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### OCCURRENCE OF INTERGRADE BRANT IN OREGON

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On 19 July 1973 two small geese of the *Branta bernicla* species complex were found feeding on Eelgrass (*Zostera marina*) in Yaquina Bay, Lincoln County, Oregon. Since the occurrence of Brant of any form is most unusual on the Pacific Coast in midsummer (Barnard 1973, Einarsen 1965) the birds were observed quite carefully.

Both birds showed distinctly light bellies and were at first identified as Atlantic Brant (*Branta bernicla brota*). No specimens of Atlantic Brant are known from Oregon, although reports of light-bellied Brant have come from hunters and from W. Batterson (pers. comm.). However, it soon became apparent that the birds were not typical *B. b. brota* (see description below). Several observers noted and photographed the birds in the same area over the next several weeks, and on 3 August they were seen to be entering molt. One was captured on 15 August during their period of near flightlessness and was examined and banded. Measurements of this individual were as follows: culmen, 36mm; bill depth, 19.5mm; left wing chord, 311mm; right wing chord, 311mm; right tarsus, 69.5mm; middle toe with claw, 62mm; middle claw, 7mm; weight, 1176 g. At this time many of the breast feathers had molted so that the black of the upper breast did not extend as far as in non-molting birds. New feathers growing into the center of the lower breast were white. The white neck markings were continuous in front (on both birds) and nearly continuous in back. Connection of the neck-marks in front is characteristic of the Black Brant (*Branta nigricans* of the AOU 1957, *B. bernicla orientalis* of Delacour 1954) and of the rather dubious Lawrence's Brant (*B. bernicla nigricans* Delacour). The neck markings were narrower than is usual for Black Brant and consisted of solid white rings without the oblique striations which widen the typical Black Brant neck-ring. The flight feathers and rectrices were very badly worn but had not started dropping. The wing coverts and scapulars were worn and faded, giving the backs of both birds a light brown appearance.

The feet and bill were uninjured and showed no signs of unusual wear, so we concluded that there was no evidence the birds had previously been in captivity. The captured bird was released and joined its companion apparently unharmed. It was not seen again by the authors, but was shot by a hunter at Yaquina Bay on 21 November 1973 (Federal Bird Banding Laboratory pers. comm.). The unbanded bird was frequently seen until 2 September.

The taxonomic status of the Brant is unsettled. The AOU (1957) considers the Black Brant and American Brant separate species, but Delacour (1954) considers all Brant conspecific. Short's (1969) criteria for determining species status of sympatric populations cannot be applied to Brant, since pair formation normally occurs on the wintering grounds, where the populations are effectively allopatric. Delacour and Zimmer (1952) differentiated the supposed intermediate subspecies *B. bernicla nigricans* on the basis of two specimens and some anecdotal evidence from hunters. This of course greatly confuses the nomenclature of the Black Brant, which could be *B. nigricans*, *B. orientalis*, *B. bernicla nigricans* or *B. bernicla*

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*orientalis*, depending on the specific status of the Black Brant and on the status of Lawrence's Brant.

Manning et al. (1956) assembled a series of seven specimens of Brant from Prince Patrick Island in Arctic Canada; on the basis of breast color he considered the series showed complete intergradation. He did not consider neck-ring pattern in the birds, but W. Earl Godfrey, of the National Museum of Canada, kindly provided us with the information that the lighter birds had interrupted neck markings, but the darker ones did not. Manning felt, probably justifiably, that Delacour's birds were probably intergrades. Bailey (1948) reported atypical "American Brant" from Arctic Alaska; he described them to Bent (1925) as light-bellied birds with the neck-ring complete in front.

The identity of our birds is not completely certain. They differ from all of the four subspecies described by Delacour, being lighter in breast color than any of the forms except *B. b. brota*. On the other hand, they resemble the Black Brant (and Lawrence's Brant) in neck pattern. The most likely explanation is that our birds, Bailey's birds and Delacour's *B. b. nigricans* (Lawrence's Brant) are all intergrades between American Brant and Black Brant. It is conceivable that if Lawrence's Brant actually is a distinct and extant form, our birds could be intergrades between it and the American Brant.

A genetic explanation is available for the variability among these apparent intergrades. Manning's series provides good evidence that breast color in Brant is controlled quantitatively by several gene loci. Thus hybrids would be expected to be intermediate between their parents for the trait. The pattern of neck markings, however, could be controlled by a single gene locus. In this case, first-generation hybrids ( $F_1$ ) might have neck markings resembling one or the other of their parents.



Figure 1. One of two intergrade Brant present at Yaquina Bay, Oregon in July and August 1973. This bird was later captured and banded.

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If these hybrids bred among themselves or, as is much more likely, with individuals of the parental forms, some of their (F<sub>2</sub> or Backcross, respectively) offspring could show interrupted and some could show complete neck markings. Very light intergrades would have interrupted markings more often than darker intergrades, but either trait could be present anywhere in the series.

Since Brant, like many other geese, tend to remain in family groups during the fall migration and perhaps after, it is likely that our two birds were siblings. Their very close association in the field led us to believe at first that they were a mated pair, but the chances of two nearly identical unrelated intergrades pairing would of course be low.

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