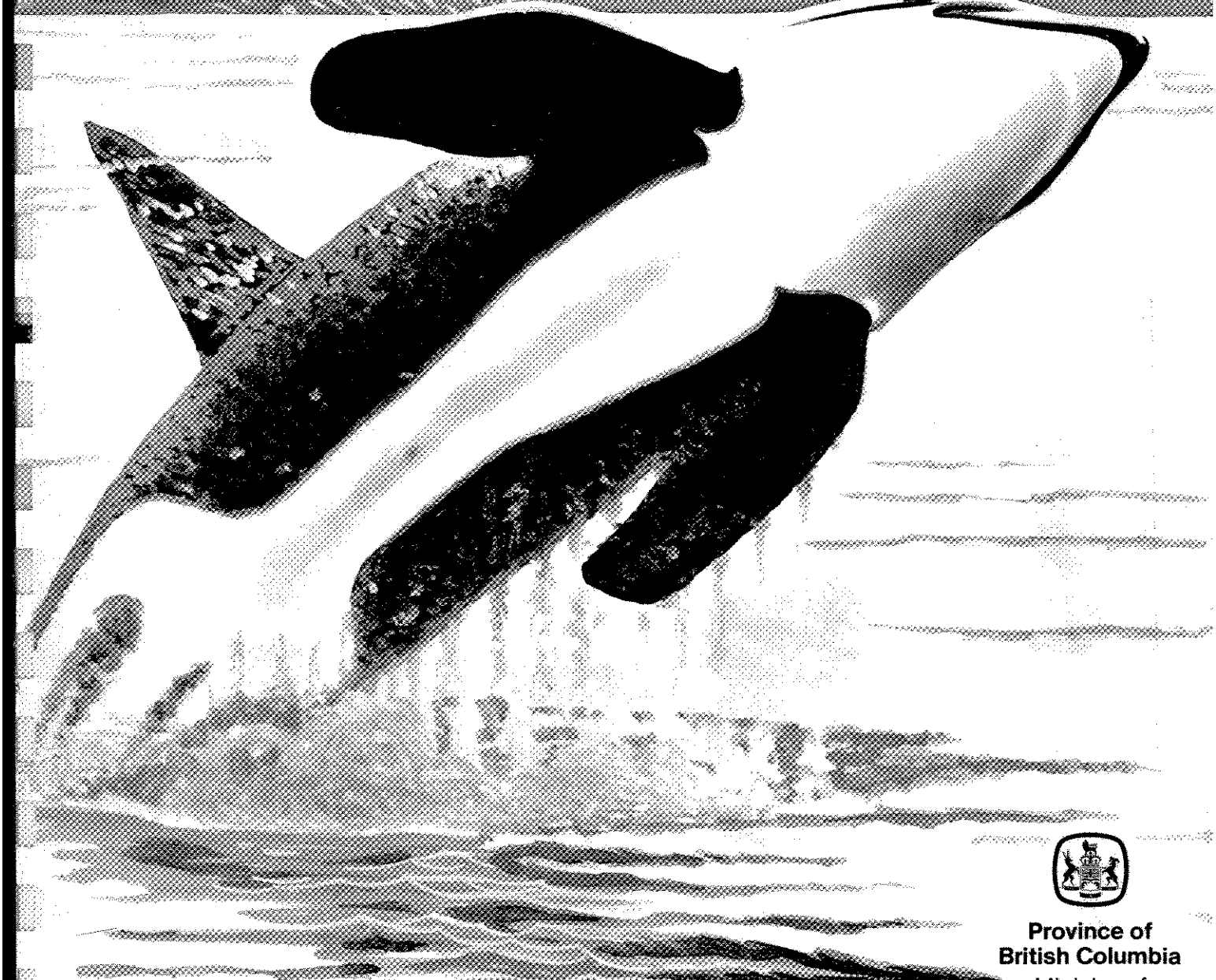
Killer Whales and Coastal Log Management

AN OVERVIEW OF FUTURE USES OF ROBSON BIGHT

Robson Bight (Michael Bigg)



Province of British Columbia
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ASSESSMENT AND PLANNING DIVISION

APD BULLETIN NO. 6

KILLER WHALES AND COASTAL LOG MANAGEMENT: AN OVERVIEW OF FUTURE USES OF ROBSON BIGHT, BRITISH COLUMBIA

Robson Bight Study Team
COORDINATED BY ASSESSMENT BRANCH

Victoria, B.C.
June 1981

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LIST OF APPENDICES

ACKNOWLEDGMENTS

The study team wishes to acknowledge the following individuals who have kindly responsed to our request for information and guidance on this unique problem:

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Paul Spong	Orcalab - Pacific Killer Whale Foundation, Greenpeace Foundation.
George and Kay Wood	Sierra Club of Western Canada.

In addition, the assistance of members of the Tsitika Follow-up Committee who met with the study team to share their views on this issue, the Top Island Econauts who assisted the study team on a tour of the area, and the marine mammal research staff of the Pacific Biological Station, Nanaimo, is gratefully acknowledged.

CONCLUSIONS

1. Robson Bight plays a unique role in the ecology of killer whales by serving as "core" habitat for a large portion of the population which has its range through Johnstone Strait and northern Vancouver Island waters.

2. High significance is attached to Robson Bight as a killer whale habitat because:
   a) it is considered to be the best area in the world for observing concentrations of killer whales;
   b) disruption of killer whale activity in the Bight would pose a risk to a large portion of this northern community of killer whales.

3. Killer whales could be adversely affected by industrial activity in Robson Bight:
   a) Current proposals for a log handling operation in Robson Bight present a significant risk to the whales which use the Bight and adjacent beach areas regularly throughout the summer months.
   b) Although few data exist to quantify the winter use of Robson Bight by killer whales, limiting log transportation in Robson Bight to the winter months would also present a significant risk to killer whales.

4. There appears to be overwhelming public support for the protection of Robson Bight and the killer whales which use it.

5. Although studies of alternative log transportation methods continue, preliminary information indicates that at least one alternative (road haul via Eve River) would be only marginally more expensive than a facility at Robson Bight. Further assessment is essential to prove the technical feasibility of winter use of this and other road haul options.

RECOMMENDATIONS

RECOMMENDATION 1: REGARDING INDUSTRIAL ACTIVITY IN ROBSON BIGHT

The Study Team is unanimous in recommending that the requirements of killer whales be given the highest priority in any decision regarding the use of Robson Bight and the adjacent upland.

On the basis of the information and opinions considered in this report, none of the options identified to date for a log handling facility in Robson Bight would serve to protect the value of the area to killer whales. To achieve such protection, a reserve or combination of reserves over the area appears essential. Human activity in the killer whale core area will increase, and since this in itself will threaten the whales and their habitat, a comprehensive management program is required.

Following are two courses of action distinguished by the level of risk to killer whales from log handling activity in Robson Bight. The advantages and disadvantages of each are discussed below. OPTION A provides for an immediate decision to protect the killer whale core area and to rule out industrial use of Robson Bight. OPTION B is structured to defer the decision and to allow for a more thorough consideration of costs to the forest sector, as well as evaluation of other possible log handling methods and the associated risks of each to killer whales.

In view of the study team's position as noted above, a careful approach to managing risks to killer whales, based on present knowledge, is favoured. <u>OPTION A is the course of action recommended by the Robson Bight Study Team.</u>

<u>OPTION A:</u> DECISION NOW - RULE OUT INDUSTRIAL ACTIVITY IN ROBSON BIGHT

Immediately disallow any industrial activity in Robson Bight. Continue the present interim reserve over the Robson Bight area until a suitable and permanent reserve or reserve/park

3. Provides an opportunity to preserve the last major estuary on the east coast of Vancouver Island in an undeveloped state.
4. Retains options for future land use decisions.

Disadvantages:

1. Eliminates the possibility of developing a log handling facility in Robson Bight without provision to consider new technologies which may pose less risk to killer whales than any of the options identified to date[1].
2. Eliminates the flexibility to consider further options for a log handling facility in Robson Bight should all adverse road haul options prove infeasible for a winter operation.
3. All financial and employment cost implications and overall effects on the Tsitika Plan are not determined at this time.

OPTION B: DECISION DEFERRED - CONSIDER LOG HANDLING ACTIVITY IN ROBSON BIGHT IN RELATION TO FOREST SECTOR COSTS AND TO NEW TECHNOLOGIES FOR LOG HANDLING

Immediately reject present log handling options for Robson Bight as these are judged to pose significant risks to killer whales. Continue the present interim reserve over the Robson Bight area until the costs and feasibility of overland haul options and winter stockpiling of logs are further assessed. If, after review by the Tsitika Follow-up Committee, the results of this assessment indicate that there is no feasible alternative for transporting lower Tsitika Timber other than the use of Robson Bight, the Company then has the option to advance a new concept.

It is necessary that any such new concept be advanced by early 1982 in order to allow sufficient time before winter logging is scheduled to begin (January, 1986) for the following to occur:

- a review of the concept by the Robson Bight Study Team to determine whether or not it presents an acceptably low level of risk to killer whales[1];

[1] At present, the Study Team is not aware of any existing log handling facility or any proposal which would meet this criterion.

direct and indirect effects of logging do not impact severely on killer whales.

The Tsitika Follow-up Committee should first seek additional information on the potential impacts on killer whales which could result from the logging program prescribed for the Tsitika watershed. Where it is deemed that the Plan must be revised to accommodate the requirements of killer whales, the following would apply:

a) Provided that the intent of the Plan to guide forest harvesting within the Tsitika drainage will not be altered, the necessary amendments should be made subject to ratification by the Environment and Land Use Technical Committee (ELUTC).

b) In the case of significant implications for any resource sector, the Environment and Land Use Committee, on the advice of the Tsitika Follow-up Committee and the ELUTC, should consider re-opening the Plan to allow reassessment of management alternatives.

RECOMMENDATION 3: REGARDING REVISION OF THE INTERIM RESERVE BOUNDARY

Should the government select Option B of Recommendation 1 as its preferred course of action (i.e., defer decision and consider new log handling proposals for Robson Bight), it is recommended that the Lands and Housing Regional Operations Division immediately redraft the boundaries of the 3-year interim reserve for the Robson Bight area. The objective would be to provide adequate screening from the sights and sounds of near-shore, land-based activities and of taking full advantage of topography and areas of uneconomic timber. In preparing this revision, input from the Tsitika Follow-up Committee and the Ecological Reserves Unit should be sought.

1. INTRODUCTION

1.1 THE ISSUE

Robson Bight is a small, remote bay on the northeast coast of Vancouver Island situated midway between Kelsey Bay and Port McNeill[1]. The Bight is contiguous with Johnstone Strait and, at its mouth, measures approximately 3.5 kilometres across (Figure 1). It is the site of a potential conflict between killer whales (Orcinus orca) and the marine transport of logs. This report examines this conflict as well as other activities which have implications to the killer whales which use Robson Bight.

Recently, Robson Bight and the adjacent shoreline have been recognized as important components in the habitat of killer whales. They are described as forming a "core" area for a large number of killer whales which range through Johnstone Strait and the northern Vancouver Island waters. In recent years, the Bight has experienced increasing use by whale researchers and the public because of the prime opportunities it offers for observing this species in its natural habitat.

Under the terms of a 1978 Provincial Government decision which approved a resource development plan for the watershed of the Tsitika River[2], MacMillan Bloedel Ltd. is now proceeding to harvest timber from the Tsitika drainage. A number of options for transporting this timber involve the establishment of a log handling facility in Robson Bight.

Strong concerns have been expressed that this and other forms of industrial activity would be incompatible with the use of the area by killer whales. These concerns include the potential for impacts to whales through: occupation of shoreline waters by booming and barging facilities;

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[1] The specific coordinates of Robson Bight are between 126°33' and 126°36'W; and 50°28' and 50°29'N.

[2] The entire Tsitika watershed is currently being managed under the Tsitika Watershed Integrated Resource Plan, October, 1978.

increased noise levels; and deterioration of marine habitat through the accumulation of wood debris and silt.

On December 9, 1980, the Honourable Stephen Rogers, Minister of Environment for the Province of British Columbia, announced the appointment of a special study team (Page i and Appendix A) to describe the interactions and risks involved and to recommend an appropriate course of action to resolve the issue.

In order to provide interim protection to the shoreline and waters of Robson Bight while studies were in progress, the Honourable James Chabot, Minister of Lands, Parks and Housing, on January 26, 1981, placed an interim reserve over the area (Appendix B). This reserve includes Robson Bight, the estuary of the Tsitika River and certain adjacent uplands (see Figure 2), and is to remain in effect for three years or until such time as studies currently underway are completed.

1.2 TERMS OF REFERENCE

Terms of Reference were developed by the study team in January, 1981. In general, they called for a short-term study to assess only existing information; no new data collection programs were anticipated.

The analysis was to focus on the ecology of killer whales and the potential impacts or risks to killer whales from log handling proposals in Robson Bight. In addition, the potential impacts, risks or benefits of other activities and land use proposals were to be addressed. Finally, recommendations for alternative courses of action were to be proposed. (See Appendix C for the complete terms of reference).

1.3 THE STUDY AREA

At the outset of this investigation, sufficient evidence of killer whale activity in the Robson Bight area was available to warrant concern for shoreline habitat which extended both east and west of Robson Bight proper. Thus, if all of the beaches and shoreline used with some regularity by killer whales are considered, the boundaries of the study area (or "core" area as it will be referred to here) include a shoreline distance of approximately 9 kilometres (Figure 1).

The shoreline is generally steeply sloping, debris-free, and made up of smooth, rounded bedrock and small boulders. Pebble beaches are located at the western end of Robson Bight, while gravel beaches and rock faces are common for 1 to 2 kilometres east of the Bight.

Robson Bight lies at the mouth of the Tsitika River, a 39,490-hectare, 42-kilometre-long watershed which rises from sea level to 1,780 metres. This watershed and adjacent upland lie within the Coastal Western Hemlock Biogeoclimatic Zone, with the climate classified as Marine West Coast. Precipitation at lower elevations averages about 250 cm per year. The higher elevations receive more precipitation, with much of this accumulating as snow.

The Tsitika estuary consists primarily of cobbles, gravels and coarse sands, with emergent vegetation established on its upper margin. This small delta, with three main channels, drops steeply into Johnstone Strait which has a depth of 439 metres.

At present, evidence of human disturbance in the area is slight. Two small frame structures on the shoreline serve as temporary accommodations for researchers and occasional visitors. The upland spruce forest at the edge of the estuary is used occasionally by campers, but shows few signs of disturbance. A telegraph line was constructed on the western side of the Tsitika River valley but, today, only decayed telegraph poles and an overgrown trail remain. A few old stumps on the western perimeter of the Bight give evidence of selective logging along the shoreline.

In general then, Robson Bight can be considered to be in near-pristine condition.

1.4 BACKGROUND TO THE TSITIKA PLAN

The intent of the Tsitika Watershed Integrated Resource Plan is to allow logging while preserving important non-timber resource values. Although the plan is now being implemented, two outstanding matters are pertinent to the killer whale issue:

2. THE BIOLOGY OF KILLER WHALES IN THE ROBSON BIGHT AREA AND NORTHERN JOHNSTONE STRAIT

At least 14 persons have undertaken research on killer whales in the Robson Bight area in the eleven years from 1970 to 1980 (Appendix E). Much of the following information is taken from reports and other records of this research (Appendix F), and from results of a questionnaire, "Data and Comments on the Use by Killer Whales of the Robson Bight Area and Northern Johnstone Strait", which was prepared and circulated by the study team[1].

2.1 WORLD STATUS

Killer whales consist of one species, Orcinus orca, which is found in all oceans of the world. While total numbers are unknown, the species is not considered abundant anywhere. The low numbers have made studies of the life history of the species difficult, with the result that little is known about such important aspects as feeding habits, social behaviour, birth season and rates of birth, death and growth.

The commercial value of killer whales is limited to a few hundred killed annually by the world's whaling nations and, in recent years, a few individuals (less than one hundred) captured alive for zoos and aquaria from British Columbia, Washington and Iceland.

Based on current knowledge, there is little doubt that the inshore waters of British Columbia and Washington contain the largest known concentration of killer whales. Certainly this region provides the greatest accessibility to the species for public observation and research.

2.2 BRITISH COLUMBIA AND WASHINGTON

The relative abundance of killer whales in British Columbia resulted in the development of a small live-capture program. About 65 whales were taken from 1964 to 1977. The management needs for this program and

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[1] These questionnaires are on file with the Assessment Branch, Ministry of Environment, Victoria, and with the Pacific Biological Station, Nanaimo.

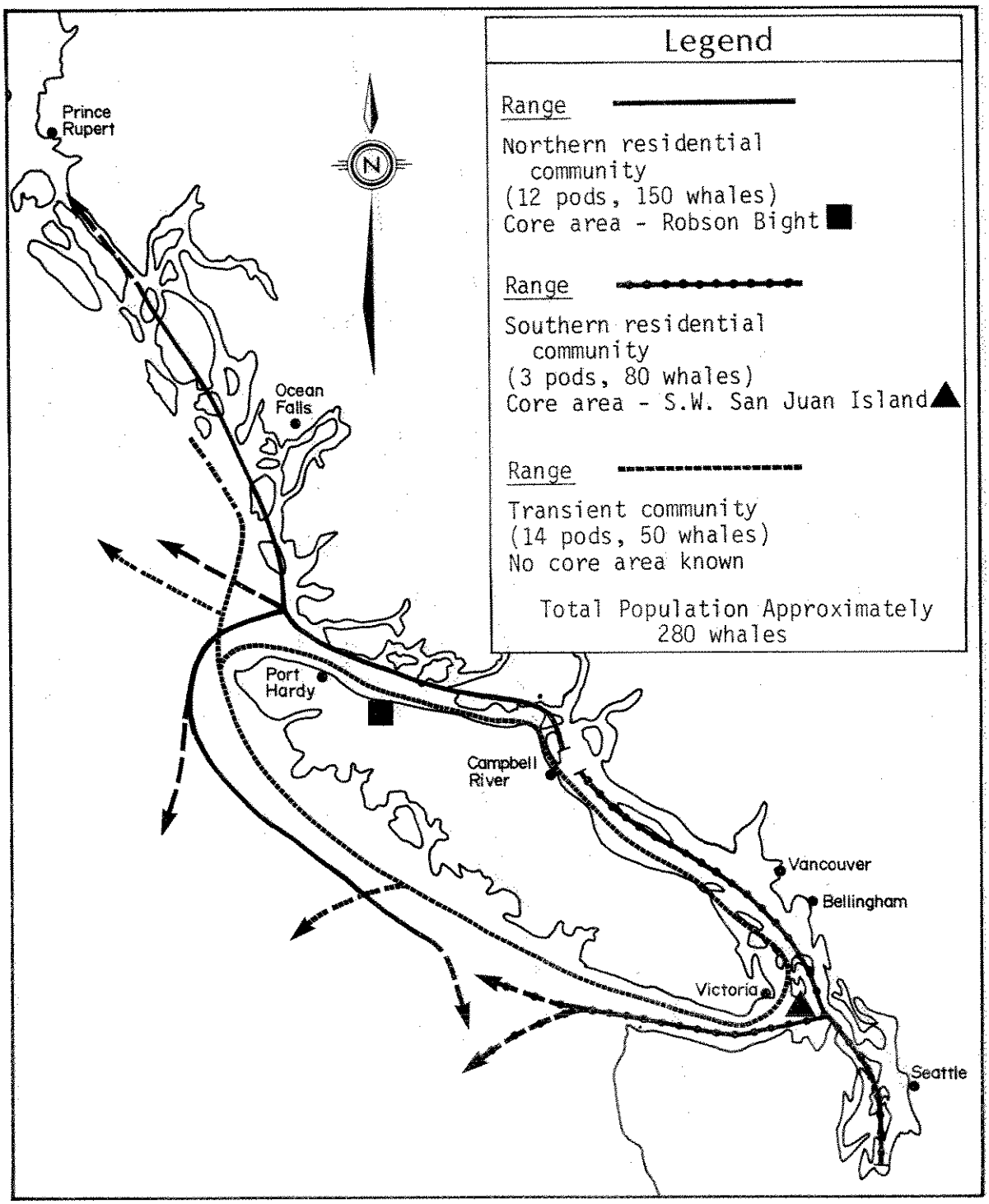

Figure 3 The Summer Ranges, Core Areas and Approximate Sizes of the Three Killer Whale Communities in British Columbia

Both of the known core areas are located close to shore and adjacent to concentrations of migrating salmon on which the whales feed. Both seem to be used most frequently when salmon are migrating. Presently, the full biological significance of these areas is unclear, primarily because most of the whales' activities are underwater and cannot be observed. Nevertheless, it is these activities and the use of a core area which form the basis for potential conflict between log handling and whales in Robson Bight. The key question which remains unanswered is whether or not forcing killer whales out of Robson Bight will affect their survival.

2.3 ROBSON BIGHT AND NORTHERN JOHNSTONE STRAIT

The following information is taken from the study team's questionnaire returns. The data are relevant to northern Johnstone Strait as well as to Robson Bight because research effort was not limited to the Bight itself.

a. Methods and Times of Study

Data have been collected each year from 1970 to 1980, with intensive studies occurring since 1973. Most observations were made during the summer months, partly because of weather and partly because of the apparent scarcity of whales in other seasons. The Pacific Biological Station and Paul Spong of Orcalab have completed some surveys during the fall to spring period.

The main methods of study have been to follow individual whales, each of which can be identified by unique natural markings on the dorsal fin and saddle patch. Aerial and boat censuses, filming, and vocal communication studies have been conducted in the study area.

b. Numbers

It is known that 7 to 8 pods, totalling 65 to 85 whales, utilize the Robson Bight core area and 12 pods, totalling about 125 whales, utilize northern Johnstone Strait. Another 9 pods with 65 whales have been observed within 60 kilometres of the Bight. Not all pods in the northern region make use of Johnstone Strait and Robson Bight to the same extent. The most common use of Robson Bight is by 3 pods totalling 30 whales.

migrating salmon. The use of Robson Bight, then, may be no more than a convenient, quiet location close to shore where the various pods can socialize and rest between foraging periods. However, Robson Bight could also be the location for some important, and as yet unrecognized, social activity associated with productivity.

g. Effect of Boat Traffic on the Behaviour of Killer Whales in Robson Bight and Northern Johnstone Strait

The reaction of killer whales to boat traffic is different in Robson Bight than in the adjacent areas of northern Johnstone Strait. The reason is that in the former region they are mainly resting, while in the latter, they are mainly travelling. If approached by boat while in Robson Bight, whales resting or rubbing will disperse and leave the area. Whales in northern Johnstone Strait are usually "touring" or foraging, and frequently encounter ferries, tugs, fishing boats and other vessels. Their reaction is usually little more than to avoid collision.

h. Research and Observational Values of Robson Bight

The abundance and accessibility of killer whales in Robson Bight provide unique opportunities for public viewing and research. Public viewing occurs primarily from pleasure craft cruising the eastern waters of Vancouver Island. Trailer boat activity is increasing in the area, with trips emanating from Telegraph Cove and Port McNeill. At least one environmental group is planning to conduct whale watching tours to Robson Bight in the summer of 1981.

Robson Bight is now well-known to whale researchers as a prime location for all types of investigations into killer whale biology. There already exists substantial information about the whales' use of the area, some of which is recorded on film. But more information is required. A solid body of base data will be useful in documenting the importance of the core area, long-term changes in behavioural patterns and population trends in this northern killer whale community.

3. ALTERNATIVES FOR HANDLING TSITIKA LOGS

3.1 BACKGROUND

Marine transportation of timber is an essential feature of the coast forest industry but it is an increasing source of conflict. Because of the difficult terrain of coastal B.C. and the high cost of alternative transportation modes where they are available, the forest industry prefers to have access to sheltered tidewater locations. However, handling and storage of logs in estuaries or other protected foreshore waters can be detrimental to environmental or recreational values. The end result is usually a compromise between the needs of the forest sector and the other values being protected. Impacts to the other resources can be mitigated to a degree through measures such as dryland sorting, bundling logs prior to watering, avoiding shallow water sites, and directing operations to the least sensitive feasible alternative.

The evaluation of transportation of timber from the Tsitika River focuses on the winter season. The lower Tsitika Valley is a major source of future winter logging operations for MacMillan Bloedel's Eve River Division. This Division currently shuts down for approximately two months each winter but remains open for the remainder of the winter by logging low elevation sites in the Eve River drainage. Within five to six years, (probably by January, 1986), it will be necessary to move the winter logging operation into the lower Tsitika Valley or face the prospect of extended winter lay-offs. This consideration and the related road construction necessary to accommodate winter logging were factors in arriving at the land use decisions underlying the Tsitika Watershed Plan.

3.2 LOG TRANSPORTATION OPTIONS

At the outset of the Tsitika Planning process, a down-hill haul to the estuary from the lower portion of the Tsitika Valley, rather than a long adverse haul to the Eve River, naturally was considered to be most economical. However, concerns for estuarine resources (i.e. fisheries and recreation) were expressed and, as recommended in the Tsitika Plan, MacMillan Bloedel undertook to examine the relative costs of a number of

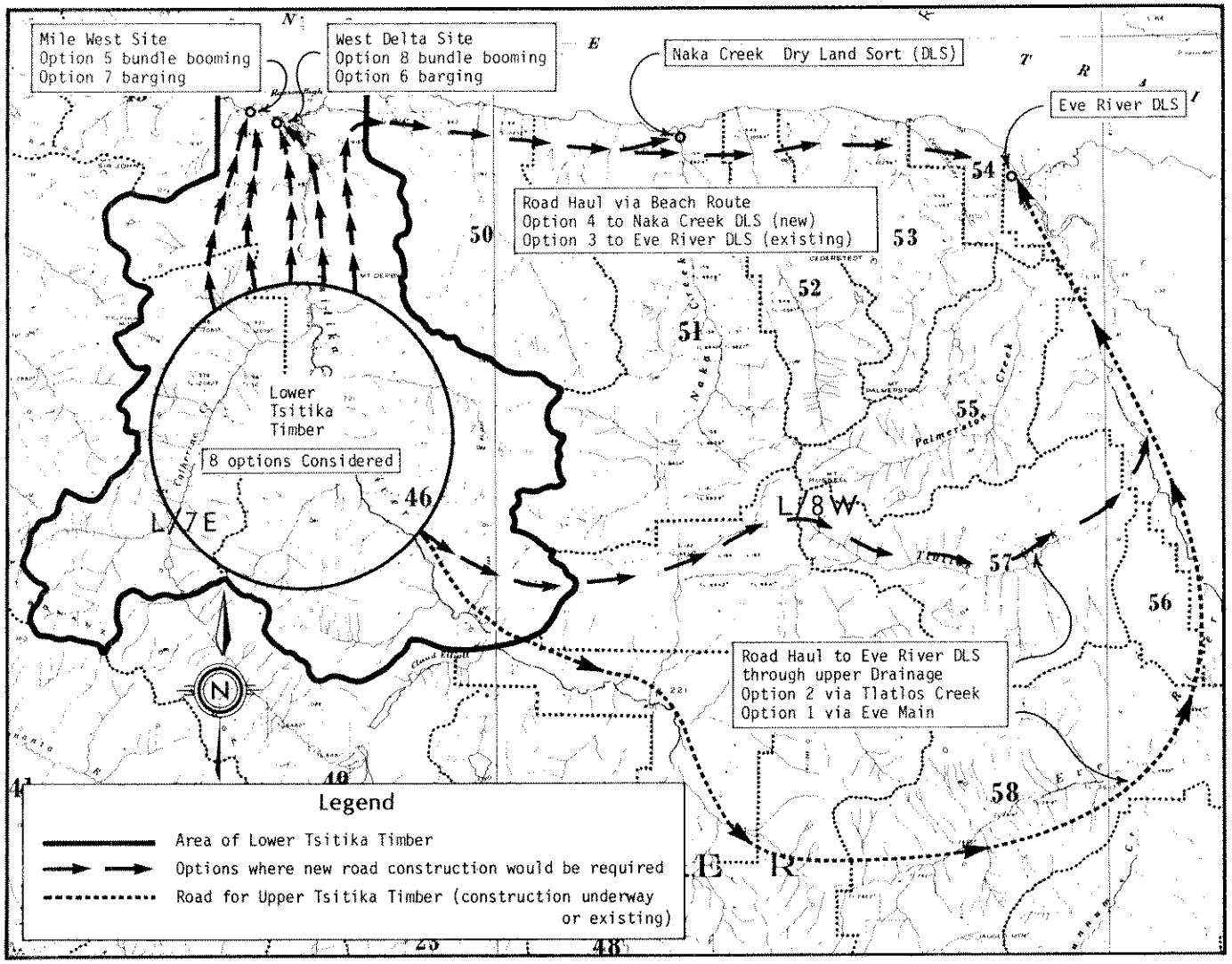

Figure 5 Schematic Diagram Showing Options for Transporting Lower Tsitika Timber

Log Handling Alternatives for Tsitika Watershed:

Summary of Relative Equivalent Annual Costs After Tax[1]

Alternative	Equivalent Annual Cost ($)	Relevant Equivalent Annual Cost Above Alt. #8 ($)
1. Eve D.L.S. - Eve Route	583,899	40,072
2. Eve D.L.S. - Tlatlos Route	613,586	69,759
3. Eve D.L.S. - Beach Route	784,892	241,065
4. Naka D.L.S. - Beach Route	905,503	361,676
5. Mile West Site (Booming)	544,940	1,113
6. Barge - West Delta	878,354	334,527
7. Barge - Mile West	865,215	321,388
8. West Delta Site (Booming)	543,827	0

The road haul to the existing Eve River dryland sort via the upper Tsitika drainage (Option 1) appears to be only marginally more expensive than the West Delta or Mile West boom assembly options. If the initial estimates are borne out, the incremental costs of this road haul over booming in Robson Bight is about $40,000 per year or $0.05 per cubic metre. However, it is important to note that this and other road hauls may prove to be infeasible during winter months in some years. In that case, it will be necessary to: examine the concept of stockpiling winter-cut logs at the logging site for later transport; reassess the present options involving the use of Robson Bight, or; look at new technologies for transporting logs. Assuming that even then a satisfactory solution cannot be reached, it may be necessary to reconsider the Tsitika Plan in order to accommodate the transportation constraints and winter logging.

At present, there is insufficient information to determine the length of time that snow conditions would curtail hauling operations each year.

[1] From "Study of Booming Alternatives for Timber in the Lower Tsitika Drainage", March, 1979, Forest Resource Consultants Ltd., for MacMillan Bloedel Ltd.

4. IMPLICATIONS TO KILLER WHALES OF LOG HANDLING OPTIONS AND LOGGING THE TSITIKA WATERSHED

Potential exists for both direct and indirect impacts on killer whales from logging and log handling[1]. Since the focus of this study is the location of a log handling facility, the potential for impacts will first be examined in terms of log handling alternatives and secondly in terms of logging the Tsitika Watershed.

4.1 IMPLICATIONS OF LOG HANDLING OPTIONS

The log handling alternatives currently under consideration fall into three categories:

Truck Transport - either to Naka Creek or Eve River;
Bundle Booming - from either the West Delta or Mile West Sites;
Barging - from either the West Delta or Mile West Sites.

a. Truck Transportation to a Point Outside Robson Bight

In these options logs would be taken out of the Tsitika Watershed by truck and put into Johnstone Strait at either Naka Creek or Eve River, thus avoiding Robson Bight.

There would be no direct impacts to the whales in the Robson Bight area from these options provided that a suitable buffer from the haul road is established. There is a potential for indirect impacts should the Naka Creek option be selected, since Naka Creek is close to the whale core area and debris carried by the prevailing southeast and easterly winds could degrade prime rubbing beach habitat.

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[1] For the purpose of this report, "direct" impacts are defined as those which have immediate and obvious effects on killer whales such as consumption of habitat (e.g. through breakwater or dock construction, log storage, log and debris sinkage, etc.) and visual or auditory disturbance (e.g. boat traffic, shoreline sights and sounds, etc.). "Indirect " impacts are defined as those which are not immediately obvious since they take time to occur. The source is often geographically removed from the point of impact and the effects may be transitory or cumulative (e.g. silt, logging debris or pollutants carried by stream flows, ocean currents or both).

c. Barging Logs from Robson Bight

The locations of the barge sites are the same as for the bundle booming options. Many of the same direct impacts would prevail, particularly if logs were first stored in the water and then loaded onto the barge. However, if logs were loaded directly from dryland storage onto the barge, and care was taken in the operation of the upland facility, the amount of debris entering the water would be substantially reduced. Moreover, tugs and boom boats would not be required to operate in Robson Bight. The essential traffic would be one or two barges a week depending upon the size of the unit.

On the other hand, the existence of a dock suitable for accommodating a barge would be a major visual feature in the Bight, and loading equipment may create considerable noise. Thus, while the impacts of this type of barging operation on killer whales would likely be less than those described for a booming operation, there is a risk that they would still be sufficient to discourage killer whale use of the area.

4.2 IMPLICATIONS OF LOGGING THE TSITIKA WATERSHED

Coastal logging practices normally result in increases in runoff, silt loads and debris transport, thus affecting water quality. Although the Tsitika Plan is designed to minimize these occurences, some changes can be expected, and there is concern that indirect impacts to whales may result. For example, the core area could be subjected to sediment buildup, decreased underwater visibility and accumulation of debris. Such changes could foul rubbing beaches or alter some aspect of inshore life which may now attract the whales. Although it is acknowledged that the risks to whales from log handling within the Bight would be greater than those from logging in the watershed, the potential for downstream impacts from logging should be recognized and managed, as is recommended.

5. IMPLICATIONS OF LOG HANDLING OPTIONS TO THE TSITIKA PLAN

Although this study focuses on the direct and indirect impacts of the log handling options on killer whales, it is relevant to note how other resource sectors and the Tsitika Plan itself are affected by each option.

5.1 FOREST SECTOR

From the point of view of logging economics, it is apparent that selection of either the Estuary or Mile West option would be the most acceptable. Selection of road haul options 1 or 2 to the Eve River could preclude some marginally economic timber stands in the lower watershed from being harvested because of the increased handling and transportation costs. Moreover, while no specific data are available, below the confluence of Claud Elliot Creek and the Tsitika River, the adverse haul would involve minor changes in road locations as presently contemplated, in order to improve grades. In general, however, operability should not be substantially affected with selection of any of the road haul options.

5.2 FISH AND WILDLIFE RESOURCES

From the point of view of fish and wildlife resources, selection of the Estuary site would result in land alienation and activity detrimental to an elk population wintering on the estuary. Since only a preliminary study of the Tsitika estuary has been completed, it is not presently possible to make an accurate projection of risks to fish and related estuarine resources which would be imposed by log handling. It is logical to project, however, that selection of the Mile West site would present substantially less risk to fish and wildlife than selection of the Estuary site.

A road haul through the upper drainage, on the other hand, poses no risk to the estuary or shoreline resources. However, depending on how the road system is developed in the lower watershed, it may present problems to key wildlife habitats:

6. OTHER LAND USE PROPOSALS AND PLANS FOR ROBSON BIGHT

6.1 PROPOSALS FOR AN ECOLOGICAL RESERVE

a. The Proposal

The original Tsitika Estuary Ecological Reserve proposal, as recommended in the Tsitika Watershed Integrated Resource Plan in 1978 (application 111.1, 131 ha), covered only the immediate vicinity of the river mouth. It was to:

- provide an example of an undeveloped Vancouver Island estuary;
- protect the relatively natural integrity of estuarine fish habitat;
- maintain options for future research; and
- provide opportunities for monitoring and evaluating estuary changes brought about by forest development.

After finalization of the Tsitika Plan in late 1978, when information about the use of Robson Bight by killer whales was brought forward, the Ecological Reserves Unit proposed a larger reserve, essentially adding a 300 m wide foreshore zone and a 100 m wide upland zone, both to extend 5.5 km east of the estuary. This application intentionally did not cover the proposed "Mile West" log handling site or the gravel beach immediately west of the estuary.

When even more information on killer whales became available (1979-80), a second extension (current boundaries 220 ha land, 915 ha water) was proposed and submitted to the Regional Land Manager in September, 1980 (Figure 2). This current proposal includes almost all locations identified as being extensively and consistently used by the whales.

b. Implications of the Robson Bight Ecological Reserve Proposal

Dedication of this Ecological Reserve would involve compensation to MacMillan Bloedel Ltd. since that company owns part of the estuary, and the remainder of the upland area within the proposal lies within a MacMillan Bloedel timber licence. The company has supported establishment

comment pending confirmation that a feasible alternative exists for extracting timber from the Tsitika Watershed. It is the position of the Forests Ministry that, until such time as further analyses of transportation alternatives have been completed, the Robson Bight Ecological Reserve should not be dedicated.

6.2 PROPOSAL FOR A PROVINCIAL PARK

The Sierra Club of Western Canada has proposed the creation of a Provincial Park for the lower Tsitika Watershed (Figure 6). The rationale for this park proposal includes creation of a buffer zone between logging activity and the killer whale habitat, as well as provision of some protection against adverse changes in water quality in the Bight which are anticipated as a result of logging and road construction.

If adopted, this proposal could serve to benefit the whales. However, it would also attract large numbers of people which would compound the increasing problem of managing the movements and activities of visitors in and near the killer whale core area. Thus, a well planned management program would be essential. Creation of a park would also dictate the choice of log transportation options, clearly forcing the use of a road haul to the Eve River.

The Sierra Club proposal is to be assessed by the Ministry of Lands, Parks and Housing. This assessment is then to be reviewed by the Tsitika Follow-up Committee for its implications to the Tsitika Plan.

7. POSITION OF THE PUBLIC WITH RESPECT TO ROBSON BIGHT

For the purposes of this report, no specific survey of public views on the Robson Bight Killer Whale issue was undertaken. However, on the basis of public expressions reaching the study team, there would appear to be overwhelming support for the protection of Robson Bight and the killer whales which use it. These expressions have come to the study team in the form of petitions and letters to the Minister of Environment and the Minister of Lands, Parks and Housing (some 1700 signatures), comments from environmental organizations (Robson Bight Preservation Committee, Greenpeace, Sierra Club), and from a public meeting at Port McNeill (February 26, 1981) attended by study team members. Not a single expression opposing the protection of Robson Bight was received.

APPENDICES

Province of British Columbia | Ministry of Environment

NEWS RELEASE

Appendix A

Released by: Minister's office,
Ministry of Environment.
Parliament Buildings, 387-3769.

Date: December 9, 1980.

KILLER WHALE CONFLICT STUDIED

Environment Minister Stephen Rogers announced today that his ministry would be heading up a small team of experts to study a potential conflict involving killer whales and a proposed log handling facility at Robson Bight, on the northeast coast of Vancouver Island.

Robson Bight, a small bay at the mouth of the Tsitika River, has been described by marine biologists as an important core habitat for approximately 150 killer whales, which range through Johnstone Strait and the north coast.

However, said Rogers, it is also the site of a proposed log handling operation for MacMillan Bloedel Ltd., who have begun logging in the upper Tsitika watershed.

"There is evidence that the northern pods of killer whales, which represent more than half of the total killer whale population in B.C. waters, use Robson Bight as both a resting and play area almost every day through the summer months," said the minister.

"At the same time, it appears that the use of at least part of the shoreline somewhere near the mouth of the Tsitika River for a log handling facility is critical to the economics of the logging operation, and to maintaining winter logging employment in the area."

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Province of British Columbia | Ministry of Environment

NEWS RELEASE

Appendix B

HONOURABLE JAMES R. CHABOT,
MINISTER OF LANDS, PARKS AND HOUSING

CONTACT: S. Ainscough
PHONE: 387-3502

RELEASE: January 26, 1981

NO: 81-10

SUBJECT: ENVIRONMENT RESERVE ESTABLISHED AT ROBSON BIGHT

The province has established a reserve over the area known as Robson Bight, according to an announcement by Lands, Parks and Housing Minister Jim Chabot.

Robson Bight is located between Port McNeill and Sayward on the north east coast of Vancouver Island, and the reserve has been established to protect it from any contemplated development.

The reserve will remain in effect for three years or until such time as ecological studies currently underway by various government ministries are completed.

The reserve will include the estuary of the Tsitika River to the high tide mark, and an area of foreshore totalling approximately 936 hectares, and adjacent upland Crown land for a distance of 100 meters from the high tide mark.

Chabot said, "Preliminary studies have demonstrated the importance of this area to the killer whale population of the British Columbia coast".

"This matter has been the subject of discussion with my colleagues, Honourable Stephen Rogers and Honourable Tom Waterland, whose staff are participating in the studies. To date no applications have been received for development, and I do not wish to raise expectations that any proposed development may be considered while the ecological values of the area are being confirmed". Chabot said.

Appendix C

Terms of Reference

Robson Bight Killer Whale and Log Handling Overview Study

1. Marine Resource Inventory

   a) Describe, in general terms, existing marine and shoreline conditions at Robson Bight.

   b) Assemble existing information on the use by killer whales of the Robson Bight marine habitat, and identify information gaps.

2. Log Handling Alternatives

   a) Assemble existing information to describe several alternatives for transferring logs from the Tsitika watershed to Johnstone Strait.

3. Impacts of Log Handling Alternatives

   a) If possible, project impacts or risk of impacts to killer whales and to killer whale habitat resulting from the log handling alternatives described above.

4. Other Land Use Proposals

   a) Describe the status of a proposed Ecological Reserve for Robson Bight which is currently under review; summarize agency and industry reaction to that proposal; comment briefly on its implications to whale habitat, log handling alternatives and the Tsitika Plan.

   b) Summarize the proposal for a Provincial Park in the lower Tsitika watershed submitted by the Sierra Club of Western Canada; comment briefly on its implications to whale habitat and log handling alternatives.

   c) Comment briefly on the implications of logging the Tsitika watershed on whale habitat.

5. Recommendations

   a) Describe alternate courses of action and specify the implications of each. Based on the information available and risk analysis, recommend a preferred course of action.

   b) Identify unanswered questions and recommend additional studies.

THE UNIVERSITY OF BRITISH COLUMBIA
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Appendix D

DEPARTMENT OF ZOOLOGY

October 11, 1978.

Mr. Ray Ostby, Chairman
Tsitika Planning Committee
B.C. Forest Service
355 Burrard St.
Vancouver, B.C.

Dear Mr. Ostby:

Under contract with the federal Department of Supply and Services I currently am investigating, with one of my graduate students, the underwater acoustics of killer whale groups in B.C. Last summer our work was concentrated, as it will be next year, in the upper Johnstone Strait area. Because of the nature of the whales' regular behavioural routine, much of the work centres on the Robson Bight area.

In their passage down the Strait, the whales invariably stop in the Bight for up to two hours, resting, then go through a routine of intense activity close inshore just adjacent to the Bight as shown on the attached map. This consists mainly of rubbing themselves vigourously both against the rocks and on small pebbly beaches. They react markedly to anyone on the rocks above them at this time, or too close to them in boats, showing agitation and movement away.

This behaviour pattern is so regular during each circuit made by the whale social groups in whose home range the Bight is, that any permanent disturbance to it could be construed as an undesirable ecological impact. At the time of our initial work there I was unaware of the plans to develop the Bight as a logging port, and of the hearings that I understand were held. I would however now like to provide this additional input to your committee, with the hope that any ecological reserves being planned could be extended offshore where appropriate, to protect as far as possible this aspect of the biology of what surely is the most spectacular marine member of the region's fauna.

Most important, it seems to me, would be to include the area adjacent to the Bight that I have mentioned. As an ideal situation, I mark on the map an outline that would enclose as well the resting and play area that is described above.

There is a natural grade running into the "rubbing rocks", with ribbon survey markers all about. Any path or road into this small area would, I emphasize, be a most undesirable development, as the whales are very sensitive to any presence on shore in the area, and it forms an important part of their ritual.

I am sending copies of this letter to Dr. Bristol Foster, as I believe he is involved with an ecological reserve proposal for the area, and to Dr. M.A. Bigg, in charge of marine mammal research and management for the Department of Fisheries and Environment at Nanaimo. I very much hope that this aspect of the Bight's ecology can be considered in any plans for the region.

Sincerely,
(original signed by)
H.D. Fisher, Professor.

Appendix E

Persons Involved in Research or Observations in the Robson Bight Area and Northern Johnstone Strait

Person	Affiliation	Years of Research
Bigg, M.A.	Pacific Biological Station, Nanaimo	1971-1980
Ellis, G.E.	Pacific Biological Station, Nanaimo	1973-1980
MacAskie, I.B.	Pacific Biological Station, Nanaimo	1971-1979
Spong, P.	Pacific Killer Whale Foundation, Alert Bay	1970-1980
Ford, J.	University of British Columbia, Vancouver	1978-1980
Hoyt, E.	Independent researcher, writer, Vancouver	1973-1978
Jacobsen, J.	Independent researcher, California	1978-1980
Jepson, P.	Independent researcher, California	1978-1979
Hubbard, A.	Independent researcher, California	1979-1980
Morton, R.A.	Aqua Cine Productions, films, observations, Duncan	1979-1980
Orton, N.	Aqua Cine Productions, films, observations, Duncan	1973-1980
Borrowman, J.	Top Is. Econauts Society, observations, Pt. McNeill	1976-1980
Harrower, B.	Top Is. Econauts Society, observations, Pt. McNeill	1979-1980
MacKay, B.	Top Is. Econauts Society, observations, Telegraph Cove	1977-1980

Appendix F

Reports and Observations on Killer Whales at Robson Bight and Northern Johnstone Strait

1. RELEVANT REPORTS

Balcomb, K.C., J.R. Boran, R.W. Osborne, and N.J. Haenel. 1980. Observations of killer whales (Orcinus orca) in greater Puget Sound, State of Washington. Rept. No. MMC-78/13, U.S. Marine Mammal Commission, 1625 I St., N.W. Washington, D.C. 2006: 42 p.

-This is a significant report regarding the behaviour of killer whales in the core area of S.W. San Juan Is., Haro Straits.

Bigg, M.A., and A.A. Wolman. 1975. Live-capture killer whale (Orcinus orca) fishery, British Columbia and Washington, 1962-73. J. Fish. Res. Bd. Can. 32: 1213-1221.

Bigg, M.A., I.B. MacAskie, and G.E. Ellis. 1976. Abundance and movements of killer whales off eastern and southern Vancouver Island with comments on management. A Preliminary Report. Typed 20 p. Pacific Biological Station, Nanaimo, B.C. March 1976.

Bigg, M.A. 1979. Interaction between pods of killer whales off British Columbia and Washington. Abst. 1 p. Third Biennial Conf. on the Biol. of Marine Mammals. Olympic Hotel, Washington, 7-11 Oct. 1979.

Bigg, M.A. 1980. The life cycle of killer whale pods in British Columbia. Abst. 1 p. Orca Symposium, University of Washington, Seattle, 10-12 Oct. 1980.

Ford, J.K.B. 1980. Dialects in British Columbia killer whales. Abst. 1 p. Orca Symposium, University of Washington, Seattle, 10-12 Oct. 1980.

Hoyt, E. (In press). The whale called killer.

Hubbard, A. 1980. Sound-behaviour correlations in Orcinus orca. Abst. 1 p. Orca Symposium, University of Washington, Seattle, 10-12 Oct. 1980.

Jacobsen, J. 1980. The behaviour of a pod of killer whales (Orcinus orca) in the Johnstone Strait, British Columbia. Typed, 69 p. Copy on file at Pacific Biological Station, Nanaimo.

Jacobsen, J. 1980. Behaviour of the killer whales (Orcinus orca) in the Johnstone Strait, British Columbia. Abst. 1 p. Orca Symposium, University of Washington, Seattle, 10-12 Oct. 1980.

Jacobsen, J. 1980. The birth of a wild killer whale (Orcinus orca). Abst. 1 p. Orca Symposium, University of Washington, Seattle, 10-12 Oct. 1980.

Appendix G

Additional References

1. Armstrong, Luanne. 1981. Robson Bight: Making Way for Progress. The Martlet, Jan. 29, 1981.

2. Associated Engineering Services Ltd. 1980. Tsitika River Wave Study. For MacMillan Bloedel Ltd. 4 pp. plus Figs., mimeo, March, 1980.

3. Ceska, Adolf. 1981. Vegetation of the Tsitika River Estuary. 28 pp. plus Figs., mimeo.

4. CJOR Radio. 1980. Transcript of CJOR Radio Interview - Robson Bight Killer Whale Issue., 15 pp., mimeo. Dec. 19, 1980.

5. Fisheries and Marine Service, Canada. 1980. Preliminary results of a baseline study of the Lower Tsitika River and estuary, May, June and July, 1979, 15 pp. plus Figs., mimeo.

6. Forest Resource Consultants Ltd. 1979. Evaluation of Potential Booming and Barge Loading Sites in the Vicinity of Tsitika River, 18 pp., mimeo for MacMillan Bloedel Ltd.

7. Hoyt, Erich. 1980. Can the Wilderness Survive? B.C. Outdoors, November-December, 1980.

8. MacMillan Bloedel Ltd., Eve River Division. 1979. Study of Booming Alternatives for Timber in the Lower Tsitika Drainage. 8 pp. plus Appendices, mimeo.

9. Sierra Club of Western Canada. 1981. Tsitika Provincial Park; Robson Bight Ecological Reserve No. 111. 25 pp.

10. Tsitika Planning Committee. 1978. Tsitika Watershed Integrated Resource Plan. 52 pp.

LIST OF A.P.D BULLETINS

A BULLETIN is one of four Regular Publication series produced by the Division. (This series replaces the former Resource Analysis Branch series). Bulletins present the results of technical or scientific studies including the interpretation or application of resource data.

APD BULLETIN 1 - Saanich Peninsula Spring-Time Freeze Risk. R.R.H. Chilton

APD BULLETIN 2 - Soil and Vegetation Resources of the Pend-d'Oreille Valley, B.C. T. Vold, R.F. Ferster, T.K. Ovanin, R.D. Marsh, G.P. Woods.

APD BULLETIN 3 - Regional Hydrology of the Northeast Coal Study Area. Michael J. Miles.

APD BULLETIN 4 - Studies on Aquatic Macrophytes Part XXXI. J.R. Rudolph, C.E.W. Dyer.

APD BULLETIN 5 - Terrain Inventory and Geological Hazards: Northern Vancouver Island. D.E. Howes.

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