Seabirds detected on inshore transects conducted in Barkley Sound, British Columbia, winter 1984

Spencer G. Sealy

Department of Biological Sciences, University of Manitoba, Winnipeg, MB R3T 2N2; e-mail: Spencer.Sealy@umanitoba.ca

Abstract: Three fixed-strip transects were conducted in Barkley Sound, British Columbia, in 1984: 10 January, 23 February, and 5 April. A total of 24 species was recorded: 14 (58.3%) on the first transect, 13 (54.2%) on the second, and 15 (62.5%) on the third transect, which was truncated due to inclement weather. Brandt's Cormorant (*Phalacrocorax penicillatus*), Pelagic Cormorant (*P. pelagicus*), Mew Gull (*Larus canus*) and Glaucous-winged Gull (*L. glaucescens*), Common Murre (*Uria aalge*), and Marbled Murrelet (*Brachyramphus marmoratus*) were recorded on all transects, but totals were 10 or fewer individuals of Brandt's Cormorant, Mew Gull and Marbled Murrelet. Of 1,764 individuals recorded, Glaucous-winged Gull and Common Murre were the most abundant species, but their numbers declined through early spring, but not because the third transect was shorter. Most species were recorded as singletons or groups of 2 or 3 and no multispecies feeding flocks were recorded.

Key Words: At-sea surveys, Barkley Sound, migrants, non-breeding season, seabirds, Vancouver Island

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Introduction

Prior to the early 1980s, knowledge of the seasonal occurrence of seabirds in the waters along the west coast of Vancouver Island, British Columbia, was fragmentary. A few species had received attention (*e.g.* Martin 1942, Guiguet 1971, Hatler *et al*. 1978, Martin and Myres 1969), and studies were generally conducted at scattered locations and at irregular intervals. Augmenting this information were results of vessel transects conducted in and off Barkley Sound during the breeding and early post-breeding seasons, from late March through October (*e.g.* Hatler *et al*. 1978, Porter and Sealy 1981, Chilton and Sealy 1987, Carter and Sealy 1991). Almost nothing was known about seabirds in the region during the non-breeding season (but see Martin and Myres 1969, Hatler *et al*. 1978). Three transects conducted in 1984 provide an early snapshot of the composition of seabird presence in the inshore waters of Barkley Sound late in the non-breeding season. Despite limited data, comparisons were made with results of studies conducted later by other workers farther offshore of SW Vancouver Island (*e.g.* Vermeer *et al*. 1987, 1992; Morgan *et al*. 1991; Burger *et al*. 2004; Kenyon *et al*. 2009).

Location and Methods

Bamfield Marine Science Centre (48°50' N, 125°08' W), formerly Bamfield Marine Station, served as home base from which vessel surveys along a fixed-strip transect covering ~60 km (Figure 1) were run in the 11-m research vessel MV *Alta* (eye level, 2.5 m above the sea) on 10 January 1984 (transect #1), 13 February 1984 (#2), and 5 April 1984 (#3), spanning about 11 weeks from mid-winter through early spring. Vessel speed was relatively constant (mean 8 knots [14.8 km h^{-1}]). The transect route duplicated that used by Porter and Sealy (1981) to describe the chronology of multispecies flocking in Barkley Sound during the breeding season and early post-breeding season. Transects #1 and #2 began in the middle of Trevor Channel at point A and consisted of 6 legs that changed direction at points B, C (immediately west of Seabird Rocks), D, and E, the latter entering Imperial Eagle Channel and running to point F, before returning to point A (Figure 1). Transect #1 began at 0800 hr (ended 1349 hr) and transect #2 began at 0837 hr (ended 1145 hr). Inclement weather forced the spring transect (#3) to be truncated (0828 hr to 1004 hr); it also started at point A, but turned at point B and

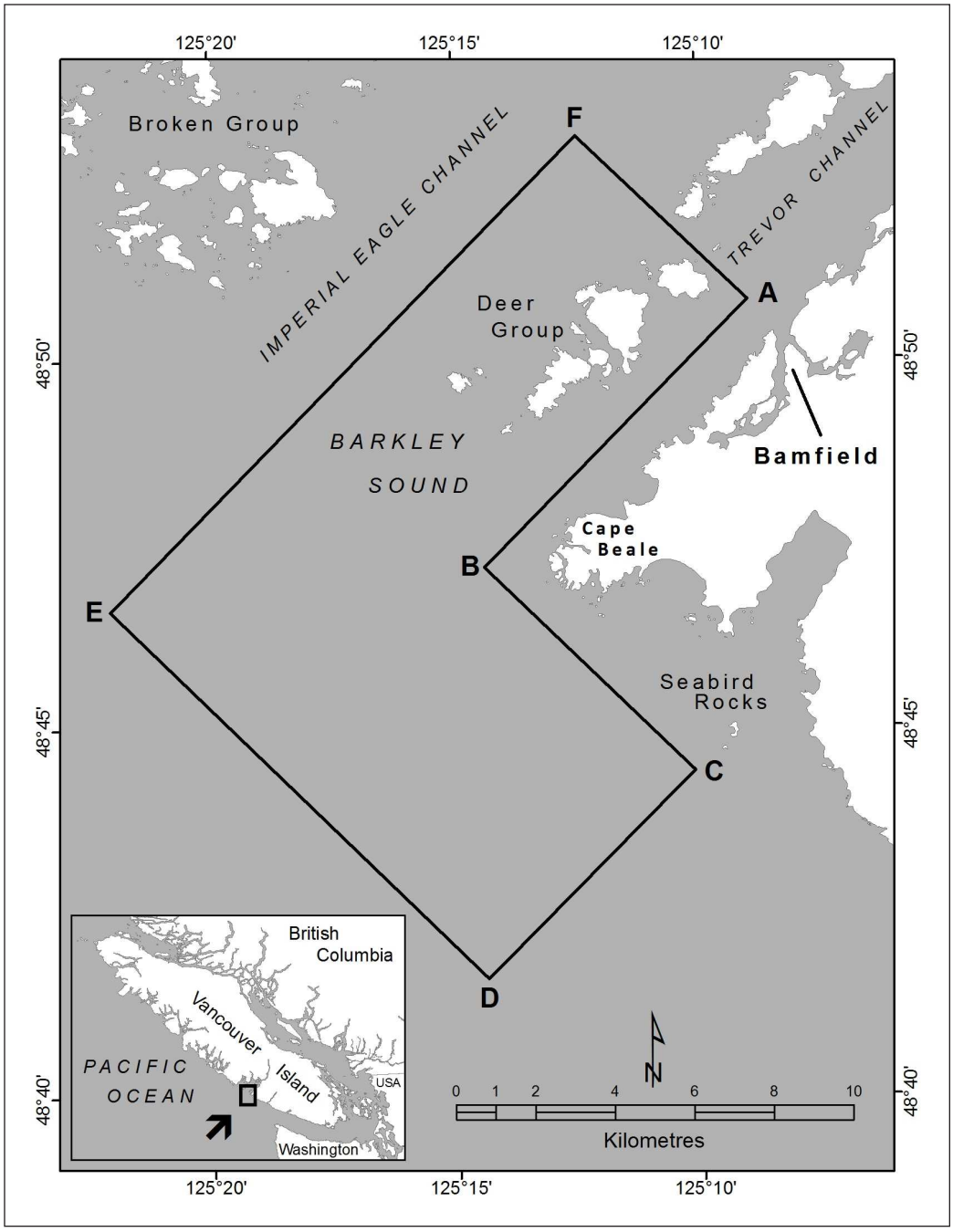

Figure 1. Study area (inset) and transect route, Barkley Sound, British Columbia, winter 1984. Letters A-F-A represent different legs and directions of the transect. Transect #1 (10 January) and transect #2 (13 February) were conducted in their entirety, whereas transect #3 (5 April) was truncated, turning at point B off Cape Beale and merging with E-F mid-way between points E and F, then entering Imperial Eagle Channel before returning to point A.

joined E-F mid-way between points E and F and continued into Imperial Eagle Channel, before returning to point A. I recorded all observations continuously during each transect, which included time (PST) and location of each observation within 150 m on either side of the vessel (*i.e.* 300-m wide strip), species, and number of individuals per sighting (*i.e.* group size).

Order and names of birds follow the American Ornithologists' Union (1998) *Check-list of North American Birds* and supplements.

Results

Nineteen species were recorded on the 2 completed transects: 14 species (73.73%) on transect #1 and 13 species (68.2%) on transect #2 (Table 1). Pacific Loon, Brandt's and Pelagic cormorants, Mew, Iceland and Glaucous-winged gulls, Common Murre, and Marbled Murrelet occurred on both transects, though total numbers of individuals were 10 or fewer for Brandt's Cormorant, Mew and Iceland gull, and Marbled Murrelet; 16 and 13 Pelagic

Table 1. Species and number of individuals recorded on 3 transects conducted in Barkley Sound, British Columbia, 1984. Note: transect #1 (10 January) and transect #2 (13 February) were run in their entirety, whereas transect #3 (5 April) was truncated due to inclement weather (also see Table 2).

Species	Transect #1 (*n*)	Transect #2 (*n*)	Transect #3 (*n*)
Harlequin Duck (*Histrionicus histrionicus*)	0	0	4
Surf Scoter (*Melanitta perspicillata*)	4	0	18
Black Scoter (*Melanitta americana*)	2	0	46
White-winged Scoter (*Melanitta fusca*)	2	0	6
Red-throated Loon (*Gavia stellata*)	0	0	8
Pacific Loon (*Gavia pacifica*)	55	34	0
Common Loon (*Gavia immer*)	0	0	1
Red-necked Grebe (*Podiceps grisegena*)	0	0	1
Western Grebe (*Aechmophorus occidentalis*)	0	0	3
Northern Fulmar (*Fulmarus glacialis*)	5	0	0
Double-crested Cormorant (*Phalacrocorax auritus*)	0	3	0
Brandt's Cormorant (*Phalacrocorax penicillatus*)	2	5	6
Pelagic Cormorant (*Phalacrocorax pelagicus*)	16	13	8
Bald Eagle (*Haliaeetus leucocephalus*)	1	0	0
Black-legged Kittiwake (*Rissa tridactyla*)	0	1	0
Mew Gull (*Larus canus*)	3	10	3
Iceland Gull (*Larus glaucoides*)	2	1	0
Glaucous-winged Gull (*Larus glaucescens*)	265	159	12
Common Murre (*Uria aalge*)	804	230	8
Pigeon Guillemot (*Cepphus columba*)	0	2	3
Marbled Murrelet (*Brachyramphus marmoratus*)	2	3	1
Cassin's Auklet (*Ptychoramphus aleuticus*)	0	1	0
Ancient Murrelet (*Synthliboramphus antiquus*)	0	5	0
Rhinoceros Auklet (*Cerorhinca monocerata*)	6	0	0
Total individuals	**1169**	**467**	**128**
Total species	**14**	**13**	**15**

Cormorants were recorded, respectively (Table 1). The most abundant species were Glaucous-winged Gull and Common Murre, but fewer individuals were recorded on transects #2 and #3, though the third transect was incomplete (Tables 1, 2). Most Glaucous-winged Gulls and Common Murres were recorded on the C-D leg of transect #1, which turned offshore at Pachena Bay near Seabird Rocks (Figure 1), whereas most individuals of both species were recorded along the shore on transect #2, on legs A-B and B-C (Table 2). Fifteen species were recorded on transect #3, but it was truncated because legs B-C, C-D and the outer half of E-F were omitted (Table 2). The limited data in Table 2 suggest numbers of the 4 most abundant species recorded on the April transect were actually lower, not because the transect was shortened. Most species were recorded as singletons or groups of 2 or 3 (Table 3), but exceptions were 3 flocks of 6-9 Pacific Loons, 30 Glaucous-winged Gulls, and 11 to 200 Common Murres recorded on the C-D leg of transect #1. No multispecies feeding flocks were recorded (Table 3).

Discussion

Observations derived from 2 complete transects in winter, and one truncated transect in spring, provided an early snapshot of the inshore avifauna of Barkley Sound during the latter portion of the non-breeding season. The relatively low abundance of most species in winter (Table 1) reflected the picture presented by earlier workers who had recorded anecdotally the occurrence of seabirds in this region (*e.g.* Martin and Myres 1969, Hatler *et al*. 1978). Glaucous-winged Gull and Common Murre were the most numerous species (Table 1), with numbers exceeding those reported by Hatler *et al*. (1978). Fewer individuals of both species were recorded on the truncated third leg of the transect in early spring (Table 2). Murres may have moved toward colonies south and/or north of Barkley Sound (Kenyon *et al*. 2009) and Glaucous-winged Gulls may have begun to attend colonies in the area (Guiguet 1971). In transects run on the continental shelf off SW Vancouver Island in the early 1990s, Burger *et al*.

Table 2. Species with 10 or more individuals recorded on at least one leg of transect #1 (10 January), transect #2 (13 February), and truncated transect #3 (5 April) in Barkley Sound, British Columbia, 1984. Transect leg and number of individuals are presented.

Species	Transect #1 (*n*)	Transect #2 (*n*)	Transect #3 (*n*)
Pacific Loon	A-B (9)	A-B (0)	A-B (0)
	B-C (1)	B-C (1)	– –[1]
	C-D (27)	C-D (0)	– –[1]
	D-E (10)	D-E (17)	– –[1]
	E-F (7)	E-F (12)	E-F[2] (0)
	F-A (1)	F-A (4)	F-A (0)
Total individuals	55	34	0
Pelagic Cormorant	A-B (14)	A-B (8)	A-B (1)
	B-C (0)	B-C (0)	– –[1]
	C-D (0)	C-D (0)	– –[1]
	D-E (0)	D-E (0)	– –[1]
	E-F (0)	E-F (1)	E-F[2] (5)
	F-A (2)	F-A (4)	F-A (2)
Total individuals	16	13	8
Glaucous-winged Gull	A-B (23)	A-B (26)	A-B (6)
	B-C (14)	B-C (28)	– –[1]
	C-D (126)	C-D (4)	– –[1]
	D-E (70)	D-E (54)	– –[1]
	E-F (29)	E-F (20)	E-F[2] (3)
	F-A (3)	F-A (27)	F-A (3)
Total individuals	265	159	12
Common Murre	A-B (62)	A-B (123)	A-B (7)
	B-C (69)	B-C (33)	– –[1]
	C-D (584)	C-D (6)	– –[1]
	D-E (28)	D-E (37)	– –[1]
	E-F (42)	E-F (6)	E-F[2] (1)
	F-A (19)	F-A (25)	F-A (0)
Total individuals	804	230	8

[1] B-C, C-D and D-E could not be run due to inclement weather.

[2] The outer half of E-F was not run due to inclement weather.

(2004) recorded more Common Murres in February than in January, and low numbers of Glaucous-winged Gull. No multispecies feeding flocks were recorded (Table 3), though Glaucous-winged Gulls initiated some flocks in Barkley Sound in late summer and early fall (Porter and Sealy 1982, Chilton and Sealy 1987). Most of those flocks formed around California Gulls (*L. californicus*), which were not recorded on the transects.

Marbled Murrelet was an abundant breeding species in and around Barkley Sound in the 1970s and early 1980s (Hatler *et al*. 1978, Porter and Sealy 1982, Carter and Sealy 1991), but few were recorded in winter (Table 1). The low numbers are consistent with observations of this species recorded by others, who designated it in winter as "occasional winter resident" (Richardson 1971) and "rare" (Hatler *et al*. 1978). Dorst (2018:269–270) noted that "In our west coast region [of Vancouver Island], Marbled Murrelets may be seen in all months of the year, though they are uncommon in winter." Some individuals are observed in protected waters (Vermeer and Morgan 1992, Butler *et al*. 2018) and on nearby freshwater lakes in winter (Carter and Sealy 1986), but most move elsewhere, some possibly offshore (Morgan *et al*. 1991, Piatt and Naslund 1995) or to more southerly waters (Nelson 1997). Morgan *et al*. (1991) recorded Marbled Murrelets relatively common in winter in Hecate Strait (also see Butler *et al*. 2018), between Haida Gwaii and Banks Island, and over La Pérouse Bank. Putative pairs of Marbled Murrelets suddenly begin returning to the outside waters of Vancouver Island, including Barkley Sound, in late March or early April (Hatler *et al.* 1978, Dorst 2018).

Two Iceland Gulls were recorded on leg A-B of transect #1, in Trevor Channel, but at Pachena Bay on the day before, I observed 32 adults and juveniles loafing with

Table 3. Individuals of 24 species recorded on 3 transects run in Barkley Sound, British Columbia, 1984.

Transect	Species/ transect	Individuals/ transect	Sightings/ transect	Individuals/ sighting
January 10	14	1169	432	2.7
13 February	13	467	128	3.6
5 April	15	128	48	2.7
Mean	**14**	**588**	**203**	**2.9**

Mew Gulls and Glaucous-winged Gulls at the mouth of the Pachena River. Only 8 records of 30 or more Iceland Gulls were reported by Dorst (2018), with 100 birds at Pachena Bay on 7 December 1978 and 600 along the North Shore of Barkley Sound on 28 December 1989. Two species of loon, scoter, and grebe were not recorded until the truncated transect April (Table 1), which suggests spring movements. A flock of 17 Western Grebes recorded in Bamfield Inlet on 4 April is consistent with observations of this species in sheltered bays (Vermeer and Morgan 1992). Numbers of Pacific Loon recorded on transects #1 and #2 suggest an overwintering population, whereas previous observations suggested migration (Martin and Myres 1969, Hatler *et al*. 1978). Movements of individuals of most species away from the region leave the lowest numbers in winter, whereas the greatest densities are from May through November, augmented mainly by migrants that take advantage of abundant food resources (Porter and Sealy 1982, Burger *et al*. 2004).

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