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

Winter 2016/2017

FINAL

Prepared for:

ConocoPhillips Alaska

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Survey Conducted by Fairweather Science, LLC. for ConocoPhillips Alaska, Inc.

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Introduction

Between December 3 and December 4, 2016 ConocoPhillips Alaska, Inc. (CPAI) sponsored Infrared (IR) surveys on the North Slope of Alaska around proposed activities planned for the winter of 2016/2017. The proposed activities included:

- Routine operations and ice road construction within the Kuparuk River Unit;
- Alpine oil field operations and ice road construction in the Colville River Unit;
- GMT1 Development construction activities; and
- A seismic program in the National Petroleum Reserve – Alaska (NPRA).

The IR 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. This report summarizes the survey results.

Methods

The surveys were conducted using the Shared Services Twin Otter (DHC-6) equipped with a Star SAFIRE® HD 380 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 coordinators interfaced with the pilots and the sensor 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. USFWS participated in the survey flights.

Survey Activities

On December 3rd and December 4th potential denning habitat (drainages, bluffs, and channels conducive to adequate snow drifting) were surveyed in anticipation of winter activities (Figures 1 and 2).

Results

Heat signatures indicative of polar bear dens were not detected during the CPAI surveys.

Video footage was reviewed as necessary and released to USFWS.

Summary

No polar bear dens were detected near any CPAI planned activity.

IR technology, while a prudent methodology for assessing potential polar bear den locations, may not locate 100% of the dens in the survey area. Work and travel should be done with caution in all areas following the guidelines outlined in *CPAI's Polar Bear Avoidance and Interaction Plan (July, 2016)*. USFWS will advise CPAI of any supplemental findings (e.g. locations of collared bear den locations) once they are obtained.

TABLES

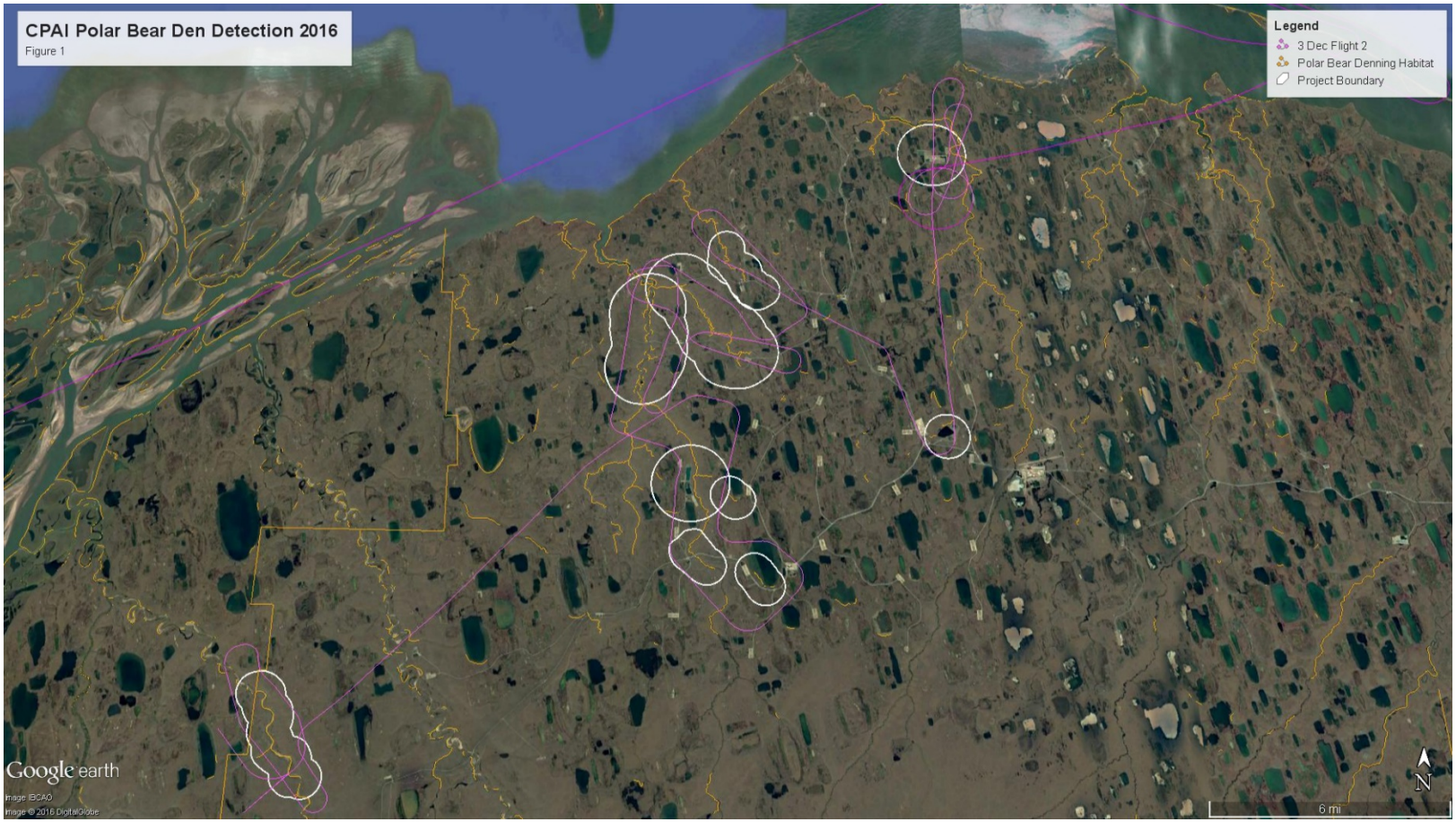
Table 1 Winter 2016-2017 CPAI Polar Bear Den Detection Survey Details

	December 3, 2016 Flight 2 of 2	December 4, 2016 Flight 1 of 2	December 4, 2016 Flight 2 of 2
Departed	19:53	15:07	20:07
Landed	21:20	18:06	21:31
Aircraft	DHC-6 Twin Otter (N842AR)	DHC-6 Twin Otter (N842AR)	DHC-6 Twin Otter (N842AR)
Sensor	FLIR SAFIRE HD380	FLIR SAFIRE HD380	FLIR SAFIRE HD380
Pilot	Mike Watson	Mike Watson	Mike Watson
Co-Pilot	Craig Briske	Craig Briske	Craig Briske
FLIR Operator	Brian Nelson	Brian Nelson	Brian Nelson
Survey Coordinator	Justin Blank	Justin Blank	Justin Blank
Observer(s)	Kimberly Klein (USFWS)	Kimberly Klein (USFWS)	Kimberly Klein (USFWS)
Areas Surveyed	Jones Islands (Control), Kuparuk Area	Colville River Delta, CD-5 area, NPRA .	Colville River, Ocean Point, NPRA
Notes	Departed and Landed at ALP. After flying the Jones Islands, surveys started near Oliktok Point and worked west. No hotspots discovered.	Departed and Landed at ALP. Flew the Alpine area and crossed into the NPRA looking at drainages within the planned seismic program. No hotspots discovered.	Departed and Landed at ALP. Surveyed areas south near Ocean Point then made another pass through the NPRA. No hotspots discovered.

Table 2 Weather Conditions

	3-Dec-16	4-Dec-16	4-Dec-16
Alpine (PALP) Weather Conditions	Flight #2	Flight #1	Flight #2
Time of Observation (local)	16:48	14:53	15:48
Wind Direction (magnetic)	1	SE	Calm
Wind Speed (knots)	Calm	7	0
Visibility (miles)	10	10	10
Cloud Cover	Overcast at 2,000	Clear	Clear
Temp (Celsius)	-11.2	-25.6	-25.6
Dew Point (Celsius)	-16.6	-31	-31
Altimeter	30.65	30.9	30.9
Notes	N/A	N/A	N/A
Kuparuk (PAKU) Weather Conditions	Flight #2	Flight #1	Flight #2
Time of Observation	18:45	14:47	18:45
Wind Direction (magnetic)	WSW	SSE	SSE
Wind Speed (knots)	6	7	9
Visibility (miles)	10	10	10
Cloud Cover	Broken clouds at 1,800ft	Clear	Clear
Temp (Celsius)	-14.8	-29.2	-29.2
Dew Point (Celsius)	-18.4	-34.6	-34.6
Altimeter	N/A	30.9	30.9
Notes	N/A	N/A	N/A
Nuiqsut (PAQT) Weather Conditions	Flight #2	Flight #1	Flight #2
Time of Observation	18:53	14:53	20:20
Wind Direction (magnetic)	SW	S	Calm
Wind Speed (knots)	17	7	0
Visibility (miles)	8	8	6
Cloud Cover	Overcast 2,100ft	Clear below 12,000ft	Clear
Temp (Celsius)	-11.2	N/A	N/A
Dew Point (Celsius)	-16.6	N/A	N/A
Altimeter	30.71	30.97	N/A
Notes	N/A	N/A	Mist

FIGURES


CPAI Polar Bear Den Detection 2016
Figure 1
Legend
3 Dec Flight 2
Polar Bear Denning Habitat
Project Boundary
Google earth
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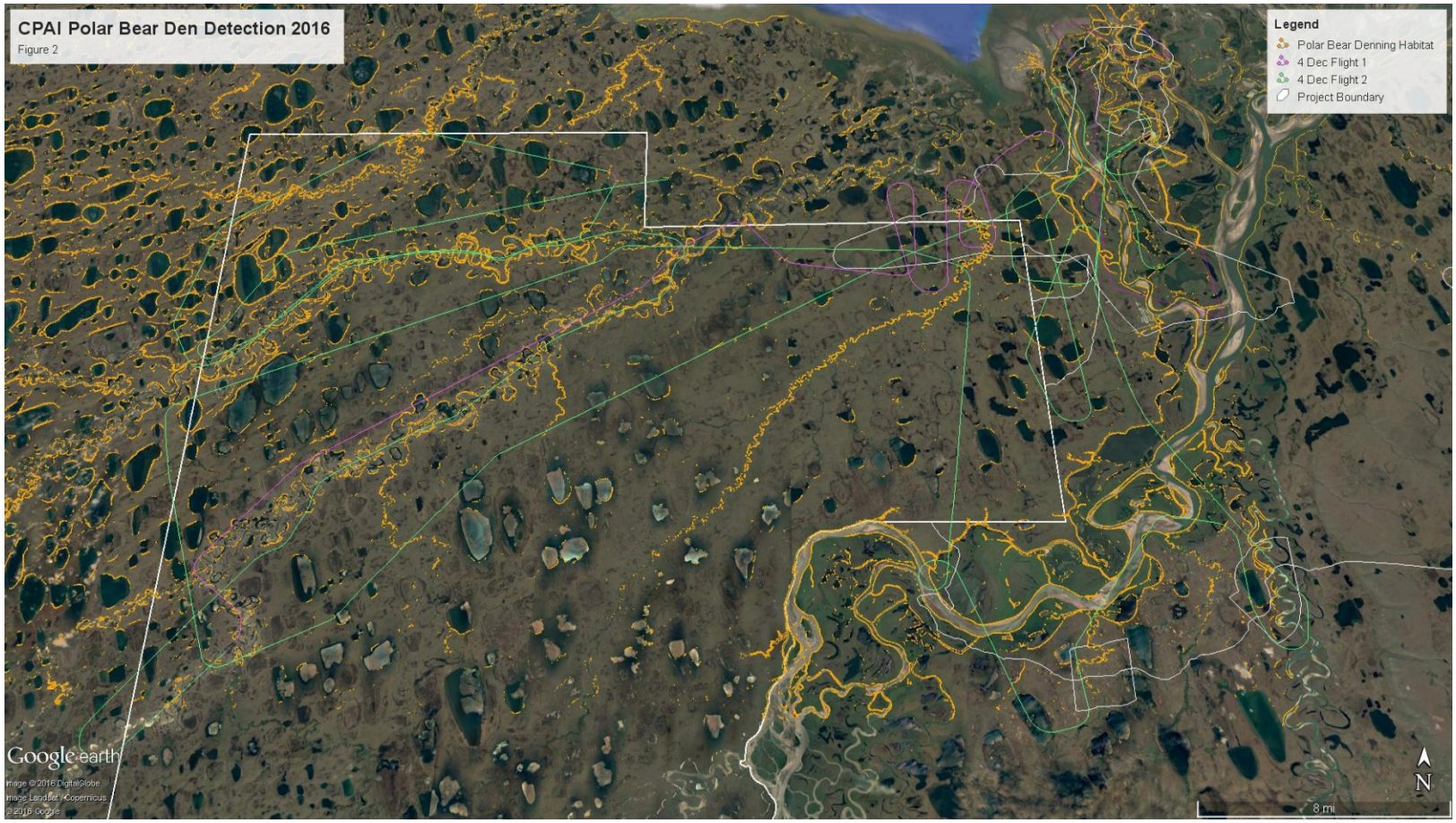
CPAI Polar Bear Den Detection 2016
Figure 2
Legend
Polar Bear Denning Habitat
4 Dec Flight 1
4 Dec Flight 2
Project Boundary
Google earth
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