BREEDING BIOLOGY OF THE COMMON MURRE AT TRIANGLE ISLAND, BRITISH COLUMBIA, CANADA, 2002–2007

J MARK HIPFNER

ABSTRACT—Triangle Island, the most westerly of the Scott Islands, supports the larger of 2 active Common Murre (*U*) breeding colonies (about 3000 pairs) in British Columbia, Canada. However, little is known about the species' breeding ecology at this site. Here, we report on investigations of murre biology at

vide a benchmark against which future changes can be measured. Here, we report our findings on adult morphometrics, egg size, timing and success of breeding, adult and chick mass, and nestling diets from 2002 to 2007, a period of extreme variation in environmental conditions off the coast of British Columbia (Mackas and others 2007). We also make comparisons with other northeast Pacific colonies, because while murre biology is well described throughout its range many basic facets tend to be colony-specific (Ainley and others 2002).

METHODS

Field crews were present on Triangle Island from late March until late August in each year between 2002 and 2007. That time period more than encompassed the murres' breeding season. We monitored the presence or absence of murres on the colony daily from the time we arrived on the island, and logged detailed, systematic observations when murres began to regularly attend the colony.

From 2003 to 2007, we made daily observations of about 50 to 60 pairs of Common Murres breeding on a small part of the colony on Puffin Rock. Observations were made from a viewing blind situated about 50 m away from the murres using 7× binoculars and a 25 to 60× spotting scope. We used standardized methods (Birkhead and Nettleship 1980) to determine dates of laying (1st and replacement eggs), hatching, and nest departure, and used these 3 indices to determine hatching success (the proportion of eggs laid that hatched), fledging success (the proportion of hatched chicks that survived at least 15 d before they disappeared), and breeding success (the proportion of eggs laid that produced chicks that survived to departure). We have no way of knowing what proportions of chicks survived the period at sea after nest departure and before true fledging, during which they are attended by their father. As it was difficult to determine an exact laying date for some pairs due to the fact that murres breed very densely and do not build nests, we in some cases assumed that the laying date was 32 d prior to the hatching date (A

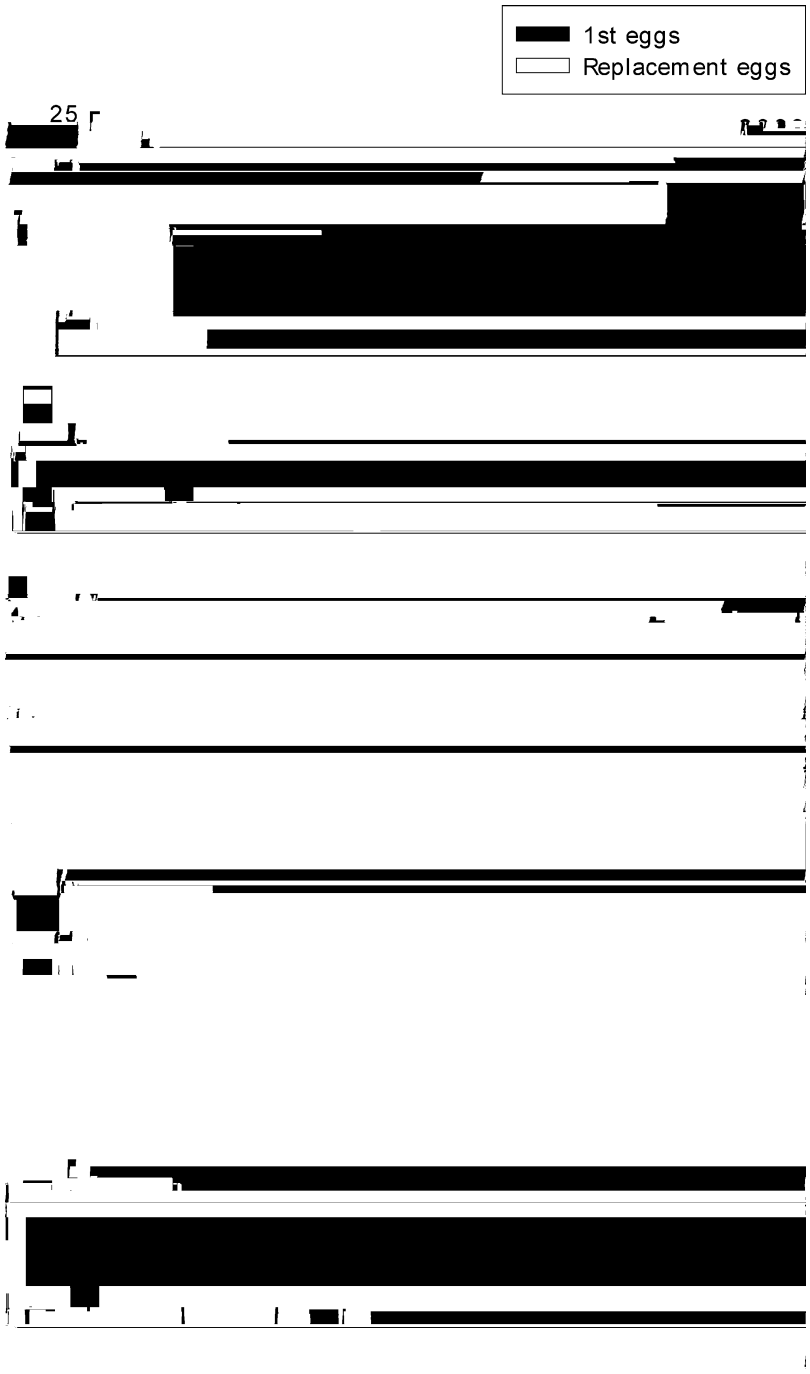

FIGURE 1. Five day frequency distributiTc[dTJMT65(ts0(Fi)rp(8or9C(522.5(d)12iistrib)12.5(ug(1st1.3(se1es9-)ist-.ug(1st1.39t(1st1.an)1.)-10

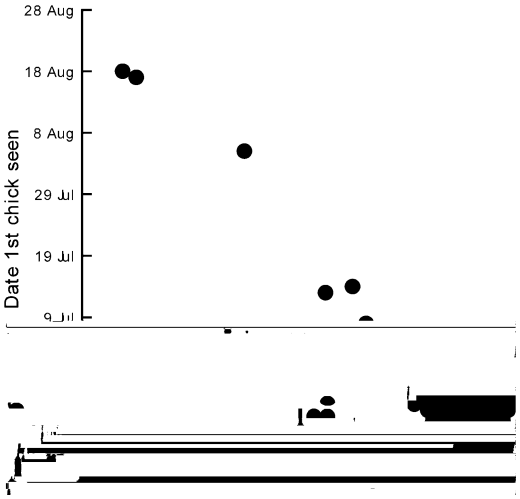

FIGURE 2. Dates on which Common Murre chicks were first seen on the colony at Triangle Island, 1980–2007. This is the only measure of phenology available for all years through the whole of that time period (Bertram and others 2001). Note that data from 1980 and 1981 probably represent hatching dates of replacement eggs; Vallée and Carter (1987) reported that the bulk of egg-laying occurred between 25 and 30 June in those years, thus 1st chicks would have been expected between late July and early August.

TABLE 2. Measurements (mean ± 1) of Common Murre eggs at Triangle Island in 2002. Egg measurements from the Kerouard Islands, British Columbia (JM Hipfner, unpublished data), the Farallon Islands, California (Gress and others 1973), and Tatoosh Island, Washington, and 6 colonies in the Gulf of Alaska (both Vander Pol and others 2003) are shown for comparison.

Colony		Length (cm)	Breadth (cm)	Volume index (cm^3)[1]
Triangle I., BC	15	8.55 ± 0.35	5.05 ± 0.12	218.1 ± 15.1
Farallon Is., CA	66	8.25 ± 0.78	5.05 ± 0.37	210.4
Tatoosh I., WA	14	8.24 ± 0.23	5.08 ±	

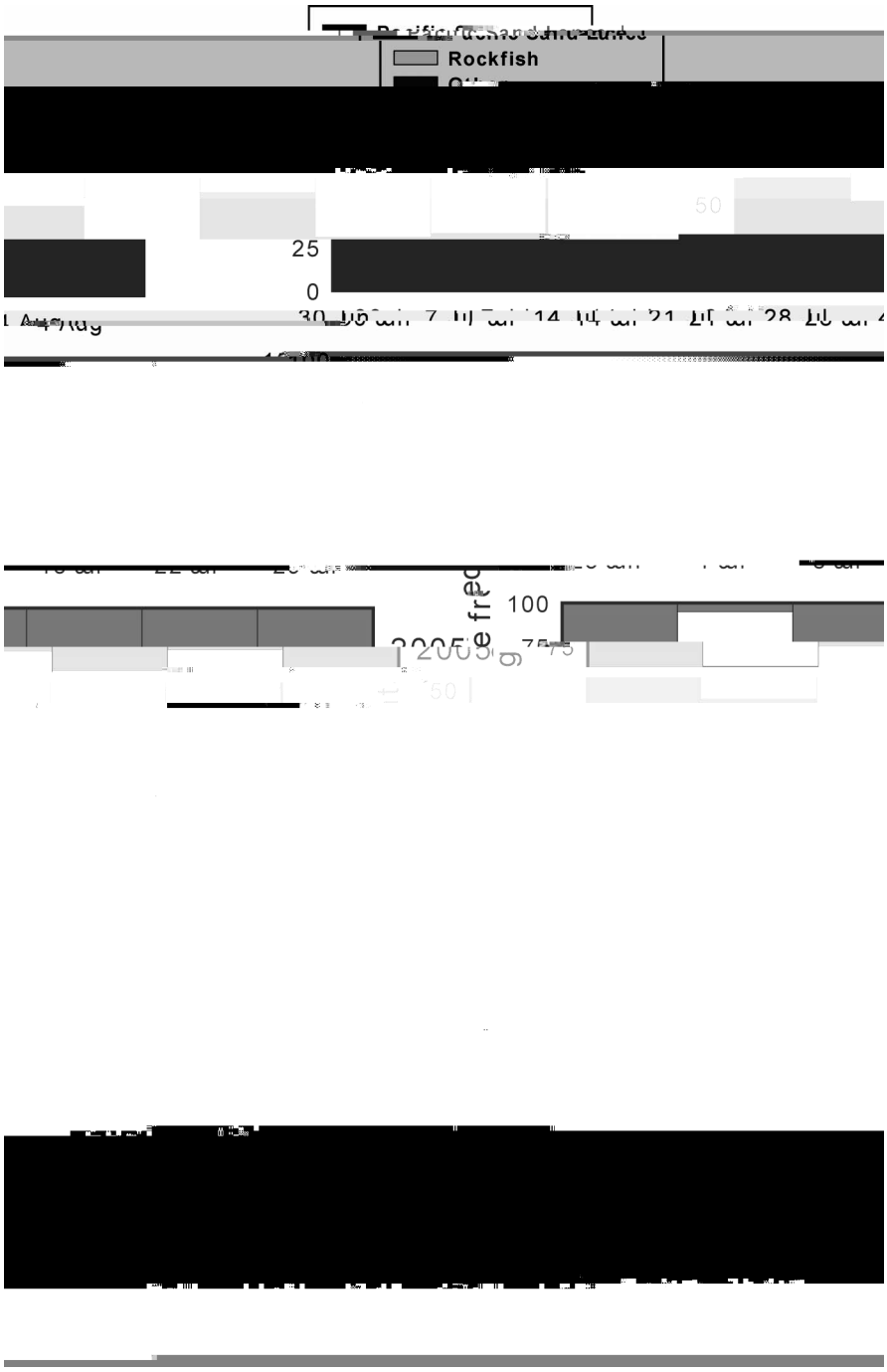

FIGURE 3. Weekly frequency

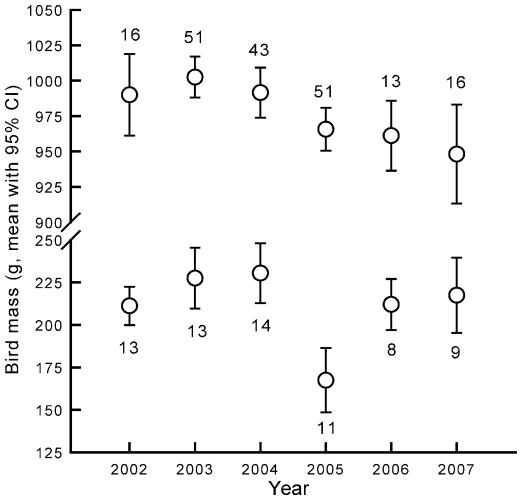

FIGURE 4. Mean (with 95% confidence intervals) adult and chick Common Murre body masses at Triangle Island, 2002–2007. Measurements were taken just prior to the start of fledging. Only chicks with wing lengths >60 mm (those near to fledging) are included.

ACKNOWLEDGMENTS

We thank many field workers for their efforts collecting these data, especially B Addison, G Blackburn, K Charleton, S Franks, G Keddie, V Labrecque, L MacFarlane-Tranquilla, W Nelson, B Newton, and L Savard, who each helped us for 2 or more seasons. Thanks also to Stacy Vander Pol for providing us a copy of the STAMP report containing information on Common Murre egg size at colonies in Washington State and Alaska. Funding was provided by the - Oil Spill Trust Fund, the Centre for Wildlife

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