RESPONSES OF BARREN-GROUND CARIBOU TO OILFIELD DEVELOPMENT NEAR MILNE POINT

A Request to the Milne Point Unit Owners
Conoco Inc., Unit Operator

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Alaska Department of Fish and Game
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Starting Date: May 1, 1982
Duration: 3 years
Cost (1982): $26,100

INTRODUCTION

Conoco Inc., as the Unit Operator, intends to develop an oil reserve near Milne Point, some 40 km west of Prudhoe Bay. The Milne Point Service Road (MSR), now under construction, will provide access from the West Sak Road to the site of the proposed Milne Point Development Complex (MDC), approximately 16 km to the north. The MDC will initially consist of seven well sites, a processing facility, and a network of flowlines and secondary roads totaling about 7 km. A 45-cm main pipeline will be routed along the MSR. This Milne Point Pipeline (MP) will transport processed crude to the Kuparuk Pipeline Corridor, thence to the Trans-Alaska Pipeline origin station.

All roads and well pads will be essentially complete by May 1982. Construction of the MP and various production flowlines will commence in fall 1983, with completion scheduled for the following spring. Production modules will be installed in fall 1984. Conoco projects production startup by early 1985.

This initial complex will occupy approximately 2,500 ha in the immediate vicinity of the Arctic coast. Based on the ownership of adjacent tracts and the proximity of existing or probable unit boundaries to the east and west, it is unlikely that unit development will exceed 10,000 ha.

BACKGROUND

This central portion of the Arctic coastal plain is traditional calving and summer range for the Central Arctic Caribou Herd (CAH), a distinct subpopulation of about 9,000 head. Proposed oilfield development in the Milne Point area and the associated MP/MSR complex elicit two specific concerns with respect to resident caribou and, in addition, will contribute to overall regional conflicts.

Calving Distribution

CAH calving occurs in early June, roughly between the Colville and Canning Rivers within approximately 50 km of the coast. For a number of years, numerous calving caribou have been observed between the West Sak Road and the Oliktok/Milne Point area. The MDC will be within, or in close proximity to, this calving/post-calving habitat, and the MSR will be routed through an area in which such caribou have been consistently present in relatively high numbers.

The extreme sensitivity of parturient and post-partum female caribou to disturbance stimuli is well-documented. We believe that the local decline in calving activity near Prudhoe Bay reflects avoidance of disturbed areas, with maternal cows selecting and occupying less stressful surroundings. Given suitable alternate habitat, calving may proceed otherwise normally. On the other hand, the possible consequences of displacing females to unfamiliar and/or physically suboptimal habitats should be recognized. Unfortunately, knowledge of the precise habitat requirements of calving caribou is lacking; consequently, the implications of disturbance-induced changes in occupancy cannot be assessed in terms of known risks or probabilities. Nevertheless, it is reasonable to

assume that, in general, normal patterns of distribution have survival value and, therefore, that free access to preferred habitat during this critical period should be preserved to the greatest extent possible.

Summer Distribution

The potential effects of Milne Point development on caribou summer distribution and movements are of additional concern. In midsummer, oscillatory movements of CAH caribou occur between insect relief habitat on or near the coast and preferred feeding areas inland. In theory, these movements maximize feeding and nursing opportunity, and are therefore bioenergetically advantageous. It follows that any interference with these movements would be energetically undesirable. Past observations indicate that these movements tend to parallel rivers and creeks which, in this region, are oriented approximately north-northeast/ south-southwest. Thus, caribou may diagonally intersect the MSR and, eventually, the MP. Admittedly, since primary movement orientation is nearly parallel to the latter linear structure(s), such conflicts may not be serious. However, in light of the nearby West Sak Road and its associated pipeline, the possibility of an additive effect should be considered.

Milne Point Development may pose a more direct conflict with east-west movements of caribou. Rapid movements of post-calving aggregations commonly occur north of the West Sak Road, frequently along the coast itself. The MDC may constitute a serious barrier because of its coastal location and proximity to the estuaries of Simpson Lagoon. The possibility that caribou will circumvent the MDC to the south, together with the probability of other east-west movements farther inland, emphasizes the special importance of providing for passage across the MSR/MP complex.

Cumulative Effects

A final, somewhat undefined, concern involves the overall nature and extent of petroleum development west of the Kuparuk River and its net effect on the distribution, movements, and general well-being of CAH caribou. Individual development actions should not be viewed in isolation, but rather as components of an expanding oilfield network. Hence, the Milne Point project must be considered in conjunction with ARCO's growing Kuparuk Development Area, a future dock at Oliktok Point, SOHIO's proposed expansion west of the Kuparuk River, and infrastructure resulting from probable offshore development. Various statements of concern, the identification of abnormalities, and the implementation of mitigative measures must all be made in the context of both existing and probable future conflicts. For this reason, coordinated regional planning continues to be of crucial importance.

Although the present research program will not specifically address cumulative impacts, it is nonetheless important to recognize the implications of progressive development. This study, along with others currently in progress, will hopefully contribute toward an improved understanding of caribou disturbance behavior and habitat requirements, and encourage the development of mitigative concepts having both general and site-specific application.

OBJECTIVES

The present study is designed primarily to provide information on caribou distribution necessary for the appropriate design and placement of pipeline crossing structures. This will require identification of local caribou movement patterns as well as an examination of the spatial relationships between resident caribou and the various existing/proposed components of Milne Point oilfield development. Based on such information and other relevant data, design recommendations can be made to maximize passage across the MP and, where feasible, the MDC flowline network. A related goal is an assessment of the success of such mitigative measures, including an evaluation of the relative accommodation of caribou to various pipeline modes and modifications.

It is essential that the observed responses of caribou be interpreted in the context of numerous temporal, spatial, social, and environmental variables. In fact, mandatory attention to disturbance-unrelated factors provides an opportunity for parallel investigation of some of the more fundamental aspects of caribou ecology. For example, detailed studies of timing, direction, and destination of insect-induced movements of caribou would be an appropriate complement to this research program.

In accordance with the broad project goals outlined above, this study is designed to accomplish the following principal objectives:

1. To determine seasonal and annual changes in the regional distribution of caribou associated with Milne Point development.

2. To describe the local distribution and movements of caribou in relation to the MSR and MDC, including

    a. concentration areas and major crossing points,

    b. differences with respect to season, group structure, insect activity, etc., and

    c. changes occurring with progressive development.

3. To describe the movement characteristics, behavioral responses, and road/pipeline crossing success of caribou, with special interest in interactions involving special design features of the MP and MDC flowline system.

DESIGN

Methods

Low-level aerial surveys will be conducted by helicopter or fixed-wing aircraft at 10-day intervals between 1 May and 31 August. Each survey will consist of a series of transects, extending 10-15 km east and west of the MSR. The location, size, and composition of each group of caribou will be recorded. Variations in caribou density and group composition will be described, with emphasis on distribution in relation to development complexes and linear structures.

Standardized ground surveys (by light truck) will be conducted 2 or 3 times daily from the MSR and within the MDC. Among the variables that will be recorded for each observation are: location, group size/ composition, position with respect to the road and other structures, direction/speed of movement, local terrain features/vegetation type, physical characteristics of crossing sites, and gross behavioral responses. Changes in insect activity will be determined by direct observation and through weather data obtained locally.

Pending the identification of high caribou use areas along the road system, stationary and/or mobil observation facilities will be employed for intensive studies. Sites of special pipeline crossing structures will be of particular interest.

Personnel

The major components of this study will be developed into a graduate student (M.S.) research program implemented through the University of Alaska. The Principal Investigator will advise on research design and data collection, and will also serve as co-chairman of the faculty advisory committee. Staff associates K. R. Whitten and W. T. Smith will provide additional assistance as necessary.

Schedule of Major Activities

Year 1 (1982) - Pre-pipeline, roads in place.
Describe chronological changes in regional caribou distribution.
Determine local patterns of caribou movement and occupancy along the MSR and within the MDC; identify important use areas.
Provide recommendations for pipeline design.

Year 2 (1983) - Pre-pipeline, roads in place.
Re-examine chronology of regional/local caribou distribution; compare with Year 1 data.
Conduct additional site-specific studies as required.
Review design recommendations.

Year 3 (1984) - All pipelines in place.
Continue aerial and ground survey programs; identify any changes in regional/local distribution of caribou.
Continue site-specific behavioral studies.
Assess effectiveness of special crossing structures.

Year 4 (1985) - Production
(Optional) Follow-up studies during the production phase may be required to increase the data base or to re-evaluate previous findings.

Reporting

1982 Data summary with recommendations for the location and mode of special pipeline crossings - due 1 October 1982

1983 Progress summary with recommendations for minor redesign of crossing structures - due 1 October 1983

1984 Progress summary with preliminary assessment - due 1 October 1984

Thesis completed May 1985 (tentative).

1985 Data supplement and final synthesis (if appropriate) - due 1 January 1986.

BUDGET 1982

Personnel	
Student stipend - 8 mos.	$ 4,400
Tech I - 4 mos.	7,000
	$11,400
Travel	
In-State*	$ 1,200
Out-of-State**	1,000
	$ 2,200
Contractual	
Helicopter charter	$ 5,000
Fixed-wing charter	1,000
Vehicle	600
Computer	300
	$ 6,900
Commodities	
Fuel (vehicle, aircraft)	$ 2,000
Field rations	500
Miscellaneous	300
	$ 2,800
Equipment	
Optics	$ 400
	$ 400
Subtotal	$23,700
10% Overhead	$ 2,400
Amount Requested	$26,100

* Commercial air travel between Fairbanks and Prudhoe Bay.
**Scientific conference, principal investigator/staff associates.

Note: Renewal requests should not exceed $30,000.