

INTERBREEDING OF GLAUCOUS-WINGED AND HERRING GULLS IN THE COOK INLET REGION, ALASKA

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In the course of field studies of birds about the Cook Inlet over the past seven years, one of the objectives has been to determine annually the relative abundance of nesting gulls. In so doing some difficulty was encountered from time to time in identifying adults of the two large species, the Herring Gull (*Larus argentatus*) and the Glaucous-winged Gull (*Larus glaucescens*). Our tendency has been to consider as *argentatus* all birds with black or dark gray subterminal bands on the primaries. All others, the paler ones, we considered to be *glaucescens*. We were aware that much variation in coloration existed among these birds and, of necessity, allowed some individuals to go unidentified.

However, during an intensive banding program conducted by Peyton in 1961 and 1962, near Anchorage, Alaska, large numbers of Glaucous-winged and Herring gulls became available for inspection, and the great range in variation in the characters generally used for identification of these species became readily apparent. Most striking was the discovery that the color of the subterminal bands of the primaries, black normally in *argentatus* and gray in *glaucescens* (Ridgway, 1919:597, 612), actually graded in an unbroken series from one to the other. The color of the irides and the naked orbital rings were likewise variable and therefore of no assistance in identification. The backs, scapulars, and upper wings of all the birds were generally a pale neutral gray, or kindred color, and showed no detectable relationship to the color of the other parts.

The large breeding colonies are accessible only by air from Anchorage, and it was not until just following the 1962 banding program that an opportunity came to visit a breeding colony and collect adequate material for study. Mr. James Branson, of the United States Fish and Wildlife Service, kindly provided transportation and assistance with the collecting. Twenty specimens were collected at random from a compact breeding colony surrounding a group of small lakes on the Susitna Flats between the mouths of the Little Susitna and Susitna rivers on the north side of Cook Inlet. Typical specimens of *glaucescens* and *argentatus*, as well as birds showing intermediate characteristics, were among this series. We selected eight of these as being representative of the range of variation in color and pattern of primaries (fig. 1). Other data, including those on color of soft parts and reproductive condition, are presented in table 1. Excluded from the table are data on the color of (1) the feet, all of which were flesh colored, and (2) the bills, all but three of which were yellow with a bright red spot on the lower mandible. The three exceptions were immature birds showing in addition a trace of blackish near the tips of both mandibles. All the birds had started molt of the innermost primaries and body plumage; virtually all had nests containing well-incubated eggs, while a few contained newly hatched young. One female, however, was still laying.

The data presented in table 1 indicating species composition and interbreeding of these gulls based on the color of the wing tips can be briefly summarized as follows:

<i>Larus glaucescens</i>	2
<i>Larus argentatus</i> x <i>Larus glaucescens</i>	2
<i>Larus glaucescens</i> toward <i>Larus argentatus</i>	1
<i>Larus argentatus</i> toward <i>Larus glaucescens</i>	4
<i>Larus argentatus</i>	11

The preponderance of birds assigned to *argentatus*, while no doubt largely due to their greater numbers in the colony, may also be attributed to the likelihood that the black

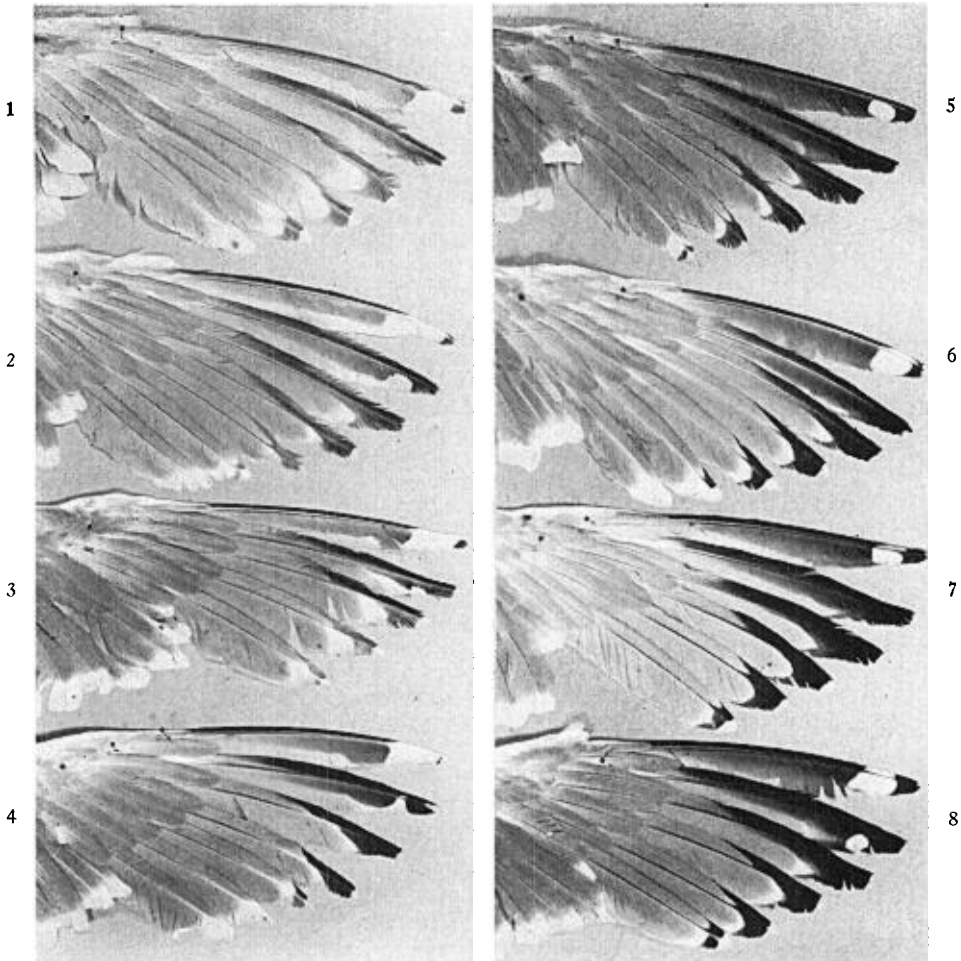


Fig. 1. Variation in color and pattern of the primaries of intermediates between *Larus glaucescens* (1) and *Larus argentatus* (8). Wings arranged from top left (*glaucescens*) to bottom right (*argentatus*). The specimen of typical *glaucescens* is actually somewhat paler than shown. Wings shown are those with superscript numbers in table 1.

coloration is dominant and masks the corresponding character of *glaucescens*. We feel it is probable that some of these birds have in their background incidents of hybridization; this assumption is based on the slight variation in shade of black color of the subterminal bands of the primaries together with the variable color of the naked orbital rings. It was found that mensural characters are so broadly overlapping as to be of no value in treatment of this group or in separating the other specimens.

Three immature birds have been included in this tabulation. Two of these were found to be in the third-year plumage with essentially adult characteristics, while the third was considered to be in second-year plumage. All possessed a limited amount of dark marking in the tail and a remnant of blackish bill marking near the tips of both mandibles. Otherwise, the bills were yellow with a distinct red spot on the lower mandible as in the adults; this is a quite different situation from that reported for the

TABLE 1

DATA ON AGE, WEIGHT, REPRODUCTIVE CONDITION, AND COLOR OF SOFT PARTS FOR SPECIMENS OF *Larus* COLLECTED IN THE UPPER COOK INLET AREA, JUNE 11, 1962

Sex*	Age	Weight (gm.)	Wing** (mm.)	Reproductive condition	Orbital ring	Iris
<i>Larus argentatus</i>						
Male	2nd year	1448.9	407	Testis 13 mm., incubation patches refeathering	Yellowish flesh	Yellow gray
Male	Adult	1483.2	417	Testis 22 mm., incubation patches well developed	Yellowish flesh	Yellow gray, flecked black
Male ⁸	Adult	1485.8	410	Testis 12 mm., incubation patches well developed	Yellowish flesh	Yellow gray
Male ⁷	Adult	1474.7	410	Testis 13 mm., incubation patches well developed	Yellowish flesh	Pale yellow, flecked gray
Male	Adult	1465.8	435	Testis 16 mm., incubation patches well developed	Yellowish flesh	Yellow brown, mottled
Male	Adult	1492.4	425	Testis 12 mm., incubation patches well developed	Flesh	Yellow gray
Male	Adult	1711.1	450	Testis 19 mm., incubation patches well developed	Flesh	Pale yellow, flecked black
Male	Adult	1263.5	412	Testis 15 mm., incubation patches well developed	Yellow	Pale yellow, flecked black
Male	Adult	1704.1	420	Testis 19 mm., incubation patches well developed	Yellowish flesh	Silver gray
Female	3rd year	1059.5	398	Largest ovum 5 mm., collapsed follicles, incubation patches well developed	Yellow	Yellow gray
Female	Adult	1158.4	385	Largest ovum 40 mm., two collapsed follicles, egg in the oviduct, incubation patches well developed	Yellowish flesh	Pale yellow
<i>Larus argentatus</i> toward <i>Larus glaucescens</i>						
Male ⁶	Adult	1370.2	418	Testis 13 mm., incubation patches well developed	Yellowish flesh	Yellow gray, flecked black
Male	Adult	1487.4	426	Testis 15 mm., incubation patches well developed, starting to refeather	Flesh	Yellow gray
Male	3rd year	1461.4	419	Testis 11 mm., incubation patches refeathered	Flesh	Yellow gray
Female ⁵	Adult	1076.5	394	Largest ovum 5 mm., incubation patches well developed	Flesh	Silver gray
<i>Larus argentatus</i> x <i>Larus glaucescens</i>						
Male ²	Adult	1543.4	430	Testis 14 mm., incubation patches well developed	Yellowish flesh	Yellow brown
Female ³	Adult	1340.4	395	Largest ovum 5 mm., collapsed follicles, incubation patches well developed	Yellowish flesh	Yellow gray
<i>Larus glaucescens</i> toward <i>Larus argentatus</i>						
Female ⁴	Adult	1388.5	402	Largest ovum 7 mm., two collapsed follicles, oviduct enlarged, incubation patches well developed	Flesh	Yellow gray
<i>Larus glaucescens</i>						
Male ¹	Adult	1537.9	420	Testis 12 mm., incubation patches well developed	Flesh	Silver gray
Female	Adult	1285.0	409	Largest ovum 7 mm., collapsed follicles, oviduct enlarged, incubation patches well developed	Flesh	Pale yellow, flecked gray

* Numbers following some entries relate to order in figure 1.

** Chord, all somewhat worn.

Glaucous Gull, *Larus hyperboreus* (Johnston, 1955:204). Both dark tail markings and bill marking were more pronounced in the second-year bird which possessed, in addition, numerous, dusky secondaries than in the third-year birds. The second-year bird and one of the third-year birds had nearly completely refeathered incubation patches, indicating probable nonbreeding status, while the remaining third-year bird had well developed incubation patches and what appeared to be old, collapsed follicles.

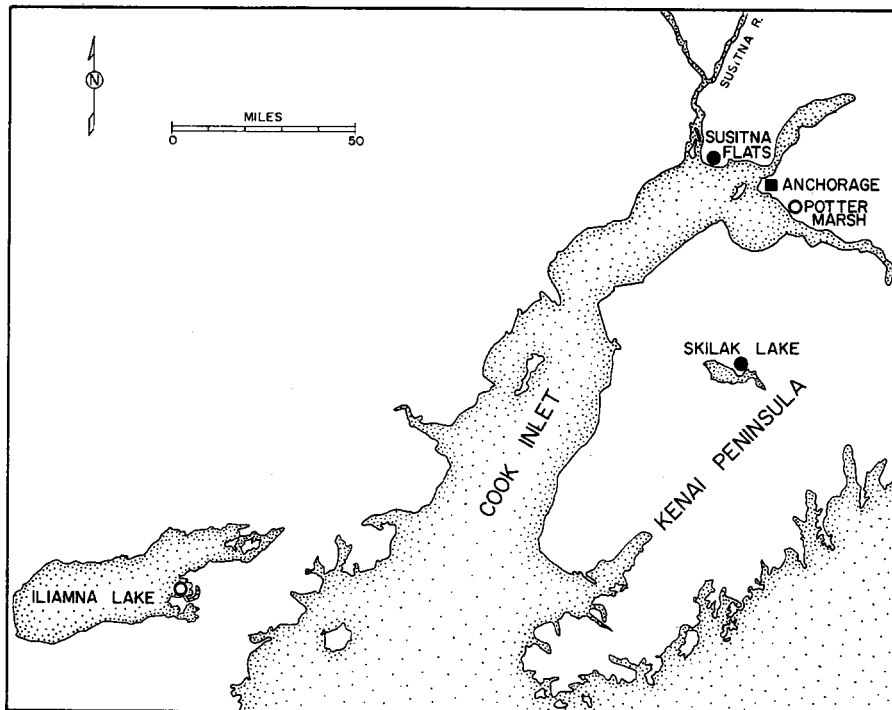


Fig. 2. Locations of mixed colonies of *Larus glaucescens* and *Larus argentatus* in the Cook Inlet region, Alaska. Hollow circles indicate observations only and solid circles indicate specimens collected.

Other information regarding breeding on the part of the gulls showing intermediate characteristics is presented in table 1, under "Reproductive condition."

Observations at a colony of *glaucescens* on islands in Bidarka Bay, at Iliamna Lake, on the base of the Alaska Peninsula, in 1958 (Williamson and Peyton, 1962:36), as well as recent observations of a colony of breeding *glaucescens* and *argentatus* at Potter Marsh, 9 miles south of Anchorage, indicate situations similar to the one discussed above. Specimens collected at Skilak Lake in the central Kenai Peninsula, although not analyzed here, were also found to be intermediate between *glaucescens* and *argentatus*. As a result of these findings it is concluded that interbreeding between these two species is common and widespread in the Cook Inlet region (fig. 2). These two gulls are generally allopatric (A.O.U. Check-list, 1957:218, 221), and, in Alaska, overlap in breeding distribution can, so far as is presently known, be expected only in the area about Cook Inlet west to the base of the Alaska Peninsula and on Forrester and Muir islands in the extreme southeastern portion of the state (Gabrielson and Lincoln, 1959:437, 443). However, small colonies of breeding Herring Gulls occur along many of the rivers of

interior Alaska and, at least in the southeastern portion and probably on the Seward Peninsula, sympatry with breeding Glaucous-winged Gulls is to be expected. In western Alaska, along the Kuskokwim River, and likely the Yukon River as well, where the tundra is interposed between the interior nesting areas of *argentatus* and the coastal ones of *glaucescens*, the breeding range of *hyperboreus* separates the two (Williamson, 1957: 317-338).

These findings demand further careful study of the relationships of the large gulls in as many breeding colonies as possible, including observations and collections of *glaucescens* and *hyperboreus* in areas where they are sympatric in breeding distribution. Swarth (1934:36-38) felt that birds collected on Nunivak Island were so nearly intermediate between the latter two species that they could be assigned to one or the other only arbitrarily. He felt that similar blendings between *hyperboreus* and other forms seemed likely, as well as between *glaucescens* and *Larus occidentalis*, the Western Gull. Surprisingly, he did not consider *argentatus* in his discussion. Swarth's data, as well as our own, tend to make puzzling the extreme scarcity of known hybrids of members of this group of the genus *Larus* in North America (Cockrum, 1952:144-145). We feel, as did Swarth, that the nomenclature of these gulls might best be left unchanged until additional data can be gathered.

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