

EIDER NEST SEARCHES IN THE ALPINE AREA, 2016



Pam E. Seiser and Charles B. Johnson

Prepared for
ConocoPhillips Alaska, Inc.
Anchorage, Alaska

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

Cover:

Eider nest searches in the Colville River delta, NE NPRA, and adjacent areas, Alaska. Inset: Spectacled Eider on nest.
Photos © ConocoPhillips Alaska, Inc. All rights reserved.

EIDER NEST SEARCHES IN THE ALPINE AREA, 2016

FINAL REPORT

Prepared for

ConocoPhillips Alaska, Inc.

P.O. Box 100360

Anchorage, Alaska 99510-0360

Prepared by

Pam E. Seiser and Charles B. Johnson

ABR, Inc.—Environmental Research & Services

P.O. Box 80410

Fairbanks, Alaska 99708

September 2016



Printed on recycled paper.

TABLE OF CONTENTS

List of Figures	iii
List of Tables	iii
List of Appendices	iii
Acknowledgments	iv
Introduction.....	1
Objectives	13
Methods	13
Results.....	14
Spill Response Sites	14
CD-5 Habitat Monitoring Transects	15
CD-5 Ice Pad Area	15
Summary	15
Literature Cited.....	15

LIST OF FIGURES

Figure 1.	Study area for eider nest searches conducted prior to spill response activities in the Colville River delta, NE NPRA, and adjacent areas, Alaska, 2009–2016	2
Figure 2.	Study area for eider nest searches for CD-5 habitat monitoring transects and four spill response equipment sites associated with CD-5 pipeline, Colville River delta, and NE NPRA, Alaska, June 2016.....	3
Figure 3.	Eider nest search area around the CD-5 ice pads, NE NPRA, June 2016	5

LIST OF TABLES

Table 1.	Site descriptions and eider habitat assessments for 23 spill response equipment sites and 3 pipeline bridge sites, in the Alpine area, Colville River delta, NE NPRA, and adjacent areas, Alaska, 2009–2016.....	6
Table 2.	Numbers of nests of large waterbirds found in search areas at 8 spill response equipment sites, CD-5 habitat monitoring transects, and the CD-5 ice pads on the Colville River delta and NE NPRA, Alaska, 20–26 June 2016.....	14

ACKNOWLEDGMENTS

Nest searches in the Alpine and CD-5 area were conducted by a hard-walking crew consisting of Laura Gutierrez, Erin Johnson, James Smith, Joe Welch, and the two co-authors. Pam Odom provided travel and publication support. Will Lentz and Tony LaCortiglia supplied equipment and technical assistance. Bob Burgess reviewed the report. In the field, we were assisted by Mary Hrynyk and Candy Fitzpatrick with helicopter logistics, Dave McKnight with helicopter piloting, Jessika Gonzalez with oilfield support, and Lewis Hiatt and Tim Hilliard with identifying spill response equipment locations. All our field activities benefited from the safe and courteous support of staff and personnel at Alpine. This work was facilitated by Robyn McGhee, Senior Environmental Scientist at ConocoPhillips; we appreciate Robyn's continued support and review of our field projects.

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) consists of 4 drill sites located on the Colville River delta and 1 drill site (CD-5) in the northeastern National Petroleum Reserve-Alaska. To comply with the Terms and Conditions issued in the Biological Opinions for the Alpine satellites (USFWS 2004, 2011) 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 and then modifies those activities to avoid disturbance if nests are found. Consequently, 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 2016 breeding season. In this report, we document the absence of eider nests within search areas around 8 Alaska Clean Seas (ACS) spill response equipment sites (Figure 1) and the CD-5 habitat monitoring transects (Figure 2), located on the Colville River delta, and the CD-5 drill site ice pads (Figure 3), located in the adjacent Northeast National Petroleum Reserve-Alaska (NE NPRA).

Spectacled Eiders are common breeders on the Colville River delta and NE NPRA. 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, and CD-5 (Figures 1–3), and least common at the southernmost drill site, CD-4 (for eider distribution see Figure 3 in Johnson et al. 2016).

In contrast, Steller's Eiders are extremely rare along the central Beaufort Sea coast, where Alpine is located; their Alaska breeding distribution is primarily centered to the northwest near 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 25 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 20 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]). No records exist of a Steller's Eider nest or brood from the Colville 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 (USFWS 2004). 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, and 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.

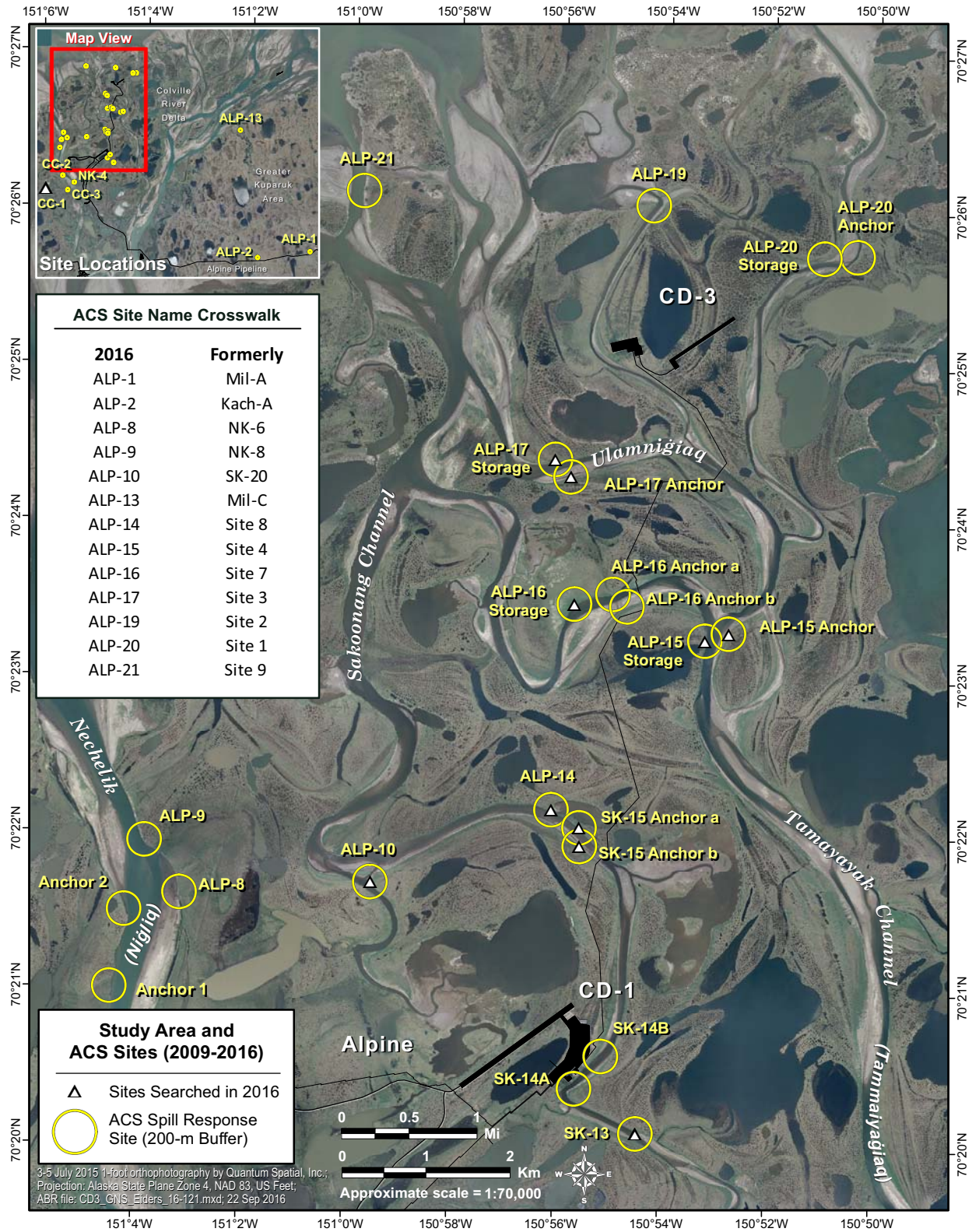
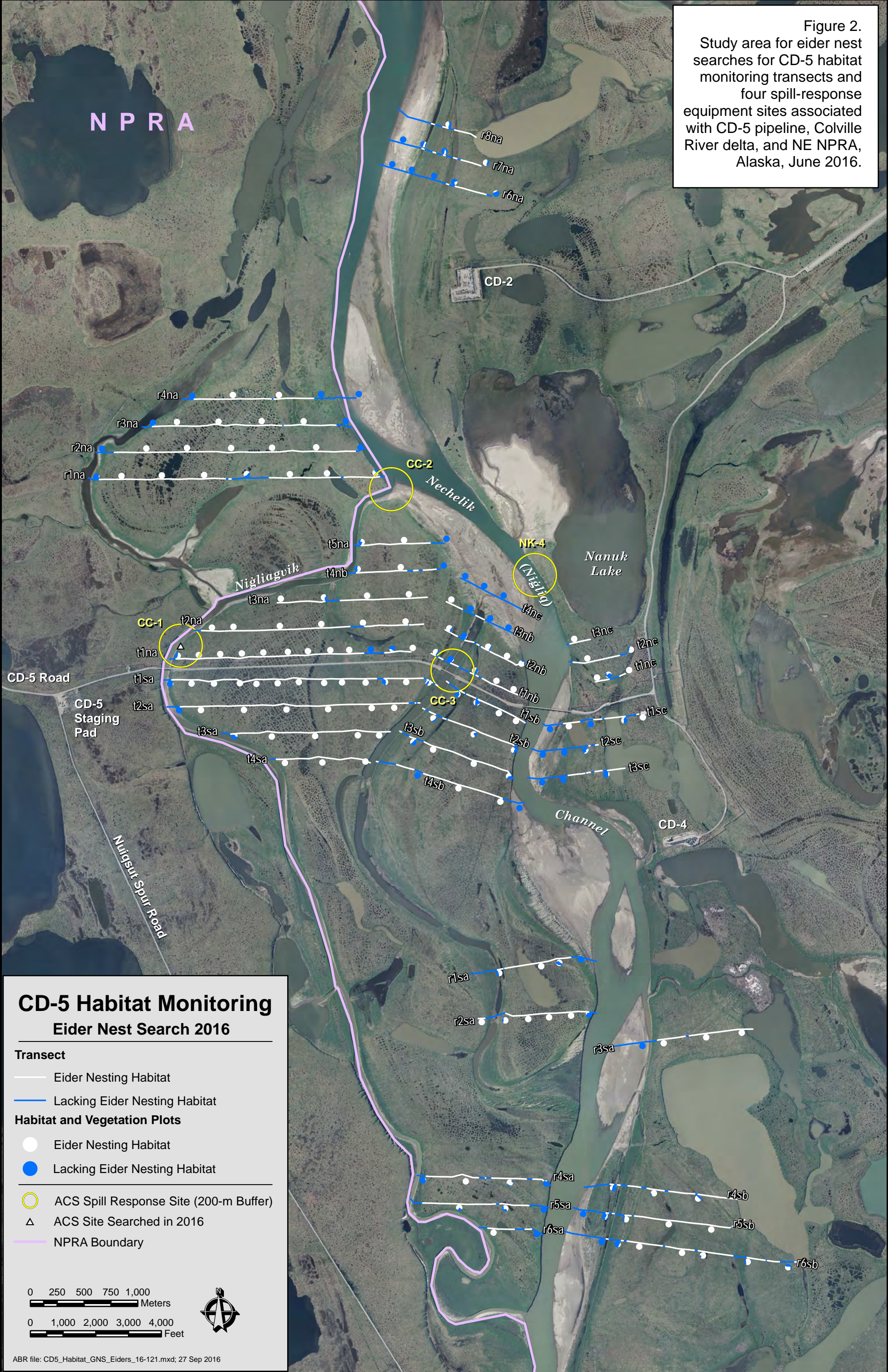


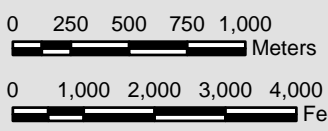
Figure 1. Study area for eider nest searches conducted prior to spill response activities in the Colville River delta, NE NPRA, and adjacent areas, Alaska, 2009–2016.

Figure 2. Study area for eider nest searches for CD-5 habitat monitoring transects and four spill-response equipment sites associated with CD-5 pipeline, Colville River delta, and NE NPRA, Alaska, June 2016.



CD-5 Habitat Monitoring Eider Nest Search 2016

- Transect**
- Eider Nesting Habitat
 - Lacking Eider Nesting Habitat
- Habitat and Vegetation Plots**
- Eider Nesting Habitat
 - Lacking Eider Nesting Habitat
- ACS Spill Response Site (200-m Buffer)
- △ ACS Site Searched in 2016
- NPRA Boundary



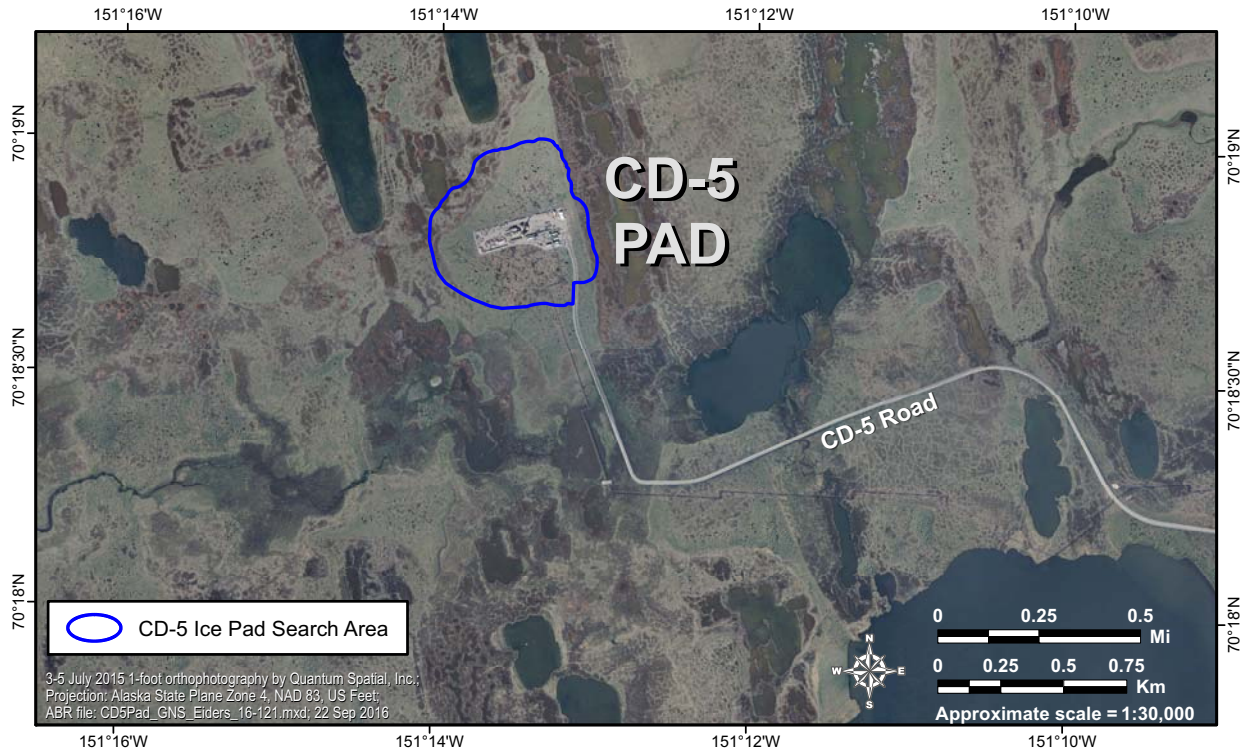


Figure 3. Eider nest search area around the CD-5 ice pads, NE NPRA, June 2016.

spectabilis], and Common eiders [*S. mollissima*] are hard to distinguish with the untrained eye. Without prior knowledge of nest locations, workers could 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 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 2016 is the eighth year that eider nest searches have been conducted in advance of off-pad work in the Alpine Oilfield. In the past, nest searches have centered on the Colville River delta, but with construction of CD-5, nest searches have been extended into the adjacent NE NPRA. This is the first year since 2008 that searches around CD-3 were not necessary; in 2016, off-pad work near the CD-3 drill pad and airstrip was delayed until after 1 August. Off-pad work was scheduled for June and July 2016 at several ACS spill response sites, the CD-5 habitat monitoring transects, and ice pad locations at CD-5. A summary of the habitat composition and nest search histories at 23 spill response equipment sites and 3 pipeline bridge sites that have been visited at least once during 2009–2016 is presented in Table 1 (Seiser and Johnson 2010; 2011a, b; 2012; 2014a, b; 2015).

Table 1. Site descriptions and eider habitat assessments for 23 spill response equipment sites and 3 pipeline bridge sites, in the Alpine area, Colville River delta, NE NPRA, and adjacent areas, Alaska, 2009–2016. Sites that were renamed in 2015 have their previous names listed in parentheses.

Site Name	Location	Site Description	Wildlife Habitat ^a	Habitat Description	Nesting Habitat Present ^b	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 the pipeline	PWM MSSM TLDS	Diverse site, 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, contained marginal nesting habitat.
ALP-2 (Kach-A)	N 70.23750 W 150.45838	Kachemach River, just north of the pipeline	MSSM MTTU NWM TLDS	Small pocket of wet meadow surrounded by drier habitat	No	No/No	2011	No	Poor habitat because NWM is <10% of the total area, and the surrounding area is occupied by shrubs.
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.
ALP-9 (NK-8)	N 70.36606 W 151.06483	NW 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.
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	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.

Table 1. Continued.

Site Name	Location	Site Description	Wildlife Habitat ^a	Habitat Description	Nesting Habitat Present ^b	Search History/ Nesting Records	Years Searched	Search in Future Years?	Comments
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.
ALP-14 (Site 8)	Storage: N 70.369519 W 150.935226	Predominately on the northern bank of the Sakoonaang Channel; site barely spans the channel	TLLWC, PWM, TLDS, BAR	~20% low-relief PWM, ~30% high-relief PWM, and ~50% shrub habitats (MSSM & TLDS) on north bank, TLDS and BAR on south bank	Yes	No/No	2009–2011 2013–2016	Yes	Nesting habitat limited to area of PWM north of container. Shoreline of channel and tap lake are unsuitable because of abundance of low shrubs. Two female Spectacled Eiders observed flying over the site in 2010.
ALP-15 (Site 4)	Storage: N 70.38775 W 150.88718 Anchor I: N 70.388532 W 150.87973	Container on western bank of the Tamayayak; boom anchor opposite bank slightly down stream.	PWM, MSSM, DOWIP, BAR	~70% dry, low-relief PWM; ~10% high-relief PWM; ~10% DOWIP; ~10% BAR	Yes	No/No	2009–2016	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.

Table 1. Continued.

Site Name	Location	Site Description	Wildlife Habitat ^a	Habitat Description	Nesting Habitat Present ^b	Search History/ Nesting Records	Years Searched	Search in Future Years?	Comments
ALP-16 (Site 7)	Storage: N 70.39152 W 150.92881 Anchor 1: N 70.392613 W 150.916575 Anchor 2: N 70.391308 W 150.912088	Container on NW bank of Tamayayak; site includes mud bar in the of middle channel	NWM, TLDS, BAR	Well-drained NWM and low shrubs along the river channel	No	No/No	2009 2011, 2016	No	No suitable nesting habitat near storage unit, the area is dry, shrubby and lacks ponds. Anchor 1 and 2 have unsuitable habitat within 100 m.
ALP-17 (Site 3)	Storage: N 70.40692 W 150.93549 Anchor 1 N 70.405078 W 150.93047	Container on northern bank of Ulamnigig; site spans the channel and mud flats on south bank	NWM, PWM, BAR	Vegetated areas ~50% NWM and ~50% PWM	Yes	Yes ^c /Yes	2009–2016	Yes	Eider nesting habitat near spill response container and anchor; a Spectacled Eider nested 160 m from the container in 2011 and 207 m from the container in 2009. Two female Spectacled Eiders observed flying in 2012.
ALP-19 (Site 2)	N 70.43417 W 150.90533	Container on western bank, site includes both sides of the of the West Ulamnigig	MSSM, PWM, NWM, BAR, SM, SKT	Half of site is vegetated. MSSM is on the west bank and on the east bank SM with NWM grades into PWM	Yes	Yes ^d /No	2009–2011 2014	No	Marginal nesting habitat; site borders better nesting habitat; driftwood lines indicate flooding is common at this site. Channel is ~60 m wide.

Table 1. Continued.

Site Name	Location	Site Description	Wildlife Habitat ^a	Habitat Description	Nesting Habitat Present ^b	Search History/		Search in Future Years?	Comments
						Nesting Records	Years Searched		
ALP-20 (Site 1)	Storage:	Container on west bank of the Tamayayak and the boom is anchored downstream where the channel narrows	NWM, PWM,	Vegetated areas on west side are predominately NWM and PWM; The east side also includes DPC and BAR.	Yes	Yes ^c /Yes	2009–2011 2013–2015	Yes	Eider nesting habitat consists of polygon ponds 100 m inland from the container; nesting habitat is easily delineated from the rest of the site by distinct rise in elevation above the current river bank and container location. One Spectacled Eider nest present in 2013 and 2014.
	N 70.42874		DPC						
	W 150.85064		BAR, SOW						
ALP-21 (Site 9)	N 70.428919								
	W 150.840197								
Anchor 1	N 70.43531	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	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.
	W 150.99748								
Anchor 2	N 70.35003	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.
	W 151.07447								
Anchor 2	N 70.35828	Western bank of the Nigliq Channel	PWM, DOWIP	Shrubs, low-relief low-center polygons	Yes	No/No	2009–2011	Yes	Marginal nesting habitat because of prevalence of shrubs. Large and small ponds are suitable habitat.
	W 150.07022								

Table 1. Continued.

Site Name	Location	Site Description	Wildlife Habitat ^a	Habitat Description	Nesting Habitat Present ^b	Search History/ Nesting Records	Years Searched	Search in Future Years?	Comments
CC-1 (CD-5 Site 3)	N 70.30756 W 151.11541	Nigliagvik Channel, ~300 m from Bridge #3	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 ^c /No	2009, 2015–2016	No	The 2015 site visit revealed that the low center polygon area on the east bank was MSSM with abundant willow coverage.
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 landscape is patterned the vegetation tends to be MSSM with abundant willow coverage.
CC-3 (CD-5 Site 2)	N 70.30589 W 151.04806	Bridge #3 over Lake L9341	TLDS, NWM, TLHWC, HUMO	Mostly TLDS with a narrow band of NWM on top of old river bank.	Yes	Yes ^c /No	2009, 2014–2015	Yes	The site spans an old river channel and included the bridge. Nonpatterned Wet Meadow occurs in patches, which may support eider nesting.
NK-4 (CD-5 Site 4)	N 70.31398 W 151.02808	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 willow over growth and flooding made habitat unsuitable for nesting eiders.

Table 1. Continued.

Site Name	Location	Site Description	Wildlife Habitat ^a	Habitat Description	Nesting Habitat Present ^b	Search History/ Nesting Records		Search in Future Years?	Comments
						Yes ^d /No	Years Searched		
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 ^d /No	1998–2000 2009 2011–2016	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 ^d /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 ^d /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	Anchor 1: N 70.36764 W 150.92625 Anchor 2: N 70.36565 W 150.92608	~2.5 km north of Alpine and next to a pipeline bridge on the Sakoonang	TLLWC, PWM, NWM, MSSM, TLDS, BAR	Tapped lake with brushy shoreline on NW side, opposite side mostly NWM. Small areas of PWM on both sides	Yes	No/No	1998 1999 2009–2016	Yes	Nesting habitat on both sides of the channel in areas of PWM and NWM.

Table 1. Continued.

Site Name	Location	Site Description	Wildlife Habitat ^a	Habitat Description	Nesting Habitat Present ^b	Search History/ Nesting Records	Years Searched	Search in Future Years?	Comments
Sakoonang Pipeline Bridge	N 70.36444	First Colville	PWM,	PWM on NE	Yes	Yes ^d /No	1998	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.
	W 150.91888	River channel-crossing north of Alpine, adjacent to SK-15	NWM, TLDS, BAR	bank, SW bank is shrubs with low-centered polygons in PWM			1999 2010		
Tamayyak Pipeline Bridge	N 70.39277	Second Colville	PWM,	PWM and NWM	Yes	No/No	2010	Yes	Willows along channel margins, suitable nesting habitat away from channels.
	W 150.90805	River channel-crossing north of Alpine	NWM, TLDS, BAR	on north bank, south bank is BAR, shrub, and NWM					
Ulamnigíaq Pipeline Bridge	N 70.39277	Third Colville	PWM,	PWM and NWM	Yes	Yes ^c	2000–2007	Yes	The majority of this site contains suitable nesting habitat.
	W 150.90805	River channel-crossing north of Alpine	NWM, BAR	on north bank, south bank is NWM			2010		

^a 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 (MTTU), Tall, Low, Dwarf Shrub (TLDS), Barrens (BAR), and Human Modified (HUMO)

^b Areas containing SM, SKT, DOWIP, DOW, SOW, NWM, PWM, or DPC (Deep Polygon Complex)

^c 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)

^d Alpine nest searches conducted in 1995–2001 (Johnson et al. 2003)

^e CD-5 eider nest searches conducted in 2009, 2014 and 2015 (Seiser and Johnson 2011, 2014, Johnson and Seiser 2015a)

OBJECTIVES

The primary objective of nest searching in 2016 was to identify the locations of nesting Spectacled and Steller's eiders prior to off-pad activities in eider nesting habitat. Documentation of nest locations allows CPAI to modify planned activities occurring near nests, either by delaying activities until after the nesting season or by maintaining a 200 m zone of no activity around nests. ABR searched for eider nests in designated off-pad work areas and transmitted the locations of active Spectacled Eider nests to CPAI field environmental compliance staff, who then modified work schedules or informed helicopter pilots and off-pad workers of areas to avoid.

METHODS

We conducted intensive ground-based nest searches for eiders on the Colville River delta and NE NPRA where mobilization and maintenance of spill response equipment, civil surveys, or tundra clean-up were proposed to occur during the breeding season. Search areas typically included a 200 m buffer around work sites located within potential eider nesting habitat. The 200 m buffer around work sites is based on terms and conditions in the Incidental Take Statement issued in the Biological Opinions for the Alpine Satellite Development Project (USFWS 2004) and for CD-5 (USFWS 2011). While regulatory guidelines have not been issued on the extent of area around human activity that should be monitored for nesting activity, or conversely, the area around nests in which human activity should be avoided, we have applied the 200 m buffer as a zone outside of which human activity is not likely to cause severe disturbance. 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 3–7 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 200 m search boundaries. Each habitat monitoring transect for CD-5, and the associated habitat and vegetation plots were searched by a single person. Crews were

transported by truck when possible, otherwise a helicopter or boat was used to access sites. All nest locations were recorded with handheld GPS units. Each nest was 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. Research activities were approved under USFWS Federal Fish and Wildlife Permit TE012155-5 and Alaska Department of Fish and Game Scientific Permit 16-118.

Eider nest searches were conducted only in the subset of ACS sites and along habitat monitoring transects that contained suitable nesting habitat and that were scheduled for site visits between 9 June and 1 August. Sites included spill response equipment storage containers and/or anchor points for floating boom. At sites where spill response equipment storage containers were permanently pre-staged, we searched within a 200 m radius of the container, otherwise we searched a 200 m radius around the coordinates provided by ACS. Anchor locations were identified based on aerial photos of the boom placements in 2014.

We searched habitats that were preferred or frequently used by nesting and pre-nesting Spectacled Eiders, as determined by previous studies in the area (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, and Patterned Wet Meadow. 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, NE NPRA, and the Alpine Transportation Corridor (Johnson et al. 1997; Jorgenson et al. 1997, 2003, 2004). 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 2016, we have conducted habitat evaluations at 23 spill response sites and 3 bridge sites (Table 1).

During a 2 May 2011 meeting, USFWS, CPAI, and ABR agreed to conduct nest searches at a reduced list of spill response sites based on presence of potential Spectacled Eider nesting habitat. Requests to drop 4 sites in 2011 and 6

additional sites in 2012 were accepted by all parties (letters from Caryn Rea to Sarah Conn, dated June 2011 and March 2012). Four spill response sites associated with CD-5 were searched in 2015, of which 3 were appraised as having low potential for use by nesting eiders. Thus, 10 ACS sites and 3 pipeline bridge crossings (between CD-1 and CD-3) remain on the list for nest searches when maintenance activities are planned during the eider breeding season (Table 1). In 2016, only 8 ACS sites were scheduled for spill response activities between 9 June and 1 August and, consequently, received nest searches.

RESULTS

SPILL RESPONSE SITES

No Spectacled Eider or Steller's Eider nests were found within 200 m of the 8 spill response

sites that we searched during 20–22 June (Figure 1). The 2016 search sites included one of 4 new spill response sites associated with the CD-5 pipeline (CC-1, CC-2, CC-3, and NK-4). During our visit to CC-1, we documented abundant low to tall shrubs at the site, which are not favored by nesting Spectacled Eiders. We updated our 2015 habitat assessment for 3 CD-5 spill response sites to recommend no future eider nest searches be required before off-pad activities; only CC-3 has potential among the 4 CD-5 sites to support Spectacled Eider nests. During eider nest searches of the 8 spill response sites, we located 31 large waterbird nests, of which all but one of those nests belonged to Greater White-fronted Geese (Table 2). No Steller's Eider adults or nests were sighted in any of the search areas in 2016, or during the 25 years of nest searching that has occurred on the Colville River delta (ABR, unpublished data).

Table 2. Numbers of nests of large waterbirds found in search areas at 8 spill response equipment sites, CD-5 habitat monitoring transects, and the CD-5 ice pads on the Colville River delta and NE NPRA, Alaska, 20–26 June 2016. No Spectacled or Steller eider nests were found in 2016.

Search Area (Former Names)	Greater White-fronted Goose	Cackling/Canada Goose ^a	Tundra Swan	Northern Pintail	Long-tailed Duck	Willow Ptarmigan	Red-Throated Loon	Bar-tailed Godwit	Total
ACS Spill Response Sites									
ALP-10 (SK-20)	1	–	–	–	–	–	–	–	1
ALP-14 (Site 8) Storage	5	–	–	–	–	–	–	–	5
ALP-15 (Site 4) Storage and Anchor	4	–	–	–	–	–	–	–	4
ALP-16 (Site 7) Storage	2	–	–	–	–	–	–	–	2
ALP-17 (Site 3) Storage and Anchor	9	–	–	–	–	–	–	–	9
CC-1	2	–	–	–	–	–	–	–	2
SK-13	2	–	–	–	–	1	–	–	3
SK-15 Anchor a and b	5	–	–	–	–	–	–	–	5
Subtotal	30	–	–	–	–	1	–	–	31
CD-5 Habitat Monitoring Transects	33	1	2	3	1	–	2	1	43
CD-5 Ice Pad	11	–	–	–	–	–	–	–	11
Total Nests	73 ^b	1	2	3	1	1	2	1	84 ^b

^a Nest belonging to either Cackling Goose or Canada Goose

^b One Greater White-fronted Goose nest was included in both the CC-1 and CD-5 transect subtotals

CD-5 HABITAT MONITORING TRANSECTS

We did not find Spectacled Eider nests or adults along the CD-5 habitat monitoring transects that we searched during 23–26 June (Figure 2). The search area included 39 transects, 30 vegetation plots, and 30 habitat plots that fell within potential eider nesting habitat. While searching for eider nests, we found 43 nests of 7 large waterbirds species, the majority of which belonged to Greater White-fronted Geese (Table 2).

CD-5 ICE PAD AREA

We searched 33 ha within ~100–300 m of the CD-5 drill pad on 21 June (Figure 3). We adjusted our search boundaries to include areas requiring tundra clean-up, including the remnants of 2 ice pads adjacent to the drill pad and excluding the waterbodies on the east side of the pad. We found no Spectacled Eider nests or adults. While searching for eider nests, we found 11 nests of Greater White-fronted Geese in the CD-5 ice pad search area (Table 2).

SUMMARY

In 2016, no Spectacled Eider nests were found within 200 m of spill-response sites, on the CD-5 habitat monitoring transects, or in the CD-5 ice pad area. Neither Steller's Eider nests nor adults were seen in any of the areas searched in 2016. Evidence of breeding by Steller's Eiders has not been documented on the Colville delta, NE NPRA, or in the Greater Kuparuk Area, despite nearly annual aerial surveys and ground-based nest search efforts over the last 25 years (ABR, unpubl. data).

Three of 4 spill response sites newly established for the CD-5 pipeline contained low quality habitat for nesting eiders; therefore, we are not recommending that they be added to the list of 9 sites that USFWS, CPAI, and ABR agreed would require ground searches prior to off-pad activities during the nesting season. Overall we have determined that 13 of 23 spill response sites either lacked eider nesting habitat, contained nesting habitat low in quantity or quality, or had degraded and unusable nesting habitat (for example, the flare at SK-14A and remnant snow berms at SK-14B).

We did not find Spectacled Eider nests at any of the 8 spill response sites, CD-5 habitat

monitoring transects, or the CD-5 ice pad search areas in 2016. In the past, we have found Spectacled Eider nests north of CD-1, CD-2, and CD-5. Identification of active Spectacled Eider nests through nest searches prior to off-pad human activity continues to be an important method of complying with Endangered Species Act terms and conditions by reducing the potential for unintended disturbance to nesting Spectacled Eiders, while allowing vital oilfield operations, such as spill response preparation, to continue on schedule.

LITERATURE CITED

- Anderson, B. A., and B. A. Cooper. 1994. Distribution and abundance of Spectacled Eiders in the Kuparuk and Milne Point oilfields, Alaska, 1993. Report for ARCO Alaska, Inc., and the Kuparuk River Unit, Anchorage, AK, by Alaska Biological Research, Inc., Fairbanks, AK. 71 pp.
- Anderson, B. A., A. A. Stickney, T. Obritschkewitsch, and J. E. Shook. 2008. Avian studies in the Kuparuk Oilfield, Alaska, 2007. Data summary report for ConocoPhillips Alaska, Inc., and the Kuparuk River Unit, Anchorage, AK, by ABR, Inc., Fairbanks, AK. 38 pp.
- Johnson, C. B., and P. E. Seiser. 2015a. CD-5 pipeline Spectacled Eider nest search, 2015. Report for ConocoPhillips Alaska, Inc., Anchorage, AK, by ABR, Inc., Fairbanks, AK. 7 pp.
- Johnson, C. B., and P. E. Seiser. 2015b. GMT-1 pipeline route Spectacled Eider nest search, 2015. Report for ConocoPhillips Alaska, Inc., Anchorage, AK, by ABR, Inc., Fairbanks, AK. 7 pp.
- Johnson, C. B., B. E. Lawhead, J. R. Rose, A. A. Stickney, and A. M. Wildman. 1997. Wildlife studies on the Colville River delta, Alaska, 1996. Fifth annual report for ARCO Alaska, Inc., and Kuukpik Unit Owners, Anchorage, AK, by ABR, Inc., Fairbanks, AK. 139 pp.

- Johnson, C. B., R. M. Burgess, B. E. Lawhead, J. R. Rose, A. A. Stickney, and A. M. Wildman. 2002. Wildlife studies in the CD North study area, 2001. Second annual report for PHILLIPS Alaska, Inc., Anchorage, AK, by ABR, Inc., Fairbanks, AK. 114 pp.
- Johnson, C. B., R. M. Burgess, B. E. Lawhead, J. Neville, J. P. Parrett, A. K. Prichard, J. R. Rose, A. A. Stickney, and A. M. Wildman. 2003. Alpine Avian Monitoring Program, 2001. Fourth annual and synthesis report for ConocoPhillips Alaska, Inc., and Anadarko Petroleum Corporation, Anchorage, AK, by ABR, Inc., Fairbanks, AK. 194 pp.
- Johnson, C. B., A. Zusi-Cobb, A. M. Wildman, A. A. Stickney, and B. A. Anderson. 2004. Biological assessment for Spectacled and Steller's eiders in the Alpine Satellite Development Project area. Report for ConocoPhillips Alaska, Inc., and Anadarko Petroleum Corporation, Anchorage, AK, by ABR, Inc., Fairbanks, AK. 119 pp.
- Johnson, C. B., A. M. Wildman, J. P. Parrett, J. R. Rose, T. Obritschkewitsch, and J. E. Shook. 2008a. Avian studies for the Alpine Satellite Development Project, 2007. Fifth annual report for ConocoPhillips Alaska, Inc., and Anadarko Petroleum Corporation, Anchorage, AK, by ABR, Inc., Fairbanks, AK. 28 pp.
- Johnson, C. B., J. P. Parrett, and P. E. Seiser. 2008b. Spectacled Eider monitoring at the CD-3 development, 2007. Annual report for ConocoPhillips Alaska, Inc., and Anadarko Petroleum Corporation, Anchorage, AK, by ABR, Inc., Fairbanks, AK. 43 pp.
- Johnson, C. B., J. P. Parrett, T. Obritschkewitsch, J. R. Rose, K. B. Rozell, and P.E. Seiser. 2015. Avian studies for the Alpine Satellite Development Project, 2014. Twelfth annual report for ConocoPhillips Alaska, Inc., and Anadarko Petroleum Corporation, Anchorage, AK, by ABR, Inc., Fairbanks, AK. 115 pp.
- Johnson, C. B., J. P. Parrett, J. R. Rose, and P.E. Seiser. 2016. Avian studies for the Alpine Satellite Development Project, 2015. Thirteenth annual report for ConocoPhillips Alaska, Inc., and Anadarko Petroleum Corporation, Anchorage, AK, by ABR, Inc., Fairbanks, AK. 47 pp.
- Jorgenson, M. T., J. E. Roth, E. R. Pullman, R. M. Burgess, M. Reynolds, A. A. Stickney, M. D. Smith, and T. Zimmer. 1997. An ecological land survey for the Colville River delta, Alaska, 1996. Report for ARCO Alaska, Inc., Anchorage, AK, by ABR, Inc., Fairbanks, AK. 160 pp.
- Jorgenson, M. T., J. E. Roth, M. Emers, S. Schlentner, D. K. Swanson, E. R. Pullman, J. Mitchell, and A. A. Stickney. 2003. An ecological land survey for the Northeast Planning Area of the National Petroleum Reserve-Alaska, 2002. Report for ConocoPhillips Alaska, Anchorage, AK, by ABR, Inc., Fairbanks, AK. 84 pp.
- Jorgenson, M. T., J. E. Roth, M. Emers, W. Davis, E. R. Pullman, and G. J. Frost. 2004. An ecological land survey for the Northeast Planning Area of the National Petroleum Reserve-Alaska, 2003. Addendum to 2002 report for ConocoPhillips Alaska and Anadarko Petroleum Corporation, Anchorage, AK, by ABR, Inc., Fairbanks, AK. 40 pp.
- King, J., and C. Dau. 1997. Expanded aerial searches for Steller's Eiders on the Arctic Coastal Plain of Alaska, 1997. Unpublished report by U.S. Fish and Wildlife Service, Fairbanks, AK. 4 pp.
- Quakenbush, L. T., R. H. Day, B. A. Anderson, F. A. Pitelka, and B. J. McCaffery. 2002. Historical and present breeding season distribution of Steller's Eiders in Alaska. *Western Birds* 33: 99-120.
- Seiser, P. E., and C. B. Johnson. 2010. Eider nest searches at the CD-3 pad, ice road, and spill-response sites on the Colville River delta, 2009. Report for ConocoPhillips Alaska, Inc., Anchorage, AK, by ABR, Inc., Fairbanks, AK. 13 pp.

- Seiser, P. E., and C. B. Johnson. 2011a. Eider nest searches at the CD-3 pad, ice road, and spill-response sites on the Colville River delta, 2010. Report for ConocoPhillips Alaska, Inc., Anchorage, AK, by ABR, Inc., Fairbanks, AK. 15 pp.
- Seiser, P. E., and C. B. Johnson. 2011b. Eider nest searches at the CD-3 pad, ice road, and spill-response sites on the Colville River delta, 2011. Report for ConocoPhillips Alaska, Inc., Anchorage, AK, by ABR, Inc., Fairbanks, AK. 14 pp.
- Seiser, P. E., and C. B. Johnson. 2012. Eider nest searches at the CD-3 pad, ice road, and spill-response sites on the Colville River delta, 2012. Report for ConocoPhillips Alaska, Inc., Anchorage, AK, by ABR, Inc., Fairbanks, AK. 14 pp.
- Seiser, P. E., and C. B. Johnson. 2014a. Eider nest searches at the CD3 pad, ice road, and spill-response sites on the Colville River delta, 2013. Report for ConocoPhillips Alaska, Inc., Anchorage, AK, by ABR, Inc., Fairbanks, AK. 13 pp.
- Seiser, P. E., and C. B. Johnson. 2014b. Eider nest searches at CD3, spill-response sites, and the CD3 and CD5 ice roads, in the Alpine Oilfield, 2014. Report for ConocoPhillips Alaska, Inc., Anchorage, AK, by ABR, Inc., Fairbanks, AK. 16 pp.
- Seiser, P. E., and C. B. Johnson. 2015. Eider nest searches at CD3 and spill-response sites in the Alpine Oilfield, 2015. Report for ConocoPhillips Alaska, Inc., Anchorage, AK, by ABR, Inc., Fairbanks, AK. 13 pp.
- USFWS (U.S. Fish and Wildlife Service). 2004. Final biological opinion for the Alpine Satellite Development Project. Fairbanks Fish and Wildlife Field Office, U.S. Fish and Wildlife Service, Fairbanks, AK. 62 pp.
- USFWS. 2011. Biological opinion for the CD-5 Alpine Satellite Facility, ConocoPhillips Alaska, Inc. Fairbanks Fish and Wildlife Field Office, U.S. Fish and Wildlife Service, Fairbanks, AK. 140 pp.