



B.C. MINISTRY OF LANDS AND PARKS
MIRACLE ZONE

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

ROBSON BIGHT (MICHAEL BIGG) ECOLOGICAL RESERVE VISITOR MANAGEMENT PROGRAM

1992 SEASON REPORT

DECEMBER 1992



PREPARED BY: M.L. WONG, E.J. GREGR, AND L.ELLIOTT



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March 31, 1993

Mr. Ted Kremer
Area Supervisor, Miracle Zone
B.C. Parks
Ministry of Environment, Lands and Parks
R.R.#1, Site 11, Unit 1
Black Creek, B.C.
V0R 1C0

Dear Mr. Kremer:

**RE: Robson Bight - Michael Bigg Ecological Reserve
Visitor Program**

As requested, Bion Research is pleased to present B.C. Parks with 5 additional copies of the 1992 Season Report for the above project.

We are pleased to know you are currently considering some of the recommendations we have outlined in our report. One observation some of the tour operators made at the end of the season last year; was that non-compliance with the Reserve boundaries escalated once the wardens were removed from the area. Both whales and recreational vessels were in abundance after the Labour Day weekend. B.C. Parks may wish to consider extending the warden patrol into this period.

If you or your associates have any questions please feel free to contact us at 322-9200 or fax us at 322-4907.

Yours sincerely,
BION RESEARCH INC.

Marke L. Wong, B.Sc., R.P.Bio.
Project Manager

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Haidaway Inn, Port McNeill, B.C.

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Project Staff included;

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1.0 INTRODUCTION

1.1 Background

Located on the Northeast coast of Vancouver Island, Johnstone Strait is well known as the best location in the world to observe killer whales in their natural habitat (Figure 1). Since the early 1970's, researchers have conducted routine annual monitoring of killer whale abundance and behaviour (Bigg et al. 1976, 1990; Ford, 1980, 1981, 1984; and Nichol 1990). Pods of killer whales return to this area each summer to feed on salmon, socialize, rest and rub on pebble beaches near Robson Bight. Killer whales are not known to congregate in such large numbers with such predictable movement patterns anywhere else in the world. Recent research on human activities in the Reserve (Kruse, 1984; Briggs, 1985, 1986, 1988 and 1991a,b; Darling, 1986; Duffus and Dearden, 1987 and Taylor 1988a,b) tend to support concerns that disturbance of whales while rubbing and resting in the Reserve area may interfere with the natural behaviour patterns of the whales. Habitat encroachment from whale watching, logging and commercial fishing all contribute to the disturbance of the whales in this special core use area and therefore may threaten the long term use by whales.

The B.C. northern resident community of killer whales has a total population of approximately 208 individuals (1992). This is thought to be made up of 44 distinct pods or family groups. The known range of the northern residents extends from southern Desolation Sound to northern British Columbia, excluding most of the west coast of Vancouver Island and the Queen Charlotte Islands (Bigg et al., 1987). Although they are observed throughout this range, a high percentage of the northern resident population can be found in the Johnstone Strait/Blackfish Sound area between June and November. Such a predictable presence of killer whales appears to be unique. For this reason western Johnstone Strait has been labelled a "core" habitat for the northern resident community of killer whales.

In 1982, B.C. Parks established the Robson Bight (Michael Bigg) Ecological Reserve (RBMBER), Reserve #111. This 1248 hectares of marine and 505 hectares of land buffer represents B.C. Parks' commitment to the preservation of the ecological integrity of this special ecosystem. Since the establishment of the reserve, the province has maintained a volunteer warden service. In 1987, 1989, and 1990, visitor management programs were conducted on-site to direct vessel traffic away from RBMBER, monitor visitor use and whale encounters, assist researchers and to provide information to boaters and visitors in the vicinity of the Reserve. Bion Research Inc. was contracted in June 1991 to continue this program and to incorporate a research and land-based visitor education component. This report summarizes the 1992 season of this program.

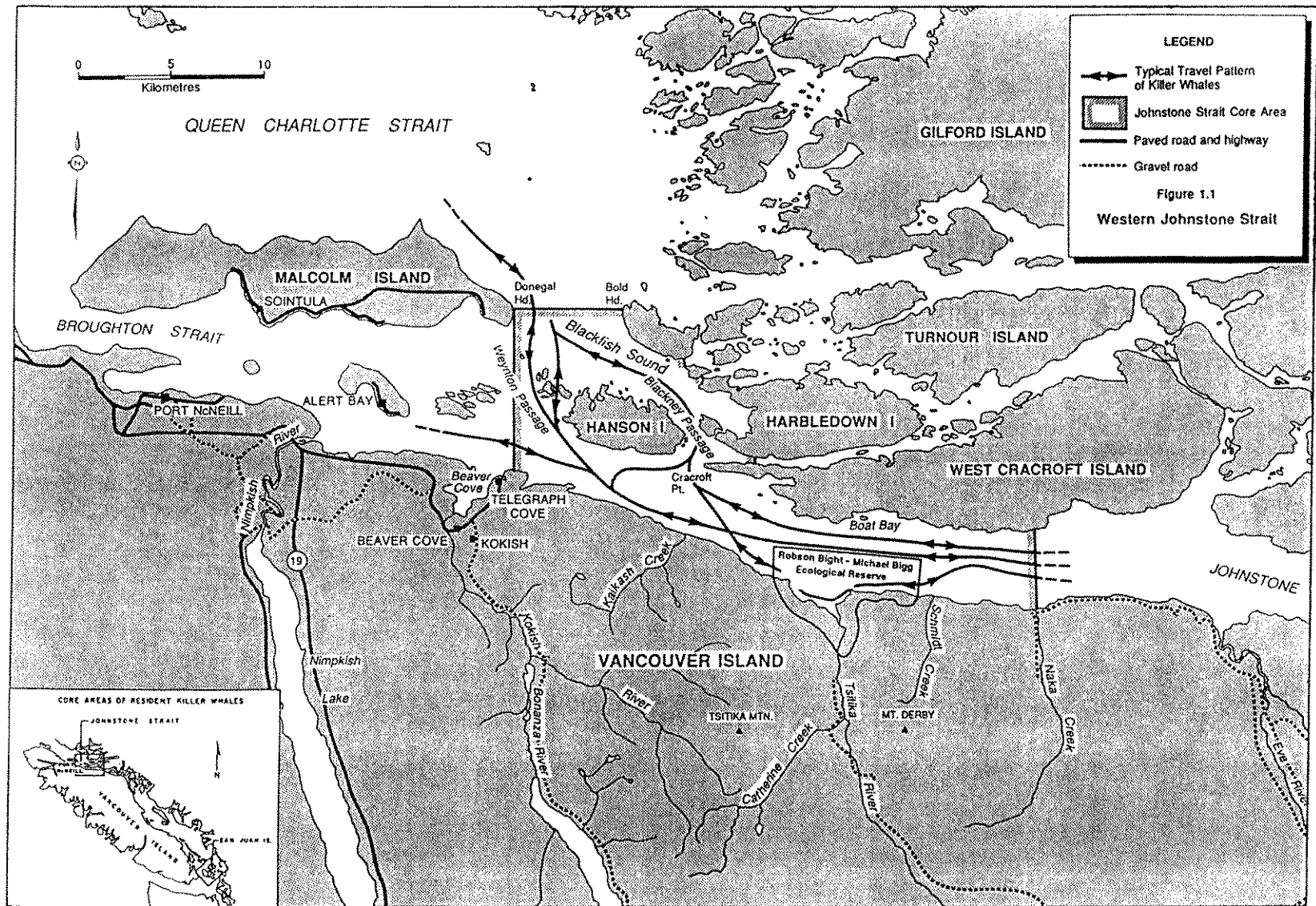


Figure 1: Western Johnstone Strait showing location of Robson Bight (Michael Bigg) Ecological Reserve (RMBER) (after JSKWC Background Report 1991).

1.2 Objectives

The objectives defined by the Ministry of Environment, Lands and Parks for the 1992 season were designed to address both short and long term management goals of the area. The warden/information service was conducted to address the need for immediate mitigation of vessel traffic within the reserve area. The killer whale/vessel traffic research and the education program is designed to monitor visitor/vessel activity within the Reserve and to promote and encourage responsible whale watching. The following objectives were established in order to accomplish these goals;

- 1) To patrol the marine reserve boundary and greet boaters entering the Reserve area, to distribute information provided by the B.C. Parks, to answer questions, to request that boaters stay out of RBMBER and to request compliance with whale observation guidelines.
- 2) To facilitate enforcement of the Ecological Reserve Act that applies to the water access portion of lands in the Reserve.
- 3) To keep daily records of the numbers of visitors and whales in the Reserve.
- 4) To keep abreast of the whale research programs operating in the Robson Bight area and act as a liaison between researchers and visitors.
- 5) To submit a report to the Ministry Representative detailing the operations of the program, including summation of all data and records as part of this contract.
- 6) To compile information on the duration and nature of whale movements and vessel traffic in and around the ecological reserve.
- 7) To provide weekly audio-visual programs in Telegraph Cove and Alder Bay campgrounds, and in surrounding communities, such as Port McNeill, to;
 - a) Promote public interest and understanding of killer whale biology, history, behaviour and management for the purpose of pre-educating Ecological Reserve visitors on the RBMBER program and whale watching guidelines.
 - b) Integrate the purpose and necessity of whale watching guidelines.
 - c) Promote the Robson Bight Ecological Reserve as an important killer whale sanctuary.

2.0 METHODS AND MATERIALS

The 1992 program was divided into three main components;

- 1) Warden/Information Officer Service
- 2) Killer Whale/Vessel Traffic Research
- 3) Land-based Education Program

The warden/information service program was conducted on the water in and around the Reserve. The research observations were made from a cliff located across from the Reserve and from Boat Bay on West Cracroft Island (Figure 2). The education program consisted of biweekly interpretive audio/video presentations at local communities. All staff were based at a tent camp in Boat Bay on West Cracroft Island in Johnstone Strait. Staff for each component worked cooperatively to achieve the program objectives. Wardens made daily trips to drop-off/pick-up research crews at the observation cliff. A pool of volunteer staff was maintained to assist in all components of the project.

2.1 Warden/Information Program

Warden service began on June 27, 1992 and continued through September 7, 1992. Warden/Information Officers patrolled the RBMBER area from approximately 0800 - 2000 hours (depending on level of traffic and weather conditions). Vessels included a 15' Zodiac Hurricane (rigid hull inflatable) with a 50hp motor and a 14' Achilles inflatable with a 30 hp motor. Warden service was overlapped during peak visitor periods.

All visitor encounters were made in a cheerful, friendly and informative manner. Guidelines for approaching vessels were generally as follows;

- 1) slow and safe approach (VHF contact if direct approach unsafe)
- 2) greeting and identification
- 3) information exchange and interpretation
- 4) voluntary compliance request

B.C. Parks Ecological Reserve pamphlets on RBMBER containing policy information and whale watching guidelines were distributed. The information officers informed visitors of the purpose of Reserve and of ongoing research activities in the area.

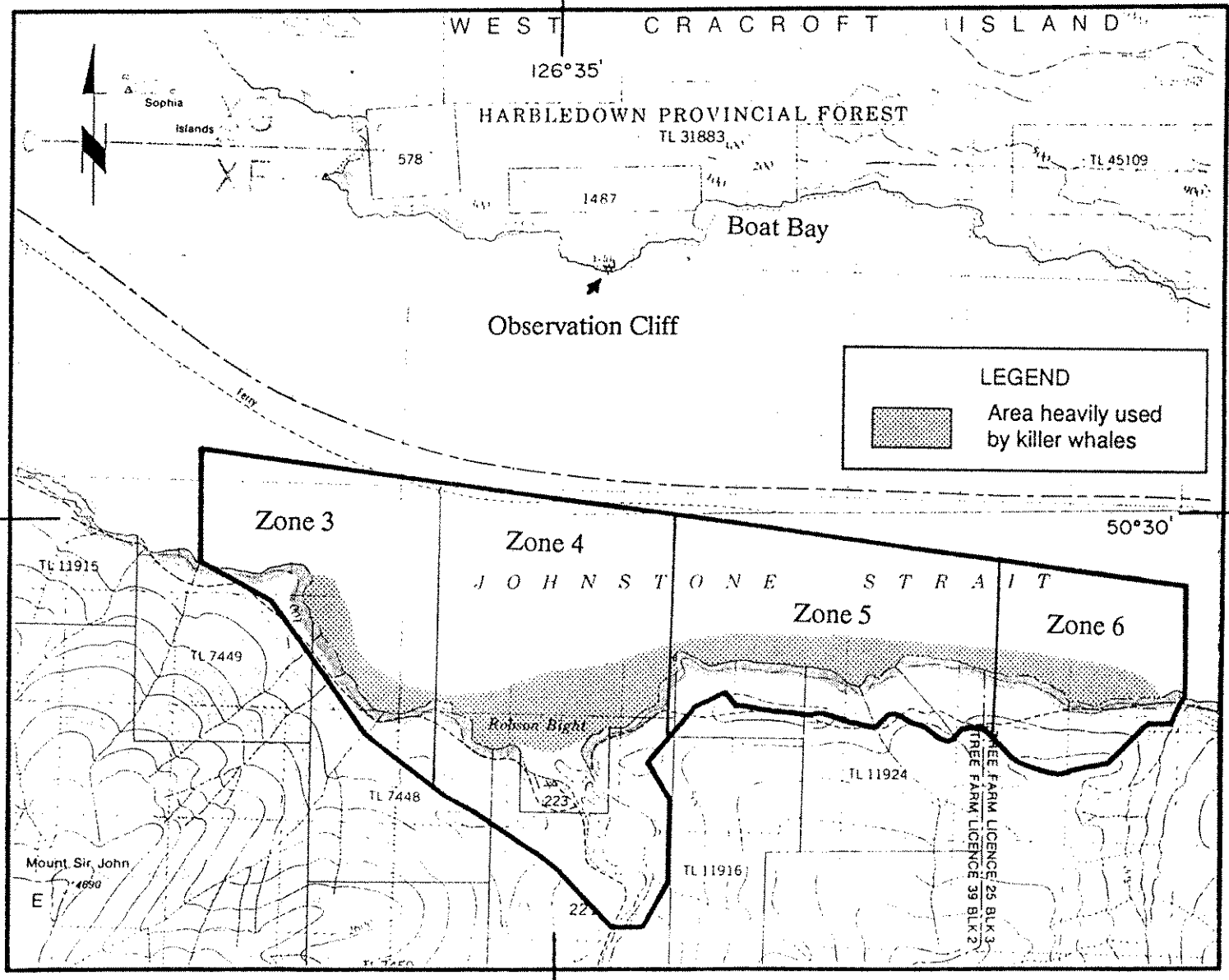


Figure 2: Robson Bight (Michael Bigg) Ecological Reserve showing locations of study area, zones 3-6 and base camp

Visitors arriving at the same time were prioritized according to the following criteria:

- 1) Whale oriented vessels in Reserve
- 2) Whale oriented vessels outside Reserve boundary
- 3) Non-whale oriented vessels approaching Reserve
- 4) Non-whale oriented vessels inside Reserve (ie. Commercial Fishing Vessels)

Data on Reserve visitors was recorded for long-term management considerations. Data collected included:

- * Contact Time
- * Vessel Type (Recreational, Commercial, Kayak etc.)
- * Number of Passengers
- * Launch Point
- * Visitor Accommodation
- * Visitor Origin (B.C., Canada, International)
- * Purpose of Trip
- * Contact in Reserve (Yes/No)
- * Level of RBMBER Awareness consisting of:
 - a) Aware of Reserve existence (Yes/No);
 - b) Knowledge of Reserve boundaries (Yes/No);
 - c) Knowledge of "No Entry" policy (Yes/No);
- * Voluntary Compliance (Yes/No)

Vessel types were placed in the following categories;

CFV Commercial Fishing Vessel
CCV Commercial Charter Vessel
COL Ocean Liner
GPV Government Patrol Vessel
PRV Photographer/Research Vessel
RKG Recreational Kayak Groups (recorded by groups)
RPV Recreational Power Vessel
RSV Recreational Sailing Vessel

2.2 Research and Monitoring

The study area for 1992 includes four zones.

Zone 3: West Reserve boundary to Robson Point
Zone 4: Robson Point to East point of Robson Bight
Zone 5: East Robson Bight point to West Beach
Zone 6: West Beach to East RBMBER Border

Zone 1 was composed of Western Johnstone Strait and Blackfish Sound and was not considered in this study. Zone 2 is Kaikash Creek to Naka Creek and was dropped from this study due to the difficulty in monitoring the large area from a single observation point and the difficulty cross referencing data collected from other sources.

Figure 1 shows the location of zone 2 and the Ecological Reserve with respect to Johnstone Strait. Figure 2 shows zones 3 through 6, the base of operations and the observation cliff. Observations were made from July 1 to August 31, 1992 (n = 62 days). Visual references of zone boundaries and distance estimates were obtained using a reference vessel, nautical chart and LORAN positioning device in the first week of observation. Whales and subpods were identified visually by their unique natural markings (Bigg et. al., 1987) and by acoustic subpod identification (Ford and Fisher, 1982).

Whale activity data included; time of day, identity of individual whales, subpod, number of individuals, location (by zone), direction of travel and activity state. Whale activity and vessel traffic in Zones 3-6 (RBMBER) were recorded continuously. Whale activity was primarily measured using whale-hours (*wh*). Whale-hours were calculated by the following formula

$$wh = t_1 \times n$$

where: *wh* = whale hours
 t_1 = duration of subpod visit
 n = total no. of individuals in subpod

Vessel traffic in RBMBER (zones 3-6) was assessed by vessel visits (*vv*). One vessel visit is defined as one vessel crossing into a given zone. For analysis, marine traffic was categorized into the following groups;

| | |
|----------------------------|-------------------------------------|
| Commercial Fishing Vessels | CFV |
| Commercial Charter Vessels | CCV |
| Recreational Vessels | RPV,RSV,RKG |
| Other Marine Traffic | (Commercial vessels >10m in length) |

Whale behaviour was divided into rubbing, resting and other. Other behaviours included travelling, feeding and socializing. These behaviours were felt to be less sensitive to disturbance from vessel activity and were not analyzed further. Behaviours were defined after Ford (1984).

2.3 Education/Interpretation Program

Visitor programs were scheduled twice a week at two of three locations (Port McNeill, Telegraph Cove and Alder Bay). Locations were selected to target the starting points of Johnstone Strait whale watching visitors in order to maximize visitor contact. Visitor program schedules were posted at Telegraph Cove, Port McNeill, Alder Bay and the four Type II information shelters several weeks in advance of the presentation dates.

High interest groups whose clients frequent Robson Bight (ie. Ecosummer Expeditions, Northern Lights Tours) were contacted before program commencement and informed of the visitor programs scheduled for presentation. Groups were encouraged to promote the program to their clientele. Programs were scheduled as follows:

Telegraph Cove Resort, Telegraph Cove:

July 3, 17, 31, August 7, 21, 28, September 4

Alder Bay Resort, Alder Bay:

July 11, 18, 25, August 8, 14, 22, September 5

The Haida Way Inn, Port McNeill

July 10, 24, August 1, 15, 29

Bion supplied the following materials to the program:

- 1 slide projector *
- 1 slide screen *
- Killer whale slide collection (courtesy B.C. Parks)
- Various props (i.e. killer whale costume, model killer whales)
- B.C. Parks related pamphlets and brochures

* Courtesy Georgia Strait Alliance

All programs were conducted in the format and style of B.C. Parks regular park interpretive programs with minor modifications to accommodate the mandate of the Ecological Reserve.

3.0 RESULTS AND DISCUSSION

3.1 Warden/Information Officer Program

3.3.1 Warden/Information Officer Data

A) Vessel Contacts

525 vessel contacts (group contacts for Kayaks) for a total of 4473 passengers were made over a total of 59 warden full service days. A total of 7 days of the program were lost to foul weather. Recreational vessels (RPV, RSV, RKG) represented 86% of all vessels contacted. These groups totalled 452 vessels and 1651 passengers. Table 1 presents a summary of warden service visitor statistics. Post contact compliance was generally very good among all vessel groups (Table 1). Mean compliance rate was 85.2%. Future education programs should be directed at groups who lack an understanding of the program and its goals. These groups include both commercial and sport fishers.

Table 1: Summary of Warden Contact Data - 1992 Season

| Vessel Type | No. of Vessels | No. of Visitors | * P/V Ratios (%) | Vessels Contacted (%) | Vessels In Reserve (%) | Vessels Comply |
|-------------|----------------|-----------------|------------------|-----------------------|------------------------|----------------|
| CFV | 30 | 90 | 3.0 | 5.7 | 83.3 | N/A |
| CCV | 28 | 445 | 15.9 | 5.3 | 10.7 | 89.3 |
| COL | 5 | ** 2260 | 452.0 | 1.0 | 40.0 | 40.0 |
| GPV | 9 | 26 | 2.9 | 1.7 | 66.7 | 77.8 |
| PRV | 1 | 1 | 1.0 | 0.2 | 0.0 | 100.0 |
| RKG | 123 | 589 | 4.8 | 23.4 | 30.1 | 98.4 |
| RPV | 202 | 691 | 3.4 | 38.4 | 57.9 | 93.7 |
| RSV | 127 | 371 | 2.9 | 24.1 | 57.5 | 96.9 |
| Total | 525 | ** 4473 | N/A | N/A | N/A | N/A |
| Mean | 65.6 | 559.1 | 60.7 | N/A | 43.3 | 85.2 |

* P/V = no. of passengers to no. of vessels ratio

** No. of passengers contacted could have been much higher. However only two of the COL's permitted passenger contact over the ships PA system.

Total number of vessels contacted increased from 361 in 1991 to 525 in 1992, an increase of 45%. Mean number of visitors contacted per day also increased from 51.4v/d (1991) to 66.8v/d (1992).

As in 1991, Visitor contacts in 1992 peaked between 1300 and 1400 hours. In 1992 87% of all vessels contacted were made between 1100 and 1700 hours, this represents a slight increase over the 1991 value of 84.7%. Figure 3 shows the frequency distribution of diurnal visitor contacts.

Daily Vessel Contacts

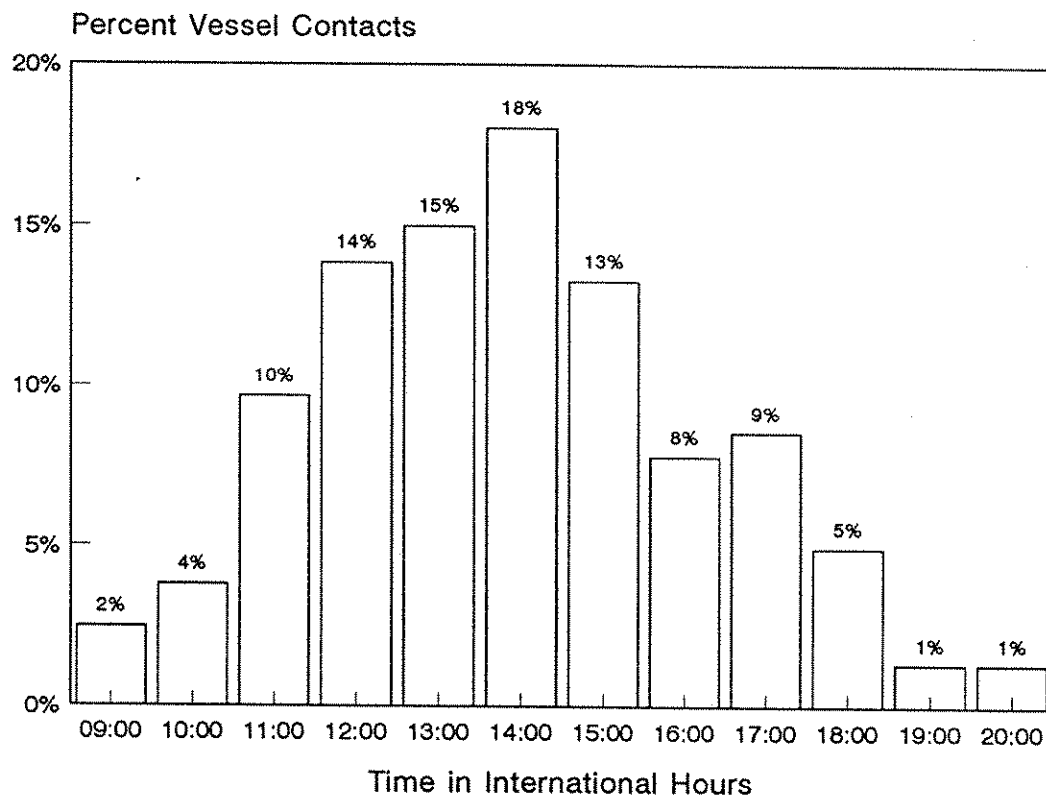


Figure 3 Daily vessel contact peaked between 1300h and 1400h similar to 1991.

Table 2 and 3 compares warden statistics from previous years. Wardens targeted recreational vessels which made up 86% of all vessels contacted. Recreational vessels (RPV/RSV/RKG's) represented the majority of vessels contacted. The increase in percentage of recreational oriented vessel contacts from 1987 - 1992 represent both

the increased priority of recreational vessel contact and the increase in the volume of recreational traffic. Of note is the decreased contact with CCV's.

Table 2: Vessel Percentage per Year

| Vessel Type | Percent | | | |
|----------------------|-------------|-------------|-------------|-------------|
| | 1987 (%) | 1989 (%) | 1991 (%) | 1992 (%) |
| Charter (CCV) | 51.8 | 40.3 | 6.1 | 5.3 |
| Power (RPV,PRV,GPV) | 10.8 | 19.3 | 41.8 | 40.3 |
| Sail (RSV) | 3.7 | 12.1 | 20.5 | 24.1 |
| Kayak (RKG) | 16.9 | 23.3 | 25.5 | 23.4 |
| Ocean Liner (COL) | 0.0 | <0.5 | 0.8 | 1.0 |
| Other (CFV or other) | 16.8 | 4.5 | 5.3 | 5.9 |

Table 3: Total Number of Visitors Contacted per Year

| Vessel Type | Visitor Contact | | |
|----------------------|-----------------|----------------|----------------|
| | 1989 (n=51) | 1991 (n=55) | 1992 (n=67) |
| Charter (CCV) | 789 | 406 | 445 |
| Power (RPV,PRV,GPV) | 356 | 490 | 718 |
| Sail (RSV) | 248 | 226 | 371 |
| Kayak (RKG) | 451 | 466 | 589 |
| Ocean Liner (COL) | 1559 | ** 1200 | 2260 |
| Other (CFV or other) | 92 | 32 | 91 |
| Total | 3495 | 2825 | 4474 |
| Mean | 61.6 | 51.36 | 66.8 |

* 1990 visitor contact data was not included as data was not representative of actual warden contact

** Number of passengers contacted could have been much higher. However only one of the COL's permitted passenger contact over the ships PA system.

B) Visitor Awareness

The majority (70.7%) of visitors to the area reported being aware of the Reserve's existence. Reported knowledge of the RBMBER boundaries and "no entry policy"

was significantly less (48.1% and 42.8% respectively). Table 4 shows a summary of the level of visitor reported awareness.

Table 4: Summary of Visitor Awareness - 1992 Season

| Vessel Type | No. of Visitors | Aware of Reserve (%) | Knowledge of Boundaries (%) | Aware of "No Entry" Policy (%) |
|--------------------|------------------------|-----------------------------|------------------------------------|---------------------------------------|
| RPV | 691 | 74.3 | 20.8 | 39.1 |
| RSV | 371 | 61.4 | 13.4 | 23.6 |
| RKG | 589 | 88.6 | 52.8 | 61.0 |
| CCV | 445 | 96.4 | 96.4 | 90.0 |
| CFV | 90 | 56.7 | 33.3 | 30.0 |
| COL | 2260 | 40.0 | 0 | 0 |
| GPV | 26 | 77.8 | 33.3 | 55.6 |
| Total: | 4473 | N/A | N/A | N/A |
| Mean: | 559.1 | 70.7 | * 48.1 | ** 42.8 |

* *Mean boundary knowledge excluding COLs = 56.2.*

** *Mean policy knowledge excluding COLs = 49.9.*

C) *Visitor Launch Points*

Telegraph Cove was identified as the primary launching point for RBMBER visitors, with Port McNeill and Alert Bay as secondary launch points. Other launch points and vessel origins were spread out among many different locations, each representing less than 5% of total visitors.

Table 5: RBMBER Visitor Launch Points

| Launch Point | No. of Visitors | Percentage of Visitors |
|----------------|-----------------|------------------------|
| Telegraph Cove | 155 | 31.9 |
| Port McNeill | 32 | 6.6 |
| Alert Bay | 29 | 6.0 |
| Kelsey Bay | 13 | 2.7 |
| Port Hardy | 11 | 2.3 |
| Campbell River | 10 | 2.1 |
| Blinkinsop Bay | 9 | 1.9 |
| Alder Bay | 9 | 1.9 |
| Naka Creek | 8 | 1.6 |
| Sointula | 7 | 1.4 |
| Other | 202 | 41.6 |
| Total | 485 | NA |

D) Visitor Origin

51.5% of visitors reported to be B.C. residents. The other 48.5 % reported to be either from the United States, Other regions of Canada or Overseas.

Table 6: RBMBER Visitor Origins

| Visitor Origin | No. of Visitors | Percentage of Visitors |
|----------------|-----------------|------------------------|
| Vancouver | 136 | 23.7 |
| South Island | 71 | 12.4 |
| North Island | 51 | 8.9 |
| B.C. Other | 37 | 6.5 |
| Canada | 44 | 7.7 |
| USA | 177 | 30.8 |
| International | 57 | 9.9 |
| Total | 573 | NA |

E) Trip Objectives and Accommodations

41.3% of visitors surveyed (n=899) reported whale watching as their primary trip objective. Another 52.9% reported trip objectives which secondarily whale oriented such as cruising, fishing, nature touring. The remaining 5.3% were engaged in non-whale oriented activities such as commercial and government travel. Please note that recreational vessels were targeted for this survey.

58% of visitors interviewed reported using onboard vessel accommodations. 34% reported camping and 8% reported local accommodations such as motels etc.

3.1.2 Operations

General Operations of the 1992 RBMBER Visitor Management Program were unchanged from 1991. In summary;

- * fewer volunteers with longer work terms reduced person hours and provided more consistency to the program,
- * a faster warden vessel (Rigid Hull Hurricane 440) was implemented which allowed an increase in visitor contact with out increasing person hours,
- * warden vessels were outfitted with Ecological Reserves signs produced by Bion Research Inc. Providing increased identification, visibility and credibility during approaches to other vessels.

3.1.3 Brochures

The Robson Bight Ecological Reserve brochures were distributed to RBMBER visitors and served as an integral part of the warden/information program. The brochure served as an excellent information package regarding whale watching guidelines and for identifying good whale watching locations away from the Reserve. It is not likely that the brochure serves as an inadvertent advertising medium for the RBMBER by attracting potential whale-watchers to the area since most of the visitors contacted (70.7%) were aware of the existence of the reserve prior to arriving in the area.

BC Parks should make every effort to publish an updated pamphlet containing all new policies (i.e. "no entry" policy, land based restrictions, etc.) regarding the RBMBER. This pamphlet should be as widely distributed as possible in order to divert people from the area. It is important to note that most visitors intent on visiting Robson Bight are aware of it's existence through other, less authoritative sources resulting in many visitors arriving misinformed. A revised publication by Parks would provide some much needed up to date information.

The Robson Bight brochure should be consistent with all other whale watching guidelines published by the provincial or federal governments. B.C. Parks should support the publication of a general purpose brochure on killer whale watching to be produced by the federal government. Information presented in this brochure should be consistent with that presented in the Robson Bight brochure and should include the "no entry" policy on RBMBER and provide alternative viewing locations to potential whale watchers.

3.1.4 Information Signs

Information signs produced by B.C. Parks in 1991 were maintained at Type II shelters at Kaikash Creek, Blinkhorn Peninsula and Boat Bay. An information sign was added in Telegraph Cove part way through the 1992 season. These attractive signs duplicate the information in the current Robson Bight brochure. This is an excellent management strategy, but unfortunately the signs do not reflect the "no entry" policy. It is recommended that B.C. Parks design decals to attach to the existing signs which would reflect the recent changes in policy (particularly as relating to Reserve entry). This would save many recreational boaters the trip to Robson Bight only to be turned away by the wardens. This is true particularly for kayaking groups which must expend a great deal of time and energy to reach RBMBER. Current information at popular launch points would help them plan their trip to areas where access is not restricted.

Many visitors reported reading the sign at Kaikash Creek, however the Blinkhorn and Boat Bay signs were not as effective. Information signs should be relocated to sites which maximize visitor contact and assist visitors in planning their trip.

3.1.5 Boundary Display

The new large boundary signs located on the shore of the Reserve are highly visible and will effectively delineate the east-west extent of the Reserve. This should provide adequate visual references to the Reserve boundaries in lieu of marker buoys. The shore markings should also be placed on CHS charts with instructions to mariners in defining the Reserve boundaries (ie. distance from shore).

One of the most frequent comments made by RBMBER visitors in all the years of the program was that the Reserve boundaries should be marked on Canadian Hydrographic Service (CHS) marine charts. Publication of the RBMBER boundaries on CHS marine charts would help mariners identify the Reserve boundaries. This would increase voluntary compliance. It is understood that one of the strategies of the Ecological Reserve is to keep a low profile and that publication of its' location may actually attract more visitors. However knowledge of the Reserve and the presence of killer whales at Robson Bight is widely known and marine chart

publication would likely serve greater purpose in defining boundaries to mariners than cause an increase in the level of traffic.

3.2 Research and Monitoring

The 1992 study focused on the zones within RBMBER. A total of 2,356 whale hours (*wh*) with a daily mean of 39.9 *wh/d* were recorded for RBMBER for 1992. This is comparable to 1991 data (Total whale hours = 2,255 *wh*) Mean daily whale hours 41.8*wh/d*). 115 of the 208 known northern residents visited RBMBER during the 1992 season. This represented 55% of the population and is down from a 1991 representation of 78%. The 115 individuals observed represented 24 of the 44 known northern resident subpods. This accounted for 54% of the 44 northern resident subpods and corresponds with 1991 values of 54%.

Mean daily recreational vessel activity (17.8*vv/d*) was up 15% from 1991 (15.5*vv/d*). Total vessel activity (81.2*vv/d*) was down from 1991 (92.2*vv/d*). This was due to the smaller fisheries opening and fewer CFV's in the area. Table 7 summarizes whale and vessel activity for 1992.

Table 7: Summary of 1992 Whale and Vessel Activity.

| Traffic Type | Zone 3 | Zone 4 | Zone 5 | Zone 6 | Reserve |
|------------------------------------|--------|--------|--------|--------|---------|
| Total Whale Hours (<i>wh</i>) | 481.7 | 541.9 | 516.9 | 815.7 | 2356.2 |
| Mean Whale Hours per Day (n=59) | 8.2 | 9.2 | 8.7 | 13.8 | 39.9 |
| % of Total Activity | 20.4% | 23.0% | 21.9% | 34.6% | NA |
| CFV (<i>vv</i>) | 1012 | 1026 | 862 | 729 | 3629 |
| RPV, RSV, RKG | | | | | |
| GPV, PRV (<i>vv</i>) | 357 | 262 | 232 | 200 | 1051 |
| Other (<i>vv</i>) | 23 | 31 | 29 | 26 | 109 |
| Total Vessel Visits | 1392 | 1319 | 1123 | 955 | 4789 |
| Mean <i>vv</i> per Day (n=59) | 23.6 | 22.3 | 19.0 | 16.2 | 81.2 |

3.2.1 RBMB Ecological Reserve (Zones 3-6)

1992 Whale activity was concentrated in Zone 6 (34.6%) and is comparable to 39.2% in 1991. Caution should be used when interpreting this data as the size of each zone is not accounted for and Zone 6 is significantly smaller than all other zones (Figure 2). Figure 5 shows daily activity means for whale and vessel activity over all reserve zones

Reserve Whale and Vessel Activity

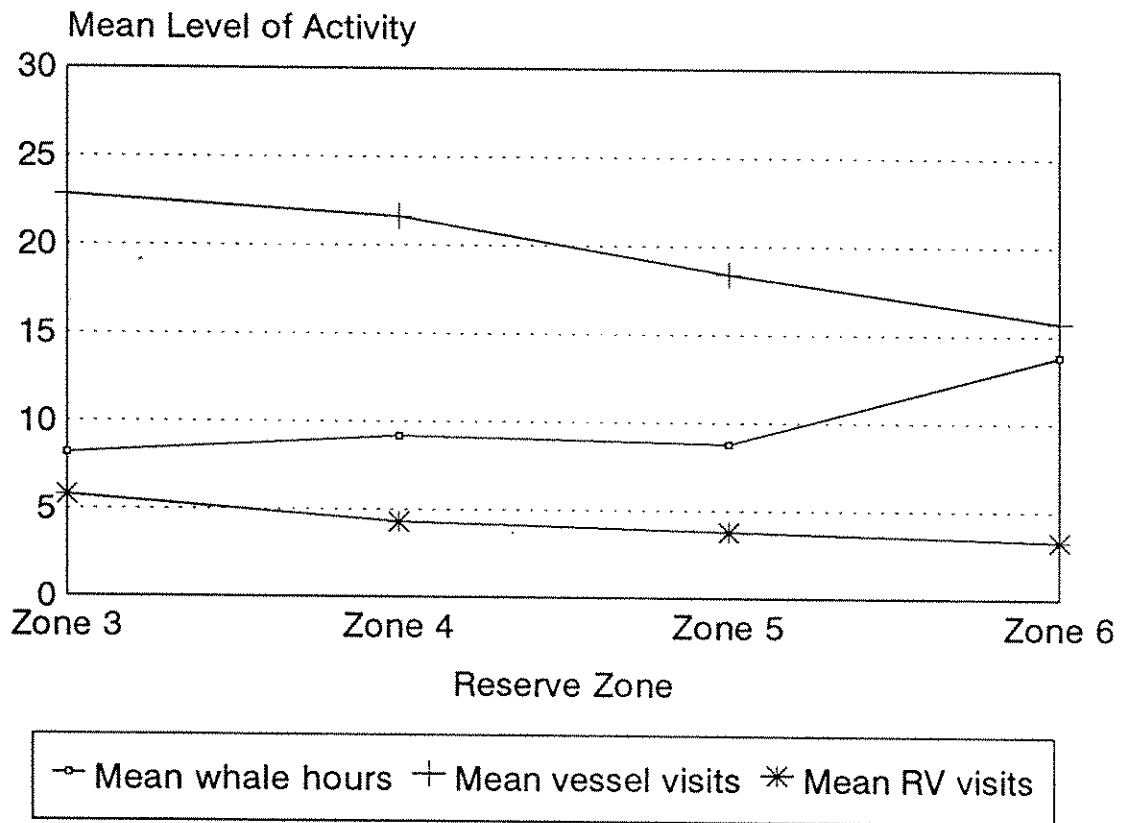


Figure 5 Mean daily whale activity was concentrated in Zone 6 similar to 1991

A) Summer Activity

Mean whale hours/day for all zones showed a general increasing trend throughout July, Peaking during the week of July 15th. (Figure 6). Dips in activity were observed for the weeks of July 22 and August 5th. These reductions in activity are unexplained and warrant further investigation. The highest number of whale hours was observed for the week of August 12th and coincided with a drop in vessel visits to the reserve

by CFV and RV's (Figures 7 and 8) which suggests that whale activity may be effected by high levels of vessel traffic. Subsequent seasons of data sets are required to determine the significance of these correlations.

RMBER Summer Whale Activity

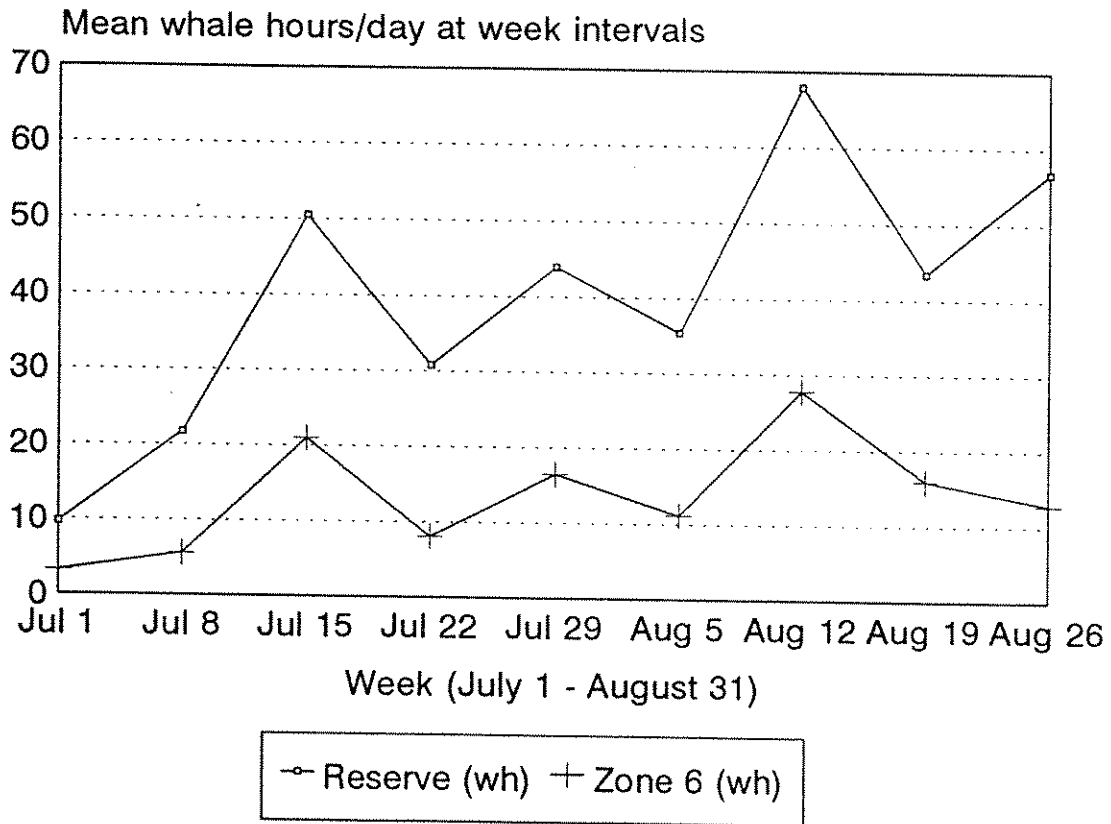


Figure 6 Mean daily whale activity peaked the week of August 12

RMBER Summer CFV Activity

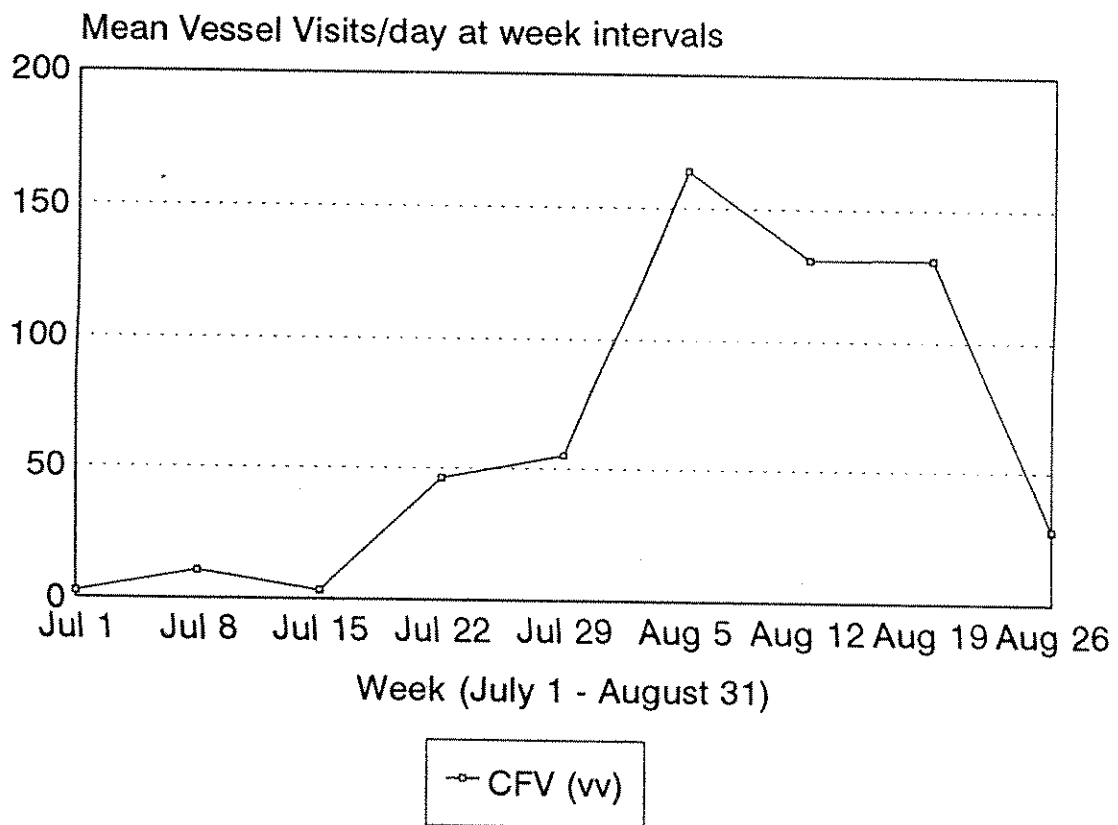


Figure 7 Mean daily CFV vessel visits increased sharply during the week of August 5. This coincided with the local fisheries opening

Rubbing: Rubbing represented 32% of total whale activity within the reserve. The majority of rubbing activity took place in Zone 6. Rubbing was also observed once in zone 3 and 4. Zone 6 behaviour was composed primarily of rubbing (70%). This was divided between the East Beach (60%) and the West Beach (10%).

3.3 Land Based Visitor Program

Of 19 scheduled presentations one was cancelled due to poor weather conditions. Total attendance for all presentations was 706 visitors. Mean attendance was 37.2 visitors per presentation with range of 12 - 84. Mean attendance was highest at Telegraph Cove (58.1%). Table 8 illustrates the attendance record, locations and dates for all presentations.

The use of props with the interpretive slide show was very successful. Audience participation was achieved by asking for volunteers to dress up in the whale costume for the morphology portion of the program. Additionally, children were often asked to come and act out whale behaviors using the whale puppets. This maintained a high level of visitor interest and enhanced the value of the program for the family groups. The program was seen as both entertaining and educational.

Advertising in Telegraph Cove and Alder Bay were adequate since virtually all visitors to these campgrounds encountered the signage. It is possible that more extensive advertising in Port McNeill (newspapers, radio, etc.) would reach more of the local community. Assistance in pre-season contact by B.C. Parks would greatly assist in generating public interest in this program.

Program effectiveness is difficult to assess quantitatively as warden/information officers would not receive direct feedback from with boaters complying with the programs message. In fact, if the program's message was successful, boaters would tend to avoid RBMBER. Wardens contacted relatively few boaters who had previously been at the interpretive talk and these were not contacted within RBMBER. Feedback from visitors immediately following the programs was invariably positive. It is likely that all visitors who attended the programs came away with a heightened sense of understanding of and respect for the killer whales.

The interpretive program should continue in its present format since a high level of visitor satisfaction was observed at every presentation. Alert Bay should be added to the list of venues for several reasons: Alert Bay represents the third most common launch point for vessels encountered by the wardens. In addition, there is a high level of interest in killer whales and the reserve within the local, largely native community.

Table 8: Visitor Attendance Land Based Visitor Services Programs 1992

| Month | Day | Port McNeill | Alder Bay | Telegraph Cove |
|--------|-----------------------------|--------------|-----------|----------------|
| July | 03 | | | 40 |
| | 10 | 32 | | |
| | 11 | | 26 | |
| | 17 | | | 48 |
| | 18 | | 24 | |
| | 24 | 12 | | |
| | 25 | | 24 | |
| | 31 | | | 64 |
| August | 1 | 17 | | |
| | 7 | | | 52 |
| | 8 | | RAIN | |
| | 14 | | 56 | |
| | 15 | 27 | | |
| | 21 | | | 73 |
| | 22 | | 36 | |
| | 28 | | | 84 |
| Sept | 29 | 24 | | |
| | 4 | | | 46 |
| | 5 | | 21 | |
| Total | 706 | 112 | 187 | 407 |
| Mean | | 22.4 | 31.2 | 58.1 |
| | Total - All Locations = 706 | | | |
| | Mean - All Locations = 37.2 | | | |

Audience interest and background seemed to vary between location. Haidaway Inn visitors were the most diverse group reflecting the variety of hotel guests (ie. kayaking groups). Relatively few local people attended despite numerous notices posted around Port McNeill. Alder Bay visitors were mostly sport fishing oriented and were generally less informed than other groups about RBMBER or whale watching guideline. Telegraph Cove had the most informed group and the highest level of RBMBER visitation. This is likely due to it's close proximity to the Reserve and presence of whale watching charter companies (ie. Stubbs Island Charters).

4.0 CONCLUSIONS

Recreational vessel traffic within RBMBER is largely due to a lack of knowledge of the reserve guidelines and boundaries on behalf of mariners. Increased education efforts through effective signage, brochures and publication of reserve marine boundaries on marine charts could greatly increase voluntary compliance with present B.C. Parks RBMBER policy.

Telegraph Cove is the primary launching point for RBMBER visitors accommodating 32% of all visitors. Secondary launch points are Port McNeill and Alert Bay 6.6% and 6.0% respectively. Alert Bay should be included in the Land based visitor program venue for the 1993 season.

51.5% of visitors reported to be B.C. residents. The other 48.5 % reported to be either from the United States, Other regions of Canada or Overseas. Thus RBMBER represents a significant attraction for out of province tourists.

Whale activity within RBMBER was comparable to 1991 with a daily mean of 39.9wh/d (1991 = 41.8wh/d). Whales concentrated activity within Zone 6 of the reserve. Zone 6 behaviours were composed primarily of rubbing (70%). Rubbing activities represented 24% of the total time spent in the reserve. Rubbing was also observed in 3 and 4.

Mean daily recreational vessel activity (17.8vv/d) was up 15% from 1991 (15.5vv/d). Total vessel activity (81.2vv/d) was down from 1991 (92.2vv/d). This was due to the smaller fisheries opening and fewer CFV's in the area. Table 7 summarizes whale and vessel activity for 1992.

Total attendance for the Land-based visitor program was 706 visitors. This was up from the 1991 total of 575. Mean attendance was highest at Telegraph Cove (58.1 visitors/presentation). Alert Bay should be included in the venue for the 1993 season.

- a) B.C. Parks and the Department of Fisheries and Oceans should increase cooperation in this area utilizing shared resources. This should include financial and jurisdictional support.
 - c) Pre-season communications by B.C. Parks with other government agencies (ie. Coast Guard, Fisheries and Oceans, Environment Canada) and visitor groups (commercial cruise lines, adventure travel operations, local communities) could greatly increase voluntary compliance and information dispersion.
- 4) Establishment of seasonal facilities (particularly pit toilets) for recreational visitors to the area. A continued increase in recreational traffic to the area may constitute a health risk particularly at the Kaikash Creek area.
- 5) Operational modifications will allow more effective management of the reserve
- a) Future warden operations should continue to utilize a second vessel on a on-call basis only.
 - b) The continued use of Boat Bay should be secured by B.C. Parks for the Warden and Research program. It is suggested that this take place in the form of a Crown Lands Lease and a letter of agreement with Tree Farm Licensee, Fletcher Challenge (Canada) Ltd.
 - c) B.C. Parks should publish new pamphlets containing up to date information on Reserve boundaries and policy prior to the 1993 season. Signage in the area referring to RBMBER should be corrected through the use of decals displaying the location of Reserve boundaries and the "No Entry" policy.
 - d) The research and monitoring program should continue to assess whale and vessel activity in RBMBER. Efforts should center on daily and summer activity and on correlating whale and vessel data.
 - e) The land-based visitor program should continue it's present format. Alert Bay should be added as a venue for both visitor and local educational purposes. An increased level of local advertising should be supported by B.C. Parks.

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