The Development of an Ethogram for the Northern Vancouver Island *Orcinus orca* during the Fall, Winter and Spring

July 85

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During the summer months the northern Vancouver Island resident pods of *Orcinus orca* occupy Johnstone Strait with great regularity (Bigg et al. 1976; Jacobsen in press). This project was conceived after conducting three summer studies in this area on the sound/behavior corelation in A1, A4 and A5 pods (after M.A.Bigg). We observed that during September the whales spent less time in Johnstone Strait and frequented the waters to the north and northwest on a more regular basis. The late fall, winter and spring range and prey inventory of these whales is incomplete. The project's objectives include; mapping the movements of the northern Vancouver Island orcas, documenting their social structure and behavior at this time of year and recording their sound production.

As of February 23/85 we have been monitoring Blackfish Sound, Queen Charlotte Strait and the mainland waterways from Wells Passage to Clio Channel (Johnstone Strait has been included on a weather dependent schedual) for six months. To cover this coastal expanse, we travel up to 70nm in an infatable boat outfitted with directional and omnidirectional hydrophones, loran C and VHF radio. During stormy weather the motor vessel 'Blue Fjord' serves as our research platform and also provides us with a mobile operations base. In addition, we utilize radio communications with other vessels cruising these waters and the seaplanes servicing the mainland communities. Although the whales still transit Johnstone Strait they are no longer found there with any regularity. In fact, since October there hasn't been any one location where we have found them consistently.

The average number of whales per sighting has declined from 21.25 in October to three in February. Since November 7/84 none of the resident pods or subgroups have been sighted in the presence of whales from another pod. The subgroups' compostion has been consistent; one to two cows and their offspring. The offspring include young, adult bulls. These matriarchial subgroups behave more like transients (Bigg 1982) than residents; swimming close to shore, following the coastline in and out of each bay and remaining predominatly silent.

The whales seem to prefer swimming against the tide when traveling in the narrow inlets, channels and passages. 86% of the sightings in these areas revealed the orcas were heading into the flow. In contrast, the whales swam against the tide in only 54% of the sightings in Johnstone and Queen Charlotte Straits. In October 100% of our sightings involved the resident pods. Since then the number of encounters with the transient pods has increased. To date in February we have seen only transients.

There has been a distinct change in the dominant sounds types used by the A pod members outside Johnstone Strait. The most common vocalizations have shifted from B1, C2 and C3 corelated with play and foraging (Morton et al. in press and research in progress) to F1, F4, D1, and A1 associated with highly coordinated activities; for example, synchronized swimming, 180° changes in direction of travel and birth.

Our preliminary observations have indicated that the orca's behavior, vocal production and social structure exhibited during the summer months in Johnstone Strait are highly distinctive and not representative of the rest of the year. We are looking forward to examining how *Orcin-*

us orca movements will be affected by the influx and decline of possible food sources other than the salmonids i.e. Pacific herring Clupea pallasii, Eulachons, Thaleichthys pacifius, and Stellar sea lions, Eumetopias jubatus.

While locating and tracking Orcinus we have made the following observations on the other marine mammals in our study area; Stellar sea lions have increased in number since September. There are currently 70 individuals at the Eden Island winter haulout site (Bigg 1984) and they are common in most inlets. Harbor seals, Phoca vitulina, are also common in the inlets, particularily in the small bays. No Minke whales, Balaenoptera acutorostrata, were sighted in November, December or January. They have recently reappeared with the herring. An interesting influx of Pacific white-sided dolphins, Lagenorhynchus obliquidens, commenced December 24/84. The people living throughout the mainland inlets have rarely sighted this species until this winter. The first group contained 12 dolphins, since then eight groups numbering upto 200 individuals have transitted Raleigh Passage. Dall porpoise, Phocoenoides dalli, have been sighted consistently. Harbor porpoise, Phocoena phocoena, are not numerous, but can be found in specific areas.

Report submitted February 23/85
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