ALASKA LEGISLATURE COMMITTEE FILES 1983-1984 8672

2887 SRES SJR 31

2887

January 16, 1984

Mr. Robert B. Brumsted, Chief
Permits and Documentation Division
U.S. Department of Commerce
NOAA/NMFS
Washington, DC 20235

Dear Mr. Brumsted:

In our departmental letter to you, dated July 6, 1983, regarding application P2M by Sea World, Inc., we stated our concurrence with the issuance of that permit by your agency. However, we requested that as a condition of the permit, "approval of the State of Alaska must be obtained prior to any effort by Sea World, Inc. to take killer whales in state waters, under the broader authority of a Federal permit."

We have reviewed Mr. William G. Gordon's November 1, 1983, letter and your agency's permit (#439) to Sea World, Inc., which authorizes the taking of killer whales in Alaska waters. We did not find a permit condition which requires the permittee to obtain approval from the State of Alaska prior to conducting activities in state waters. Therefore, I request the following actions be initiated by your agency:

(1) provide the permittee (Sea World, Inc.) with a written supplemental permit condition which requires State of Alaska approval prior to any efforts being undertaken to capture killer whales in state waters;

(2) require that an observer from the National Marine Fisheries Service and/or the State be present during <u>all</u> capture operations in state waters; and

(3) establish a procedure whereby the State of Alaska will receive copies of all reports and pertinent

information compiled by Sea World, Inc., to include mortality reports, capture reports, summaries of research results, and annual reports.

At your earliest convenience, please advise as to your intentions to fulfill the above requests. Should you consider these conditions unnecessary, the State may decide to oppose the Sea World, Inc. program in state waters.

Sincerely,

for Don W. Collinsworth
Commissioner

cc: William G. Gordon

bcc: Game Headquarters
John Burns
Rep. Mike Szymanski

DWC:WLP:M²:h

SUBMISSION TO

THE U.S. NATIONAL MARINE FISHERIES SERVICE

COMMENTS CONCERNING SEA WORLD, INC'S

ORCA CAPTURE PERMIT APPLICATION UNDER

THE GUIDELINES OF THE U.S. MARINE

MAMMAL PROTECTION ACT

GREENPEACE, SEATTLE

GOOD SHEPHERD CENTER
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TELEPHONE
206/632-4326

Greenpeace Northwest

Alan Reichman, Wildlife
Campaign Coordinator

June 6, 1983

SUBMISSION TO THE U.S. NATIONAL MARINE FISHERIES SERVICE

COMMENTS CONCERNING SEA WORLD, INC.'S ORCA CAPTURE PERMIT APPLICATION UNDER THE GUIDELINES OF THE U.S. MARINE MAMMAL PROTECTION ACT

GREENPEACE, SEATTLE

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The Pacific Northwest regional office of Greenpeace—with approximately 20,000 members—is opposed to granting Sea World, Inc. a permit to capture killer whales (orcinus orca) from Alaska and California coastal waters under the guidelines of the U.S. Marine Mammal Protection Act.

Greenpeace Northwest has experienced Sea World orca capture operations firsthand in the past as a result of our location. Therefore, we are submitting comments in addition to those submitted by Greenpeace U.S.A., emphasizing our experience with Sea World as well as other concerns.

There are four facets of our position opposing a potential Sea World orca capture permit:

1. The biological and ethical implications of capturing orcinus orca and holding them in captivity.

2. The clear lack of scientific justification for Sea World's proposed exploitation of Alaska and California orcinus orca populations; as well as an equally clear lack of scientific justification for the scientific research they propose to conduct.

3. Sea World's interest in procuring a source of display animals for its highly profitable marine circus operations—as well as potential sale to other aquaria worldwide. Sea World's proposed research appears to possibly represent an attempt to justify its desire to provide its facilities with a resource.

4. Sea World's pitiful capture operations in the State of Washington. As citizens of Washington State, we have experienced the negligence of Sea World firsthand. In 1976, the State of Washington successfully sued Sea World and their capture operation was subsequently shut down.

I. BIOLOGICAL AND ETHICAL IMPLICATIONS

The risks of mortality to orcas during capture operations, transport, and captivity are manyfold. There is a bonafide risk of death for non-target as well as target animals during capture, and an exceptionally high risk of mortality to captive animals during transport as well as the first few months of captivity. Furthermore, the longevity of captive orcas is far below that of orcas in the wild (please see the attached table provided by Washington Secretary of State Ralph Munro concerning orcas captured in Washington State and British Columbia waters from 1961-1976). Also, no orcas have ever successfully bred in aquaria facilities anywhere in the world. Thus, captive orcas are denied an opportunity to contribute to the survival of their particular pod or the population as a whole.

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Ethical considerations must also be scrutinized. For instance, we must consider the importance of the pod as the intricate social unit which orcas live within. During capure operations, entire pods are harassed: often by "California seal devices" (which are better known as seal bombs), high speed boats, and sea planes. As a result, non-target animals are adversely affected by such operations. All orcas within an affected pod are disrupted and disturbed by the removal of individual members. A trauma factor for all the whales must be considered. Furthermore, the conditions of confinement in aquaria enclosures are not acceptable by modern zoo-keeping standards Orcas can range up to one hundred miles per day in the wild. Enclosures which are not realistically much larger than backyard swimming pools simply are not adaquate. Orcas have sophisticated sonar systems for communication, hunting and navigation and live in perpetual distress in a captive environment wherein their communications reverberate off concrete walls.

II. LACK OF SCIENTIFIC JUSTIFICATION FOR PERMIT

Sea World does not provide ample evidence supporting their estimate of a world orca population of 200,000 animals. Furthermore, Sea World does not provide sufficient information concerning the stocks in Alaska and California they wish to exploit. Greenpeace Northwest supports the reasons given by the Moclips Cetalogical Society of Friday Harbor, WA. in its opposition of a potential Sea World permit for these reasons as well as the others they cite.

We agree with Moclips' critique of Sea World's plan to develop a "sustained captive breeding population." Orcas have never successfully bred in captivity. Greenpeace Northwest recommends that Sea World demonstrate that it can provide a captive environment wherein orcas that are currently in captivity can successfully breed before they are permitted to capture more orcas for the explicit purpose of breeding orcas. Until Sea World can successfully demonstrate that captive orca breeding is possible, a permit should not be granted.

A NON-PROFIT
TAX-EXEMPT
ORGANIZATION

Also, Sea World does not provide sufficient justification for the research that it wishes to conduct. They do not establish that such research could not be successfully conducted from orcas that are currently in captivity. There especially is no justification for Sea World to transport orcas away from the capture site if they are going to be released. Sea World needs to clarify its intentions concerning the duration of time they intend to experiment on whales. They are requesting up to three weeks to conduct experimentation yet Lanny Cornell claims the whales will be held only twenty minutes to two hours in a Seattle Post-Intelligencer article of June 2, 1983 (which is enclosed). Sea World only concedes that it will "attempt" to release orcas near other orcas. Furthermore, they could never insure that orcas would be released at locations where they could reintegrate themselves into their pods. Given the intricacy and dynamacy of the relationship between an individual orca and its pod this could cause an inhumane level of pain and suffering.

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In summation, Greenpeace Northwest is in agreement with the Mo-clips Cetalogical Society's comments concerning Sea World's lack of evidence regarding orca population sizes; the lack of credibility for their proposed "sustained breeding population"; and the lack of justification for the validity as well as methodology of the research they propose to conduct.

III. SEA WORLD'S OVERRIDING INTEREST IN PROCURING DISPLAY ANIMALS

When one traces the history of the orca capture industry, one realizes that Sea World may be more interested in procuring a source of display animals for its highly profitable marine circuses than it hopes to increase scientific knowledge of orcinus orca.

As I will further explain in section IV of these comments, Sea World conducted its capture operations in Washington State waters until it was successfully sued by the State of Washington in 1976. As a result, Sea World's "orca capture expert" Donald Goldsberry travelled to Iceland where he helped start a similar capture operation based at the Saedryasafned Zoo (see accompanying portion of Erich Hoyt's The Whale Called Killer, New York, E.P. Dutton, 1981). Iceland has been Sea World's source of orcas since 1977.

Since the National Marine Fisheries Service has temporarily stopped issuing permits allowing the importation of orcas from Iceland, Sea World is wondering where its display animals will be obtained from. The National Marine Fisheries Service should consider the possibility that Sea World is submitting this application because its Icelandic source has dried up.

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IV. SEA WORLD'S RECORD IN WASHINGTON STATE

Until March of 1976, Sea World regularly attempted—many times successfully—to capture orcas in Washington State coastal waters. Their capture operations raised considerable public concern. One such occasion is described by Sheldon Campbell in his Lifeboats to Ararat (New York: Times Books, 1978):

"A year before this time (Campbell has described a confrontation between Goldsberry and Don McGaffin, a columnist with Seattle's KING-TV which is an NBC affiliate, in the preceding paragraph) a tragedy had occurred which stirred many of the residents around Penn Cove to anger, for by 1970 killer whales were a welcome addition to the local scenery, coming as they did around the same time every year, generally in August, remaining awhile, and then departing on what happened to be an annual migration. In 1970 some of the visiting whales had been left behind dead, their corpses washing up along the shore. Several had their bellies slit and rocks, concrete, and old chunks of iron placed inside. Because whale collectors had been in the vicinity before the deaths, some residents blamed them. (Footnote at bottom of page: "Nothing was proved but accidents do occur in animal collecting, particularly in the earlier stages of developing capture techniques.")."

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While it has never been proven that Sea World's orca capture operation under the direction of Donald Goldsberry killed the orcas, it has never been proven otherwise.

In early March of 1976, Sea World attempted its last ever capture attempt in Puget Sound waters. Sea World utilized seal bombs, high speed boats, and sea planes to herd whales from north of the Tacoma-Narrows Bridge to Budd Inlet, just outside of Olympia. A heated public outcry ensued. On Wednesday, March 10, Governor Dan Evans asked Attorney General Slade Gorton to file suit in District Court at Seattle to block the removal of orcas that were trapped at Budd Inlet.

The lawsuit questioned whether Sea World was authorized to use the seal bombs, etc. within the terms of the permit that had been issued by the U.S. National Marine Fisheries Service. I have enclosed some of the transcripts of Sea World's appeal that was dismissed by the U.S. District Court. Many of the transcripts from the successful suit are not included in the file that is held in archives in Seattle, WA.

Judge Morell Sharpe's verdict ruled that the defendents illegally pursued orcas in a prohibited zone north of the Tacoma-Narrows Bridge. Moreover, Sea World's permit stipulated that the allowed method of capture would be as follows:

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"Methods of capture will be allowing the animals to enter a bay or harbor and then closing off the mouth or entrance with a specially designed mesh net which keeps the animals inside the bay but allows the passage of fish back and forth. From this point another net is placed inside the original net to herd the animal into a working area and from there the animals are divided into smaller groups and put in floating pens large enough to accomodate two or three animals as necessary. Some animals which are to be taken are then seperated, placed in floating pens, and the remaining animals are freed. The size of the pens would be adjusted so that individual animals accomodated would have at least twice their body length in depth within the pen. This method allows the collector to evaluate the animals and pick out the most likely specimens, while not placing undue stress on the animals."

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Clearly, these terms do not permit the usage of explosives, high speed boats, and sea planes for herding. Sea World broke the terms of its agreement.

While Sea World is not asking for authority to capture orcas from Puget Sound waters in this application, we must consider that they have not followed National Marine Fisheries Service regulations in the past. I have enclosed a copy of the 1976 Washington State Senate Resolution that bans capture and harassment of orcas in Washington State coastal waters.

Interestingly enough, the text that Sea World cites as its description of the techniques it plans to utilize in proposed capture operations is co-authored by none other than Donald Goldsberry.

V. SUMMATION

Greenpeace Northwest agrees with the recommendations of the Moclips Cetological Society of Friday Harbor, WA. and further recommends that:

1) Sea World, Inc. conducts any scientific research it deems necessary on orcas that are currently in captivity at its facilities in San Diego, CA., Aurora, OH., and Orlando, FL., as well as other aquaria worldwide.

2) Sea World, Inc. demonstrate that it can successfully develop a captive environment where orcas that are currently in captivity can breed successfully. Orcas that are currently in captivity at their facilities as well as other aquaria could be transferred to the new enclosure system.

A NON-PROFIT TAX EXEMPT ORGANIZATION

3) Public hearings be conducted to further scrutinize Sea World, Inc.'s application. Citizens should be invited to voice their opinions con-

cerning this proposal. A hearing should be held in the Puget Sound region of Washington State as the citizens of Washington State have had experience with Sea World, Inc.'s capture operations in the past and should be allowed to participate in the decision-making process.

Yours Sincerely,

Alan Reichman

Alan Reichman
Wildlife Campaign Coordinator
Greenpeace Northwest

ENCLOSURES

A Scientific Review of the SeaWorld Permit Application of March 7,1983 for Public Display and Scientific Research Under the Marine Mammal Protection Act

16 - August - 1983

by Richard Ferraro and Dr. Merrill Spencer

Seattle, Washington

abstract:

On March 7,1983 SeaWorld requested a five year permit to confine and capture Orca Orcinus (killer whale) for the reasons of public display and scientific experimentation.

This review addresses all scientific aspects of this permit request and is presented by two concerned research scientists. The SeaWorld permit request should not be approved. We request that this written review be entered into the record.

authors:

Richard Ferraro is a research scientist specializing in computer applications of medical electronics. He has a masters degree in Electrical Engineering, and acts as a consultant to electronics corporations, hospitals, Universities and the National Institutes of Health. He has focused his attention, in the past 18 months, to the Orca of the Puget Sound.

Dr. Merrill Spencer is a physiologist specializing in the field of Cardiovascular research. He has published over 160 scientific papers including comparative Physiology subjects, and 7 papers on Orca and Grey Whale physiology. He has served on many National panels reviewing scientific research proposals. He has participated in the capture of wild Orca inthe San Juan Islands as well as Grey Whales of Laguna OjoDelebrie Baja California and thus has first hand experience with the logistical and stress related problems involved in the capture and confinement process.

review and risk assessment:

The general criticisms we have of the SeaWorld permit request are that it is poorly organized, omits important information, and lacks consideration for scientific hypothesis and protocol. The consultants listed have no defined roles nor is the five year plan clearly outlined.

The risks to Orcus Orcinus, both individuals and pods, are not clearly identified in either the capture and handling techniques nor in the medical procedures. Subsequently the methods for minimizing obvious risks are missing.

For example the risk of infection due to the tooth extraction process is not dealt with. No mention is made to the use of antibiotics in eliminating this infection potential. Nor is it suggested that the Orca whose teeth are to be extracted could be the animals that SeaWorld currently holds or plans to keep. Their standard animal husbandry program would further minimize the risk of infection.

The specific criticisms of the SeaWorld permit application follow. We have reorganized each of the experiments and proceedures into the following five categories:

1. Breeding

There is no hypothesis stated as to how SeaWorld plans to sucessfully breed Orca when they have been unsuccessfull in the past. The procedural changes such as larger pools, hormone levels, Karyotyping, vaginal swabs, and increased numbers of whales proposed could be tested on the 8 existing captive SeaWorld Orca. If a larger population of captive whales or a larger tank are believed to be the solutions to the unsuccessfull breeding problem then the 8 current captive Orca owned by SeaWorld could be put into one of SeaWorlds larger tanks to prove the hypothesis. It is also not proposed that the freshly captured animals will be held in the larger tanks.

No where is it mentioned in this proposal whether any or all of the proposed Orca to be kept by SeaWorld for breeding purposes will be required to perform and how this performance schedule would effect the whales ability to breed.

2. Animal Husbandry

Tests involving the health care of the captured Orca including blood chemistry, liver biopsy, hemotology, and nasal swabs are important for animal husbandry to protect the dollar investment. This is health care of captured animals and therefore provide no scientific justification for this proposal any more than these procedures are considered scientific research projects when applied to human health care.

3. Gastric Lavage

The reviewers believe that the gastric lavage has scientific merit in the analysis of the stomach contents of free ranging Orca. Gastric lavage could provide valuable information comparing stomachs contents of the free ranging Orca with the sacrificed Orca data from Rice. The only comparisons discussed however relate to adult male/non adult males however, and no mention is made regarding stress related changes caused by the capture process preceeding the stomach lavage.

4. Population Dynamics, Vocalizations, Body Dimension, and Growth Rates

Census data obtained in the population dynamics studies could be of scientific merit yet we feel the success others are having with visual and photographic techniques merit further consideration.

Certain data from vocalizations, radio telemetry, spaghetti streamers cryogenic marking, and tagging desired could be acquired using less invasive techniques currently being successfully employed with free ranging Orca. The highly invasive techniques proposed could damage the very data they are trying to obtain by capturing, taging with various markers, releasing and recapturing the Orca.

The mensural data made available through the original capture could be of scientific value however the plan to recapture the same whales up to 3 times involves serious risk to the individual Orca and to the pod. It is unclear as to how SeaWorld plans on using this mensural data. Again we feel that more extensive use of less invasive techniques should be explored before resorting to the proposed invasive techniques.

5. Respiratory Gas Analysis, Hearing and Aging

Certain data related to respitory gas analysis, hearing thresholds, and tooth extraction desired in this experiment could be obtained using already existing captive Orca . No justification is given for performing the hearing threshold tests or the respitory gas analysis on Orca under captive conditions, what information is being looked for with these tests, or why they couldn't be performed on existing captive Orca.

conclusion:

In conclusion this 5 year massive invasion of Orca enviornment in the Alaskan waters is not justified on the basis of the scientific aspects of this proposal. The benefits proposed in this permit application are far outweighted by the risks of such an aggressive invasive disturbance of the free ranging Orca of the Alaskan and California waters.

98TH CONGRESS
1ST SESSION

H. R. 4457

To prohibit the taking and importation of killer whales for public display purposes.

IN THE HOUSE OF REPRESENTATIVES

NOVEMBER 17, 1983

Mr. CHANDLER (for himself, Mr. FOLEY, Mr. DICKS, Mr. MORRISON of Washington, Mr. LOWRY of Washington, and Mr. SWIFT) introduced the following bill; which was referred to the Committee on Merchant Marine and Fisheries

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A BILL

To prohibit the taking and importation of killer whales for public display purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 101(a)(1) of the Marine Mammal Protection Act of 1972 (16 U.S.C. 1371(a)(1)) is amended by adding at the end thereof the following new sentence: "After the effective date of this sentence, no permit may be issued for the taking and importation of killer whales (Orncus orca) for public display purposes.".

SEC. 2. The amendment made by the first section of this Act shall take effect on the date of the enactment of this Act

Grand Camp
Alaska Native Brotherhood

71ST, ANNUAL ANB-ANS GRAND CAMP CONVENTION
JUNEAU, ALASKA
NOVEMBER 14-19, 1983

RESOLUTION NO. 92

WHEREAS, Sea World of San Diego, California has been issued a permit by the Federal government to capture 100 killer whales in a period of five years, and

WHEREAS, The state of Washington and the government of Canada have both opposed and stopped the capture of killer whales within their water boundaries in the past, and

WHEREAS, Sea World has promised safe capture of these mammals, but has caused many deaths in past captures because of their use of seal bombs, high speed boats, sea planes, and methods of capture, and

WHEREAS, These offenses during the capture of killer whales influenced the state of Washington to file a law suit against Sea World in 1976, putting an end to their operations and cancelling their permit, and

WHEREAS, The state of Alaska has no mammal protection laws to protect killer whales, or to prevent this type of operation within the water boundaries of Alaska, NOW

THEREFORE BE IT RESOLVED that the 71st Annual Grand Camp Convention of the Alaska Native Brotherhood and Sisterhood assembled in Juneau, Alaska strongly urge the State of Alaska to enact legislation banning the capture of killer whales within the boundaries of Alaska waters, and

BE IT FURTHER RESOLVED that an intense investigation be conducted by the Dept. of Fish and Game on the methods used by Sea World in their capturing methods in Puget Sound. Copies of this resolution to be sent to the Assistant Administrator for Fisheries, Washington, D.C., to Alaska Legislature, and the U. S. Delegation from Alaska.

ATTEST:
I certify that this resolution was adopted by the ANB ANS Grand Camp in Convention at Juneau during the week of Nov. 14-19, 1983.

Ronald Williams, Grand President

Albert Kookesh, Grand Secretary

Institute of Marine Science

NRN

UNIVERSITY OF ALASKA, FAIRBANKS
Fairbanks, Alaska 99701

24 February 1984

Representative John Ringstad
Chairman, House Resources Committee
Alaska State Legislature
Pouch V (MS 3100)
Juneau, AK 99811

Dear Representative Ringstad:

I understand that the House Resources Committee will conduct a hearing on 29 February 1984 on the issue of capture of killer whales in Alaskan near-shore seas. I gave testimony concerning this matter before the Senate Resources Committee on 31 January, but I will be unable to attend the meeting of your committee next week. The purpose of this letter is to enter my written testimony into the record, and I should be very grateful if it can be accepted in this manner.

My comments are directed to two parts of this issue: my experience of collaborative work with Sea World and the related autonomous Hubbs-Sea World Research Institute in San Diego and my knowledge of the background and prospects for the research program which is planned in conjunction with the killer whale capture. It is my opinion that much of the discussion of these issues has resulted in exaggeration and inflammation of the purposes and likely outcome of these activities.

From 1961 until 1970 I was a member of the research staff and from 1970 to 1973 a faculty member at Scripps Institution of Oceanography. Stimulated by earlier Alaskan experience, I had embarked on a program of study of marine mammal physiology expecting to explore the mechanisms whereby these animals can experience long and deep dives underwater and can protect themselves from the effects of life-long immersion in polar seas. The nearby Sea World oceanarium was just getting started in the early 1960's, and their activities naturally attracted the attention of persons involved in marine mammal studies. From the beginning, Sea World has shown an interest in providing opportunities for qualified scientists to study their captive animals in ways that would not harm them. Sea World management was and continues to be, of course, especially interested in new knowledge which contributes to the healthy condition of their marine mammals, but their enlightened attitude toward research has extended well beyond those concerns. It is fair to say that Sea World has supported investigations of physiology, behavior and animal welfare by many reputable scientists which would not otherwise be possible. That dedication to understanding these remarkable animals has steadily gained in strength and effectiveness as Sea World has grown and initiated new and improved technology for husbandry of marine mammals. That organization and its research arm - Hubbs-Sea World Research Institute - are today world leaders in this field.

Sea World research into the care of captive dolphins, for example, has progressed to such a level that it is no longer necessary for them to capture those animals in the wild. In recent years 27 live births of dolphins have taken place at Sea World. It is for a similar purpose, among others, that the presently debated killer whale capture is proposed. If any organization is to succeed in the captive breeding of killer whales, it is likely to be Sea World. I believe that we should applaud these efforts. Sea World proposes to take 10 killer whales into captivity over a period of 5 years. In that process more whales would be temporarily held for a few hours in order to evaluate which animals would be taken into captivity. For this reason Sea World has sought to "take" up to 100 killer whales. News reports sometimes fail to make this distinction clear, and the public then may be left with the inaccurate impression that a total of 100 Alaskan killer whales are destined for removal to California.

The proposed research program will provide an unprecedented opportunity to expand our knowledge of killer whales in the Alaskan environment. Seventeen scientists from several institutions will take part in more than a dozen research projects. These are not trivial activities, and they are not hobbies. They are part of the long-term, step-by-step process by which reliable and useful scientific information is acquired.

Since I joined the faculty of the University of Alaska in 1973 I have continued research investigations of marine mammals. I have also continued collaborative studies with colleagues in other places, including Sea World. Much of our research success depends upon team work to realize the most productive means for acquiring new information and understanding of marine mammals. As a result of such studies we know more about the biology of those animals and, incidentally, about our own physiological processes. Adaptations to long underwater diving, for instance, were originally identified in mammals and birds which live in aquatic habitats. We know today that those adaptations can also be traced in other species, including humans, as a defense against the threats of asphyxia. Studies of aquatic animals have lead directly to new appreciation of the importance of these reactions in medical problems. The possible implications extend to protection of newborn infants against asphyxia, survival of victims of near-drowning and hypothermia, prevention of sudden infant death syndrome and new perspectives on heart disease.

Quite apart from these examples of contributions to human health, there is a great need to learn more about marine mammal populations, distribution and ecology in these days when rapid and possibly irreversible changes are taking place in our marine environments. I cannot think of a location where such knowledge can be more usefully gained and put into practice than here in Alaska. In my view the State of Alaska can gain considerable benefits while making adequate safeguards for a rational and considered approach to this issue.

There is clearly a basis for difference of opinion regarding the ethics of keeping animals in captivity for purposes of public display. Many millions of Americans accept that premise as reasonable, and they have

gained enormously by the educational and aesthetic values which have been derived from appreciation of Nature gained through learning about animals in this way. Sea World, its profit motives notwithstanding, has made an essential and lasting contribution to that public knowledge and appreciation. There is also a basis for disagreement about the use of animals for scientific research. Certainly, every thoughtful and humane person would accept the idea that such animals should be well cared for and not subjected to unkind treatment. Such conditions are accepted as the responsibility of scientists and form the basis upon which new knowledge is founded. I have confidence that the proposed killer whale research will adhere strictly to these policies.

There have been recent news reports suggesting that the Greenpeace organization intends to use its ship to physically interfere with the killer whale captures if they are undertaken in Alaskan seas. In my opinion such an activity would constitute a most unfortunate and uninformed misplacement of that group's priorities. An otherwise well-meaning and sincere concern for animal welfare would be dissipated in an irrational effort. How much more useful a contribution to Alaskan interests and to our society could be made if we would join forces to make certain that the resources available to the State of Alaska could be brought to bear in such a way as to assure maximum sensible use and beneficial results from this unique opportunity.

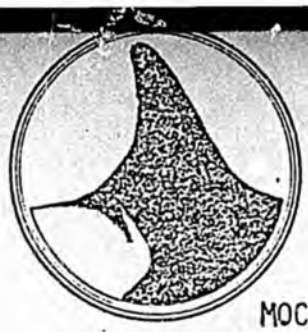
Respectfully,

Robert Elsner

Robert Elsner
Professor of Marine Science

RE/rmh

cc: Chancellor O'Rourke
Representative Mike Davis
Senator Vic Fischer
Senator Bettye Fahrenkamp ✓
Editor, Fairbanks Daily News-Miner
John Burns, ADF&G
National Marine Fisheries Service



MOCLIPS CETOLOGICAL SOCIETY
friday harbor, washington

Natural Resources Committee
Alaska State Senate
Juneau, Alaska

RE: Recommendations Concerning U.S. Federal Permit # 439
Under the Marine Mammal Protection Act (1972)
To Allow SeaWorld Inc. of San Diego, CA. to Capture
Killer Whales (Orcinus orca) in Alaskan Waters.

FROM: Research Division, Moclips Cetological Society,
Friday Harbor, Washington 98250

CONTENTS

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Moclips Cetological Society

The Whale Museum · Orca Survey

P.O. Box 945 Friday Harbor, Washington 98250 (206) 378-4710

Natural Resources Committee
Alaska State Senate
Juneau, Alaska

30 January 1984

RE: Recommendations Concerning U.S. Federal Permit # 439
Under the Marine Mammal Protection Act (1972)
To Allow SeaWorld Inc. of San Diego, CA. to Capture
Killer Whales (Orcinus orca) in Alaskan Waters.

FROM: Research Division, Moclips Cetological Society,
Friday Harbor, Washington 98250

I. GENERAL COMMENTS:

We acknowledge that the people of the state of Alaska have the right to allow the killer whales (Orcinus orca) in their waters to be captured for research and public display. However, we do not feel the state of Alaska has had a chance to evaluate all the implications of allowing those captures,

A. because they have not been adequately consulted, and

B. because the Alaskan killer whale stocks have not been documented thoroughly enough to allow for an adequate management decision (Evans, 1983; Matkin and Leatherwood, 1984; Hall, 1984).

There are thoroughly proven methods for studying whales in the wild which do not require capture. These alternative methods employ photo-identification of natural markings, and only require photography from vessels, observation from shore stations, and aerial surveys (Whitehead and Payne, 1976; Darling, 1977; Wursig, 1977, Saayman and Tayler, 1979; Katona et al, 1979, 1980, Dorsy, 1982; Payne, 1983; Kelly, 1983). In the case of the killer whales of British Columbia and Washington State, the exact composition and distribution of wild stocks have been photo-documented for the last 10 years (Fig. 1; and Balcomb et al, 1980, 1982; Bigg, 1982; Kirkevold and Lockard, In press). In addition to documenting the number and composition of the Greater Puget Sound killer whale stocks, these long-term observations have allowed: 1) correlations of pod movements with fisheries data (Balcomb et al, 1980; Boran et al, 1981; J. Heimlich-Boran, 1984b), 2) documentation of

mortality, natality, emigration, and individual growth rates (Balcomb et al, 1980, 1982; Bigg, 1982; J. Heimlich-Boran, 1984a; Haenel, 1984), 3) documentation of social and reproductive interactions between pod communities (Ford, 1980; Ford and Fisher, 1982; Heimlich, 1981; Hoelzel and Osborne, 1984; Osborne, 1984, S. Heimlich-Boran, 1984) and, 4) the ability to distinguish differences between the way resident and transient pods exploit salmon, seals and sealions (Osborne, 1984). These findings are proof that the state of Alaska could make a management decision based on a detailed understanding of their killer whale resource without the expense or necessity of capture.

Figure 1: Greater Puget Sound Resident Pod Composition
(Moclips Cetological Society and M.A. Bigg data)

Pod Composition from 1974 to 1983

	1974	75	76	77	78	79	80	81	82	83
J adult females	8	8	8	8	8	8	8	8	8	8
J adult males	3	3	3	3	3	3	3	3	3	3
J immatures	3	4	5	6	7	8	7	7	8	8
Total	14	15	16	17	18	19	18	18	19	19
K adult females	5	5	5	5	5	5	5	5	5	5
K adult males	3	2	2	2	2	2	2	2	2	2
K immatures	2	2	2	3	3	3	3	3	3	3
Total	10	9	9	10	10	10	10	10	10	10
L adult females	22	22	22	22	22	22	22	22	21	21
L adult males	7	7	7	8*	10**	10	9	9	8	8
L immatures	16	18	17	20	21	21	23	22	21	21
Total	45	47	46	50	53	53	54	53	50	50
Combined females	35	35	35	35	35	35	35	35	34	34
Combined males	13	12	12	13	15	15	14	14	13	13
Combined immatures	21	24	24	30	31	32	33	32	32	32
COMBINED TOTAL	69	71	71	77	81	82	82	81	79	79

* one male matured

** three males matured

In Greater Puget Sound, which includes Washington State and the south end of Vancouver Island, the effects of captures are still being evaluated. Between 1962 and 1972 a minimum of 47 whales were either killed or removed from the resident pods as a result of captures, and a minimum of 8 transient whales were removed between 1968 and 1975 (Duffield and Cornell, 1979; Hoyt 1981). In 1974 there were only 69 whales left in the resident population (Fig. 1). By 1980 the resident population had increased to 82 individuals, but by 1982 it had dropped to

79 individuals, where it has remained. Prior to captures it is estimated that the original size of this population could have been anywhere from 90 - 110 individuals. The maximum reproductive rate for female Killer whales in this population is only 1 calf every 2.5 years, and sexual maturity does not occur until at least the age of 9 or 10 in females and even later in males. For these reasons it appears population recovery in this species is an extremely slow process. It is still too early to determine if the Greater Puget Sound resident population has already gone through recovery from the captures, or is simply following a very slow cycle of flucuations that will continue to increase the population towards some higher level equalibrium.

The effects of captures on the much smaller transient pods has been more difficult to determine because of their sporadic occurrence, but in at least 1 case (M-Pod), capture resulted in the reduction of a pod to a single inbreeding pair. From correlations of call dialects between transient pods in B.C. and S.E. Alaska (Ford, personal comm.), and photo-documentation between Prince William Sound and S.E. Alaska (McSweeny, personal comm.), it appears that transient pods do occur Alaskan waters and may represent a cosmopolitan population that covers huge distances throughout the Gulf of Alaska. If this were the case, it would make whale counting surveys in the absence of absolute identification, suspect of over estimating the population. It still remains to be proven whether there are any resident pods in southern Alaska, or whether the alaska populations are arranged in some other fasion. Only through photo-identification of all Killer whales in Alaska can these problems be sorted out so that an accurate acessment of the stocks can be obtained.

Of further interest to the state of Alaska might be the fact that in Washington and British Columbia we have found significant differences in strategies of food resource exploitation between transient pods and resident pods, and between different age-classes within the pods (Balcomb et al, 1980; Boran et al, 1981; J. Heimlich-Boran, 1984; Osborne, 1984). Resident pods appear to be tied into exploiting local salmon and hering fisheries, and apparently do not eat very many marine mammals (no marine mammal remains have ever been found in a resident whales stomach contents, and they have only been observed to prey on porpoise on two occasions out of over 1000 hours of observation). On the other hand transient pods are regularly observed eating seals and sealions, and usually have some amount of marine mammal remains in adult stomach contents. Also, both resident and transient pods appear to secondarilly exploit many varieties of rock fish and bottom fish.

It is unknown how much of the Alaskan Killer whale population is resident, transient, or neither of the above, and it is unknown which food resources different populations are exploiting. But it could be important to select pods for capture depending on the desired effect on the ecosystem.

For example, if the Killer whales in alaska primarily eat salmon and other important comercial species, then maybe it would make financial sense to exploit Killer whale populations that are piscivorous. However,

in Greater Puget Sound we calculated the amount of salmon the resident Killer whale population would be taking if they ate nothing but salmon all year round, and we found the Killer whale share of the salmon was only 2 - 5% of the ommercial fishery (Balcomb et al, 1980; J. Heimlich-Boran, 19(.).

On the other hand, if certain populations of Killer whales in Alaska primarilly eat seals and sealions, or if all populations do, then maybe it makes sense to maintain or even enhance the Killer whale population so that seal and sealion populations can be subsequently kept in check. These are the kinds of questions that should be answered before captures are begun, and they are questions that could be answered if a 2-5 year photo-identification study were undertaken first.

II. RECOMMENDATIONS TO THE STATE OF ALASKA (We also refer you to section III below, which are the recomendations we submitted to the U.S. federal government on August 15th 1983):

A. We recommend that the state of Alaska refuse to allow any Killer whale captures before the Alaskan Killer whale population has been adequately documented using individual photo-identification. Photo-identification research is relatively inexpensive, non-intrusive and could be safely carried out at a massive scale throughout the state with the help of widespread public participation.

B. We recommend that the state of Alaska become actively involved in conducting photo-ID research on its Killer whales, by either implementing its own research project, or by joining forces with the exallent Photo-ID research team Hubbs-Seaworld Research Insitute has assembled under Steve Leatherwood.

C. However, we recommend that Hubbs-Seaworld not be allowed to conduct captures or the intrusive research techniques of freez-branding, spagetti-tagging and radio-taging, because photo-identification is all that is necessary to efficiently document all the Killer whales in Alaska. In the 9 years that the over 350 killer whales in Washington and British Columbia have been photo-documented, there has never been a whale that couldn't be identified with a proper photograph.

D. We also recommend that the state of Alaska consider:

1. The recreational benefits of maintaining wild Killer whales as a source of natural beauty.

2. The scientific benefits of closely monitoring a top level predator as a benign indicator of disturbances in the ecosystem that would directly effect humans.

3. The possibility that Seaworld is not the only aquarium in the U.S. that would like the federal government to give

them a permit to capture Alaskan Killer whales.

3. The political implications of the U.S. domestically exploiting a cetacean resource, while at the same time calling for a world moratorium on the comercial exploitation of cetaceans.

4. The ethical implications of condeming a highly intelligent social predator to a severely reduced life span in a highly restricted environment, primarilly for the purpose of commercial gain.

5. The fact that the state of Washington has successfully banned further captures of killer whales in their waters since 1976.

III. RECOMMENDATIONS SUBMITTED TO THE NATIONAL MARINE FISHERIES SERVICE, NOAA ON 15 August 1983:

A. We recommend that SeaWorld conduct or initiate field research to determine the exact stock size of the populations they want to expliot before they re-apply for a permit. Utilizing the field photographic techniques that have been thoroughly proven in British Columbia and Washington State (Bigg, 1982 and Balcomb et. al., 1980; 1982), two seasons of field data would be sufficient to determine the exact composition without the use of artificial marking techniques. A three month field effort the first year would give an initial inventory of all the whales, and an additional three month photo-inventory conducted the second season would confirm the stability of the pod compositions (confirmed as feasible by M.A. Bigg and J.R. Heimlich-Boran, pers. comm.). Then SeaWorld would be able to adequately evaluate the populations they want to exploit. Currently, SeaWorld is unable to adequately document the sizes and compositions of the Killer whale populations they propose to capture.

B. We recommend that SeaWorld prove their ability to breed Killer whales in captivity by breeding the six females and two males already under their care. In the June 15 letter all these animals were estimated to be over 7 years old. The males are estimated to be 20 and 7 years old; two of the females are estimated at 7 years, three at 8 years and one at 9 years old. However, it is not stated how these age estimates were determined, but it is certain they are not based on known birth dates. All the whales, except the 20 year old male, are North Atlantic whales, which average a foot smaller at birth than North Pacific Killer whales (Jonsgaard and Lyshoel, 1970; Bigg, 1982). Therefore it is probably safe to say that at least one male and one female are currently at or very near breeding age, and that the other whales will all reach breeding age within the next 5 years. These animals are all as close to breeding age as the largest whales SeaWorld proposes to capture. It is our opinion that they should prove they can accomplish captive breeding with these whales before capturing whales that are even further from breeding age

than the whales they already have.

C. We recommend that the permit application be denied:

1. Because the permit application of 7 March and the 15 June letter of revision are inconsistent in defining what SeaWorld is proposing.

2. Because the populations of Killer whales they propose to exploit have not been adequately studied in order to evaluate the possible consequences of that exploitation.

3. Because the justification of setting up a successful breeding program as proposed by SeaWorld is not supported by the scientific evidence:

   a. Killer whales have never successfully bred in captivity despite numerous attempts. The four calves that were born at Marineland of the Pacific all died within 46 days of birth.

   b. The whales SeaWorld proposes to capture in the 15 June letter are between 11 and 17 feet (336 and 518 cm). According to measurement data on three captive male and five captive female North Pacific Killer whales, a size of 11 feet (336 cm) is attained between two and three years of age, a size of 14 feet (427 cm) is attained between three and one-half and four and one-half years of age, and a size of 17 feet (518 cm) is attained between five and six years of age (Bigg, 1982). Three year observations on 23 feral cow-calf associations in J, K and L pods indicate that calves are still dependent through their second year and still have their highest associations with their mother through their third year (S. Heimlich-Boran and M.A. Bigg, pers. comm.; N.J. Haenel, 1984; and MCS unpublished data). The precise age or size at sexual maturity in Killer whales is unknown because no individuals, captive or feral, have ever been documented from birth to sexual maturity. However, in the resident pods of Greater Puget Sound, birth dates to within six months have been documented for 28 calves (Balcomb et. al., 1982; M.A. Bigg, pers. comm.; and MCS unpublished data). Two of these calves have died or disappeared and ten of those individuals are older than 7 years. Of the eight who are females, the two oldest are 11 years old now, yet none of them have given birth to their first calf. The oldest individual is a 12 year old male, and only during his 11th year did he show the beginnings of allometric growth of his dorsal fin. From photo-grammetric analysis of allometric growth of the dorsal fin in five males of unknown age in this population (Balcomb et. al.,1980; J. Heimlich-Boran, 1984a) it appears to take 4-5 years before adult proportions are reached, suggesting that physical maturity in males does not occur until the 14th to 16th year.

For these reasons we feel animals under 16.5 feet (500 cm) should not be considered for a breeding program because of their extreme immaturity and the danger that these animals will be naive of the proper techniques of parental care. Without question animals under 400 cm should not be considered for capture, let alone for breeding purposes, because of the likelihood that some of these individuals are still dependent calves. Even if we use optomistic calculations on the average lifespan for captive Killer whales that do not count animals who lived less than one year (Cornell et al,1981), we come up with an average life span of only 7.2 years. In the wild a conservitive lifespan for Killer whales is 48 years (Bigg,1982; Matkin and Leatherwood,1984). Thus, for animals less than 400cm (animals approx. 3 years old) it becomes statistically certain that some of the whales will not live to sexual maturity.

4. It is also our recommendation that the permit be denied because many of the proposed research techniques still have not been adequately justified in terms of their effectiveness or degree of impact on the wild whales. We wonder how much of the research is actually aimed at answering questions important to husbandry, rather than problems affecting the wild populations. Under section VI, part A, #2, of the Marine Mammal Protection Act Permit Application Guidelines it states that all research objectives must state how they will enhance or benefit the wild population.

   For example:

   a. SeaWorld still proposes to use spaghetti tagging, ribbon tagging and freeze branding in order to identify individual whales in the wild. However, photo-identification has been thoroughly proven as an effective method of repeatedly identifying individual whales (Whitehead and Payne, 1976; Wursig and Wursig, 1977; Darling, 1977; Katona et. al., 1980; Dorsey, 1982), and especially with Killer whales (Balcomb et. al., 1980, 1982; Bigg, 1982; Ford,1980; Ford and Fisher, 1982; Kelly,1983). There is absolutely no valid justification for the use of artificial marking techniques, they represent totally unneccessary harassment.

   b. SeaWorld still has not explained how liver biopsies will benifit wild whales. It is conceivable however that liver biopsy data would be useful to SeaWorld in allowing them to select the most healthy individuals from the wild pods. But how does a liver biopsy benefit the wild individuals with unhealthy samples? Are the least healthy individuals just going to be released with the hope that they won't develop infections from the procedure?

   c. Analysis of respiratory gases is a complicated procedure, if indeed SeaWorld uses the methods they cite in the 15 June letter (Olsen et al,1969; Wabrenbrok et al,1974).

We question the value of respiratory gas analysis on animals who are under the stress of capture.
This type of basic physiological study makes much more sense if it is conducted on whales already in captivity. What is the justification for collecting this data on freshly caught whales rather than whales already in captivity?

d. Analysis of hearing thresholds using surface electrodes again represents a fairly elaborate procedure that makes much more sense to perform on an already captive whale. We question why a basic physiological variable like hearing threshold needs to be examined in so many animals and under the stress conditions of capture.

e. The extraction of teeth from wild unidentified whales will do little to further an understanding of the significance of dentin layers as a way of aging whales, because none of the whales sampled will be of known age. The only thing SeaWorld's proposed tooth extractions will contribute to is an already very large data base on the lengths of whales and the number of dentin layers in their teeth, it does not reveal anything more about age than could be obtained by calculating the length of the individual. However, there are currently 26 calves of known age in the resident pods of Greater Puget Sound and British Columbia. These whales are being closely monitored so that as soon as one of them dies the body can be recovered and its teeth removed. When this happens, length data, age data and dentin layer data will finally all be correlatable, and ages can then be determined simply on the basis of making photographic measurements of the whales in the wild (Whitehead and Payne,1976; Balcomb et al,1980; J.Heimlich-Boran,1984a).

f. The degree of harassment necessary to carry out a stomach lavage does not appear to be justified by the type of data that will be generated. Stomach lavage is only a partial sampling of the stomach contents. Traditionally stomach contents are collected from dead individuals so that the entire contents are documented. Thus we question whether stomach lavage data will be comparable with data already in use and whether it is truely representative of the animals diet.

In addition to sampling stomachs alternative methods of determining the diet of killer whales are also available. These include:

1. Plotting the movements of identifiable pods with data on abundance of local food species (Balcomb et al,1980; Boran et al,1981; J.Heimlich-Boran, 1984b).

2. Theotoloite plotting of identifiable individuals during feeding behavior so that spatial and temporal environmental

components can be correlated (J. Heimlich-Boran, in prep).

3. Hydro-acoustic (sonar) studies of killer whales and their prey during feeding behavior (F. Felleman, in prep).

g. The collection of blood samples for genetic studies (Duffield, 1980 and 1984) would definetly benefit our scientific understanding of wild whales. However, all methods for gathering blood samples from wild whales have not been tested. It is quite possible that blood samples could be collected using biopsy darts, thus eliminating the need to capture whales. Genetic relatedness in whales might also be determined on the basis of photographs of the morphology of saddle patches or eye patches, thus eliminating the need to even collect blood samples. We feel these alternative methods should be explored further so that the detremental effects of research are minimized for the whales.

In conclusion, it is the opinion of the Research Commitee of Moclips Cetological Society, that there is very little justification for the majority of research SeaWorld has proposed. In fact some of the research proposed is completely without justification, as is their proposal to breed whales in captivity. It appears that SeaWorld has made a long list of research proposals primarilly to justify capturing 10 more whales for their displays. We recommend that Seaworld re-submit their application after they have documented the composition of the pods they wish to exploit, and after they have proven they can breed Killer whales in captivity. If what SeaWorld really wants is just 10 more whales for their displays they should submit a permit for that alone. If they really want to conduct scientific research on wild Killer whales, they should propose research techniques that have been proven effective and that result in the least interference to the whales.

As the application permit now stands, rather than just capturing 2-3 pods and permanently removing the whales they need for displays, they are proposing to capture many pods over and over again and are subjecting all the whales to multiple harassment, in addition to permanently removing the display animals they need.

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Moclips Cetological Society

The Whale Museum · Orca Survey

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APPENDIX A

DESCRIPTION OF
MOCLIPS CETOLOGICAL SOCIETY

INTRODUCTION AND HISTORICAL PERSPECTIVE

Moclips Cetological Society is a non-profit corporation founded in 1969 by free-lance cetologist Kenneth C. Balcomb III. Incorporated in 1976, M.C.S. is dedicated to scientific research and education concerning marine mammals, primarily cetaceans (whales, dolphins and porpoises). M.C.S. is almost wholly based on San Juan Island in the northern reaches of Puget Sound in the state of Washington. A fluctuating breeding population of approximately 80 killer whales (Orcinus orca) reside year-round in this inland sea, in three pods. These three socially interacting family groups, J,K and L-pods, are probably the most thoroughly studied wild cetacean population in the world, largely due to the non-intrusive field studies conducted by M.C.S. in cooperation with the pioneering studies of Canadian biologists working under Michael A. Bigg (Pacific Biological Station, Environ. Canada). Other marine mammal inhabitants include a minimum of 22 seasonally resident minke whales (Balaenoptera acutorostrata), resident harbor seals (Phoca vitulina) and river otters (Lutra canadensis), occasional gray whales (Eschrichtius robustus), humpback whales (Megaptera novaeangliae), elephant seals (Mirounga angustirostris), California sea lions (Zalophus californianus), Stellar's sea lions (Eumetopias jubatus), and an undetermined number of Dall's porpoise (Phocoenoides dallii) and harbor porpoise (Phocoena phocoena).

M.C.S. research operations are administered from the Whale Research Lab located at Lime Kiln Lighthouse on San Juan Island. The Research Division also maintains a remote field station at Turn Point Lighthouse, ten miles north east along Haro Strait on Stuart Island. Both facilities are under lease from the U.S. Coast Guard.

Orca Survey is the primary research project of the Research Division of M.C.S. It was begun in April 1976 as a photographic population survey of killer whales resident to Washington State waters. Since that time Orca Survey has logged over 1000 hours of research time in the presence of the pods. For over seven years continual year-round observations have been maintained, documenting changes in seasonal habitat exploitation, behavioral-activity patterns, individual associations, call dialects, sub-adult maturation rates and flucuations in population structure. Orca Survey findings have been presented at five international symposia and in numerous publications, including seven chapters in a forthcoming book on the biology and behavior of killer whales (Kirkevold and Lockard, in press). The research findings of Orca Survey played a major role in determining the new policy of the International Whaling Commission at its 1981 Killer Whale Workshop (Balcomb et al. 1982), and recently has been instrumental in providing data for management decisions concerning domestic exploitation of killer whales for commercial display. It is the objective of M.C.S. to continue to support this research and build on the already expansive data base.

Other research efforts include continuation of a harbor porpoise study initiated by the American Cetacean Society in 1980 (Flaherty and Stark, 1980), a Dall's porpoise survey begun in 1982, and a photo-ID catalog of gray whales. M.C.S. is also contributing to a New York Zoological Society study of minke whales, and has helped initiate cetacean field studies in Hawaii and New Zealand.

In conjunction with these studies, since 1976 M.C.S. has operated the 24-hour Whale Hotline, which receives up-to-the-minute sightings of cetaceans and marine mammal strandings by anyone in the Puget Sound area. The hotline collects an average of 41.2 sightings a month, and has accumulated a valuable data base on local marine mammal occurrence and distribution which has on numerous occasions proven invaluable to local, state and federal decision makers. Also as part of the Whale Hotline, M.C.S. is a member of of the Northwest Marine Mammal Stranding Network which is sponsored by the National Oceanic and Atmospheric Administration.

These research results, and the results of other studies of cetaceans from throughout the world are presented in CETUS, the semi-annual scientific journal of M.C.S. A copy of this journal as well as the quarterly news letter, MCS NEWS, are benefits of membership in M.C.S., along with free admission to The Whale Museum and a discount on Museum Gallery items.

Begun in 1979, The Whale Museum is the primary educational medium of M.C.S., but as a major part of its efforts in exhibit preparation, The Whale Museum also conducts scientific research in marine mammal anatomy and taxonomy, and maintains a comprehensive marine mammal library. Museum exhibits consist of artistic and scientific displays of living marine mammal natural history, ranging from complete skeletal displays of two spinner dolphins, a gray whale and killer whale, to a fossil dolphin brain, three odontocete fetal series and 12 species of cetacean parasites. Such topics as cetacean evolution, migration, feeding habits, brain anatomy, acoustics and the natural history of local marine mammals are comprehensively presented, and the library and video viewing room are accessible to visitors. The Children's Room is devoted to young whale enthusiasts. Whale related items are available for sale in the museum's gallery. The Whale Museum is open from 10am to 5pm, 7 days a week in summer, closed Tuesdays from October through May. A small admission charge, $2 for adults is asked, and special tours are regularly given to schools and citizens groups.

Several other endeavors fulfill the educational purposes of M.C.S. GENTLE GIANTS OF THE SEA, a teaching package on cetaceans for use in kindergarten through 6th grade classrooms, was produced by The Whale Museum for nationwide distribution. During the summer months M.C.S. operates a college accredited field course called Whale School. The one week intensive program is offered in conjunction with the Dept. of Biology at Western Washington University, and includes both field and laboratory experience in addition to a comprehensive lecture series in cetacean biology and ethology. In addition M.C.S. contributes to radio, video and print media educational projects, and personnel often provide lectures and slide shows for schools and citizens groups.

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"Killer Whales in Puget Sound: A Population Ideally Suited For Statistical Modelling". REP. INTL. WHAL. COMM., 32:681-686.

Dorsey, E.M., 1982.
"Exclusive Home Ranges in Individually Identified Minke Whales (Balaenoptera acutorostrata)". REP. INTL. WHAL. COMM., 32.

Dorsey, E.M., 1983.
"Minke Whale Project 1982". CETUS, (5)1: 22.

Flaherty, C.V., and S.Stark, 1982.
"Harbor Porpoise (Phocoena phocoena) Assessment in 'Washington Sound'". Final report for subcontract #80-ABA-3584. NMML, NMFS, NOAA, Seattle.

Flaherty, C.V., 1983.
"Observations of Gray Whales in Washington Waters". CETUS (5)1:16-18.

Kirkevold, B.T., and J.S. Lockard (eds.), 1984.
BEHAVIORAL BIOLOGY OF KILLER WHALES. New York, Plenum Press.

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Moclips Cetological Society

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APPENDIX B

RESEARCH CONTRACTS

MOCLIPS CETOLOGICAL SOCIETY RESEARCH CONTRACTS
($500.00 and above)

Title: Huatabampo Whale Stranding
Contractor: U.S. Marine Mammal Commision
Grant Receipient: MCS
Contract Number: MM 6AD-045
Contract Amount: $1,884.00
Contract Duration: 1 February 1976 - 6 March 1976
(Report on file U.S. M.M.C., Wash. D.C.: K.C.Balcomb, C.A. Goebel and R.D. Chandler)

Title: Killer Whale Survey in Puget Sound
(Orca Survey 1976)
Contractor: National Marine Mammal Lab. (NMFS, NOAA)
Grant Receipient: MCS
Contract Number: NASO-6-35330
Contract Amount: $31,069.22
Contract Duration: 1 April 1976 - 31 October 1976
Project Duration: 1 April 1976 - 11 December 1976
(Report on file Nat. Mar. Mamml. Lab., NMFS, NOAA, Seattle, WA.: K.C. Balcomb and C.A. Goebel)

Title: Orca Survey 1977
Contractor: National Marine Mammal Lab. (NMFS, NOAA)
Grant Receipient: MCS
Contract Number: 01-7-208-14657
Contract Amount: $500.00/ (supplimentary funds and facilities from MCS)
Contract Duration: 19 August 1977 - 19 October 1977
Project Duration: 1 January 1977 - 31 December 1977
(Reports on file Nat. Mar. Mamml. Lab., NMFS, NOAA, Seattle, WA.: K.C. Balcomb, J.R. Boran and R.W. Osborne)

Title: Behavior Budgeting in Greater Puget Sound Killer Whales.
Contractor: MCS
Grant Receipient: Orca Survey (MCS)
Contract Number: 77-001
Contract Amount: Lab Facilities and expendables
Project Duration: 1 October 1977 - Present
(Reports on file MCS, Friday Harbor, WA.: R.W. Osborne)

Title: Humpback Whale Survey
Contractor: MCS
Grant Receipient: Humpback Whale Survey, Holualoa, Hi.
Contract Number: 77-002
Contract Amount: Advertising Costs and Research Assts.
Project Duration: 1 November 1977 - 30 April 1980
(Reports on file, Center for Long-Term Research, Lincoln, Mass: D. McSweeny and R.D. Chandler)

Title: Whale Survey in Puget Sound 1978
Contractor: National Marine Mammal Lab. (NMFS, NOAA)
Grant Receipient: MCS
Contract Number: 01-78-M02-01198
Contract Amount: $3,500.00
Contract Duration: 10 February 1978 - 30 September 1978
Project Duration: 1 January 1978 - 31 December 1978
(Report on file Nat. Mar. Mamml. Lab., NMFS, NOAA, Seattle Wa.: J.R. Boran, N.J. Haenel and S.L. Heimlich)

Title: Orca Survey 1978
Contractor: U.S. Marine Mammal Commision
Grant Receipient: MCS
Contract Number: MM 1300 731-7
Contract Amount: $7,920.00
Contract Duration: 19 June 1978 - 31 October 1978
Project Duration: 1 January 1978 - 31 December 1978
(Report on file U.S. M.M.C., Wash. D.C.: K.C. Balcomb, J.R. Boran, R.W. Osborne and N.J. Haenel)

Title: Employing Fixed Hydrophone Arrays for Locating Underwater Whales
Contractor: National Marine Mammal Lab. (NMFS, NOAA)
Grant Receipient: MCS
Contract Number: 01-78-M02-03702
Contract Amount: $4,790.52
Contract Duration: 3 September 1978 - 30 September 1978
Project Duration: 3 September 1978 - 10 December 1978
(Report on file Nat. Mar. Mamml. Lab., NMFS, NOAA, Seattle, WA.: K.C. Balcomb and Lon Brocklehurst)

Title: Sound Production by Dall Porpoises in Greater Puget Sound
Contractor: Naval Ocean Systems Center, USN
Grant Receipient: MCS
Contract Number: 5131 DD853-78
Contract Amount: $1,700.00
Contract Duration: 27 July 1978 - 27 July 1979
(Report on file Naval Ocean Systems Center, USN, San Diego, CA., K.C. Balcomb)

Title: Fishery Correlations with Occurence of Killer Whales in Greater Puget Sound
Contractor: MCS
Grant Receipient: Orca Survey (MCS)
Contract Number: 78-001
Contract Amount: Lab Facilities and expendables
Project Duration: 1 January 1978 - 1 November 1980
(Report on file MCS, Friday Harbor, WA.: James R. Boran)

Title: Acoustic Communication in Greater Puget Sound Killer Whales.
Contractor: MCS
Grant Receipient: Orca Survey (MCS)
Contract Number: 78-002
Contract Amount: Lab facilities and expendables
Project Duration: 1 October 1978 - 30 December 1983
(Reports on file MCS, Friday Harbor, WA.: R.W. Osborne, A.R. Hoelzel and S.C. Healy)

Title: Photo-grammetric Analysis of Growth in Greater Puget Sound Killer whales.
Contractor: MCS
Grant Receipient: Orca Survey (MCS)
Contract Number: 78-003
Contract Amount: Lab Facilities and expendables
Project Duration: 1 November 1978 - 1 November 1981
(Reports on file MCS, Friday Harbor, WA.: James R. Boran)

Title: Whale Survey in Puget Sound 1979
Contractor: National Marine Mammal Lab. (NMFS, NOAA)
Grant Receipient: MCS
Contract Number: 79-ABD-00013
Contract Amount: $3,000.00
Contract Duration: 1 January 1979 - 30 September 1979
(Report on file Nat. Mar. Mamml. Lab., NMFS, NOAA, Seattle, WA.: J.R. Boran, S.L. Heimlich, N. Quaster)

Title: Behavioral Ontogeny of Greater Puget Sound Killer Whales.
Contractor: MCS
Grant Receipient: Orca Survey (MCS)
Contract Number: 79-001
Contract Amount: Lab facilities and expendables
Project Duration: 1 January 1979 - 30 September 1980
(Report on file MCS, Friday Harbor, WA.: N.J. Haenel)

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nd Killer Whales.
3
ca Survey (MCS)
-002
ab facilities and expendables
January 1979 - 30 November 1981
Friday Harbor, WA.: S.L. Heimlich)

Population Biology of Greater Puget Sound Killer Whales.
Contractor: Moclips Cetological Society
Grant Receipient: Orca Survey (MCS)
Contract Number: 79-003
Contract Amount: Lab facilities and expendables
Project Duration: 1 January 1979 - Present
(Reports on file MCS, Friday Harbor, WA.:K.C. Balcomb, N.J. Haenel, J.R. and S.L. Heimlich-Boran, and R.W.Osborne)

Title: Whale Hotline
Contractor: MCS
Grant Receipient: The Whale Museum (MCS)
Contract Number: 79-004
Contract Amount: $2,000.00/year
Project Duration: 1 October 1979 - Present
(Reports on file MCS, Friday Harbor, WA.: C.V. Flaherty)

Title: Energetics of Greater Puget Sound Killer Whales.
Contractor: MCS
Grant Receipient: Orca Survey (MCS)
Contract Number: 80-001
Contract Amount: Lab facilities and expendables
Project Duration: 1 October 1980 - Present
(Preliminary report on file MCS, Friday Harbor, WA.: N.J. Haenel)

Title: Turn Point Wildlife Observatory
Contractor: U.S. Coast Gaurd
Grant Receipient: MCS
Contract Amount: Lease of Turn Point Lighthouse, Stuart Is., WA.
Contract Duration: 11 May 1981 - 10 May 1987
(Contract can be renewed in 1987)

Title: Habitat Use By Greater Puget Sound Killer Whales.
Contractor: MCS
Grant Receipient: James R. Boran (Orca Survey, MCS/Moss Landing Marine Lab
Contract Number: 81-001-A
Contract Amount: MCS lab facilities and expendables.
Project Duration: 1 June 1981 - Present
(Preliminary reports on file MCS, Friday Harbor, WA.: James R.

Heimlich-Boran)

Title: Gray Whale Photo-ID in Greater Puget Sound
Contractor: MCS
Grant Receipient: Gray Whale Survey (MCS)/The Evergreen State College
Contract Number: 82-001
Contract Amount: Lab Facilities, expendables and advertising
Project Duration: 15 March - 1 September 1982
(Report on file MCS, Friday Harbor, WA.: Raymond Fowler)

Title: Occurence, Photo-Identification and Ecology of Greater Puget Sound Porpoise
Contractor: MCS
Grant Receipient: Porpoise Ecology Project (MCS)
Contract Number: 82-002
Contract Amount: Lab facilities and expendables
Project Duration: 15 May 1982 - Present
(First report in preparation: C.V. Flaherty)

Title: Cohesive Relationships in Pods of Free-Ranging Killer Whales.
Contractors: Lerner-Gray Fund, Amer. Museum of Natural History/Sigma Xi: The Scient. Resch. Comm./ MCS
Grant Receipient: Sara L. Heimlich (Orca Survey, MCS/Moss Landing Marine Lab)
Contract Amount: $1,000.00/MCS Lab facilities
Contract Number: 82-003-A
Contract Duration: 1 June 1982 - 20 August 1982
Project Duration: 1 June - Present
(Report in preparation: Sara L. Heimlich-Boran)

Title: Northwest Marine Mammal Stranding Network
Contractor: National Marine Fisheries Service (NOAA)
Grant Receipient: MCS
Contract Duration: 1 June 1982 - Present
(Reports on file National Marine Mammal Lab, Seattle, WA and MCS, Friday Harbor, WA.: C.V. Flaherty, R.W. Osborne, J.F. Heimlich-Boran and A. Shepard)

Title: Photo-Inventory of Puget Sound Killer Whales
Contractor: National Marine Mammal Lab. (NMFS, NOAA)
Grant Receipient: Kenneth C. Balcomb (Orca Survey, MCS/Ocean Research and Education Society)
Contract Number:
Contract Amount: $2,400.00 / MCS field data, lab facilities and expendables.
Contract Duration: 1 - 31 October 1982(Report on file National Marine Mammal Lab, NMFS (NOAA), Seattle, WA.: K.C. Balcomb)

Title: Preliminary New Zealand Sperm Whale Study
Contractor: MCS
Grant Receipient: Prentice Bloedel and Barbara Todd (MCS)
Contract Number: 82-004
Contract Amount: Lab facilities
Project Duration: 1 November 1982 - 30 January 1983
(Report in peparation: Prentice Bloedel and Barbara Todd)

Title: Acoustic Development and Behavior in Killer Whale Calves.
Contractors: MCS/Packard Foundation/Sigma Xi, The Scient. Resch. Comm.
Grant Receipient: Suzanne C. Healy (Orca Survey, MCS/Moss Landing Marine Lab)
Contract Number: 83-001-A
Contract Amount: $1,000.00 / MCS Lab facilities
Contract Duration: 1 July - 30 September 1983
Project Duration: 1 July 1983 - present
(Preliminary report in preparation: Suzanne C. Healy)

Title: Feeding Ecology of Orcinus orca
Contractor: MCS/Seaspace Inc./Nat. Marine Mamml. Lab (NMFS)
Grant Receipient: Frederic L. Felleman (Orca Survey, MCS/Univ. Wash., Coll. Ocean and Fish. Sci.
Contract Number: 83-002-A
Contract Amount: $500.00 / MCS Lab facilities / NMFS Resch. Vessel
Contract Duration: 1 June 1983 - 15 September 1983
Project Duration: 15 June 1983 - Present
(Preliminary report on file: Frederic L.Felleman)

Title: Cohesive Relationships in Pods of Free-Ranging Killer Whales.
Contractor: Packard Foundation/MCS
Grant Receipient: Sara L. Heimlic-Boran (Orca Survey, MCS/Moss Landing Marine Lab)
Contract Number: 82-003-B
Contract Amount: $500.00/MCS Lab facilities
Contract Duration: 1 June 1983 - 30 September 1983
Project Duration: 1 June 1982 - Present
(Preliminary reports on file MCS, Friday Harbor, WA.: S.L. Heimlich-Boran)

Title: Habitat Use by Greater Puget Sound Killer Whales.
Contractor: Packard Foundation/MCS
Grant Receipient: James R. Heimlich-Boran (Orca Survey, MCS/ Moss Landing Marine Lab
Contract Number: 81-001-B
Contract Amount: $500.00/MCS Lab facilities
Contract Duration: 1 June 1983 - 30 September 1983

Project Duration: 1 June 1981 - Present
(Preliminary reports on file MCS, Friday Harbor, WA.: James R. Heimlich-Boran)

Title: Whale Research Lab
Contractor: U.S. Coast Gaurd
Grant Receipient: MCS
Contract Amount: Lease of Limekiln Light House, San Juan Is., WA.
Contract Duration: 1 December 1983 - 30 September 1984
(Renewal on a yearly basis for first 5 years, or untill a longer lease is implemented)

Title: Cetacean Sightings and Strandings in Puget Sound
Contractor: Cascadia Research Cooperative
Grant Receipient: MCS
Contract Number:
Contract Amount:
Contract Duration:
(First report in preparation: C.V. Flaherty)

Title: Orca Communications Project
Contractor:
Grant Receipient: MCS / Institute of Applied Physiology and Medicine
Contract Number:
Contract Amount:
Contract Duration:
(Feasibility report and proposals in preparation, R.W. Osborne, A.R. Hoelzel and R. Feraro)

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APPENDIX C

SELECTED LIST OF PUBLICATIONS

MOCLIPS CETOLGICAL SOCIETY
RESEARCH PUBLICATIONS AND SYMPOSIA PAPERS

PUBLICATIONS:

Balcomb, Kenneth C., 1980.
The Killer Whale (Orcinus orca) in Puget Sound. CETUS, 2(5):6-7.

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. NTIS PB80-224728. U.S. Dept. of Comm., Springfield, Va. 27p.

Balcomb, K.C., J.R. Boran and S.L. Hiemlich, (N.J. Haenel and R.W. Osborne) 1982.
Killer Whales in Greater Puget Sound:A Population Ideally Suited for Statistical Modelling. Paper SC/JN81/KW9, International Whaling Commission, Cambridge, England. 19p.

Balcomb, K.C., and M.A. Bigg, 1984.
Population Biology of the Three Resident Pods of Killer Whales in Puget Sound and Southern Vancouver Island.
In: B.C. Kirkevold and J.S. Lockard (eds.), BEHAVIORAL BIOLOGY OF KILLER WHALES, New York, Plenum Press.

Boran, James R., 1980.
The Whale Hotline. CETUS 2(2):4-5.

Chandler, Richard D., Camile Goebel and K.C. Balcomb, 1976.
Who Is That Killer Whale?. PACIFIC SEARCH 11:26-35.

Flaherty, Chuck V., 1983.
Observations of Gray Whales in Washington Waters. CETUS, 5(1),16-18.

Haenel, Nancy J., 1984.
Behavioral Ontogeny of Puget Sound Killer Whales With Notes on the Occurance of Allomaternal Behavior. In:
B.C. Kirkevold and J.S. Lockard (eds.), BEHAVIORAL BIOLOGY OF KILLER WHALES, New York, Plenum Press.

Heimlich-Boran, Sara L., 1984.
Cohesive Relationships Among Puget Sound Killer Whales.
In: B.C. Kirkevold and J.S. Lockard (eds.), BEHAVIORAL BIOLOGY OF KILLER WHALES, New York, Plenum Press.

Heimlich-Boran, James R., 1984a.
Fishery Correlations with the Occurance of Killer Whales in Greater Puget Sound. In: B.C. Kirkevold and J.S. Lockard (eds.). BEHAVIORAL BIOLOGY OF KILLER WHALES. New York, Plenum Press.

Heimlich-Boran, James R., 1984b.
Photogrammetric Analysis of Growth in Puget Sound Orcinus orca. In: B.C. Kirkevold and J.S. Lockard (eds.), BEHAVIORAL BIOLOGY OF KILLER WHALES, New York, Plenum Press.

Hoelzel, Alan R., and R.W. Osborne, 1984.
Killer Whale Call Characteristics With Implications For Their Role in Cooperative Foraging Strategies. In: B. C. Kirkevold and J.S. Lockard (eds.), BEHAVIORAL BIOLOGY OF KILLER WHALES, New York, Plenum Press.

Moclips Cetological Society, 1978.
A MINI-GUIDE TO THE WHALES AND DOLPHINS OF WASHINGTON STATE. Friday Harbor, Moclips Cetological Society.

Osborne, Richard W., and S.L. Heimlich, 1981.
Deciphering the Behavioral/Acoustical Patterns of Puget Sound Orca. CETUS 3(1):8-9.

Osborne, Richard W., and J.W. Sundsten, 1981.
Preliminary Observations on 13 Killer Whale Cranial Volumes. CETUS 3:(5)12-13.

Osborne, Richard W., 1984.
A Behavioral Budget of Puget Sound Killer Whales. In: B.C. Kirkevold and J.S. Lockard (eds.), BEHAVIORAL BIOLOGY OF KILLER WHALES, New York, Plenum Press.

Shepard, Albert, 1983.
CETACEANS SIGHTING REPORT 1980-1983. Friday Harbor, Moclips Cetological Society.

Sugarman, Peter, R.W. Osborne, E.M. Dorsey and A. Shepard, 1984.
A FIELDGUIDE TO THE CETACEANS OF GREATER PUGET SOUND AND SOUTHERN VANCOUVER ISLAND. Friday Harbor, Moclips Cetological Society

Todd, Barbara, 1981.
Sick Orca and Unusual Group Behaviors Seen During Orca Survey Encounter. CETUS, 3(4):8.

DELIVERED SYMPOSIA PAPERS:

*Balcomb, Kenneth C., J.R. Boran, and R.W. Osborne, 1979.
Killer Whales (Orcinus orca) in Greater Puget Sound. Abstract of a paper given at the THIRD BIENNIAL CONF. ON THE BIOL. OF MAR. MAMML., Seattle, Wa.

*Balcomb, Kenneth C., 1980.
Techniques in Whale Research. Abstract of a paper given at the ORCA SYMPOSIUM: BIOL. BEH. KILLER WHALE, Seattle Wa.

*Boran, James R., and K.C. Balcomb, 1980.
Photogrammetric Analysis of Growth of Puget Sound Orcinus orca. Abstract of a paper given at the ORCA SYMPOSIUM: BIOL. BEH. KILLER WHALE, Seattle, Wa.

*Boran, James R., K.C. Balcomb, N.J. Haenel, S.L. Heimlich, and R.W. Osborne, 1980.
Fishery Correlations with the Occurance of Orcinus orca in Puget Sound. Abstract of a paper given at the ORCA SYMPOSIUM: BIOL. BEH. KILLER WHALE, Seattle, Wa.

*Boran, James R., 1981.
Photogrammetric Analysis of Growth in Puget Sound Orcinus orca. Abstract of a paper given at the FOURTH BIENNL. CONF. BIOL. MAR. MAMML., San Francisco, CA.

*Boran, James R., *F.L. Felleman, S.L. Hiemlich and R. W. Osborne, 1981.
Habitat Use of Puget Sound Killer Whales. Abstract of a paper given at the FOURTH BIENNIAL CONF. ON THE BIOL. MAR. MAMML., San Francisco, Ca.

*Haenel, N.J., K.C. Balcomb, J.R. Boran, S.L. Heimlich and R.W. Osborne, 1980.
Observations of Nurturant Behavior of Puget Sound Killer Whales. Abstract of a paper given at the ORCA SYMPOSIUM: BIOL. BEH. KILLER WHALE, Seattle, WA.

Healy, Suzanne C., *R.W. Osborne and A.R. Hoelzel, 1983.
Comparison of Call Use Among Three Socially Interacting Pods of Killer Whales (Orcinus orca). FIFTH BIENNIAL CONF. ON THE BIOL. MAR. MAMML., Boston, Mass.

*Heimlich, Sara L., J.R. Boran, K.C. Balcomb, N.J. Haenel, and R.W. Osborne, 1980.
Surfacing Associations of Orcinus orca. Abstract of a paper given at the ORCA SYMPOSIUM: BIOL. BEH. KILLER WHALE, Seattle, WA.

*Heimlich, Sara L., 1981.
Social Organization of Puget Sound Killer Whales. Abstract of a paper given at the FOURTH BIENNL. CONFF. BIOL. MAR. MAMML., San Francisco, CA.

*Hoelzel, Alan R., and R.W. Osborne, 1981.
Correlations and Classifications of Calls from Puget Sound, Wa. Orcinus orca. Abstract of a paper given at the FOURTH BIENNL. CONFF. MAR. MAMML., San Francisco, CA.

*Osborne, Richard W., K.C. Balcomb, J.R. Boran, N.J. Haenel and S.L. Heimlich, 1980.
A Behavior Budget of Puget Sound Killer Whales (Orcinus orca). Abstract of a paper given at the ORCA SYMPOSIUM: BIOL. BEH. KILLER WHALE, Seattle, WA.

*Osborne, Richard W., 1980.
Calls of Puget Sound Killer Whales (Orcinus orca).
Abstract of a paper given at the ORCA SYMPOSIUM: BIOL.
BEH. KILLER WHALE, Seattle, WA.

*Osborne, Richard W., 1981.
Social Behavior of Puget Sound Killer Whales: Budgetting and
Circadian Independence. Abstract of a paper given at the FOURTH
BIENNIAL CONF. ON THE BIOL. MAR. MAMML., San Francisco, Ca.

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APPENDIX D

COOPERATING INSTITUTIONS

COOPERATING INSTITUTIONS

Institution	Form of Cooperation
A. Universities:	
1. University of Washington	
a. Dept. of Zoolgy	4 undergrad. internships
b. College of Fisheries and Ocean Sciences	facilities 1 grad. thesis project (2 more in the works)
c. Friday Harbor Labs.	facilities
2. Western Washington Univ.	7 undergrad. internships co-sponsor summer courses facilities
3. The Evergreen State College	16 undergrad. internships facilities
4. Central Washington Univ.	1 undergrad. internship
5. University of California	
a. U.C. Santa Cruz	3 undergrad. internships 2 graduate stud. projects
b. U.C. Davis	2 accredited summer courses
6. San Jose State Univiversity	2 graduate thesis projects
7. San Francisco State Univ. ...	2 undergrad. internships 2 grad. student projects
8. Humboldt State University ..	1 undergrad. internship
9. Orange Coast College	4 accredited summer courses
10. Oregon State University	1 undergrad. internship
11. Reed College (Portland Or.)	1 undergrad. thesis project
12. Boston University	1 undergrad. internship
13. University of Michigan	1 undergrad. internship
14. University of Florida	1 undergrad. internship
15. Washington Univ. (St. Louis)	1 undergrad. internship
16. Nothern Iowa State Univ.	1 undergrad. internship.

B. Research Institutions:

1. Moss Landing Marine Lab ..... facilities
   student sponsorship
2. Institute of Applied
   Physiology and Medicine ..... facilities and consulting
3. Prism Computer Corp. ..... facilities and consulting
4. Cascadia Research Co-op. .... grants and consulting
5. Marine Animal Resource Ctr. consulting

C. Government Institutions

1. U.S. Marine Mammal Commision grants
2. National Marine Mammal Lab
   NMFS, NOAA ..... facilities and grants
3. National Parks Service ..... grants
4. U.S. Coast Guard ..... grants
5. U.S. Naval Ocean Syst. Ctr. grants
6. Pacific Biological Station
   Canadian Dept. of Fisheries
   and Oceans ..... consulting, data sharing

D. Non-Profit Corporations:

1. Oceanic Society ..... co-sponship of programs
2. Ocean Researc and Ed. Soc. facilities
3. American Cetacean Society ... co-sponsorship of programs
4. International Cetacean Watch facilities co-sponsorship
   of programs
5. Conneticut Cetcean Society .. grants, co-sponsorship of
   programs
6. Greenpeace ..... grants, co-sponsorship of
   programs
7. Center for Long-Term
   Research ..... consulting, data sharing

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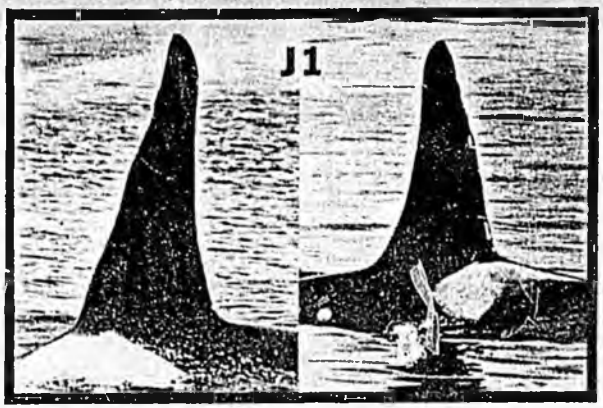
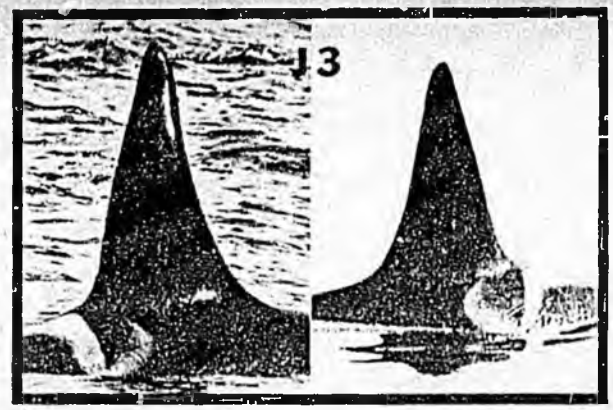
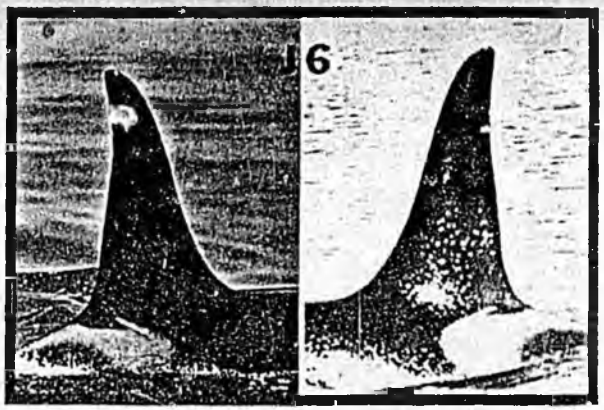
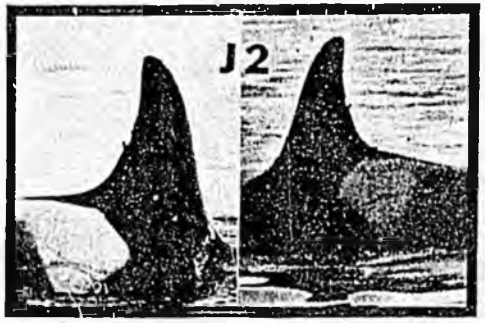
APPENDIX E

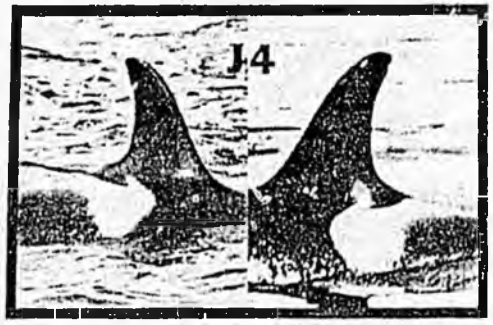
EXAMPLE OF KILLER WHALE
ID PHOTOS

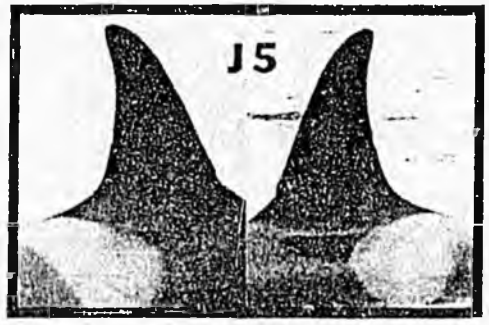


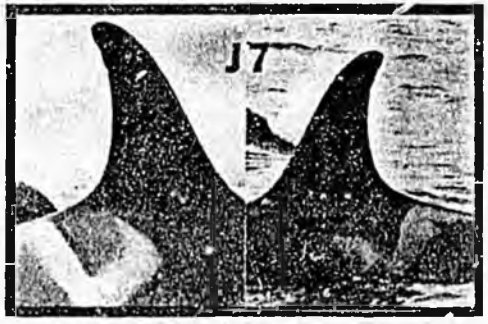


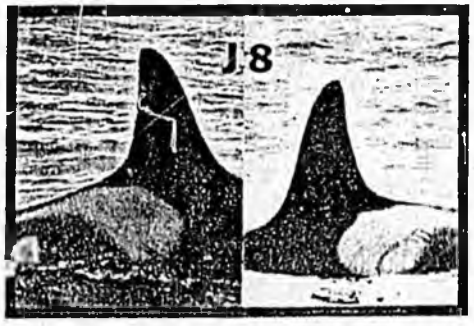


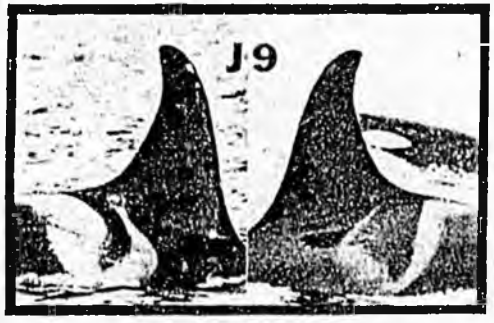


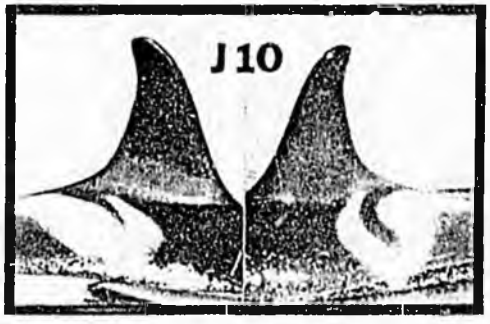












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TOP ROW — ADULT MALES
MIDDLE ROWS — FEMALES
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Information gathered will give a clearer understanding of the natural biology, social behavior, and population dynamics of these animals.

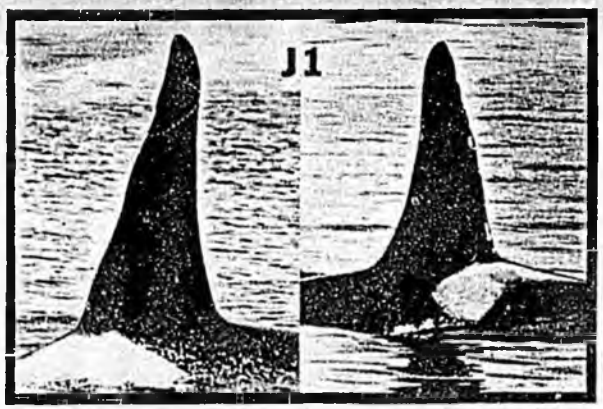
PUBLIC PARTICIPATION is vital to the success of the study.

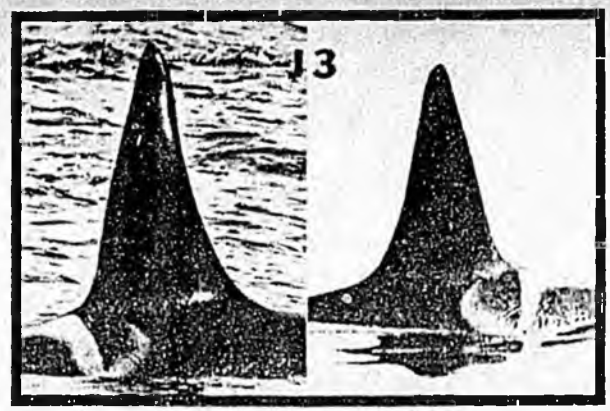
IF YOU SEE KILLER WHALES PLEASE CALL IN YOUR SIGHTING

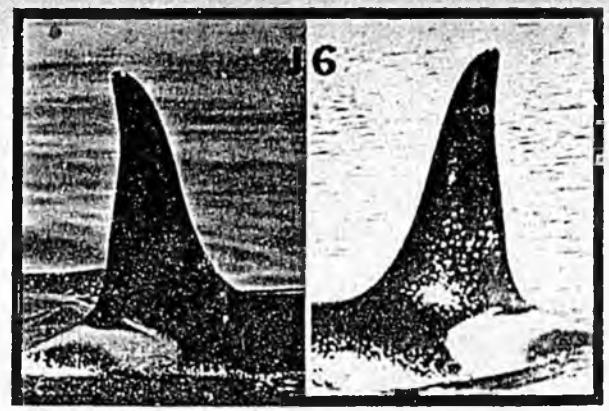
National Marine Fisheries Service contact at direct

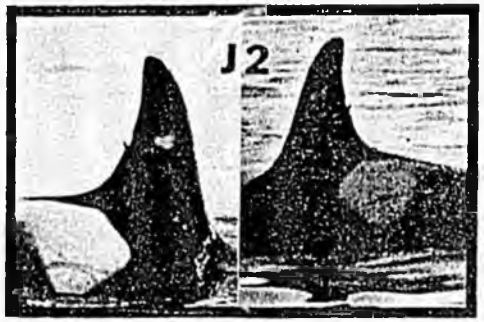
442-4737

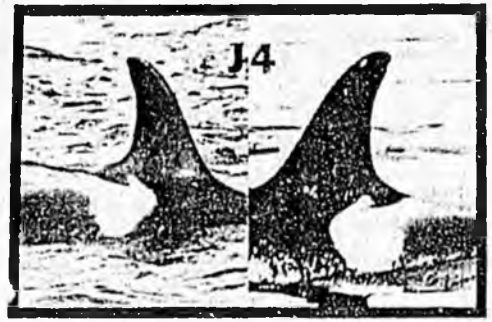
Pacific Cetological Society 8-77

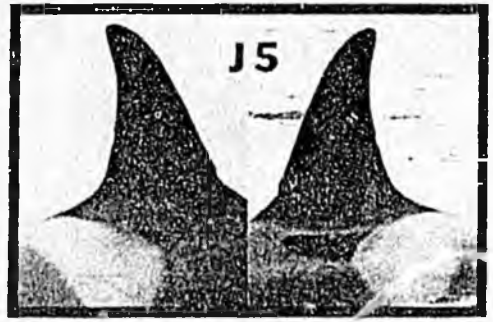


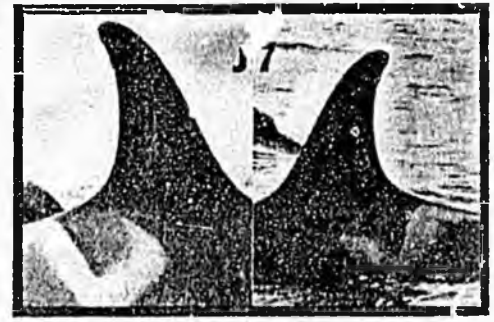


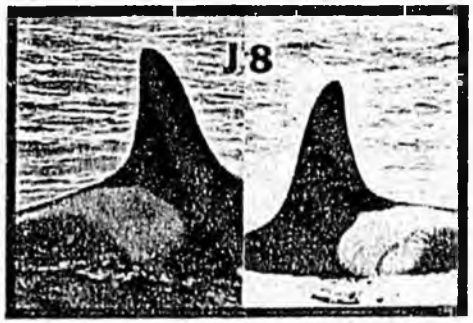


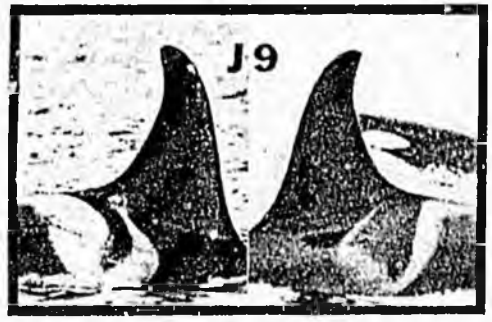


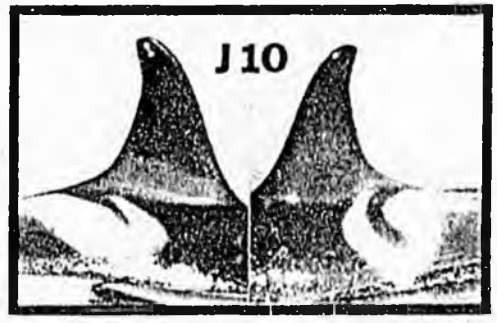












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National Marine Fisheries Service
collect or direct
442-4737

Mastips Cetological Society 8-77

Celia M. Hunter
Backwoods Trail
Star Rt. 20972
Fairbanks, Alaska 99701

January 24, 1984

Senator Vic Fischer
Alaska State Legislature
Pouch V (MS 3100)
Juneau, Alaska 99811

Dear Vic:

RE: ORCAS - the Killer Whales

Thank you very much for slowing down the process of automatically granting permits to Sea World to take 100 Orcas in Alaskan waters. The killer whales are an amazing species, with very strong familial ties, so any wholesale disruption of their pods by indiscriminate captures is a major offense.

I have land on San Juan Island, in Washington State, and am a member of the "Moclips Society" which operates the Whale Museum in Friday Harbor, and which sponsors 'whale watches' by almost everyone on the island. I will enclose clippings I have taken from the Friday Harbor newspapers concerning public viewings of the Orca pods which operate around and among the various San Juan Islands. These pods are so well identified that even the social structure, and such things as the greeting ceremony when the pods reunite after separations, has been observed and understood.

I will also send you copies of other material I have concerning orcas. The State of Alaska certainly needs to defend them within our state waters, and I would hope they would consider Alaskan waters as they do the fisheries, extending out 200 miles from our shores.

Sea World has a very bad reputation for handling orcas in the capture and retention of the whales. It is also significant that orcas die so quickly after capture when they live to such ripe old age in the wild. What Sea World does is not education but exploitation. Their real purpose is to make money, and their pretext for obtaining permits to capture the orcas is fraudulent.

I want to testify during the teleconference mentioned on "Alaska News Nightly" last night. I was most pleased with statements attributed to you and to Rep. Mike Szymanski in defending Alaska's orcas. Could you share this material with him, and with as many other legislators as possible. I don't have the funds to copy it to each of them. ?

Sincerely,

Celia

Celia M. Hunter

Congratulations on your new offspring!

479-2754 Fairbanks

Please support NJR #58. We are concerned
Paul + Bonnie Steer

ALASKA'S KILLER WHALES

To: Prince William Sound Boaters and other Concerned Persons

From: Jim and Nancy Lethcoe, Alaskan Wilderness Sailing Safaris (Whittier); Stan Stephens, Stan Stephens Yacht Charters (Valdez), Tim Jones, PWS charter boat skipper; Gail Somerville, Anchorage Friend of the Killer Whales. Beth Buchanan, Alaska Marine Charter Service; Carol Clause, Resurrection Bay Sails (Seward), Bev and Carroll Griffeth, Adventure Cruises (Seward), Jeep Reed, Pilot Rock Sailing Charters (Whittier), Joan Gidlund, Prince William Sound Glacier Cruises (Whittier); Bob Scott, Mt. McKinley Alaska Glacier Tours (Anchorage); Anita Stewart, Anchor Tours and Charters (Homer); Katy Case, Case Alaska with Katy (booking agent, Anchorage). Natural History Ventures, (Whittier); Paul and Priscilla Steer, Arctic Tern II Leasing, (Whittier); John Sheety, Mariah Charters (Seward). Background materials prepared by Nancy Lethcoe.

Topic: BACKGROUND SHEET ON KILLER WHALES AND CAPTURE PROGRAMS

Killer whales, *orcinus orca,* are the largest toothed whales utilising Prince William Sound. Although Killer whales may be seen any time during the year, it is not known whether individual pods, which are permanent family groups, are year round residents or migrants who use the Sound as an important part of their yearly cycle. Larger than normal concentrations of killer whales are often seen in November and early December. Unlike other U.S. coastal areas, virtually no base-line research exists on Alaska's killer whale pods including their size, composition, range, territories and behavior.

In Sept. 1983, the National Marine Fisheries granted Sea World a permit to capture 100 killer whales. The permit authorises capture of 100 killer whales with an average of 2 killer whales being kept each year for 5 years for public display and breeding purposes. Not more than 30 whales are to be captured each year in Alaska. Prince William Sound's Knight Island pod is a specific target. Sea World's operations are expected to begin in July, 1984.

Among other things, the permit states that:

1. Authorisation from the Assistant Administrator for Fisheries (William G. Gordon) is required prior to conducting any capture activities.
2. A local population census study (minimal) must be made.
3. No more than two animals may be removed from any distinct pod and no more than 1/2 of any sex/age class (immature, matur~) may be removed for any distinct pod during a 5-year period.
4. The animals shall be taken by the means, in the areas, and for the purposes set forth in the application unless otherwise specified in this Permit.
5. The captured animals can only be held for as long as "the associated animals remain in the area," until authorised by the Assistant Adm. for Fisheries. Authorisation to hold them longer is pending on the results of a pilot study to determine how long killer whales can be kept and still return to their original pod.
6. Animals previously captured may be recaptured up to 2 times but not more than once in any calendar year.
7. Animals encircled by net in the course of any authorised activity shall be considered captured.

The permit requires only that the Assist. Admin. for Fisheries be notified that a capture is about to occur, it does not require that an observer be aboard any or all Sea World associated boats from the beginning to the end of the capture effort or that Sea World make available its records so that outside observers can know whether Sea World is abiding by the terms of its permit in capturing the right number of whales the specified number of times.

REVIEW OF SOME PAST CAPTURE EFFORTS AND POTENTIAL PROBLEM AREAS:

1. The permit does not sufficiently stipulate the capture techniques and any restrictions on such techniques.

To capture killer whales, the hunters must be able to track a pod. Tracking procedures have not been specified in the application or the permit. In the Puget Sound area, there were considerable problems with inhumane tracking procedures, such as harpooning the dominant whale and following the brightly colored float attached to the harpoon for days and weeks at a time. This was banned by the Marine Mammal Protection Act.

Techniques used in the capture need to be analysed for their safety to the killer whales and their humaneness. "The ethics of killer whale hunting became a nationwide topic of discussion after a hunter (Don Goldsberry, Chief Collector for Sea World) captured six whales near Olympia, Wash. . . . He used two motorboats, a spotter airplane, and small explosive depth charges to frighten the animals into a net. In an atmosphere of strong public feeling, the State of Washington brought suit against the hunter and the aquarium corporation for which he was acting. Soon the federal government was drawn into the action. By then, three of the captives had escaped and one had been released because it was too large to keep. The corporation abruptly released the remaining two and agreed never again to hunt whales in Puget Sound (volunatarily signed by Dr. Lanny Cornell, Sea World)." (Scheffer, p. 125–126).

The permit states that "the collection techniques and procedures referenced in the applications are acceptable and shall be the manner in which the animals are taken." Sea World's application requests that Donald Goldsberry be allowed maximum flexibility in the use of any techniques described in the two-page paper "A Live Capture Technique for the Killer Whale," by Goldsberry and Asper, 1978 (ironically, this is the year that another 2 of their captured whales died). The paper recommends using explosives, speedboats, and low-flying aircraft within 50 feet of the water -- or less when landing. This leaves open the use of very low flying and taxing float planes being used to drive the whales.

2. Observers are needed to see that the terms of the permit are followed. The observers must have access to Sea World Scientific data to know whether whales are being recaptured or taken from the same pods.

In the past, hunters in Puget Sound have attempted to avoid adverse publicity by concealing the deaths of killer whales during capture. "For example, in 1970, the bodies of four baby killer whales, trussed and weighted like Chicago gangsters, washed ashore . . . at the scene of a previous hunt." (Scheffer, p. 125). Observers should be placed aboard all Sea World chase and capture boats to avoid this type of tragedy.

3. Captured killer whales need to be kept either temporarally or permanently. The permit makes no mention of how and where captured killer whales are to be held. Lanny Cornell has stated that they will be kept in nets or on deck for 4–5 days (presumably after they have satisfied the NMFS's concern that killer whales will be able to return to their pods when released.) Sea World's application mentions "allowing" the killer whales to swim into a bay, then closing the bay off with large mesh nets until the killer whales are moved into water once their length in depth. They will be penned in enclosures twice their body length.

4. Some scientists and boat operators claim that persistent hunting 'spooks' killer whales.
Some collectors, such as Sea World's Don Goldsberry, deny this. However, others report that killer whales learned to recognise the motor of capture boats and avoided going to places where they had been harassed of captured. (Scheffer, p. 127 and personal communication with Bill Boyd, former Skipper of Killer Whale capture boat for Sealand of the Pacific Ltd. Victoria, B.C.). Charter boat operators and recreational boaters in Puget Sound felt that killer whale hunting made the killer whales more wary of boats in general and that fewer migrant pods of killer whales visited Puget Sound waters. At the time, inadequate baseline information was available to ascertain this. No killer whale pod identification, territory, and behavioral studies have been done in Prince William Sound, so Sea World will again be able to argue that their hunting has no demonstrable effect on killer whale population shifts or behavior.

5. In the past, many killer whales have died during the capture process or from illnesses probably resulting from stresses related to capture. In the wild killer whales are believed to live 25 to 50

years. Of the 86 whales kept for exhibition or research between 1961 and 1980, 54 have died; 23 died within the first year. Stress related illnesses, such as pneumonia, ulcers, heart-attacks, and fungus are the major causes of death. Based on statistics in E. Hoyt, *The Whale Called Killer*. pp. 186-192. Of the 223 whales captured in Puget Sound, 10 died during capture, 31 were kept and 182 were released or escaped. These figures are low because accurate records were not kept of any category except whales kept. Hoyt, pp. 182-184. According to Hoyt's statistics, Sea World had kept 18 whales by 1980 of which 9 had died and 7 (from Iceland) had been in captivity for less than 3 years. At the time of the permit, Sea World had 8 whales.

6. **Sea World and their chief collector, Donald Goldsberry, have a dubious past record.** In 1970, Canada banned the collection of killer whales by non-Canadians partly as a result of abuses associated with Don Goldsberry's activities. In 1976, Sea World voluntarily signed the out-of-court settlement never to hunt in Washington State again as a direct result of lawsuit against them and Donald Goldsberry over their chase and capture procedures. After leaving Washington, Don Goldsberry went to Iceland. In the first two years, he captured 18 whales. Five suffered frostbite through neglect while in the holding pens. Two died. The rest were subsequently released. No attempt was apparently made to follow up on their survival. The Icelandic zoo with which Don Goldsberry is associated is under serious threat of closure by Icelandic authorities for neglecting the animals and treating them inhumanely.

7. **Sea World's breeding program:** According to Sea World spokesman, Lanny Cornell, Sea World already has enough killer whales to carry on and eventually obtain their breeding objectives, but it would take less time if more whales could be captured and added to the program. However, some marine biologists question whether Sea World or any other aquarium can keep a sufficient number of killer whales alive long enough to carry on a successful breeding program. Female killer whales attain maturity at about 13 years.

8. **Opening Pandora's Box:** Issuance of a permit to Sea World has opened the possibility that numerous other aquariums and freelance hunters will seek permits. Sea World argues that once they obtain more whales to speed up their breeding program that wild killer whales will no longer need to be captured. In effect, either Sea World will have been given a monopoly on the killer whale market for amusement parks or potentially all other aquariums will now be able to argue that they should receive equal access to and use of the wild killer whale resource.

SUGGESTED ACTION:

STATE LEVEL: You may wish to write your State Senators and Representatives asking for their support on House Joint Resolution 58 (major sponsor, Rep. Mike Szymanski) and Senate Joint Resolution 31 (major sponsor: Senator Vic Fischer). These bills are currently in the Resources committee. Public opinion messages can be sent to all members of the resources committee by calling 278-3668.

Representative Mike Szymanski and Senator Vic Fischer have introduced joint resolutions that address many of the above concerns. For additional packets of information, including a copy of the permit, contact: Representative Mike Szymanski, Pouch V, Juneau, AK 99811, phone: 465-4978/4979 or Vic Fischer, Pouch V, Juneau, AK. 99811, phone, 465-4954/4955/4997.

FEDERAL LEVEL: Legislation has recently been introduced to the House of Representatives seeking a ban on capturing killer whales in all United States waters. You might wish to write Rep. Don Young asking him to support this. Similar letters could be sent to Senators Murkowsky and Stevens asking them to co-sponsor this legislation in the Senate.

You might wish to include some of the following points:

1. Sea World maintains that they are confident no killer whales are going to die as a result of their chase and capture program. Sea World should be asked to make a public statement that if a killer whale does die as a result of their capture efforts, that they will voluntarily cease and desist from any

more efforts to capture killer whales in Alaskan waters.

2. Observers should be placed aboard all Sea World chase and capture boats to verify that Sea World follows the stipulations in its permit. National Marine Fisheries Service issued the permit and has enforcement responsibilities. However, they apparently have no boats or funding to enforce the stipulations in the permit. According to Jim Brooks of the NMFS (Juneau), Sea World will notify the NMFS when they intend to implement their permit and that the NMFS will then place an observer aboard the boat to watch the process from start to finish. The NMFS is pleased that the State of Alaska is considering placing Dept. of Fish and Game personnel aboard the boats. If this is done, then the NMFS will probably deputise the AK. Dept. of Fish and Game personnel. The State would then be expected to pick up the costs of having enforcement officers aboard the boats. According to Jim Brooks, Sea World is very aware of its public image. He is confident that they will not begin any capture operations (even if poor weather delays the arrival of an enforcement officer for several days) until the designated officer is aboard the boat.

3. Before any hunting is permitted in Alaskan waters, Sea World should be required to spend 3 to 5 years establishing base-line research on killer whale pods including their composition, productivity, territories and behavioral patterns. This is needed to obtain a better understanding of the short and long term effects of capturing killer whales on local killer whale populations and behavior. This is a standard professional procedure that for some inexplicable reason has apparently been waivered by the National Marine Fisheries Service. Instead they are accepting population estimates which have little statistical reliability and which provide no information on pod size, distribution, behavior, etc.

4. Hunting, capture, and transportation procedures should be subject to periodic public review to guarantee the minimum amount of cruelty and inhumaneness to the animals directly involved and the least amount of harassement possible to those indirectly involved.

5. Some type of follow-up studies should be required on those killer whales that were captured and released to determine what effects if any capture had on the killer whale and if it returned successfully to its original pod or met with subsequent mishaps as a result of capture.

6. Killer whales should not be captured within Alaskan waters until the State of Alaska Dept. of Fish and Game gives its approval.

7. Public hearings should be held in Alaska. Sea World strongly opposes public hearings.

8. Many questions need to be answered on the validity of the research. Is this a responsible research plan or one that fits best with Sea World's own commercial interests? In the judgement of the scientific community is this the type of research that is really needed or are there more important research projects?

9. Sea World maintains that killer whales thrive in an aquarium environment. Sea World should be asked to provide evidence supporting this claim. High death statistics, the failure of killer whales to emit sounds in captivity, reproduction problems (Marineland has had a least 4 killer whales that were conceived in captivity either died prior to birth or within a short time after birth), and physical problems such as collapse of their dorsel fins would seem to indicate that captivity places considerable stress on the whales.

10. The strongest protection that could be given Alaska's killer whales is to ask the State Legislature and Dept. of Fish and Game to prohibit the taking of killer whales within the 3 mile limit.

For additional general information or to place your name on a mailing list to be kept informed of developments, contact the Alaska Wildlife Alliance, P.O. Box 6953, Anchorage, AK 99502. Phone: 277-0897.

Sea World

Lanny H. Cornell, D.V.M.
Senior Vice President/
Zoological Director

June 21, 1983

Robert Brumsted
Acting Chief
Protected Species Division
National Marine Fisheries Service
U. S. Department of Commerce
Washington, D.C. 20235

Dear Mr. Brumsted:

You have now received our comments on the questions asked by the Marine Mammal Commission regarding Sea World's application (P2M) to collect killer whales over a 5-year period for captive propagation, research and public display.

In the early and mid-1960's, several of us recognized the need for controls on the collection of marine mammals for scientific research and public display. I first began ministering to marine mammals as an equine practitioner in 1964 consulting to Marineland of the Pacific and later at Marine World-Africa USA and other smaller aquariums. I also was a consultant on occasion to Sea World during that same period. I was astounded to learn early on that marine mammals could be collected in United States waters without a permit.

Inasmuch as I was most familiar with public display, I concentrated my efforts at that area of the Act. I was pleased to see the final version which devotes an entire section to public display. To see that the Congress agreed with the 100 million annual zoological visitors who see marine mammals on display was gratifying. And to know the taking and care of these creatures would be regulated was a tremendous comfort personally.

Relatively few today realize or remember the contributions of responsible individuals and organizations to this regulatory process. Sea World was among the

first to recognize such a responsibility, and today the staff and management of Sea World continue this recognition and are dedicated to it. One need only visit a Sea World park to realize the tremendous dedication of the staff, and the management as expressed in the investment in fine exhibits and off-public areas.

Sea World maintains a clinical laboratory in each park devoted to investigating continued preventive medicine, environmental control and disease discovery. This staff is dedicated, paramedically trained and diligent. To see members of the animal care and behavioral staffs risk their lives crawling down cliffs to rescue beached and stranded marine animals, or stay with these creatures all night in freezing water to help ensure their survival is to perceive that dedication firsthand.

To suggest that killer whales live only two years in captivity is to ignore that the killer whales currently at Sea World have been with us for from 5½ years to 14½ years, and all are doing well. Let's not forget that it has only been during the last 19 years that anyone has tried to keep killer whales in a zoological environment as a result of planned capture attempts or expeditions.

It was, in fact, the National Marine Fisheries Service in Seattle that called for Sea World's assistance in 1972 to save from a Puget Sound beach a large (18-ft.) female killer whale. "Sandy", as she came to be called, was saved and lived a bonus 5½ years more in our facilities at our expense, not used for shows but for children's education classes.

"Sandy", at the time she beached, suffered from a 2,000-lb. weight loss, a severe bone infection (jaw) and was nearly deaf as a result of her illness. Our Seattle team worked all night to dig under the whale, stretcher her and lift her to safety aboard a truck to be taken to the then Seattle Marine Aquarium at Pier 56. That vintage aquarium was later closed by Sea World so as not to compete with the new Seattle city aquarium.

But it served "Sandy" quite nicely, as it was there her infected teeth were removed and she was nursed back to health and full weight. Later that year she was airlifted to our San Diego park. She lived at Sea World the rest of her years.

Other debilitated whales, too, have come from Puget Sound. I have, unfortunately, witnessed several necropsies on killer whales from that area. Some of these had bullets insidiously lodged in their bodies and heads, and one in particular was doomed from the outset as a result of a large caliber rifle bullet and an associated abscess in the chest. Only two years ago, nearly a thousand killer whales were slaughtered in Antarctica with almost no protest.

Sea World's corporate mortality rates with all species range from 3.0-6.0% in all our parks - at least as good and possibly better than wild mortality rates.

Certainly animals have died at zoos all over the world as practitioners, curators and animal care staff have learned to cope with their special needs. Many lost in the past would not die today as a result of the tremendous increase in knowledge in the last ten years. To assume only environmentalists and well-meaning but ill-informed citizens care about these animals is both unfair and dangerous.

For it was only in the mid-sixties and early seventies that these same people began to know enough about sea animals to begin to care. Only after killer whales were included in educational displays was the public awakened to their beauty, intelligence and educational value. Only then did their protection become an issue. The State of Washington and its citizens were enthralled by the saga of Namu, the first killer whale exhibited in Seattle. Two ordinary fishermen became heros and later villains as the press first acclaimed their ingenuity and politicians later made hay with their public relations awkwardness.

Dangerous explosives have never been used by Sea World! Large firecrackers, yes - and thousands are still used today by commercial fishermen in Puget Sound and all over the world in lieu of bullets to

keep marine mammals out of their fishing gear. Insensitive? No, I think not - not when the alternative is death.

To condemn the use of seal controls, as they are called, is fine if you buy your food at the supermarket. But to commercial fishermen, who must pay for their gear and nets and make their living from the sea, seal controls seem a small price to pay to help sustain themselves. Although Sea World no longer utilizes these devices, we cannot condemn the salmon, herring and squid fishermen who still do use them to keep killer whales from their nets.

Sea World spends millions of dollars annually on facilities, not because of government rules or complaints by citizens, but because by doing so we can assure the lives and safety of the animals in our care to a better degree. Even if viewed only for the financial impact, such a program makes far more sense than a wasteful and sacrificial approach. Add that to the caring attitude of the staff, and a picture emerges of the empathy and love our shows and displays portray - and which the public, including thousands from Washington State, (over 7 million in 1982) perceives and appreciates.

Sea World's attendance has grown steadily since our inception in 1963-64 when we had only 400,000 visitors. Projected attendance in the late 1980's is 10 million per year. Since our beginning, over 70 million guests have learned about whales at Sea World. Currently over 7.0% of the 100 million zoological visitors attend Sea World parks. More people visit oceanaria and zoos than attend <u>all athletic</u> events in the United States. Nearly half the population of the United States attends zoological parks each year - a huge and overwhelming vote of approval and confidence by the American public.

Sea World has not been nor will we ever be a part of the animal trade in killer whales or dolphins. All funds received so far for animals provided to qualified zoos from our beached and stranded animal program or our captive breeding program are <u>paid directly</u> to the

nonprofit Hubbs-Sea World Research Institute. The marine and aquatic research conducted worldwide by this group directly benefits the marine mammals themselves since the more we learn about marine mammals the better position we are in to protect and preserve them for future generations.

We would join those who would put a stop to the unregulated international trade in killer whales by the inexperienced from Iceland. We have objected to it from the outset. We have never been part of, nor condoned, trade. Sea World has always espoused that only qualified and experienced personnel collect marine animals. Icelandic officials early on were notified by Sea World personnel of the technological expertise needed to properly collect and care for marine mammals. Sea World personnel warned these same people of the danger and problems they would encounter in the care of newly collected animals in Iceland, including the recommendation not to build the pool in Reykjavik and the problems with the weather which they soon did encounter. We also warned their European veterinary staff, who were aware and informed as to the danger well in advance of the occurrence of the problems.

No animals have been lost in killer whale collecting activities during any Sea World collecting attempts since the implementation of our professional collecting team concept in 1972. No killer whales have been collected and removed in Washington waters since implementation of the Marine Mammal Protection Act of 1972. All killer whales removed from Washington waters were collected under Washington State law by Washington State fishermen. Sea World is not responsible for any mortalities or distribution of whales from those waters. The State of Washington controlled all activities in those waters until late 1972 when the Marine Mammal Protection Act became law.

Yes, animals died in the early collecting attempts by the Namu, Inc. Seattle fishermen. Those animals were offered to Washington State officials, museums and the University of Washington. None accepted. The animals were then weighted and sunk in Puget Sound,

not to hide them, but to avoid the navigational and health hazards associated with decaying whales on the beach. It was a sad waste of data and lives, we agree.

Sea World has always volunteered that any animals lost during collection, or later, would be utilized to the fullest extent possible by interested and qualified scientists. We have followed that policy to date, as a search of marine mammal literature will show.

In 1976 in Budd Inlet, Sea World collectors had no plans to remove animals after discovering their size. They were voluntarily, and at Sea World's expense, removed and held in a bay until University of Washington scientists could attach radiotags, etc. A prominent Seattle TV newscaster called the handling and transport procedure from Budd Inlet an amazing example of American technology in action on the news that night. We withdrew from Washington voluntarily, and under agreement, as it was evident no whales would be taken there again.

Sea World personnel have never denied that our goals are profit motivated. In fact we are proud that because of profits we have been able to establish one of the finest overall marine zoological complexes ever imagined. Profits have provided millions of dollars worth of improvements, exhibits, facilities and displays both for the public to enjoy and for the animals to live in. We, like the Boeing Company of Seattle, are prominent, community minded, successful employers in our communities. And like Boeing, we produce quality. There were those who said the 747 would never fly.

The permit application, when approved, will provide Sea World with the tools for future stability, better animal care and reproductive assurance with killer whales. As you recall, only a few years ago bottlenose dolphins were never expected to reproduce in captivity in significant numbers. Today, captive bred dolphin calves are commonplace. These negative arguments are not based on reality. A negative approach, if thus promoted and if allowed to prevail, would cripple the very ingenuity this country thrives

upon. Killer whales can be bred in captivity - they will be. Our plan only assures that will occur. Up to 1956, no gorillas had been bred in any zoo. If progressive thinking had not occurred, no gorillas would be in zoos today. Over 35% of all gorillas currently in zoos are captive bred.

Since 1976, over 86% of the whales collected for public display are still living, and the percentage improves annually. Technological advances and improvements are inevitable. Just as farmers improve crops and NASA improves rockets, we, too - the zoological community - continue to improve our knowledge and understanding and thus help ensure the future of species all over the world.

As we have previously stated, one of our male killer whales is currently of breeding size and age. Several others (females) are approaching maturity. Hopefully these animals will be the first to conceive and reproduce successfully. During the time these begin to reproduce, obviously, others will be needed for educational display purposes. It is these whales we hope to collect under this new permit.

Two years of acclimation and training time will be required and later, as they also grow, they too can be rotated with the successful breeders. Thus not only will Sea World be able to maintain show schedules and our commitment to the public and our guests, but also our responsibility to the species reproduction in captivity. The program is designed to be self-sustaining as are our current bottlenose dolphin, California sea lion and harbor seal populations.

Our new killer whale facilities will ensure space and space age technological skills for our future killer whales - the new breed of domesticated whale for generations to come.

Hundreds of killer whales will not be involved in this process. Up to 100 might be encircled and researched at the capture site in Alaska and California. Very few, if any, will be removed from the site, and those few only for logistical reasons as the researchers

involved require for their programs. As far as Sea World is concerned, only the two animals per year - for a take of ten - need be removed, and those will quickly be transported to our killer whale facilities in San Diego, Florida and Ohio.

Although, as some point out, there are hundreds of killer whales which could be involved, our plan is to research only those animals actually involved in the collecting process for public display. The title of the application should probably read: To take 10 animals for public display and research the biology on up to 90 more animals and then release them on site.

With reference to my letter of June 15, 1983, public hearings should not be deemed appropriate for the issuance of this application. The activities of collection are to be offshore San Diego, California and Juneau, Kodiak and Cordova, Alaska. It is these areas whose populace has a direct interest in the collection activities and whose best interests would be served by such hearings.

Sea World has followed to the letter the requirements for application to take these animals. The populations of killer whales in the waters indicated meet all the requirements for take as established for both scientific research and public display under the Marine Mammal Protection Act of 1972. The issuance of such permit would be in direct correlation with the wishes of Congress written into the Act.

This application is among the most detailed ever submitted to the National Marine Fisheries Service. Subsequent information provided to the Marine Mammal Commission on June 16 and this letter represents more detail than has ever been prepared for National Marine Fisheries Service for such permit issuance. All questions have been answered fully. All inquiries have been addressed to date. All parties wishing to do so have had the opportunity to meet with us in private as individuals and in several meetings in Washington, D.C., San Diego, California and Anchorage, Kodiak and Cordova, Alaska.

It is our opinion that there is no need to further delay the permit process.

We respectfully submit this letter. Should you have any questions regarding the letter or our application, please feel free to contact me at any time.

Sincerely,

Lenny H. Cornell, D.V.M.

LHC/ld

NEW WHALE STADIUM - FLORIDA

SJR 31

From: North Pacific Fishermen's Federation

TO: Senate Resources
House Resources

SUB: Sea World proposed capture of Killer Whales.

Madam Chairman
Mr. Chairman

As I am frequently around killer whales, I am intensely appreciative of and respect the magnificence of these mammals. It is hard to visualize these mammals in captivity.

I have met with representatives of Sea World and discussed their proposal to capture a few killer whales. After consideration of some important reasons for the whales capture, we would appreciate being put on record as supportive of Sea Worlds' proposal.

The educational benefits to the public, the scientific benefits to the deeper and better understanding of the killer whales, the expression of seemingly ease of the whales to adapt to captivity, the quality personnel and facilities as expressed by many who have visited Sea World as well as representative documents and personnel, seem to give credibility to Sea World's proposal.

We believe the killer whales are going to

be studied to a great extent, anyway. We would definitely appreciate these types of projects done in the private sector rather than by governmental agencies. The results will be thorough, the care will be the best, and the costs and investment be protected. This, as past experience shows, is not the case with governmental involvement.

These capturing activities should, as can be worked out with Sea World representatives, be done in a manner as to not hinder fishing activities in Southeast Alaska.

Jerry Smelcer
Chairman NPFF
Box 3020
Juneau, Ak. 99803
907-789-9923

COMMITTEE REPORT

SENATE

FURTHER: RESOURCES

1/23/84

Date: _____

Mr. President:

The Committee on STATE AFFAIRS has had SJR 31

relating to the capture of orcas in Alaska waters.

under consideration and (a majority of the committee) (the committee) reports it back with the following recommendations:

[ ] do pass [ ] do not pass

[ ] do pass with attached amendments(s)

[ ] replace with CS for _____ [ ] same title [ ] new title

and recommends _____

[ ] AND attaches a "Letter of Intent" [ ] New Fiscal Note

[ ] reports it back without recommendation

[ ] referred to the _____ Committee

MEMBERS SIGNING DO PASS

_____

_____

_____

_____

_____

_____

_____

_____

MEMBERS HAVING OTHER RECOMMENDATIONS:

_____

_____

_____

_____

_____

_____

_____

CHAIRMAN

S 60 (Rev. 12/78)

Sea World®

Jan. 16, 1984

Dear Fabrenkamp:

Enclosed is a copy of Hubbs-Sea World Research Institute Technical Report No. 84-175: "KILLER WHALES (Orcinus orca) OF SOUTHERN ALASKA, Results of Field Research 1984, Preliminary Report," prepared under a grant from Sea World, Inc., and with the authority of National Marine Fisheries Permit No. 439.

The study reflected in this report was requested by the NMFS permit. This work, undertaken between April and September, 1984, in Southeast Alaska, Prince William Sound and the Kodiak Island area, represents the first comprehensive effort to scientifically photodocument and identify individual killer whales occurring in those areas.

This past year, biologists working in these areas actually photographed and positively identified 286 individual killer whales. With the addition of about a dozen other animals that were identified but not photographed, the minimum number of killer whales known for these regions now is 297-299 individuals. Prior to the initiation of this study, estimates for killer whale populations in these limited areas of Alaska were 239 to 293 individuals (Leatherwood et al, 1984). The photo identification techniques employed in this study also have been successful in the Washington/British Columbia areas.

Using data from those long-term studies on rates of encounters each year with new animals, the 1984 Alaska findings can be conservatively extrapolated to establish an estimate of a minimum population of 356-372 killer whales in these areas, an increase of about 100 animals over the earlier estimates. These numbers, based on a single year of study, are expected to be revised upward as the result of continuing work in 1985 and later years.

Sincerely,

Jackie O'Connor Hill
Public Relations Director

Sea World, Inc. • 1720 South Shores Road • Mission Bay • San Diego, California 92109 • (619) 222-6363

COPY

Sea World Enterprises, Inc.

1720 SOUTH SHORES ROAD, SAN DIEGO, CA 92109-9980

LANNY H. CORNELL, D.V.M.
Senior Vice President/
Zoological Director
(619) 226-3829

December 20, 1984

Mr. Robert Brumsted
Chief, Protected Species Division
National Marine Fisheries Service
U. S. Department of Commerce
Washington, D. C. 20235

Dear Mr. Brumsted:

National Marine Fisheries Service Permit No. 439, issued to Sea World, Inc. on November 1, 1983 for the acquisition of killer whales and the conduct of scientific studies, calls for field research on killer whale populations in Southern Alaska and requests a report on such research be submitted to National Marine Fisheries Service prior to the end of 1984. The report was to include a summary of activities conducted under the permit, results of surveys and monitoring efforts, and an outline of activities planned for the following year.

Leatherwood et al, (1984), using their own field observations and sightings from fishermen, reported to the International Whaling Commission a minimum population estimate of 239-293 killer whales in Southeast Alaska, Prince William Sound and Kodiak Island/Shelikof Strait area. In the summer of 1984, Sea World contracted with the Hubbs-Sea World Research Institute to conduct a photographic survey of killer whales in those areas. I enclose with this letter five copies of a preliminary report on the 1984 research under that contract.

This paper reports that in 1984 researchers conservatively identified 286 whales by individual markings. In addition they could visually identify approximately a dozen more animals but were not able to photograph them. Therefore, we know there are at least 297-299 naturally marked animals in the areas studied to date. By extrapolating the findings, using data from the long term studies in Washington/British Columbia, one would estimate a minimum population of 356-372 killer whales in these limited areas of Alaska examined so far. It is evident these numbers, based on only one year's study, will be revised as a result of studies in 1985 and in later years. We expect these conservative estimates to climb in future years.

The report also documents exchange of animals between Prince William Sound and both Southeast Alaska and Shelikof Strait. We are aware of reports and studies of killer whales in the Gulf of Alaska and the Unimak Pass area, which because of their timing lead us to believe the animals involved are not part of the reported population(s). We have elected, however, not to include those animals in our minimum population estimate at this time but will study them further in the coming years and report on them at the time of study.

We find the enclosed Technical Report from the Hubbs-Sea World Research Institute a quality product. Previous studies of killer whales have occurred in much smaller geographic locations in highly populated areas. The present study covered a vast area with few people and equipment. The results presented are a credit to the team involved.

As an adjunct to the study of killer whales, observers noted data on animals other than killer whales and photographed animals whenever possible. Reports on these activities, including data on species of special management interest to National Marine Fisheries Service, a catalogue of photo-identified humpback whales, and sightings of harbor and Dall's porpoise, are in press and will be distributed under different authorship.

In 1985 the Institute will continue to study Southeast Alaska and Prince William Sound, will increase efforts in the Kodiak Island/Shelikof Strait area and will extend some activities to the waters in and around Unimak Pass and, to the extent possible, the Gulf of Alaska. We are proud of the field work accomplished in 1985 and look forward to supporting it in future years.

In addition to the field studies reported in this paper and outlined for 1985, we will conduct the following studies on animals encircled but not removed from the study area: photographic-identification, morphologic analysis, blood sampling, hearing and respiratory studies and tooth-aging studies, as provided for in the permit. To date we have removed three teeth from captive killer whales; a fourth will be removed in early 1985. These teeth will be valuable in calibrating GLGs for killer whales. If you wish, we can forward photographs of the most recent procedure, showing the removal of a tooth using a periosteal elevation and forceps under local anesthesia. To date, no antibiotics have been utilized for the tooth removals. However, the Marine Mammal Commission has suggested that tetracycline be injected into the temporarily restrained whales

to mark the tooth structure for date identification at some later examination. If such marking is requested by you, the dosage will be the previously reported 50mg/kg of tetracycline hydrochloride (or similar drug) parentally injected.

For tooth removal, the whale's mouth is opened by gently inserting a finger or other object into the lip area. When thus stimulated, the whale's mouth will open (this is not a trained behavior but is a natural response), and a padded speculum is placed in the corner of the mouth. The speculum keeps the mouth open for the surgical procedure. Prior to conducting hearing and respiratory studies on wild animals, we will perform these tests on captive animals and report the results to you.

We have elected not to conduct liver biopsies on killer whales in 1985, as we believe newer serum chemistry analysis can give as complete a picture as is needed at this time. We will not conduct stomach lavage studies in 1985. These studies were originally suggested by National Marine Fisheries Service personnel and have not been further clarified at this time.

We do not anticipate tagging whales with spaghetti or streamer tags, as we feel most of the animals can be identified through photographic means. However, we will have cryogenic marking equipment on the scene and will use it in the event animals are observed which cannot be identified readily through photographic markings. In our experience cryogenic marks on killer whales have completely disappeared within 18 months to 2 years.

Should you have any questions regarding the report or the information in this letter, please feel free to contact me.

Sincerely,

Lanny H. Cornell, D.V.M.

LHC/ld
enclosure

December 19, 1984

M E M O R A N D U M

TO: Lanny H. Cornell, D.V.M.

FROM: Joseph R. Jehl, Jr.

Enclosed is the original of Institute Technical Report #84-175, "Killer Whales (Orcinus orca) of southern Alaska", summarizing results of research directed by Mr. Stephen Leatherwood and conducted in 1984 under contract to Sea World. Numbered copies of the report have been delivered to you for distribution. Although the report is self-explanatory, several points require emphasis.

1. This is a preliminary report, the field season having ended only 2 1/2 months ago. Although analysis continues, the general results will not be reversed by further study. Indeed, further review of the 1984 photographs, and new photographs taken in 1985 will likely allow the identification of additional whales as well as clarification of their status (age, sex) and pod affinities. Thus, this report is a conservative interpretation of the data, which we believe will stand critical scrutiny.

2. To place the results in perspective, please recall recent reviews of the size of the southern Alaskan population(s). In 1984, Leatherwood and co-authors estimated that there were 239 (same day counts) to 293 (estimates based on these counts) whales in three areas of southern Alaska (southeast Alaska, Prince William Sound and Shelikof Strait). In reviewing those data, the Alaskan Department of Fish and Game accepted the lower figure as conservative and expressed their view that removal of an average of 2 whales a year over a 5 year period would have no significant biological impact on the population. To date, from the 1984 photographic record, we have photo-identified 286 whales and have noted presence of 11 to 13 more which we know are different but for which we were unable to obtain useful photographs. Therefore, there are 297-299 naturally-marked animals known in the study areas.

3. To insure the conservative nature of this report, we have not extrapolated our findings to a population estimate in the body of the text but in Appendix I. By our reasoning, based on rates of encounters with new pods and whales by researchers in British Columbia and Washington during 11 years of study, the population in our study area can be estimated at 356 to 372 whales. Even though this figure seems conservative, for reasons spelled out in the Appendix, it is biologically reasonable and provides a valid estimate for further discussions with management agencies for 1985.

The photographic catalogue for 1984 is at the printers and will be delivered to you in January. It will be a useful companion to this report and an essential tool for researchers participating in the projected studies for 1985-1988.

We appreciate your support for this very important study.

JRJ/ar

ENCLOSURE

ERRATA

Please correct the following mi.or printing errrors in your copy as they may affect the clarity or meaning intended:

Page	Paragraph	Line	
1	1	6	insert ")" after "(R="
		14	insert quotes around "preferred areas"
	2	12	insert comma between "Boran" and "Osborne"
2	1	11	replace "in" with "and"
11	2	7	insert comma after "(ATA)"
	4	9	insert comma after "Camp A"
14			under area 112 the correct April/May Subtotal is 11, the correct Total is 97
15	1	1	remove "a"
25	2	1	insert comma after "Alaska"
	4	4	"x 3.22" should read "$\bar{x}$=3.22"; "(x =" should read "($\bar{x}$ ="
42	2	5	following "Bigg et al." replace comma with "("
	5	8	"x=5.10" should read "$\bar{x}$=5.10"
	5	9	"x=18.1" should read "$\bar{x}$=18.1"
44			Figure 13 caption should continue "...Numbers correspond with encounter numbers, Table 9."
48	2	1	insert comma after "Nevertheless"
49	2	3	following "percent)" replace comma with period
		6	following "percent)" replace comma with period
49	3	3	should read "percent to 60.7 percent) and Prince William Sound (14.4 percent to ..."
55	1	6	insert comma after "Alaska"
	2	4	insert comma after "table"
	3	10	insert "and" after "logical"
57	1	14	insert comma after "1982"

KILLER WHALES (Orcinus orca) OF SOUTHERN ALASKA
Results of Field Research 1984
Preliminary Report

Prepared by
Stephen Leatherwood
Hubbs-Sea World Research Institute
San Diego, CA

Kenneth C. Balcomb, III
Center for Whale Research
Friday Harbor, WA

Craig O. Matkin
North Gulf Oceanic Society
Cordova, AK

and

Graeme Ellis
West Coast Whale Research
Vancouver, B.C.

From Contributions By
(In Alphabetical Order)

K. C. Balcomb, III, K. M. Balcomb, L. H. Bloedel, G. Ellis, B. Goodwin, J. D. Hall, C. O. Matkin, D. J. McSweeney, K. W. Miller, O. von Ziegesar, J. K. Yamada and E. R. Yohe

HSWRI Technical Report No. 84-175

December 1984

ABSTRACT

A study was undertaken between mid-April and late September 1984 to photographically identify killer whales in Southeast Alaska and Prince William Sound. Similar activities were conducted in Shelikof Strait 27-30 August. A total of 256 whales was photo-identified and catalogued by pod (=clan). The minimum population documented from photographs in the three areas is 286, including 96 animals from Southeast (counting all 19 members of AR (= R pod known from British Columbia, though only three were photo-identified when the group was encountered in Southeast Alaska), 173 from Prince William Sound and 17 from Shelikof Strait. It is highly unlikely that all pods using these areas were encountered and it is known that not all animals encountered were photographed. Southeast Alaska appears to have few if any "preferred areas" (areas of concentration); the portion of its population known to date includes 39.3 percent transients, 60.7 percent "residents". Prince William Sound does appear to have preferred areas; the portion of its population known to date includes 14.4 percent "transients" and 85.6 percent "residents". The 256 animals classified by age/sex class consist of 48 adult males (18.7%), 140 adult females or subadult males (54.7%) and 68 juveniles or calves (26.6%). One "resident" pod (AR) and one "transient" pod (AM) known from Washington/British Columbia were encountered in Southeast Alaska. One "resident" pod (AF) encountered most often in Southeast Alaska in 1984 was also photographed four times in August 1984 in Prince William Sound. It had been photographed in the Sound in 1983. Members of AD pod, a resident group known from Prince William Sound in 1984, were also photographed in Shelikof Strait in 1984. Foraging ranges of up to 1,445 km (780 nm) are documented. Historical encounters with known pods, 1977-1983, are presented. Work in 1985-1988 will refine estimates of population size and composition, estimate productivity and natural mortality, define other vital statistics and document feeding and other behaviors.

INTRODUCTION

In 1973, the Canadian government initiated studies of the population(s) of killer whales, Orcinus orca, in the inland marine waters of British Columbia (Bigg, MacAskie and Ellis, 1976). Researchers obtained high quality, high resolution close up photographs of the dorsal fin and "saddle" (the area of light pigmentation below and behind the dorsal fin) and used them to identify individuals and describe composition and behavior of the groups (pods or clans) into which they assembled. In 1976, the United States government initiated comparable studies of killer whales in adjacent inland marine waters of Washington state (Balcomb 1976; Chandler, Goebel and Balcomb, 1976). In both areas, research using photo-identification has continued through a variety of government and private organizations (for example, see Balcomb, 1978; Balcomb, Boran and Osborne, 1979; Balcomb, Boran Osborne and Haenel, 1980; Balcomb, Boran and Heimlich, 1982; Bigg, 1984, Bigg, MacAskie and Ellis, 1983; Contributors to Kirkevold and Lockhard, eds., (in press). Results of these research efforts have formed the basis of much of our current understanding of the population biology of killer whales and are often quoted as the authority for management models (Perrin, ed., 1982; Matkin and Leatherwood, in press).

In 1981 the Small Cetacean Sub-Committee of the International Whaling Commission convened a meeting of invited experts in Cambridge, England to review the status of knowledge on killer whales (Perrin, ed., 1982). The sub-committee noted the extensive amounts of new information derived from the observational/photographic studies in British Columbia and Washington but pointed out some important discrepancies between results of such studies and information available from more traditional examination of specimen materials. For example, Bigg (1982) reported birth rates of 6.94 to 9.77 percent off British Columbia, where observed calving intervals were as long as 12.47 years in uncropped pods. By contrast, Jonsgard and Lyshoel (1970) and Christensen (1978 and 1982) found pregnancy rates of 14.8 percent in 37.3-43.2 percent of mature females, respectively, in samples they examined from the whaling industry in Norway. These authors believed that there were shorter calving intervals in the Norwegian population(s). Anderson (1982) estimated pregnancy rate of 13.3-19.9 percent of mature females in samples from Antarctic whales taken in 1979/1980. Based largely on such disparate results the sub-committee recommended that (1) observational/photographic research be continued to document dynamics of killer whale populations in British Columbia and Washington, (2) comparable programs be undertaken in other geographical areas to determine whether the studied populations are representative of the species in general and (3) comparisons be made whenever possible between results from observational/photographic studies and those from more traditional biological studies of the same individuals and populations.

Most of the sub-committee's recommendations have been implemented. The research in British Columbia and Washington continues (Bigg, MacAskie and Ellis, 1983; Ellis, Balcomb, and Bigg, in prep.). Census work was conducted off Norway in 1982 and 1983 (Christensen, 1983) and off Iceland in 1982 (Sigurjonsson, 1982). A photo-identification pilot program was initiated off the Möre Coast, Norway (Balcomb, 1984, unpublished data; Lyrholm, 1984). A preliminary photographic catalogue of killer whales identified off southern California and Baja California was assembled (Kelly, 1984). And a research program was begun in southern Alaska[1] to compare characterizations of the killer whale population(s) from observational/photographic studies with similar characterizations from scientific examination of live animals captured and briefly restrained. The research reported in this paper is part of that Alaskan research program.

The killer whale is a genuinely cosmopolitan species, likely to be encountered virtually anywhere in marine waters, world-wide (Leatherwood and Dahlheim, 1978; Dahlheim, 1981; Perrin, ed., 1982; Matkin and Leatherwood, in press). In general, however, it is thought to be most abundant in colder waters of both hemispheres with centers of greatest abundance within about 800 km of continents (Mitchell, ed., 1975). In Alaska, killer whales have been reported from the Beaufort Sea (Richardson, ed., 1981) and can be found at least seasonally virtually anywhere in the Chukchi and Bering seas, Gulf of Alaska, North Pacific and inland marine waters of Southeast Alaska, Prince William Sound

1. Authorized by National Marine Fisheries Service (NMFS) Permit Number 439, dated 1 November 1983 (Federal Register, Vol. 48, #215, 1 November 1984, 4 November 1984: 50915).

and Cook Inlet (see Braham and Dahlheim, 1982; Lowry et al., 1982; Leatherwood, Bowles, and Reeves, 1983;). Although the Alaskan populations have been speculated to contain 3,000 or more individuals (Brooks, 1984)[2], there have, in fact, been only a few regional surveys from which authors have presented figures on population size, density or relative abundance in Alaskan waters (see Appendix I).

In 1983 a review was undertaken of information available on the population(s) of killer whales of southern Alaska (Figure 1) (Leatherwood et al., 1984). From sightings data it was estimated that a minimum of 239 (same day counts) to 293 (conservative estimates from these counts) killer whales frequent waters of Southeast Alaska, Prince William Sound and Shelikof Strait. At least the first two of those areas were judged suitable for observational/photographic research of the sort conducted off Washington and British Columbia. Based on that review, Hubbs-Sea World Research Institute (HSWRI) initiated in April 1984 a long-term observational/photographic study of killer whales in southern Alaska. The 1984 activities focused mostly on inland marine waters of Southeast Alaska and Prince William Sound; activities near Kodiak Island were limited to three days of aircraft and vessel surveys. The principal purpose of the first field season was to photograph as many killer whales as possible so that, as in other areas, identifiable marks on individuals could be used as natural tags in a study of population structure and behavior. This paper reports on progress of that research through the 1984 field season. It must be regarded as preliminary.

MATERIALS AND METHODS

Specific equipment and techniques for photo-identification studies of cetaceans have evolved over the last decade and are at present more or less standardized for each species under study. Those developed for killer whales are discussed in detail in Ellis et al. (in prep.); they are only summarized here.

The success of any photo-identification project depends upon locating animals of the species under study and approaching them closely so that high resolution photographs of each individual can be taken. These activities require a suitable research platform, familiarity with the animals and proper photographic equipment and techniques.

To locate killer whales we made active searches from a variety of platforms. Some permitted broad coverage; others focused on limited areas of known or suspected killer whale occurrence. Observers on each noted all observations of killer whales and, when weather, daylight and logistics permitted, followed the whales to photograph them and record their underwater phonations. In addition to making our own searches we solicited and noted reports of killer whale sightings by others and investigated such reports whenever feasible.

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2. J.Brooks, Alaska Department of Fish and Game (ADFG), testimony to House Resources Standing Committee, Juneau, Alaska, 29 February 1984.

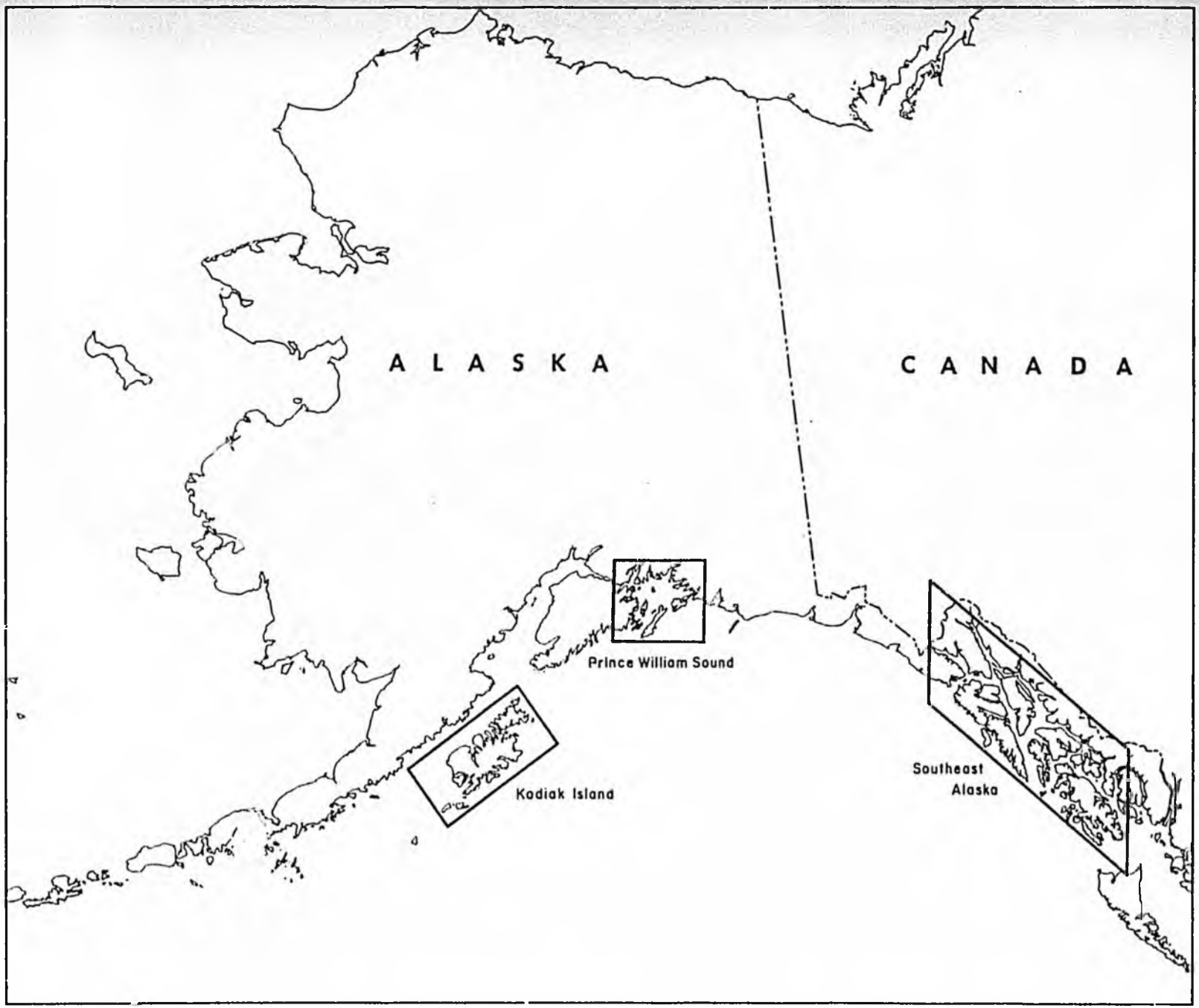

Figure 1. The three regions of Alaska where research on killer whales was conducted in 1984.

In this paper we refer to our own observations (direct visual observations or acoustic detections) of killer whales as "sightings" and to reliable and specific accounts of killer whales from others as "reports." We define an "encounter" as any situation in which killer whales, detected and located by any means, were approached to within 30 m (about 100 ft) or less and photographed. In most observations, number of animals in the group was counted or estimated. In all encounters, counts or estimates were supplemented by classification of individuals into age/sex class according to the following criteria, largely following Bigg (1982):

"Adult males" (Figure 2A) are markedly larger than other whales [about 5.8 to 9 m (19-29 ft) or more] and are characterized by a tall [about 1.1 to 1.7 m (3.5-5.5 ft)] triangular dorsal fin which reaches exaggerated proportions when the animal is sexually mature. Identification of most bulls is probably certain though the actual relationship between dorsal fin characteristics and the onset of sexual maturity is unquantified.

"Adult females" and "subadult males" (Figure 2B) are not always readily distinguishable from the shape of dorsal fin; so, they are grouped at present. This category includes whales about 4.6-7.3 m (15 to 24 ft) long and with a dorsal fin 0.5 to 0.8 m (1.5-2.5 ft) tall. The fin of an adult female does not change in size or shape over several years; that of a large subadult male does (Bigg, 1982). A photo-identified individual in this broad category can only be reliably classified in cases where it is observed over several years, is determined by constant presence of a calf or juvenile to be an adult female or is sexed by observation of the genital region.

Whales less than about 4.6 m (15 ft) long were classified as "juveniles or calves" (Figure 2C). Newborn are about 2.1 to 2.4 m (6.8-7.9 ft) long (Leatherwood et al., 1982). Very young calves consistently swim alongside or in close proximity to an animal classified as an adult female or subadult male, usually respire more frequently than larger animals in the group and often buck the head higher above the surface than other animals when they breathe. Though orange to yellow rather than white coloration in the eye patch is often indicative of a young animal, it is not reliable to distinguish a calf of the year as it may persist for two years or more. Although most animals we tentatively judged to be calves are likely one year old or younger, some may be in their second year; thus, the conservative classification.

Markings on killer whales, both natural pigmentation and scarring patterns, often differ significantly from one side of an individual to the other (Figure 3). Therefore, in most previous photo-identification studies of killer whales researchers have agreed to use only left side views so that images from repeat encounters could be matched and results from all areas could be compared readily. Photographs used in the present investigations were taken from the left side, at right angles to the dorsal fin, using a motor-driven Nikon FM2 camera with a fixed focal length Nikor 300 mm f 4.5 lens and Kodak Tri-X film exposed at ASA 1600 (occasionally ASA 1000).[3]

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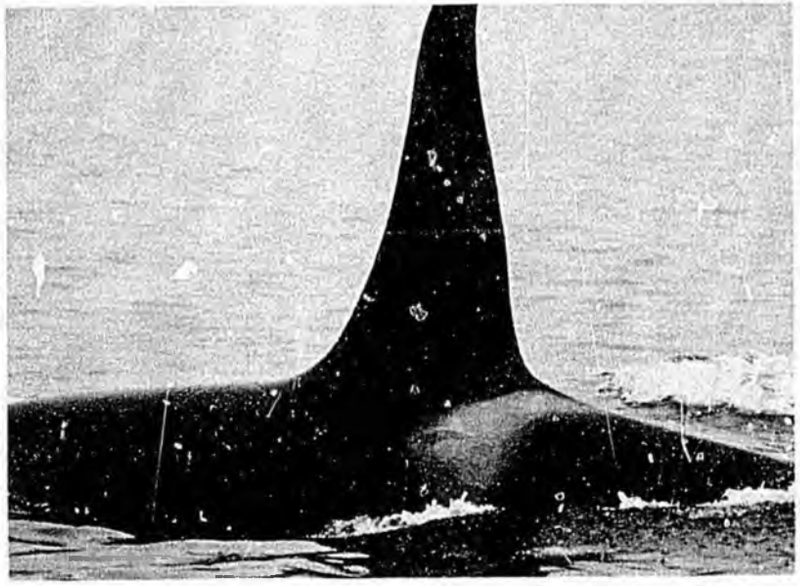
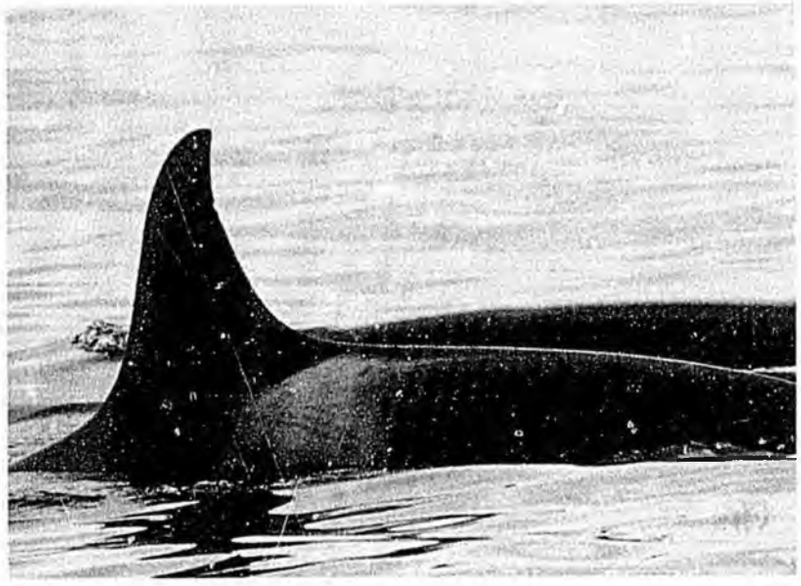
3. Based on comparative results from our 1984 photographs we have decided in future years to follow strictly the procedures outlined in Ellis, et al. (in prep.). These include the recommendation that film be exposed only at ASA 1600 and a shutter speed of 1/1000 or faster.

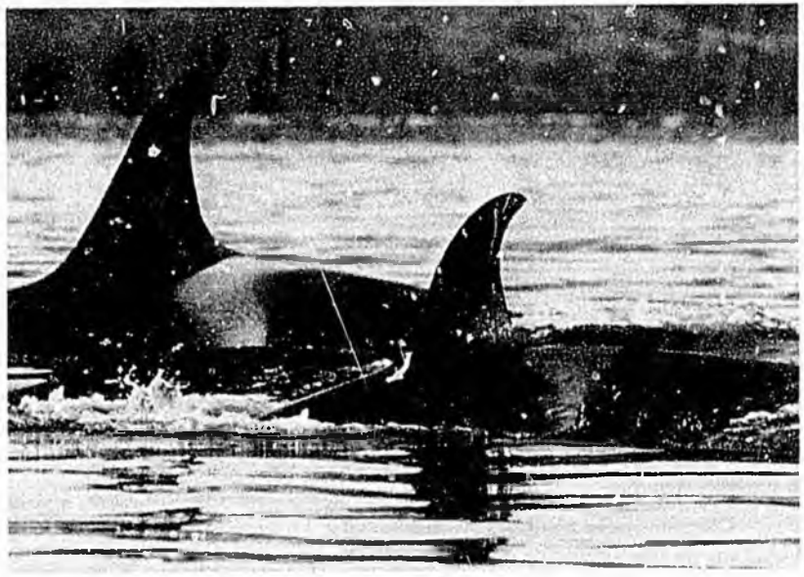
Figure 2. The three age/sex classes identifiable during the first field season: Adult male, AG 1 (A), adult female or subadult male, AB 10 (B), and juvenile or calf AN 22 (C), in foreground. (Photos by K.W. Miller in Southeast Alaska 8 September 1984 (A) and C.O. Matkin in Prince William Sound 16 September 1984 (B) and 2 September 1984 (C).)



A



B



C