

SJR

19

DATE: 2/19/91

FURTHER:

No Further Rules

Date of 5-Day Notice: 3-7-91
(in accordance with Uniform Rule 23)

DATE TURNED INTO OFFICE: 3-11-91

Resources Committee considered SJR 19

Management of the walrus population.

and recommended: and a majority of the committee recommends it be replaced with

replace with _____ CS SJR 19 (Res) same title
 attached amendment(s) and do pass new title

_____ letter of intent adopted

do pass

do not pass

no recommendation

individual recommendations

further referral to _____

DFN

ATTACHES NEW FISCAL NOTE(S):

Department(s)/Date:

Department(s)/Date:

fiscal note(s) _____

zero fiscal note(s) _____
F-G 2/26/91
SB 100'S

appropriation-no fiscal note

Governor's bill w/fiscal note

SIGNING DO PASS:

OTHER RECOMMENDATIONS:

Shane G. Cottrell
[Signature]
[Signature]
[Signature]
[Signature]
[Signature]

[Signature]
Chair: Signature and Recommendation

Alaska State Legislature

Sen. Lloyd Jones, *Chair*
Sen. Sam Cotten, *Vice-Chair*
Sen. Dick Eliason, *Member*
Sen. Steve Frank, *Member*
Sen. Rick Halford, *Member*
Sen. Curt Menard, *Member*
Sen. Fred Zharoff, *Member*



P.O. Box V
Juneau, AK 99811

907 465-4907
Fax: 907-465-3922

Senate Resources Committee

MEMORANDUM

March 8, 1991

TO: Senate Resources Committee Members

FROM: Senator Lloyd Jones, Chair

A handwritten signature in dark ink, appearing to be "LJ", written over the name "Senator Lloyd Jones, Chair".

SUBJECT: SJR 19, relating to the management of the walrus population

SJR 19 requests that the Pacific walrus remain with its current Appendix III designation.

The Convention on International Trade in Endangered Species (CITES) places restrictions on international trade in certain endangered species. At this time, the Pacific walrus Appendix III designation means that the population needs to be watched but it is not threatened to the point of curtailing international trade.

In 1987, the Netherlands proposed that all walrus be designated as Appendix II which would have meant restrictions on international trade. The Netherlands was primarily concerned about the status of Atlantic walrus.

Although the proposal was ultimately withdrawn, the Netherlands has indicated that they might reintroduce the proposal at the 1991 CITES conference.

This resolution sends a message of support for maintaining the current Appendix III listing for Pacific walrus.

The resolution is supported by the Alaska Department of Fish and Game and the Eskimo Walrus Commission.

Alaska State Legislature

Al Adams
District L

WHILE IN SESSION
P.O. Box V
State Capitol
Juneau, Alaska 99811
(907) 465-3707

OUT OF SESSION
P.O. Box 333
Kotzebue, Alaska 99752
(907) 442-3245

3111 C Street
Anchorage, Alaska 99503
(907) 561-7622

Official Business

FEB 20 1991

TO: Senator Lloyd Jones, Chair
Senate Resources Committee

FROM: Senator Al Adams *AA*

RE: Senate Joint Resolution 19, Relating to the management of the walrus population

DATE: February 20, 1991

This is to request a hearing on the aforementioned resolution regarding Pacific walrus. The resolution requests that a coordinated effort be established by the U.S. Department of Fish and Wildlife Service, the Alaska Eskimo Walrus Commission and the Alaska Department of Fish and Game to thwart any proposals to change the appendix designation of Pacific walrus with the Convention on International Trade in Endangered Species (CITES) and that Pacific walrus remain with the current Appendix III designation.

Enclosed as background information are information on Pacific walrus and correspondence that has gone on addressing the events surrounding the 1987 CITES meeting.

A fiscal note has been requested from the Department of Fish and Game.

Thank you for your consideration of this request.

FISCAL NOTE

STATE OF ALASKA
1991 LEGISLATIVE SESSION

BILL NO. SJR 19

Revision Date: _____ Department Affected: Fish and Game
 Title: Relating to the management of BRU: Division of Wildlife Conservation
the walrus population Component: Wildlife Conservation
 Sponsor: Senator Adams
 Requestor: _____ COMPONENT SERIAL NO.

	4	7	3
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Expenditures/Revenues: (Thousands of Dollars)

OPERATING	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	0	0	0	0	0	0

CAPITAL	0	0	0	0	0	0
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REVENUE	0	0	0	0	0	0
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FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER						
TOTAL	0	0	0	0	0	0

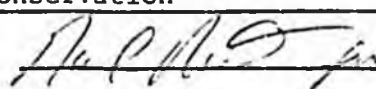
POSITIONS:

FULL-TIME	0	0	0	0	0	0
PART-TIME	0	0	0	0	0	0
TEMPORARY	0	0	0	0	0	0

Estimate of current year impact: No FY 91 impact

ANALYSIS: (Attach a separate page if necessary.)

See attached page.

Prepared By: Phil Koehl Phone: 465-4190
 Division: Wildlife Conservation Date: 2/26/91
 Approved by Commissioner:  Date: 2/25/91
 Agency: _____

Distribution (by preparer): Legislative Finance, Legislative Sponsor, Requestor, OMB, & Impacted Agency(ies).

The next CITES Conference of the Parties will be held on March 2-13, 1992 in Kyoto, Japan. Any proposal to change the designation of walrus from Appendix III to Appendix II may be submitted up to October 4, 1991. Later that month, we will learn whether a proposal regarding walrus has in fact been submitted. By January 1992 a U.S. negotiating position on proposals will be developed, and Alaska should then decide what state action (perhaps involving sending a delegation to Japan) is appropriate.

The cost of representing Alaska at such conferences is not budgeted within the department's marine mammal program and would require a supplemental appropriation from the state. (In 1987 a two-person delegation was sent to the CITES biennial meeting in Ottawa, Canada to represent state interests on walrus and furbearer issues for the approximate cost to the state of \$10,000. Additional funding was provided by the Alaska Outdoor Council.)

NORTH SLOPE BOROUGH

Department of Wildlife Management

P.O. Box 69
Barrow, Alaska 99723

Phone: Central Office: (907) 852-2611
Arctic Science Facility: (907) 852-2401
FAX: (907) 852-2403

*Further
Plo Research
what can we do for
the [CITES]*



Benjamin P. Nageak, Director

January 28, 1991

Mr. John F. Turner, Director
U.S. Fish and Wildlife Service
Department of the Interior
18th and C Streets, NW Room 3256
Washington, D.C. 20240

Dear Mr. Turner,

As you may know, the Eskimo Walrus Commission (EWC) represents Alaska Natives who hunt walruses for subsistence. Since the communities and individuals represented by the EWC have a strong cultural and economic dependence on walruses, we are very concerned that appropriate conservation and management programs are in place for the Pacific walrus population. One of our efforts in that regard was the signing of a Memorandum of Agreement with the U.S. Fish and Wildlife Service (U.S. F&WS) and the Alaska Department of Fish and Game (ADF&G) that formally commits the three groups to cooperation in walrus conservation and management activities.

One issue of major concern to the EWC is the possibility that the Convention in International Trade in Endangered Species (CITES) may consider listing of walrus at their 1991 meeting. Such a proposal was made by the government of the Netherlands at the 1987 CITES Convention. Although that proposal was ultimately withdrawn, the Netherlands indicated that they might re-introduce such a proposal in the future.

When this issue was under consideration in 1987 we were very disappointed that the U.S. Fish and Wildlife Service did not consult with both the EWC and the ADF&G prior to the Convention in Ottawa, even with the Memorandum of Agreement in effect at that time. That was a clear violation of the agreement and an insult to the other two signatories. The slight to both the EWC and the ADF&G resulted in an unnecessarily disorganized and difficult negotiation process during the Convention itself. This would have been avoided if the U.S. Fish and Wildlife Service had lived up to the agreement and made available to us all the communication and documentation which dealt with the attempt by a member nation to

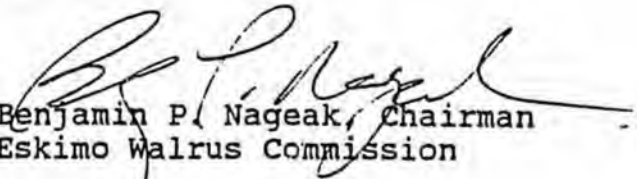
Mr. John F. Turner, Director
January 28, 1991
Page 2

CITES to place walrus in appendix II of the convention. I can't speak for the ADF&G, but the EWC does not want to go through a similar situation again. Although it is evident from contacts between people in the Netherlands and walrus experts in Alaska that a proposal may be forthcoming from a member country, it is not clear whether that will be done during the 1991 CITES convention. We want to be prepared if such a proposal is to be considered during the Convention and we would like to be apprised and notified if the federal government has any notification to that effect as soon as that information is received by your agency.

The Eskimo Walrus Commission is opposed to the listing of Pacific walrus by CITES, and is convinced that domestic and local laws and authorities are adequate to provide conservation and management of the population. This view is shared by virtually all people who are familiar with subsistence hunting of walrus in Alaska and the use of ivory for production of handicrafts. Additional international regulation will not enhance walrus conservation and will definitely harm Alaska Natives who depend on this and other renewable resources for their sustenance.

As I stated earlier I would appreciate it if you would ensure that the EWC is kept informed of any activities that relate to CITES listing of walruses. We would like to know if listing proposals are submitted, and to receive copies of any supporting documentation or other correspondence. We would also like to be fully involved in the development of the U.S. position on any such proposals. As indicated by the Memorandum of Agreement, the goals of the EWC are consistent with those of federal and state wildlife agencies, and we are committed to working cooperatively towards the development of effective walrus conservation programs.

Sincerely,


Benjamin P. Nageak, Chairman
Eskimo Walrus Commission

cc. Mr. John Twiss, Marine Mammal Commission
Hon. U.S. Senator Stevens
Hon. U.S. Senator Murkowski
Hon. U.S. Representative Young
Mr. Lloyd Lowry, Alaska Department of Fish and Game
Mr. Matthew Iya, Executive Director, Eskimo Walrus Commission
Eskimo Walrus Commission members
Mr. Burton Rexford, Alaska Eskimo Whaling Commission
Hon. State Senator Al Adams
Hon. State Representative Eileen Maclean
NSB Mayor, Jeslie Kaleak, Sr.



Official Business

Alaska State Legislature

Al Adams
District L

WHILE IN SESSION
P.O. Box V
State Capitol
Juneau, Alaska 99811
(907) 465-3707

OUT OF SESSION
P.O. Box 333
Kotzebue, Alaska 99752
(907) 442-3245

3111 C Street
Anchorage, Alaska 99503
(907) 561-7622

February 9, 1991

Mr. John F. Turner, Director
U.S. Fish and Wildlife Service
Department of the Interior
18th and C Streets, NW, Room 3256
Washington, D.C. 20240

Dear Mr. Turner:

This is to resonate the requests of Ben Nageak, Director of the North Slope Borough Department of Wildlife Management and State Representative Eileen MacLean in their letters to you regarding cooperation in deflecting efforts to place Pacific walrus on the CITES Appendix II designation.

As I understand the situation, your department was less than helpful before and during the 1987 CITES meeting when the Netherlands proposed the change in status for Pacific walrus. I consider this a breach of the faith and spirit that surrounds the Memorandum of Agreement between your department, the Alaska Department of Fish and Game and the Eskimo Walrus Commission.

Given the schedule of another CITES meeting in 1991 where again an inappropriate proposal regarding Pacific walrus may surface, I urge your sincere and concerted efforts to share information with the other parties in the memorandum and diligence in working with them to scotch these unfounded attempts to change the status of Pacific walrus.

Sincerely,

A handwritten signature in cursive script that reads "Al Adams".

Senator Al Adams

cc: Matthew Iya, Eskimo Walrus Commission
Ben Nageak, North Slope Borough
Representative Eileen MacLean
Lloyd Lowry, Alaska Dept. of Fish and Game



REC'D AUG 3 1987

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DATE: July 29, 1987

TO: Interested Parties

FROM: Matthew Iya - Staff to EWC *Matthew Iya*

RE: ~~Netherland's Proposal to Place Pacific Walrus on CITES~~

I just returned from the CITES Meeting at Ottawa, Canada. CITES stands for Convention on International Trade in Endangered Species of Wild Flora and Fauna to prevent trade in animals and plants from contributing to further decline of endangered species. The Netherlands and some animal rights groups has proposed to place the Pacific Walrus on Appendix II of CITES. If placed on Appendix II, it would be similar to the International Whaling Commission, in that they can regulate and effect quotas and restrictions that Yupik and Inupiat had to abide by. Under the Convention, there are different degrees of protection depending on how endangered a particular species is. Appendix I Species are considered to be the most endangered and are stringently regulated. Currently, walrus are listed on Appendix III of CITES. Species listed on Appendix III are "unilaterally designated by a member nation as being subject to regulation within it's jurisdiction for the purpose of preventing or restricting exploitation, and as needing the cooperation of other parties in the control of trade." As one literature states that "in reality, much of the interest at a CITES meeting is generated, not by endangered species, but by issues of International Trades in plants and animals and the politics of conservation, preservation and animal rights."

When I arrived at Ottawa, the animal rights groups were showing a video tape of "NBC 1986", a one-sided publicity on walrus. By then, John Burns, with Alaska Outdoors Council and Lloyd Lowry, State of Alaska, was at Ottawa and they had found out that International Union for Conservation of Nature (ICUN) and World Wildlife Fund (WWF), the scientific committee to CITES, had opposed the proposal. We contacted the press thru Indigenous Survival International (ISI) and had a press conference the next morning for one hour. Portion of the press conference is enclosed. Meanwhile, while we were at the press conference, the Netherland's had postponed reviewing the proposal until they could consult their country.

The range-state countries of USA, Canada and Denmark was opposing the proposal and John Burns talked and convinced USSR to oppose the proposal. Norway was still uncertain but we were invited to attend a closed door meeting with Netherlands, USA, Denmark, Canada, USSR, and Norway that evening on Friday. The animal rights groups, since they have a non-governmental organization (NGO) status was circulating "Walrus: Species in Crisis" as a NGO document.

We had a five hour meeting arguing point per point at the proposal and the animal rights groups document which has a lot of misconceptions. Our biggest argument was that the Netherlands proposal did not meet "Berne Criteria." To qualify for listing, there should be "some indication" that the species will become "threatened with extinction." This can be indicated by "a decreasing for very limited population size for geographic range of distribution." Information of the biological status must be based on, in order of preference:

- 1) scientific reports on population size or geographic range over a number of years;
- 2) similar reports based on single survey's;
- 3) reports by "reliable observers other than scientists" over a number of years; or
- 4) reports from various sources on habitat destruction, heavy trade or other potential causes of extinction.

In addition to these biological criteria, the species must either be subject to trade or likely to become subject to trade.

First of all, in the 1950's, there were 50,000 Pacific Walrus. According to the U.S. Fish and Wildlife Service, walrus population estimates are as follows: 1975 - 221,360, 1980 - 246,140 and 1985 - 233,828. (Source J.R. Gilbert, 1986 Aerial Survey of Pacific Walrus in the Chukchi Sea, 1985). In the Soviet side walrus haul-out areas for males have increased from 9 haul-outs in 1975 to 17 haul-outs in 1980 to a total of 13 haul-outs in 1985! The native people who has observed walrus for numbers of years are harvesting healthier animals since early 1980's and are observing more walrus calves in the spring, that have an excellent recruitment in the future. **This spring was our lowest harvest since 1979 with only 1,790 walruses taken.** We had to convince Netherlands that we do not take walrus year round and when we did in spring time, our harvest are hampered by weather and ice conditions. The other argument that the animal rights groups argued upon was the excerpt from a paper entitled "Managing the Exploitation of Pacific Walruses; A Tragedy of Delayed Response and Poor Communication" by Dr. F.H. Fay, B.R. Kelly, and J.L. Sease of the Institute of Marine Science, University of Alaska (in press). They put excerpts of certain material that is best for their argument and distorted the paper. From my understanding is that there is poor communication with the Soviets and that walrus should have management and should be managed like any other species. Since walruses are believed to reach their carrying capacity in early 1980's, the increase harvest could reduce or help with the natural decrease of the walrus. That is why "Walrus Management needs to be based on more than response to crisis and needs more sensitive means for monitoring the present and predicting the future status of the population." We had to explain the number of "headless" walruses in the beaches and a picture of all the ivory heads in the pictures. If there is 234,000 walrus out there, then 2-5% of the walrus die naturally. That is 5,000 - 11,000 that dies from natural mortality. There are some that dies from wounds but we need to study the present loss/sunk ratio.

In the early 1960's, John Burns estimated that 40-60% of the walrus taken, were lost. That was based on single surveys that he observed when hunters had 0% loss to 100% loss of their harvest. He estimated somewhere in the middle. The pictures was explained that certain hunting communities, like Little Diomed, have large extended families and others, with a crew of 12-15 people who hunt together during the spring. They divide the meat when they bring them home but stockpile the ivory and then divide the ivories at the end of the season. We told them that Ottawa was a very clean city and if we want to distort the image, we could go out and take pictures we want the audience to see, as was in the picture. There was some major bust of ivories but the majority of the ivories were returned to the owners because they were legally taken before 1972 and when the State of Alaska had management. The U.S. Fish and Wildlife Service states that they haven't observed walrus tusks that was in international trade. By the end of the meeting, the Netherland's wanted to continue the meeting in the morning and indicated to us that they are going to be withdrawing their proposal. I made a quick presentation of the recent Memorandum of Agreement that the Eskimo Walrus Commission, the U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game signed for the management of Pacific Walrus. This document was one of the major contributor for winning the proposal and we are very proud of the document, a success to the native people.

The next morning, Saturday, the Netherland's said that they are officially going to withdraw their proposal and we helped them with proper wordings on their presentation to the assembly. By Tuesday morning at 8:00 a.m., they met with the European Economic Community (EEC) and advised them that they were withdrawing their proposal. The EEC have to vote the same way on various proposals - majority wins. At 9:00 a.m., Tuesday, the Netherlands brought the proposal to the floor and said that they have new scientific information and asked the range-states for their comments. **Mr. Charles Dane, a delegate from the USA said that there were 234,000 walrus and have no indication of extinction or will be threatened.** Our government has signed a Memorandum of Agreement with the natives and State of Alaska for management of walrus. The sealing and tagging regulations will be finalized in the future so our government would have an idea if walrus ivories is getting into the international markets. That we were having better communication and will improve communications with the Soviets in the future for management and research needs for walrus. The chair was handed over to the Netherlands and they said that they will continue to watch the situation and they will re-submit the proposal if they think the walrus are in trouble in the future. The Netherland's representative, Van Vlick then withdrew their proposal and the chairman of CITES put his gavel down and went on to the next agenda item.

The tougher battle will be when the reauthorization hearing takes place in 1988 on the Marine Mammal Protection Act and the Eskimo Walrus Commission is seeking your funding so we can participate with the hearings, with a unified native position.

MEMORANDUM

State of Alaska

TO: Don W. Collinsworth
Commissioner
Juneau

DATE: July 29, 1987

FILE NO:

TELEPHONE NO: 456-5156

THRU: W. Lewis Pamplin, Jr.
Director
Anchorage

SUBJECT: Outside Travel - CITES
Meeting

L.F.L.

FROM: Lloyd F. Lowry
Marine Mammals Coordinator
Division of Game
Department of Fish and Game
Fairbanks

From July 15 to 21 I attended meetings of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) which were held in Ottawa, Canada. My main purpose in attending the meetings was to represent the State's position on the Netherlands proposal to include walrus on CITES Appendix II. Other Alaskans attending the meeting were John Burns (representing the Alaska Outdoor Council), Matthew Iya (representing the Eskimo Walrus Commission (EWC)), and Ron Nalikak (representing the Inuit Circumpolar Conference). The official U.S. delegation consisted of 15 people, of which 14 were from the Washington, D.C. area. Although several members of the delegation were from the Fish and Wildlife Service (FWS) there was no one from their Alaska Region.

The CITES meetings officially started on July 12. By the time I arrived Burns had already taken a number of substantial actions relating to the walrus proposal. After contacting the U.S. delegation and determining that they had no plan for dealing with the issue, he arranged a meeting with the Netherlands representative and representatives of the range states (countries within the range of the walrus - Canada, Denmark/Greenland, Norway, U.S.A., and U.S.S.R.). Range state representatives, with the exception of Norway, agreed that neither Atlantic nor Pacific walrus fit the criteria for inclusion on CITES Appendix II. Although the Netherlands did not entirely agree with this it was evident that their primary concern was not with population status or international trade, but rather was due to the large, mostly unregulated harvests being taken from the Pacific population. Subsequent to the meeting, Burns and representatives from Canada and Greenland continued working to try and convince the Netherlands and other delegations that the proposed listing of walrus was inappropriate. The U.S. delegation seemed to be systematically avoiding the issue and appeared to plan on waiting to deal with it during the meeting of the full committee.

After being briefed by Burns, Matt Iya and I went to Charles Dane (a FWS representative on the U.S. delegation), reminded him of the Memorandum of Agreement (MOA) regarding walrus which commits FWS to cooperation with ADF&G and the EWC, and insisted that we be involved in any subsequent

discussions. We also suggested that the U.S. delegation should take a more active role in trying to ensure defeat of the proposal.

The walrus proposal came up in committee on July 17. At that time, the Netherlands requested that discussion be postponed until July 21. That evening a meeting was held between the Netherlands, range state representatives, and representatives from Alaskan non-governmental organizations. At that time, population status, trade, and existing management measures were discussed. We presented the MOA as an indication of ongoing conservation and management activities and discussed provisions of the Marine Mammal Protection Act (MMPA) and the proposed federal sealing/tagging regulations. It was suggested to the Netherlands that they might consider withdrawing their proposal in light of this new information.

On the morning of July 18 the U.S., Alaskan, Canadian, and Greenland representatives met again with the Netherlands. The Netherlands representative indicated a willingness to withdraw the proposal provided that he could get approval from his government and members of the European Economic Community, and that the range states, particularly the U.S., would address their concerns when the proposal came up in committee. This strategy was agreed upon.

During the next 2 days I tried to ensure that the statement prepared by the U.S. delegation was appropriate, but it became clear that it would not be prepared until the last minute. Burns and I made sure that we and others were prepared to discuss the proposal in the committee meeting if the Netherlands representative decided to change his mind.

The walrus proposal was introduced the morning of July 21. The Netherlands stated that they thought the proposal was well prepared and appropriate but that they had been given new information and deferred to the range states for comments. Greenland, Norway, and Canada each stated that their walrus populations, although small, were well managed and they therefore opposed the listing. The U.S. statement recognized the Netherlands' concern about large and possibly wasteful harvest, stated that the population was large and would be censused regularly, indicated that international trade was not a problem, and pointed out that certain provisions of the MMPA should prevent the population from becoming endangered and that better management should result from the MOA. The Netherlands then stated that they were still concerned because the Pacific population is thought to have reached carrying capacity and may decline, that they strongly supported marking of tusks to help control trade, and that they would withdraw the proposal but would continue to monitor events.

This was an interesting exposure to the politics of international wildlife conservation. I gained a number of insights into the process which, as relates to the walrus issue, can be lumped into 3 topics:

1. You cannot depend on scientific fact to determine the outcome of a proposal. It was clear that walrus did not fit the Appendix II criteria on scientific grounds but the Netherlands representative was

continuously pressured by protectionist groups to try for the listing. Even when it became fairly clear that the proposal would fail to pass if voted upon, they continued to try and use the issue to embarrass Alaskan walrus hunters and management agencies. Notwithstanding, it is essential to be represented at such meetings by people thoroughly familiar with the scientific facts because the politics cannot be dealt with until the scientific battle is won.

2. We cannot depend on federal agencies to defend the State's interests in these issues. For some unexplicable reason the FWS Alaska region staff was not represented. The U.S. delegation was insensitive to the issue, made several errors during public statements, and was generally not inclined to do what was necessary to ensure that the proposal was withdrawn without creating unnecessary problems.
3. Our allies on this issue were representatives of the governments of Canada and Greenland/Norway who were concerned with the welfare of their residents and opposed to unnecessary regulation, and several Native organizations. Groups such as the Inuit Circumpolar Conference, Inuit Tapirisat of Canada, and Indigenous Survival International were well represented at the meeting by dedicated and professional people. They were very effective in exerting political influence and their efforts complimented the scientific arguments provided by government agency staff. A coordinated effort is clearly required in order to successfully oppose the combined efforts of radical preservationist groups and the governments that they influence.

cc: Bishop
Burns
Coady
Iya
Nalikak

NGO DOCUMENTPopulation Status and International Trade in Pacific walrus, *Odobenus rosmarus divergens*.

The Pacific walrus population was severely depleted by commercial hunting twice in the last 100 years (Fay 1982). Population size began increasing in about 1960 and the population is now fully recovered.

Aerial surveys conducted in 1975, 1980, and 1985 have provided estimates of the minimum population size. The mean of these estimates, approximately 234,000 animals, compares favorably with the minimum estimate of the "pre-exploitation" population (200,000), and the range of estimates (221,000 to 246,000) indicates that the population size is stable (Gilbert 1986). It should be noted that recent estimates are conservative indices of population size because they do not account for animals occurring outside the survey area or for animals that were in the water at the time surveys were conducted. The actual population is therefore larger, perhaps much larger, than is indicated by the surveys. The healthy and abundant status of the Pacific walrus population is confirmed by the fact that their historical range is now completely re-occupied (Fay 1982).

Pacific walrus are harvested by coastal Native peoples of Alaska and the USSR and are also subject to controlled exploitation from ships by the USSR. Harvests taken through the 1970's were obviously not excessive since the population increased by an average of approximately 10,000 animals per year. Average harvests have been somewhat higher in the 1980's, but have not shown a consistently increasing trend. The take at 5 villages in Alaska that are monitored annually was lower in 1987 than in any of the previous 10 years (Alaska Department of Fish and Game and United States Fish and Wildlife Service, unpublished data).

Although it has been suggested that the population exceeded carrying capacity in the late 1970's and is now declining (Fay et. al. in press) this projection was based on static population parameters and larger removals from the population than have actually occurred. Recent information suggests that density dependent responses are occurring which would slow a decline and maintain the population within an optimum range.

The United States Marine Mammal Protection Act has prohibited both domestic and international trade in raw walrus ivory (and other marine mammal products) since 1972. Illegal trade has been monitored by State of Alaska and federal law enforcement agents. Results of enforcement efforts indicate only occasional minor

infractions of a domestic nature. International trade is therefore not a significant conservation concern for the Pacific walrus population.

Summary: Pacific walruses now occupy all of their historical range. The population has increased from about 60,000 in the 1950's to approximately 234,000 in 1985. Average annual harvest had increased (about 40%) since the 1970's, commensurate with the increase in population. Recent harvests (1986 and 1987) have been reduced through cooperative efforts of the Eskimo Walrus Commission, the State of Alaska, and the United States Fish and Wildlife Service. The magnitude of this recent voluntarily reduction in harvests is 20% of the average for 1980 - 1987. International trade in walrus ivory from Alaska is presently illegal and the amount of illegal trade is insignificant.

Submitted by:

Lloyd F. Lowry, Marine Mammal Specialist, State of Alaska

John J. Burns, Marine Mammal Specialist, Alaska Outdoor Council

References:

Fay, F.H. 1982. Ecology and biology of the Pacific walrus, Odobenus rosmarus divergens. North American Fauna. No. 74, U.S. Fish and Wildlife Service, Washington, D.C.

Fay, F.H., B.P. Kelley, and J.L. Sease. (In press) Managing the Exploitation of Pacific Walrus: A Tragedy in Delayed Response and Poor Communication. Marine Mammal Science. Vol. 3. 1987.

Gilbert, J.R. 1986. Aerial Survey of Pacific Walrus in the Chukchi Sea, 1985. U.S. Fish and Wildlife Service, Region 7, Anchorage, Alaska.

MEMORANDUM OF AGREEMENT

U.S. Fish and Wildlife Service
Anchorage, Alaska

Alaska Department of Fish and Game
Juneau, Alaska

and

Eskimo Walrus Commission
Nome, Alaska

THE UNITED STATES FISH AND WILDLIFE SERVICE, THE ALASKA DEPARTMENT OF FISH AND GAME AND THE ESKIMO WALRUS COMMISSION DO MUTUALLY AGREE AND DECLARE:

That there should be open and continuous communication and exchange of information among agencies and groups interested in the health, well being, and utilization of the Pacific walrus (*Odobenus rosmarus divergens*), and that a sound management policy for this species is best implemented as the result of mutual cooperation and assistance.

THEREFORE:

The following Memorandum of Agreement (Agreement) is presented in recognition of this acknowledgment of mutual goals and understanding.

I. PURPOSE:

This Agreement is designed to assist the signatory Agencies in the management of the Pacific Walrus by forming a memorandum of agreement for the exchange of biological and management information and for support of the requirements of pertinent statutes, regulations and resolutions.

In furtherance of this purpose, the Agreement provides for:

A. cooperation among the Eskimo Walrus Commission, the Alaska Department of Fish and Game and the U.S. Fish and Wildlife Service (Service) for the sound management and utilization of the Pacific Walrus, and;

B. a vehicle by which information regarding the effective and efficient management of the walrus can be exchanged, shared, and/or made public.

PACIFIC WALRUS MEMORANDUM OF AGREEMENT, PAGE 2

II. AUTHORITIES:

The United States Fish and Wildlife Service enters into this Agreement pursuant to the authority granted in the Marine Mammal Protection Act, 16 USC 1382 (c).

The Alaska Department of Fish and Game enters into this Agreement pursuant to the authority granted in AS 16.05.050.

The Eskimo Walrus Commission enters into this Agreement pursuant to Article I of Commission By-Laws.

III. APPLICATION TO OTHER TREATIES, CONVENTIONS OR AGREEMENTS:

A. Nothing in this Agreement shall be read to abrogate the responsibility of the U.S. Fish and Wildlife as charged under the Marine Mammal Protection Act (16 USC 1361-1407). Further, the provisions of this Agreement shall be deemed to be in addition to and not in contravention of, the provisions of any existing international treaty, convention, statute or agreement, which may otherwise apply to the Pacific walrus.

B. If anything in this Agreement shall be deemed unlawful, or contrary to the Regulations made and provided for in such case, it shall be null and void and not affect the remainder of the Agreement.

WHEREAS:

This Agreement, is developed to serve the following purposes:

1. to promote sound management and utilization of the Pacific walrus based upon scientific information by encouraging a cooperative management process in a manner consistent with the Marine Mammal Protection Act of 1972, as amended;
2. to promote the development and dissemination to the public of information and educational material concerning walrus;
3. to encourage cooperation by the U.S. Fish and Wildlife Service, the Alaska Department of Fish and Game, and the Eskimo Walrus Commission in scientific, management and enforcement programs concerning the Pacific walrus and its utilization;
4. to encourage further cooperation and exchange of information between the United States and other Nations in matters pertaining to the Pacific walrus.

PACIFIC WALRUS MEMORANDUM OF AGREEMENT, PAGE 3

NOW, THEREFORE, be it known that the Parties hereto agree as follows:

THE UNITED STATES FISH AND WILDLIFE SERVICE AGREES:

1. that it may cooperate with other agencies and persons in carrying out its responsibilities under the Marine Mammal Protection Act of 1972, as amended, as provided in 16 U.S.C. section 1377 (a) and (b), 1379 (h) and (k), and 1382 (c);
2. to manage the Pacific walrus under the requirements of the Marine Mammal Protection Act of 1972, as amended, until such time as relieved of this responsibility by law;
3. to support the development of a resource management plan through which the State of Alaska may seek a transfer of management authority consistent with requirements of the Marine Mammal Protection Act;
4. To continue to observe the Alaska Native exemption of the Marine Mammal Protection Act of 1972, as amended, as implemented by the Service's regulation at 50CFR section 18. 23;
- X 5. To conduct scientific studies in cooperation with the Alaska Department of Fish and Game, and the Eskimo Walrus Commission, as allowed by budgetary constraints and fiscal priorities to:
 - a) determine the size and trends of the Pacific walrus population;
 - b) assess the general health, welfare, and other life history parameters of the Pacific walrus;
 - c) monitor the presence of pollutants and/or contaminants, and their effects upon walrus;
 - d) determine the distribution and migration chronology of Pacific walrus;
 - e) identify, describe and protect important breeding, calving, and feeding habitat and haul-out areas of the Pacific walrus;
 - f) assess the impact on walrus of harassment; oil, gas or other exploration or development activity; aircraft over-flights; noise pollution; and hunting;
 - g) conduct research on methods of take of Pacific walrus in order to reduce loss due to non-retrieved animals;
6. to utilize input from users of the Pacific walrus as represented by the Eskimo Walrus Commission;

PACIFIC WALRUS MEMORANDUM OF AGREEMENT, PAGE 4

7. to provide such law enforcement input and activity as necessary and possible under budgetary constraints and fiscal priorities, and to cooperate with the Eskimo Walrus Commission and designated user groups to continue compliance with the provisions of the Marine Mammal Protection Act;
8. to implement Reporting and Sealing Regulations if feasible, and as permitted by budgetary constraints and fiscal priorities, consistent with section 109(i) of the Marine Mammal Protection Act of 1972, as amended, and to utilize village residents as monitors to the maximum extent practicable;
9. to prepare and disseminate educational materials regarding the Pacific Walrus, including information about pertinent scientific, management and enforcement programs;
10. to cooperate with the Eskimo Walrus Commission, Alaska Department of Fish and Game, and other parties in the development and implementation of management plans;
11. to promote and encourage further research, communication and agreements with foreign nations regarding the management, conservation and utilization of the Pacific walrus.

THE ESKIMO WALRUS COMMISSION AGREES:

1. to recognize the United States Fish and Wildlife Service as the agency with legal responsibility for the management of the Pacific Walrus under the mandate of the Marine Mammal Protection Act (16 USC 1361-1407), as amended;
2. to fulfill such responsibilities assigned and accepted by all parties of this Agreement, or through amendment to the Agreement;
3. to cooperate by informing and educating users of the Pacific walrus regarding:
 - a) the value and necessity of their compliance with applicable statutes, laws, regulations and agreements;
 - b) the value and necessity of cooperating with efforts to obtain biological specimens;
4. to provide a method for the acquisition and transfer of traditional Native knowledge for application to biological and other studies;

PACIFIC WALRUS MEMORANDUM OF AGREEMENT, PAGE 5

5. to cooperate with the Service in the implementation of walrus Reporting and Sealing Regulations (when implemented by a final rule issued by the Department of the Interior) and to assist through information and education programs and the provision of monitors, as budgetary constraints and fiscal priorities allow;

6. to cooperate with the Service, and the Alaska Department of Fish and Game as appropriate in:

a) the development and implementation of management plans for the Pacific walrus;

b) the development of conservation management plans for walrus haul-out areas in Alaska;

c) conducting scientific studies to monitor the health, status and trends of the Pacific walrus population;

d) research on methods of take of Pacific walrus in an effort to reduce loss due to non-retrieved animals;

7. to actively encourage and promote a harvest that is consistent with Fish and Wildlife Service regulations, and the Eskimo Walrus Commission's applicable authorities, based upon considerations of the biological status of the walrus population, by means such as:

a) manipulation of the age and sex composition of the harvest;

b) maximizing utilization of the walrus and by-products thereof within the constraints of the Marine Mammal Protection Act and related legislation;

c) improving the retrieval rate by using the most efficient, effective, and humane methods of harvest, including but not limited to the prohibition of the use of fully automatic weapons;

8. to cooperate with the Service and the Alaska Department of Fish and Game in efforts to:

a) monitor the presence of pollutants and/or contaminants and their effects upon walrus;

b) determine the distribution and migration chronology of Pacific walrus;

c) identify, describe and protect important breeding, calving, and feeding habitat and haul-out areas of the Pacific walrus;

d) assess the impact on walrus of harassment; oil and gas and other exploration or development activity; aircraft overflights; noise pollution; and hunting;

PACIFIC WALRUS MEMORANDUM OF AGREEMENT, PAGE 6

9. to cooperate in the preparation and distribution of educational materials and information concerning the Pacific walrus as a valuable natural resource;
10. to promote and encourage further research, communication and agreements with foreign nations regarding the management, conservation and utilization of the Pacific walrus.
11. to encourage village residents to make suggestions, comments or concerns to the Eskimo Walrus Commission, (P.O. Box 948, Nome, Alaska 99762).

THE ALASKA DEPARTMENT OF FISH AND GAME AGREES:

1. to recognize the United States Fish and Wildlife Service as the agency with legal responsibility for the management of the Pacific Walrus under the mandate of the Marine Mammal Protection Act (16 USC 1361-1407), as amended;
2. to fulfill such responsibilities assigned and accepted by all parties of this Agreement, or through amendment to this Agreement:.
3. to cooperate with the Service and the Eskimo Walrus Commission in;
 - a) conducting scientific studies to monitor the health, status and trends of the Pacific walrus population;
 - b) the development of conservation management plans for walrus haul-out areas in Alaska;
 - c) research on methods of take of Pacific walrus in an effort to reduce loss due to non-retrieved animals;
 - d) monitoring the presence of pollutants and/or contaminants and their effects upon walrus;
 - e) determining the distribution and migration chronology of Pacific walrus;
 - f) studies to identify, describe and protect important breeding, calving, and feeding habitat and haul-out areas of the Pacific walrus;
 - g) studies to assess the impact on walrus of harassment; oil, gas, or other exploration or development activity; aircraft overflights; noise pollution; and hunting;
4. to encourage local programs for voluntary compliance with applicable laws, regulations and agreements;
5. to cooperate with the Service in the implementation of walrus Reporting and Sealing regulations (when implemented by a final rule issued by the Department of the Interior) as allowed by budgetary constraints and fiscal priorities;

PACIFIC WALRUS MEMORANDUM OF AGREEMENT, PAGE 7

6. to cooperate in the preparation and distribution of educational materials and information concerning the Pacific walrus as a valuable natural resource;
7. to encourage village residents to make suggestions, comments or concerns to the Eskimo Walrus Commission, (P.O. Box 948, Nome, Alaska 99762).
8. to promote and encourage further research, communication and agreements with foreign nations regarding the management, conservation and utilization of the Pacific walrus.

Amendments to this agreement may be proposed at any time by submission in writing to the other affected parties, and shall become effective upon approval by the signatories hereto or their representatives.

The effective date of this agreement shall be from the date of final endorsement. The agreement shall remain in force until one of the parties signifies in writing to the others the desire to terminate its participation and obligations. The agreement shall become null and void 30 days after such notification. This agreement shall be reviewed by all signatory parties annually on the anniversary date and recommended changes be incorporated by amendment, or the agreement terminated in part or in whole.

SIGNED:

Walter O. Stiglitz

Regional Director
U.S. Fish and Wildlife Service
Anchorage, Alaska

DATED:

5/21/87

Oliver Callenworth

Commissioner
Alaska Department of Fish and Game
Juneau, Alaska

5-21-87

Joseph K. Johnson

Chairman
Eskimo Walrus Commission
Nome, Alaska

May 21 1978

Pacific Walrus _____ *Odobenus rosmarus divergens*

JOHN L. SEASE,* *Department of Biology, Fisheries, and Wildlife, University of Alaska, Fairbanks, Alaska 99775*
and

DOUGLAS G. CHAPMAN, *Center for Quantitative Sciences, University of Washington, Seattle, Washington 98105*

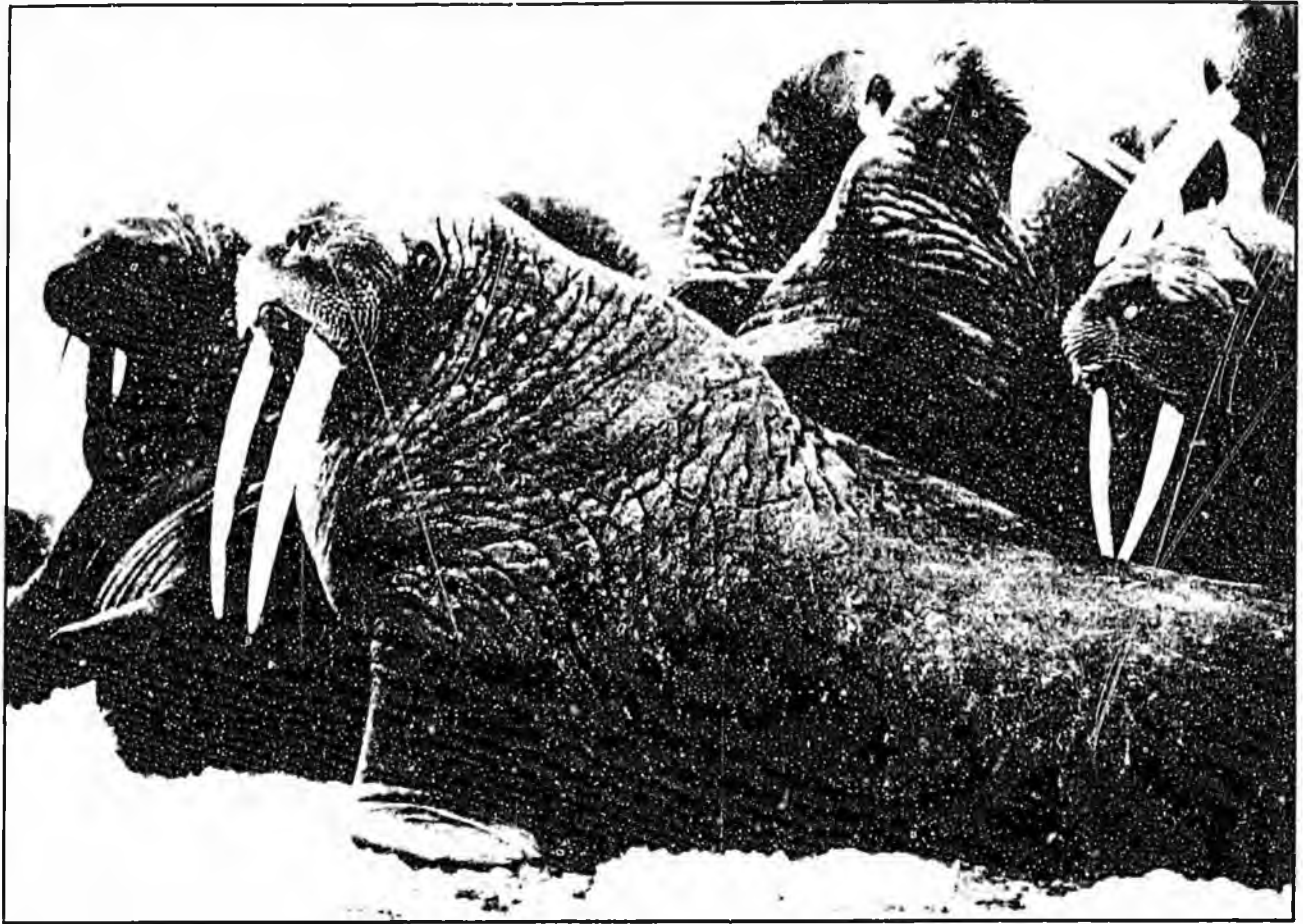
CURRENT POPULATION STATUS	20
Distribution	20
Population Size	22
Age Composition and Sex Ratio	24
Reproduction	25
Food Habits	26
Blubber Thickness and Physical Condition	27
Mortality	27
EXPLOITATION	29
Russian Expansion—1648 to 1867	29
The Yankee Whalers—1848 to 1914	29
The Arctic Traders—1880 to 1930	29
Soviet Exploitation—1930 to 1960	29
Recent Trends—1960 to 1985	30
CONSERVATION ISSUES	31
Management and Exploitation	31
Petroleum Exploration and Development	32
Coastal Development	32
Fisheries Conflicts and Incidental Take	32
Environmental Contaminants	32
RESEARCH AND MANAGEMENT RECOMMENDATIONS	33
ACKNOWLEDGMENTS	34
REFERENCES CITED	35
PERSONAL COMMUNICATIONS AND SOURCES OF UNPUBLISHED DATA	38

* Current address: U.S. Department of Commerce, NOAA, National Marine Fisheries Service, Northwest and Alaska Fisheries Center, P.O. Box 1658, Juneau, Alaska 99801.



Photograph by Brendan P. Kelly

Pacific Walrus _____ *Odobenus rosmarus divergens*



Photograph by Kathryn J. Frost

Walruses have a discontinuous, holarctic distribution. Several discrete populations are generally included in two subspecies. The Pacific walrus (*Odobenus rosmarus divergens*), which includes about 80% of the world's walrus population, occurs primarily in the Bering and Chukchi seas. The Atlantic walrus (*O. r. rosmarus*) occurs in at least four distinct populations from Hudson Bay and the eastern Canadian Arctic to Greenland, Spitzbergen, and the Barents and Kara seas (Allen 1880; Smirnov 1929; Fay 1981, 1982, 1985). Some Soviet authorities recognize a third subspecies (*O. r. laptevi*), the small, isolated population that occurs in the Laptev Sea (Chapskii 1940, Arsen'ev 1976). Fay (1982, 1985), however, tentatively included the Laptev walrus with the Pacific form because of morphological similarities. The Pacific walrus population is the only one that occurs in waters of the United States (Alaska).

Pacific walruses have traditionally been extremely important in the subsistence economy of the Natives in the Bering-Chukchi region. The origins and cul-

tures of some communities were centered around the hunting of walruses, which were a source of food, fuel, and raw materials for construction of homes, boats, tools, and weapons (Collins 1937, Rudenko 1947, Arutiunov and Sergeev 1968). At several times in the past, reduction of the Pacific walrus population has led to severe hardship, and even starvation, for the dependent Natives, especially the residents of the island communities. The Pacific walrus resource is still extremely important to Natives in some areas of Alaska.

The population has undergone several episodes of reduction and recovery since the late 1880s. Each time, recovery was possible only after relaxation of harvest pressure. In 1980 the Pacific walrus population was estimated to number about 250,000 animals (Fay *et al.* 1984a; Gilbert, pers. commun.). Some biologists believe that this population level is similar to or even larger than the population size prior to exploitation by Europeans, but because there are no reliable estimates of the early population levels, there

may be no way to resolve this question. The vulnerability of the Pacific walrus population to overharvest by man underlines the need for development of sound management guidelines to prevent future depletion of this important resource.

CURRENT POPULATION STATUS

Distribution

The Pacific walrus population occurs primarily in the shelf waters of the Bering and Chukchi seas (Allen 1880, Smirnov 1929). Most of the population congregates during the summer in the southern edge of the Chukchi Sea pack ice between Long Strait and Wrangel Island to the west and Point Barrow to the east (Fig. 1). The main concentrations are near the coasts of Chukotka and Alaska, rather than in the middle of the Chukchi Sea (Fay *et al.* 1984a). The remainder of the population, primarily adult males, stays in the Bering Sea during summer.

In winter, walrus occur in areas where there are polynyas, open leads, or thin ice in which they can create and maintain breathing holes. There are two main concentrations in winter: one in the northwestern Bering Sea, south and west of St. Lawrence Island and in Anadyr Gulf; and the other in the southeastern Bering Sea, especially in Bristol and Kuskokwim bays (Fay 1982, Fay *et al.* 1984a).

Extralimital observations of walrus in the Beaufort, East Siberian, and Okhotsk seas and the Gulf of Alaska are not uncommon, but they represent very few animals (Harrington 1966, Kosygin and Sobolevskii 1971, Arsen'ev 1976, Fay 1982). The frequency of extralimital observations has been greatest in recent years, which coincides with the recent increase in the abundance of the walrus population (Fay *et al.* 1984a, Sease 1986) and may be a good indicator of relative population size.

Walrus spend about one-third of their time hauled out on ice or land (Fay and Ray 1968). The preferred substrate is ice, and thus the distribution of walrus is closely associated with the distribution of the pack ice. This association results in most of the Pacific walrus population migrating northward as the pack ice breaks up and melts in spring and southward as the ice re-forms in winter. Weather and ice conditions influence the timing of migrations, and the entire migration or portions of the migration may be advanced or delayed, compressed or drawn out. The following general description of the Pacific walrus migration is from Brooks (1954), Fay (1955, 1982), Burns (1965), and Fay *et al.* (1984a).

Female and young walrus, which are more migratory than the adult males, travel from the wintering areas in the Bering Sea to the summering areas in the Chukchi Sea. The migration begins in late March

or April. Sometimes walrus are transported northward while they rest on ice floes, but the principal progress in migration is achieved by swimming (Fay 1982). Animals from the northwestern Bering Sea wintering area migrate through Anadyr Strait, between St. Lawrence Island and the Chukotsk Peninsula, and begin to reach Bering Strait in mid-May. Animals from the southeastern Bering Sea pass to the east of St. Lawrence Island and reach Bering Strait by late May or early June. Virtually all walrus remaining in the Bering Sea during summer are males, which stay principally in Bristol Bay, Anadyr Gulf, and western Bering Strait.

When the pack ice begins to re-form in autumn, the females and subadult males begin their southward migration toward Bering Strait, swimming ahead of the ice edge in the open sea (Fay 1982). At the same time, some of the adult males that remained in Bristol Bay during the summer move toward Bering Strait and join the females there (Kelly and Taggart, pers. commun.). Soviet biologists have observed a similar "reverse migration" by males in the fall from Anadyr Gulf to southwestern Bering Strait, where they presumably join the southward-migrating females and young (Nikulin 1941, Krylov *et al.* 1964, Gol'tsev 1968, Fay *et al.* 1984a). The magnitude of the reverse migration by males in fall is not known. Most of the walrus arrive in their wintering areas by December or January.

Since the mid-1960s walrus have reoccupied portions of their range where they had not occurred for many years. Reoccupation has been most pronounced along the Soviet coast, from Anadyr Gulf southward to Karaginskii Bay, on the eastern coast of the Kamchatka Peninsula. This area had been the southwestern limit of the walrus' range until the end of the nineteenth century. A few walrus appeared south of Cape Navarin during the 1930s, but large numbers were not observed there until the mid- to late 1970s. Fedoseev (1981) observed about 1,500 walrus in Karaginskii Bay in fall 1980, and large herds of males have been seen along the Koryak coast (south of Cape Navarin) each year since then (Bukhtiyarov, Burns, and Kibal'chich, pers. commun.).

Research Needs. — Our knowledge of the seasonal distribution of the Pacific walrus contains many gaps because of insufficient data. The area to be covered is large, and weather and ice conditions are extremely variable, especially during fall and winter. It is quite clear, however, that walrus are widely distributed in the Bering and Chukchi seas. They are not restricted to the economic zones of either the United States or the Soviet Union, and may occur in both areas at different times of the year. For this reason, effective management of the walrus population requires a joint U.S.-Soviet effort.

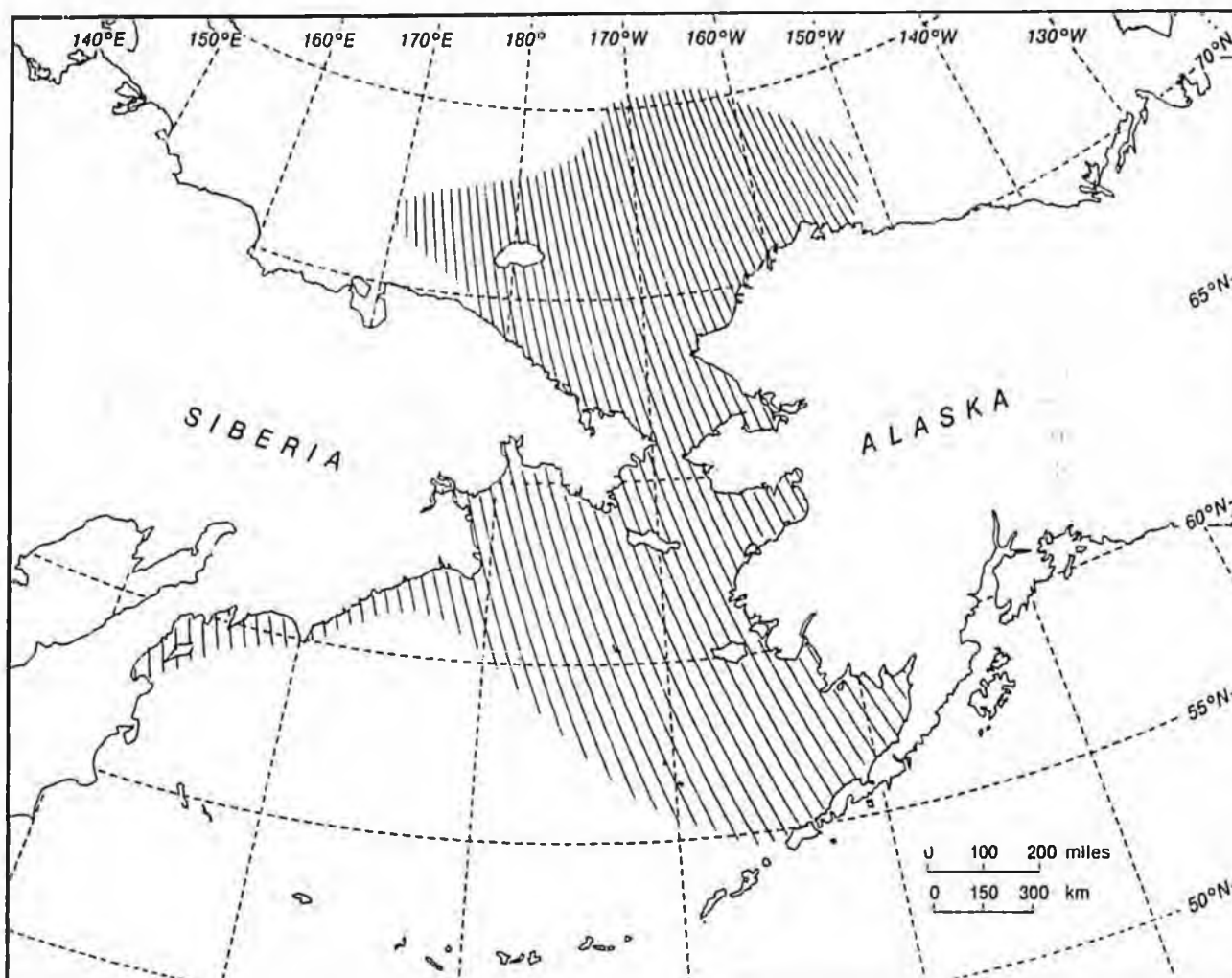


FIGURE 1.—Range of the Pacific walrus (*Odobenus rosmarus divergens*) population. (Adapted from Fay *et al.* 1984a.)

The degree to which the two wintering groups mix or remain discrete is unknown. Similarly, their contributions to the main concentrations near the Alaskan and Chukotkan coasts during summer are unknown. It is possible that individual animals are faithful to particular summering and wintering (breeding) areas and only mix casually as they move through Bering Strait in spring and fall. On the other hand, there could be interbreeding and genetic interchange. The two extreme possibilities, *i.e.*, a single, mixed population versus two or more discrete populations, would dictate radically different management approaches.

Radiotelemetry probably offers the best opportunity for investigating these questions. Research at Round Island in Bristol Bay (Taggart and Zabel 1980), which used radio transmitters attached to the tusks of male walrus to study haulout behavior, confirmed the occurrence of northward migration in fall by some males. Investigation of distribution and migration over the entire range of walrus certainly would require

the use of satellite transmitters, such as those used successfully with polar bears (*Ursus maritimus*) and caribou (*Rangifer tarandus*) (Amstrup, Cameron, and Pank, pers. commun.).

Visual tags are another potential tool for investigation of walrus distribution and migration patterns. Fay (1982) cited several tagging studies that had been conducted on walrus in the Bering and Chukchi seas and the Canadian Arctic in the 1950s and 1960s. Those efforts were not successful because none of the 638 tags was recovered. Metal or plastic tags are extremely difficult to apply, but paint or dye may be more practical. Marking walrus with paint or dye has been attempted, but on a very small scale (Fay, pers. commun.).

In 1980 the U.S. Fish and Wildlife Service began analyzing walrus tissue samples for the presence of environmental contaminants: heavy metals, organochlorines, and hydrocarbons (Metsker and Taylor, pers. commun.). Examination of the samples may reveal that walrus that winter in a particular geographical

region carry characteristic contaminant traces in their tissues; identification of the same "natural tags" in other areas might provide information about migration routes and summer range. Electrophoretic analysis of blood and tissue proteins might offer similar possibilities, but the initial attempts to identify different races of several delphinid species have not been successful (Sharp 1975). Analysis of mitochondrial DNA has proved to be an extremely successful method for the identification and separation of populations of several vertebrate species, including birds and small mammals (Wilson *et al.* 1985). This technique may be able to distinguish walrus stocks if those stocks are actually discrete (Shields, pers. commun.).

Potential Conflicts with Development Activities.—Walrus use terrestrial haulouts extensively during the fall migration and in other seasons when suitable haulouts on ice are unavailable. The major haulouts are located along the northern, eastern, and southern coasts of the Chukchi Peninsula, on islands in Bering Strait, on the Penuk Islands (east of St. Lawrence Island), and on Round Island in Bristol Bay. Coastal development already appears to have conflicted with walrus use of terrestrial haulouts in two locations on the Soviet coast and could also be a major concern in Alaska, especially on the Alaska Peninsula. Walrus haulout sites currently in use in the Soviet Union are protected from disturbance, but extensive development of coastal areas may occur if the economic trade-offs are high enough.

One of the two most important terrestrial haulouts in the United States, Round Island, is a State of Alaska preserve. The other, the Penuk Islands, is controlled by a Native corporation. Since the late 1960s and early 1970s walrus have begun using new haulouts or re-establishing abandoned haulouts elsewhere along the Alaskan coast, especially in the southeastern Bering Sea (Frost *et al.* 1982). Two of these, St. Matthew Island and Cape Pierce, are protected by federal refuge status. Creation of new preserves may be necessary to protect walrus from hunters, tourists, or coastal development on some of these haulouts.

The potential adverse effects of oil and gas exploration and development are another concern. The range of the Pacific walrus includes all of the proposed outer continental shelf oil lease areas in the Bering and Chukchi seas. Disturbances from drilling platforms and support vessels could impinge on major mating areas in winter, calving areas and migration corridors in spring, nursery areas in summer, and feeding areas and migration corridors in autumn. Ship and aircraft traffic in the immediate vicinity of walrus may cause them to flee into the water, potentially resulting in injury or abandonment of calves (Fay *et al.* 1984a). Environmental contamination from drilling muds or

oil spills could affect food supplies or directly affect walrus through bioaccumulation (see Food Habits). Future management plans should include means to assess and monitor the extent of disturbance from oil development as well as to mitigate adverse effects.

St. Matthew Island has been proposed as a staging and supply base for drilling platforms in the central Bering Sea. This island had been a traditional walrus haulout in summer and fall up to the late 1800s, then was abandoned for nearly 100 years (Sease 1986). Its reoccupation by walrus apparently began in 1978, and it has been used regularly at least since 1980 (Frost *et al.* 1982). Establishment of the proposed staging and supply base could cause the walrus to abandon the area once again. Furthermore, large numbers of breeding walrus frequently gather on the ice to the north and west of St. Matthew Island during winter (Fay 1982, Fay *et al.* 1984a), and aircraft traffic to and from the island at that time could disrupt breeding activity. The proposed support base has been blocked by a federal court action (Martin, pers. commun.), but similar proposals may be offered in the future, especially if oil is discovered in the Navarin Basin.

Population Size

The first attempts to enumerate the Pacific walrus population ranged from general statements of relative change over time to educated guesses based on little data. Nelson and True (1887) reckoned that the walrus population had been halved between about 1870 and 1880. In the 1930s Zenkovich (1938) derived an estimate of 60,000 walrus from harvest data and from information from Chukotkan hunters and workers. The first census estimated 40,000–50,000 animals from counts made during the cruise of the U.S. icebreaker *Northwind* in May and June 1954 (Fay 1957, Fay *et al.* 1984a).

The first aerial survey of walrus was conducted by the Soviet Union in 1958 (Nikulin, unpubl. data, cited in Fedoseev 1962), and the second by the United States in 1960 (Kenyon 1960a; Kenyon, unpubl. data, cited in Fay 1982). The countries conducted a combined total of seven additional surveys during the next 15 years. Most of the surveys were planned and conducted without benefit of communication between Soviet and U.S. biologists. Communication was established in 1973, and the U.S.-U.S.S.R. Agreement on Cooperation in the Field of Environmental Protection, Project V-6 (Marine Mammals), led to the first joint U.S.-Soviet survey in 1975 (Estes and Gol'tsev 1984). Additional joint surveys were conducted in 1980 (Johnson *et al.* 1982) and 1985 (Gilbert, pers. commun.). The population estimates from surveys in 1954 to 1985 are presented in Table 1.

All of the U.S. surveys have been based on strip sampling methods, but the techniques have continually

been refined and the statistical treatment of data has become increasingly sophisticated (Gilbert, pers. commun.). The time of year and area of coverage of the surveys have also varied. All of the U.S. surveys up to 1972 were conducted in February, March, and April in the Bering Sea and were attempts to survey the entire population. Since 1975 the U.S. surveys have been conducted in September and October in the Chukchi Sea, and only of the eastern part of the population in the pack ice. Consequently, the results are not directly comparable (Fay *et al.* 1984a).

The Soviet surveys have been less sophisticated statistically than the U.S. surveys, but the methods have remained constant. Each of them since 1958 has

counted walrus only along the Soviet coast in September and October and, at least initially, assumed that the number of walrus in the U.S. zone at that time was insignificant. During each survey the Soviets have based about 60% of their estimate on direct counts from aerial photographs of walrus on the coastal haulouts. The remainder of each estimate has been based on strip surveys over the pack ice in the western Chukchi Sea. Thus, the differences among the Soviet estimates cannot be attributed to increased sophistication of methods or equipment, or to changes in timing or coverage. Their results, therefore, at least for the Soviet zone, are more comparable than those from the U.S. surveys. The Soviet results indicate nearly a tripling of the number of walrus in the Soviet zone from 1958 to about 1975 and a lesser increase from 1975 to 1980 (Fig. 2).

An exponential curve fitted to the estimates for the Soviet zone from 1958 to 1975 is

$$N_t = 40.2 e^{0.067t}$$

with $t = 0$ in 1958. This curve implies an instantaneous growth rate of 0.067 during that time. The 1980 survey estimate for the Soviet zone falls significantly below that for the exponential model, which is in accord with the views of Fay *et al.* (1984a) that population growth slowed after 1975.

In the most recent joint U.S.-Soviet survey, conducted in September and October 1985, the estimate from the U.S. survey in the eastern Chukchi Sea was about 80% of the 1975 estimate and 65% of the 1980 estimate (Gilbert, pers. commun.). The joint surveys in September and October 1975 and 1980 indicated each time that the U.S. estimate from the eastern Chukchi Sea represented about 40% of the total estimated population, with an additional 5% occurring in Bristol Bay (Fay *et al.* 1984a; Gilbert, pers. commun.). The decrease that is suggested by the 1985 U.S. survey cannot be evaluated more precisely until the results from the Soviet portion are available.

Aerial survey is the best tool currently available for assessing the size of the Pacific walrus population. Like many other marine mammals, however, walrus tend to be patchy in distribution, unequally visible (*e.g.*, underwater, at the surface, on land, on ice), and distributed over very large areas (see Chapman *et al.* [1977] for discussion of sampling techniques). Consequently, sampling variances and confidence intervals for strip surveys are discouragingly large (Estes and Gilbert 1978). Because the Soviets base their estimates largely on visual and photographic counts, the problem of sampling variance for those estimates is reduced, but the Soviets have not given confidence limits for their total estimates. Adverse weather frequently interrupts survey operations, thus upsetting the continuity of coverage and increasing the probability of counting

TABLE 1.—Estimated size of the Pacific walrus population based on a shipboard survey in 1954 and aerial surveys from 1958 to 1985.

Date	Estimated size (thousands)		Source
	Soviet	Total	
May-Jun 1954	—	45	Fay 1957
Aug-Sep 1958	40	(73)	Nikulin, unpubl. data, cited in Fedoseev 1962
Feb-Mar 1960	—	96	Kenyon 1960a
Apr 1960	—	85	Kenyon 1960a
Sep-Oct 1960	46	(84)	Fedoseev 1962
Mar 1961	—	85	Kenyon, unpubl. data, cited in Fay 1982
Sep-Oct 1964	59	(107)	Gol'tsev 1968
Apr 1968	—	92	Kenyon, unpubl. data, cited in Fay 1982
Sep-Oct 1970	101	(184)	Gol'tsev 1972
Sep-Oct 1970	—	168	Fedoseev 1984
Apr 1972	—	124	Kenyon 1972
Sep-Oct 1975	129	(235)	Gol'tsev 1976
Sep-Oct 1975	—	170	Estes and Gol'tsev 1984
Apr 1976	112	(204)	Fedoseev 1981
Sep-Oct 1980	—	280	Johnson <i>et al.</i> 1982
Sep-Oct 1980	140	250	Fedoseev 1981, 1984
Sep-Oct 1980	—	246	Fay <i>et al.</i> 1984a; Gilbert 1986
Sep-Oct 1985	155	234	Gilbert 1986

NOTE: Median values are used for estimates that were reported as ranges (adapted from Fay 1982). Total estimates in parentheses are extrapolated from the estimates for the Soviet zone, based on the estimates from the 1975 and 1980 joint U.S.-Soviet surveys that about 40% of the population occurs in U.S. waters of the Chukchi Sea in September and October and about 5% occurs in Bristol Bay.

individual animals more than once. In addition, the estimate derived from each of the aerial surveys may have been very conservative, because none was corrected for the activity rhythms of walrus and the proportion of animals underwater (Fay *et al.* 1984a). A comprehensive discussion of sampling problems associated with the walrus surveys is being prepared by Gilbert (pers. commun.).

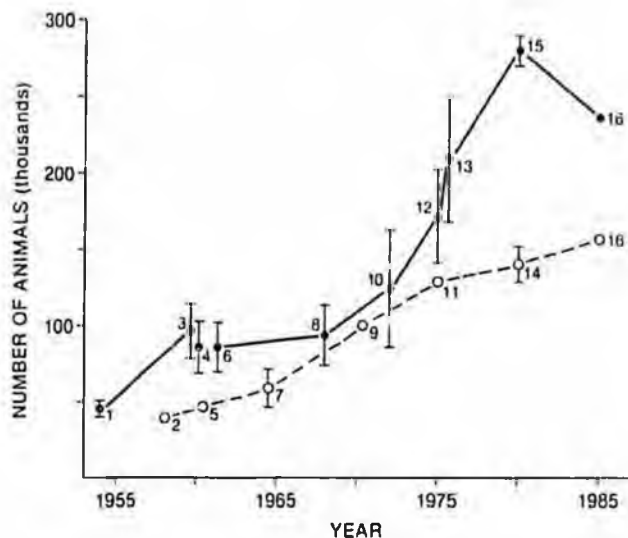


FIGURE 2.—Estimated size of the Pacific walrus population, based on a shipboard survey in 1954 and aerial surveys from 1958 to 1985. Open circles represent estimates for the Soviet zone; solid circles represent estimates for the entire population. Vertical bars represent confidence limits reported by the investigators. Sources: (1) Fay 1957; (2) Nikulin, unpubl. data, cited in Fedoseev 1962; (3) and (4) Kenyon 1960a; (5) Fedoseev 1962; (6) Kenyon, unpubl. data, cited in Fay 1982; (7) Gol'tsev 1968; (8) Kenyon, unpubl. data, cited in Fay 1982; (9) Gol'tsev 1972; (10) Kenyon 1972; (11) Gol'tsev 1975; (12) Estes and Gol'tsev 1984; (13) Krogman *et al.* 1979; (14) Fedoseev 1984; (15) Johnson *et al.* 1982; (16) Gilbert 1986.

Because of these sampling problems, interpretation of survey results has been a persistent problem. For example, the total initial estimate of 270,000–290,000 animals in 1980 (Johnson *et al.* 1982) was later adjusted to about 250,000 (Fay *et al.* 1984a; Fedoseev 1984; Gilbert, pers. commun.). Nonetheless, a dramatic increase in the size of the walrus population up to 1980 has been indicated by the survey results, and has also been suggested by expansion of range, as noted above (see also Fay *et al.* 1984a, Sease 1986). Other methods to estimate population size, such as mark-recapture, have not been used.

Research Needs.—Additional research is needed to reduce the sampling variances and confidence limits

for population estimates. Radiotelemetry could help to analyze activity patterns and to calculate the proportion of walrus that would be underwater, out of the survey area, or otherwise uncountable during aerial surveys. Radiotelemetry may also improve our understanding of walrus distribution in the pack ice in September and October, thus allowing improvement of survey design and reduction in sampling variance. If a suitable tag or other marking procedure could be developed and used to mark animals which could be recovered in the harvests, a mark-recapture program might be attempted as an alternate census method.

Age Composition and Sex Ratio

In recent years some of the Eskimo walrus hunters from St. Lawrence Island reported their observations of an unusually high proportion of adult walrus with extremely worn, blunted tusks (Fay *et al.* 1988). These observations could indicate an abundance of old animals in the population because, although tusks grow continuously during life, the rates of wear and breakage exceed that of growth for old animals (Fay 1982). A shift in the age structure of the population toward older animals is also suggested by an increase in the mean age of females in nonselective samples taken during U.S.–Soviet research cruises in the 1960s, 1970s, and 1980s (Krylov 1965, 1968; Fedoseev and Gol'tsev 1969; Fay *et al.* 1983, 1988, unpubl. data). The trend of increased mean age is also apparent in walrus dying of natural causes on the Punuk Islands during the 1960s and 1970s (Fay and Kelly 1980, Fay *et al.* 1984a) and in the walrus harvested by Alaskan Natives from the 1960s to the 1980s. Although the data from the Punuk natural mortality and the Native harvests may not be representative of the population as a whole, the changes in the harvest samples cannot be attributed entirely to the selective biases of the hunters (Fay *et al.* 1984a, 1988; Sease 1986). (See Exploitation for a more complete discussion of the harvest data.)

An adult walrus sex ratio of 1 : 1 was assumed until estimates by Fay (1982) and justification based on polygyny (Fay 1982; Fay *et al.* 1984b) suggested a ratio of about 1 male to 3 females. Since females mature at an earlier age than males, the adult sex ratio would be unbalanced even if natural mortality rates were equal for both sexes. Higher mortality rates for adult males, either from exploitation or natural causes, will skew the adult sex ratio even more.

Research Needs.—Analysis of photographs of herds will probably provide information about current age composition, as well as relative values for comparison of past and present values. Detailed information on sex ratio is needed for computer modeling of population dynamics. The acquisition

of sex ratio information will require cooperation between the United States and Soviet Union.

Reproduction

Mating takes place primarily during January and February, when the walrus are concentrated in their wintering areas in the pack ice of the Bering Sea. Implantation of the blastocyst is delayed 4–5 months, until June. Calves are born during the northward migration the following spring, mainly in May (Belopol'ski 1939; Krylov 1969; Fay 1981, 1982). Female walrus often give birth in isolation, but typically they congregate in large, compact "nursery herds" a day or two after birth (Burns 1965, 1970). The cow-calf bond is stronger in walrus than in other pinnipeds; cows are extremely protective of their young. Calves are dependent on their mother's milk during the first year of life and are gradually weaned during the second year. Other adult females may foster orphaned calves, but most orphaned calves probably perish. Young males usually remain with the female herds for 2–5 years after weaning, before joining the all-male herds, whereas young females remain with the herds of adult females (Fay 1981, 1982).

Males typically become reproductively mature at the age of 9 or 10 years, but they are usually excluded from breeding until they are about 15 years old and large enough to compete successfully with other adult males (Fay 1981, 1982). Because walrus are polygynous, there is potentially a surplus of males; hence, a harvest that consists predominantly or exclusively of males would not have the same impact on the population as a harvest that removed large numbers of females. The potential, long-term effects (*e.g.*, through changes in the gene pool) of selective male harvests have not been examined.

Samples collected during the 1950s, 1960s, and early 1970s, when the population was still growing rapidly, indicated that female walrus ovulate for the first time at an age of 4–8 years, with a median age of about 6 years. The age at first birth was about 8 years (Krylov 1966, Fay 1982). Maximum fecundity was at 9–10 years, with a decline in older age classes (Fay 1982, Fay and Stoker 1982a). The ages of first ovulation and maximum fecundity calculated at that time probably reflect ideal conditions for rapid growth and maturation of individual animals. More recent data suggest that the age at first birth has shifted upward by about 2 years since 1975 (Fay *et al.* 1988). The greater age of first breeding observed since 1975 is probably more representative of a population at or near carrying capacity.

The recent samples have not been examined yet for a corresponding shift in age of maximum fecundity. However, such a shift has been suggested by changes

in the mean ages of female walrus in the Alaskan catches. In general, the mean age of the catches increased from 1960 to 1980. Hunters from St. Lawrence Island preferentially select female walrus with calves (Fay 1958; Iya, pers. commun.), thus taking a high proportion of females from the age classes with the highest mean fecundity. Mean ages of those catches remained fairly constant at St. Lawrence Island until about 1972, when they also began to increase. Since hunter selection for females with calves apparently did not change in that time (Burns and Fay, pers. commun.), a shift in age-specific fecundity of the females is implied (Fay *et al.* 1984a, Sease 1986).

Because the duration of pregnancy is 15–16 months, the intervals between successful parturitions for any given female cannot be less than 2 years. Biennial breeding is typical for females in their reproductive prime (9–10 years), but older females may breed at intervals of 3, 4, or more years (Krylov 1962). For this reason the reproductive potential of walrus is much lower than that of any other pinniped. Using samples collected from 1952 to 1976, Fay (1982) calculated a mean birth rate of about 37% for adult females. As noted above, the Pacific walrus population was growing rapidly during most of that period; hence that birth rate is probably higher than it would be in equilibrium conditions with the population near carrying capacity.

Recent data suggest that the reproductive rate of the Pacific walrus population has decreased slightly and has become erratic, at least since the late 1970s. Calf production was especially poor in 1980. Samples of reproductive organs collected at Gambell and Diomed indicate the estimated birth rate in 1980 was about 15%, the lowest ever recorded and significantly lower than the mean rate of 37% calculated from earlier samples (Fay and Stoker 1982b, Sease 1986). Since 1980, birth rates have been extremely variable and generally lower than they were before (Fay *et al.* 1988). Samples of reproductive organs from adult females collected in 1980 and 1983 revealed a higher frequency of prenatal mortality than was observed in other years (Fay *et al.* 1983; Fay and Kibal'chich, unpubl. data). Samples collected by the U.S. Fish and Wildlife Service in 1985 have not been analyzed yet.

Age of maturation and birth rate are density-dependent for many species of large mammals, including several species of pinnipeds (Fowler *et al.* 1980). Erratic pregnancy rates are also typical for populations of K-selected species that have closely approached or exceeded the carrying capacity (Fowler, Siniff, pers. commun.). The observed reproductive performance of the Pacific walrus population is consistent with the hypothesis that the population is at or near the carrying capacity of the Bering-Chukchi region.

Research Needs.—Additional research is needed to determine the current reproductive parameters of Pacific walrus. For example, using data collected primarily at St. Lawrence Island, Fay (1982) calculated that the interval between ovulations increases with age; hence fecundity is maximum at 9–10 years of age (Fay and Stoker 1982a). Reexamination of those data led Gilbert (pers. commun.) to believe that the interval between ovulations does not increase in older age classes and that fecundity remains high. As Fay (1982) pointed out, however, because of the hunters' selective harvesting of females with calves, those samples are primarily from the most productive portion of the female population and thus may not be representative of the population at large.

The existing data sets need to be carefully reexamined to resolve such differences in interpretation. In addition, recent samples have suggested that values of several reproductive parameters have changed during the past 5–10 years. The 1985 sample needs to be analyzed and additional new data need to be collected to quantify the changes as precisely as possible. Such information is crucial for population modeling.

Food Habits

Walrus feed almost exclusively on benthic invertebrates. Vibe (1950) and Fay (1982) reported that walrus typically feed in depths of 10 to 50 m, with a maximum depth of about 80 m. A greater maximum feeding depth of 115 m was recorded near St. Matthew Island in the central Bering Sea in February 1985 (Burns and Fay, pers. commun.), but walrus probably cannot feed efficiently at depths much greater than that.

More than 60 genera of marine organisms from 10 phyla have been identified from stomach contents. Several kinds of bivalve molluscs appear to be the preferred or most important prey (Fay 1982; Fay and Stoker 1982a,b; Fay *et al.*, unpubl. data). Average daily food intake of walrus in captivity is at least 5–7% of the total body weight (Fay 1982, Gehrich 1984). Some walrus, primarily males, occasionally feed on seals. Pieces of ringed seals (*Phoca hispida*), spotted seals (*Phoca largha*), and bearded seals (*Erignathus barbatus*) have been found in walrus stomachs, sometimes in substantial volume. Most seal-eating is thought to be predation, rather than scavenging on carrion (Lowry and Fay 1984).

Fay *et al.* (1977) observed that stocks of benthic bivalves were low in areas where large numbers of walrus were feeding. This led to the hypothesis that maximum, or nearly maximum, utilization of food resources was occurring in those locations at that time. Soon after that, Alaskan Eskimos observed that walrus apparently were eating different foods than they had eaten during previous years. Stomach samples

collected during the spring harvests at Gambell, Savoonga, and Diomedes in 1980 and 1982 confirmed a decrease in the proportion of bivalves and a corresponding increase in the proportion of fishes and other alternative prey. Sizes of individual prey were approximately 50% smaller than they were before 1980 (Fay and Stoker 1982a,b). In addition, those samples suggested that male and female walrus were consuming similar sizes and species of bivalves. Prior to 1980, males and females had consumed bivalves of different species and size ranges (Fay and Stoker 1982a,b; Fay *et al.* 1984a). The 1980 and 1982 stomach samples also contained greater quantities of gravel and sediments than had been observed previously. Presumably, walrus ingest small quantities of sediments along with prey, and they probably ingest more sediments with soft-bodied epifaunal organisms than with the preferred bivalves. Increased amounts of sediments in stomachs could result from the increased consumption of non-bivalve prey or the shift to smaller organisms, possibly suggesting that walrus are working harder to find the necessary quantities of food (Fay and Stoker 1982a,b).

Research Needs.—Walrus are selective feeders, but the kinds and sizes of prey may vary considerably among age classes, sexes, and locations (Fay 1982). In addition, rates of food intake may vary during the year. Walrus reared in captivity show the highest food intake in autumn and lowest in midwinter, during the breeding season (Gehrich 1984). The quantity of food in stomachs and the overall condition of digestive tracts from samples of walrus collected in the Bering and Chukchi seas confirm that feeding activity is lowest in midwinter but autumn samples are too few for speculation (Fay *et al.* 1984a). Detailed statistical analysis of the available samples is necessary to qualify and quantify the suspected differences in diet between sexes, age classes, and locations, as well as to clarify the probability that changes took place during the late 1970s and 1980s. Those analyses may also add to our understanding of the seasonal aspects of feeding by walrus, possibly allowing identification of critical feeding areas.

Walrus appear to have a structuring effect on the benthic fauna by selectively feeding on the mature age classes of a few species, especially of the larger bivalve molluscs (Vibe 1950; Fay and Stoker 1982a,b). Intensive feeding by walrus could directly reduce or limit populations of those long-lived, slow-maturing bivalves (Fay *et al.* 1977; Feder, pers. commun.). Foraging by walrus also causes massive perturbation of the benthic sediments; this perturbation releases nutrients that may be beneficial to other organisms, but it also may have a disruptive effect by interfering with colonization by invertebrate larvae (Ray 1973, Fay *et al.* 1977, Oliver *et al.* 1983). The relationship

between walruses and the benthic invertebrate communities appears to be complex and is not well understood. If change is indicated by walrus stomach contents, then larger changes could be expected in the structure and successional stages of benthic communities in the Bering-Chukchi region, due to selective feeding by walruses. Three large, comparable data sets exist for benthic communities within the walrus range in the Bering Sea from 1970 to 1986, and preliminary analysis of these indicates major change (Feder, pers. commun.). A full analysis is planned if funding for it can be obtained (Feder and Fay, pers. commun.).

Potential Conflicts with Development Activities.—

Depletion of food resources by fisheries is not considered a problem at this time. Development of a clam fishery in Bristol Bay could have had a severe impact on the male walruses that spend the summer in the bay (Fay and Lowry 1981), but development of that fishery appears to be unlikely in the near future. Trawl fisheries present a potential threat to walrus food resources through disruption of benthic communities. Most trawl fisheries have occurred along the shelf break, beyond the range of walruses (Fay, pers. commun.). Detailed analysis of food habits, as outlined above, may identify critical feeding areas that should be monitored for, and perhaps protected from, potential damage from fisheries.

As noted above, all of the proposed offshore oil lease areas on the Bering-Chukchi shelf lie within the range of the Pacific walrus. Contamination from oil spills, drilling muds, and other sources could have long-term adverse effects on walrus benthic food resources by killing benthic invertebrates directly, altering species composition, lowering productivity, or slowing growth rates (Hansen 1985).

Blubber Thickness and Physical Condition

Blubber thickness has been used as a general index of body condition in several species of pinnipeds, including walruses (McLaren 1958, Pitcher and Calkins 1979, Fay 1982, Fay *et al.* 1984a). Age, sex, time of year, and reproductive condition can confound comparison of samples (McLaren and Smith 1985), but if the contrast is great enough, even those factors may not mask it (Sease 1986). Adult male Pacific walruses (10 or more years of age) and adult females (6 or more years old and divisible into those at or near full-term pregnancy and those not at or near full-term pregnancy) were all found to be significantly leaner in 1980 and 1981 than they had been earlier (Fay *et al.* 1988). Only samples from February to June were included in that analysis to reduce the impact of seasonal variation. Furthermore, those sampled in 1985 were significantly leaner than the 1980 and 1981 samples, which indicates that the walruses are still

not eating as nutritious a diet as they were in the 1960s to early 1970s or are expending more energy than before. Reduced nutritional intake could be affecting their growth and reproduction.

The available data sets have not been examined yet for shifts in growth rate, but some of the reproductive data show that the age at first parturition has been increasing in recent years (Fay *et al.* 1988). Age of sexual maturation is highly correlated with growth rate for several species of large mammals, including marine mammals (Laws 1956, 1981; Fowler *et al.* 1980); hence increases in age of maturation are indicative of reduced growth of individuals in the population.

Research Needs.— Additional research is needed to analyze growth and reproductive data sets, and monitoring of blubber thickness should continue. Combined, these data sets may help to determine the physical condition of the walrus population. Because of potentially large observer variability in measurement of blubber thickness, these data should be collected only by experienced observers.

Mortality

Mortality of exploited animals is typically divided into two categories, mortality due to human activity and natural mortality. As used in this report, mortality due to human activity includes direct exploitation as well as indirect effects, such as habitat modification or depletion of food resources by fisheries. "Natural" mortality includes mortality from all causes other than human, including predation, parasitism, and disease.

Mortality Due to Human Activity.— Mortality of Pacific walruses due to direct disturbance, alteration of habitat, depletion of food resources by fisheries, or incidental catch by fisheries is thought to be near zero at this time. The potential impacts of fisheries and oil development are discussed above (see Distribution, Food Habits).

Mass mortality of calves and abortion of fetuses due to trampling during an aircraft-induced stampede have been observed once in the Soviet sector (Tomilin and Kibal'chich 1975). The principal mortality due to human activity is the annual harvest by Natives of the Bering-Chukchi region, and, at present, by Soviet sealing vessels. These harvests appear to be the most significant source of mortality affecting the population (Fay 1982). The historical and current exploitation of walruses is discussed below (see Exploitation).

Natural Mortality.— Fay (1982) summarized the known major sources of natural mortality. For calves, these sources include trauma from trampling, abandonment, predation by polar bears, and possibly hypothermia. For all age classes, sources of mortality

include predation by killer whales (*Orcinus orca*), parasitism, disease (bacterial and viral), trauma from trampling or rockslides, entrapment in ice, and exhaustion. During the past 100 or more years, natural mortality has probably been quite low in relation to harvest mortality. Fay (1982) considered that the poor understanding of natural mortality was one of the major gaps in our knowledge of walrus biology and ecology.

The Walrus Calicivirus (WCV), a form similar to the San Miguel Sea Lion Virus (SMSLV), was identified in walrus in 1977. SMSLV is known to cause skin lesions, probably abortion, and possibly encephalitis and pneumonia in other pinnipeds (Smith *et al.* 1983). The frequency of occurrence of WCV antibodies appeared to have increased slightly by 1983, and some of the strongest reactors in the 1983 sample were adult females that had aborted a fetus or had failed to conceive in that year (Fay *et al.* 1983, Barlough *et al.* 1986). The actual impact of WCV on the walrus population cannot be determined at this time, but it may have contributed to the recently observed decline in reproductive rates (see Reproduction).

Age-composition data, collected by observation of large numbers of walrus in the Bering and Chukchi seas, suggest that mortality of juvenile age classes was higher during the late 1970s and early 1980s than it was 10 or more years before. From data collected during the period of rapid population growth, Fay (1982) estimated that about 37% of all adult females would be accompanied by a calf in any given year, whereas the observed proportion of adult females with calves ranged from about 5% to 15% in 1981 to 1984. All readily identifiable age classes (calf to 4-5-year-old) were poorly represented in each sample year, indicating that the poor survival was not an isolated event in 1980 but had been taking place for several years (Fay *et al.* 1984a, Sease 1986). The cause of the increased mortality of juvenile walrus is unknown. An increase in mortality rates for juveniles as a population approaches carrying capacity is consistent with density-dependent theories of population regulation (Eberhardt 1977, Eberhardt and Siniff 1977, Fowler *et al.* 1980, Fowler and Smith 1981).

Mass natural mortality due to trampling has been observed at the Penuk Islands (Fay and Kelly 1980). Spontaneous stampeding into the water was observed there several times by Kelly and co-workers (pers. commun.). Calves are probably more susceptible than older age classes to trampling, but walrus other than calves may be predisposed to trampling if they are debilitated by such factors as exhaustion, disease, or poor physical condition (Fay and Kelly 1980, Fay 1982, Fay *et al.* 1984a). In several cases fetuses were aborted as a result of trampling (Fay and Kelly 1980).

The natural mortality at the Penuk Islands has taken place for thousands of years, primarily in October to December, during the walrus' southward migration. Most of the carcasses are of females and young (Burns 1965, Fay and Kelly 1980). Unusually high mortality occurred during fall 1978, with 466 carcasses on the Penuk Islands and an estimated 400 to 1,100 on nearby St. Lawrence Island (Fay and Kelly 1980).

Variation in the number of carcasses found on Penuk Island beaches has followed, in a general manner, variation in the size of the Pacific walrus population. Numbers of carcasses have been lowest during periods of low walrus abundance (*e.g.*, 1940s and 1950s). The high mortality in 1978 occurred when the Pacific walrus population is thought to have reached peak numbers. Factors causing the unprecedented high number of walrus to haul out on St. Lawrence and Penuk Islands in 1978 may have included weather and ice conditions, killer whales, disease, and starvation. Human disturbances, such as low-flying aircraft, may have contributed to the extremely high mortality. Unfortunately these are merely speculations.

Estimation of Natural Mortality.— Because the pregnancy rate for walrus is half that for other pinnipeds (see Reproduction), natural mortality must be very low. The Leslie equation of Eberhardt and Siniff (1977:185, equation 1) and the available estimates for reproductive parameters yield an estimated mortality rate of 0.04 given a growth rate of 0.067 (see Population Size). Assumptions are that (1) the pregnancy rate for mature females in a growing population, as given above, is 0.37; (2) the sex ratio at birth is 1:1; (3) the mean age of females giving birth to their first calf is 8 years; and (4) mortality rates are independent of age. Using the same parameters for a population that is not growing, the total annual mortality rate would be slightly below 0.10.

Taking into account the sampling errors in the estimates of the parameters involved, the fitted model is not unreasonable. In any case, the natural mortality rate must be low, and a low mortality rate is difficult to determine accurately, as are any changes in it (Fowler *et al.* 1980). This difficulty is especially true for walrus, because population segregation creates sampling problems. In addition, precise determination of the age of individuals is difficult, as it is with other mammals. Age determination is least precise for the older age classes that are included in calculations of mortality (Fay *et al.* 1986; Fay, pers. commun.). Thus, it is not reasonable to monitor the condition of the walrus population on the basis of observed changes in calculated mortality rates, except with a long time series of data.

Juvenile mortality has been indicated to be density-dependent for large mammals, including several species of marine mammals (Fowler *et al.* 1980, Fowler and Smith 1981). Direct measurement of juvenile mortality is difficult, but indirect assessment via age-composition data (see Natural Mortality) has suggested a marked increase in juvenile mortality since at least 1978 (Fay *et al.* 1984a, Sease 1986). Fay *et al.* (1988) believe that this method can be developed into a powerful tool for the assessment of juvenile survival and recruitment, thus allowing greater predictability of major fluctuations in the population size.

Research Needs.—Age-composition data have indicated that juvenile mortality rates increased after the mid-1970s. The causes of the increased mortality are unknown, as are the relative importance and magnitude of different natural mortality factors in relation to harvest mortality. The importance of the Walrus Calicivirus as a mortality factor, either by itself or in conjunction with other factors, is unknown. The causes of juvenile mortality need to be identified, and assessment of the level of such mortality should continue. In particular, what changes, if any, have taken place since the late 1970s and early 1980s?

EXPLOITATION

Although the Natives of the Bering-Chukchi region have harvested walrus for thousands of years, their catches may have been small in relation to all other mortality factors (Fay 1982). There is little information on the numbers of animals killed or wounded but not retrieved (rate of loss) by Native hunters. Exploitation by non-Natives has been the major source of mortality for Pacific walrus since Europeans first entered the Bering-Chukchi region. The following is a brief summary of exploitation of the walrus resource, beginning with the first western contact in the Bering-Chukchi region (Fay *et al.* 1984a, Sease 1986).

Russian Expansion—1648 to 1867

The impact on the walrus population by the Russian expansion into the region probably was not very great, because the Russians were interested primarily in furs, especially from sea otters (*Enhydra lutris*) and fur seals (*Callorhinus ursinus*). They harvested some walrus, and obtained many tusks from the Natives through trade and excise. The maximum yield of ivory from Alaskan waters probably represented about 1,000 walrus per year from 1821 to 1842 (Tikhmenev 1978). Catches during other periods were less than half that amount (Berkh 1974, Golovin 1977). In addition, catches during the entire Russian expansion period were primarily from the southern

Bering Sea, and thus practically all were males. The impact of such harvests on the productivity of the population was less severe than it would have been with a harvest of females.

The Yankee Whalers—1848 to 1914

The whalers, primarily from New England, first reached the Bering Strait region in 1848 in search of bowhead whales (*Balaena mysticetus*), rather than walrus. Catches of walrus were small at first, but they increased as the stocks of whales were depleted (Bockstoe and Botkin 1982). The walrus catches were primarily of females because females yielded more oil and were more accessible than males in the Bering Strait-southern Chukchi region in summer. From about 1869 to 1880 the total catches and losses (animals killed but not retrieved) must have been in excess of 200,000 animals (Bockstoe and Botkin 1982). The walrus population decreased to half its former size during the 1870s, and half to two-thirds of the Natives on the Bering Sea islands died of starvation during the winter of 1878-79 (Nelson and True 1887, Allen 1895). Apparently the plight of the Natives was compounded by unusually harsh weather and ice conditions, and perhaps some other factors, but the drastic reduction of the walrus population was certainly a contributing cause. By 1890 the catch of walrus by the Yankee whalers had dwindled to very few animals. It ended by about 1914.

The Arctic Traders—1880 to 1930

The Arctic traders first appeared during the latter years of the whaling period. The traders harvested walrus on their own, but also traded with the Natives for tusks and hides. Little information exists about the numbers of walrus taken or the size of the walrus population during that period. Distribution records suggest that the population recovered slightly during the 1920s and 1930s (Fay *et al.* 1984a, Sease 1986). Apparently the recovery was sufficient to permit a major Soviet walrus harvesting venture, beginning in the 1930s.

Soviet Exploitation—1930 to 1960

In the 1930s the Soviet government initiated efforts to improve the economic welfare of the Natives of the Bering-Chukchi region and to pull them into the Soviet sphere of influence and away from influences of the United States. These efforts included the establishment of government-operated shore- and ship-based walrus harvests. The size of the catches increased to as many as 8,000 animals per year by the late 1930s (Krylov 1968). The total kill, including both the Soviet and Alaskan catches as well as losses, probably was at least 10,000 during most years from 1930 to 1960 (Fay *et al.* 1984a).

By the mid-1950s biologists from the United States and the Soviet Union independently concluded that the Pacific walrus population was severely reduced, guessing that it was no more than half of its pre-exploitation size (Fay 1957, Geller 1957, Kleinenberg 1957). The U.S.S.R. and the newly established Alaska Department of Fish and Game passed protective measures by 1960 to restrict the number of female walrus taken (Krylov *et al.* 1964, Burns 1965, Krylov 1968), and during the following 20 years, the walrus population rapidly increased in size (see Population Size and below).

Recent Trends—1960 to 1985

Walrus harvests take place in remote areas and under difficult logistical conditions. Animals killed and not retrieved have been a problem, at least since the use of firearms began, but such losses are difficult to estimate. Measured loss rates in the 1950s and 1960s were about 40% of the total number killed (Fay 1958, 1982; Kenyon 1958, 1960b; Krylov 1968). Higher loss rates have been estimated in more recent years (Alaska Dep. Fish and Game, unpubl. reports), but the basis of these estimates remains obscure. Harvest of walrus in Alaska is by Natives in small, remote villages, and a complete count, even of retrieved animals, is difficult to obtain. The estimated total kill, therefore, is probably somewhat low with respect to the number of animals retrieved; the number killed but lost may be overestimated.

Sease (1986) calculated harvest estimates for 1955 to 1985 (Table 2). The estimates for the Soviet catches and for the Alaskan catches prior to 1980 probably are reasonably accurate, because those estimates attempted to include the catches from all areas during the entire year. Alaskan catches since 1980 have been monitored only during the spring harvest and only at five locations (Gambell, Savoonga, Diomedé, Nome-King Island, and Wales). The spring catches at Gambell, Savoonga, and Diomedé constituted about 62% of the total annual harvest in Alaska in the 1970s. The estimates for the Alaskan catches from 1980 to 1984 in Table 2 were extrapolated from the spring catches at those three villages (Sease 1986). Estimated losses are based on the data of Fay (1958) and Kenyon (1958), which are the only documented loss rates.

From 1960 to 1972 the Alaska Department of Fish and Game restricted the number of female walrus that could be taken by Native hunters (Burns 1965). Enactment of the Marine Mammal Protection Act in 1972 removed those harvest restrictions by transferring jurisdiction from the Alaska Department of Fish and Game to the U.S. Fish and Wildlife Service. With the exception of a quota of 3,000 walrus per year that was in effect from 1975 to 1979, the size and com-

position of catches in Alaska have not been restricted since 1972, except that walrus can be taken only (1) by Aleuts, Eskimos, and Indians who reside in Alaska, (2) for subsistence purposes or the creation

TABLE 2.—Reported and estimated commercial (ship-based) and Native (shore-based) harvests of Pacific walrus from the Bering and Chukchi seas, 1955-85.

Year	Reported and estimated harvests		Estimated harvest loss	Estimated total kill
	Soviet	Alaskan		
1955	4,828	1,400	4,152	10,380
1956	5,814	1,400	4,809	12,023
1957	4,092	1,400	3,661	9,153
1958	4,038	1,500	3,692	9,230
1959	3,183	1,400	3,055	7,638
1960	2,866	2,356	3,481	8,703
1961	2,573	1,860	2,955	7,388
1962	1,818	1,690	2,339	5,847
1963	1,249	1,725	1,983	4,957
1964	1,500	1,040	1,693	4,233
1965	891	1,767	1,772	4,430
1966	909	2,828	2,491	6,228
1967	940	1,367	1,538	3,845
1968	939	1,436	1,583	3,958
1969	965	882	1,231	3,078
1970	988	1,422	1,607	4,017
1971	897	1,915	1,875	4,687
1972	1,518	1,325	1,895	4,738
1973	1,291	1,581	1,915	4,787
1974	1,205	1,410	1,743	4,358
1975	1,265	2,378	2,429	6,072
1976	1,271	2,989	2,840	7,100
1977	1,461	2,377	2,559	6,397
1978	1,500	2,224	2,483	6,207
1979	1,526	2,510	2,691	6,727
1980	1,982	2,784	3,177	7,943
1981	2,564	3,932	4,331	10,827
1982	3,569	2,696	4,177	10,442
1983	3,936	2,316	4,167	10,419
1984	5,000	5,747	7,165	17,912
1985	5,000	4,385	6,257	15,642

SOURCES: Soviet harvests—1955-65, Krylov 1968; 1965-85, Soviet Ministry of Fisheries. Alaskan harvests—1955-58, Fay 1958; 1957-85, Alaska Dep. Fish and Game, U.S. Fish and Wildl. Serv., unpubl. reports.

NOTE: Total harvest is the sum of those for Siberia and Alaska; losses are those walrus killed and not retrieved, estimated at 66.7% of the harvest (after Fay 1958); total kill is the sum of the harvest and the estimated harvest loss.

of authentic articles of Native handicraft, (3) in a nonwasteful manner, and (4) so long as the walrus population is not shown to be depleted. At least in part as a consequence of the changes in regulation, the average number of walruses taken annually by Alaska Eskimos rose from about 1,500 during the 1960s and early 1970s to about 3,500 by the early 1980s. The Soviets resumed ship-based harvesting in the early 1980s, and their harvests then increased from about 1,200 to 4,000. Thus, the total kill of walruses, including the estimated losses of sunk and mortally wounded animals, appears to have been at least 10,000 each year since 1981 (Fay *et al.* 1984a, Sease 1986). The loss rate in Alaskan and Soviet waters and the total kill in Alaska since 1980, however, are not adequately documented.

The age and sex compositions of Alaskan walrus harvests have changed since 1960. Mean ages of catches, which had remained fairly constant during the 1950s, began to increase after about 1960 at the three principal hunting locations in Alaska (Gambell and Savoonga on St. Lawrence Island and Ingaluk on Little Diomed Island). Samples from the 1980s suggested that the increase in mean age leveled off after about 1979 (Fay *et al.* 1988). Similar trends have been observed in nonselective samples from Soviet research cruises in the 1960s to 1980s (Krylov 1965, 1968; Fedoseev and Gol'tsev 1969; Fay *et al.* 1983, unpubl. data), as well as from samples of walruses that died of natural causes at the Penuk Islands. The "selective biases" for the Penuk samples, however, are not clearly understood (Fay *et al.* 1984a).

The sex ratio of the Soviet catch prior to 1960 appears to have been close to 1:1 (Freiman 1941, cited in Fay 1982); since 1960 the Soviets have limited their catches almost entirely to males, taking only limited numbers of females for scientific purposes (Fay, pers. commun.). Probably more females than males were taken in Alaska before 1960 (Burns 1965). The State of Alaska restricted the catch of females from 1960 to 1972 (Burns 1965), and from that time to the mid-1970s about one-fourth of the kills in Alaska were estimated to be females (Alaska Dep. Fish and Game, unpubl. reports). The proportion of females in the Alaskan catch increased significantly in the 1970s (Sease 1986). The increase was most significant at Diomedes, where the proportion of females in the catches increased from about 25% in the 1960s to about 59% in the early 1980s, and at Savoonga, where it increased from about 11% to 34% in the same period (Sease 1986; Alaska Dep. Fish and Game, U.S. Fish and Wildl. Serv., unpubl. reports).

Research Needs.—Documentation of the loss rate associated with walrus harvests is the most pressing research need, along with development of methods

to reduce losses. In addition, the size, age composition, and sex composition of the whole Alaskan harvest should be determined on a regular basis.

CONSERVATION ISSUES

Management and Exploitation

From the time of the first European contact until the late 1930s, constraints on the exploitation of walruses were economic in nature (*e.g.*, low prices for oil, hides, or tusks). In 1909 the U.S. government prohibited the commercial harvest of walruses within the territorial waters of Alaska, but apparently those regulations were not well enforced (Madsen and Douglas 1957) and harvests at sea and in Siberian waters were not affected at all. Commercial harvests stopped only after the markets for ivory and hides collapsed during World War I (Madsen and Douglas 1957, Bockstoe and Botkin 1982), but resumed soon after the war for a few more years (Brooks 1954, Burns 1965). The killing of walruses by U.S. citizens was banned, except for local use by Natives in Alaska, by the U.S. Department of Commerce in 1937 and the Congressional Walrus Act of 1941 (Fay 1982). About 10 years earlier, however, the Soviet Union had begun its most intensive exploitation of the same population. By the late 1950s biologists from the United States and the Soviet Union recognized that the walrus population was seriously reduced. By 1960 both Alaska and the Soviet Union had placed restrictions on the size and sex composition of catches (see Exploitation—Recent Trends). In addition, walruses received full protection on several important and regularly used haulouts.

As noted above (see Exploitation—Current Trends), the annual removal from the population, including catches and losses, appears to have been as high during the 1980s as it was during the peak of the Russian exploitation period in the 1930s and 1940s. The population may be much larger now, but it is probably composed of older and less productive animals than it was in the 1930s and 1940s. Simple arithmetic models suggest that between 1980 and 1990 the population will have been reduced significantly if harvest rates remain constant, even if recruitment increases after 1986 (Sease 1985; Fay *et al.* 1988). In those models, rates for recruitment into the adult population were derived from the proportions of juveniles (calf or 0-year-old to 4–5-year-old) in herds observed at sea (Fay *et al.* 1984a, unpubl. data). Certainly, rates of reproduction, recruitment, and mortality may change and mitigate the rate of decline, but despite this, the increased harvests in Alaska and the Soviet Union could result in a marked reduction of the population. Additional research is necessary to evaluate

current rates of reproduction, recruitment, and mortality, as well as possible changes in these parameters. With that information, more detailed population modeling may help to evaluate the current status of the walrus population and levels of allowable take.

The maximum sustainable level of exploitation for the future is difficult to predict without more sophisticated modeling. Harvests in the United States will probably be limited entirely to those by Alaska Natives for the purposes of subsistence and the creation of handicrafts. If the Native population continues to grow as it has in the recent past, harvests for these purposes may continue to increase.

One major, unresolved problem for management is the allocation of catches between the United States and the U.S.S.R. Unilateral management by both nations does little to simplify a very complex management problem. Communication between the two countries might have prevented the concurrent exploitation by the Soviet Union and protection by the United States that took place in the 1930s to 1950s. Both nations should strive to manage this and other shared resources cooperatively. The channels of communication necessary for exchange of biological information and management plans have been established, but improved communication has not yet led to development of an acceptable joint conservation and management program.

Petroleum Exploration and Development

The potential conservation issues associated with oil and gas lease exploration and development activities have been described above (see Distribution, Food Habits, and Mortality). All of the proposed outer continental shelf lease areas in the Bering-Chukchi region lie completely within the walrus' range. Contamination from a major oil spill could have long-term, adverse effects locally on walrus food resources; little is known about the effects of oil on walrus at the individual level, and even less is known about impacts at the population level (Hansen 1985). Ship and aircraft traffic could disrupt walrus at all times of the year in important breeding, nursery, and feeding areas and in migration corridors. Frequent disruptions in a particular location can cause walrus to abandon that area (Fedoseev, pers. commun.). Low-flying aircraft can cause stampedes that result in mortality, especially of calves. The responsible management agencies, currently the Minerals Management Service (U.S. Department of the Interior) and the National Ocean Service (U.S. Department of Commerce, National Oceanic and Atmospheric Administration), should monitor the locations and magnitudes of exploration and development as well as the locations of traffic lanes used by support ships and aircraft. Concurrent monitoring by the U.S. Fish

and Wildlife Service of walrus seasonal distribution and movements, activity patterns, food habits, and food resources in and near affected areas will be necessary to identify future conflicts as quickly as possible, so that adverse impacts can be minimized.

Coastal Development

The conservation issues related to coastal development have been discussed above (see Distribution, Mortality). Since the late 1960s walrus have been establishing new haulouts and reestablishing old haulouts along the coast of Alaska, especially in the southeastern Bering Sea (Frost *et al.* 1982). These haulouts should be monitored to identify their relative importance, seasonal patterns of use by walrus, and the potential sources of disturbance at each. Additional preserves, similar to that at Round Island, may be needed to protect walrus at particular haulouts.

Fisheries Conflicts and Incidental Take

Conflicts with fisheries, through competition for or degradation of food resources, are not likely to present conservation problems in the foreseeable future (see Food Habits). Although some interest has been expressed in commercial harvesting of clams in the Bering Sea, the costs at present are too high. The responsible management agencies should continue to monitor the food habits and important feeding areas of walrus as well as the location and magnitude of the major commercial fisheries in the same region. Monitoring will be necessary to identify potential future conflicts as early as possible. Incidental take of walrus as a result of commercial fishing is not likely to be a conservation issue.

Environmental Contaminants

A variety of contaminants, including heavy metals, organochlorines, and hydrocarbons, have been identified in walrus tissues. The highest levels of cadmium ever recorded in any wild mammal have been found in walrus from the Bering Sea. Refined hydrocarbon compounds, presumably from ship ballast expelled at sea, also have appeared in walrus tissues; the sources of the other contaminants are unknown (Metsker, pers. commun.).

The potential for bioaccumulation and the adverse effects that environmental contaminants could have on the biology of pinnipeds are unknown, although polychlorinated biphenyls (PCBs) have tentatively been linked with abnormally high abortion rates in Baltic Sea ringed seals (Holden 1978, Jensen *et al.* 1979). Similarly, the adverse effects that environmental contaminants might have on the walrus population are unknown. Contaminants in walrus tissues may present a potential public health problem for the Natives who eat walrus meat. The nature and magni-

tude of the contaminant problem and the potential public health dangers are unknown at present and should be investigated.

RESEARCH AND MANAGEMENT RECOMMENDATIONS

1) Develop a Joint U.S.-U.S.S.R. Conservation Agreement. — The need for joint conservation of the Pacific walrus population by the United States and the Soviet Union is self-evident. Walrus are not restricted to the economic zones of either nation, and they are an important resource for both. Development of a U.S.-Soviet agreement would encourage cooperative research and monitoring programs and allow the allocation of catches to both countries, and, at the same time, greatly reduce the probability of future depletion of the stock. Channels of communication are open between the responsible regulatory agencies in the two nations via the Marine Mammal Project of the U.S.-U.S.S.R. Environmental Protection Agreement, but more frequent exchanges are needed so that the conservation program in each nation can be developed with full compatibility with the program in the other.

2) Develop Population Models. — According to the Marine Mammal Protection Act's regulatory definition of optimum sustainable populations (OSP), marine mammal populations are to be maintained within a range defined at the lower level to be that population which has the largest net annual growth increment (MNPL), and at the upper level to be the largest population supportable by the ecosystem of which it is a part (K). At this time no fully acceptable estimates of MNPL and K for walrus are available. Population modeling is necessary to evaluate those parameters before the Marine Mammal Protection Act can be implemented successfully. Results from population models, however, are only as accurate as the data upon which they are based. Additional research is necessary to supply the most accurate data possible for reproductive parameters, harvest characteristics, and population size (see recommendations 3-6).

3) Develop Better Methods to Assess Population Status. — Current methods (estimates of harvests and aerial surveys) for assessing trends in the walrus population's size and status are slow to detect changes, and typically do so only after any trends already are historical. Fay *et al.* (1988) stress the need for a new, more sensitive method of assessing the status of the walrus population. For example, monitoring the survival of young and recruitment into the adult population would allow more rapid identification of current trends and prediction of future trends. The ratios of

dependent young to adult females can probably be assessed by annual visual sampling of herds in the Chukchi Sea in summer. Additional research on the method is needed before it can be applied.

4) Conduct Aerial Surveys. — Aerial surveys of the walrus population should be conducted at intervals of no more than 5 years. As noted above, coordination of surveys with the Soviets is essential for meaningful results. Additional research is needed to determine how to reduce the sampling variances and confidence limits for population estimates (see Population Size—Research Needs). Radiotelemetry could help to analyze activity patterns and to calculate the proportion of walrus on the ice versus in the water, at the surface versus underwater, out of the survey area, or otherwise uncountable during aerial surveys. Radiotelemetry also may improve our understanding of walrus distribution in the pack ice in September and October, thus allowing improvement of survey design and reduction in sampling variance (see recommendation 7).

5) Expand the Harvest Monitoring Program. — Continuation and expansion of the Alaskan harvest monitoring program are necessary to assess size and composition of the annual harvests, at least at the major hunting locations (Gambell, Savoonga, Nome-King Island, and Diomed) each year and from the other locations intermittently. Collection of comparable data from the Soviet harvests would also be desirable. The collection of teeth for age determination should continue each year at each location. Those data are essential for population modeling. The precision of age determination from sectioned walrus teeth is low for inexperienced personnel (Fay *et al.* 1986); therefore age determination should be performed by an experienced biologist or technician. Stomach contents from as many individuals as possible and reproductive organs from adult females should be collected at Gambell, Savoonga, and Diomed to monitor changes in food habits and reproductive performance. The harvest monitor program could be expanded to collect tissue samples for contaminant analysis at little or no additional cost.

A statistically sound sampling plan should be developed for the collection of tooth, stomach content, and reproductive organ samples. Interpretation of results from the analyses of current collections is difficult, because these collections may not be representative of the population. Samples are currently collected on a quota system, and sampling stops when the quota is filled. Gilbert (pers. commun.) has expressed the opinion that continuation of sampling throughout the season might lessen sampling biases caused by seasonal variation. A high variation among years has been observed in previous samples of stomach contents and

reproductive organs (Fay and Stoker 1982a,b; Fay *et al.* 1984a; Sease 1986).

A public education program should be developed in conjunction with the Eskimo Walrus Commission, regional and village Native corporations, and other Native groups. Such a program would provide a forum for government agencies to explain management decisions and procedures and to outline proposed management and research goals.

Harvest monitoring and enforcement should be separate programs. Native hunters frequently equate the harvest monitors with "game wardens," an association that can affect the collection of harvest data and samples adversely. The U.S. Fish and Wildlife Service is considering a program for the sealing and tagging of marine mammal products, including walrus tusks (Taylor, pers. commun.).

6) Conduct Random Sampling of Reproductive Organs. — Whenever possible, samples of reproductive organs should be collected from female walrus in a manner not subject to the selection biases of the Native walrus hunters. In recent years, nonselective samples have been collected during U.S.-Soviet research cruises. Random sampling would allow estimation of reproductive parameters that is more representative of the population as a whole. There is a lack of agreement among biologists about some parameters, such as age-specific fecundity, and some data sets suggest that several parameters have been changing during recent years (see Reproduction). Further analysis of earlier data is needed, and additional samples are needed to determine current reproductive parameters and to assess recent trends. Precise, unbiased estimates are necessary for accurately assessing the condition of the population as well as for inclusion in population models.

7) Obtain Better Information on Distribution and Migration. — The gaps in our knowledge of the distribution and the migration paths of walrus are described above (see Distribution). Whether the walrus population is composed of a single, mixed stock or of two (or more?) fairly discrete stocks will have a significant bearing on the development of an effective management plan. Assessment of potential conflicts with oil and gas lease development, offshore mining, and commercial fisheries will require a better understanding of distribution and migration. A radio-tagging and satellite tracking project, coupled with genetic studies and examination of possible local or regional differences in contaminant loads, would provide answers to some of the questions. Further monitoring of the use of terrestrial haulouts, especially in the southeastern Bering Sea, may indicate that more of those sites should be protected from human intrusion.

8) Obtain Better Information on Food Habits and Benthic Fauna. — The seasonal and regional feeding habits of walrus are poorly known. In addition to the samples of stomach contents collected periodically in the harvest monitoring program in the Bering Strait region, samples should be obtained where walrus concentrate during winter and summer and in migration. Those samples, coupled with benthic surveys, could help to identify the most important feeding areas and kinds of food, and would contribute toward assessment of the status of food resources and the ecological interactions between walrus and the benthic faunal community.

9) Reduce Harvest Losses. — The unretrieved kill was estimated in 1958 to be about 40% of the total kill (see Exploitation—Recent Trends). The exact current proportion is unknown. Regulation of the calibers of rifles to be used for hunting walrus and restrictions against killing walrus in the water are ways to reduce the unretrieved kill. These and other measures should be developed in consultation with the Eskimo Walrus Commission, regional and village Native corporations, and other Native groups. It is important to take whatever steps are possible to reduce harvest losses.

10) Monitor Development Activity. — The responsible management agencies (Minerals Management Service and National Oceanic and Atmospheric Administration) should continue to assess and take such actions as necessary to ensure that development activities in the Bering-Chukchi region relating to oil exploitation or fisheries do not affect walrus or their habitat adversely. These agencies should take actions to ensure that critical feeding areas are protected. Monitoring or patrolling particular walrus haulout areas may be necessary when the animals are vulnerable to human disturbance.

11) Obtain Information on Contaminant Sources and Effects. — Walrus tissues have been found to contain high levels of several contaminants (see Conservation Issues—Environmental Contaminants). Additional research is needed to determine the nature, level, and sources of contaminants, the effects of those contaminants on the health and reproduction of walrus, and the potential dangers (if any) for people of the Bering-Chukchi region who consume walrus meat.

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PERSONAL COMMUNICATIONS AND SOURCES OF UNPUBLISHED DATA

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- Y. A. Bukhtiyarov, Pacific Scientific-Investigational Institute of Fisheries and Oceanography (TINRO), Magadan, U.S.S.R.
- J. J. Burns, Marine Mammals Coordinator (retired), Alaska Department of Fish and Game, Fairbanks, Alaska.
- R. Cameron, Game Division, Alaska Department of Fish and Game, Fairbanks, Alaska.
- F. H. Fay, Institute of Marine Science, University of Alaska, Fairbanks, Alaska.
- H. M. Feder, Institute of Marine Science, University of Alaska, Fairbanks, Alaska.
- G. A. Fedoseev, Pacific Scientific-Investigational Institute of Fisheries and Oceanography (TINRO), Magadan, U.S.S.R.
- C. W. Fowler, National Marine Mammal Laboratory, Seattle, Washington.
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- L. F. Pank, Alaska Office of Fish and Wildlife Research, U.S. Fish and Wildlife Service, Anchorage, Alaska.
- J. L. Sease, Department of Biology, Fisheries, and Wildlife, University of Alaska, Fairbanks, Alaska.
- G. F. Shields, Institute of Arctic Biology, University of Alaska, Fairbanks, Alaska.
- D. B. Siniff, Department of Ecology and Behavioral Biology, University of Minnesota, Minneapolis, Minnesota.
- S. J. Taggart, Department of Zoology, University of California, Berkeley, California.
- D. L. Taylor, Wildlife Assistance, U.S. Fish and Wildlife Service, Anchorage, Alaska.

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FINAL REPORT

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED
SPECIES OF WILD FAUNA AND FLORA

SIXTH MEETING OF THE CONFERENCE OF THE PARTIES
OTTAWA, CANADA
JULY 12 TO 24, 1987

PREPARED BY

JOHN J. BURNS
LIVING RESOURCES, INC
P.O. BOX 83570
FAIRBANKS, ALASKA 99708
(907) 479-2671

AUGUST, 1987

BACKGROUND

In mid-May, 1987, I was contacted by Mr. Ron Somerville, Executive Director of the Alaska Outdoor Council (AOC), concerning representation of that organization at the Sixth Meeting of the Conference of the Parties to the Convention On International Trade In Endangered Species Of Wild Fauna And Flora (hereafter referred to as CITES). The Alaska Outdoor Council, having been informed that certain matters of great importance to our state were under consideration at the Sixth Conference, had made official arrangements to participate as a recognized Non Governmental Organization (NGO). However, my participation was to be contingent upon the availability of funds to cover transportation, per diem, minor expenses and personal compensation. Those funds were not directly available to the Alaska Outdoor Council, though several alternatives were being explored at the time. It was estimated that the total cost of the project would require something on the order of \$ 8,000.

In early June, I was contacted by Mr. W. Lewis Pamplin, Jr., Director of the Alaska Department of Fish and Game's Division of Game. He had made the decision that one way or another, the required funds would be available, even if they had to come from his Division. On that assurance, I began making preparations for the conference. The most immediate need was to purchase reduced rate airline tickets within the required time period, which I did.

In early July, I received papers necessary for executing a professional services contract between myself (dba LIVING RESOURCES, INC.) and the Alaska Department of Fish and Game (see Attachment I). I was not party to all the steps involved in actually arranging for availability of the funds, and am therefore unable to comment on that. The net result, however, was that I was an official NGO representative of the Alaska Outdoor Council, being paid by the State of Alaska, to address issues of primary concern to trappers and to walrus hunters.

INTRODUCTION

CITES is an international convention that came into force in 1973. The guiding philosophy of the convention is that, "...wild fauna and flora in their many beautiful and varied forms are an irreplaceable part of the natural systems of the earth which must be protected for this and the generations to come;" and that, "...international cooperation is essential for the protection of certain species of wild fauna and flora against over-exploitation through international trade...."

About 95 nations are party to the convention at this time. However, that number is always subject to change, depending on whether a nation pays it's annual assessment and meets other obligations.

The convention was initially developed as the result of public

concerns, interest and support, most notably lead by the International Union For the Conservation Of Nature. A great many other private organizations were also involved. Private sector (=public) involvement is therefore a cornerstone of the convention and the rights and privileges accorded to official NGO groups has been maintained within the structure of the CITES process and is considerable. It includes the rights to address delegates, from the floor at committee and plenary sessions. NGO's are very active in working with delegates on all sorts of matters.

Since the Convention, by definition, is an agreement among nations, national governments play the primary role in the decision making process, though many responsibilities seem to have been delegated to quasi-governmental agencies. Many nations, including the U.S., have their own CITIES Authorities to deal with domestic enforcement of commitments agreed to by the parties to CITES. The World Wildlife Fund underwrites the costs of maintaining groups in several countries, that monitor traffic in wild fauna and flora. The International Union for the Conservation of Nature maintains a Species Survival Commission and a Trade Specialist Group. The CITES Secretariat, currently headquartered in Switzerland, functions as a quasi-governmental organization that oversees and coordinates all of these activities. Thus, there is a continuous and significant exchange of information between nations, about international trade in living resources. Attachment II is a guide to the convention. It may be a useful reference for explaining CITES goals and processes.

In my opinion, the Convention as it is intended to function, is a positive and effective conservation tool. There are many examples of species actually being driven to extirpation or, more importantly to extinction as the result of commercial demand for products that enter into international trade. Examples of some species include the rhinoceros, the elephant , several parrots and cockatoos and a variety of rare tropical hardwoods. However, interested parties must be vigilant in order to insure that national delegates have factual and accurate information available to them about the real status of an organism.

Central to the CITES process is the listing of species on one of three appendices, each designating a different level of species welfare and the significance of international trade. Listing on Appendix I means that a species is currently threatened with extinction and is or may be further affected by international trade. Listing on Appendix II indicates concern that a species may become threatened with extinction and that it does enter into international trade. Appendix III indicates no immediate concern about the threat of extinction, but signals that there is a need or desire to monitor international trade. A listing on any appendix triggers regulatory and reporting regimes for international trade, that are supposed to be commensurate with the level of biological threat. additionally, organisms that resemble others that are listed on Appendix I or II, may also be subject to restrictions on international trade.

Usually, the listing of any species that moves in international trade is, a priori, the subject of considerable attention and debate, either formally or informally. There are groups on the "free trade" side of issues that work to oppose most listings, even those that are needed to protect disadvantaged species. Conversely, there are many active groups on the "animal rights" side of the issues, that work diligently to obtain the most restrictive listings for as many species as possible, including those that may be abundant. Restricting trade eliminates markets which, in turn, removes the economic incentive to take the birds, fishes, plants or animals. CITES protection that is accorded to so-called look alike species, which may be very abundant, can result in trade restrictions on the abundant species.

At the international level, CITES provides the framework for two major things: 1) designating the status of living resources that move in international commerce, and 2) triggering national and international regulatory regimes. It is within this setting that the different interest groups, primarily represented as NGO'S, try to achieve their goals. Clearly, there is both opportunity and incentive to selectively use (and misuse) information that encourages delegates to vote one way or another.

PROJECT OBJECTIVES

Since The Alaska Outdoor Council and the Alaska Department of Fish and Game, each with slightly different priorities, were responsible for my participation in this project, my efforts had to respond to the stated desires of both. My instructions from the Alaska Outdoor Council were:

1. To represent interests of the fur industry, particularly those of Alaskan trappers, in activities, discussions and deliberations relevant to actions by or through CITES that affect Alaskan participants in that industry.

2. To establish liaison with other NGO, government and non-official groups, particularly U.S. and Canadian, that may be able to work together in efforts to discourage or defeat unnecessary threats to trapping and to trade in furbearers.

3. To try and obtain a functional understanding of the CITES process and, as appropriate, to recommend steps that can be taken within Alaska to assure adequate availability and presentation of biological and socio-economic data that may be needed in a CITES type forum.

4. To assist in efforts to defeat the Dutch proposal that would list walrus on CITES Appendix II and to comment on future steps that should be taken in Alaska, pertinent to Pacific walrus.

5. To determine the need for participation of Alaskan NGO's at future CITES conferences.

It was apparent to me that AOC's objectives were closely intertwined and that active participation in an effort to defeat the walrus proposal would amount to first-hand experience with diverse components of the CITES process and the potential effectiveness of

NGO status.

My tasks on behalf of the State of Alaska, as stated in the Professional Services Agreement, were:

1. To coordinate state input at the 1987 CITES Conference of the Parties, through the Alaska Outdoor Council.
2. To attend and participate in the Sixth Conference of the Parties, in Ottawa, Canada, beginning July 12, 1987.
3. To prepare a report about convention and conference activities, along with my observations and findings; subject report to be submitted to the Department of Fish and Game no later than September 1, 1987.

Clearly, objectives of the State of Alaska and of the Alaska Outdoor Council were mainly mutually shared and completely compatible.

ACTIVITIES AND RESULTS

My activities can be categorized as having occurred in three phases: preparations for the CITES conference (3 1/2 days); attendance at the conference, and associated travel (14 days); follow-up and preparation of the draft report (in progress).

The first phase of my efforts, though basic, were not particularly noteworthy. They included such things as arranging for travel and hotel accommodations, correspondence and phone conversations with some of the groups I was to represent, contacts with the AOC and ADF&G, accumulation and review of recent research results and management data about walrus, establishment of liaison with the Wildlife Legislative Fund of America, review of past CITES procedures and actions, and review of available documents relevant to the July 1987 conference.

I departed for Ottawa at 12:30 am on Saturday, July 11, and arrived at 10:34 pm, finally getting to the hotel at 11:45 pm. Participation in the conference was from the 12th to 23rd. I departed Ottawa at 9:50 am on 24 July and arrived in Fairbanks at 9:55 pm. The main body of this report will be an account of events at the conference.

Phase three of this project mainly involved preparation of this report, though several ancillary activities also occurred. The latter included follow-up contacts with other participants, a presentation about the conference made to Interior members of the AOC and invited guests, and 2 meetings with members of the Alaska Trappers Association and their invited guests.

The following is a detailed though summarized account of my efforts at the CITES conference. It also includes my perceptions of events. My presentation is in the form of a review of daily events intended to provide information on how I found the system to work and what I, as an NGO, could or could not accomplish.

Sunday, July 12 (day 1): Primary goals were to register, confirm my credentials, pick up the CITES documents (voluminous!), meet key initial contacts, determine the probable time table for consideration of the walrus proposal, attend the opening ceremonies, and try to develop some sort of strategy.

I registered during the morning, picked up 2 arm loads of documents and set out to find my fellow NGO representatives. Locating my fellow NGO's turned out to be an event of significance. I walked into the "operations center" of what were identified as conservationist lobbyists, which I considered myself to be. Though some conservationist organizations were part of the coalition that funded the operations center I was in, most seemed mainly inclined toward protectionist and animal rights causes. In all respects the large room was indeed a control center complete with video equipment, xerox machines, computers, phones, tables of pamphlets, typewriters, maps and other equipment. The place was bustling with activity and the few people I talked with were obviously energetic, very committed and very sincere and eager to accomplish their goals within the CITES arena. After informing folks of where I was from and what my intentions were, I was told that I did not belong there and was politely shown to the door. The whole experience was very useful and greatly influenced my strategy and enthusiasm.

To generalize greatly, there seemed to be 4 types of NGO organizations active at this CITES convention; protectionist and animal rights groups, mainline conservation and management groups, wildlife trade groups (i.e. fur and pet industries), and seemingly non-aligned observers.

I eventually located the operations room that was sponsored and supported by the Canadian Wildlife Federation. It was similar to the set up I previously saw, though smaller and without all the video equipment. The services of translators were available. There I met Ms. Carol Porter, of the Wildlife Legislative Fund Of America. Ms. Porter introduced me to other NGO's that would be using the operations center, provided some orientation, and explained some of the CITES procedures. It was arranged that each day, after the CITES meetings were recessed, there was to be a debriefing meeting. Purpose of the daily meeting was to review events of the day, make individual progress reports, exchange ideas, enlist the support of sympathetic NGO's, obtain typing and translation services as needed, provide updated material and discuss other matters as appropriate. The official languages of the conference were English, French and Spanish. NGO's were advised to approach delegates, using one of those languages as appropriate. As things turned out, most delegates had a fair to good understanding of English.

Opening ceremonies of the Conference began at 5:00 pm and were to be followed by a reception given by the Canadian Government. Before the opening ceremonies, I briefly introduced myself to one of the U.S. delegates and came away with the very strong feeling that either NGO's were a nuisance to them, or that walruses were

something they did not want to discuss. I tried to find out when the walrus proposal was likely to be brought up for consideration, but the gentleman I spoke with did not know. I decided to try and locate delegates from other countries that have walruses within their jurisdictions, to determine their attitudes toward the Dutch proposal, and to find out when the proposal might come to the floor for consideration.

By the time of the reception, I had decided that it would be prudent to begin working simultaneously on two different approaches to the immediate problem of the walrus proposal: to try and get the Dutch to withdraw it prior to consideration at the plenary session, and to lobby delegates to vote against the proposal in the event that it might come to the floor.

During the reception by the Canadians I spoke with delegates from Hungary, England and Denmark. The Dane seemed inclined toward the proposal, though she indicated there was a bit of a conflict with respect to the wishes of the Greenland Home Rule Government, toward which Denmark has obligations. The Hungarian listened politely but asked no questions. The British representative was very interested in the matter and asked many questions about the biological status of walruses, particularly those of the Bering Sea stock. He informed me that the walrus proposal was likely to come up for discussion by the Scientific Committee on July 16 or 17. I then located representatives from the Greenland Home Rule Government and introduced myself. That contact turned out to be a very significant one.

I returned to the hotel very late and began drafting the outline of arguments against the Dutch proposal.

Monday, July 13 (day 2). In line with the decision to work along two parallel tracks, my goals for this day were to meet with as many delegates as possible, to try and organize a meeting of "range" states (nations that have populations of walruses), to prepare a paper of key points for other sympathetic NGO's to use in their conversations with delegates and to meet with the marine mammal specialists from Canada and Denmark (on loan to Greenland). Each of those was accomplished.

During part of the morning I attended the plenary session and made contact with the Soviet delegates during the first break. The Soviet delegate was receptive to my points and agreed to meet with other delegates from range states, if I could make appropriate arrangements. During the remainder of the morning I was able to arrange for use of the operations room provided by the Canadian Wildlife Federation, and to contact other delegates from the range states (U.S., Canada, Denmark/Greenland, Norway and the U.S.S.R.). Dr. Eric Born, the Danish biologist on loan to Greenland assisted me in contacting some of the delegates. We met for about 1 1/2 hours, starting at about 2:45 pm. We exchanged views about walruses, I made my pitch in opposition to the Dutch proposal and I asked them

if they would consider agreeing on a unified statement from the range states, if I prepared a draft for their editorial review. By the end of this mini-meeting I felt that all but Norway might either oppose the Dutch proposal, or at least not speak in favor of it.

Use of the NGO operations room was critical to me, for holding the meeting of range states. It was in the hotel close to the conference hall and was suitable for the meeting. Mr. Kenneth Brynaert, Executive Vice President of the Canadian Wildlife Federation, arranged for everyone to vacate the room for purposes of holding the meeting. That was a considerable inconvenience for which he deserves much thanks. The opportunity for an NGO to organize and convene such a meeting speaks to the role that NGO's can play.

During the daily debriefing I informed the NGO's of the days events, made note of their progress in meeting delegates, and arranged to have 3 documents typed. These would be, 1) the talking points for NGO's, 2) the "statement" of range states and 3) my critique of the Dutch proposal.

In the early evening I again met with the Danish biologist (Dr. Born) and with the representatives from Greenland. I learned a little about how the Greenland/Denmark connection works in an international forum and, more importantly, the rules by which members of the European Economic Community (EEC) operate when voting at an international meeting. EEC members are constrained to all vote the same way, or to abstain as a block. That put Denmark (an EEC member) in a very interesting position. They vote on behalf of themselves and for Greenland. Greenland was urging Denmark to vote against the Dutch proposal (The Netherlands is a member of the EEC), though at least one member of the Danish delegation was in favor of the proposal to put walruses on Appendix II. The Dutch would have a bit of a problem defending a proposal which they and all other EEC members might have to abstain from voting on, if the Danes decided to heed the wishes of Greenland.

During the late evening I drafted the statement of range states and continued working on my speech for a potential debate in the Plenary session.

Tuesday, July 14 (day 3). Goals for the day were to lobby as many delegates as possible, to meet for the second time with the representative from the U.K., and to begin working directly on the Dutch to consider withdrawing their proposal.

Off and on, I attended the meetings of the scientific committee. This committee debates all proposals and makes recommendations to the committee of the whole (i.e. the plenary meeting). During breaks and at lunch I met separately with delegates from Zimbabwe, Tanzania, Japan, India, Argentina, Ecuador and St. Lucia. Dr. Born and Mr. Hans Jacob Helms (of the Greenland Home Rule) arranged an evening meeting with the Dutch. I was also able to talk again with

a delegate from the U.K. about why the Dutch proposal was a poor one, and why I thought that walrus did not meet the criteria for listing on Appendix II.

Dr. Born had successfully arranged for a meeting with the Dutch delegation, as time would allow, during the evening. That meeting took place in the hotel room of the 2 Dutch delegates, starting at about 9:35 pm and lasting to about midnight. Five people were present including the 2 delegates from Holland, Dr. Born, Mr. Helms (Greenland Home Rule Government) and myself. A considerable part of the meeting was quite strained and argumentative, involving as it did the conflicts associated with pride of sponsorship on one hand and severe criticism of the proposal on the other. One of the Dutch delegates was a scientist (botanist) and became concerned about the scientific credibility of the proposal, though he adamantly defended the necessity to take some corrective action to insure that Pacific walrus are subject to some (any) kind of a meaningful management program. Lack of management and the perception of unregulated "head" hunting for ivory, were the main factors that motivated introduction of the proposal by the Dutch. In my opinion they were both very reasonable concerns, based on the information they were provided. However, magnitude of the problem is not as great as the Dutch were lead to believe.

Toward the end of the meeting, after the discussions became less charged, I suggested that the Dutch withdraw the proposal and that we explore other ways to make their concerns known. They could not agree to that at the time, though they did agree to ask for postponement of the matter in order to get more information and to check things out with superiors in Holland. A good first sign!

Wednesday, July 15 (day 4). My goals were to meet with as many of the delegates as possible and lobby against the walrus proposal. At last evenings strategy meeting, some of my fellow NGO's had told me that some delegates they lobbied, especially those from nations that depend on production of raw materials, were easily persuaded to oppose the listing of such an abundant species as the walrus.

My notes reflect that the EEC nations met in closed session this morning. It had great relevance to my cause and I was informed of the outcome with respect to the walrus proposal. Great Briton suggested that the Dutch withdraw the proposal primarily because walrus did not meet the Berne Criteria for listing on Appendix II. Such a move by the Dutch would have several advantages. They would not have to defend a scientifically inaccurate proposal, the EEC nations would avoid the embarrassment of having to abstain in a vote, and the Greenland/Denmark connection would remain in tact without a crucial test. The advantages stated above are strictly my speculations.

I spent the day attending the scientific committee deliberations, which were fascinating, and lobbying delegates (just in case!). I was able to speak with delegates of Nepal, Isreal, Niger, Gambia,

Cameroon, France and Senegal. I also met with with several members of the press corps, at their request. At the NGO evening meeting the feedback was that the walrus proposal was probably dead. My opinion was the same, though I remained concerned about the few final skirmishes required in order for all involved parties to come away with something positive. There was virtually no direct feedback from the U.S. delegation, so I had little idea of their concerns or approach to any compromise meetings.

Lloyd Lowry (ADF&G), Matthew Iya (Alaska Eskimo Walrus Commission) and Ron Nalikak (Inuit Circumpolar Conference), arrived from Alaska during the afternoon. We had opportunity to meet and discuss matters at an evening reception sponsored by an organization called Indigenous Survival International. I informed them that I thought the Dutch proposal would eventually be withdrawn and that other than attendance of a U.S. delegate at the meeting of walrus range states, I could not get any action from them, nor predict what they might do.

Today I saw my first of several documents produced at this meeting by NGO's favoring the listing of walruses (ECO, vol. 1, issue 1). It is included, along with other documents pertinent to the walrus issue, as part of Attachment III. It indicates the capabilities and approaches that can be used to influence delegates.

Thursday, July 16 (day 5) Goals were to circulate my "Statement of Range States", seek concurrence in the event it may have to be used, meet with Canadian wildlife specialists, lobby delegates and begin to work on fur and trapping issues.

Another very timely NGO document favoring the listing of walruses, appeared today. This one (also part of Attachment III) attempts to explain why walruses do meet the Berne Criteria for inclusion on Appendix II. It should be noted that it follows, by 1 day, the U.K. position that walruses do not meet the Berne Criteria.

I circulated the draft Statement of Range States to the appropriate delegates, to hold until it might be needed. The Soviet delegate signed his copy immediately and gave me his permission to circulate it as I saw fit. Other range state delegates kept their copies.

I attended the scientific committee meeting, off and on, throughout the day, lobbied a few delegates (Pakistan, India, Kenya and Norway) and generally began to focus on issues other than walrus. I met with several Native representatives from northern Canada and discussed trapping issues in general and protectionist threats to trapping in particular. I did the same with representatives from the provinces of British Columbia, Yukon and Northwest Territories. It was interesting to have a little more time to look around at the exhibits, pick up some of the voluminous propaganda and watch some of the ever present videos, a good many of which show very gruesome horror scenes of animal abuse. One of the especially gruesome ones showed a supposedly "typical" head hunting expedition for walrus, on

St. Lawrence Island (note another effective method used in convincing delegates to vote the way one would like).

The NGO debriefing took place as usual, after the days official meetings were ended. I spent the evening with the Danish biologist and the Greenlanders and we solved all of the problems of the Arctic (at least the major ones). Actually, we were trying to figure out a better way to improve the exchange of information on a continuing basis.

Friday, July 17 (day 6). Somehow it was beginning to feel like I was in Ottawa at least 2 weeks already! My goals were to work with Lowry and Iya where possible, lobby some delegates (I was really beginning to enjoy that), confirm that the Dutch would seek a postponement of the walrus debate, and continue to gather information on fur issues to take back to Alaska.

The Dutch were as good as their word and, when the walrus issue came up, they asked for a postponement until Tuesday, July 21. I would have preferred that they had withdrawn the proposal. Not having done so would mean that the opposition would mount every kind of pressure they could bring to bear over the period from today to Tuesday. Though it would hopefully be ineffective, certain things, particularly documents circulated to delegates, would have to be reviewed and responded to. One such document appeared today and was entitled, "Supplemental Biological Information on Walrus (*Odobenus rosmarus*)" It was a blatant misuse of data, but again demonstrated one aspect of the methods and capabilities of some groups that take the CITES process very seriously. The document in question is also part of Attachment III. During the afternoon I obtained yet another document from the protectionist side entitled, "Walrus: Species In Crisis". Those 2 documents prompted Lowry and I to begin work on a joint document (Population Status and International Trade in Pacific Walrus, *Odobenus rosmarus divergens*).

Lowry, Iya and I, along with Canadian Inuit representatives participated in a rather lengthy press conference and interview session. I think it was arranged by the Canadian Inuit and designed to discuss the protectionist threats to rural life-styles and economies. I did not hear of any feedback from that session.

The CITES Conference had been chosen as the appropriate happening at which the formal signing of The Porcupine Caribou Agreement was to take place. That happened today. There was great pomp and circumstance, glorious speeches by U.S. Dept. of Interior and Canadian officials and by Natives from Alaska and the Yukon. The Great State of Alaska was not to be seen or heard. I got depressed about our absence and went off to lobby someone (it turned out to include Switzerland, Suriname, Bolivia and Costa Rica).

The Dutch requested a meeting with delegates of the walrus range states and NGO's from Alaska. That meeting began about 7:00 pm and lasted until 9:30 pm. In my opinion, it was the required procedure

in which they listened to what they already knew by now, informed the principal parties of their concerns and explored ways to withdraw the proposal but still get their points across. I think it was a very useful exercise for those of us from Alaska, especially Matthew Iya. All parties were made aware of the extent of international scrutiny, the unacceptable status of walrus management in Alaska and the unacceptability of head hunting as practiced only in Alaska. Once again the Greenlanders, especially Dr. Born, were particularly helpful to the Alaska position. Also, it was obvious to me that Lowry and Iya had been able to get through to the U.S. delegator.

The nuts and bolts of a trade out between the Netherlands and the U.S. were to be worked out tomorrow morning, starting at 9:00am.

Saturday, July 18 (day 7). The goal was to assist the U.S. delegate to develop a position that satisfied the Dutch, but strongly opposed their proposal.

The meeting was held as scheduled. The Alaska coalition (Lowry, Iya and myself) was present, as was a representative from Canada and Greenland. Most of the mutually desired points were quite obvious, at least to some of us. Lowry and Iya handled most of the discussions from the Alaska "side". I gave a hand written list of key points to Dr. Nancy Foster (FWS Office of Endangered Species) for consideration by the U.S. delegation in the formulation of their official statement.

The agreement was that the Dutch would make some introductory statements when the proposal came up in the scientific committee. In their remarks they would state their concerns about walruses and ask for comments from the range states that wished to be heard. The U.S. would address the points mutually agreed on. After the range states were given the opportunity to speak, the Dutch would graciously withdraw their proposal, as opposed to asking that it be left on the table for consideration in plenary session.

That was a satisfactory solution whereby all parties would be put on notice that the walrus management situation in Alaska was being scrutinized and the management situation had to improve and, we would not be faced with a nasty floor fight during which all the horror stories about walrus hunting and black market trading of ivory would be discussed at length on the floor.

After that meeting I met with a small group of NGO's and tried to organize a meeting of those interested in furbearers, and fur trade issues.

I spent an enjoyable afternoon with Lowry and Iya.

Sunday, July 19 (day 8). Today was a relaxed sort of work day. Iya, Nalīkak and I participated in a picnic/outing sponsored by the

Canadian Wildlife Federation. There I met and talked with delegates from Sierra Leone, Zambia, Austria and Zaire. However, my main interest had now shifted to furbearers, and I spoke to several people about that. We got back to the city about 8:30 pm

Monday, July 20 (day 9). My main goals today were to get the Lowry/Burns document typed in English and French versions, work more actively with folks interested in furbearer related issues, and listen to the CITES deliberations.

Prior to the arrival of Lowry, interests of the State of Alaska were, as I understood things, to be dealt with by me, (so far as discretely possible), by a representative of the International Association of State Fish and Game Commissioners and, presumably by the official U.S. delegates. If a representative of the International was present at this conference, I was certainly unable to locate him or her, and there was no indication of any sort that the organization was representing Alaskan issues. There were no representatives in the U.S. delegation that were from Alaska and could knowledgeably speak to Alaskan issues on other than a policy or agency level.

Several issues of great importance were dealt with today in the scientific committee. Constructive and proper actions were recommended on, among other things, certain endangered birds that enter into the pet trade. It was gratifying to watch the system working to meet a real conservation needs. I spent most of the day listening to the deliberations meeting with various representatives from throughout northern Canada, and watching propaganda videos about various birds, mammals and reptiles.

At the evening meeting of NGO's, I arranged for an informal meeting of people that were interested in furbearer issues, to be convened on the evening of the 22 nd.

Tuesday, July 21 (day 10) Goals were to watch the proceedings on walrus, continue to make contact with people interested in furbearers and gather useful material to take back to Alaska.

The walrus proposal came to the floor and was disposed of in the manner previously arranged. The Dutch delegate made his points and I would urge that his stated concerns be dealt with in a meaningful way. The record of the floor discussions are also included as part of Attachment III. I asked one of the U.S. delegates for a copy of his statement, but my request was refused. However the Dutch delegate kindly provided me with copies of his statement, as well that of the U.S. delegation.

Today the animal rights people were really focusing on an anti-trapping program. I watched a video that showed lynx trapping. It made me and others around me almost ill in its gory vividness. There are over 700 active and involved people at this conference and

a majority of them could not avoid seeing this video, even if they wished to. The television is set up in the main corridor of the conference hall. I have been trapping since my youth and have never witnessed such apparent torture of animals in traps. I must say that without doubt the video had its intended effect on the audience. I can not imagine that such a video could be made without being completely staged. This sort of extreme emotional manipulation is going to be a fact of life that trappers have to deal with. The bobcat/lynx issue is already being raised in the CITES arena and one of the gentleman I met today was vigorously lobbying for more restrictive regulations on North American cats.

This evening after the NGO debriefing I met with those people that showed up to discuss furbearers and trapping. The list of interested people (not all of which were at our little meeting) that I was able to compile is included as part of Attachment IV. As it turned out, it was very hard to focus on any single and crucial issue, since there was no immediate crisis at this CITES conference. Perhaps the only concrete accomplishment at the fur meeting was to exchange names and addresses so that a communications network can be put in place. This will require follow-up.

Wednesday and Thursday, July 22 and 23 (days 11 and 12). Goals were to continue following the CITES process, make myself available to NGO's that wanted my assistance (reciprocity), continue talking furbearers, visit the offices of the Canadian Department of Oceans and Environment, and pick up available materials to take back to Alaska.

These 2 days are combined mainly for brevity and because there are few additional insights to be gained from my activities. I spent half a day with Canadian marine mammal specialists at the Dept. of Oceans and the Environment and about 2 hours with the president of a U.S. trappers organization called the National Trappers Association, Inc. I Also had the distinct pleasure of meeting and talking with Mr. Arthur Frayling (International Fur Trade Federation) and Mr. Joseph Poser (a fur merchant and broker). Both are influential in the fur trade and both are capable of funding programs dealing with trapping and trappers. Any information network should include them.

The remainder of my time was spent attending the CITES deliberations, updating notes of the meetings, mailing papers back to Alaska and working with other NGO's.

CONCLUSIONS AND RECOMMENDATIONS

I shall approach this section of the report in 3 phases: general comments, those specific to walruses and those specific to furbearers and trapping.

CITES is a very important convention affecting resource management on an international level. In many respects it functions as an

international version of our domestic Lacey Act, except that a very active program for monitoring international trade has been established and is continuing to be expanded. A program is being instituted which will link parties of the convention via computer terminals. CITES is the well intended product of private conservation groups throughout the world, as well as the product of many concerned governments. We have to applaud it's increasing effectiveness, while vigorously trying to insure that CITES actions are objective and based on realistic data of several kinds including but not limited to biology, ecology and economics.

In my opinion, the walrus proposal was withdrawn because it did not pass the first test of biological necessity for the proposed action and it did not meet even minimum standards for accuracy. However, those failings were recognized and vigorously brought forward because people that were very familiar with the issues were at the conference of the parties. Prior to the conference, many scientists reviewed and commented on the Dutch proposal. So far as I am aware, editorial comments as well as updated or new data were sent to the U.S. CITES Authority, to the Dutch, to the CITES Secretariat and to others. None of those comments seem to have found their way to the delegates at the conference either in the form of a more accurate proposal or as supplementary information sheets. Conversely, the protectionist NGO's were producing "updated scientific data" as the conference was in progress.

Attendance at a CITES conference is very costly. The people and the government of Alaska will be informed of CITES actions and activities if they demand to be kept informed by the U.S. CITES Authority, if they establish more formal lines of communications with organizations such as the Wildlife Legislative Fund of America and with the office of the CITES Secretariat. I do not anticipate a great many issues that will directly affect Alaska. However those that will affect us are very important. When an "Alaskan" issue comes up, we must be prepared to represent ourselves. The 1987 Conference amply demonstrated that no one will step forward to represent our interests.

We, as Alaskans, should not oppose CITES actions directed at resources that really need international protection from excessive trade. That means we should critically examine the actual biological status of a resource in question. If international trade is detrimental to endangered or threatened species, we should support actions to limit or more closely monitor that trade.

The NGO operation centers (there were 2) are critical to the functions that NGO's serve. These centers are funded by coalitions of NGO's that have common, or at least compatible goals. The center I worked out of was financed by the Canadian Wildlife Federation. At future CITES conferences where Alaskan matters are on the agenda, we should consider paying some portion of the costs for an operations center. In July, I was operating strictly on the shirt tails of the CWF.

I will now turn specifically to the walrus issue. The Dutch proposal was actually drafted in the U.S. Any party nation can introduce a proposal and any interest group can look for a national delegation to carry a proposal forward. CITES operates on the international level. Other levels of concern to resource users are at the national, state and municipal levels.

In my opinion, even though the Dutch proposal was withdrawn at the CITES convention, the general issues are still with us and in an immediate way. I anticipate that all of the energy and work that those in favor of the proposal put forward, will be focused on the up-coming reauthorization hearings for the Marine Mammal Protection Act. The CITES Conference will probably turn out to have been, in part, a dress rehearsal for those hearings. The protectionist organizations are now very familiar with the issues, having lobbied them from their perspective. The pamphlets, brochures and position statements have, in large part, been drafted and the horror video will again be ready to go. This time the "parties" will be congressman rather than international delegates. I would recommend that, so far as possible, the State try and accomplish 3 things prior to the reauthorization hearings: 1) make some substantive progress on return of management; 2) encourage FWS to institute the sealing regulations; and 3) work with the Eskimo Walrus Commission to eliminate the practice of head hunting. The latter will require development of alternative uses for walrus parts and development of locally based guiding operations. The thrust of the Dutch proposal was that the U.S. does not have an effective walrus management program. That situation should be rectified as soon as possible.

Attachment II is an accumulation of documents pertinent to the walrus issue as it was addressed at the CITES conference. That attachment deserves careful study as it is a practical primer to what gets done, how and by whom. Note the organizations that claimed sponsorship of the documents.

As previously stated, furbearer and trapping issues were a bit difficult to focus on at this CITES conference, if only because there was no immediate crisis. There was a message in that for me. That message was the necessity to establish a communications network with trappers and fur industry people and try and focus on key issues that people agree on. At the moment there are a lot of different organizations that are very interested in fur related issues and they were well represented at the Ottawa conference. However, it was as if they were unable to gear up for anything but a defensive type of strategy. Everyone will have their chance at the next CITES conference (if not sooner). Most certainly, bobcats, lynx and perhaps wolverines will be proposed for listing on Appendix I or II.

The lynx issue will be a very interesting first because the delegates have so far not had to deal with cyclic species, and especially one that fluctuates between such extremes of abundance and scarcity.

The wolverine issue will be difficult for 2 reasons. It is a "rare" species even when abundant, and in the contiguous 48 states, its range is dwindling due to human expansion. That will be interpreted to mean that although the wolverine population in Alaska remains healthy, throughout most of their range they will be considered to be threatened, or worse.

Readers are referred to Attachment IM for a compilation of fur related information that I was able to obtain while in Ottawa. Of note is the list of contacts for future follow-up.

ACKNOWLEDGMENTS

For orientation and help while at the CITES conference I, on behalf of AOC and ADF&G, am indebted to Ms. Carol Porter (WLFA) and Mr. Kenneth Brynaert (CWF). It was a distinct pleasure to work with the modern version of the Danish Vikings, in the service of the Greenland Home Rule Government, especially Dr. Eric Born (a scientist and statesman), and Hans Jacob Helms (now I feel obligated to read "THE SAGAS"). Dr. Arthur Mansfield of the Canadian Department of Fisheries and Oceans was most helpful in providing and presenting information about walrus in Canada.

My fellow Alaskans, Lloyd Lowry and Matthew Iya, were much appreciated. Their activities forced a closer connection with the U.S. Delegation and both contributed to the final agreement with the Dutch. Their arrival was an increase from 1 loose cannon on a rolling deck, to 3.