

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



Winter 2015/2016
FINAL

Prepared for:

ConocoPhillips
Alaska

ConocoPhillips Alaska, Inc.
PO Box 100360
Anchorage, AK 99510

Prepared by:


FAIRWEATHERSCIENCE

Fairweather Science LLC.
301 Calista Court
Anchorage, AK 99518

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

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Introduction

Between December 2 and December 5, 2015 ConocoPhillips Alaska, Inc. (CPAI) sponsored Infrared (IR) surveys on the North Slope of Alaska around proposed activities planned for the winter of 2015/2016. 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; and
- An exploration drilling 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 on November 9, 2015. This report summarizes the survey results.

Methodology

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.

Survey Activities

On December 2nd through December 5th potential denning habitat (drainages, bluffs, and channels conducive to adequate snow drifting) were surveyed in anticipation of winter activities (Figures 1 and 2). Note that the December 5 flight was a short segment to revisit a hotspot (HS1502-see below) and is not represented on Figures 1 and 2.

Results

At USFWS's direction, CPAI conducted several "control" flights over known historical denning locations to calibrate the equipment and crew. On December 2, 2015 HS1501 was discovered on Cottle Island which is not near any CPAI planned activities (Table 2, Table 3, Figure 2, Photo 1).

Another heat signature indicative of a maternal polar bear den was discovered on December 3, 2015 (HS1502). After multiple revisits and CPAI consultation with USFWS (December 4 and 5, 2015), it was determined that the heat signature was not a polar bear den and no special protections were required. See Tables 1 and 3, and Photo 2 for more information.

All video footage was reviewed after the flights for verification 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. 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

Table 1 Winter 2015-2016 CPAI Polar Bear Den Detection Survey Details

	Survey 1: December 2, 2015 Flight 1 of 1	Survey 2: December 3, 2015 Flight 1 of 2	Survey 3: December 3, 2015 Flight 2 of 2	Survey 4: December 4, 2015 Flight 1 of 3	Survey 6: December 4, 2015 Flight 3 of 3	Survey 7: December 5, 2015 Flight 1 of 1
Departed	18:20	16:10	19:16	15:05	19:58	13:15
Landed	21:25	17:20	22:04	15:20	21:57	13:20
Aircraft	DHC-6 Twin Otter (N842AR)	DHC-6 Twin Otter (N842AR)	DHC-6 Twin Otter (N842AR)	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	FLIR SAFIRE HD380	FLIR SAFIRE HD380	FLIR SAFIRE HD380
Pilot	Mike Mercier	Mike Mercier	Mike Mercier	Mike Mercier	Mike Mercier	Mike Mercier
Co-Pilot	Rich Mullowney	Rich Mullowney	Rich Mullowney	Rich Mullowney	Rich Mullowney	Rich Mullowney
FLIR Operator	Don Short	Steve Wackowski	Steve Wackowski	Steve Wackowski	Steve Wackowski	Steve Wackowski
Survey Coordinator	Justin Blank	Justin Blank	Justin Blank	Justin Blank	Justin Blank	Justin Blank
Observer(s)	Steve Wackowski, Robyn McGhee	-	-	-	-	-
Areas Surveyed	Staging Pad (Control), Jones Islands (Control) (Discovered Hotspot 1501), Ugnuravik River, Oliktok Point, Kalubik Creek.	Colville River Delta	Colville River Delta, CD-5 area, NPRA (Discovered Hotspot 1502).	HS1502	HS1502, Eastern extent of NPRA Iceroad Program, Rolligon route river crossings.	HS1502
Notes	Departed and Landed at ALP. Only one flight on this date. Nothing noted at Staging Pad. Putative dense HS1501 found at Cottle Island. Visibility was good. Experienced challenges with adjusting zoom on the SAFIRE. Flight tracks were not captured within the Churchill Software so they had to be recovered from Shared Services Aviation's flight following service.	Departed and Landed at ALP. Challenges with adjusting zoom resulted in early termination of the survey and the crew returned to Alpine to troubleshoot. Did get some good images of the survey area however. No hotspots discovered.	Departed and Landed at ALP. Minimized use of zoom to prevent camera malfunction. Flew the Alpine area and crossed into the NPRA following the winter exploration iceroad route. Did not go west of Midway camp location. HS 1502 discovered in the NPRA.	Departed ALP, Landed SCC. Reacquired HS1502. Imagery was not definitive.	Departed and Landed ALP. Reacquired HS1502. Imagery was not definitive. Flew areas in the NPRA, then south to Ocean point and east across the Colville following the rolligon route towards DS2P.	Departed ALP, Landed SCC. Reacquired HS1502. Infrared and Electro-optical Imagery was captured and agreed with the USFWS determination that HS1502 was NOT a den. Flight tracks from this short survey were not obtained.

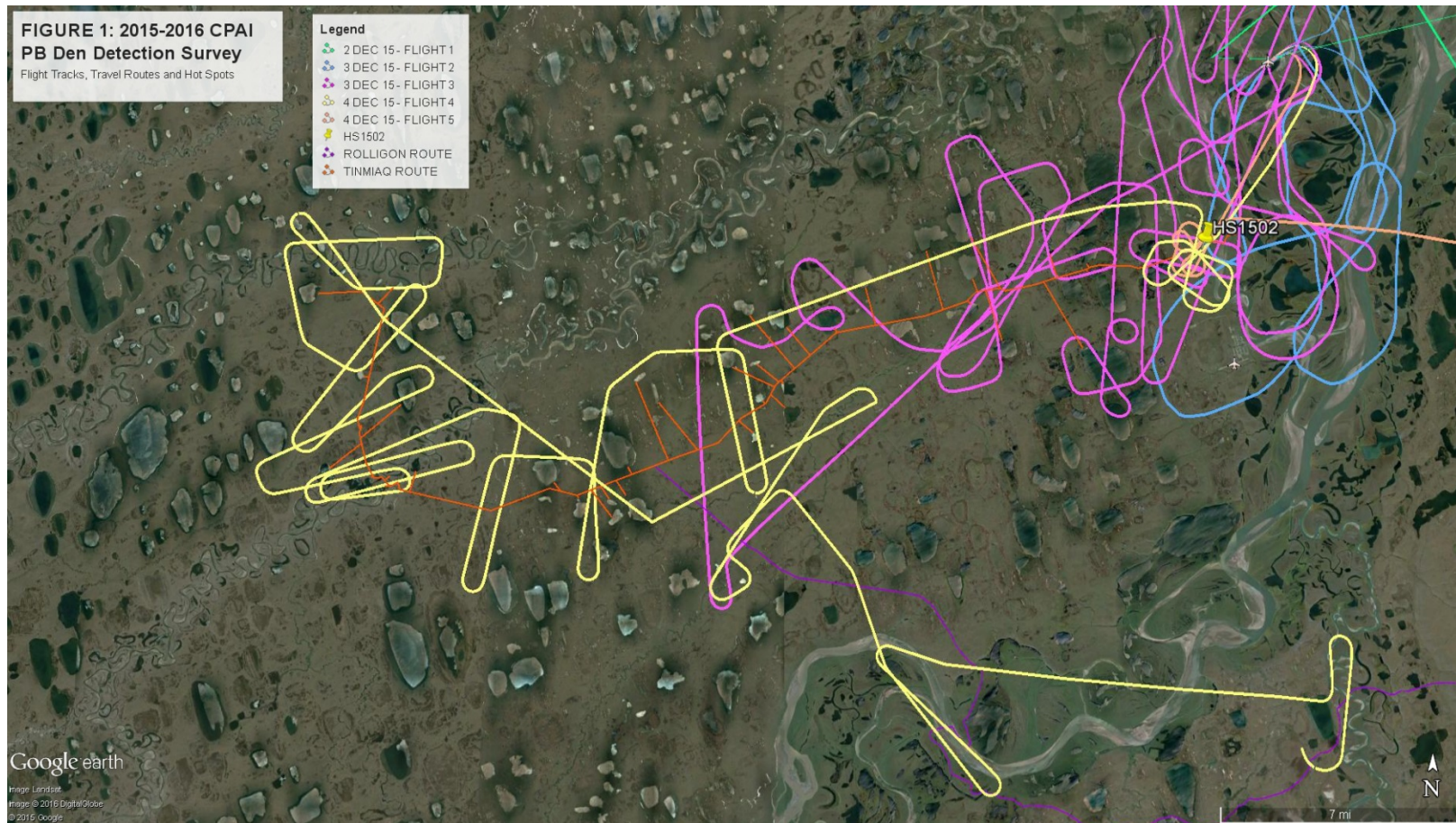
Table 2 Weather Conditions

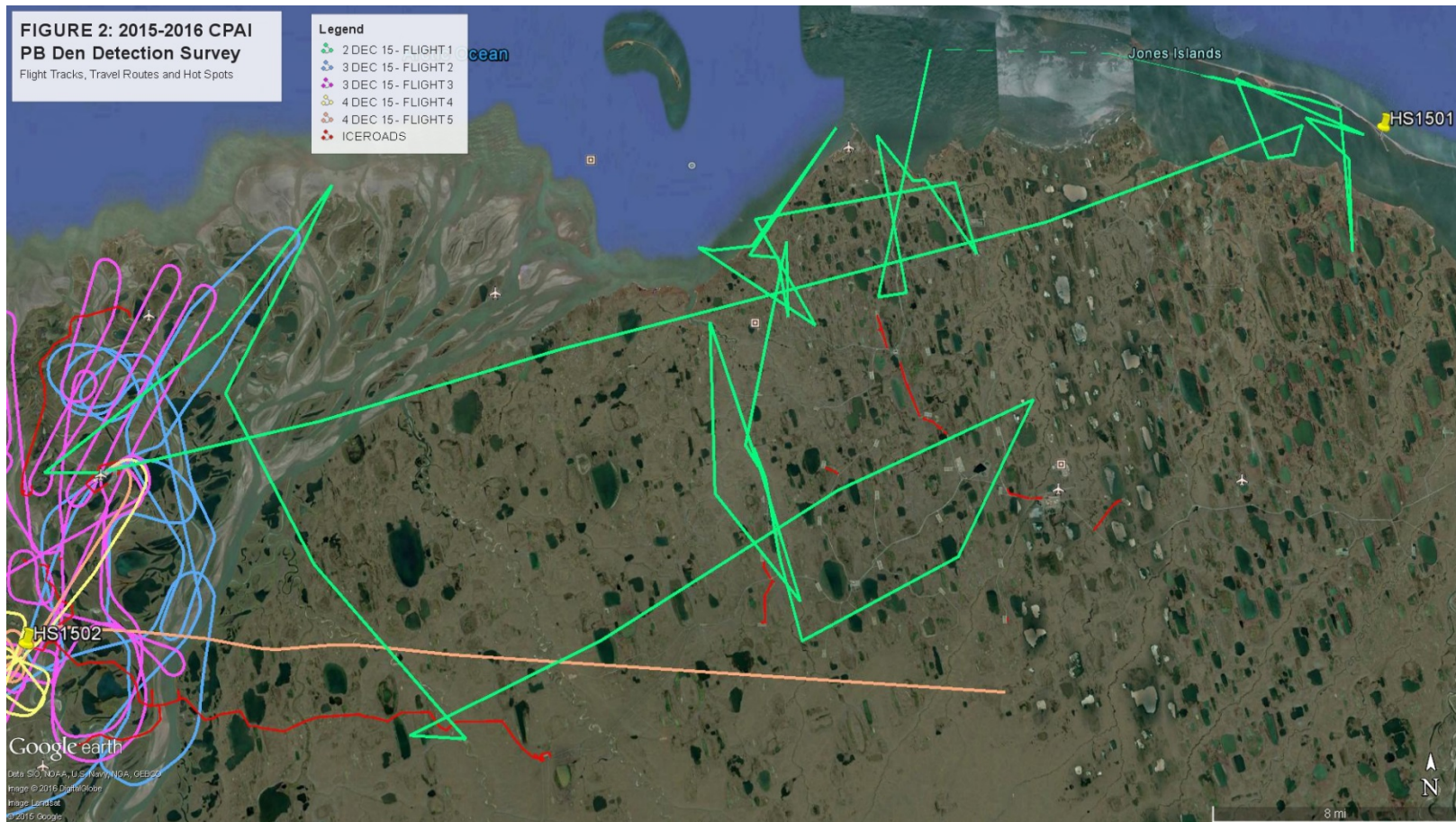
	2-Dec-15	3-Dec-15	3-Dec-15	4-Dec-15	4-Dec-15	5-Dec-15
Alpine Weather Conditions	Flight #1	Flight #1	Flight #2	Flight #1	Flight #3	Flight #1
Time of Observation	17:45	15:50	19:55	14:46	19:46	13:51
Wind Direction (magnetic)	NNE	NE	NE	SSW	NNE	NE
Wind Speed (knots)	13	7	7	2	7	10
Visibility (miles)	5	15	15	8	6	10
Cloud Cover	Scattered 20,000	Clear	Few clouds 2,400, scattered 11,000	Broken 1,100, Scattered 1,400	Broken 1,600, Overcast 2,200	Clear
Temp (Celsius)	-26	-31	-31	-37	-24	-31
Dew Point (Celsius)	-29	-34	-35	-30	-28	-34
Altimeter	30.11	30.15	30.17	N/A	N/A	30.13
Notes	Mist	N/A	N/A	Light Snow	Light Snow, Mist	N/A
Kuparuk Weather Conditions						
Time of Observation	18:45	15:45	19:45	14:45	19:45	13:47
Wind Direction (magnetic)	NE	NE	NE	W	W	ENE
Wind Speed (knots)	14	10	7	8	8	9
Visibility (miles)	7	10	10	10	7	10
Cloud Cover	Few at 22,000	Clear	Few clouds at 2700ft Few clouds at 19000ft	Overcast 1,200	Overcast 2,200	Clear
Temp (Celsius)	-26	-30	N/A	-30	-28	-33
Dew Point (Celsius)	-28	-33	N/A	-32	-34	-36
Altimeter	N/A	30.14	N/A	N/A	N/A	30.13
Notes	N/A	N/A	N/A	N/A	Light Snow	N/A
Nuiqsut Weather Conditions						
Time of Observation	18:53	15:53	19:53	14:53	19:53	13:53
Wind Direction (magnetic)	NNE	NE	NNE	S	S	NNE
Wind Speed (knots)	11	40	5	5	6	4
Visibility (miles)	4	10	10	9	5	10
Cloud Cover	Scattered 400	Clear below 12,000	Broken 2,300	Overcast 1,400	Overcast 1,500	Clear below 12,000
Temp (Celsius)	-26	-31	-34	-28	-27	-32
Dew Point (Celsius)	-29	-34	-34	-31	-31	-35
Altimeter	30.12	30.16	30.17	30.09	30.09	30.14
Notes	Haze	N/A	N/A	N/A	Haze	N/A

Table 3 2015-2016 CPAI Hotspots Discovered

Hotspot	Date Discovered	Discovery Platform/Sensor	Subsequent Examinations (Platform)	Location	Notes	Video Details
Hotspot 1501	12/2/2015	Twin Otter/Safire HD380	12/4/2015 Twin Otter; 12/10/2015 GA-8	70°29'56.57"N 149° 5'37.00"W	Cottle Island	See Video Clips: SSA_HS1501_Dec2_1.MP4 SSA_HS1501_Dec2_2.MP4 SSA_HS1501_Dec4.MP4 FWS_HS1501_Dec10.MP4
Hotspot 1502	12/3/2015	Twin Otter/Safire HD380	12/4/2015 Twin Otter(flown twice); 12/5/2015 Twin Otter	70°15'36.60"N 151° 2'30.11"W	NPRA-Repeated flights resulted in a determination that this was NOT a den.	See Video Clips: SSA_HS1502_Dec3.MP4 SSA_HS1502_Dec4_1.MP4 SSA_HS1502_Dec4_2.MP4 SSA_HS1502_Dec5.MP4

FIGURES





PHOTOS



Photo 1: Hot Spot 1501

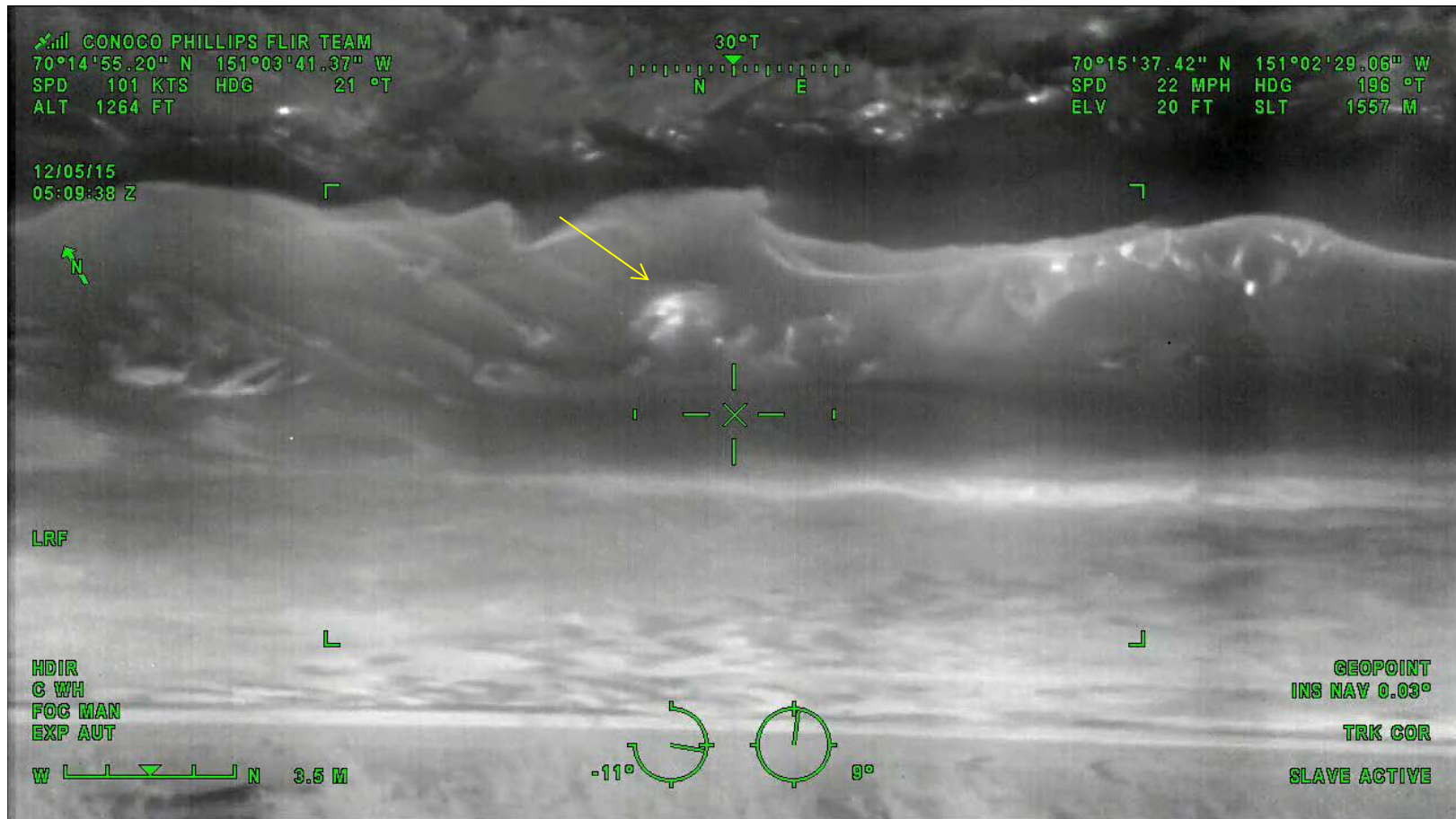


Photo 2: Hot Spot 1502