ARTICLES

INFLUX OF BROWN PELICANS OFF SOUTHWESTERN VANCOUVER ISLAND DURING THE 1997 EL NIÑO

By *Alan E. Burger, Jerry K. Etzkorn, Brian Gisborne*, and *Rod Palm*

Brown Pelicans (*Pelecanus occidentalis*) are rare transient visitors to the coastal waters of British Columbia (Campbell et al. 1990), and their presence in the province is generally associated with periods when inshore sea temperatures are well above normal and prey is generally less available to seabirds along the Pacific Northwest coast. Mean sea surface temperatures in the 1990s have been consistently above average, and in 1997-1998 the southern B.C. coast experienced prolonged and severe El Niño-like conditions (H. Freeland, Institute of Ocean Sciences). This coincided with sightings of Brown Pelicans in several locations on the southern coast of Vancouver Island. In this paper we document sightings of pelicans made in systematic counts from land at and near Carmanah Point, and boat surveys made along the nearshore coast of southwest Vancouver Island in 1997 (Figure 1). These observations offered a rare opportunity to monitor the duration of the influx, the numbers and age-ratio of the pelicans, and the foraging behavior of the pelicans in British Columbia

Counts of pelicans were made by BG as he piloted a water taxi between Port Renfrew and Bamfield on most days from May through September. The boat travelled 100-400 m from the shoreline, just offshore of the kelp beds. Most pelicans were seen in the morning and the numbers reported here were from the Port Renfrew to Bamfield run between 0800 and 1300. All pelicans seen from the boat were recorded, including those seen flying, on the water, and roosting on rocks or beaches.

Carmanah Point (48° 37' N, 124° 46' W) lies within this stretch of coast, and faces the entrance to the Strait of Juan de Fuca. Seabirds routinely seen here include both pelagic species (e.g., Sooty Shearwaters *Puffinus griseus*) and those of sheltered coastal waters (e.g., loons, grebes, sea ducks). It is a likely area to locate Brown Pelicans as they move north from the United States coast. Observations were made with 8x30 binoculars and a 20x spotting scope. The ocean around Carmanah Point was scanned for birds by JKE one or more times per day from the light station and the spotting scope was used to determine the age-class of the pelicans. Additional observations were made at locations along the coast within 2 km on either side of Carmanah Point.

Brown Pelicans were first seen on 31 August 1997 and then almost every day until 14 October (Table 1, Figure 2). None was seen after that date. The highest counts at Carmanah Point were between 12 September and 3 October, with the maximum count of 76 on 15 September. The nearshore boat counts showed a similar peak between 12 and 20 September with a maximum count of 129 on 15

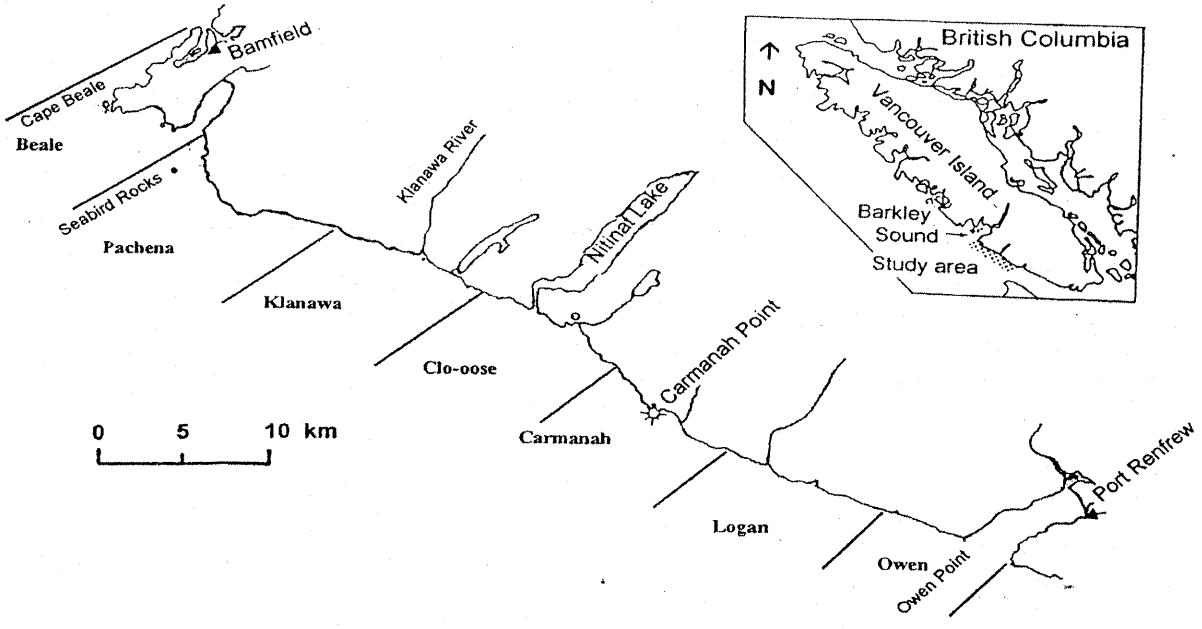

Figure 1. Map of southwestern Vancouver Island, showing the divisions of the coast surveyed by boat between Port Renfrew and Bamfield, the location of Carmanah Point where systematic observations were done, and some other features mentioned in the text.

Table 1. Counts of Brown pelicans seen from or near Carmanah Point in 1997. On days in which more than one count was made the maximum count is given.

Date	Plumage type			Total	Behavior notes
	Adult	Immature	Not aged		
5 September			1	1	Flying
12 September	7	27		34	Roosting on nearshore rock
13 September			10	10	Flying by
14 September			10	10	Roosting on Bonilla Point and on beach
15 September	20	56		76	Roosting on nearshore rock
17 September	7	6		13	Roosting on sandy beach
19 September			61	61	Roosting on rocks (41) and feeding nearby (20)
21 September	0	6		6	Roosting on nearshore rock
22 September	1	4		5	Roosting on rocky point and nearshore rock
23 September			12	12	Flying near shore
24 September			11	11	Flying near shore
25 September	1	16		17	Flying near shore
27 September	17	5		22	Roosting on rocks (20) and flying near shore (2)
28 September	8	2		10	Roosting on rock (2) and flying near shore (8)
30 September			14	14	Roosting on rocks and flying near shore
2 October	8	2		10	Feeding and sitting on water
3 October	19	19		38	Roosting on rock (10) and feeding in Carmanah Bay (28)
4 October	2	1		3	Feeding in mixed-species flock (see text)
7 October			5	5	Roosting on nearshore rock
8 October	4	8		12	Roosting on rocks, feeding and flying near shore
11 October	5	3		8	Flying and resting on sea in Carmanah Bay
12 October			6	6	Flying and resting on sea in Carmanah Bay
14 October			1	1	Flying 200 m offshore
Total sightings	99	155	131	385	

September. There were few boat counts made during late September when 10-30 pelicans were still regularly reported off Carmanah Point. The timing of this influx was typical of previous ones in British Columbia, in which 77% of all records occurred between late July and early November (Campbell et al. 1990). No pelicans were seen from Carmanah Light Station in daily scans in 1996, and only one sighting of two birds, on 28 September 1996 was reported from 75 daily boat trips between Port Renfrew and Bamfield between 6 August and 26 October 1996.

In the area covered by the boat surveys, between Port Renfrew and Bamfield, the highest average counts were in the Carmanah area, with other concentrations in the Pachena area, often on or near Seabird Rocks island, and off the Klanawa River (Figure 3). South and east of our study area, Brown Pelicans were also seen repeatedly during September and October 1997 within the Strait of Juan de Fuca, particularly at Sombrio Bay, Parkinson Creek, Jordan River, Race Rocks, and occasionally off Victoria (BG's vessel log, Victoria Natural History Society unpublished sight records). North of our study area single pelicans or small groups (<6) were occasionally seen in Barkley Sound and near Cleland Island, off Clayoquot Sound (Bamfield Marine Station unpublished records; RP sight records).

Pelicans were usually seen in groups feeding by plunge-diving within 1 km of the shore, sitting on the water, flying, or roosting on nearshore rock stacks or on sandy beaches. They were also seen in mixed species flocks feeding on small schooling fish. These flocks included variable numbers of Pacific Loons (*Gavia pacifica*), Common Murres (*Uria aalge*), Heermann's Gulls (*Larus heermanni*), California Gulls (*L. californicus*), Glaucous-winged Gulls (*L. glaucescens*) and, rarely, Sabine's Gulls (*Xema sabini*). Pacific herring (*Clupeus harengus*) and sand lance (*Ammodytes hexapterus*) were the most common schooling fish taken by seabirds in this area, with surf smelt (*Hypomesus pretiosus*), northern anchovy (*Engraulis mordax*), and salmon smolts (*Oncorhynchus* spp.) taken occasionally (Carter 1984, Burger et al. 1993, Davoren 1997). Schools of Pacific sardine (*Sardinops sagax*), normally very rare, were regularly found in 1997 in the study area and in nearby Barkley Sound (Anne

Stewart, Bamfield Marine Station, in litt.). BG reported pelicans feeding at schools of sardines. Pelicans were also occasionally seen circling over or sitting on the water near the muddy plumes created by feeding Grey Whales (*Eschrichtius glaucus*), but feeding was not confirmed there.

On most days more immatures than adults were seen at Carmanah (overall ratio of sightings 99 adults: 155 immatures, Table 1). The proportion of immature birds was five times higher than in previous sightings of Brown Pelicans in British Columbia, in which the cumulative age ratio was 22 adults: 7 immatures (Campbell et al. 1990). The high proportion of immature pelicans is typical of post-breeding northward movements (Anderson and Anderson 1976). Immature birds, being less experienced, are likely to be more severely impacted by decreases in prey availability in their normal feeding range to the south, and hence might move further than adults in search of food during El Niño events.

Following breeding in Mexico and California, Brown Pelicans typically move northward along the California coast in late summer and early fall (Anderson and Anderson 1976), and variable numbers continue northward beyond California (Jaques 1994, Gress 1995). This population of Brown Pelicans declined as a result of DDT and other pollution (Anderson and Anderson 1976), but since the 1970s has recovered (Anderson and Gress 1983, Gress 1995). Consequently, sightings of Brown Pelicans in late summer and fall off Oregon and Washington have increased greatly in the 1980s and 1990s (Jaques 1994, Gress 1995), and might be more likely in British Columbia too.

Previous sightings of Brown Pelicans on the Vancouver Island coast coincided with warm-water events, particularly the 1982-1983 El Niño. Fifteen pelicans were reported at Carmanah Point on 11 November 1983, and the previous high count of pelicans in British Columbia was 24 seen nearby at Port Renfrew on 23 August 1983 (Campbell et al. 1990). The species is well known to prefer warm ocean conditions (Anderson and Anderson 1976). The higher numbers and prolonged presence of the pelicans in 1997 off southwestern Vancouver Island is attributed to their expanded post-DDT population, and the impacts of the persistent warm 1997-1998 El Niño-like ocean conditions.

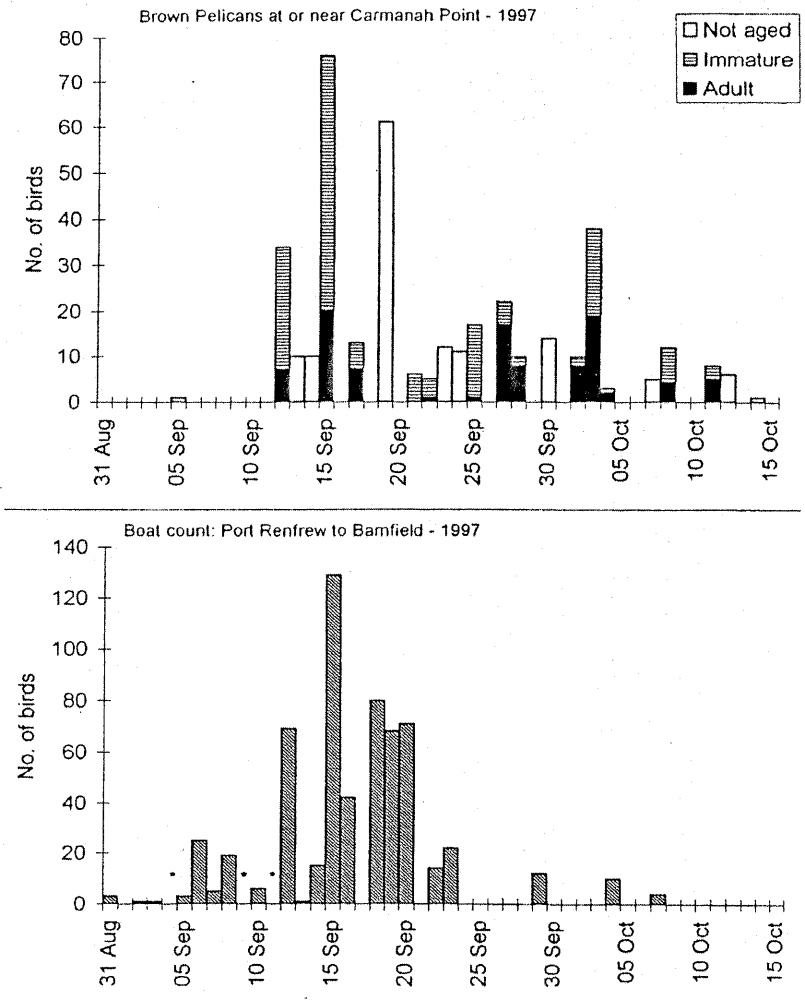

Figure 2. Counts of Brown Pelicans off southwestern Vancouver Island. The upper graph shows daily counts made from or near Carmanah Point. The lower graph shows counts made from a boat between Port Renfrew and Bamfield; no birds were recorded on boat trips on 4, 9 and 11 September (asterisks), but all other days with no birds had no boat surveys.

Acknowledgments

We thank Andrea Lawrence for collating some of the data and commenting on the manuscript, Ken Morgan for helping to get data together, and Deborah Jaques and Mark Rauzon for helpful comments on an earlier draft.

References cited

Anderson, D. W. and I. T. Anderson. 1976. Distribution and status of Brown Pelicans in the California Current. American Birds 30:3-12.

Anderson, D. W. and K. F. Gress. 1983. Status of a northern population of California Brown Pelicans. Condor 85:79-88

Burger, A. E., R. P. Wilson, D. Garnier. and M. P. T. Wilson. 1993. Diving depths, diet and underwater foraging of Rhinoceros Auklets in British Columbia. Canadian Journal of Zoology 71:2528-2540.

Campbell, R. W., N. K. Dawe, I. McTaggart-Cowan, J. M. Cooper, G. W. Kaiser, and M. C. E. McNall. 1990. The birds of British Columbia. Volume 1. Victoria, BC: Royal British Columbia Museum and Canadian Wildlife Service.

Carter, H. R. 1984. At-sea biology of the Marbled Murrelet (*Brachyramphus marmoratus*) in Barkley Sound, British Columbia. M.Sc. Thesis, University of Manitoba, Winnipeg, Manitoba. 143 p.

Davoren, G. K. 1997. Parental investment in the Rhinoceros Auklet (*Cerorhinca monocerata*) at the colony and at sea off southwestern Vancouver Island. M.Sc. Thesis, University of Victoria, Victoria, B.C. 140 p.

Gress, K. F. 1995. Organochlorines, eggshell thinning, and productivity relationships in Brown Pelicans breeding in the Southern California Bight. Ph.D. thesis, University of California, Davis. 140 p.

Jaques, D. 1994. Range expansion and roosting ecology of non-breeding California Brown Pelicans. M. S. thesis, University of California, Davis. 133 p.

Alan E. Burger, Department of Biology, University of Victoria, Victoria, British Columbia V8W 3N5, Canada. aburger@uvvm.uvic.ca, **Jerry K. Etzkorn,** Carmanah Light Station, c/o 25 Huron Street, Victoria, British Columbia V8V 4V9, Canada, **Brian Gisborne,** Juan de Fuca Express, Apartment 427, 118 Menzies Street, Victoria, British Columbia, Canada, and **Rod Palm,** Strawberry Isle Research Society, Box 213, Tofino, British Columbia, V0R 2Z0, Canada. sisle@island.net.

Address all correspondence to: Dr. Alan E. Burger, Department of Biology, University of Victoria, Victoria, British Columbia V8W 3N5, Phone (250) 721-7127, Fax (250) 721-7120, E-mail: aburger@uvvm.uvic.ca

[This is a peer reviewed article]

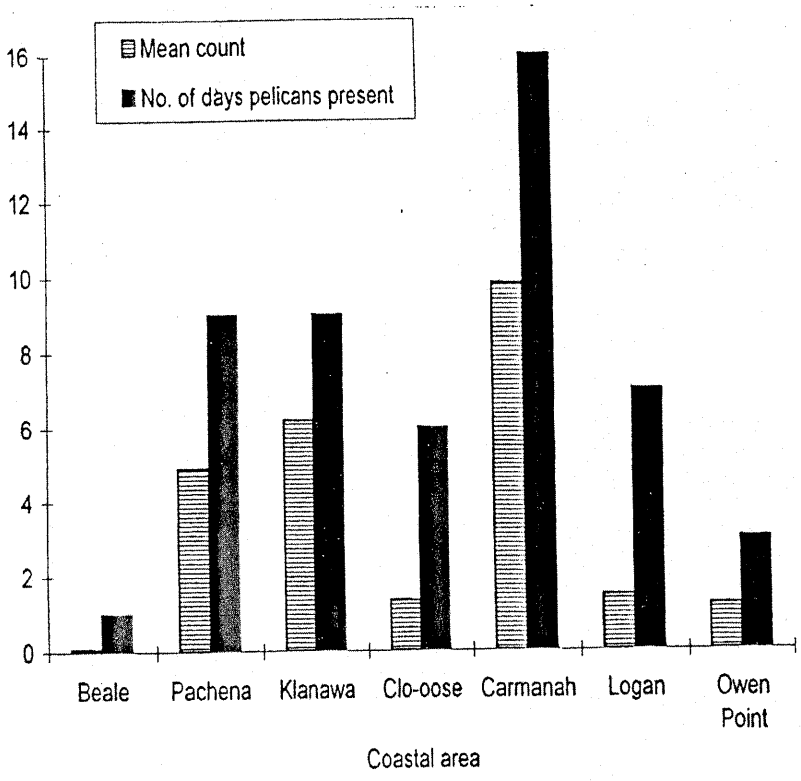
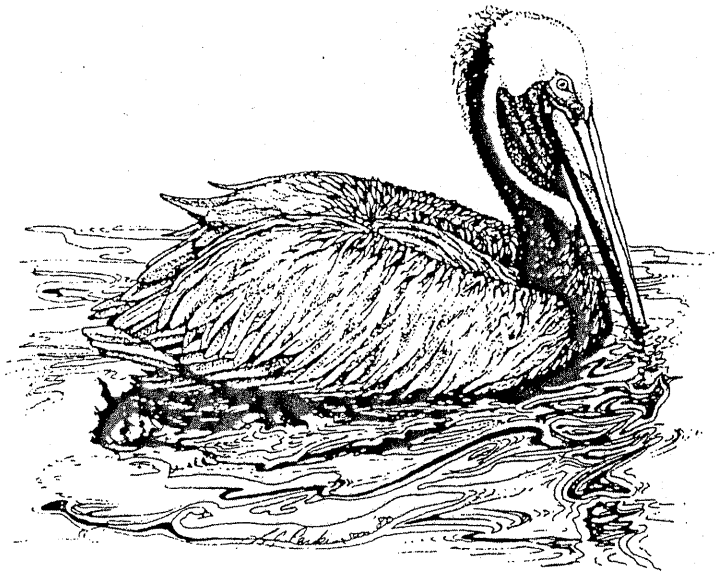
Figure 3. Distribution of sightings of Brown Pelicans off southwestern Vancouver Island, showing the mean count per area and the number of days pelicans were present in 24 days of boat surveys between 31 August and 7 October 1997. See Figure 1 for location of each coastal area.