

VISITOR PROGRAM
AT ROBSON BIGHT ECOLOGICAL RESERVE
SUMMER 1987

prepared by
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EXECUTIVE SUMMARY

The ten kayaks drifted in the current as the pod of killer whales surfaced abreast in unison and headed for the fragile crafts. As the powerful predators approached, they gradually split into two groups and veered around the kayaks.

This scenario is being repeated more often now in Johnstone Strait near the northeastern tip of Vancouver Island, one of the most accessible areas in the world to watch killer whales. Many people do not realize that killer whales take on this formation when resting. Researchers have noticed less resting and sleeping behavior among the killer whales of Johnstone Strait and managers are concerned how this may eventually affect the whales.

Robson Bight Ecological Reserve, located on Johnstone Strait, was established in 1982 to protect killer whale habitat for scientific and educational purposes. It has become increasingly popular as a site for recreational whale watching although presently only accessible by boat. Visitation now exceeds the capacity for the volunteer warden who has managed the area since its creation.

A very successful program provided onsite visitor information, management and monitoring services at the reserve during the summer of 1987. Three persons were hired through the CareerTrac Program from June - September 1987. Visitors near or in the reserve were contacted with the objectives of minimizing disturbance to the killer whales and maintaining the integrity of the reserve while still providing a satisfying experience to the visitor. Over 1480 boaters in the vicinity of the reserve were provided with brochures, whale watching guidelines and other interpretive information. Another 280 visitors attended weekly interpretive slide talks in Telegraph Cove. Self-guided contacts consisted of brochures and signs, both at the reserve and in Telegraph Cove, the nearest launching point. Levels of boat traffic, research activity, and 350 boat-whale encounters were monitored.

Response to the information program was very positive with high visitor compliance and frequently voiced satisfaction. Boat traffic was lower inside the reserve than outside, with the notable exception of commercial seine boats. Boat use indices in all areas were highest in August. Preliminary analysis of recreational boat-whale encounters show that encounter duration and distance maintained generally increased with the length of the boat. The future success of the program relies on achieving co-operative relationships with users and agencies.

ACKNOWLEDGEMENTS

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This program would have been difficult or impossible to complete without such willing assistance from the following people: Jim and Ann Borrowman and Bill and Donna Mackay from Stubbs Island Charters; Louise Goulet, Hans Roemer and John Pinder-Moss of the Ecological Reserves Program, Ministry of Environment and Parks; and assistant information officers Martin West and Michelle Taylor. Thanks to Phil Dearden and Dave Duffus of the University of Victoria Geography Department for the loan of their zodiac and other equipment. Dave also helped to set up and dismantle the field camp. Volunteers who provided enthusiastic assistance (in order of appearance) were Jane Dawson, Ian Callen, Kelly Newman, Dawn Smith, Christi Bricknell, Chris Mehling, Randi Movich, Laura Kotler, Evelyn Parsons, Steve Wischniowski, Karen Wipond and Larry and Mary Berg. Louise Goulet provided inspiration and direction and edited the report. Pat Teti and Mary Sansavarino were speedy expeditors. Jim, Ann, Bill and Donna deserve special mention for many helpful conversations, sustenance, a place to sleep and coffee. Jim Borrowman, Jeff Foott and Dave Duffus kindly lent their photos to be used in the interpretive slide talks. Thanks to the Bauza Cove Campground people for their assistance in the production of the slide shows. Finally, Robin Draper, Nicole Beissner and Tracey Cooke of the Outdoor Recreation Foundation of B.C. were responsible for financial administration of the project.

VISITOR PROGRAM AT ROBSON BIGHT
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	<u>Page</u>
EXECUTIVE SUMMARY	iii
ACKNOWLEDGEMENTS	iv
1. <u>INTRODUCTION</u>	1
2. <u>DESCRIPTION OF PROGRAM</u>	
2.1 - Visitor information and education	3
2.1.1 - Visitor contacts: boats in Johnstone Strait and Telegraph Cove visitors	3
2.1.2 - Slide shows	4
2.1.3 - Media	4
2.1.4 - Self-guided contacts	4
2.2 - Visitor monitoring	4
2.2.1 - Boat counts	6
2.2.2 - Whale - visitor encounters	6
2.2.3 - Upland activity	6
2.3 - Control of whale-watching activities	7
2.4 - Program personnel and logistics	7
3. <u>RESULTS AND DISCUSSION</u>	
3.1 - Visitor information and education	7
3.1.1 - Boat contacts	9
3.1.2 - Slide shows	11
3.1.3 - Media	11
3.1.4 - Local community contacts	12
3.1.5 - Self-guided contacts: brochures, signage	12
3.1.6 - Collaboration with local communities	13
3.2 - Visitor monitoring	
3.2.1 - Boat counts	13
3.2.2 - Whale - visitor encounters: preliminary results	15
3.2.3 - Upland activity	17
3.3 - Control of whale-watching activities	
3.3.1 - Visitor control	18
3.3.2 - Collaboration with agencies and individuals	19
3.3.3 - Management issues	20

	<u>Page</u>
3.4 - Program personnel and logistics	
3.4.1 - CareerTrac program	21
3.4.2 - Length of season	21
3.4.3 - Number of personnel required	21
3.4.4 - Use of volunteers	22
4. <u>CONCLUSIONS AND RECOMMENDATIONS</u>	
4.1 - Visitor information and education program	
4.1.1 - Boat contacts	22
4.1.2 - Slide shows	23
4.1.3 - Media	23
4.1.4 - Contacts and collaboration with local communities	23
4.1.5 - Self-guided contacts: brochures, signage	24
4.2 - Visitor monitoring	
4.2.1 - Boat counts	24
4.2.2 - Whale - visitor encounters	25
4.2.3 - Upland activity	26
4.3 - Control of whale-watching activities	26
4.4 - Program personnel and logistics	26
5. <u>LITERATURE CITED</u>	28

APPENDICES

- A. CareerTrac project description and proposal for information and monitoring services at Robson Bight Ecological Reserve - June 1987.
- B. Slide show script
- C. Robson Bight Ecological Reserve brochure and specific recommendations for text changes/additions
- D. Data forms
- E. North Island Gazette article
- F. Data summaries

ADDENDUM

Diary of program, June 28 - Sept. 8, 1987

LIST OF TABLES

TABLE 1. Distribution of visitor contacts, July - September 1987	8
TABLE 2. Average number of boats per count for various boat-types inside and outside Robson Bight Ecological Reserve	14

LIST OF FIGURES

FIGURE 1. Location of Robson Bight Ecological Reserve	2
FIGURE 2. Robson Bight information sign in Telegraph Cove	5

VISITOR MANAGEMENT PROGRAM AT ROBSON BIGHT ECOLOGICAL RESERVE, SUMMER 1987

1.0 INTRODUCTION

Robson Bight Ecological Reserve was created in 1982 to preserve the area as a killer whale sanctuary and to protect its scientific and educational values. Robson Bight is located on Johnstone Strait approximately 20 km southeast of Alert Bay, British Columbia (Fig. 1). A recent addition by Ecological Reserves now protects a 412-ha buffer strip along the shoreline including 38 ha in the estuary of the Tsitika River, the last undeveloped estuary on the east coast of Vancouver Island.

The area has been the object of increasing recreational interest since its status as core habitat for killer whales became widely known in 1978. Accessibility to the region has increased dramatically with the completion of the highway to Port Hardy in 1982. Recently, over 500 campsites and four boat launches have opened on the north end of Vancouver Island. Most ecological reserves have a volunteer warden. Jim Borrowman has been volunteer warden at Robson Bight since its inception. Despite the lack of road access into the area, recreational boating pressures have generated the need for a full-time information officer or warden.

In 1986, Dr. Jim Darling assessed human impacts on killer whales at Robson Bight. He stressed the need for more quantitative data on the effects of vessel activity on killer whales, an extensive education and publicity program in 1987 with assessment of its impact and the hiring of a seasonal warden to maintain a presence in the area. A visitor management program was initiated in 1987, following Darling's recommendations. Three persons were hired under the CareerTrac Program to provide these services between June and September.

The purpose of Robson Bight visitor management, as stated in the project description (App. A), was to establish "a routine for on-site management and control of whale watching activities, whale and visitor monitoring, public information and interpretation at Robson Bight Ecological Reserve". A proposal outlined in June 1987 (App. A) outlined the visitor program designed to meet these objectives.

The purpose of this report will be to outline the information, education and management aspects of the project, in addition to providing feedback on personnel and logistics as it relates to the CareerTrac program.

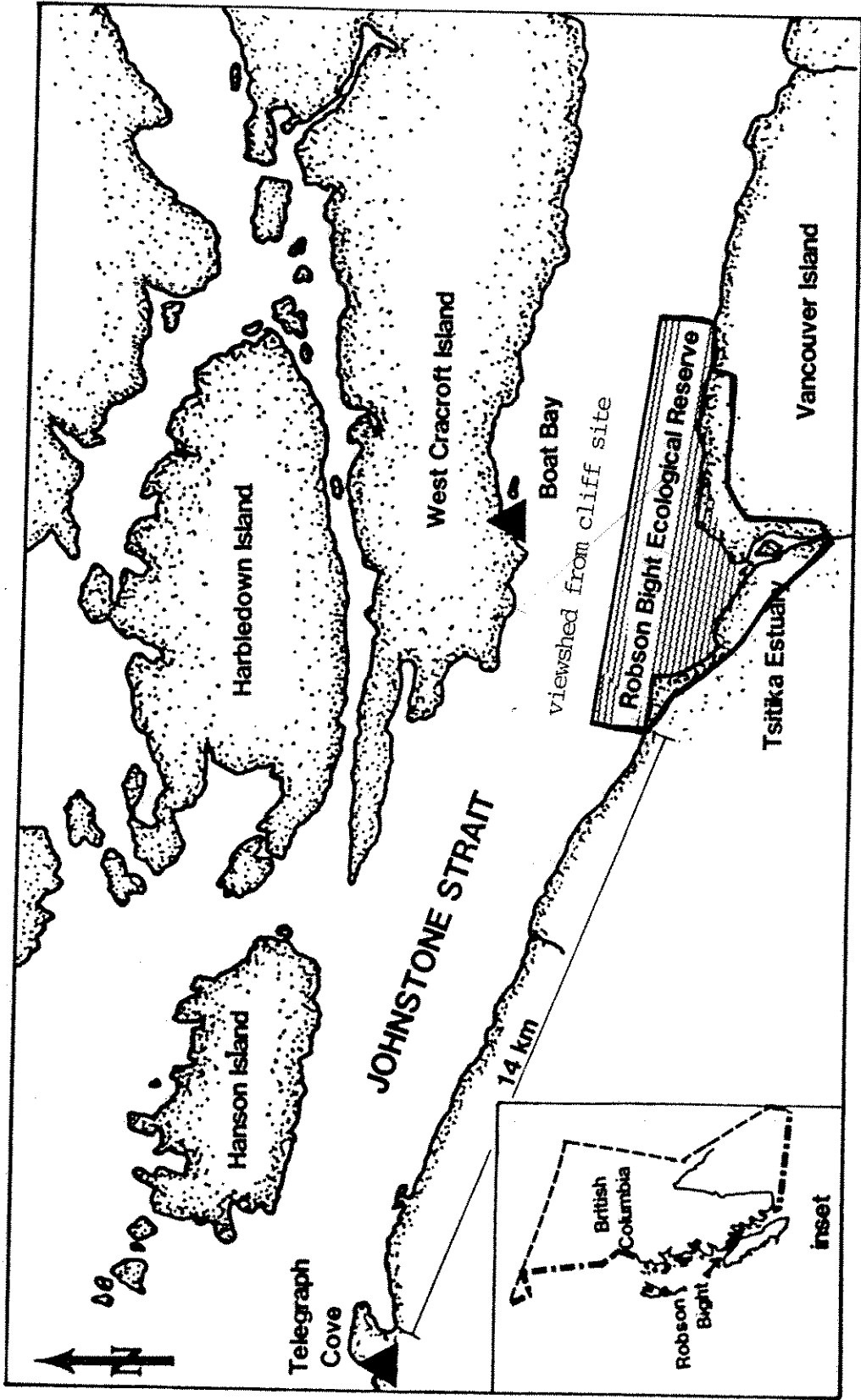


Figure 1 Location of Robson Bight Ecological Reserve

2.0 DESCRIPTION OF PROGRAM

The field program, extending from June 25 to September 8/87, had three facets: visitor information and education, visitor/researcher monitoring, and control of whale-watching activities. The Program's personnel and logistics will also be discussed.

2.1 Visitor information and education

2.1.1 Visitor contacts : boats in Johnstone Strait and Telegraph Cove visitors.

Boaters were contacted on the water in the vicinity of Robson Bight 6 days per week in July and 5 days per week in August and September. Two information officers were situated in a 4.6 m (14') Zodiac near the reserve from 9 am until 4-5 pm and maintained radio contact with a third information officer at a cliff-top observation point on West Cracroft Island opposite Robson Bight. When an encounter between a recreational boat and killer whales was observed, the boater was contacted. An encounter was considered in progress when a boat changed behavior and positively oriented towards an individual group of whales. Positive orientations included stopping the boat, changing direction towards the whales or changing speed. In addition, boaters were contacted when it appeared they were looking for whales.

Approaches to boaters were considered an important prelude to the contact. It varied with the speed and type of boat. Approaches to recreational boaters who were within the reserve and whale watching had the highest priority. People camping on shore within the reserve were also contacted as soon as possible. Journal entries were made on all contacts, which include date, number of persons contacted, boat type and whether the hydrophone was used. A hydrophone was employed as an interpretive tool and was intended for use with all visitors when time and circumstances permitted.

The following is a description of a typical contact. After approach, we immediately introduced ourselves. Identification of our purpose was greatly enhanced by our yellow exposure suits equipped with Ecological Reserve shoulder patches. We would then inform visitors of the boundaries of the reserve and briefly outline whale-watching guidelines. Visitors were asked not to enter the reserve when whales were present. This message would be reinforced by information in the Robson Bight brochure, distributed to visitors at this time. If there was time, the hydrophone was lowered into the water, to pick up any whale vocalizations. This would also provide an excellent opportunity to elaborate on previous information, and answer any questions prior to termination of the contact.

Relatively little time was lost through either high winds or heavy rain.

Visitors were also contacted informally in Telegraph Cove during supply runs. No attempt was made to keep track of the numbers contacted.

2.1.2 Slide shows

A 30-minute slide talk was written, and produced for shows beginning in late July. As well as giving the audience a brief background on killer whale biology, the slide talk introduced ecological reserves and ended with whale-watching guidelines and impacts of boaters on whale behavior. This show and script are now on file with the Ecological Reserve Program. The script is included in Appendix B.

Slide shows were also given at Telegraph Cove once a week from July 30 - September 8. Telegraph Cove is the closest community to Robson Bight, being located approximately 15 km west of the bight. Several Telegraph Cove locations were tried for the show and the Bauza Cove campground was found to attract the most people. Rain caused cancellation of only one slide show. In addition, campers at Bauza Cove were also encountering whales at the fishing hotspots of Blackney and Weynton Passes, since many were sports fishermen. We knew from previous years that killer whales travelling through and feeding in these passes were subjected to short-term but intense disturbance by some of these fishermen.

2.1.3 Media

Contacts with media were primarily casual and opportunistic. Only one contact, with the North Island Gazette, the local paper, was solicited.

2.1.4 Self-guided contacts

Self-guided contacts, consisting of a brochure and signs, were educational tools not requiring personal intervention of an information officer. The Robson Bight brochure (App. C) contains a map, some general killer whale biology and whale-watching guidelines, and is produced by the Ecological Reserves Program.

Two signs demarcate the eastern and western boundaries of the reserve informing the public that Robson Bight is a killer whale sanctuary and to maintain 300 m distance between themselves and the whales. An information sign, with Robson Bight brochures, was also set up near the boat ramp in Telegraph Cove (Fig. 2) for maximum exposure.

2.2 Visitor monitoring

Monitoring took place in the form of boat counts, whale-visitor encounter monitoring and upland activity monitoring. For the purpose of this study and unless otherwise specified, whale researchers are considered as visitors.

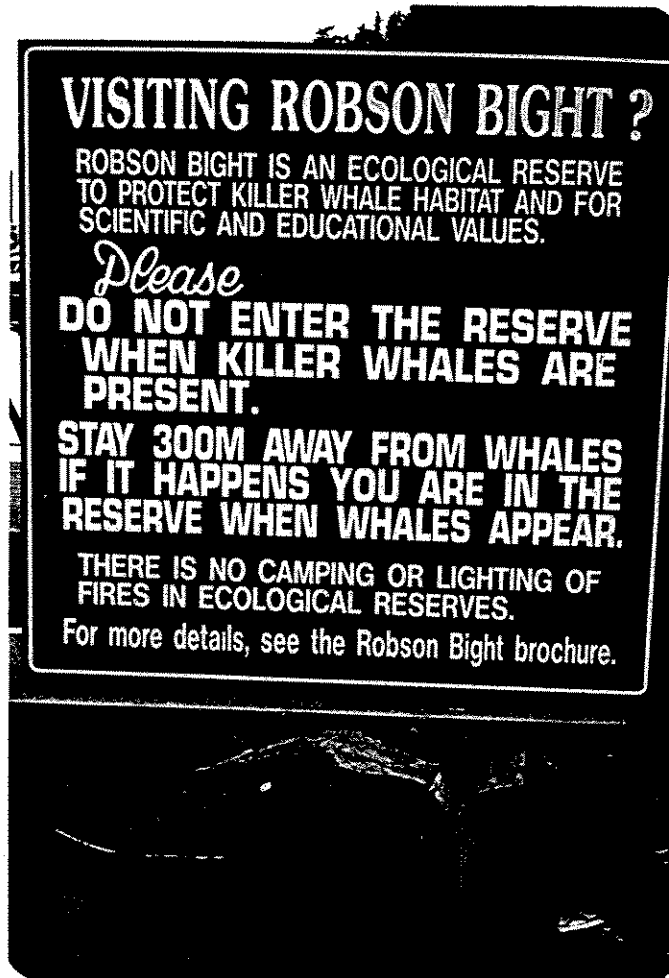


Figure 2. Robson Bight Information Sign at Telegraph Cove

2.2.1 Boat counts

Boats were counted from June 28 until September 5 to determine volumes of traffic in Johnstone Strait generally as well as in the reserve specifically. Date, time, number and type of boats, location and activity were noted at 30 minute intervals from 8 am to 8 pm daily (App. D). From June 28 to August 5, boat counts were conducted from the Boat Bay camp on West Cracroft Island and from the zodiac. For the remainder of the season, counts were done from Boat Bay and the nearby cliff, also located on West Cracroft. Boat names were noted for cruise ships and charter vessels. Daily summaries of the number of boat counts, i.e. total number of boats seen divided by number of counts, were considered rather than absolute totals of boats, to give an average. This gave an index of use. The method is somewhat biased towards larger, more visible boats.

2.2.2 Whale-visitor encounters

This monitoring study was designed by Dave Duffus of the University of Victoria as part of his Ph.D research on recreational whale-watching in BC. Recording forms and techniques were designed by Duffus; all data were provided to him for analysis. Boats encountering whales were tracked with a Faber-Castell theodolite from the cliff-top observation point of known elevation. Time period of encounter, boat type and changes in behavior and speed of both the whales and boats were coded (App. D). The area for this part of the study was Johnstone Strait from 2 km west of Kaikash Creek to the east edge of the reserve on the Vancouver Island shore and narrowing in a triangle to the cliff site. The period of data collection was June 28 to September 2.

Initiation of encounters was recorded when a boat made an alteration of behavior for the purpose of whale-watching. Encounters ended either when the boat changed direction or speed and left the whales, or when the whales eluded the boaters. Disturbance of whales had two parameters: a) intensity, for example, a boat running through a pod and b) duration, a boat paralleling a pod for several hours. Disturbance was also defined by avoidance behaviors taken by whales.

2.2.3 Upland activity

Activity on the Vancouver Island shore bordering the reserve was monitored to determine level of use presently in comparison to future activity. Date, time, number of persons, mode of entry, location, activity and affiliation (if any) were noted (App. D). from the cliff observation point and from the Zodiac. We were assisted in this monitoring by David Briggs, and his researchers. This type of information was also entered into the daily journal.

2.3 Control of whale-watching activities

All visitors contacted were told about the reserve and invited to take a copy of the Robson Bight brochure. Control of whale-watching activities consisted of maintaining a monitoring presence, contacting as many visitors as possible, informing people of the reserve guidelines, and reducing or preventing human disturbance of the whales within the reserve by boat-based, or shore-based groups. Visitors were requested to stay 300 m from whales in the reserve and not to enter the reserve if whales were already there. Visitors were also asked to stay 100 m from whales outside the reserve. Regulations regarding harassment of whales are part of the Fisheries Act, however, Fisheries personnel did not monitor or control situations unless they involved discharge of firearms. The hydrophone was used as a satisfying substitute experience for getting close to the whales. In addition, interpretation of whale behaviors provided another surrogate but no less satisfying experience.

Researchers constituted a special form of visitor and worked both in shore-based and boat-based studies in the Johnstone Strait area. , Shore-based studies, with the exception of a study at the rubbing beaches had less potential for disturbance, since the whales do not come as close, to shore. These studies required little monitoring and management.

Since researchers had recommended that an information officer position be created, this group was generally very co-operative. Most researchers were familiar with the guidelines and volunteered to distribute brochures when the officers were not available to talk to recreationists. Researchers also reported any situations involving whales and recreationists when the information officers were not present.

2.4 Program personnel and logistics

Funding from CareerTrac provided for a supervisor and two assistants to be employed for at least 100 person-days each. Funding was also provided for tents and various camp gear, boat fuel, transportation and communication/office costs. All personnel were camped on West Cracroft Island. Daily boat trips were made to the reserve across the strait. Radio communication was maintained between an observer from a cliff on West Cracroft Island and the other two information officers boating in or near the reserve.

3.0 RESULTS

3.1 Visitor Information and Education

In total, 1768 people were personally contacted on the water (84%) and during slide shows (16%) between July 1 and September 8, 1987 (Table 1), with the majority being contacted in August (53%) and July (38%). People were also informed through media, brochures, signs, and uncounted informal contacts. Shoulder flashes identifying personnel as information officers in the Ecological Reserves program facilitated encounters on the water, during slide shows and in local communities.

TABLE 1

Distribution of visitor contacts, July - September 1987.

Distribution of total visitor contacts		Distribution among boat types* at or near Robson Bight								Slide show attendance at Telegraph Cove
		SPm	LPm	SPs	LPs	Cm	Cs	K	F	
JULY (25 days) Monthly total % of Season Total Daily Average	673 38.1% 26.9 people per day	2.7%	2.6%	0	1%	25%	2.3%	3.2%	0.3%	1.1%
AUGUST (25 days) Monthly total, % of Season Total Daily Average	944 53.4% 37.89 people per day	4.2%	1.2%	0.4%	2.5%	13.9%	4.4%	12.9%	0.3%	13.6%
SEPTEMBER (6 days) Monthly total % of Season Total Daily Average	151 8.5% 25.2 people per day	0	0.1%	0	0	5.3%	1.0%	0.7%	0	1.4%
SEASON (56 days) Total number of contacts % of Total Daily Average	1768 100% 31.6 people per day	122 6.9%	69 3.9%	7 0.3%	61 3.4%	781 44.1%	136 7.7%	298 16.9%	12 0.7%	284 16.1%

* Boat Types (after Duffus and Dearden, 1986)

- SPm - Small pleasure motor vessel
- LPm - Large pleasure motor vessel
- SPs - Small pleasure sailing vessel
- LPs - Large pleasure sailing vessel
- Cm - Charter motor vessel
- Cs - Charter sailing vessel
- K - Kayak or canoe
- F - commercial fishing vessel

3.1.1 Boat contacts

There were 1484 people contacted on the water in the vicinity of Robson Bight Ecological Reserve (Table 1). Of the total number of personal contacts, 44% of these were on charter motor vessels, such as the Gikumi and the Clavella. In July, 25% of people contacted were aboard such vessels. However, in August this percentage dropped to 14% when kayak contacts became more prevalent (13%). Included are people who were camping near or inside the reserve, as all of these people had arrived by kayak or canoe. Contacts with commercial fishing vessels were less than 1%, although many boats were present in the area.

Feedback from personal contacts made on the water came in two forms: subsequent visitor whale-watching behavior and verbal feedback. Subsequent behavior usually indicated an understanding of the guidelines and desire to reduce disturbance to the whales. This involved either cessation of whale-watching for the day, or maintenance of appropriate distances from the whales. Often, visitors shifted attention from the whales to our information. Many contacts lasted 15 minutes or more, especially if we lowered the hydrophone to listen for whale vocalizations. However, in a number of instances, inappropriate behavior continued after the contact. These persons were primarily organized groups, researchers or professional photographers. Inappropriate behavior included encountering whales in the reserve and motoring closer than 300 m, motoring or kayaking close to the rubbing beaches, and being present on the beaches when whales came in to rub.

Verbal feedback was almost always positive. There were only two instances when it was not, and one of them was subsequently rectified and a positive relationship has ensued.

Charter Vessels

Contacts aboard the charter motor vessels such as the Gikumi and Clavella contributed the largest percentage of contacts due to the highly co-operative attitude of the operators. The operators felt it lent credibility to their trips. Charters such as these concentrate the number of visitors in a way that is minimally disturbing to the whales and highly satisfying for visitors. Furthermore, these charters help promote the observations of whale-watching guidelines by not entering the reserve when whales are present.

Kayaks, Canoes

Kayaks usually travel in groups of 2-8 and would travel close to shore to avoid wave and current action, unless having to make a strait crossing. This skirting of the shore is also a behaviour of killer whales, particularly in the area of the rubbing beaches. Encounters with kayaks are generally uneventful, but activity near the reserve shoreline can cause avoidance and disruption of behaviours. There is a concern that kayaks can approach resting groups of whales almost noiselessly, and startle the whales.

Kayakers and canoeists form the majority of groups which camp in the vicinity of the reserve. Many of these groups are organized and respectful of the reserve guidelines. However, a few individuals and groups either know about the guidelines and believe the rules do not apply to them, or did not know of the guidelines and camped in the reserve by mistake.

The non-motorized mode of travel is a statement of philosophy as well as method of conveyance. Kayakers tended to be less than receptive to the approach of a Zodiac initially, unless prepared before hand. However, after a few minutes of contact, most groups would be extremely eager for more information.

The number of contacts with kayaks increased markedly in August. Business people in Telegraph Cove estimated that there were at least 1000 kayak launchings this season, an increase of 400 over last year's estimated launchings. These groups were primarily organized tours from Seattle, Port Townsend, San Francisco and Vancouver. Kayak groups were also numerous in September (Borrowman, pers. comm.), probably taking advantage of the unseasonably good weather and reduced power boat traffic.

Motor Vessels

Small and large pleasure cruisers constituted 5.3% of the contacts in July and August. Boaters in large motor vessels tended to be the least cognizant of their environment. The smaller boats were generally more manoeuvrable. Boaters in this group would often be travelling quickly and accidentally run into a pod of whales; shutting down almost immediately and watching briefly, before continuing on their way. A number of contacts with motor boaters were missed, due to their ability to have an encounter and then be gone, within the space of ten minutes.

Sailboats

Large and small sailboats constituted only 2% of total contacts in 1987. Because of their relative height off the water and mode of travel, sailors were often aware of the presence of whales and would as a group, keep their distance from the animals, more than any other. Indeed, in some cases, they were so far away it didn't appear that they were whale-watching. However, if contact was made with these boats, they would often say they had been following the whales for several miles. Contact time with sailors was longer than with motor boaters and often involving hydrophone session.

Commercial Fishing Vessels

Only .3% of contacts were with commercial fishing vessels despite their almost constant presence in the area in July and August. Although most of their behaviour was non-whale-oriented, since they were either anchored, fishing or travelling through, those fishermen contacted showed respect for the cetaceans. In addition, while anchored, fishermen would often disembark in smaller skiffs to fish or explore and occasionally to watch whales. It would probably be very beneficial to increase the number of these contacts.

3.1.2 Slide shows

There were 284 people contacted during slide shows given primarily at the Bauza Cove campground near Telegraph Cove. Attendance was highest during early August when occupancy rates at the campground were close to 100% (Marilyn Graham, pers. comm.). Also at this time, many of the long-term residents were viewing the slide show.

Reactions to the slide shows were very positive. Most people stayed at least 15 minutes afterwards for questioning. Attendance was high for the two first slide shows in August and then gradually decreased towards the end of the season with the decrease in campground occupancy. Participants came from all over the U.S., Europe and Canada. During one show, the only Canadian was the one giving the show!

Slide show attendance fell off during August for two reasons. The Bauza Cove campground was not as full during the latter part of August and most long-term campers had already seen the show by mid-month.

Many of the participants were sport fishermen who spend their fishing time at Weynton or Blackey Passes, coincidentally the usual path of killer whales entering or exiting Johnstone Strait. According to fishermen, fishing became poor once the killer whales appeared. Dave Briggs (pers. comm.) and others have observed that once this happens, killer whales then become the object of some intense although short-term attention. The slide shows (App. B) were an ideal opportunity to educate this type of whale-watcher as well as potential visitors to the Robson Bight area.

3.1.3 Media

Media contacts included journalists from newspapers, magazines, television and other publications, and were due in no small measure to assistance from Stubbs Island Charters. Media contacts were as follows:

		<u>Publication Date</u>
Newspapers	North Island Gazette	July 7/87 (see App. E)
	Seattle Times	Aug/87
	San Diego Standard (?)	?
	Vancouver Sun	Sept. 7/87
Magazines	National Geographic Magazine	1 of last 3 mths of 1988
	Sunset	Nov/87 (?)
Books	National Geographic book	
	"Cruises of the World" approx. title	?
Television	CBC-TV 'Out Our Way with Wayne Rostad"	Dec. 3/87

The North Island Gazette article (App. E) seemed to have an immediate positive effect on whale-watching behavior. A number of local people subsequently contacted and commended for their behavior had all read the article.

Although Robson Bight has a very high profile with media, information published does not always include the purpose and conditional use restrictions of ecological reserves. This can be misleading, and many people have assumed that the area is open to recreationists and that they are free to approach as close as they wish to the whales. This has resulted in some very surprised people once they were informed of the situation. For example, "Sea Kayaking Canada's West Coast" by John Ince and Heidi Cottler (1982) not only mentions the rubbing beaches as a great spot to see whales but suggests camping there as well.

With continued high profile exposure, it will be even more important to publish the reserve whale-watching guidelines, and to stress the conservation and research/education purposes of ecological reserves and Robson Bight in particular.

3.1.4 Local community contacts

During supply runs to Port McNeill, as well as visits to Port Hardy, and Sointula, our shoulder flashes as well as the North Island Gazette article, created awareness about the program. The shoulder flashes identified us as information officers for the Ecological Reserves Program.

Little was actively done to foster community contacts outside of Telegraph Cove and Johnstone Strait area due to lack of manpower and logistical considerations. Local people were very receptive to anything involving killer whales. Several groups of Pt. McNeill residents who had heard of our program subsequently came to Johnstone Strait and were contacted. They were receptive, enthusiastic and observed the guidelines.

3.1.5 Self-guided contacts : brochures, signage

Robson Bight brochures were distributed during boat contacts, aboard charter vessels, in the Stubbs Island office and Bauza Cove store in Telegraph Cove, and the Miracle Beach Provincial Park headquarters. A total of 3200 brochures were used, with approximately 1000 distributed to boats, 200 at Miracle Beach and the rest at Telegraph Cove. Two 1.2 x 2.4 m (4' x 8') yellow and black signs demarcate the eastern and western boundaries of the reserve and are mounted on trees. Their lettering is extremely simple : "Killer Whale Sanctuary : Stay 300 m Away from Whales". A new sign was erected at the west end of the reserve in July as the one from 1986 had disappeared. Provincial Parks staff at Miracle Beach also executed an information sign for Robson Bight which was erected in Telegraph Cove in mid-August (Fig. 2).

The Robson Bight brochure was the most useful interpretive tool of the information program, reinforcing the verbal message and giving more detail on whale-watching guidelines than we were usually able to.

The boundary signs located at the reserve, although large, are difficult to spot from the water. With an upland portion in the reserve, the program will be able to rectify this problem. The map in the brochure is at present the best way of informing people about the extent of the reserve. Suggestions have been made about using buoy markers in Johnstone Strait. However, at the 1000 m limit of the reserve, the strait is approximately 400 m deep, and markers would be difficult to install. The simple message that the sign conveys, has led to some confusion amongst the public. Some people do not realize that the sign is also a boundary marker.

The sign erected at Telegraph Cove in late August provides the basic information necessary to bring visitors' expectations more into line with the situation actually encountered at the reserve. It also provides another point of distribution for the brochure.

3.1.6 Collaboration with local communities

The residents of Telegraph Cove were very supportive of the program. Slide shows benefitted the Bauza Cove campground since prior to this, no educational or interpretive services of any kind had been provided. No attempt was made to provide such services in other communities.

Killer whales are one of the dominant themes of tourism on the north end of Vancouver Island at present. This, combined with the genuine interest of many individuals in the whales, will probably make any programs concerning Robson Bight very easy to implement.

3.2 Visitor and researcher monitoring

3.2.1 Boat counts

Boat counts were conducted on 53 days from June 29 - September 4. Only data from July and August will be considered since the number of samples in June and September were small. In July, there were 578 counts inside and outside the reserve. In August, 266 counts were made inside the reserve and 260 outside the reserve (Table 2). Fewer counts were made in August due to increased workload of other monitoring when this duty shifted to the cliff-top. Despite fewer counts, these were probably more accurate due to greater perspective on the strait. The discrepancy in the August counts was due to visibility differences.

Indices of use within the reserve were lower than outside the reserve for most types of boats. An exception was the index of commercial seine boats in August (9.07 vs 6.88). This meant that the average number of boats per count within the reserve was over 9 during August; only 6.9 seiners/count were seen outside the reserve at that time. Seine boats moor along the reserve shoreline between fishing openings, arriving as much as a week prior to pre-empt a valued spot and frequently launching small skiffs from which they would fish, whale-watch or visit other boats. Indices were higher in the reserve for tugs towing

TABLE 2

Average number of boats per count for various boat-types inside and outside Robson Bight Ecological Reserve

BOAT TYPE	INSIDE	OUTSIDE	INSIDE	OUTSIDE	SEASONAL AVERAGE IN & OUTSIDE RESERVES (n=841)
	JULY (n=578)	JULY (n=578)	AUGUST (n=266)	AUGUST (n=260)	
COMMERCIAL PURSE SEINER	0.029	0.590	9.07	6.88	(5.422)
COMMERCIAL GILLNETTER	0.007	0.377	1.88	2.57	(1.652)
KAYAK (INCL. CANOE)	0.126	0.105	0.42	0.27	(0.378)
LARGE PLEASURE SAILBOAT	0.038	0.265	0.03	0.29	(0.309)
SMALL PLEASURE MOTORBOAT	0.057	0.218	0.07	0.28	(0.298)
BARGE	0.009	0.294	0	0.23	(0.278)
LARGE PLEASURE MOTOR BOAT	0.021	0.157	0.04	0.22	(0.203)
CHARTER MOTOR VESSEL	0.024	0.123	0.03	0.26	(0.191)
RESEARCHER	0.005	0.041	0.04	0.26	(0.127)
SMALL PLEASURE SAILBOAT	0.014	0.099	0.02	0.07	(0.106)
CHARTER SAILBOAT	0.022	0.022	0	0.08	(0.057)
FREIGHTER	0.002	0.055	0	0.06	(0.057)
LOGBOOM WITH TUG	0.043	0.022	0	0.03	(0.055)
CRUISE CHIP (INCL. ALASKA FERRY	0.003	0.038	0	0.08	(0.053)

logbooms. They generally chose a route very close to Vancouver Island sometimes passing within 30 m of shore (Briggs, pers. comm.). None were observed mooring along the shore of the reserve. Kayakers were also spotted more frequently in the reserve than outside.

In almost all cases, indices of use were higher in August than in July. This was most striking for commercial gillnetters and seiners. However, charter sailboats had a July index of 0.02 inside the reserve and an August index of 0. The Island Roamer and the Tuan, the primary charter sailboats in Johnstone Strait, both avoided entering the reserve during August in accordance with the guidelines.

Commercial fishing boats, and especially seine boats, were the most common boats present in the reserve. This was primarily because they moor in the reserve, so the same boats would be counted repeatedly. Commercial gillnetters were actually more numerous but moored in bays on West Cracroft when not fishing, out of sight of the observers. Counts of other types of boats generally corresponded to the actual number of boats, except for logbooms, which moved so slowly they might be counted six or seven times in a day. The use index minimized this problem of double-counting.

3.2.2 Whale-visitor encounters: preliminary results

A preliminary summary of whale-visitor encounter monitoring prepared by Martin West, a fellow information officer, is presented here. Final results will be provided later by David Duffus, from the University of Victoria.

Approximately 75% of the 350 whale-visitor encounters occurred along the Vancouver Island shore between Kaikash Creek and the east end of the reserve (Fig. 1). Approximately 20% occurred mid-strait and the remainder were recorded along the West Cracroft Island shoreline. Encounters began either along the Vancouver Island shore or more commonly, with boaters sighting the whales from mid-strait and intercepting them on the south shore. Few encounters were initiated within the reserve except when boaters parked near the estuary waiting for whales.

Average encounter durations were as follows:

- (1) 12 minutes for kayaks
- (2) 50 minutes for recreational sail and motor boats
- (3) more than 2 hours for large charter boats (motor & sail)
- (4) 15 minutes for small charter boats (motor)

Average distances maintained during encounters were as follows:

- (1) kayaks - approximately 25 m
- (2) small recreational boats - approximately 50 - 100 m
- (3) large recreational boats - approximately 100 m
- (4) small charter boats - less than 100 m
- (5) large charter boats - approximately 100 - 200 m

Researchers and professional photographers approached whales the closest. In addition to duration, intensity was a characteristic of encounters. Intensity is a combination of speed and approach, distance maintained during encounter, and behaviour of the whales.

Pods were seen to be split into smaller groups mostly by small recreational boats 10 to 20 times through the summer. The "harassment" behavior code was only used 5 to 10 times during the season.

Small recreational boaters primarily disturbed whales through intensity while researchers and photographers disturbed through duration of their encounters.

The most common avoidance tactic by whales was to sound (dive for longer than normal). Fluke slapping was observed occasionally. Changes in direction were most radical in avoiding commercial fishing boats. Whales usually continued in a straight line when paralleled by a boat. Positive changes in direction were noted on 19 occasions, 17 of these in relation to the Gikumi or Clavella, large charter boats.

Some whale subpods were more frequently watched than others, i.e. seemed to be habituated to the presence of boats. In decreasing order of frequency, these were the A11's, A5's, A30's, other A's, C's, D's, B's. Other pods such as G's, H's, W's and R's were watched less and dove more often.

For the most part, boaters approached the whales at a sharp angle and then either ran parallel or behind the whales for the duration of the encounter. The next most common approach was to "leap-frog" the whales. This could occur from 1 to 20 times in an encounter. Whales appear to avoid close "leap-frogs".

Essentially, smaller boats were more maneuverable around the whales. Whale-watching distances varied from more than 300 m to less than 10 m. Most people seemed to choose a "safe distance" at the beginning of the encounter and maintained it for the duration. The distance seemed pre-determined and it was unusual for someone who had been staying 300 m away to rapidly approach much closer.

Researcher encounters with whales were of longer duration than those of recreationists. Groups of whales appeared to choose a direction of travel gradually away from researchers and subsequently researchers would change their direction to again parallel the whales. Analysis of data by Dave Duffus may substantiate this.

Researchers usually avoided entering the reserve to observe the whales this season, unless an unusual behavior or group needed documentation. However, there was an instance when a researcher entered the reserve to follow the A30 subpod, one of the most commonly observed in the pod. An encounter between a researcher in a kayak and a group of whales outside the reserve lasted for approximately one hour and

consisted of some very unprofessional behavior (yelling, very close approaches, and rapid maneuvering). This display was the exception to the minimal disturbance techniques displayed by other researchers in the vicinity of Robson Bight.

3.2.3 Upland activity

There were a number of activities which took place in the area upland from the reserve : blasting for a logging road, camping, and hiking in the estuary.

Blasting took place on 20 days in July and August according to Chris Mehling and Dawn Smith, researchers located nearby. On weekdays between July 13th and July 24th, blasting occurred twice daily at 11 am and 4 pm. It is presumed that the blasting was part of the logging road-building process for Peel-Main, Western Forest Products access to timber in the Fines Creek drainage east of the reserve (Darling, 1986).

Camping in the reserve was observed on only two occasions, both times by canoeists. In the first occasion, the individual was aware that the reserve did not include the upland portion. Rather than antagonizing the individual, he was asked to watch for potential harassment of whales and to explore areas outside the reserve to use as alternative campsites. He was also asked to maintain a low profile, especially when kayakers were in sight.

On the second occasion, a group from San Francisco State College camped on the point directly behind the western boundary sign for the reserve. They were requested to move to the beach west of the reserve twice, but this campsite had been traditionally used by groups from this college since 1985. Their campsite was completely hidden from the water so that it was not obvious that they were camping.

Hiking and lunching in the estuary was the most common activity in the upland, observed on 18 occasions during July and August. Casual use of the reserve for such purposes was allowed although not actively encouraged.

There are a number of beaches within the Bight area of the reserve which have inconspicuous campsites adjoining them. Controlling camping at these sites is difficult when individuals haven't been observed landing and make an effort to remain hidden. No one was observed using these sites during July and August.

There were several occasions when individuals were observed landing at the rubbing beaches (as reported by Dave Briggs' research crew.) It is doubtful whether most of these activities would have been noted by our team due to the location of the beaches in relation to the cliff and location of most of the boat activity. On at least two occasions, individuals from commercial seine boats would bring a skiff to the beach.

On two other occasions, recreationists were reported at the beaches by Dave Briggs. The most serious incident was with Michael Modzoluski's Sea Trek kayak group from San Francisco. They had been contacted twice prior to the incident and specifically asked to stay away from the beaches. On August 13, we received a report from Dave Briggs and went over to find Modzoluski's group talking with several of Briggs' crew. Subsequently we learned they had been dancing, yelling and playing a flute while whales were rubbing.

Upland activity in the Tsitika River valley is still relatively minor. No people were observed within the estuary who had hiked down the river valley. Most people using the reserve observed the "no camping" restriction, and no fires were seen.

Access from the new logging road at the east end of the reserve was not used by recreationists. However, it is likely in the near future, unless restrictive measures are taken.

3.3 Control of whale-watching activities

3.3.1 Visitor activities

Co-operation and information were the primary tools available for controlling whale-watching activities. Visitors were asked to follow whale-watching guidelines so as not to disturb the whales. This aspect of the program was very successful with all but two contacts being positive. Compliance with the guidelines was also very high although no figures were kept on this part of the program.

People encountering whales for the first time were often enthusiastic but uninformed whale-watchers. They would sometimes maneuver too closely to whales or otherwise potentially disturb them by positioning their boat in front of a resting group of whales. Generally, only a small amount of information was required to change this group's behavior. First-time visitors who had been whale-watching in Hawaii or in Alaska's Glacier Bay were generally well-informed in whale-watching behavior and would motor slowly and stay at least 100 m away from whales. However, as the reserve is not marked on any charts, all first-time visitors usually needed to be briefed on the boundaries of the reserve, and the 300 m guideline.

More experienced visitors were often familiar with the reserve guidelines and were either easier to control or did not think the guidelines applied to them. Many of these visitors felt a sense of "ownership" of the resource, especially if they operated commercially in the area and would attempt to get as close as possible to the whales. This sentiment applied especially to charter boat operators, local residents, commercial fishermen, professional photographers and researchers. Interactions with these groups were probably the most critical for the long-term success of the program. The most effective approach with these individuals was to call attention to the example they were setting for other boaters, in terms of behavior around whales.

Researchers are a special group in terms of their whale-watching behavior. Their conduct partially arises from the need for co-operation, assistance and peer approval from the researcher "community" in Johnstone Strait (Taylor, in press). This community includes the volunteer wardens and charter operators Jim Borrowman and Bill Mackay, researchers from Humboldt State University, University of California at Santa Cruz, the Ecological Reserves Program, Department of Fisheries and Oceans as well as independent researchers living locally on Hansen Island, and Echo Bay.

Researchers acquiring close observations of behaviors and photo identifications are boat-based, following pods at distances often closer than 300 m for periods of 20 minutes to several hours. Shore-based researchers are generally more interested in acoustic behaviors and overall movements of pods, recording from hydrophones or tracking with theodolites. To truly monitor their impact within the reserve, theodolite tracks of whales and boat-based researchers need to be conducted synchronously. Additional data will be available from Duffus (in press). However, it appears that whales gradually try to swim away from or negatively orient the new anticipated direction of researchers' boats.

Although there was a small amount of resistance to the increasing control over activities in and around the reserve, most researchers welcomed more control, even if inconvenient.

3.3.2 Collaboration with agencies and individuals

The University of Victoria, Department of Fisheries and Oceans and the RCMP are agencies with which contributed to the management of whale-watching activities at Robson Bight during the 1987 season. Stubbs Island Charters, an important private group also help inform the public and assisted in many other ways.

The co-operative arrangement with the University of Victoria has already been discussed in section 2.2.2. The Department of Fisheries and Oceans has agreed to place signs outlining whale-watching guidelines in major marinas on the North Island for 1988. The RCMP marine patrol responded to two incidents which involved discharge of firearms with whales in the vicinity of the reserve. They also charged an individual who had been leading whale watching expeditions from the United States without appropriate work permits.

Stubbs Island Charters helped us to inform over 600 people about the Ecological Reserves Program and Robson Bight, in particular. Jim Borrowman, the volunteer warden for Robson Bight and an active agent in the establishment of the reserve, along with his partner, Bill Mackay, contributed in many ways to the success of the summer program.

Volunteers came to us through a number of routes: University of Victoria; Cetacean Watch, a local interest group; and as personal friends. They were invaluable as crew relief, providing assistance in cliff observations and other duties.

David Briggs and his crews researching whale use of the rubbing beaches were without a boat this summer. One of our responsibilities this summer was to supply their crews. They assisted our team with observation and boat duties as a change of pace from their work.

3.3.3 Management issues

A variety of management issues were discussed at an annual researchers' workshop held on Hansen Island Aug 29-31/87. Issues specifically dealing with visitors and researchers at Robson Bight will be covered here.

Increasing tourism

Robson Bight may be the focus of a tourism industry about to boom. Visitation is certainly on the increase. More than 500 new campsites and 4 boat ramps have opened on the north island. If so, planning for the future is essential, encouraging more land-based whale-watching, and group charters, rather than individual boats. A suggestion was made for an interpretive park at Cracroft Point to take the pressure off visitation at the reserve.

Monitoring impacts of boaters on whales

Researchers agreed there was a need for long-term data on resting behavior (such as monitoring of respirations, and associations of individuals) to determine impacts on whales. John Ford remembered longer periods of resting and sleeping in the Bight in 1978-82 than at present. Jeff Jacobsen discussed the larger aggregations of resting whales during the 1970's than are seen at present.

Use of reserve by researchers and photographers

Peer review of research proposals and circumstances appropriate for reserve use by researchers and photographers was discussed. Peer review may be necessary in the future to determine validity of projects and whether crucial biological and management questions are being answered. It was generally agreed that researchers do not need to use the reserve on a regular basis. However, there are some projects such as time budgets where it is necessary to follow whales throughout the entire day, regardless of where they go. Use of the reserve by professional photographers should be reserved only for cases where there were demonstrated benefits to the research community and public education. Care must be taken to assure that research is undertaken to increase the scientific community's public's knowledge of these whales, rather than just for more personal motivations. While long-term studies are important, capacity for boat-based research is limited and space should be made for an influx of new research.

3.4 Program Personnel and Logistics

Three persons were hired through the CareerTrac program on June 15 to handle the visitor program at Robson Bight. A field program was proposed, equipment ordered, purchased and packed, and the crew transported to the field camp by June 26th.

The field camp at Boat Bay was originally set up in 1981 and has had continual summer use since that time.

A habituated black bear(s) began visiting camp in early July and foiled all our efforts to keep food out of reach until we constructed a bear-proof platform in mid-July. From that time on, we were visited occasionally and a tent was damaged, but otherwise bears gave us few problems. Flares, smoke bombs and our air horn (all recommended bear deterrents) were kept accessible for emergencies.

During July, a slide show was produced. We began showing it in Telegraph Cove at the end of July and continued on a weekly basis until September 8th. This necessitated an overnight stay in Telegraph Cove for the crew since the slide show was held outdoors in the evening. We could not run the boat at night.

Supply runs were made to Port McNeill once a week, leaving the boat moored in Telegraph Cove. Between supply runs, a vehicle was left at the Cove. To minimize parking charges (\$3.00/day), we co-operated with two of the other research teams in sharing the use of one vehicle. Equipment is now stored at Miracle Beach Provincial Park.

3.4.1 CareerTrac program

The CareerTrac program provides training and employment for unemployed youths aged 17 to 24. The Robson Bight visitor management program provided two students with training in the areas of adventure tourism and resource management, interpretation and public information, logistics and field camp maintenance, boat handling and survival, and first aid techniques. Training for the supervisor included logistics, interpretation, and report writing.

3.4.2 Length of season

Our work depended on the presence of both boaters and whales. During late June and early July, 1987, neither were frequent, but this varies from year to year. Similarly in September, after our field season was finished, sightings of whales were less frequent as were boaters. However, some boaters wait until the shoulder season to camp in Robson Bight when there are fewer people around (Taylor, in press; Borrowman, pers. comm.).

3.4.3 Number of personnel required

During the 1987 field season, it was necessary for all three staff to work at the same time as well as do the supply runs together. One person

left at camp without a boat was not efficient. In addition, it was difficult for anyone to take any time off without inconveniencing the other two. At least one person was needed for observing from the cliff and two were needed in the boat for safety and docking or approaching other boats. As a consequence, we accumulated considerable time "credit", to be taken at the end of the field season.

3.4.4 Use of volunteers

Volunteers were a much-needed resource this summer, providing enthusiasm and manpower. Unfortunately few could stay longer than a week, making it necessary to have a fourth person in the boat for town runs (one volunteer going out, another coming in). The size of the boat, loaded with 4 people and supplies for our camp and often David Briggs' camps, made supply runs logistically difficult.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Visitor Information and Education program

Robson Bight is an ecological reserve created to protect key habitats for killer whales, to prevent harassment of whales while using those habitats, and to maintain unique opportunities for killer whale research and education (Ecological Reserves Program, 1987). A visitor information and education program should aim not only to minimize disturbance to the killer whales, but to provide a satisfying experience to the visitors. The visitor program should attempt to substitute information and interpretation for an experience that consists solely of getting close to the whales. This program should use a variety of media and methods to enhance visitor satisfaction and community support, ensure protection of the reserve and assess impacts for long-term management.

4.1.1 Boat Contacts

Contacts were made primarily with boaters as there is no road access. Of the 1484 contacts made, less than 1% were with commercial fishermen, the remainder being with recreational boaters. However, commercial seine crews were occasionally seen exhibiting whale-watching behavior, i.e. launching small boats in which they followed whale groups. In addition, commercial fish boats were present in the ecological reserve at levels at least 900% higher than other groups. **It is recommended that future information and education programs be also directed at commercial fishermen. An ideal time to contact seine crews is between fishing openings when their boats are moored at or near the reserve.**

The program of contacting boaters near the reserve provides both control and information, with an immediacy necessary to prevent harassment and degradation of whale habitat. The method used was very successful. **The program should continue in the same format.**

4.1.2 Slide Shows

Slides show attracted 284 attendees in Telegraph Cove although only offered on 8 occasions. Recreational whale-watchers originate from other local communities such as Port McNeill and Port Hardy. Recent increases in numbers of campsites and boat launches may affect the amount of recreational boat traffic in Johnstone Strait. In addition, many commercial fishermen are local. General content of the slide show was received very well.

The distribution of the Robson Bight slide show, with its emphasis on whale-watching guidelines, should be expanded to include local communities such as Port Hardy, Port McNeill, Sointula, and Alert Bay.

The exceptionally good weather during summer 1987 will not necessarily be repeated in the future. **An alternative, sheltered area should be found for shows during inclement weather.** In addition, the program could be expanded to include spring shows in these local communities.

4.1.3 Media

Media contact was an unanticipated channel of communication. Contacts were made with newspapers, magazines and television such as National Geographic Magazine, and CBC-TV. The contact with the local newspaper, North Island Gazette, had immediate positive repercussions. Whale-watchers who had read the article and to whom we subsequently talked were among those who maintained at least a 100 meter distance to whales.

Effort should be made to repeat the article in the North Island Gazette in the future seasons. **Content of any articles should include information on whale-watching guidelines and the sanctuary purpose of the reserve.**

4.1.4 Contacts and Collaboration with Local Communities

While killer whales have a sanctuary at Robson Bight, protection for the animals outside the reserve is minimal. Public education and the popularity of killer whales in aquariums have fostered a genuine interest in the species. Interest by the local communities of northern Vancouver Island would best be channelled by promoting a sense of ownership of the whales in their local waters. Only through this local support will the whales be effectively protected. Cooperation with local communities is critical to the success of the program.

Slide shows and media contacts should foster co-operative relationships in local communities as well as this sense of "ownership".

Every effort should be made to foster positive relationships in the local communities. Although this is common sense, this aspect of an information program can easily be overlooked. In a program where the protection of the resource is entirely dependent on the co-operation of visitors, researchers and agencies, the positive relationships are essential.

4.1.5 Self guided Contacts: Brochures and Signage

Presently self-guided contacts consist of a brochure, two boundary signs and a sign in Telegraph Cove briefly outlining whale-watching guidelines. The brochure, with general killer whale biology, whale-watching guidelines and a brief outline of the Ecological Reserves Program, was distributed primarily at Telegraph Cove and on the water at Robson Bight. The brochure was the single most important interpretive tool. **Continued publication and distribution of this brochure is strongly recommended.**

Although self-guided contacts cannot replace the role and presence of a warden in maintaining the integrity of the reserve, they are important aids to this objective. However, visitors often expressed confusion over intent of the boundary signs. When an upland extension is added to the marine component of the reserve, more detailed signage will be necessary on the boundaries to clarify the restrictions of the reserve.

Recommended changes to the brochure are included in Appendix C. **The brochure should continue to be distributed at the Stubbs Island charter office, and at the Bauza Cove office, where the visitor is most likely to pick it up and look at it.** In addition, it should be available under the "Visiting Robson Bight?" sign at Telegraph Cove.

Although boat contacts, brochures, and signs at Telegraph Cove are useful ways to reduce impacts on killer whales and their habitat, in the future this may not be enough. Researchers have led the trend towards land-based observation and this is a viable option for recreationists. An observation station located for example at Blackney Passage is a possible interpretive center not only for killer whales, but Minke whales, Dall's porpoises and several species of seabirds are also present in this active tidal channel.

4.2 Visitor Monitoring

4.2.1 Boat Counts

Indices of use were higher outside the reserve than inside and higher in August than July. The indices of use inside the reserve were highest for commercial seine boats (9.07 in August). Between openings, the moored boats would often launch small skiffs which whale-watched and "buzzed" whales in the reserve.

Commercial fishermen should be included in an education program to minimize disturbance to killer whales. As their perceptions and reasons for presence within the reserve are very different from those of recreational whale-watchers, the education program must be tailored to account for these differences.

4.2.2 Whale-visitor Encounter Monitoring

From the preliminary results, some tentative conclusions can be made regarding intensity and duration of approximately 350 encounters observed. Generally, both encounter duration and distance maintained and increased with boat length. The most intense encounters happened at least 10 times during the summer when small recreational boats split pods into smaller groups. Researchers generally approached whales more closely than recreationists but with less speed and did not cause pods to separate. Encounters between researchers and whales may have been longer, but were not always observed.

As this monitoring was completed as part of a Ph.D. thesis study from University of Victoria, it may not necessarily be continued as an integral part of the information program in future years. It is unclear that this type of study will give information indicative of long-term impacts and disturbance of the whales. At the researchers' workshop, other indicators were discussed. Respiration data and documentation of resting behavior may be more important.

Analysis of the whale-visitor encounters should be examined closely to determine whether this is appropriate data to be collected in the future. In addition, it should be examined whether it is appropriate that any monitoring of whale behaviour be included as part of the visitor program.

The cliff-top observer is a necessary part of the visitor program, to report encounters which the boat team cannot see because of their low perspective on the water. It is useful to have the observer continue monitoring boat and whale encounters but possibly in a different way. If one observer were to monitor respirations of the focal animal with an event recorder, as well as resting behaviour and another observer to monitor whale-oriented boat activity, quantification of respiration in the presence or absence of boats would be possible. Sue Kruse, of the University of California at Santa Cruz, has done a study similar to this and may be able to assist in methodology.

Another option, without attempting to determine impacts on the whales, would be to only measure distance between whales and boats, using theodolite. To be useful, the data would have to be available in real-time to inform visitor of how closely they are approaching whales (or vice-versa). **It is strongly recommended that a research program be continued on the cliff that includes some aspects of both whale and boat behaviours.**

4.2.3 Upland activity

Upland activity above the reserve was primarily recreational in nature, and consisted primarily of picnicking, hiking, whale-watching, and tardy camping. In addition, a research team was based in the reserve but kept an extremely low profile, so that recreationists were unaware of their presence. This low level of activity is probably the result of limited access, and change is anticipated as logging road access increases. **To control land access, seasonal closure of logging roads by gating should be considered. Efforts should be made to direct activity towards a land-based observation station away from environmentally sensitive areas.**

4.3 Control of Whale-watching Activities

Control of visitors on their boats was successful. Little change is recommended for this aspect of the program other than for the acquisition of a slightly larger and less deflatable boat.

Although no figures on compliance to guidelines by contacted whale-watchers kept, it was quite high. To assess this more accurately in the future, **cliff observations should include whale-watching behaviors pre- and post-information contact.**

4.3.2

Researchers were generally self-regulating, that is, conscious of the impact they could have on whale behaviour. They tried to minimize this as well as attempting to enter the reserve as little as possible. This behaviour was re-inforced by peer pressure and the need for cooperation among the researchers. However, there are few control measures that can be taken by the Ecological Reserves Program, other than denial or withdrawal of a research permit. This has the disadvantage of transferring them outside of a process that documents their research and actions.

4.4 Program Personnel and Logistics

The program was very successful regarding training, providing a unique opportunity to development human and resource environment. In the future, enthusiasm for biology must be considered as a characteristic for candidates to withstand isolation, long hours and a camping situation.

The field season lasted from 26 June to 8 September. While it began early enough to set up camp prior to much whale-watching activity, it may not have lasted long enough to monitor and control activity in September. **It is recommended that future field seasons extend from late June to September 30. It is also recommended that start-up time be lengthened from two weeks to one month to allow adequate time for planning, hiring and gearing up for the field season.**

Personnel were paid on an hourly wage rather than salary. Hours were very long and it was impossible to avoid overtime. It is recommended that in the future, personnel be salaried and paid at a level which recognizes the amount of overtime necessary. This would simplify bookkeeping and completion dates for employees.

Three persons were found to be inadequate to conduct an uninterrupted field program in addition to supply runs and slide programs, however more time off was needed. It is recommended that future personnel should be a minimum of four.

Volunteers were found to be an extremely useful source of willing manpower. It is recommended that a volunteer contingent be encouraged, with the possible caveat of minimum 2 week work periods.

At least one person in camp should have their radio operator's licence. VHF radios should have a registered vessel name so that calls may be made from camp in the event of an emergency.

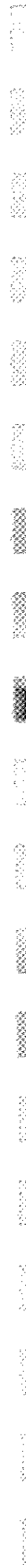
The use of Boat Bay as a camping site by researchers has been casual since the beginning. However this site has many valuable characteristics, not the least of which is protected moorage and a kitchen-living area useful for the storage of data and equipment. However, there is no guarantee that Boat Bay would not be usurped by a recreational interest or a research group since occupation has always been determined on a first-come, first-serve basis. It is recommended that the relationship with the tenure holder, Crown Forest, be formalized at least to the point of obtaining a letter of permission for Ecological Reserves Program personnel to camp here.

5.0 LITERATURE CITED

- Darling, J. 1986. An assessment of the impacts of human activities on the killer whales of Robson Bight Ecological Reserve with management guidelines. Report prepared for the Ecological Reserves Program.
- Taylor, R.E. in press. The use of a marine mammal reserve by researchers and photographers. Masters of Natural Resources Management paper. Simon Fraser University.

APPENDIX A

Proposal



PROPOSAL FOR INFORMATION AND MONITORING SERVICES
AT
ROBSON BIGHT ECOLOGICAL RESERVE

ECOLOGICAL RESERVES PROGRAM

B.C. MINISTRY OF ENVIRONMENT AND PARKS
VICTORIA, B.C.

BY

ROBIN TAYLOR

CAREERTRAC PROGRAM

ADMINISTERED THROUGH THE OUTDOOR RECREATION FOUNDATION OF B.C.
VANCOUVER, B.C.

**PROPOSAL FOR INFORMATION AND MONITORING SERVICES
AT
ROBSON BIGHT ECOLOGICAL RESERVE**

This proposal outlines information and monitoring services to be provided at Robson Bight Ecological Reserve between June 15 and September 15 1987 and in Victoria between September 16 and November 20. The following describes services provided, personnel, project description, work schedule, training component, safety plan and budget.

Robson Bight Ecological Reserve was established in 1982 by the provincial government to protect core habitat for the world's largest and most accessible concentration of killer whales. It is a unique and valuable site for long-term scientific study of the whales, particularly of behavior and population biology. Recommendations have been made every year since 1981 for the provision of a full-time warden to ensure the protection of the reserve. In 1987, the Ecological Reserves Program of the B.C. Ministry of Environment and Parks sponsored a CareerTrac pilot project for Robson Bight visitor management.

1.0 SERVICES PROVIDED

- * Monitoring of boat traffic, and whale-boat interactions, with consideration of long-term management of the reserve.
- * Information and interpretive services to boaters at Robson Bight Ecological Reserve and to visitors at Telegraph Cove, to maximize visitor education and minimize disturbance of the whales.
- * Protection of the resources at Robson Bight Ecological Reserve in accordance with the Ecological Reserves Act.

Also to be Provided

- * Report on methodology, activities and observations as well as recommendations for management (by November 23 1987)
- * Duplicate slide file of minimum 100 good quality photographs (by November 23 1987)
- * Input to the terms of reference for a management plan for Robson Bight (as required)

2.0 PERSONNEL

The crew will consist of a supervisor and two assistants. The specialized nature of the work will require a relatively high degree of training in the assistants, therefore students of geography or biology background are necessary. The supervisor will be Robin Taylor, a Masters student from Simon Fraser

University with experience in management and public information at Robson Bight. The assistants will be Martin West, recently graduated from UBC in physical geography and Michelle Taylor (no relation to R. Taylor), a graduate of geography at University of Victoria. Robin Taylor assisted on a University of Victoria survey of whale watchers at Robson Bight in 1986, where visitors were contacted about the reserve and she supervised a field crew. Resumes are attached.

3.0 PROJECT DESCRIPTION

This project will establish an on-site management routine for control of whale-watching activities, visitor and whale monitoring and visitor information and interpretation. Activities to be monitored will include data useful to management in the long-term. The number of fishing boats, recreational boats, industrial traffic and presence of log booms will be monitored. In addition, researchers and photographers will be noted and behaviors recorded.

Typically a day will start about 8 am with monitoring from camp of activities in Robson Bight and in Johnstone Strait in general. Two persons will be assigned to information and interpretation each day. The other person and a volunteer will be assigned to monitoring from the cliff. This cliff position is essential to the effective operation of the boat crew, as the boat crew cannot see far from their position on the water. However, the boat crew needs to be on the water in order to intercept boating visitors. Close radio contact will be necessary to the effective operation of both crews. Duties will be rotated weekly to maximize training possibilities. A form for recording data is attached. Information useful to the long-term management of Robson Bight will be priority.

Monitoring will continue until mid- to late afternoon, when conditions usually become too rough for recreational whale watching or monitoring from the boat. At that time, the cliff crew will be picked up and monitoring will continue if necessary from the Boat Bay camp as long as visibility allows.

Interpretive services to be provided are weekly slide shows in Telegraph Cove, distribution of Ecological Reserve pamphlets, information on an informal basis to visitors and opportunities to listen to a hydrophone carried in the Zodiac. Efforts will be made not only to involve visitors but also commercial fishermen where possible.

Boat encounters will be made in a friendly and informative manner, with prior contact on VHF channel 16 if possible, and with an approach sensitive to their mode of travel. Ecological Reserve pamphlets on Robson Bight will be distributed, and visitors will be informed of researchers' activities. Failure to act in accordance with the reserve guidelines will be reported with boat name, date and time and a detailed description of the

behavior. A daily journal will be kept. Serious transgressions of the reserve guidelines and other incidents such as whale entrapments, will be reported to Department of Fisheries and Oceans patrol vessels or enforcement officers in Alert Bay initially. This journal will be included as an appendix to the final report. Transgressions and incidents will also be reported to Provincial Park district manager in Parksville, Ecological Reserves Unit in Victoria, the volunteer warden in Telegraph Cove and Department of Fisheries and Oceans research staff in Nanaimo.

Management of the reserve also depends on non-personal interpretation in the form of signs and pamphlets. The crew will distribute the Robson Bight pamphlet produced by Ecological Reserves Unit wherever appropriate. Signs marking the boundary of the reserve will be maintained and improved if possible. Logistics for a sign in Telegraph Cove will be investigated, reported on and implemented if possible. Recommendations will be made on any changes to these interpretive devices for the future, such as number and content of pamphlets and location of signage.

4.0 WORK SCHEDULE

Total period of work will be June 15 to November 23 1987. Assistants will end work one week earlier. Period of field services at Robson Bight will be July 1 1987 to September 15 1987.

After a two week period of training and orientation, the crew will depart for Telegraph Cove on June 26 1987, with stops scheduled in Nanaimo and Parksville. Depending on weather and transportation, camp will be set up at Boat Bay in Johnstone Strait by July 1 1987. All services will be provided until September 15. At this time the crew will move to Victoria and Vancouver to write reports, assist in data compilation, store gear and complete any other commitments to Ecological Reserves.

Daily work schedule will begin at 8 am for one person to monitor activity on the strait. Cliff monitoring will begin at 9 am, weather permitting. The early monitoring shift will end an hour earlier than the other two. Most recreational whale-watching is over by 4 pm, although monitoring of other activity will continue in the strait until nightfall. Persons will be assigned to monitoring from camp from approximately 5 pm until nightfall on a rotational basis.

At least once a week, crew will travel to Telegraph Cove to give interpretive programs, obtain supplies and report on activities to relevant administrative contacts in B.C. Ministry of Environment and Parks. In addition, research staff at the Department of Fisheries and Oceans in Nanaimo will be kept informed of activities.

Time off during the summer will be negotiated with staff. At this point, neither assistant has requested any time off. On

weather days, staff will work as much as possible on data reduction, data entry and camp maintenance. Otherwise, weather days may also be time off. Total time worked will not exceed the equivalent of 21 40-hr. weeks for assistants and 22 weeks for supervisor.

5.0 TRAINING COMPONENT

The supervisor will further skills in:

- * planning, operation and reporting of a field project;
- * supervision and administration;
- * planning, implementation and execution of interpretive programs; and
- * identification of individual killer whales by distinctive markings.

Assistants' positions contain a large training component. Among the skills to be learned or further are:

- * experience in wilderness tourism and natural resource management;
- * public relations and interpretation, public speaking;
- * recording of various types of data including observations of human and animal behavior;
- * visual identification of individual killer whales by distinctive markings;
- * operation and maintenance of a field camp;
- * survival and first aid techniques;
- * operation of VHF radios; and
- * boat handling, safety and maintenance;

Many of these duties will be alternated to maximize training. In addition, assistants will be introduced to background reading on the ecological reserves program in British Columbia, observational techniques, Robson Bight and wilderness tourism.

6.0 SAFETY PLAN

Highlights

- * Crew working in the boat will be required to wear a personal flotation device at all times, which in most cases will be a 'Mustang Exposure' suit. The boat will also be equipped with survival and first aid kits, repair kit and VHF radio when operating. Safe handling of the boat will be emphasized.
- * All personnel will have at least a St. John Emergency First Aid Certificate and one will have current Standard First Aid and Heart Saver II Certificates.
- * Assistants will be trained in the keeping of a 'clean' camp, to minimize conflicts with wildlife.

The water of Johnstone Strait averages 7 degrees C. during the summer, with tidal currents up to 4 knots. Winds often reach 25 km/h. Obviously conditions such as this require caution and judgment as well as good equipment. Every effort has been taken to choose serious, responsible assistants. Judgment will also be required to determine when conditions are safe to work and when they aren't. The best boat for working in these sea conditions, as well as approaching other boats, is an inflatable. A 14 -ft Zodiac will be shared with a research crew from the University of Victoria. All care will be taken in the proper operation of this boat and its motor. In addition, the University of Victoria will lend our crew 3 Mustang exposure suits, two first aid kits, a survival kit and two VHF handheld radios to maximize safety and adequate communication. The crew will be briefed on hypothermia, and outdoor safety (see attached) and will have a current St. John Ambulance emergency first aid course. In addition, one member of the crew will have a current St. John Ambulance standard first aid certificate and a CPR certificate.

Bears have been seen in camp several times a year. The crew will be drilled on bear safety and keeping a clean camp. However, since the camp has a permanent location, bears may have become somewhat habituated to the site and extra vigilance will be required in disposing of garbage daily. The location of flares will be known to all camp members and kept in a convenient location away from the kitchen. Crew members will be camped away from the kitchen area to minimize the chance of a night encounter.

The supervisor is aware of all medical conditions of the crew. In the event of a medical emergency, a VHF radio network links Telegraph Cove and Boat Bay, where the camp is located. In addition, it is possible to send a general alert on VHF channel 16 at any time of the day. The nearest medical clinic is located approximately 10 miles north of the camp site, at Alert Bay.

APPENDIX B

Slide Show Script

SLIDE SHOW SCRIPT - ROBSON BIGHT ECOLOGICAL RESERVE

Prepared by Robin E. Taylor, July, 1987

Slide
Number

(Picture of Whale and reserve sign)(Reserve sign only)

Robson Bight is an ecological reserve. This means that it was set aside by the B.C. Provincial Government as a protected area for Killer Whales, to be used for research and educational uses only.

(Killer Whale crowd)

Robson Bight is a unique place. The British Columbia coast (along with the Puget Sound area of Washington State), contains the densest concentration of Killer Whales anywhere in the world in an accessible location.

(The Bight-scenic R.T.)(Map D.D.)

Robson Bight is located on Johnstone Strait, at the mouth of the Tsitika River. It is a relatively protected embayment where Killer Whales feed, socialize and rest.

(Northern community, south community, transients)

The Killer Whales which frequent the Bight are called the "northern community" by Mike Bigg and his associates at the Pacific Biological Station in Nanaimo. The northern community, southern community and the transients from three separate populations.

(K.W.'s and ferry)(K.W.'s and map of Vancouver Island?)

The northern community ranges as far south as Cope Mudge near Campbell River, which also happens to be the northern range extension for the southern community. Whales from the southern community are those most frequently seen from the B.C. Ferries from Vancouver to Victoria, and Vancouver to Nanaimo.

(K.W., ^{male and females} ~~and~~ dolphins)

Killer Whales are the largest member of the dolphin family. Males are larger than females. Adult male dorsal fins may be 6' in height while those of females are only 3'!

(Map. Vancouver Island)

Transient Whales have been seen all around Vancouver Island, as well as north and south of Vancouver Island.

(Salmon, J.B. Herring, large aggreg. - K.W., picture J.B. with devious and blow)

The northern and southern communities are primarily fish eaters, living in pods or stable family groups of 5-45 animals. Their movements are quite predictable, their respirations frequent and they communicate frequently when they are hunting.

(J.B. seal(s), small J.B. group transient)

Transient Killer Whales are primarily marine mammal eaters, living in pods of 1 to 5 animals, and they breath less frequently than

resident whales, which makes them harder to follow. They are very quiet when hunting, probably so they don't alert their prey to their presence. And they have pointy dorsal fins.

(Mike Bigg, bull W A2) - 3 generation shot

Mike Bigg and his colleagues have found that the family group or pod is an extremely stable unit. Pods are made up of sub-groups or "mom-pods" which centre around one female. In this matriarchal society, no bull has ever been seen to leave his mother's pod. Females may leave the mom-pod to form another.

(Skeletan ~~E~~baleen Whales)

Killer Whales are very long-lived. It is estimated that males may live to be 50 years old and females live to be 70 or even 100. Two females gave birth last year for their first time at 15 and 16 years of age.

(John Ford and Graeme taking pictures of long² transient in Q.C. Sound)(I5, A5 with bullet hole)

Killer Whales have distinctive dorsal fins and markings which have made them a good subject for a photo-id study where much of this information has come from. ^{on} Maintain the book. Graeme Ellis.

(J. Ford holding hydrophone)

K.W.'s also have distinctive calls which were discovered by John Ford from U.B.C. Each pod has a set of calls, some shared with other pods and most distinctive to that pod. The more similar the calls, probably the more related the pods.

(Picture of Ecological Reserves map)

What many people do not realize is that there are places to see the whales outside the reserve. The Ecological Reserves brochure map shows the typical travel patterns of the whales. They often come close to shore west of the reserve near Kaikash Creek as well as near West Cracroft Island.

The Ecological Reserves Program

(Vegetation, flower shots, etc.)

There are 117 ecological reserves in B.C. These are under the authority of the Ministry of Environment and Parks. British Columbia was the first province to give permanent status to reserves for preservation of "unique and rare examples of botanical, zoological or geological phenomena".

(Recreationist, researcher)

The scientific purpose is much more strongly emphasized in the Ecological Reserves Act, which makes them very different from parks and parks' recreational purpose. Researchers must have permits to conduct research within ecological reserves.

Robson Bight was established in 1982 as a reserve and contains 1,248 ha.

(Reserve sign)

If you do get a chance to visit the area, there are yellow signs on shore at either side of the reserve. The reserve extends out for 1,000 m into Johnstone Strait from the sign. This is approximately a quarter of the distance across the strait.

Researchers and Photographers

(Ken Norris, J.F.)

A small number of researchers and photographers are allowed to work within the reserve each year. They must apply for permits from the Ecological Reserves Program. These people have been specifically allowed to closely approach the whales.

(Researchers in Zodiacs)

You will see them out there, primarily in small zodiacs. Please allow them clearance to conduct their research. They may be flying small black and yellow pennants.

(Picture of ourselves in Red Zodiac)

If you do have any questions, we will be out there all day (weather permitting) in the vicinity in a red zodiac and we'd be glad to chat.

(Tesseract II, JJ)

Some research that is ongoing:

- . a study on the energetics of babysitting behavior
- . a study on the social structure of Killer Whale pods
- . a photo-identification study of population biology as mentioned previously.

Uses of Johnstone Strait and Area

Recreational Whale Watching and Sportfishing

Slides (People whale-watching)(sportfishing)(boat and whales-canoe, motorboat, Clavella, Gikumi)

The area has become increasingly popular over the past ten years as a spot for recreational whale-watching. People come under their own steam, in sailboats and motorboats, as well as with day charters and week long charters.

Logging

Slides (logging to the west)(logging to the east)

The Tsitika is the last unlogged watershed on the east coast of Vancouver Island. Logging is an important economic activity on the North Island. Watersheds to the east and west have been logged.

Commercial Fishing

Slides (Gillnetter, seiner setting, bunt end of net)

Johnstone Strait is also an important commercial fishing

ground as it funnels the salmon runs that come around the north end of the Vancouver Island on their way to the Fraser River. Last year there were over 500 gillnetters and 100 purse seiners between Kelsey Bay and the north end of the island.

Whale-watching Guidelines

(Killer Whale with Mt. Durley in background)

Killer Whales are powerful predators and don't seem like much would scare them but they are sensitive. This Killer Whale reserve is very important habitat and an important research area. Researchers and others are concerned that too much activity directed at the whales might eventually drive them from the area. (J.B.)(Shot of ferry, planes and zillions of boats.)

(Need slide of guidelines)

In order to preserve this area as a sanctuary for them, we ask that you follow these guidelines:

In addition, we ask that if you see killers inside the reserve, that you do not go in.

As information officers, our job is to contact people on the water and provide information to help them better appreciate this unique resource. We have a red zodiac and yellow suits so if you see us out on the water, come on over and say hi! We have a hydrophone on board which we would be glad to hook up for you.

We also have a boat-whale encounter monitoring program, research being conducted in co-operation with the University of Victoria. This aids in the long-term management of the area.

SLIDE SHOW

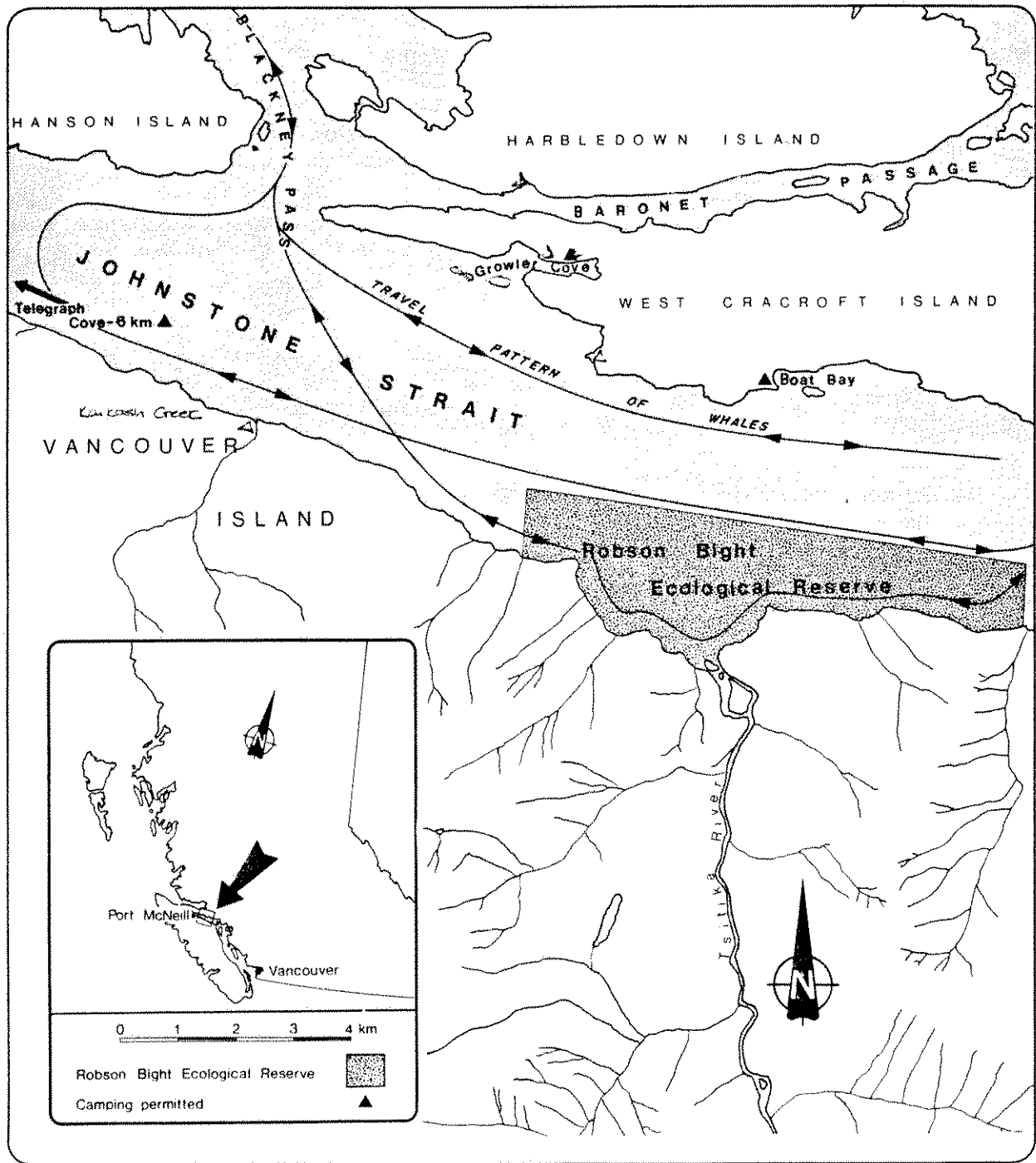
1. Estuary scenic - J.B.
2. Mountains in clouds and K.W. - J.B.
3. K.W. with E.R. Sign in background - R.T.
4. Reserve sign by itself - Jeff Foott
5. DFins slicing calm water - Jeff Foott
6. Johnstone Strait and Robson Bight from the air - J.B.
7. Location map - J.B.
8. K.W.'s - northern community - J.B.
9. Sailboat whale-watching in San Juans - Jeff Foott (J.F.)
10. Transient (pointy d. fins?) - J.B.
11. Difference in d. fins - backlight shot - J.F.
12. Dolphins - J.B.
- 12a. Minke Whale with K.W. teeth marks - J.B.
13. K.W. and ferry - J.F.
14. Distributional map - K.W.'s - M.B.'s map must obtain pink or coho
15. Herring - J.B.
- 15a. Salmon in Tsitika - J.B.
16. Tight group of whales - J.B.
17. K.W. with blow backlit - J.B.
18. K.W. close-up with blow backlit - J.B.
19. Sea lion
20. Shot of sea lion and K.W. - caused turbulence - J.B.
21. Sea lion and K.W. diving - J.B.
- 21a. Sea lion head and tip of K.W. d. fin - J.B.
22. Hind end of sea lion - J.B.
23. Dean Fisher - J.F. and M.B., J.B.

24. Shark and her calf - J.B.
25. Skeleton of minke whale - J.B. - Plumper Islands
26. Chile K.W. - J.B.
27. Nicola - J.B.
28. Bull? - J.B.
29. Top Notch (A5) with bullet hole in d. fin - J.B.
30. I5 - with wrinkly d. fin - J.B.
31. John Ford and Graeme photo-id.ing long transient in Q.C. Sound - J.B.
32. J.F. and Graeme with spyhopping whale - J.B.
33. Erich Hoyt with camera - J.B.
- 33a. John Ford photo-id transient - J.B.
34. Graeme Ellis - J.B.
35. John Ford holding hydrophone - J.B.
36. Sunrise shot through forest - J.B.
37. Close-up of stones in Tsitika estuary
- 37a. Yellow mimulus - J.B.
38. R.B. reserve sign - most obtain
39. Dave Bain, Kelley and Jeannie - R.E.T.
- 39a. Ken Norris - J.B.
- 39b. Cliff Lane and Rebecca - J.J.
- 39c.
- 39d. Sportsfishermen - J.B.
- 39e.
- 39f. Dean Fisher, John Ford, Mike Bigg
- 39g.
40. K.W. and whalewatchers - R.E.T.
41. K.W. and canoeists - J.B.

42. Clarella and K.W. - J.B.
43. Gikium and K.Q. - J.B.
44. W.'s and logging in background - R.E.T.
45. Logging at Naka - R.E.T.
46. Fish boats and fog - R.E.T.
47. Porse-seiner making set - R.E.T.
- 47a. Seiner havling bunt - J.B.
48. K.W. with Mt. Darley in background - R.E.T.
49. Whale-watchers and whales - wide angle - J.B.
50. Boat crowd scene - J.B.
51. Whale-watching guidelines
52. Fiuke slap - J.B.
53. Fiuke slap - J.B.
54. Breach
55. Ecological Reserves map showing movements of whales - D.D.
56. Picture of ourselves
57. Sunset shot

APPENDIX C

Robson Bight Brochure



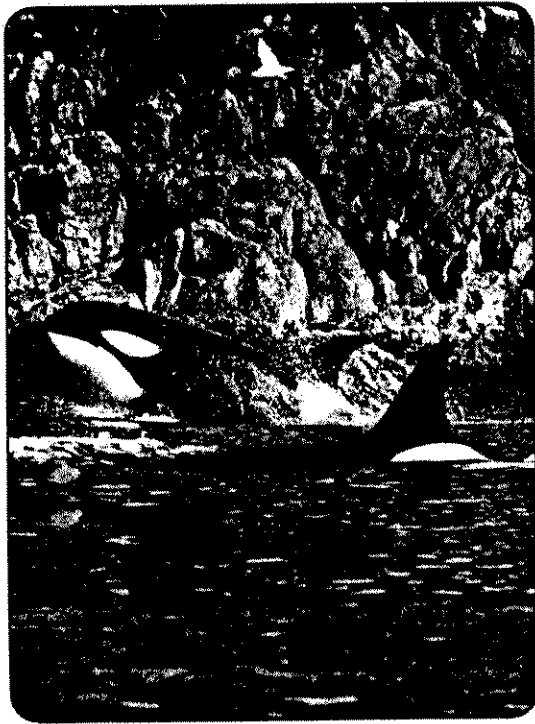
Robson Bight Ecological Reserve



Robson Bight Ecological Reserve

Robson Bight Ecological Reserve was established in June, 1982, by the Province of British Columbia to protect a core habitat of the killer whale for research and educational purposes.

Robson Bight is known as one of the best locations in the world for scientific observation of *Orcina orca*, the killer whale. As an ecological reserve, it is protected from incompatible development and designated for scientific study. Its effectiveness for study and education depends on recreational boaters co-operating in refraining from detrimental encroachment.



Guidelines For Observing Killer Whales

Ecological reserves are not established for the benefit of human recreation but for the benefit of wild species and their environment. Boaters should refrain from entering the reserve when whales are present. Whales can easily be observed elsewhere. (See map). To avoid disturbing the whales and for your safety, you should follow these guidelines:

- 1) Should you stray into the reserve, keep at least 300 metres away from the whales. Only researchers are issued permits by the Park Programs Branch to observe whales at closer range in the reserve.

Whales may be approached to within 100 m outside the reserve without a permit.

- 2) Always approach whales from the side; not from the front or the rear. Always approach and depart slowly. *Whales rest in lines abreast each other and subside their breathing.*
- 3) When travelling beside whales, maintain a speed of 2 to 4 knots; do not alter your speed abruptly. *They are particularly susceptible to disturbance at this time.*
- 4) Keep noise levels down — no horns, whistles, shouting or racing of motors.
- 5) Be conscious of the effect of your actions on the whales. Do not engage in any activity which disturbs or molests them. **It is illegal under Federal Fisheries Regulations, Section 71 (A) (2) to disturb or molest killer whales.**

Camping

Camping, lighting fires and any form of consumptive use is not permitted within an Ecological Reserve. People wishing to camp are requested to do so at Telegraph Cove, Boat Bay, or Growler Cove on West Cracroft Island. (See map). Anchorage is good but there is no fresh water supply. Both are excellent sites for whale-watching. *shore-based whale-watching.*

About Killer Whales

The following information will help you anticipate the movement of killer whales when watching them.

A pod, or family group, usually consists of 5 to 20 bulls, cows and juveniles. Studies indicate that each whale is recognizable from unique markings and that each pod is always composed of the same individuals. Each pod has its own dialect. About 30 pods totalling 300 whales occur year round in B.C. and Washington with 19 pods (180 whales) seen in Johnstone Strait.

Killer whales travel at 6 to 8 km/h, sometimes as a tightly-knit group and at other times dispersed over a few square kilometres. Periodically, groups join with one another and are then spread over several square kilometres.

The dive sequence consists of one long dive lasting 3 to 4 minutes followed by three short dives of 15 to 20 seconds. Whales range in length from 2.5 m at birth to 8 m in females and 9 m in males. Cows probably live to a maximum of 75 years and bulls to 50 years. On average, a cow gives birth only once every 10 years. Their diet consists mainly of fish.

Resident vs. transient.

For more information on killer whales or Ecological Reserves, write to:

Park Programs Branch
Ministry of Environment and Parks
4000 Seymour Place
Victoria, B.C.
V8V 1X5 (604) 387-5002

APPENDIX D

Data Forms

CODES

=====

BOAT TYPES (from Dearden and Duffus, 1986)

=====

- CM - CHARTER MOTOR VESSEL
 - any size boat without sails known to be a chartered craft
- CS - CHARTER SAILING VESSEL
 - any size boat with sails known to be a chartered craft
- SPs- SMALL PLEASURE SAILING VESSEL
 - private sail boats under 30 feet in length [estimated]
- LPs- LARGE PLEASURE SAILING VESSEL
 - private sail boats over 30 feet in length [estimated]
- SPm- SMALL PLEASURE MOTOR VESSEL
 - private motor vessel under 30 feet in length [estimated]
- LPm- LARGE PLEASURE MOTOR VESSEL
 - private motor vessel over 30 feet in length [estimated]
- K - KAYAKS
 - single and double kayaks, canoes
- R - RESEARCH
 - any vessel known to be engaged in whale research or permit commercial photography
(from Dearden and Duffus, 1986)
- GN - GILLNETTER
 - commercial gillnetter fishing vessel
- P - PURSE SEINER
 - commercial purse seiner fishing vessel
- C - CRUISESHIP
 - commercial cruiseship or Alaska State Ferry
- LB - LOGBOOM
 - tugboat with logboom
- B - BARGE
 - tugboat with barge

ACTIVITY OF BOAT

=====

- WD1 - whale-oriented and < 100 m from whales
- WD2 - whale-oriented and < 300 m from whales
- WD3 - whale-oriented and > 300 m from whales
- F - fishing
- M - moored
- T - directional travel
- Q - other (specify)

USE OF THIS FORM

=====

- * Monitoring will be done at two hour intervals from 8 am to 8 pm
- * Monitoring will have to be done primarily from the cliff, with assistance from the boat for names and activities
- * Boats will be entered separately on the form dependent on the activities each is engaged in.

APPENDIX E

North Island Gazette Article

July 8, 1987

On the lookout for killer whales

Robson Bight info officer says it's an art

by Laurie Best

There's an art to whale watching. And Robin Taylor wants people to know about it.

Taylor has been hired as an information officer at Robson Bight this summer.

Established in 1982 as an ecological water reserve, Robson Bight is one habitat for hundreds of killer whales.

Designed originally as a scientific and educational reserve, it is coming an increasingly popular spot to view the animals.

Assistant ecological reserves coordinator Hans Roemer said Taylor and two student assistants have been hired on the provincial job-training program Career Trak to help us manage an overabundance of visitors to the area.

They will monitor "boat-whale tivity" and pass on information about the reserve and its residents.

"We'll be travelling around in a Zodiac and contacting people on boats, handing out brochures on how to approach the reserve," said Taylor.

Taylor, who earned a degree in resource management from Simon Fraser University, said the main instruction she'll give visitors is to enter the reserve when the whales are present.

Outside the reserve, there is a government imposed buffer around the animals which forbids boats from coming closer than 100 metres.

"But people get overzealous," Roemer said. "They tend to get carried away and get too close to the whales while trying to get the best photograph possible."

Although researchers know killer whales use the bight for fishing, feeding and socializing, Roemer said much of their behavior is still under investigation.

"We know it's a very important spot to them," he said. "But if they are followed by boats all the time, they will move out of it and chances are they will not continue using the reserve."



Robin Taylor

"We could endanger or lose our resource altogether."

Roemer said Taylor's job is to inform the public, something she has experience doing.

Last summer Taylor spent the season monitoring whale watchers themselves and handed out over 900 questionnaires and brochures.

"People were really appreciative of the information. They didn't really know how to whale watch."

And the whales can certainly be heard if not seen.

Taylor said their Zodiac will be equipped with a hydrophone to monitor underwater noises.

"So people will be able to tune into us and listen to the whales."

From July to October, Taylor and her crew will camp out in Boat Bay, directly across from the reserve on West Cracroft Island.

"From there we get a good view of the whole reserve and further up and down the strait. We can be monitoring any type of water or land activity that goes on."

Jim Borrowman, operator of Stubbs Island Charters Ltd., one of the several companies in the area that give whale watching tours of the area, played a key role in getting the ecological reserve established.

He said it was not the tourists, but the locals, who needed more information.

"A lot of locals have their own boats and they spend a lot of time out in the strait. But they come out of their own ports and don't know too much about the fact that a reserve has been established."

Borrowman supports the idea of having information officers in the bight.

"It's not a very defined place. There are signs on the shore but once you get close enough to read them, you are already in the reserve."

The killer whales consistently seen near the reserve during the

summer months are members of the northern community of whales. In the winter, the whales tend to move further north, perhaps following schools of salmon.

Taylor said researchers will also be in the bight.

"They are identifiable by yellow and black flags on their Zodiacs," she said. "But their behavior should not be copied because they have a permit to approach the whales at close range."

Once a week, Taylor will travel into Telegraph Cove to give a slide show presentation on killer whales.

"It has become more popular here in the last six or seven years," she said. "The interest in whales seems to have started in further south. Now it has almost peaked in California and there seems to be more growth in B.C."

Borrowman said that while he "certainly couldn't make a living from taking out whale watching tours," he agreed that the number of whale watchers has increased slightly every year.

"And that's great. The tourism potential here is marvellous," he said.



Thank You

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APPENDIX F

Data Summaries

MONTHLY SUMMARY

ROBSON BIGHT VISITOR MANAGEMENT

ACTIVITY MONITORING FORM - PART I

IN RESERVE

BOATS
COUNTS

OUTSIDE RESERVE

BOATS
COUNTS

ENCOUNTER NO.	DATE	# BOATS	BOAT TYPE	LOCATION (see map)	ACTIVITY & BOAT NAME	# BOATS	BOAT TYPE	LOCATION (see map)	ACTIVITY & BOAT NAME	# BOATS	BOAT TYPE	LOCATION (see map)	ACTIVITY & BOAT NAME
	JUNE	40	G		0	50	G						140
			P			21	P						0.52
			C			3	C						0.07
			LB			2	LB						0.05
			B			6	B						0.15
			F			1	F						0.02
			CM			0	CM						0
			Cs			0	Cs						0
			SP ₂			6	SP ₃						0.15
			LP ₂			5	LP ₃						0.12
			SP _{1A}			5	SP _{1A}						0.12
			LP _{1A}			4	LP _{1A}						0.10
			K			0	K						0
			R			0	R						0

4
1
14
1

MONTHLY SUMMARY

ROBSON BIGHT VISITOR MANAGEMENT

ACTIVITY MONITORING FORM - PART I

BOATS
COUNTS

BOATS
COUNTS

IN RESERVE

OUTSIDE RESERVE

ENCOUNTER NO.	DATE	# BOATS	IN RESERVE			OUTSIDE RESERVE			ACTIVITY & BOAT NAME
			# BOATS	BOAT TYPE	LOCATION (see map)	ACTIVITY & BOAT NAME	# BOATS	BOAT TYPE	
	AUGUST	500	G		1.88	G 2	1108 + 222 = 1330	2.57	
		2412	P		9.07	P 1	1021 + 358 = 1379	6.88	
		1	C		0	C 13	21 + 24 = 45	0.08	
		1	LB		0	LB 12	94 + 38 = 132	0.03	
		0	B		0	B 6	59 + 175 = 234	0.23	
		0	F		0	F 11	15 + 33 = 48	0.06	
		7	CM		0.03	CM 8	76 + 65 = 141	0.26	
		0	Cs		0	Cs 11	22 + 26 = 48	0.08	
		6	SPe		0.02	SPs 10	24 + 65 = 89	0.07	
		9	LPs		0.03	LPs 4	85 + 175 = 260	0.27	
		18	SPm		0.07	SPm 5	92 + 159 = 251	0.28	
		11	LPm		0.04	LPm 7	65 + 105 = 170	0.22	
		113	K		0.42	K 3	184 + 134 = 318	0.27	
		12	R		0.04	R 9	86 + 27 = 113	0.26	

