

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



Winter 2014/2015
FINAL

Prepared for:



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

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Introduction

Between December 3 and December 6, 2014 ConocoPhillips Alaska, Inc. (CPAI) sponsored Forward Looking Infrared (FLIR) surveys on the North Slope of Alaska around proposed activities planned for the winter of 2014/2015. The proposed activities included:

- Routine operations and exploration drilling in the vicinity of the Oliktok Point, Kalubik Creek, and DS-3S areas within the Kuparuk River Unit;
- Alpine oil field operations in the Colville River Delta;
- Construction in the Alpine CD5 area;
- Seismic data acquisition in the National Petroleum Reserve – Alaska (NPRA); and
- Annual and project-specific ice road construction both within and near existing lease units.

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 13, 2014. 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 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 winter activities.

Lakes and creeks were surveyed within the NPRA (Figure 1), and the Colville River Delta (Figure 2) on December 4 and 5.

The Oliktok Point and Kalubik Creek areas in the Kuparuk field were surveyed on December 3, 4, 5, and 6 (Figure 3).

Results

Two heat signatures indicative of potential dens (Hotspots 1401 and 1402) were discovered on December 3rd in the Oliktok Point area (Figure 3). A bear was observed actively excavating a den at Hotspot 1402 on December 3rd. The hotspots were revisited numerous times over the following days. Both heat signatures remained strong and are believed to represent active maternal polar bear dens (Photos 1 and 2).

At USFWS's direction CPAI conducted several "control" flights over known historical denning locations to calibrate the equipment and crew. Other hot spots were discovered during these control flights however none of them were near CPAI planned areas of operation (See Table 3 and Photos 3 and 4).

Technical difficulties prevented complete video capture on December 3 and 4. Images of hotspots were recorded using handheld mobile devices pointed at the FLIR Operator's Console. Complete mission video was recorded to Mini-DV Cassette on December 5 and 6. All video footage was reviewed after the flights for verification and released to USFWS.

Summary

CPAI, though collaboration with USFWS, has suspended all travel within 1 mile radius of Hotspots 1401 and 1402 until the dens are verified to be abandoned, or after April 15th, pending consultation with the USFWS.

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

Table 1 Winter 2014-2015 CPAI Polar Bear Den FLIR Survey Details

	Survey 1: December 3, 2014	Survey 2: December 4, 2014	Survey 3: December 5, 2014	Survey 4: December 6, 2014
Departed	20:43	21:37	20:14	19:19
Landed	23:03	0:23	23:56	20:46
Pilot	Dave McElroy	Dave McElroy	Dave McElroy	Dave McElroy
Co-Pilot	Craig Briske	Craig Briske	Craig Briske	Craig Briske
FLIR Operator	Brian Nelson	Brian Nelson	Brian Nelson	Brian Nelson
Survey Coordinator	Justin Blank	Justin Blank	Justin Blank	Justin Blank
Observer(s)	Willow Hetrick, Nathan Wolf, Bonnie Easley-Appleyard, Robyn McGhee	Willow Hetrick, Nathan Wolf, Bonnie Easley-Appleyard	Willow Hetrick, Nathan Wolf, Jodi Smith	Willow Hetrick, Nathan Wolf
Area Surveyed	Staging Pad (Control), Cottle Island (Control) (Discovered Hotspot 1408), Kalubik Creek, Oliktok Point (Discovered Hotspots 1401, 1402), Ugnuravik River.	Hot Spot #1401, Hot Spot #1402, Staging Pad (Control), Cottle Island (Hotspot 1408), Southside of Jones Islands, Colville River Delta, CD-5 Area, NPRA.	GMT1, Colville River Delta, Hot Spot #1401, Hot Spot #1402, Staging Pad (Discovered Hotspot 1404), Cottle Island (Hotspot 1408).	Hot Spot #1401, #1402, Cottle Island (Hotspot 1408).
Notes	Video capture problems. Only short images of hotspots were captured utilizing mobile devices belonging to the crew.	Video capture problems. Only short images of hotspots were captured utilizing mobile devices belonging to the crew.	Complete Flight Video was captured onto Mini-DV cassette.	Complete Flight Video was captured onto Mini-DV cassette.

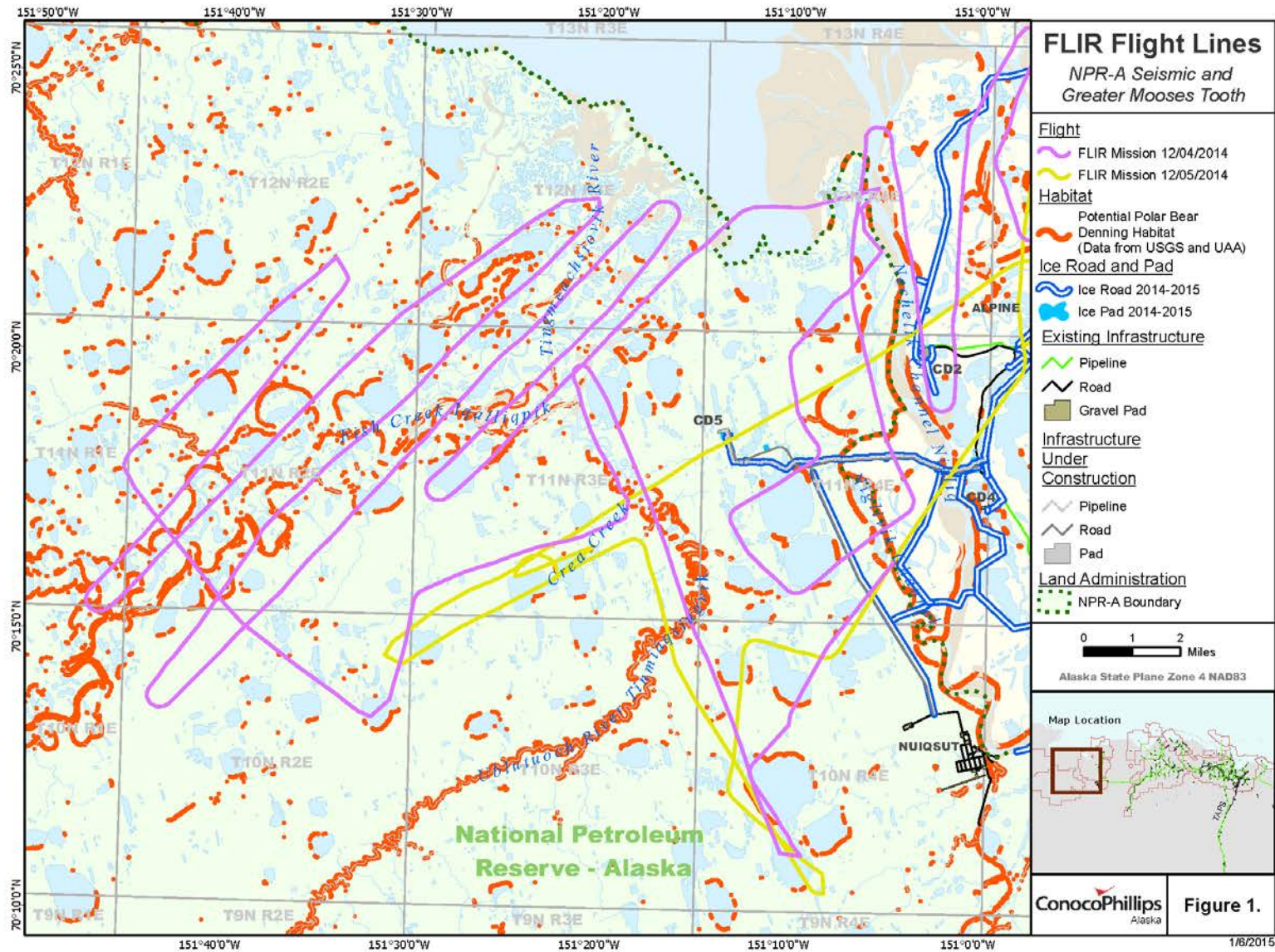
Table 2 Weather Conditions

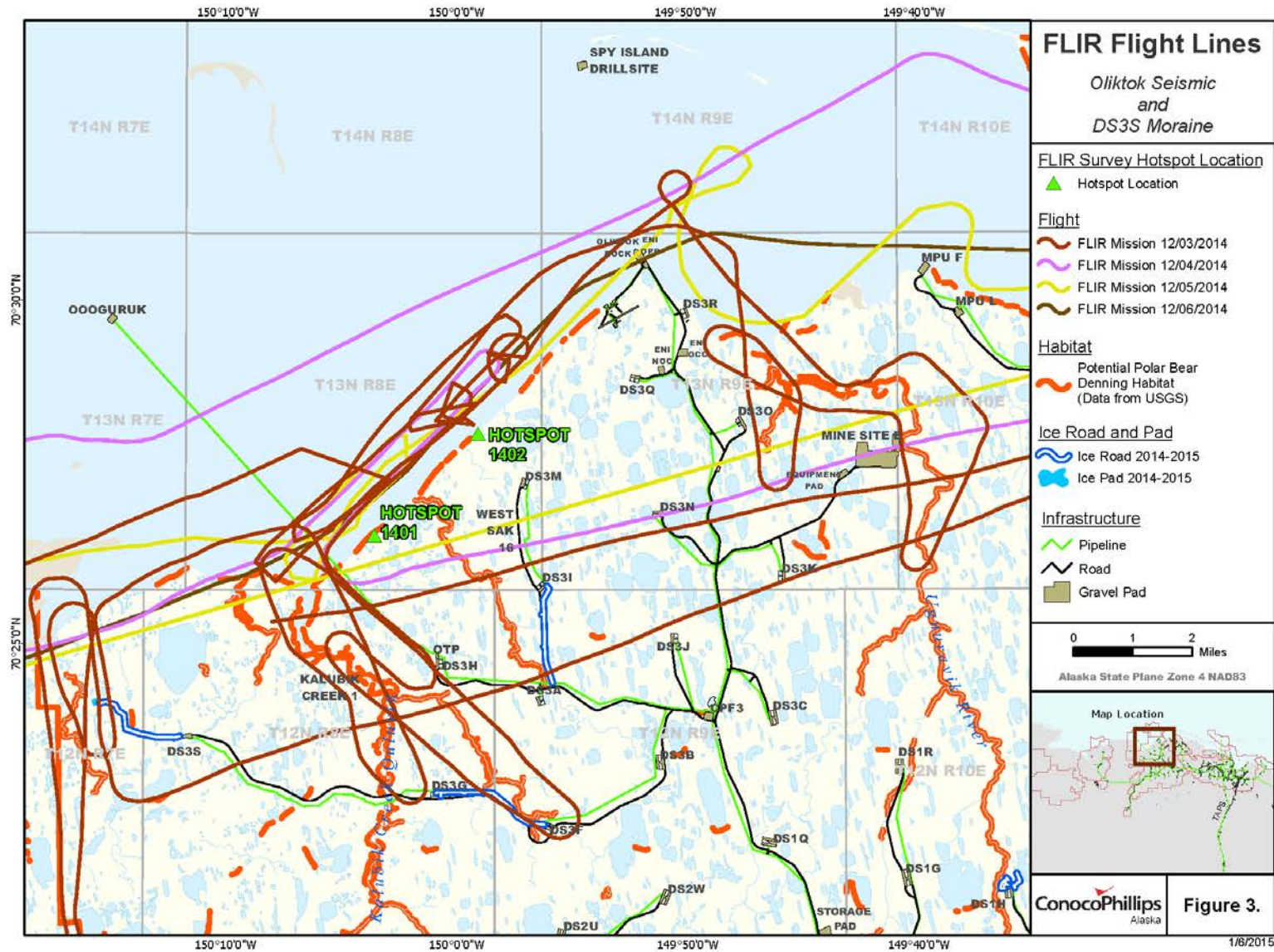
	3-Dec-14	4-Dec-14	5-Dec-14	6-Dec-14
Alpine Weather Conditions				
Time of Observation	21:45	21:45	20:51	19:45
Wind Direction (magnetic)	n/a	n/a	ENE	NE
Wind Speed (knots)	Calm	Calm	9	11
Visibility (miles)	10	10	10	15
Cloud Cover	Broken 500	Broken 1,000	Broken 1,100	Broken 1,300
Temp (Celsius)	-9	-11	3	-8
Dew Point (Celsius)	-15	-17	-2	-13
Altimeter	30.09	30.26	30.32	30.22
Notes	Mostly Cloudy	Mostly Cloudy	Mostly Cloudy	Mostly Cloudy
Deadhorse Weather Conditions				
Time of Observation	21:53	21:53	20:53	19:53
Wind Direction (magnetic)	W	WNW	ENE	NE
Wind Speed (knots)	5	4	14	15
Visibility (miles)	10	10	6	9
Cloud Cover	Overcast 600	Overcast 4,900	Overcast 1,300	Overcast 1,500
Temp (Celsius)	-3	-6	-1	-7
Dew Point (Celsius)	-9	-14	-7	-13
Altimeter	390.06	30.25	30.31	30.18
Notes	Overcast	Cloudy	Haze	Light Fog
Kuparuk Weather Conditions				
Time of Observation	18:45	18:45	18:45	17:50
Wind Direction (magnetic)	Variable	WNW	ENE	ENE
Wind Speed (knots)	2	4	6	10
Visibility (miles)	10	10	10	10
Cloud Cover	Broken 800	Broken 5,500	Overcast 1,100	Overcast 1,300
Temp (Celsius)	-11	-13	0	-9
Dew Point (Celsius)	-18	-13	-4	-13
Altimeter	30.14	30.23	30.33	30.21
Notes	Mostly Cloudy	Mostly Cloudy	Snow Showers	Cloudy
Nuiqsut Weather Conditions				
Time of Observation	21:53	21:53	20:53	19:40
Wind Direction (magnetic)	W	WSW	E	NE
Wind Speed (knots)	5	3	12	13
Visibility (miles)	5	3	4	3
Cloud Cover	Overcast 600	Clear	Overcast 1,300	Overcast 1,500
Temp (Celsius)	-4	-11	1	-8
Dew Point (Celsius)	-11	-16	-4	-13
Altimeter	30.06	30.28	30.33	30.23
Notes	Overcast	Haze	Blowing Snow	Haze

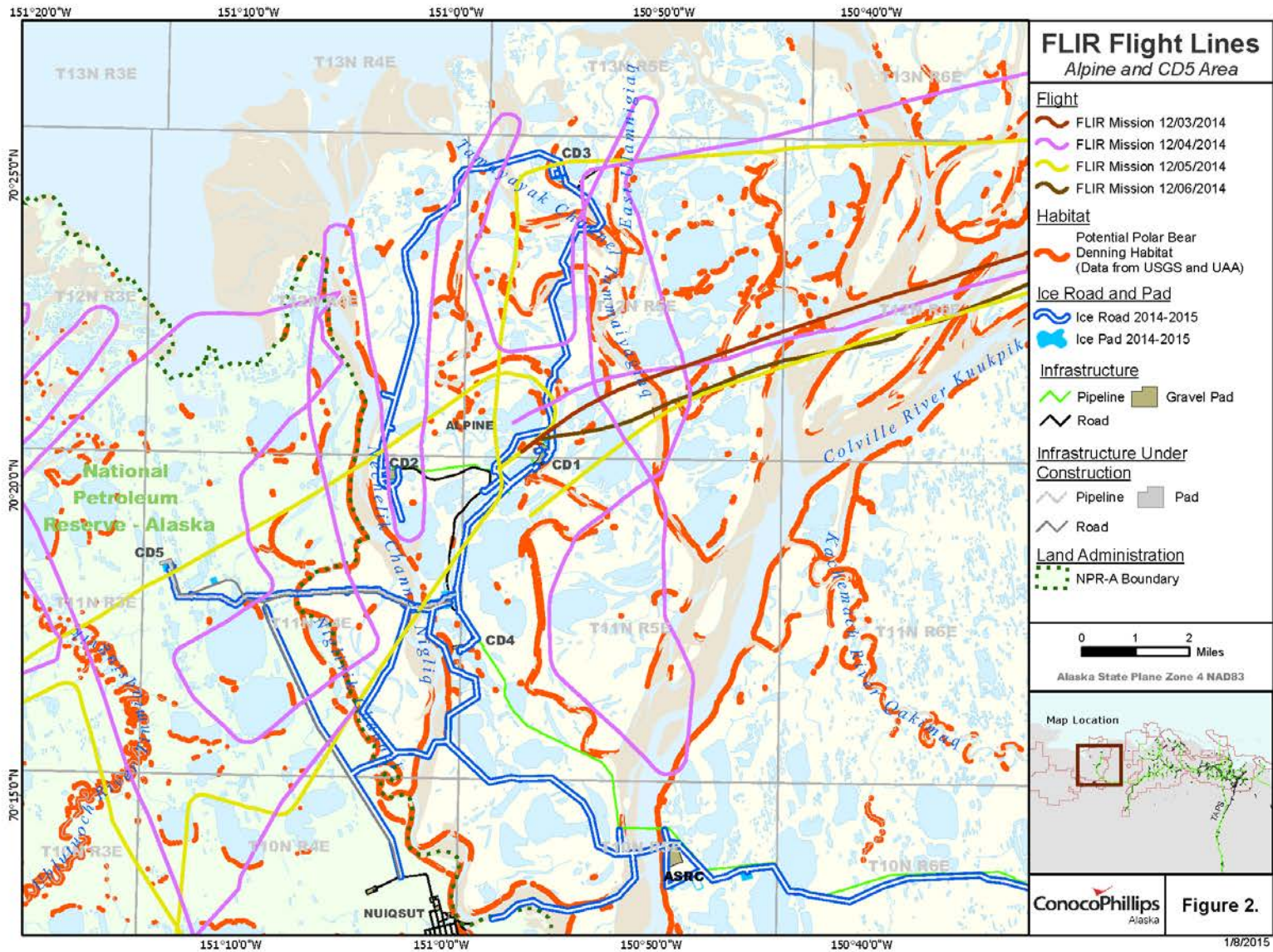
Table 3 2014-2015 CPAI Hotspots Discovered

	Date Discovered	Location	Notes
Hotspot 1401	12/3/2014	N70 26 35.5 W150 03 37.1	0.9 mile from Ooguruk Iceroad route between Kalubik and Oliktok. Hole was still open and fresh. Tracks visible. Estimated den entrance date between Dec 1-3. Heat signature did not dissipate over the following days. It is believed that bear remained at location.
Hotspot 1402	12/3/2014	N70 28 04.5 W149 59 06.1	Near Oliktok. Bear was seen excavating the den so believed entry date is 12/3/14. Heat signature did not dissipate over the following days. It is believed that bear remained at location.
Hotspot 1404	12/5/2014	N70 29 18.8 W149 14 37.4	Staging Pad. This was flown Dec 3, 4 with no dens noticed, then on 12/5 den spotted. Estimated den entry date 12/5/14. Heat signature did not dissipate over the following days. It is believed that bear remained at location.
Hotspot 1408	12/3/2014	N70 29 52.8 W149 05 39.0	Cottle Island. There were several excavations. Most cooled down except for this one and maybe one immediately west. Though this spot was discovered early in the surveys it did not receive a number because we were waiting for 1 of the excavations to remain hot after the other 7 observations on the island had cooled down. By December 13 this was the only obviously warm spot. Estimate den entrance date between Dec 1-3. It is believed that bear remained at location.

FIGURES







PHOTOS



Photo 1: Hot Spot 1401



Photo 2: Hot Spot 1402



Photo 3: Hotspot 1404



Photo 4: Hot Spot 1408. Although several heat signatures are visible it is believed that the bear remained at the location indicated by yellow arrow.