

# EIDER NEST SEARCHES IN THE ALPINE OILFIELD AREA, ALASKA, 2021



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Prepared for  
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Anchorage, Alaska

Prepared by  
**ABR, Inc.—Environmental Research & Services**  
Fairbanks, Alaska





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## TABLE OF CONTENTS

Acknowledgments .....	iii
Introduction.....	1
Objectives .....	5
Methods .....	13
Results.....	14
Spill-Response Sites.....	14
Pipeline, Ice Road, and Lake Surveys.....	14
Summary.....	14
Literature Cited.....	16

## LIST OF FIGURES

Figure 1.	Study area for eider nest searches, sites searched in 2021, and locations of eider nests on the Colville River delta and NPR-A, within the Alpine Oilfield area, Alaska, 2009–2021 .....	3
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## LIST OF TABLES

Table 1.	Site descriptions for 27 spill-response equipment sites and 4 road/pipeline bridge sites in the Alpine Oilfield and adjacent areas, Alaska, 2009–2021.....	6
Table 2.	Species and number of nests found within search areas at 12 spill-response equipment sites, 1 pipeline site, 1 ice road site, and 2 lake sites in the Alpine Oilfield area, Alaska, 19 June–25 June 2021 .....	15

## LIST OF APPENDICES

Appendix A.	Mean densities of Spectacled Eiders observed during pre-nesting aerial surveys in the Colville Delta (blue outline), NPR-A, and Kuparuk study areas, Alaska, 1994–2020 ..	19
Appendix B.	Location of 27 spill-response equipment sites and 4 road/pipeline bridge sites where Spectacled Eider nest searches have been conducted in the Alpine Oilfield, Alaska, 2009–2021 .....	21

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## INTRODUCTION

The Alpine Satellite Development Project (Alpine Oilfield) is within the current or historical 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 3 drill sites (CD-5, GMT-1 [MT6], GMT-2 [MT7]) 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 searches for eider nests prior to initiating off-pad activities during the nesting season. If eider nests are found, and after consultation with U.S. Fish and Wildlife Service (USFWS), CPAI then modifies those activities to avoid disturbance. Since 2009, CPAI has 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 breeding season. In this report, we document the searches for eider nests in 16 areas searched in 2021: 12 Alaska Clean Seas (ACS) spill-response equipment sites, the pipeline from CD-1 to the valve house, the northern section of the ice road between GMT-1/MT-6 and GMT-2/MT-7, and 2 lake sites (Figure 1).

Spectacled Eiders are common breeders on the Colville River delta and less common in the NE NPR-A. Nest searches in the Alpine Oilfield have shown that Spectacled Eider nests are not distributed uniformly across the Alpine Oilfield (Johnson et al. 2015). Spectacled Eider nests are more common on the outer Colville delta where the CD-3 drill site is operated as a roadless satellite to the Alpine Oilfield. Fewer nests have been found in the areas around CD-1, CD-2, CD-4, CD-5, and NE NPR-A developments, including GMT-1/MT-6, and GMT-2/MT-7 (Appendix A).

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 northwest of the Alpine area, near Utqiagvik, although their historical range included the entire Arctic Coastal Plain of Alaska (Quakenbush et al. 2002). Evidence of nesting Steller's Eiders east of Utqiagvik 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 3 times on the Colville delta (1995 [J. Bart, Boise State University, pers. comm.], and 2001 and 2007 [Johnson et al. 2002, 2008b]), and 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 (ITSS) can be issued to allow actions that are prohibited under Section 9 if they comply with specific terms and conditions. In the Biological Opinions (BOs) issued prior to construction of the Alpine satellites (CD-3, CD-4, and CD-5), the USFWS stipulated terms and conditions in the ITS that restrict human activity to existing gravel fill within 200 m of occupied Spectacled Eider nests during the breeding season. The dates used to define the eider breeding season vary across the Alpine oilfield and are listed in BOs for each developmental area. Ground-level activity is restricted on the Colville Delta and CD-5 from 9 June through 1 August (USFWS 2004, 2011). In the GMT-1/MT-6 development, breeding occurs 1 June–15 August, and 1 June–31 July for GMT-2/MT-7 (USFWS 2014, 2018). The restriction end dates for all development areas were later changed to 1 August for consistency in

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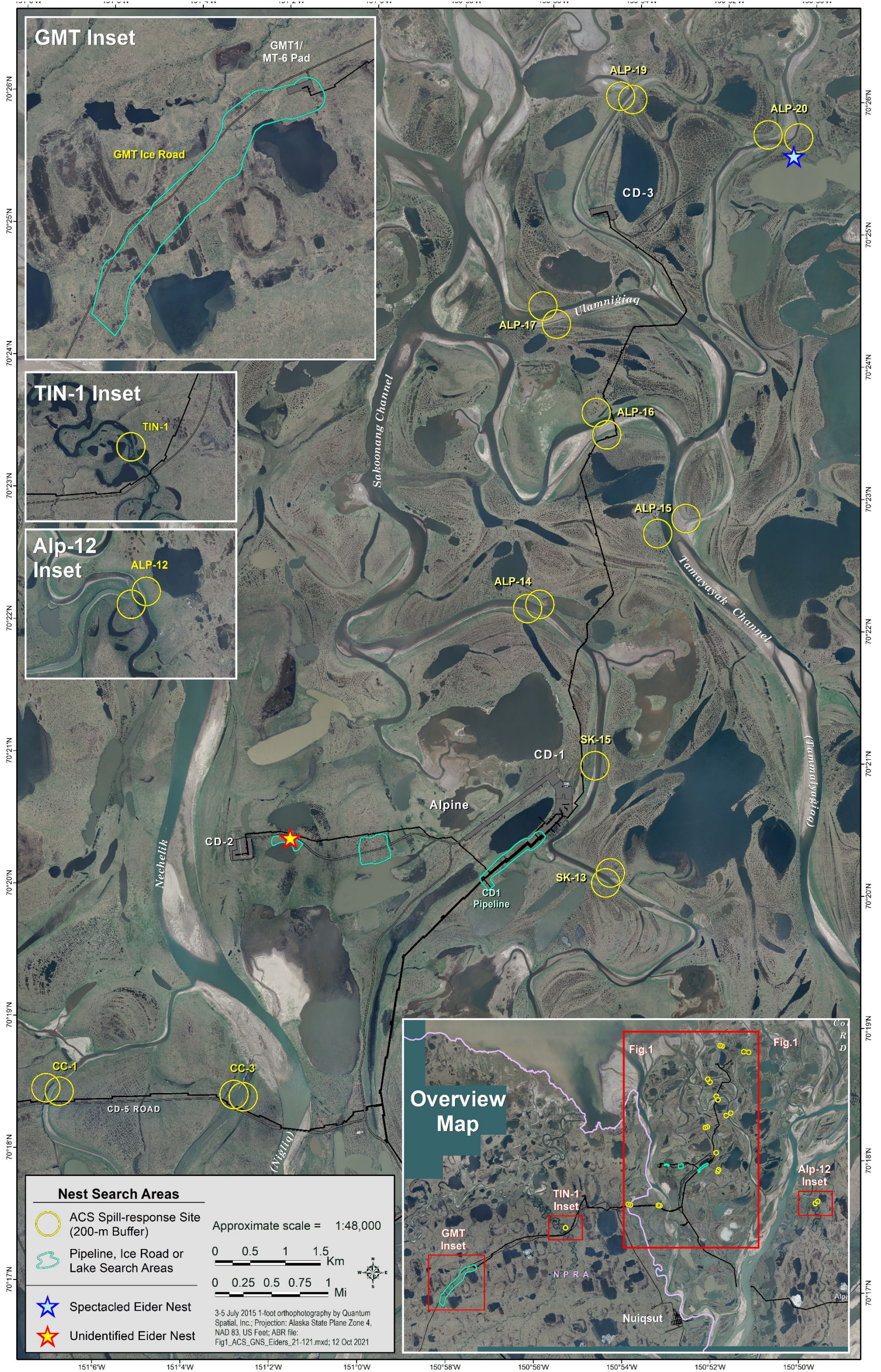


Figure 1. Study area for eider nest searches, sites searched in 2021, and locations of eider nests on the Colville River delta and NPR-A, within the Alpine Oilfield area, Alaska, 2009–2021.



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response to a letter sent by Robyn McGhee (CPAI) to Sarah Conn (USFWS) on 23 May 2018.

Despite the seasonal restrictions to limit work on the tundra, some off-pad activities are necessary during the breeding season for regulatory compliance and operational needs. Such off-pad activities include tundra clean-up after the ice-road season, spill-response equipment deployment, hydrological monitoring, water access, civil surveys, operational inspections and maintenance. When summer support or construction activities must occur off existing gravel fill during that restricted period, USFWS-approved nest surveys for Spectacled Eiders are required prior to those activities so that active nests can be identified and avoided. It is important that nest searches are conducted by trained biologists because female eiders on nests are cryptic, and the females of the 4 eider species (Steller's, Spectacled, King [*S. spectabilis*], and Common eiders [*S. mollissima*]) are very similar, making them challenging to identify to species. Without prior knowledge of eider nest locations, workers could accidentally damage eggs or force 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 breeding 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 change the earliest date when nest searches would be required for off-pad activity from 1 June to 9 June. Therefore, any off-pad work that needed to occur from 9 June to 1 August, including spill-response equipment deployment, would require nest searches if it occurred in areas with potential nesting habitat of Spectacled Eiders.

The summer of 2021 is the thirteenth season that eider nest searches (also referred to as "site clearance") 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; Shook and Johnson 2019, Shook

and Attanas 2020). Over the last 13 years in the Alpine Oilfield, the number of spill-response sites has expanded from 23 sites to 27 sites plus 4 bridges (Table 1, Appendix B). The number of sites increased when the CD-5 drill site came online in 2016, extending the range of sites from the Colville River delta as far as the Nigliagvik Channel. Not all of the spill-response sites require nest searches prior to off-pad activities. Ten of the 27 spill-response 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 lacked appropriate eider nesting habitat, contained nesting habitat but 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; Table 1). In the cases of sites ALP-16 and ALP-19, the storage sites but not the anchor sites were exempted (Appendix B). South of CD-4, the ALP-5 and ALP-3 sites are in low-density areas for pre-nesting eiders. Three new Nigliq spill-response sites, NK-3, NK-4, and CD-2, were also excluded from the nest searching list because they lack suitable nesting habitat.

Nest searches are currently required at 14 spill-response sites and 4 road/pipeline bridge crossings if maintenance activities are planned during the eider breeding season. In addition to these spill-response sites, ABR biologists also search areas identified by CPAI as needed in advance of summer support or construction activities.

## OBJECTIVES

The primary objective of nest searches in 2021 was to document the presence of nesting Spectacled and Steller's eiders prior to scheduled off-pad activities. If active nests of Spectacled or Steller's eiders were found, their locations were communicated to CPAI field environmental staff within 24 hours of the completion of the search in each work area. CPAI field coordinators would then decide if planned activities occurring near nests needed to be modified to prevent disturbance of these sensitive species.

Table 1. Site descriptions for 27 spill-response equipment sites and 4 road/pipeline bridge sites in the Alpine Oilfield and adjacent areas, Alaska, 2009–2021. Sites that were renamed in 2015 have prior names listed in parentheses.

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-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	Sakoong 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	2009–11	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, 2015–16, 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, 2021	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: 2009–11, 2013–16, 2019–20 Anchors: 1998–99, 2009–21	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	2009–21	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. 2021 site downstream.
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: 2017–21	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 Ulamniġiaq; anchor on opposite bank.	NWM, PWM, BAR	Vegetated areas ~50% NWM and ~50% PWM	Yes	Yes <sup>d</sup> /Yes	2009–21	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 Ulamniġiaq.	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 PWM.	Yes	Yes <sup>d</sup> /No	2009–2011, 2014, 2017, 2019–21	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
ALP-20 (Site 1)	Storage: N 70.429162 W150.84817 Anchor: N 70.42885 W150.84019	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	2009–11, 2013–15, 2017–18, 2021	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. One Spectacled Eider nest outside search area boundary in 2021.
ALP-21 (Site 9)	N 70.43531 W150.99748	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	2009–11, 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 W151.07447	Western bank of the Nigliq Channel.	NWM, MSSM, PWM	Shrubs, low-relief low-center polygons	Yes	No/No	2009–11	No	Marginal nesting habitat because of prevalence of shrubs. Few ponds.
Anchor 2	N 70.358277 W151.07019	Western bank of the Nigliq Channel.	PWM, DOWIP	Shrubs, low-relief low-center polygons	Yes	No/No	2009–11	Yes	Large and small ponds are suitable habitat. Non-shoreline nesting habitat diminished by shrubs.
CC-1 (CD-5 Site 3)	N 70.30756 W151.11541	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 channel	No	Yes <sup>f</sup> /No	2009, 2015–16, East side: 2018–19, 2021	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
CC-2 (CD-5 Site 1)	N 70.32093 W151.06402	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 W151.04845	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, 2014–15, 2017–18, 2021	Yes	The site spans an old river channel and a roadway. NWM occurs in patches, which may support eider nesting.
NK-3	N 70.316971 W151.03307	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 willow-covered banks.
NK-4 (CD-5 Site 4)	N 70.313982 W151.02805	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.
SK-13	N 70.33506 W150.90711	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>e</sup> /No	1998–00, 2009, 2011–21	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.

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-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 W150.91836	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	1996–01, 2009–10	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 W150.91092	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	1996–01, 2017–18, 2021	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 W150.91888	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	1998–99, 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 W151.26606	North of bridge on Tiḡmiaqsiuḡvik (Ublutuoeh 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	2019–21	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.
Tamayayak Pipeline Bridge	N 70.39277 W150.90805	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, 2020–21	Yes	Willows along channel margins, suitable nesting habitat away from channels.
Ulamniḡiaq Pipeline Bridge	N 70.405872 W150.88291	Third channel-crossing north of Alpine.	PWM, NWM, BAR	PWM and NWM on north bank, south bank is NWM	Yes	Yes <sup>d</sup>	2000–07, 2010	Yes	Most 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. 2008a).

<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).

## METHODS

The methods for site clearance work have been similar since 2009, when USFWS approved biologist-led nest searches prior to off-pad work. Eider nest searches were conducted only in the subset of spill-response sites that contain suitable nesting habitat and that were scheduled for off-pad work visits during the restricted breeding period. In 2021, 12 spill-response sites and 1 lake site were scheduled for work activities between 9 June and 1 August and were surveyed for eider nests (Figure 1). We searched 3 additional areas: 1) the CD-1 pipeline to the valve pad was searched prior work along the pipeline; 2) high-value eider habitat in the northern portion of the GMT Ice Road corridor was searched prior to off-pad stick-picking; and 3) lake site (L9322) near CD-2 (Figure 1).

Most search areas included a 200-m buffer around work sites located within potential eider nesting habitat. The 200-m buffer around work sites was based on terms and conditions in the ITS issued in the Biological Opinions for the Alpine Satellite Development Project (USFWS 2004) and for GMT-1/MT-6 and GMT-2/MT-7 (USFWS 2014, 2018) that restricts 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 more than 25 m away (ABR, unpublished data).

A crew of 4 biologists experienced in eider identification searched for nests by walking 10–20 m apart throughout the search area boundary. This method provided total coverage of the tundra within search boundaries. In each search area, biologists focused their efforts on 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. 2008a, 2015, 2016), and using wildlife habitat

maps of the Colville River delta and the Alpine Transportation Corridor (Johnson et al. 1997; Jorgenson et al. 1997, 2002). Preferred habitats include: 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. Sites where habitat had been modified so that nesting was unlikely (i.e., gas flares or snow dumps), were re-classified as having unsuitable nesting habitat. Crews were transported to search areas by truck or helicopter, depending on the site.

We recorded nest locations for eiders and other bird species (primarily waterfowl, and some shorebirds, seabirds, and landbirds) using a custom application on an Android smartphone. We documented observations of raptors and Common Ravens because they are potential predators of eider adults, eggs, and young (Quakenbush and Suydam 1999; Rozell et al. 2021). Eider nests were recorded as ‘active’ if occupied, ‘inactive’ if empty, and ‘unknown’ if eggs were present but no female was observed. Upon nest discovery, searchers avoided disturbing incubating Spectacled Eiders by approaching nests no closer than needed to identify them to species. If Spectacled Eider hens flushed from nests inadvertently, we floated the eggs to estimate the date of hatch. No artificial eggs or time-lapse cameras were used to monitor nests in 2021. Research activities were approved under USFWS Federal Fish and Wildlife Permit ESPER0010687 and Alaska Department of Fish and Game Scientific Permit 21-123.

Spill-response sites included spill-response equipment storage containers and/or anchor points for floating booms. In 2021 spill-response sites had 2 search areas centered on storage containers or anchor points for booms (Figure 1, Table 1). At sites where spill-response equipment storage containers are pre-staged year-round, we searched within a 200 m radius of either the container or the coordinates provided by ACS. In 2018, ACS installed anchor posts at several 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), or communications with ACS personnel.

Crews also searched for eider nests along the pipeline between CD-1 and the valve-pad prior to inspection/maintenance activities. Because these activities were located very near the pipeline, we searched a 50-m buffer on either side of the pipeline. High-value eider habitat was also searched within a 200-m buffer around the GMT ice road alignment prior to clean-up activities (i.e. stick-picking). Two lake sites (M9524, and L9322) were also searched prior water extraction set up.

## RESULTS

### SPILL-RESPONSE SITES

The ABR biologist team searched 12 spill-response sites during 19–25 June 2021 (Figure 1). We recorded 61 nests of 7 species within 200 m of spill-response and bridge sites (Table 2). No eider nests were found within the search areas. A male Spectacled Eider was observed within the 200-m search area boundary of ALP-20, and a female on a nest was later found 75 m outside of this boundary.

In recent years, raptor and raven nests or fledglings have been observed on or near infrastructure during nest searches. In 2021, we observed a Peregrine Falcon (*Falco peregrinus*) attacking a juvenile Common Raven (*Corvus corax*) on the bridge spanning the Nigliagvik channel, a nearly identical observation was made on this bridge in 2020. We did not locate a Common Raven or Peregrine Falcon nest on the Nigliagvik bridge, but at least 3 fledgling Common Ravens were seen near this bridge on several occasions. We suspect a raven nest was on this bridge or other nearby infrastructure in 2021. Peregrine Falcons have also nested on this bridge in previous years, but there was no evidence of successful breeding in 2021. Fledgling Peregrine Falcons were observed on the bridge in both 2018 and 2019, and a pair of adults was observed here in 2016. In 2021, four juvenile ravens and 2 adults were also observed on the TIN-1 bridge during the eider nest search. In 2020, a successful raven nest was also recorded on this bridge. A Rough-legged Hawk (*Buteo lagopus*) nest was found near the ALP-16 anchor on the south side of the channel, and the adults were actively calling during nest searches in the area. Rough-legged Hawks nests

have been observed on pipelines since 2018 (Seiser and Johnson 2018a).

### PIPELINE, ICE ROAD, AND LAKE SURVEYS

From 19–25 June, ABR biologists also searched the pipeline corridor from CD-1 to the valve pad (adjacent the CD-2 turnoff), the northern portion of the GMT ice road, and 2 lake sites prior to off-pad activities (Figure 1). We did not find any eider nests or adult eiders along the pipeline corridor, GMT ice road or the M9524 lake site. An unidentified eider nest (likely a King Eider), was found ~ 3 m from a pullout by lake site L9322, near CD-2. The nest had only one egg that was recently laid (estimated from egg-floating), and there was no down lining the nest or adult eiders in the area to aid species identification. This nest's proximity to a pullout made it vulnerable to disturbance and it was reported to CPAI despite not knowing the species of eider. Two days later, ABR biologists returned to the nest to check on its status and determine the species. On the second visit, there were no eggs in the nest and no adult eiders seen in the vicinity. The nest was likely depredated by a fox, raven, gull, or other species capable of removing a whole egg from a nest.

Crews found 27 nests of 7 other bird species, including 5 nests in the CD-1 pipeline search area, 11 nests in the northern search area along the GMT ice road, 8 nests in the M9524 lake site and 3 nests in the L9322 lake site (Table 2). Most nests recorded during eider nest searches belonged to Greater White-fronted Geese (*Anser albifrons*).

### SUMMARY

We found 1 Spectacled Eider nest near spill-response site ALP-20 in 2021, but it was outside the search area, and likely would not be affected by off-pad activities. We also found an unidentified eider nest near a pullout next to lake site L9322. We communicated to CPAI environmental coordinators the locations of both eider nests within 24 hours of discovery. The unidentified eider nest was revisited but it had been depredated within 2 days of discovery. ABR crews found a total of 88 nests of 12 species at spill-response, pipeline, ice road and lake sites during nest searches for eiders.



Table 2. Species and number of nests found within search areas at 12 spill-response equipment sites, 1 pipeline site, 1 ice road site, and 2 lake sites in the Alpine Oilfield area, Alaska, 19 June–25 June 2021.

Search areas <sup>b</sup>	Greater White-fronted Goose	Snow Goose	Cackling/Canada Goose	Spectacled Eider <sup>a</sup>	Unidentified Eider <sup>a</sup>	Rough-legged Hawk	Semipalmated Sandpiper	Stilt Sandpiper	Red-necked Phalarope	Sabines Gull	Arctic Tern	Unidentified Passerine	Total
<b>Spill Response Sites</b>													
ALP 12													0
ALP-14	3												3
ALP-15	2												2
ALP-16	8					1							9
ALP-17	7												7
ALP-19	2						1						3
ALP-20	6	1		1			2						10
CC-1	9												9
CC-3	5		1										6
SK-13	7							1					8
SK-15	3												3
TIN-1	1												1
<b>Subtotal</b>	<b>53</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>61</b>
CD1 Pipeline to Valve Pad	4									1			5
GMT Ice Road North	10								1				11
Lake Site M9524	6						1					1	8
Lake Site L9322	1				1						1		3
<b>Subtotal</b>	<b>21</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>27</b>
<b>Total Nests</b>	<b>74</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>88</b>

<sup>a</sup> Spectacled and Unidentified eider nests were found outside search area boundaries.

<sup>b</sup> All search area boundaries are shown on Figure 1.

No Steller's Eider nests have been observed in any of the spill-response, hydrotest, water-source lake, or pipeline search areas since searches began in 2009; and there has been only one sighting of a Steller's Eider in the Alpine Oilfield which was at CD-3 in 2001 (Johnson et al. 2002). Long-term surveys, including annual aerial surveys and ground-based searches over 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; Wilson et. al 2018).

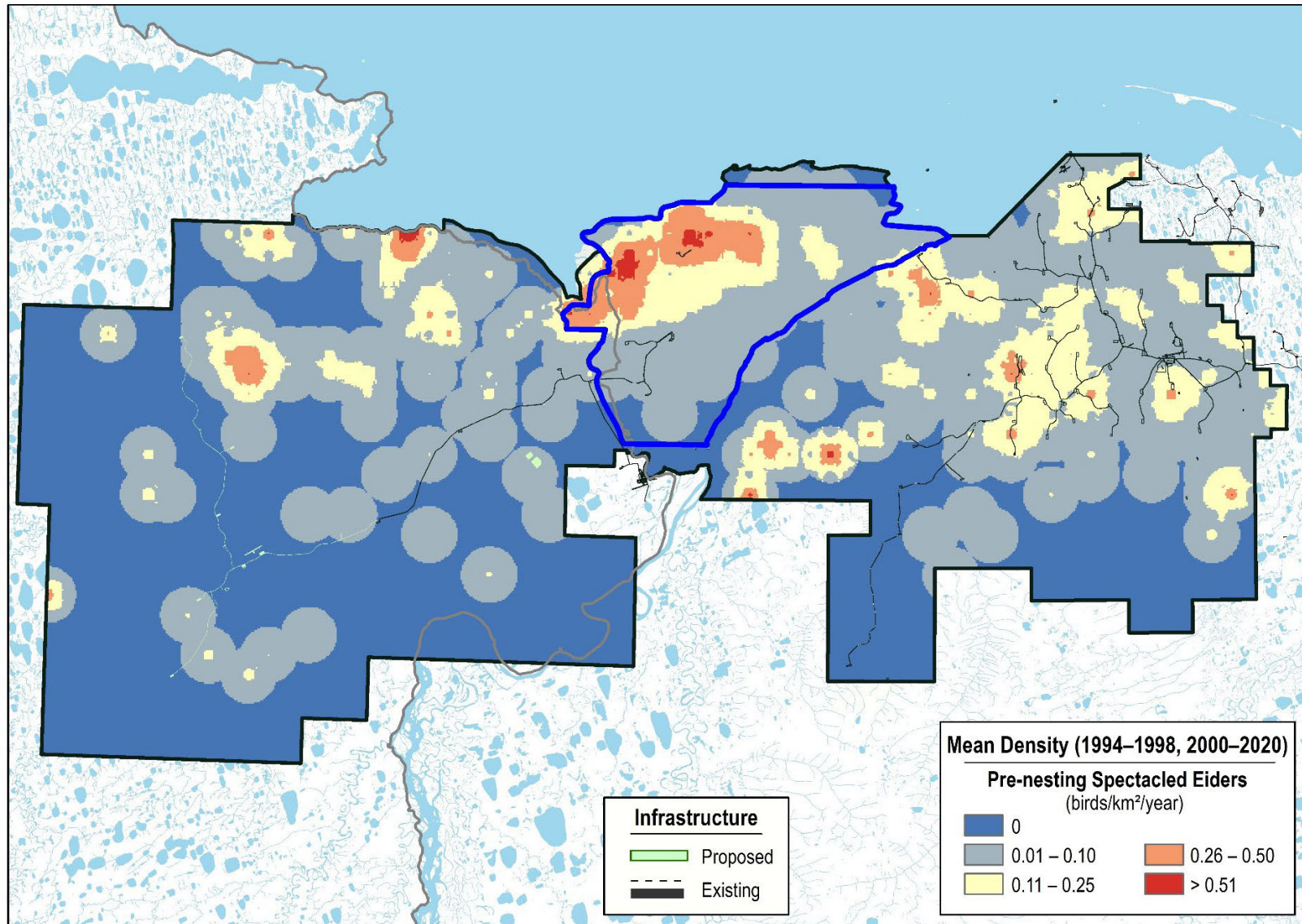
Site clearance in the Alpine Oilfield, which involves locating eider nests before off-pad activities are conducted, and communicating the location of nests to CPAI environmental personnel, minimizes the potential for disturbing or harming nests of threatened or endangered species; and ensures compliance 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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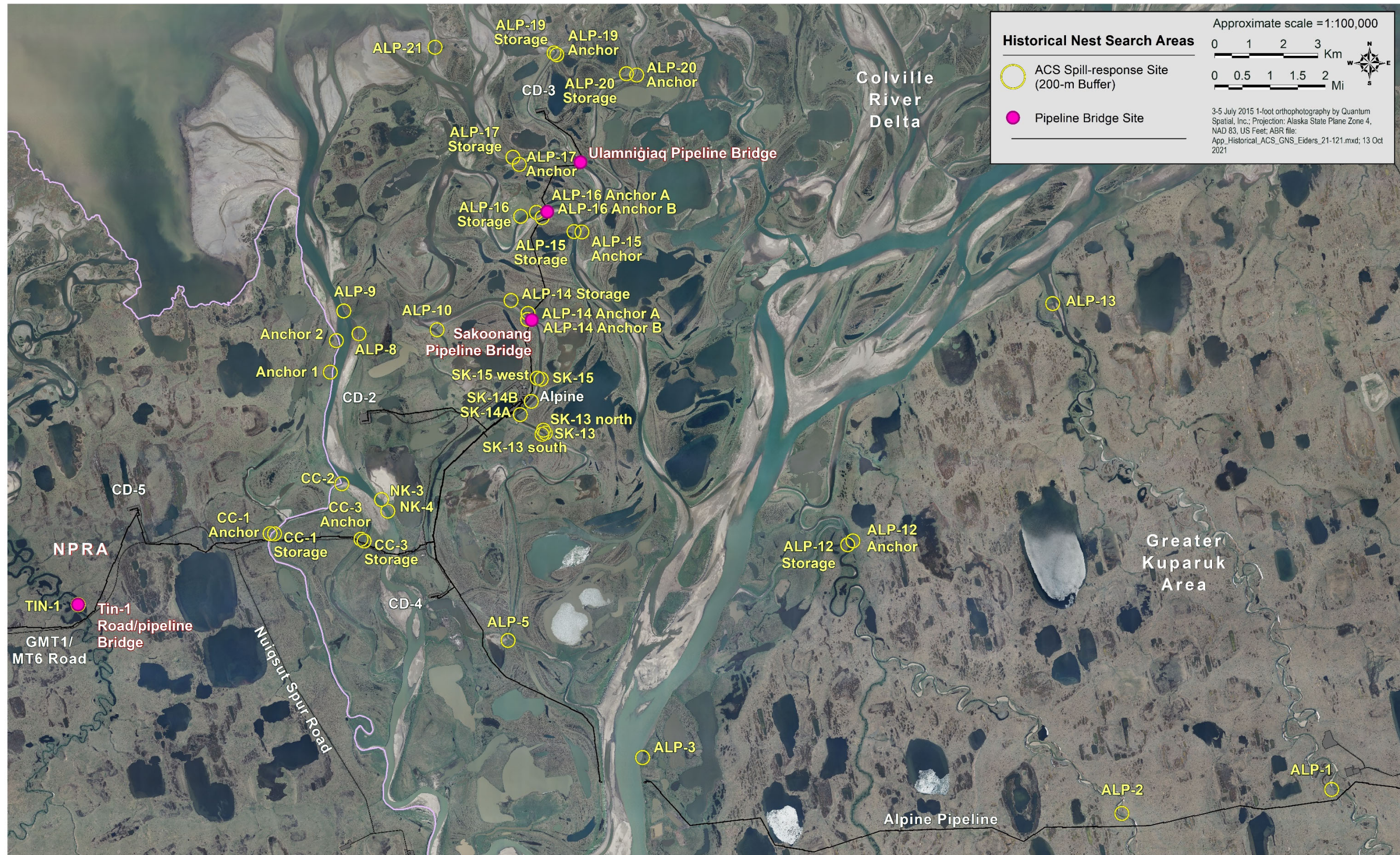
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Appendix A. Mean densities (mean of areas surveyed 1–27 years) of Spectacled Eiders observed during pre-nesting aerial surveys in the Colville Delta (blue outline), NPR-A, and Kuparuk study areas, Alaska, 1994–2020. No Spectacled Eiders were observed in the Willow and GMT study area in 2020 (adapted from Parrett et al 2021, Figure 5).

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Appendix B. Location of 27 spill-response equipment sites and 4 road/pipeline bridge sites where Spectacled Eider nest searches have been conducted in the Alpine Oilfield, Alaska, 2009–2021.