

ALASKA LEGISLATURE COMMITTEE FILES 1987-1988 8672

4858 HRES ANWR ENVIRONMENTAL ISSUES

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Director in accordance with a final court opinion for which no appeal was filed and which resolved all disputed claims of ownership to the affected deposits of sand and gravel. Use of an escrow account by the Director or the State shall not be deemed to be prejudicial to any claim that either the State or the Federal government might have to subsurface property interests beneath the beds of navigable river and other bodies of water within the leasehold area.

(f) SUSPENSION OF LEASE.--A lease shall be suspended, including all rent or minimum royalty payments thereunder if--

(1) within two years of submission of a complete plan of operations for exploration, development or production, as required by subsection (c) of this section, the Director has neither approved nor rejected the proposed plan;

(2) exploration, development or production are interrupted by circumstances beyond the control of the lessee which were not reasonably foreseeable, exclusive of economic market conditions; or

(3) the Director determines that there is a threat of a significant adverse effect upon human life, fish and wildlife, their habitat or the environment;

No rent or minimum royalty payments shall be suspended as the result of gross negligence or the willful violation of the lease or special use permit, or of the regulations issued with respect to the lease or permit. No lease shall expire if suspended pursuant to this subsection. The term of any suspended lease

shall be extended by the period of suspension, but in no case shall a suspended lease be extended for a period of more than five years.

(g) FINANCIAL TERMS.--All leases issued under this section shall be conditioned upon payment by the lessee of bonuses or bonus bids as may be accepted by the Director of the Bureau of Land Management, of royalty as may be fixed in the lease (which shall be not less than $16 \frac{2}{3}$ per centum in amount or value of the production removed or sold from the lease), and of a rental of not less than two dollars per acre for each year of the lease. Each year's lease rental shall be paid in advance. A minimum royalty of three dollars per acre in lieu of rental shall be payable at the expiration of each lease year beginning on or after a discovery of oil or gas in paying quantities on the lands leased. Lessees shall also be required by regulation to pay current fair market value, as determined by the Director, for rights-of-way, as well as for sand, gravel and other coastal plain natural resources used by the lessee pursuant to a special use permit in the course of oil and gas exploration, development or production.

(h) CANCELLATION OF LEASE DUE TO ENVIRONMENTAL HAZARDS.--

(1) The Director may cancel any lease or special use permit if, after an administrative hearing, he determines that--

(A) continued activity pursuant to the lease or permit would reasonably have a significant adverse

effect upon human life, fish and wildlife, their habitat or the environment; and

(B) the threat of significant adverse effects will not diminish or cease to an acceptable extent within a reasonable period of time.

(2) Cancellation shall not occur unless and until operations under the lease or permit have been under suspension, or temporary prohibition, by the Director, with due extension of any lease or permit te. continuously for a period of five years, or for a lesser period upon request of the lessee.

(3) Cancellation of a lease pursuant to this section shall entitle the lessee to receive such compensation as he shows to the Director to be equal to the lesser of--

(A) the fair market value of the canceled rights as of the date of cancellation, taking account of both anticipated revenues from the lease and anticipated costs, including the costs of compliance with all applicable regulations and operating orders, liability for cleanup costs or damages, or both, in the case of an oil spill or spill of other hazardous or toxic materials, and all other costs reasonably anticipated on the lease; or

(B) the excess, if any, over the lessee's revenues. from the lease (plus interest thereon from the date of receipt to date of reimbursement) of all consideration

paid for the lease and all direct expenditures made by the lessee after the date of issuance of such lease and in connection with exploration or development, or both, pursuant to the lease (plus interest on such consideration and such expenditures from date of payment to date of reimbursement).

In the case of joint leases which are canceled due to the failure of one or more partners to exercise due diligence, the innocent parties shall have the right to seek damages for their loss from the responsible party or parties.

(i) ROYALTY MANAGEMENT.--The provisions of the Federal Oil and Gas Royalty Management Act of 1982 (30 U.S.C. 1701) shall apply to royalties generated from oil and gas leasing on the coastal plain.

(j) REDUCTION OF RENTS OR ROYALTIES TO PROMOTE PRODUCTION.-- For the purpose of encouraging the greatest ultimate recovery of oil and gas, and in the interest of conservation of natural resources, the Director of the Bureau of Land Management, with the concurrence of the Director, may reduce the rental, or minimum royalty, or reduce the royalty of an entire leasehold, or on any tract or portion thereof segregated for royalty purposes, whenever in his judgment it is necessary to promote development or production, or whenever in his judgment the leases cannot be successfully operated under the terms provided therein. The Director of the Bureau of Land Management shall notify the appropriate Committees of Congress on an annual basis of the

reduction of any rents or royalties pursuant to this subsection.

(k) JUDICIAL REVIEW.--It is the intent of Congress that judicial review of any administrative action pursuant to titles II or III of this Act, including compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321), shall be expedited to the maximum extent possible. Any action seeking judicial review of the adequacy of any environmental documentation under the National Environmental Policy Act of 1969, impact analysis, permit, or regulation concerning oil and gas leasing on the coastal plain shall be barred unless brought in the appropriate District Court within 30 days after notice of its availability is published in the Federal Register.

SEC. 303. ENVIRONMENTAL STIPULATIONS.

(a) IN GENERAL.--In addition to the general provisions set forth in section 302 of this title, the comprehensive oil and gas leasing regulations issued by the Director shall include environmental stipulations, terms and conditions as are required by this section. These environmental regulations shall require the application of best available technology from an engineering and technical standpoint to all phases of oil and gas exploration, development and production on the coastal plain and shall ensure that oil and gas operations and related activities avoid significant adverse effect on fish and wildlife, their habitat and the environment. To avoid unnecessary duplication and minimize surface occupancy or use, oil and gas operations and

related activities shall be coordinated and consolidated to the maximum extent possible.

(b) SPECIFIC ENVIRONMENTAL STIPULATIONS.--The environmental regulations issued by the Director shall include protective stipulations, terms and conditions regarding the subjects set forth in section 203(c)(2) of this title; Provided, That all references to "exploratory drilling" in section 203(c)(2) shall, for purposes of regulations issued pursuant to this section, be interpreted to mean "exploratory drilling performed under lease, developmental drilling, development and production". The environmental regulations shall also include provisions regarding the establishment of--

(1) seasonal limitations on exploration, development and related activities, where necessary, to avoid significant adverse effects during periods of concentrated fish and wildlife breeding, denning, nesting, spawning and migration;

(2) a special no-surface-occupancy-and-use protective zone prohibiting oil and gas exploration, development and production and related activities within one-half mile of the source of the Sadlerochit Spring or within one-quarter mile on either side of Sadlerochit Spring Creek for a distance of five miles downstream from the spring;

(3) with the sole exception of any port facility or offshore causeway authorized pursuant to section 305 of this title, a special no-surface-occupancy-and-use protective zone prohibiting oil and gas exploration, development and

production and related activities. This zone shall comprise an area which runs two miles inland along the coastline of lands within the Arctic National Wildlife Refuge between the westernmost bank of the mouth of the Staines River to the common line of range 31 east and range 32 east in township 8 north;

(4) design safety and construction standards for all pipelines and access roads which--

(A) minimize adverse effects upon the passage of migratory species such as caribou to the maximum extent possible; and

(B) minimize adverse effects upon the flow of surface water by requiring the use of culverts, bridges and other structural devices;

(5) total prohibitions on public access and use on all pipeline access and service roads;

(6) stringent reclamation and rehabilitation standards regarding the removal from the coastal plain of all oil and gas development and production facilities, structures and equipment upon completion of oil and gas production operations; Provided, That the Director may exempt from the requirements of this subsection those facilities, structures or equipment which he determines would assist in the management of the Arctic Refuge and which are donated to the United States Fish and Wildlife Service for that purpose;

(7) reasonable reimbursement schedules to recover from

the lessees on an annual basis those costs incurred by the Director in implementing an oil and gas leasing program on the coastal plain, including all research, administrative, monitoring, enforcement and reporting costs associated with leasing. All reimbursements for costs collected pursuant to this paragraph by the Director shall be deposited into a special account for the United States Fish and Wildlife Service established in the Treasury of the United States. Notwithstanding any other provision of law, amounts deposited into this special account for reimbursement of costs during each fiscal year shall be available for obligation or expenditure by the Director during the next fiscal year, without further appropriation, to cover all additional research, administrative, monitoring, enforcement and reporting costs associated with implementing an oil and gas leasing program on the coastal plain; and

(8) all other protective environmental stipulations, restrictions, terms and conditions deemed necessary by the Director.

(c) ARCTIC REFUGE SCIENTIFIC ADVISORY PANEL.--Within two months of the date of authorization of oil and gas leasing pursuant to section 302(a) of this title, the Director shall reconvene the Arctic Refuge Scientific Advisory Panel established under section 206 of this Act. Once reconvened, the Scientific Advisory Panel shall remain in existence until two years after the date of the first production of oil or gas on the coastal

plain. The responsibilities of the Advisory panel shall include--

(1) reviewing and commenting on proposed plans of operation and site-specific environmental stipulations, mitigation measures and environmental documentation required by this title;

(2) developing additional recommendations for fish and wildlife research which would supplement on-going research programs for the Arctic Refuge and adjacent areas;

(3) reviewing all reports submitted to, or prepared by, the United States Fish and Wildlife Service pursuant to this title exclusive of section 302(d); and

(4) other responsibilities as the Director may propose.

All other provisions of section 206 consistent with this section shall apply to the actions of the Scientific Advisory Panel in advising the Director on the oil and gas leasing program for the Arctic Refuge.

SEC. 304. RIGHTS-OF-WAY ACROSS THE COASTAL PLAIN.

(a) REGULATORY AUTHORITY.--Notwithstanding any other provision of Federal law, this title shall contain the sole and exclusive authority of the Director to grant a right-of-way across the coastal plain or other parts of the Arctic Refuge for purposes of a transportation or utility system corridor. No right-of-way shall be granted until the Director is authorized to open the coastal plain of the Arctic Refuge to competitive oil

and gas leasing pursuant to section 302(a) of this title. Comprehensive oil and gas leasing and development regulations issued pursuant to sections 302 and 303 of this title shall include provisions regarding the granting of rights-of-way across the coastal plain. Any construction specifications regarding the transportation of oil or gas shall be developed in consultation with the Director of the Bureau of Land Management and the State of Alaska. Right-of-way regulations shall be consistent with all environmental stipulations and restrictions set forth in this title. The Director shall not be authorized to grant any right-of-way through or within the "Protective Management Zone" identified as such on the map entitled "Arctic National Wildlife Refuge Coastal Plain" dated May 7, 1987. These regulations shall apply to any right-of-way request regardless of whether or not the request is associated with an authorized Federal oil and gas leasing program on the coastal plain.

(b) CONSISTENCY OF RIGHT-OF-WAY STANDARDS.--No right-of-way shall be granted for the construction of a segment of an oil or gas pipeline across the coastal plain unless the Director finds that the environmental and engineering design specifications adopted for the construction of the remainder of the pipeline outside of the Arctic Refuge are at least as protective and sound from an environmental and engineering point of view as those set forth in the regulations issued under this title.

SEC. 305. CONSTRUCTION ACTIVITIES AFFECTING ARCTIC WILDLIFE

REFUGE MARINE COASTAL RESOURCES.

(a) To protect the marine coastal resources of the Arctic National Wildlife Refuge, no more than one new port facility shall be permitted by the Director and other administrative authorities to be constructed along the coastal area east of the westernmost bank of the mouth of the Staines River to the common line of range 36 east and range 37 east in township 8 north as the result of any oil or gas development and production directly or indirectly affecting the Arctic Refuge.

(b) No Federal authorization or permit regarding the construction or expansion of a port facility or offshore causeway within the above-described coastal area shall be granted without prior consultation with the United States Fish and Wildlife Service, the National Marine Fisheries Service and the Alaska Department of Fish and Game. Notwithstanding any other provision of law, any permit authorizing port facility or offshore causeway construction or expansion within the above-designated coastal area shall include such prescribed mandatory terms and conditions as these Federal and State fish and wildlife agencies determine to be necessary to avoid significant adverse effects to the marine coastal resources of the Arctic Refuge.

(c) Consistent with the designation of a "Protective Management Zone" set forth in subsection 302(a) of this title, the Director shall not authorize or permit the construction of any port facilities or causeways along the coastline of any lands within the Arctic National Wildlife Refuge between the common

line of range 36 east and range 37 east in township 8 north to the easternmost bank of the mouth of the Aichilik River.

SEC. 306. SUPPLEMENTAL ENFORCEMENT AUTHORITY.

(a) DEFINITIONS.--As used in this section--

(1) "damages" means damages for injury to, destruction of, or loss of natural resources and damages for economic loss specified in paragraph (e)(3) of this section;

(2) "discharges" means any emission, intentional or unintentional, and includes, but is not limited to spilling, leaking, pumping, pouring, emitting, emptying, or dumping;

(3) "natural resources" includes land, fish, wildlife, biota, air, water, groundwater, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States or the State;

(4) "oil" means petroleum, including crude oil or any fraction or residue therefrom;

(5) "remove" or "removal" refers to removal of oil or hazardous or toxic substances from the land or water within the coastal plain or the taking of other actions as may be necessary to prevent, minimize, compensate, or otherwise mitigate damage to the natural resources of the coastal plain and to public health or welfare;

(6) "removal costs" means all costs of removal taken after a discharge of oil or hazardous or toxic substances

has occurred, including all costs of completing removal, and all costs to prevent, minimize, compensate, or otherwise mitigate oil or hazardous or toxic substance pollution where there was a substantial threat of a discharge of oil or hazardous or toxic substances; and

(7) "responsible party" means any person issued a permit under section 205 of this Act, or granted a lease under section 302 of this Act. The term shall include all employees, operators and agents of such responsible parties.

(b) CIVIL AND CRIMINAL ACTIONS.--In addition to remedies available under other applicable provisions of law, whenever the Director determines that any person involved in oil and gas exploration, development or production or related activities on the coastal plain is in violation of any applicable provision of Federal law administered or enforceable by rule, regulation, or order, including any term or condition of any right-of-way, permit, lease, or other authorization, issued or granted by the Director, the Director may--

(1) issue a compliance order requiring the person to take immediate action to comply with such provision or any rule, regulation, or order thereunder;

(2) assess a civil penalty, not to exceed \$10,000 for each violation, in accordance with the procedures set forth in section 1002(g) of ANILCA. For purposes of imposing a civil penalty in connection with the violation of any right-of-way term or condition involving the construction,

operation or maintenance of an oil or gas pipeline, the maximum amount of the civil penalty authorized under this subsection may not exceed \$25,000 for each violation. Each day of a continuing violation shall constitute a continuing offense;

(3) bring a civil action in accordance with subsections (d) and (e) of this section;

(4) bring a criminal action in accordance with section 4 of the Refuge Administration Act as amended by section 401 of this Act; or

(5) hold, in the case of any sport hunting or fishing violation which occurs within the coastal plain, a responsible party jointly, severally or strictly liable for any civil or criminal penalty assessed against an agent, operator, or employee of the responsible party.

(c) SPECIFICITY OF COMPLIANCE ORDER.--Any order issued under subsection (b)(1) of this section shall state with reasonable specificity the nature of the violation and shall, except in emergency situations, establish a time limit for compliance, not to exceed 30 days, which the Director determines is reasonable, taking into account the seriousness of the violation and any good faith efforts to comply with the applicable provisions of law.

(d) INJUNCTIVE AND OTHER CIVIL RELIEF.--Upon request of the Director, the Attorney General shall commence a civil action for appropriate civil relief, including but not limited to damages or removal costs established under subsection (e) of this section,

specific performance or a permanent or temporary injunction for any violation set forth in subsection (b) of this section. Any action under this subsection may be brought in the district court of the United States for the State, the District of Columbia, or the district court in which the defendant is located, resides or is conducting business. Any such court shall have jurisdiction to restrain such violation, require compliance, or give ancillary relief.

(e) REMOVAL COSTS AND LIABILITY FOR

DAMAGES.--Notwithstanding any other provision of law, if any area of the coastal plain is polluted by discharges of oil or hazardous or toxic substances from any exploratory or development drilling, or development or production of oil or gas or related activities conducted by, or on behalf of, a responsible party, and the pollution damages fish and wildlife, their habitat, or the environment of the coastal plain, or where there is a substantial threat of damaging those natural resources, the responsible party shall be jointly, severally and strictly liable for the removal costs and damages specified in this subsection that arise directly out of or directly result from such pollution or threat. Upon failure of the responsible party to adequately control and remove the pollutant or threat, the Director, in cooperation with other Federal, State, or local agencies, or in cooperation with the responsible party, or both, shall have the right to accomplish the control and removal at the expense of the responsible party. The removal costs and damages referred to in

this subsection are the following--

(1) all necessary removal costs as determined by the Director;

(2) damages for injury to, destruction of, loss of, and replacement for natural resources, including the reasonable costs of assessing such injury, destruction, loss or replacement; and

(3) damages for economic loss resulting from injury to, or destruction of, real or personal property or natural resources, and loss of subsistence use of natural resources by local rural residents.

SEC. 307. COMPREHENSIVE REFUGE PLANNING.

The Director shall revise the comprehensive conservation plan prepared for the Arctic Refuge pursuant to section 304(g) of ANILCA within one year after the authorization of oil and gas leasing for the coastal plain pursuant to subsection 302(a) of this Act. The revised comprehensive conservation plan shall include the coastal plain of the Arctic Refuge and shall reflect the management authorities and limitations then applicable to the Arctic Refuge.

SEC. 308. CONSULTATION AND REPORTING.

(a) CONSULTATION RESPONSIBILITIES.--In developing oil and gas leasing regulations and related environmental stipulations, terms and conditions pursuant to the provisions of this title,

the Director shall work closely with the State and affected Native Village and Regional Corporations in evaluating the impact of oil and gas exploration, development, production and related activities on the fish and wildlife resources, their habitat and the environment of the coastal plain. In addition, and prior to publication of draft oil and gas leasing regulations, the Director shall consult with the appropriate agencies of the Government of Canada in evaluating such impacts, particularly with respect to the Porcupine caribou herd and other shared migratory resources.

(b) Upon authorization of an oil and gas leasing program on the coastal plain pursuant to subsection 302(a) of this Act, the Director shall biannually report to the appropriate Committees of Congress on the status of the program. The report shall describe: the areas which have been leased; the level of exploration, development and production on those areas; violations, if any, of the environmental stipulations, terms and conditions of oil and gas leases and the Director's response to those violations; the population status of the Porcupine and Central Arctic caribou herds, the Beaufort Sea population of polar bear, muskoxen and lesser snow geese; and significant adverse effects, if any, of leasing activities upon populations of fish and wildlife, their habitat and the environment.

SEC. 309. GENERAL AMENDMENTS TO THE NATIONAL WILDLIFE REFUGE REVENUE SHARING ACT.

Section 401 of the Act of June 15, 1935 (commonly known as the "Refuge Revenue Sharing Act", 16 U.S.C. 715s) is amended by adding a new subsection (h) as follows:

"(h) OIL AND GAS RECEIPTS FROM ALASKAN UNITS OF THE NATIONAL WILDLIFE REFUGE SYSTEM.

(1) Notwithstanding the provisions of subsections (c) and (e) of this section, the Secretary shall segregate by refuge and from all other revenues deposited into the Refuge Revenue Sharing Fund established under subsection (a) of this section, all rents, royalties, bonus bids or other revenues and receipts generated from oil and gas leasing and related activities, including the sale of sand or gravel, on Alaskan units of the National Wildlife Refuge System. The provisions of this section shall not apply to Federal income taxes generated by such oil and gas leasing and related activities. Notwithstanding the provisions of subsection (c)(2) of this section, this subsection shall contain the sole and exclusive provisions regarding the distribution of refuge revenue sharing funds attributable to oil and gas leasing and related activities, including the sale of sand or gravel, within Alaskan units of the National Wildlife Refuge System. All segregated revenues and receipts shall be disposed of in accordance with the provisions of this subsection and shall not be taken into account by the Director when projecting the level of entitlements otherwise owed under the provisions of subsection (c)(2) of this

section.

(2) At the end of each fiscal year, the Secretary shall disburse any revenues and receipts segregated under subsection (h)(1) by first deducting and keeping in the Refuge Revenue Sharing Fund for distribution to affected counties an amount equal to the amount necessary to ensure full funding of the payments required under subsection (c) of this section.

(3) Those segregated revenues and receipts which remain after the deduction authorized under subsection (h)(2) of this section shall be distributed under the following apportionments--

(A) State of Alaska--

(i) Fifty per centum to the State of Alaska;

(B) Federal Fish and Wildlife Conservation--

(i) Twenty-five per centum as initial principal to the Fish and Wildlife Enhancement Trust Fund established under section 312 of this Act. Annual distributions to the Fish and Wildlife Enhancement Trust Fund under this clause shall cease once the initial principal of the Trust Fund reaches 150 million dollars. Upon termination of distributions to the Trust Fund pursuant to the provisions of this clause, the per centum of revenues otherwise apportioned under this clause shall be reallocated for distribution pursuant to clause (ii) of subparagraph (B) of this paragraph.

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(ii) Twenty-five per centum to be considered as "excess net receipts" for purposes of subsection (e) of this section and to be distributed as such in accordance with the provisions of that subsection and section 4 of the Act of March 16, 1934 (commonly known as the Migratory Bird Hunting Stamp Act, 16 U.S.C. 718d), as amended by section 310 of this Act."

SEC. 310. GENERAL AMENDMENTS TO THE MIGRATORY BIRD HUNTING STAMP ACT (16 U.S.C. 718d).

Section 4 of the Act of March 16, 1934 (commonly known as the Migratory Bird Hunting Stamp Act, 16 U.S.C. 718d) is amended by inserting after the last sentence the following:

"(d) ACQUISITIONS WITH ALASKAN OIL AND GAS LEASING REVENUES.--The Secretary shall segregate from all other monies within the Migratory Bird Conservation Fund those revenues and receipts attributable to oil and gas leasing and related activities, including the sale of sand or gravel, on Alaskan units of the National Wildlife Refuge System which were considered excess net receipts for purposes of the Act of June 15, 1935 (commonly known as the "Refuge Revenue Sharing Act", 16 U.S.C. 715s(e)) as amended by section 309 of this Act. Revenues and receipts so segregated shall be available for the location, ascertainment and acquisition of suitable areas for national wildlife refuges for migratory birds and other species of fish and wildlife pursuant to the provisions of the Migratory Bird

Conservation Act (16 U.S.C. 715a), as amended by section 311(a)(4) of this Act. All administrative acquisition costs incurred under this program shall be deducted from the revenues and receipts segregated under this subsection."

SEC. 311. GENERAL AMENDMENTS TO THE MIGRATORY BIRD CONSERVATION ACT.

(a) MIGRATORY BIRD CONSERVATION COMMISSION.--Section 2 of the Migratory Bird Conservation Act (16 U.S.C. 715a) is amended by--

- (1) inserting "(a)" in front of the first sentence;
- (2) striking out "two" each place that it appears and inserting in lieu thereof "four";
- (3) inserting after the first sentence the following:
"The commission is also authorized to consider and approve any acquisition recommendation made by the Secretary of the Interior which is pursuant to and in support of any provision of the North American Waterfowl Plan with Canada signed by the Secretary in May of 1986, or any subsequent amendments thereto, and which provides for appropriate public access and use and the preservation and conservation of such waterfowl habitat in perpetuity."; and
- (4) inserting after the last sentence the following:
"(b) In addition to its authorities under subsection (a), the commission is authorized to consider and pass upon recommendations by the Secretary of the Interior for the

acquisition of land, water and interests therein out of those revenues and receipts generated from oil and gas leasing and related activities, including the sale of sand or gravel, on Alaskan Units of the National Wildlife Refuge System which were segregated in the Migratory Bird Conservation Fund pursuant to section 4 of the Act of March 16, 1934, as amended by section 310 of this Act, (commonly known as the Migratory Bird Hunting Stamp Act, 16 U.S.C. 718d). In exercising its acquisition authority under this subsection, the commission shall ensure, to the maximum extent possible, that in any given fiscal year, the segregated funds are expended in accordance with the following allocation--

(A) fifty per centum for the acquisition of major wintering and migration route habitat for migratory birds originating in Alaska or Canada;

(B) twenty per centum for the acquisition of migratory bird habitat in accordance with the provisions of the North American Waterfowl Plan with Canada; and

(C) thirty per centum for the acquisition of national wildlife refuges for species of fish and wildlife other than migratory birds. Half of this thirty per centum shall be directed towards the priority acquisition of inholdings within Alaskan units of the National Wildlife Refuge System and a portion of this fifteen per centum shall be available for the

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acquisition of habitat outside of Alaska only when the number of willing sellers of inholdings in Alaskan units of the National Wildlife Refuge System is insufficient to commit the entire amount."

(b) AUTHORITY OF THE SECRETARY OF INTERIOR.--Section 4 of the Migratory Bird Conservation Act (16 U.S.C. 715c) is amended by striking out the semicolon and all that follows and inserting in lieu thereof the following--

"or is to be acquired in accordance with the provisions of section 2 of the Migratory Bird Conservation Act (16 U.S.C. 715a), as amended by section 311(a)(4) of this Act; and (2) has consulted with the county or other unit of local government in which such area is located and, where applicable, with the Governor of any State concerned or the appropriate State agency."

SEC. 312. FISH AND WILDLIFE ENHANCEMENT TRUST FUND.

(a) CREATION OF TRUST FUND.--There is hereby established at the United States Treasury the Fish and Wildlife Enhancement Trust Fund. The Secretary of the Treasury shall serve as the Trustee for the Fish and Wildlife Enhancement Trust Fund and shall manage the Trust Fund on behalf of the Director in accordance with the provisions of this section.

(b) PURPOSE OF TRUST FUND.--The purpose of the Fish and Wildlife Enhancement Trust Fund shall be to promote fish and wildlife conservation and enhancement by enabling the Director to

fund projects and programs in the following areas--

(1) fish and wildlife research in Alaska and Canada with a special emphasis on shared migratory species, the analysis of effects of development and pollution on the fish and wildlife populations of the North Slope of Alaska, and the identification of measures to avoid, minimize, compensate, or otherwise mitigate any adverse effects from the development and pollution;

(2) State nongame programs under the grant-in-aid program under the Fish and Wildlife Conservation Act (16 U.S.C. 2901);

(3) funding proposals under the matching grant program of the National Fish and Wildlife Foundation;

(4) natural resource use conflict resolution, including the facilitation of endangered and threatened species habitat conservation planning pursuant to section 10(a)(2) of the Act of December 28, 1973 (commonly known as the Endangered Species Act, 16 U.S.C. 1539(a)(2)); and

(5) education and training programs and facilities regarding--

(A) fish and wildlife ecology;

(B) environmental pollution and its effects upon fish and wildlife populations and their habitat; and

(C) conservation education programs on individual units of the National Wildlife Refuge System.

(c) INITIAL PRINCIPAL OF TRUST FUND.--An initial endowment

shall be provided to the Fish and Wildlife Enhancement Trust Fund from revenues and receipts from oil and gas leasing and related activities, including the sale of sand or gravel, on Alaskan units of the National Wildlife Refuge System pursuant to section 309 of this Act. No further revenues and receipts shall be placed in the Trust Fund pursuant to section 309 of this Act once the initial principal of the Trust Fund reaches 150 million dollars.

(d) INVESTMENT OF PRINCIPAL OF TRUST FUND.--It shall be the duty of the Secretary of the Treasury to invest the principal of the Trust Fund in public debt securities with maturities suitable for the needs of such Fund and bearing interest at rates determined by the Secretary, taking into consideration current market yields on outstanding marketable obligations of the United States of comparable maturities.

(e) EXPENDITURE OF FUNDS.--The Secretary shall not make funds available to the Director to expend until the principal of the Trust Fund has reached a minimum of 20 million dollars. The Director shall expend during each fiscal year all available annual net income, and, if he deems it advisable, up to a maximum of two per centum of the principal of the Trust Fund. None of the principal of the Trust Fund may be expended until such time as the principal endowment reaches 150 million dollars and at no time may the expenditure of principal pursuant to the provisions of this subsection result in a remaining balance of principal of less than 120 million dollars. For purposes of this subsection,

the term "annual net income" means all income from investment authorized under subsection (d) of this section. To provide for diversity in funding, the Director shall ensure that in any given fiscal year, no less than ten per centum and no more than thirty per centum of the funds available for distribution shall be allocated to any one of the five program or project areas set forth in subsection (b) of this section.

(f) ANNUAL REPORTS.--The Director shall prepare an annual report summarizing the expenditures of the Trust Fund during the preceding 12-month period. Annual reports shall be submitted to the appropriate Committees of Congress.

SEC. 313. TESHEKPUK-UTUKOK NATIONAL WILDLIFE REFUGE.

(a) Effective on the date of the enactment of this Act, the area depicted as the "Teshekpuk-Utukok National Wildlife Refuge" on a map so identified dated May 7, 1987, is established as a National Wildlife Refuge and as a unit of the National Wildlife Refuge System. Except as provided in subsection (d) of this section, this wildlife refuge shall be administered in accordance with the Refuge Administration Act, ANILCA and other existing provisions of Federal fish and wildlife conservation law.

(b) PURPOSES OF REFUGE.--The purposes for which the wildlife refuge is established and shall be managed include--

(1) to conserve fish and wildlife populations and habitats in their natural diversity, including but not limited to migratory waterfowl, raptors and other migratory

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birds, barren-ground caribou, moose, polar bears, brown bears, wolves, fish and marine mammals;

(2) to fulfill the international treaty obligations of the United States with respect to fish and wildlife and their natural habitats;

(3) to provide, in a manner consistent with the purposes set forth in paragraphs (1) and (2), the opportunity for continued subsistence uses by local residents; and

(4) to ensure, to the maximum extent practicable and in a manner consistent with the purposes set forth in paragraph (1) of this subsection, water quality and necessary water quantity within the wildlife refuge.

(c) COMPREHENSIVE CONSERVATION PLAN.--The Director shall prepare a comprehensive conservation plan for the wildlife refuge in the manner provided in section 304(g) of ANILCA. Notwithstanding paragraph (6)(C) of such section, the plan shall be prepared before the end of the 3-year period beginning on the date of the enactment of this Act.

(d) COORDINATION WITH OTHER LAWS.--

(1) OIL AND GAS EXPLORATION AND LEASING.--

(A) The Director, in exercising his existing management authorities under section 4(d) of the Refuge Administration Act, shall not authorize any further oil or gas leasing within the area designated as the Teshekpuk-Utukok National Wildlife Refuge prior to either the expiration of a period of five years from the

date of enactment of this Act or the issuance of final oil and gas leasing regulations pursuant to paragraph (d)(1)(B) of this section, whichever is earlier. Notwithstanding the expiration of this limited moratorium, the Director shall not issue any additional oil and gas leases within the Teshekpuk Lake Special Area boundaries defined by the Secretary of the Interior on June 3, 1977 (42 Federal Register 28723). Any subsequent oil and gas leasing in Teshekpuk-Utukok National Wildlife Refuge by the Director shall be pursuant to the provisions of section (4)(d) of the Refuge Administration Act and this Act.

(B) The enactment of this Act shall not affect the validity of any existing oil or gas lease within the area designated as the Teshekpuk-Utukok National Wildlife Refuge. Oil and gas exploration, development, production and related activities under existing leases shall avoid significant adverse effects upon fish and wildlife, their habitat, and the environment. In the case of termination or cancellation of any lease which would cause significant adverse effects to fish and wildlife, their habitat or the environment, the Director shall provide compensation to the lessee for the termination or cancellation of any such activity in accordance with the provisions of section 302(h) of this Act. Oil and gas exploration, development and

production and related activities shall continue, subject to the administrative control of the Director, under existing leasehold terms and conditions until such time as the Director publishes final regulations regarding the exploration, development and production of oil and gas on the Teshekpuk-Utukok National Wildlife Refuge in accordance with those provisions of sections 302, 303, 305 and 306 of this title which are capable of application to the Teshekpuk-Utukok National Wildlife Refuge. The Director of the Bureau of Land Management shall assist the Director in managing any oil and gas leasing program within the Teshekpuk-Utukok National Wildlife Refuge in the same manner as provided for in section 302 of this Act for the Arctic National Wildlife Refuge. The authority of the Federal and State fish and wildlife agencies described in subsection 305(b) of this title shall apply to port facility or offshore causeway construction along the coastline of the Teshekpuk-Utukok National Wildlife Refuge. Notwithstanding any other provision of law, no transportation or utility corridor may be authorized or permitted which traverses a line from the line of mean high water at the easternmost point of Antigaru Point in Harrison Bay, thence due west to the western shoreline of Teshekpuk Lake unless the Director has concluded that there is no economically reasonable and prudent alternative.

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(2) NATIVE ALASKAN RIGHTS AND STATE OF ALASKA LAND ENTITLEMENT CLAIMS.--The enactment of this Act shall not affect any right of--

(A) any Native, Native group, Native village, Native Corporation, or Regional Corporation (within the meaning given each term by section 3 of the Alaska Native Claims Settlement Act (16 U.S.C. {1601}) under the Alaska Native Claims Settlement Act or ANILCA; or

(B) the State or any political subdivision of such State, under the Act entitled "An Act to provide for the admission of the State of Alaska into the Union" and approved July 7, 1958 (48 U.S.C. prec. 21) or ANILCA, to select or acquire any land.

SEC. 314. PROPERTY INTERESTS OF THE INUPIAT ESKIMO PEOPLE.

Upon the authorization of an oil and gas leasing program on the coastal plain pursuant to section 302(a) of this title or pursuant to a subsequent Act of Congress, the prohibitions and limitations contained in Section 1003 of ANILCA, insofar as they have application to the subsurface property interests owned by the Inupiat Eskimo people within and adjacent to the coastal plain, are repealed. Consistent with the provisions of section 1431(o)(4) of ANILCA, no surface disturbance in support of oil or gas exploration, development or production involving such subsurface property interests shall be authorized prior to publication of final regulations issued pursuant to subsection

302(b) of this title which establish environmental stipulations, terms and conditions for an oil and gas leasing program for the coastal plain. Such regulatory environmental stipulations, terms and conditions shall apply to the development of all subsurface property interests owned by the Inupiat Eskimo people within and adjacent to the coastal plain.

TITLE IV--MISCELLANEOUS PROVISIONS

SEC. 401. GENERAL ENFORCEMENT AMENDMENTS TO THE REFUGE ADMINISTRATION ACT AND THE REFUGE RECREATION ACT.

(a) Section 4(e) of the Refuge Administration Act is amended by--

(1) striking out "\$500" where it appears and inserting in lieu thereof "\$5,000"; and

(2) striking out "six months" where it appears and inserting in lieu thereof "one year".

(b) Section 4 of the Act of September 28, 1962 (commonly known as the Refuge Recreation Act, 16 U.S.C. 460k-3) is amended by--

(1) striking out "\$500" where it appears and inserting in lieu thereof "\$5,000"; and

(2) striking out "six months" where it appears and inserting in lieu thereof "one year".

SEC. 402. MISCELLANEOUS PROPERTY INTERESTS WITHIN REFUGES.

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(a) IN GENERAL.--Section 6 of the Migratory Bird Conservation Act (16 U.S.C. 715e) is amended--

(1) by inserting "(a)" before "The Secretary";

(2) by inserting ",or by the head of any other Federal department or agency for the Secretary," after "Secretary of Interior" the third place it appears therein;

(3) by inserting "either (1)" after "subordinate to and subject to";

(4) by striking out "or if deemed necessary" and all that follows thereafter and inserting the following: ", or (2) such rules and regulations as the Secretary of the Interior may from time to time prescribe."; and

(5) by adding at the end thereof the following: "(b) The rules and regulations set out in any deed or lease under subsection (a)(1) shall, at a minimum, address the same fish and wildlife conservation matters, and provide the same degree of resource and habitat protection, as are addressed and provided for at the time by general regulations applicable to the access to, and development of, reserved non-Federal mineral interests in areas within the National Wildlife Refuge System."

(b) CONFORMING AMENDMENT.--Section 4(d) of the Refuge Administration Act is amended by adding at the end thereof the following new paragraph:

"(3) The Secretary shall permit by regulation limited access to, and the development of, reserved non-Federal mineral

interests within the National Wildlife Refuge System. Any such access and development shall be carried out only in accordance with a permit which contains such economically reasonable terms and conditions as deemed necessary--

"(A) to protect the fish and wildlife resources of, and their habitat in, the affected refuge from any significant adverse effects; and

"(B) to minimize, to the maximum extent possible, any adverse effects upon such resources and their habitat.

Notwithstanding any provision of this section, any term or condition imposed by the Secretary under this paragraph is in addition to any other requirement that is imposed under other applicable Federal or State law."

SEC. 403. GENERAL AMENDMENTS TO THE FISH AND WILDLIFE IMPROVEMENT ACT OF 1978.

Section 3(h)(3) of The Fish and Wildlife Improvement Act of 1978 (16 U.S.C. 712(2)) is amended by inserting after the last sentence the following:

"(3) The Secretary, through the Director of the United States Fish and Wildlife Service and in cooperation with the Secretary of State, is authorized to take action as may be necessary to implement the provisions of the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (RAMSAR) (11 I.L.M. 963). There are authorized to be appropriated not to exceed \$150,000 for each fiscal year through

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fiscal year 1997 to enable the Secretary to carry out such responsibilities and functions as may exist in implementing the RAMSAR Convention.

"(4)(a) GENERAL AUTHORITY.--In accordance with the provisions of Article IV, Paragraph (2)(c) of the Convention between the United States and the Union of Soviet Socialist Republics for the Conservation of Migratory Birds and Their Environment, the Secretary, through the Director of the United States Fish and Wildlife Service, is authorized to designate significant areas of breeding, wintering, feeding and moulting habitat which are of special importance to the conservation of migratory birds. Such identification may also include migratory bird habitat areas which require special protection because of their ecological diversity or scientific value.

"(b) DESIGNATION AND RESPONSE.--After consultation with the appropriate State Fish and Wildlife Agency or Department of the affected State, significant habitat areas of special importance for migratory birds shall be designated by informal rulemaking accompanied by the publication of a map of adequate scale in the Federal Register. Not less than 90 days for public comment shall be allowed on any proposed designation and a copy of the proposed designation shall be published in a newspaper of general circulation in the affected area. A public hearing on the proposed designation shall also be held in the affected area if requested. In addition to the criteria set forth in subsection (a) of this section, no area shall be designated a significant

habitat area of special importance for migratory birds unless the Secretary finds that it contains significantly high concentrations of migratory birds during some portion of the year and is at least 1,700 contiguous acres in size; Provided, That colonial nesting sites of smaller contiguous acreage may be designated if the Secretary finds that they are otherwise significant habitat areas of special importance for migratory birds. No Federal agency shall authorize, fund or carry out any activity which would adversely modify or destroy a significant habitat area of special importance for migratory birds designated pursuant to this section unless, after consultation with the Secretary, the Federal agency concludes that there is no feasible and prudent alternative to the proposed activity which would avoid such adverse effects."

SEC. 404. MANAGEMENT PLANS ON NATIONAL WILDLIFE REFUGES.

Section 4(c) of the Refuge Administration Act is amended by adding at the end thereof the following: "Nothing in 18 U.S.C. Section 47 shall preclude the use of aircraft and motor vehicles in implementation of approved management plans on national wildlife refuges."

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KEY CONCEPTS OF
NATIONAL FISH AND WILDLIFE ENHANCEMENT ACT OF 1987

1. Exploratory drilling/conditional leasing authority (provide leasing authority now but require completion of exploratory drilling program and Presidential decision in favor of leasing prior to actual leasing -- no further Act of Congress required).
2. Number of exploratory wells - 4 wells.
3. Private industry to run exploratory program with chance to designate areas to drill - USGS as backup only.
4. Industry recovers 50% of its costs for conducting exploratory program by off-setting costs as a credit against future ANWR leasing, OCS leasing or BLM on-shore leasing. If company doesn't participate in exploration program, it would be barred from participating in subsequent leasing program.
5. Establish 376,000 acre "Protective Management Zone" (PMZ) out of 1,550,000 acre coastal plain. Would include core calving area and eastern coastal area of coastal plain - no exploratory drilling or surface occupancy for oil and gas leasing allowed in the PMZ.
6. Use "no significant adverse effect" environmental standard for regulating exploratory program and oil and gas leasing program.
7. Ask National Academy of Sciences (NAS) to conduct independent assessment of results of exploratory drilling program and to advise Director FWS of overall energy needs of Nation.
8. Upon completion of exploratory drilling program, require Director FWS to issue revised and updated Section 1002 report including NAS advice where adopted.
9. Upon issuance of revised Section 1002 report, Secretary of Interior shall recommend oil and gas leasing to the President unless he makes one of three findings against leasing. President to adopt Secretary's recommendations on leasing unless President finds it not in Nation's paramount interest to do so - President can authorize leasing without further Act of Congress unless significant adverse environmental effects would occur.
10. Put Director, USFWS, in charge of environmental controls and overall exploration and leasing programs on ANWR while having the Bureau of Land Management run the technical, geological and financial parts of oil and gas leasing program.

11. Set up an ANWR Scientific Advisory Panel comprised of Federal, State and local agency representatives and oil industry and environmental community to assist FWS in implementing exploratory program and any oil and gas leasing program.
12. Leasing revenues - overturn Supreme Court Kenai Borough case and put all ANWR oil and gas leasing revenues into Refuge Revenue Sharing Fund. First allocate amount of revenues necessary to eliminate current large deficit in Refuge Fund and provide for full funding of Fund, then divide royalties and revenues 50/50 with State of Alaska.
13. 50/50 split of royalties/revenues
State share (50%)
Federal share (50%)
 - 25% - to endow \$150 million Fish and Wildlife Enhancement Trust Fund managed by the Secretary of the Treasury for the Director, FWS, (once \$150 million endowment reached, then this 25% of revenues merged with other 25% for Migratory Bird Conservation Fund). Enhancement Trust Fund to provide Director with revenues to fund five categories of activities: State non-game programs; Arctic wildlife research; National Fish and Wildlife Foundation matching grant program; natural resource conflict resolution; and wildlife conservation education and training programs.
 - 25% - to Migratory Bird Conservation Fund - Migratory Bird Commission to spend ANWR oil revenues as follows:
 - 50% - migration route/wintering habitat for migratory birds from Alaska and Canada
 - 20% - in support of North American Waterfowl Plan with Canada
 - 30% - for acquisition of wildlife refuges for species other than migratory birds (Half of this amount (15%) to be made available each year on priority basis for acquiring inholdings in Alaska refuges from willing sellers. If not enough willing sellers in any given year to use entire 15%, then remainder of money available for Lower 48 State acquisitions also.)
14. To protect coastal marine environment of ANWR, grant Directors of FWS and NMFS new authority to impose mandatory terms and conditions on Section 404 permits for port facilities and off-shore causeways (would follow existing Section 18 and Section 30(c) approach of Federal Power Act) - prohibit any port facilities on eastern coastline of coastal plain and allow only one port on western/central part of coastal plain.

15. Create new 23.5 million acre national wildlife refuge on North Slope out of National Petroleum Reserve-Alaska (NPRA) currently managed by BLM. Impose moratorium on further leasing in NPRA for up to 5 years. Any resumption of leasing in NPRA subject to requirements of Refuge Administration Act and no oil and gas leases to be issued in Teshekpuk Lake area. Bar transportation/utility corridor around right side of Teshekpuk Lake unless no economically reasonable and prudent alternative.
16. Enhance enforcement authorities of Director FWS and increase penalties for violation of leasing or exploratory drilling rules. \$10,000 maximum civil penalty generally, with \$25,000 civil penalty for pipeline violation. \$5,000 criminal penalty and one year in jail. Use oil spill approach in H.R. 1632 for clean up authority for pollution/spills on refuge.
17. Strictly prohibit public access on pipeline service roads and restrict sport hunting and fishing in coastal plain by oil field work crews. Oil lessees liable for civil or criminal penalties for hunting and fishing violations by their employees.
18. Establish exclusive authority for granting rights-of-way across coastal plain. (Title XI of ANILCA would not apply.) No right-of-way for pipeline to be granted until coastal plain opened to leasing. Applies to requests for rights-of-way from lands off-refuge - no rights-of-way granted through designated 376,000 acre Protective Management Zone. In order to ensure safety and consistency, requires State to duplicate Refuge oil pipeline standards for part of pipeline on State lands.
19. Authorizes FWS to assess and recover its administration, research and monitoring costs from oil lessees and exploratory drilling permittees.
20. Would prevent Arctic Slope Regional Corporation (ASRC) from developing its mineral interests in adjacent land obtained through the Chandler Lake land exchange until coastal plain opened to leasing (the Chandler Lake Exchange provided that ASRC would be bound by any terms and conditions included in ANWR legislation) - also would prevent ASRC from authorizing surface disturbance on ASRC lands in connection with leasing until FWS issues its oil/gas development and production regulations.
21. Requires State and FWS to reach agreement on ownership of sand/gravel in beds of bodies of water in coastal plain or put proceeds into escrow account until ownership dispute settled.

22. Increase maximum penalties under Refuge Administration Act and Refuge Recreation Act from \$500 to \$5,000 per violation and from six months to one year in jail per violation.
23. Reaffirms authority of Director FWS to regulate and impose economically reasonable environmental terms and conditions on private oil and gas activities within national wildlife refuges.
24. Implements migratory bird habitat protection provisions of Soviet Migratory Bird Treaty - Director FWS may designate areas of 1,700 contiguous acres or more with exceptional concentrations of migratory birds. Limitation on Federal agencies authorizing, funding or carrying out activities in these designated areas if they have serious adverse effects unless there is no feasible and prudent alternative to the project as proposed.

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ENVIRONMENTAL BENEFITS RESULTING FROM THE
NATIONAL FISH AND WILDLIFE ENHANCEMENT ACT OF 1987

Although enactment of this legislation would provide a vehicle for cautious development of the Arctic Refuge coastal plain, the positive conservation aspects of the bill are numerous. The legislation substantially enhances the nation's fish and wildlife resources and contributes to international conservation efforts in the following ways:

1. ALASKAN REFUGE OIL AND GAS ROYALTIES DEDICATED TO FISH AND WILDLIFE CONSERVATION PURPOSES.
 - Greatly enhances wetland conservation efforts by dedicating hundreds of millions of dollars of Federal oil revenues from the Arctic Wildlife Refuge to the Migratory Bird Conservation Fund to be used for land acquisition for the Wildlife Refuge System; specifically, acquisition of bird migration and wintering habitat; refuge acquisitions for species other than migratory birds, as well as for Alaskan Native inholdings in Alaskan refuges; and land acquisitions in support of the North American Waterfowl Management Plan with Canada.
 - Establishes the Fish and Wildlife Enhancement Trust Fund of \$150,000,000 to be used for funding diverse wildlife conservation programs such as additional fish and wildlife research in Alaska and Canada, conservation education and training programs, State non-game programs, natural resource conflict resolution efforts, and the matching grant program of the National Fish and Wildlife Foundation.
 - Makes possible full funding levels for the Refuge Revenue Sharing Fund, thus providing additional payments-in-lieu of taxes compensation for counties and local jurisdictions containing units of the National Wildlife Refuge System. Fiscal year 1988 projections show deficit in Fund to run at \$.56 on the dollar. Full funding will make new additions to the Refuge System more attractive to local governments.

2. NEW 23,500,000 ACRE NATIONAL WILDLIFE REFUGE ON THE NORTH SLOPE OF ALASKA.
 - Establishes the Teshekpuk-Utukok National Wildlife Refuge encompassing that area currently known as the National Petroleum Reserve - Alaska (NPR-A).
 - Protects areas of premiere wildlife values, such as the Teshekpuk Lake Special Area for molting Pacific brant and the Utukok highlands for calving of the 250,000 Western Arctic caribou herd.

- Severely restricts transportation/utility corridors in the Teshekpuk Lake Special Area, thus providing added protection for wildlife.
 - Authorizes State and Federal wildlife resource agencies to impose mandatory terms and conditions on section 404 permits for any port facility/causeway constructed in the coastal area of the new refuge.
 - Establishes a five-year moratorium on further oil and gas leasing on the new refuge and imposes new environmental standards on current leases. After expiration of moratorium, prohibits additional oil and gas leases in the Teshekpuk Lake Special Area and only allows leasing elsewhere in refuge where compatible with refuge purposes.
 - Requires that a comprehensive refuge management conservation plan be prepared.
3. ESTABLISHMENT OF A "PROTECTIVE MANAGEMENT ZONE" ON THE COASTAL PLAIN OF THE ARCTIC NATIONAL WILDLIFE REFUGE.
- This 376,000-acre special management area would protect significant fish and wildlife resources on the Arctic Refuge, including the sensitive Porcupine caribou core calving grounds and coastal polar bear denning habitat, by precluding surface occupancy and use for oil and gas exploration, development and related activities within its boundaries.
 - Establishes an eight- to ten-mile no surface occupancy zone between already designated wilderness areas of Arctic Refuge and areas open for development.
 - Protects coastal lagoon and barrier island habitats, caribou insect relief habitat, and associated waterfowl nesting and feeding areas on the eastern shore of the coastal plain in a continuous three-mile wide coastal strip.
 - Protects the concentrated Porcupine caribou calving area in the Jago Uplands and provides an undeveloped "insect relief corridor" for caribou access to the northeast coast.
 - Protects the entire 4,000-acre Sadlerochit Spring Special Area as well as the headwaters and riparian zones of at least ten major drainages of the coastal plain.
 - Protects known high use areas for polar bear, muskoxen, brown bear, snow geese, caribou, moose, various raptors and significant wetland habitat.

4. PHASED EXPLORATION AND DEVELOPMENT PROGRAM PROVIDES MAXIMUM PROTECTION.

- Four on-structure exploratory wells are authorized, as well as possible additional season of seismic exploration, with leasing decisions made only after the exploration program is completed. No leasing would occur if there would be significant adverse environmental effects from development.
- The environmental standard during exploration and development would be "no significant adverse effect on fish and wildlife, their habitat and the environment" and would require the application of best available technology from an engineering and technical point of view.
- A comprehensive list of environmental subject matters must be addressed in regulations providing protective environmental terms, conditions, prohibitions or restrictions. All regulations require impact disclosure and mitigation planning pursuant to CEQ guidelines.
- Exploratory drilling performed only in the winter months, with equipment brought in on ice roads or flown in to ice airstrips or, in exceptional cases, overland during periods of adequate snow cover.
- A Scientific Advisory Panel will assist the Fish and Wildlife Service in implementing the exploratory drilling and leasing programs by reviewing exploration and development plans and recommending appropriate wildlife research activities to ensure that significant adverse effects are avoided.
- The National Academy of Sciences will provide independent scientific review throughout the exploration phase and will act as a source of objective information for moving into a leasing phase. The Academy will also review national energy needs, likelihood of commercially recoverable deposits of oil and gas on the coastal plain, and whether the coastal plain could be developed without significant adverse effects on fish and wildlife, their habitat or the environment. The Academy will also review and comment on the revised Section 1002 report.

5. COASTAL MARINE ENVIRONMENT PROTECTED.

- Director, FWS, shall establish a 2-mile wide coastal protection zone along western and central part of coastal plain coastline where no surface occupancy would be allowed for oil and gas development and related activities.
- Only one new port facility authorized on western and central coast of refuge - no port site allowed at key polar bear denning area at Pokok Lagoon on eastern side of coastal plain.

- Directors of FWS, NMFS and State of Alaska Department of Fish and Game given new authority to impose mandatory terms and conditions on federal permits for port facility and offshore causeways to protect coastal marine environment of Arctic Refuge, specifically migratory fish.

6. WILDLIFE LAW ENFORCEMENT CAPABILITIES BOLSTERED BY THE BILL.

- Enhances Fish and Wildlife Service law enforcement powers to ensure compliance with Arctic Refuge environmental controls: civil penalties ranging from \$10,000 to \$25,000 per day; criminal penalties up to \$5,000 per violation; injunctive powers; oil lessee liable for civil and criminal penalties for hunting violations of their employees, and liable for damages to natural resources from pollution, and cleanup costs.
- Upgrades penalties for violations of the Refuge Administration Act and Refuge Recreation Act from \$500/six months in jail to a maximum of \$5,000/one year in jail.

7. SEVERAL PAST COURT CASES OVERTURNED TO FAVOR FISH AND WILDLIFE CONSERVATION.

- Overturns a Federal district court opinion which held that the Director, FWS, had no authority to impose reasonable environmental controls over private oil and gas activities within national wildlife refuges.
- Overturns a Supreme Court decision that diverts royalties from oil and gas leasing on national wildlife refuges away from fish and wildlife conservation programs. Current Federal law in Alaska would give the State 90% of the Federal royalties from oil development in the Arctic Refuge and 10% to the U.S. General Treasury -- not one penny goes to fish and wildlife conservation. This bill would split royalties with the State 50/50 and dedicate the use of Federal revenues from oil leasing on wildlife refuges to fish and wildlife conservation purposes.

8. INTERNATIONAL CONSERVATION FEATURES.

- The bill provides implementing legislation for the International Convention on Wetlands Conservation (RAMSAR), a treaty designed to enhance the protection for nationally and internationally significant wetlands.
- The bill provides implementing legislation for the migratory bird habitat protection provisions of the Soviet Migratory Bird Treaty by authorizing the designation of significant areas of migratory bird habitat which require special protection due to their ecological diversity or scientific value.

COASTAL PLAIN
PROTECTIVE MANAGEMENT ZONEINTRODUCTION

The Protective Management Zone is an estimated 376,000-acre area on the coastal plain of the Arctic National Wildlife Refuge where oil and gas exploration, development, production and related activities are precluded due to the high habitat value and sensitivity of the area for fish and wildlife resources. This management area protects important habitats and other unique natural features for the majority of the Arctic Refuge's most significant wildlife resources, while allowing for potential oil and gas development on approximately 1.2 million acres on the coastal plain.

ENVIRONMENTAL BENEFITS

Porcupine caribou herd: 1) Affords protection to the entire 84,000-acre "concentrated calving area" and much of the post-calving aggregation area; 2) provides for an unrestricted "insect relief corridor" to the northwest coastal area; 3) leaves undisturbed approximately 15 miles of coastline as insect relief habitat.

Muskoxen: Protects about 1/2 of the Niguanak-Okerokovik-Angun muskoxen subpopulation's high-use habitat. This subpopulation is isolated from the rest of the Arctic Refuge muskoxen herd and is considered by FWS to be the most vulnerable to disruption.

Polar bear: Protects the Pokok Lagoon bluff area (including documented den sites), considered by FWS to be the most important and consistent denning habitat for polar bears on the Arctic Refuge.

Brown bear: Protects about 1/2 of the largest and most important brown bear high-use areas (50 to 70 adult bears and cubs from May to September) located in the caribou concentrated calving grounds.

Snow geese: Protects a significant portion of the documented snow goose preferred staging habitat in the upper Aichilik, Okpilak and Jago River area.

Bowhead whale: Protects endangered bowhead whale nearshore feeding area by precluding marine port development along eastern shoreline of coastal plain.

Raptors: Protects several documented raptor nest sites located in cliffs on the upper Jago River. These are unique areas, as there is limited cliff habitat such as this on the coastal plain.

Moose: Protects all of the year-round moose habitat and about 1/2 of the seasonal-use habitat on the coastal plain.

Sadlerochit Springs: Protects the entire 4,000-acre Sadlerochit Spring Special Area and major outflow, nominated as a National Natural Landmark in 1981.

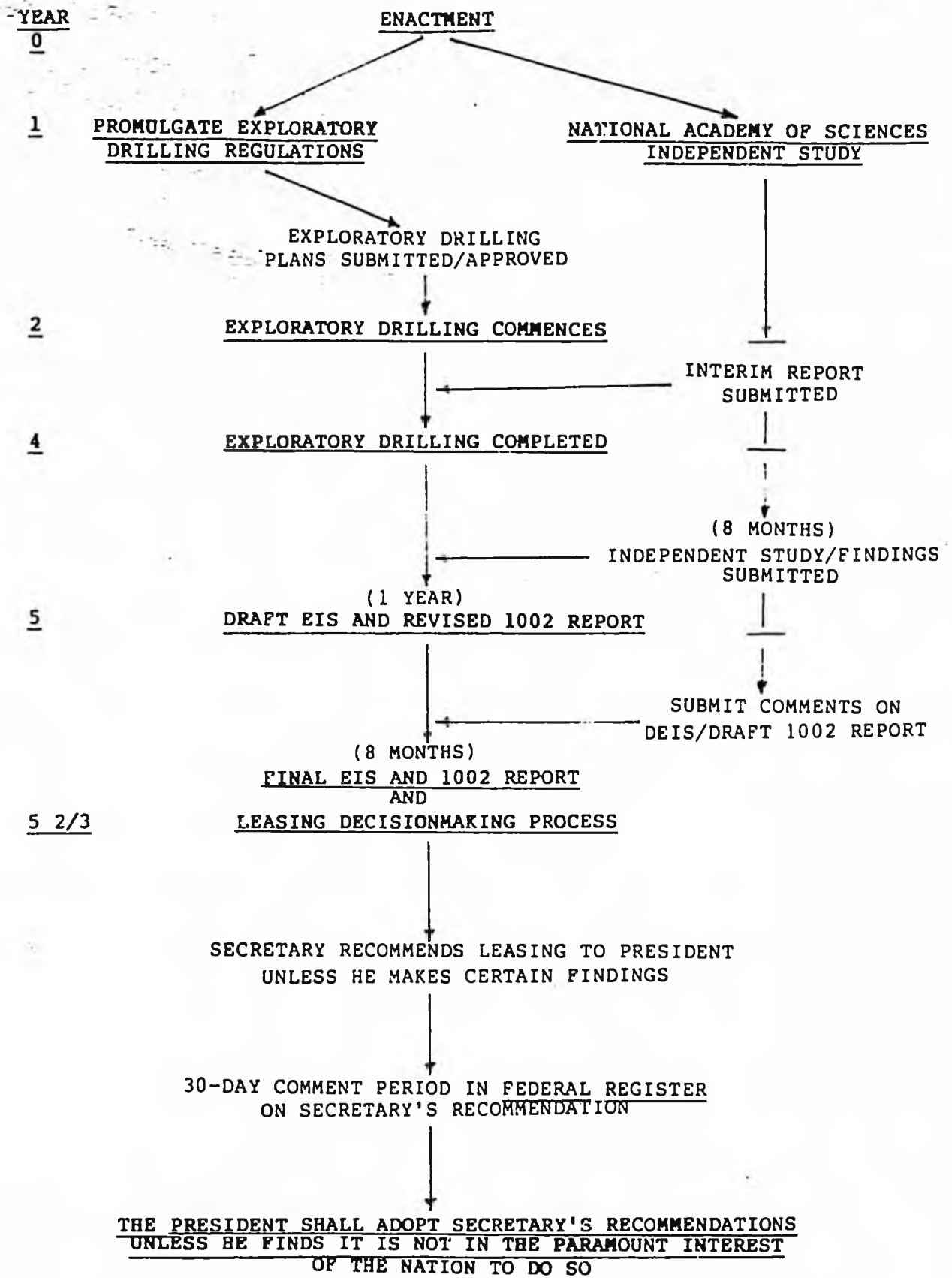
Drainages: Protects the headwaters and riparian habitats of at least 10 of the main drainage systems on the coastal plain.

Wilderness buffer: Establishes an 8 to 10-mile no-surface-occupancy zone between industrial development and the adjacent designated wilderness areas of the southeastern portions of the Arctic Refuge.

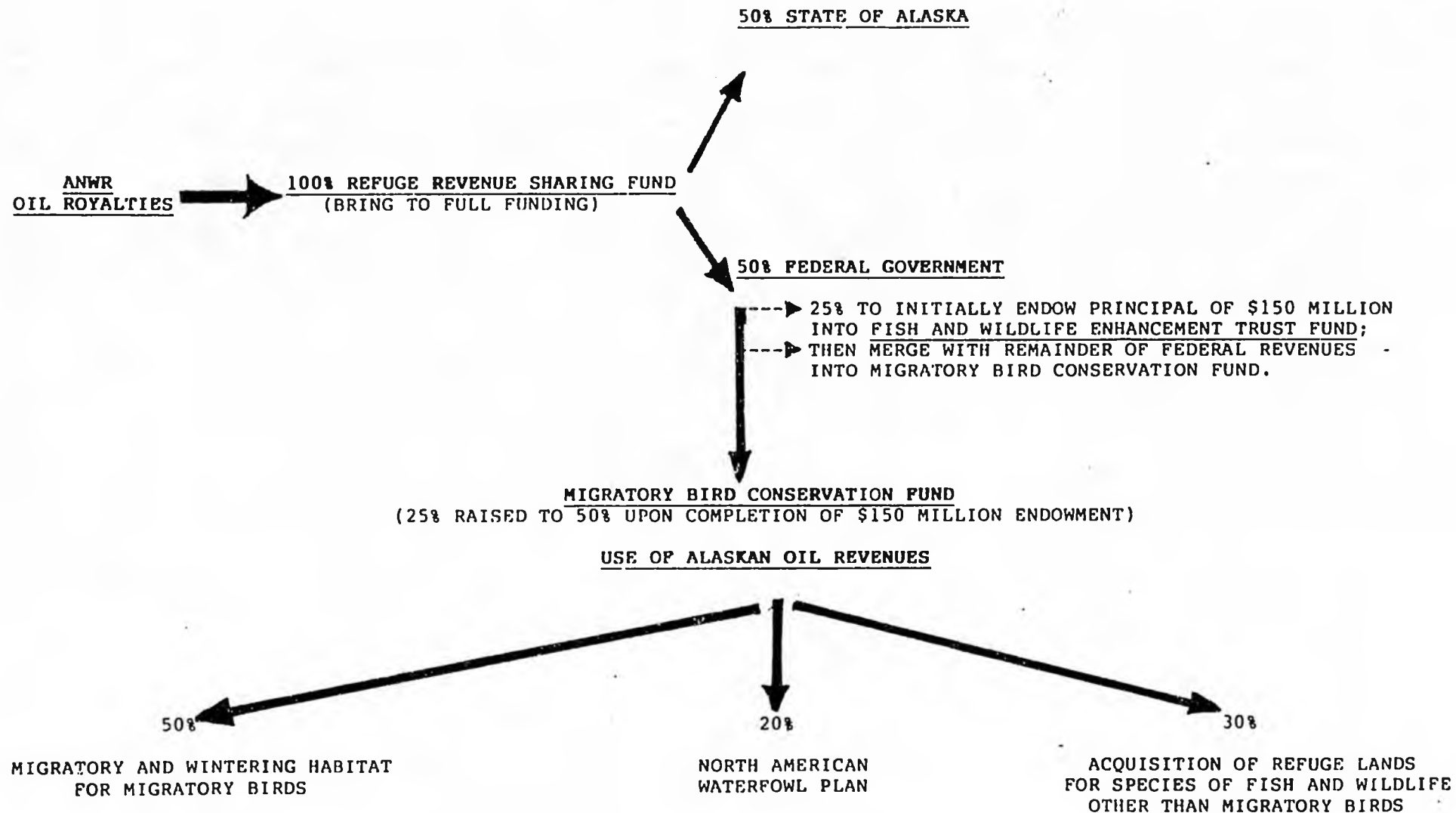
Coastal habitat: Protects approximately 15 miles of coastal lagoon/barrier island habitats (Beaufort and Angun Lagoons and Pokok Bay) and associated waterbird nesting and feeding habitats on the eastern shoreline of the coastal plain.

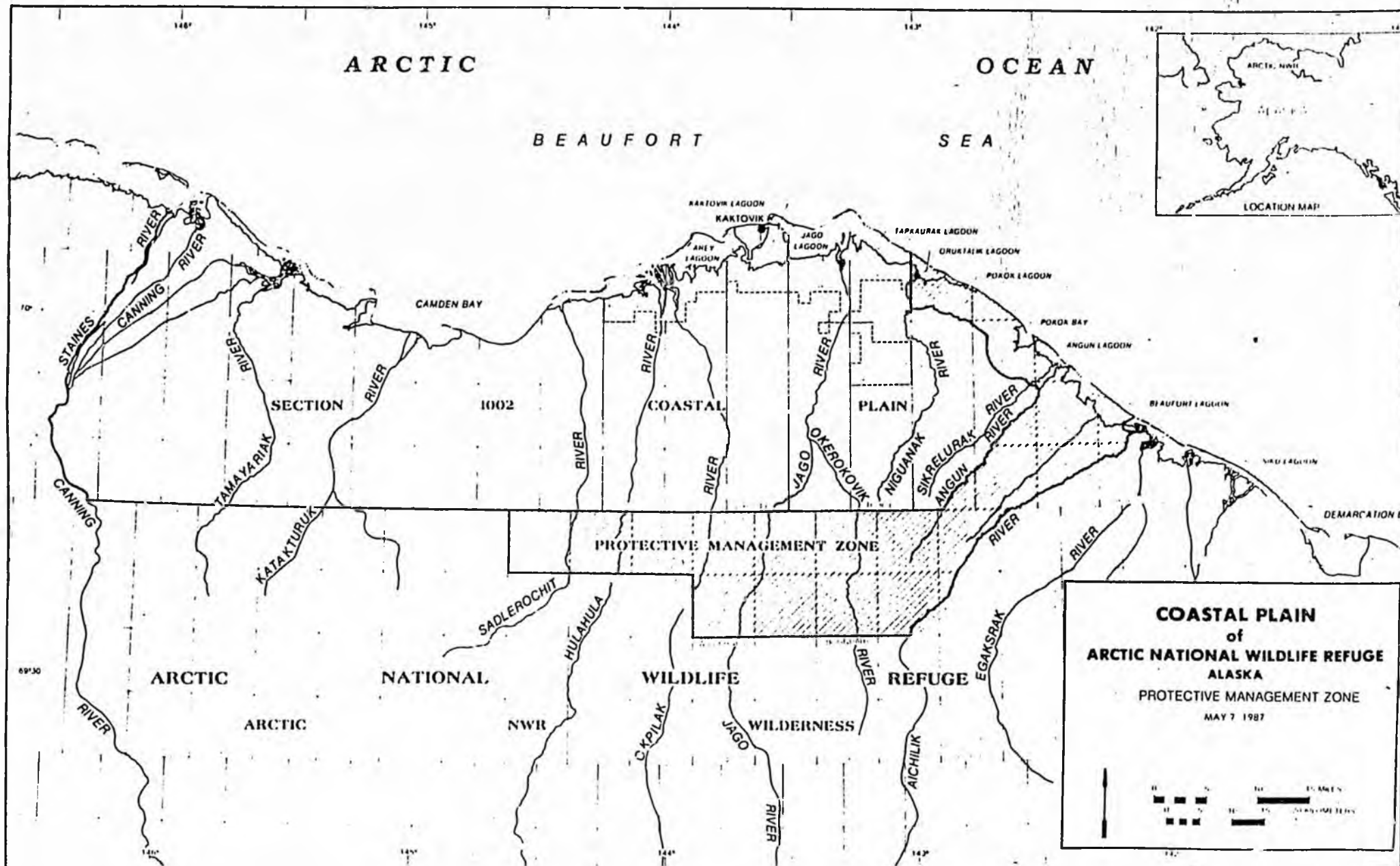
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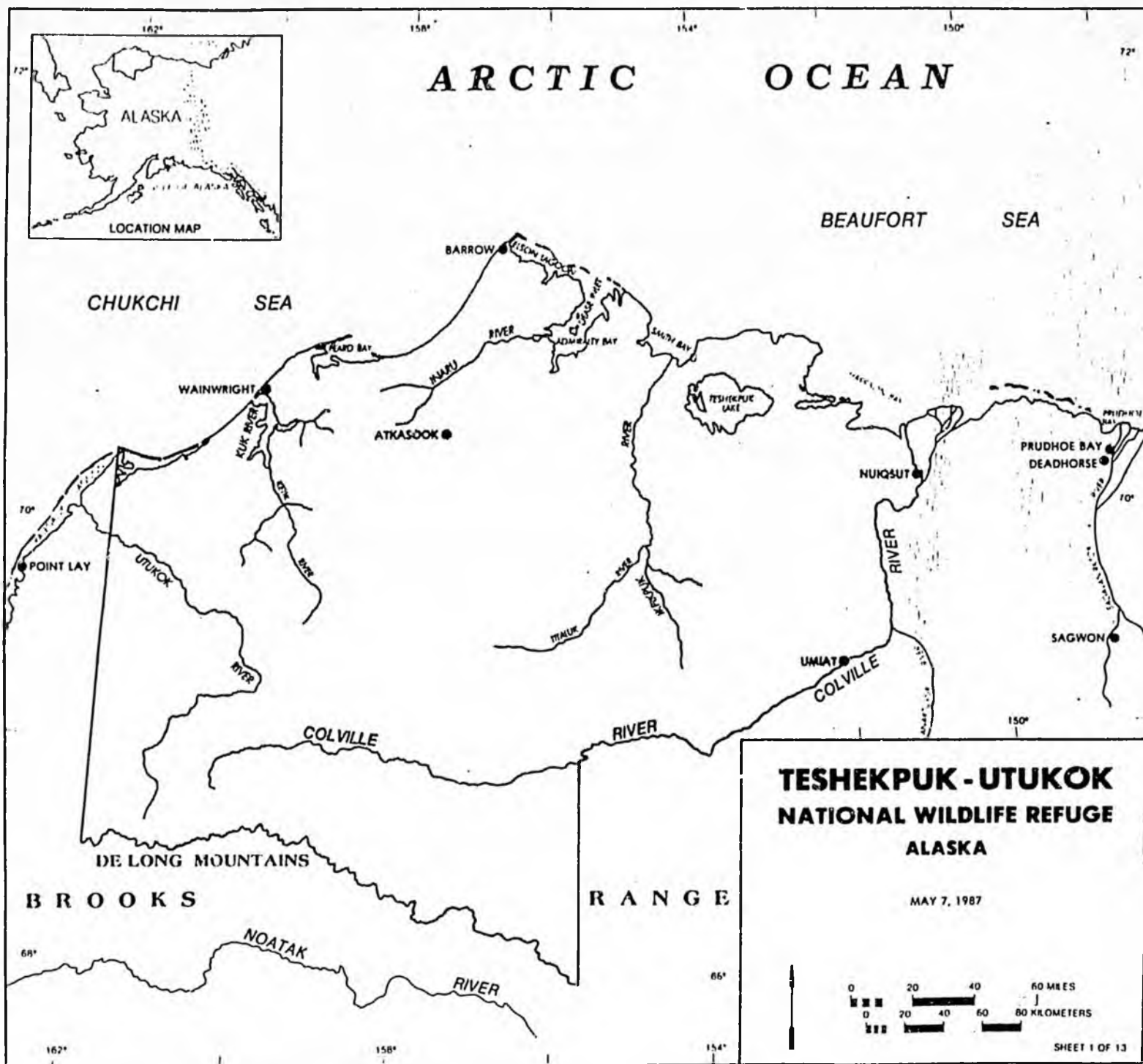
10/14/87



NATIONAL FISH AND WILDLIFE ENHANCEMENT ACT OF 1987
ALASKA OIL AND GAS ROYALTIES/REVENUES DISTRIBUTION







TESTIMONY OF DENNIS D. KELSO
BEFORE THE HOUSE SUBCOMMITTEE ON
WATER AND POWER RESOURCES
October 8, 1987

Mr. Chairman and Members of the Subcommittee:

My name is Dennis Kelso. I am Commissioner of the Alaska Department of Environmental Conservation. With me today is Larry Dietrick, Director of our Division of Environmental Quality.

The Department of Environmental Conservation is responsible for protecting public health and the environment. We enforce regulations governing air quality, water pollution control, solid waste management, hazardous waste management, and oil spill prevention and response. We write permits specifying emission levels and disposal methods, monitor activities under permits, and take enforcement actions when needed. The Department has considerable experience with the effects of oil and gas related activities.

On Alaska's North Slope, the Department has developed stipulations for oil and gas lease sales, helped with siting of disposal facilities, and carried out the full range of environmental protection activities. We also participate in the design and review of environmental studies, collect monitoring data, and maintain a field office at Prudhoe Bay in Deadhorse.

Effective waste stream management for oil and gas activities in the Arctic National Wildlife Refuge (ANWR) requires the following steps:

1. Evaluation of past practices and operating procedures at other fields on the North Slope.
2. Advance planning for effective waste disposal facilities and practices.
3. Development and application of specific, effective requirements for industry as lease stipulations and permit conditions.
4. Coordination of efforts among agencies with authority to regulate oil and gas exploration and development.
5. Monitoring of impacts and compliance with environmental requirements.

I will briefly discuss each of these steps and will illustrate them with examples drawn from our experience with solid waste management. In addition to solid waste, key areas for adequate environmental protection measures include air quality, liquid wastes, hazardous wastes, spill prevention and response, and area of impact. I have included an overview of these issues as an attachment to my written testimony.

REVIEW OF WASTE MANAGEMENT PRACTICES IN ALASKA'S NORTH SLOPE OIL FIELDS

Decisions on the exploration and development of ANWR should reflect the experience and information gained by the State and the industry during operations at the National Petroleum Reserve in Alaska (where exploration began in the mid 1940's), Prudhoe Bay (where exploration confirmed the field in the late 1960's), Milne Point, Lisburne, Endicott, and the Kuparuk River oil fields. The technology and operating

methods used in oil and gas development have evolved considerably since the early days of Prudhoe Bay. Both the industry and the agencies have learned a great deal in the process. Operations in the newer fields at Endicott and Kuparuk differ substantially from those at Prudhoe. Some waste disposal practices have proven effective while others can and should be improved.

The Department is currently reviewing North Slope waste disposal practices. A technical accounting of these practices, a description of their evolution, and an assessment of potential impacts will help identify the most appropriate management regime for each waste stream for ANWR.

Moreover, there is a role for Congress in designing the waste stream management regime for ANWR by setting the standards to be met. If Congress concludes that some areas of ANWR warrant a particularly high degree of environmental protection, it may be appropriate, for example, to require removal of wastes from those areas. The level of protection deemed necessary by Congress can best be met through lease stipulations or permit conditions, evaluation of the effectiveness of these measures, and modification of the requirements if field experience warrants.

The State's waste stream management requirements have evolved in response to the North Slope oil development experience. During the past year the State developed new regulations for handling solid waste, particularly drilling muds. Those regulations are now in effect. They establish requirements for disposal of drilling muds and for water quality monitoring to ensure that the disposal techniques used will protect the environment.

PLANNING FOR ADEQUATE WASTE STREAM MANAGEMENT

Planning before start-up is essential for proper management of waste streams in ANWR. Inadequate planning before start-up was a major reason why some North Slope development occurred without the best technology. Similarly, inadequate planning led to the absence of sufficient waste disposal facilities for the oil field support industry, which does not have access to the same disposal facilities as the field operators. This has contributed to the abandonment of drums and dumping of other waste materials on vacant sites in the Deadhorse area.

Solid waste management provides numerous examples of the advantages of careful planning for disposal facilities and methods. Major sources of solid waste are garbage, drilling wastes, scrap metal, oily wastes, construction debris, drums, junked vehicles, tires and a host of other materials. Comprehensive waste material management plans could minimize the amount of waste and incorporate salvaging, reusing, and recycling as waste management tools. Backhauling scrap metal and crushed drums is an additional technique which could make most landfills in ANWR unnecessary. Ash and residue from incinerator operation could easily be consolidated into a single facility.

Comprehensive planning could also lead to regional disposal facilities. This would prevent unnecessary proliferation of landfills while enabling the support service industry to have access to proper disposal facilities. Ultimate disposal of pipelines, flow stations, camps, and related facilities should also be addressed at the outset of ANWR planning so that a financial mechanism is in place to provide for proper disposal upon completion of use.

Plans for management of drums should be required as a condition of operation. They should include inventory and tracking, cleaning, crushing, backhaul, and disposal of waste liquids or residues from cleaning.

PERMIT CONDITIONS AND LEASE STIPULATIONS

Stipulations placed in leases and conditions written into permits provide a means to address site-specific factors. Lease stipulations apply to the tracts to be explored and developed; they should be tailored to the conditions found there. An example of a solid waste issue that could be addressed by stipulation is the collection of litter and other debris.

Litter, including construction materials and other debris, can be a persistent problem near the arctic coast where flat terrain and strong winds combine to carry these materials considerable distances. Once "offsite", it is often difficult to determine their source. Consequently, it may be desirable to implement a "no fault" requirement in stipulations applied to successful tract bidders, so that litter and other debris are routinely collected regardless of their origin.

Permits are written to govern specific activities of the permit applicant, often in a particular location. They are useful in fine tuning the waste stream management system and in preventing undesirable side effects of disposal. For example, solid waste disposal facilities such as landfills require a permit from the Alaska Department of Environmental Conservation. By taking account of the site configuration and other circumstances, conditions written into the permit can help prevent air and water pollution which might otherwise result from an improperly placed or operated landfill. However, the site-specific characteristics of most permits also limit their ability to deal with area-wide problems involving many different activities. Waste management problems often affect large areas and several operators or industries. Consequently, permits are no substitute for area-wide planning for disposal needs.

Effective use of lease stipulations and permit conditions requires flexibility. Otherwise, new circumstances may undercut their appropriateness. Changes in available technology, legal requirements, or new scientific data may dictate corresponding changes in the way a particular waste is managed. In order to determine whether stipulations or permit conditions are having the intended effect, it is also necessary to monitor on a continuing basis.

COORDINATION AND REVIEW

To achieve the optimum level of environmental protection, State and Federal agencies and industry must coordinate their efforts. They must share data in order to ensure that the best available information is brought to bear on ANWR waste management issues. Agency requirements should also be consistent and flexible enough to respond to changing circumstances. Congress should establish a formal consultation process involving these parties. If developed properly, this would also allow the opportunity for the participating agencies to clarify their respective authorities and to avoid duplication.

Among the issues which this process would address are the timing of the various phases of development; the need for studies; and the coordination of permitting, operating plan reviews, field monitoring, and field approvals. In all aspects of this process, it is essential that State and Federal regulatory agencies maintain their own oversight responsibilities.

MONITORING

Monitoring provides data to evaluate the effectiveness of permit conditions and lease stipulations. It may demonstrate the need to modify environmental requirements or operating methods and may help identify areas where additional study is needed. Monitoring also allows a determination of whether operations are in compliance with these requirements and with other environmental standards. For example, data from water quality monitoring under the new drilling mud disposal regulations will show whether contamination is occurring. If it is, the regulations require corrective measures.

CONCLUSION

Governor Cowper has taken a firm position that ANWR exploration and development must be done right, that the environment and the special values of ANWR must be protected. I have outlined some of the steps that can be taken to achieve this goal. These are just highlights, of course. Oil and gas development in the Arctic is a complicated business and I have only touched on the major environmental issues to be addressed.

Mr. Chairman, the Department of Environmental Conservation is available to the members and staff to discuss the details of environmental matters affecting your decision about ANWR. Thank you for the opportunity to testify. We look forward to working with you.

Attachment

SUMMARY OF WASTE STREAM MANAGEMENT
AND OTHER ENVIRONMENTAL PROTECTION ISSUES
RELEVANT TO OIL AND GAS DEVELOPMENT
IN THE ARCTIC NATIONAL WILDLIFE REFUGE

AIR QUALITY

The principal air pollutants discharged during oil and gas development are sulphur dioxide, suspended particulate matter, carbon monoxide, and nitrogen oxides. Concentrations of these four types of emissions depend, in large part, on the type and volume of fuel burned in the turbines, generators, and other internal combustion engines, and the amount of flaring in the area.

Flaring is a significant contributor to visibility impairment. Flaring during exploratory flow testing and operational phases is potentially a major source of emission of soot -- primarily unburned hydrocarbons -- and other materials. Technology exists to prevent such problems in future developments.

The primary source of NOx at Prudhoe Bay is the more than 100 gas turbines, each rated at more than 10,000 horsepower. This may be the greatest concentration of large turbines in the world. Approximately 20 air quality permits have been issued, and three are pending. The cumulative annual discharge allowed under these permits is more than 90,000 tons of NOx. Actual emissions are approximately 70 to 90 percent of the permitted values. Modeling has been used to predict the ground level concentrations of NOx and ground level monitoring is now underway to verify the modeling effort and measure ambient levels.

LIQUID WASTE MANAGEMENT

Liquid waste discharges include domestic wastewater, reserve pit fluids, brine discharges, hydrostatic test discharges, vessel rinsates, radiographic wastes, excavation discharges, oily wastewater streams, equipment washing runoff, workover fluids, waste oil solvents, and a wide range of other wastewater streams. Each needs to be identified with a provision made for proper disposal.

Zero discharge of non-domestic (industrial) wastewater streams, with the possible exception of excavation dewatering, should be carefully considered for ANWR. Based upon current experience on the North Slope, alternatives to dewatering of reserve pits should be used in ANWR. The management regime selected for drilling wastes could eliminate the need to discharge to the tundra or roads. Conventional dust control measures or water should be used instead of wastewater. The planning stage should identify specific disposal methods for liquid waste streams classified under the Federal Resource Conservation and Recovery Act (RCRA) and non-RCRA liquid oily-waste streams. Rinsates from tank, vessel and truck cleaning also must be disposed properly. Consequently, both the oil field operators, and the oil field support service industry must have access to appropriate facilities. Underground injection, potentially an acceptable disposal solution for many of these waste streams, should be considered. Produced water disposal should be limited to subsurface techniques.

Unlined gravel impoundments have been used in other North Slope oil and gas developments to contain various wastewater streams. This technique may not be appropriate in ANWR because of its limited effectiveness and its requirement for large amounts of gravel.

Comprehensive planning is needed to ensure that liquid waste disposal solutions are available for all users. This would allow all liquid waste streams to be accurately identified, characterized, and quantified along with an acceptable method for disposal. For example, subsurface disposal options should be available for use by the support service industry.

SOLID WASTE MANAGEMENT

Major sources of solid waste are drilling wastes, scrap metal, oily wastes, construction debris, drums, junked vehicles, tires and a host of other materials. It is critical that proper management of all these wastes be addressed from the beginning. Drilling wastes are of particular concern. The State's new regulations governing drilling waste disposal provide an appropriate starting point.

Disposal of solid waste is another area for which careful planning can lead to development of proper facilities at the outset. Provisions for picking up "off-site" litter and other debris should be addressed by stipulation placed on successful tract bidders. Because it is often difficult to determine the source of off-site litter or debris, it may be desirable to implement a "no fault" policy by which litter and debris are routinely collected regardless of origin.

Plans for management of drums should be required as condition of operation. They should include inventory and tracking, cleaning, crushing, backhaul and disposal of waste liquids or residues from cleaning.

Garbage and other wastes which may attract wildlife should be incinerated. Collection and storage of such wastes must also avoid attracting wildlife. Plans for collection of these wastes and for central incineration should be prepared and adopted as a condition of field exploration and development.

Disposal methods for solid oily wastes from tank bottoms, sludges, hydrocarbon waxes, oil contaminated muds and cuttings and spill debris require very careful evaluation. At Prudhoe, the North Slope Borough operates one of two permitted non-RCRA solid oily waste disposal sites in Alaska. Results from the operation of this site are mixed.

Additional work and technology review are needed to develop acceptable solutions for this very difficult waste stream management issue. Incineration would provide the most reliable and complete solution to the problem. However, this is also more costly to the operators.

Comprehensive waste material management plans could minimize the amount of waste to be disposed and could incorporate salvaging, reusing, and recycling materials. Backhaul of scrap metal and crushed drums are additional tools which could make most landfills in ANWR unnecessary. Ash and residue from incinerator operation could easily be consolidated into a single facility.

Comprehensive planning to develop solutions for solid waste disposal must also enable the support service industry to have access to proper disposal options. Regional disposal facilities can also help prevent unnecessary proliferation of landfills. Ultimate disposal of pipelines, flow stations, camps and related facilities should be addressed at the outset of ANWR planning so that a financial mechanism is in place to provide for proper disposal upon completion of use.

HAZARDOUS WASTE MANAGEMENT

Hazardous waste management is governed by stringent requirements under the Federal Resource Conservation and Recovery Act (RCRA). Transportation of hazardous substances is regulated by the Federal Department of Transportation. The State has adopted hazardous waste regulations and is currently in the process of implementing them through a cooperative agreement with the Environmental Protection Agency.

As with other waste streams, it is essential that acceptable disposal methods be available both to the oil field operators and to the support service industry. Comprehensive planning is needed to develop appropriate management facilities at the outset.

OIL SPILL PREVENTION AND RESPONSE

Coordinated response capability should be required. Adequate oil spill contingency plans and secondary containment requirements for drums and small facilities are also important. Buffer zones should be established to isolate these facilities from sensitive areas.

If field gas or refining capacity is available to supply fuels it should be made available to the support service industry. This will significantly reduce the occurrence of spills by eliminating fuel storage and piping for space heating and electrical generation. Local availability of refined products to all users would eliminate haul road tanker spills.

AREA OF IMPACT

Many of the tools developed in other North Slope fields are directly applicable to minimize the "footprint" of individual drill sites and of the overall production effort. Appropriate facility siting criteria and buffer distances will also help maintain adequate levels of environmental protection.

Development plans should include the following: a design to minimize the number of drill sites and production facilities while optimizing the layout of roads and pipelines; provisions for a limited number of intensive use material sites; and plans to centralize and consolidate support facilities. Consolidation of the service industry at Kuparuk provides an example of centralized support services in planning for ANWR.

Ice pads should be considered for all exploratory drilling. Ice pads may also be used for temporary stockpiling of overburden and muds and cuttings.

Restoration of the site at each stage from exploration through production can reduce the cumulative impact of development activities. Adequate drainage must be provided for all facilities to prevent impoundments.

TESTIMONY OF DR. ALVIN G. OTT
BEFORE THE HOUSE SUBCOMMITTEE
ON WATER AND POWER RESOURCES
October 22, 1987

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE:

MY NAME IS DR. ALVIN G. OTT. I AM THE REGIONAL SUPERVISOR OF THE HABITAT DIVISION WITH THE ALASKA DEPARTMENT OF FISH AND GAME IN FAIRBANKS, ALASKA.

THE TESTIMONY PRESENTED TODAY FOCUSES ON OIL AND GAS EXPLORATION AND PRODUCTION IN THE 1002 AREA OF THE ARCTIC NATIONAL WILDLIFE REFUGE (ANWR), AND SPECIFICALLY HOW ENVIRONMENTAL IMPACTS FROM LARGE SCALE DEVELOPMENT PROJECTS CAN BE MITIGATED BASED ON EXPERIENCES WITH OIL AND GAS PRODUCTION ON THE NORTH SLOPE OF ALASKA. THE STATE OF ALASKA HAS CONSIDERABLE EXPERTISE, PARTICULARLY THE ALASKA DEPARTMENT OF FISH AND GAME (ADF&G), IN TERMS OF POTENTIAL IMPACTS TO FISH AND WILDLIFE RESOURCES AND ACCEPTABLE MITIGATION WITH RESPECT TO OIL AND GAS EXPLORATION AND PRODUCTION.

IT IS IMPORTANT TO RECOGNIZE THE SCOPE AND MAGNITUDE OF OIL PRODUCTION, AS CONTRASTED WITH EXPLORATION. THE STATE OF ALASKA'S COMMENTS ARE BASED ON THE ASSUMPTION THAT IF AN AREA IS LEASED, PRODUCTION OF OIL AND GAS MAY OCCUR. ENCLOSURE #1 OF THIS TESTIMONY DEPICTS OIL PRODUCING FACILITIES IN PLACE IN 1973 AND 1985 IN THE PRUDHOE BAY AND ADJACENT AREAS. AS CAN BE CLEARLY SEEN BY THE SIGNIFICANT INCREASE IN NUMBER OF FACILITIES BETWEEN 1973 AND 1985, OIL

PRODUCTION IS AN ONGOING ACTIVITY WITH FACILITIES BEING ADDED CONTINUALLY. FOR EXAMPLE, ARCO ALASKA, INC. RECENTLY SUBMITTED PRELIMINARY APPLICATIONS FOR ANOTHER SEVENTEEN DRILL PADS IN THE KUPARUK DEVELOPMENT AREA.

IN ORDER TO EFFECTIVELY MITIGATE POTENTIAL ADVERSE ENVIRONMENTAL EFFECTS OF OIL AND GAS ACTIVITIES, WE HAVE TAKEN THE FOLLOWING STEPS:

- (1) A SIGNIFICANT AMOUNT OF INFORMATION HAS BEEN GATHERED BY THE U.S. FISH AND WILDLIFE SERVICE (USFWS) AND THE ADF&G OVER THE PAST FIVE YEARS ON THE DISTRIBUTION AND ABUNDANCE OF FISH AND WILDLIFE RESOURCES IN THE ANWR. THESE DATA HAVE BEEN REVIEWED AND ANALYZED IN ORDER TO IDENTIFY HABITATS OF SPECIAL CONCERN TO SELECTED SPECIES OF FISH AND WILDLIFE;
- (2) DATA GAPS HAVE BEEN IDENTIFIED AND STUDIES RECOMMENDED TO FILL THESE DATA GAPS;
- (3) EXISTING OIL AND GAS ACTIVITIES ON THE NORTH SLOPE HAVE BEEN EXAMINED TO DETERMINE THE TYPE AND NUMBER OF FACILITIES REQUIRED FOR THE PRODUCTION OF OIL AND GAS IN COMMERCIAL QUANTITIES AND THE IMPACTS OF THESE FACILITIES ON FISH AND WILDLIFE HABITATS;
- (4) GENERAL MITIGATIVE MEASURES (FOR EXAMPLE, ENVIRONMENTALLY SOUND STANDARDS FOR FACILITY SITING) THAT WE HAVE FOUND NECESSARY TO ENSURE ADEQUATE PROTECTION OF KEY FISH AND WILDLIFE HABITATS HAVE BEEN RECOMMENDED TO THE DEPARTMENT OF THE INTERIOR (DOI); AND
- (5) RECOMMENDATIONS HAVE BEEN MADE TO THE DOI TO ENSURE THAT A PROPER LEGAL FRAMEWORK IS IN PLACE FOR A SOUND REGULATORY BASIS FOR THE IMPLEMENTION AND ENFORCEMENT OF REQUIRED MITIGATION.

IT ALSO WILL BE NECESSARY TO REFINE AND MODIFY MITIGATIVE MEASURES BASED ON FUTURE RESEARCH AND NEW INFORMATION.

FURTHERMORE, IF AREAS WITHIN ANWR ARE LEASED, SITE SPECIFIC MITIGATION WILL BE NEEDED FOR EACH EXPLORATION AND PRODUCTION PLAN. FIELD MONITORING AND COMPLIANCE ALSO WILL BE REQUIRED TO ENSURE, TO THE EXTENT PRACTICABLE, THAT MITIGATIVE MEASURES ARE WORKABLE AND THAT COMPLIANCE IS ACHIEVED DURING FIELD ACTIVITIES.

THE STATE OF ALASKA'S RECOMMENDED STRATEGY FOR MITIGATING ADVERSE IMPACTS OF OIL AND GAS EXPLORATION AND PRODUCTION IN THE 1002 AREA OF THE ANWR IS BASED ON A CLEAR AND DISTINCT SEPARATION OF THE EXPLORATION PHASE FOR OIL AND GAS AND THE PRODUCTION PHASE OF AN OIL OR GAS FIELD OF COMMERCIAL SIZE. OUR RECOMMENDATIONS FOLLOW:

- (1) WE HAVE REQUESTED THAT THE DOI PREPARE SEPARATE TERMS AND CONDITIONS FOR THE EXPLORATION AND PRODUCTION PHASES. WE BELIEVE THAT WITH SEASONAL CONSTRAINTS ON EXPLORATION ACTIVITIES (E.G., WINTER DRILLING WITH SOME ALL-SEASON ACTIVITY) MOST OF THE POTENTIAL ADVERSE EFFECTS OF OIL AND GAS EXPLORATION CAN BE MITIGATED EFFECTIVELY.

IN CONTRAST, IF OIL AND GAS ARE FOUND IN QUANTITIES SUFFICIENT FOR PRODUCTION, THE POTENTIAL FOR IMPACTS TO FISH AND WILDLIFE AND THEIR HABITATS ARE ORDERS OF MAGNITUDE GREATER. PRODUCTION OF OIL AND GAS WILL THEREFORE REQUIRE A SUBSTANTIAL NUMBER OF ADDITIONAL STEPS TO ENSURE ADEQUATE ENVIRONMENTAL PROTECTION.

- (2) OUR STRATEGY FOR ENSURING EFFECTIVE MITIGATION OF ADVERSE IMPACTS TO FISH AND WILDLIFE RESOURCES INVOLVES TWO BASIC CONCEPTS. FIRST, THE ESTABLISHMENT OF A JOINT STATE/FEDERAL PROGRAM COVERING THE FOLLOWING PHASES OF OIL AND GAS EXPLORATION AND PRODUCTION IS REQUIRED:
 - (a) PROJECT PLANNING INCLUDING NECESSARY FIELD STUDIES;
 - (b) A TECHNICAL ANALYSIS OF PROPOSED DESIGNS, PLANS, AND PROCEDURES (I.E., DESIGN REVIEW);
 - (c) PERMITTING;
 - (d) FIELD MONITORING; AND
 - (e) COMPLIANCE.

SECOND, DEVELOPMENT OF EFFECTIVE ENVIRONMENTAL MITIGATION FOR THE PRODUCTION PHASE OF OIL AND GAS DEVELOPMENT IS NEEDED.

IN ORDER TO WORK EFFECTIVELY WITH THE OIL AND GAS INDUSTRY, A JOINT STATE/FEDERAL INTERDISCIPLINARY TEAM WOULD OVERSEE AND PARTICIPATE IN PROJECT PLANNING, PROJECT DESIGN REVIEW, PERMIT ACTIONS, FIELD MONITORING, AND COMPLIANCE. IN ALL ASPECTS OF THIS PROCESS, IT IS ESSENTIAL THAT STATE AND FEDERAL REGULATORY AGENCIES MAINTAIN THEIR OVERSIGHT RESPONSIBILITY WHILE WORKING COOPERATIVELY AND CLOSELY WITH THOSE PARTIES RESPONSIBLE FOR OIL- AND GAS-RELATED ACTIVITIES. AS RESEARCH RESULTS BECOME AVAILABLE IN THE FUTURE, THIS GROUP WOULD INCORPORATE APPROPRIATE CONCLUSIONS IN PROJECT PLANNING AND APPROVALS. PROGRAMS FOR ENSURING PROTECTION OF FISH AND WILDLIFE RESOURCES AND HABITATS EXIST AND HAVE BEEN USED SUCCESSFULLY IN ALASKA FOR LARGE SCALE DEVELOPMENT PROJECTS SUCH AS THE TRANS-ALASKA PIPELINE SYSTEM AND THE PRECONSTRUCTION PHASE OF THE ALASKA NATURAL GAS TRANSPORTATION SYSTEM.

DEVELOPMENT OF EFFECTIVE MITIGATION METHODS AND PROCEDURES IS A PROCESS THAT WILL CONTINUE AS LONG AS THERE IS OIL AND GAS ACTIVITY. A NUMBER OF GENERAL RECOMMENDATIONS ALREADY HAVE BEEN MADE BY THE STATE OF ALASKA BASED ON ADF&G'S MITIGATION POLICY AND EXPERIENCES WITH NORTH SLOPE OIL AND GAS EXPLORATION AND PRODUCTION IN SUCH AREAS AS THE NATIONAL PETROLEUM

RESERVE-ALASKA AND IN OIL PRODUCING FIELDS SUCH AS PRUDHOE BAY, MILNE POINT, ENDICOTT, KUPARUK, AND LISBURNE.

THE ADF&G HAS BEEN INVOLVED IN GATHERING BIOLOGICAL INFORMATION IN ANWR FOR THE LAST SIX YEARS. OUR GAME BIOLOGISTS HAVE WORKED COOPERATIVELY WITH THE USFWS SINCE 1981 ON BASELINE BIOLOGICAL STUDIES. PERSONNEL FROM THE DIVISION OF SUBSISTENCE HAVE CONDUCTED RESEARCH IN THE KAKTOVJK AND ARCTIC VILLAGE AREAS DOCUMENTING RESOURCE USE PATTERNS OF INDIVIDUALS LIVING IN THESE AREAS. THESE EFFORTS ON THE PART OF ADF&G PERSONNEL CONTINUE TODAY IN THE ANWR 1002 AREA, AND OUR HABITAT BIOLOGISTS HAVE BEEN INVOLVED WITH LARGE SCALE CONSTRUCTION PROJECTS THROUGHOUT ALASKA INCLUDING THE PRUDHOE AND KUPARUK OIL FIELD COMPLEXES. WE HAVE ANALYZED THE INFORMATION ON FISH AND WILDLIFE RESOURCES IN THE ANWR, IDENTIFIED SIGNIFICANT DATA GAPS, AND RECOMMENDED MITIGATIVE MEASURES IN LIGHT OF OUR EXPERIENCES WITH NORTH SLOPE OIL AND GAS PRODUCTION AND OTHER OIL-RELATED DEVELOPMENTS WITHIN THE STATE.

IN THE SPRING OF 1986, THE ADF&G EVALUATED THE AVAILABLE RESOURCE INFORMATION FOR THE 1002 AREA AND IDENTIFIED HABITATS OF SPECIAL CONCERN. SPECIFIC EMPHASIS WAS PLACED ON KEY SPECIES IN THE 1002 AREA SUCH AS CARIBOU, MUSKOXEN, ARCTIC CHAR, SNOW GEESE, AND POLAR BEARS. BASED ON THIS EVALUATION, RECOMMENDATIONS WERE MADE TO THE DOI FOR THE MITIGATION OF POTENTIAL ADVERSE IMPACTS TO FISH AND WILDLIFE RESOURCES, THEIR HABITATS, AND USES OF THESE RESOURCES FOR SUBSISTENCE PURPOSES. NOTABLE AREAS OF CONCERN INCLUDED THE FOLLOWING:

- (1) THE "CORE CALVING AREA" OF THE PORCUPINE CARIBOU HERD;
- (2) A THREE MILE BUFFER ZONE ALONG THE COAST USED BY VARIOUS SPECIES OF WATERFOWL, CARIBOU, AND POLAR BEARS;
- (3) FRESH WATER SPRING AREAS SUPPORTING OVERWINTERING FISH;
- (4) THE NEARSHORE MARINE ENVIRONMENT USED BY ANADROMOUS FISH AND WATERFOWL DURING THE SUMMER MONTHS; AND
- (5) RIPARIAN HABITATS ALONG MAJOR STREAM SYSTEMS.

MITIGATIVE MEASURES FOR THESE HABITATS WERE RECOMMENDED TO ENSURE THE PROPER PROTECTION OF THE VARIOUS FISH AND WILDLIFE SPECIES THAT USE THESE HABITAT TYPES. UTILIZING THIS INFORMATION, WE RECOMMENDED GENERAL APPROACHES TO EFFECTIVE MITIGATION, AS WE DEEMED IT PREMATURE TO PROVIDE RECOMMENDATIONS ON A SITE-SPECIFIC BASIS. IN RECOMMENDING THESE MITIGATIVE MEASURES, WE GAVE DUE CONSIDERATION TO THE FACT THAT CERTAIN ACTIVITIES AND FACILITIES ASSOCIATED WITH PRODUCTION WOULD BE NEEDED IN SOME OF THESE IMPORTANT HABITATS. IN THESE PARTICULAR CASES, THE RECOMMENDATIONS MADE WERE BALANCED WITH KNOWN REQUIREMENTS OF OIL AND GAS EXPLORATION AND PRODUCTION. ALTHOUGH THESE MEASURES WOULD MITIGATE MANY OF THE EFFECTS OF EXPLORATION AND DEVELOPMENT, IT SHOULD BE NOTED THAT SOME EFFECTS CANNOT BE FULLY MITIGATED.

TO ILLUSTRATE HOW THE PROCESS MIGHT WORK IN THE 1002 AREA OF THE ANWR, WE WILL DISCUSS A HABITAT OF SPECIAL CONCERN - STREAM SYSTEMS AND ASSOCIATED RIPARIAN HABITATS - COUPLED WITH AN EXPLORATION AND PRODUCTION ISSUE - INDUSTRIAL REQUIREMENTS FOR TREMENDOUS QUANTITIES OF GRAVEL AND WATER. THIS IS BUT ONE OF THE ENVIRONMENTAL ISSUES THAT WILL HAVE TO BE ADDRESSED IF PORTIONS OF THE 1002 AREA OF ANWR ARE LEASED - EXAMPLES OF SOME OTHER ISSUES ARE DISCUSSED BRIEFLY IN ENCLOSURE II.

BASED ON RESOURCE INFORMATION CURRENTLY AVAILABLE FOR THE 1002 AREA, THE ADF&G DETERMINED THAT STREAM SYSTEMS AND

THEIR ASSOCIATED RIPARIAN HABITATS WERE OF MAJOR IMPORTANCE TO MANY FISH AND WILDLIFE SPECIES. MOOSE ON THE NORTH SLOPE OCCUR ALMOST EXCLUSIVELY IN RIPARIAN HABITATS, POLAR BEAR DENS FREQUENTLY ARE LOCATED IN AREAS OF DRIFTED SNOW SUCH AS CUTBANKS ALONG LOWER PORTIONS OF THE RIVERS, MAJOR NORTH/SOUTH MOVEMENT CORRIDORS FOR CARIBOU AND MUSKOXEN OCCUR ALONG RIPARIAN HABITATS, SHOREBIRD AND PASSERINE DENSITIES AND DIVERSITIES ARE HIGHEST IN STREAM SYSTEMS AND ASSOCIATED RIPARIAN HABITATS, AND FISHERIES RESOURCES (E.G., ARCTIC CHAR, ARCTIC GRAYLING, WHITEFISH) ARE DEPENDENT ON THESE SYSTEMS. BASED ON THESE RESOURCE VALUES WE RECOMMENDED THAT THESE AREAS BE AFFORDED THE NECESSARY DEGREE OF PROTECTION AND THAT ALL OIL AND GAS FACILITIES WHICH CAN BE MOVED BE PLACED OUTSIDE OF A 3/4 MILE BUFFER ADJACENT TO THE MAJOR RIVER SYSTEMS.

CONSTRUCTION OF FACILITIES WITHIN ANWR OR BETWEEN ANWR AND THE TRANS-ALASKA PIPELINE SYSTEM WOULD OCCUR OVER PERMAFROST SOILS. CURRENT CONSTRUCTION TECHNIQUES REQUIRE THAT ALL STRUCTURES BE PLACED ON GRAVEL PADS WITH A NOMINAL THICKNESS OF FIVE FEET TO PROVIDE ADEQUATE INSULATION, THEREBY PREVENTING THAW DEGRADATION OF UNSTABLE SOILS. ROADS CONNECTING ALL MAJOR OIL AND GAS FACILITIES AND CAUSEWAYS IN THE NEARSHORE ENVIRONMENT ALSO REQUIRE SIGNIFICANT VOLUMES OF MINERAL MATERIAL. WATER REQUIREMENTS ASSOCIATED WITH ICE ROAD AND PAD CONSTRUCTION, HYDROTESTING OF PIPELINES, DRILLING, SAFETY, AND DOMESTIC WATER REQUIREMENTS ARE SIGNIFICANT, AND GREATLY EXCEED THE AMOUNT OF FREE WATER AVAILABLE IN THE ANWR 1002 AREA DURING THE WINTER MONTHS. THE VOLUME OF WATER IN RIVER SYSTEMS PEAKS DURING SPRING RUNOFF AND AFTER SUMMER STORMS BUT DIMINISHES TO ZERO DURING THE LONG WINTER MONTHS WITH THE EXCEPTION OF SPRING AREAS FED BY GROUNDWATER. ISOLATED DEEP POOLS MAY OCCUR WITHIN SOME OF THE MAJOR RIVER SYSTEMS SUCH AS THE CANNING RIVER. INADEQUATE WATER RESERVES EXIST WITHIN ANWR TO SUPPORT LARGE SCALE EXPLORATION OR PRODUCTION ACTIVITIES.

AT THE PRESENT TIME IN THE OILFIELD AROUND PRUDHOE BAY, GRAVEL IS OBTAINED FROM LARGE MINE SITES (SURFACE AREA OF 40 TO 100 ACRES WITH A MINING DEPTH OF 35 TO 70 FEET) LOCATED BOTH WITHIN AND ADJACENT TO STREAM SYSTEMS. DURING THE LAST SEVEN YEARS, GRAVEL REMOVAL DIRECTLY FROM ACTIVE FLOODPLAIN AREAS HAS BEEN DISCOURAGED BY RESOURCE AGENCIES DUE TO A LACK OF FIELD SURVEILLANCE AND COMPLIANCE AND THE NEED TO ESTABLISH WATER RESERVOIRS. NEW GRAVEL SITES HAVE BEEN LOCATED IN WETLAND AREAS ADJACENT TO STREAM SYSTEMS. FOLLOWING COMPLETION OF MINING AT SPECIFIC GRAVEL SITES, THE MINED-OUT SITES HAVE BEEN FLOODED WITH WATER DURING THE BREAKUP PERIOD AND HAVE BEEN CONVERTED INTO WATER RESERVOIRS. RECENT WORK BY THE ADF&G AT SEVERAL OF THESE INUNDATED GRAVEL SITES INDICATES THAT WITH PROPER SITE RESTORATION AND CONTROL OF WATER USE, SOME NET BENEFIT TO SELECTED FISH AND WILDLIFE SPECIES MAY BE ATTAINABLE. TO DATE, HOWEVER, NO MATERIAL SITES IN THE PRUDHOE BAY AREA HAVE BEEN RESTORED IN SUCH A MANNER THAT THEY PROVIDE SUITABLE HABITAT FOR FISH AND WILDLIFE.

THE STATE OF ALASKA RECOGNIZED, AS DID DOI, THAT PIPELINES AND ROADS WOULD HAVE TO CROSS THESE MAJOR STREAMS AND RIPARIAN HABITATS. PERFORMANCE STANDARDS ON CROSS DRAINAGE WERE DEVELOPED AND PROVIDED TO THE DOI. THESE PERFORMANCE STANDARDS WERE BASED ON EXPERIENCE GAINED DURING THE PAST DECADE OF WORK WITH OIL AND GAS ON THE NORTH SLOPE. THEREFORE, WE RECOMMENDED THAT A COMPREHENSIVE PROGRAM BE INITIATED TO FULLY ASSESS GRAVEL AND WATER AVAILABILITY IN THE ANWR 1002 AREA, INCLUDING AVAILABILITY OF GRAVEL IN FLOODPLAIN AND RIPARIAN HABITATS. DECISIONS ON LOCATIONS OF GRAVEL SITES SHOULD NOT BE MADE WITHOUT AN ADEQUATE DATA BASE ON THE GRAVEL RESOURCES AVAILABLE IN THE VARIOUS HABITAT TYPES, THE MATERIAL REQUIREMENTS FOR EACH EXPLORATION OR PRODUCTION SCENARIO, AND THE IMPACTS OF THE VARIOUS MINE SITE ALTERNATIVES ON FISH AND WILDLIFE HABITAT.

IN THE ANWR AREA, HOWEVER, IT APPEARS THAT THE BEST LOCATION FOR AT LEAST SOME GRAVEL SITES MAY INDEED BE IN RIVER SYSTEMS. THIS SHIFT IN APPROACH IS BASED ON INFORMATION COLLECTED BY THE ADF&G ON THE NORTH SLOPE THAT INDICATES THAT SOME OF THE GRAVEL SITES THAT HAVE BEEN CONVERTED TO WATER RESERVOIRS MAY ALSO PROVIDE USABLE HABITAT FOR FISH AND OTHER WILDLIFE SPECIES. HOWEVER, TO DEVELOP GRAVEL SITES IN FLOODPLAIN ENVIRONMENTS AND CONVERT THEM TO USABLE WATER RESERVOIRS WHILE STILL PROVIDING SOME LONG TERM BENEFIT TO FISH AND WILDLIFE, WILL REQUIRE A FULL COMMITMENT ON THE PART OF INDUSTRY AND REGULATORY AGENCIES TO RESOLVE THIS ISSUE. ADVANCE PLANNING, APPROPRIATE DATA COLLECTION, AND ASSESSMENT OF THE OPTIMAL GRAVEL SITES IN TERMS OF SITE LOCATION, MINING PLANS, OPERATIONS, AND REHABILITATION WILL BE REQUIRED.

THEREFORE, WE RECOMMENDED TO THE DOI THAT ALTERNATIVE SOURCES OF WATER BE CONSIDERED, AND THAT GRAVEL SITES BE SITED, DEVELOPED, AND RESTORED IN A MANNER SUCH THAT OVERALL IMPACTS TO WATER QUALITY AND FISH AND WILDLIFE RESOURCES ARE MITIGATED. A POSSIBLE APPROACH TO SUCH A RESOLUTION FOLLOWS.

A JOINT STATE/FEDERAL INTERDISCIPLINARY TEAM WORKING WITH INDUSTRY SHOULD IDENTIFY ALTERNATIVE APPROACHES FOR THE ACQUISITION OF LARGE QUANTITIES OF WATER AND GRAVEL, INCLUDING NEEDED FIELD STUDIES. SUBSURFACE GEOTECHNICAL STUDIES TO IDENTIFY GRAVEL RESOURCES (QUANTITIES, QUALITY, AND LOCATION) IN VARIOUS HABITAT TYPES SHOULD BE REQUIRED PRIOR TO SUBMITTAL OF INDIVIDUAL PERMIT APPLICATIONS. WORK SHOULD BE INITIATED TO DEVELOP DESIGN CRITERIA AND STANDARDS FOR THE DEVELOPMENT OF MINING PLANS INCLUDING RESTORATION OF GRAVEL SITES CONCURRENT WITH MINING OPERATIONS. MINING PLANS SHOULD BE PREPARED TO INCLUDE CONSIDERATION FOR FISH AND WILDLIFE USE FOLLOWING COMPLETION OF MINING. ALL AREAS, INCLUDING STREAM AND ASSOCIATED RIPARIAN SYSTEMS SHOULD BE CONSIDERED WITH THE OBJECTIVE OF PROVIDING GRAVEL, SUBSEQUENT WATER SITES FOR SUPPORT OF INDUSTRIAL ACTIVITIES, AND FISH AND WILDLIFE HABITAT. ASSUMING THESE ACTIONS ARE TAKEN, WE BELIEVE THAT THE ISSUE OF GRAVEL AND WATER AVAILABILITY AND MITIGATION OF EFFECTS TO FISH AND WILDLIFE RESOURCES CAN BE RESOLVED WITHOUT SIGNIFICANT ADVERSE EFFECTS TO FISH AND WILDLIFE IN THE 1002 AREA OF ANWR. WE ALSO BELIEVE THAT THE POTENTIAL EXISTS FOR PROVIDING HABITAT TO SELECTED SPECIES AS WAS DEMONSTRATED IN THE FIVE YEAR GRAVEL STUDY CONDUCTED BY A CONSULTING FIRM FOR THE USFWS.

WE HAVE FOCUSED ON AN OVERALL APPROACH TO MITIGATION OF ADVERSE IMPACTS TO FISH AND WILDLIFE RESOURCES USING WATER AND GRAVEL TO ILLUSTRATE AN EXAMPLE IN WHICH IMPACTS OF OIL AND GAS PRODUCTION COULD BE MITIGATED IF THE PROPER PROCEDURES WERE FOLLOWED. WE KNOW THAT THERE WILL BE TREMENDOUS DEMANDS FOR WATER AND GRAVEL IF EXPLORATION AND PRODUCTION OCCUR, AND WE KNOW THAT GRAVEL AND WATER SOURCES WILL HAVE TO BE DEVELOPED. WE KNOW THAT WATER IS NOT READILY AVAILABLE IN ANWR. WE ALSO KNOW THAT STREAMS AND ASSOCIATED RIPARIAN HABITATS MUST BE AFFORDED A HIGH DEGREE OF PROTECTION. USING THESE KNOWN FACTORS AS WELL AS OUR EXPERIENCES WITH OIL AND GAS DEVELOPMENT ELSEWHERE ON THE NORTH SLOPE, WE HAVE RECOMMENDED A WORKABLE APPROACH TO RESOLUTION OF THIS PROBLEM WHILE AT THE SAME TIME ENSURING AN ACCEPTABLE LEVEL OF PROTECTION FOR FISH AND WILDLIFE RESOURCES.

UNLIKE THE GRAVEL AND WATER EXAMPLE, WE DO NOT CURRENTLY BELIEVE THAT SUFFICIENT INFORMATION NOR EFFECTIVE MITIGATIVE MEASURES EXIST TO PREVENT ADVERSE IMPACTS TO THE PORCUPINE CARIBOU HERD WITHIN THE CORE CALVING AREA. AT THIS TIME, MR. KEN WHITTEN (ADF&G) WILL DISCUSS THE PORCUPINE CARIBOU HERD WITH EMPHASIS ON CARIBOU CALVING IN THE 1002 AREA.

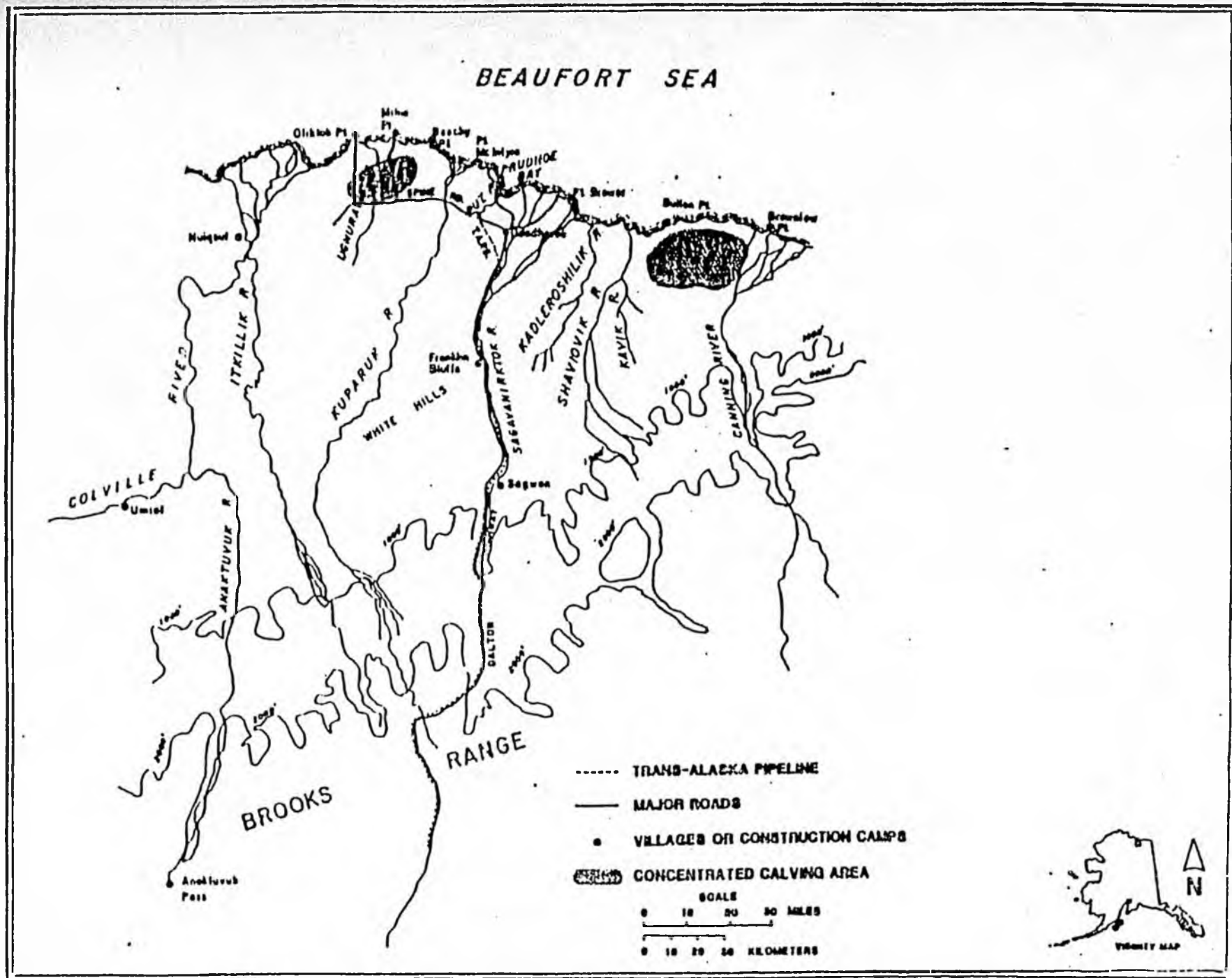
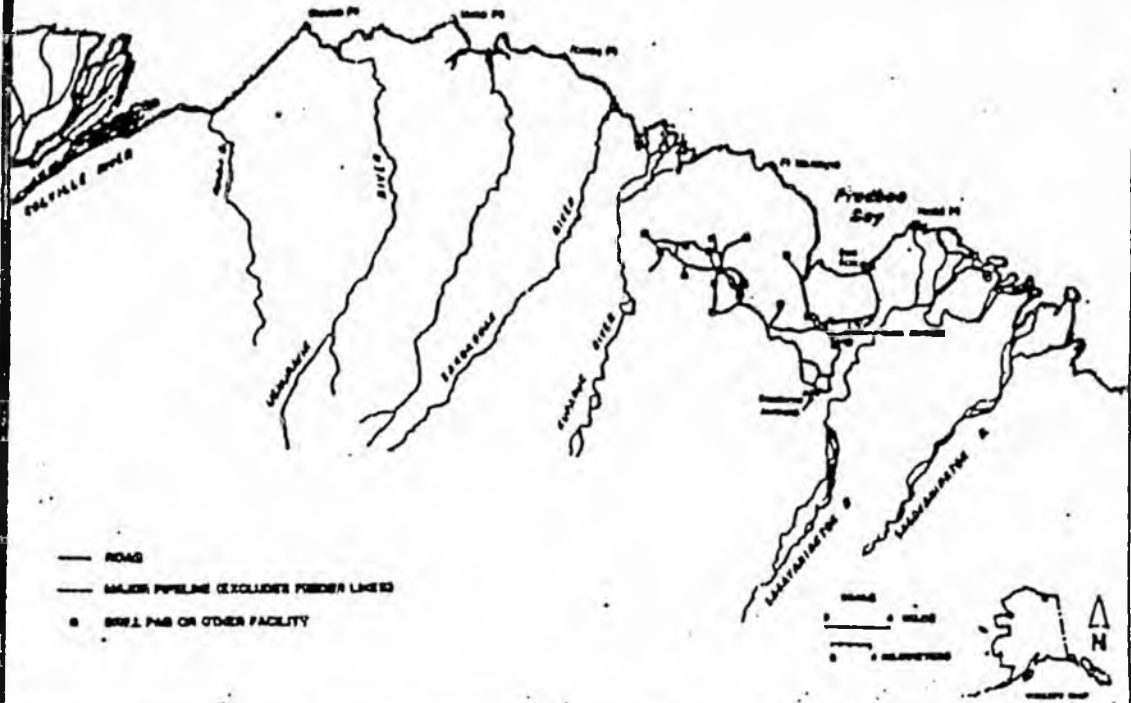


FIGURE 1.

1973

BEAUFORT SEA



1985

BEAUFORT SEA

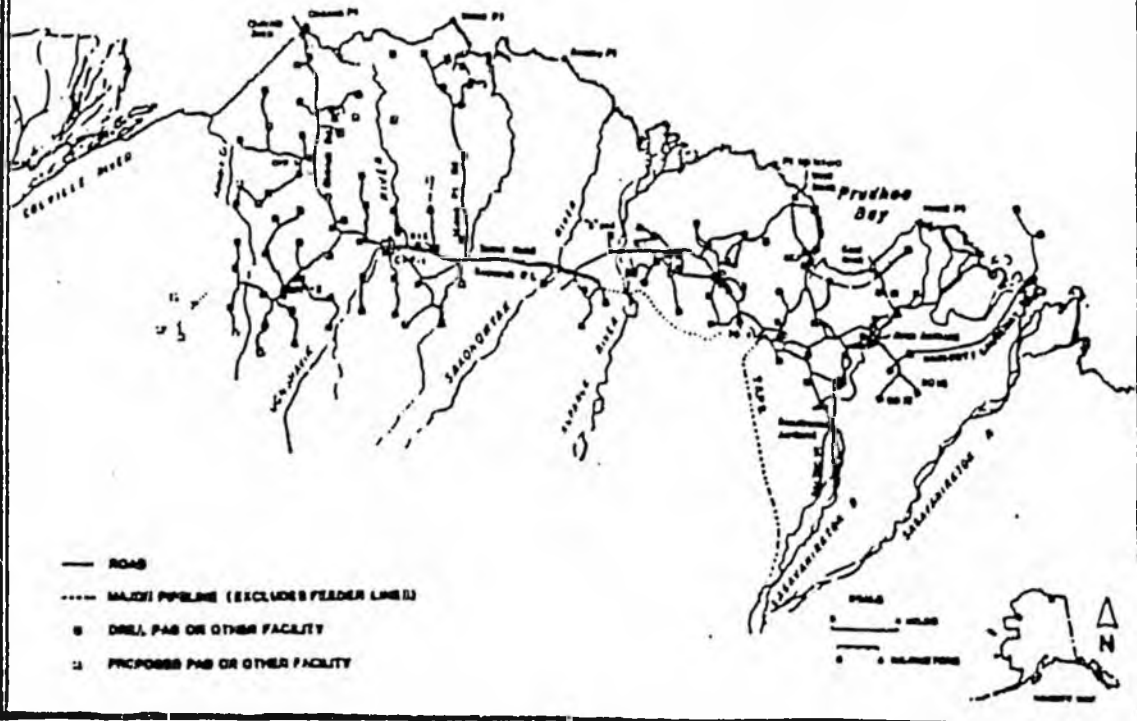


FIGURE 2.

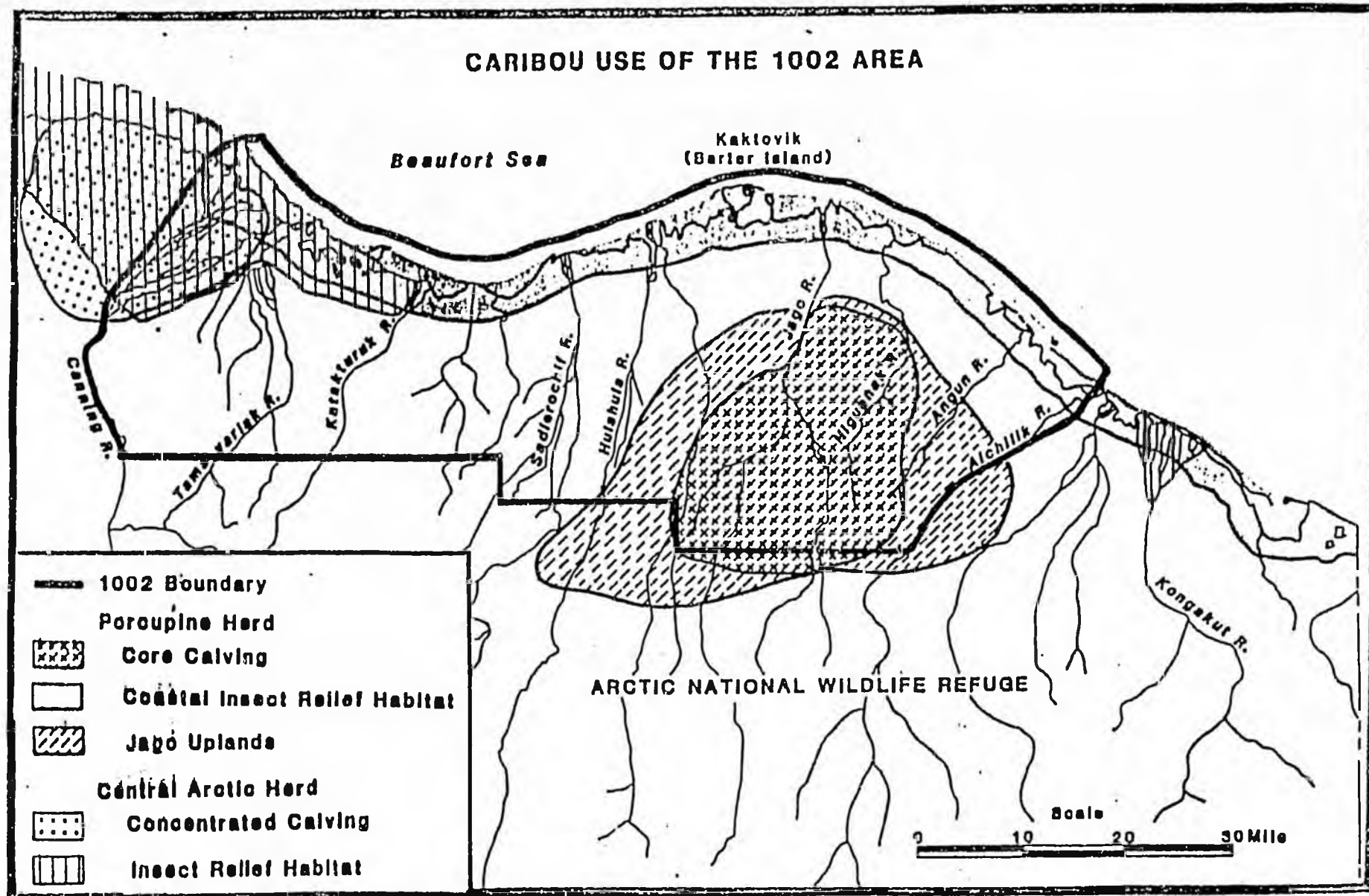


FIGURE 3.

TABLE 1. YEAR-BY-YEAR ANALYSIS OF CALVING DISTRIBUTION OF THE PORCUPINE CARIBOU HERD.

Year	Jago Uplands ¹		Confidence Rating	Survey Methods	Investigators
	Used?	Most Used?			
1972	Yes	--	Low		RRCS ² , ADF&G
1973	Yes	Yes	Low		RRCS
1974	Yes	No	Low	Nonsystematic aerial surveys, infrequent flights; no radio collars	RRCS
1975	Yes	Yes	Low-medium		RRCS
1976	Yes	--	Low-medium		RRCS
1977	Yes	--	Low-medium		RRCS
1978	Yes	Yes	Medium	Systematic aerial transect surveys	YGB ³
1979	Yes	Yes	Medium	including density estimates; few radio collars	YGB
1980	Yes	No	Medium	(12); infrequent relocations	YGB
1981	Yes	Yes	Medium		YGB
1982	No	No	High		ADF&G, USFWS
1983	Yes	Yes	High	Daily aerial surveys with frequent relocations of many (20-80) radio-collared cows	ADF&G, USFWS
1984	Yes	Yes	High		ADF&G, USFWS
1985	Yes	Yes	High		ADF&G, USFWS
1986	Yes	No	High		ADF&G, USFWS
1987	Yes	No	High		ADF&G, USFWS

CONCLUSIONS: The Jago Uplands were used as a concentrated calving area over 90% of the time. The Jago Uplands area was the most heavily used area for calving within the Porcupine Caribou Herd range over 60% of the time.

¹Coastal plain/foothill area between Hulahula and Aichilik Rivers; the "core calving area", as defined in the draft 1002 report, falls within this area.

²Renewable Resources Consulting Services

³Yukon Game Branch

TESTIMONY OF KEN WHITTEN
BEFORE THE HOUSE SUBCOMMITTEE
ON WATER AND POWER RESOURCES
October 22, 1987

Mr. Chairman and members of the Subcommittee:

My name is Ken Whitten. I am a game biologist for Interior Alaska for the Alaska Department of Fish and Game.

INTRODUCTION

The Porcupine Caribou Herd (PCH) is a significant international resource. Its lengthy migrations are an impressive ecological event and an important link in the Northern Alaska and Yukon wildlife and human ecosystem. Several Indian and Eskimo communities on both sides of the border rely heavily on the PCH for subsistence.

During their annual cycle, pregnant cows of the PCH migrate to the coastal plain in Alaska and northwestern Canada to calve. Although some calving likely occurs over most of the coastal plain, calving concentrations are readily apparent in some areas. The concentration area which has been most frequently and heavily used has been called the "core" calving area.

The PCH also forms huge post-calving aggregations. These huge aggregations move extensively within the coastal plain and foothills to gain relief from mosquitoes and other insect pests. Biologists believe that unrestricted access to these relief areas is important to the herd's well-being.

The State of Alaska is concerned that oil and gas development in the 1002 area of the Arctic National Wildlife Refuge (ANWR) could adversely affect use of calving areas. We have recommended that approximately 15% of the 1002 area, that portion delineated in the draft 1002 report as the "core" calving area, be deferred from leasing for ten years. During this moratorium, a seven-year research program would be undertaken to improve our understanding of the importance of this core calving area, to assess the effects that oil development may have on use of the area, and to develop appropriate mitigative measures.

In addition, in order to mitigate the effect of development on the use of early summer habitat we have recommended that, within three miles of the coast, only those facilities that cannot be sited elsewhere be allowed. We have also recommended that a study be undertaken to evaluate the responses of large aggregations to a road/pipeline simulation and to develop measures that would assure free passage of these aggregations.

The objective of the approach described here is to ensure the viability of the Porcupine Caribou herd. I want to emphasize, however, that there may be other ways to achieve this objective. We remain open to hearing other ideas which may accomplish this end. The State would like to work with the Interior Committee to develop an approach which will foster exploration and development of the oil and gas potential of the Coastal Plain while protecting the Porcupine Caribou herd.

THE CENTRAL ARCTIC HERD EXPERIENCE

Before considering the distribution of the PCH within the ANWR coastal plain, we will review the status of knowledge on the responses of the Central Arctic Herd (CAH) to petroleum development in the Prudhoe Bay area and comment on the relevance of those observations to the ANWR issue. We will discuss the effect of development on habitat use and

population size sequentially. As the principal concerns for both herds currently apply only to calving and midsummer, the discussion will be restricted to those two periods.

Habitat Use

Results of aerial surveys over the past ten years indicate that the majority of the CAH, like other arctic herds in North America, calves predictably in certain specific areas--primarily near Milne Point and the Canning Delta (Fig. 1), but also in the adjacent uplands to the south. When spring snowmelt is late, relatively more calving occurs in inland areas than in coastal regions. In the "average" year, however, most parturient cows are found in coastal concentrations.

Estimates of caribou density have also been made during the calving period for various regions between the Colville and Canning Rivers. The results show that densities within the area encompassing the Prudhoe Bay oilfield complex are less than one-half of the next lowest density area and less than one-tenth of the highest density area. While there is little reason to believe that the immediate Prudhoe Bay area previously supported particularly high densities of calving caribou (i.e., on the order of those near Milne Point or the Canning Delta), we believe that reduced calving in that area is due to the presence of a major oilfield complex.

Additional abnormalities in calving distribution have been observed in the vicinity of the Milne Point oilfield complex, west of Prudhoe Bay. A comparison of caribou distribution during the four years prior to construction with that during the four years after road placement indicates that only half as many cows and calves used the area within two miles of the road right-of-way after the road was built. The logical implication of these results is that an extensive, dense network of transportation corridors may well result in widespread loss of calving habitat. In hindsight, we believe that this occurred in the Prudhoe Bay complex as it grew from a minor oilfield with minimal support facilities in the early 1970's, to a large development center. Additional losses of calving habitat within the traditional concentration area west of Prudhoe Bay may be forthcoming as the Kuparuk and Milne Point oilfields continue to expand to their full recovery potential. Figure 2 depicts the regional growth of oil-related development that has occurred in only 12 years.

The second of our major concerns involves a decline in the use of developed areas during midsummer. During this period, caribou must maximize nutrient intake to promote growth and fattening, and, in the case of maternal females, to meet the metabolic demands of lactation. It is generally believed that failure to attain a minimum standard of body condition by autumn may result in reduced reproductive performance of females and predispose calves to higher rates of mortality.

The summer grazing process is complicated considerably by the frequent appearance of insect pests, which become active during warm, calm periods. Caribou of the CAH respond to insect attack by aggregating and moving rapidly to coastal areas where lower temperatures and higher winds discourage insect activity. With an abatement of insect attack, caribou disperse and drift inland to preferred feeding areas. Thus, numerous movements may occur between coastal insect relief habitat, where energy expenditure can be minimized, and inland foraging areas, where energy intake can be maximized. The result, in theory, is a net increase in energy retention. We therefore believe that unrestricted summer movements are of considerable importance.

Unfortunately, our experience in the Prudhoe Bay area over the past decade suggests that maintaining the functional integrity of caribou summer range might not be possible, given the widespread surface use requirements for oil and gas development. Overall caribou density within the oilfield complex is considerably lower than in adjacent areas, and cows and calves are not present in normal numbers. Apparently, industrial growth of the area has also greatly restricted the east-west summer movements of caribou. In the late 1960's and early 1970's, several authors reported the passage of large groups (i.e., in the thousands) through what is now the main oilfield complex. Since the late 1970's, however, there has been little movement of caribou through this complex. The known movements of numerous radio-collared caribou confirm this observation.

Recent observations suggest that CAH caribou are experiencing difficulty gaining access to various components of summer range within the Kuparuk and Milne Point oilfields. As oil development in the region continues to expand and intensify, large portions of habitat may become inaccessible. Thus far, however, caribou have continued to occupy the general region in moderate numbers, despite localized abnormalities in distribution and the impediments to movement posed by an increasingly complex system of roads and pipelines. But the future is uncertain with respect to continual use of this portion of CAH summer range.

Population size

The CAH has undergone rapid growth during the period of oil development in the Prudhoe Bay area--from 6,000 in 1978 to an estimated 16,000 at present, in spite of the affects on habitat use discussed above. The following factors may account for the increase in herd size:

1. Only a small percentage of the total calving and summer range has been affected to date, and it appears that suitable alternative areas remain available.
2. Wolves, a major predator of caribou, were sharply reduced in the region in the late 1970's.
3. Hunter harvest has been generally low.
4. Winter weather has been generally favorable.
5. Summer insect activity has been low-to-moderate--at least in recent years.
6. Mitigative measures have been incorporated into the Kuparuk and Milne Point oilfields in the form of modified pipeline configurations, special crossing structures, and some restrictions on traffic.

Favorable environmental factors, some of which are short-term, make it impossible to determine what affect development has had on the long-term health of the Central Arctic Herd.

Experiences with the CAH provide the primary basis for predicting the responses of PCH caribou to oil development. However, we believe that the two herds are not entirely comparable in terms of susceptibility to disturbance, owing to differences in herd size and the distribution of seasonal habitats. In contrast to the apparently numerous habitat options available to the CAH, the PCH has relatively few. Quite simply, with a narrower coastal plain within ANWR, less calving habitat is available to the PCH--an effect that

is compounded further by its greater size. The net result is less flexibility in the use of calving areas. Also, the PCH typically forms huge aggregations in midsummer. These are frequently on the order of 50,000-80,000 animals, far larger than those of the CAH, which tend to number only 3,000-4,000 at maximum. Recent work on the CAH indicates that large groups have considerably more difficulty negotiating roads and pipelines than small groups, but it is impossible to predict at this time how large aggregations of the PCH would react to production facilities, roads and pipelines, and human activity characteristic of oilfields, much less the long-term consequences to the population of serious perturbations in distribution and movements that might occur as a result. Also, the PCH would contact industrial development on the coastal plain for only a brief period each year (i.e., less than 2 months), and might therefore react more strongly to disturbance stimuli than CAH caribou. That is, the PCH may be relatively "naive," and predictions based on CAH responses may underestimate the impacts on caribou within ANWR.

On the other hand, much of the knowledge gained on the CAH over the past ten years should apply rather well to the PCH. For example, there is little reason to expect that the qualitative responses of PCH females during calving will be markedly different from those documented for CAH females; we can anticipate similar avoidance responses to linear structures placed within calving areas. And we now know from work on the CAH that heavy traffic on roads, in close proximity to elevated pipelines, reduces caribou crossing success. Mitigation strategies, such as buried pipelines, road/pipeline separations, and strict traffic restrictions could be effective on both herds.

THE PORCUPINE CARIBOU HERD

The PCH occupies three fairly distinct wintering areas in Alaska and western Canada: The vicinity of Arctic Village and Venetie, the Richardson Mountains, and the Ogilvie Mountains/upper Peel River. In spring, pregnant females move northward along three principal routes, known as the Old Crow, Richardson, and Chandalar routes. The onset of spring migration, the particular route selected, and rate of travel are highly dependent on regional snow conditions and the wintering area occupied. Movements appear to be highly "purposeful," in that cows delayed by adverse snow conditions compensate by subsequently traveling faster (often 20-30 km/day) when conditions improve. The initial destination appears to be a "staging area" along the lower Firth River in Canada, which is often snow-free earlier than other areas to the west. If snow conditions are generally favorable on the coastal plain, cows will continue westward to the main calving area south of Barter Island. Some calving occurs elsewhere on the coastal plain, creating the false impression of a broad continuum of calving activity; but in the overwhelming majority of years for which adequate records are available, a large calving concentration was clearly apparent between the Hulahula and Aichilik Rivers.

After calving, the bulls and yearlings, which had slowly followed the northward progression of snow-melt and "green-up," join the cows and newborn calves. Large mixed aggregations (in the tens of thousands) form on or near the main calving area and move extensively within the coastal plain, frequently under the influence of insect harassment. By mid-July most of these aggregations have moved eastward along the coast into Canada, although variable numbers of caribou move directly through the mountains, thence to midsummer ranges in Canada or on the south slopes of the eastern Brooks Range. In late summer, caribou begin a drift toward wintering areas, completing the annual cycle of movement.

The central issue here is the location and use of a discrete calving area by the PCH. It should be emphasized that the concept of traditional calving areas is not new. Since the 1960's, caribou herds have been identified on the basis of their use of a common calving ground. Such areas have been described for most Alaskan and Canadian herds, and several herds in the Soviet Union as well. The available data on many herds indicate that there are areas of concentrated calving within traditional calving grounds. Those concentration areas occupied most frequently in high density are known as "core" calving areas.

The survey methodologies employed over the years have been extremely variable in terms of timing, overall effort, type and number of aircraft used, and the availability of radio-collared caribou. Also, many early surveys yielded data that are of marginal usefulness in addressing the present issue. Surveys since 1982 were designed for the express purpose of closely monitoring movements, determining actual calving sites, and delineating calving concentrations. We now routinely employ satellite-tracking technology and conventional radio-telemetry techniques as integral components of our field program.

In spite of recent improvements in our surveillance capabilities, virtually all data on PCH calving distribution are principally qualitative and descriptive. Some progress has been made in quantifying the occurrence of caribou in various areas, but precise density figures are still lacking, and boundaries are based largely on subjective judgment.

A second problem lies in the dynamics of the calving process itself, in that a changing situation is extremely difficult to describe using point-in-time measurements. Calving occurs continuously over roughly a two-week period, during which an individual female caribou may be both highly mobile and nearly sedentary. Thus, at any given time during the calving period, some pregnant females are enroute to actual calving sites, others with new calves are relatively stationary, and still others with older calves may be undergoing moderate movements characteristic of the post-calving phase. For this reason, survey results obtained early in the calving period may be more a reflection of movements into calving areas than the distribution of caribou during calving per se; similar errors are likely if surveys are conducted too late in the calving period.

Such problems in the design and timing of surveys, together with other unknowns regarding the completeness and quality of coverage, place severe limitations on reinterpreting much of the early information on calving distribution of the PCH. In fact, considerable care must be taken to avoid refining the analyses beyond the inherent precision of the original data. These and other restrictions preclude a totally precise delineation of calving concentrations for any given year.

Nevertheless, consistencies in calving distribution do emerge when 16 years' data are superimposed graphically. Even the most cursory examination reveals a clear pattern of recurrent--albeit not exclusive--use of the Jago Uplands, between the Hulahula and Aichilik Rivers (Fig. 3). In more than 90% of the annual observations, this area included a calving concentration. Furthermore, in more than 60% of the years for which estimates of relative caribou abundance were reported, the Jago Uplands supported more calving caribou than any other area within the PCH range (Table 1).

The "core" calving area, as defined in the draft 1002 report, lies within the Jago Uplands. The core area

describes the zone of heaviest use for calving, based on a thorough examination of all available data. In addition, participants at a 1985 caribou workshop sponsored by USFWS agreed that this core area best describes a common zone of concentrated calving activity, and that it is of sufficient size to accommodate the majority of calving caribou in the herd.

Recurrent, heavy use of certain calving areas implies a strong preference, and the persistence of such a tradition implies a net benefit to the herd in terms of calf production and survival. Among the possible attributes of calving concentration areas are:

1. A relative scarcity of predators.
2. Early snow ablation with locally advanced forage availability.
3. Proximity to insect relief habitat.

Most likely, several factors are instrumental in sustaining an affinity for certain specific calving areas, and all may not be important in a given year. It is conceivable that, from an evolutionary point of view, the tradition is retained primarily to offset the effects of exceptionally adverse conditions, perhaps in the form of heavy predation or deep snow during the previous winter; the periodic advantages derived from certain habitats would therefore tend to buffer fluctuations in the herd. The overall benefits to the PCH may be extremely subtle, but nonetheless important to the long-term well-being of the population.

INFORMATION NEEDS

The State has recommended that leasing in the core calving area be deferred for a ten-year period. During this moratorium, a research program would be undertaken that consists of four main components:

1. To evaluate the physical and biological characteristics of core and peripheral calving areas; features such as the vegetation, topography, meteorology, predator abundance, predation rates, and caribou use would be compared between core and peripheral areas.
2. To evaluate the effects of oil development on caribou calving distribution; because oil development would not occur within the core calving area of the PCH, this evaluation would rely on the continuation of the long-term study of the CAH, and especially the responses of calving caribou to continued development in the Kuparuk oilfield.
3. To evaluate the effects of oil development on insect-induced movements, particularly movements of the extremely large groups that commonly occur in the PCH; this component would focus on the responses of such large groups to a simulated transportation system, as well as analyzing the bioenergetics of such movements.
4. To characterize the caribou harvest in villages within the range of the PCH, principally Kaktovik and Arctic Village; this baseline information would be used in evaluating the effects of oil development on subsistence use of caribou.

We believe that the results of this research program would improve our understanding of the importance of the core

calving area to the PCH, and would improve our ability to predict the potential effects of oil development on the herd, thereby providing a more informed basis for recommending mitigative measures.

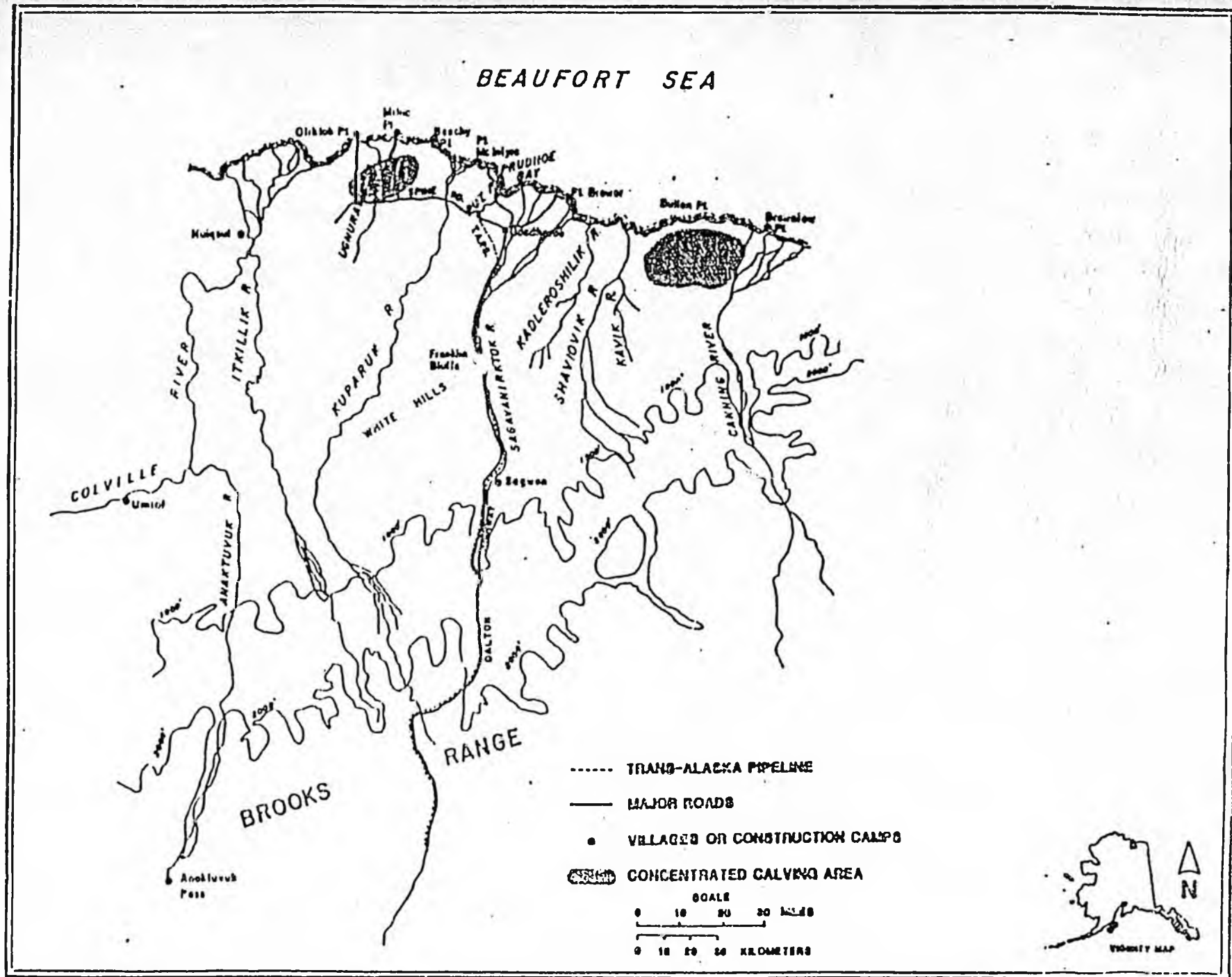
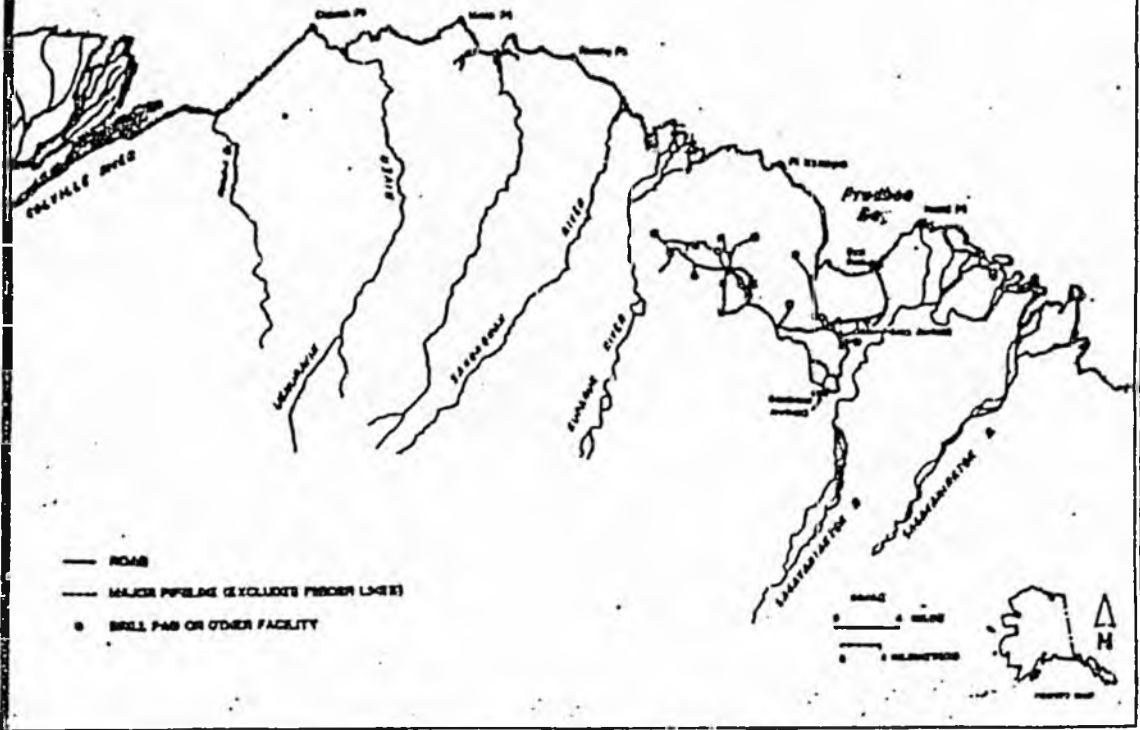


FIGURE 1.

1973

BEAUFORT SEA



1985

BEAUFORT SEA

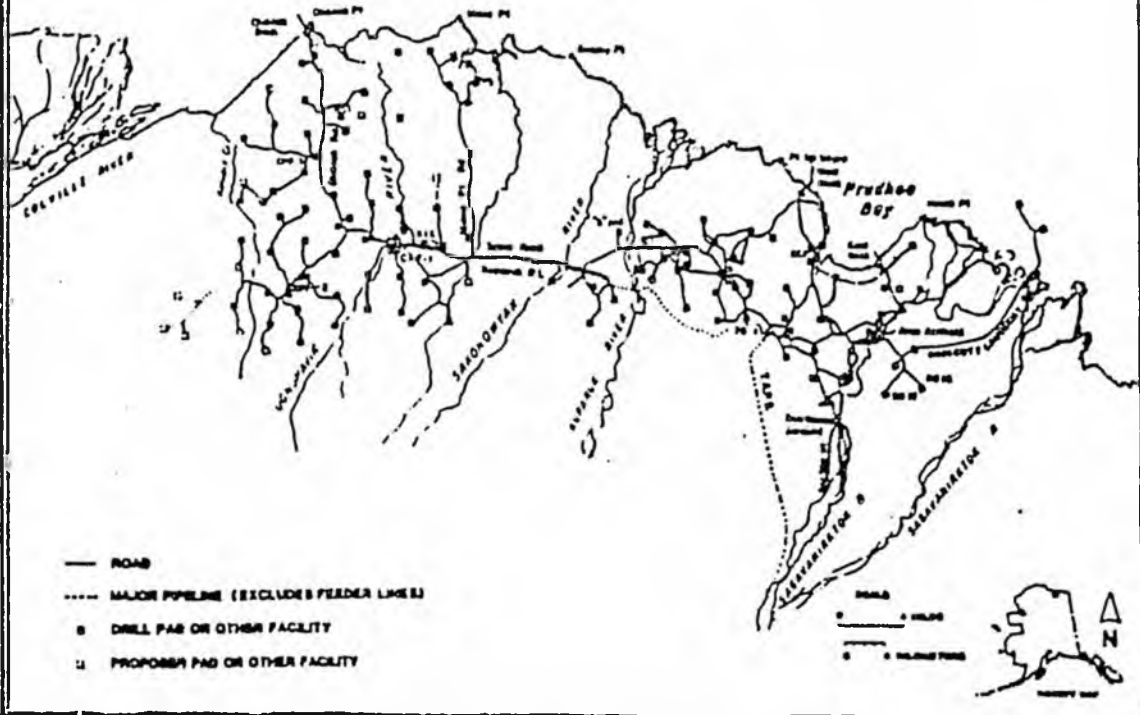


FIGURE 2.

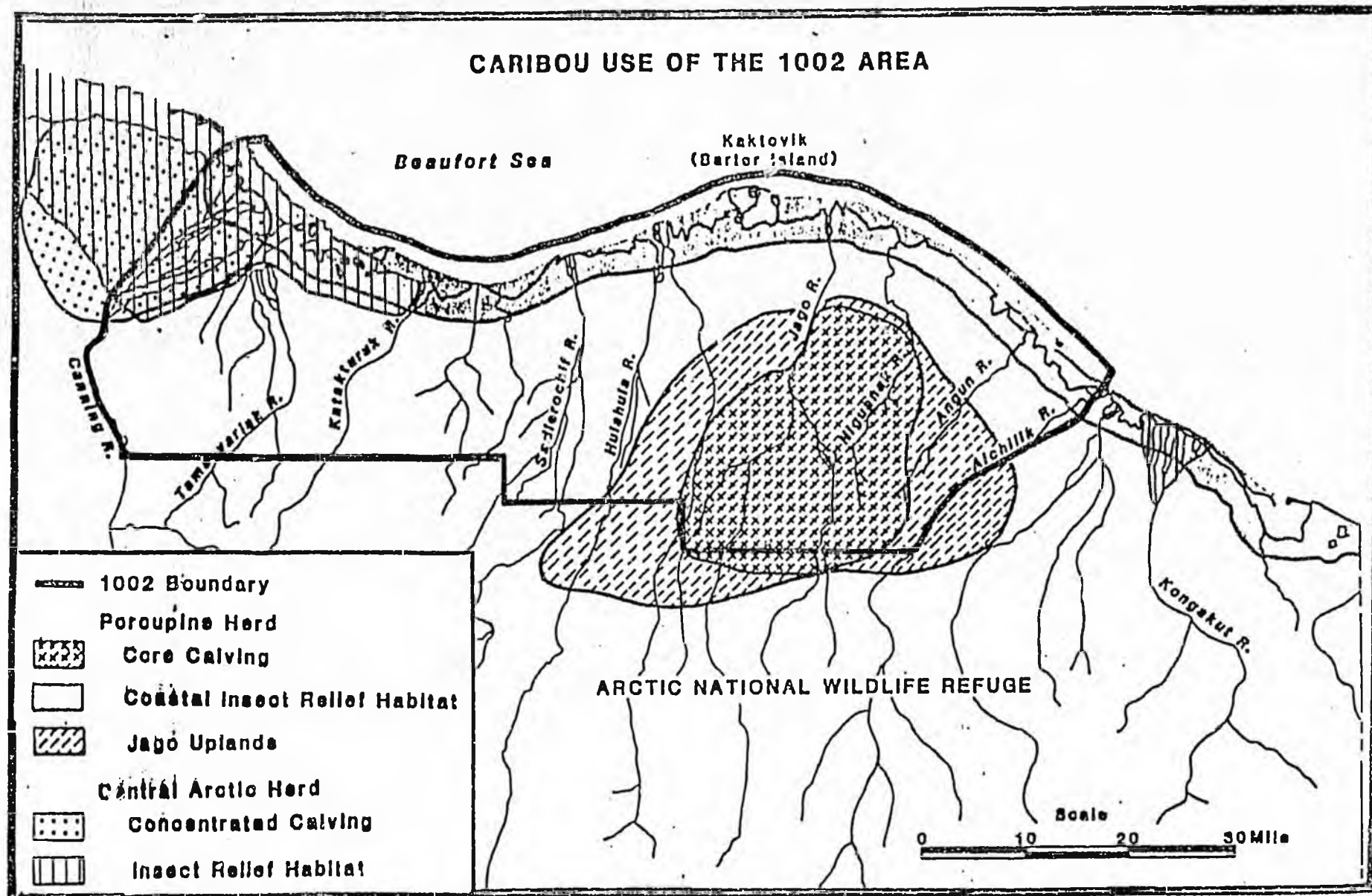


FIGURE 3.

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CONCLUSIONS: The Jago Uplands were used as a concentrated calving area over 90% of the time. The Jago Uplands area was the most heavily used area for calving within the Porcupine Caribou Herd range over 60% of the time.

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²Renewable Resources Consulting Services

³Yukon Game Branch

TESTIMONY OF LARRY DIETRICK
BEFORE THE SENATE COMMITTEE ON
ENERGY AND NATURAL RESOURCES
October 13, 1987

Mr. Chairman and Members of the Committee:

My name is Larry Dietrick. I am Director of the Alaska Division of Environmental Quality of the Alaska Department of Environmental Conservation.

The Department of Environmental Conservation is responsible for protecting public health and the environment. We enforce regulations governing air quality, water pollution control, solid waste management, hazardous waste management, and oil spill prevention and response. We write permits specifying emission levels and disposal methods, monitor activities under permits, and take enforcement actions when needed. The Department has considerable experience with the effects of oil and gas related activities.

On Alaska's North Slope, the Department has developed stipulations for oil and gas lease sales, helped with siting of disposal facilities, and carried out the full range of environmental protection activities. We also participate in the design and review of environmental studies, collect monitoring data, and maintain a field office at Prudhoe Bay in Deadhorse.

Effective waste stream management for oil and gas activities in the Arctic National Wildlife Refuge (ANWR) requires the following steps:

1. Evaluation of past practices and operating procedures at other fields on the North Slope.
2. Advance planning for effective waste disposal facilities and practices.
3. Development and application of specific, effective requirements for industry as lease stipulations and permit conditions.
4. Coordination of efforts among agencies with authority to regulate oil and gas exploration and development.
5. Monitoring of impacts and compliance with environmental requirements.

I will briefly discuss each of these steps and will illustrate them with examples drawn from our experience with solid waste management. In addition to solid waste, key areas for adequate environmental protection measures include air quality, liquid wastes, hazardous wastes, spill prevention and response, and area of impact. I have included an overview of these issues as an attachment to my written testimony.

REVIEW OF WASTE MANAGEMENT PRACTICES IN ALASKA'S NORTH SLOPE OIL FIELDS

Decisions on the exploration and development of ANWR should reflect the experience and information gained by the State and the industry during operations at the National Petroleum Reserve in Alaska (where exploration began in the mid 1940's), Prudhoe Bay (where exploration confirmed the field in the late 1960's), Milne Point, Lisburne, Endicott, and the Kuparuk River oil fields. The technology and operating

methods used in oil and gas development have evolved considerably since the early days of Prudhoe Bay. Both the industry and the agencies have learned a great deal in the process. Operations in the newer fields at Endicott and Kuparuk differ substantially from those at Prudhoe. Some waste disposal practices have proven effective while others can and should be improved.

The Department is currently reviewing North Slope waste disposal practices. A technical accounting of these practices, a description of their evolution, and an assessment of potential impacts will help identify the most appropriate management regime for each waste stream for ANWR.

Moreover, there is a role for Congress in designing the waste stream management regime for ANWR by setting the standards to be met. If Congress concludes that some areas of ANWR warrant a particularly high degree of environmental protection, it may be appropriate, for example, to require removal of wastes from those areas. The level of protection deemed necessary by Congress can best be met through lease stipulations or permit conditions, evaluation of the effectiveness of these measures, and modification of the requirements if field experience warrants.

The State's waste stream management requirements have evolved in response to the North Slope oil development experience. During the past year the State developed new regulations for handling solid waste, particularly drilling muds. Those regulations are now in effect. They establish requirements for disposal of drilling muds and for water quality monitoring to ensure that the disposal techniques used will protect the environment.

PLANNING FOR ADEQUATE WASTE STREAM MANAGEMENT

Planning before start-up is essential for proper management of waste streams in ANWR. Inadequate planning before start-up was a major reason why some North Slope development occurred without the best technology. Similarly, inadequate planning led to the absence of sufficient waste disposal facilities for the oil field support industry, which does not have access to the same disposal facilities as the field operators. This has contributed to the abandonment of drums and dumping of other waste materials on vacant sites in the Deadhorse area.

Solid waste management provides numerous examples of the advantages of careful planning for disposal facilities and methods. Major sources of solid waste are garbage, drilling wastes, scrap metal, oily wastes, construction debris, drums, junked vehicles, tires and a host of other materials. Comprehensive waste material management plans could minimize the amount of waste and incorporate salvaging, reusing, and recycling as waste management tools. Backhauling scrap metal and crushed drums is an additional technique which could make most landfills in ANWR unnecessary. Ash and residue from incinerator operation could easily be consolidated into a single facility.

Comprehensive planning could also lead to regional disposal facilities. This would prevent unnecessary proliferation of landfills while enabling the support service industry to have access to proper disposal facilities. Ultimate disposal of pipelines, flow stations, camps, and related facilities should also be addressed at the outset of ANWR planning so that a financial mechanism is in place to provide for proper disposal upon completion of use.

Plans for management of drums should be required as a condition of operation. They should include inventory and tracking, cleaning, crushing, backhaul, and disposal of waste liquids or residues from cleaning.

PERMIT CONDITIONS AND LEASE STIPULATIONS

Stipulations placed in leases and conditions written into permits provide a means to address site-specific factors. Lease stipulations apply to the tracts to be explored and developed; they should be tailored to the conditions found there. An example of a solid waste issue that could be addressed by stipulation is the collection of litter and other debris.

Litter, including construction materials and other debris, can be a persistent problem near the arctic coast where flat terrain and strong winds combine to carry these materials considerable distances. Once "offsite", it is often difficult to determine their source. Consequently, it may be desirable to implement a "no fault" requirement in stipulations applied to successful tract bidders, so that litter and other debris are routinely collected regardless of their origin.

Permits are written to govern specific activities of the permit applicant, often in a particular location. They are useful in fine tuning the waste stream management system and in preventing undesirable side effects of disposal. For example, solid waste disposal facilities such as landfills require a permit from the Alaska Department of Environmental Conservation. By taking account of the site configuration and other circumstances, conditions written into the permit can help prevent air and water pollution which might otherwise result from an improperly placed or operated landfill. However, the site-specific characteristics of most permits also limit their ability to deal with area-wide problems involving many different activities. Waste management problems often affect large areas and several operators or industries. Consequently, permits are no substitute for area-wide planning for disposal needs.

Effective use of lease stipulations and permit conditions requires flexibility. Otherwise, new circumstances may undercut their appropriateness. Changes in available technology, legal requirements, or new scientific data may dictate corresponding changes in the way a particular waste is managed. In order to determine whether stipulations or permit conditions are having the intended effect, it is also necessary to monitor on a continuing basis.

COORDINATION AND REVIEW

To achieve the optimum level of environmental protection, State and Federal agencies and industry must coordinate their efforts. They must share data in order to ensure that the best available information is brought to bear on ANWR waste management issues. Agency requirements should also be consistent and flexible enough to respond to changing circumstances. Congress should establish a formal consultation process involving these parties. If developed properly, this would also allow the opportunity for the participating agencies to clarify their respective authorities and to avoid duplication.

Among the issues which this process would address are the timing of the various phases of development; the need for studies; and the coordination of permitting, operating plan reviews, field monitoring, and field approvals. In all aspects of this process, it is essential that State and Federal regulatory agencies maintain their own oversight responsibilities.

MONITORING

Monitoring provides data to evaluate the effectiveness of permit conditions and lease stipulations. It may demonstrate the need to modify environmental requirements or operating methods and may help identify areas where additional study is needed. Monitoring also allows a determination of whether operations are in compliance with these requirements and with other environmental standards. For example, data from water quality monitoring under the new drilling mud disposal regulations will show whether contamination is occurring. If it is, the regulations require corrective measures.

CONCLUSION

Governor Cowper has taken a firm position that ANWR exploration and development must be done right, that the environment and the special values of ANWR must be protected. I have outlined some of the steps that can be taken to achieve this goal. These are just highlights, of course. Oil and gas development in the Arctic is a complicated business and I have only touched on the major environmental issues to be addressed.

Mr. Chairman, the Department of Environmental Conservation is available to the members and staff to discuss the details of environmental matters affecting your decision about ANWR. Thank you for the opportunity to testify. We look forward to working with you.

Attachment

SUMMARY OF WASTE STREAM MANAGEMENT
AND OTHER ENVIRONMENTAL PROTECTION ISSUES
RELEVANT TO OIL AND GAS DEVELOPMENT
IN THE ARCTIC NATIONAL WILDLIFE REFUGE

AIR QUALITY

The principal air pollutants discharged during oil and gas development are sulphur dioxide, suspended particulate matter, carbon monoxide, and nitrogen oxides. Concentrations of these four types of emissions depend, in large part, on the type and volume of fuel burned in the turbines, generators, and other internal combustion engines, and the amount of flaring in the area.

Flaring is a significant contributor to visibility impairment. Flaring during exploratory flow testing and operational phases is potentially a major source of emission of soot -- primarily unburned hydrocarbons -- and other materials. Technology exists to prevent such problems in future developments.

The primary source of NO_x at Prudhoe Bay is the more than 100 gas turbines, each rated at more than 10,000 horsepower. This may be the greatest concentration of large turbines in the world. Approximately 20 air quality permits have been issued, and three are pending. The cumulative annual discharge allowed under these permits is more than 90,000 tons of NO_x. Actual emissions are approximately 70 to 90 percent of the permitted values. Modeling has been used to predict the ground level concentrations of NO_x and ground level monitoring is now underway to verify the modeling effort and measure ambient levels.

LIQUID WASTE MANAGEMENT

Liquid waste discharges include domestic wastewater, reserve pit fluids, brine discharges, hydrostatic test discharges, vessel rinsates, radiographic wastes, excavation discharges, oily wastewater streams, equipment washing runoff, workover fluids, waste oil solvents, and a wide range of other wastewater streams. Each needs to be identified with a provision made for proper disposal.

Zero discharge of non-domestic (industrial) wastewater streams, with the possible exception of excavation dewatering, should be carefully considered for ANWR. Based upon current experience on the North Slope, alternatives to dewatering of reserve pits should be used in ANWR. The management regime selected for drilling wastes could eliminate the need to discharge to the tundra or roads. Conventional dust control measures or water should be used instead of wastewater. The planning stage should identify specific disposal methods for liquid waste streams classified under the Federal Resource Conservation and Recovery Act (RCRA) and non-RCRA liquid oily-waste streams. Rinsates from tank, vessel and truck cleaning also must be disposed properly. Consequently, both the oil field operators, and the oil field support service industry must have access to appropriate facilities. Underground injection, potentially an acceptable disposal solution for many of these waste streams, should be considered. Produced water disposal should be limited to subsurface techniques.

Unlined gravel impoundments have been used in other North Slope oil and gas developments to contain various wastewater streams. This technique may not be appropriate in ANWR because of its limited effectiveness and its requirement for large amounts of gravel.

Comprehensive planning is needed to ensure that liquid waste disposal solutions are available for all users. This would allow all liquid waste streams to be accurately identified, characterized, and quantified along with an acceptable method for disposal. For example, subsurface disposal options should be available for use by the support service industry.

SOLID WASTE MANAGEMENT

Major sources of solid waste are drilling wastes, scrap metal, oily wastes, construction debris, drums, junked vehicles, tires and a host of other materials. It is critical that proper management of all these wastes be addressed from the beginning. Drilling wastes are of particular concern. The State's new regulations governing drilling waste disposal provide an appropriate starting point.

Disposal of solid waste is another area for which careful planning can lead to development of proper facilities at the outset. Provisions for picking up "off-site" litter and other debris should be addressed by stipulation placed on successful tract bidders. Because it is often difficult to determine the source of off-site litter or debris, it may be desirable to implement a "no fault" policy by which litter and debris are routinely collected regardless of origin.

Plans for management of drums should be required as condition of operation. They should include inventory and tracking, cleaning, crushing, backhaul and disposal of waste liquids or residues from cleaning.

Garbage and other wastes which may attract wildlife should be incinerated. Collection and storage of such wastes must also avoid attracting wildlife. Plans for collection of these wastes and for central incineration should be prepared and adopted as a condition of field exploration and development.

Disposal methods for solid oily wastes from tank bottoms, sludges, hydrocarbon waxes, oil contaminated muds and cuttings and spill debris require very careful evaluation. At Prudhoe, the North Slope Borough operates one of two permitted non-RCRA solid oily waste disposal sites in Alaska. Results from the operation of this site are mixed.

Additional work and technology review are needed to develop acceptable solutions for this very difficult waste stream management issue. Incineration would provide the most reliable and complete solution to the problem. However, this is also more costly to the operators.

Comprehensive waste material management plans could minimize the amount of waste to be disposed and could incorporate salvaging, reusing, and recycling materials. Backhaul of scrap metal and crushed drums are additional tools which could make most landfills in ANWR unnecessary. Ash and residue from incinerator operation could easily be consolidated into a single facility.

Comprehensive planning to develop solutions for solid waste disposal must also enable the support service industry to have access to proper disposal options. Regional disposal facilities can also help prevent unnecessary proliferation of landfills. Ultimate disposal of pipelines, flow stations, camps and related facilities should be addressed at the outset of ANWR planning so that a financial mechanism is in place to provide for proper disposal upon completion of use.

HAZARDOUS WASTE MANAGEMENT

Hazardous waste management is governed by stringent requirements under the Federal Resource Conservation and Recovery Act (RCRA). Transportation of hazardous substances is regulated by the Federal Department of Transportation. The State has adopted hazardous waste regulations and is currently in the process of implementing them through a cooperative agreement with the Environmental Protection Agency.

As with other waste streams, it is essential that acceptable disposal methods be available both to the oil field operators and to the support service industry. Comprehensive planning is needed to develop appropriate management facilities at the outset.

OIL SPILL PREVENTION AND RESPONSE

Coordinated response capability should be required. Adequate oil spill contingency plans and secondary containment requirements for drums and small facilities are also important. Buffer zones should be established to isolate these facilities from sensitive areas.

If field gas or refining capacity is available to supply fuels it should be made available to the support service industry. This will significantly reduce the occurrence of spills by eliminating fuel storage and piping for space heating and electrical generation. Local availability of refined products to all users would eliminate haul road tanker spills.

AREA OF IMPACT

Many of the tools developed in other North Slope fields are directly applicable to minimize the "footprint" of individual drill sites and of the overall production effort. Appropriate facility siting criteria and buffer distances will also help maintain adequate levels of environmental protection.

Development plans should include the following: a design to minimize the number of drill sites and production facilities while optimizing the layout of roads and pipelines; provisions for a limited number of intensive use material sites; and plans to centralize and consolidate support facilities. Consolidation of the service industry at Kuparuk provides an example of centralized support services in planning for ANWR.

Ice pads should be considered for all exploratory drilling. Ice pads may also be used for temporary stockpiling of overburden and muds and cuttings.

Restoration of the site at each stage from exploration through production can reduce the cumulative impact of development activities. Adequate drainage must be provided for all facilities to prevent impoundments.

TESTIMONY OF MARGARET A. MORAN
BEFORE THE HOUSE COMMITTEE ON
MERCHANT MARINE AND FISHERIES
October 6, 1987

Mr. Chairman and members of the Committee:

My name is Margaret A. Moran. I am the special assistant for the Arctic National Wildlife Refuge (ANWR) to Governor Steve Cowper of Alaska. I want to thank you for providing the State the opportunity to comment on the Department of the Interior's final 1002 Report.

Based on our review of the final 1002 report, we strongly support the conclusion that oil and gas exploration and development be allowed in the ANWR, consistent with appropriate environmental stipulations. Our review of the 1002 report focused on its treatment of ANWR's potential petroleum resources, fish and wildlife, and other environmental attributes.

The State concurs with the 1002 report findings that the coastal plain area represents the most outstanding oil and gas frontier remaining in the United States. It has been clearly demonstrated by federal, state and independent investigators that the coastal plain (or 1002) area could yield Prudhoe Bay-sized quantities of petroleum.

The estimates are that if oil is discovered beneath the coastal plain, there is a five percent probability of finding between 26.5 and 29.4 billion barrels of oil. This compares favorably with the 23.5 billion barrels initially in-place at Prudhoe Bay. For perspective, it is noteworthy that prior to drilling, some industry officials estimated that there was only a 2 percent probability that the Prudhoe area contained as much as 2 billion barrels of oil. Today that area accounts for more than 20% of our domestic production.

All of the key geologic elements necessary for major hydrocarbon accumulations exist beneath the 1002 area. Oil seeps, oil-stained reservoir rocks and excellent quality petroleum source rocks are present. Large subsurface structures and traps have been mapped from seismic data. The federal 1002 report documents 26 of these large, prospective structures beneath the surface of the coastal plain. In addition, the 1002 area lies between the huge discoveries at the Prudhoe and Kuparuk oil fields to the west, and the Canadian Mackenzie Delta field to the east.

In our opinion, development of ANWR's petroleum potential is in the national interest. We have just recently produced the five billionth barrel of Prudhoe Bay oil. This means that one-half the total proven 10 billion barrels of recoverable oil have been produced and that the largest field in North America, will begin a precipitous production decline in the near future. By the year 2000, Alaska's yearly production will have dropped to approximately 386 million barrels per year from today's rate of 685 million barrels per year.

Production from the ANWR coastal plain could help to significantly offset the expected decline. Industry experts place the range of potential U.S. domestic production by the year 2000 at between 4.5 million and 6.4 million barrels per day, substantially less than the current 8.3 million barrels per day. These quantities would satisfy between 24 percent and 37 percent of projected domestic consumption.

In addition to the hydrocarbon potential of the area, the other intrinsic feature of ANWR is the fish and wildlife

resources. Wildlife resources include caribou of the Central Arctic and Porcupine herds, polar bears, muskoxen, and snow geese and other waterfowl. Fish resources include migratory Arctic char and whitefish.

These fish and wildlife resources are an important component of the economy and culture of local communities in Alaska and Canada. The State has a great interest in seeing that development is done properly with respect to such resources, since we must live with the results. We believe that the impacts on fish and wildlife resources can and should be minimized, though some cannot be totally mitigated, during the production of oil and gas in the area.

Perhaps the environmental issue which has received the most attention to date is the potential effect of development on the Porcupine Caribou Herd. The population of the Porcupine Herd is estimated to be 180,000 animals. The herd migrates annually between the United States and Canada, and gives birth to its young in the coastal plain of both countries. However, the herd has traditionally favored a particular portion of the 1002 area for bearing its young. This area has been depicted differently in the Department of the Interior's draft and final 1002 reports. The State has reviewed these reports and believes the draft 1002 report correctly outlines the core calving area. This area contains about 242,000 acres. We believe that within this area lies about 19% of the highest oil and gas potential of ANWR.

The State believes the herd's use of the core calving area could be disrupted if oil and gas is developed there. This disruption could affect the population, although it is not possible to predict the magnitude of such an impact. This conclusion is based upon the professional judgment of State and other caribou biologists rather than on definitive scientific evidence. The State recommends that leasing in this area be deferred.

In both the draft and final 1002 reports, the Department of the Interior (DOI) indicated its intent to coordinate federal and state agencies in the planning and permitting process. Consistent with this federal intent, we feel it is essential that DOI be directed to establish a formal consultation process with the State and other parties in order to clearly establish at what points in the process and at what levels of detail, different issues and authorities will be addressed. This process would also allow the opportunity for the parties to clarify their respective authorities, permitting, and field procedures to avoid duplication or conflicting efforts. Experiences associated with the development of the Trans-Alaska Pipeline System (TAPS) and the proposed Alaska Natural Gas Transportation System (ANGTS) from Prudhoe Bay to the Canadian border could provide useful models for cooperative management programs.

Overall, the State believes that DOI did a reasonable job in compiling and summarizing a large amount of relevant data. However, the report lacks detailed information regarding waste stream management issues -- control of air, water, and solid waste pollutants. We assume the 1002 report was not intended to be an all-inclusive document. However, on this issue, further information would have been helpful. Congress should not confuse the absence of information in the 1002 report with a lack of answers to the many important waste management issues associated with oil and gas development in an arctic environment.

The State has 20 years of experience in dealing with oil exploration and development in the Arctic. Our resource agencies have accumulated expertise and information that the Committee may find useful. We feel strongly that the

lessons of the past should serve as guidelines for the future. In our opinion, Congress can be confident that the necessary information exists to direct that the appropriate regulatory tools and technology be used to develop ANWR in an environmentally sound manner.

The State's comments to the Secretary of the Interior on the Draft 1002 report contain additional recommendations that the Committee may find helpful. Our comments suggest ways to mitigate development impacts on the Porcupine Caribou Herd. They also recommend a responsible approach for conserving other wildlife and fisheries resources in and adjacent to ANWR. And finally, they look at waste stream management issues and suggest mitigation measures. With the Chairman's permission, I will submit these comments to the committee.

In summary, the coastal plain has the tremendous potential to contribute to this Nation's economic strength and energy security. If we begin now, legislation can be passed that will open the area to exploration, development and production. At the same time, Congress can provide for the environmental measures necessary to protect and preserve the natural resources in the area. The State of Alaska strongly supports the opening of the 1002 area. We look forward to working with you and your staffs as you consider this important issue.

TESTIMONY OF DR. ALVIN G. OTT
BEFORE THE SENATE COMMITTEE
ON ENERGY AND NATURAL RESOURCES
October 13, 1987

Mr. Chairman and members of the Committee:

My name is Dr. Alvin G. Ott. I am the Regional Supervisor of the Habitat Division with the Alaska Department of Fish and Game in Fairbanks, Alaska.

INTRODUCTION

The Porcupine Caribou Herd (PCH) is a significant international resource. Its lengthy migrations are an impressive ecological event and an important link in the northern Alaska and Yukon wildlife and human ecosystem. Several Indian and Eskimo communities on both sides of the border rely heavily on the PCH for subsistence.

During their annual cycle, pregnant cows of the PCH migrate to the coastal plain in Alaska and northwestern Canada to calve. Although some calving likely occurs over most of the coastal plain, calving concentrations are readily apparent in some areas. The concentration area which has been most frequently and heavily used has been called the "core" calving area.

The PCH also forms huge post-calving aggregations. These huge aggregations move extensively within the coastal plain and foothills to gain relief from mosquitoes and other insect pests. Biologists believe that unrestricted access to these relief areas is important to the herd's well-being.

The State of Alaska is concerned that oil and gas development in the 1002 area of the Arctic National Wildlife Refuge (ANWR) could adversely affect use of calving areas. We have recommended that approximately 15% of the 1002 area, that portion delineated in the draft 1002 report as the "core" calving area, be deferred from leasing for ten years. During this moratorium, a seven-year research program would be undertaken to improve our understanding of the importance of this core calving area, to assess the effects that oil development may have on use of the area, and to develop appropriate mitigative measures.

The objective of the approach described here is to ensure the viability of the Porcupine Caribou herd. I want to emphasize, however, that there may be other ways to achieve this objective. We remain open to hearing other ideas which may accomplish this end. The State would like to work with the Energy Committee to develop an approach which will foster exploration and development of the oil and gas potential of the Coastal Plain while protecting the Porcupine Caribou herd.

In addition, in order to mitigate the effect of development on the use of early summer habitat we have recommended that, within three miles of the coast, only those facilities that cannot be sited elsewhere be allowed. We have also recommended that a study be undertaken to evaluate the responses of large aggregations to a road/pipeline simulation and to develop measures that would assure free passage of these aggregations.

THE CENTRAL ARCTIC HERD EXPERIENCE

Before considering the distribution of the PCH within the ANWR coastal plain, we will review the status of knowledge on the responses of the Central Arctic Herd (CAH) to petroleum development in the Prudhoe Bay area and comment on the relevance of those observations to the ANWR issue. We will discuss the effect of development on habitat use and

population size sequentially. As the principal concerns for both herds currently apply only to calving and midsummer, the discussion will be restricted to those two periods.

Habitat Use

Results of aerial surveys over the past ten years indicate that the majority of the CAH, like other arctic herds in North America, calves predictably in certain specific areas--primarily near Milne Point and the Canning Delta (Fig. 1), but also in the adjacent uplands to the south. When spring snowmelt is late, relatively more calving occurs in inland areas than in coastal regions. In the "average" year, however, most parturient cows are found in coastal concentrations.

Estimates of caribou density have also been made during the calving period for various regions between the Colville and Canning Rivers. The results show that densities within the area encompassing the Prudhoe Bay oilfield complex are less than one-half of the next lowest density area and less than one-tenth of the highest density area. While there is little reason to believe that the immediate Prudhoe Bay area previously supported particularly high densities of calving caribou (i.e., on the order of those near Milne Point or the Canning Delta), we believe that reduced calving in that area is due to the presence of a major oilfield complex.

Additional abnormalities in calving distribution have been observed in the vicinity of the Milne Point oilfield complex, west of Prudhoe Bay. A comparison of caribou distribution during the four years prior to construction with that during the four years after road placement indicates that only half as many cows and calves used the area within two miles of the road right-of-way after the road was built. The logical implication of these results is that an extensive, dense network of transportation corridors may well result in widespread loss of calving habitat. In hindsight, we believe that this occurred in the Prudhoe Bay complex as it grew from a minor oilfield with minimal support facilities in the early 1970's, to a large development center. Additional losses of calving habitat within the traditional concentration area west of Prudhoe Bay may be forthcoming as the Kuparuk and Milne Point oilfields continue to expand to their full recovery potential. Figure 2 depicts the regional growth of oil-related development that has occurred in only 12 years.

The second of our major concerns involves a decline in the use of developed areas during midsummer. During this period, caribou must maximize nutrient intake to promote growth and fattening, and, in the case of maternal females, to meet the metabolic demands of lactation. It is generally believed that failure to attain a minimum standard of body condition by autumn may result in reduced reproductive performance of females and predispose calves to higher rates of mortality.

The summer grazing process is complicated considerably by the frequent appearance of insect pests, which become active during warm, calm periods. Caribou of the CAH respond to insect attack by aggregating and moving rapidly to coastal areas where lower temperatures and higher winds discourage insect activity. With an abatement of insect attack, caribou disperse and drift inland to preferred feeding areas. Thus, numerous movements may occur between coastal insect relief habitat, where energy expenditure can be minimized, and inland foraging areas, where energy intake can be maximized. The result, in theory, is a net increase in energy retention. We therefore believe that unrestricted summer movements are of considerable importance.