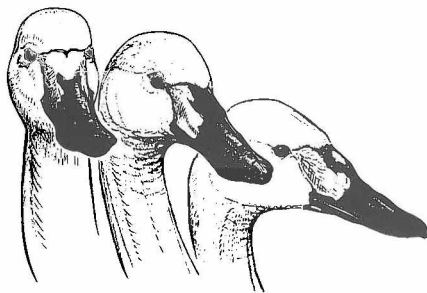


Bewick's and Whooper Swans *Cygnus columbianus bewickii* and *C. cygnus*: the 1994-95 season



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The start of the 1994-95 swan season at Wildfowl & Wetlands Trust Centres was later than normal because of the weather conditions in Iceland during October. A dominant southwesterly airflow with associated heavy cloud-cover delayed the departure of the bulk of the Whooper Swans until a weather window of clear skies and northerly winds on 26 and 27 October. The very first Whooper Swans appeared on 28 September at both Caerlaverock and Martin Mere and on 4 October at Welney, but it was not until the end of October that numbers rose to above 100 at any of the Wildfowl & Wetlands Trust reserves. There were large influxes of Whooper Swans to the British Isles in November and numbers continued to build up at Martin Mere and on the Ouse Washes at Welney throughout November and December reaching record-breaking levels at both sites. A total of 738 Whooper Swans were present at Martin Mere on 13 December which was a new reserve record, a further 35 birds were present some 25 miles further north near Pilling on the Fylde bringing the Lancashire county record to at least 777 Whooper Swans. Not to be outdone, Welney played host to 853 Whooper Swans on 4 December which with the 289 birds present on the RSPB section of the Washes, produced a grand total of 1,142 Whooper Swans for the whole of the Ouse Washes, the largest single concentration of the species ever recorded in England. Whooper Swans have certainly benefitted from recent reserve management at both Martin Mere and Welney; around 700 Whooper Swans were to remain at Martin Mere for much of the season, whilst over 1,000 Whooper Swans spent the winter on the Ouse

Washes with up to 905 birds on occasion on the Welney refuge.

The 1994-95 winter in Britain was exceptionally mild until early March, as indeed it was throughout most of continental Europe. Bewick's Swans consequently arrived both later and in smaller numbers than in recent years. The first Bewick's Swans arrived on 17 October at Welney, on 18 October at Martin Mere, on 19 October at Caerlaverock and on 20 October at Slimbridge. These were fairly typical arrival dates but the subsequent increase in numbers at all sites was slow and peak counts during the winter were low. The maximum count of Bewick's Swans on the Ouse Washes at Welney was just 3,668 on 4 December, whilst peak counts of 548 at Martin Mere on 15 December and 286 in the Severn valley on 7 February were also disappointing. Larger numbers of Bewick's Swans than normal (c.10,000) are known to have remained in The Netherlands this winter (T. Haitjema pers. comm.) probably as a result of the mild conditions. The mass departure of Bewick's Swans from Britain was also earlier than normal. Continuing mild weather with favourable southwesterly 'tail-winds' encouraged the bulk of the Bewick's Swans to depart from the Ouse Washes and Martin Mere in early February, a full two to three weeks earlier than usual. The Bewick's Swans at Slimbridge lingered a little longer but most had departed by the end of February.

The proportion of Bewick's Swan cygnets recorded at Welney and Martin Mere indicated that 1994 was another poor breeding season, with some 8-11% juveniles in the population, well below the average of 15-16% cygnets recorded

during the 1970s and 1980s. There have now been four poor consecutive breeding seasons since the last above-average breeding season in 1990. As in the 1993-94 winter, the proportion of cygnets at Slimbridge was higher, however; 13.6% of all Bewick's Swans recorded at the site during the winter were juveniles, suggesting a bias in the distribution of family parties throughout the wintering grounds. The Whooper Swans, on the other hand, appeared to have had a good breeding season in Iceland in 1994, with estimates on the wintering grounds ranging from 17% juveniles in the herds at Martin Mere and Welney, to 20.9% at Caerlaverock.

Review of the season at WWT Centres

Slimbridge

The first Bewick's Swan to arrive at Slimbridge was Auberon, who flew into the European Pen early on the morning of 20 October, having first been seen on the River Severn at dawn. Auberon was also the first Bewick's Swan to arrive at Slimbridge during the 1992-93 winter and is a regular member of the group of swans that roost on pools in the collection area. The arrival date was roughly average for Slimbridge, but the swan departed the next day and it was not until 4 November that the next seven birds appeared. The build-up in swan numbers was relatively slow with counts rising from 48 on 6 November, to 63 on 21 November and to 120 on 28 November. Amongst these arrivals were Pedro and Weaver with four cygnets, returning for their second consecutive winter at the site. Pedro now appears to have forsaken Welney after ten years at the site in favour of Slimbridge, which is the traditional wintering site of his mate Weaver.

Swans continued to arrive almost daily in small groups throughout December with numbers rising to 140 on 5 December and to 182 on 29 December. Amongst the December arrivals was Casino. Now in her twenty-fourth year, Casino was the oldest surviving Bewick's Swan to return to Slimbridge during the 1994-95 winter. For the sev-

enth year she was accompanied by her second mate, Punter, with whom she successfully raised two cygnets this season. A fodder beet field, planted on the reserve specifically for the swans, attracted the bulk of the birds throughout November, whilst in December the birds favoured a flooded pasture field adjacent to the beet field and frequently commuted between the two fields during the day. These two fields served to hold the swans at Slimbridge and numbers were correspondingly low at Walmore Common, an important alternative feeding area lying some 10 km north of Slimbridge, despite the presence of extensive flood-waters at the site for much of the period. Only a handful of birds were recorded feeding at Walmore Common before the New Year, with a peak of 23 on 18 December, and all returned to Slimbridge each evening to roost.

A short period of freezing weather in the New Year caused a small influx of swans, with numbers rising to 216 on 3 January. Numbers at Slimbridge then declined as birds began to make use of flood waters at Walmore Common both for feeding and roosting purposes. A combined count on 10 January found a total of 244 swans divided between the two sites of which 66 were at Walmore. The Walmore flock decreased in mid-January, however, and numbers correspondingly increased at Slimbridge; a total of 253 was counted at Slimbridge on 15 January and some 130-150 swans roosted each night on Swan Lake for most of the month. Numbers declined at the end of the month, to around 160, as swans returned to Walmore in order to take advantage of extensive flooding on the common, following a period of unusually heavy rainfall. A count of 127 Bewick's Swans at Walmore Common on 24 January was the highest of the winter for this important alternative site. A few new swans appeared at Slimbridge during the first week of February and a simultaneous count of Walmore and Slimbridge on 7 February found a total of 286 swans in the area of which 188 were at Slimbridge. This was the highest count of the winter for the Severn valley flock. Around 90 to 100 birds remained at Walmore until 9 February when the floods receded rapidly, encouraging the

swans to leave the site. Not all of these birds returned to Slimbridge, however. Sightings of ringed birds revealed that some, at least, moved north along the River Severn to make use of flooded pasture in the Ashleworth and Coombe Hill areas. Over 100 Bewick's Swans were present on the floods near Coombe Hill on 19 February whilst some 60 to 80 of these birds moved on to frequent the Ashleworth area until the second week of March.

Some 200 Bewick's Swans were present at Slimbridge in mid-February but the mild conditions and persistent south-westerly "tail-winds" resulted in the birds leaving the site towards the end of the month. The first large departure occurred just after the second afternoon feed at 1700 hrs on 26 February when a group of 75 swans departed north from Swan Lake. A total of 84 Bewick's Swans remained at Slimbridge the next day but numbers dropped to 32 on 2 March and to four on 7 March. The last Bewick's Swan remained until its demise on 26 March.

A total of 330 individual Bewick's Swans was recorded at Slimbridge during the winter, indicating that turn-over at the site was unusually low. Some 45 (13.6%) of the birds were juveniles, which suggests that 1994 was another fairly poor breeding season. The mean brood size was 2.14 cygnets per family which was very similar to the 2.12 cygnets per family recorded in 1993-94. The proportion of new birds at the site was lower than normal; 176 (61.8%) of the adults and yearlings had been recorded at Slimbridge in previous years.

One of the highlights of the winter season was the inauguration of the new swan-pipe at Slimbridge. This had been built during the summer to replace the old pipe, which had blown down during the gales of December 1993. The pipe proved to be an immediate success when over 100 ducks were caught (including 61 newly-ringed Pochard) in a lunch-time catch on 25 November. The first swan-catch was held on 27 January, when a total of 58 Bewick's Swans were caught, of which 34 were ringed for the first time, including 15 cygnets. All of the birds were X-rayed to examine their

tissues for lead shot; 33.3% of the adult swans were found to be carrying gunshot in their tissues, a very similar figure to previous estimates. None of the cygnets were found to be carrying shot however which suggests that the illegal shooting of Bewick's Swans may be more common in the spring.

Swans that had been ringed elsewhere, but which were identified at Slimbridge during the course of the winter included Pedro from Welney, four birds originally marked at Martin Mere, and four birds that had been fitted with neck-collars in Russia. These included two birds (148P and 409P) which visited Slimbridge during the 1993-94 winter and another (430P) which had been seen at a nearby site along the River Wye at Letton, Herefordshire, also in 1993-94. A further 49 swans ringed at Slimbridge were not seen at the site during the season but were reported elsewhere. These included eight in the Welney area, two at Martin Mere, two at other sites in England, three in Denmark, one in Germany and 33 in the Netherlands. One of the swans observed on the Ouse Washes near Welney, named Cry, is now in her twenty-fifth year and is the oldest Bewick's Swan known to be alive.

Welney

The start of the Welney swan season was delayed by the rather late arrival of the Whooper Swans from Iceland. The first two birds appeared on 4 October, but there were few further arrivals until the end of the month when a sudden influx pushed Whooper Swan numbers up to 446 by 23 October. Mild conditions prevailed and just 492 Whooper Swans were present on 20 November. There was a further influx at the end of November, however and 853 Whooper Swans were present on 4 December. Amongst these late November arrivals were a number of Welney regulars including Cod, Cackle and Descant.

It soon became clear that 1994 had been a good breeding season for the Whooper Swans. There were good numbers of families amongst the herds and the largest brood was of six cygnets. The proportion of juveniles in the popu-

lation on the Ouse Washes was estimated at 17%. Following such a good breeding season it was perhaps not surprising that the record count for Whooper Swans on the Ouse Washes was again broken this year and, for the first time ever, topped 1,000. On 4 December an additional 289 Whooper Swans were present on the RSPB section of the Washes, which when added to the 853 at Welney gave a grand total of 1,142, shattering the previous record of 986 set on 6 February 1994. The swans remained quite mobile along the Washes, changing their roosting and feeding sites in response to changes in flood conditions. The peak count on the Welney reserve itself was 905 on 21 January. Numbers remained high throughout the winter and over 1,000 Whooper Swans were still present on the Ouse Washes on 19 February.

The Bewick's Swans were also rather slow in arriving at Welney this winter. The first bird appeared on 17 October and numbers increased gradually to 150 by 20 October, but then declined to 117 on 21 October as birds moved away from the site. Amongst those that departed were two birds that had been originally ringed in Russia and which subsequently appeared, three days later, on the Wexford Slobs in south-east Ireland. There were further arrivals at Welney at the end of October and a total of 173 Bewick's Swans were counted on 23 October. Mass migration of Bewick's Swans to the site occurred in November, with numbers reaching 1,285 on 5 November and 2,462 on 20 November. Further influxes occurred towards the end of November and 3,668 were counted at dawn, roosting on the reserve on 4 December. Several Bewick's Swans that had wintered regularly at Welney since the early 1980's were again seen this winter, including Bazaar, Burnie, Captoe and Frappe. Panier arrived safely on 5 November together with his unringed mate, and all four of their 1994 brood. The cygnets had been caught and ringed during the summer at Panier's breeding territory near Khabuicka in the Nenetski State Game Reserve, Russia. Breeding success amongst the Bewick's Swans was again disappointing this year; the proportion of juveniles in the population on the Ouse Washes was

estimated at 8%.

The International Bewick's and Whooper Swan census on 21 January found 3,480 Bewick's Swans on the Ouse Washes of which 2,906 were on the Welney section. By late January, severe flooding was affecting the whole of the reserve area, which resulted in the swans dispersing widely to roost. Some Bewick's Swans moved to the Nene Washes at this time. The flooding persisted throughout February and, coupled with the very mild conditions, caused a large number of the Bewick's Swans to vacate the Washes during the month, presumably embarking early on their spring migration. A number of the missing colour-ringed birds appeared at sites near Great Yarmouth prior to departing for the continental mainland at the end of February. Just 723 Bewick's Swans remained at Welney on 19 February. Very few Bewick's Swans remained into March with eight on 26 March and just two injured birds at the end of the month.

During the first half of the winter both the Bewick's and Whoopers Swans concentrated on agricultural fields surrounding the Washes during the day, feeding predominantly on the remains of sugar-beet and potato crops. The swans switched to feeding on freshly sprouting wheat in January and dispersed over a wider area to sites up to ten miles away from the reserve. The switch from root crops to winter wheat occurred much earlier than in previous winters. This may have been due to relatively dry conditions in autumn enabling farmers to plough their fields following the harvest, thereby reducing the supply of waste root crops as food for the swans.

As in recent years, the Whooper Swans dominated the main lagoon at Welney, and few Bewick's Swans came forward to feed on the grain in front of the observatory. This situation was particularly marked during 1994-95 as high flood levels encouraged the Bewick's Swans to roost at more distant sites on the reserve. Despite the flooding, the regular swan feeds continued during the winter, thanks to the wardens who resorted to chest waders and life jackets in order to brave the elements! Unlike in previous winters, waste potatoes were

in short supply, particularly in the New Year. This reduction in supplementary feeding meant that even the Whooper Swans had to fly out to the surrounding fields in search of food during the day.

Numbers of Whooper Swans on the reserve remained high well into March with 386 present on 26 March. More favourable weather conditions for migration at the end of the month encouraged the remaining birds to depart with numbers dropping rapidly to 163 on 1 April and to 53 on 4 April. Twelve birds were still present on the main lagoon on 23 April.

Swan casualties due to collisions with overhead cables were very low this year. Although this reflected, in part, a shift in feeding areas away from key power-line routes, and comparatively little freezing fog, it may also reflect the steady progress being made on the fitting of bird diverters to the power-lines. Diverters were fitted to the earth-wire above some of the national grid wires, which span the northern end of the reserve, during the summer. Although progress was slow because the fields were very wet, it is hoped that the project will be completed during summer 1995. The only casualty recorded on a power-line to the north of the reserve, a Mute Swan, struck the section not yet fitted with diverters.

A total of 200 ringed migratory swans were recorded on or near the Welney reserve during the winter; 100 Bewick's Swans and 100 Whooper Swans. Of the Bewick's Swans, eight were originally ringed at Welney, 28 at Martin Mere, eight at Slimbridge, 42 in Russia (including 13 leg-ringed birds and 29 with blue neck-collars) and 12 on the continent by Dutch and German ringers (marked with yellow neck-collars). Of the Whooper Swans, six were originally ringed at Welney, eight at Martin Mere, ten at Caerlaverock, and 76 in Iceland (including 58 leg-ringed birds and 18 fitted with yellow neck-collars by Danish and Icelandic ringers in August 1994).

Caerlaverock

The first Whooper Swan of the winter arrived on 28 September. This bird had originally been ringed at Caerlaverock

as a cygnet during the 1991-92 winter and has returned regularly to the site ever since. It soon joined the five, mostly injured and recuperating Whooper Swans, that had spent the summer on the Whooper Pond. The number of Whooper Swans rose very slowly to a peak of 12 birds on 4 October, then dropped back to just three birds the next day. Numbers remained in single figures until 23 October when 14 birds were present. Bewick's Swans no longer appear at Caerlaverock in the numbers seen in the early to mid 1980's, when some 30-40 birds regularly spent the winter at the site. It was therefore most pleasing that a group of three unringed Bewick's Swans appeared at the back of the Folly Pond on 19 October, increasing to four on 21 October, seven on 23 October and nine on 18 November, which remained in the area for much of the winter. These birds roosted on the reserve and flew out to feed at neighbouring sites during the day, initially at Merklands Farm near Bankend, some three miles north of Caerlaverock, but later at Newmain's Pond (about half a mile north of the reserve) and at Priestsides Farm. These birds became less easy to find in December but a group of up to 13 Bewick's Swans, possibly including some of the earlier arrivals, made use of the Flood Field at Caerlaverock from the end of January until 8 February.

Unfavourable weather conditions for migration in October were thought to be responsible for the late arrival of Whooper Swans this winter. A window in the weather on 26 and 27 October, with wind directions predominantly from the north, enabled many of the swans to migrate south from Iceland towards the end of the month. A group of 21 Whooper Swans flew in at 1130 hrs on 26 October, and swans continued to arrive on the Folly Pond with 37 present by the end of the day and 45 by dawn on the following morning. A further three Whooper Swans were located nearby at Newmain's Pond. Further arrivals on 27 October included the first of the two swans that had been fitted with satellite transmitters in Iceland during the previous summer (JSC) together with her mate and five cygnets. By the end of the

day on 28 October a total of 100 Whooper Swans were present including 27 (27.0%) cygnets. The second swan fitted with a satellite transmitter (CDD) arrived with her mate during the night of 28 October and numbers rose to 110 by 29 October. However, only eight Whooper Swans were present the next morning and this set the pattern for the next few weeks, with the swans flying out early in the morning to feed on nearby flooded pastures and stubble fields, returning to Caerlaverock only to roost. By 18 November there had been several new arrivals of ringed swans but roost counts remained at just over 100 Whooper Swans with the bulk of the flock feeding on flooded potato fields east of Caerlaverock at Priestsides Farm. The number of swans roosting at Caerlaverock rose to 170 on 20 November and to 176 on 26 November, and there was an increase in the number of swans feeding on fields on the reserve at this time. The count of 176 Whooper Swans proved to be the highest of the winter and was remarkably similar to the peak count of the 1993-94 winter, with 175 Whooper Swans present on 18 February 1994.

Mild, wet conditions throughout December and January encouraged the swans to spread out in the surrounding area, to feed on the flooded pasture, and numbers at Caerlaverock were consequently lower. Around 100 Whooper Swans were present at Caerlaverock for most of December, whilst in January numbers fluctuated daily between 70 and 150 birds. Sightings of ringed birds for the first time this winter suggested, however, that swans were continuing to arrive during this period. A count of 153 Whooper Swans on 4 January included 32 (20.9%) cygnets, the highest number of cygnets to be recorded at Caerlaverock during the winter.

During the latter part of January it appeared that most of the birds roosting at Caerlaverock were flying further than usual to feed, since the number of birds located within a 20 mile radius of the centre was lower than in previous years. The swan flock at the traditional Netherwood/Crichton sites was unusually large at the start of the season, with up to 120 Whooper Swans and one Black Swan present. However this flock

declined rapidly in November to a more typical size of 20 to 30 birds and remained so for the rest of the winter. A number of the missing birds, including the Black Swan, were subsequently seen at Caerlaverock, indicating a higher than normal level of interchange between these two generally discrete flocks. A further 22 birds were present in the Kirkton/Gullyhill area, nearby in Cumbria, in January.

A highly successful swan-catch was held on 7 February when a total of 122 Whooper Swans were caught, of which 49 were newly ringed including all 27 cygnets known to have been at the site at the time. The satellite transmitters fitted to the Whooper Swans in Iceland last summer were successfully removed, and two more were fitted to two male Whooper Swans in order to monitor their return flights to Iceland in the spring. We hope to track the birds back to their nest-sites, which are currently not known, and to retrieve the transmitters during the swans' annual moult in early August.

Up to 143 Whooper Swans were still using the reserve at Caerlaverock at the end of February, including both of the birds fitted with satellite transmitters in January. Numbers of Whooper Swans continued to remain high during March with 150 birds present on 11 March, and 142 on 24 March. The first big departures took place at the end of the month with numbers dropping to 117 on 31 March, 76 on 3 April and 26 on 9 April. A group of 16 birds were present on 16 April of which six remained on 23 April.

Of the 119 ringed Whooper Swans observed at Caerlaverock during the 1994-95 season only thirty had been ringed at other sites. Of these 18 (including 5 cygnets) had been ringed in Iceland and the remaining 12 had been ringed at Martin Mere. A further 50 birds were ringed for the first time at Caerlaverock during the winter. Some 52 Whooper Swans ringed at Caerlaverock in previous years, but not seen at the site during 1994-95, were reported elsewhere. These included three at flocks nearby in Dumfriesshire, seven at other Scottish sites, four at Martin Mere, nine at Welney, four elsewhere in England, one in Wales, 21 in Ireland and three in Iceland. Two of the

swans which returned to Caerlaverock during the winter had been seen earlier in the season in Northern Ireland, whilst two others which appeared briefly at Caerlaverock in the autumn were relocated in Ireland towards the end of the winter.

Martin Mere

Two Whooper Swans spent the summer on the Mere in 1994; one was an adult that had broken its wing the previous winter and was unable to fly, the second was one of its 1993 brood. The first four migrating Whooper Swans to reach the Mere arrived on the morning of 28 September, and included two marked birds, one originally ringed as a cygnet at Martin Mere during the 1993-94 winter and the other in Iceland. The build-up of Whooper Swans was much slower than normal, with only 32 present on 21 October and 345 by the end of the month. The first Bewick's Swan of the season had been marked with a blue neck-collar (300P) in Russia, in August 1992, and has since been a regular winter visitor to Martin Mere. She arrived alone on 18 October, but by 22 October 57 Bewick's Swans and 40 Whooper Swans were present at the dawn count. It is very unusual to have more Bewick's than Whooper Swans on the reserve at this time of the year. By the end of October there were 71 Bewick's in the area, including only three juveniles.

Whooper Swan numbers rose rapidly in early November; 533 were counted at dawn on 5 November and by 24 November there were 651 birds at the site. Less than one hundred birds remained on the reserve during the day, with the bulk of the swans feeding on stubble fields near the Ribble estuary. From mid November to mid December some 450 Whooper Swans plus a variable number of Bewick's Swans fed on an unharvested potato field, which was partially flooded. Smaller numbers (<200) of Whooper Swans and the majority of the Bewick's Swans fed on shooting cereals and left-over grain on stubble fields near the Ribble throughout November and December. Whooper Swan counts continued to increase during December and by 13 December there were 738 birds in the area. This

was a new reserve and county record, and the number of birds remained at around this level for the rest of the winter. On 13 December a further 39 Whoopers were recorded on a field some 25 miles to the north of Martin Mere, near Pilling on the Fylde, bringing the Lancashire county record to at least 777 Whooper Swans. Of 723 Whooper Swans counted on 22 January, 125 (17.3%) were cygnets with a mean brood size of 2.7 cygnets per family.

Bewick's Swan counts reached 309 by 10 November, then increased very slightly to 329 on 24 November, and 409 on 27 November. There appears to have been an influx of Bewick's Swans around 15 December, when a total of 548 birds, including 61 (11.1%) cygnets, were recorded in the area. This proved to be the maximum count of the winter, which was slightly lower than the 582 birds recorded in 1993-94. Up to 300 of the Bewick's Swans may have been roosting on the Ribble estuary at this time, since the direction of morning flight to the fields was from the river rather than Martin Mere. A flock of up to 109 Bewick's Swans and 11 Whooper Swans, also roosted on the River Douglas, a tributary of the Ribble. The swans were first seen using this roost during the 1993/4 winter.

The number of Bewick's Swans in the area fell to 452 birds on 26 December, and to 428 by the end of the year, although feeding birds were widely scattered and difficult to find. The number of Bewick's Swans counted at dawn on Martin Mere at this time was low, either because the birds were still roosting on the Ribble or because they were leaving the Mere before first light. In December less than 20 Bewick's Swans remained on the reserve during the day, and only a handful fed on the grain distributed twice daily. This may be due both to the abundance of food in the surrounding fields, and to the larger and more aggressive Whooper Swans monopolising the two main feeding sites. Although up to 80 Bewick's Swans attended the grain feed in the New Year, only around 20 birds obtained much food from this source. In contrast, at least 300 Whooper Swans attended the grain feeds from early December onwards, and up to 600

birds stayed on the reserve throughout the day in January and February. The Whooper Swans fed on grass fields such as Plover Field and Outer Vinson's, and on re-sown grass fields on neighbouring farms. Both species of swans also fed on Owl Marsh, a field on the reserve where extensive areas of rushes had been cut to provide better pasture. In mid-January waste potatoes were brought to the reserve by local farmers and these attracted 100-150 Whoopers and up to 50 Bewick's Swans for the following month. The majority of the Bewick's Swans used a winter wheat field near the Ribble, and also grazed on flooded pasture, potatoes and re-sown grass close to the reserve. In early February some 100 to 150 Bewick's Swans remained on the reserve during the day where they fed on waste potatoes and pasture.

Swans were present near Pilling on the Fylde from November onwards. After Christmas up to 115 Bewick's and 50 Whooper Swans used this area. Sightings of ringed birds indicated that the Whooper Swans had not visited Martin Mere during the winter, whereas some of the Bewick's Swans had been in the Martin Mere area until late December. The high number of migratory swans on the Fylde was most unusual and may have resulted from the exceptionally wet winter which allowed the birds to roost on flooded fields close to their feeding sites.

The Bewick's Swans wintering in Lancashire embarked on their spring migration exceptionally early this season. On 22 January there were still 433 in the area, but numbers had dropped to 214 by dawn on 7 February, 137 on 14 February, and by 19 February just 27 birds remained. On 23 February only 2 Bewick's Swans (both cygnets) were left at Martin Mere, with a further 13 on the Ribble. There were still 93 Bewick's and 15 Whooper Swans on the Fylde on 15 February, but by 20 February none were found here either. The Whooper Swans stayed later, as usual; on 21 February 734 roosted at Martin Mere, with 10 roosting on the Ribble. Numbers declined slightly to 666 present on 1 March, but the first major departures did not occur until mid-March with counts dropping rapidly

from 514 on 9 March, to 390 on 11 March, and to 106 on 23 March. Just 26 birds were still present on 30 March but there were no further departures until 6 April. Three injured/ill Whooper Swans, including an adult and two cygnets, remained on the Mere on 9 April.

A total of 191 of the Whooper Swans at Martin Mere was identified by ring number during the course of the winter. Thirty two of these had been caught and marked in Iceland, including seven birds fitted with neck collars in summer 1994. They also include nine swans marked at Caerlaverock, one at Welney and 16 which were newly ringed at the site during the winter. Only 15 Whooper Swans which had been ringed at Martin Mere in previous winters and which did not return to the site during 1994-95, were reported elsewhere during the season, highlighting the high degree of site-fidelity exhibited by these birds. Of the 13 swans seen away from the site there was one nearby at Pilling, Lancashire, five at Welney, three at Caerlaverock, four elsewhere in Scotland and one, most unusually, on the Polder Pinjum in the Netherlands. Ring-readers helped to record some interesting movements in the autumn as the Whooper Swans returned from Iceland to Martin Mere. No fewer than eleven Whooper Swans, originally ringed at Martin Mere, were observed in Northern Ireland prior to returning to the site. A further eight stopped over at Caerlaverock, whilst two more first appeared in North Wales before arriving at Martin Mere.

With fewer Bewick's Swans taking advantage of the grain feeds, there were no large swan-catches at Martin Mere this winter. However a duck-catch on 2 February produced 18 Whooper Swans of which 16 were newly ringed (including 11 cygnets), in addition to 50 Pochard, 46 Shelduck and a Pintail.

Some 102 Bewick's Swans were identified by ring number at Martin Mere during the winter. Of these, 96 had been ringed at the site in previous years (including two of the seven birds ringed in January 1987), two at Slimbridge, one at Welney and three in Russia. Eighty-two Bewick's Swans ringed at Martin Mere in previous win-

ters, but not seen at the site during 1994-95, were reported elsewhere during the season. These included 24 on the Ouse Washes, four at Slimbridge, one in Yorkshire, one at Horsey, Norfolk, one near Roxburgh, Scotland, one in Ireland, five in Germany, one in Denmark and 44 in the Netherlands.

Arundel

A small number of Bewick's Swans visited Arundel during the course of the winter from their more traditional haunts in the Arun valley at Pulborough and Amberley. The first Bewick's Swan which arrived at Arundel on 2 January, had been marked with a neck-collar (235P) in Russia in 1992. A second neck-collared bird (109P) arrived on 12 January and was subsequently observed nearby on the floods at Amberley on 25 January. This swan has now spent three consecutive winters in the Arun valley. The swans visited Arundel in order to roost on the pools within the enclosures and were present from 2 to 16 January, with a peak of at least 26 birds on the night of 3 January. Around 50 birds were known to have spent the winter in the valley.

International Research projects

Iceland

A new dimension was added to the study of Whooper Swan migration this year when, as part of a collaborative project with Bristol University, Professor Colin Pennycuik fitted satellite transmitters to two adult female birds at Skagafjörður, north Iceland. The two swans selected were both regular visitors to Caerlaverock, and were chosen so that the transmitters could be retrieved upon their return this winter. Prior to this study, information concerning the timing, duration, and direction of the migratory flight from the Icelandic breeding grounds to wintering grounds in Britain and Ireland was based, less precisely, on sightings of colour-marked individuals.

The satellite transmitters were fitted upon catching the swans during their

annual wing moult in late July, and were programmed to begin continuous transmission in late September, in time for their departure from the breeding grounds. The operation was a complete success and both birds were tracked by satellite from their nest-sites to their Caerlaverock wintering grounds. The two birds departed at different times. One left Skagafjörður on 16 October but then remained for over a week in southern Iceland before departing finally on 26 October. The other flew directly from Skagafjörður to Britain on 26 October without stopping off at a staging area. Although the timing of the flights of the two birds differed, they followed a very similar route over the first leg of the journey as they struck out across the open ocean from Iceland. Both birds flew in to Britain through the Outer Hebrides and then proceeded down the west coast of Scotland, prior to arriving safely at Caerlaverock; one with its mate and five cygnets on 27 October and the other with its mate on 28 October.

There has always been much speculation about the height at which swans fly during migration. Altimeters fitted to the transmitters of the two swans in this study revealed that they flew the entire journey just above the waves, and that both actually spent some time resting on the sea itself. Although we have not proven that Whooper Swans never migrate at high altitudes, given favourable atmospheric conditions, the study has clearly demonstrated for the first time that they can cross from Iceland to Scotland without needing to fly high. These exciting results encouraged the team to fit transmitters to two male Whooper Swans at Caerlaverock during the winter. The two original transmitters were successfully removed from the swans during their winter at Caerlaverock and two new transmitters were fitted to two carefully selected male birds during the swan-catch on 7 February. The two swans will be tracked from Scotland back to Iceland, firstly to see how the return migratory flight compares with that in the autumn, and secondly to help locate the nests of some Caerlaverock birds whose nesting areas are currently unknown.

As well as helping with the satellite tracking, our Icelandic colleagues were

also very busy with more traditional ringing and monitoring of the breeding success of known pairs. For the seventh year running, surveys were made of clutch size and fledging success for Whooper Swans nesting in the two main study areas at Skagafjörður in north Iceland and Jokuldals-heidi in the east of Iceland. In the Skagafjörður lowlands breeding success was again very high with a mean clutch size of 4.6 eggs per nest and a mean brood size of 3.7 cygnets. Breeding success at the highland study site of Jokuldals-heidi was again lower than at Skagafjörður, with a mean clutch size of 3.8 eggs per nest and a mean brood size of 2.8 cygnets. However these figures are higher than in 1993 and suggest that 1994 was a good breeding year for Whooper Swans in Iceland. In addition, Oli Einarsson, Sverrir Thorstensen and Danish scientist Bjarke Laubek, together with a sterling band of Icelandic volunteers, caught a total of 623 birds during the late summer moulting period, of which 522 were ringed for the first time.

Ring-readers throughout the British Isles and Iceland were kept busy by the large number of leg-ringed swans currently in the Icelandic breeding population. By the end of the winter some 538 individuals had been identified including 72 in Iceland only, 132 in Scotland, 104 in England, two in Wales and a record-breaking 228 in Ireland thanks to the concerted efforts of a network of observers, most notably Graham McElwaine, Jim Wells and Kendrew Colhoun. (Swans seen at several sites during the winter were allotted to their final mid-winter destination for this analysis). More unusually, one Whooper Swan marked with a leg-ring in Iceland, was observed at the Lauwersmeer in the Netherlands in January 1995.

Russia

There were two expeditions to the breeding grounds of the Bewick's Swan in the Russian arctic in 1994. Dafila Scott and Eileen Rees returned to the Khabuicka study site in the Nenetski State Game Reserve in late May together with our Russian colleagues, in order to monitor the establishment of nesting territories by known pairs and to record

their final clutch size. The spring was particularly late this year with snow and ice remaining well into June, and initiation of nesting was delayed by at least a week compared with 1993, and by two weeks compared with 1992. Large sections of the study site remained inaccessible to the scientists but a total of ten nests were reached and were found to have a mean clutch size of 3.3 eggs. This figure is a little higher than in 1993 but is down on both 1991 and 1992, and may be attributable, in part, to low food availability caused by the late blanket covering of snow and ice.

A second team of Wildfowl & Wetlands Trust and Russian scientists returned to the study site in August, where they joined Dutch and Danish scientists who had been present since late July. A total of 25 broods were relocated in the study area with a mean brood size of 2.4 cygnets. Although there were good numbers of cygnets present, they were generally smaller in size than expected for the time of year, presumably because of the late spring. Food supply in the form of sedges, grasses, pondweeds and a bumper crop of tundra berries, was abundant this summer, however, allowing the cygnets to grow rapidly. Timing of the onset of winter may have been critical since many of the cygnets would have been too small to fly if freezing conditions started early, as happened in 1992.

The main aim of the second expedition was to catch and ring the swan families in the study area and, with the help of our Russian, Dutch and Danish colleagues, a total of 88 swans had been caught by the end of the month, including 73 which were ringed for the first time (29 adults and 44 cygnets). Following the discovery of the nest belonging to Croquet (a Martin Mere-ringed bird) in the study area in 1991, the team were most surprised to capture Panier (a Welney-ringed bird) together with his family of four cygnets in the northern part of the study area on 26 August. Panier was first ringed as an adult at Welney back in the 1982-83 winter, and is now at least 15 years old. He arrived at Welney safe and well with his mate and all four cygnets on 5 November.

Of the 124 swans that have been fitted with conventional darvic leg-rings since

1992 at the Khabuicka study site, a total of 48 were observed during the period June 1994 - March 1995. Of these, 12 were identified on the Ouse Washes near Welney, one at Martin Mere and two in Northern Ireland. In addition, seven were observed in Germany and 23 in the Netherlands; whilst three were seen back on the breeding grounds at Khabuicka but not subsequently. One of the first cygnets to have been colour-ringed at Khabuicka in August 1992, a female now in its third year, was observed with a mate at Welney in November.

Russian oil spill

News broke in October 1994 of a serious oil spillage from a leaking pipeline in the far northeast of European Russia. The spill, near the city of Usinsk in the Komi district, was reported to be spreading into the Kolva River, a tributary of the River Pechora. Although the spill is likely to have a serious local effect on the taiga habitat, it was some 150 miles south-east of the Nenetski State Game Reserve and its high densities of breeding Bewick's Swans. By March 1995 it was still uncertain whether migratory swans were going to be affected in large numbers. Continental Whooper Swans breed throughout the taiga and shrub tundra belts and would be at risk when they returned to their nesting areas in spring 1995. The greatest threat however would be if the spill were to flow unchecked into the River Pechora itself. The delta of the Pechora is an important breeding area for Whooper Swans, and is used by very large numbers of both Whooper and Bewick's Swans as a rest-

ing and feeding area on both the spring and autumn migrations. Over half of the Western European wintering population of Bewick's Swans have, in previous autumns, used the shallow Gulf of Korovinskaia (immediately north of the delta) as a migratory stop-over site, and the consequences of a large oil-spill reaching the Gulf could be very serious. Together with the World Conservation Monitoring Centre, the United Nations EP/DHA Environment Unit and other concerned conservation organisations we continue to follow developments closely. A team from WWT plans to revisit the area north of the Pechora Delta in June 1995 and will keep a careful watch for any signs of oil on the fragile tundra ecosystems.

Our work is greatly helped by the efforts of voluntary ring-readers throughout the British Isles, in Iceland and on the continent, as well as by the staff at all WWT Centres. To all who report their observations of swans we extend our grateful thanks. In addition we would like to thank the many swan supporters and members who gave to the Slimbridge Swan Pipe Appeal. The appeal raised 11,000 pounds. Thanks to this generosity, and to the hard work of the Slimbridge grounds staff, a new swan pipe has now been built to replace the one which blew down in the severe gales of December 1993. The Iris Darnton Foundation and PSTERIC kindly supported our Whooper and Bewick's Swan research respectively. Special thanks go to the British Airways' Assisting Nature Conservation programme for their support of the WWT's Bewick's Swan project.

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