

ALASKA LEGISLATURE COMMITTEE FILLES 1987-1988 8672

4876 HRES ANWR: STATE AGENCY COMMENTS

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Opinion

Thursday, January 15, 1987

Why develop ANWR with oil prices low?

I am unequivocally opposed to the Interior Department recommendation of full leasing of the coastal plain of the Arctic National Wildlife Refuge for oil and gas production. My reasons for arriving at this decision are based on my primary concern for the environmental integrity of this unique area and the preservation of the wildlife populations dependent upon it, both for themselves and the subsistence needs dependent on them.

However, the national and international debate now going on over whether oil and gas leasing and development should occur will be decided primarily on economic grounds. With the current state of Alaska's economy, it is natural that the governor and the Legislature will be desperately thrashing around to come up with any possible sources of state income.

Under current formulas, the state of Alaska would be awarded 90 percent of oil royalties from production within a federal wildlife refuge. This is a big carrot for state endorsement of opening up ANWR, even if it doesn't take into account the limited probabilities of finding another Prudhoe Bay there, the long delay in obtaining returns, nor the far greater certainty of unacceptable negative impacts on every major wildlife species found within ANWR. (It is highly probable that this present Alaskan oil formula will be revised to concur with other state formulas should oil be found in ANWR.)

Under ANILCA, Section 1002(h), a full assessment of the fish and wildlife resources, as well as the oil and gas potential of the coastal plain was required.

The process, initiated under the Reagan administration, had a distinct bias from the beginning toward opening up the coastal plain.



Celia Hunter

Views expressed here do not necessarily represent those of the Daily News-Miner

As a matter of fact, the Alaska regional director of USF&WS has issued a virtual "gag order" to all his employees, ordering them to make no public comments on any matters relating to the 1002 report.

If we look at the current oil and gas situation on the North Slope, the arguments for immediate opening up of the ANWR coastal plain don't make good sense. In the central part of the North Slope, where state land ownership has encouraged intensive oil development, Conoco Inc. notified the state of Alaska in November 1986 that it would be shutting down its Milne Point operation because of slumping oil prices. Estimates of recoverable oil from Milne Point exceed 100 million barrels.

Other fields on the North Slope with known reserves are being kept out of production because of low oil prices. Obviously the oil industry knows how to manage its own resources for maximum profits to themselves. Isn't it interesting that they seek early leasing of the coastal plain—while oil prices are low and lease prices could be obtained for extremely low figures?

On another front, the Reagan administration has consistently opposed all oil and gas conservation measures passed by Congress. The most recent example of this bias against oil conservation was

Reagan's veto of the bill to require use of energy efficient standards for all electrical appliances manufactured in the United States. Electrical appliances consume 30 percent of the electrical output of the United States.

The bill would save the United States approximately 20,000 megawatts of electric power by the year 2000. The total energy savings from the bill would exceed the amount of oil that could be produced reliably from a field similar to the proposed coastal plain field.

In addition, this administration is attempting to remove the restrictions on the manufacture of large gas-gobbling automobiles, as well as the 55 mph speed limit, both of which account for large savings of oil. At the same time, filling up of the reservoirs of the strategic oil reserve has been terminated by presidential order. With present cheap oil prices, this reserve could be maintained at capacity and afford a U.S.-controlled supply protecting us from another oil embargo impasse.

While the state of Alaska is pressing for opening up the coastal plain, it also is lobbying Congress to permit the export of North Slope oil to Japan, and it is pushing for a right of way permit for the gas pipeline between Prudhoe Bay and Valdez, to feed an LNG plant designed solely for export.

Where does the national interest come into all of these machinations? U.S. national energy policies diametrically oppose all oil and gas conservation, while they favor exploitation of every possible oil source within federal conservation units. Oil fields all over the United States have been shut down because of low oil prices, and the oil glut, but still the push for exploitation of the Arctic coastal plain of ANWR is full speed ahead.

The economics used in the USF&WS 1002 Report use oil prices between \$33 and \$40 per barrel to justify development of this field. Oil experts continue to doubt that such oil prices will be reached in this century. If realistic oil price figures are used, then the economics of ANWR development lose much of their appeal.

What will Alaska lose if development of ANWR is pushed? The body of the 1002 Report, written by USF&WS biologists, doesn't track with the executive summary produced by Interior officials.

The report projects a "population decline or distribution change for 20-40 percent of the Porcupine caribou herd" due to oil field development. The same sad story concerns each of the major wildlife and bird populations which use the coastal plain. The negative impacts defy mitigation, because the area involved is irreplaceable.

Musk oxen have recently been transplanted to the coastal plain herd after being exterminated in the 19th century. The herd has been slowly increasing, and is in excellent condition. This entire herd will probably be eliminated, since wild musk oxen are highly intolerant of human activities, and extremely vulnerable to predation by humans.

The subsistence economies of Native peoples of Arctic Village, Venetie, and Canadian Natives throughout the upper Yukon Territory are highly dependent upon the Porcupine caribou herd. For this reason, Canadian biologists testifying on the 1002 Report opposed opening up of the coastal plain for oil development.

The most vital area of the coastal plain is the caribou calving grounds. At a recent conference involving biologists from all major agencies and industries, the vir-

tually unanimous finding was that under no circumstances should leasing occur within these calving grounds. It was agreed that exploiting the calving grounds would decimate the Porcupine caribou herd.

Many other important questions dealing with oil and gas development have not been adequately addressed in the Interior 1002 Report. Among these are the scarcity of available water and gravel sources, both items essential to oil field roads, pads, and drilling operations.

Obtaining these essential items could create far greater havoc with the natural environment of the coastal plain than has occurred in the Prudhoe Bay area, which happens to have handy sources for both gravel and water.

In short, basing a demand for exploitation of the oil and gas resources of the ANWR coastal plain on either national security or the national interest fails to take into account a whole range of alternatives, primarily conservation measures, which would effectively replace whatever oil may exist in the coastal plain.

We aren't losing any oil that may exist there. We can defer its use until we have a much greater need for it in the future, when hopefully technology will have been developed enabling oil extraction with far less impacts than present methods.

Our national interest and our state interest in maintaining the integrity of this last small portion of the only Arctic coastal area within U.S. boundaries far outweigh the transient short-term benefits to be derived from oil and gas exploitation now. Failing to protect these irreplaceable values will indict this generation for a deplorable lack of responsible stewardship of our land.

National security and the Coastal Plain

Sunday, January 4, 1987, The Anchorage Times

Editor's Note: This is the second of three columns devoted to the issue of developing oil and gas resources of the Arctic National Wildlife Refuge.

Any possible oil reserves in the Arctic National Wildlife Refuge, with only a one in five chance of being found, could well be uneconomical to produce at current and realistically projected oil prices. My last column examined the reasons and noted that the same dilemma prevents several proven North Slope fields from being tapped or from continuing production.

Nevertheless, this reality did not stop the Department of Interior from proposing that the entire Coastal Plain be opened to oil and gas leasing. Nor does this situation dampen the oil industry's interest in drilling for oil in that wildlife-rich area.

The reason?

National security.

The claim goes something like this: As domestic oil production rapidly declines, the United States becomes increasingly dependent on foreign sources of oil. This subjects the nation to the possibility of a severe interruption of oil supplies, which jeopardizes the nation's security.

Simplistic and emotional rhetoric like this is meant to play on the patriotic fervor of every citizen. The presence of the Soviet hockey team last week in Sullivan Arena posed more of a threat to national security than a future without unproven oil from ANWR.

In fact, our national security (whatever that truly means) is seriously threatened by exhausting the last of our domestic supplies because this brings us closer to the inevitability of complete dependence on foreign oil.

Each day, the United States demands about 16 million barrels of oil, and domestic supplies can only satisfy half that. At those consumption rates, the mean estimated supply of 3.2 billion barrels that might be found across the Coastal Plain would provide the U.S. with about six months worth of oil. I personally don't feel that nominal amount of oil is worth risking internationally significant wildlife and wilderness resources.

But whatever your personal beliefs, you have to admit a six-month supply of oil doesn't secure the nation for very long. It's

Environmental perspective



by
Mike
Matz

a sad fact, but we will always be largely dependent on the two-thirds of the non-communist world's oil supply that comes from the Middle East.

However, the oil flow from the Middle East is now stable. Thanks to a dying OPEC cartel, current oil prices are rock-bottom low, and predicted to stay low into the next century.

Common sense therefore dictates stockpiling foreign oil in our nation's Strategic Petroleum Reserve, which could be tapped if foreign supplies are interrupted. At the same time, we should continue aggressive energy conservation programs, while industry strives to improve technology to enhance oil recovery.

In the last year, however, the Reagan administration halted deposits into the Strategic Petroleum Reserve at a level less than half the minimal 750 million barrel target. Reagan also vetoed an energy conservation bill that would have saved a billion barrels of oil annually.

Now, instead of encouraging industry to improve oil recovery techniques so more oil can be pumped out instead of wastefully left in the ground, the administration wants to allow draining every last drop of the nation's presently recoverable oil.

The undeveloped oil that may or may not lie underneath ANWR is not the last barrier that stands in the way of a Russian invasion or that prevents long lines at the gas pumps.

But emotional rhetoric is a very persuasive tactic. If development advocates persuade Congress to open the coastal plain because otherwise the country is in peril, what does it mean to Alaska?

Anchorage environmentalist Mike Matz is a field representative for the Sierra Club.

12/21



by
Mike
Matz

ANWR and economics

Editor's note: This is the first of three columns pertaining to the recently released 1002 Report on the issue of developing oil resources on the Arctic National Wildlife Refuge. A public hearing on the report will be held Jan. 5 in Anchorage. Written comments may be sent to the U.S. Fish and Wildlife Service, 2343 Main Interior Building, 18th and C Sts., N.W., Washington, D.C. 202409, until Jan. 23.

Christmas came early to the oil industry.

The Interior Department's draft 1002 report on the Coastal Plain of the Arctic National Wildlife Refuge contains an anticipated recommendation that Congress allow full leasing of its oil reserves, which "could be the largest discovered since Prudhoe Bay and Kuparuk River," according to the biased report.

With the report's release, a large lump of coal was dropped by the Department of Interior into the Christmas stockings of environmentalists, natives who pursue subsistence lifestyles, and millions of Americans who care about protection of wildlife and its habitat. The report acknowledges that "long-term losses in fish and wildlife resources, subsistence uses, and wilderness values would be the inevitable consequences of a long-term commitment to oil and gas development, production, and transportation."

As a reminder, ANWR was established by executive order in 1960, and expanded in 1980 by law, for the purposes of "conserving fish and wildlife populations and habitats in their natural

diversity," and "providing the opportunity for continued subsistence uses by local residents."

But dollar signs dance like sugar plums in the heads of development advocates. The resource losses that would be incurred from development means very little to the oil industry's bottom line, and thus very little to them.

So in arguing against development, I will not discuss any aspect of biology, despite the existence of very convincing evidence that development should not proceed on those grounds. From standpoints of economics, national security, and the state's interest, it is simply absurd to be extracting whatever oil may lie underneath the flat tundra of the Coastal Plain.

The report estimates a range of possible in-place reserves of oil, the average being 13.8 billion barrels (BBO) scattered in 26 prospective areas across the coastal plain. The estimates are largely speculative, and what's more, the report frankly admits that the "in-place resource includes many deposits well below any economic size limit."

In fact, the report says the probability of actually finding economically recoverable deposits is only one chance in five.

But let's pretend the oil companies get lucky.

An economist with the Institute of Social and Economic Research crunched some numbers, and found that at current prices of \$15 per barrel, oil produced from ANWR would yield disappointing rates of return in the range of minus 2 percent to 4 percent. Not very encouraging, and there's more.

Most realistic projections don't foresee oil prices rising above \$20 a barrel over the next 20 years. The report assesses the economic viability at a dreamy price of \$33 per barrel. Even if exploration found significant pools of oil, it wouldn't be worthwhile to pump it out.

That's why the Milne Point field is shutting down. That's why the West Sac field, which holds nearly 1 billion barrels of oil, and the Seal Island deposit of 350 million barrels, haven't been developed. Neither have the Sandpiper and Colville Delta pools been tapped. It's too costly, the market is glutted, and the price doesn't justify it.

So how exactly does the oil industry and its Department of Interior supporters justify cracking open the coastal plain for oil development? The nebulous "national security" argument.

Key Points in the 1002 Report:

- p. 29 Talks about subsistence use of the Porcupine Caribou Herd. Central Arctic Herd - para. 3 on right-hand side of page, indicates "little or no calving" at Prudhoe
- p. 33 Polar bears - see para. 4 on left re. importance of 1002 area
Second to last paragraph on right re. international treaties
- p. 34 Endangered species - whales
- p. 35 Geese - left hand side of page
- p. 45 Wilderness values
- p. 49 20% chance of finding economically recoverable oil
- p. 50 Figure III-2: graphs cannot be compared because they are based on different kinds of data
- p. 72 Table III-4 Significant economic assumptions: \$33 and \$40 per-barrel oil price ??!!
Also, natural gas economics - what if they build TAGS?
- p. 75 Right-hand side, top of page: sources for water and gravel undetermined
- p. 100 Para. 2, left re. pollution from reserve pits at Prudhoe. (note these are "preliminary results", we're just beginning to learn about some of the impacts of oil development)
Also, the para. above "Consequences of Development Drilling" = year round exploratory drilling would have far greater impacts than winter drilling
- 103 Last para. re. fuel spills → p. 104
- p. 108 Para. 2: reasons why central Arctic Herd has not declined even with development at Prudhoe

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- p. 113 Last para. on left-hand side re. Muskox impacts
- p. 128 Second to last para., right hand side of page: oil development equals a lock-up in terms of sport & subsistence hunting
- p. 131 Summary of Unavoidable Impacts
- And remember, this report represents a best-case scenario, not Prudhoe-scale development that would be likely

See Jan. 2, 1987 Memorandum (and attachments) re. ADFEG's comments on Interior's proposed mitigation measures; they feel them to be inadequate

p. 162 Table VII-2

Does not indicate "significant" contributions to domestic energy



**WILDLIFE
FEDERATION
OF ALASKA**

The Alaska Affiliate of the
National Wildlife Federation

February 6, 1987

U.S. Fish and Wildlife Service
ATTN: Division of Refuge Management
2343 Main Interior Building
18th and C Streets NW
Washington, D.C. 20240

Re: Comments and Recommendations Pertaining to Draft "Arctic National Wildlife Refuge, Alaska, Coastal Plain Resource Assessment", November 1986

The Wildlife Federation of Alaska (WFA) is the state affiliate of the National Wildlife Federation, an organization with 4 1/2 million members nationwide, 8,000 of whom are Alaskans. We have reviewed the above referenced report and recommendation to the Congress of the United States and the legislative environmental impact statement prepared in accordance with Section 1002(h) of the Alaska National Interest Lands Conservation Act (ANILCA) and the National Environmental Policy Act (NEPA). The Wildlife Federation of Alaska recommends that no oil and gas leasing or development activities be allowed on the Coastal Plain of the Arctic National Wildlife Refuge until the issues and deficiencies identified in our comments and recommendations are adequately addressed.

The Wildlife Federation of Alaska offers the following comments on the 1002 process, the Coastal Plain Resource Assessment, and the recommendation of the Department of Interior proposing full leasing of the coastal plain. We have previously offered testimony at a public hearing on the Coastal Plain Resource Assessment held in Anchorage, Alaska, on January 5, 1987. We wish to expand upon selected concerns and issues identified in that testimony by addressing the following topics:

- o 1002 Evaluation Process
- o Coastal Plain Resource Assessment
- o Mitigation
- o Recommendations

1002 EVALUATION PROCESS

As stated previously in our public testimony, the coastal plain of the Arctic National Wildlife Refuge must always be viewed first as a wildlife refuge. The assessment report recognizes the value of this conservation unit when it states (p. 45) "...The Arctic Refuge is the only conservation system unit that protects, in an undisturbed condition, a complete spectrum of the various arctic ecosystems in North America." The important values of the coastal plain are also acknowledged by the report's observation that "...The 1002 area is the most biologically productive part of the Arctic Refuge for wildlife and is the center of wildlife activity on the refuge" (p. 46).

The establishment of the refuge in 1960 to preserve its unique wildlife, wilderness, and recreation values resulted in the remainder of Alaska's North Slope and adjacent offshore waters being made available for petroleum exploration and development. Passage of the Alaska National Interest Lands Conservation Act (ANILCA) in 1980 created a requirement under Section 1002(h) of the Act to prepare the Arctic National Wildlife Refuge Coastal Plain Resource Assessment. The analyses and evaluations required for the Section 1002(h) Report to Congress are clearly intended to provide an assessment of the biotic resources, oil and gas production potential, and compatibility of exploration and development in view of impacts to fish, wildlife, and habitats of the area.

The Department of the Interior, and the Draft Resource Assessment before us at this time, would have benefitted significantly from a more open public process that included conservation groups, industry, the State of Alaska, and Canada. Lacking this input, the report exhibits critical deficiencies in adequately addressing the requirements of Section 1002(h)(1-6). We are particularly concerned that the Secretary's recommendation to pursue full leasing of the 1002 area (Alternative A) is not supported by the information and analyses presented in the report. To the contrary, our examination of the baseline information, recognized values of fish and wildlife habitats, and environmental consequences of oil and gas development as presented in the Resource Assessment clearly identifies a level of adverse impact to national and international wildlife populations which is unacceptable and clearly not compatible with the purposes for which the refuge was established. We find it incongruous that this report, recognizing the anticipated loss of unique wildlife use areas and irreplaceable habitats, still concludes that this significant level of adverse impacts is justified. While espousing adherence to the Fish and Wildlife Service Mitigation Policy (46 F.R. 7644-7663, January 23, 1981) in the report's assessment process, the Department of Interior has failed to comply with the criteria for treatment of unmitigable impacts to Resource Category 1 habitats. For those

habitats, the policy direction is clear; "...all losses of existing habitat be prevented as these one-of-a-kind areas cannot be replaced..." (46 F.R. 7657, January 23, 1981). If the Mitigation Policy is truly an integral part of the 1002 area evaluation process and not just a placebo, Resource Category 1 habitats must not be impacted, and the ecological function and access to these areas must be maintained.

As an organization principally concerned with maintenance of fish and wildlife resources and the habitats upon which they depend, the Wildlife Federation of Alaska will attempt to focus their comments in this area of primary interest. However, we feel compelled to briefly express our concerns relating to the economic and social issues addressed in the report.

The Department of Interior predictions of oil and gas potential, estimates of contribution to domestic energy supplies, and projections of net national economic benefits are subjective and highly speculative. Lacking exploration confirmation of oil or gas discoveries, location and size of reservoirs, and a highly optimistic assumption of \$33 per barrel for oil, the economic benefits and national need for exploration and production of petroleum from the 1002 Area is not well supported.

This is particularly true in light of the fact that President Reagan recently vetoed the National Appliance Energy Act of 1986. Passed overwhelmingly by both houses of Congress, this act would have saved the nation millions of barrels of oil and billions of dollars on utility bills by the year 2000. In addition, the Reagan Administration has opposed establishment of fuel efficiency standards for automobiles and continuance of the 55 mile/hour speed limit.

No development in the Coastal Plain should be allowed until the concept of national energy security is more clearly defined, including a full discussion of economic forecasts, domestic oil consumption, the projected need for domestic oil reserves in the 1990's, and national strategies for energy conservation such as efficiency standards for home appliances and fuel economy standards for automobiles.

COASTAL PLAIN RESOURCE ASSESSMENT

The Description of the Existing Environment (Chapter II) provides a reasonably good summary of available information and research results for fish and wildlife distributions, populations, and seasonal use of terrestrial and aquatic habitats within the 1002 area. However, discussions of the coastal habitats, their occurrence within and outside the 1002 area, and ecological relationships to fish and wildlife populations are generally not adequate to define specific habitat affinities and habitat

characteristics. This short-coming is particularly important when evaluating opportunities for maintaining no net loss of in-kind habitat values, an important consideration in the mitigation process.

The Evaluation of Environmental Consequences (Chapter VI) is seriously limited since its assessment is dependent on hypothetical development scenarios derived from insufficient geological information. The general locations of oil and gas development activities may be reasonably accurate, but the scenarios are dependent on additional information which is not currently available, including the depth of structures containing oil or gas, the type of recovery methods, well spacing, the need for water injection or gas lift, and other factors specific to the petroleum field. Lacking more dependable geological information which may only be attainable through selected exploratory drilling, the locations, routing, and density of development facilities as shown in the proposed scenarios are meaningless.

The evaluation process and analysis of anticipated impacts to fish, wildlife, and habitats as presented in this report is highly influenced by the presence and precise siting of facilities in relation to important habitats and use areas, including migration corridors. Relatively minor relocation of facilities in the scenario could physically impact comparable acreages, but have drastically differing effects on fish and wildlife populations, their use of habitats, and access to those habitats. The Evaluation of Environmental Consequences should identify facilities and structures which are not site-dependent and which could potentially be relocated as part of the mitigation process. The evaluation must acknowledge that a significant portion of the oil and gas development facilities are site-dependent and do not have the flexibility of relocation to minimize adverse impacts to important habitats.

The Evaluation of Environmental Consequences also suffers from an excessive dependence on mitigation techniques utilized in the Prudhoe Bay development area (which may not be applicable to resources and habitats in the 1002 area) and the assumption that mitigation technology to be developed in the future will reduce anticipated impacts to an acceptable level. When considering the irreplaceable values of some of the fish and wildlife resources at stake, we are not confident that "...performance standards ...developed for safety and environmental requirements rather than adherence to highly specific design or operational procedures..." (p. 97) is an appropriate approach to mitigation. It is perhaps more important to recognize that a Prudhoe Bay scale development may not be acceptable within a national wildlife refuge.

Consideration of cumulative impacts of oil and gas development in the 1002 area with other existing and proposed onshore and

offshore developments has not been adequately addressed in the Evaluation of Environmental Consequences. In addition, the national and international range and human use of migratory wildlife resources which are highly dependent on habitats available in the 1002 area has not been adequately recognized for the Porcupine Caribou Herd (PCH) or snow geese. Some of our concerns regarding the treatment of these key species are presented below:

PORCUPINE CARIBOU HERD:

A great deal has been learned about the effects of oil and gas exploration and production on caribou in the Prudhoe Bay area, e.g. levels of road traffic that can occur without adversely affecting free passage of caribou or the minimum distances required to separate roads and pipelines to cause minimal disturbance to caribou. However, we must be careful not to extrapolate from all of the Prudhoe Bay conclusions when estimating impacts in the Arctic National Wildlife Refuge because the refuge must accommodate a very large number of animals in a small space. In comparison, Prudhoe Bay supports a relatively small caribou herd in an area of very extensive suitable habitat.

The available literature concerning the Central Arctic Caribou Herd suggests that portions of the herd have been displaced from the Prudhoe Bay and Kuparuk areas during part of their annual cycle with no obvious effect on herd growth. However, within the Arctic National Wildlife Refuge the Coastal Plain is extremely narrow when compared with the Prudhoe - Kuparuk area. The Arctic Refuge Coastal Plain is 6 times larger than the Prudhoe Bay field, but there are approximately 12 times more caribou in the Porcupine Caribou Herd than the Central Arctic Herd. In addition, the PCH appears to be reaching maximum herd size. Most large mammal biologists would conclude that a herd approaching a peak population within its range would occupy essentially all suitable habitat available. Therefore, the opportunity for displacement of the PCH during calving is probably limited, and such displacement could result in a net loss to the caribou population. Although the projected 20-40% decline in PCH population estimated by FWS under a full development scenario (p. 112) is impossible to verify considering all the variables associated with preferred calving and insect relief habitats and migration movement areas, it strongly indicates that displacement of the PCH could cause a significant decline in population.

We heartily concur with the designation of approximately 242,000 acres of the PCH core calving area as Resource Category 1 habitats, recognizing that the 1002 core calving area represents approximately 80% of the total core calving area used by the Porcupine Caribou Herd (p. 106). The assessment also notes (p. 108) that "...measuring the probable population decline from complete loss of habitat values in calving areas is impossible

and the ultimate effects of displacement are unknown...". Under the full development scenario, the FWS has appropriately recognized that "...mitigation of the loss of caribou habitat in Resource Category 1 ... is not possible..." (p. 111). Following the premise (p. 98) that "... the FWS normally recommends that all losses of Resource Category 1 habitat be prevented, as these one-of-a-kind areas cannot be replaced...", the logical conclusion is that the PCH core calving habitats within the 1002 area should be justifiably excluded in the Secretary's recommendation for oil and gas development.

As spring progresses on the coastal plain and the weather warms following completion of calving activity, conditions are ripe for the emergence of swarms of mosquitos. As harassment by these insects increases, caribou form dense aggregations and move rapidly toward the coast to seek relief in cooler, windswept areas such as river deltas, mudflats, aufeis, large gravel bars, barrier islands, and in the shallows of lagoons (p. 29). At this time, parturient cows are particularly stressed from the rigors of pregnancy, migration, birth, lactation, hair molt, antler growth, and the the ever-present insect harassment.

The Resource Assessment noted that "...the entire 180,000-member PCH may use the area in some years, mainly during the late June/early July insect-relief period..." (p. 105). The FWS observation that "...access to insect relief habitat and forage resources during this period may be critical to herd productivity..." (p. 29) recognizes the significant importance of insect relief areas to the post-calving aggregations of the PCH. The availability of forage resources and the physical features which make up insect relief areas comprise a specialized habitat that may not be replaceable. We recommend designation of primary insect relief habitats in the Coastal Plain of the 1002 area as Resource Category 1 habitats which are unique and irreplaceable components of the Porcupine Caribou Herd use area. In addition to maintaining the function of insect relief areas, access to these habitats from the core calving area must be assured.

Contrary to the facts and analyses presented in the Environmental Consequences and Mitigation discussions, the Secretary's Recommendation (Chapter VIII) to make the entire 1002 area available for oil and gas leasing, even with the caveat that "...leasing would be phased so the core calving area of the PCH would be last to be explored and developed..." (p. 170), is in direct conflict with the findings of the Resource Assessment and the procedures of the FWS Mitigation Policy which "...guided the assessment team in identifying appropriate measures for mitigating avoidable adverse impacts so there would be no unnecessary adverse effects" (p. 97). In this light, we can only conclude that the Secretary has determined "avoidable adverse impacts" to the Porcupine Caribou Herd are the "necessary adverse effects" of oil and gas development.

SNOW GEESE:

Critical fall staging habitats of snow geese from the Banks Island population have not received adequate attention in the report discussions and evaluation of environmental consequences. The Resource Assessment should be expanded to include greater detail on the importance of fall staging activities to the welfare of migrating snow geese, the characteristics of preferred staging habitats, and the human use values of this resource outside the boundary of the 1002 area. An average of 105,000 snow geese, and as many as 325,000 snow geese, have historically staged on the 1002 area in the fall to feed intensively and build energy reserves prior to their southward migration. These fat reserves are considered by waterfowl biologists to be necessary energy reserves to successfully complete migration, particularly for female snow geese recovering from the stress of reproduction activities.

Chapter VI recognizes that "...reduced time spent feeding and lost habitat in which to feed would result from petroleum development, adversely affecting the accumulation of energy reserves essential for migration" (p. 121). In addition, "...a major reduction or change in distribution of snow geese using the 1002 area could occur through the cumulative effects of direct habitat loss, indirect habitat loss due to disturbance, and direct mortality" (p. 122). Based on the report's assumed displacement of snow geese from 45% of their preferred staging habitat, a reduction in the Banks Island snow goose population of 5-10% could occur and the number of snow geese annually staging in the 1002 area could be reduced by almost 50 percent (p. 122). We are not impressed by the statement that "...staging snow geese are highly mobile..." (p. 121) as it indicates a lack of insight into the concepts of preferred habitat and carrying capacity.

The potential reduction in numbers of Banks Island snow geese would be 15-30,000 birds. Approximately 60-70,000 snow geese are harvested annually in the Pacific Flyway with 80-90% of this harvest occurring in California. An additional 30-50,000 snow geese are harvested annually in Alberta and western Saskatchewan. A draft management plan for the Pacific Flyway identifies protection of the Arctic National Wildlife Refuge and Yukon staging areas as an important need. The potential reduction in Banks Island snow geese numbers from loss or disturbance of fall staging habitats in the 1002 area could be equivalent to 50% of the total Pacific Flyway harvest or essentially all of the Alberta and western Saskatchewan hunting harvest in a given year. Based on the important value of this species to national and international uses, we would not consider potential impacts of oil and gas development in the 1002 area to be insignificant.

The report does not demonstrate the availability of alternate staging habitats which could be utilized for in-kind replacement of habitat values, an important consideration for these staging

areas which are currently designated Resource Category 2. The baseline studies for snow geese conducted on the 1002 area do not define the habitat characteristics which were representative of preferred staging areas, although they noted a heavy dependence on cottongrass (Eriophorum sp.) and speculated that annual shifts in preferred staging areas may be related to heavy utilization of previously used staging areas. If this annual shift to allow recovery of staging habitat vegetation is verified, it would suggest the necessity of considering all fall staging areas used by snow geese in the 1002 area as a part of an annual habitat rotation.

The significant segment of the snow goose population which could be adversely affected or displaced by oil and gas development, the vulnerability of staging snow geese to disturbance, and the undefined unique habitat characteristics of traditional staging areas supports the WFA recommendation to include snow goose fall staging areas within the coastal plain as Resource Category 1 habitats.

PERENNIAL SPRINGS AND FRESHWATER OVERWINTERING AREAS FOR FISH:

Perennial springs and freshwater overwintering areas for resident and anadromous fish have not been adequately addressed in the Resource Assessment. Suitable overwintering habitats in freshwater systems of the refuge are concentrated at a limited number of locations where adequate flow, water quality, dissolved oxygen, and benthic food organisms are available. Perennial ground water sources (springs) are found on most of the major drainages in the 1002 area.

Within the Arctic National Wildlife Refuge, "...overwintering habitat is probably the greatest limiting factor for Arctic anadromous and freshwater fish populations..." (p. 37). The Alaska Habitat Management Guide for the Arctic Region (Alaska Department of Fish and Game, 1986) notes that in smaller North Slope drainages it is conceivable that a single spring-fed site might harbor virtually all members of a particular Arctic char population from eggs to mature adults during the winter period.

Due to the limited occurrence of spring-fed overwintering areas for fish and their importance in maintaining anadromous and freshwater fish populations in the 1002 area, the Wildlife Federation of Alaska recommends that perennial ground water sources which support overwintering fish be designated Resource Category 1 habitats. Protection of these vulnerable habitats must also include appropriate protection of the groundwater source which supplies the overwintering use areas and prohibition of water removal for domestic or industrial use during the winter period. We also request that FWS identify the location of known, spring-fed overwintering areas, suspected but unsubstantiated

overwintering areas, and necessary mitigation measures to avoid adverse impacts to these irreplaceable habitats.

MITIGATION

The WFA has previously identified serious concerns with the approach to mitigation of impacts to fish, wildlife, and their habitats in our January 5, 1987 testimony. We wish to expand upon those concerns and the mitigation process as it applies to the resources and proposed activities identified for the 1002 area.

As examples of the important fish and wildlife habitat values of the 1002 area, the report recognizes intensively used calving, postcalving, and insect-relief habitats for a significant portion of the Porcupine Caribou Herd and sensitive fall staging areas for a large segment of the Banks Island, Canada, snow goose population. The sensitivities of these species and the unique factors of the habitats they utilize are documented. Approximately 78 percent of the PCH core calving area is within the 1002 area, and disturbance of the cow-calf groups on the calving grounds may interfere with bond formation and can increase calf mortality (p. 28).

In addition, the limited availability of these habitats is acknowledged with statements such as "...Geography apparently limits the availability of suitable alternative calving or insect-relief habitats for the herd..." (p. 6) and "...Access to insect-relief habitat and forage resources...may be critical to herd productivity" (p. 28).

Summary statements also reflect the importance of the 1002 area to a wide spectrum of wildlife resources by stating "...The 1002 area is the most biologically productive part of the Arctic Refuge for wildlife and is the center of wildlife activity on the refuge" (p. 46).

The evaluation of Irreversible and Irretrievable Commitments of Resources for Alternatives A and B recognizes the significant impacts attributed to oil and gas development:

- o declines in population, herd vigor, and behavioral patterns due to disturbance and displacement of PCH (p. 142)
- o long term losses in fish and wildlife resources, subsistence use, and wilderness values as the inevitable consequence of long term development

- o lack of relative experience regarding the responses or adaptability of the PCH to intensive development activities
- o unknown capacity of the PCH to utilize undisturbed areas in greater concentrations for calving
- o acknowledgement that EVEN WITH EFFECTIVE MITIGATION (emphasis added), PCH displacement or reduction could be as great as 20-40 percent
- o recognition that Alternative A development will result in a loss of, at minimum, a significant part of the PCH calving grounds and other use habitats, a limit to continued expansion of 1002 area muskoxen herds, and a loss of notable staging habitats for internationally important migratory snow geese.

A summary of biological effects of Alternative A on the 1002 area identifies major effects on caribou (PCH), muskox, and snow geese (p. 149). Major environmental effects were previously defined (p. 96) as "...Widespread, long-term change in habitat availability or quality which would likely modify natural abundance or distribution of species using the 1002 area".

The Secretary's Recommendation (p. 170) to make the entire 1002 area available for oil and gas leasing includes the control of development by imposition of appropriate mitigation measures to insure "...no unnecessary adverse effects on the refuge's fish and wildlife and their populations..." and with assurance "...that any unavoidable habitat losses are fully compensated" (p. 170). Additionally, the Secretary indicates that "...Development would proceed with the goal of no net loss of habitat quality...", a goal discussed in greater detail in Chapter VI, Environmental Consequences.

The Fish and Wildlife Service Mitigation Policy (46 F.R. 7644-7663, January 23, 1981) recognizes four resource categories with corresponding mitigation planning goals to insure that the level of mitigation is consistent with the fish and wildlife resource values involved. Within the 1002 area, the FWS analysis designated the PCH core calving area as Resource Category 1 based on its unique and irreplaceable values; the remainder of the 1002 area has been designated Resource Category 2 for its importance to five evaluation species used in the analysis.

Resource Category 1 is defined as habitat of high value for evaluation species which is unique and irreplaceable on a national basis or in the ecoregion. The commensurate Mitigation Planning Goal is no loss of existing habitat value. Development of the rationale for mitigation planning goals (46 F.R. 7645, January 23, 1981) included a fundamental principal "...that avoidance or compensation be recommended for the most valued

resources..." and that "...the degree of mitigation requested correspond to the value and scarcity of the habitat at risk".

The Secretary's Recommendation (Chapter VIII) proposes making the entire 1002 area available for oil and gas leasing based on the assumption that most adverse environmental effects would be minimized or eliminated through mitigation based on information from prior oilfield development at Prudhoe Bay, or through additional, ongoing studies and assessments conducted during phased leasing. The FWS Mitigation Policy Guideline for Resource Category 1 habitats states "...The Service will recommend that all losses of existing habitat be prevented as these one-of-a-kind areas cannot be replaced" (46 F.R. 7657, January 23, 1981). Where there is likely to be a significant fish and wildlife resource loss (Resource Category 1), the FWS Mitigation Policy (46 F.R. 7659, January 23, 1981) provides criteria to be addressed in evaluation of projects. Of significant importance is criteria (2) to select the least environmentally damaging reasonable alternative, and criteria (4) which states "...All important recommended means and measures have been adopted with GUARANTEED IMPLEMENTATION (emphasis added) to satisfactorily compensate for unavoidable damage or loss consistent with the appropriate mitigation goal." Since the mitigation goal for Resource Category 1 is no loss of existing habitat value and no means and measures have been identified to achieve that goal in the 1002 Report, we believe that any proposal to permit oil and gas development in or adversely affecting Resource Category 1 habitats is not in compliance with the FWS Mitigation Policy.

Finally, the mitigation measures identified in Chapter VI (p. 145) are more appropriate for protection of discrete location habitats and use areas which can be addressed by development buffers, timing of activities, and performance criteria within the scope of technical concerns addressed in prior North Slope oil and gas developments. In particular, the calving, post-calving, and insect relief habitats of the PCH are more extensive, and currently available information indicates unique characteristics which may not be replaceable or available in alternate habitats. The important issue of free movement between seasonally-important use areas of the PCH has not been adequately addressed in the evaluation process. Wildlife movements and migration are recognized as a part of habitat values which must be addressed during the mitigation process (46 F.R. 7645, January 23, 1987).

RECOMMENDATIONS

The Wildlife Federation of Alaska recommends that no oil and gas leasing or development activities be allowed on the coastal plain of the Arctic National Wildlife Refuge until the issues and deficiencies identified in our comments and recommendations are

adequately addressed. In summary, these include the following:

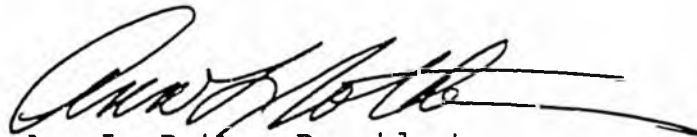
- o National energy security should be clearly defined, including a full discussion of economic forecasts, domestic oil consumption, the projected need for domestic oil reserves in the 1990's, and national strategies for energy conservation such as efficiency standards for home appliances and fuel economy standards for automobiles.
- o Decisions on the use of the coastal plain should be delayed until biological research on the characteristics of the Porcupine Caribou Herd calving habitat can be clearly defined. The conclusions of our nation's leading caribou biologists at a workshop entitled "Demography and Behavior of the Central Arctic and Porcupine Caribou Herds in Relation to Oil Field Development" conducted in October 1986 was that scientists do not yet have a clear understanding of the ecological attributes of caribou calving areas on the Arctic Slope. (This workshop was sponsored by the Alaska Oil and Gas Association and the Alaska Department of Fish and Game.) Until critical calving habitat boundaries can be delineated, all land use decisions within the 1002 area should be deferred.
- o Insect relief habitats used by the Porcupine Caribou Herd in the Coastal Plain of the 1002 area should be designated Resource Category 1 habitats with specific provision made for adequate access by the PCH to these use areas.
- o Fall staging areas for snow geese in the Coastal Plain of the 1002 area should be designated Resource Category 1 habitats.
- o The Coastal Plain Resource Assessment should clearly describe appropriate mitigation measures for each development alternative that would result in no net loss of critical fish and wildlife habitat. How will the Department of Interior determine whether appropriate technology is available to restore or revegetate plant communities which occur on the coastal plain, particularly those which comprise caribou calving habitat, caribou insect relief habitat, and snow goose staging habitat?
- o The following criteria should be incorporated into the mitigation process for all oil and gas development alternatives considered:
 - no net loss of caribou calving or insect relief habitat is justified in any of the alternatives;

- free passage of caribou must be provided to all insect relief habitats;
- no net loss of snow goose fall staging habitats is justified in any of the alternatives;
- o The Wildlife Federation of Alaska opposes any land trade actions that precede or circumvent completion of the 1002 process or any land trade actions that would remove Resource Category 1 habitats (including caribou calving and insect relief areas, snow goose staging areas, and fish overwintering areas) from the Arctic National Wildlife Refuge.

If these issues and deficiencies are addressed in the context of an open public process, then the Fish and Wildlife Service, conservation groups, the oil industry and Congress would have the tools necessary to make well-reasoned decisions about oil and gas development and the protection of wildlife, recreation, subsistence, and wilderness values on the Coastal Plain of the Arctic National Wildlife Refuge.

Thank you for your consideration of these comments.

Sincerely,



Ann L. Rothe, President
WILDLIFE FEDERATION OF ALASKA

cc: Senator Ted Stevens
Senator Frank Murkowski
Congressman Don Young
Jay Hair, National Wildlife Federation
Bruce Apple, National Wildlife Federation

STATE OF ALASKA
THE LEGISLATURE

POUCH Y - STATE CAPITOL
JUNEAU, ALASKA 99811
907.465.3800

LEGISLATIVE AFFAIRS AGENCY
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Copies of minutes listed below were originally included in this file. The minutes are available on the STAIRS database CMPR. In order to save space copies of minutes have not been left in the files.

Mary Van Nimwegen

JOINT Senate - House Resources
February 4, 1987
1:32 p.m.

C: COTTEN. GTK (DGM)

February 26, 1987

The Honorable Sam Cotten
Co-Chairman
Resources Committee
P.O. Box V
Juneau, AK 99811

Re: 90-10 Revenue distribution
for federal lands

Dear Representative Cotten:

INSERT on tape

~~Ned Farquhar of your staff informed me that United
Lundquist
States Senator Ted Stevens had told you that, under current
law, Alaska would be entitled to no share of revenues re-
ceived by the federal government from federal oil and gas
leasing in the Arctic National Wildlife Range ("ANWR") if
ANWR is open to such leasing by Congress. Senator Stevens
apparently is of the view that, because federally owned
lands in ANWR have been withdrawn from the public domain and
reserved as a wildlife refuge, removes them from the class
of federal lands from which the state receives 90 percent of
oil and gas revenues:~~

I represented Alaska in Watt v. Alaska, 451 U.S.
259 (1981). The precise issue in that case was whether the
90-10 revenue distribution formula in section 35 of the

Mineral Leasing Act, 30 U.S.C. § 191, applied to the withdrawn and reserved lands of the Kenai National Moose Range.

no new A

In a 5-3 decision, the United States Supreme Court held that the 90-10 revenue distribution formula applied to oil and gas revenues from federal leasing in the Moose Range. Like the lands in ANWR, the lands in the Moose Range were withdrawn and reserved from the public domain for refuge purposes. In my opinion, there is absolutely no substantive distinction between the Moose Range lands and the lands in ANWR, and there is no substantive legal basis for concluding that federal oil and gas leasing revenues from ANWR would be distributed differently than those from the Moose Range under current law.

To my knowledge,

A the only ~~instance~~ *situation* where a state is not entitled to share in the benefits of oil and gas production from lands reserved from the federal public domain ~~that I am aware of of~~ *relates to* ~~is in the case of~~ the four naval petroleum reserves created early in this century (Elk Hills, Buena Vista, Teapot Dome and Naval Petroleum Reserve No. 4 ~~which was~~ *"Pet. 4"* redesignated in 1976 as the National Petroleum Reserve in Alaska or *withdrawals* ~~"NPRA"~~). In those four specific ~~reservations~~ *reservations* from the federal public domain, the United States expressly reserved the

~~and reservations of the oil and gas~~

The Honorable Sam Cotten
Co-Chairman, Resources Committee

February 26, 1987
Page 3

oil and gas to itself for national defense purposes and, generally, receives all financial benefits from oil and gas development and production from those reserves. As you know, Congress ^{in 1976} provided in 42 U.S.C. § 6508 that 50 percent of federal oil and gas revenues from NPRA are to be transferred to the State of Alaska; however, to our knowledge, none of the federal revenues from the other petroleum reserves are shared with the states in which they are located.

The petroleum reserves constitute a very specific and limited exception to the general revenue-sharing policy governing federal lands. The general revenue distribution scheme under the Mineral Leasing Act represented a historical trade-off in the history of public land law. In enacting it, Congress terminated its historic policy of disposing of the public lands. Instead, it determined that the federal government should retain those public lands remaining in the states, but should use most of the mineral revenues from those lands for ^{those} the state's benefit. This ~~X~~ "was to compensate for the state's inability to tax the lands to pay for governmental services." Fairfax and Yale, The Financial Interest of Western States in Non-Tax Revenues From the Federal Public Lands (manuscript copy published by the Western

The Honorable Sam Cotten
Co-Chairman, Resources Committee

February 26, 1987
Page 4

Legislative Conference, Council of State Governments, and the Lincoln Institute of Land Policy in 1985) at 19.

To summarize, there is no substantive ground to distinguish the lands in ANWR from any other federal lands in Alaska, with the exception of NPRA. Alaska is entitled to 90 percent of federal oil and gas leasing revenues from all federal lands in the state, including those in ANWR, with the sole exception of those in NPRA where Congress independently has elected to share 50 percent of the revenues. With respect to wildlife refuges in particular, Watt v. Alaska makes it absolutely clear that the state is entitled to 90 percent of the revenues from federal leasing from lands withdrawn from the public domain and reserved for that purpose.

If I can be of any additional assistance or answer any further questions in this regard, please contact me at your convenience.

Sincerely,

GRACE BERG SCHAIBLE
ATTORNEY GENERAL

By:

The Honorable Sam Cotten
Co-Chairman, Resources Committee

February 26, 1987
Page 5

G. Thomas Koester
Assistant Attorney General

GTK:dlm

cc: Lieutenant Governor Stephen McAlpine
Commissioner Judy Brady, DNR
Commissioner Don W. Collinsworth, F&G
Commissioner Dennis Kelso, DEC
John Katz, Office of the Governor
Bob Grogan, Office of the Governor
Senator Ted Stevens

REPRESENTATIVE
SAM COTTEN
DISTRICT 15



P.O. BOX 296, EAGLE RIVER, AK 99577
P.O. BOX V, JUNEAU, AK 99811

ALASKA STATE LEGISLATURE
HOUSE OF REPRESENTATIVES

February 6, 1987

The Honorable Bill Horn
Assistant Secretary for
Fish, Wildlife and Parks
U. S. Interior Department
Washington, D. C. 20240

Dear Secretary Horn:

I am writing with regard to the draft 1002(h) study which presents alternatives for management of the coastal plain of the Arctic National Wildlife Refuge (ANWR).

The interest shared by Alaskans in the decisions about ANWR are fairly clear: we need to maintain a clean, healthy environment and provide jobs and revenue for Alaska's people. These are national interests as well.

Toward achieving these goals, the U. S. Congress should promptly open the coastal plain of the ANWR to oil and gas exploration, production, and transportation under conditions that are in the interest of the nation and the state; reserving the leasing of land in the core caribou calving grounds until a later date. Although, at this time, there is some controversy about the location of the calving ground, we are hopeful that the research data can be put to good use in the near term to define it. Protection of the Porcupine herd is in the interest of American and Canadian citizens. Other environmental issues such as air and water quality, waste management and disposal, and development coordination also need attention.

The Interior Department should desist from discussing land trades that would eliminate the State of Alaska's revenue share from oil and gas activity in the Refuge and that could reduce the ownership influence of the state and federal governments.

Unless the state concurs, the U. S. Congress should not allow measures or actions that reduce the state's entitlement to oil

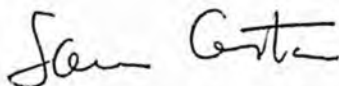
and gas revenue from the Refuge. The Congress should require the protection of the environmental and subsistence resources of the Refuge, including habitat, air, and water, in the event of oil and gas development on the coastal plain of the Refuge.

In recognition of Alaska's economic situation and the need for long-term economic development in the state, the Congress should require that exploration and development activity in the Refuge be conducted by Alaska work forces.

The Congress also should amend the Export Administration Act to reduce America's trade problem and energy costs by allowing the export of new production from Alaska's North Slope.

Thank you for considering these concerns. I hope that the Interior Department will work toward accomplishing these objectives during the Congressional debate on ANWR.

Sincerely,

A handwritten signature in cursive script, appearing to read "Sam Cotten".

Representative Sam Cotten
co-Chairman, House Resources Committee
(907) 465-3711/15/99

SC:smc

STATE OF ALASKA

OFFICE OF THE GOVERNOR
JUNEAU

STEVE COWPER
GOVERNOR

NEWS RELEASE



FOR INFORMATION CONTACT
David Ramseur
Press Secretary
Office of the Governor
Box A, Juneau, AK 99811
Bus. Phone (907) 465-3500

FOR IMMEDIATE RELEASE
February 6, 1987
No. 87-11

STATE URGES EXPLORATION IN ANWR MORATORIUM IN CARIBOU "CORE" CALVING AREA

JUNEAU--Oil and gas exploration should be permitted in the Arctic National Wildlife Refuge, but delayed in the "core" caribou calving area for at least 10 years pending a study of the impact of exploration on the Porcupine caribou herd, according to the state of Alaska's response to a federal report on ANWR.

In a nine-page letter to the U.S. Interior Department, the state says oil and gas potential in the refuge is extremely promising and therefore, exploration should proceed. At the same time, the state says not enough is known about the potential impact exploration may have in the area of most concentrated caribou calving.

As a result, the state proposes creation of a group composed of federal, state, university and private researchers to study the issues and offer recommendations to the Interior secretary and Alaska's governor about future exploration in the core calving area.

The proposal is contained in the state's formal response to the Interior's Draft Arctic National Wildlife Refuge Coastal Plain Resource Assessment 1002 report. The response, delivered to Interior officials in Washington, D.C., today, details the state's concerns with the draft report.

-MORE-

The comments follow testimony offered by the state in Anchorage on Jan. 5 in which Gov. Steve Cowper said he supports exploration in ANWR with the proper environmental protections.

"Alaska's coastal plain contains the best prospects in this country for a significant oil and gas find," Cowper said, upon release of the state's comments. "I think we can go after it responsibly and with a minimum of disruptions if we follow the guidelines outlined in our response to the federal report."

The state says two key facts are at issue in the debate over development of the coastal plain: (1) ANWR is home to fish and wildlife resources which are of significant national and international importance as well as necessary to the subsistence way of life of those who live in and near the refuge, and (2) the area contains the most outstanding oil and gas frontier remaining in the U.S.

State officials point out that Alaska has more than two decades of experience with oil exploration and that, using the best and latest technology, safe development of the coastal plain is possible. One way to ensure minimum disruption of the caribou is a thorough report on the potential impacts of the core calving area.

After seven years of careful study, the Interior secretary and governor would submit a report to Congress for a decision on whether to open or defer leasing in the core area, under the state's proposal. That study would seek to document the biological importance of the core calving area, the effects of oil and gas activities and the effectiveness of mitigation measures.

The state's comments are the result of months of discussions among state resources agencies, the oil industry and environmental groups. A final 1002 report is expected to be delivered in April to Congress, which then begins debate on opening ANWR to exploration.

-30-

(A copy of the state of Alaska's response to Interior's 1002 report is attached.)

STEVE COWPER
GOVERNOR



STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

February 6, 1987

The Honorable Donald P. Hodel
Secretary
Department of the Interior
Interior Building, Room 6151
C Street between Eighteenth
and Nineteenth Streets, NW
Washington, DC 20240

Dear Mr. Secretary:

I wish to take this opportunity to thank you for providing the state with the additional two weeks to review and comment on the draft Arctic National Wildlife Refuge, Alaska, Coastal Plain Resource Assessment. The additional time enabled us to conduct a more thorough and useful review of this important document. Enclosed is a copy of the state's comments on the draft assessment.

Like you, I feel it is extremely important that Congress be persuaded to open the coastal plain to oil and gas leasing consistent with the purposes of the refuge to preserve its fish and wildlife values. The state is committed to this objective and with your cooperation will work to see that it is accomplished. I look forward to reviewing the final report to Congress and hope to meet with you in the near future to discuss how we might best advance a cooperative effort to move forward with oil and gas leasing in the Arctic National Wildlife Refuge.

Sincerely,

A handwritten signature in black ink, appearing to read "Steve Cowper".

Steve Cowper
Governor

Enclosure

The Hon. Donald P. Hodel

-2-

February 6, 1987

cc/enc: Senator Ted Stevens
Senator Frank Murkowski
Representative Don Young
William Horn, Department of
the Interior, Washington, DC
John Katz, Office of the
Governor, Washington, DC
Alaska Senate Resources Committee
Alaska House Resources Committee

MEMORANDUM

State of Alaska

TO: Robert L. Grogan
Associate Director
Division of Governmental
Coordination

FROM: Dennis D. Kelso
Commissioner
Department of Environmental
Conservation

DATE: January 12, 1987

FILE NO:

TELEPHONE NO: 465-2600

SUBJECT: ANWR

The Department of Environmental Conservation (DEC) has completed a review of the draft Arctic National Wildlife Refuge Coastal Plain Resource Assessment prepared by the Department of the Interior. As mandated in Section 1002(h) of the Alaska National Interest Lands Conservation Act, the report is intended to provide a recommendation to Congress on whether to open the coastal plain for leasing. Consequently, the bulk of the report is devoted to descriptions of the biological resources and estimated geological potential of the area at question. Review of this information is primarily within the purviews of the Departments of Natural Resources and Fish and Game. Similarly, the selection of an alternative that represents the best balance between the need to preserve essential habitat and the need to develop energy resources is an area outside this agency's direct expertise.

In summary, DEC has four major concerns. One is that air and water quality issues have not been addressed. The second is that it is essential for Interior to define a process during which these issues, as well as others, can be addressed. The third is that the report does not reflect the need to improve upon certain practices that have been employed elsewhere on the North Slope in defining acceptable practices in ANWR. The fourth is to ensure that full consideration is given to protecting special values of ANWR.

The role of this department in discussions of exploration or development of the Arctic National Wildlife Refuge (ANWR) is to ensure that an appropriate degree of environmental protection is provided for any exploration or development scenario that is to be implemented. Our comments on this document are focused on air, land and water quality issues. It is crucial to ensure that any exploration or development is conducted properly and in accordance with environmental standards appropriate for the coastal plain of ANWR. The State must emphasize this point in its comments on the 1002(h) report.

DEC Issues Are Not Addressed

The 1002(h) document is extremely inadequate in its treatment of air, land and water quality issues. It is essential that the Department of Interior recognize and become familiar with State authority in this area and the body of regulations and requirements associated with sound environmental practices. It does not appear that this has occurred to date. The narrative descriptions of issues and past experiences related to physical emissions are also seriously deficient.

It is essential that the Department of Interior address, at a minimum, the following key issues:

a. Air Quality Management

Particular attention should be paid to emissions associated with start-up and upset flaring, emissions of nitrogen oxides, and the best available technology review process associated with "prevention of significant deterioration" review.

b. Solid Waste Management

Major waste streams include garbage, drilling wastes, metal wastes, and oily wastes. It is very important that proper management of all these wastes be addressed from the beginning. Drilling wastes are of particular concern. Recent efforts by the State to complete a workable set of regulations governing these activities should be viewed as a starting point. Provisions for pickup of windblown litter and other debris must be addressed by stipulation. Planning for sound disposal of each waste stream will lead to the best environmental results.

c. Liquid Waste Management

Possible liquid waste discharges include domestic wastewater, reserve pit fluids, brine discharges, hydrostatic test discharges, vessel rinsates, radiographic wastes, etc. Each needs to be identified and provision made for proper disposal. The existing State and federal regulatory structure, ranging from plan review to best practicable technology, needs to be addressed.

d. Hazardous Waste Management

No discussion of hazardous waste management is included in the 1002(h) report. Hazardous waste

management is governed by stringent requirements under the federal Resource Conservation and Recovery Act. Transportation of hazardous substances is regulated by the federal Department of Transportation. Proper management must be addressed.

e. Oil Spill Prevention and Response

The report refers to the need to address oil spill control requirements at page 84. More detailed plans will be required under the cited State and federal statutes. Provision for a coordinated response capability should be provided by stipulation.

None of these environmental concerns has been addressed at an acceptable level of detail at this point in the process. Concerns related to regulation and development of the support industry and fuel transportation should be addressed by stipulation. As mentioned previously, the document represents only a small step towards identifying topics for which environmental stipulations are needed. The State must be assured that these concerns will be addressed.

Improvements to Past Practices

Decisions on the exploration or development of ANWR will be influenced, to a large extent, by the experience and information gained by the State and the industry during operations at the Prudhoe Bay, Milne Point, and Kuparuk River oil fields. Mitigating measures, regulations, and procedures implemented successfully in these areas should be employed in exploration or development at ANWR. However, the Department believes that it is inappropriate simply to assume that all practices employed at Prudhoe and adjacent fields will be appropriate in ANWR.

Experience gained in monitoring past operations has shown that there are North Slope practices that could and should be improved. Key areas where improvements need to be considered include the management and disposal of drilling wastes, solid waste, hazardous wastes, oily waste, and produced fluids and gas. The Department will want to ensure that the management regime selected for ANWR incorporates proper practices and disposal methods in these areas and provides for appropriate reclamation at the conclusion of operations. In the area of air quality, greater attention to flaring, open burning, visibility impairment and ambient air monitoring will be needed. The management regime will need to ensure that appropriate monitoring is conducted at all stages, including verification of the effectiveness of

stipulations and operating procedures to protect values in question.

The Department of Interior needs to fully evaluate existing practices and determine where improvements are needed. The proper approach is for the Department of Interior to use the body of regulations and stipulations that already exist, particularly those associated with recent State oil leasing on the North Slope, in developing stipulations. Interior should explicitly define those areas where practices at North Slope oil fields should be improved.

Special Values of ANWR

The purposes for which the Arctic National Wildlife Refuge was established must be recognized in developing the appropriate environmental protection standards. In some areas, a particularly high degree of environmental protection may be warranted to protect special values such as wilderness or wildlife values, of ANWR. It could be appropriate, for example, to provide for a greater degree of removal of wastes from areas that are especially valuable. A decision on this issue will require discussions on specific areas to be explored or developed. DEC will work with the Department of Interior to identify appropriate stipulations or requirements to provide the level of protection deemed necessary to protect the values of any areas leased. The review period provided has obviously not been adequate to complete this exercise at this time.

Consultation and Resolution of Issues

The Department believes it is essential for Interior to identify when environmental issues will be addressed. To provide for environmental protection Interior should establish a formal consultation procedure with the State and other parties in order to establish at what points in the process different issues and authorities will be addressed and at what level of detail. This would also allow the opportunity to clarify respective authorities, permitting, and field procedures to avoid duplication or conflicting efforts. The agreement on a process should identify or acknowledge existing regulatory requirements and authorizations. It should address different agencies' review times and public notice requirements. Agencies with jurisdiction include the Alaska Oil and Gas Conservation Commission, Alaska Departments of Natural Resources, Fish and Game, and Environmental Conservation; the U.S. Environmental Protection Agency, Corps of Engineers, U.S. Department of Transportation, North Slope Borough, as well as the Division of Governmental Coordination. Issues that should be addressed are the timing of the various phases of review for

this project and the level of detail to be addressed at each, and coordination of permitting, review of plans of operations, field surveillance, and field approvals. Experiences associated with the Pipeline Coordination Office and the Department of Interior's pre- and post-leasing procedure under the Minerals Management Service could provide useful models. A coordinated process for design review, permitting, field surveillance, compliance and enforcement, and reclamation would serve the State, Interior, and industry well. Failure to provide for coordinated environmental review will not be acceptable to this agency.

Detailed comments on the document are included as Enclosure 1. A summary of key requirements is included as Enclosure 2.

Enclosures

cc/enc: Lieutenant Governor McAlpine
Commissioner Judy Brady
Department of Natural Resources
Commissioner Don Collinsworth
Department of Fish and Game
John Katz, Office of the Governor
Washington, D.C.
Lennie Gorsuch, Office of the Governor
Juneau
Rod Swope, Special Assistant to
the Governor
Tom Koester, Department of Law

bc/enc: Amy Kyle/DEC
Keith Kelton/DEC
Doug Redburn/DEC
Bob Martin/DEC
Larry Dietrick/DEC
Mike Wheeler/DEC
Stan Hungerford/DEC
Bob Butts/DNR
Tom Hawkins/DNR
James Eason/DNR
Norm Cohen/DF&G
Al Ott/DF&G
Lance Trasky/DF&G

DK/ADK/mt

ENCLOSURE 1

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PAGE-SPECIFIC COMMENTS ON THE 1002(h) REPORT

Chapter II Existing Environment.

A section on water quality should be added.

Pages 12-13 Standards for Environmental Protection.

This section provides a general description of standards for environmental protection. It should be noted that the U.S. Fish and Wildlife Service mitigation policy provides for protection of habitat and is useful for that purpose. However, it is less applicable to the standards associated with environmental protection enforced by this agency. At page 13, the list of statutes applicable to development is not complete. It is essential that the Department of Interior identify and address all pertinent environmental authorities.

Page 23 Air Quality.

This section does not reflect current conditions or information. The substantial air emissions occurring in the Kuparuk/Prudhoe area are not described at all. Data sources cited predate development at Prudhoe Bay.

The issue of "Arctic haze" should be described more completely. Arctic haze was first reported as early as the 1950's. Recent efforts to "fingerprint" and track Arctic haze have provided more detail about the sources of these particulates, which appear to originate from sources in Eastern Europe and the Soviet Union. Dr. Glenn Shaw at the University of Alaska's Geophysical Institute in Fairbanks could provide current information on this subject.

The data source cited for carbon dioxide predates development at Prudhoe Bay and, consequently, is in no way representative of current conditions. Monitoring data collected in the late 1970's on nitrogen oxides, particulates, carbon monoxide, sulphur dioxide, and meteorological conditions should be cited. In addition, comprehensive ambient monitoring was initiated by the Department and industry in the fall of 1986. Data from these efforts should be considered in the description and

subsequent evaluation, as these data are most representative of current conditions.

Department staff in Prudhoe have observed a noticeable increase in visibility impairment. The exact causes are not currently known, but should be better understood after current monitoring is completed. It is extremely unlikely that sea spray is a main contributor to particulate levels, as is suggested in the report. The implication that air quality impacts of human activities in the villages is equivalent to those at the Prudhoe/Kuparuk development area (in paragraph three) is misleading at best and should be deleted.

Page 76 The description of reserve pit practices is no longer appropriate under proposed changes in the State solid waste management regulations. If a determination is made that ANWR warrants a higher degree of protection than does Prudhoe Bay, stipulations in addition to the proposed regulations should be developed.

Page 95 Chapter VI Environmental Consequences.

Like the rest of the report, the chapter on environmental consequences focuses primarily on habitat and wildlife issues. The requirements associated with this agency must also be meaningfully addressed during the planning for the project.

Page 97, paragraph four.

The process of consultation should be formalized, as described in our general comments.

Page 97, paragraph six.

The assumption in this paragraph is that technology is the limiting factor in environmental practices on the North Slope. This is not necessarily the case. While air emissions and wastewater discharges are required under federal law to be regulated according to some version of "best available technology" this is not necessarily true for other types of waste disposal.

Page 98, Assumption 2.

The mitigation measures defined at the end of the chapter are by no means adequate to fulfill the requirements of this agency.

Page 98, Assumption 4.

The implication here is that the standards governing seismic exploration and the land use stipulations in the land exchange will provide appropriate guidance for several issues of concern to this agency. We have not had the opportunity to review this issue in detail. The stipulations would obviously be appropriate only at an exploratory stage.

Page 99, last paragraph and page 100.

The treatment of practices and issues associated with disposal of drilling wastes is grossly inadequate and misleading here and elsewhere. As in other areas, a careful review of practices to date and careful consideration of needed improvements is called for. The option cited of simply leaving pits open is unequivocally unacceptable to the State. The description on the following page of impacts should not be considered "unavoidable."

Page 145 Summary of Recommended Mitigation Measures.

Measures 27, 30, 31, and 32 pertain to DEC issues. These measures represent a very small step toward defining what will be needed to provide an appropriate level of environmental protection if the project is to go ahead. The necessity for Interior to become acquainted with the extensive body of environmental regulation and to provide appropriate forums for decisions about stipulations, plans of operations, permits and so on cannot be overstated. The stipulations represent an understanding of these issues that is rudimentary at best.

ENCLOSURE 2

SUMMARY OF MAJOR DEC AUTHORITIES PERTINENT TO ANWR

The State of Alaska defines and regulates the following:

1) <u>Type of Waste</u>	<u>Statutes</u>	<u>Definitions</u>	<u>Regulations</u>	<u>Definitions</u>
SOLID WASTE	AS 46.03.100-120 800-810	AS 46.03.900(24)	18 AAC 60 (draft)	18 AAC 60.910(49)
Construction Waste				(Not defined)
Industrial Waste		AS 46.03.900(10)		-- --
Other wastes		AS 46.03.900(16)		-- --
"Drilling Wastes"		AS 46.03.900(31-32)		18 AAC 60.910(16)
Putrescible Waste		-- --		18 AAC 60.910(40)
Septage, Sewage Sludge, Sludge		-- --		18 AAC 60.910(46) to (48)
Sanitary Waste		-- --		-- --
2) LITTER	AS 46.06	AS 46.06.150(4)		
3) HAZARDOUS WASTE	AS 46.03.296-308 830-833	AS 46.03.299(a)-(b)	18 AAC 62	

<u>Type of Waste</u>	<u>Statutes</u>	<u>Definitions</u>	<u>Regulations</u>	<u>Definitions</u>
4) OIL and HAZARDOUS SUBSTANCES*	AS 46.03.740 758-760 780-790 822-826 AS 46.04		18 AAC 20 18 AAC 75	
Oil		AS 46.03.758(6) AS 46.03.826(4) AS 46.04.120(9) AS 46.08.900(7)		
Hazardous Substances		AS 46.03.826(3) AS 46.08.900(6) AS 46.09.900(4)		
5) WASTEWATER	AS 46.03.100-120		18 AAC 72	
Domestic Wastewater		-- --		18 AAC 72.990(16)
Graywater		-- --		18 AAC 72.990(24)
Non-domestic Wastewater		-- --		18 AAC 72.990(29)
Other Wastes		-- --		18 AAC 72.990(32)
Septage		-- --		18 AAC 72.990(44)
Sludge		-- --		18 AAC 72.990(50)
Spoils		-- --		18 AAC 72.990(52)
6) TOXIC MATERIALS and WASTES are a "special" class regulated under the Federal Toxic Substances Control Act and National Emission Standards for Hazardous Air Pollutants.				

* Note new legislation adding AS 46.08, AS 46.09, and amending AS 46.03.745, 758(k), 760(a), 765, 780(a), 790(a)(b)(d) and AS 46.04.010 and 090(b).

MEMORANDUM State of Alaska

ALASKA DEPARTMENT OF NATURAL RESOURCES

TO: Robert Grogan
Division of Governmental
Coordination

DATE: January 6, 1987

FILE NO:

TELEPHONE NO:

FROM: *JMB*
Judith M. Brady
Commissioner

SUBJECT: Comments on the ANWR
Section 1002(h) Report

Presented below are the Department of Natural Resources' comments on the draft U.S. Department of the Interior report titled Arctic National Wildlife Refuge, Alaska, Coastal Plain Resource Assessment. General comments are presented first, followed by two enclosures. The first enclosure includes comments on the three unresolved issues that were identified by state agencies during discussion on the exchange agreement. The second enclosure includes specific comments on the document and recommended mitigation measures.

General Comments

In responding to the Department of Interior, the state's comments must be clear: the state supports the opening of the coastal plain, and that with proper mitigation, oil and gas exploration, development, and production can occur in a manner compatible with the purposes of ANWR. Accordingly, the department recommends that the state's comments clearly reflect this policy, and that we not send DOI pages and pages of comments informing DOI and Congress of all the flaws in the report. The state's letter will likely be included in the an appendix to the 1002 (h) report where it will be very visible and widely circulated.

The Report's Conclusions

The department concurs with the report's findings that the 1002(h) area "...is clearly the most outstanding oil and gas frontier remaining in the United States, and could contribute substantially to our domestic energy supplies." We also concur with the Department of Interior's (DOI) conclusion that "...most adverse impacts would be minimized or eliminated through carefully applied mitigation, using the lessons learned and acquired from development at Prudhoe Bay and from the construction of the Trans-Alaska Pipeline System."

In addition, we agree with DOI's selection of Alternative A as the preferred course of action. This alternative would allow oil and gas leasing to occur throughout the 1002(h) study area,

with the caribou calving area in the southern portion of the area to be leased last.

This alternative has the greatest potential of resulting in enormous benefits to the nation and the residents of Alaska. As discussed in the Chapter VII of the report, allowing oil and gas exploration and development on the Arctic Plain of ANWR under this proposed alternative gives the greatest promise of:

- 1) making a significant contribution to the nation's oil reserves;
- 2) reducing the nation's dependence on foreign oil;
- 3) enhancing national security;
- 4) providing net economic benefits to the nation on the order of \$79 to \$325 billion (1984 undiscounted dollars)
- 5) providing sizable economic benefits to the residents of Alaska in terms of jobs and state and local government revenue;
- 6) extending the life and amortizing the investment in the Trans-Alaska pipeline, which also will result in increased production from other North Slope fields; and
- 7) greatly enhancing the economic feasibility of oil production from reservoirs found to the north of ANWR in state and federal OCS waters, and those found onshore to the west of ANWR.

In brief, the potential economic and social benefits to the state and nation of allowing oil and gas leasing to occur throughout the 1002 area are substantial, and the state should strongly advocate that the entire plain, including the caribou calving area, be opened for leasing subject to adequate environmental safeguards.

Provision for the Siting of Support Facilities for Offshore Development

It is important that the state urge Congress to allow the siting in ANWR of oil and gas facilities needed to support offshore oil and gas development occurring north of ANWR on state-owned submerged lands and on the federal Outer Continental Shelf. As written, none of the alternatives specifically state that support facilities, if needed, would be permitted. This provision would be compatible with Alternatives A, B, C and D, and accordingly, should be added to these alternatives.

Disputed Acreage

Although the draft report recognizes the submerged lands ownership dispute between the state and federal government regarding the coastal lagoons between the mainland and offshore barrier islands (page 42), it does not address the navigability status of inland waterways. The state also asserts ownership of the submerged lands underlying the Aichilik, Jago, Okpilak, Hulahula, Sadlerochit, Staines and Canning Rivers within the 1002 area. The maintains that these are navigable waterbodies, in which the title of the beds were vested to the state at the time of statehood.

Unresolved Issues

In reviewing the proposed stipulations, and as a result of the interagency discussions on the proposed exchange agreement, three major issues were not resolved at the director level. A brief discussion of our position on these issues is presented below. A more comprehensive discussion is included in Enclosure 2 of our comments.

The three issues involved requests by ADF&G to: 1) defer oil and gas leasing in the "core" calving area, 2) prohibit surface entry, with the exception of one transportation corridor, within three miles of the coast, and 3) prohibit surface entry within 3/4 mile of selected rivers and 500 feet from other waterbodies.

According to preliminary estimates of the Division of Mining and Geological and Geophysical Surveys, the three-mile surface entry restriction along the coast would result in 19% of the ANWR acreage with the highest rated oil and gas potential being placed under severe land-use restrictions. The deletion of the caribou calving area would result in 10.8% of the highest potential area, and 16.5% of the second highest rated acreage, being placed offlimits. Combined, these two measures would preclude 30.1% of the highest rated acreage, and 16.5% of the second highest rated potential acreage, from oil and gas activity, with a substantial corresponding reduction in potential economic and social benefits to the nation, state, and Native corporations.

Caribou Calving Area

In the department's view, there is little evidence, that oil and gas development activity in the calving area will have an adverse impact on the Porcupine caribou herd population if adequate measures are taken to allow caribou passage through developed areas, and if measures are taken to reduce disturbance during calving periods. The department agrees with the Department of Fish and Game that some caribou displacement has

occurred in the Prudhoe Bay Field due to the very large amount of traffic and low pipelines in that particular field. In the Milne Point and Kuparuk Fields, where extensive mitigation measures have been employed, displacement has been much more limited, and has occurred most often in the vicinity of facilities in which high levels of noise are produced, or near roads with high levels of vehicle traffic.

However, even if some displacement of caribou from calving areas does occur, based on our review of the scientific literature and after consulting with recognized caribou biologists, we remain unconvinced that this displacement will likely result in reductions in the caribou population. Based on a review of the literature, we have yet to find a study in which it has been documented -- or even strong evidence presented -- that caribou displacement and disturbance occurring in a calving area has led to a reduction in the size of a caribou herd population.

We understand that ADF&G wants to take a very conservative management approach, and not lease the calving area. However, if this area is rich in petroleum resources, such an approach would result in sizable foregone social and economic benefits in exchange for uncertain benefits to the caribou population.

The department also is seriously concerned with the prospect of the State of Alaska taking a position on caribou calving in ANWR that is inconsistent with policies and actions taken by the state on state-owned lands. On the North Slope, the State of Alaska has leased both core calving areas of the Central Arctic Caribou Herd. Unless there are compelling reasons for adopting a different state policy for ANWR calving areas, the department urges the state to support leasing of the caribou calving areas with the mitigation measures that are required in state leases.

Three-mile buffer Adjacent to the Coast

With respect to the proposed prohibition of facilities within three-miles of the Arctic coast, the department has similar concerns as those expressed above. This buffer is intended to maintain caribou access to and along the coast, and to protect waterfowl, nesting birds, and polar bears from potential impacts. First, it has been shown that mitigating measures, such as pipeline elevation, ramps, and seasonal restrictions on traffic, are effective in achieving the objective of maintaining caribou access to and along the coast. Second, we have not heard any compelling reasons to have a policy in ANWR that is substantially different from that applied to state-owned lands. Third, if and when facilities are proposed, the facilities can be sited and designed to minimize impacts on waterfowl, nesting birds, and polar bears.

Buffers Adjacent to Streams and Rivers

The adoption of a proposed policy of requiring a 3/4 mile buffer adjacent to selected streams, and a 500 foot buffer adjacent to all other waterbodies, would be another case of the state advocating a different standard for federal lands than that used on state-owned lands. On state-owned North Slope acreage, a 500 foot buffer is required for selected major rivers, and a 100 foot setback is required for all other fish-bearing streams and lakes. In both instances, smaller buffers may be allowed if the "...Director, Division of Oil and Gas, after consultation with the Department of Fish and Game, determines that such facility placement will not significantly disturb sensitive wildlife habitats or that such a requirement is not feasible or prudent."

We are not aware of deficiencies with the 500 foot/100 foot setbacks, which have been developed over the years as a result of considerable interagency discussion and debate, and represent a careful balancing of habitat protection requirements with the economics of oil and gas field design and siting requirements. We agree that there may be site specific cases in which a larger setback is necessary, but as a general rule, the 100/500 foot setbacks are adequate.

It should be noted that if the larger setbacks are advocated, the state would be arguing for a 3/4 mile setback for the federal land on the east side of the Canning River, while it has adopted a 500 foot setback on its lands on the west side of the Canning River.

In our view, the state should not adopt the 3/4 mile buffers unless it can clearly be shown that there are compelling reasons for having larger buffers in ANWR relative to the buffers that have been used for years on state-owned lands on the North Slope.

Conclusion

In summary, the department urges the Governor to adopt and convey a strong, positive position towards the report. Alaska's response should state that we support Alternative A, that oil and gas activity can occur with minimal impacts to fish and wildlife resources as evidenced by the Prudhoe Bay experience, and that the social and economic benefits to the nation and state far outweigh any potential environmental costs.

cc: Lieutenant Governor McAlpine
Commissioner Collinsworth
Commissioner Kelso
Deputy Commissioner Arnold
Deputy Commissioner Barnett

ENCLOSURE 1

UNRESOLVED ISSUES
Arctic National Wildlife Refuge

Oil and Gas Leasing in the "Core" Caribou Calving area

Issue: Should the State of Alaska request that the Department of Interior and Congress continue to prohibit oil and gas leasing in the "core" calving area of the Porcupine caribou head.

ADNR's Position: Oil and gas leasing should be permitted in the calving area. The oil and gas potential of the area is high, and mitigation measures can be taken to minimize, and perhaps eliminate, adverse impacts on the caribou population.

Rationale:

1. The concept of a area-specific critical "core" calving area is not supported by the facts. Caribou calving has taken place throughout the area north of the Brooks Range. While it is true that caribou calving frequently occurs in the "core" area, there are years in which it is not used, and other years in which only a portion of the "core" area is utilized.

2. Only moderate amounts of caribou displacement has occurred to date on the North Slope where state-of-the-art mitigation measures have been employed. In the Kuparuk Milne Point areas there is evidence of displacement of maternal cows and calves in the immediate vicinity of pads and roads with high levels of vehicle traffic and activity. However, no regional displacement has occurred. Once development and construction activity and subsides, the current amount of displacement will likely be reduced.

- A. If mitigation measures are taken (roads are separated from pipelines, pipelines are elevated, well-designed ramps at appropriate locations are provided, and traffic is minimized) caribou will cross pipelines and roads.
- B. Displacement in the vicinity of structures and roads is largely a function of the level of activity and noise generated from the facilities and roads, not their physical presence.
- C. Mitigation measures can reduce disturbance-producing activity when caribou are present to minimize potential displacement.

3. Even if one assumes displacement is occurring, there is no scientifically supportable evidence that displacement of the herd from the calving area will, or is even likely to, effect the size of the caribou population.

A. Case histories relied upon by biologists to argue that displacement of caribou from calving areas will result in population effects are not comparable to the ANWR situation. Population declines in these case studies can largely be attributed to greater hunting pressure and physical barriers that are difficult, if not impossible, to cross.

B. Other studies have indicated that the maintenance of disturbance-free calving ground habitat does not appear to be critical to the health of the population.

C. The basis for claiming that caribou calving areas have unique biological features different from other areas has never been documented, and based on the large and varying areas in which calving takes place, it can be assumed that these core areas must not be critical to the animal's survival.

D. The department is not aware of any studies that show herd productivity is reduced in cases where disturbance has taken place in calving areas.

E. Reputable scientists have concluded that the controlling factors have the greatest affect on caribou population size are predation and hunting, not minor losses of habitat in calving areas

4. Mitigation measures to reduce or eliminate the amount of displacement on caribou are available, and have been largely successful in the Milne Point and Kuparuk areas. Measures that are used include: 1) separation of pipelines and roads, 2) elevated pipelines, 3) consolidation of facilities, 4) flight restrictions, 5) restrictions on non-essential activities during calving periods, and 6) traffic controls. These same measures can be successfully applied to the "core" calving areas of the Porcupine herd.

5. Deletion of the "core" caribou calving area will foreclose oil and gas leasing opportunities in approximately 10.8% of the 1002 area with the highest ranked oil and gas potential, and 16.5% of the 1002 area with the second highest ranked potential, with no certain benefits to the caribou herd.

6. A state recommendation to delete the caribou calving area would be inconsistent with state policy applied to state-owned lands on the North Slope. The state of Alaska has leased both "core" caribou calving grounds of the Central Arctic Herd.

7. The department recommends that the state support Management Alternative A in the 1002 report, which would not delete the caribou calving area from oil and gas leasing. This recommendation is based on the low risk of adversely affecting the caribou population, the need to have a consistent state position in regards to calving areas, and the potential large economic and social benefits to the nation and the state of leasing the calving area.

Surface Entry Restriction within Three Miles of the Coast

Issue: Should the State of Alaska request that the Department of Interior (DOI) and Congress restrict surface entry, with the exception of transportation corridors and facilities needed to support offshore development, within three miles of the coast? The restriction is intended to preserve insect relief habitat for caribou and to protect waterfowl, bird nesting, and polar bear denning habitat.

ADNR's Position: The state should not request that DOI prohibit surface entry in this area. The oil and gas potential of the area is high, the area encompassed by the restriction is extremely large, and mitigation measures can be taken to minimize, if not eliminate, adverse impacts on caribou and waterfowl populations.

Rationale:

1. Mitigation measures are available to ensure that caribou access can be maintained. As discussed in the previous issue, if measures are taken to separate roads and pipelines, if ramps are provided, and if traffic is minimized, caribou will cross pipelines and roads. Restrictions on activities during insect relief periods can reduce disturbance producing activity when caribou are present.

2. Even if caribou access to the coast is not provided in limited, site-specific areas, there will continue to be large portions of the the Beaufort coast in which access will be possible. The coast in ANWR is over 150 miles long, and a large portion to the east of the 1002 area is designated wilderness. It is extremely unlikely that oil and gas facilities will occupy more than a small fraction of the coastline.

3. However, even if site specific access was prevented, no scientifically supportable evidence exists that this lack of access would likely affect the size of the caribou population.

A. The department is not aware of any studies that show that herd productivity is reduced when insect relief habitat is slightly reduced.

B. Reputable scientists have concluded that the controlling factors largely affecting caribou population size are predation and hunting, not minor losses of habitat in calving and insect relief areas.

4. Mitigation measures to reduce or eliminate the impacts of oil and gas activity on waterfowl, and nesting birds are available, and have been successfully on the North Slope which have higher waterfowl and bird nesting habitat values.

These same measures can be successfully applied to waterfowl and nesting habitat on the coastal plain of ANWR.

5. A surface entry restriction within three miles of the coast will preclude, or seriously restrict, oil and gas development in approximately 19.3% of total 1002 acreage designated as having the highest oil and gas potential.

6. A restriction on the siting of onshore support facilities for offshore development could have an adverse impact on feasibility of production from offshore state-owned and OCS acreage.

7. A state recommendation to prohibit surface entry in this area would be inconsistent with state policy applied to state-owned lands on the North Slope. When facing this same question, the State of Alaska has leased caribou insect relief habitat and "critical" waterfowl areas on the North Slope adjacent to ANWR. Instead of large scale surface entry prohibitions, mitigation measures have been developed and successfully employed.

8. The department recommends that the state not support a restriction on surface entry within three miles of the coast. This recommendation is based on the low risk of adversely affecting the caribou and waterfowl populations, the need to have a consistent state position in regards to insect relief and waterfowl habitat areas, and the potential large economic and social benefits to the nation and the state of allowing surface entry in this area.

3/4 mile Buffer Adjacent to Specified Streams

Issue: Should the State of Alaska request that the Department of Interior (DOI) and Congress restrict surface entry, with the exception of transportation corridors, within 3/4 mile of specified streams, and 500 feet from other streams, lakes, and other water bodies? The restriction is intended to protect riparian habitat and minimize pollutants from entering the water bodies.

ADNR's Position: The State should not request that DOI prohibit surface entry within 3/4 mile of specified streams, and 500 feet of other waterbodies. Instead, the setbacks should be 500 feet from specified streams, and 100 feet from other water bodies. Provisions could be made to require larger buffers when it is determined to be necessary on a site-specific basis.

Rationale:

1. As a result of the extensive discussions, the State of Alaska has established setbacks of 500 feet from specified streams (such as the Canning River), and 100 feet from other waterbodies.
2. The established setbacks of 500/100 feet resulted from a careful balancing of habitat protection requirements and the economics of oil field design and economics. The department is not aware of problems that have arisen from these setbacks.
3. Accordingly, the department has not seen any compelling reasons to enlarge the setbacks.
4. A setback of 3/4 miles on each side of a river will likely increase the cost of developing a field, and could reduce the amount of oil and gas ultimately recovered.
5. Larger setbacks have been agreed to in the Cook Inlet and Bristol Bay Region in order to protect popular fishing streams and critical habitat areas. However, setbacks on the North Slope have consistently been 500/100 feet. And, the department does not object to larger setbacks on a case-by-case basis adjacent to critical habitat areas.
6. A state recommendation to prohibit surface entry in this area would be inconsistent with state policy applied to

state-owned lands on the North Slope. If 3/4 mile buffers are adopted in ANWR, there will be a 3/4 mile buffer on the east bank of the Canning River, and a 500 foot buffer on the west bank.

7. The department recommends that the State support a position consistent with state policy on state-owned lands. This recommendation is based on the lack of evidence that 500/100 foot buffers are inadequate, the additional development costs associated with larger buffers, and the need to have a consistent state position on stream setbacks.

ENCLOSURE 2

Specific Comments on the draft

Arctic National Wildlife Refuge, Alaska
Coastal Plain Resource Assessment

Specific Comments
Alaska Department of Natural Resources

Overall, the Department of Natural Resources found that the U.S. Fish and Wildlife Service did an excellent job in compiling and summarizing a large amount of information.

Presented below are the department's specific comments on the contents of the report. Only comments that were considered to be of substantial importance have been included.

Chapter III - Assessment of Oil and Gas Potential

The department found this discussion to be well written, comprehensive, and based on what is known regarding the geology of the area, well-founded forecast. While the resource estimates developed by the department vary from the estimates presented in the report, the overall conclusions are very similar: the coastal plain of ANWR has the highest known oil and gas potential of any unexplored area on the North American Continent.

Chapter IV - Development and Transportation Infrastructure

This chapter was also well-written. The department's only comment is that based on the experience of oil and gas development near the village of Nuigsut, it is likely that Kaktovik residents will want to have access to a road system built in the vicinity of the village.

Chapter V - Alternatives

As noted in our earlier comments, the department supports Management Alternative A - Full Leasing of the 1002 Area.

In the discussion of potential development scenarios, readers should be cautioned that the scenarios presented in the text are only one possible set of outcomes, and that there are a multitude of additional possibilities. It is possible that no oil will be found, and that the only trace of oil activity will be the minor traces of exploratory drilling activity. It also is possible that sizable geological structures were not identified, and that oil and gas may be found in other areas than those identified on the maps. Until actual drilling takes place, we will not know if, or where, oil exists.

Chapter VI - Environmental Consequences

Page 97 - The department has serious reservations regarding the need to "compensate" the loss of habitat on the North Slope. According to the USF&WS policy, habitat impacted by oil and gas

activity which is located in the caribou calving area must be replaced, or substitute resources or environments provided. While we fully understand the need for this in wetlands and coastal areas found in heavily populated and impacted areas in which habitat is limited, we are not convinced that there is a scarcity of caribou habitat on the North Slope. Based on our review of the literature, the loss of several thousand acres of caribou habitat, even if it occurs in the "core" calving area, is inconsequential to the health of the population.

We also have reservations concerning the designation of the calving area as "Resource Category 1," and all other areas in the refuge as "Resource Category 2." Based on the definitions and the habitats of the 1002 area, the department does not think that the vast majority of the 1002 lands qualify for such a high level of protection and mitigation as defined by the current USF&WS Mitigation Policy.

Page 97 - This section should also recognize the multitude of other permits that will be required for oil and gas operations in ANWR. In addition to the USF&WS Special Use Permit, operators also will be required to obtain state and federal permits for drilling wells, disposing of solid wastes, air emissions, placement of fills in wetlands and coastal waters, water appropriations, oil spill contingencies, and a host of other activities. In addition, all activities impacting the coastal area must be consistent with the Alaska Coastal Management Program.

Summary of Recommended Mitigation for the 1002 Area

In reviewing the proposed stipulations, it was assumed by the department that this summary was not intended to be all inclusive, and that more detailed stipulations would be developed prior to any lease sales or transfer of subsurface rights. We found this to be a reasonable approach, and therefore limited our comments to those items that were especially troublesome.

Item 4 - Rehabilitation Plan Requirement

The need for rehabilitation plans is clear, but the timing of their submittal and measures necessary to ensure that they will be implemented need further consideration. First, a overall rehabilitation policy should be developed early in the leasing process so that lessees are aware of what degree of rehabilitation will be required. Based on the policy, a very general rehabilitation plan could be submitted with a proposed plans of operation. Detailed specific plans would then be required several years before operations are to be abandoned.

Item 6 - Limits on oil exploration

This policy would limit exploratory activity, with the exception of geology studies, to November 1 - May 1, although "local exceptions could be made." While we agree in principle with this stipulation, as written it is too restrictive. It may be necessary to conduct summer site surveys and summer drilling activities, and it may be desirable to have operations start-up prior to November 1 at pre-existing drill sites. Assurances should be made that these activities will not be precluded.

Item 8 - Pipeline elevation

This policy requires that pipelines allow "free passage" of caribou. Because of the problems of defining "free passage," the department recommends that just "passage" be used.

Item 10 - Pipeline Burial

Instead of requiring that pipelines be buried where "possible," we strongly recommend that they be buried "where feasible and prudent."

Item 12 - Surface occupancy restriction within three miles of the coast

For the reasons cited earlier, the department strongly recommends that this stipulation be deleted.

Item 13 - Monitoring and Research Requirements

If monitoring and research is to be a useful management tool, the objectives of the research must be clearly and specifically identified prior to the research being conducted. Without this occurring, the monitoring and research efforts are useless. Also, who will pay for this research, and how extensive a program is anticipated?

Items 16 and 17 - Peregrine Falcon and Raptor protection

Since peregrine falcons are endangered, the department concurs with the recommended setbacks from known peregrine nests. However, we are not convinced that the same high level of protection should be provided for all raptors. The department recommends that raptors be deleted from these stipulations.

Item 19 - Polar Bears

In our view, it is not clear that denning polar bears are bothered by anything other than very loud noises, such as that emitted during geophysical operations. Accordingly, this stipulation should be modified to apply only to geophysical operations. Also, it should be made clear that if a bear builds a new den adjacent to existing structures, the activity associated with the structure does not have to be suspended.

Item 21 - Discharge of firearms

A restriction on the discharge of firearms in the vicinity of structures is necessary to protect human safety and oil field operations, but the five-mile prohibition is excessive.

Item 23 - Protection of *Thaspi arcticum*

This stipulation causes the department concern for several reasons. First, it is not known to the department how widespread this plant is, so it is impossible to determine how large an area will be placed off limits by this stipulation. Second, at this point in time the plant is a candidate for the endangered species list, it is not on it. This stipulation should be dropped.

Item 24 - Causeways

This stipulation should be modified with "To the extent feasible and prudent,..."

Item 25 - Time and Area Closures for wildlife

The department has no objections to the concept of closures and activity restrictions for exploratory activities and certain activities associated with development and production, such as vehicle movement. As written, this stipulation should apply only to exploratory activities, vehicle movements, and other activity than can reasonably be rescheduled for another period of time.

Item 26 - Overflight Restrictions

These restrictions should be consistent with the elevations used by the state. In addition, it should be made clear that human safety takes precedence over the restrictions.

Item 27 - Reduction of human/bear conflicts

This stipulation should be modified to read:

"Measures must be taken to minimize human/bear interaction and conflict. These measures may include, but not be limited to, the use of bear-proof fencing around certain facilities, special waste management plans (such as incineration of putrescible wastes), and employee education programs."

Item 31 - Reinjection of drilling wastes

The department recommends that "cuttings" be deleted from this stipulation. The advantages of reinjecting cuttings would be negligible, and unless the cuttings were crushed (which could be very expensive), reinjection of cuttings is not technically feasible.

10/6 - MMF - 1002 Report.

Russell (Lowe) - w/ Al Emery -

re Alt v A - air; water + gravel; marine transp. - partic. causeways; calving areas;
fish - CESCO - range of alt vs; redxn of core calving area for draft.

Don Yang - elaborate the impacts; what's a CESCO?; fish don't know the
difference b/w a bridge + a culvert; argue to rely on knowledge of
state/fed'l wildlife experts (at EPA wh. is stip'g on fish protecn.);

Thomas - classif'n of o/g wastes (mats/cuttings) as nonhaz's in draft resp.
water quality at Pothole Bay.

Savds - DOI pol'ns'd through 1002 LEIS, but State + EPA appear to hv
big resrvns.

Maggie - 1) core calving area - about 19% of o/g POT (w; 2) waste stream
mgmt issues;

oppos'n to land trades -

Maggie Moran

witness list for Sen. Gr ANSWR legs?

- agenda - 13th - EPA, USFWS, DOI, state of AK, Senators, congress.
- 14th - Murk's support by OH/Mietuch/Eason -
- 15th - opposed

will prob'ly be another round

Sen. E + PW - Maggie will know more - poss'ly not get Roth's bill -

Lindsey Thomas + ^{Walter Jones} ch. 1 are exp'd to do a bill - allow expl'n -
4-6 wells -

Coalition mtg 10/8 S-207 in Capitol at 3:00 -

LGIS trades - no axn -

10/17 Katz -

✓ ANCSA lunches
✓ Nat'l Treasury Inspector
✓ lawsuit

land exchanges

- ✓ has enough sense of ANCSA/DOI lobbying to be able to judge the dangerous times -
- ✓ Mobil/Sun oppos'n
- ✓ 7(i) - NANA - Sulaska -
- ✓ McClure hated the trades -
- ✓ moratorium language in submgd lands - Murk sez OK - submgd lands -
- ✓ He's out 11/17 - Gov testify - Sam same day - Jeff Petrich. -
- ✓ Basin bus trip. - me/hen?
- ✓ Rota bill -
- ✓ won't pursue now but maybe

4/3

Bob Gilmore

land trades - no lobbying, just ans'g q's -

non-duplication - in steps prob'ly -

leasery - stand-alone - reg's + steps wd be based on ex'g prac's -
wd need new resp for coastal plain log system -

Is supervision - don't know wh'r it's to

R/W's - new act'g - sep. act'g fr. Pipeline R/W Log - ANILCA
or Refuge Admin Act - both wd be very cumbersome -

NEPA - exp'd jud'l now as in TAPS -

*2-4b - excluding - 89% of value is still available w/ trades -

EIS - wants Congress to use LEIS/1002 as basis for 1st lease
sale - based on prospectiveness -

Solizator's Opinion is on hold - it was finished + then discussed

w/ AG

won't move on LEIS until Bennett Johnston nodes
mark-ups wait happened bec. of budget stuff -

10/13 1

Call Tom Canby.

Gail Galtan

Bart Watson

Budrick

Bumpus Bradley, Ford Johnson, McBurne, Murkowski, Heston, Evans, Pingaman

10/12 Sen Energy - Domenici ~~Conrad~~ Fowler Conrad

Horn speaks against explorin prog. bec. it cd affect the
pot'l bonus revenue fr. adj. tracts (analog - land exchanges)
"no unnecy adv's ^{effects} ~~impk~~" - The st^d offered in 1002 for any dev't, lsg
on coastal plain

Refuge Adminin Act -

1002 contains 29 rec'd env't strips on lsg. - "starting point", will dev.

Other strips in NEMA process -

water + gravel a major concern -

want new auth's re duplicin of similar facilities, R/W est. -

want ^{low priced} cash, royalties, bidding

1002 LEIS shd be programmed EIS but there shd be 18-24 mos. of
lsg. EIS work bef. lsg occurs - can't meet S 1217's 12 mo. deadline

Johnson issues:

- 1) exploration-only phase? he doesn't support - no Ct. members seem to supp.
- 2) core-calling area set-aside - State interest
- 3) st^d for proten of f+w - what does no unnecy adv's effx mean
- 4) lease all, save some for later?
- 5) expedited judicial rev on EIS
- 6) lease strips
- 7) R/W with: - under no unnecy advs impk st^d -

8) wastes, gravel, water

9) special liability provisions

10) lease terms - beyond activity or > specific -

5735 - need legal opinion fr. DOI solicitor on legality of reducing

Act's entitlement -

ali of coastal plain? Horn - yes. NEPA process might result in some
staying. EIS for lsg process - strips, areas

how define "reasonable" on strips, impact?

pot-grn?

→ want activity to be able to suspend leases if there's no transport system
available - (what a scam!) - (Horn)

new length of lease - not a 10-yr std - due diligence (Johnston)

lease sale revenues of \$2-4b, acc. to Horn - how arrived at? (trades mid?)

std ls terms? what price of oil? what date of ls sale? discounted \$?

Horn - State will not hv a strong case if challenging unilateral rden of 90/10 -

→ want stand-alone lsg activity, not MLA 1920 -

Bradley - EPA 6/1 let - Blueprint EIS record - cumulative effx - impact aid for

locals (Horn opposes) - can rank stress by pot'l? (Horn sez yes by region,

might hv missed a lot) 2 most impact are 18/19 + Tago River

→ area ^{2d/21} + 75% of pot'l in ANWR - diff's btw draft + final 1002 impact

analysis -

(scribbles)

Evans -

State

planning

waste mgmt

jt fed-state coop in monitoring / stip dev't -

monitoring + enforcement

explor only wd be unfair to adj. owners, wd red. bonus revs, wd be

exp. dozens of wells wd be need

Johnston wants larg. fr. state on jt. state-fed coop

10/15 - 1

Sea Energy - ANWR - env't groups

Janston, Benjamin, Wirth, Meizenbaum, Fowler, Mukli,

DOE - compl'g - problems?

steps - enforceability, economics, effectiveness

constitutionality of steps as - taking - courts are divided

steps are often waived.



ADGA attitude tow. steps. - working gov;

prev' measures aren't proven after fail.

Joe Fisher - Winers Socy.

Lisa Speer - NRDC/NWF/Trustees

"disturbing record of non-compliance" @ Prudhoe

air/water poll'n, absence of habitat

data gaps bec. of inad. monitoring

burden of proof is on agencies - indy -

Milton Freeman - subsistence -

1002 Ind. ^{to meet} NEPA req'ts. - DOE/SOLDF

Celia -

Debbie Miller - her 1-yr old daughter spoke up a wolf on coastal plain this summer

THE FOLLOWING PAGES WERE TREATED AS
A UNIT IN THE ORIGINAL FILE.

MEMORANDUM

State of Alaska

DEPARTMENT OF FISH AND GAME

TO: Robert L. Grogan
Associate Director
Division of Governmental
Coordination
Office of Management
and Budget

DATE: January 2, 1987

FILE NO.:

TELEPHONE NO.: 465-4100

SUBJECT: ANWR 1002 Report

FROM: Don W. Collinsworth
Commissioner
Department of Fish and Game

DWC

The Alaska Department of Fish & Game (ADFG) has reviewed the Draft Arctic National Wildlife Refuge, Alaska, Coastal Plain Resource Assessment 1002 report, and the accompanying cover memo by William Horn. The 1002 report contains a substantial amount of information that is useful for guiding the U.S. Fish & Wildlife Service (USFWS) and other agencies in protecting fish and wildlife resources should Congress open the area for oil and gas leasing.

We have predicated this review on the fact that the Arctic National Wildlife Refuge (ANWR) is a unique part of the national wildlife refuge system and furthermore, as stated on page 46 of the 1002 report, "The 1002 area is the most biologically productive part of the Arctic Refuge for wildlife and is the center of wildlife activity on the refuge." We have conducted an extensive review of the resource information and have summarized this review in Enclosure A. Data on distribution and abundance of fish and wildlife are presented, and areas of special concern are highlighted.

The ADFG's major comments on the adequacy of the 1002 report, including our recommended alternative, are summarized below. It should be recognized that there are a number of major resource issues and that time did not allow a full evaluation of the 1002 document:

(1) Selection of Alternatives

Based upon the state's interest in having exploratory drilling proceed but in a manner that affords protection of the Porcupine caribou herd, ADFG recommends support of Alternative B, limited leasing of the 1002 area. Under Alternative B, oil and gas leasing would be allowed in the 1002 area with the exception of losses to habitats placed in Resource Category 1, as defined in the USFWS Mitigation Policy. ADFG supports the placement of the Porcupine Caribou Herd (PCH) core calving area in Resource Category 1 as noted in the 1002 report. Furthermore, ADFG recommends that spring-fed overwintering areas used by fish be added to Resource Category 1, thereby precluding loss of these important fish habitats during leasing. Further discussion of these recommendations is presented in Enclosure B (Major Fish and Wildlife Issues).

(2) Mitigation Measures

ADFG concludes that the 1002 report does not adequately address mitigation of oil and gas impacts on fish and wildlife resources. This conclusion is based on the following: (1) there is no forthright commitment in the report by the Department of Interior (DOI) to incorporate any or all of the mitigation measures mentioned in the report; and (2) the mitigation measures in the report are inadequate to prevent significant adverse effects on fish and wildlife resources and their human uses. A glaring example that there is no assurance that DOI will incorporate meaningful mitigation measures is that William Horn, Assistant Secretary of the Interior, recommends that Congress approve leasing in the entire 1002 area. This recommendation was given in spite of statements in the report that significant adverse effects on the PCH would occur if the core calving area were developed.

As a partial improvement to the mitigation measures in the report, ADFG has revised the summary of recommended mitigation (pages 145-147 in the report), and suggested additional topics to be covered (Enclosure C, Summary of ADFG Comments on the ANWR 1002 Mitigation). Considerable work and additional time will be needed in order to develop an adequate set of terms and conditions designed to ensure protection of fish and wildlife resources.

(3) Land Exchanges

The 1002 report is flawed because it does not evaluate the effects on fish and wildlife resources and their human uses caused by potential land exchanges between DOI and private landowners. Such land exchanges are currently being negotiated. Preliminary review by ADFG of a draft land exchange agreement and attached terms and conditions indicates that there are substantial differences among the mitigative measures in the 1002 report and those in the draft land exchange agreement. Terms and conditions applied to the draft land exchange agreement appear inadequate to prevent significant adverse effects on fish and wildlife resources and their human uses. ADFG recommends that the final draft of the 1002 report contain an evaluation of the effects of the proposed land exchanges, and that terms and conditions for 1002 lands involved in the exchanges and for those retained by USFWS reflect the best mitigation measures to protect fish and wildlife resources and their human uses.

(4) Joint Federal/State Review

The 1002 report makes a general statement that oil and gas development will adhere to applicable state and federal laws, but does not discuss the process by which such adherence will be assured. ADFG recommends that a joint state/federal interdisciplinary team be established to participate in strategic and project planning, and for project design review, permit monitoring, and compliance. This recommendation is discussed further in Enclosure D, General Issues.

(5) Subsistence

The 1002 report does not address the process by which the impacts of oil and gas development on subsistence activities will be identified and mitigated. Such an analysis is required by section 810 of Alaska National Interest Lands Conservation Act (ANILCA). ADFG recommends that a requirement for such an analysis be included in the final report, and ADFG further recommends procedures for such an analysis. Additional discussion of this recommendation is included in Enclosure E, Subsistence.

As previously stated, a number of major resource issues are discussed in the enclosures to this memo. Examples include ADFG recommendations on insect relief habitat for caribou (Enclosure B), use of Prudhoe Bay as the Industry Standard (Enclosure D), stream buffers and setbacks (Enclosure B), and Transportation Routing Considerations (Enclosure D). Please refer to the Table of Contents which identifies specific subjects addressed in each enclosure. Questions on major issues may be addressed to Norman Cohen or Bruce Baker (465-4107), or Al Ott (452-1531) of the Habitat Division. Al and his staff will be able to respond to questions of a specific nature.

Enclosures

- A - Fish and Wildlife Habitat and Resources in the Arctic National Refuge
- B - Major Fish and Wildlife Issues
- C - Summary of ADFG Comments on the ANWR 1002 Mitigation (Pages 145-147 of DEIS)
- D - General Issues
- E - Human Uses of Fish and Wildlife
- F - Specific Comments on 1002 Report and Stipulations

cc w/enc: Commissioner Judy Brady, Department of Natural Resources
Commissioner Dennis Kelso, Department of Environmental Conservation

Robert L. Grogan

-4-

January 2, 1987

bcc w/enc: Norman Cohen
Lew Pamplin
Steve Behnke
Bruce Baker
Al Ott
Lance Trasky
Dick Bishop
John Clark
Fred Andersen

C2098

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- Fox
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Enclosure B - Major Fish and Wildlife Issues

- Resource Category 1
- Core Calving Area of the Porcupine Caribou Herd
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Enclosure C - Summary of ADFG Comments on the ANWR 1002 Mitigation (Pages 145-147 of DEIS)

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Enclosure E - Human Uses of Fish and Wildlife

- Basic Requirements of ANILCA Section 810 Attached

Enclosure F - Specific Comments on 1002 Report and Stipulations

Enclosure A

FISH AND WILDLIFE HABITAT AND RESOURCES IN THE ARCTIC
NATIONAL WILDLIFE REFUGE

The ADFG has conducted an extensive review of the resource information as collected by the USFWS, the ADFG, and industry for the ANWR and adjacent lands. This enclosure consists of a summary of the key fish and wildlife resources in the general area of the ANWR coastal plain. Data on distribution and abundance of fish and wildlife are presented, and areas of special concern (e.g., calving areas, insect relief habitat, staging areas, overwintering, and spawning habitats) are highlighted for each species or species group. Fish and wildlife groups and species of importance in the ANWR include fishes, caribou, muskox, moose, bowhead whale, peregrine falcon, waterfowl, shorebirds, wolf, wolverine, foxes, polar bear, brown bear, and ringed seal. Discussions on the various fish and wildlife species are not limited geographically to the 1002 lands but include data pertinent to areas that would be affected by transportation corridors and support activities associated with the exploration and development of oil/gas resources.

FISH

AC	arctic char	LT	lake trout
ACI	arctic cisco	NSB	ninespine stickleback
BB	burbot	PS	pink salmon
CS	chum salmon	RS	red salmon
FSC	fourhorn sculpin	RWF	round whitefish
GR	grayling	SSC	slimy sculpin

Distribution and Abundance

There are ten streams in the 1002 area that are known to contain fish. Twelve species of freshwater or anadromous fish have been identified in these waterbodies. The following is a listing of the streams containing fish and the species present (Bendock 1984, Sonnichsen 1985):

Canning River	AC, ACI, BB, CS, GR, LT, NSB, PS, RS, RWF, SSC
Tamayariak River	GR, NSB
Katakturuk River	AC, NSB
Marsh Creek	AC
Sadlerochit River	AC, GR, LT, NSB, PS
Hulahula River	AC, GR
Okpilak River	AC, GR, LT
Jago River	AC, NSB
Kogotpak River	AC, GR
Aichilik River	AC, ACI, FSC, GR

The Canning River drainage supports the greatest diversity and abundance of fish species in the 1002 area. An aerial survey of the Canning River conducted in September, 1982 upstream of the Marsh Fork resulted in an estimate of 39,000 arctic char (Smith and Glesne 1982). The Canning River differs from other rivers in the 1002 area due to the number and magnitude of perennial ground water sources flowing into the river.

The Aichilik and Hulahula River drainages also support populations of anadromous arctic char. An aerial survey conducted in September, 1982 on a section of the Aichilik documented a large concentration (2,000-4,000) of arctic char located downstream from a spring (ibid.). In 1983 surveys of the Hulahula River, arctic char were found to be widely distributed throughout the drainage. Arctic char were collected in almost all of the areas surveyed as far upstream as East Patuk Creek (Daum, Rost and Smith 1984). Fall concentrations of Arctic char were observed at three holes on the Hulahula River that have historically been used by villagers from Kaktovik (ibid.). Arctic grayling have also been reported from the Canning/Tamayariak River system, the Hulahula/Okpilak River system and the Aichilik River.

No systematic abundance surveys for arctic grayling have been conducted in the 1002 area (ADFG 1986). Some information on catch per unit effort is available from the U.S. Fish and Wildlife Service (USFWS) lake and stream surveys in the area. The Sadlerochit River drainage contains populations of lake and stream resident arctic char and arctic grayling. A dwarf form of arctic char is present in the vicinity of Sadlerochit Springs (Smith and Glesne 1982). Lake resident arctic char, along with arctic grayling and lake trout, are found in Peters and Schrader lakes. Anadromous arctic char have not been positively identified in the drainage (ibid.). Although arctic char are identified as occurring in the Katakaturuk River, Marsh Creek and the Jago River, studies conducted by the USFWS indicate that abundance is very low. Those fish captured most likely reflect summer excursions from neighboring drainages.

The lagoon and nearshore waters adjacent to the 1002 study area represent important summer feeding habitat for anadromous arctic char and whitefish. Fish from North Slope drainages disperse along the coast and utilize lagoon and nearshore waters as summer feeding areas. The warmer, less saline nearshore habitats are areas of high seasonal abundance for anadromous fish.

Areas of Special Concern

Overwintering areas probably are the greatest single limiting factor for anadromous and freshwater fish populations because severe winter conditions in the arctic drastically reduce available water supplies. Many sections of river channels and coastal lakes (less than 3 m in depth) freeze solid. Winter flow is generally immeasurable (USFWS 1982). During the winter, water sources are limited to spring areas, deep isolated pools, deep lakes, and brackish river delta areas (ibid.). Most of the spring water sources, as identified below, have been surveyed by the USFWS:

Shublik Spring - 24 cubic feet per second (cfs) of water
Red Hill Spring - .85 cfs
Katakaturuk River Tributary Spring - 4.28 cfs
Sadlerochit Spring - 35 to 38.7 cfs
Hulahula River Spring - 4.6 to 7.3 cfs
Okerokivik River Spring - 26 cfs
Aichilik River Spring - 1.5 cfs

Stream channels in the 1002 area exhibit a high degree of braiding and have relatively steep gradients. Pools suitable for supporting overwintering are rare (Smith and Glesne 1982). Perennial ground water sources (springs) are found on most of the major drainages in the 1002 area.

These springs are essential for the spawning and overwintering of arctic char and other resident freshwater fish species. In the 1002 area, arctic char rely extensively on spring-fed habitats at particular stages in their life. Springs are used as spawning grounds, summer rearing areas of fry and juveniles, and as overwintering areas. In smaller North Slope drainages, it is conceivable that a single spring-fed site might harbor virtually all members of a particular arctic char population, from eggs to mature adults during the winter period (ADFG 1986). Perennial groundwater sources generally are discrete areas associated with the foothill and mountainous regions south of the coastal plain.

The Canning River drainage differs to some degree from other rivers in the 1002 area due to the number and magnitude of perennial ground water sources flowing into the river. The cumulative discharge of the springs on the Canning River drainage is one of the largest on the North Slope (USFWS 1982). The largest of these is Shublik Springs located at the southwest end of Coplestone Mountain in the Shublik Mountains. Spawning arctic char appear to be located primarily in the Marsh Fork and the main river above the Marsh Fork confluence (Smith and Glesne 1982). Red Hill Spring located at the western end of the Sadlerochit Mountains, is the only spring identified on the Tamayariak River. It is a hot spring with temperatures at the orifice reported to be between 29.3 and 32.9°C (USFWS 1982). Overwintering habitat has not been documented in the drainage. In the Sadlerochit River system the Sadlerochit spring located at the eastern end of the Sadlerochit Mountains is the only identified spring area. Two large lakes, Lake Peters (775 ha) and Lake Schrader (1450 ha) are located in the headwaters of the Sadlerochit drainage and provide overwintering habitat. Three springs have been identified on the Hulahula River, one of which is located in the 1002 area. These areas are located at the confluence of the Hulahula River and the East and West Patuk creeks, one mile above Old Man Creek and at a location 25 miles downstream from Old Man Creek. Two springs have been identified in the Aichilik River. The springs are located at 69° 31' N latitude and 143° 02' W longitude and 20 km upstream at 69° 22' N latitude and 143° 05' W longitude (Smith and Glesne 1982).

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CARIBOU (Rangifer tarandus)

Two caribou herds are found in the ANWR and its environs. The Porcupine Caribou Herd (PCH) consists of approximately 150,000 animals (Whitten 1985) and is one of two international herds ranging between Canada and Alaska. The Central Arctic Herd (CAH) consists of approximately 15,000 animals (Cameron 1986), and is resident on the North Slope between the Canning and Colville Rivers.

Distribution and Movements

Porcupine Caribou Herd

Unless otherwise noted, the following discussion is from ADFG (1986).

The PCH ranges in Alaska between the Canning and Chandalar rivers on the west, east to the Richardson Mountains and Peel River in Canada, and south as far as the Ogilvie Mountains in the Yukon Territory. The PCH winters in the Chandalar, Coleen, and Sheenjek river drainages in Alaska, and in the Ogilvie and Richardson Mountains and Peel River drainages in Canada. During spring of most years, the herd follows traditional migration routes through the British and Davidson Mountains and Firth River valley onto the northern foothills and coastal plain between the Katakturak River in the ANWR and the Babbage River in Canada. During the past 15 years calving has occurred on the coastal plain and northern foothills between the two drainages noted above, although calving has been concentrated in several locations. In most years following calving, cows, and newborn calves form dense aggregations on the coastal plain near Camden Bay. Although these aggregations often form in June prior to significant mosquito emergence, mosquito harassment probably influences the size and movement of these aggregations. During severe mosquito harassment periods, large numbers of caribou (tens of thousands) can be found along the coast, on beaches, shorefast ice, and coastal lagoons (USFWS 1982). Caribou in these aggregations tend to move eastward along the coast, and southeastward into foothills and the mountains and into Canada.

By late July and August, most of the PCH are in the foothills and mountains of the south slope of the Brooks Range, or in Canada (USFWS 1982). A small proportion of the PCH resides on the North Slope year-round, but little is known about these animals.

Central Arctic Herd

Unless otherwise noted the following discussion is from Shideler (1986).

The CAH ranges on the North Slope primarily between the Colville and Canning rivers, although a small proportion of CAH winters in the 1002 area between the upper Sadlerochit and Canning Rivers (Whitten et al. 1985). Movements of the CAH are generally north/south between wintering areas in the foothills, and calving and mosquito relief areas along the coast. Concentrated calving occurs on the coastal plain in two areas--a western concentration between Oliktok and Milne Points, and an eastern concentration between Bullen Point and the Canning River delta. Only the latter calving concentration area is of concern here.

In some years following calving, CAH caribou move eastward across the Canning River toward Camden Bay in the 1002 area, then reverse and head west again. Under severe mosquito harassment, CAH caribou remain near the coast, moving to coastal deltas, points, and other promontories for relief from mosquitos. As mosquito activity abates in late July, CAH animals drift southward toward the foothills, although a small proportion of animals remain as year-long residents on the coastal plain.

Areas of Special Concern

Two types of caribou use areas in the ANWR region merit special concern--calving areas and coastal mosquito relief areas. Although much of the coastal plain between the Babbage River in Canada and the Shavirovik River in Alaska has supported at least some calving in the past, several areas of concentrated calving have been used repeatedly over the years by a large proportion of the PCH and CAH respectively (ADFG 1986). These concentrated calving areas deserve special protection because of their traditional use by caribou. Topographic and climatic effects in the foothills and coastal plain of the upper Jago River, for example, have often resulted in early snow ablation and subsequently early green-up of cottongrass (Eriophorum vaginatum) tussocks (USFWS 1982). PCH caribou use this area heavily during calving, at least in part due to the abundance and availability of this important forage species, as well as forage on nearby riparian benches and associated uplands (Whitten 1985). Although there are no easily identifiable habitat characteristics that explain the use of the CAH concentrated calving area along the Canning and Staines rivers, caribou have traditionally used that area (Shideler 1986) suggesting that it is important.

Coastal mosquito relief habitat, and continued access to that habitat, are especially important to the CAH because it does not use areas of altitudinal variation which can aid in relief from mosquito harassment (Shideler 1986). Thus the coastline between Camden Bay and Prudhoe Bay along with the area within several kilometers are important as mosquito

relief habitat, but also as movement corridors back and forth to optimal relief areas (ibid.).

Coastal areas are also important to the PCH because, although some portions of the herd use wind-swept foothills and mountains as mosquito relief areas, a considerable portion, often numbering in the tens of thousands, uses coastal areas as mosquito relief as well as movement corridors back into Canada (ADFG 1986). Much of this use during the post-calving season occurs east of Camden Bay, and inland for several kilometers (Whitten et al. 1985). In general, these areas are used for a shorter period of time than is mosquito relief habitat used by the CAH, but because of the larger size of the PCH access to this habitat in the ANWR is particularly important.

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MUSKOX (Ovibos moschatus)

Muskoxen were indigenous to the eastern North Slope of Alaska until they were extirpated there in the late 1800s (Gunn 1982). In 1969, 52 muskoxen from Nunivak Island were released at Barter Island (Gunn 1982, Lent 1978). In 1970, an additional 13 animals were released near the mouth of the Kavik River (ibid.). The descendants of these animals comprise the population of muskoxen that is resident on the eastern North Slope.

Distribution and Abundance

Since the initial reintroduction, the eastern North Slope population of muskoxen has increased to 450 animals (Whitten 1985). This is the second largest muskoxen population in the state, and comprises almost one-third of the state's total number of wild muskoxen (Hinman 1985). This population has exhibited a high growth rate compared to other muskox populations (Robus 1984). Demographic parameters such as an early age at first breeding (2 years old as opposed to three or four years old in other populations), calving in successive years (as opposed to every second or third year in other populations), and high calf survival attest to the excellent habitat quality in the 1002 study area (Jingfors 1984, Robus 1984).

The major areas of muskox distribution on the eastern North Slope are all within the 1002 study area, and are inhabited by approximately 400 animals. An additional 50 animals (approximately) are located outside the study area, with some ranging as far west as the Trans-Alaska Pipeline System (TAPS) and others ranging east into the northern Yukon Territory. Of these 50 or so animals, one herd of approximately 10 animals of mixed sex ranges along the middle and upper Kavik River (Reynolds et al. 1985, Whitten 1985); the remainder are solitary, adult bulls which wander widely, but probably serve an important role in pioneering new winter ranges which are eventually occupied by larger groups.

There are three major areas of muskox distribution on the eastern North Slope (Jingfors and Klein 1982). These areas are centered along three of the river systems within the 1002 area--the Tamayariak, Sadlerochit, and Okerokovik rivers. All or part of each of these three areas have been used by muskoxen since the early 1970s (Reynolds et al. 1985). Muskoxen movements within these areas are influenced by forage availability and quality during most of the year; however, mosquito harassment in July and the disruption of herd cohesiveness by rutting bulls in August may influence local movements during these seasons.

Within each of the three major areas, calving areas have overlapped considerably. Jingfors (1984) documented repeated use of the same calving area by the Sadlerochit herd between 1978 and 1980. Reynolds et al. (1985) documented repeated use of the same general area for calving in all three major areas between 1982 and 1984. The size of the calving areas appears to have expanded as the herd has increased. The calving areas are located along the Coastal Plain, generally within 15 miles of the coast, and in upland areas characterized by newly emergent cottongrass tussocks (Eriophorum vaginatum) and/or wind-blown upland areas where snow has ablated.

Although there is a tendency for mixed sex and age herds to remain within the same major area, this affinity is not absolute; there is some movement by these herds into the other major areas. Much of the movement between areas is by adult bulls that tend to remain solitary, or in small (2-5 individuals) groups, and to wander back and forth throughout the region rather than to remain associated with any particular area (Reynolds et al. 1985).

Seasonal Movements and Habitat Use

Muskoxen are generally associated with riparian areas and adjacent uplands. Seasonal movements are mostly in a north/south orientation following the phenology and availability of forage plants along the major river systems with which muskoxen are associated. Localized elevational movements following the seasonal availability of forage occur during the general movements. During the mosquito season muskoxen may move temporarily to windy areas to avoid mosquito harassment but these movements are not comparable to the extensive latitudinal movements of caribou to coastal areas. During the rut, competition between muskox herd bulls and potential interlopers may result in herds fragmenting into small harems until the breeding activity declines and the harems coalesce again into herds. During winter herd size reaches a maximum as individual herds encounter each other on winter range and join and split.

The general pattern of habitat use is for muskoxen to be distributed during winter in mixed herds of 20-30 (occasionally up to 100) animals that remain on wind-blown upland and bench areas along riparian systems where the animals can minimize the amount of energy expenditure that would be caused by cratering for forage. As spring approaches and cottongrass tussocks (Eriophorum vaginatum) begin to green up, muskoxen move to these tussock areas where most of the herd feeds and where calving takes place. The herds remain sedentary near the calving area until the calves are old enough to travel. As spring progresses muskoxen move to river bars and riparian benches where forbs

such as oxytrope (Oxytropis), mountain-avens (Dryas integrifolia), and fireweed (Epilobium) become available. Muskoxen remain in these riparian areas and gradually shift to feeding on willow in late June and through July as the leaves begin to emerge. Riparian willow remains a mainstay of the summer diet until August when rutting commences and herds move to side drainages and creeks and leave the major river systems. During the rut muskoxen feed on sedges that are just greening up in marshy areas along these smaller creeks. During fall, muskoxen move from the side drainages back to the major river systems where they remain feeding on riparian willow until snow becomes deep enough that they must move to adjacent upland areas.

Areas of Special Concern

Although much of the riparian and adjacent upland habitat of the Coastal Plain portion of the Tamayariak, Sadlerochit, and Oklerokovik rivers may be used by muskoxen, two types of use areas are of special concern. These are calving areas and winter feeding areas. Calving areas are a concern not only because they appear to be associated with unique habitat characteristics--i.e., south-facing slopes where early snow-melt allows green-up of cottongrass tussocks (Eriophorum vaginatum)--but also because human disturbance during the calving period can result in calves or cow/calf pairs being abandoned by the remainder of the herd. Because muskoxen rely on herd defense against predators rather than on escape by flight, the survival of young calves is dependent on their being able to remain with the herd.

Winter feeding areas are found along upland benches and ridges along the major river systems with which muskoxen are associated. These areas occur where snow depth is shallow due to the topographic features, and forage composition is sufficient to provide nutrition over the winter. Because almost the entire herd of each major area can use these wintering areas, destruction of these areas can have far-reaching effects.

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MOOSE (Alces alces gigas)

Distribution and Abundance

Unless specifically noted, information presented below is from the Alaska Habitat Management Guide for the Arctic Region (ADFG, 1986).

Moose (Alces alces gigas) occur throughout most of the Arctic Region, and are seasonally distributed over the Arctic Coastal Plain. They have been counted in most of the major river drainages from the Kongakut (on the east) to the Utukok (on the west). The seasonal distribution of moose is affected by factors such as the quantity and quality of riparian willow (winter habitat), snow conditions, and insect harassment, among others. Only winter concentration areas are delineated in the ANWR area, and movements between seasonal ranges have not been documented. Even in non-winter months, when moose are distributed north onto the coastal plain, riparian zones in river valleys remain important to moose. Major drainages such as the Canning, Jago, Hulahula, and Aichilik Rivers (within the ANWR 1002 area) and the Sagavanirktok, Kavik, and Shaviovik Rivers (between Prudhoe Bay and ANWR), as well as smaller creeks and rivers, probably comprise the most valuable habitat areas.

Historical and archeological evidence suggests that moose, once rare on the Arctic Coastal Plain, became more abundant during the 1940s. Numbers continued to increase from the 1950s into the 1970s, with little change in distribution. Densities on Alaska's North Slope appear highest between the Colville and Canning rivers, although moose occur outside this zone, along most major stream corridors. In the area between the Dalton Highway and the Canning River, the ADFG in 1985 estimated moose numbers at 600-650 animals, based upon 1984 aerial surveys. In the area east of the Canning (ANWR), 330-360 moose were estimated. Aerial surveys conducted in the spring have documented higher numbers of moose, indicating that these units have supported greater numbers of moose than previously thought. These increases were attributed to excellent sighting conditions, since productivity and survival are insufficient to support rapid population growth (Whitten, 1986).

Surveys indicate a high degree of utilization of annual growth of browse species, and population trends show an inverse relationship between total numbers of adults and percentages of calves. This suggests that browse may limit moose populations here.

Areas of Special Concern

Habitats associated with riparian corridors are of particular value to moose. These areas provide shrubby browse, cover, insect relief areas, and probably serve as movement corridors to and from winter concentration areas which lie in major drainages upstream (south) of the study area.

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BOWHEAD WHALE (Balaena mysticetus)

Distribution and Abundance

Unless specifically noted, information presented below is from the Alaska Habitat Management Guide for the Arctic Region (ADFG, 1986).

Bowhead whales are distributed in arctic and subarctic waters adjacent to the northern and western coasts of Alaska. They migrate in association with the seasonal movement of sea ice, traveling from wintering areas of the west central Bering Sea through the eastern Chukchi Sea and Beaufort Sea into summering areas in Alaskan and Canadian waters.

Interest in this species has increased in recent years because of its endangered status, its importance to subsistence hunters, and the large increase in exploratory and industrial activities in arctic waters.

Most bowheads are believed to winter (January-March) in the west central Bering Sea adjacent to the pack ice edge, which usually occurs between St. Lawrence and St. Matthew islands. The summer range (June-August) of the bowhead whale extends throughout the eastern Beaufort Sea; major concentrations occur in Amundsen Gulf and the Canadian Beaufort Sea east of Herschel Island and northward. Some bowheads do not complete the spring migration into Canadian waters, and instead spend the summer months in the northern Chukchi and/or the western Beaufort Sea. These whales are suspected to be late migrants that feed and summer in Alaskan waters.

In September and October, bowheads begin to migrate westward over a broad front along the Alaskan coast, sometimes in shallow, nearshore waters (10-50 m), apparently feeding along the way. Autumn feeding concentration areas are: 1) east of Barter Island to at least the United States-Canada demarcation line (141°W); and 2) east of Barrow to Pitt Point.

The bowhead whale is one of the few marine mammals that spends all or most of its life in or near the edge of the arctic ice pack, migrating north in the spring as the ice recedes and moving south as pack ice reforms in winter. The migration route, their distribution along the migration pathway, and the rate of migration are influenced primarily by ice conditions and the presence or absence of open water areas.

The predominant activity of bowheads in summer and autumn is feeding (Richardson et al. 1983). Copepods and euphausiids are the main food items for bowheads in the Alaskan Beaufort Sea during early autumn and presumably are also important to bowheads in summer. Thus, factors affecting the availability of these and other foods in the eastern Beaufort Sea probably have a strong influence on the distribution of bowheads.

Bowhead whales of the western arctic population begin to leave their wintering areas between St. Lawrence and St. Matthew Islands in the central Bering Sea in April and May. The northward movements appear to be timed with the development of shore leads and the breakup of pack ice, and they vary considerably from year to year. Migration occurs along at least two routes to the Bering Strait: one route close to the western end of St. Lawrence Island and another farther offshore. A smaller number of bowheads may travel past the eastern end of St. Lawrence Island, but this route does not appear to be a major one.

Most bowheads have arrived at Bering Strait by early May, depending upon ice conditions. North of Bering Strait, bowheads move northeast across outer Kotzebue Sound, with some using a recurring polynya between Kivalina and Point Hope and others travelling up to 45 km offshore. Bowheads follow open leads north past Cape Thompson and then northeast past Cape Lisburne in the nearshore lead. Past Barrow the principal migration takes place from the last week of April through May. The earliest and latest recorded dates of bowhead northward migration past Barrow are March 29 and June 19, respectively.

Past Point Barrow, bowheads migrate northeast in the extensive lead system and shear zone in the northern Beaufort Sea. This system may occur up to 600 km north of the Canadian Beaufort Sea coast, and therefore whales may migrate well offshore. Bowheads reach Banks, Prince Albert, and Victoria islands in Canadian waters in late May and early June, and as the ice further recedes they move south and east as far as Amundsen Gulf. The spring bowhead migration past Point Barrow appears to occur in three or four pulses. Younger individuals are the earlier migrants, and larger, older males and females with calves compose the later waves. These pulses in migration are closely related to weather and ice conditions. Whales appear to congregate in open water areas until leads in the ice appear offshore.

In July, bowheads are present throughout the Amundsen Gulf area; however, current information is insufficient to precisely identify bowhead distribution in this area. Bowheads also occur in the eastern Beaufort Sea waters of Prince of Wales Strait between Banks and Victoria islands and may occur in McClure Strait and Viscount Melville Sound.