



**EIDER NEST SEARCHES IN THE  
ALPINE OILFIELD AREA, ALASKA, 2019**

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Prepared for  
**CONOCOPHILLIPS ALASKA, INC.**  
Anchorage, Alaska

Prepared by  
**ABR, INC.—ENVIRONMENTAL RESEARCH & SERVICES**  
Fairbanks, Alaska

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Female Spectacled Eider on nest. Photograph © ConocoPhillips Alaska, Inc. All rights reserved.

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## INTRODUCTION

The Alpine Satellite Development Project (Alpine Oilfield) is within the current or historic ranges of 2 species of eiders that are listed as threatened under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.): the Spectacled Eider (*Somateria fischeri*) and the Steller's Eider (*Polysticta stelleri*). The Alpine Oilfield, operated by ConocoPhillips Alaska, Inc., (CPAI) currently consists of 4 drill sites on the Colville River delta and 2 drill sites (CD-5 and GMT-1/MT-6) plus another drill site under construction at the time of this report (GMT-2/MT-7) in the northeastern National Petroleum Reserve-Alaska (NE NPR-A). To comply with the Terms and Conditions issued in the Biological Opinions for the Alpine satellites, CD-5, GMT-1/MT-6 and GMT-2/MT-7 (USFWS 2004, 2011, 2014, 2015, 2018) and to reduce potential disturbance to breeding eiders, CPAI Operations requires documentation of the presence or absence of eider nests prior to initiating off-pad activities during the nesting season. If eider nests are found, CPAI then modifies those activities to avoid disturbance, after consultation with U.S. Fish and Wildlife Service (USFWS). CPAI contracted ABR, Inc.—Environmental Research & Services (ABR) to conduct nest searches for eiders on the Colville River delta and adjacent areas where off-pad activities were scheduled during the 2019 breeding season. In this report, we document the presence or absence of eider nests in 10 search areas: 7 Alaska Clean Seas (ACS) spill-response equipment sites, the CD-5 habitat plots, VSM-726 near CD-1, and the pipeline/powerline between CD-1 and CD-4 (Figures 1 and 2).

Spectacled Eiders are common breeders on the Colville River delta and NE NPR-A. However, Spectacled Eider nests are not distributed uniformly in the Alpine area (Johnson et al. 2015). Spectacled Eider nests are relatively common on the outer Colville delta where the CD-3 drill site is operated as a roadless satellite to the Alpine Oilfield, less common in the areas around CD-1, CD-2, CD-4, and CD-5 (for eider distribution see Figure 4 in Johnson et al. 2018).

In contrast, Steller's Eiders are extremely rare along the central Beaufort Sea coast, where the Alpine Oilfield is located. Their breeding

distribution in Alaska is primarily centered to the northwest of the Alpine area, near Utqiagvik (Barrow), although their historic range included all of the Arctic Coastal Plain of Alaska (Quakenbush et al. 2002). Evidence of nesting by Steller's Eiders east of Barrow has been reported only 3 times in the last 30 years: a single brood was seen inland along the Colville River in 1987 (T. Swem, USFWS, unpubl. data), 1 brood was seen near Prudhoe Bay in 1993 (M. M. Deering, USFWS, pers. comm.), and another brood was seen near the upper Chipp River, approximately 80 km inland from the Dease Inlet/Admiralty Bay area in 1997 (King and Dau 1997). In the last 22 years, Steller's Eiders have been sighted only 3 times on the Colville delta (1995 [J. Bart, Boise State University, pers. comm.], and 2001 and 2007 [Johnson et al. 2002, 2008a]), and only 5 times in the Greater Kuparuk Area (1995, 2000, 2001, 2007, and 2014 [Anderson et al. 2008; CPAI, unpubl. data]). There are no records of Steller's Eider nests or broods from the Colville River delta or adjacent areas.

Section 9 of the ESA prohibits harming, harassing, and disrupting normal activities of threatened and endangered species, without special exemption. However, under Section 7(b)(4) and 7(o)(2) of the ESA, Incidental Take Statements can be issued to allow actions that are prohibited under Section 9, if they comply with specific terms and conditions. In the Biological Opinions issued prior to construction of the Alpine satellites (CD-3, CD-4, and CD-5), the USFWS stipulated terms and conditions in the Incidental Take Statement that restrict human activity to existing gravel fill within 200 m of occupied Spectacled Eider nests during 1 June–1 August (USFWS 2004, 2011). Where summer support or construction activities must occur off existing gravel fill during that restricted period, USFWS-approved nest surveys for Spectacled Eiders must be conducted during the nesting period prior to those activities so that active nests can be identified and avoided. CPAI conducts off-pad activities necessary for regulatory compliance and operational needs (e.g., tundra clean-up after the ice-road season, spill-response equipment deployment, hydrological monitoring, water access, civil surveys) on the tundra in portions of the nesting habitat of the Spectacled Eider annually during the breeding season (June

and July). Eider nests are difficult to avoid, because female eiders are cryptic and the females of 4 eider species (Steller's, Spectacled, King [*S. spectabilis*], and Common eiders [*S. mollissima*]) are hard to distinguish with the untrained eye. Without prior knowledge of nest locations, workers could accidentally damage eggs or unintentionally flush birds from their nests, leaving eggs exposed to predators.

CPAI has a regulatory obligation in its Oil Discharge Prevention and Contingency Plan for the Alpine Oilfield to stage or deploy spill-response equipment as soon as ice leaves the river channels, which typically overlaps with the eider nesting season. In a meeting on 2 May 2011, USFWS, CPAI, and ABR reviewed the data available on nest initiation dates for Spectacled Eiders and identified 9 June as the earliest known record of nest initiation for Spectacled Eiders on the Colville delta (ABR, unpubl. data). As a result of this meeting, USFWS agreed to postpone the earliest date when nest searches would be required for off-pad activity from 1 June to 9 June. Any off-pad work, including spill-response equipment deployment, from 9 June to 1 August would require nest searches if it occurred in areas where potential nesting habitat of Spectacled Eiders existed.

The summer of 2019 is the eleventh season that eider nest searches have been conducted in advance of off-pad work in the Alpine Oilfield (Seiser and Johnson 2010; 2011a, b; 2012; 2014a, b; 2015; 2016; 2018a, b, c). Over the last 11 years in the Alpine Oilfield, the number of spill-response sites has expanded from 23 sites to 27 plus 4 bridges. The number of sites increased when the CD-5 drill site came on line in 2016, extending the range of sites from Colville River delta as far as the Nigliagvik Channel. Not all ACS sites require nest searches prior to off-pad activities. Ten sites were exempted from nest searches after joint reviews by USFWS, CPAI, and ABR (letters from Caryn Rea, CPAI, to Sarah Conn, USFWS, dated June 2011 and March 2012) because they either lack appropriate eider nesting habitat, contained nesting habitat in insufficient quantity or quality, or had degraded and unusable nesting habitat (for example, the flare site at SK-14A and persistent snow berms at SK-14B). In the cases of ALP-16 and ALP-19, the storage sites but not the anchor

sites were exempted. South of CD-4, the ALP-5 and ALP-3 response sites are in low density areas for pre-nesting eiders. Three new Nigliq response sites not on the list, NK-3, NK-4, and CD-2, also lack nesting habitat.

Currently, 12 ACS sites plus the anchor locations for ALP-16 and ALP-19 and 4 road/pipeline bridge crossings remain on the list for nest searches if maintenance activities are planned during the eider breeding season (Table 1). A summary of the habitat composition and nest search histories at 27 spill-response equipment sites and 4 pipeline bridge sites is presented in Table 1.

## OBJECTIVES

The primary objective of nest searching in 2019 was to document the presence or absence of nesting Spectacled and Steller's eiders prior to off-pad activities. If active nests of Spectacled or Steller's eiders were found, their locations would be transmitted to CPAI field environmental staff. Documentation of nest locations allowed CPAI to modify planned activities occurring near nests, as needed. ABR searched for eider nests in designated off-pad work areas and transmitted information on presence or absence of active Spectacled Eider nests to CPAI field environmental staff within 24 hours of the completion of the search in each work area.

## METHODS

Methods have been similar since USFWS-approved nest searches for off-pad work were initiated in 2009. Eider nest searches were conducted only in the subset of ACS sites that contain suitable nesting habitat and that are scheduled for work visits between 9 June and 1 August. In 2019, 7 ACS sites, the CD-5 habitat monitoring plots, VSM (726) adjacent to CD-1, and the entire pipeline/powerline between CD-1 and CD-4, were scheduled for work activities between 9 June and 1 August, and consequently were searched for eider nests.

We conducted intensive ground-based nest searches for Spectacled Eiders where off-pad work was proposed to occur on the Colville River delta during the breeding season. Search areas included a 200 m buffer around work sites located within



Table 1. Site descriptions for 27 spill-response equipment sites and 4 road/pipeline bridge sites in the Alpine Oilfield and adjacent areas, Alaska, 2009–2019. Sites that were renamed in 2015 have prior names listed in parentheses.

Site Name	Location	Site Description	Wildlife Habitata	Habitat Description	Nesting Habitat Presentb	Search History/ Nesting Records	Years Searched	Search in Future Years?	Comments
ALP-1 (Mil-A)	N 70.24403 W 150.29674	Miluveach River, just north of TransAlpine pipeline.	PWM MSSM TLDS	West side well drained, east side is MSSM grading to PWM	Yes	No/No	2011	No	Conexes are located on a well-drained bluff. Search area on the opposite bank, near boom anchor point, contains marginal nesting habitat.
ALP-2 (Kach-A)	N 70.23750 W 150.45838	Kachemach River, just north of TransAlpine pipeline.	MSSM MTT NWM TLDS	Small pocket of wet meadow surrounded by drier habitat	No	No/No	2011	No	Unsuitable habitat because NWM is <10% of the total area, and the surrounding area is occupied by shrubs.
ALP-3 (Colville E)	N 70.25062 W -150.82796	East bank of the Colville River, 0.7 km north pipeline.	PWM NWM TLDS BAR		–	No/No	None	No	No Site Visit. Pre-nesting aerial surveys in adjacent areas suggest lack of use by eiders.
ALP-5 (SK-4)	N 70.280721 W 150.93346	Sagoonang Channel, ~6.6 km south of CD-1.	PWM NWM TLDS BAR		–	No/No	None	No	No site visit. Pre-nesting aerial surveys indicate lack of use by eiders.
ALP-8 (NK-6)	N 70.36017 W 151.05275	Eastern bank of the Nigliq Channel.	TLDS, MSSM	Low willow shrubs and non-patterned grass/sedge	No	No/No	2009	No	No nesting habitat at this site for eiders or most other species of waterfowl. In 2018, it was mapped opposite of Anchor 1.
ALP-9 (NK-8)	N 70.36606 W 151.06483	Eastern bank of the Nigliq Channel.	PWM, MSSM	Low willow shrubs with some polygons, river bank with polygon troughs	Yes	No/No	2009– 2011	No	Marginal nesting habitat due to prevalence of shrubs; contains some polygonal areas.

Table 1. Continued.

Site Name	Location	Site Description	Wildlife Habitat <sup>a</sup>	Habitat Description	Nesting Habitat Present <sup>b</sup>	Search History/ Nesting Records	Years Searched	Search in Future Years?	Comments
ALP-10 (SK-20)	Storage: N 70.36154 W 150.99201	Near the intersection of channels on the Sakoonang.	PWM, NWM, TLDS, BAR	10% PWM, 50% low relief MSSM, 40% riverine habitats	Yes	No/No	2009, 2013, 2015–2016, 2018	Yes	Nesting habitat on both sides of the channel in areas of PWM, but not on willow covered island. Container location shifted between 2014 and 2015.
ALP-12 (Kach-C)	Storage: N 70.306921 W.150.67197 Anchor: N 70.307904 W 150.66798	Alpine Pipeline site, Kachemach River, ~12 km east of CD-4.	PWM, NWM, TLDS, BAR	Low shrubs 50-100 m from river banks. West side NWM, and the east side is PWM	Yes	No/No	2018	Yes	East of the Colville delta. Booms span ~100 m wide channel. Potential nesting habitat beyond shrub lined banks. Location updated in 2018.
ALP-13 (Mil-C)	N 70.37038 W 150.51505	Shoreline and islands ~800 m upstream of Miluveach River mouth.	NWM, BAR, SKT	NWM on river banks, BAR and SKT on islands	Yes	No/No	2010	No	No habitat mapping available for this site. Field appraisal in 2010 concluded only marginal nesting habitat existed on banks and islands and subject to frequent flooding.
ALP-14 (Site 8 & SK-15 <sup>c</sup> )	Storage: N 70.369519 W 150.93522; Anchor a: N 70.366204 W 150.92193; Anchor b: N 70.364615 W 150.92218	Storage: Conex on the northern bank of the Sakoonang Channel; anchors adjacent to Sakoonang pipeline bridge, ~2.5 km north of CD-1.	TLLWC, PWM, NWM, MSSM, TLDS, BAR	Storage: ~50% PWM, and ~50% MSSM and TLDS. Anchor a in PWM surrounded by shrub habitats. Anchor b: NWM with narrow band of PWM	Yes	No/No	Storage: 2009–2011, 2013–2016, 2019 Anchors: 1998, 1999, 2009–2019	Yes	Nesting habitat at storage site limited to area of PWM north of container. Shoreline of channel and tapped lake are unsuitable because of abundance of low shrubs. Potential nesting habitat present at both anchor sites. Anchor a has high relief PWM and Anchor b has a 125 m band of PWM and NWM. Two female Spectacled Eiders observed flying over the site in 2010.

Table 1. Continued.

Site Name	Location	Site Description	Wildlife Habitat <sup>a</sup>	Habitat Description	Nesting Habitat Present <sup>b</sup>	Search History/ Nesting Records	Years Searched	Search in Future Years?	Comments
ALP-15 (Site 4)	Storage: N 70.38775 W 150.88718 Anchor : N 70.38767 W 150.88104	Container on western bank of the Tamayayak; boom anchor opposite bank slightly down stream.	PWM, MSSM, DOWIP, BAR	~70% low-relief PWM; ~10% high-relief PWM; ~10% DOWIP; ~10% BAR	Yes	No/No	2009–2019	Yes	Suitable habitat on container side in low-relief areas and along lake. Marginal nesting habitat in the high-relief area. Eider nesting habitat is also present on the anchor side of the channel.
ALP-16 (Site 7)	Storage: N 70.39152 W 150.92881 Anchor a: N 70.39261 W 150.91657 Anchor b: N 70.39130 W 150.91208	Container on NW bank of Tamayayak; anchors adjacent to Tamayayak pipeline bridge.	PWM, NWM, TLDS, BAR	Storage: Well-drained NWM with low shrubs. Anchor a: PWM edged with low shrubs. Anchor b: NWM with narrow band of PWM	Yes	No/No	Storage: 2009, 2011, 2016 Anchors: 2017–2019	Yes, at Anchor sites only	No suitable nesting habitat near storage unit, the area is dry, shrubby and lacks ponds. Anchors a and b have suitable habitat inland from the shrub lined banks.
ALP-17 (Site 3)	Storage: N 70.40692 W 150.93549 Anchor: N 70.40507 W 150.93047	Container on northern bank of Ulamnigïaq; anchor on opposite bank.	NWM, PWM, BAR	Vegetated areas ~50% NWM and ~50% PWM	Yes	Yes <sup>d</sup> /Yes	2009–2019	Yes	Eider nesting habitat near spill-response container and anchor; a Spectacled Eider nested 160 m from the container in 2011 207 m from the container in 2009, and 120 m from the container in 2019. Two female Spectacled Eiders observed flying in 2012.
ALP-19 (Site 2)	Storage: N 70.43417 W 150.90533 Anchor: N 70.433872 W 150.90261	Container on western bank; anchor on the opposite bank of the West Ulamnigïaq.	MSSM, DPC, NWM, BAR, SM, SKT	Half of site is vegetated. MSSM, NWM, and BAR is on the west bank, the east bank has BAR, and SM grading into NWM and	Yes	Yes <sup>d</sup> /No	2009–2011, 2014, 2017, 2019 Anchor 2018–2019	Yes	On the anchor side there is eider nesting habitat consisting of polygon ponds. Otherwise marginal nesting habitat bordering ~60 m wide channel. On the storage unit side driftwood lines indicate flooding is common at this site.

Table 1. Continued.

Site Name	Location	Site Description	Wildlife Habitat <sup>a</sup>	Habitat Description	Nesting Habitat Present <sup>b</sup>	Search History/ Nesting Records	Years Searched	Search in Future Years?	Comments
				PWM.					
ALP-20 (Site 1)	Storage: N 70.429162 W 150.84817 Anchor: N 70.42885 W 150.84019	Container on west bank of the Tamayayak; boom anchored downstream where the channel narrows.	NWM, PWM, DPC BAR, SOW	Vegetated areas on west side of channel are predominately NWM and PWM; east side includes DPC and BAR.	Yes	Yes <sup>d</sup> /Yes	2009–2011, 2013–2015, 2017–2018	Yes	Eider nesting habitat consists of polygon ponds 100 m inland from the container and deep polygon ponds on east side. One Spectacled Eider nest present in 2013 and 2014.
ALP-21 (Site 9)	N 70.43531 W 150.99748	Container on eastern side of Tamayayak.	SM, SKT, BAR	Salt-affected vegetation and abundant drift wood on east bank, river channel and BAR	Yes	No/No	2009–2011, 2018	Yes	Suitable nesting habitat with sparse vegetation; better habitat ~250 m east of the container in low-center polygon area; area probably used extensively by molting/brood-rearing geese in late July and early–mid August.
Anchor 1	N 70.35003 W 151.07447	Western bank of the Nigliq Channel.	NWM, MSSM, PWM	Shrubs, low-relief low-center polygons	Yes	No/No	2009–2011	No	Marginal nesting habitat because of prevalence of shrubs. Few ponds.
Anchor 2	N 70.35828 W 150.07022	Western bank of the Nigliq Channel.	PWM, DOWIP	Shrubs, low-relief low-center polygons	Yes	No/No	2009–2011	Yes	Large and small ponds are suitable habitat. Non-shoreline nesting habitat diminished by shrubs.
CC-1 (CD-5 Site 3)	N 70.30756 W 151.11541	Nigliagvik Channel, ~200 m from bridge.	TLDS, BAR MTT, MSSM	TLDS along banks with MTT on the west side and MSSM in polygonal area on the east side of	No	Yes <sup>f</sup> /No	2009, 2015–2016, East side: 2018–2019	Yes, east side.	Potential nesting habitat on the east bank in an area of low center polygons. Willow cover is prevalent along the river bank. Road access.

Table 1. Continued.

Site Name	Location	Site Description	Wildlife Habitat <sup>a</sup>	Habitat Description	Nesting Habitat Present <sup>b</sup>	Search History/ Nesting Records	Years Searched	Search in Future Years?	Comments
				channel					
CC-2 (CD-5 Site 1)	N 70.32093 W 151.06402	Mouth of the Nigliagvik Channel.	TLDS, DPC, MSSM, BAR	Narrow band of TLDS with MSSM high relief low centered polygons on the north side and willow covered low centered polygons on the south side	No	No/No	2015	No	Low value to no nesting habitat for eiders; in areas where the tundra is patterned the vegetation tends to be MSSM with abundant willow cover.
CC-3 (CD-5 Site 2)	Storage: N 70.30608 W 151.0460 Anchor: N 70.30652 W 151.04845	Lake L9341, ~100m from bridge.	TLDS, NWM, TLHWC, HUMO	Mostly TLDS with a narrow band of NWM on top of old river bank.	Yes	Yes <sup>f</sup> /No	2009, 2014–2015, 2017–2018	Yes	The site spans an old river channel and a roadway. NWM occurs in patches, which may support eider nesting.
NK-3	N 70.31924 W 150.03083	Overflow waterway between Nigliq Channel and large tap lake.	BAR TLDS		No	No/No	None	No	Excluded from Spectacled Eider nest searches because it is mostly unvegetated with willows covered banks
NK-4 (CD-5 Site 4)	N 70.31697 W 151.033072	Nigliq Channel, ~1.3 km north of Bridge #2.	BAR, TLDS	East bank TLDS and silt covered polygons. Barrens on west bank	No	No/No	2015	No	Polygonal area present at the site but the abundance of willows and silt deposited by floods made habitat unsuitable for nesting eiders.

Table 1. Continued.

Site Name	Location	Site Description	Wildlife Habitat <sup>a</sup>	Habitat Description	Nesting Habitat Present <sup>b</sup>	Search History/ Nesting Records	Years Searched	Search in Future Years?	Comments
SK-13	N 70.33506 W 150.90711	Both banks of Sakoonang just south of Alpine.	PWM, NWM, TLDS, BAR	Low-relief PWM with narrow bands of TLDS, BAR, and NWM	Yes	Yes <sup>c</sup> /No	1998–2000, 2009, 2011–2018	Yes	Potential eider nesting habitat in areas of PWM. In 2011, a Spectacled Eider pair was sighted 550 m north of SK-13 and, in 2014, a female Spectacled Eider was observed flying by the site.
SK-14A	N 70.33975 W 50.92675	Site is adjacent to the Alpine flare pit on the Sakoonang.	PWM, NWM, TLDS, BAR	Gravel pad, high-relief polygons, and shrubs are on the NW bank. The east bank contains TLDS, NWM, and PWM.	Yes	Yes <sup>c</sup> /No	1996–2001, 2009	No	Marginal nesting habitat because of shrubs and habitat modification. The NW side bank habitat is modified by the gravel pad and flare; the SE bank is relatively dry. Previous searches have not found eider nests.
SK-14B	N 70.34325 W 150.91836	Site is NW of the Alpine boat ramp.	PWM, NWM, TLDS, BAR	PWM, gravel pad and NWM on NE bank, TLDS and PWM on SW bank	Yes	Yes <sup>c</sup> /No	1996–2001, 2009, 2010	No	Eider nesting habitat adjacent to the Alpine gravel pad and to a lesser degree on the east side of the channel. Snowbanks on the pad edge may delay availability. Previous searches have not found eider nests.
SK-15 <sup>c</sup> (new site)	N 70.349086 W 150.910916	Near CD-1, on the Sakoonang.	PWM, NWM, TLDS	Willow and barrens along channel banks grading into NWM east side into low and high-relief polygons	Yes	Yes <sup>c</sup> /No	1996–2001, 2017–2018	Yes	Potential eider nesting habitat in 50-m band of NWM on west side and a wider band of PWM and shallow lake on the east side of the channel.
Sakoonang Pipeline Bridge	N 70.36444 W 150.91888	First channel-crossing north of Alpine	PWM, NWM, TLDS, BAR	PWM on NE bank, SW bank is shrubs with low-centered polygons in PWM	Yes	Yes <sup>c</sup> /No	1998, 1999, 2010	Yes	Potential nesting habitat in polygons in the southwest end of the site. Marginal nesting habitat on the NE side because of prevalence of shrubs.

Table 1. Continued.

Site Name	Location	Site Description	Wildlife Habitat <sup>a</sup>	Habitat Description	Nesting Habitat Present <sup>b</sup>	Search History/ Nesting Records	Years Searched	Search in Future Years?	Comments
Tin-1 Road/pipeline Bridge	N 70.28804 W 151.26606	North of bridge on Tiḡmiaqsiuḡvik (Ublutuoch River)	PWM, NWM, DOWIP, DOW	PWM in NW corner, NWM on shores of lakes on both sides of riv., DOWIP on East side, DOW in East and West sides.	Yes	No/No	2019	Yes	New site for 2019. Potential nesting habitat in PWM in northwest corner of plot, in NWP on shores of lakes on both sides of river, DOWIP on east side of river and DOW on both sides of river. Poor habitat immediately along banks of river due to prevalence of shrubs.
Tamayyak Pipeline Bridge	N 70.39277 W 150.90805	Second channel-crossing north of Alpine..	PWM, NWM, TLDS BAR	PWM and NWM on north bank, south bank is BAR, shrub, and NWM	Yes	No/No	2010	Yes	Willows along channel margins, suitable nesting habitat away from channels.
Ulamniḡiaq Pipeline Bridge	N 70.39277 W 150.90805	Third channel-crossing north of Alpine.	PWM, NWM, BAR	PWM and NWM on north bank, south bank is NWM	Yes	Yes <sup>d</sup>	2000–2007, 2010	Yes	The majority of this site contains suitable nesting habitat.

<sup>a</sup> Wildlife Habitats = Salt Marsh (SM), Salt-killed Tundra (SKT), Tapped Lake with Low-water Connection (TLLWC), Tapped Lake with High-water Connection (TLHWC), Deep Open Water without Islands (DOW), Deep Open Water with Islands or Polygonized Margins (DOWIP), Shallow Open Water without Islands (SOW), Deep Polygon Complex (DPC), Nonpatterned Wet Meadow (NWM), Patterned Wet Meadow (PWM), Moist Sedge-Shrub Meadow (MSSM), Moist Tussock Tundra (MTT), Tall, Low, Dwarf Shrub (TLDS), Barrens (BAR), and Human Modified (HUMO).

<sup>b</sup> Areas containing SM, SKT, DOWIP, DOW, SOW, NWM, PWM, or DPC (Deep Polygon Complex).

<sup>c</sup> SK-15 was reassigned to a new site near CD-1. Prior to 2017, ALP-14 anchors, a and b, next to Sakoonang Pipeline Bridge, were known as SK-15 anchors, a and b.

<sup>d</sup> CD-3 nest searches conducted during 2000–2007; Spectacled Eider and unidentified eider nests were found at these sites during some years (Johnson et al. 2008b).

<sup>e</sup> Alpine nest searches conducted in 1995–2001 (Johnson et al. 2003).

<sup>f</sup> CD-5 eider nest searches conducted in 2009, 2014–2017, 2019 (Seiser and Johnson 2011, 2014, 2016, 2018b; Johnson and Seiser 2015).

potential eider nesting habitat. The 200 m buffer around work sites is based on terms and conditions in the Incidental Take Statement (ITS) issued in the Biological Opinions for the Alpine Satellite Development Project (USFWS 2004) and for CD-5 (USFWS 2011) that prohibit off-pad human activity within 200 m of active nests. While regulatory guidelines have not been issued on the area around human activity that should be monitored for nesting activity, or conversely, the area around nests in which human activity should be avoided, the 200 m buffer has been applied in ITSs for specific projects as a zone outside of which there is a reduced probability for off-pad human activity to cause severe disturbance to nesting and brood-rearing Spectacled Eiders. Data on flushing distances for nesting Spectacled Eiders over the last 20 years of nest searching suggest that this species rarely flushes from a nest when people are greater than 25 m away (ABR, unpublished data).

A crew of 2–4 people experienced in eider identification searched for nests by walking a regular search pattern with 10–20 m between searchers, which provided total coverage of the tundra within search boundaries. Crews were transported by truck when possible, otherwise a helicopter was used to access sites. All nest locations were recorded using a custom application on an Android smartphone or on a DeLorme GPS. Eider nests were recorded as active if occupied or inactive if empty. Biologists avoided disturbing incubating Spectacled Eiders, once they were discovered, by approaching nests no closer than needed to identify to species. If Spectacled Eider hens flushed from nests inadvertently, we floated the eggs to estimate hatch dates and installed in the nest an artificial temperature-sensing egg. Temperature data recorded by artificial eggs were used to determine nest fate (success or failure), and the timing of hatch or nest failure as described in Johnson et al. (2008b). No time-lapse nest-monitoring cameras were deployed in 2019. Research activities were approved under USFWS Federal Fish and Wildlife Permit TE012155-7 and Alaska Department of Fish and Game Scientific Permit 18-169.

ACS sites included spill-response equipment storage containers and/or anchor points for floating boom. Some ACS sites may have as many as 3

search areas centered on storage containers or anchor points for booms (Figures 1 and 2, Table 1). At sites where spill-response equipment storage containers are pre-staged year-round, we searched within a 200 m radius of the container; otherwise we searched a 200 m radius around the coordinates provided by ACS. In 2018, ACS had installed anchor posts at several of the sites, which were used as center points for the 200 m search area. Where anchor posts were not present, we based anchor position on aerial photos of the boom locations in 2015 (ConocoPhillips 2017).

We searched the pipeline/powerline between CD-1 and CD-4 due to a power outage which required electricians to inspect the entire route during the beginning of eider nesting season. We performed a search of VSM-726 area (adjacent to CD-1) ahead of an inspection. The electricians were going to be focused only on the electrical line, therefore we only searched a 50 m buffer on each side of the pipeline. Human activity occurred between the CD-1 pad and the VSM, therefore, we searched a 200 m buffer around the pathway to and including the VSM. For the CD-5 habitat plots, researchers planned to spend substantial time inside habitat plots and surveying along transects between plots, therefore we searched appropriate eider nesting habitat in the plots (100 m diameter) and along transects (50 m wide path).

We searched habitats that were preferred or frequently used by nesting and pre-nesting Spectacled Eiders, as determined by previous studies in the area (Figure 2; Johnson et al. 2008b, 2015, 2016): Brackish Water, Salt-killed Tundra, Salt Marsh, Deep Water (both with and without islands), Shallow Water (both with and without islands), Deep Polygon Complex, Sedge Marsh, Grass Marsh, Patterned Wet Meadow, and lake shorelines. We inventoried habitat within search areas at each site by visual inspection and by overlaying each site on a wildlife habitat map of the Colville River delta and the Alpine Transportation Corridor (Johnson et al. 1997; Jorgenson et al. 1997, 2002). Sites where habitat had been modified so that nesting was unlikely (i.e., gas flares or snow dumps), were re-classified as having insufficient nesting habitat. Between 2009 and 2019, we have conducted habitat evaluations at 27 spill-response sites and 4 bridge sites (Table 1).



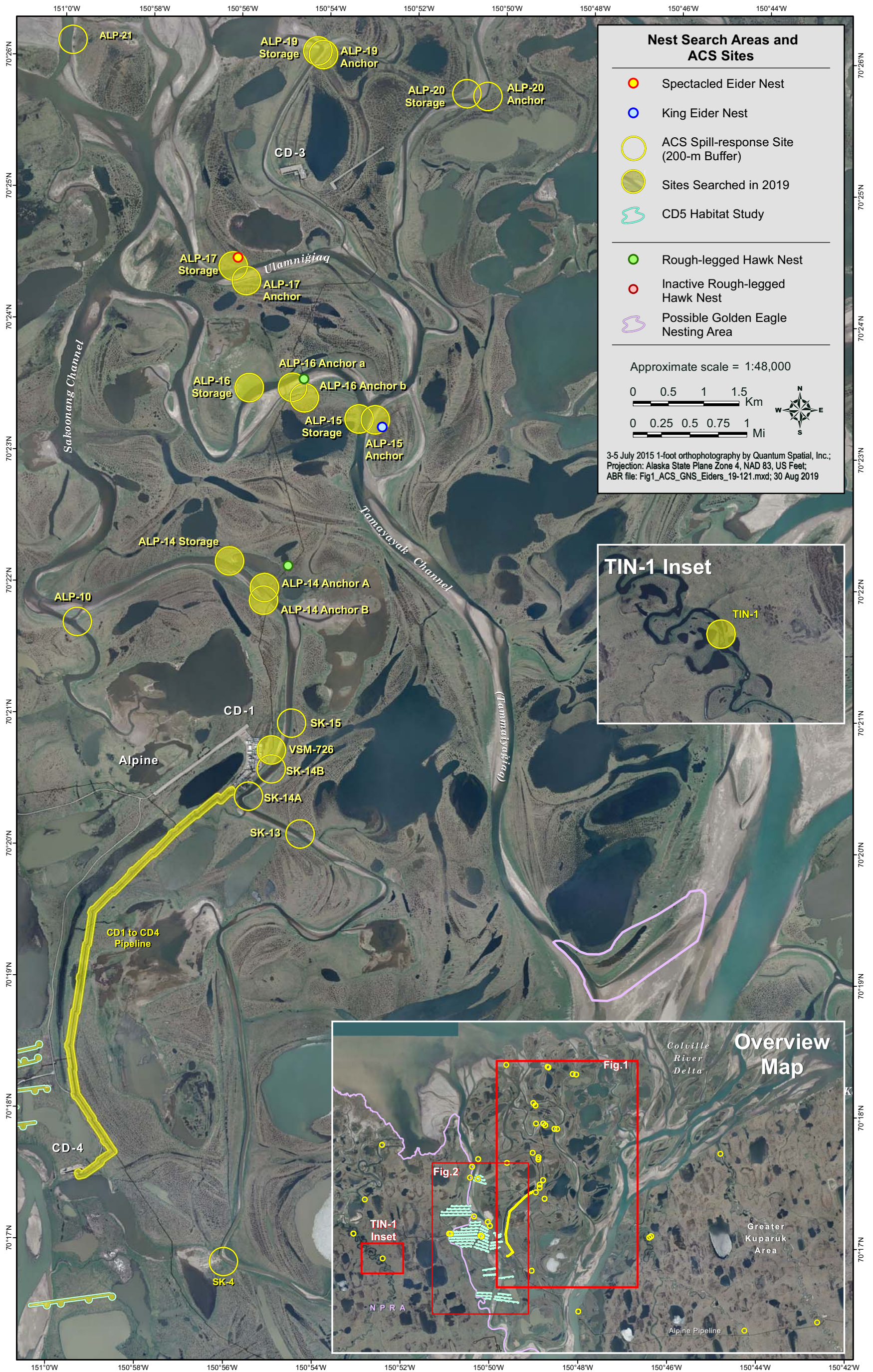


Figure 1. Study area for eider nest searches, sites searched in 2019, and locations of 2019 eider and raptor nests on the Colville River delta and Kachemach River in the Alpine Oilfield area, Alaska, 2009–2019.

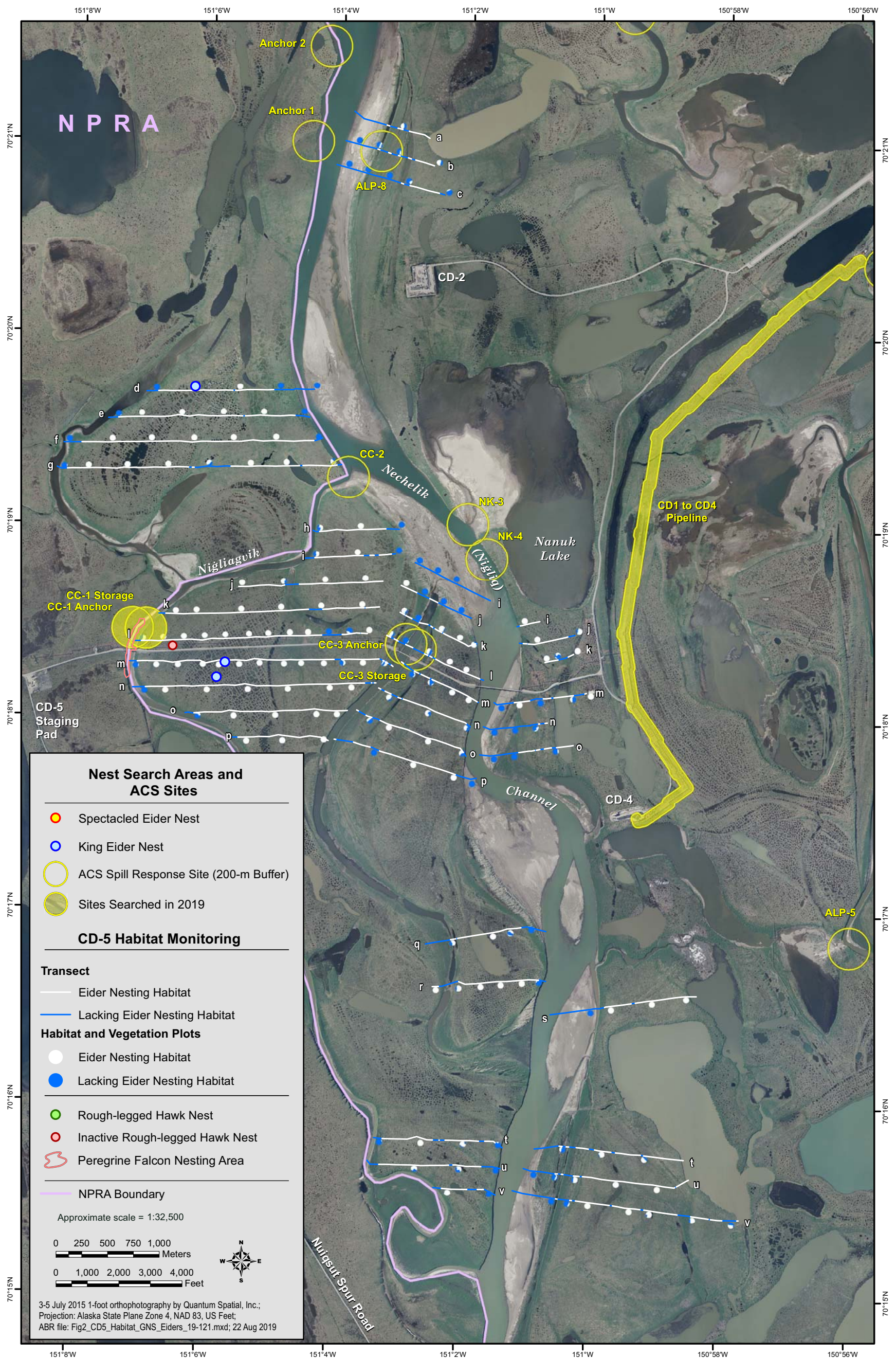


Figure 2. Study area for eider nest searches, sites searched in 2019, and locations of 2019 eider and raptor nests in the Alpine Oilfield area, Alaska, 2009–2019.

## RESULTS

## SPILL-RESPONSE SITES

One Spectacled Eider and no Steller's Eider nests were found within 200 m of the 7 spill-response sites that we searched on 21–26 June 2019 (Figure 1). The single incubating Spectacled Eider was found in the Alp 17 Storage nest search plot on 23 June 2019, 120 meters from the storage conox. When floated, the eggs were determined to be 3–5 days old, yielding a predicted hatch date of 12–14 July. A temperature-sensing egg (thermistor) was installed into the nest alongside the 3 eggs and the temperature record shows that the female returned to incubate about 20 minutes after our departure. During nest fate checks on 14 July, nest fate evidence was ambiguous and it appeared that the temperature-sensing egg was predated by an avian predator.

However, the temperature data indicated that the nest was successful (Figure 3): first hatch occurred and brooding started on 11 July, brooding ceased on 12 July, and thereafter the thermistor recorded ambient temperature fluctuations. Estimated hatch dates for eiders on the Colville delta range from 3 to 18 July ( $n = 43$  nests; ABR, unpublished data). The hatch date of 11 July falls within this period and appears typical. We found one King Eider nest within ACS plots, at the Alp 15 site (Figure 1), it was not flushed so there is no egg count and nest fate was not determined.

During searches of the spill-response sites, we located 74 nests of 8 species (Table 2). Noteworthy were 4 nests belonging to Rough-legged Hawks (*Buteo lagopus*; 1 inside the plot on the bridge at ALP 16 and 3 outside plots; Figures 1 and 2). Additionally, CPAI employees reported in June a possible Golden Eagle nest near the confluence of

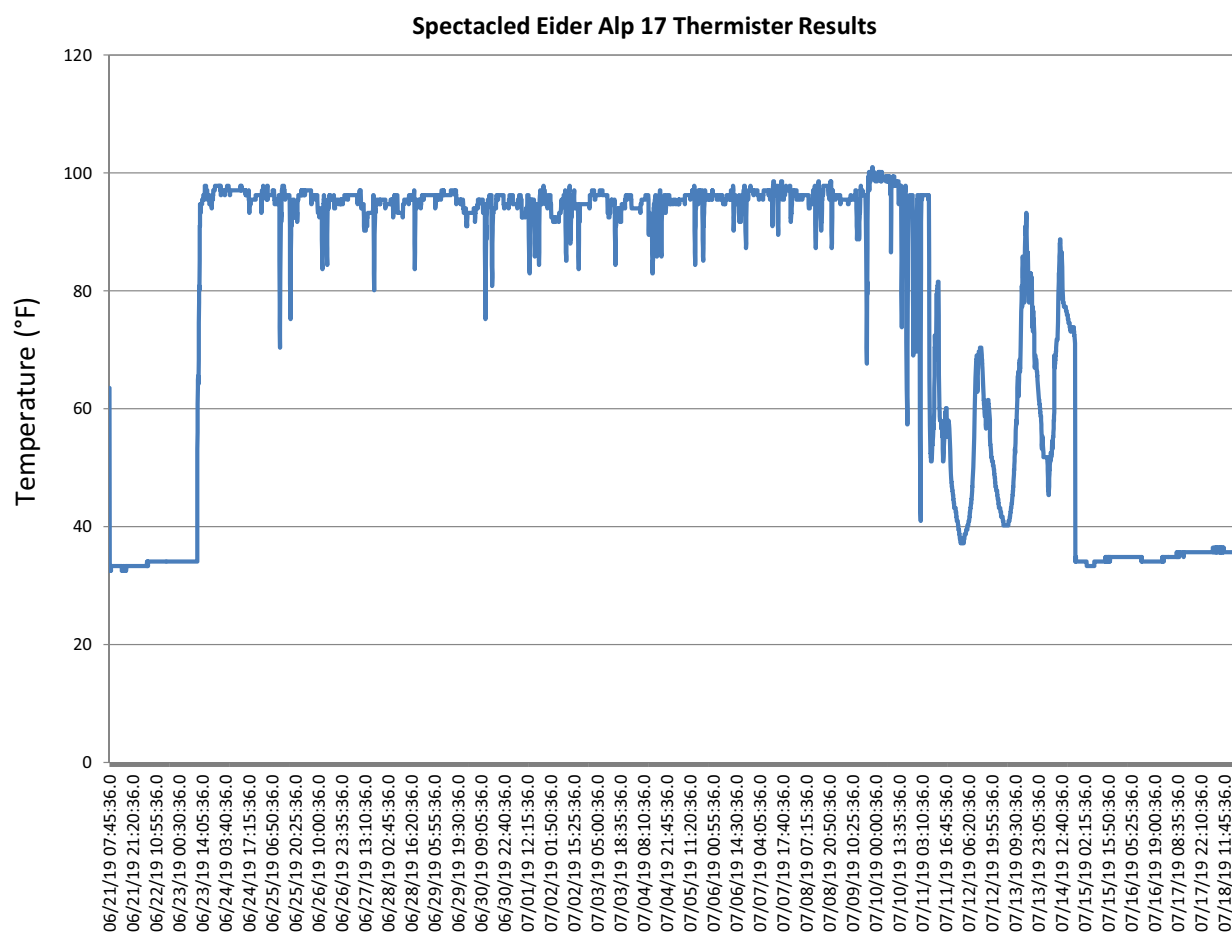


Figure 3. Temperature record of the thermistor egg installed in a Spectacled Eider nest in the Alp 17 search area, showing probable successful hatch, Alpine Oilfield area, Alaska, 2019.

Table 2. Numbers of nests found within search areas at 7 spill-response equipment sites, CD-5 habitat monitoring transects, VSM-726, and the pipeline/powerline between CD-1 and CD-4 in the Alpine Oilfield area, Alaska, 10–26 June 2019. No Steller's Eider nests were found in 2019.

Search Area (Former Names) <sup>a</sup>	Spectacled Eider	King Eider	Greater White-fronted Goose	Snow Goose	Cackling/Canada Goose <sup>b</sup>	Northern Pintail	Long-tailed Duck	Unidentified Duck	Sandhill Crane	Stilt Sandpiper	Bar-tailed Godwit	Parasitic Jaeger	Red-throated Loon	Rough-legged Hawk	Total
ACS Spill Response Sites															
ALP-14 Storage and Anchor a, b (SK-15)	–	–	13	–	–	–	–	–	–	–	–	–	–	–	13
ALP-15 Storage and Anchor b (Site 4)	–	1	4	–	1	–	–	–	–	–	–	–	–	–	6
ALP-16 Anchor a, b	–	–	12	–	–	1	–	–	–	–	–	–	–	1	14
ALP-17 Storage and Anchor (Site 3)	1	–	18	–	1	–	–	–	–	1	–	–	–	–	21
ALP-19 Storage and Anchor (Site 2)	–	–	1	15	–	–	–	–	–	–	–	–	–	–	16
CC-1	–	–	2	–	1	–	–	–	–	–	–	–	–	–	3
Tin-1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0
Subtotal	1	1	50	15	4	1	0	0	0	1	0	0	0	1	74
CD-5 Habitat Transects	–	2	145	–	6	2	2	1	2	–	2	1	2	–	165
CD-1 VSM 726 area	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1
Pipe/powerline CD-1 to CD-4 <sup>c</sup>	–	na	na	na	na	na	na	na	na	na	na	na	na	1	1
Total Nests	1	3	196	15	10	3	2	1	2	1	2	1	2	2	241

<sup>a</sup> Additional nests located just outside of the search areas include: King Eider (1), Greater White-fronted Goose (46), Canada Goose spp (7), Red-throated Loon (2), Rough-legged Hawk (3). Totaling 300 nests plus nests not recorded on pipeline search.

<sup>b</sup> Nests belonging to either Cackling Goose or Canada Goose.

<sup>c</sup> This urgent unplanned search was performed to focus on eider nests because there was a power outage between CD-1 and CD-4. Species other than eiders were not recorded (except for a Rough-legged Hawk nesting on the pipeline).

the Tamayayak channel and main Colville channel (J. Theriot, Alpine ACS, pers. comm.). A pair of adult Golden Eagles were observed in this area in mid-August but nesting could not be confirmed (J. Parrett, ABR, pers. comm.). Similar unconfirmed reports in 2018 suggested that Golden Eagles raised young in this location in that year as well (Alpine ACS crew). On several occasions in June, ABR biologists observed a pair of Peregrine Falcons exhibiting nesting behaviors near bridge 3 over the Nigliagvik channel (near CD-5) and fledglings were observed perching on the bridge railing in August, indicating a successful nest

either on this bridge or on nearby bluffs on the West side of the channel. Adult Peregrine Falcons were also observed exhibiting nesting behaviors near this bridge and a fledgling was photographed on this bridge in 2018.

We evaluated eider nesting habitat at Tin-01 (the Tinmiaqsiugvik River [formerly Ublutuoch River] ACS site) (Figure 1). On both sides of the river, we found potential eider nesting habitat, thus this site likely warrants nest searches in the future for any tundra work scheduled during the eider nesting period (Table 1).

## VSM AND PIPELINE/POWERLINE SURVEYS

We did not find Spectacled Eider or Steller's Eider nests or adults at the VSM 726 site, nor along the pipeline/powerline between CD-1 and CD-4 (Figures 1 and 2, Table 2). We also did not find any King Eider nests. One Rough-legged Hawk nest was recorded on the pipeline during the pipeline/powerline search. Other species were not recorded during this search.

## CD-5 HABITAT MONITORING TRANSECTS

No Spectacled Eider or Steller's Eider nests were found during the CD-5 habitat transect searches (Figure 2, Table 2). Two King Eider nests were found within the plots and an additional one was found just outside of the plot boundary. During the eider nest search on CD-5 habitat plots, we located 165 nests belonging to 10 species. The majority of those nests belonged to Greater White-fronted and Canada geese (145 nests; Table 2).

## SUMMARY

One Spectacled Eider nest was found in 2019, at the Alp 17 ACS site in the outer Colville Delta. The eggs were floated and a temperature-sensing egg installed in the nest, which proved valuable in determining that the nest was successful. Of the 15 spill-response sites with suitable eider nesting habitat, 7 were searched in 2019. No Steller's Eider nests have ever been observed in any of the spill-response, hydrotest, water-source lake, or pipeline search areas. The only sighting of a Steller's Eider at CD-3 occurred in 2001. Long-term surveys, including annual aerial surveys and ground-based searches of the last 29 years, verify the rarity of Steller's Eiders on the Colville Delta, NE NPR-A, and in the Greater Kuparuk Area (ABR, unpubl. data). Searches of spill-response sites totaled 74 bird nests recorded within plots, 1 each were recorded on the VSM and pipeline/powerline searches, 165 were recorded in CD-5 habitat plots/transects, and an additional 59 nests were recorded just outside of plots; totaling 300 nests of 14 species recorded.

Identification of active Spectacled Eider nests through nest searches prior to off-pad human activity reduces the potential for unintended disturbance to nesting Spectacled Eiders and

ensures compliance with the terms and conditions listed in the Biological Opinions for Alpine, CD-5, GMT-1/MT-6, and GMT-2/MT-7. Cooperation between the USFWS and CPAI on the details, locations, and timing of required nest searches has allowed critical oilfield operations, such as spill-response preparation and shutdown operations, to be completed with minimal modifications.

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