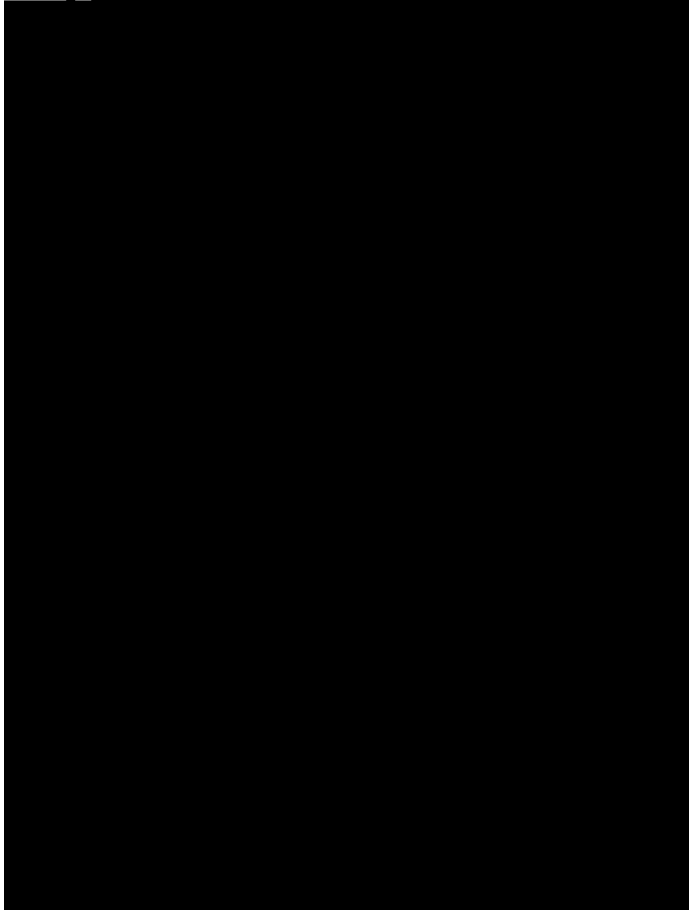


WHEELWRIGHT, N. T., LEAHY, L., and ERGREN, L. G. 1991. The costs of reproduction in tree swallows (*Icterus hiemalis*)

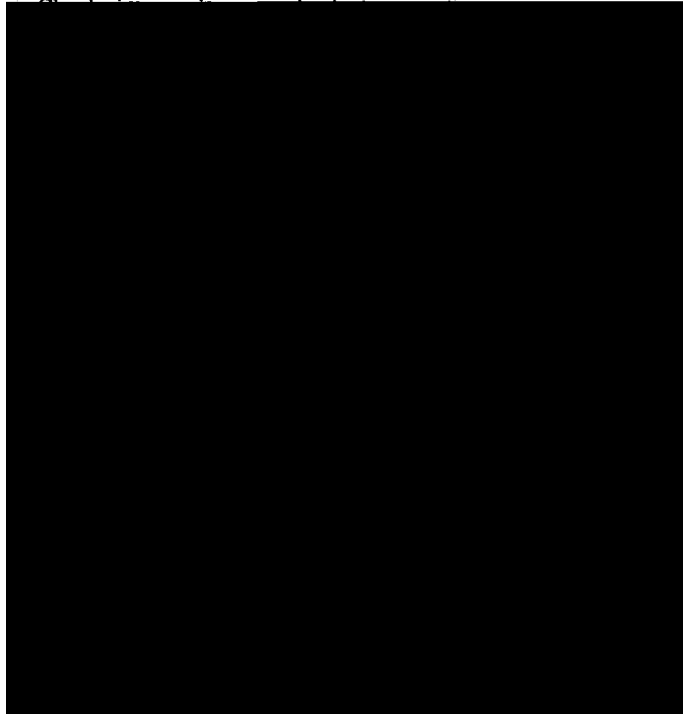
NEUMANN, T., WERNER, J., LEAHY, L., and ERGREN, L. G. 1991. The costs of reproduction in tree swallows (*Icterus hiemalis*)

WHEELWRIGHT, N. T., LEAHY, L., and ERGREN, L. G. 1991. The costs of reproduction in tree swallows (*Icterus hiemalis*)

Nur (1988b) made several valid criticisms of earlier studies. He



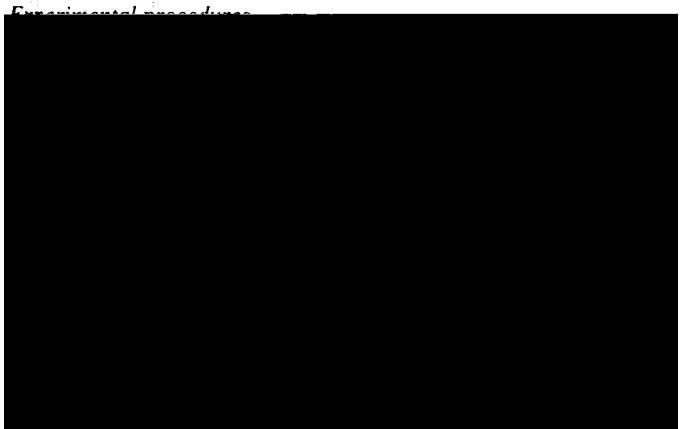
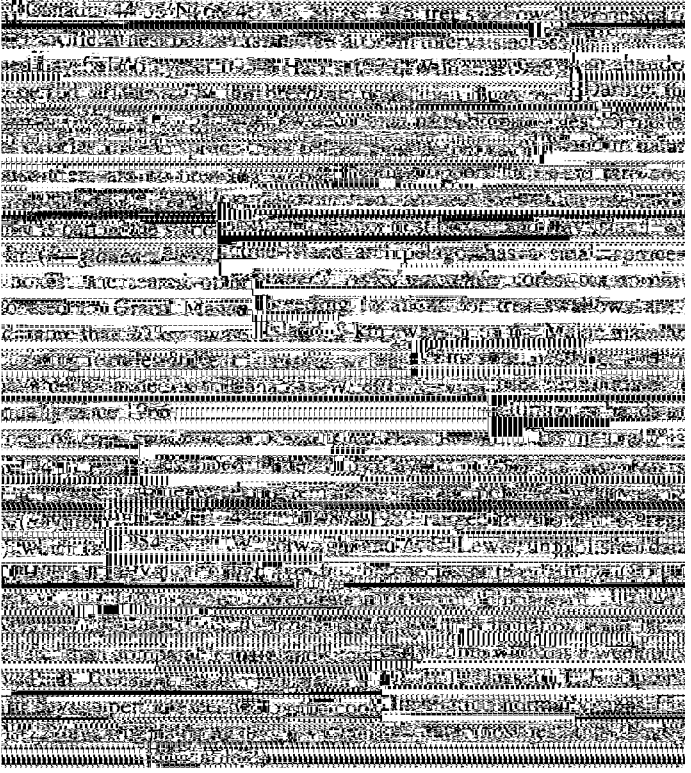
*Nonexperimental procedures*



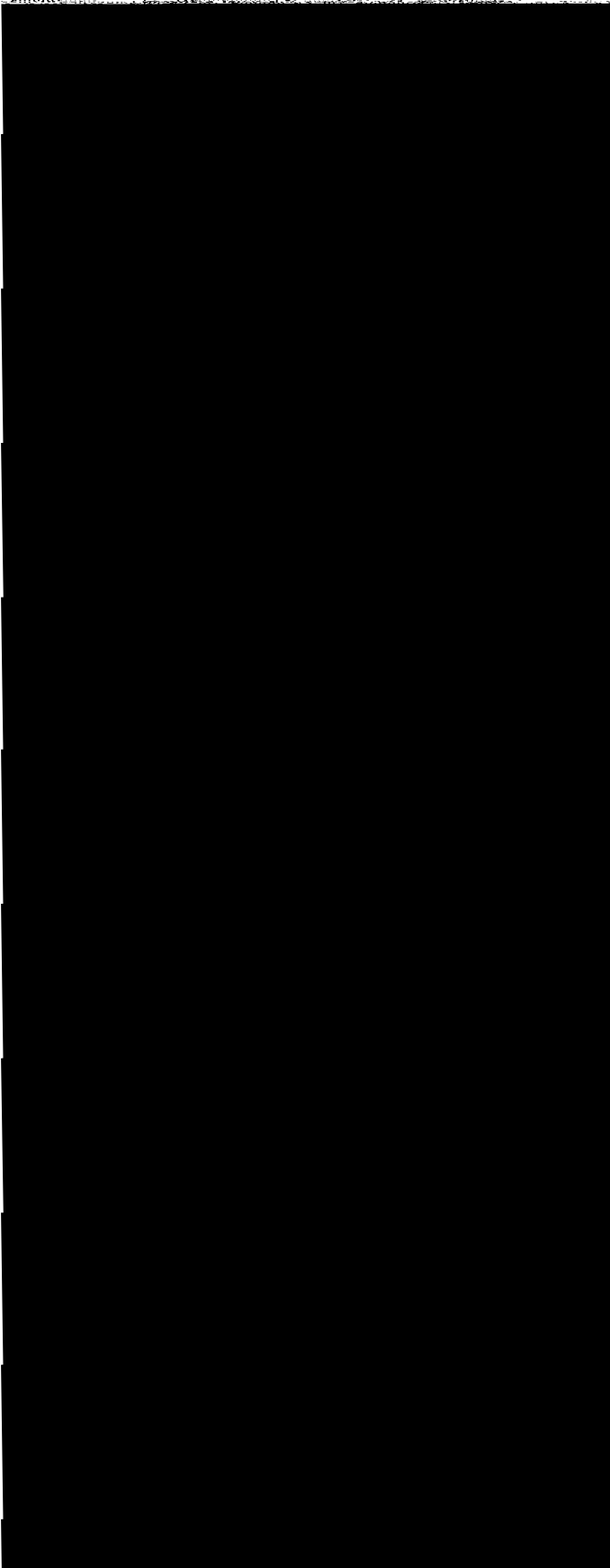
**Methods**

*Study site and species*

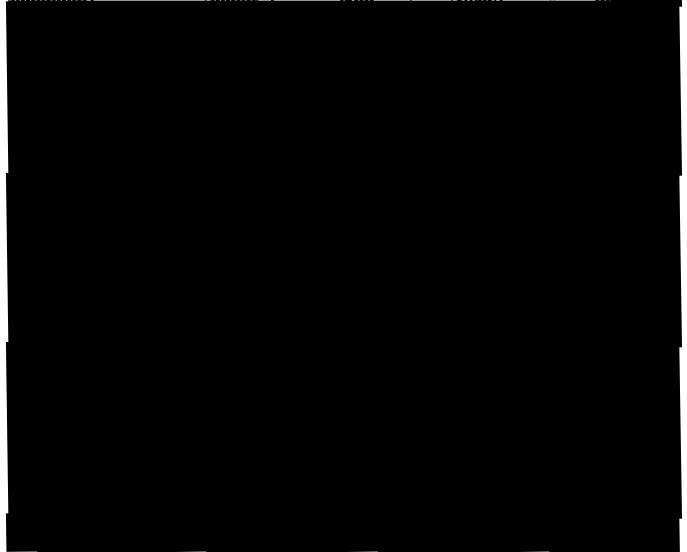
Our study was conducted at the Bowdoin Scientific Station, located on Kent Island, an 80-ha island in the Bay of Fundy, New Brunswick, Canada (44°35'N, 65°41'W).



1980; Røskoft 1985; Finke et al. 1987; Korpimäki 1988). Given that individual differences in parental abilities are often invoked to explain some of the results, it is not surprising that individual differences in parental abilities have been shown to reflect



undetected. Such problems are probably of only minor importance for adult females at Kaitumaesi, given the sensitivity of certain avian species



## Results

### *Unmanipulated nests*

#### *Brood size, fledging quality, and survival*

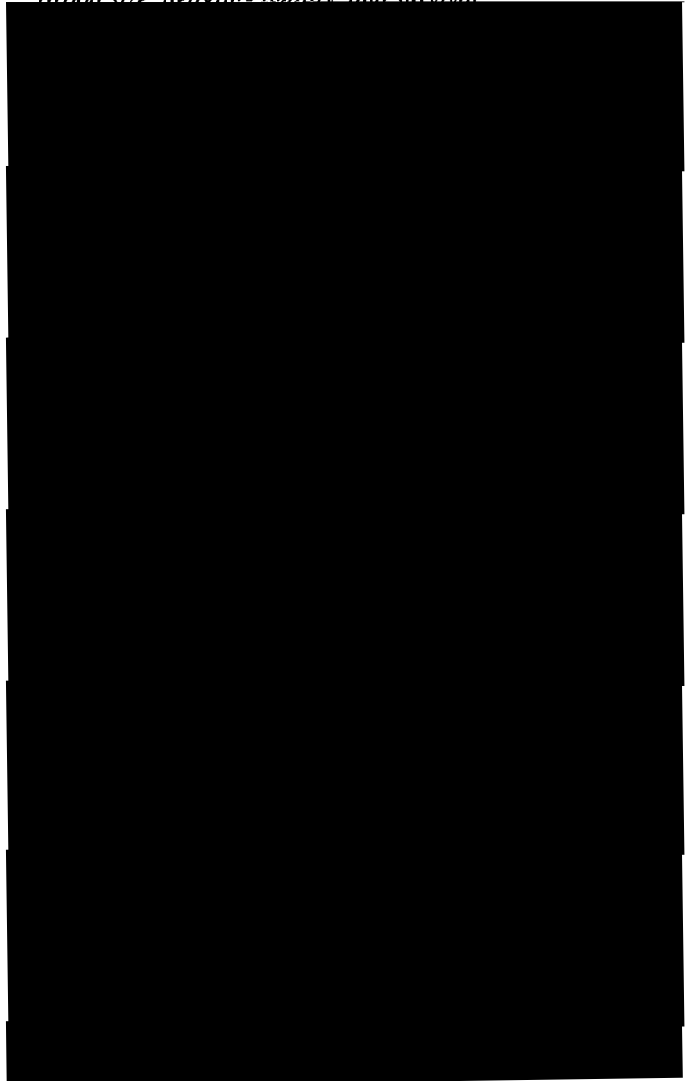


TABLE 1. Spearman rank correlations ( $r_s$ ) between brood size and three measures of nestling size (averaged across the brood) in unmanipulated nests measured when nestlings

	Rank correlation			
	Mass	Wing length	Tarsus length	
1987	-0.26			12
1988	-0.29*	0.02	-0.28*	55
1989	-0.21		0.00	12
1990	0.12		0.26	12

\*Number of broods.  
\* $P < 0.05$ .

TABLE 2. Fraction of all individuals that returned in a given year as a function of clutch size in

	Rate of return		
		6-8 eggs <sup>a</sup>	$p^b$
1987 to 1988			
Nestlings	0.035 (114)	0.027 (328)	0.89
Females		0.538 (65)	0.30
Males		0.036 (65)	0.33
1988 to 1989			
Nestlings	0.011 (93)	0.011 (177)	~1.00
Females	0.308 (26)	0.457 (46)	0.32
Males	0.500 (10)	0.143 (35)	0.06
1989 to 1990			
Nestlings	0.033 (60)	0.026 (222)	~1.00
Females	0.364 (22)	0.453 (64)	0.63
Males	0.105 (19)	0.462 (52)	0.01

NOTE: Sample (in parentheses) excludes individuals involved in experimental brood manipulations.

Experimental nests

Effects of brood size on fledgling size

Brood size had no significant effect on nestling wing length, mass, or tarsus at age 11 or 12 days in experimental nests

Table 3 combining probabilities from all years

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Brood size, parent survival, and future reproductive success

Females that produced small clutches were no more likely to

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TABLE 3. Effects of brood-size manipulations on nestling size and fledging success

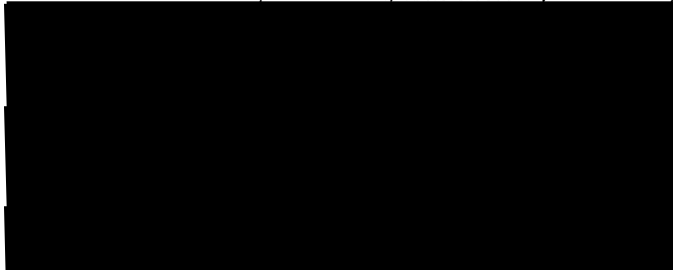


tion in tree swallows over the range of brood sizes that we



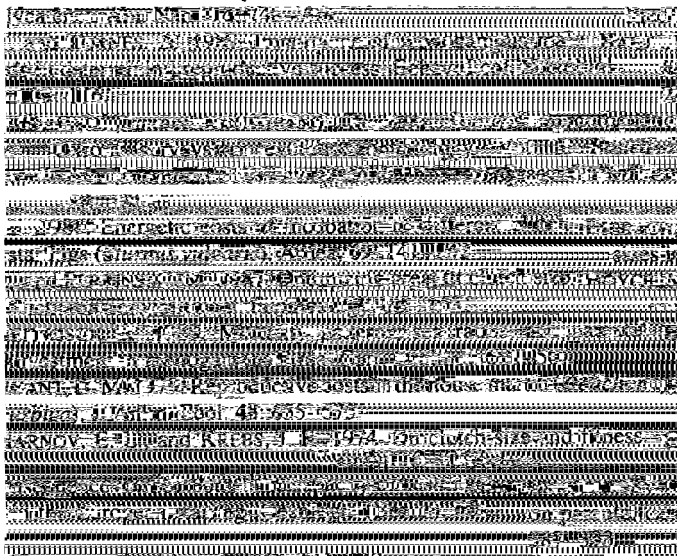
**Acknowledgements**

We thank Juan Amat, Peter Dunn, Kate Lessells, Nadav Nur,

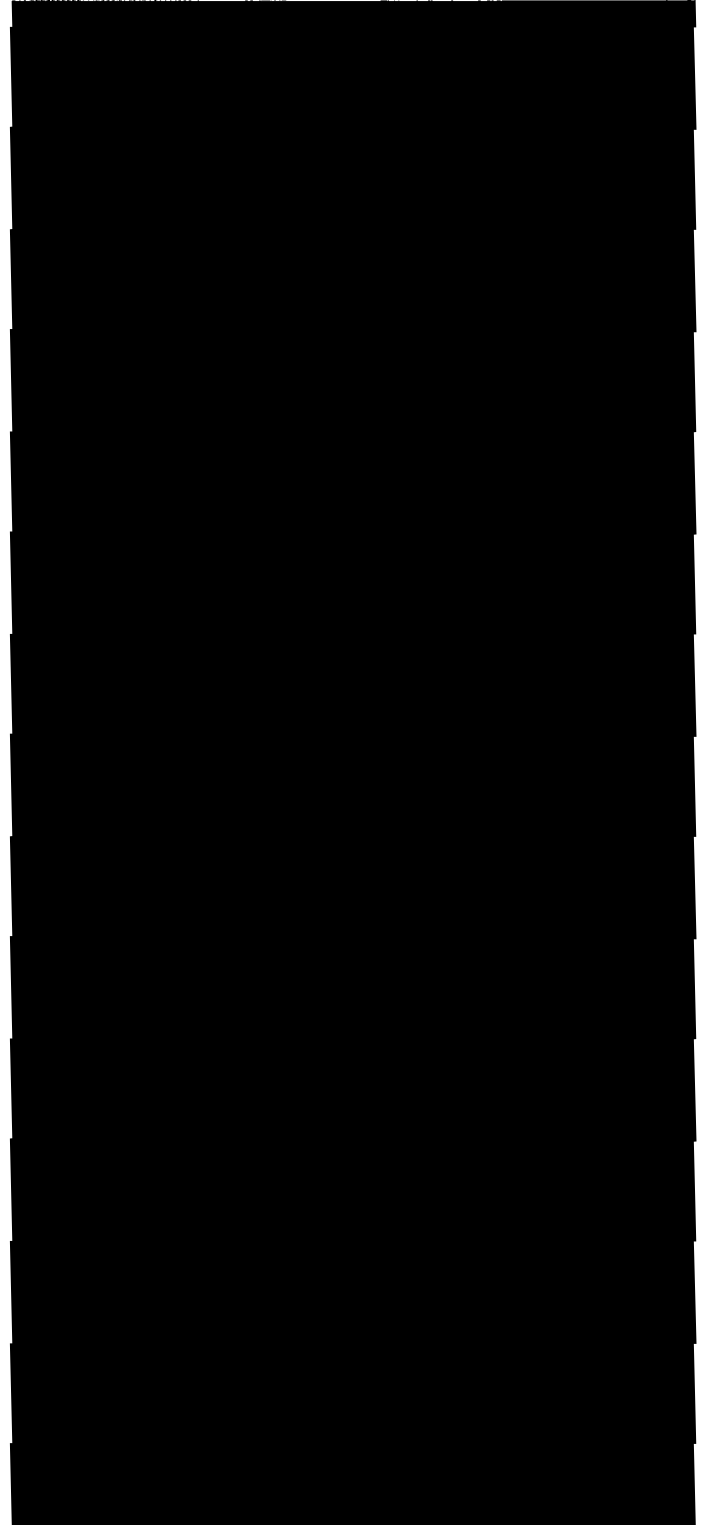


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