

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

**Survey conducted by ConocoPhillips Alaska, Inc.**

**Winter 2010/2011**

Prepared for the United States Fish and Wildlife Service

### **Introduction**

Between December 9, 2010 and January 8, 2011 ConocoPhillips Alaska Inc. (CPAI) conducted Forward Looking Infrared (FLIR) surveys on the North Slope of Alaska within a one-mile buffer around proposed activities planned for the winter of 2010/2011. The 2010/2011 proposed activities include:

- Seismic data acquisition in and around the Kuparuk River Unit.
- Alpine oil field operations in the Colville River Delta area.
- Hemi Springs wellsite plug and abandonment.
- Puviaq 1 wellsite plug and abandonment.

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

### **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 1,000 feet above ground level (agl) depending on weather conditions. The crew used Global Positioning Satellite (GPS) 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. Suspect heat signatures were re-visited during subsequent surveys.

The surveys were not completed as planned in December due to weather and equipment delays. Therefore the remaining surveys were flown in early January.

## Results

All GPS coordinates appearing in this document are in World Geodetic System 1984 (WGS 84) format.

Weather conditions for the surveys are shown on Table 2. Visibility was good for all surveys, except for the January 7, 2010 flight, which was cut short due to persistent fog.

On December 9, 2010 the survey began on the Colville River Delta. Various channels and locations were examined in anticipation of ice road construction and tundra travel. Two suspect heat signatures were observed. The first was along the Sakoonang Channel at N70 22.391 W150 58.807 (ALP Hotspot 1). The second was near Lake M0677 at N70 25.005 W150 59.848 (ALP Hotspot 2). Several locations around the proposed Fiord West and CD5 locations were also surveyed. The survey transects and hotspot locations are shown on Figure 1.

The December 10, 2010 survey covered the Hemi Springs area (Figure 2) and several locations within the Kuparuk 3D seismic survey area (Figure 3). No potential dens were identified. The Alpine area hotspots located on December 9<sup>th</sup> were also re-flown, but due to scheduling conflicts the crew was only able to make one pass on each site (Figure 4).

The Alpine hotspots were re-flown again on December 12, 2010 (Figure 5) in order to obtain additional footage of the sites.

Four well sites (Aklaqyaaq, Aklaq 2, Aklaq 6, and Puviaq 1) scheduled to be plugged and abandoned, as well as the associated travel corridors, were surveyed west of Teshekpuk Lake in the National Petroleum Reserve-Alaska on January 3, 2011 (Figures 6 and 7). CPAI will only be conducting operations associated with the Puviaq 1 site; however as a prudent measure all sites were surveyed to further reduce the probability of a human/polar bear interaction. No potential dens were identified in these areas.

On January 7, 2011 the crew set out to survey various locations in the NPR-A. However, thick fog only allowed for survey of Eskimo Island and the barrier island immediately to the west (Figure 8). No potential dens were identified in these areas.

Banks and bluffs along Teshekpuk Lake, the Kogru River, Atiguaru Point and several barrier Islands were surveyed on January 8, 2010 (Figures 9 and 10). No potential dens were identified in these areas.

One of the hotspots (ALP Hotspot 1) in the Colville River Delta was re-surveyed on January 8<sup>th</sup> in order to obtain additional footage of the suspected den site (Figure 11).

The final January 8, 2011 survey concentrated on a segment of the Miluveach River within the Kuparuk 3D seismic survey area (Figure 12). No potential dens were identified in this area.

After subsequent surveys and review of the footage ALP Hotspot 1 was determined to have a high probability of being a maternal polar bear den; ALP Hotspot 2 was ruled out as a den site, and was believed to be associated with an ice feature. On December 13, 2010 Caryn Rea (CPAI) met with Christopher Putnam (USFWS). Mr. Putnam concurred that ALP Hotspot 1 should be treated as a den location, and that ALP Hotspot 2 was not a den location therefore work in that area could continue as planned. FLIR images of ALP Hotspot 1 are included as Photos 1 and 2.

### **Summary**

CPAI has suspended all travel within one mile of the suspected maternal Polar Bear den along the Sakoonang Channel at N70 22.391 W150 58.807 (ALP Hotspot 1). Additionally, CPAI will be extremely vigilant during the spring den-emergence period to avoid human/bear interactions.

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 listed in CPAI's Polar Bear/Human Interaction Plan. USFWS will advise on any supplemental findings (e.g. locations of collared bear den locations) once they are obtained.

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Table 1: Winter 2010-2011 CPAI Polar Bear Den FLIR Survey Details

	Survey 1 December 9, 2010	Survey 2 December 10, 2010	Survey 3 December 12, 2010	Survey 4 January 3, 2011	Survey 5 January 7, 2011	Survey 6 January 8, 2011
Departed	18:45	19:15	11:00	18:15	18:15	9:45
Landed	20:55	21:35	12:10	21:45	21:00	14:00
Pilot	Mike Mercier	Mike Mercier	Mike Mercier	Mike Mercier	Andy Fowler	Andy Fowler
Co-Pilot	Jeff Fondy	Jeff Fondy	Jeff Fondy	Glenn Hanson	Erica Bennet	Erica Bennet
FLIR Operator	Terry Kaas	Peter Bjornstad	Peter Bjornstad	Jonathan Plummer	Ron Moore/Will Graham	Peter Bjornstad
Survey Coordinator	Justin Blank	Justin Blank	Justin Blank	Justin Blank	Justin Blank	Justin Blank
Observer	Christopher Putnam	Christopher Putnam				
Area Surveyed	Colville River Delta/CD5 Area/Fjord West Area	Staging Pad/Hemi Springs/Collared Grizzly Dens 006-10 and 139-10/Kuparuk Seismic area/Hot spots near Alpine/KIC artificial control dens	Alpine Hot Spots	Aklaqyaaq 1/Aklaq 2/Aklaq 6/Puviaq 1	Eskimo Island	Teshkepuk Lake/Kogru River/Atiguaru Point and Barrier Islands/Alpine Densite/Kuparuk Seismic Area/KIC artificial control dens

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Table 2 Weather Conditions Reported by CPAI Air Traffic Advisory Centers

	December 9, 2010	December 10, 2010	December 12, 2010	January 3, 2011	January 7, 2011	January 8, 2011
<b>Alpine Weather Conditions</b>						
Time of Observation	16:46	18:48	10:57	17:47	17:59	9:57
Wind Direction (magnetic)	240	280	170	110	210	110
Wind Speed (knots)	8	6	7	20	9	11
Visibility (miles)	10	10	10	7	10	10
Cloud Cover	Clear	Scattered @ 8500 ft.- Scattered @ 11000 ft.- Broken @ 14000 ft.	Overcast @ 7000 ft.	Clear	Clear	Scattered @ 11000 ft.
Temp (Celsius)	-26	-25	-23	-16	-26	-20
Dew Point (Celsius)	-28	-28	-25	-19	-29	-22
Altimeter	3018	3021	2995	2938	3044	3045
Notes				Drifting Snow		
<b>Kuparuk Weather Conditions</b>						
Time of Observation	18:46	18:45	10:50	18:45	18:46	9:45
Wind Direction (magnetic)	230	200	120	80	220	90
Wind Speed (knots)	11	5	6	14	11	9
Visibility (miles)	10	10	10	7	10	10
Cloud Cover	Scattered @ 2800 ft.	Scattered @ 2800 ft.-Broken @ 6500 ft.	Broken @ 7500 ft.-Broken @ 10000 ft.	Scattered @ 1000 ft.-Broken @ 23000 ft.	Overcast @ 8500 ft.	Clear
Temp (Celsius)	-23	-24	-28	-16	-22	-22
Dew Point (Celsius)	-26	-26	-31	-18	-24	-24
Altimeter	3017	3021	2977	2940	3043	3047
Notes		Snow		Drifting Snow		

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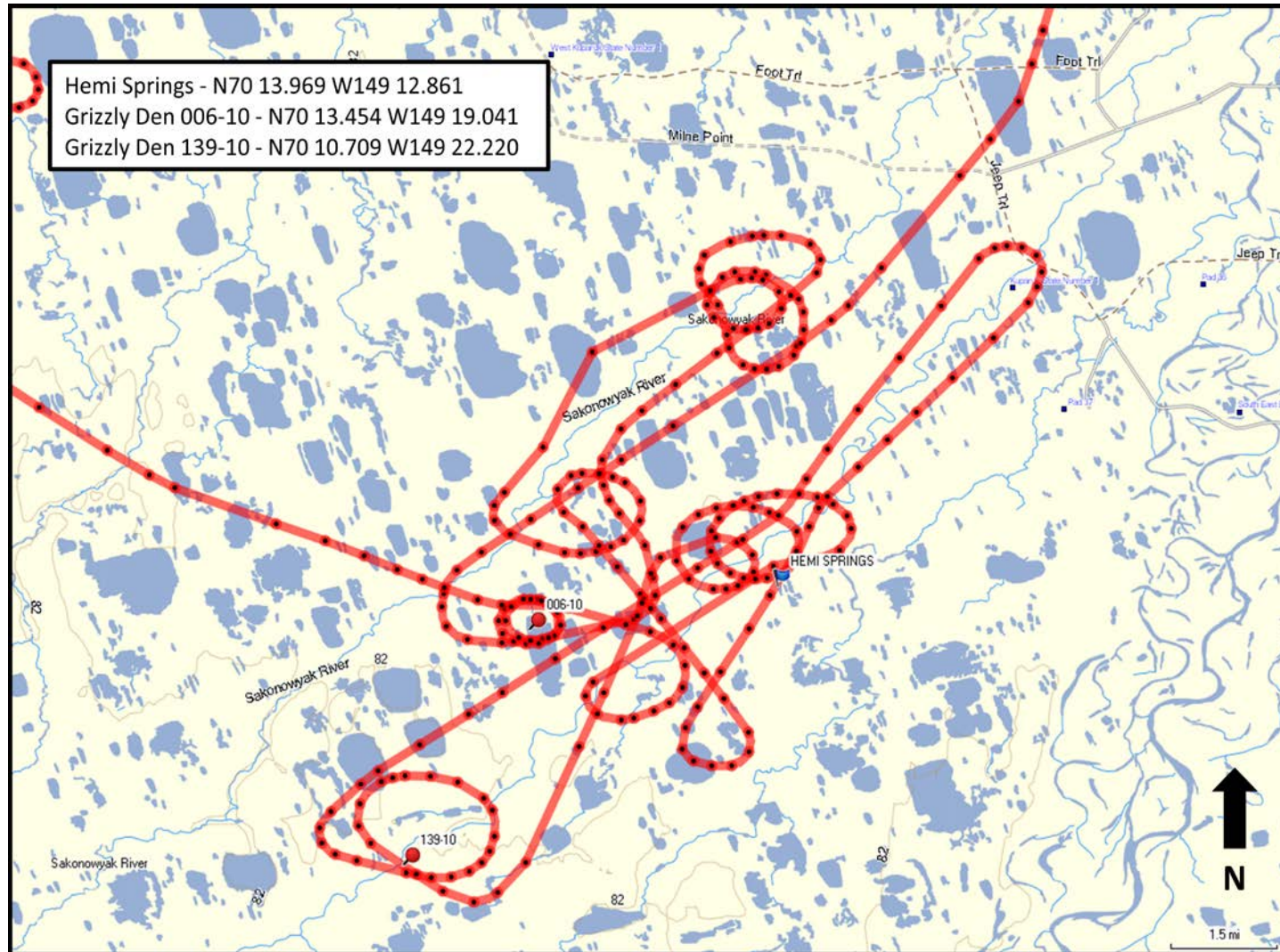


**Figure 1: Actual flight lines (in red) of FLIR survey conducted on the Colville River Delta and in the vicinities of Fiord West and CD5 on December 9, 2010.**



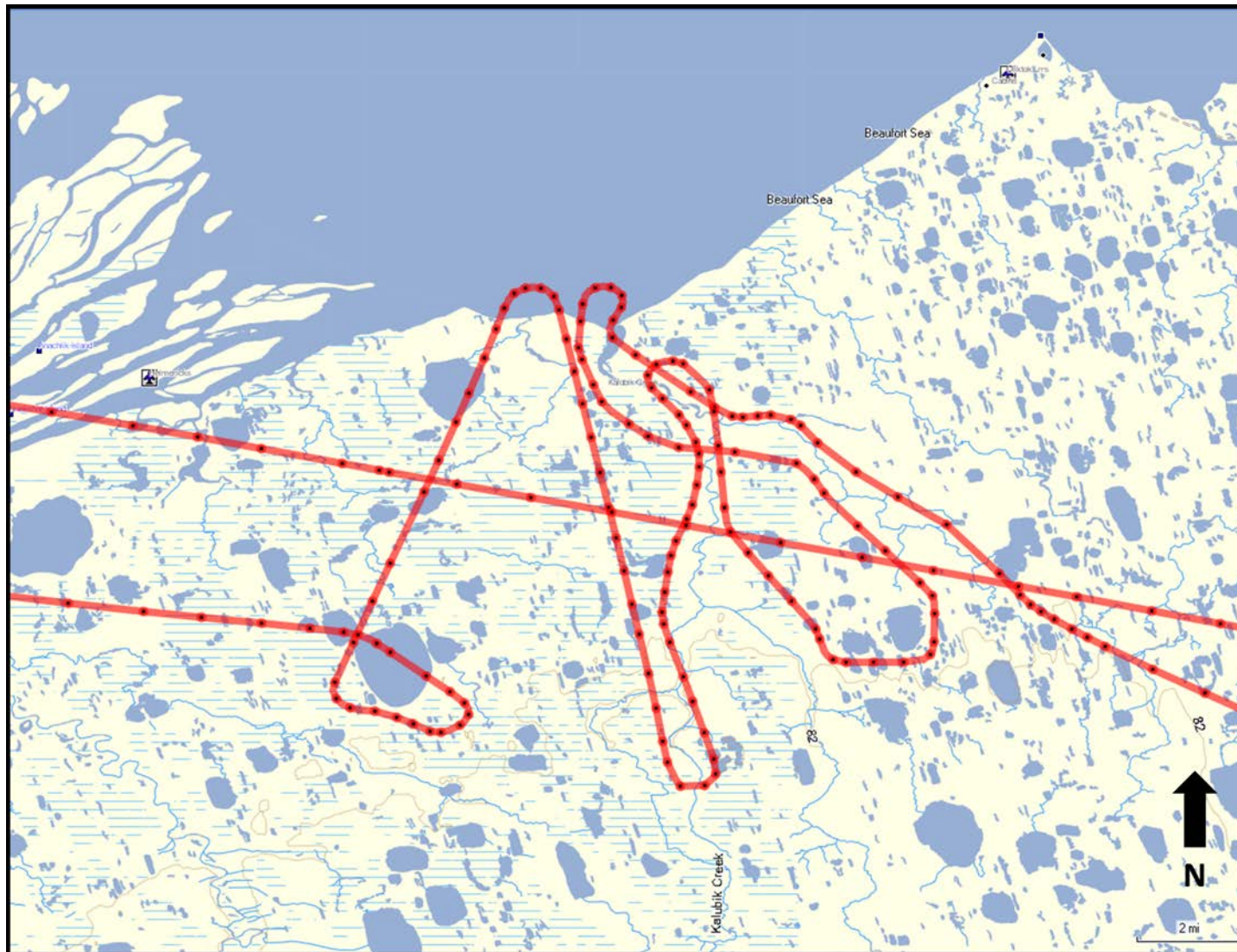
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**Figure 2: Actual flight lines (in red) of FLIR survey conducted for the Hemi Springs area on December 10, 2010. Note that two collared grizzly dens were also investigated.**



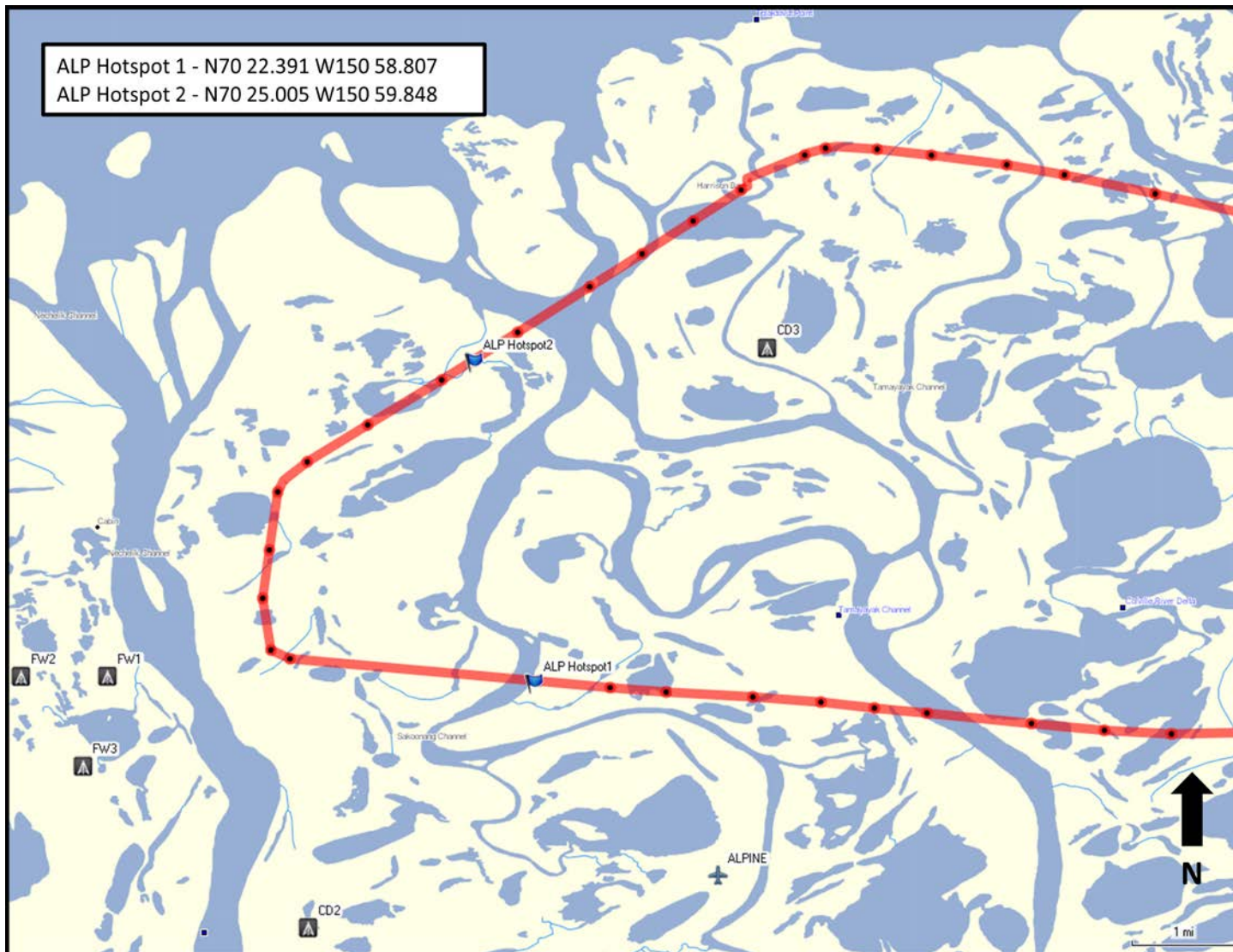
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**Figure 3: Actual flight lines (in red) of FLIR survey conducted in the Kuparuk River Unit on December 10, 2010.**



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**Figure 4: Actual flight lines (in red) of FLIR survey conducted on December 10, 2010 to re-assess two previously identified hotspots on the Colville River Delta, Alaska.**



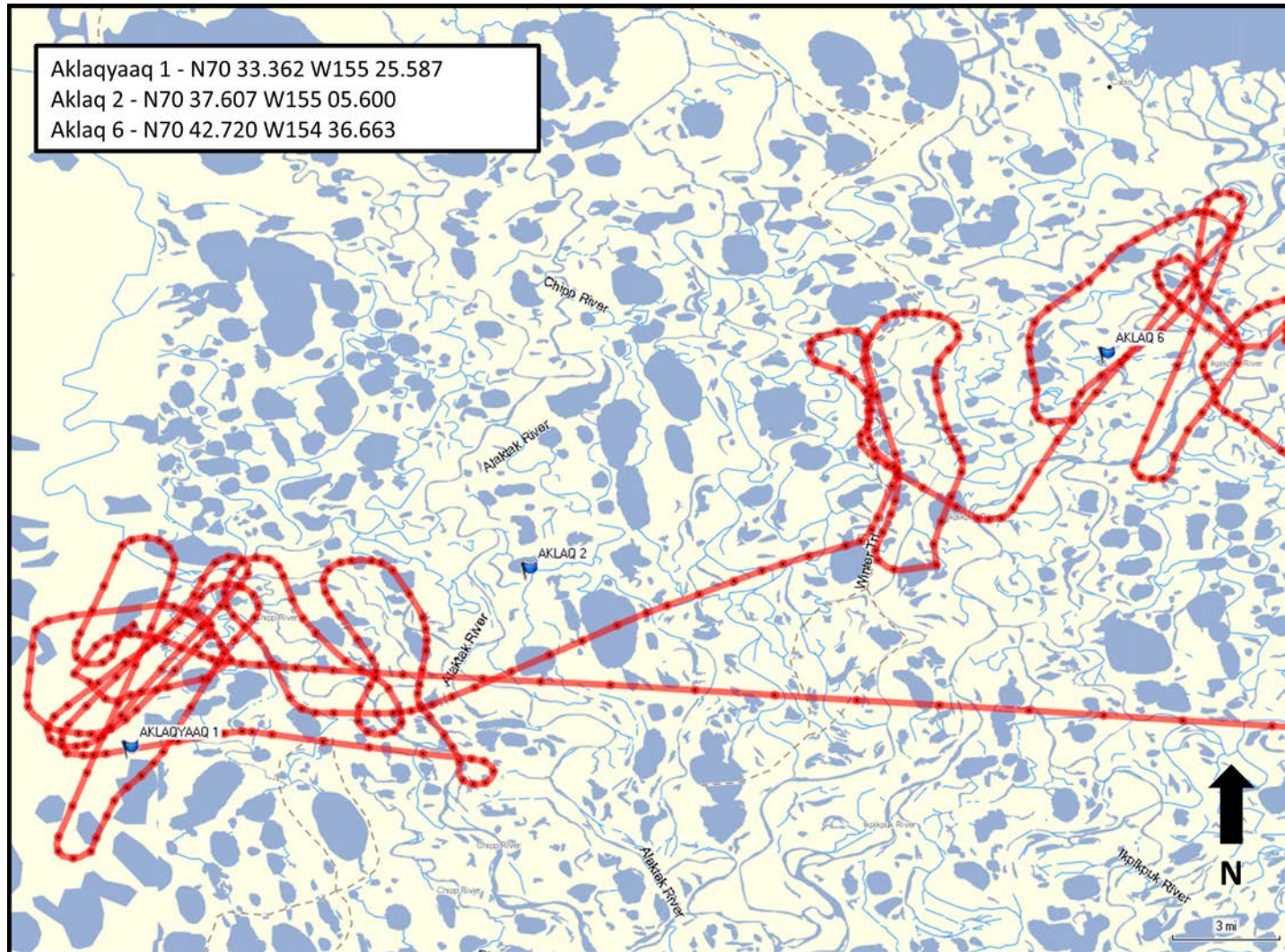
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**Figure 6: Actual flight lines (in red) of FLIR survey conducted on January 3, 2011 in the National Petroleum Reserve-Alaska (NPR-A).**



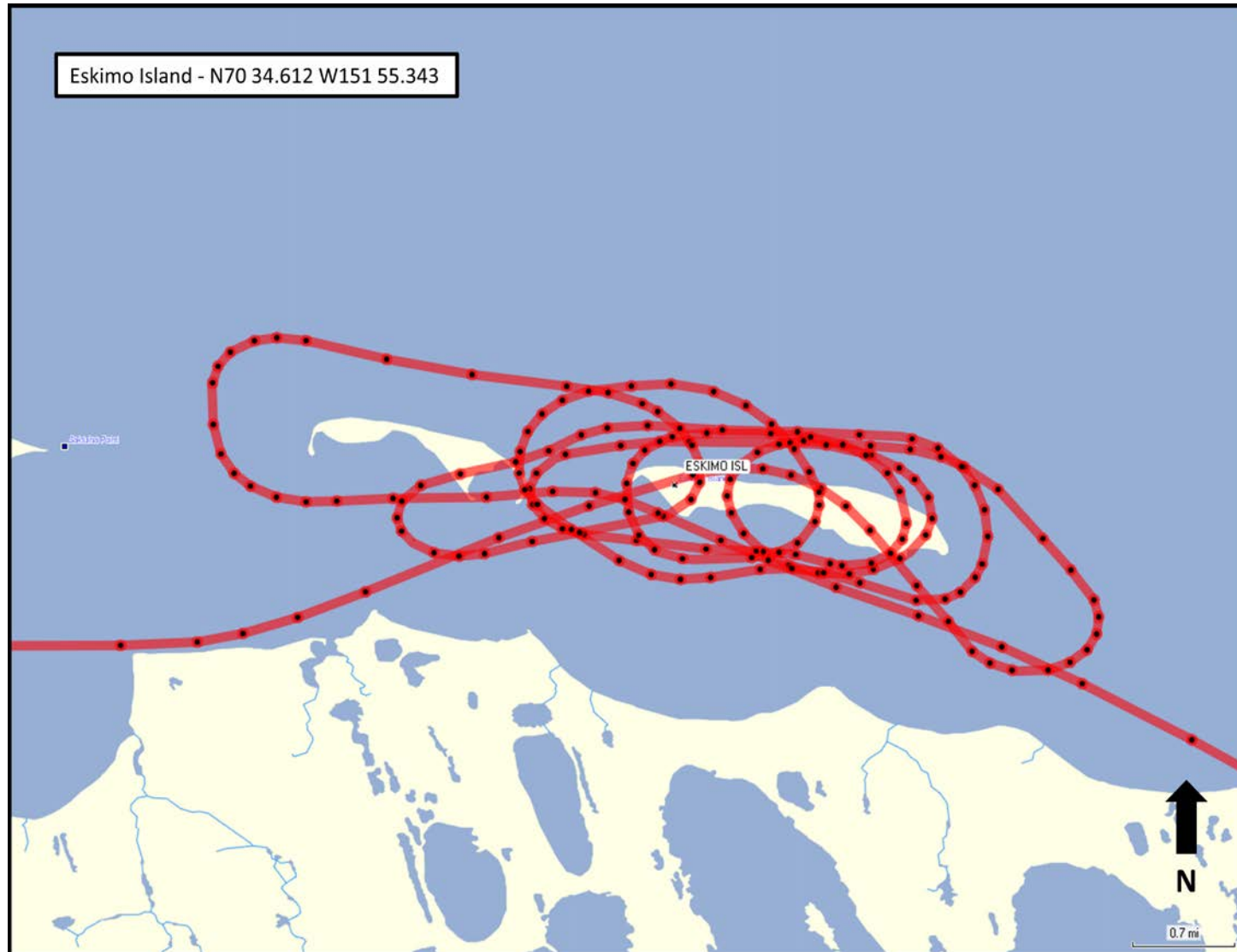
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**Figure 7: Actual flight lines (in red) of FLIR survey conducted on January 3, 2011 near the Puviaq 1 well site in the National Petroleum Reserve-Alaska (NPR-A).**



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**Figure 8: Actual flight lines (in red) of FLIR survey conducted on January 7, 2011 in the area of Eskimo Island, Alaska.**



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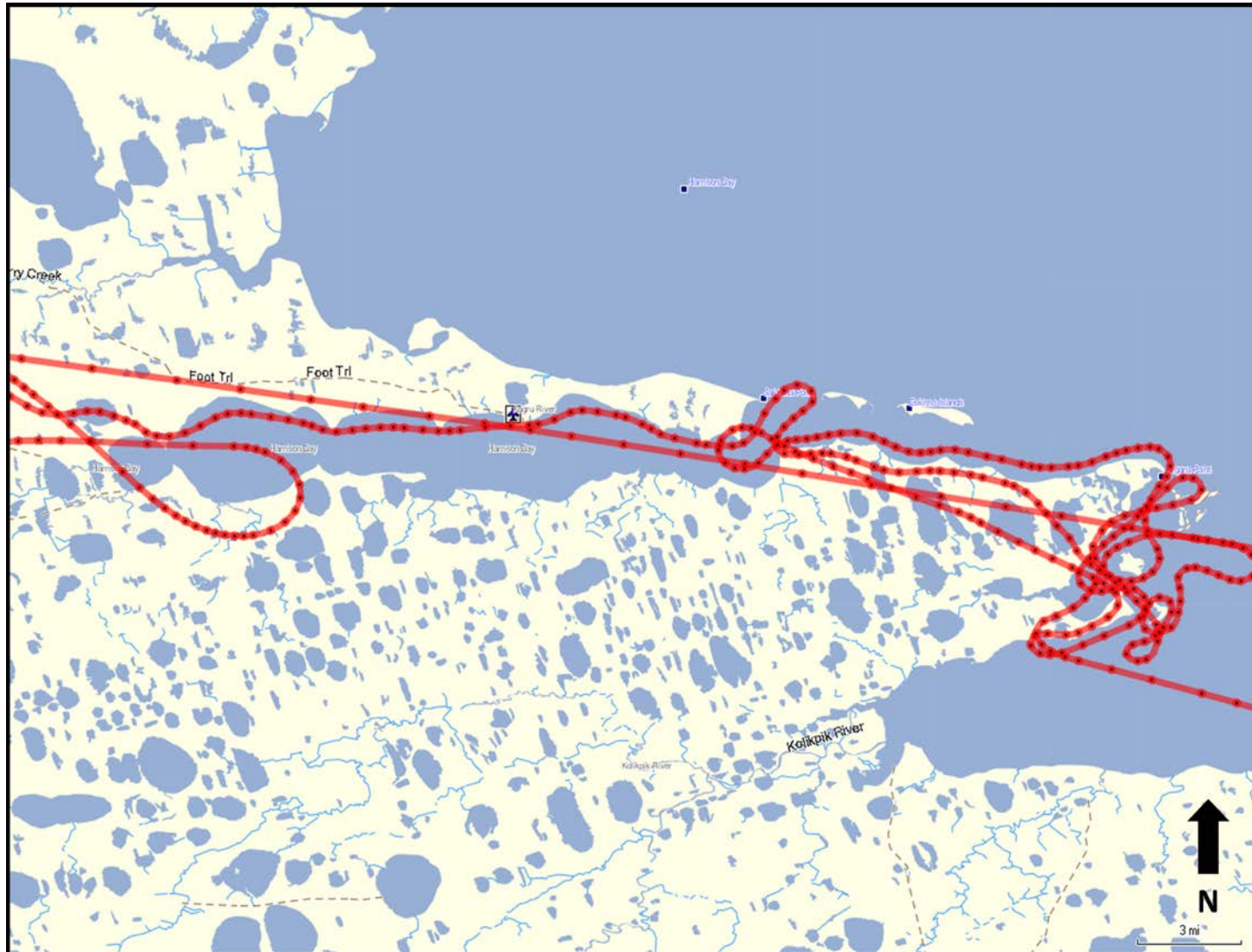


**Figure 9: Actual flight lines (in red) of FLIR survey conducted on January 8, 2011 along the shore of Teshekpuk Lake.**



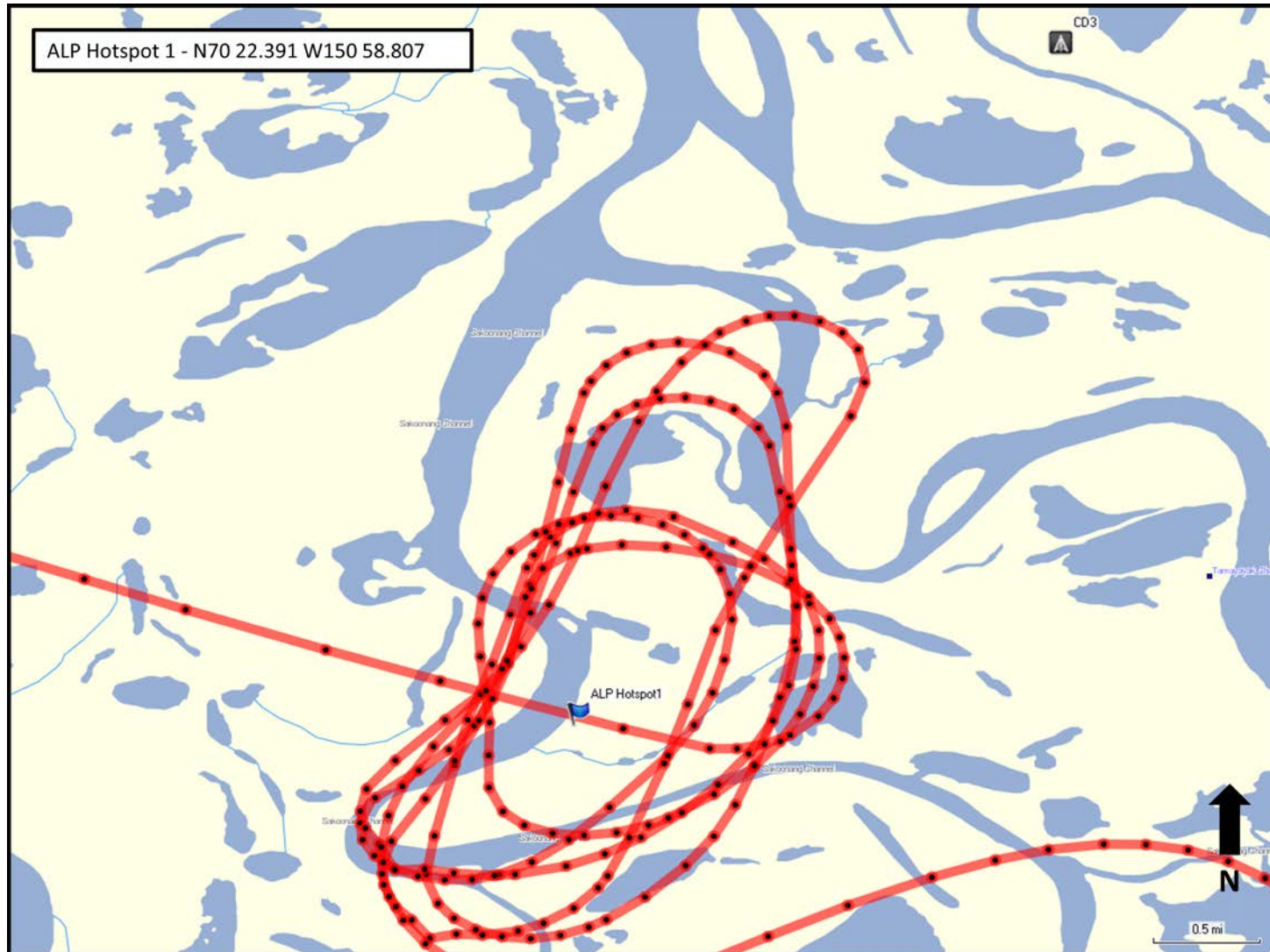
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**Figure 10: Actual flight lines (in red) of FLIR survey conducted on January 8, 2011 along the shore of the Kogru River, Atigaru Point, and nearby barrier islands.**



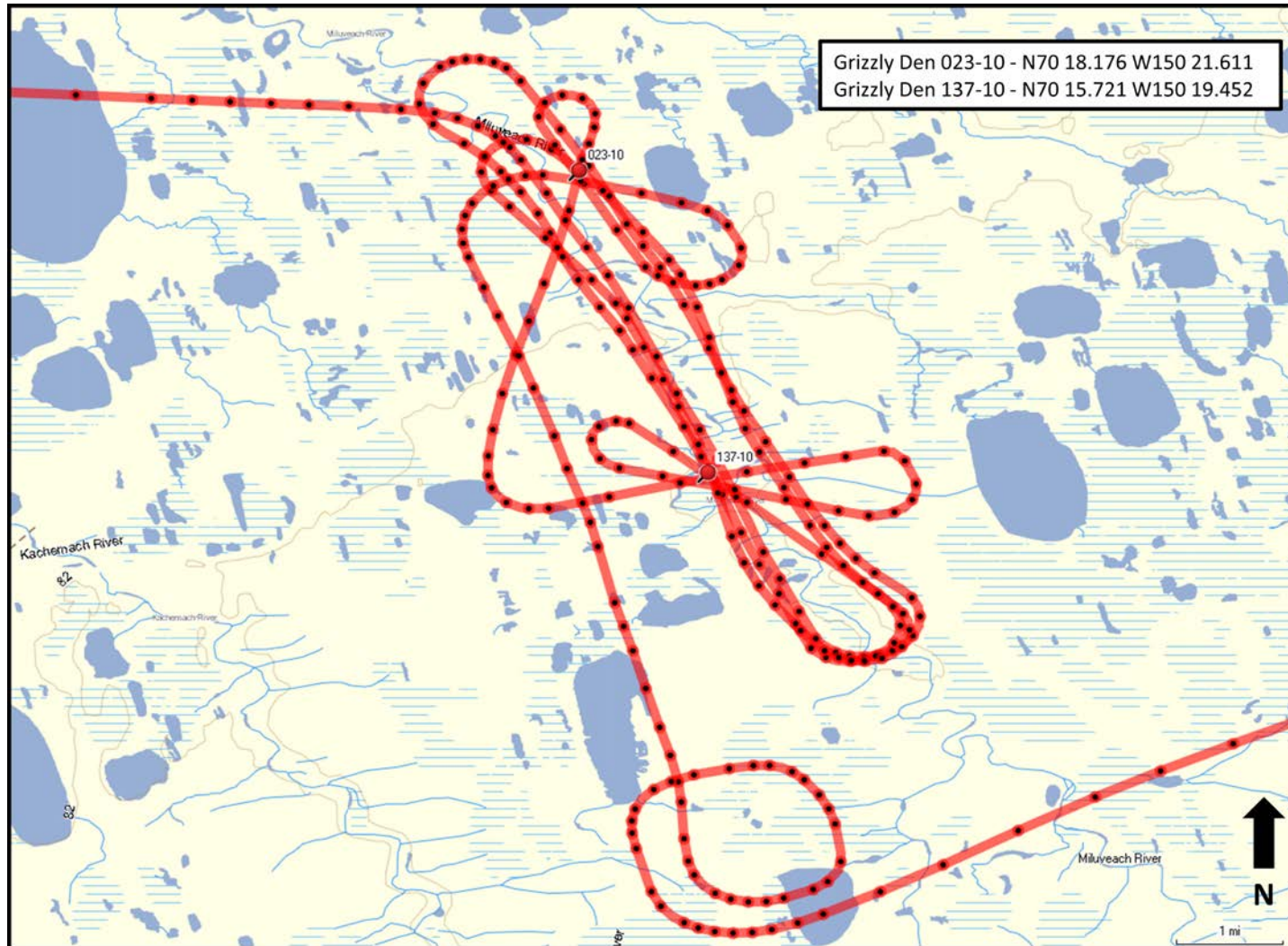
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**Figure 11: Actual flight lines (in red) of FLIR survey conducted on January 8, 2011 to re-assess a previously identified hotspot on the Colville River Delta, Alaska.**



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**Figure 12: Actual flight lines (in red) of FLIR survey conducted on January 8, 2011 along the Miluveach River near the Kuparuk River Unit. Note that two collared grizzly dens were also investigated.**



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**Photo 1: FLIR image of suspected polar bear den site (ALP Hotspot 1) located on the Colville River Delta at N70 22.391 W150 58.807 taken on December 9<sup>th</sup>, 2010. The yellow arrow indicates the detected heat signature on the east bank of the Sakoonang Channel with frozen water in the foreground and tundra in the background.**



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**Photo 2: FLIR image of suspected polar bear den site (ALP Hotspot 1) located on the Colville River Delta at N70 22.391 W150 58.807 taken on December 12<sup>th</sup>, 2010. The yellow arrow indicates the detected heat signature on the east bank of the Sakoonang Channel with frozen water in the foreground and tundra in the background.**



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