

Monitoring the Breeding Population of Bearded Tits *Panurus biarmicus* in the Tay Reedbeds. Report for the 2003 Season.

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Introduction

This is the second year of a three-year mark-recapture study commissioned by Scottish Natural Heritage to assess and monitor the important Bearded Tit *Panurus biarmicus* population of the Inner Tay Site of Special Scientific Interest.

The primary task of the Tay Ringing Group in relation to this contract is to provide the basic raw data for detailed statistical analysis by SNH. The data collected is attached in Excel format. This report therefore concerns itself primarily with fieldwork methods and results, not detailed population analysis.

Access difficulties at the Seaside site continued, which prevented full coverage of all visits being achieved. Since recent works by Scottish Water, Seaside has become much wetter, with permanent areas of flooding. This may have positive or negative impacts on the site's suitability for Bearded Tit and other reedbed species.

Methods and Study Sites

The four main sites remain the same as those used in 2000 and are, from West to East; Tay Lodge (NO2622), Seaside (NO2723), Powgavie (NO2925), and Kingston (NO2926). A core study period from the 1st April – 31st August during which a minimum of six visits had to be made was agreed with SNH. In order to further standardise visits this was broken down into six visit periods as listed below;

April 1 – April 25
April 26 – May 21
May 22 – June 15
June 16 – July 9
July 10 – July 31
Aug 1 – Aug 27

Teams operating at the sites undertook to have a minimum separation of 3 days between visits, and where possible to operate the same net rides in terms of location and amount of netting deployed. Times of opening and closing nets were recorded to assist in data standardisation. Table 1 below details this data on a site basis.

Table 1-Visit Details

Tay Lodge						
Date	05/04	11/05	01/06	29/06	12/08	28/08
No. of Nets & Length	3x60 2x40 260ft	3x60 2x40 260ft	3x60 2x40 260ft	3x60 2x40 260ft	3x60 2x40 260ft	3x60 2x40 260ft
Time Nets Opened	0630	0600	0530	0530	0600	0600
Time Nets Closed	1200	1100	1030	1030	1100	1100

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Seaside

Date	13/07
No. of Nets & Length	5x60 1x40 340ft
Time Nets Opened	0530
Time Nets Closed	0845

Kingston

Date	30/03*	18/04	31/05	26/06	26/07#	27/07	06/08	09/08
No. of Nets & Length	4x60 240ft							
Time Nets Opened	0730	0700	0700	0630	0630	0545	0615	0630
Time Nets Closed	0930	1000	1100	1200	1200	1115	1130	1130

Powgavie

Date	06/04	26/04	31/05	5/07	26/07	27/07#	24/08
No. of Nets & Length	10x60 560 ft						
Time Nets Opened	0700	0630	0630	0600	0630	0630	0530
Time Nets Closed	1230	1100	1045	1045	1230	1230	1200

Additional Visits Post-Study Period

	Tay lodge	
Date	9/10	23/11
No. of Nets & Length		
Time Nets Opened	0730	0645
Time Nets Closed	1330	1200

Visits marked with a * are the initial setting up visits, involving the cutting of net rides. In some cases nets were set up during this process and birds caught.

Visits marked with a # are additional visits occurring within the main study period.

Due to waterlogging, a new, parallel net ride was cut at Powgavie approximately 5 metres from the original site. This incurred a slight change in the number of nets erected resulting in a loss of 4 feet of netting. Supplementary visits outwith the core period were carried out at Tay Lodge to get additional information on activity later in the season. Unlike 2002 these generated few captures, a total of only 16 birds (9 new and 7 retraps).

Results

These results relate to the core period 1st April-31st August. One visit was made on the 30th March but is included in the core period. Captures were down on the previous year (2002 totals given in brackets). In total 217 (360) birds were caught of which 141 (230) were new and 76 (130) were retraps (i.e. ringed previously and captured on a subsequent visit). The loss of five visits to Seaside,

the second most productive site in 2002, will account for some of this decline. Table 2 below illustrates the proportion of new & retrap birds caught by month and by site.

Table 2-New & Retrap Captures by Site & Month

Type	Site	April	May	June	July	August	Grand Total
New	KINGSTON	7	4	15	12	4	42
	POWGAVIE	3	3		58	4	68
	SEASIDE				21		21
	TAY LODGE	1	1	5		3	10
New Total		11	8	20	91	11	141
Retrap	KINGSTON		17	6	2	7	32
	POWGAVIE	4	4		21	2	31
	TAY LODGE	9	2			2	13
Retrap Total		13	23	6	23	11	76
Grand Total		24	31	26	114	22	217

Table 2 indicates that Powgavie recorded the most captures whilst Tay Lodge was the least productive site during the core period. All sites recorded a decline in captures compared to 2002. Kingston recorded the highest number of retraps. The peak capture period was July, with numbers falling off rapidly in August. Total capture rates were lowest in April, with the lowest period for new birds being May and the lowest for retraps being June.

The proportion of adult to juvenile captures is illustrated in Table 3 below. Adult numbers were highest in April and May, and lowest in August. Juveniles do not appear in the capture totals until June (the first were caught on the 1st June at Taylodge), numbers peaking in July and declining rapidly in August. Retrap rates for juveniles are about a third of those for adults.

Table 3- Adult & Juvenile Captures by Month

Age	Type	April	May	June	July	August	Grand Total
Juvenile	New			14	84	9	107
	Retrap			1	11	5	17
	Total			15	95	14	124
Adult	New	11	8	6	7	2	34
	Retrap	13	23	5	12	6	59
	Total	24	31	11	19	8	93
Grand Total		24	31	26	114	22	217
Ad/juv ratio		0.0	0.0	1.4	5.0	1.8	1.3

The adult to juvenile ratio is derived by dividing the total number of juvenile captures by the total number of adult captures, and gives a crude indication of the ratio of adults to juveniles present. It is an imprecise measure, not least as adults appear to be more likely to be retrapped and therefore may lower the ratios and caution is advised in interpreting the results. Given these caveats the figures appear to suggest that the ratio of juveniles to adults was highest in July, and dropped off rapidly in August. This pattern differs from that of 2002 when there was a steady increase to a minor peak in August. The grand total ratio of 1.3 is a slight increase on the 1.2 recorded in 2002.

Table 4 below presents the adult and juvenile data used above but on a site basis. This indicates that the highest numbers of adults were caught at Kingston, whilst the highest numbers of juveniles were caught at Powgavie. Seaside had the highest proportion of juveniles to adults, but this is an artefact caused by having only a single visit during the peak juvenile production period. Tay Lodge and

Kingston handled more adults than juveniles, with a high proportion of these adults being retraps at all sites except Seaside (which again may be a product of the timing of the only visit).

Table 4-Adult & Juvenile Captures by Site

Site	Type	Juvenile	Adult	Grand Total
KINGSTON	N	28	14	42
	R	5	27	32
KINGSTON Total		33	41	74
POWGAVIE	N	60	8	68
	R	12	19	31
POWGAVIE Total		72	27	99
SEASIDE	N	17	4	21
	R	0	0	0
SEASIDE Total		17	4	21
TAYLODGE	N	2	8	10
	R	0	13	13
TAYLODGE Total		2	21	23
Grand Total		124	93	217

Table 5 illustrates the sex ratios by month and age. Overall more juvenile males were captured than females, whilst in adults the trend tended towards gender parity, with only a very slight female capture bias. Juvenile gender differences were most obvious in July and August. More adult females than males were caught in every month except June. Two juveniles were not sexed during processing but this has no real impact on the results observed.

Table 5-Sex Ratios

Age	Sex	April	May	June	July	August	Grand Total
juvenile	Female	0	0	8	41	3	52
	Male	0	0	7	52	11	70
	No data				2		2
Total		0	0	15	95	14	124
Adult	Female	14	16	4	11	3	48
	Male	10	15	7	8	5	45
Total		24	31	11	19	8	93
Grand Total		24	31	26	114	22	217

Recapture Histories

Full details of all 76 retraps are included in the appendices. Of these retraps, 42 were originally captured prior to 2003, the oldest of which was P040106: originally ringed as a full-grown female at Powgavie on the 5/12/99, subsequently retrapped at Taylodge on 9/10/2003. There were 38 retraps (50%) where the birds were retrapped at a different site to that of original capture. The longest movement between sites was five kilometres, made by 11.8% of all retrapped birds (n=9).

Discussion

The failure to complete all the visits to Seaside due to access difficulties has had an impact on the overall data set. Taking this into account, the data still suggests a poorer year than 2002, with Tay Lodge recording the same number of total captures (23) as 2002, whilst Powgavie and Kingston both recorded fewer captures in 2003, with Powgavie having 99 captures (133 in 2002) and Kingston 74 (97 in 2002). All sites produced fewer juveniles than in 2002.

42 birds ringed in 2002 survived to join the breeding population in 2003. However, overall adult numbers were lower due to a lower rate of new adults captured. 34 new adults were captured in 2003, giving a total of 76 breeding adults. The comparable figure for 2002 was 99 (31 retraps and 68 new adults). Therefore declines in adult captures appear to be related to a lack of new unringed adults joining the breeding population, although the lack of data from Seaside (which in 2002 supplied 27 new unringed adults) underlines the need for caution in interpreting this data. Equally it should be noted that as the study progresses the proportion of unringed adults would be expected to decline.

The monthly capture data indicates a very different pattern of juvenile production compared to 2002, with a much sharper peak in July, with fewer young in June and August than in 2003. Visits after the core period failed to repeat the large scale captures of unringed juveniles and wandering adults that were so apparent in 2002. It may be that the dry summer adversely affected broods, and this may partly explain the lower juvenile capture rates at all sites.

Table 5 indicates that peak adult captures occurred in May (the peak adult capture rate was April in 2002). These high capture rates, especially when male & female ratios are near parity, are assumed to relate to pairs feeding young at the nest. In 2002 there was a second, greater, peak of adult captures in July, probably feeding mobile dependant young. Such a peak was more muted in 2003, and may again point to changes in the timing of breeding attempts and a decline in breeding success.

Overall there seems to have been some decline in between site movements, although again the picture is complicated by lack of data from Seaside. The number of long distance movements also appears to have declined, and this taken with the absence of large flocks in the late autumn and early winter may serve to underline the possibility of a poorer breeding season in 2003.

