

Robson Bight (Michael Bigg)

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ECOLOGICAL RESERVES COLLECTION
GOVERNMENT OF BRITISH COLUMBIA
VICTORIA, B.C.
V8V 1X4

Usage of the Rubbing Beaches
at Robson Bight Ecological Reserve
by Whales and Boats

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Prepared for:

Ecological Reserves Program,
Parks and Outdoor Recreation Division
Ministry of Environment and Parks
4000 Seymour Place, Victoria, B.C.

V8V 1X4

Prepared by:

David A. Briggs

314 Jessie St.
Santa Cruz, CA

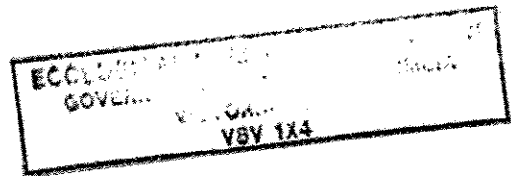
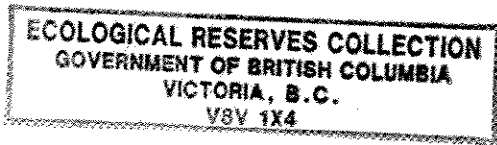
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Summary

The rubbing beach area of Robson Bight Ecological Reserve is used regularly by a resident population of killer whales (Orcinus orca) which inhabit the area during the summer months. The area faces increasing human activities which appear to affect behavior patterns of the whales. This report summarizes findings on the whales and boat usage patterns of the rubbing beach area and makes management suggestions for the area.

The whales which entered the Johnstone Strait area during the study period visited the beaches on over 70% of their days in the strait. Whales visited at all hours of the day, but showed a preference for night-time visits during July, when boat activity was only during the day. Most of the residents visited the beaches and averaged 3 visits per day for an average of 47 minutes a visit. Whales were observed to spend much time resting while at the beaches.

Boat traffic was heavy in the beach area, mostly during the day during July, but 24 hours a day during August. Commercial fishing activities brought the highest numbers of boats into the area, but many different types of boats were observed in the area. Shore observers, other than the members of this study, were present while whales were at the beaches. Logging activities were taking place to the east and upland of the reserve during the study as well.



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Whales reacted to boats in most cases, usually leaving the area as boats approached. Kayaks and skiffs with the motor off elicited the most splash behaviors and also caused the whales to leave the area. Most all boat types affected the usage patterns of the whales at the beaches. Observers on shore also affected the behavior of the whales while at the beaches, causing them to leave the area. No direct effects from logging were observed to affect the whales, although kayakers entering the beach area from the new road just to the east of the reserve were observed as a disturbance to the whales and the potential for growing numbers of kayakers and hikers from this road exists as a major source of disturbance to the whales.

This study provides a database for the monitoring of whale and boat usage of the rubbing beach area to aid in future management decisions affecting the area.

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Chapter 1

Introduction

A population of killer whales (Orcinus orca) are regular summer residents to the Johnstone Strait-Blackfish Sound area off northern Vancouver Island. This core summer feeding area includes the Robson Bight Ecological Reserve. The rubbing beaches are located within the reserve and are unique to British Columbia. The whales make regular visits to the beaches during the summer to rub on the pebbles. Although beach rubbing has been observed at other places in B.C., it has not occurred with such regularity nor for such lengths of time as observed at Robson Bight. The function of rubbing is largely unknown but rest and social activities have been observed while the whales were rubbing.

The Robson Bight area faces increasing human activity in the near future (Darling, 1986). Increased access (which is predicted to still further increase) has led to a doubling in the number of research and photography crews to visit the area over the last 10 years while other whale-oriented activities such as whale watching and potential whale-oriented activities such as sports fishing and recreational cruising are expected to increase steadily in the near future (Darling, 1986). A recently constructed logging road (1987) just to the southeast of the reserve which runs to within 300 meters of the coast has already been discovered by kayakers as an easy access to the rubbing beach area. The possibility of

groups of kayakers and other boaters camping at the beach area was viewed as a potential disturbance due to the fact that the whales sometimes react to people on shore and leave the area (Robin Taylor 1987, pers. comm.). The potential for hikers and backpackers to enter the reserve and beach area presently exists as well. Logging activities on shore in the eastern portion of the reserve exist as a potential source of disturbance to the whales. Blasting is common as the new road is being built and much debris has been bulldozed into the strait just outside of the reserve boundary.

Little is known about the effects of shore activity or vessel traffic on killer whales in general, while even less information exists on such effects on the whales while in the reserve or rubbing beach area. Concern has been raised over the possible negative reactions by the whales to such disturbances which may interfere with feeding, resting, reproduction and social activities. The objective of this report, summarizing data compiled for the Ministry of Environment and Parks Service Contract P-00274, is to provide a database of information on the usage of the rubbing beaches at Robson Bight by the orcas and by humans noting possible disturbance and providing suggestions for future research and guidelines for management.

Chapter 2

General Methods

2.1 Study Area

The study area included the main beach area to the east of Robson Bight and out to 300 meters offshore. Observations were made of whales and boats that were over 300 meters offshore but only intermittently. Sighting information on the whales was gathered for the area from Queen Charlotte Strait and Blackfish Sound to and including the northern Johnstone Strait. This area included Robson Bight and the rubbing beaches.

Two campsites for shore observations were established, one at each of the two main rubbing beaches. Site members were in radio contact and could travel between the two sites (separated by 1.5 km) by kayak when necessary. This only occurred when whales were not in the area and when at least one other member remained at the site. Supplies were delivered by Robin Taylor with a motorized inflatable approximately once per week. Radio contact with site members would be made before entry into the beach area to avoid disturbing whales which might be in the area. If whales were nearby, the delivery would be postponed. The campsites were well hidden and behind blinds so that the camp and observers watching the whales were not visible from the water.

Research was conducted from June 26-August 27, 1987, although the eastern camp, hereafter referred to as Beach 2, was not

staffed until June 28. From Beach 2, observations of the main beach area and of another rubbing area located to the east of Beach 2 and just west of the eastern boundary of the reserve, hereafter referred to as Beach 3 were possible. Times that the whales spent at Beach 3 were included with Beach 2 times due to their close proximity to one another. From the western of the 2 camps, hereafter referred to as Strider, observations to the west and to the north could be made. Observations could also be made of another rubbing area just east of Strider, hereafter referred to as Middle Beach, but 3 observers were needed to watch both areas simultaneously. The area to the east of Middle Beach was not visible to observers without coming out from behind the blinds and becoming visible to the whales and boaters.

2.2 Functions

The two sites collected data on whale and boat usage of the areas visible to the observers within the reserve boundary and out to 300 meters offshore. Observations were made of reactions by the whales to boats that were over 300 meters from shore but only if there were no boats closer than 300 meters. Site members were in radio contact with several other researchers in the area and knowledge about the whale's whereabouts from Southern Queen Charlotte Strait and Blackfish Sound to the eastern end of the reserve was possible. This information was used to determine how much time the whales spent in the Johnstone Strait area and how much of that time was spent in the rubbing beach area of the reserve. The rubbing beach area was defined as the area from Strider to Beach 3.

Distances while whales were in the beach area were estimated by sight. Data on whales included the identity of individuals, subgroups and pods entering the beach area, time of day, amount of time per visit, rest, rubbing and splash behaviors and which beaches the whales used. One visit was defined as continuing from the time the first whale entered the area to rub to the time the last whale had left the area. Times for individuals and subgroups were obtained for each beach as well as for the entire beach area. Rest was defined as surface hanging (Jacobsen, 1980). Rubbing was defined as beginning when exhalation bubbles from the whale surfaced to when rest began. Data on vessel traffic included type of vessel, direction, speed and distance from shore, distance from whales if whales were offshore, time of day and reaction if any by the whales. Speeds of vessels were categorized as low, medium and fast. The amount of commercial fishing activity was also recorded. Reactions by whales to boat traffic, shore observers and logging activities were recorded.

2.3 Observational Equipment

Observations were made with Bushnell 7x35 binoculars when the whales were close to shore and with a Bausch and Lomb 60 power spotting scope when they were offshore.

2.4 Data Collecting Procedures

Data taking required a minimum of 2 people at each site. Observations on whale usage were made 24 hours a day. Data on boat

usage was usually only recorded during daylight. During daylight, one observer vocally identified individual whales, types of vessels and behaviors of whales and vessels while a scribe recorded the data noting the times of entries and departures into and from the area by both whales and vessels as well as times spent resting and rubbing by the whales. A tape recording of whale vocalizations would also be made to aid in identification. At night, a tape recording would be made when whales entered to rub or passed close by. Times that they spent in the area would be recorded. The method of using recordings of night-time vocalizations as an identification technique has not been tested yet.

A written log of all whale and boat sightings was kept during the study period. Logbooks from other researchers in the area were also used to add to the data on which whales were in Johnstone Strait and for what lengths of time. From this information, it was possible to estimate what percentages of time whales spent in Johnstone Strait and what percentage of that time was spent in the rubbing beach area. It was also possible to determine if the whales frequented the beaches more at specific times of day and to correlate that with peaks in vessel traffic. Census information on vessel traffic was not recorded at night, when much commercial fishing activity took place, but whale oriented vessel traffic was present and recorded during observations.

All whale-vessel interactions were recorded and later categorized by response of the whale to the vessel. Response types are listed below.

1) No Reaction: The whale made no visible reaction as the vessel passed by. No change in activity was observed.

2) Interrupt and Return: The whale left the beach area as the vessel passed by, but then returned shortly after (usually 1-2 minutes) the vessel had left the immediate area. Whales in this case would remain nearby until the vessel had departed and then resume its original activity.

3) Interrupt and Leave: The whale left the beach area as the vessel passed by and did not return after the vessel had departed. Whales in this case either left the entire beach area or moved to one of the other rubbing areas.

4) Short Rub: The whale remained at the beach for a period of time less than 5 minutes and then departed. This was common when boats were in the area before the whales arrived. If whales arrived first and then a boat passed by causing the whale to leave it would be classified as an Interrupt and Leave.

5) Passed By: The whale did not stop to rub or rest at all but continued travelling past the beach area. Whales sometimes did this when no boats were around, but it was common for whales to pass by the beach area if boats were already present before they arrived.

6) Wait To Rub: The whale stopped travelling offshore and waited for some time period before entering the beach area. Whales rarely did this if no boats were around, but often did if boats met them before they entered the beach area.

7) Splash: The whale exhibited a splash behavior as the vessel approached. This included pec and fluke slaps and breaches.

Whale-observer interactions were recorded in a narrative form noting whether or not the whale saw the observer and reaction by the whale.

Reactions to logging activities were recorded noting type of activity and reaction by the whale.

Chapter 3

Usage By Whales

3.1 Number in Beach Area-Days and Times Visited

Whales made regular visits to the rubbing beaches during the 63 day study period. Whales entered the beach area on 57 of the 59 days that they were observed in the Johnstone Strait. Whales were not observed in the strait on 4 days of the study period. The usage information discussed below will be from July and August unless otherwise noted. Only 5 observation days were made in June so it is difficult to compare with results from July and August.

During July, 138 whales (80% of the northern resident population) visited the beach area for a total of 8363 whale hours spent there. 56% of that time was spent between the hours of 2000-0800, indicating a preference for night-time visits. Boat activity at night during July was virtually nonexistent but during the daylight hours it was fairly constant in and around the beach area. Whales visited the beach area at all hours of the day, showing no preference for any specific time period. Boat traffic was most heavy between 1000-1600 and there was no significant drop in whale activity during those times, but whales were present very few times while boats were in the beach area during July. The average number of whales per day during July was 24.

During August, 117 whales (64% of the northern resident population) visited the beach area for a total of 9174 whale hours spent there. There was no clear preference for day or night visits to the area as the whales split their time in the area evenly between night and day, 50% each. Boat traffic was much heavier during August, both for whale oriented and non-whale oriented vessels. There were 4 commercial fishing openings during August and high numbers of fishing boats were present 24 hours a day during these openings. Higher numbers of day-time boat traffic were counted during August but, unlike July, night-time traffic became constant and very numerous as well. Day-time traffic was constant at all hours of the day and whales visited at all times. The average number of whales per day during August was 37.

Whales visited the beaches regularly on most days during the study period. 157 of the 173 residents (94%) visited the beaches and averaged 30 whales per visit. Whales during July showed a preference for night-time visits, when boat activity was low but during August when boat activity was 24 hours a day, no preference for time of day was shown by the whales.

3.2 Number and Length of Visits - With and Without Boats Present

Whales entered the beach area 179 times, or about 3 times a day during the study period. They spent 8341 minutes, or about 141 minutes a day, while they were there and averaged 47 minutes a visit.

During July, whales entered the beach area 81 times for a total of 3636 minutes and averaged 45 minutes a visit. Times ranged from 8-210 minutes (times include all whales for 1 visit; individuals and subgroups may have shorter visit times). The whales made 20 visits (25%) while boats were present totalling 1036 minutes (28%) and averaged 52 minutes a visit. 14 of these visits were times in which no boats had been in the area while the whales rubbed until one or more passed by and caused the whales to leave the area. Most of the time the whales rubbed during those visits were free of boats. Whales visited the beach area 61 times (75%) for a total of 2600 minutes (72%) and averaged 43 minutes a visit while no boats were in the area. Whales visited the area more often when no boats were present during July, but boat traffic was minimal in July.

During August, whales entered the beach area 98 times for a total of 4705 minutes and averaged 48 minutes a visit. Times ranged from 6-275 minutes (as for July, times include all whales for 1 visit). The whales made 64 visits (65%) with boats present totalling 3459 minutes (74%) and averaged 54 minutes a visit. The first commercial opening was on August 2 and boats were in the area during most days throughout August. Whales visited the beach area 34 times (35%) for a total of 1246 minutes (26%) and averaged 37 minutes a visit while no boats were in the area. Whales were in the beach area much more while boats were present, but very little time in August was free of boats.

Whales entered the beach area 179 times during July and August, or 3 times a day on average, for 4705 total minutes and an average of 47 minutes a visit. During July when boat traffic was sparse, whales spent more time rubbing while no boats were in the area, but during August boat activity was heavy and most times at the beaches was with boats in the area. The longer average visits during boat activity in the area is largely due to large numbers of whales (which tended to have long visit times) attracting boats, whales rubbing with no boats until the end of the visit (boats which caused an Interrupt and Leave response) and times in which whales left and returned several times before finally departing (Interrupt and Returns with an Interrupt and Leave). This will be discussed further in Chapter 5.

3.3 Amount of Time in Strait and at Beaches

During the study period, whales that were sighted in the study area spent an average of 58% of their time in the Johnstone Strait and 17% of that time in the beach area (23% of the total time included unknown locations for whales so the strait time may be higher and the beach time lower).

During July, whales spent an average of 51% of their time in the strait and 15% of that time at the beaches.

During August, whales spent 64% of their time in the strait and 19% of that time at the beaches.

This is close to John Ford's findings from 1980 in which he found whales spending an average of 17% of their time in and adjacent to Robson Bight. It would greatly aid in management of the reserve to find out how much time whales are spending in the bight and the beach area separately to determine usage patterns of the area.

3.4 Variance By Subgroup

There was a range in the number of days that each subgroup visited the beaches when in the strait, but only 3 of the 31 subgroups (14 whales) observed in the strait did not visit the beaches at all during the study period. The 3 subgroups did enter the bight while other whales continued on to the beaches and then waited there until the others had left the beach area. They then all departed together. Each of these groups were only sighted in the strait once and these sightings all occurred when many boats were in the beach area. Observations of the effects of boats on the whales will be discussed in Chapter 5, but many whales were observed to not enter the beach area while boats were present.

13 subgroups (63 whales) visited the beaches from 10-37 days during the study period and were sighted in the strait from 11-43 days. 76% of all days in the strait for this group included at least one visit to the beaches, so subgroups with a high number of days in the strait also had a high number of days at the beaches.

The other 18 subgroups (92 whales) ranged from 0-5 days at the beaches with 1-6 days seen in the strait. These 18 subgroups

visited the beaches on an average of 74% of their days in the strait, so subgroups with a low number of days in the strait also visited the beaches on most of days that they were in the strait.

Both regular and irregular visitors to the strait visited the beaches on most days that they were sighted in the strait. 5 subgroups totalling 18 whales were not sighted in the strait during the study period.

3.5 Summary

Whales visited the beaches on 57 of the 59 days that they were in the strait and on only 4 days whales did not enter the strait. 155 of the 173 (90%) northern residents were sighted in the Johnstone Strait during the study period and 141 of those 155 (91%) visited the beaches at least once, 63 whales making visits on 10 or more days. The lengths of time that whales spent at the beaches varied from just a few minutes to over 3 hours but the beach area received, on average, 3 visits totalling over 2 hours for each day during the study period. A larger number of the resident population visited the beaches in July than in August (138 to 117) but whales made more visits and stayed longer in August than in July (98 visits for 4705 minutes to 81 visits for 3636 minutes). Whales showed a preference for night-time visits during July, when boat traffic was mostly during the day, but not in August, when boat traffic was heavy during the night as well. During the peak times of boat activity in July whales showed no drop in the number of their visits to the area. Whales spent, on

Chapter 5

Human Activities in the Rubbing Beach Area
and Reactions by the Whales

5.1 Vessel Activity

188 boats entered the beach area while whales were present, some singly, others in groups of 2-5. 170 whale reactions were recorded. The reaction types described under general methods (see Chapter 2) were used. Usually, one response was recorded for each passage of boats, but sometimes whales splashed in addition to another response. Several interactions were recorded involving boats over 300 meters offshore. These were instances in which a noticeable affect by the boat on the whales was observed. Initially, the study was concerned with boats within the reserve boundary, but we observed boats outside the reserve affect whales as well and this should be looked at in any future research on this topic.

Of the 170 responses (see table 3, page 31), 71 (42%) were Interrupt and Leave (IL). This was the most common reaction type and it was observed more frequently the closer the boats were to the beach as they passed by. The second most common response was No Reaction (NR). It was observed 35 times (20%) and was more common the further from shore the boat was. Short Rubs (SR) were observed 22 times (13%) and were a common response when boats were

already in the area before the whales arrived. Whales Passed By (PB) 18 times (11%). This was another common response when boats were already present in the area before the whales arrived. Interrupt and Returns (IR) were observed 10 times (6%). Often, this would proceed an IL if several boats passed by during one visit by the whales, the second or third boat causing the whales to leave. Wait To Rubs (WTR) were observed 4 times (2%) and usually occurred when boats came between the whales and the beaches when the whales were heading in to rub. Splashes were observed 11 times (6%). This figure may be low due to the fact that the whales often splashed while rubbing and so splashing wasn't always noted. These 11 observations especially stood out as a sudden change in activity state by the whales, usually as rest was interrupted by the boats. Splashes were observed often in addition to other responses such as IL and IR. Reaction type varied by boat type as well as by the distance the boat was from shore.

Reactions were not tallied for boats over 300 meters offshore, but on several occasions wakes from cruise-ships, tugs passing by and other large boats passing through the area appeared to cause the whales to leave the beaches. On another occasion, a research zodiac began to follow a group of whales on the shore opposite the beaches and all the whales in the strait, including those at the beaches, left the area after resting in the area for nearly 3 hours. It appeared that the whales the zodiac was following began to leave first and that the others followed in the same direction. Whales have been observed many times to "travel

Table 3 - Reactions by Whales to Boats

Reactions for All Boats Combined

| Whale Reaction | | Number | Percentage |
|----------------------|-------|--------|------------|
| Interrupt and Leave | (IL) | 71 | 42% |
| No Reaction | (NR) | 35 | 20% |
| Short Rub | (SR) | 22 | 13% |
| Passed By Beach Area | (PB) | 18 | 11% |
| Interrupt and Return | (IR) | 10 | 6% |
| Splash | (SP) | 10 | 6% |
| Wait To Rub | (WTR) | 4 | 2% |
| TOTAL | | 170 | 100% |

Reactions by Distance of Boat to Whales
(number and percentage of reactions at each distance)

| Reaction | 0-30m | 31-100m | 101-300m |
|----------|-----------|-----------|-----------|
| IL | 21 (58%) | 37 (45%) | 13 (25%) |
| NR | 2 (5.5%) | 19 (23%) | 14 (27%) |
| SR | 2 (5.5%) | 9 (11%) | 11 (22%) |
| PB | 6 (17%) | 7 (8%) | 5 (10%) |
| IR | 1 (2%) | 5 (6%) | 4 (8%) |
| SP | 2 (5.5%) | 4 (5%) | 4 (8%) |
| WTR | 2 (5.5%) | 2 (2%) | 0 (0%) |
| TOTAL | 36 (100%) | 83 (100%) | 51 (100%) |

Number of Each Reaction by Boat Type

| Boat | IL, IR & SP | NR | SR & PB | WTR | TOTAL |
|---------|-------------|----------|----------|---------|-----------|
| cb | 54 (62%) | 20 (23%) | 10 (11%) | 3 (4%) | 87 (100%) |
| cb fish | 8 (24%) | 4 (12%) | 21 (64%) | 0 (0%) | 33 (100%) |
| skiff | 8 (80%) | 2 (20%) | 0 (0%) | 0 (0%) | 10 (100%) |
| tl | 0 (0%) | 2 (50%) | 2 (50%) | 0 (0%) | 4 (100%) |
| fishery | 0 (0%) | 0 (0%) | 1 (100%) | 0 (0%) | 1 (100%) |
| kc | 3 (100%) | 0 (0%) | 0 (0%) | 0 (0%) | 3 (100%) |
| rs | 11 (69%) | 3 (19%) | 2 (12%) | 0 (0%) | 16 (100%) |
| rl | 1 (17%) | 1 (17%) | 4 (67%) | 0 (0%) | 6 (100%) |
| res | 1 (33%) | 1 (33%) | 0 (0%) | 1 (33%) | 3 (100%) |
| photo | 2 (67%) | 1 (33%) | 0 (0%) | 0 (0%) | 3 (100%) |
| chart | 3 (75%) | 1 (25%) | 0 (0%) | 0 (0%) | 4 (100%) |

KEY-

- cb: commercial fishing boat
- cb fish: commercial fishing boat fishing
- skiff: commercial fishing boat skiff
- fishery: fishery patrol boat
- kc: kayak
- rs: small (under 18') motorized recreational boat
- rl: large (over 18') motorized recreational boat
- res: research boat
- photo: professional photographer
- chart: charter whale watching boat



together" even though they are on opposite sides of the strait. It is possible that disturbance affecting one part of a spread out group may affect other animals in that group if they travel together, so boats outside of the reserve may affect whales inside the reserve. For a complete listing of all whale-boat interactions observed during this study, see Appendix 1, page 57.

Responses by the whales to the observers in our research group were also recorded. We attempted to remain hidden whenever possible, but on several occasions whales did see us and react. It was difficult to tell when a whale had actually seen us most of the time. They spyhopped, splashed and left the area at varying time intervals whether they saw us or not, but on several occasions, the behavior by the whale appeared to be a direct response to our presence.

A. Response By Boat Type

The whales' reaction varied depending on the type of boat and the distance that the boat was from the whale. Distance seemed to be the primary factor affecting the type of response that the whale exhibited, although certain boat types elicited many more of a specific response behavior than other boat types (see Table 3, page 31). For example, kayaks and skiffs (including skiffs under oar with the engine off) elicited the greatest relative amount of splash behaviors for any boat type while commercial fishing in the area seemed to cause a high number of short rubbing sessions to

occur.

1. Non Whale-Oriented Boats

135 of the 170 responses were in reaction to non-whale oriented boats, mostly commercial fishing boats. 55 of the 135 (41%) were IL's and 28 (21%) were NR's. The fishing boats and skiffs did whale watch, on occasion, and the whales reacted by leaving the area each time.

Commercial Fishing Boats

There were 87 observations of commercial fishing boats passing through the beach area while whales were present. A total of 111 boats were counted due to passages of 2 or more boats during an observation. Most (49%) of the responses were IL's which were common when boats were close to shore but a relatively large number of No Reactions (23%) were observed as well, all but one of which occurred over 30 meters from shore. The majority of the reactions (54, 62%) included being interrupted and leaving (IL), returning (IR) and splash behaviors (SP). Commercial fishing boats had an overall negative effect on the whales.

On several occasions, boats were driven less than 10 meters from the beach and the whales, usually to whale watch. The whales immediately left the area each time. Another time, a gill-netter deliberately drove the whales away from the area. The gill-netter drove his boat directly into the beach area, just after we heard 2 bangs, and chased the whales out of the area. The bangs may have

been gunshots or small explosives such as firecrackers. The whales dove immediately and surfaced several hundred meters away. This was reported to the RCMP's who spoke with us the next day, since this occurred at night.

There were 30 commercial fishing boats fishing in the beach area while whales were present. Most of these boats were over 30 meters from shore and the most common responses were Short Rubs (48%) and then IL's (21%), Passed By's (15%) and No Reactions (12%). The high number of SR's and PB's is due to the fact that fishing was usually taking place before the whales arrived. The whales appeared to shorten their rub times when commercial fishing was taking place in the area.

If whales were in the area and then boats arrived the whales tended to leave the area, but if boats were present first the whales usually short rubbed or passed by. Boats closer to shore elicited the stronger response by the whales. Whales splashed twice when fishing boats passed by but not while they fished, suggesting that the sudden arrival of boats into the area startles the whales more than if they know boats are already there. This response was seen with other boat types as well.

The number of commercial fishing boats whale watching in the beach area was not as high as the traffic just passing through, but it was common. The one possible shooting incident we observed by the gill-netter suggests that some fisherman still see whales as a threat to their livelihood. The uniqueness of the rubbing

beach area may make it difficult for whales to find an alternative site to rub. Commercial fisherman may be a serious threat to the whales usage of the beach area if both continue to compete for the same space.

Skiffs

The 8 skiffs to enter the beach area while whales were present elicited 10 responses by the whales due to 3 splash behaviors in addition to the other 7 responses. 5 IL's and 2 NR's were observed. 8 (80%) responses included IL, IR and SP's. This was second only to kayaks. The sample size was small, however.

The splashes were observed by skiffs under motor and with the engine off and oars out. Whales reacted very strongly to skiffs under oars. The same response was exhibited when kayaks entered the area as well. It is possible that the whales react so strongly to non-motorized boats because they are surprised by them (D. Bain 1987, pers. comm).

On one occasion, a skiff dropped off 10 kayakers just before whales arrived into the area. The people began to sing, play music and yell when the whales arrived. They also walked on the beach. The whales left within 3 minutes.

On another occasion, a female breached 3 times as a skiff passed by 200 meters from shore. The skiff then turned and angled towards the beach and came to within 50 meters, while travelling at high speed. An unidentified whale fluke slapped 3 times and

then breached and the whales left Strider and headed to Beach 2. The skiff raced after them and followed them back towards Strider. The men in the boat were whistling to the whales as they followed them with oars engine off. The engine was then started and the whales left the entire beach area.

In another instance, several fisherman rowed into the beach area and also followed the whales back and forth along the entire beach area. When the boat first entered the area, it was 75 meters from shore and under motor. The whales did not react this first time. Then, the motor was shut off and they rowed into the area. When the boat got within 5 meters of the whales, one of the moms with a 1 year old calf fluke slapped 2 times and all the whales left the area. The skiff continued to row after the whales towards Beach 2. They left that area and continued back to Strider. The skiff then continued out of the area.

Skiffs were often in the area and entered to whale watch several times. Whales reacted strongly each time the skiff was rowed into the area and on 6 of 8 times under motor. The number of skiffs in the area while whales were present was low but the reactions were quite negative. Skiffs do affect the usage of the area by the whales.

Tugs With Log Tows

Tugs with log tows were in the area 3 times while whales were present. 2 Short Rubs and 1 No Reaction were observed. Whales would leave as the log tow approached. The whales reacted

similarly to log tows and commercial fishing boats that were fishing in the area. The constant sound of engine noise in the area appears to cause them to shorten their rub times.

The long time that these boats are in the area does seem to affect the whales usage of the beaches. The whales never entered the area if log tows were nearby, although we have no record of how often whales may have been nearby at the same time as the tugs and out of view of our observers.

Fishery Patrol Boats

Fishery patrol boats were only in the area while whales were present once and the whales passed by the beaches on that occasion. Many commercial fishing boats were present as well.

Fishery boats did not pose a problem to the whales usage of the area.

Cruise-Ships and Tankers

Cruise-ships and tankers did not enter the beach area while whales were present but their wakes often did. Whales were observed to leave the area, usually at night, as wakes hit the beach. Whales were observed to play in the wakes at the beaches during the day, but often did leave at night when wakes hit shore.

2. Whale-Oriented Boats

Whale-oriented boats accounted for 35 of the reactions by whales to boats, 16 (47%) of which were IL's. It was common for these boats to follow whales into the beach area and stay with them until they left. Whales usually left the area or did not stop at the beaches if followed by boats.

Kayaks

Only 6 kayaks entered the area while whales were there (not including once when a member of our group was going from one site to the other and had whales enter the area). These 6 entered as one group and the whales splashed and then left the area. As soon as the kayaks were about 10 meters from the whales at the beach one whale fluke slapped 3 times, another breached once followed by 2 inverted fluke slaps and then they all left the area. It was the most splashing we saw due to the presence of boats. The one instance when one of our group kayaked towards the whales, they left when he was within 25 meters of them. Kayaks accounted for the highest relative percent of IL, IR and SP's observed among all the boat types (100%). It was, however a very small sample size (3).

Kayakers did land on the beach once, in a fisherman's skiff (see skiffs above). The whales left the area within 3 minutes.

Kayaks seemed to affect the whales much as did the skiffs when rowing. It may be that the whales are being surprised by the sudden arrival of these quiet boats. It is certain that the kayaks do affect the whales usage of the beach area and cause a strong

reaction by the whales.

Motorized Recreational Boats

22 reactions were observed by the whales to motorized recreational boats. 9 (41%) were IL's and 4 (18%) were NR's. These boats would often follow the whales into the beach area, sometimes whistling and yelling to the whales. The whales stopped and rubbed twice (shortly) and passed by 4 other times.

On one occasion, a small skiff with 2 young boys landed on Beach 2 just before whales arrived. One boy ran to a rock with an underwater camera and pointed it underwater while the other sat on the rock and watched. The boat was left on the beach. The whales left after a short rub.

Motorized recreational boats would often follow the whales at low speeds and stay with them for long periods of time. Following whales into the beach area or approaching them closely appeared to affect them most strongly. These habits by operators of these vessels do affect the whales usage of the area. As the number of recreational boats in the area increases, the likelihood of more people landing skiffs on the beaches will increase.

Charter Boats

Charter boats entered the beach area 6 times and 4 of the 6 times, whales left the area. Usually the charter boats remained over 30 meters from shore, but on one occasion one boat came within 5 meters from the beach area. The boat continued to follow

the whales from Strider to Beach 2 as the whales left the area. Calls on the radio failed to deter the operator from following so closely.

On one occasion the whales did not react to the presence of a charter boat. One observation was not recorded due to an error. Charter boats did affect the whales usage of the area on most of the times they were in the area.

Research Vessels

Researchers entered the beach area on 5 occasions while whales were present. 2 IL's, 1 Wait To Rub (WTR) and 2 NR's were observed. During the WTR, a zodiac was on the beach and whales entered the area. The one lead whale waited until the zodiac was out of the area and then entered to rub. The IL's were caused by passing by to close, as in the case with other boats.

As described above, whales were observed to leave the beach area as a research boat on the opposite shore began to follow a group of previously resting whales. The whales had all entered the area together, some at the beaches and others spread out across the strait. As the ones being followed began to leave, so did all the whales in the strait. There were 31 whales present at that time.

Photographers

Photographers entered the beach area once while whales were present and was 30-100 meters from shore and some of the whales

left the area. Others did not leave.

B. Summary

All boat types caused the whales to leave the area in most cases. Kayaks and skiffs caused relatively the most splash responses while fishing in the area by commercial boats and log tows passing by caused short rub times. Any boat which followed whales into the area caused the whales to either pass by the beaches or to rub shortly. Wakes from cruise ships appeared to cause whales to leave the beaches as well. Boats which cause whales to leave an area near the beaches, but not in the reserve area may cause whales at the beaches to leave as well. The whales appear to be very sensitive to disturbance to disturbance from boats while at the beaches.

5.2 Research From Shore at the Beaches

We observed whales enter the area on 57 days during the study period and most of the time it appeared that the whales did not mind our presence. It was difficult to tell how often they knew we were there, but on several occasions it was apparent that they did. We did not quantify the times when whales had spotted us because it was difficult to tell when they had.

One time, we had stepped out from behind the blind. It was dusk and we thought we were hidden in the dark. One of the older whales, a grandmother, looked up and saw us, vocalized loudly into the air and left with all of her kids. We were sure she was upset

at our presence. After that we remained behind the blinds, but on 2 other occasions whales appeared to see us and then spyhopped, splashed and left the area. Many other times whales would spyhop or splash causing us to wonder if we had been spotted. Whales often splashed just before leaving the area, perhaps to signal their group members that they were leaving, but we did question if the splashing was sometimes because of us.

On other occasions, a member of our group was getting water from the strait as whales entered the area. We would run for cover and never had the whales leave in such a situation, but being spotted by whales and boats was always of concern.

Research from shore in the rubbing beach area needs to be conducted with much care and concern. Whales appear to be able to spot observers fairly easily and sometimes leave the area. At times, we believed we were spotted and the whales did not immediately leave the area, but on other occasions, they would splash and then leave a few minutes later. We were almost never visible from the water and yet we still felt we caused some disturbance to the whales. The whales are sensitive to disturbance from shore while in the rubbing beach area and so any future research conducted in this area should be strictly limited if not curtailed completely.

5.3 Logging Activities

A. Blasting

16 blasts were recorded as having occurred during the study period, but it was not always noted. The whales were not in the area during any of these times. Each blast was quite loud at the study site. Whales would probably be able to hear the blasts and their reaction would probably be to leave if they associated blasts with guns or fisherman who throw explosives at them.

B. Debris

The debris from the road building to the east of the reserve was kept to that area, although much was bulldozed into the water below the site. No debris was observed in the study area and the water did not become murky due to the debris, but the possibility exists if debris is bulldozed into the strait. The whales may not use the area if the pebbles which attract them to the area become covered with debris and mud.

C. Summary

Blasting was not observed to occur while whales were present, although the possible effects would probably be negative. Debris from road building has not entered the area as of yet, but the potential effects of debris in the beach area are not good. The largest impact observed during the study was the number of kayakers that launched from the new road. Many kayakers have already found the road and the possibility for many more to enter the area from this road exists as a source of much disturbance to the

whales.

5.4 Summary

The whales were observed to be disturbed by both boat traffic and by shore activity. It appeared that boats both outside the reserve and in the beach area affected whales at the beaches. Most boats caused an adverse reaction by the whales and the presence of our shore group also affected their behavior at times. Whales actively avoided boats while in the beach area and seemed very alert and observant to movements on shore as well. The whales seemed especially sensitive while at the rubbing beaches. There were no effects from logging activities on the whales at present, but the potential exists. The new road is the closest access point yet for hikers and kayakers into the rubbing beach area and exists as a possible source of disturbance to the whales.

The 186 boats which entered the rubbing beach area while whales were present elicited 170 reactions by the whales. The whales immediately left the area twice as often as they showed no visible reaction (71 to 35). It seems that any boat which enters the beach area while whales are present will cause them to leave the area in most cases. Even non-motorized boats caused this response. This suggests that the whales are adversely affected by boat traffic in the beach area. The whales reacted more to boats which were close to shore, those which approached them while at the beaches and those which followed them into the beach area. Boats which cause whales outside the reserve to leave the area may

cause whales at the beaches to also leave. It is possible that the entire area from Robson Bight to the rubbing beaches and the width of the strait may be a sensitive area for the whales.

Non-motorized boats, such as skiffs and kayaks caused the greatest splash responses by the whales, possibly because of being surprised by the boats. These boats also elicited the highest relative amount of interrupt and leaves (IL) and interrupt and returns (IR) of any boat types. These boats were often at close distance from the whales, but on one occasion whales splashed when a skiff was still 200m offshore. Whales did not splash when commercial fishing boats came within 30m. Commercial fishing activities brought the highest number of boats into the area and so most cases of boat-whale interactions involved commercial fishing boats or skiffs. Commercial fishing in the area seemed to cause the whales to rub for shorter amounts of time, but this was difficult to determine because boats were almost always present during August. Short rubs were the most common response by the whales to commercial fishing. Commercial fishing boats and skiffs often stopped to whale watch, sometimes following whales to within 10 meters from shore. The whales left the area each time. Recreational boats tended to follow the whales for longer amounts of time, but skiffs often pursued whales for long times as well. Recreational boats would often follow whales into the beach area, stay with them while they rubbed and then follow them out. The whales usually did not stop to rub or did so for a very short time in these cases. Charter boats also affected the whales in the

area. They followed the whales in much the same way as recreational boats did, but were usually further from the whales. The whales left the area in most cases once again. Research boats did not enter the area often, but whales left the area once when a boat was close to shore and did not react when one was further off. A research boat on the opposite side of the strait from the beaches appeared to cause whales over there to leave and immediately cause whales at the beaches to leave in the same direction. The question of how large an area the whales may react to boats in while at the beaches needs to be addressed. Photographers only entered the area once and caused some whales to splash and leave while others stayed. Researchers and photographers have the potential to disturb the whales due to their tendency to follow them for long periods of time.

Boats which actively followed whales and those which stopped in the area caused the whales to splash or leave the area most often. Kayaks, other recreational boats and any boat which whale watches in the area pose the greatest threat to the whales. Whales leave the area when boats stop to whale watch. Boats passing through caused the whales to react in the same way if they were within 300 meters but not as often. Boats passing through caused the smallest reaction the further offshore they were.

Human activities in the rubbing beach area, and perhaps in the waters adjacent to the beaches does affect whale usage in the area. Many different types of boats encounter whales in the beach area and others may affect their behavior as they pass through.

Whales not in the beach area that are affected by boats may cause other whales that are in the beach area to change their behavior as well. Whale watching by any boat in the area causes the whales to leave the beaches. Shore activity also affects whale usage of the area. Human activity in the area needs to be carefully monitored. Providing more information to users of the area may help encourage responsible actions by people in the area.

Chapter 6

Possible Effects of Disturbance from Human Activity
on the Whales While at the Rubbing Beaches

The whales are very sensitive to disturbance while at the beaches. They react to boats and to activity on shore by leaving the area in most cases. Observations from this study, although not yet analyzed, show that whales spend a large amount of time resting while in the beach area. This disturbance could be detrimental to the long-term health of the whales if resting is one of the primary activities by the whales at the beaches.

Darling (1986) reports that some long-term researchers and whale watchers in the area believe that the whales are resting less now than they did during the 1970's. We observed whales resting many times, only to be disturbed by boats entering the area. People on shore also caused whales to leave. The whales would leave and then would often be followed by the research, photography and charter boats waiting just outside the beach area. At night, commercial fishing boats traveled close to shore and fished nearby. By 8 AM, research, photography and recreational boats would be looking for the whales and by 10 AM the whale watching charters would join in. Boats would begin to leave by 5 PM.

Darling (1986) also reports that whales in the area are generally easier to approach and that the number of times that whales approach vessels has apparently increased. The reactions we

observed by whales to boats was so strongly negative that we do not believe that the whales could habituate to the presence of boats in the area. We never observed whales approach boats, nor did we feel that the whales seemed approachable when boats entered the area. The whales appear to be especially sensitive to boat traffic while at the beaches and their behavior while in this area may not be the same as in other parts of the Johnstone Strait area.

The effects by shore observers on the whales is not known and we did not conduct any tests to monitor their reactions to us. We remained hidden and so it was difficult to tell when whales had seen us. Several times when we know we were spotted, the whales left the area. People not involved with our study were only on the beach twice when whales were present, but they left each time. The reactions to shore observers by the whales appear to be similar to those from vessels.

6.1 Boat Traffic

Whales appear to be disturbed by boats in most cases while at the beaches. Whales leave if approached, pass by if they are being followed and appear to remain for shorter amounts of time if there is much activity in the area, such as commercial fishing.

Non-motorized boats such as kayaks and skiffs under oars caused much splashing by the whales, as they left in apparent surprise. Boats which followed them into the area, such as recreational and commercial fishing boats, caused them to pass by the

beaches. Tugs with log tows and commercial fishing boats that were fishing nearby caused the whales to stay in the area for shorter amounts of time. Boats that were closer to shore affected the whales more than boats that were further offshore. Boats that caused whales on the opposite side of the strait to leave the area appeared to cause whales at the beaches to also leave.

Boats disturbed whales while in the beach area. The "beach area" needs to be defined, as whales from one end of the reserve to the other and across the strait appeared to be affected the movements of whales at the beaches. If this is true, boats far off the beaches with whales may affect whales at the beaches. These disturbances may be affecting the amount of time that the whales in the area spend resting and so affect their overall general health. Whales may seek another rest area if present disturbances continue or increase.

6.2 Shore Observers

There were few instances of human activity on shore, but those that were observed caused the whales to leave the area. Two instances involved people walking out in the open on the beaches and others were when members in our group were spotted. Our group members were sometimes barely visible when spotted and not walking on the beaches but the whales reacted in the same way as when people were out in the open. I have been in other areas of the Johnstone Strait and have had whales sit less than 10m away for 5-10 minutes while our group was out in the open watching them, but I

would not try this at the beaches. The whales seem especially sensitive to shore disturbance while at the beaches.

The possibility for whales to be disturbed by researchers, photographers or hikers in the beach area seems likely if people are allowed into the beach area. Any careless activities could have detrimental results for the whales. The whales will leave if they sight people in the area. This will disturb their resting behavior. Whales could possibly leave the area if this type of disturbance becomes common.

6.3 Logging Activities

At the present time logging was restricted to the eastern portion of the reserve and did not directly affect the whales. Blasting did not occur while whales were at the beaches and debris from the road building did not enter the area. The potential for blasting to disturb the whales and for debris to pollute the beach area does exist.

Logging has affected the whales in an indirect way by allowing kayakers (and possibly hikers) easy access to the beach area. The new logging road to the east of the reserve has become a launching site for many kayakers in its first season of existence and the possibility of many more kayakers entering the area in future summers exists as a source of much disturbance to the whales.

Logging may become a problem if debris begins to cover up the pebbles which are unique to the area and are what draws the whales to the beaches. Blasting may also deter the whales from using the area if whales are present when it occurs or if it is done more often or closer to the beaches. The main source of disturbance at present, however, are the many kayakers which may enter the area from the new road.

Chapter 7

Management Suggestions

7.1 Boat Traffic in the Beach Area

It is suggested that the rubbing beach area, and preferably the entire Robson Bight Ecological Reserve, be closed to all boat traffic when whales are in the area. Whale usage of the beach area is very high and most boat-whale interactions resulted in the whales leaving the area. Much resting by the whales was observed while at the beaches, and this was often interrupted by the arrival of boats into the area. The long-term affects of boats on the whales is not known at present, so a monitoring program of whale and boat usage of the area in and around the reserve should be conducted to determine if whale usage changes as a factor of boat activity.

The short-term affects of boats on the whales has been observed to cause the whales to leave the area. It is not known how important the reserve is for resting by the whales, but the potential for detrimental impacts on the population of the northern residents exists at present. Excluding boat traffic in the area will aid in preventing this.

7.2 Shore Activity

Activities on shore have also been observed to cause whales to leave the area. People walking on the beaches as well as those

just peering out from behind the bush appear to affect the whales. Photographers, researchers and hikers all exist as sources of possible disturbance to the whales. Conducting research at the beaches is very difficult for the researchers. It is stressful to remain hidden for such long periods of time. Research at the beaches should be limited to those with experience with the area and the whales or not conducted at all. The possibility of detrimental affects to the whales and to the beach area exists if people are allowed to enter the area on foot.

7.3 Summary

Human activities in the rubbing beach area should be strictly regulated. Boat traffic in the area should not be allowed while whales are present and shore activity should be restricted only to essential research for the benefit of the area. Recreational boaters may be easier to have stay out of the area than commercial fishing and tug activities but the majority of the boats in the area were the commercial fishing boats. The new logging road to the east of the reserve exists as the greatest potential source of disturbance after commercial fishing at present. Logging activities, although not directly affecting whales at the beaches at present, exist as a possible source of disturbance to the whales and of debris into the beach area. Both would be detrimental to the whales.

The whales seem especially sensitive to disturbance while in the beach area and all that can be done to ensure that they con-

tinue to use this unique area should be undertaken.

Literature Cited

Darling, J.D. 1986. Robson Bight Ecological Reserve Management Plan. Report submitted to Ecological Reserves Program, Victoria, B.C.

Jacobsen, J. 1980. The behavior of the killer whales (Orcinus orca) in the Johnstone Strait, B.C. Presented at Orca Symposium, American Cetacean Society, Seattle, Wash.



Appendix 3

Listing of Boat-Whale Interactions
at the Rubbing Beaches
July - August 1987

Key:

- Whales leave - They leave the beach area.
Whales leave and return- They leave as the boat approaches and then return after it has passed by.
Whales rub shortly- Same as a "Short Rub" (see text).

| Date | Description |
|----------|---|
| July 2- | Whales leave as tug with log tow (tl) approaches to within 100m. |
| July 7- | Orcas leave Beach 2, then orcas at Strider leave there as a commercial fishing boat (cb) passes within 100m. |
| July 12- | Orcas leave as kayak approaches to within 30m. |
| July 13- | 33 orcas resting all across strait (W. Robson Bight-E. Robson Bight, W. Cracroft-Vancouver Is.) from 0554-0805. At 0805 research zodiac approaches whales from west along W. Cracroft shore and all whales (including those at the rubbing beaches on the opposite shore) leave to the east within 5 minutes. |
| July 16- | Research zodiac at beach. Whale waits to rub until boat leaves. Charter boat nearby. Whale has a short rub then leaves. |
| July 19- | Whales leave as a cb passes by ~400m offshore. |
| July 19- | Whales leave as a cb passes by 300m offshore. |
| July 20- | Whales leave just before a cb passes by 50m offshore. |
| July 22- | Whales leave as an unidentified boat (night-time) passes by. |
| July 22- | Whales pass by as many cb's pass by. |
| July 22- | Whales heading towards beaches from the west. Float plane lands ~ 200m from whales at mid-strait off the bight |

to whale watch. Plane turns off engine. 4 large recreational boats (rl's) approach to within 50 meters of whales and whale watch. Whales begin to mill about. Robin Taylor arrives (27 minutes later). Robin talks to boat operators and all boats sit. 12 minutes later the whales head into the beach.

July 25- Whales leave the area as a cb passes by within 100m.

July 26- Whales sleep off Robson Bight for 3 1/2 hours until many cb's pass by. All whales leave.

July 28- 101 whales heading to the beaches from west. A cb heads towards whales from east. One group splits up, whales going SE and NE around the boat and then to the beaches.

July 28- Many whales at Strider. A cb drifts, engine off, towards whales until it comes within 50m. Then it starts its engine and all the whales leave.

July 28- At Beach 2, whales leave just before several cbs pass by within 100m.

July 29- Whales leave and return as a cb passes by within 100m.

July 29- Whales leave and return as large wakes from a cruise ship come in. Whales leave for good as a cb passes within 50m.

July 29- A charter boat follows the whales within 15m along the shore inside the reserve. The whales pass by Strider and then Beach 2 while whales already at Beach 2 leave as the charter passes by there.

July 29- Whales leave as 2 cbs pass by within 50m.

July 29- Whales leave as 2 cbs pass by (50 and 200m).

July 30- Whales leave as a large wake comes in.

July 30- Whales leave and return as a cb passes by within 200m.

July 30- Whales leave as a cb whale watches 75m off and another passes by 100m off.

July 30- Whales are heading towards the beaches. Several cbs head towards the whales and the whales dive and leave.

July 31- Whales pass by as a cb moored at Beach 2 is making noise.

July 31- Whales leave and return to Strider 2 times as cbs pass by (100 and 50m) and then leave for good as 2 rls pass by within 30m. Whales pass by Beach 2 as the same rls pass by there.

July 31- Whales splash 5 times and then leave as a cb skiff fishes 100m off.

July 31- Whales rub shortly as a cb passes by within 150m.

July 31- Whales leave after a cb drifts in 20m off and then starts its engine.

August 1- Whales leave and return 2 times as cbs pass by (both 200m).

August 2 - Whales leave the area as a cb passes by within 100m.

August 2 - Whales leave as a cb passes by within 100m.

August 2- Whales leave and return as a cb passes by within 100m and then leave for good as ac cb passes by within 10m.

August 2- Whales pass by as 4 cbs pass by (30-100m).

August 2- Whales show no reaction as a cb passes by within 100m and another cb comes towards the beach, within 30m. Once the cb is within 5 meters, the whales leave.

August 3- Whales leave as a cb passes by within 200m.

August 3- Whales leave as a cb passes by within 100m.

August 3- Whales pass by as cbs pass by.

August 3- Whales pass by as a cb passes within 30m.

August 3- Whales leave as a cb passes within 100m.

August 3- Whale leaves and returns with calf as cb fishes 100m off.

August 3- Whales leave as cb passes within 25m.

August 3- Whales leave as loud boat (heard on hydrophone at night) becomes audible.

August 3- Whales rub shortly as many gill-netters fish ~300m off.

August 4- Whales rub shortly as one gill-netter fishes 75m off.

August 4- Whales show no reaction as a cb passes by within 25m.

August 4- Whales leave as a small recreational boat (rs) passes by within 50m.

August 4- Whales rub shortly as gill-netters fish 150m off.

August 4- Whales rub shortly as a gill-netter fishes 100m off.

August 4- Whales rub shortly as gill-netters fish.

August 5- Whales rub shortly as gill-netters fish.

August 5- Whales leave as a cb passes by within 100m.

August 5- Whales leave as a cb runs its net 150m off.

August 5- Whales rub shortly as 2 gill-netters fish, 100 and 400m off.

August 5- Whales leave as a cb passes by within 200m (first cb after 63 minutes at the beach).

August 5- Whales leave as a rs passes by within 50m.

August 5- Whales splash 3 times (3 fluke slaps) as 1 kayak approaches (~450m off) and then 3 more times (1 breach and 2 inverted fluke slaps) as all 6 kayaks come within 10m. Then the whales leave.

August 5- Whales leave and return as a cb passes by within 30m and then leave as the same 6 kayaks from the above entry arrive at the other beach.

August 6- Whales leave as a cb comes to within 100m and follows the whales (person in boat whistling at whales).

August 6- Whales leave as a skiff passes by within 10m.

August 7- Whales leave as an rs passes by within 75m.

August 8- Whales pass by Strider and Beach 2 as an rl follows the whales within 20m.

August 8- Whales pass by as a cb passes by within 50m.

August 8- Whales leave as a cb passes by within 50m.

August 8- Whales leave and return 2 times as 2 cbs pass by (30, 50m) and then leave for good as 2 more cbs pass by (50, 150m).

August 8- Whales leave as a cb passes by within 150m.

August 9- Whales rub shortly as a seiner fishes 50m off.

August 9- Whales rub shortly as a seiner fishes near Beach 2.

August 10- Whales leave and return as a cb passes by within 15m while a seiner fishes 300m off.

August 10- Whales leave as a cb approaches the whales within 20m. There is much loud whistling at the whales.

August 11- Whales leave as a cb passes by within 40m.

August 12- Whales leave as a cb passes by within 100m.

August 12- Whales leave as a cb passes by within 100m.

August 12- Whales leave as a cb passes by within 100m.

August 12- Whales show no reaction as a tug passes by within 300m.

August 12- Whales splash 2 times (2 pec slaps) as a photographer's zodiac comes within 50m. He turns the engine off and the whales rub. The whales leave when he turns on the engine.

August 12- Whales rub shortly (30 seconds) at Strider as an r1 follows the whales within 40m, but change direction at Beach 2 and don't rub there.

August 12- Whales show no reaction as a cb passes by within 250m, then leave and return as a cb passes by within 100m.

August 13- Whales leave as a skiff passes by within 25m.

August 13- Whales show no reaction as a cb passes by within 250m while others leave.

August 13- Whales leave as people walk on the beach. Some sing and play flute to the whales. People are kayakers dropped off by a skiff just before whales arrived. The kayakers, an organized group (Sea-Trek, based in California) asked a commercial fisherman to drop them off with his skiff. He did and left. Then the whales arrived and once they saw the people they left.

August 13- Whales rub shortly as a cb is moored 15m off the beach.

August 13- Whales rub shortly as a cb is moored 15m off the beach.

August 14- Whales show no reaction as an rs passes by within 100m. Then they leave as a charter comes within 100m.

August 14- Whales splash (1 fluke slap) as a cb passes by within 300m and then leave.

August 14- Whales splash (1 fluke slap) and then rub as an rs passes by within 150m.

August 14- Whales leave and return as an rl and rs pass by within 150m. They leave for good as a charter and rs come within 300m.

August 14- Whales leave as a cb passes by within 100m.

August 15- Whales splash (1 fluke slap) and leave as a cb passes by within 250m.

August 15- Whales pass by and some rub shortly as a cb passes by within 20m.

August 15- Whales leave as a cb passes by within 30m.

August 15- Whales leave as a cb passes by within 30m.

August 15- Whales wait to rub while others leave as a cb passes by within 10m.

August 15- Whales leave as a cb passes by within 50m.

August 16- Whales pass by as many cbs are in the area (night-time).

August 16- Whales rub shortly as cbs fish within 400m off.

August 17- Whales rub shortly as cbs fish nearby (night-time).

August 17- Whales rub shortly as cbs fish nearby (night-time).

August 17- Whales pass by as cbs fish nearby (night-time).

August 17- Whales pass by as cbs fish within 400m.

August 17- Whales wait to rub as a cb passes by within 75m.

August 17- Whales leave as a cb passes by within 60m.

August 18- Whales pass by as 4 gill-netters fish 75-300m off.

August 18- Whales pass by while some rub shortly as 4 gill-netters fish 75-300m. They all leave as a cb passes by within

100m.

August 18- Whales rub shortly as gill-netters fish mid-strait.

August 18- Whales rub shortly as gill-netters fish mid-strait.

August 18- Whales pass by while some rub shortly as 1 rs and 2 cbs pass by (250, 300m).

August 18- Whales pass by while some rub shortly as an rs and cb follow whales that are 500m off.

August 18- Whales leave as a cb 100m off starts its engine.

August 18- Whales pass by while one rubs shortly as gill-netter fishes 200m off.

August 18- Whales leave as a gill-netter runs along its net 100m off.

August 18- Whales leave as a gill-netter chases and either shoots or throws explosives at them. The fisherman and his net drifted to within 10-15m off the beach and then drove his boat towards the whales which had been there rubbing for 37 minutes prior to his drifting there. We heard 2 bangs and the whales dove immediately and resurfaced 250-300m away. This was reported to the RCMP's who took the information from us the next day (this occurred at dusk).

August 19- Whales leave as a cb passes by within 75m.

August 19- Whales rub shortly as a tl passes by within 200m.

August 20- Whales show no reaction as a charter comes within 50m.

August 20- Whales splash 7 times (3 breaches by one then 3 fluke slaps and a breach by another) and then leave as a skiff follows whales. The whales first splashed as the skiff came within 200m (at high speed) and then again as it came within 50m (at high speed). They turned off the engine and whale watched for several minutes while whistling at the whales. The whales left as they started their engine.

August 20- Whales show no reaction as a cb passes by within 100m.

August 21- Whales wait to rub as cbs pass by and wakes hit beach.

August 21- Whales leave as a cb passes by within 50m.

August 21- Whales leave a cb passes by within 40m.

August 21- Whales wait to rub as 2 cbs pass by (20, 50m).

August 22- Whales show no reaction as 2 cbs pass by (50, 75m).

August 22- Whales show no reaction as an rl passes by within 75m, but then leave as a cb passes by within 50m and a skiff passes by within 10m.

August 22- Whales splash 3 times (3 fluke slaps) as a cb passes by within 50m and then leave as a cb passes by within 100m.

August 22- Whales rub shortly while a skiff sits on the beach. 2 men landed just before whales arrived to photograph them from shore. The whales left when they spotted them on the beach.

August 22- Whales leave as the commercial opening begins and 4 seiners begin to fish 100-300m off.

August 22- Whales leave as an rs comes within 25m.

August 22- Whales rub shortly while others pass by as seiners fish 100-300m off.

August 22- Whales show no reaction as 2 seiners fish 70 and 200m off but then leave as an rs passes by within 50m and a cb passes by within 150m.

August 23- Whales leave as a cb passes by within 75m.

August 23- Whales leave and return as a seiner begins to fish.

August 23- Whales rub shortly as 4 gill-netters fish 200-400m off.

August 23- Whales rub shortly as 5 cbs are moored 50m off the beach.

August 24- Whales rub shortly as 4 gill-netters fish 300m off.

August 24- Whales rub shortly while others pass by as a cb fishes 50m off.

August 27- Whales leave as a skiff comes within 10m to whale watch. It follows them to the other beach under cars and the whales splash twice (2 fluke slaps) and then leave as the skiff comes within 5m.

Appendix 2- Reactions by Whales to Boats

| Non-Whale Oriented | | IL | IR | SR | PB | SP | WTR | NR |
|--------------------|----------|----|----|----|----|----|-----|----|
| cb | 0-30m | 10 | 1 | 1 | 3 | 0 | 2 | 1 |
| | 31-100m | 25 | 4 | 1 | 5 | 2 | 1 | 10 |
| | 101-300m | 8 | 2 | 0 | 0 | 2 | 0 | 9 |
| cb fishing | 0-30m | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 31-100m | 4 | 1 | 7 | 1 | 0 | 0 | 2 |
| | 101-300m | 2 | 0 | 9 | 4 | 0 | 0 | 2 |
| cb skiff | 0-30m | 4 | 0 | 0 | 0 | 1 | 0 | 1 |
| | 31-100m | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| | 101-300m | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| tl | 0-30m | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 31-100m | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 101-300m | 0 | 0 | 2 | 0 | 0 | 0 | 1 |
| fishery | 101-300m | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Total | | 55 | 8 | 20 | 14 | 7 | 3 | 28 |
| Whale Oriented | | | | | | | | |
| kayaks | 0-30m | 2 | 0 | 0 | 0 | 1 | 0 | 0 |
| rl | 0-30m | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| | 31-100m | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| | 101-300m | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| rs | 0-30m | 3 | 0 | 1 | 0 | 0 | 0 | 0 |
| | 31-100m | 4 | 0 | 0 | 1 | 0 | 0 | 2 |
| | 101-300m | 2 | 1 | 0 | 0 | 1 | 0 | 1 |
| charters | 0-30m | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 31-100m | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 101-300m | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| research | 0-30m | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| | 31-100m | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 101-300m | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| photo | 31-100m | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Total | | 16 | 2 | 2 | 4 | 2 | 1 | 7 |
| TOTAL-BOTH GROUPS | | 71 | 10 | 22 | 18 | 9 | 4 | 35 |

Key: cb- commercial fishing boat
 tl- tug with log tow
 rl- recreational boat over 18'
 rs- recreational boat under 18'
 charter- whale watching charters
 photo- professional photographer



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Table 1- Usage By Whales

Number of Whales to Use Beaches
and Number of Days Visited

| | Number of Different Whales at Beaches | Number of Days Visited | Average Number of Whales Per Day |
|--------|--|---------------------------|-------------------------------------|
| July | 138 (80%) | 27 | 24 |
| August | 117 (64%) | 27 | 37 |
| Total | 157 (94%) | 54 | 31 |

Number and Lengths of Visits

| | Number of Visits | Average Number Per Day | Total Minutes at Beaches | Average Length of Visit per Day |
|--------|---------------------|---------------------------|-----------------------------|------------------------------------|
| July | 81 | 3 | 3636 | 45 |
| August | 98 | 4 | 4705 | 48 |
| Total | 179 | 3 | 8341 | 47 |

Number of Whale Hours (# whales x length of visit)

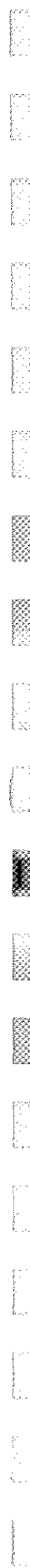
| | | | | | |
|------|------|--------|------|-------|-------|
| July | 8363 | August | 9174 | Total | 17537 |
|------|------|--------|------|-------|-------|

Percent of Time in Strait and at Beaches
(Percent time all whales in strait; percent of that at beaches)

| | Percent of Time in Strait | Percent of Time at Beaches |
|--------|------------------------------|-------------------------------|
| July | 51% | 15% |
| August | 64% | 19% |
| Total | 58% | 17% |

Variance by Subgroup (Days at Beaches/Days in Strait)

| | | | | | |
|-----------|-------------|-------------|-------|---------------|------------|
| A2, 30's- | 37/43 (86%) | G4's | - | 3/4 (75%) | |
| A14's | - | 24/30 (80%) | G2's | - | 3/3 (100%) |
| A8's | - | 22/26 (85%) | R9's | - | 4/6 (67%) |
| A9's | - | 22/28 (79%) | I31's | - | 4/6 (67%) |
| A11's | - | 18/22 (82%) | I11's | - | 3/4 (75%) |
| A24's | - | 15/19 (79%) | I2's | - | 2/2 (100%) |
| D's | - | 14/23 (61%) | R2's | - | 2/2 (100%) |
| C's | - | 12/18 (67%) | I1's | - | 1/1 (100%) |
| A23's | - | 12/19 (63%) | I18's | - | 1/1 (100%) |
| H's | - | 11/13 (85%) | R7's | - | 1/1 (100%) |
| A20 | - | 10/13 (77%) | G3's | - | 0/1 (0%) |
| A36's | - | 10/17 (59%) | G18's | - | 0/1 (0%) |
| A12's | - | 10/11 (91%) | I16's | - | 0/1 (0%) |
| G17's | - | 5/5 (100%) | G12's | - | 0/0 (0%) |
| I33's | - | 5/5 (100%) | I17's | - | 0/0 (0%) |
| W's | - | 5/5 (100%) | R4's | - | 0/0 (0%) |
| B's | - | 4/6 (67%) | R5's | - | 0/0 (0%) |
| I15's | - | 4/5 (80%) | R17's | - | 0/0 (0%) |
| | | TOTAL | - | 264/341 (77%) | |



average, 58% of their time in the strait and 17% of that time at the beaches. This is similar to John Ford's findings of 1980.

The rubbing beaches are visited regularly by most whales. They spend a relatively large percentage of their time there considering the great distances they often travel in a day. They rub at all times of the day and often make several visits in the same day. Once in the beach area, whales usually spent over 45 minutes there resting and rubbing. It appeared to be a very important part of their day. Whales would often rub and rest until interrupted by boat traffic, leaving us to wonder how long they may have stayed had they not been interrupted. The longer visit times when boats were in the area is largely due to large numbers of whales (which tend to have long visit times) attracting boats to whale watch and boats arriving at the end of a previously boatless visit. Usage of the area varies among subgroups, but most all visited the beaches on over 70% of their days in the strait. The daily usage patterns of the whales is likely to be the result of many factors but the rubbing beaches certainly seem to be an important part of the daily activities of these whales.

Chapter 4

Usage By Boats

Boat traffic inside the reserve boundary of the beach area was constant for most of the study period. A total of 1047 boats entered the reserve from July 1-August 27, 859 while no whales were present and 188 while whales were in the area. 343 boats were counted in the area from 0-30 meters from shore, 558 from 31-100 meters and 146 from 101-300 meters. Boats entered the area at all hours of the day but census counts were only recorded during daylight hours. Traffic was mainly during the day during July but during August there was much boat traffic at night due to the commercial fishing openings which only occurred during August. Both non-whale oriented and whale oriented boats entered the area frequently. Non-whale oriented boats were present in greater numbers (due to commercial fishing in the area) but whale oriented boats entered the area on a greater number of days (43 versus 40 of 59). Only 6 days during the study period had no boats enter the area.

Boat traffic was generally not monitored more than 300 meters offshore, although boat-whale interactions sometimes were (See Chapter 5).

4.1 Non-Whale Oriented Boats

Non-whale oriented boat traffic (in order of highest numbers counted) include commercial fishing boats, outboard skiffs from the commercial fishing boats, tugs with log tows, fishery patrol boats and and cruise ships. These boats accounted for 240 of the 342 boats in the 0-30 meter area during the study, 488 of the 560 in the 31-100 meter area and 125 of the 148 in the 101-300 meter area.

Commercial Fishing

Commercial fishing was the most visible and audible activity on the the water in the beach area. As many as 64 fishing boats were counted passing within 300 meters from shore on a single day, while 5 or more frequently fished within 300 meters of the beaches simultaneously. Seiners frequently tied off to shore and one time landed a dingy on Strider to tie off to a tree there. Our group was discovered but they left after making the set and weren't seen on shore again. Gill-netters often fished just 10-20 meters from the beaches.

During July, 93 commercial fishing boats passed within the reserve boundary off the beaches, 22 while whales were present. There were 24 in the 0-30 meter area, 48 in the 31-100 meter area and 21 in the 101-300 meter area. There were no openings for commercial salmon fishing in the area during July.

Four commercial fishing openings totalling 16 days occurred during August in which 696 commercial boats were counted within the reserve boundary just off the beach area. Of these 696, 598

were passing through and 98 were fishing. Whales were present while 89 of the 598 boats passed by and while 30 of the 98 boats fished. 195 were in the 0-30 meter area, 410 in the 31-100 meter area and 91 in the 101-300 meter area. Seiners were almost constantly moored at Beaches 2 and 3 in between openings and often at Strider as well.

Commercial fishing boats were the most numerous boats in the area. Fishing openings were the periods of greatest human activity in the beach area and included other types of boat traffic as well. These included outboard skiffs from the fishing boats, fishery patrol boats, and friends of the fisherman visiting in small recreational boats. The past numbers of fishing boats in the area has fluctuated over the years but it is no lower now than in it was in the past 13 years (Darling, 1986).

Skiffs

Between openings, skiffs from the seiners would travel very close to shore, often at high speed. as the fisherman visited each other or ran errands to town and back. They would travel mostly during the day. As many as 6 skiffs were counted on a single day and they would frequently spend hours in the area fishing or following whales. This was done both with engine off and on. Only 1 skiff was counted during July, but 37 were counted during August. Of these 38, 8 were in the area while whales were present. 21 were in the 0-30 meter area, 16 in the 31-100 meter area and 1 in the 101-300 meter area.

The rubbing beaches provide easy landing for skiffs and several times fisherman and others did come ashore. On one occasion, a fisherman landed his skiff on both Strider and Beach 2 to look around. He left after we informed him of the study. Another time, 10 kayakers received a ride in a skiff and were dropped off on Beach 2 just before whales showed up. They had asked a fisherman for a ride to the beach as the whales were approaching. He dropped them off and left before the whales arrived and picked them up later. The possibility of skiffs landing on the beaches was a concern of ours throughout the study period. They also tended to travel closer to shore than other boats.

The numbers of these skiffs in the area corresponds to the number of commercial fishing boats present and the present numbers of the fishing boats show no sign of decreasing.

Tugs With Log Tows

Tugs towing logs were fairly frequent between fishing openings. They move very slowly close to shore, at moderate engine speed and so introduce much noise to the area over a long period of time. They would frequently take 2-3 hours to pass through the area.

During July, 9 log tows were counted and 1 was with whales present. During August, 6 log tows were counted and 2 of these were with whales present. 14 were in the 31-100 meter area and 1 in the 101-300 meter area.

The length of time that the log tows spend in the area may affect the whales usage of the area. Whales were observed to avoid the beaches while a log tow was there and to leave just as one came into acoustic range (heard on hydrophones). Another concern may be the possibility of a spill of the logs onto the beach area. On one occasion a tow began to drift towards shore and was less than 5 meters from the rocks before it was pulled further offshore by the boat operator. Possibly these tows can move further offshore. Levels of future activity are unknown but can be predicted to continue as logging in the area continues.

Fishery Patrol Boats

Fishery patrol boats were usually only present during commercial fishing openings. There were no sightings during July and just 10 during August, 1 with whales present. All sightings were in the 101-300 meter area.

Patrol boats tended to travel slowly between the fishing boats and usually just 1 was in the area at a time.

Cruise-Ships

Passenger cruise-ships only entered the reserve once during the study period, while no whales were present and was in the 101-300 meter area.

4.2 Whale-Oriented Boats

Whale-oriented boat traffic (in order of highest numbers counted) include kayaks, small motorized recreational boats, large motorized recreational boats, research and charter boats, sailboats and photographers. These boats accounted for 103 of those in the 0-30 meter area during the study period, 70 of those in the 31-100 meter area and 21 of those in the 101-300 meter area.

Kayaks

Kayaks were present throughout the study period. They all were in the 0-30 meter area and traveled at low speed. Many appeared to have launched from the new logging road just to the east of the reserve. They never did land on the beaches (except the previously mentioned occasion in the skiff), but were frequently observed pointing to the beaches and were often overheard describing the rubbing behavior by the whales or exclaiming how the beaches looked like such nice places to stop. Usually the person describing the rubbing behavior to the others appeared to be the trip leader. In this way, many people were being tempted to come back again at a later time to witness the whales rubbing. This should be of concern for future management of the area.

During July, 12 kayaks were sighted and all appeared to have launched from the new logging road just to the east of the reserve. Apparently kayakers had discovered the road and put a sign up so others could find it. All passed by with no whales present.

During August, 60 kayaks passed through the beach area, 6 while whales were in the area. 29 of these appeared to have launched from the new logging road as well. It was one of these groups, a large group of 10, in which the leader was overheard to say, "Those are the famous rubbing beaches!" as they passed by.

The logging road just to the east of the reserve and its discovery by kayakers poses a threat to the beach area. Kayak traffic could greatly increase and hikers and backpackers may begin to enter the area. It seems likely that usage of this road will increase as more kayakers find out about it. Kayak activity in the area is already high.

Motorized Recreational Boats

Both small and large motorized recreational boats passed by close to shore throughout the study period, accounting for 108 sightings of boats inside the reserve in the beach area, 18 while whales were present. 28 were in the 0-30 meter area, 62 in the 31-100 meter area and 18 in the 101-300 meter area. Sport salmon fishing and video filming were common. Comments were overheard from people on these boats about the rubbing beaches as well.

During July, 4 small and 22 large recreational boats passed through the beach area, 2 while whales were present.

During August, 55 small and 27 large recreational boats passed through the area, 16 while whales were present.

On several occasions, these boats would follow whales into the beach area, sometimes idling less than 30 meters from the whales. The sign noting the reserve boundary was either ignored or was never seen. When these boats spotted whales, they would often angle in towards them sometimes causing the whales to leave the beach area. Their presence in the area is expected to increase (Darling, 1986).

Charter Boats

Charter boats only entered the area when whales were present. There were 6 sightings during the study period, 1 in the 0-30 meter area, 2 in the 31-100 meter area and 3 in the 101-300 meter area. The two main charter and cruise companies in the area, both familiar with the beach area and the reserve, did enter the area while whales were present on several occasions. It appeared that they did so to observe the rubbing. Usually, whale watching boats would follow the whales to the beach area, wait just offshore while the whales rubbed and then follow them again. Sometimes a different group would be followed instead once the whales entered the beach area.

Charters entered the area once in July and 5 times in August. Each of these times whales were present. On one occasion, a charter boat loaded with whale watchers followed whales into the beach area within 10 meters from the whales while they rubbed and remained there until the whales departed.

Usually, operators waited just offshore until the whales finished rubbing, but several times reasons were found by the operators to enter the area. While the number of future trips to the area by one company may drop, another has shown a steady increase since 1980 (Darling, 1986).

Research

Research vessels entered the beach area minimally during the study period (with the exception of Robin Taylor of Ecological Reserves who delivered supplies to us about once a week). Our study group was the only group conducting shore based research in the area. Other researchers also knew of this study and may have made an extra effort to stay out of the area while we were there. Research boats following whales that were over 300 meters from the beaches appeared to affect the behavior of whales at the beaches on several occasions, but these incidents are not included in the data. They are described in the section on reactions by whales to boats.

Research boats only entered the area once during July and 6 times during August, 4 of these times whales were present. 1 sighting was in the 0-30 meter area and 6 in the 31-100 meter area.

Research boats, like whale watching boats, generally follow the whales to the beach area, wait just offshore while they rub and then follow them once they leave the beach area. The number of research boats in the area is not expected to decrease in the near

future (Darling, 1986).

Sailboats

Sailboats entered the area 4 times during the study period, all during July. Whales were not present during any of those times. 2 sightings were in the 31-100 meter area and 2 were in the 101-300 meter area.

The number of sailboats, as other recreational boats in the area, is expected to increase (Darling, 1986).

Photographers

Photographers only entered the area once during the study period and this was while whales were present. Photographers tend to get very close to whales and this was the case here. Many photographers apply for permits to film and photograph the whales at the beaches and others just enter on their own. This latter category usually consists of amateurs and recreationists.

The Johnstone Strait area and, specifically, Robson Bight and the rubbing beaches, are becoming quite well known by amateurs and professionals alike and their numbers are not expected to decrease.

4.3 Summary

Boat activity in and around the beach area was nearly constant throughout the study period, but much more so during August. During July, boat traffic was sparse but commercial fishing boats,

motorized recreational boats and kayaks were common. During August, commercial fishing boats were most numerous, but the numbers of recreational boats, kayaks and whale watching charters to enter the area were up from July as well.

Commercial fishing brought the greatest number of boats to the area but whale oriented boats entered the beach area more often and were more likely to follow and get close to whales. Of greatest concern seem to be the potential for kayakers and hikers to enter the area from the new logging road to the east of the reserve and for whale watching charters to grow and enter the area to satisfy a growing public interest in the whales and the rubbing beach area.

Table 2- Usage by Boats

| Non-Whale Oriented Boats July 1-August 27: | | Whales Not Present | Whales Present | Total |
|---|----------|--------------------|----------------|-------|
| cb | 1- 30m | 176 | 29 | 205 |
| travelling | 31-100m | 371 | 51 | 422 |
| | 101-300m | 33 | 31 | 64 |
| cb | 1- 30m | 9 | 5 | 14 |
| fishing | 31-100m | 22 | 14 | 36 |
| | 101-300m | 37 | 11 | 48 |
| skiff | 1- 30m | 17 | 4 | 21 |
| | 31-100m | 13 | 3 | 16 |
| | 101-300m | 0 | 1 | 1 |
| tl | 1- 30m | 0 | 0 | 0 |
| | 31-100m | 11 | 3 | 14 |
| | 101-300m | 1 | 0 | 1 |
| fishery | 1-100m | 0 | 0 | 0 |
| | 101-300m | 9 | 1 | 10 |
| ol's | 1-100m | 0 | 0 | 0 |
| | 101-300m | 1 | 0 | 1 |
| TOTAL | | 700 | 153 | 853 |
| | | | | |
| Whale-Oriented July 1-August 27: | | Whales Not Present | Whales Present | Total |
| kc | 1- 30m | 66 | 6 | 72 |
| | 31-300m | 0 | 0 | 0 |
| rl | 1- 30m | 10 | 3 | 13 |
| | 31-100m | 24 | 2 | 26 |
| | 101-300m | 10 | 0 | 10 |
| rs | 1- 30m | 12 | 3 | 15 |
| | 31-100m | 30 | 6 | 36 |
| | 101-300m | 4 | 4 | 8 |
| charters | 1- 30m | 0 | 1 | 1 |
| | 31-100m | 0 | 2 | 2 |
| | 101-300m | 0 | 3 | 3 |
| research | 1- 30m | 1 | 0 | 1 |
| | 31-100m | 2 | 4 | 6 |
| | 101-300m | 0 | 0 | 0 |
| photo | 1- 30m | 0 | 1 | 1 |
| | 31-300m | 0 | 0 | 0 |
| TOTAL | | 159 | 35 | 194 |

Key:

cb- commercial fishing boat
tl - tug with log tow

skiff- commercial fishing boat
fishery- fishery patrol boat

ol - cruise-ship kc- kayak
research- research boats photo - photographers
rl - motorized recreational boats over 18'
rs - motorized recreational boats under 18'
charter - commercial whale watching charters