

Research

The Wildfowl Trust's contribution in 1973

The thirty-eight research publications by staff and by those using Trust material and facilities are listed on p. 174.

A complete aerial survey was made of the Greenland population of Barnacle Geese wintering in Scotland and Ireland, while the Spitsbergen population was investigated by a Trust expedition to their breeding grounds (p. 102) and at their Solway winter quarters. Other long-term censuses, counts and ringing of wildfowl continued and are detailed below. Steps were taken towards computer-based methods of analysis of the data. Considerable success was achieved in the new programme of marking Brent Geese to study their dispersal from Foulness, in relation to the Third London Airport plans.

Wildfowl censuses and counts in Britain and Ireland, 1973-1974

Goose censuses

Arctic breeding populations of geese are subject to considerable annual variations in breeding success. The weather on the breeding grounds, either before laying or during the breeding cycle, plays a large part. The summer of 1973 was clearly a very good one in Iceland and Arctic Russia, but only about average in West and East Greenland and in Svalbard.

Pink-footed Goose *Anser brachyrhynchus*. The annual census was held over the weekend 3-4 November 1973 when 82,000 birds were counted. This is an increase of 9,000 over the previous year which is due to the much better than average breeding success with 29.9% young birds and a mean brood size of 2.35.

European White-fronted Goose *Anser albifrons albifrons*. The peak numbers in Britain came in the second half of January when about 8,000 were counted. This was low considering the very good breeding success for the second year running (44% young birds, mean brood size 2.9). The mildness of the winter will have allowed more birds to remain on the continent.

Greenland White-fronted Goose *Anser albifrons flavirostris*. Breeding success was a little better than the previous 2 years with

The feeding ecology of geese was further investigated, including the use of experimental grassland management techniques. The long-term studies of Bewick's Swans at Slimbridge, and at Welney, continued. The breeding behaviour of a pair at Slimbridge was closely studied. So was that of a group of White-headed Ducks (p. 56). Exciting new ecological and physiological projects as joint ventures were initiated with Bath, Bristol and Cardiff Universities and with the Royal Aeronautical Establishment, Farnborough. The health of the Trust's collections was again monitored through postmortem examinations and by the development of hygienic techniques and methods of disease prevention.

15.1% young birds and 2.8 average brood size, and flock size at the main haunts was about normal.

Greylag Goose *Anser anser*. 76,000 Greylags were counted at the annual census held over the weekend of 3-4 November 1973. This is an increase of 8,000 over 1972 which is a result of the best breeding season for 11 years (30.2% young, mean brood size 2.56).

Barnacle Goose *Branta leucopsis*. The count on the Solway wintering grounds of the Svalbard breeding population reached a new record peak of 5,100. Breeding success was moderately good with 21% young birds, but the brood size was low at 1.5. There was no census of the Greenland breeding population this winter but counts on the main haunt of Islay showed a further slight increase to 18,300. Breeding success was about average at 17.4% young, mean brood size 2.5.

Light-bellied Brent Goose *Branta bernicla hrota*. The highest count at Lindisfärne, Northumberland, the only British wintering place of the Svalbard breeding population, was 470. A census of the Greenland/Canada population wintering in Ireland was held in November and 16,000 were counted.

Dark-bellied Brent Goose *Branta bernicla bernicla*. The second successive excellent breeding season (41% young) raised the peak count in Britain to a new record of 41,000 in mid-December.

M.A.O.

Duck counts

Mallard *Anas platyrhynchos*. There was a slight increase in number over last year, but the high figures of the late sixties have still not been repeated.

Teal *Anas crecca*. The seasonal index was the highest since the early sixties, indicating a sudden influx similar to that which occurred then. This latest upsurge has been reflected most strikingly on the Mersey, which had a peak count of 9,580 in January. This estuary held exceptional numbers of Teal last year as well, but the peak this year was slightly earlier. A big increase on the Ouse Washes in March balanced the fall off in numbers on the Mersey.

Wigeon *Anas penelope*. The seasonal index was easily the highest ever, several sites, notably the Mersey, recorded much higher numbers than usual. Over 30,000 were still present on the Ouse Washes in March, when only 9,000 were counted last year.

Pochard *Aythya ferina*. As with Wigeon, the seasonal index is by far the highest ever. Although several other sites often hold very large numbers, the key to the Pochard index is held by the most important site, Duddingston Loch, Edinburgh. On the February 1973 count day the loch was frozen over and no Pochard were present, whereas the February 1974 count reach 8,000, thus greatly inflating the index.

Tufted Duck *Aythya fuligula*. The high level of recent years was continued with several sites holding over 1,000 at some time during the winter.

Shelduck *Tadorna tadorna*. This year's seasonal index was the highest ever. The comparatively few major sites seem on the whole to be maintaining or increasing their numbers.

Seasonal indices 1973-1974
(1959-1960 = 100)

Mallard	93	Pochard	261
Teal	96	Tufted Duck	125
Wigeon	157	Shelduck	148

International Wildfowl Census 1973-1974

The eighth census was held in mid-November 1973 and mid-January 1974.

G. L. Atkinson-Willes
D. G. Salmon

Wildfowl ringing in Britain, 1973

The total numbers of ducks ringed (see Table) was slightly up on the previous year, but yet again mild weather in autumn and early winter meant that the duck decoys did not realize their full potential. However, Borough Fen was back in form and the catch at nearby Deeping Lake was nearly half as

large again as in 1972. Nacton and Abberton gave the mixture as before. Caerlaverock began its development as a ringing station. Subsidiary use was made of the trapping stations for research on orientation, measurements and heavy metal contamination of the environment.

Table. Ducks ringed by the Wildfowl Trust, 1973

	Abberton	Nacton	Borough Fen	Deeping Lake	Slimbridge	Caerlaverock	Others	Totals
Shelduck	1						2	3
Pintail	84	139		7				230
Teal	400	114	383	17		3		917
Mallard	1,310	658	883	600	31	44	9	3,535
Gadwall	47	2		10				59
Wigeon	46	181	1	10		1		239
Garganey	9			1				10
Shoveler	42	28		3			10	83
Pochard	44			19			2	65
Tufted Duck	278	1		232				511
Red-breasted Merganser				1				1
Totals	2,261	1,123	1,267	900	31	48	23	5,653

Brent Geese were marked in large numbers, 243, for the first time. Engraved plastic rings proved very successful for their individual identification in the field. These rings were again used on the Bewick's Swans, seventy-eight, caught at Slimbridge, where

more than half those marked were in the most valuable, known-age, category. Colonially-breeding Mute Swans, thirty-three, were ringed in Dorset.

M.A.O.

Education

The Wildfowl Trust's contribution in 1973

There was a major expansion of the Trust's Education Department in 1973. Mr E. E. Jackson became Chief Education Officer in overall charge of the education department at all Trust centres, and Mr J. Blossom joined the staff at Slimbridge as Education Officer. An Education Advisory Committee was formed during the year and met for the first time at Slimbridge in December. The number of schools using the educational facilities at Slimbridge again increased and over 26,000 children from about 800 schools visited the centre for tuition. The Field Study Courses based on the Slimbridge Youth Hostel became even more popular, and five special courses were run for members of the Young Ornithologists' Club.

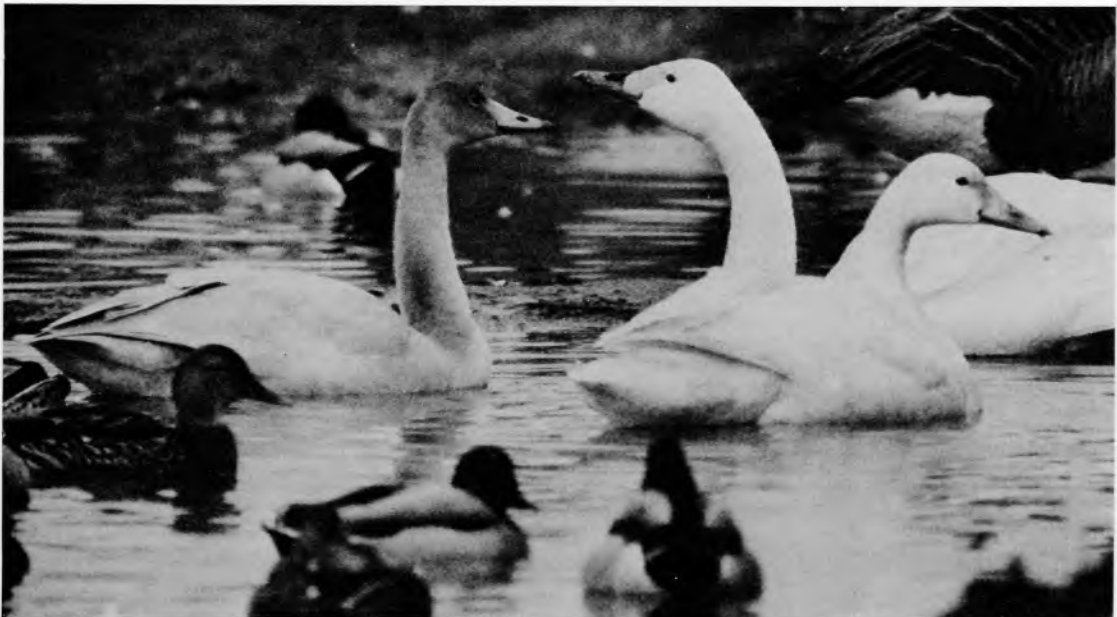
Series of lectures were given to the zoology and psychology departments of Bristol and Cardiff Universities by Professor Matthews and Dr Kear. External lectures were given to a large number of natural history and educational organizations. Several displays were also mounted. The annual schools competition was held at Slimbridge in March.

Major new projects undertaken during the year included a completely new Guide Book for Slimbridge and Peakirk, the design and development of a new labelling system for Trust collections, and the start of a new film to replace the highly successful, but now outdated, *Wild Wings*.

E. E. Jackson

'Needham' with his two cygnets, one normal, the other white (see p. 167)

Mary Evans



Conservation

The Wildfowl Trust's contribution in 1973

Activities at the Trust's own Refuges at Slimbridge, Welney and Caerlaverock are recorded in the following pages. The practical knowledge derived from research was also applied to the wild areas at the developing new centres at Martin Mere, Lancashire, at Washington, Durham, and at Arundel, Sussex. Interventions were made to safeguard the ecology of a number of wetland sites in Britain threatened by various forms of development. Close liaison was maintained with the other conservation bodies, official and voluntary, in these matters. The United Kingdom became the third signatory of the Ramsar Convention on the Conservation of Wetlands, and the principle of compensatory

reserves for wetlands lost to development was written into a Parliamentary Bill.

The International Waterfowl Research Bureau headquarters remained at Slimbridge and there was participation in Symposia in Belgium and Poland. A 3-day international symposium on Flamingos was organized at Slimbridge and the proceedings will appear in book form. Advisory visits were made, at the invitation of the Governments concerned, to Iran and the Soviet Union. A behavioural study of the Pink-footed Goose in Thjorsarver, Iceland, was assisted. The situation of the Red-breasted Geese in Romania was investigated by a Trust team.

Slimbridge: the wild geese 1973-1974

European White-fronted Geese *Anser albifrons albifrons*

The first arrivals were eleven on 27 September. Numbers built up slowly and there were still only fifty-two by the end of October. On 3 November the total increased to 112 and on 23 November to 253. An influx at the beginning of December brought a count of 2,300 on the 2nd. There was a further rise to 2,500 on the 12th and this level was maintained for the rest of the month. On 9 January there were 3,200 and then on 20 January the winter's peak of 4,500 was reached. The flock stayed at this size until the end of the month when it dropped to 4,000. Further departures took place in mid-February and on the 23rd the count was 2,300, while on the 28th it was 700. There were still 625 on 13 March but only thirty-five on the 14th which were the last seen.

For the second year running the breeding success was high with 44% young birds and an average brood size of 2.9.

Lesser White-fronted Goose *Anser erythropus*

An adult bird was first seen on 2 December (a very early date). It stayed through the winter and was last recorded on 23 February.

Bean Goose *Anser fabalis*

An adult bird was seen on 6 December and frequently through the winter, while on 20 January three were observed. All belonged to the Scandinavian race *fabalis*.

Pink-footed Goose *Anser brachyrhynchus*

Only two were seen this winter, from 20 to 27 January.

Cackling Canada Goose *Branta canadensis minima*

A bird referable to this race was seen among the Whitefronts on 2 December staying until about the 12th. It must be assumed to have been an escape, though not from Slimbridge.

Barnacle Goose *Branta leucopsis*

For the first time for seven winters no wild Barnacle Geese were recorded. Two full-winged birds from the Slimbridge collection spent much of the winter with the wild Whitefronts, however.

Dark-bellied Brent Goose *Branta bernicla bernicla*

A juvenile bird of this race appeared on 27 November and departed with almost the last Whitefronts to leave on 13 March.

M.A.O.

Slimbridge: The wild swans 1973-74

Once again the Bewick's Swans beat their record for the earliest arrival; the first pair, Nijinsky and Caroline, here for their fifth winter, returned to Slimbridge on 13 October. Two days later the intrepid Lancelot flew in, the first swan so far to return for its eleventh consecutive winter.

Arrivals were, however, scarce for the first 12 days. Then there was a gentle build-up to sixty-six. Thereafter there were two major arrival periods. At the beginning of November 104 birds arrived in 5 days. A month later, when N. W. Europe was caught in one of the most severe freezes for many years, 102 swans arrived during the first 3 days of December, bringing the total then recorded for the season to exactly 400. The final figure for the year was 541, and 515 of these had arrived by 31 December. On that date the greatest day total for the year was recorded. This was 294 which, while similar to those in the previous 2 years (325 in 1972-73 and 311 in 1971-1972), was nevertheless the smallest since 1967-1968.

There was no noticeable mass departure in January. Day attendances dwindled to 153 by the 24th, then rose 3 days later to 211. These gradual disappearances and temporary fluctuations were apparently caused by the swans' discovery of the attractions of Walmore Common, 10 km away on the other side of the river Severn. January saw unusually many gales and accompanying heavy rain, with much flooding. Walmore Common became a lake, and was very popular with the swans. However, some of these would turn up periodically at the Trust, presumably when they were disturbed. Indeed for several years now swan attendances have often increased at Slimbridge at weekends, particularly on Sunday afternoons, the traditional walking time of the British public. Numbers continued to dwindle very gently throughout February, so that on the 28th 109 swans were present. Although it was known that swans had started to leave the Slobs in Co. Wexford, and the Ouse Washes, it was still, nevertheless, a shock when attendances dropped right away to none on 3 March! However, after 2 days a few turned up again, although they used Swan Lake only as a roosting place, a complete reversal of their normal behaviour. The last of these left on 16 March.

The cygnet proportion was even better than last year's 19%. This winter it was 24%, comprised of three families with five cygnets, seven each with four and three, twenty-three with two, and twenty-two singles. The mean

brood size was 2.1. It was interesting to note differences in behaviour among the larger families. Some pairs were extremely good parents, and wherever they were their offspring were always close by, except at feeding times, when it is difficult to make out individuals in the general mêlée. The daily check of the less organized families was often much more tedious, for the cygnets would be dispersed pursuing various activities. Cygnets are unrecognizable by bill pattern, still unformed, so it was often easier to check off those ringed by their number than wait for parents to assemble their wayward young. Ravens and parrots can discriminate between numbers up to six, but it is not known if Bewick's Swans are similarly skilled. A pair certainly does not appear to become unduly agitated if they lose sight of a cygnet, and it is not within calling distance. Thus one of the families with five cygnets, Daniel and Burnel, dwindled to four, then to three. One female, McJuliet, who had lost her mate, Romeo, nevertheless had two cygnets. These she had also lost by the beginning of January. This difference in parental ability does not seem to be related to experience. Some pairs are also strikingly more tolerant than others of their previous year's offspring when they meet up again at Slimbridge. Some offspring are allowed to rejoin the family group; others are driven off resolutely by the male.

The saddest loss of a cygnet was that belonging to Needham and Ethelrida (*Wildfowl*, 24: 61-62). Needham has an abnormal amount of red on his bill, and yellow legs, while Ethelrida is normal. The pair returned to Slimbridge on 3 November with two cygnets, one normally grey, the other white, with pale grey/white legs and a pink bill, i.e. a leucistic bird. We were lucky to get a photograph (p. 165), for the family only reappeared briefly the following day before reverting to their last year's haunt at Walmore Common. There they were identified on 15 November and on several subsequent occasions during the winter. Although the grey cygnet was with them, the white one was never seen again after leaving Slimbridge.

There were only five ringing catches this season, but four of these were, by previous standards, large, and, indeed, one consisted of eighty-four swans. This season more birds (267) were processed than in any other. Eighty-eight were ringed for the first time, and of these forty-eight were cygnets and yearlings in which we are particularly interested since their age is precisely known. So

far 558 Bewick's Swans have now been ringed at Slimbridge.

The X-raying of the swans was continued. Of adults X-rayed for the first time, the proportion carrying lead pellets was found to be 46%, which is 2% more than the result of the adults X-rayed over the past three winters. The greater number of 1st and 2nd winter birds X-rayed (47% against 40% in 1970-1973) reduced the overall proportion of birds with shot from 34% to 29%.

This season the tails and wing tips were not marked with yellow dye, which in the past three winters had enabled us to learn much about the migration routes. Aesthetic considerations mainly led to this change of policy, but we had not realized how useful the dye was nearer home. Some smaller mark would greatly have facilitated the observation of the Slimbridge Bewick's at Walmore for instance. If the birds were at a distance in shallow water, it was very difficult to make out their bill markings, or see if they had rings. Nevertheless, thirty-eight Slimbridge birds were recognized out of 107 swans seen there on 24 January, and several interesting sightings were received from other places, often from observers who had previously been alerted to 'Slimbridge' swans by the dyeing policy.

Seven ringed Bewick's were seen on the Slobs, in Co. Wexford, Ireland, and six were identified. Interestingly, four are of known age. They were too young to have mates when at Slimbridge, and apparently do not yet. The other two birds were adults at Slimbridge, again without mates, both then and in this last winter. Three of them had been on the Slobs in 1972-1973, and two of these also in 1971-1972.

One ringed swan was reported from West Cornwall in December, and two from Tealham Moor in Somerset on 17 November. One of these, called Lattice, arrived at Slimbridge on 10 December, and spent the rest of the winter here.

The most comprehensive reporting is possible from Welney on the Ouse Washes in Norfolk, where, as at Slimbridge, the birds are lured to easy viewing distance by regular feeding. Two years ago, when this policy was introduced, it was feared that regular Slimbridge birds might be short-circuited to Welney. In that year forty birds with Slimbridge experience were recorded there. Last year the total was forty-eight. This winter it was only thirty-six. Twenty-six of these did not come to Slimbridge at all, but this included at least eighteen known to have been to Welney before. Five went to Welney, and travelled on to Slimbridge. (None of these

were known to have been at Welney before.) Five came to Slimbridge first, then went to Welney. Two of these, both with Welney experience, only stayed at Slimbridge for 1 day, returning to Welney in November. The other three arrived there after swans had already started to evacuate Slimbridge. One, the only cygnet of It and Itma, arrived alone on 27 January. Three days earlier the family had been together on Walmore Common.

Considering that there were 1,100 Bewick's at Welney at the beginning of January, the fact that so few Slimbridge birds are identified there would suggest that it does not pose any threat to the continuity of the study at Slimbridge. A regular check is kept there on ringed birds, so it is most unlikely that any would be missed; and observers from Slimbridge, familiar with the bill patterns, go to Welney several times during the winter to check the swans from that aspect. The return rate at Slimbridge of adults and yearlings from the previous season was 58%.

Sightings from the Netherlands were disappointing in comparison to the previous year. Perhaps the ringed birds simply were not there, but observers were affected by the ban on Sunday driving, due to the oil crisis. Sunday is a favourite day for bird watching, and birds can often be approached closer in a car than on foot. It is possible, of course, that more reports are yet to come. We know so far of seven ringed birds, six identified, and of these four were there last winter as well.

The opportunity arose to check the swans in Germany personally, for the swans' presence there coincided with the opening of an exhibition, in which the Wildfowl Trust was taking part, emphasizing the importance of the lower Elbe for wildfowl. This area is threatened by industrial and agricultural development, and was where Dafila Scott and I found some Slimbridge Bewick's 2 years before (*Wildfowl*, 23: 132-135). Certainly the Bewick's put on a good show this time! The count on 9 March showed 800 on Asselersand, 677 on Allwordene Aussendeich, and 130 at Balje a total of 1,600! Unfortunately time was very restricted, but on that day Sir Peter and Lady Scott found and identified Shiny and Silky and their three cygnets, which had last been seen at Slimbridge on 6 February and Walmore on 1 March. More ringed swans were seen, but I was not able to identify them until the following day, when seven were named from nine ringed. It must be admitted that, when time was short, flocks of this size were scanned for rings, and when one was found the bird was then concentrated on. However, only one was actually identified

by ring number. This was a very plain bill-patterned swan, called Fabian, that had not been to Slimbridge since 1970–1971. Three were not identifiable by any means, but would have required much more time! Another seven were identified by bill pattern, and the remaining four were cygnets in association with adults. All identified, except Fabian, had been to Slimbridge in 1973–1974, and all had last been seen there or at Walmore on 1 March—quite a coincidence! Probably also by chance the seven from Slimbridge (the Shiny/Silky family and another pair) were first seen on the 9th; those from Walmore (a single bird and a family with one cygnet) were seen on the 10th. Since then one more

bird has been identified by observers there—Odin, last heard of, again in that area of Germany, in March 1972. Three more Slimbridge birds of this year have been identified on the Hauke-Haien-Koog in N. W. Schleswig-Holstein, and another bird has been reported from the river Aller, but the number was not readable.

And so farewell to the Bewick's for another season! Three Whoopers came to Slimbridge during the winter. Two were the same pair as were here in 1969–1970 and 1971–1972, but they only stayed for 2 days in December. The third, a new bird, turned up in January, and again only graced us for 2 days.

Mary E. Evans

Aviculture—1973

This is the last issue of *Wildfowl* in which the tabulated breeding results at Slimbridge and Peakirk are given in full. With the opening of three new collections in 1974–1975, it will be necessary in future to present the results of our enlarged avicultural programme in summary form.

Meanwhile, the 1973 Slimbridge season proved an excellent one: some 1,750 birds were reared, including, for the first time in captivity, the White-headed Duck (see page 00). The season was also an exceptionally long one, the first egg (Egyptian Goose) being laid on 18 January and the last hatch (Black Swans) occurring on 19 November. While these late cygnets were still being hand-reared, wildfowl eggs from South America arrived and hatched, so the winter season was busy also.

The generous grant from the Slater Foundation Ltd enabled us to redesign and re-equip the propagation centre, so that temperature and disease control were adequate for the first time, and looking after the large number of young birds was a comparatively easy task. The flamingos, after the driest spring on record, had a poor season, and only the Chileans produced young. This was disappointing as the first International Flamingo Symposium met in July at Slimbridge, partly because of the Trust's pre-eminence in breeding these birds. One of the aims of this very successful Symposium was to exchange information so that zoos will maintain these birds in conditions where they breed, and the unacceptably large numbers of flamingos captured from the wild can be reduced. Since the Symposium, Copenhagen and London Zoos have presented Slimbridge with their Andean and James's Flamingos which, we hope, will enable us to breed these birds

more freely, and the Wildfowl Trust has presented the London Zoo with three young Chilean Flamingos to enlarge their breeding flock of this species.

At Peakirk the breeding season started on 12 February with the first *Cereopsis* egg and ended with a clutch of Southern Red-billed Whistling Duck which hatched on 21 September. Although a total of sixty species and sub-species laid eggs and thirty varieties were reared, the general results were disappointing due, partly, to cold and wet weather. The major triumph of the season was the successful breeding of the very rare White-winged Wood Duck for the first time at Peakirk. The female was the first captive-reared bird ever to lay in captivity. One point of interest was the length of the breeding cycle of the Maned Goose. The first egg being laid on 24 February and a fourth and final clutch started on 9 July.

The number of captive birds held by, or on loan from, the Wildfowl Trust is now around 4,500. Many of these are full-winged, although they remain within our fox-proof enclosures, and well over 90% have been bred by the Trust. Slimbridge has the largest collection—2,575; Peakirk, 780; Martin Mere, 550; Washington, 150; Caerlaverock, 135, and there are 145 (mostly Nene) on loan to other zoos and breeders. Arundel will receive its first birds in autumn 1974, and at all our new collections, emphasis is being placed initially on sizeable flocks of British species which will act as decoys for wild birds. The small collection at Caerlaverock is entirely British and produced a useful surplus of geese during 1973.

Slimbridge is our only quarantine station, and so all imported birds are first brought there.

Important arrivals during the year include: Andaman Teal, Pink-ears, Maccoa and Madagascar White-backs, as well as many South American species collected as eggs by

the Slimbridge Curator, Michael Lubbock. Especially interesting were a number of Black-headed Duck (hand-reared in captivity for the first time) and Kelp Geese.

J. Kear

Welney Wildfowl Refuge, 1973

The Refuge held considerable numbers of duck during both winters but the mild weather probably kept the totals for some species down. Wigeon reached a peak of 25,000 in mid-January, dropped suddenly to 12,000 in early February but climbed again to 17,000 on the 17th before a rapid departure in March. Mallard fluctuated between 800 and 1,500 while both Pintail and Shoveler topped 300. Pochard were present in useful numbers in January and February reaching a peak of 200 in the latter month. As usual it was the swans that provided the greatest spectacle with 600 Bewick's in late January, together with up to twenty-three Whoopers and just over 100 Mutes. The Bewick's stayed in good numbers through February and early March before departing in the middle of the month. Unusual visitors included a Smew, present for most of January, a Hen Harrier in February and up to sixty wintering ruff. Up to sixteen White-fronted Geese were seen in January and February.

The breeding season started very early with the first Mallard nest found on 17 February and the first brood seen the following week. These first broods mostly perished in the cold weather that followed, but later hatchings

were more successful with at least seven broods of Tufted Duck, while Shoveler and Shelduck also bred well. Four pairs of Black-tailed Godwits breed successfully, after one early clutch had been taken by Jackdaws. Ruffs were not proved to breed but a lek was established at the end of March and it is thought that as many as four pairs may have bred. A pair of Black Terns hung around for a while but did not nest. A Hoopoe put in an appearance on 18 May and a Spoonbill the day after.

During September Mallard built up rapidly to a peak of 3,000 and after a fall in November reached this level again in December. Wigeon increased steadily through the autumn to about 18,000 at the end of the year. Other duck species were generally below average except for Shoveler which were especially numerous in September and October with a peak of 600, but these had mostly left by December. The first Bewick's Swans arrived in mid-October and there were 800 feeding on the lagoon by the end of the year. Whooper Swans totalled thirty. A single Smew was present from mid-November until late December, while a Bittern was seen many times in the second half of October.

M.A.O.

Eastpark Wildfowl Refuge, Caerlaverock, 1973-1974

Barnacle Goose *Branta leucopsis*

The first geese were seen on 20 September, a party of ten sitting on the Blackshaw Bank. By 30 September thirty-nine were present and a steady influx from 8 to 15 October brought the total to 5,100, another post-war record number. The full flock was present at Eastpark until 25 February except for occasional periods of 2-4 days, during which other Solway areas were visited. After the 25th the birds moved to Rockcliffe but up to 750 returned in early March and at the end of the month 450 were still present. In April the flock size on the Refuge varied between 00 and 0000 geese. The last Barnacle of the winter were seen on 00 April.

Age counts were made of a sample of about 1,100 geese. The proportion of juveniles in the flock was 21%, with an

average brood size of 1.5. Both figures are slightly down on last winter.

The average number of Barnacles feeding on the merse and arable fields of Eastpark and also on fields elsewhere on Caerlaverock was noted daily. The amount of time spent on the arable, where the geese are readily observable from the hides and towers, increased greatly compared with last year to about 60% of the total, or close to the level of the 1971-1972 winter.

Four white Barnacle Geese were present throughout the winter. These included the two 1972 juveniles and one separate adult seen the previous winter. The two former geese were caught and ringed in Spitsbergen by members of the Wildfowl Trust team in the summer of 1973. In early October they returned to Eastpark and were by now living

separately amongst the flock. The other single adult goose also arrived and a fourth white Barnacle appeared as well. This latter bird was a juvenile. Both its parents were normal-plumage adults and one other normal-plumage juvenile made up the family. It is tempting to believe that the same parents were responsible for the other white geese.

Pink-footed Goose *Anser brachyrhynchus*
 The first arrivals were thirteen on 20 September. By 1 October over 1,000 were present and this number increased to 4,000 by the 10th. Up to 1,500 were feeding on the stubble fields in October. A general decrease of Pinkfeet on the inner Solway occurred from late October until by mid-November only fifty to sixty were in the local area.

Numbers rose again to 2,000 by 7 December and in early January over 4,000 were roosting on the Blackshaw and Priestsides banks. In late winter numbers of Pinkfeet feeding on the Refuge increased steadily, until by 18 April not less than 5,000 were counted on the merse and fields. The last Pinkfeet of the winter were observed on 00th May.

Greylag *Anser anser*
 Numbers in the locality did not exceed 250 and the largest flock seen feeding on Eastpark was forty-nine in early January. Up to sixteen regularly fed and roosted in the enclosure for most of the winter.

Other wildfowl

For the fourth winter a single adult Light-bellied Brent accompanied the Barnacles. An

adult Lesser Snow Goose was seen on the inner Solway marshes in early November. On the 17th this bird joined the tame geese in the enclosure and is still present. On 7 December a second Snow Goose was present for one day with Pinkfeet feeding on the fields. One single Greenland Whitefront was observed on two occasions. Up to sixty Canada Geese were on the merse in August.

The first pair of Whooper Swans arrived in the enclosure ponds on 18 October. Up to fifteen, including two cygnets, were present through the winter until 1 April. One wild bird has remained. The first Bewick's Swans came on 26 October, a pair with one cygnet. Five more joined them in the following weeks. Although this is a very small flock by English standards, this is the largest recorded this winter in Scotland. Seven departed on 17 March, one remaining. This particular Bewick's has a slight injury to its wing tip and, although flying quite strongly, seems to wish to remain for the time being. Up to forty Mute Swans spent the winter in the enclosure.

Numbers of duck frequenting the enclosure, both as a daytime roost and night-time feeding area, far exceeded expectations. Up to 800 Pintail and 500 Wigeon were present in early winter for up to 6 weeks. Wigeon numbers throughout the winter were steady at between 200-400. Also present were up to twelve Pochard, six Tufted, three Gadwall, two Long-tailed Ducks, thirty-eight Shoveler, 105 Teal and 250 Mallard. A single male Garganey spent several days in June on the ponds. At times up to 800 Shelduck gathered at high tide on the merse. Wigeon and Pintail numbers both exceeded 1,000 on occasions.

C. R. G. Campbell

Breeding results, 1973

Species	Slimbridge			Peakirk		
	Date of 1st egg	Eggs hatched	Young reared	Date of 1st egg	Eggs hatched	Young reared
Spotted Whistling Duck	8-7	7	7			
Fulvous Whistling Duck	9-4	58	40	25-5	1	0
N. Red-billed Whistling Duck		24	22			
S. Red-billed Whistling Duck		62	57	2-6	7	0
Coscoroba Swan	26-3	1	1			
Black Swan	21-1	4	0			
Mute Swan	6-3	4	0			
Black-necked Swan				3-3	0	0
Bewick's Swan	4-6	2	1			
Whooper Swan	11-4	9	8			
Trumpeter Swan	17-4	3	2	13-4	2	1
Swan Goose	8-4	9	8	10-4	0	0
Western Bean Goose				30-4	0	0
Russian Bean Goose		2	1			

Species	Slimbridge			Peakirk		
	Date of 1st egg	Eggs hatched	Young reared	Date of 1st egg	Eggs hatched	Young reared
Pink-footed Goose		5	5	21.4	0	0
European White-fronted Goose		3	3			
Greenland White-fronted Goose		14	14	22.4	0	0
Pacific White-fronted Goose	30.4	0	0			
Lesser White-fronted Goose		4	3			
Western Greylag Goose	11.3	31	29			
Eastern Greylag Goose	12.4	14	12			
Bar-headed Goose	16.4	5	5			
Emperor Goose		3	3	5.6	0	0
Lesser Snow Goose		8	7	25.4	2	1
Blue Snow Goose		2	1			
Greater Snow Goose		16	14			
Ross's Snow Goose		3	3	13.5	2	2
Atlantic Canada Goose		3	3			
Moffitt's Canada Goose	27.3	0	0	8.4	0	0
Lesser Canada Goose	4.4	12	12			
Taverner's Canada Goose				25.4	0	0
Dusky Canada Goose		4	4	12.5	0	0
Aleutian Canada Goose	30.4	0	0			
Cackling Canada Goose	8.5	4	4	24.4	2	2
Hawaiian Goose	10.2	47	42	21.2	6	4
Barnacle Goose	23.4	50	46	30.4	0	0
Light-bellied Brent Goose	28.6	1	1			
Black Brant		3	3	24.5	0	0
Red-breasted Goose	24.5	4	3			
Ruddy Shelduck	4.4	8	7			
Cape Shelduck	21.4	0	0	28.3	0	0
Paradise Shelduck	6.4	0	0			
Australian Radjah Shelduck	22.7	7	7			
Common Shelduck	11.4	9	8	7.5	5	5
Egyptian Goose	18.1	9	8			
Orinoco Goose	26.3	0	0			
Abyssinian Blue-winged Goose	19.4	4	4	14.5	0	0
Andean Goose	10.4	10	8	27.4	10	9
Ashy-headed Goose	22.4	5	4			
Lesser Magellan Goose				23.4	2	1
Greater Magellan Goose				30.4	2	0
Cereopsis Goose				12.2	1	1
Falkland Island Steamer Duck	30.3	0	0			
Patagonian Crested Duck	20.2	28	28	24.4	11	10
Andean Crested Duck	3.4	4	4			
Bronze-winged Duck	15.3	6	6			
Marbled Teal		45	44	6.5	26	17
Cape Teal		4	4	6.5	0	0
Northern Versicolor Teal	9.4	9	7			
Puna Teal		19	17			
Red-billed Pintail		12	12			
Northern Bahama Pintail		16	16	19.5	8	8
Chilean Pintail	17.4	34	31	25.4	4	3
Northern Pintail		10	10	9.5	11	10
Kerguelen Pintail		1	1			
Chilean Teal		10	10	12.4	16	12
Sharp-winged Teal		16	16			
American Green-winged Teal		3	2			
Falcated Teal		1	1	29.5	0	0
Australian Grey Teal	6.6	14	14			
Chestnut-breasted Teal	18.4	13	10			
New Zealand Brown Duck	25.3	5	5			

Species	Slimbridge			Peakirk		
	Date of 1st egg	Eggs hatched	Young reared	Date of 1st egg	Eggs hatched	Young reared
Hawaiian Duck	12:3	18	17	19:4	0	0
Laysan Teal	13:4	33	33	4:4	16	14
Mexican Duck	3:4	2	2			
Indian Spotbill				24:6	5	1
New Zealand Grey Duck		9	9	1:5	1	1
Pelew Island Grey Duck		7	7			
Philippine Duck		12	12	5:5	0	0
African Yellowbill	18:3	30	29	11:4	14	13
Abyssinian Yellowbill				9:5	8	5
Gadwall	15:4	311	280	7:5	7	7
European Wigeon		32	32	23:5	5	4
American Wigeon		5	5	13:6	5	5
Chiloe Wigeon	18:4	21	19	8:5	0	0
Atlantic Blue-winged Teal		3	3			
Garganey		4	4			
Argentine Red Shoveler	18:4	1	1			
Cape Shoveler		6	6			
Common Shoveler	8:5	5	5	29:4	17	8
Ringed Teal	29:4	61	57			
European Eider	23:4	24	22	23:4	8	7
Red-crested Pochard	1:3	41	40	9:4	19	5
Rosybill	18:4	46	46	11:5	9	8
European Pochard		12	12	24:4	12	7
Redhead		5	5	22:5	4	0
Common White-eye		8	8	20:5	14	9
Baer's Pochard		3	3			
Australian White-eye	1:5	35	33	24:5	5	2
New Zealand Scaup		55	44	1:6	13	0
Ring-necked Duck				3:6	2	1
Tufted Duck		135	128			
Lesser Scaup		15	15	8:6	5	1
European Greater Scaup		9	9			
Lesser Brazilian Teal		8	8			
Greater Brazilian Teal		12	12			
Maned Goose	14:4	0	0	26:2	20	8
Mandarin Duck		62	57	2:4	31	17
North American Wood Duck	29:3	63	62	15:3	58	37
Comb Duck	27:8	1	1			
White-winged Wood Duck	21:4	10	3	30:5	4	2
Muscovy Duck	15:3	42	30			
Barrow's Goldeneye		9	1			
European Goldeneye	12:4	0	0			
American Goldeneye	6:4	0	0			
Bufflehead	5:5	4	3			
Smew	30:4	18	10			
Hooded Merganser	8:4	3	3			
Goosander		6	4			
White-headed Duck	19:7	6	4			
North American Ruddy Duck		32	20	24:5	15	5
Crested Screamer	23:3	1	0			
Chilean Flamingo	19:6	19	14			

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