



FLIR Survey of Maternal Polar Bear (*Ursus Maritimus*) Denning Habitat



Winter 2013/2014

Final

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Survey Conducted by Weston Solutions, Inc, for ConocoPhillips Alaska,
Inc.

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Introduction

Between December 10 and December 13, 2013 ConocoPhillips Alaska, Inc. (CPAI) sponsored Forward Looking Infrared (FLIR) surveys on the North Slope of Alaska around proposed activities planned for the winter of 2013/2014. The proposed activities included:

- Operations in the vicinity of Oliktok Point and Kalubik Creek areas;
- Alpine oil field operations in the Colville River Delta;
- Construction in the CD5 area; and
- Exploratory drilling in the NPR-A.

The FLIR surveys were conducted to identify potential locations of maternal polar bear dens in accordance with protocols developed by the United States Fish and Wildlife Service (USFWS). The specific survey areas to be flown were identified by the USFWS during a pre-flight meeting on November 14, 2013. This report summarizes the survey results.

Methodology

The surveys were conducted using the Shared Services Twin Otter (DHC-6) equipped with a Star SAFIRE® III FLIR unit. Survey times, crews, and locations are shown in Table 1.

Surveys were flown between 400 and 1,500 feet above ground level depending on weather conditions. The crew used Global Positioning System coordinates, computer mapping software, and visual ground reference to navigate the drainages and bluffs. The survey coordinator interfaced with the pilots and the FLIR operator to capture clear images of the target areas. Repeated transects were flown to ensure adequate coverage.

Weather conditions for the surveys are shown on Table 2. The visibility was good during all surveys.

Survey Activities

Potential denning habitat (drainages, bluffs, and channels conducive to adequate snow drifting) were surveyed in anticipation of ice road construction and tundra travel. On December 10, 2013 the survey encompassed the Oliktok Point and Kalubik Creek areas near the Kuparuk field (Figure 1).

Weather prevented any surveys from occurring on December 11th. On December 12th the surveys began around the proposed exploration activities in the NPR-A (Figure 2). Next, lakes and creeks were surveyed in the area around the CD5 construction project (Figure 3) however encroaching weather caused the survey to end prior to completion.

On December 13th the crew surveyed the Colville River Delta around the Alpine development, and completed the survey of the CD5 area (Figure 3).

Results

Heat signatures indicative of potential dens were not discovered in any of the survey areas. All video footage was reviewed after the flights for verification and released to USFWS.

Summary

FLIR technology, while a prudent methodology for assessing potential polar bear den locations, may not locate 100% of the dens in the survey area. With this in mind, work and travel should be done with caution in all areas following the guidelines outlined in *CPAI's Polar Bear Avoidance and Interaction Plan (January, 2012)*. USFWS will advise CPAI of any supplemental findings (e.g. locations of collared bear den locations) once they are obtained.

TABLES

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Table 1 Winter 2013-2014 CPAI Polar Bear Den FLIR Survey Details

	Survey 1: December 10, 2013	Survey 2: December 12, 2013	Survey 3: December 13, 2013
Departed	19:30	17:20	19:10
Landed	22:28	20:50	21:25
Pilot	Bob Andreson	Mike Watson	Mike Watson
Co-Pilot	Craig Briske	Ray Hodges	Ray Hodges
FLIR Operator	Ross Bennett	Ross Bennett	Ross Bennett
Survey Coordinator	Justin Blank	Justin Blank	Justin Blank
Observer(s)	Stacey Aughe (Weston)	Stacey Aughe (Weston), Adam Davis-Turak (CPAI Exploration Environmental Coordinator)	Stacey Aughe (Weston)
Area Surveyed	Oliktok Point and Kalubik Creek Area.	Routes and locations associated with exploratory projects in the NPR-A, and the CD5 area.	Colville River Delta, CD5 Area.

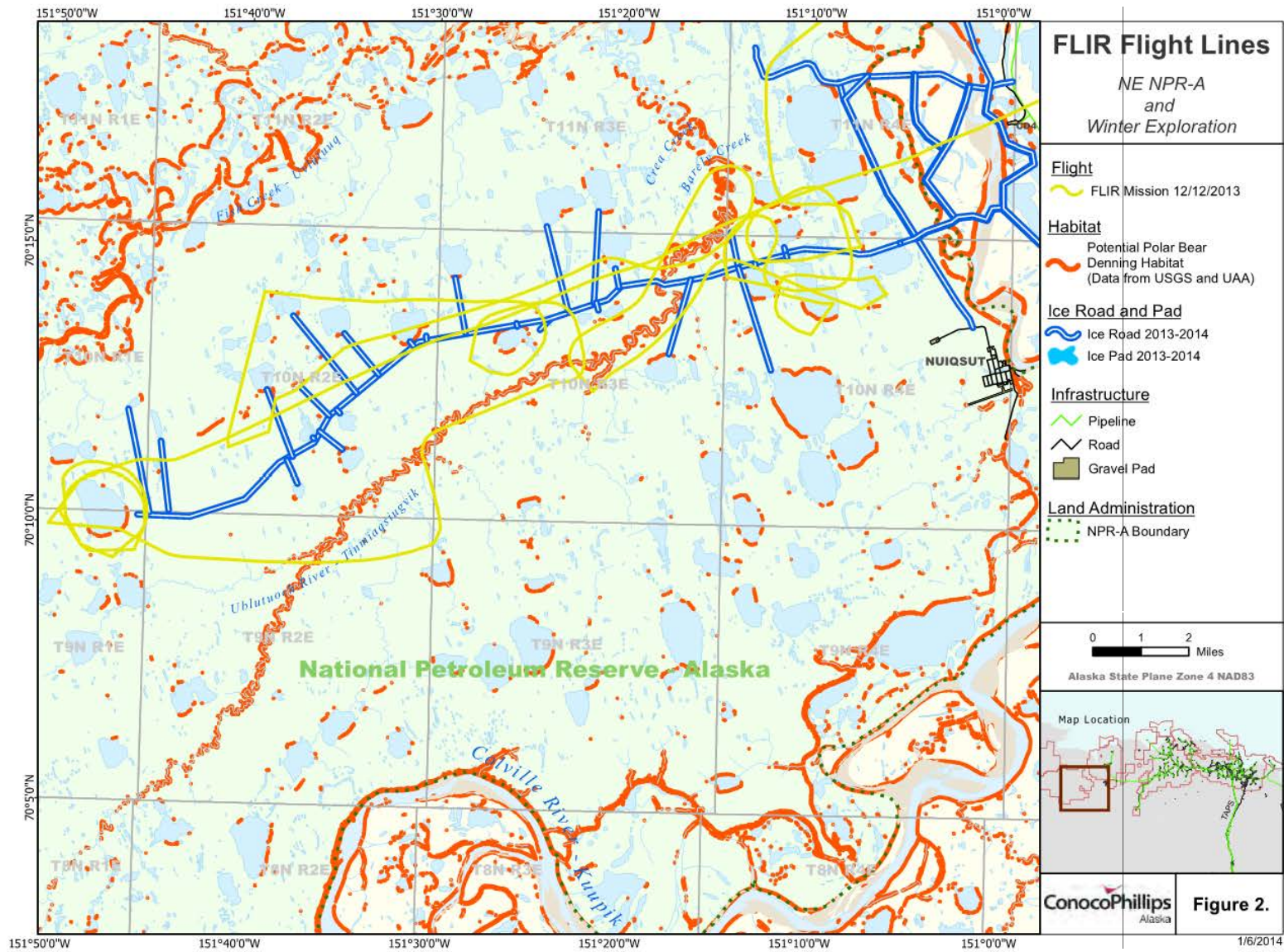
Table 2 Weather Conditions

	December 10, 2013	December 12, 2013	December 13, 2013
Alpine Weather Conditions			
Time of Observation	17:46	17:49	22:26
Wind Direction (magnetic)	260	Variable	360
Wind Speed (knots)	6	1	4
Visibility (miles)	8	5	5
Cloud Cover	Clear	Broken @ 800 ft., Broken @ 1200 ft.	Scattered @ 1200 ft.
Temp (Celsius)	-28	-27	-26
Dew Point (Celsius)	-32	-30	-29
Altimeter	30.92	30.57	29.95
Notes	-	Mist	Mist
Deadhorse Weather Conditions			
Time of Observation	19:17	17:53	19:00
Wind Direction (magnetic)	250	010	230
Wind Speed (knots)	12	4	11
Visibility (miles)	3	3	6
Cloud Cover	Few @ 1500 ft, Overcast @ 3900 ft.	Broken @ 1100 ft.	Scattered @ 1400 ft., Broken @ 2500 ft.
Temp (Celsius)	-24	-26	-32
Dew Point (Celsius)	-27	-29	-35
Altimeter	30.89	30.54	29.98
Notes	Snow, Mist	Mist	Mist

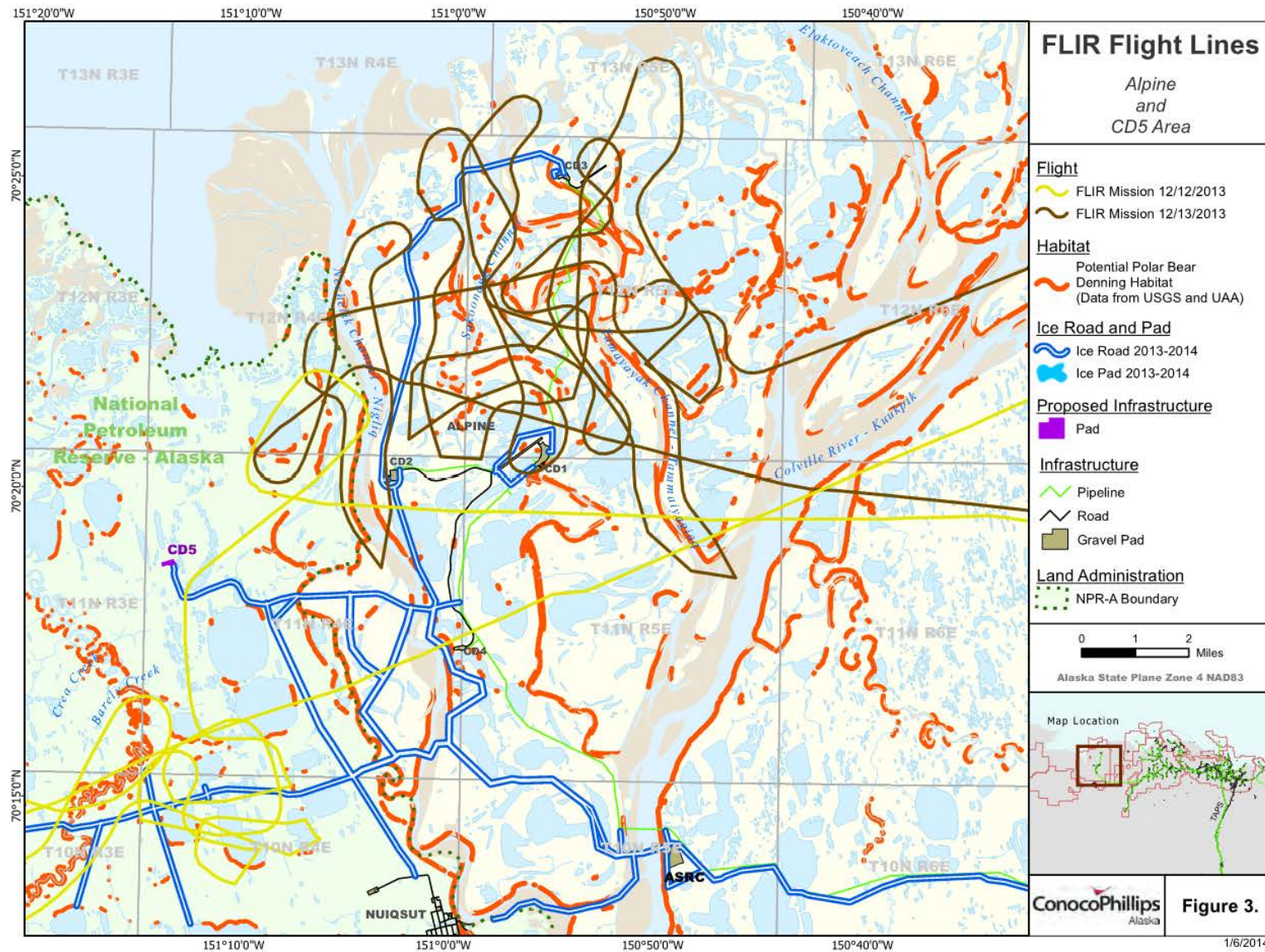
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