

Castlandhill Constant Effort Site Report for 1996 and 1997. -Years one and two.

Derek Robertson,

CES and TRG

The Constant Effort Scheme was set up by the British Trust for Ornithology in 1981. Its aims are to use a standardised ringing effort at a number of sites to monitor populations of common breeding passerines. These ringing sites are operated between May and August, and on each of the twelve visits a standard length of nets is set for the same length of time. This requires a visit once in every ten-day period. However, weather, available time, and other restrictions may mean that it is not always possible to ring on all 12 visits or in the best of catching conditions.

The CES scheme uses the comparison of the information obtained to monitor.-

- Changes in adult abundance
- The proportion of juvenile birds in the total catch
- Adult survival rates

In 1996 there were 118 registered CES sites, 11 of which were in Scotland. In the past, Tay RG members have operated two CES sites. One at Cairnie Pier, Perthshire; a reedbed site run by Bill Saunders. The other site was operated at Kinblethmont, Angus, by Allan Cowan and Ron Lawie until the woodland/scrub habitat became too high for ringing to continue. CES ringing no longer takes place at either of these sites. Jim Cobb, who is an associate member of the TRG, has operated his long-running CES site at Kippo Plantation, Fife, since 1987. Chris Broom, assisted by Jim Cobb, has run a CES site at West Quarry Brae, Fife, since 1997. In 1997 Les Hatton and Shirley Millar started up a new CES site in reedbed/willow carr at Morton Lochs, Fife.

The CES Scheme forms an essential part of the BTO's Integrated Population Monitoring programme by providing information on population changes, breeding success and survival. As such, it is one of the most productive forms of passerine ringing and is the focus of encouragement from the BTO. As the BTO continues to place more and more emphasis on project-led ringing activity, it is likely that the number of CES sites will continue to grow.

Castlandhill CES

The study area lies 1km south-west of Inverkeithing, Fife, on the north shore of the Forth estuary and just 500m from the motorway approach to the Forth Road Bridge. In 1996, it was the proposed site for the north end of a new road bridge but there are currently no plans for this project to go ahead and the area was designated as a Site of Special Scientific Interest in 1997.

The site is an area of 'reclaimed' estuary, some parts of which were infilled by coal ash and/or rubble. Other areas were infilled with sewage sludge and some of the raised embankments, which once formed the boundaries of settling ponds, still remain.

The northern and eastern part of the site consists largely of reedbed (*Phragmites communis*). This is the largest reedbed on the Firth of Forth. To the east and west, the reeds give way to areas of marsh consisting largely of Great Willowherb (*Epilobium hirsutum*) and to patches of dry herbage and grassland. In the south west corner, there is a small saltmarsh consisting of mainly *Puccinellia* species. There are areas of scrub dotted about the whole site, these being most prevalent along the embankment edges within the reedbed, and at the eastern and northern edges of the reedbed where the scrub gives way to young, broadleaved trees. Surrounding the site are extensive areas of scrub and some mature woodland.

The site has been operated by ringers for a number of years but I made my first visit there in 1995 and carried out a series of visits in the late summer and autumn which allowed me to locate suitable net-rides. In 1996, I planned to have a 'trial' year but the site worked so well that I decided to submit the data as the first year of the CES.

Nets are operated from dawn for a period of six hours. The total length of netting is 350 feet, consisting of 4 x 60', 2 x 40' and 1 x 30' nets. Two nets are set in the reedbed, two nets are set on the top of embankments among scrub and reeds and three nets are set on embankments among taller scrub and young trees. All these nets are set in an area about 500m x 200m in the northwest corner of the marsh

In both 1996 and 1997, all 12 of the CES visits were made and no additional visits were made during the CES period. In 1996, four visits were made after the CES period and in 1997 one visit was made after the CES period but the captures from these visits are not included in the tables below.

In 1994, 1995 and 1997 Scottish Natural Heritage commissioned Mr David Bell of Ecos Countryside Services to carry out a Common Bird Census (CBC) on the site.

Site Efficiency

Site efficiency = [Mean catch / net length] x 1000

Site efficiency for 1996 was 119

Site efficiency for 1997 was 169

Table 1. CES Change in Adult Abundance Between 1996 and 1997

Species	1996	1997	C'dhil	National
Wren	14	7	-50%	-16%
Dunnock	18	20	+11%	-8%
Robin	0	9	(+100%)	-24%
Blackbird	18	15	-17%	-19%
Song Thrush	0	5	(+100%)	-25%
Sedge Warbler	62	27	-56%	-32%
Whitethroat	10	6	-40%	-30%
Willow Warbler	26	39	+11%	0%
Blue Tit	37	27	-25%	-4%
Great Tit	12	11	-8%	-14%
Chaffinch	5	1	(-80%)	-18%
Reed Bunting	15	11	-27%	-12%

Figures in brackets () indicate a very small sample size

Table 2 Comparison of CBC data in 1994 / 95 / 97
(No C B C carried out in 1996)

Number of Territories(Year)

Species	1994	1995	1997
Dunnock	7	7	6
Robin	1	2	1
Blackbird	7	6	2
Song Thrush	2	1	1
Sedge Warbler	29	29	30
Whitethroat	6	7	11
Willow Warbler	4	4	7
Blue Tit	3	2	1
Great Tit	0	0	0
Chaffinch	0	0	3
ReedBunting	10	14	8

Table 3. Change in Percentage of Juveniles in Total Catch Between 1996 and 1997

Species	% Juv. 96	% Juv.97	C'dhill	National
Wren	61	78	+17	+8
Dunnock	59	53	-6	+9
Robin	100	55	-45	+10
Blackbird	25	50	+25	+10
Song Thrush	100	50	-50	+2
Sedge Warbler	33	65	+32	+8
Whitethroat	78	70	-8	+7
Garden Warbler	100	50	-50	+2
Blackcap	100	92	-8	+13
Willow Warbler	83	82	-1	+5
Blue Tit	47	74	+27	+10
Great Tit	20	48	+28	+13
Chaffinch	17	33	+16	+13
Reed Bunting	12	0	-12	+3

Table 4 Adult Retrap Rate Within Years 1996 and 1997

(Retrap rate for adults is the percentage of captures that are retraps of previously rung birds. Same-day retraps are not included but each daily capture for an individual bird is counted. The retrap rate may give some indication of the activity of breeding birds on the site. n = number of recaptures.)

Species	1996	1997
Wren	40% (n=6)	56% (n=9)
Dunnock	47% (n=8)	29% (n=8)
Sedge Warbler	34% n=18)	38% n=17)
Blackbird	29% (n=4)	12% (n=2)
Whitethroat	29% (n=2)	14% (n=1)
Willow Warbler	8% (n=2)	9% (n=4)
Blue Tit	7% (n=2)	10% (n=3)
Great Tit	14% (n=1)	0% (n=0)
Reed Bunting	0% (n=0)	8% (n=1)

Table 5 Retrap rate of birds between years.

(Retrap rate is the percentage of birds which were trapped in the previous year.)

Species	1996-1997
Wren	22%
Dunnock	20%
Robin	0%
Blackbird	0%
Sedge Warbler	8%
Whitethroat	17%
Blue Tit	15%
Great Tit	9%
Reed Bunting	18%

Recoveries 1995-1997

A first-year Sedge Warbler rung on 13.07.95 was controlled at Icklesham, Sussex later that autumn.
(630km 155deg)

A first-year Sedge Warbler caught as a juvenile on 05.08.92 at Grembergen, Oost-Vlaanderen, Belgium was controlled as an adult female in breeding condition at Castlandhill on 13.07.95
(742 km 318deg)

A first-year Willow Warbler rung on 21.08.96 was taken by a cat on 22.09.96 at Almadena, Algarve, Portugal. (2140km, 191deg)

A first-year Sedge Warbler rung on 21.08.96 was controlled at Icklesham, Sussex on 30.08.96.
(630km. 155deg)

A first-year, male, Redstart rung on 19.07.97 was controlled on 23.10.97 at Ginak Island, Gambia. (4852 km, 194deg)

An adult male Sedge Warbler in breeding condition was controlled at Castlandhill on 17.06.97. It was wearing a ring addressed to the Paris Museum. This recovery is still being processed.

Another adult male Sedge Warbler in breeding condition was controlled at Castlandhill on 05.06.98. It was wearing a ring addressed to the Paris Museum. This recovery is still being processed.

Species report for 1996 - 1997

There was little change to the site between years although the reedbed was much wetter in 1997 than in 1996 and several areas of standing water remained well into

July. 1996 was a very poor breeding year for several species that were affected by cold, wet weather early in the year. Particularly badly affected were Blue Tits and Great Tits. Numbers of Whitethroat were extraordinarily high in 1996, reflecting (probably) a large number of adults returning successfully from their wintering grounds and having a very successful breeding season.

In 1997, cooler, wetter weather in June may have hampered nesting success particularly of Whitethroats, Robins, Garden Warblers, Blackcaps and Reed Buntings although Willow Warblers may have fledged their broods early enough to avoid similar falls in productivity. However, the wetter weather and damper ground conditions may have benefited some species, particularly those that forage on the ground, and including, Wrens, Blackbirds, Song Thrushes and Sedge Warblers. Not surprisingly, Blue Tits and Great Tits improved on the extremely poor productivity of 1996.

Wren *Troglodytes troglodytes*

A 50% drop in adult abundance (worse than the 16% drop in national CES-figures) is borne out by the very low number of territories found on CBC surveys . Poor breeding in 1996, coupled with some harsh weather in January is the most likely reason for the drop in numbers . Productivity was up 17% in 1997, although this was still a drop in abundance of juvenile birds from 61 to 25 individuals. The increase in productivity was mirrored by adult activity monitored by the within-year retrap rate,- up by 16%.

Dunnock *Prunella modularis*

An increase of 11% in adult abundance in and little change in CBC numbers would seem to indicate a small increase in adult numbers in 1997,- if there was any real change at all. Certainly there was no local drop in abundance as seen in the national CES results . Productivity was down by 6% (as opposed to an increase of 9% nationally), mirrored by a decrease in within year retrap rate for adults of 18%. The change seemed to occur in the second half of the season when numbers of juvenile birds caught was well down. It seems likely that breeding success was hampered by cool weather in June and July. Perhaps birds at southern CES sites were able to fledge more youngsters before the poor weather set in.

Robin *Erithacus rebeculla*

The small sample size of adults caught and retrapped makes any analysis of data impossible. I would suggest that adult numbers breeding in the reedbed remained very much the same between 1996 and 1997 but that the drop in productivity reflected a real drop in breeding success, again occurring in the second half of the season and coinciding with cool weather. This result contrasts with the national results which show an increase of 10% in 1997. Again, I suspect that broods in the south were able to fledge a few crucial days before the poor weather that hampered breeding success at Castlandhill.

Blackbird *Turdus merula*

A drop of 17% in adult abundance in 1997 is confirmed by a low number of territories located by the CBC and closely follows the national results. However, an increase in productivity by 25% reflected an increase in numbers of juveniles caught; 9 more birds in all. To confuse the situation, adult retrap rate was down by 17%, suggesting less activity and poorer productivity by birds on the site. However, the sample size was very small and this result may not be a true reflection of the situation.

Song Thrush *Turdus philomelus*

Wetter, summer weather in 1997 may have actually benefited this species by providing softer soil conditions for catching invertebrates and by increasing the numbers of molluscs at the site. There certainly seemed to be far more slugs and snails present then in the previous year. Adult abundance was up from no individuals to five in 1997. The CBC does not indicate any change in the number of territories between years so these adults may well have been nesting elsewhere but foraging in the marsh, or moving into the area with recently fledged young. The decrease of 50% does not reflect an actual increase in juveniles caught, from none in 1996 to 5 in 1997. National results for Song Thrush and Blackbird show that they had average breeding success in 1996 so mortality through the winter is a likely cause of the drop in adult numbers in 1997 which continues to show a downward trend.

Redstart. *Phoenicurus phoenicurus*.

The control in Gambia is the first record of a British-ringed Redstart to be recovered in that country and the bird was in the southernmost part of the Redstarts' known wintering range. By coincidence, I helped carry out some ringing studies at the same ringing site, in Gambia, in 1996.

Sedge Warbler *Acrocephalus schoenobaenus*

Adult abundance was well down in 1997. However, the CBC data shows no significant change in the number of territories. Productivity was up by 32% in 1997 and signified an actual increase in numbers of juveniles caught of 20 individuals. The adult Sedge Warbler numbers probably depend more on the conditions in the winter regions than on the poor breeding season of 1996 (as does the similarly effected Whitethroat) although local birds seem to have been hit harder than the national average. Does this indicate more severe conditions in the particular wintering grounds of the Scottish birds? Of the 40 chicks rung at nests at the site in 1995, none have been retrapped. The recoveries of two first year birds in Sussex fits into the known migration of juvenile Sedge Warblers from Scotland. These individuals were staging in the south of England, on their migration south, before flying into Europe. The French recoveries are likely to be Scottish-bred birds, trapped on migration. Previous ringing recoveries from France would suggest that they are likely to have been originally caught in Brittany as

they travelled south in the Autumn. The Belgian recovery is rather further east than the usual migration route (although far from uncommon) for our birds, but is still likely to signify a first-year bird, fledged in Scotland, which was caught on its southern migration after crossing the English channel.

Whitethroat *Sylvia communis*

Large numbers, (perhaps unusually large numbers) of Whitethroats were present in 1996, and There was a drop in adult abundance of 40% in 1997. The drop in productivity by 8% does not show that there were 21 less juveniles caught in 1997. It seems likely that far fewer Whitethroat returned from their wintering quarters and that productivity at the site was only slightly down on the previous year. Interestingly, as for Sedge Warbler, the drop in adult abundance was worse than even the national average.. Unfortunately, the retrap rate is too small a sample to analyse.

Lesser Whitethroat *Sylvia curruca*

One juvenile was caught in a post-CES visit in 1996. Three juveniles were caught in CES visits in 1997. It seems likely that birds are breeding near the site although none have been heard singing there.

Grasshopper Warbler *Locustella naevia*

Two birds were heard singing in 1997 and one bird was heard singing in 1996 when a juvenile was trapped on a post-CES visit.

Garden Warbler *Sylvia borin*

Two adults caught in 1997 included a bird early in the season which was probably breeding nearby. A bird was heard singing during CES visits but was not heard during CBC. There were no adults caught in 1996. Juvenile numbers dropped from 6 in 1996 to 2 in 1997.

Blackcap *Sylvia atricapilla*

No adults, but 7 juveniles were trapped in 1996 but one adult and 11 juveniles were caught in 1997

Willow Warbler *Phylloscopus trochilus*

Adult abundance increased by 11% between 1996 and 1997, an increase that seems to be borne out by the relatively high CBC count for 1997. It is worth noting that the increase is well above the static level of the national results and may indicate favourable conditions in the specific wintering grounds of our local population.. Productivity showed no significant change (which was confirmed by adult retrap rate) but there was an increase of 59 individual juveniles caught. The recovery of a bird in

Portugal fits in with the known migration pattern of this species and indicates that this was a juvenile bird moving south on a western migration route.

Blue Tit *Parus caeruleus*

The drop in adult abundance in 1997 may have been caused by the low number of juveniles recruited into the population from 1996 or because higher numbers of adults were moving into the reedbeds earlier in the year in 1996, having failed to fledge young. 1996 was a disastrous breeding season for Blue Tits and many birds nested very late because of cold, wet weather early in the year. In 1996 I caught more adults than juveniles, - I would usually expect to catch four times as many juveniles as adults. It is not surprising then that productivity was up by 27%, confirmed by a rise in the retrap rate.

Great Tit *Parus major*

In 1997, the drop in adult abundance of 8% and the increase in productivity by 28% indicates that their breeding success was affected in a similar way to the Blue Tits over the two years. The drop in adult abundance was far less than Blue Tit, but the change in percentage of juveniles was quite different between species; a change of 47% to 74% for Blue Tit, but 20% to 48% for Great Tit. Did the larger Great Tits survive the winter better because they were able to conserve heat more efficiency (smaller size to surface area ratio) and were they less able to raise young because their larger chicks required larger quantities of food which was difficult to obtain in 1996 because of the poor weather ?

Chaffinch *Fringilla coelebs*

Numbers caught are too small a sample size to analyse but the increase in territories between 1995 and 1997 shown by the CBC is not reflected in the drop from five adults and a juvenile in 1996 to one adult and two juveniles in 1997.

Reed Bunting *Emberiza schoeniclus*

Adult abundance in 1997 was well down, reflected in the CBC data. More worrying still is the drop in productivity. The numbers of juveniles caught dropped from just two in 1996 to none at all in 1997.

The reasonable numbers of adults caught and the high retrap rate between years suggest that the site is suitable for adults but that there is some reason for the low productivity which seems even poorer than the national average It may be that the large rat population attracted by the nearby sewage plant, the small rubbish dumps and the network of ponds and ditches is the problem.

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