DRAFT

PROPOSED PROJECT-RELATED FISH AND WILDLIFE INVESTIGATIONS FOR THE NORTHWEST ALASKAN NATURAL GAS PIPELINE

A Report Prepared for the

Executive Coordinating Committee

by Interagency Fish and Wildlife Task Force

May 17, 1978

First Revision May 23, 1978

Second Revision November 29, 1979

Status of NW's Environmental Studies
as of December 14, 1979

DRAFT

TABLE OF CONTENTS

		Page No.
I.	Introduction	1
II.	Assumptions	1
III.	Study Proposals	

STATUS		Conducted by:
Underway	Status and Packaging of Available Information	Company/ADF&G
Underway	Terrestrial and Aquatic Habitat Evaluation Program	FWS/ADF&G
Underway	Stream Surveys Along the Northwest Alaskan Pipeline Corridor	Comapny
Status Uncertain	Hydrology and Fish Passage	--
Partially Complete*	Sandhill Crane Studies for the Gasline Corridor	Company
Underway	Waterfowl Studies Along the Gas Pipeline Corridor	Company
Partially Complete*	Raptor Studies for Northwest Gasline Corridor	Company
Start 1980	Proposed Upland Bird Studies Along the Gas Pipeline Corridor	Company
Status Uncertain	Effects of Blasting on Fish	
Dropped	~~Impact of the Gasline on Small Mammals and Birds in Eastern Alaska~~	
Start 1980	Carnivore Studies Associated with Construction of the Gasline	Coop Effort State & N.W.
Start 1980 (Status Uncertain)	Effects of the Trans-Alaska/Northwest Pipeline Corridor on the Distribution and Movements of Caribou	Contractor & State

IV. Appendix .....

*Federal and State Biologists do not believe that all objectives have been met.

(NOTE: Meeting between NW and Interagency Fish and Wildlife Task Force scheduled for January 15 - 16. This will provide more up-to-date status.

Status of NW's Environmental Studies
as of December 14, 1979

DRAFT

TABLE OF CONTENTS

STATUS			Page No.	Conducted By:
	I.	Introduction	1	
	II.	Assumptions	1	
	III.	Study Proposals	2	
Underway	A.	Status and Packaging of Available Information	2	Company + ADF&G
Underway	B.	Terrestrial and Aquatic Habitat Evaluation Program	7	F&WS/ADF&G
Underway	C.	Stream Surveys Along the Northwest Alaskan Pipeline Corridor	9	Company
Status Uncertain	D.	Hydrology and Fish Passage	13	—
Partially Complete*	E.	Sandhill Crane Studies for the Gasline Corridor	15	Company
Underway	F.	Waterfowl Studies Along the Gas Pipeline Corridor	17	Company
Partially Complete*	G.	Raptor Studies for Northwest Gasline Corridor	20	Company
Start 1980	H.	Proposed Upland Bird Studies Along the Gas Pipeline Corridor	24	Company
Status Uncertain		Effects of Blasting on Fish	26	—
Dropped		~~J. Impact of the Gasline on Small Mammals and Birds in Eastern Alaska~~	28	
Start 1980	K.	Carnivore Studies Associated with Construction of the Gasline	28	Coop Effort (?) State + N.W.
Start 1980 (?) Status Uncertain	L.	Effects of the Trans-Alaska/Northwest Pipeline Corridor on the Distribution and Movements of Caribou	31	Contractor + State (?)
	IV.	Appendix	36	

* Federal + State Biologists do not believe that all objectives have been met.

NOTE: Meeting between NW and Interagency Fish + Wildlife Task Force scheduled for January 15-16. This will provide more up-to-date status.

DRAFT

I. Introduction

On May 17, 1978 a document entitled "Proposed Project-related Fish and Wildife Investigations for the Northwest Alaskan Natural Gas Pipeline" was transmitted by the Interagency Fish and Wildlife Task Force (IFWTF) to the Executive Coordinating Committee (ECC). The document discussed a number of studies felt to be essential for environmentally sound construction, operation and monitoring of the Alaska Natural Gas pipeline. Since more than 18 months have elapsed since the original document was released, the IFWTF has re-evaluated the status and direction of the proposed studies.

Each study has been reviewed for its value and timeliness. Changes have been made to objectives, approach, and methods as necessary. An evaluation of work done by either government or the Northwest Alaskan Pipeline Company (NAPLINE) is found in the "status" section of each study. The introductory material and most of the appendices from the original document have not been repeated here.

II. Assumptions

Several basic assumptions must be identified before individual studies are discussed.

1. The studies must be directly applicable to gasline activities.

2. The studies will be used in three ways:

   a. to provide information to evaluate pre-construction efforts including design review and issuance of permits.

   b. to minimize adverse impacts of activities on fish, wildlife, and their habitats.

   c. to evaluate long-term effects of construction on fish, wildlife, and their habitats.

3. Northwest's on-going and projected studies would be reviewed and government proposals tailored to eliminate duplication of effort.

4. Northwest should bear all study costs, except as noted.

5. All pertinent data will be stored, displayed and disseminated by the U.S. Fish and Wildlife Service's (USFWS) computerized Alaska Information Management System (AIMS).

6. Significant changes in the pipeline mode, method of construction or alignment, or specific environmental problems identified as design and construction progresses may require additional studies.

III. Study Proposals

A. STATUS AND PACKAGING OF AVAILABLE INFORMATION

Objectives:

1. To locate and organize for rapid recall available information related to fish and wildlife resource problems which may be encountered in construction and operation of the Northwest Alaskan gasline. Packaging of data will be through AIMS.

2. To assemble, evaluate and prepare topical briefs for recurring specific problems and needs.

3. To identify, prioritize, and recommend studies to fill data gaps, if necessary.

Need:

Studies and experience gained with construction of the Trans-Alaska Pipeline System (TAPS), coupled with related information elsewhere constitutes a large data base that will be needed for decisions to minimize environmental impacts of gasline construction. Each of the technical evaluation studies proposed for the gasline project will require background information to be collected. In order to avoid unnecessary duplication of effort, assembling all available information into one location would greatly simplify the project leaders' needs. Furthermore, the data gathered could be put into a format and retrieval system readily usable by both government and industry.

Several topics have already been identified as needing particular attention. Literature searches will be conducted and topical briefs prepared for the subjects which appear at the end of this proposal. It is anticipated that the need for field studies on the topics will be obviated by a thorough review of the literature. If, however substantial data gaps are identified, studies will be developed using the briefs as a basis.

In addition, a wildlife atlas, a fish stream list and possibly an environmental atlas similar to those prepared for TAPS will need to be compiled. These projects will be continually updated as information becomes available during construction of the gas pipeline.

All of the items identified above will be needed by pipeline planners in order to site facilities, choose an alignment, and time construction in the most environmentally sound manner. They are needed by those in charge of technical evaluation projects as background information and by both industry and government for monitoring the construction of the pipeline so that intelligent site-specific decisions can be made.

Approach:

Published and unpublished reports, memos and other documents from the Joint Fish and Wildlife Advisory Team (JFWAT), Alaska Department of Fish and Game (ADF&G), United States Geological Survey (USGS), Environmental Protection Agency (EPA), Bureau of Land Management (BLM), USFWS and other sources will be examined. All data will be coded and entered into AIMS for rapid recall by government agencies and Northwest. Data will be presented both graphically and in narrative form and will include a stream list, times and locations of fish and wildlife movements, migration, spawning, calving, nesting, resting, etc. All pertinent information will be evaluated and assembled into topical briefs which deal with specific recurring problems such as fish passage requirements, siltation, and requirements to minimize the impacts of material sites. It is anticipated that the first phase of this study will be to assemble all existing data. The second phase will be to update existing data with information produced by both government and NAPLINE. Phase II will continue through construction of the gas pipeline and into operations/ maintenance.

Schedule:

This project is not dependent upon field seasons and should be initiated immediately to make the maximum amount of information available as soon as possible to planners, designers, reviewers and the technical evaluation people. It is anticipated that preparation of topical briefs could be completed in approximately six months. Assimilation of new information into the system would continue throughout the NAPLINE project but at a lower level than the initial effort.

DRAFT

Status:

On May 31, 1978, NAPLINE transmitted to government a copy of Appendices C through G of a document prepared by Woodward-Clyde Consultants. These appendices were a bibliography attached to an assessment of available information and identification of data gaps. It appears that this project encompassed a large part of what the government feels should be addressed under a status and packaging study. Northwest, however, has chosen not to release the body of the document to government and, therefore, it is impossible to ascertain how much of the government proposal is satisfied by the Woodward-Clyde document.

ADF&G began work in September 1979 on a comprehensive fish stream list for the pipeline corridor. The list, when this edition is complete, will be entered into AIMS so that it can be easily updated as additional information becomes available. Completion of the first edition is expected around January 1, 1980. At that time, ADF&G intends to begin work on the topical briefs.

USFWS has developed the gas pipeline-related AIMS aquatic information program to the point where a final list and arrangement of parameters has been distributed for review. It is anticipated that coding forms will be available and the system ready for input by the first of the year. The information from the habitat evaluation project (See Terrestrial and Aquatic Habitat Evaluation Program) will be put into the computer in Spring 1980.

NAPLINE has initiated several other environmental studies, most of which include an assimilation of background data. To a certain extent these have been made available to government and will be input into AIMS or used in writing topical briefs, as appropriate. In addition, NAPLINE is developing an environmental "master guide" which may satisfy the need identified in this proposal for an environmental atlas but may not satisfy the requirements of ease of accessibility and updating. The complexity of the data and dynamic nature of the parameters necessitates an information retrieval system with rapid response capabilities. The master guide has not been made available for review.

Many activities, such as choosing an alignment, have commenced without an organization or evaluation of existing information.

Subjects Requiring Topical Briefs

1. Fish Passage through Drainage Structures

   a. Evaluate existing information concerning fish passage and culvert installations, low water crossings (LWCs), bridges, etc.

   b. Establish criteria for culvert and low water crossing installation that will assure fish passage.

Need:

Roads and work pads needed for gasline construction will cross hundreds of fish streams. Culverts and LWCs are generally viewed by engineers as the least expensive and preferred way to construct stream crossings. From the fisheries standpoint, however, culverts can constrict the stream channel and increase current velocities to the point of preventing upstream migrations necessary for survival of salmon, grayling, and other species. In some situations, culverts can induce or aggravate an aufeis problem even when velocity criteria are satisfied. Culverts and fish passage were among the most common problems encountered with TAPS.

2. Gravel Pit Studies

Objectives:

   a. Evaluate existing information regarding effects of gravel mining on aquatic resources.

   b. Formulate guidelines for gravel mining to minimize adverse impacts.

Need:

Gravel mining in streams and floodplains can have a significant effect on aquatic resources through excessive or long-term siltation and alteration of stream morphology and flow characteristics. In order to avoid the detrimental effects associated with gravel mining, it is necessary to prepare comprehensive guidelines. In some cases, gravel can be mined in specific areas so that fish not only remain unharmed but actually prosper through creation of new pools, overwintering areas, etc. Recently completed studies funded by the USFWS should provide some guidance for minimizing the detrimental effects of mining in streams and floodplains.

3. Effects of Sedimentation on Aquatic Resources

Objectives:

1. To assimilate the current state-of-the-art knowledge concerning the adverse and/or beneficial effects of sedimentation both short and long-term, on benthic and pelagic aquatic organisms.

2. Evaluate state-of-the-art methodologies for control of sedimentation.

Need:

Much effort has been, and will be, expended by private industry and government in minimizing siltation during construction operations. Nevertheless, there remain questions as to the actual harm construction-related siltation has on the stream system. Pulling together available literature on this problem should help both government and industry gain the proper perspective regarding the amount of silt tolerable by various organisms, the effects relating to duration of siltation, seasonal variability, etc.

Additional Comments:

The subjects listed as required topical briefs were originally submitted as separate technical evaluation studies. It was felt by the IFWTF, however, that the subjects did not warrant full-scale investigations, not because the topics were unimportant but rather because of the relatively large amount of information available on them. It is possible that all the questions which arose on the subjects could be resolved with a thorough literature research. If not, a technical evaluation study may be proposed at a later date.

Recommendation:

It is recommended that (1) Northwest provide agencies with completed work for objective #1 immediately, and (2) ADF&G and USFWS personnel continue with objectives #1, #2 and #3 to evaluate the available information, enter it into AIMS, prepare topical briefs, and ensure that voids are addressed in a timely manner by appropriate project-related investigations. Funding should come from Northwest.

B. TERRESTRIAL AND AQUATIC HABITAT EVALUATION PROGRAM

DRAFT

Objectives:

1. To determine terrestrial and aquatic habitat types along the Alaska gas pipeline corridor for use in pre-construction planning to minimize adverse impacts on fish and wildlife resources.

2. To determine the quantitative and qualitative impacts of gasline construction through Alaska on terrestrial and aquatic habitats, and to define appropriate mitigation requirements.

Needs:

In order to minimize unnecessary and avoidable environmental impacts of gasline construction, it is essential that terrestrial and aquatic habitats along the corridor be systematically identified during the early stages of project development. This baseline information can then be utilized in front-end planning of pipeline alignments, material sources, disposal sites, access roads, camps, compressor stations, and other related facilties. The information is also necessary for determining what long term effects gasline construction will have on fish and wildlife resources. It will serve as a basis for detailed site-specific fish and wildlife-related studies on the gasline.

Approach:

Objective (1): (a) Utilize existing information to develop habitat type classification systems; (b) obtain pre-construction aerial imagery of the gasline corridor; (c) identify and delineate habitat types on imagery; (d) establish ground truth locations to verify typing; (e) maintain close coordination with NAPLINE on preliminary plans and proposals.

Objective (2): (a) Obtain post-construction aerial imagery; (b) utilize an electronic planimeter/computer to determine quantitative impacts of gasline construction; (c) employ appropriate USFWS habitat evaluation procedures and existing information to determine qualitative impacts and mitigation requirements for terrestrial and aquatic habitats and coordinate with the National Habitat Assessment Group.

DRAFT

Schedule:

Before construction -

Phase 1

a. conduct literature reviews

b. initiate development of habitat classification systems

Phase 2

a. obtain pre-construction imagery and begin photo interpretation

b. establish field ground truth locations

c. insure that all routing modifications and related facility sites are encompassed within the effective areas of the photo band; if necessary arrange for supplemental aerial photo coverage

Phase 3

a. finalize photo interpretation and delineation of habitats

b. analyze data and prepare detailed narrative report with appropriate recommendations for use in the pre-construction (design) phase of the project

During construction -

no work necessary unless alignments or facilities are moved to previously unclassified areas

After construction -

analyze quantitative and qualitative impacts and determine appropriate mitigation requirements; 12 to 18 months will be required.

Status:

USFWS and ADF&G have been cooperating on the Terrestrial and Aquatic Habitat Evaluation Program since October 1978 with Northwest funding. A terrestrial habitat classification system has been developed and approximately 30% of the corridor has been interpreted and typed to date. Because use of NAPLINE alignment sheet photos as base maps was not authorized by NAPLINE for this project, all habitat delineations must be displayed on enlarged U.S. Geological Survey maps.

Projected completion of the interpretation process is January 25, 1980. Final maps are expected to be completed by April 30, 1980. Computerization of final maps will take place shortly thereafter. Another data transformation process will be necessary if final maps are corrected for direct use with the NAPLINE alignment sheets.

ADF&G has received funds from the USFWS to hire an aquatic habitat evaluation program (HEP) biologist. The position is funded for one year and the product will be a series of profiles on selected fish species which can be used in a habitat evaluation. Because the project has a wider application than solely the gas pipeline, the position will not be funded with NAPLINE monies during the initial phase of the aquatic habitat evaluation program.

Work on Objective 2 has not commenced since it is concerned only with post-construction impacts of the gas pipeline.

Recommendation:

It is recommended that ADF&G and USFWS continue the pre-construction portion of this study with funding from NAPLINE and USFWS. Support should be made available from NAPLINE to government to enter the maps into AIMS. NAPLINE should release their alignment sheet aerial photos to government so that the information can be made available on both alignment sheet and USGS base maps. If the NAPLINE alignment and related facility locations differ substantially from its present proposal, it will be necessary to obtain new aerial photographs and habitat type the areas not covered on the current photos.

C. STREAM SURVEYS ALONG THE NORTHWEST ALASKAN PIPELINE CORRIDOR

Objectives:

To obtain data on the fishery resources of all waters within the Northwest Alaskan Pipeline corridor and related facilities for use in minimizing or avoiding environmental impacts of construction. The following types of specific information will be gathered:

1. Identification of all waterbodies to be affected by pipeline construction.

2. Identification of affected waterbodies which contain fish.

3. Identification of species of fish present and relative abundance.

4. Timing of fish migrations and movements.

5. Identification of areas of critical fish habitat, i.e. spawning, rearing, and over-wintering areas and major migration routes.

6. Determination of site-specific characteristics which may require special consideration during construction, i.e. aufeis, incised banks, seasonal flooding, etc.

Need:

In order to plan construction of the pipeline in an environmentally sound manner and to adequately review plans and enforce stipulations, a thorough knowledge of the fishery resources to be affected by the gas pipeline is needed. Information on critical timing and sensitive areas will have bearing on selection of pipeline alignment, siting of facilities, and timing of construction and operation activities.

Approach:

Background data will be gathered as a part of the Status and Packaging of Available Information Project. One product will be the fish stream and sensitive times list. Review of the information will serve to identify gaps and will determine the extent of the stream surveys necessary to fill those gaps. The stream surveys will be conducted during the summer and shoulder months in areas where data is scarce or incomplete. Potential overwintering areas will be staked during the fall and surveyed during the winter months.

Surveys will be of two types: aerial surveys and ground surveys. Standard fisheries sampling techniques, such as electro-shocking and seining, will be used during the ground surveys. Water samples will also be taken as well as observations on the morphology of the stream. Aerial photos will be used in the initial stages to identify areas to be surveyed. Surveys will not be confined to the pipeline corridor if related factilities are located outside of the corridor or if there is evidence that populations or habitat upstream or downstream will be affected.

DRAFT

Schedule:

Before construction - Government recommended that stream surveys begin in Spring 1978 in an effort to get the maximum amount of information to pipeline planners, designers and reviewers as soon as possible. The overwintering surveys should have begun after freeze-up in Fall 1978 and continued through the 1978-79 season. A comprehensive report is due before civil construction begins.

Status:

Fisheries data collected by JFWAT and others is currently being organized into a fish stream and sensitive times list. Also included in the list is the work of NAPLINE and its predecessor, Alcan. Fishery data was collected by various investigators for Alcan beginning in 1976. Emphasis was primarily on the area from Delta to the Canadian Border.

In early 1979, NAPLINE contracted with LGL Ecological Research Associates, Inc. to conduct a fishery investigation of the entire propopsed gas pipeline route in Alaska. To date, the government has received the following information from LGL:

1. Craig, P. 1979. Winter Fisheries Survey and Provisional List of Waterbodies Along the Alaskan Gas Pipeline Route (Prudhoe Bay to the Yukon Territroy) Proposed by Northwest Alaskan Pipeline Company. DRAFT.

2. Craig, P. 1979. Field Data Forms for Winter, Spring and Fall Fisheries Surveys.

NAPLINE has indicated that they consider the 1979 fisheries program to be the first phase of a long-term evaluation of fisheries resources. They have further stated that "as planning and project budgeting progress and the information developed by previous field investigations is assimilated, additional field programs will be implemented" (letter dated July 26, 1979 from Kuhn to Behlke).

A thorough evaluation of NAPLINE's fisheries program is difficult on the basis of a winter season draft report and field data forms, however, some observations can be made. Northwest has addressed, in part, objectives 1 through 5. The government feels however that the study requires a broader scope. Specifically, the number of streams surveyed and the number of sampling times should be increased. Another deficiency is the stream coverage, which is considered to be too narrow.

This should be expanded so that changes in alignment can be accommodated and so that the extent of potential impacts can be properly addressed.

Of primary importance is the fact that NAPLINE has confined their fisheries work strictly to the proposed pipeline route. This means that areas which may be affected by related facilities such as camps, compressor stations, material sites, disposal sites, access roads, airstrips and pipe storage yards, are not being studied. Furthermore, it is highly likely that, in certain areas, the pipeline may be substantially realigned from its present proposal. Fisheries data would have to be gathered for each potential realignment under consideration.

Objective 6 has not been addressed by NAPLINE. It is essential that observations of "site-specific characteristic that may require special consideration during construction" be made. These types of observations cannot be made by engineers and construction persons with no biological background. Neither can they be made by biologists with no construction experience.

Recommendations:

1. The government should drop their initial approach of placing special emphasis on the part of the route between Delta and the Canadian Border. Investigations and planning to date have shown that this area should receive neither more nor less emphasis than the remainder of the route.

2. NAPLINE should continue to make information relating to the fisheries study available to government at the earliest possible date, particularly field data forms which normally precede draft reports by 6-10 months.

3. NAPLINE should ensure that the fishery information is available to their designers and planners in a timely fashion and is incorporated into all permit applications (where appropriate) and review requests which are sent to the government.

4. NAPLINE should initiate fishery investigations pertinent to realignments and project-related facilities including but not limited to compressor stations, camps, disposal sites, materials sites, access roads, airstrips, and pipe storage yards.

5. NAPLINE should initiate fishery investigations concerning the site-specific characteristics of streams important to the environmental design of the project. This should include thorough documentation of conditions caused by existing facilities such as the haul road, Alaska Highway, Haines Pipeline, TAPS, etc.

6. If NAPLINE fails to expand their program as described above, it is recommended that government initiate investigations to cover the remaining objectives. NAPLINE would be expected to bear the costs of these additional investigations.

D. HYDROLOGY AND FISH PASSAGE

Objectives:

1. Evaluate existing hydrologic data.

2. Determine parameters of run-off, icing conditions, watershed characteristics and stream morphology.

3. Recommend type and size of structure for each fish stream necessary to ensure meeting hydrological criteria (including frost bulb effects) and fish passage needs.

Need:

Roads and work pads will cross many water courses that can be classified as fish streams. There is some information available on some streams crossed by the Trans-Alaska Pipeline and the Haul Road that could be applicable to the gas pipeline. However, unless the proposed gasline follows the TAPS route exactly, much of this information is not appropriate; the gasline will cross streams not only at different locations, but will cross different streams as well.

There is little or no hydrologic data on streams along the proposed gasline route from Delta to the Canadian border. In order for proper planning to proceed, a thorough stream location and gauging system should be initiated to gather as much runoff data as is possible before any construction activities begin.

In addition to re-evaluating flows and icing on the TAPS route, some additional information can be obtained along the route of the Alaska Highway.

All of this information can be utilized in final planning for any drainage structures on streams impacted by the gasline.

During the TAPS experience, it was obvious that hydrologic data was inadequate to accurately design drainage structures that would accomodate flows and still allow fish to pass through them during upstream movements. In some cases, drainage structures had to be replaced several times before problems were alleviated. The appearance of many watercourses was deceptive considering the relatively small size of the drainage channel and the amount of water actually carried during annual floods. Gathering hydrologic data on known fish steams will avoid loss of time, loss of money and environmental disruption associated with installation and reinstallation of inadequate drainage structures.

Approach:

Known information from published reports and other sources would be evaluated and preliminary design criteria established. This portion would be done as part of the Status and Packaging of Available Information project. Concurrently, studies could be conducted on existing bridge and culvert installations both along the TAPS route and from Delta to the Canadian border.

The above, coupled with hydrological field stations established immediately after break-up, would provide data for each year prior to construction activities. Results of the literature search and field work could then be compiled into a format which would ensure that the final design would be adequate with little or no modification.

Schedule:

Before construction - Evaluation of available information and preliminary design criteria could be started at once. Sites for field stations should be selected before April 1980, and crews and gear on site in sufficient time for data collection to begin with break-up. Field work on flowing water, particularly during flood conditions, would continue through the summer and fall of 1980 with icing data collection to begin with freeze-up.

Preliminary reports would be due in January 1981 for summer field work and in July 1981 for winter field work.

The same schedule (flow measurement) should be carried out through the summer of 1981, construction schedules permitting, to confirm data gathered in 1980. A final report is due in January 1982.

Discussion:

NAPLINE indicated that they have ongoing hydrologic field surveys but it is not known whether these activities will meet the objectives of the agency-proposed study. The company has not provided the RFP, consultant's work contract, or any progress reports to indicate the objectives and scope of the contracted work. Agency representatives expressed concern about the timely acquisition of hydrologic data for alignment and design review functions, and the need to verify fish passage criteria for drainage structures. Agency biologists also believe that collection of hydrologic data for environmental protection is closely associated with the timing of important hydrologic events (breakup, fall rains, etc.) and cannot be surveyed satisfactorily during the "normal performance" of stream surveys as maintained by NAPLINE.

Recommendation:

It is recommended that the data requirements of objectives #1 and #2 be obtained through contract work unless Northwest provides timely information concerning the scope and applicability of their on-going research and they include the aforementioned objectives in their scope of work. Hydrologic studies proposed by the USGS should be examined to see if agency needs can be incorporated into the USGS program.

E. SANDHILL CRANE STUDIES FOR THE GASLINE CORRIDOR

Objectives:

1. To identify staging, feeding, and nesting areas and to define migration corridors and timing of migration of sandhill cranes in the Chisana-Tanana River basins.

2. To delineate critical habitat on suitable maps, to be provided to Northwest officials before construction.

3. To develop recommendations for the protection of this species and its habitat from unnecessary harrassment from aircraft activity and other development-related activity.

DRAFT

Need:

The Northwest gas pipeline corridor parallels an important sandhill crane migration route. Disturbance to staging, feeding, and nesting birds from aircraft, construction, and material source activities may be important to the status of this population.

Approach:

1. Assess the applicability of present published and unpublished information in meeting the objectives listed above.

2. If additional field work is necessary, the wetlands adjacent to the proposed pipeline corridor from Scottie Creek to Tetlin Junction will be studied by ground and aerial surveys to document the distribution of cranes in the affected area. Population densities of migrating and nesting birds will be documented.

Schedule:

April 1978 - October 1979. Spring and fall migration surveys will be conducted before construction activity begins and results will be submitted to Northwest officials.

April 1980 October 1981. Spring and fall surveys will be conducted during construction activities to monitor changes in migration routes or habitat utilization.

Status:

Since 1977, NAPLINE has contracted sandhill crane studies to be conducted by Dr. Brina Kessel of the University of Alaska (Fairbanks). A final report entitled "Migration of Sandhill Cranes, Upper Tanana River Valley, Alaska" has been reviewed by government. On the basis of this review, it is concluded that Objective 1 has been adequately addressed. Although nesting areas are not specifically mentioned in the report, other literature indicates that few if any sandhill cranes nest in this region. Variation in migration patterns and activities due to weather conditions is discussed at length.

Maps delineating critical habitats for sandhill cranes have been prepared and incorporated into the report. This satisfies Objective 2. Twenty-nine distinctive roost sites, varying considerably in size and importance, are recognized. A general discussion considers the relative importance of the different areas to sandhill cranes.

Objective 3 has not been addressed by this report or any of the previous interim reports by Dr. Kessel. However, information is presented on the reactions of sandhill cranes to various human activities.

Recommendations:

It is concluded that:

1. The work done by Dr. Kessel for NAPLINE is adequate to satisfy Objectives 1 and 2 of this study. Government will not commence work on these items.

2. NAPLINE should use the information contained in the sandhill crane reports to formulate recommendations for the protection of sandhill cranes and their habitat from unnecessary harrassment from aircraft and other development-related activities (Objective 3).

3. If NAPLINE fails to address Objective 3 in a timely fashion, government should formulate the requirements and the costs of completing this study should be borne by NAPLINE.

Need more info.

F. WATERFOWL STUDIES ALONG THE GAS PIPELINE CORRIDOR

Objectives:

1. To collect pre- and post-construction waterfowl breeding and production data along the pipeline corridor with emphasis on the section from Delta Junction to Canada. Identify critical breeding, brood-rearing and staging areas, and time periods of waterfowl sensitivity to disturbance.

2. To identify food-rich wetlands likely to be influenced by siltation or water-level changes resulting from pipeline construction and to provide this to Northwest officials for planning purposes.

3. To determine detrimental effects on wetland habitats north of Delta Junction resulting from gas pipeline construction as distinguished from changes effected by TAPS construction.

Need:

The Tetlin Lake area has one of the highest breeding densities of waterfowl in Alaska. Part of this area is currently proposed as a wildlife refuge and refuge values must be considered prior to construction

DRAFT

activities. Trumpeter swans and canvasback ducks nest in this area and there is national concern for the population status of these species. Potential for additional damage to lower density habitat along the TAPS corridor needs to be evaluated before construction of a gas pipeline.

Approach:

1. Ground and aerial surveys of breeding and production areas will be conducted during pre-construction, construction, and post-construction phases along the Tanana-Chisana flats. Distribution and densities of the populations will be recorded. Aerial surveys of the corridor north of Delta Junction will be conducted. Critical habitat locations and seasonal sensitivity schedules will be provided for planning for construction activities.

2. Permanent water gauges will be established in selected ponds to monitor water level changes during construction activities. Vegetation cover maps will be compiled for wetlands directly affected by construction. Invertebrate and plant food resources will be surveyed to determine wetlands most valuable to waterfowl. Post-construction surveys will be conducted to determine the extent of damages for mitigative actions.

3. An aerial survey of habitat conditions along the TAPS corridor will be conducted to determine potential damages to wetlands resulting from gas pipeline construction.

Schedule:

Before construction -

1. Surveys of waterfowl and shorebird production, densities and distribution will be conducted. Food resources of wetlands from Delta to Canada will be sampled and water levels recorded.

2. Population and production survey work will be conducted.

After construction - Population and production surveys will be conducted and food resources inventoried to determine the effect of construction on wetlands. Recovery of wetlands from construction activities will be studied.

DRAFT

Status and Discussion:

The unpublished report by Brina Kessel and M.A. Spindler 1977 entitled "Wetland bird populations in the Upper Tanana River Valley, Alaska" was reviewed and evaluated for its applicability to the study needs identified by the government. In Spring 1978, the government told NAPLINE that their on-going waterfowl project was adequate only as a first step in meeting objective 1. The NAPLINE project has addressed only the area from Alaska Highway Milepost 1303 to Little Scottie Creek at Milepost 1223. Objective 1 required an overall look at the whole corridor with a thorough investigation of the area from Delta to the Canadian border.

The 1977 population and production data for several habitat strata seem fairly adequate for assessing the general abundance of species and the importance of habitats associated with the pipeline corridor in the study area. The survey, however, was conducted too late to provide any data on spring migrations and important staging areas.

The report did not satisfy the requirements of Objective 2 since it did not evaluate waterfowl food resources which are important in understanding wetlands productivity. Neither did this report make any attempt to identify wetlands which may be adversely affected by siltation or water level changes resulting from pipeline-related construction activities.

Objective 3 also was not addressed by the 1977 report. There was no attempt to identify the effects of the oil pipeline on wetlands north of Delta Junction in order to distinguish them from possible effects of the gas pipeline. This could be extremely important in order to assess cumulative impacts on wetlands and to establish responsibility for corrective actions or mitigation. The effect of a chilled gas pipeline on wetlands is also very important.

NAPLINE submitted to the government in April 1979, a proposal by Dr. Kessel for work on water birds and wetlands in the Chisana - Upper Tanana River areas. To date, no results have been received from this report. However, in reviewing the proposal itself, it is noted that the scope of the study is still too limited in terms of area surveyed.

The problems of drawing conclusions based on only one season's data should be alleviated by adding the 1979 information. There will be some attempt to collect limnological information for wetlands in the study areas and to "clarify possible impacts, including construction-induced impoundments and sedimentation problems...". However, there is no way of ascertaining how much of the environmental concerns will be covered by this additional work until the report is submitted to the government for review.

Recommendations:

It is recommended that:

1. NAPLINE broaden the scope of their waterfowl studies to encompass the entire pipeline corridor. Specifically, effects of the oil line on waterfowl habitat should be identified.

2. NAPLINE should identify wetlands that could be affected by siltation or waterlevel changes due to construction activities or icing due to gas pipeline operation. This activity should be closely coordinated with the wetland habitat types that have been delineated in the Terrestrial and Aquatic Habitat Evaluation study.

3. NAPLINE should conduct post-construction waterfowl surveys to determine detrimental effects of construction.

4. Government should complete the missing portions of this study if NAPLINE fails to do so. NAPLINE should bear all study costs.

G. RAPTOR STUDIES FOR NORTHWEST GASLINE CORRIDOR

Objectives:

1. To locate historical, active and potential peregrine falcon nesting habitat and monitor these areas before, during and after construction.

2. To locate other cliff and tree nesting raptor habitat and evaluate vulnerability of eyrie sites to current and future disturbances in and adjacent to the Northwest gas pipeline corridor.

3. To evaluate distribution, density, and status of raptors in and adjacent to the Northwest gas pipeline corridor.

4. To provide information concerning location of nesting and hunting areas and dates of restricted periods to protect nesting sites and hunting habitat from excessive human disturbance.

5. Monitor the effect of construction related aircraft activity on breeding peregrines.

Need:

The peregrine falcon must be protected from harassment and disturbance at nest sites as specified in the Endangered Species Act. Evidence indicates that inactive nesting sites may be reoccupied and should also be protected. Complete surveys of other raptor populations do not exist and are needed for protection of these species.

Approach:

1. Review previous survey results and identify all active and historical raptor nesting sites.

2. Survey current nesting sites by air and float trips along existing survey routes, particularly the Chisana-Tanana river basins.

3. Identify raptor breeding periods and indicate restricted raptor breeding zones on maps and make such maps available to appropriate officials for inclusion on sectional aeronautical charts.

4. Monitor frequency of aircraft violation of restricted zones and determine their influence on nesting raptors. Report violations to law enforcement authorities.

5. Coordinate all study proposals and actual studies with the Peregrine Falcon Recovery Team.

Schedule:

Before construction -

Conduct surveys, indicate restricted areas and provide this information to Northwest Officials.

During construction -

Continue survey of nesting areas and identification of active nests. Monitor effects of pipeline construction on nesting raptors. Observe effects of aircraft activity on nesting birds.

Status and Discussion:

In early summer 1979, NAPLINE contracted with LGL, Limited, to do a raptor survey along the proposed gas pipeline route. A final report by David G. Roseneau and Peter J. Bente entitled "A raptor survey of the proposed Northwest Alaskan Pipeline Company Gas Pipeline Route: the U.S. - Canadian border to Prudhoe Bay, Alaska, 31 May to 7 June and 7 July 1979" has been reviewed by government.

Objective 1, which calls for information on historical active and potential peregrine falcon nesting habitat, appears to be fairly well covered by the report. In addition to presenting data from their own survey, the authors have summarized most existing historical survey data. The objective also calls for monitoring the sites before, during and after construction. The 1979 survey would be the first step in pre-construction monitoring.

Objective 2 has been only partially addressed. For five raptors (rough-legged hawk, golden eagle, bald eagle, osprey and gyrfalcon) and one corvid (common raven), fairly complete and accurate information in nest locations has been provided. Information on most locations for the goshawk, sharp-shinned hawk, Harlan's red-tailed hawk, merlin and the great horned owl is present but much less complete. Five additional species (marsh hawk, American kestrel, hawk owl, great gray owl, and short-eared owl) all of whom probably nest in the vicinity of the gas pipeline corridor, are ignored. The reasons given for this omission is that "suitable nesting habitat for most of these species is available over a major portion of the State and the potential loss of this habitat resulting from the construction of the proposed pipeline would represent a relatively small proportion of the total." In addition, nesting sites for many of these species are extremely difficult to identify since they are not as easily visible as the cliff sites of a peregrine or the tree top nest of a bald eagle. The report also has not attempted to address the question of the vulnerability of eyrie sites to disturbances in and adjacent to the gas pipeline corridor.

Objective 3 also has been partially addressed. Information on the various species is covered in the same manner and with the same emphasis as described under Objective 2. The habitat preferences of goshawk and sharp-shinned hawks are discussed

in a very general fashion. Unpublished reports by Spindler and Kessel (1978,1979) document the breeding densities of the sharp-shinned hawk, American kestrel, great horned owl, hawk owl, marsh hawk, bald eagle and Harlan's red-tailed hawk in a variety of terrestrial and wetland habitats along the proposed pipeline alignment.

Information concerning location of nesting and hunting areas and dates of restricted periods (Objective 4) has been incompletely addressed. Locations of historical, active and potential raptor nesting sites was required under Objectives 1 and 2 discussed above. Hunting areas have not been addressed. A more critical omission is the lack of information on breeding chronology of raptors along the proposed alignment. This information is necessary in order to establish "dates of restricted periods." An unpublished report by Kessel (1978) gives breeding chronology for the rough-legged hawk, peregrine falcon, golden eagle, bald eagle and gyrfalcon. However, no attempt has been made in any of the reports to use the information to establish time restrictions for construction activities.

Objective 5 cannot be evaluated at this time since it calls for monitoring the effect of construction-related aircraft activity on breeding peregrines.

Recommendations:

On the basis of this review, it is recommended that:

1. NAPLINE should continue to monitor peregrine nesting sites during the pre-construction period. Frequency and methods of monitoring must be coordinated with the Peregrine Falcon Recovery Team.

2. Another survey for bald eagle and osprey nest sites should be conducted in spring 1980 before the trees leaf out. There is concern that the May - June 1979 survey occurred too late to provide accurate information on nesting locations since these birds often nest in bushy deciduous trees.

3. Information on the other species is either incompletely covered or not covered at all by these reports. This information should continue to be gathered in conjunction with other bird surveys and monitoring activities in the corridor.

4. Nesting chronologies for those species not discussed by Kessel (1978) should be determined. This information should be used to establish periods of restricted activity in the vicinity of nest sites.

5. If NAPLINE fails to complete these tasks, government should carry out the surveys and monitoring as required, funded by NAPLINE.

DRAFT

H. PROPOSED UPLAND BIRD STUDIES ALONG THE GAS PIPELINE CORRIDOR

Objectives:

1. Identify high density breeding areas, sharp-tailed grouse display grounds and other areas requiring special consideration, along with seasonal periods of sensitivity for pre-construction planning.

Good

2. Monitor population indices for grouse along the alignment. (To be deleted).

3. Determine species composition and breeding densities of small terrestrial birds in major habitat types along the gasline alignment.

4. Quantify construction effects on upland bird habitat and responses by bird populations.

Need:

The construction of a pipeline on such a large scale can cause loss or modification of significant amounts of bird habitat, and long-term effects on species composition and abundance of local populations. Construction can degrade or destroy traditional breeding and display grounds of sharp-tailed grouse which serve as areas of concentration during spring and fall and as year-round habitat for male birds. Portions of the Haines Right-of-Way are likely habitat for display grounds because open grassy areas are known to be an important feature.

Approach:

1. Provide locations, values, and sensitive periods of special bird use areas (display grounds, communal nesting areas, etc.) to Northwest officials during pre-construction planning to minimize impacts.

2. Conduct spring (ruffed, sharp-tailed grouse) or fall (spruce grouse) counts of upland game birds to provide population indices. (To be deleted).

3. Conduct periodic censuses of small birds on fixed plots within representative habitats.

4. Relate bird census data to anticipated or actual changes in habitats resulting from construction and assess the effects on avifaunal composition. The changes in avifaunal composition could be related to the terrestrial habitat evaluation studies and used to determine appropriate mitigation for unavoidable losses.

Schedule:

Before construction -

Survey portions of alignment for sharp-tailed grouse leks.

During construction -

Annual census of identified lekking populations. Evaluate effectiveness of mitigative techniques.

After construction -

Evaluate quantitative and qualitative changes in upland bird habitat.

Status:

Northwest has provided the agencies with Spindler and Kessel's (1978) report "Terrestrial Avian Habitats and Their Utilization, Upper Tanana River Valley, Alaska, 1977". Specific studies along other areas of the proposed alignment are lacking. Little or no information is available on upland game birds along the alignment.

Northwest has not addressed Objectives #1 and #2. The identification of high density breeding areas is critical only for sharp-tailed grouse as identified in the second portion of Objective #1. A review of the literature and existing information is necessary to identify seasonal periods of sensitivity for this species.

Spindler and Kessel (1978) addressed Objective #3 and their report satisfies this objective. They did not specifically address Objective #4, although the data and conclusions provide information

of a qualitative nature. This objective can be more fully addressed under the Terrestrial and Aquatic Habitat Evaluation Program in progress.

Recommendations:

1. NAPLINE should undertake studies to address Objective #1. Selected portions of the Haines Right-of-Way that are proposed as a NAPLINE route should be surveyed by NAPLINE for sharp-tailed grouse leks during the breeding and fall flocking periods. Annual surveys of lek areas should be conducted and applied mitigative techniques evaluated. Seasonal periods of sensitivity must be defined.

2. Due to the cyclic nature of most grouse populations and the difficulty in quantifying impacts from specific external sources, Objective #2 and Approach #2 should be deleted.

3. Objective #4 should be addressed under the Terrestrial and Aquatic Habitat Evaluation Program.

I. EFFECTS OF BLASTING ON FISH

Objective:

To provide guidelines governing blasting near fishery resources in order to minimize detrimental impacts.

Need:

Northwest Alaskan Pipeline Company proposes to blast essentialy all of the ditch in which the gas pipeline will be buried. This could have a significant adverse impact on fish unless adequate protective measures are implemented. This study effort would provide the information base to develop protective measures and blasting criteria.

Approach:

All available information on blasting and its effects on fish will be evaluated and preliminary blasting guidelines prepared. Through field bioassay methods and during early stages of construction, final guidelines will be formulated. Fish eggs, juveniles, and adults of several representative species will be included. Seasonal variations and the effects of different soil types, soil/water interfaces, and ice cover will be noted. Information on seismic response of some soil types can be obtained from U.S. Geological Survey. The

potential value of fish repellents and avoidance procedures will also be investigated.

DRAFT

Schedule:

Before construction -

The formulation of preliminary guidelines based on available literature can begin immediately. Field work will require the services of explosive experts to carry out the controlled tests since it appears NAPLINE will not be constructing a 2000-foot test segment as originally planned. A final report must be available soon after pipeline ditching operations commence.

Status:

Limited information is available on the effects of blasting on aquatic resources in arctic and subarctic environments. Northwest has not begun any work on this subject. In October 1977, Northwest conducted a blast test in Fairbanks. The tests were designed "to demonstrate that a controlled blasting program could be a safe and viable technique to facilitate trench excavations..." with the goal of proving that it is safe to blast a trench next to the Trans-Alaska Oil Pipeline. The tests did not attempt to incorporate any means of determining the effects of blasting on fish or other aquatic organisms.

Northwest has not begun construction of their 2000 foot test segment which was discussed with government during winter 1977-78. In fact, no recent reference has been made to this project. It is assumed that the segment has been replaced by the Fairbanks Frost Heave Test Site. If this is the case, the study can no longer be done in conjunction with blasting conducted for a scheduled NAPLINE program. Any field work for the blasting study will have to be done using a separate contractor which would significantly increase costs unless NAPLINE has scheduled other blasting tests into which this study can be integrated.

In Spring 1978, Northwest representatives indicated that adequate information on the effects of blasting on fish should already be available and that further studies, if necessary, should be funded from permitting activity income. Agency representatives are aware of the magnitude of blasting proposed for construction of the buried

gasline and the paucity of data available concerning detrimental shock levels and the transmission of shock waves across a soil/water interface. Blasting guidelines imposed in the past by agencies have not been documented to be adequate or inadequate for protection of fish resources. In lieu of definitive data on the effects of blasting on aquatic resources, the one-quarter mile restriction defined in the draft stipulations of the Grant of Right-of-Way will likely be imposed on all blasting operations.

DRAFT

Recommendation:

It is recommended that the initial phase of this study be implemented immediately. This phase would entail assembling all pertinent data into a topical brief. On the basis of data gaps identified in the topical brief, field investigations should be designed to evaluate the effects of blasting on aquatic organisms as independent studies or as a project coordinated with Northwest construction activities. Northwest should fund this study.

J. IMPACT OF THE GASLINE ON SMALL MAMMALS AND BIRDS IN EASTERN ALASKA

This proposal was deleted in the May 1978 document and will receive no further discussion.

K. CARNIVORE STUDIES ASSOCIATED WITH CONSTRUCTION OF THE GASLINE

Objectives:

1. To determine the sex, age, and distribution of grizzly bears, black bears, wolves, foxes, and coyotes which frequent construction camps and areas of human activity along the Northwest gasline corridor.

2. To describe the influence of pipeline-related activities on the daily and seasonal movements of these carnivores.

3. To evaluate the dependence of carnivores on artificial sources of food and the effects of this conditioning on behavior patterns and food habits.

4. To develop and assess practical and effective means of minimizing carnivore-human contacts and confrontations.

5. To identify the carrier status and zoonotic disease potential of carnivores within the gasline corridor and to document any abnormal incidence of disease resulting from increased contact with humans and/or other carnivores.

Need:

Various carnivore species occur along the proposed route of the Northwest gasline. Wolves, grizzly bears, black bears, foxes, and coyotes are commonly attracted to construction sites and transportation corridors where they scavenge discarded food and seek handouts from construction workers, local residents, and tourists. With construction of the gasline project in Alaska, changes in distribution, movements, and food habits of carnivores will likely occur with an attendant increase in the frequency of wildlife-human confrontations. Habitual dependence on artificial food sources may impact local carnivore populations either directly, through elimination of nuisance animals, or indirectly by decreasing productivity through nutritional and/or behavioral mechanisms. An increased potential for physical injury to construction workers and local residents exists and, in addition, transmission of zoonotic diseases identified in carnivores along the TAPS corridor may be accelerated. Rabies is enzoonotic in the Arctic and red fox, and brucellosis is present in caribou and their predators; tularemia is carried by the snowshoe hare and a population peak of this prey species is anticipated during the construction of the gasline.

The mechanism of carnivore attraction and behavior modification must be defined to enable developement of mitigative recommendations and reduction in carnivore/human confrontations.

Approach:

1. Capture and mark/radio collar carnivores which frequent the gasline corridor to determine whether individuals of specific sex or age classes are more susceptible to become problem animals and whether these animals return to specific areas from year to year.

2. Monitor the activities of marked/radio collared carnivores to define the mechanisms of attraction and the extent to which carnivores become dependent on these attractants.

3. Establish baiting stations to attract marked animals previously conditioned to artificial sources of food to experimental areas where various deterrents (fencing, electro-shocks, sonics, chemicals, emetics, etc.) can be evaluted for their effectiveness.

4. Through analysis of information obtained in approaches 1-3, define methods for avoiding creation of "attractive nuisances" and measures to minimize carnivore/human confrontations.

5. Utilizing carnivores trapped in conjunction with this study, a profile of the zoonotic disease status will be developed through biopsy samples assayed for rabies and serum and tissue samples tested for brucellosis and tularemia.

Schedule:

Project duration: Commencing January 1980 and continuing through the completion of construction. The initial research effort would be directed toward pre-construction development of mitigative measures that can be implemented prior to camp mobilization and construction-related activities.

Status:

In an April 20, 1978 commentary, Northwest indicated that the canivore studies as proposed by the government could not discern effects solely attributed to gasline activities due to previous conditioning of the animals during TAPS construction. At a May 2, 1978 meeting, Northwest representatives stated that they agreed in concept with the objectives of the carnivore studies but could not justify financing the research. At that time, Northwest also indicated they were proposing an animal control study to investigate human/animal interactions. To date, no carnivore investigations have been conducted by Northwest or the government agencies. The potential problems of carnivore/human confrontation are still present as evidenced by bear problems during 1979 at Alyeska, ADOT/PF, and Northwest facilities. At the present time, wolf populations north of the Yukon River have diminished due to trapping and hunting along the pipeline corridor; however, the possibility of an increase in wolf presence during gasline construction should be recognized.

In October 1979, Northwest provided government agencies with copies of a "Request for Quotation (RFQ) for the Mammal Studies Program". The RFQ does not outline any specific study programs, and the contractor selected will be required to develop mammal studies (including carnivores) as Phase II of the contract.

Agency representatives are aware of difficulties of conducting studies on animals with extensive home ranges, and disease transmission may extend further beyond the pipeline corridor than we are aware. Although the problems first surfaced with oil development and oil pipeline construction, Northwest should acknowledge their responsibility to define gasline disturbance impacts and incorporate procedures to minimize human/animal confrontations, adverse conditioning, and alteration of natural behavior patterns of carnivores.

Recommendations:

It is recommended that the carnivore study proposal be implemented immediately. The inter-related problems of carnivore attraction, human/carnivore confrontation, and disease transmission require a consolidated investigative effort. It is recognized that specialized disciplines may be required to conduct research involving the different carnivore groups and special concerns of disease profiling. We recommend that the Alaska Department of Fish and Game undertake a study to investigate human/animal confrontation involving grizzly bears, black bears, and wolves. This study effort will involve Objectives #1, 2, 3 and 4. NAPLINE should provide partial funding for this project.

L. EFFECTS OF THE TRANS-ALASKA/NORTHWEST PIPELINE CORRIDOR ON THE DISTRIBUTION AND MOVEMENTS OF CARIBOU

Objectives:

1. To monitor range occupancy, seasonal movements and productivity of the Central Arctic Herd (CAH).

2. To determine latitudinal distribution and sex/age composition of caribou within the Utility Corridor and to identify any local abnormalities by comparison with corresponding parameters obtained through aerial survey.

3. To determine the location, direction, and timing of caribou crossings of the Utility Corridor and to characterize the behavior of caribou which encounter the Haul Road, existing facilities, gasline system construction activities, and associated vehicular, aerial, and human activity.

4. To evaluate the effects of the various components of the Utility Corridor on caribou movements with special interest in the effectiveness of present and future big game crossings.

5. To describe the mechanisms by which movement patterns of caribou are established and subsequently sustained or altered.

Need:

Since 1974, caribou research efforts have been focused on that portion of the Trans-Alaska Pipeline corridor between Prudhoe Bay and the crest of the Brooks Range. A discrete subpopulation of caribou, the Central Arctic Herd (CAH), has been identified in this area of the Arctic Slope. Seasonal range is roughly bisected by the pipeline route and although movements are primarily north-south, they may extend across the corridor during spring and fall migration and during post-calving movements in midsummer.

Maximum activity associated with construction of the gasline as currently proposed during the snow-free months will result in conflicts with caribou occupancy on summer range. A comparison of aerial survey observations with those obtained along the TAPS haul road has revealed local abnormalities in caribou occupancy and group composition. Clearly, cows and calves are more sensitive to disturbance than other sex and age classes. The implications of adverse impacts on these components of the herd are critical to herd productivity and of priority interest. Road traffic and human presence are suspected to be dominant factors in the local alteration of caribou distribution and group composition. In fact, local disturbance has effectively precluded an adequate evaluation of caribou responses to the TAP system per se, and similar complications can be anticipated with respect to the NAPLINE project. However, since the peak of TAPS construction in 1975-1976, haul road data have suggested a slight tendency toward

more typical sex and age composition within the corridor. Future studies between now and the initiation of major gasline construction may confirm this trend, provided haul road traffic remains below a threshold level. A period of relatively low activity may also permit determination of the acceptable types and permissible levels of disturbance within the corridor.

On the other hand, perturbations of caribou distribution associated with TAPS construction/operation may be essentially irreversible, despite any recent or future decreases in local disturbance. This possibility emphasizes a need for continued study of the mechanisms by which patterns of movement are altered and sustained, and identification of any resultant changes in herd productivity. Other site-specific studies recently initiated near Prudhoe Bay may contribute to an overall understanding of the responses of caribou to development and human activity.

Continued study of the CAH is necessary to characterize the future response of caribou to existing facilities and disturbances and to determine the incremental disturbance attributable to gasline construction. Since assurance of free passage and movement of big game animals will be a stipulation requirement of both the Federal and State right-of-way leases, it is imperative that the status of the CAH be documented during the earliest possible stages of gasline construction. Specific mitigative criteria for timing, facility siting, and construction methods must be developed and subsequently incorporated into the project design and construction procedures.

Approach:

1. Seasonal distribution and movements of CAH caribou will be monitored 3-5 times annually by aerial survey.

2. Surveys will be conducted from the haul road on a regular basis between spring and fall to determine patterns of local occupancy, the location and direction of road/pipeline crossings, group composition, and behavior of caribou in the vicinity of the Utility Corridor.

3. Caribou will be equipped with radiocollars as required, and movements will be monitored by fixed-wing aircraft.

4. The CAH will be censused periodically using established techniques and herd composition will be determined three times annually to estimate calf production, survival, and yearling recruitment.

DRAFT

Schedule:

Before construction -

Pre-construction evaluation of CAH status, recommendations for mitigative actions.

During construction -

Construction evaluation of CAH status, recommendations for mitigative actions.

After construction -

Post-construction evaluation of gasline impacts.

Status:

In May 1978, Northwest and the agency representatives were in general agreement as to the need to evaluate the cumulative effects of pipelines and attendant activity on caribou. However, Northwest maintained that evaluation of disturbance factors present prior to initiation of gasline activities should be funded by other sources. The Alaska Department of Fish and Game has supported a reduced scale evaluation of the status of the CAH since mid-1978 under State funding. Activities scheduled for early 1980 by Northwest (1400 boreholes, material site exploration) indicate that the low disturbance interim period between TAPS and gasline construction has ended. Future monitoring of the status of the CAH must assume that caribou are being subjected to the disturbance effects of gasline activities and increased human presence.

In late October 1979, Northwest issued a "Request for Quotation for Mammal Studies" to eight selected contractors. The broad scope of the RFQ could encompass caribou studies but at this time no specific study programs have been developed to address agency concerns and necessary design and planning data voids. Agency personnel are concerned that the cumulative impact of gasline activity following TAPS and oil field development could adversely affect caribou movements and herd status unless specific mitigative measures are developed, evaluated, and implemented in a timely manner.

Recommendation:

It is recommended that government commence this study as proposed (objective #1 through #5) to evaluate the effects of gasline activity on the Central Arctic caribou herd during construction and initial operation of the system. We feel that the ADF&G can provide the best qualified principal investigator for this study based on past association and experience with this area of concern. It is assumed that ADF&G will provide partial support for this study since the CAH/gasline disturbance interaction has significant management implications in addition to the construction and operation concerns of the review agencies. Through combination of project-related studies and ongoing research, economy of personnel and costs can best be achieved.

Appendix A
Persons Contacted for Input On
Fish and Wildlife Studies
May 1978 and November 1979

PRELIMINARY

Name	Agency	Location
Carl Yanagawa	ADF&G	Anchorage
Nancy Hemming	ADF&G	Anchorage
Jim Glaspell	ADF&G	Anchorage
Al Carson	ADF&G	Anchorage
Jackie Campbell	USFWS	Anchorage
Ray Cameron	ADF&G	Fairbanks
Bob Hallock	USFWS	Anchorage
Hank Hosking	USFWS	Anchorage
Norval Netsch	USFWS	Anchorage
Tony Booth	USFWS	Fairbanks
Lew Pamplin	USFWS	Anchorage
Bill Eldridge	USFWS	Anchorage
Dirk Derkson	USFWS	Anchorage
Gary Pearse	ADF&G	Fairbanks
Lou Jurs	BLM	Anchorage
Lou Carufel	BLM	Anchorage
Bill Arvey	ADF&G	Anchorage
Ron Morris	NMFS	Anchorage
Jack Fisher	NMFS	Anchorage
Frank Wendling	NMFS	Anchorage
Dick Logan	ADF&G	Juneau
Joe Webb	BLM	Fairbanks
Julius Rockwell	APO	Anchorage
R. Dieterich	U of A	Fairbanks
D. Ritter	U of A	Fairbanks
P. Gibson	U of A	Fairbanks
Dave Klein	U of A	Fairbanks
Jack Luick	U of A	Fairbanks
Lou Swenson	USFWS	Anchorage
Dick Bishop	ADF&G	Fairbanks
John Coady	ADF&G	Fairbanks
Harry Reynolds	ADF&G	Fairbanks
R. Stephenson	ADF&G	Fairbanks
Vic VanBallenberghe	ADF&G	Fairbanks
Jerry McGowan	ADF&G	Fairbanks
Bruce Dinneford	ADF&G	Fairbanks
George VanWyhe	ADF&G	Fairbanks
Dan Benfield	USFWS	Anchorage
Dick Wilmot	USFWS	Anchorage
Al Ott	WCC	Anchorage
Brad Smith	NMFS	Anchorage
Charlie Sloan	USGS	Anchorage
Carl Markon	USFWS	Anchorage
John Trapp	USFWS	Anchorage
Tom Rothe	USFWS	Anchorage
Ted Schmidt	USFWS	Anchorage
Ken Chalk	USFWS	Anchorage
Chris Flanagan	ADF&G	Anchorage
Dick Shideler	ADF&G	Fairbanks
Marilyn Sigman	USFWS	Fairbanks
Jim Coan	BLM	Anchorage

INTERAGENCY FISH AND WILDLIFE TASK FORCE

PRELIMINARY

Objectives:

The Interagency Fish and Wildlife Task Force, to provide timely information which can be used to aid the decision-making process with regard to the Northwest's gas pipeline corridor, has four objectives:

1. To identify gaps in required knowledge and recommend Fish and Wildlife project-related investigations.

2. To facilitate information exchange and data retrieval.

3. To coordinate agency and company effort.

4. To provide the Executive Coordinating Committe (ECC)/Federal Inspector (FI) and appropriate agency (and company) heads with valid and timely data upon which decisions can be based to minimize unnecessary and avoidable impacts to fish and wildife resources.

As indicated by these objectives, the Task Force is a cooperative fact-finding body. The decision-making process referred to is an individual agency responsibility and cannot be delegated. On the other hand, funds, equipment, and services can be interchanged through appropriate administrative procedures to realize these mutually required objectives.

Need:

Many organizations need factual information on natural history of fish and wildife resources and on habitats of these creatures to meet individual decision-making responsibilities. This need is requied by law which established these organizations, other statutes, executive orders, and regulation. The participants have recognized the common need for all available hard data. They have also recognized the economy which would result from a timely acquisition of the data in a cooperative manner.

Approach:

A. Organization

The Task Force is an advisory body to the Executive Coordinating Committee/Federal Inspector and its actions conform to policies laid down by ECC/FI (see Figure 1). The Task Force is composed of one appointed represenative (biologist) and his alternate from each of the following agencies:

Alaska Department of Fish and Game (ADF&G) (Representative from SPCO)

U.S. Fish and Wildlife Service (Chairman)

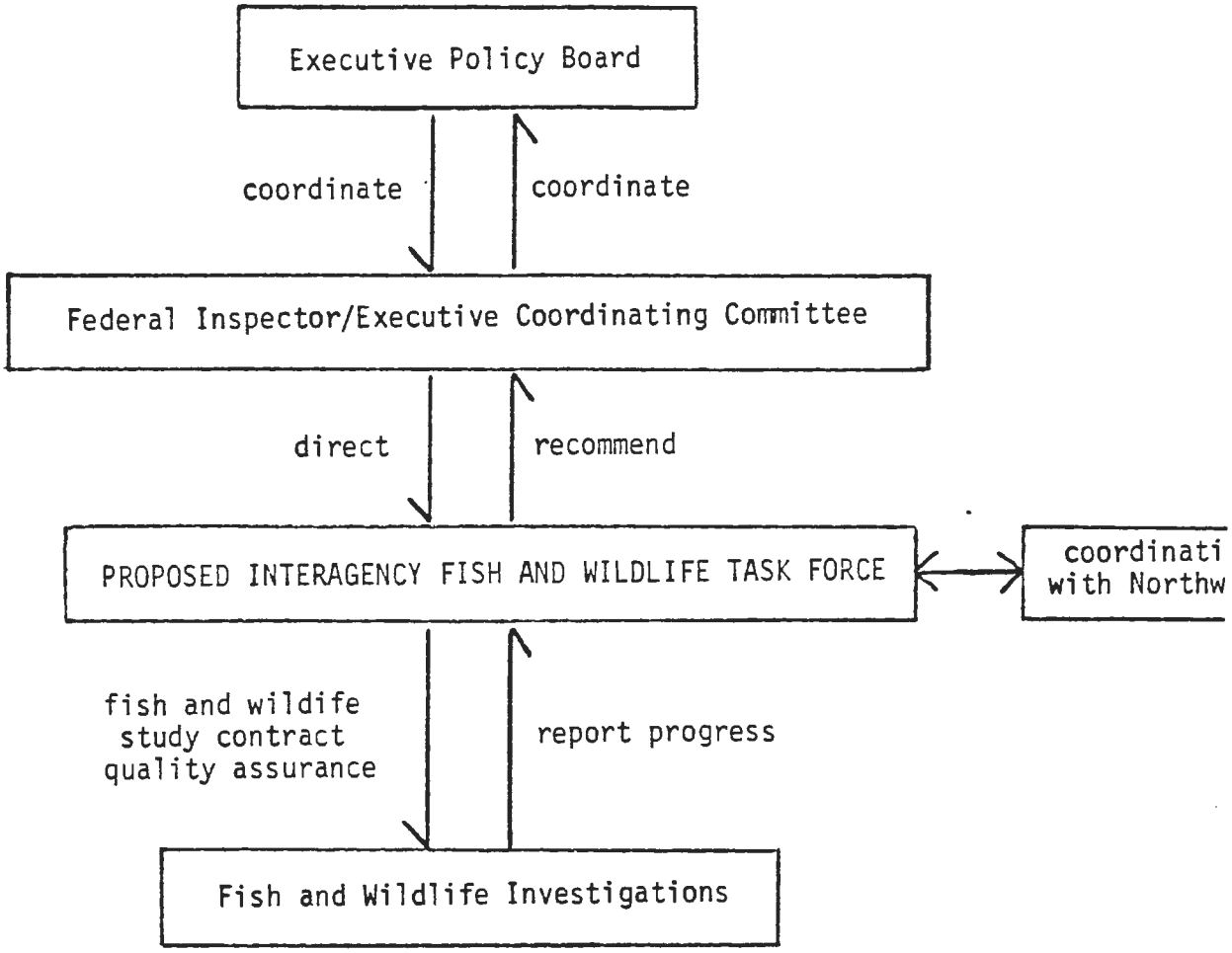
U.S. Bureau of Land Management (State Office)

National Marine Fisheries Service

Office of Special Projects (BLM)

U.S. Geological Survey

Figure 1. Coordination Diagram



Task force also includes as non-voting members (1) a biologist and his alternate from Northwest Alaska Pipeline Company and biologists from other companies as required and (2) selected experts in various fields who are invited to attend. Every attempt is made to obtain the best possible professional advice in the review processes.

B. Operation

1. Proposals

The Task Force will review proposals concerning fish and wildife studies.

Since the objectives, need, approach, design, scope, schedules, reports, and other products of the work, costs and manpower requirements, and leadership qualifications --all--have pertinent bearing on meeting overall objectives, these items will be reviewed by the Task Force in the RFP's to ensure that all state and federal requirements are met.

2. Implementation of Fish and Wildlife Study Programs

The Task Force will provide progress reports as required to the ECC/Federal Inspector.

The Task Force will have the following responsibilities with respect to the initiation, quality, and scope of the programs.

(a) Review study proposals and recommend modifications.

(b) Recommend programs to fill fish and wildlife data gaps.

(c) Review performance of fish and wildlife contract technical provisions to ensure the federal and state requirements are met.

(d) The Task Force will recommend which government agency, if appropriate, should perform fish and wildlife studies.

(e) Where gaps in knowledge are recognized and where ongoing programs will not fill the data gaps, the Task Force will work through established guidelines to recommend adequate programs through grants, contracts, or reimbursable funding.

3. Distribution of Findings

All data produced will be considered public property. Beyond the format required by the contract, investigators will be free to publish findings in proffessional and agency journals contingent upon normal Federal and State Agency restraints. All data and recommendations, interim reports, final reports and other products obtained immediately in a usable format to the Task Force. The Task Force will provide this information to the ECC/FI and appropriate agencies and organizations for use in preliminary design, monitoring, and restoration.