the total Welsh and British non-breeding populations. WeBS recorded a peak of 4,098 Shelduck in Wales in 1999/2000 and a peak of 57,421 in Great Britain. The 1% threshold for identifying sites of national importance for Shelduck in Great Britain during the non-breeding seasons is 750.

A pair of Shelduck was recorded in the Bay with a brood of seven young in July 2001 (V. Grantham, pers. comm.).

3.5 Teal *Anas crecca*

Increasing

Teal also occurred at Cardiff Bay prior to barrage-closure (BTO counts recorded a peak of 121 in the winter of 1998/99) and the species is present in nationally important numbers on the Severn Estuary as a whole (Musgrove *et al.* 2001). Numbers fell after barrage-closure, though have increased slightly over the last three winters.

BTO counts recorded peaks of 20, 30 and 42 Teal at Cardiff Bay in 1999/2000, 2000/01 and 2001/02 respectively. Means of 3.3, 6.0 and 9.9 were recorded over the respective three winters.

WeBS counts recorded peaks of 28 and 50 Teal in 2000/01 and 2001/02 respectively and, in comparison to the BTO counts, higher means of 16.0 and 31.8 over the respective winters.

A peak of 140,225 Teal was recorded in Great Britain as a whole by WeBS in 1999/2000 and a peak of 9,969 in Wales. The 1% threshold for identifying sites of national importance for Teal in Great Britain during the non-breeding seasons is 1,400.

3.6 Mallard *Anas platyrhynchos*

Stable

Mallard were present at Cardiff Bay throughout the year prior to closure (BTO counts recorded a peak of 127 in the winter of 1998/99). Numbers fell after barrage-closure, though have shown no trend since.

BTO counts recorded peaks of 51, 42 and 58 Mallard at Cardiff Bay in 1999/2000, 2000/01 and 2001/02 respectively. Means of 11.1, 9.5 and 11.5 were recorded over the respective three winters.

WeBS counts recorded peaks of 67 and 38 Mallard in 2000/01 and 2001/02 respectively and, again in comparison to the BTO counts, higher means of 28.2 and 28.8 over the respective winters.

A peak of 145,590 Mallard was recorded in Great Britain as a whole by WeBS in 1999/2000 and a peak of 6,063 in Wales. The 1% threshold for identifying sites of national importance for Mallard in Great Britain during the non-breeding seasons is 5,000.

Mallard bred in Cardiff Bay in small numbers in 2002.

3.7 Pochard *Aythya ferina*

Increasing

As with the two previous species, Pochard commonly used Cardiff Bay prior to barrage closure (BTO counts recorded a peak of 48 in the winter of 1998/99). The species also occurs in nationally important numbers on the Severn Estuary as a whole (Musgrove *et al.* 2001). Numbers of this species have risen since barrage-closure, though it should be noted that they have also risen at the neighbouring Rhymney Estuary (Burton *et al.* 2002b).

BTO counts recorded peaks of 69, 120 and 240 Pochard at Cardiff Bay in 1999/2000, 2000/01 and 2001/02 respectively. Means of 15.1, 38.0 and 71.3 were recorded over the respective three winters.

WeBS counts recorded peaks of 64 and 350 Pochard in 2000/01 and 2001/02 respectively and means of 24.2 and 155.0 over the respective winters.

A peak of 36,324 Pochard was recorded in Great Britain as a whole in 1999/2000 and a peak of 1,460 in Wales. The peak number of Pochard recorded by WeBS at Cardiff Bay in 2001/02 is close to the 1% threshold of 440 used for identifying sites of national importance for the species in Great Britain during the non-breeding seasons. To qualify as nationally important for a species, however, a site needs to regularly support 1% of the individuals in the British population of that species (Ramsar Convention Criteria b). A site is classified as regularly supporting 1% of the individuals of a waterbird species if, on average, its peak winter counts over a five-year period are equal to or greater than this 1% threshold.

3.8 Tufted Duck *Aythya fuligula*

Increasing

Tufted Duck were rarely recorded at Cardiff Bay prior to barrage-closure and only a single bird was recorded by BTO surveys in 1999/2000, when the Bay was still affected by periodic drawdowns.

Since the cessation of drawdowns in September 2000 and the change to freshwater conditions, however, this species has gradually become more established in the Bay. Numbers of Tufted Duck in 2001/02 were noticeably greater than those recorded in 2000/01. The species occurs in nationally important numbers on the Severn Estuary as a whole (Musgrove *et al.* 2001).

BTO counts recorded peaks of two and 23 Tufted Duck at Cardiff Bay in 2000/01 and 2001/02 respectively. Means of just 0.1 and 4.6 were recorded over the respective winters.

In comparison, WeBS counts recorded no Tufted Duck during 2000/01, but a peak of 18 in 2001/02 and a mean of 5.5 over that year's winter.

A peak of 56,875 Tufted Duck was recorded in Great Britain as a whole by WeBS in 1999/2000 and a peak of 1,413 in Wales. The 1% threshold for identifying sites of national importance for Tufted Duck in Great Britain during the non-breeding seasons is 600.

A single brood of four Tufted Duck was observed in the Bay in August 2001.

3.9 Goosander *Mergus merganser*

Stable

Goosander were commonly present at Cardiff Bay in the winters prior to barrage-closure (BTO counts recorded a peak of 12 in the winter of 1998/99). As with Cormorant, another fish-eating species, their presence and numbers seem to have been unaffected by the change from saline to freshwater conditions.

BTO counts recorded peaks of seven, four and 16 Goosander at Cardiff Bay in 1999/2000, 2000/01 and 2001/02 respectively. Means of 1.6, 1.8 and 1.8 were recorded over the respective three winters.

WeBS counts recorded peaks of two and eight Goosander in 2000/01 and 2001/02 respectively and means of 1.0 and 2.5 over the respective winters.

A peak of 3,576 Goosander was recorded in Great Britain as a whole by WeBS in 1999/2000 and a peak of 105 in Wales. The 1% threshold for identifying sites of national importance for Goosander in Great Britain during the non-breeding seasons is 90.

3.10 Coot *Fulica atra*

Increasing

Only a single Coot was recorded by BTO counts at Cardiff Bay in the 10 years prior to barrage-closure and none was recorded in 1999/2000, when the Bay was still affected by periodic drawdowns. Since the cessation of drawdowns in September 2000 and the change to freshwater conditions, however, this species has become firmly established in the Bay and numbers have risen rapidly over the last two years.

BTO counts recorded only occasional Coot at Cardiff Bay during the winter of 2000/01, but the species was recorded in every month during which surveys were undertaken from April 2001 to March 2002. A peak of 59 was recorded on 13 January 2002 and an average of 33.0 over the winter months.

WeBS counts recorded no Coot in the Bay in 2000/01, but a peak of 110 in 2001/02 and a mean of 56.0 over that winter.

These figures are small in comparison to the size of the total Welsh and British non-breeding populations. WeBS recorded a peak of 3,610 Coot in Wales in 1999/2000 and a peak of 112,089 in Great Britain. The 1% threshold for identifying sites of national importance for Coot in Great Britain during the non-breeding seasons is 1,100.

Coot successfully bred in small numbers in the Bay in 2001 (and again in 2002). A total of six fledged young were noted during BTO counts in August 2001.

3.11 Lapwing *Vanellus vanellus*

Decreasing

Lapwing were recorded by BTO counts at Cardiff Bay in every one of the 10 years prior to barrage-closure, though in decreasing numbers (BTO counts recorded a peak of 73 in the winter of 1998/99). None were recorded in 1999/2000, but the species was noted in both the subsequent years. Numbers declined between 2000/01 and 2001/02.

BTO counts recorded peaks of 43 and 24 Lapwing in 2000/01 and 2001/02 respectively. Means of 5.9 and 1.6 were recorded over the respective winters.

WeBS counts recorded a peak of 45 Lapwing in 2000/01 and a mean of 11.2 over the winter months. A peak of just six was recorded in 2001/02, but no birds were seen during the winter.

Again, these figures are small in comparison to the size of the total Welsh and British non-breeding populations. WeBS recorded a peak of 14,934 Lapwing in Wales in 1999/2000 and a peak of 471,564 in Great Britain. Many more Lapwing use non-wetland habitats during the non-breeding seasons. The 1% threshold for identifying sites of national importance for Lapwing in Great Britain during the non-breeding seasons is set at 20,000.

3.12 Dunlin *Calidris alpina*

Decreasing

Dunlin were one of the most common waterbird species at Cardiff Bay prior to barrage-closure and in the early 1990s, occasionally reached numbers that would have been considered nationally important. (BTO counts recorded a peak of 786 in the winter of 1998/99). The species occurs in internationally important numbers on the Severn Estuary as a whole (Musgrove *et al.* 2001). Dunlin have used the Bay only irregularly since closure, however, and usually as a high tide roost site. Numbers appear to have fallen between 2000/01 and 2001/02.

BTO counts recorded peaks of just 12, seven and three Dunlin at Cardiff Bay in 1999/2000, 2000/01 and 2001/02 respectively. Means of 2.6, 1.3 and 1.1 occurred at high tide over the respective winters. Only one Dunlin was recorded at low tide.

WeBS counts recorded a peak of 55 Dunlin in 2000/01 and an average of 11.0 over that winter, but only a single bird in 2001/02.

The Dunlin is one of the most common wader species in Great Britain during winter and thus the numbers occurring at Cardiff Bay are of little significance. A peak of 371,085 Dunlin was recorded in Great Britain as a whole by WeBS in 1999/2000 and a peak of 25,879 in Wales. The 1% threshold for identifying sites of national importance for Dunlin in Great Britain during the non-breeding seasons is 5,300.

3.13 Curlew *Numenius arquata*

Decreasing

Curlew were also common at Cardiff Bay in the years prior to barrage-closure (BTO counts recorded a peak of 122 in the winter of 1998/99). Many fewer have used the Bay since closure, however, and these primarily as a high tide roost site. Numbers fell between 2000/01 and 2001/02. The species occurs in nationally important numbers on the Severn Estuary as a whole (Musgrove *et al.* 2001).

BTO counts recorded peaks of 15, 62 and 36 Curlew at Cardiff Bay in 1999/2000, 2000/01 and 2001/02 respectively. Means of 1.6, 11.1 and just 0.4 occurred at high tide over the respective winters. No Curlew were recorded at low tide during these winters.

WeBS counts recorded 30 Curlew in 2000/01 and an average of 9.0 over that winter. A peak of just three was recorded in 2001/02, but no birds were seen during the winter.

Curlew are also common in Great Britain in winter. A peak of 99,787 Curlew was recorded in Great Britain as a whole by WeBS in 1999/2000 and a peak of 10,932 in Wales. The 1% threshold for identifying sites of national importance for Curlew in Great Britain during the non-breeding seasons is 1,200.

3.14 Redshank *Tringa totanus*

Decreasing

Redshank were also one of the most common species at Cardiff Bay prior to barrage-closure (BTO counts recorded a peak of 296 in the winter of 1998/99). As with Shelduck, Dunlin and Curlew, however, many fewer have used the Bay since closure and these primarily as a high tide roost site. The numbers of Redshank using Cardiff Bay have also fallen over the last two years. The species occurs in internationally important numbers on the Severn Estuary as a whole (Musgrove *et al.* 2001).

BTO counts recorded peaks of 22, 91 and 30 Redshank at Cardiff Bay in 1999/2000, 2000/01 and 2001/02 respectively. Means of 2.4, 11.4 and 9.1 occurred at high tide over the respective winters. Means of 2.3 and 12.8 occurred at low tide over the winters of 1999/2000 and 2000/01 respectively, but none were recorded at low tide over the winter of 2001/02.

No Redshank were recorded by WeBS counts at Cardiff Bay in 2000/01. In the following year, a peak of just three was noted and a mean of just 0.8 over the winter.

These figures are of little significance in comparison to the size of the total Welsh and British non-breeding populations. A peak of 98,007 Redshank was recorded in Great Britain as a whole by WeBS in 1999/2000 and a peak of 5,205 in Wales. The 1% threshold for identifying sites of national importance for Redshank in Great Britain during the non-breeding seasons is 1,100.

3.15 Turnstone *Arenaria interpres*

Decreasing

Turnstone were recorded at Cardiff Bay by BTO surveys in every one of the 10 years prior to barrage-closure, though numbers declined over this period (BTO counts recorded a peak of 12 in the winter of 1998/99). The species has only irregularly used the Bay since closure, however, usually at high tide.

BTO counts recorded a peak of 18 Turnstones at Cardiff Bay in 1999/2000 and an average of just 1.9 at high tide (though none at low tide). Birds were noted in the Bay in 2000/01 and 2001/02, though not during the high and low tide surveys.

WeBS counts recorded a single flock of 37 in March 2001 and thus a mean of 7.4 for the winter of 2000/01, but none in 2001/02.

Again, these figures are small in comparison to the size of the total Welsh and British non-breeding populations. A peak of 12,833 Turnstones was recorded in Great Britain as a whole by WeBS in 1999/2000 and a peak of 588 in Wales. Many Turnstones use non-estuarine coastal habitats during the non-breeding seasons, which are only partially covered by WeBS. The 1% threshold for identifying sites of national importance for Turnstone during the non-breeding seasons is 640.

3.16 Black-headed Gull *Larus ridibundus*

Trend Unknown

Black-headed Gulls occurred commonly at Cardiff Bay in the years prior to barrage-closure and have continued to use the site since. Numbers of all gull species fluctuate both with the tide and across the day. Peak counts occur at dusk as birds arrive to use the open water as a nocturnal roost site.

Black-headed Gulls were not included in BTO counts of Cardiff Bay until 2001/02 and have not been covered by WeBS counts. No trends in numbers could thus be ascertained for this species.

A peak of 423 Black-headed Gulls was recorded by BTO counts of the Bay in March 2002 and a mean of 163.7 recorded over the winter of 2001/02 as a whole. It should be noted that these counts were timed to occur at high or low tide and thus only occasionally occurred at dusk, when gull numbers were likely to be at their maximum.

Information from the Welsh Bird Reports for 1999 and 2000 (Shrubb & Green 2000, Green 2001) reveals that a peak of 2,220 Black-headed Gulls occurred in the winter of 1999/2000 and that 800 were also present in December 2000.

These numbers are small in comparison to the size of the total Welsh and British non-breeding populations. Although WeBS counts only provide a partial census of gull populations, a peak of 268,098 Black-headed Gulls was nevertheless counted in Great Britain in 1999/2000 and a peak of 18,974 in Wales. The 1993 Winter Gull Roost Survey estimated that there were at least 1.6 million Black-headed Gulls in Great Britain during winter.

The 1% threshold for identifying sites of national importance for Black-headed Gulls in Great Britain during the non-breeding seasons is 19,000.

3.17 Lesser Black-backed Gull *Larus fuscus*

**Trend Unknown
Potentially Nationally Important**

Lesser Black-backed Gulls also occurred commonly at Cardiff Bay in the years prior to barrage-closure and have continued to use the site since.

Lesser Black-backed Gulls were not included in BTO counts of Cardiff Bay until 2001/02 and have not been covered by WeBS counts. No trends in numbers could thus be ascertained for this species.

A peak of 140 Lesser Black-backed Gulls was recorded by BTO counts of the Bay in February 2002 and a mean of 41.9 recorded over the winter of 2001/02 as a whole. It should be noted that these counts were timed to occur at high or low tide and thus only occasionally occurred at dusk, when gull numbers were likely to be at their maximum.

The Welsh Bird Reports for 1999 and 2000 (Shrubb & Green 2000, Green 2001) reveal that a peak of 594 Lesser Black-backed Gulls occurred in the winter of 1999/2000 and that 900 were also present in December 2000.

The non-breeding population of Lesser Black-backed Gulls in Great Britain is better censused by WeBS than any other species of gull. A peak of 52,896 Lesser Black-backed Gulls was counted by WeBS in Great Britain in 1999/2000 and a peak of 18,974 in Wales. The 1993 Winter Gull Roost Survey estimated that there was a population of at least 60,000 Lesser Black-backed Gulls in Great Britain during the winter (Burton *et al.* 2002a).

The 1% threshold for identifying sites of national importance for Lesser Black-backed Gulls in Great Britain during the non-breeding seasons is 500. Information from the Welsh Bird Reports suggests that this figure may regularly be surpassed at Cardiff Bay. The Severn Estuary as a whole is of international importance for Lesser Black-backed Gulls in the non-breeding seasons (Musgrove *et al.* 2001).

Lesser Black-backed Gulls breed on warehouse and other roof tops around the edges of Cardiff Bay.

3.18 Herring Gull *Larus argentatus*

Trend Unknown

As with the previous two species, Herring Gulls have also continued to occur commonly at Cardiff Bay since barrage-closure.

Herring Gulls were not included in BTO counts of Cardiff Bay until 2001/02 and have not been covered by WeBS counts. No trends in numbers could thus be ascertained for this species.

A peak of 103 Herring Gulls was recorded by BTO counts of the Bay in March 2002 and a mean of 24.6 recorded over the winter of 2001/02 as a whole. It should be noted that these counts were timed to occur at high or low tide and thus only occasionally occurred at dusk, when gull numbers were likely to be at their maximum.

An exceptional count of 1,700 Herring Gulls in November 2000 was noted in the Welsh Bird Report for that year (Green 2001).

The numbers typically noted are not of national significance, though are certainly of local importance. Although WeBS counts only provide a partial census of gull populations, a peak of 70,595 Herring Gulls was nevertheless counted in Great Britain in 1999/2000 and a peak of 6,632 in Wales. The 1993 Winter Gull Roost Survey estimated that there were at least 370,000 Herring Gulls in Great Britain during winter.

The 1% threshold for identifying sites of national importance for Herring Gulls in Great Britain during the non-breeding seasons is 4,500.

3.19 Other Species

In addition to the above, a further 26 waterbird species have also been recorded at Cardiff Bay over the period from November 1999 to March 2002, 19 by BTO surveys.

Seven of these had not been recorded by BTO surveys in the 10 years prior to closure – Slavonian Grebe *Podiceps auritus*, Black-necked Grebe *Podiceps nigricollis*, Long-tailed Duck *Clangula hyemalis*, Moorhen *Gallinula chloropus*, Little Gull *Larus minutus*, Ring-billed Gull *Larus delawarensis* and Black Tern *Chlidonias niger*. Other notable individual records include a Grey Phalarope *Phalaropus fulicarius* in October 2001 and a Glaucous Gull *Larus hyperboreus* in March 2002.

4. DISCUSSION

Since the closure of the Cardiff Bay Barrage in November 1999, there has been a change from a diverse waterbird community dominated by large numbers of estuarine specialists, to a less diverse community comprising relatively small numbers of freshwater and open water species.

The present waterbird community of Cardiff Bay is dominated by grebes, Cormorants, Mute Swans, diving and dabbling ducks and Coot. As a result of its coastal location, the Bay also attracts gulls, particularly towards dusk when the open water is used for roosting. The Bay is additionally still used as a high tide roost site by small numbers of Shelduck and the waders – Dunlin, Curlew and Redshank – that were numerous on the estuarine habitats of the Bay prior to barrage-closure. It is not expected that many more species will be attracted to the Bay in the near future, though the numbers of some freshwater and open water species, e.g. Pochard and Coot, may be expected to rise.

Trends in species' populations could be determined for 15 of the 18 species whose status is discussed in detail.

Six of these have shown increases over the last three years: Great Crested Grebe, Mute Swan, Teal, Pochard, Tufted Duck and Coot. A further three species had stable populations over this period: Mallard, and two fish-eating species – Cormorant and Goosander. All of these species are associated with freshwater and open water habitats. In contrast, populations of Shelduck and five species of wader – Lapwing, Dunlin, Curlew, Redshank and Turnstone – which had fallen sharply with the change from estuarine to freshwater conditions associated with barrage-closure, have shown continued declines over the last three years.

Three species of gull – Black-headed Gull, Lesser Black-backed Gull and Herring Gull – were also numerous at Cardiff Bay over the three year study period.

The populations of the majority of the waterbird species using Cardiff Bay are small in comparison to Welsh or British populations. Numbers of Pochard have risen sharply over the last three years and the peak of 350 recorded in 2001/02 is close to the threshold of 440 used for identifying sites of national importance for the species. Should this increase continue, Pochard might in future occur in numbers that would qualify the Bay for this status. The counts reported in the Welsh Bird Reports for Lesser Black-backed Gull – which were presumably undertaken at dusk as birds arrived to roost in the Bay overnight – suggest that the numbers of this species are already of national importance. If the species is found to regularly occur in the numbers reported, Cardiff Bay may be considered worthy of SSSI or SPA designation by the JNCC.

Acknowledgements

Data from the Wetland Bird Survey (WeBS) helped to indicate the numbers of waterbirds using Cardiff Bay in the non-breeding seasons and to put these numbers in context. WeBS is a partnership between the BTO, the Wildfowl and Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee (the latter on behalf of English Nature, Scottish Natural Heritage, the Countryside Council for Wales and the Environment and Heritage Service in Northern Ireland).

Further information came from the records collated by the Glamorgan Bird Club and Vaughan Grantham.

Mike Armitage undertook BTO counts during March 2002. Mark Rehfisch commented upon the report and Nicki Read helped to finalise it.

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Species	Scientific name	Recorded by BTO surveys	Recorded by WeBS counts	County or other records
WILDFOWL				
Mute Swan	<i>Cygnus olor</i>	✓	✓	✓
Canada Goose	<i>Branta canadensis</i>	✓		✓
Dark-bellied Brent Goose	<i>Branta bernicla bernicla</i>			✓
Shelduck	<i>Tadorna tadorna</i>	✓	✓	✓
Gadwall	<i>Anas strepera</i>	✓		
Teal	<i>Anas crecca</i>	✓	✓	✓
Mallard	<i>Anas platyrhynchos</i>	✓	✓	✓
Pochard	<i>Aythya ferina</i>	✓	✓	✓
Tufted Duck	<i>Aythya fuligula</i>	✓	✓	✓
Scaup	<i>Aythya marila</i>			✓
Long-tailed Duck	<i>Clangula hyemalis</i>	✓	✓	✓
Goldeneye	<i>Bucephala clangula</i>	✓	✓	
Goosander	<i>Mergus merganser</i>	✓	✓	✓
Ruddy Duck	<i>Oxyura jamaicensis</i>			✓
WADERS				
Oystercatcher	<i>Haematopus ostralegus</i>	✓	✓	
Lapwing	<i>Vanellus vanellus</i>	✓	✓	
Dunlin	<i>Calidris alpina</i>	✓	✓	✓
Snipe	<i>Gallinago gallinago</i>			✓
Whimbrel	<i>Numenius phaeopus</i>	✓		
Curlew	<i>Numenius arquata</i>	✓	✓	✓
Redshank	<i>Tringa totanus</i>	✓	✓	
Common Sandpiper	<i>Actitis hypoleucos</i>	✓	✓	✓
Turnstone	<i>Arenaria interpres</i>	✓	✓	✓
Grey Phalarope	<i>Phalaropus fulicarius</i>			✓
GULLS & TERNS				
Mediterranean Gull	<i>Larus melanocephalus</i>	✓		✓
Little Gull	<i>Larus minutus</i>	✓		✓
Black-headed Gull	<i>Larus ridibundus</i>	✓		✓
Ring-billed Gull	<i>Larus delawarensis</i>	✓		✓
Common Gull	<i>Larus canus</i>	✓		✓
Lesser Black-backed Gull	<i>Larus fuscus</i>	✓		✓
Herring Gull	<i>Larus argentatus</i>	✓		✓
Yellow-legged Gull	<i>Larus a. cachinnans / Larus a. michahellis</i>			✓
Glaucous Gull	<i>Larus hyperboreus</i>			✓
Great Black-backed Gull	<i>Larus marinus</i>	✓		
Black Tern	<i>Chlidonias niger</i>	✓		✓
OTHER WATERBIRD SPECIES				
Little Grebe	<i>Tachybaptus ruficollis</i>	✓	✓	✓
Great Crested Grebe	<i>Podiceps cristatus</i>	✓	✓	✓
Slavonian Grebe	<i>Podiceps auritus</i>	✓	✓	✓
Black-necked Grebe	<i>Podiceps nigricollis</i>	✓		✓
Cormorant	<i>Phalacrocorax carbo</i>	✓	✓	✓
Grey Heron	<i>Ardea cinerea</i>	✓		
Moorhen	<i>Gallinula chloropus</i>	✓		
Coot	<i>Fulica atra</i>	✓	✓	✓
Kingfisher	<i>Alcedo atthis</i>	✓		

Table 3.1 Waterbird species recorded at Cardiff Bay by BTO surveys, Wetland Bird Survey (WeBS) counts or noted in Welsh, county or other local bird records between November 1999 and March 2002.

Species	Scientific name	BTO counts			WeBS counts	
		1999/2000	2000/01	2001/02	2000/01	2001/02
WILDFOWL						
Mute Swan	<i>Cygnus olor</i>	0	18 (0.8)	14 (2.2)	9 (3.8)	12 (1.5)
Canada Goose	<i>Branta canadensis</i>	0	5 (0.3)	0	0	0
Shelduck	<i>Tadorna tadorna</i>	39 (7.7)	61 (14.0)	36 (3.0)	47 (19.8)	17 (1.5)
Gadwall	<i>Anas strepera</i>	0	0	1 (0.1)	0	0
Teal	<i>Anas crecca</i>	20 (3.3)	30 (6.0)	42 (9.9)	28 (16.0)	50 (31.8)
Mallard	<i>Anas platyrhynchos</i>	51 (11.1)	42 (9.5)	58 (11.5)	67 (28.2)	38 (28.8)
Pochard	<i>Aythya ferina</i>	69 (15.1)	120 (38.0)	240 (71.3)	64 (24.2)	350 (155.0)
Tufted Duck	<i>Aythya fuligula</i>	1 (0.1)	2 (0.1)	23 (4.6)	0	18 (5.5)
Long-tailed Duck	<i>Clangula hyemalis</i>	0	0	1 (0.4)	0	1 (0.5)
Goldeneye	<i>Bucephala clangula</i>	0	0	1 (0.3)	1 (0.2)	0
Goosander	<i>Mergus merganser</i>	7 (1.6)	4 (1.8)	16 (1.8)	2 (1.0)	8 (2.5)
WADERS						
Oystercatcher	<i>Haematopus ostralegus</i>	4 (0.4)	2 (0.1)	2 (0.2)	2 (1.2)	0
Lapwing	<i>Vanellus vanellus</i>	0	43 (5.9)	24 (1.6)	45 (11.2)	6 (0.0)
Dunlin	<i>Calidris alpina</i>	12 (1.3)	7 (0.7)	3 (0.6)	55 (11.0)	1 (0.3)
Whimbrel	<i>Numenius phaeopus</i>	0	3 (0.0)	1 (0.0)	0	0
Curlew	<i>Numenius arquata</i>	15 (0.8)	62 (5.6)	36 (0.2)	30 (9.0)	3 (0.0)
Redshank	<i>Tringa totanus</i>	22 (2.4)	91 (12.1)	30 (4.6)	0	3 (0.8)
Common Sandpiper	<i>Actitis hypoleucos</i>	1 (0.1)	2 (0.1)	3 (0.0)	1 (0.2)	1 (0.0)
Turnstone	<i>Arenaria interpres</i>	18 (1.0)	0	0	37 (7.4)	0

Table 3.2 Peak annual and mean winter numbers of waterbirds recorded by BTO counts in 1999/2000, 2000/01 and 2001/02 and by WeBS counts in 2000/01 and 2001/02. Winter means are shown in parentheses. NC = not counted.

Species	Scientific name	BTO counts			WeBS counts	
		1999/2000	2000/01	2001/02	2000/01	2001/02
GULLS & TERNS						
Mediterranean Gull	<i>Larus melanocephalus</i>	NC	1 (0.1)	0	NC	NC
Little Gull	<i>Larus minutus</i>	NC	NC	4 (0.2)	NC	NC
Black-headed Gull	<i>Larus ridibundus</i>	NC	NC	423 (163.7)	NC	NC
Ring-billed Gull	<i>Larus delawarensis</i>	1 (0.1)	NC	0	NC	NC
Common Gull	<i>Larus canus</i>	NC	NC	3 (0.8)	NC	NC
Lesser Black-backed Gull	<i>Larus fuscus</i>	NC	NC	140 (41.9)	NC	NC
Herring Gull	<i>Larus argentatus</i>	NC	NC	103 (24.6)	NC	NC
Great Black-backed Gull	<i>Larus marinus</i>	NC	NC	2 (0.2)	NC	NC
Black Tern	<i>Chlidonias niger</i>	NC	NC	6 (0.0)	NC	NC
OTHER WATERBIRD SPECIES						
Little Grebe	<i>Tachybaptus ruficollis</i>	2 (0.1)	NC	3 (1.0)	1 (0.4)	3 (1.0)
Great Crested Grebe	<i>Podiceps cristatus</i>	1 (0.1)	NC	17 (7.4)	5 (1.0)	11 (6.0)
Slavonian Grebe	<i>Podiceps auritus</i>	0	0	1 (0.2)	0	1 (0.5)
Black-necked Grebe	<i>Podiceps nigricollis</i>	0	0	1 (0.2)	0	0
Cormorant	<i>Phalacrocorax carbo</i>	NC	NC	42 (13.2)	26 (23.8)	31 (19.8)
Grey Heron	<i>Ardea cinerea</i>	NC	NC	1 (0.1)	0	0
Moorhen	<i>Gallinula chloropus</i>	NC	NC	2 (0.7)	0	0
Coot	<i>Fulica atra</i>	0	NC	59 (33.0)	0	110 (56.0)
Kingfisher	<i>Alcedo atthis</i>	NC	NC	1 (0.0)	0	0

Table 3.2 continued.

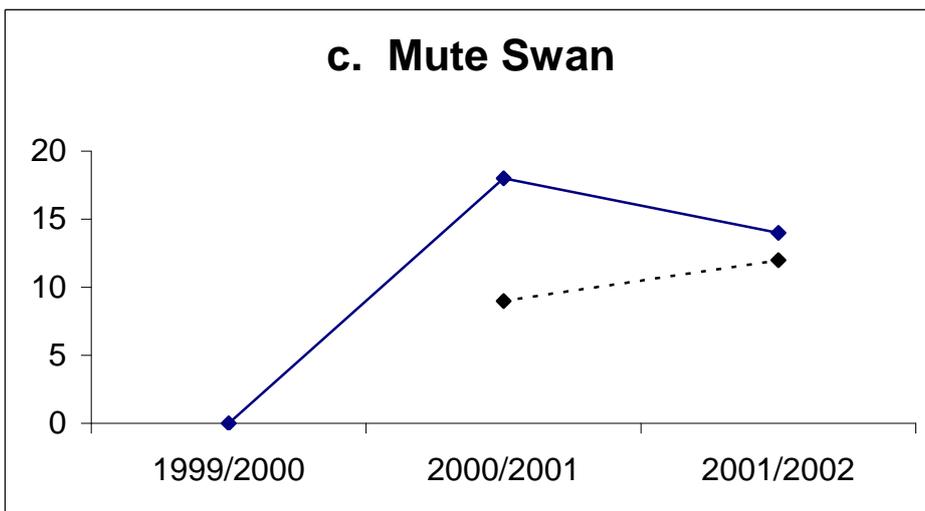
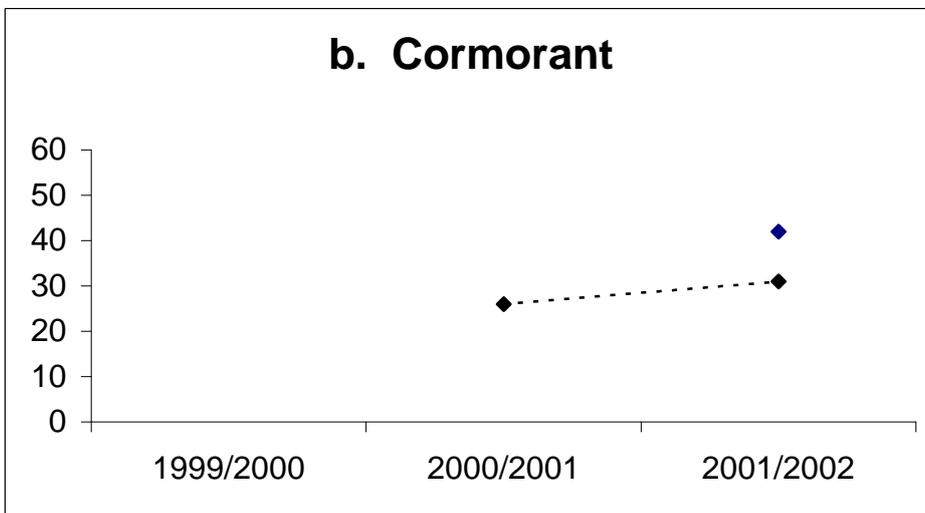
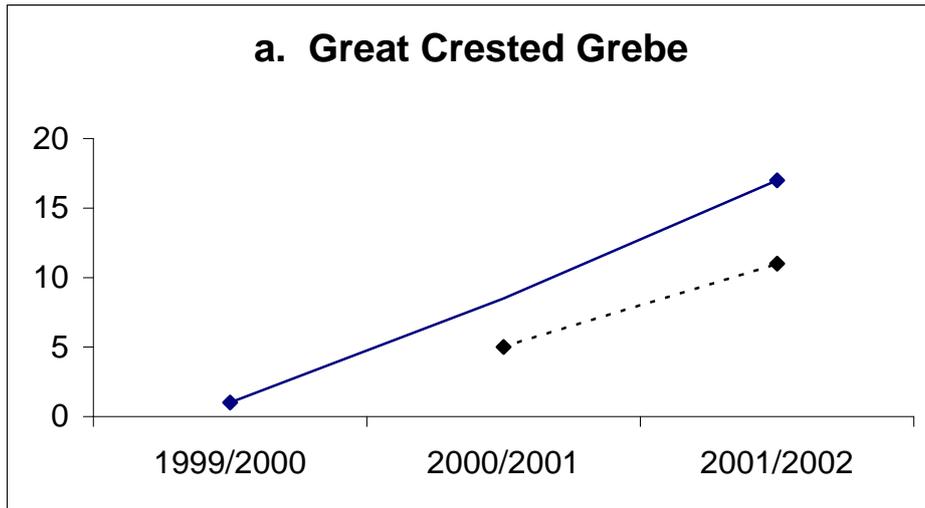


Figure 3.1 Peak annual numbers of waterbirds recorded at Cardiff Bay by BTO counts (solid line) and WeBS counts (dotted line). Only those species recorded in numbers of 10 or more are included. Insufficient data were available to graphically show trends in the numbers of gulls.

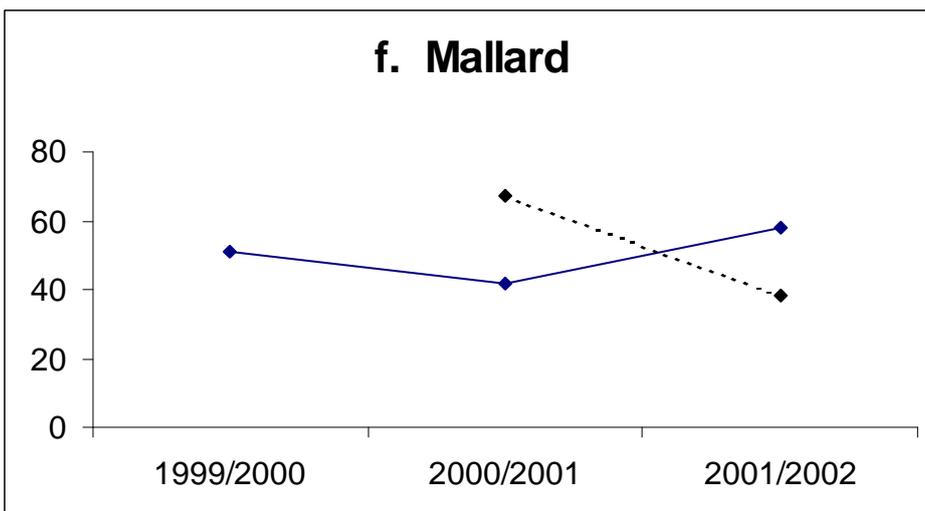
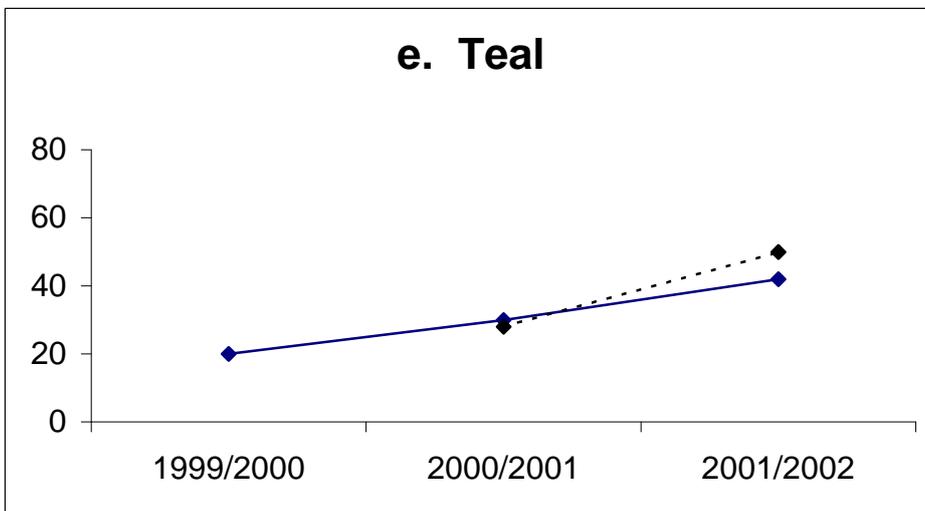
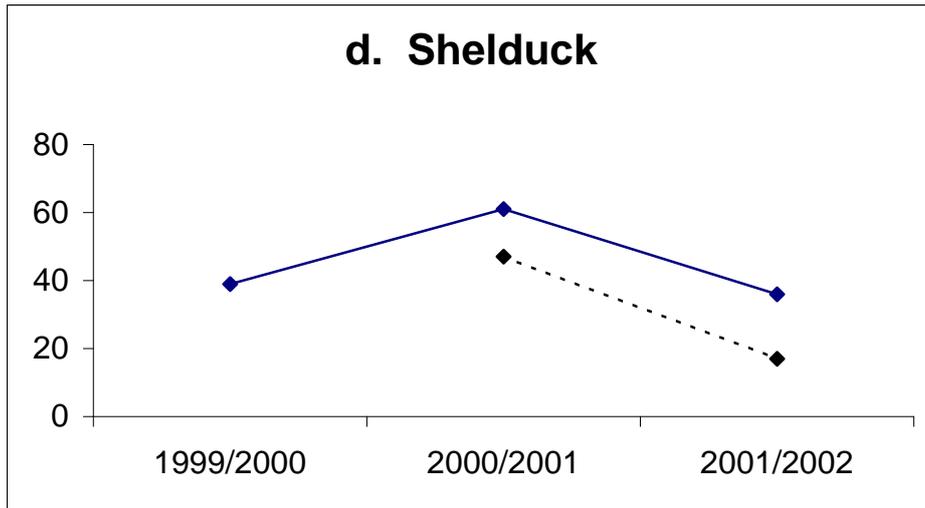


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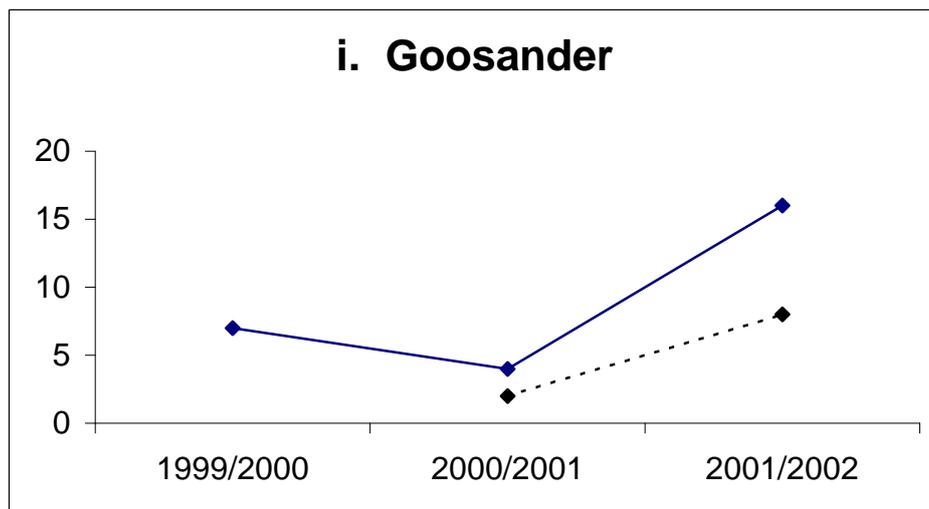
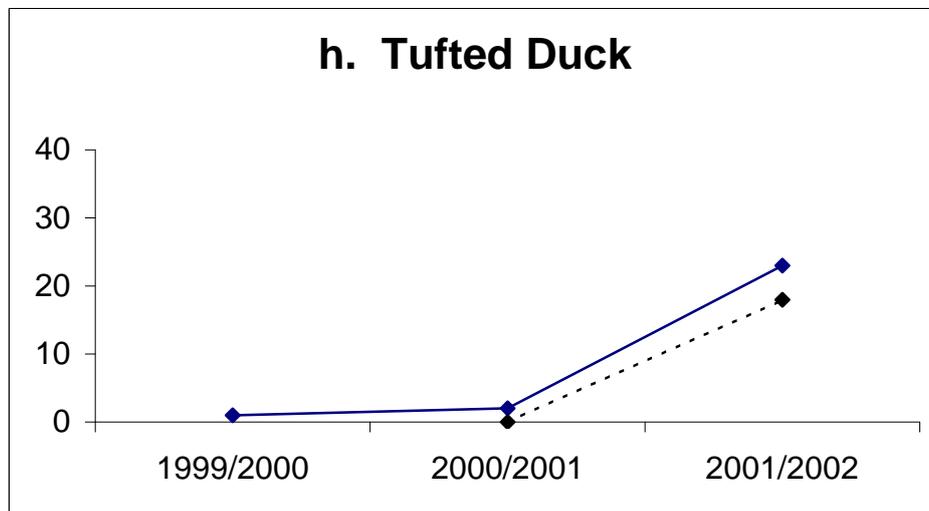
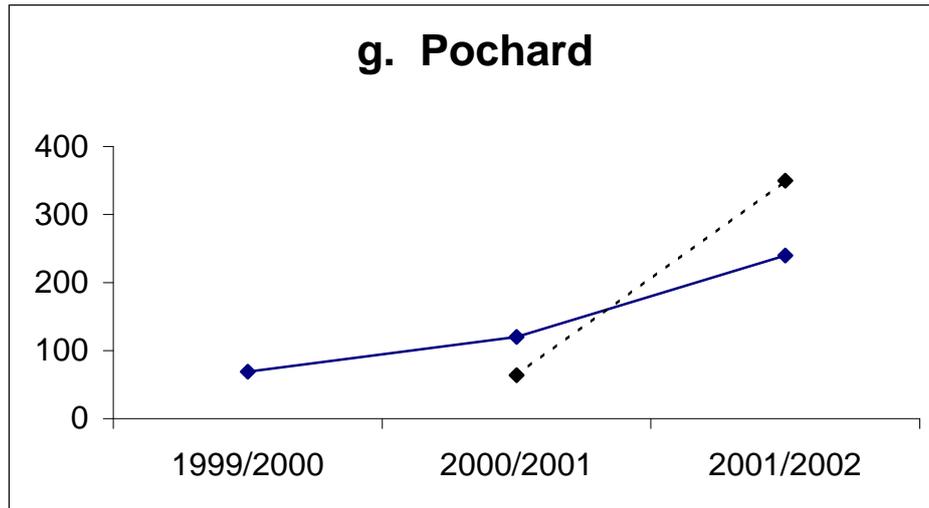


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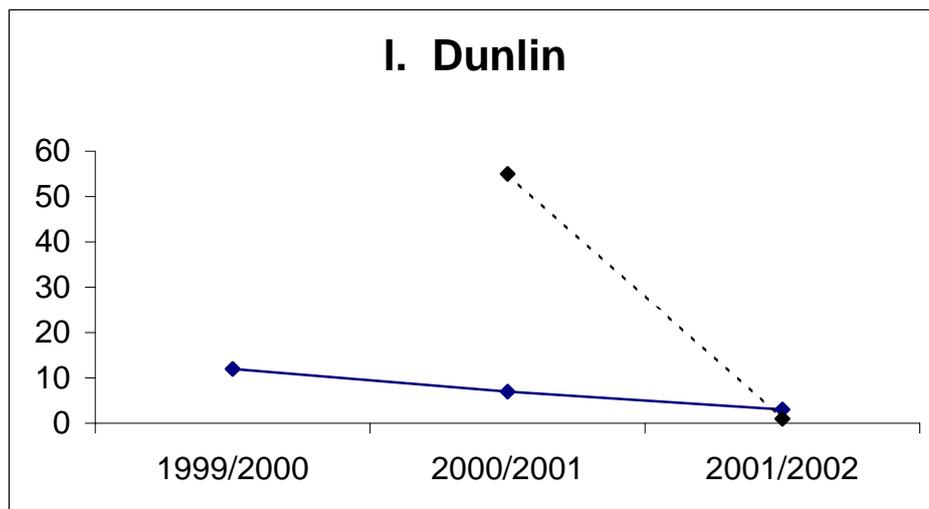
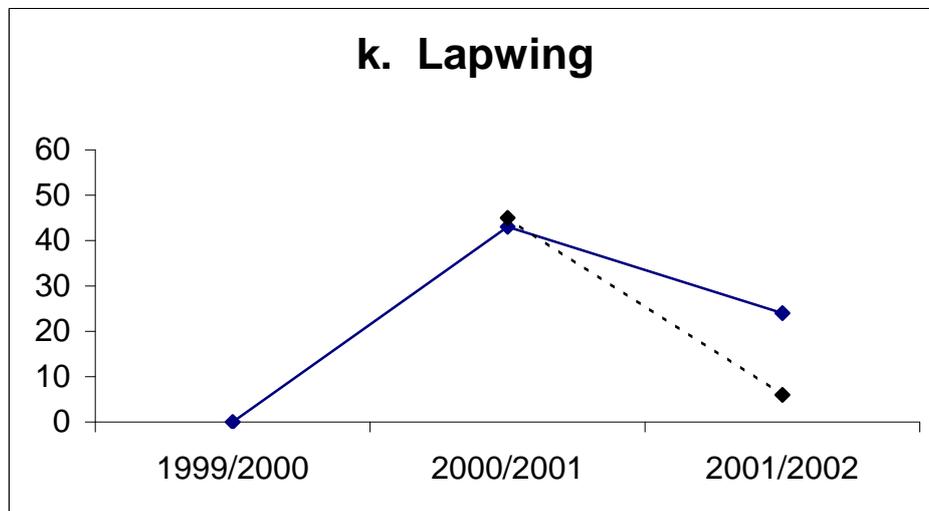
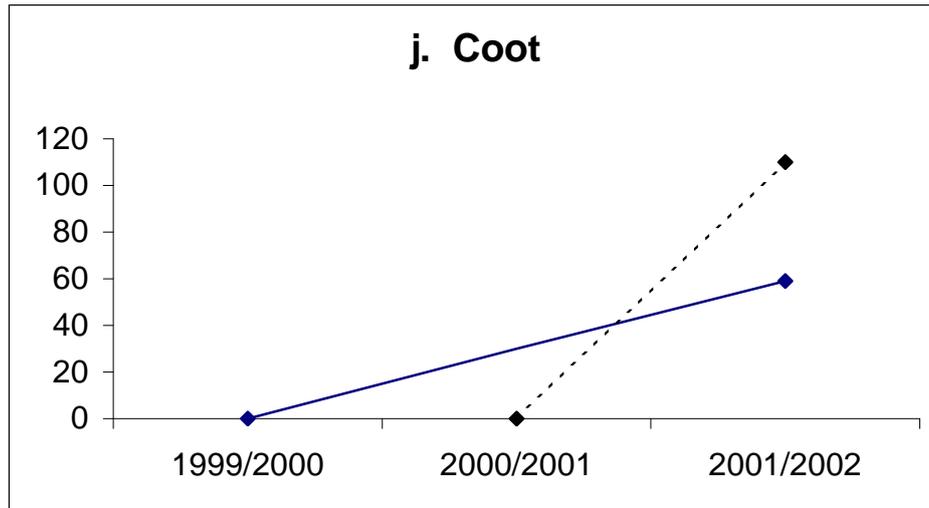


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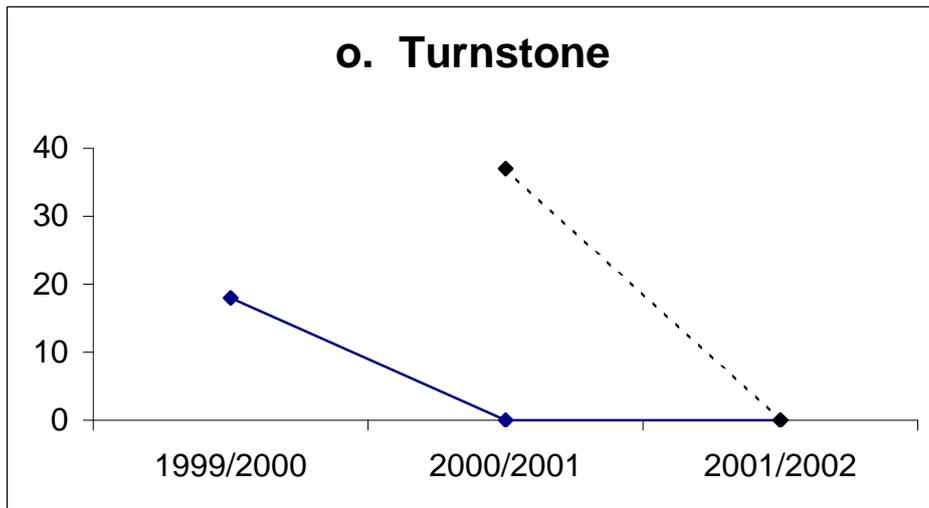
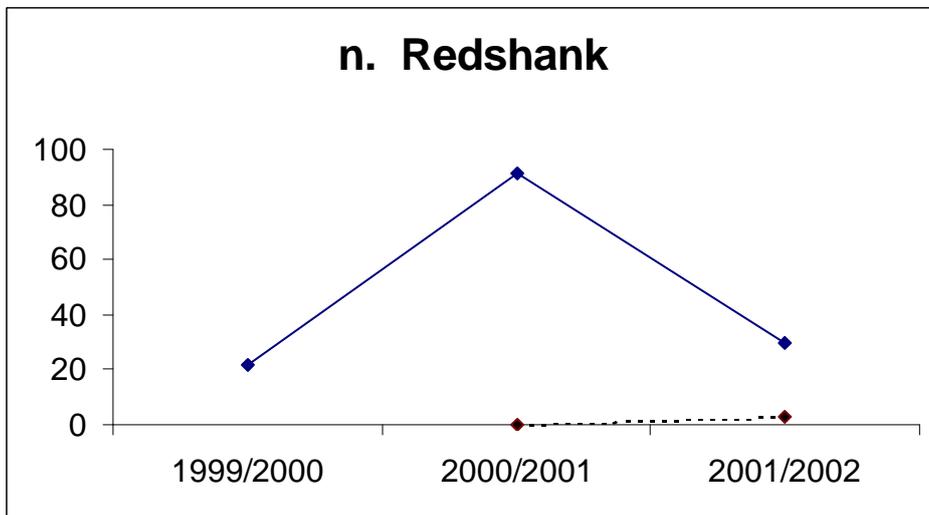
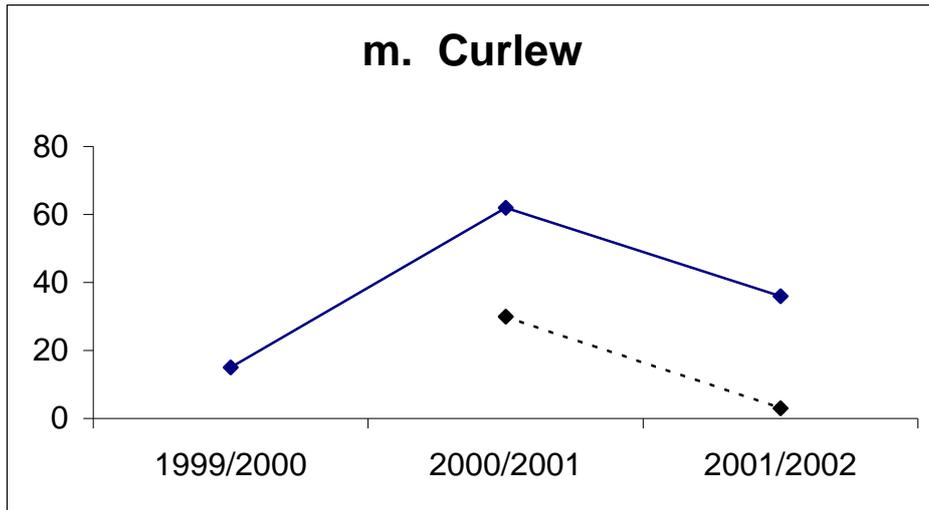


Figure 3.1 Continued.

