



Pre-Permitting Environmental / Socio-Economic Data Report Series

Report Series N- Terrestrial Wildlife and Habitats

Report N-9 Waterbird Tables 2004-2007

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Preliminary data. Do not cite or quote.

The Pebble Partnership is providing environmental and socio-economic baseline data collected to inform the development of the Pebble Project to state and federal agencies, project stakeholders and the general public prior to project permitting as part of its commitment to full and open disclosure.

A comprehensive Environmental Baseline Document (EBD) will subsequently be prepared and appended to future project permit applications. The EBD will also be made publicly available when complete.

Collected for the Pebble Partnership by:



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TABLE N-9.1
Waterbird Surveys Conducted in the Mine Study Area, 2004 and 2005

Year/ Survey Type	Target Species	Purpose	Survey Date	Aircraft	Altitude (meters)	Method
2004						
Aerial	Waterfowl	Spring Migration	Apr 21	C206	60	Lake-to-Lake
Aerial	Waterfowl	Spring Migration	May 4	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Spring Migration	May 14	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Spring Migration	May 23	Cub	60	Lake-to-Lake
Aerial	Harlequin Duck	Pre-nesting	May 25	H500	45	Stream
Aerial	Waterfowl	Breeding	Jun 2	C206	45	Transect
Aerial	Swans	Nesting	Jun 3	C206	150	Transect
Ground	Waterfowl	Brood-rearing	Jul 9-13	—	—	Lake-to-Lake
Aerial	Harlequin Duck	Brood-rearing	Jul 12	Astar	45	Stream
Aerial	Harlequin Duck	Brood-rearing	Aug 2	H500	45	Stream
Aerial	Waterfowl	Fall Migration	Sep 2	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Sep 13	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Sep 23	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Oct 7	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Oct 21	Cub	60	Lake-to-Lake
2005						
Aerial	Waterfowl	Spring Migration	Apr 21 ^a	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Spring Migration	Apr 24	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Spring Migration	May 3	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Spring Migration	May 14-15	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Spring Migration	May 21-23	Cub	60	Lake-to-Lake
Aerial	Harlequin Duck	Pre-nesting	May 24	R44	45	Stream
Aerial	Waterfowl	Breeding	May 27	C206	45	Transect
Aerial	Swans	Nesting	May 28	C206	150	Transect
Aerial	Harlequin Duck	Pre-nesting	May 29	B206/R44	45	Stream
Aerial	Gulls	Nesting	Jun 2	R44	60	Lake-to-Lake
Ground	Waterfowl	Brood-rearing	Jul 8-14	—	—	Lake-to-Lake
Aerial	Waterfowl	Molting	Jul 26	Cub	60	Lake-to-Lake
Aerial	Harlequin Duck	Brood-rearing	Jul 28-29	R44	45	Stream
Aerial	Waterfowl	Molting	Aug 11	Cub	60	Lake-to-Lake
Aerial	Harlequin Duck	Brood-rearing	Aug 13-14	R44	45	Stream
Aerial	Waterfowl	Fall Migration	Aug 17-19	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Aug 27, 29	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Sep 6, 8	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Sep 13-14	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Sep 30	R44	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Oct 7	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Oct 12	Cub	60	Lake-to-Lake

Notes: a. Reconnaissance survey conducted by pilot only.

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TABLE N-9.2

Status of Waterbird Species Observed during Aerial and Ground Surveys, Mine Study Area, 2004-2005

Common Name	Scientific Name	Status
Greater White-fronted Goose	<i>Anser albifrons</i>	Migrant
Canada/Cackling Goose ^a	<i>Branta spp.</i>	Migrant
Tundra Swan ^b	<i>Cygnus columbianus</i>	Confirmed Breeder
Gadwall	<i>Anas strepera</i>	Migrant
American Wigeon	<i>Anas americana</i>	Confirmed Breeder
Mallard	<i>Anas platyrhynchos</i>	Confirmed Breeder
Northern Shoveler	<i>Anas clypeata</i>	Confirmed Breeder
Northern Pintail	<i>Anas acuta</i>	Confirmed Breeder
Green-winged Teal	<i>Anas crecca</i>	Confirmed Breeder
Canvasback	<i>Aythya valisineria</i>	Migrant
Ring-necked Duck	<i>Aythya collaris</i>	Migrant
Greater Scaup ^c	<i>Aythya marila</i>	Confirmed Breeder
Harlequin Duck	<i>Histrionicus histrionicus</i>	Confirmed Breeder
Surf Scoter	<i>Melanitta perspicillata</i>	Migrant
White-winged Scoter	<i>Melanitta fusca</i>	Migrant
Black Scoter	<i>Melanitta nigra</i>	Confirmed Breeder
Long-tailed Duck	<i>Clangula hyemalis</i>	Confirmed Breeder
Bufflehead	<i>Bucephala albeola</i>	Migrant
Common Goldeneye ^d	<i>Bucephala clangula</i>	Confirmed Breeder
Hooded Merganser	<i>Lophodytes cucullatus</i>	Migrant
Common Merganser	<i>Mergus merganser</i>	Probable Breeder
Red-breasted Merganser	<i>Mergus serrator</i>	Confirmed Breeder
Red-throated Loon	<i>Gavia stellata</i>	Migrant
Pacific Loon	<i>Gavia pacifica</i>	Confirmed Breeder
Common Loon	<i>Gavia immer</i>	Confirmed Breeder
Red-necked Grebe	<i>Podiceps grisegena</i>	Migrant
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	Migrant
Black-bellied Plover	<i>Pluvialis squatarola</i>	Confirmed Breeder
Semipalmated Plover	<i>Charadrius semipalmatus</i>	Confirmed Breeder
Greater Yellowlegs	<i>Tringa melanoleuca</i>	Confirmed Breeder
Whimbrel	<i>Numenius phaeopus</i>	Confirmed Breeder
Least Sandpiper	<i>Calidris minutilla</i>	Confirmed Breeder
Bonaparte's Gull	<i>Larus philadelphia</i>	Confirmed Breeder
Mew Gull	<i>Larus canus</i>	Confirmed Breeder
Glaucous-winged Gull	<i>Larus glaucescens</i>	Migrant
Arctic Tern	<i>Sterna paradisaea</i>	Migrant
Parasitic Jaeger	<i>Stercorarius parasiticus</i>	Migrant

Notes:

- Canada Geese (*Branta canadensis*) probably are the primary *Branta* spp. in the mine study area, but Cackling Geese (*B. hutchinsii*) may be present.
- Tundra Swans were confirmed to occur in the mine study area, although Trumpeter Swans also may be present.
- Greater Scaup were confirmed to occur in the mine study area, although Lesser Scaup also may be present.
- Common Goldeneyes were confirmed to occur in the mine study area, although Barrow's Goldeneyes also may be present.

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TABLE N-9.3

Numbers of Waterbirds by Species-group Observed during Spring and Fall Migration Surveys, Mine Study Area, 2004

Survey Area/ Species-Group	Spring				Fall				
	Apr 21 ^a	May 4 ^b	May 14	May 23	Sep 2	Sep 13	Sep 23	Oct 7	Oct 21 ^a
Mine^c									
Geese	2	0	0	0	0	0	0	0	0
Swans	2	10	11	16	25	28	16	17	5
Ducks	35	224	663	308	956	610	214	173	98
Loons	0	0	9	5	7	4	0	0	0
Grebes	0	0	0	0	2	0	0	0	0
Shorebirds	0	15	41	23	0	0	0	0	0
Gulls/Terns	0	25	46	83	0	0	0	0	0
Jaegers	0	0	0	2	0	0	0	0	0
Subtotal	39	274	770	437	990	642	230	190	103
South Talarik^d									
Swans	—	2	5	1	2	2	31	44	—
Ducks	—	28	104	75	124	105	104	166	—
Loons	—	0	0	1	0	0	0	0	—
Cormorants	—	0	2	6	0	0	3	0	—
Shorebirds	—	0	23	2	0	0	0	0	—
Gulls/Terns	—	0	62	4	136	89	47	10	—
Subtotal	—	30	196	89	262	196	185	220	—
Nikabuna Lakes^e									
Swans	—	—	—	—	—	—	357	2	—
Ducks	—	—	—	—	—	—	954	895	—
Subtotal	—	—	—	—	—	—	1,311	897	—
TOTAL ^f	39	304	966	526	1,252	838	415	410	103

Notes:

- No survey was conducted of rivers in the South Talarik survey area.
- A partial survey of rivers in the South Talarik survey area was flown; river outlets were not surveyed because of fog.
- Includes lakes and rivers of the headwaters of Upper Talarik Creek and the north and south forks of the Kuktuli River (Figure N-3.2).
- Includes the southern-most section (approximately 2.5 kilometers) of Upper Talarik Creek and all of Lower Talarik Creek (Figure N-3.2).
- September 23 and October 7 were reconnaissance surveys and the area surveyed covered only a part of that surveyed in 2005. Only swans and ducks were counted.
- Includes subtotals from mine and South Talarik survey areas; subtotals from Nikabuna Lakes survey area not included.

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TABLE N-9.4

Numbers of Waterbirds by Species-group Observed during Spring and Fall Migration Surveys, Mine Study Area, 2005

Survey Area/ Species-Group	Spring					Fall						
	Apr 21 ^a	Apr 24	May 3	May 14-15	May 21-23	Aug 17-19	Aug 27, 29	Sep 6, 8	Sep 13-14	Sep 30	Oct 7	Oct 12
Mine^b												
Swans	0	4	10	15	16	36	23	22	38	27	24	16
Ducks	27	68	162	651	917	938	939	958	825	617	166	128
Loons	0	0	0	5	14	2	3	2	2	0	0	0
Grebes	0	0	0	0	0	0	0	0	1	1	1	0
Shorebirds	0	0	22	20	24	12	0	0	0	0	0	0
Gulls/Terns	0	0	34	80	104	2	0	0	0	0	0	0
Subtotal	27	72	228	771	1,075	990	965	982	866	645	191	144
South Talarik^c												
Geese	6	0	9	0	0	0	—	—	—	—	0	0
Swans	164	6	16	13	8	38	—	—	—	—	2	14
Ducks	90	212	210	210	536	334	—	—	—	—	45	172
Loons	0	0	2	0	6	1	—	—	—	—	0	0
Cormorants	0	0	0	2	0	0	—	—	—	—	0	0
Shorebirds	0	1	14	37	18	4	—	—	—	—	0	0
Gulls/Terns	1	10	74	233	84	84	—	—	—	—	3	6
Subtotal	261	229	325	495	652	461	—	—	—	—	50	192
Nikabuna Lakes^d												
Geese	150	376	5	116	0	20	0	6	0	0	0	0
Swans	400	165	8	6	14	40	70	17	0	6	167	333
Ducks	350	821	721	989	719	2,657	4,659	4,997	2,060	2,488	1,943	3,138
Loons	0	0	7	2	5	17	3	1	0	1	0	0
Grebes	0	0	27	3	1	0	1	0	0	0	1	0
Shorebirds	0	0	9	43	33	6	0	0	0	0	0	0
Gulls/Terns	0	8	0	9	7	0	0	0	0	0	0	3
Subtotal	900	1,370	777	1,168	779	2,740	4,733	5,021	2,060	2,495	2,111	3,474
TOTAL	1,188	1,671	1,330	2,434	2,506	4,191	5,698	6,003	2,926	3,140	2,352	3,810

Notes:

- Reconnaissance survey conducted by pilot only.
- Includes lakes and rivers of the headwaters of Upper Talarik Creek and the north and south forks of the Kuktuli River (Figure N-3.2).
- Includes lakes and rivers south of Sharp Mountain (Figure N-3.2). No surveys flown from August 27 through September 30. Only Lower Talarik Creek surveyed on October 7 and 12.
- Includes Nikabuna and Long lakes and a section of the Chulitna River (Figure N-3.2).

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TABLE N-9.5

Numbers and Densities of Waterfowl Observed during Breeding-population Surveys, Mine Study Area, 2004-2005

Year/ Species	Males	Pairs	Grouped Birds ^a	Indicated Total No. Birds ^b	Visibility Correction Factor ^c	Corrected Total No. Birds ^d	Density ^e (birds/ km ²)	Composition (% of total)
2004								
Mallard	1	3	0	8	4.01	32	1.2	10
Northern Pintail	2	1	0	6	3.05	18	0.7	6
Green-winged Teal	1	1	0	4	8.36	33	1.2	10
Unidentified scaup ^f	7	14	54	89	1.93	172	6.3	52
Unidentified scoter	2	3	4	14	1.17	16	0.6	5
Long-tailed Duck	1	1	0	4	1.87	8	0.3	2
Unidentified goldeneye	1	6	0	14	3.61	51	1.9	15
TOTAL DUCKS						330	12.2	100
Unidentified swan ^f	6	5	0	16	1	16	0.6	
2005								
Gadwall	0	1	0	2	3.04	6	0.2	3
Mallard	3	3	0	12	4.01	48	1.8	26
Northern Pintail	0	3	0	6	3.05	18	0.7	10
Unidentified scaup ^f	12	7	25	51	1.93	98	3.6	53
Unidentified scoter	3	3	0	12	1.17	14	0.5	8
TOTAL DUCKS						184	6.8	100
Unidentified swan ^f	0	4	0	8	1	8	0.3	

Notes:

- Grouped birds are those that occurred in flocks; no assumptions as to the number of pairs were made.
- Indicated Total No. Birds = (number of males in groups [less than 5 birds] x 2) + (number of pairs x 2) + number of birds in groups more than 4 birds.
- Visibility Correction Factor developed by USFWS (Conant and Groves, 2005).
- Corrected Total No. Birds = Indicated Total No. Birds x Visibility Correction Factor.
- Density based on corrected total number of birds in 27.2 square kilometers (km²) sample area.
- Males and single birds not doubled in calculating indicated total number of birds.

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TABLE N-9.6

Numbers of Harlequin Ducks Observed during Pre-nesting and Brood-rearing Aerial Surveys, Mine Study Area, 2004

Location	Pre-nesting ^a				Brood-rearing ^b		
	Single Male	Single Female	Pairs	Total Birds ^c	Females	Young	Total Birds
North Fork Koktuli	4	2	6	18	0	0	0
South Fork Koktuli	4	0	4	12	0	0	0
Upper Talarik	7	0	11	29	0	0	0
Lower Talarik	0	0	0	0	—	—	—
TOTAL	15	2	21	59	0	0	0

Notes:

- Survey was flown May 25.
- Two surveys were flown: July 12 and August 2.
- Total = (number of single males) + (number of single females) + (number of pairs x 2).

TABLE N-9.7

Numbers of Harlequin Ducks Observed during Pre-nesting and Brood-rearing Aerial Surveys, Mine Study Area, 2005

Survey/ Location	Pre-nesting				Brood-rearing			
	Single Male	Single Female	Pairs	Total Birds ^a	Females	Young	Total Birds	No. Broods
First Survey^b								
North Fork Koktuli	5	0	1	7	10	20	30	5
South Fork Koktuli ^c	0	0	10	20	2	8	10	2
Upper Talarik ^d	5	0	18	41	10	32	42	7
Lower Talarik	0	0	0	0	0	0	0	0
TOTAL	10	0	29	68	22	60	82	14
Second Survey^e								
North Fork Koktuli	2	0	4	10	12	31	43	7
South Fork Koktuli ^c	0	0	0	0	5	8	13	3
Upper Talarik ^d	4	0	3	10	13	19	32	5
Lower Talarik	0	0	0	0	0	0	0	0
TOTAL	6	0	7	20	30	58	88	15

Notes:

- Total = (number of single males) + (number of single females) + (number of pairs x 2).
- Pre-nesting survey was flown May 24 and brood-rearing survey July 28-29.
- Includes observations from two drainages on Kaskanak Mountain that drain into the South Fork Koktuli River.
- Includes observations from a northeastern tributary.
- Pre-nesting survey was flown May 29 and brood-rearing survey August 13-14.

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TABLE N-9.8

Numbers of Waterbird Broods Observed on Ponds and Lakes during Ground Surveys in Drainage Basin Survey Areas, Mine Study Area, 2004-2005

Year/ Species	Drainage Basin Survey Areas					Total
	North Fork Koktuli	Upper South Fork Koktuli	Lower South Fork Koktuli	Upper Talarik North	Upper Talarik South	
2004						
Tundra Swan	1	1				2
American Wigeon	8	3	5	1		17
Mallard		1				1
Northern Shoveler	1		2	1		4
Northern Pintail	3	2				5
Green-winged Teal	6	3	1			10
Greater Scaup	1					1
Unidentified scaup		8				8
Black Scoter		3				3
Long-tailed Duck	1					1
Common Goldeneye				1		1
Unidentified duck			1			1
Common Loon	1					1
Semipalmated Plover	3	4				7
Greater Yellowlegs	1		3		1	5
Least Sandpiper		1				1
Bonaparte's Gull	1					1
TOTAL	27	26	12	3	1	69
No. lakes surveyed	57	28	13	8	12	118
2005						
Tundra Swan		1				1
American Wigeon	18	6	7	4		35
Mallard	3	3	2	3		11
Northern Shoveler	6	2	5			13
Northern Pintail	17	5	11	3		36
Green-winged Teal	6	5	3	1		15
Greater Scaup	4	2		3		9
Unidentified scaup	3	8	3	3	1	18
Black Scoter	1					1
Long-tailed Duck	2	2	1			5
Unidentified goldeneye	1					1
Red-breasted Merganser	1					1
Unidentified merganser		2				2
Unidentified duck		1				1
Semipalmated Plover	3	1	2			6
Greater Yellowlegs	6	1		1		8
Least Sandpiper		1	1			2
Mew Gull	1	2				3
TOTAL	72	42	35	18	1	168
No. lakes surveyed	159	87	67	33	23	369

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TABLE N-9.9

Numbers of Waterfowl Broods (Excluding Harlequin Ducks) Observed on Rivers during Brood-rearing Aerial Surveys for Harlequin Ducks, Mine Study Area, 2005

Survey/ Location	Unidentified Swan	American Wigeon	Mallard	Northern Shoveler	Northern Pintail	Green- winged Teal	Unidentified Scaup	Unidentified Goldeneye	Common Merganser	Red- breasted Merganser	Total
First Survey^a											
North Fork Koktuli		1	4	1	1	5			1	1	14
South Fork Koktuli ^b		2	3			8	2		1	3	19
Upper Talarik ^c		5	7		1	8			1	4	26
Lower Talarik									2		2
TOTAL	0	8	14	1	2	21	2	0	5	8	61
Second Survey^d											
North Fork Koktuli						1				3	4
South Fork Koktuli ^b				1						7	8
Upper Talarik ^c			2			1		1	1	5	10
Lower Talarik	1										1
TOTAL	1	0	2	1	0	2	0	1	1	15	23

Notes:

- Survey was flown July 28-29.
- Includes observations from two drainages on Kaskanak Mountain that drain into the South Fork Koktuli River.
- Includes observations from a northeastern tributary.
- Survey was flown August 13-14.

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TABLE N-9.10

Numbers of Waterbirds Observed during Summer Molting Surveys, Mine Study Area, 2005

Date/ Species	Flock Size									
	1-15		16-30		31-45		46-60		Total	
	No. Flocks	No. Birds	No. Flocks	No. Birds	No. Flocks	No. Birds	No. Flocks	No. Birds	No. Flocks	No. Birds
July 26										
Unidentified swan	2	4	0	0	0	0	0	0	2	4
Northern Pintail	2	14	0	0	0	0	0	0	2	14
Unidentified dabbling duck	1	6	0	0	0	0	0	0	1	6
Unidentified scaup	12	85	1	16	0	0	1	60	14	161
Black Scoter	1	3	0	0	0	0	0	0	1	3
Unidentified scoter	1	10	0	0	0	0	0	0	1	10
Unidentified goldeneye	1	1	0	0	0	0	0	0	1	1
Unidentified merganser	3	8	1	18	0	0	0	0	4	26
Unidentified duck	6	33	0	0	0	0	0	0	6	33
Common Loon	2	3	0	0	0	0	0	0	2	3
Unidentified yellowlegs	1	1	0	0	0	0	0	0	1	1
Mew Gull	1	1	0	0	0	0	0	0	1	1
Arctic Tern	1	1	0	0	0	0	0	0	1	1
TOTAL	34	170	2	34	0	0	1	60	37	264
August 11										
Unidentified swan	11	23	0	0	0	0	0	0	11	23
American Wigeon	8	43	0	0	0	0	0	0	8	43
Mallard	1	5	1	25	0	0	0	0	2	30
Northern Shoveler	4	26	0	0	0	0	0	0	4	26
Northern Pintail	5	40	0	0	0	0	0	0	5	40
Green-winged Teal	2	14	1	30	0	0	0	0	3	44
Unidentified scaup	8	65	3	79	2	80	0	0	13	224
Unidentified diving duck	1	3	0	0	0	0	0	0	1	3
Unidentified duck	3	13	0	0	0	0	0	0	3	13
Common Loon	3	5	0	0	0	0	0	0	3	5
TOTAL	46	237	5	134	2	80	0	0	53	451

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TABLE N-9.11

Waterbird Surveys Conducted in the Transportation-corridor Study Area, 2004 and 2005

Year/ Survey Type	Target Species	Purpose	Survey Date	Aircraft	Altitude (meters)	Method
2004						
Aerial	Waterfowl	Spring Migration	Apr 21	C206	60	Lake-to-Lake
Aerial	Waterfowl	Spring Migration	May 3-4	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Spring Migration	May 13-14	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Spring Migration	May 22-23	Cub	60	Lake-to-Lake
Aerial	Harlequin Duck	Pre-nesting	May 25-28	H500	45	Stream
Aerial	Waterfowl	Breeding	Jun 2	C206	45	Transect
Aerial	Swans	Nesting	Jun 3	C206	150	Transect
Aerial	Waterfowl	Fall Migration	Sep 2-3	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Sep 13-14	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Sep 23-24	Cub/R44	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Oct 6-7	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Oct 21	Cub	60	Lake-to-Lake
2005						
Aerial	Waterfowl	Spring Migration	Apr 20 ^a	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Spring Migration	Apr 24	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Spring Migration	May 3-4	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Spring Migration	May 13-15	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Spring Migration	May 21-23	Cub	60	Lake-to-Lake
Aerial	Harlequin Duck	Pre-nesting	May 23-26	B206/R44	45	Stream
Aerial	Waterfowl	Breeding	May 27-28	C206	45	Transect
Aerial	Swans	Nesting	May 28	C206	150	Transect
Aerial	Harlequin Duck	Pre-nesting	May 29-30	B206/R44	45	Stream
Aerial	Harlequin Duck	Brood-rearing	Jul 27-28	R44	45	Stream
Aerial	Harlequin Duck	Brood-rearing	Aug 12, 14	R44	45	Stream
Aerial	Waterfowl	Fall Migration	Aug 18-19	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Aug 27-29	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Sep 6-8	Cub/R44	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Sep 13-14	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Sep 29-30	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Oct 6-7	Cub	60	Lake-to-Lake
Aerial	Waterfowl	Fall Migration	Oct 11-12	Cub	60	Lake-to-Lake

Notes:

a. Reconnaissance survey conducted by pilot only.

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TABLE N-9.12

Status of Waterbird Species Observed during Aerial and Ground Surveys, Transportation-corridor Study Area, 2004-2005

Common Name	Scientific Name	Status
Greater White-fronted Goose	<i>Anser albifrons</i>	Migrant
Canada/Cackling Goose ^a	<i>Branta</i> spp.	Migrant
Unidentified swan ^b	<i>Cygnus</i> spp.	Confirmed Breeder
Gadwall	<i>Anas strepera</i>	Migrant
American Wigeon	<i>Anas americana</i>	Confirmed Breeder
Mallard	<i>Anas platyrhynchos</i>	Confirmed Breeder
Northern Shoveler	<i>Anas clypeata</i>	Probable Breeder
Northern Pintail	<i>Anas acuta</i>	Confirmed Breeder
Green-winged Teal	<i>Anas crecca</i>	Confirmed Breeder
Canvasback	<i>Aythya valisineria</i>	Migrant
Ring-necked Duck	<i>Aythya collaris</i>	Probable Breeder
Unidentified scaup ^c	<i>Aythya</i> spp.	Confirmed Breeder
Harlequin Duck	<i>Histrionicus histrionicus</i>	Confirmed Breeder
Surf Scoter	<i>Melanitta perspicillata</i>	Migrant
White-winged Scoter	<i>Melanitta fusca</i>	Migrant
Black Scoter	<i>Melanitta nigra</i>	Probable Breeder
Long-tailed Duck	<i>Clangula hyemalis</i>	Confirmed Breeder
Bufflehead	<i>Bucephala albeola</i>	Probable Breeder
Unidentified goldeneye ^d	<i>Bucephala</i> spp.	Probable Breeder
Common Merganser	<i>Mergus merganser</i>	Confirmed Breeder
Red-breasted Merganser	<i>Mergus serrator</i>	Confirmed Breeder
Red-throated Loon	<i>Gavia stellata</i>	Migrant
Pacific Loon	<i>Gavia pacifica</i>	Probable Breeder
Common Loon	<i>Gavia immer</i>	Confirmed Breeder
Red-necked Grebe	<i>Podiceps grisegena</i>	Probable Breeder
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	Probable Breeder
Sandhill Crane	<i>Grus canadensis</i>	Confirmed Breeder
Unidentified yellowlegs ^e	<i>Tringa</i> spp.	Probable Breeder
Bonaparte's Gull	<i>Larus philadelphia</i>	Probable Breeder
Mew Gull	<i>Larus canus</i>	Confirmed Breeder
Herring Gull	<i>Larus argentatus</i>	Probable Breeder
Glaucous-winged Gull	<i>Larus glaucescens</i>	Confirmed Breeder
Arctic Tern	<i>Sterna paradisaea</i>	Migrant
Parasitic Jaeger	<i>Stercorarius parasiticus</i>	Migrant

Notes:

- Canada Geese (*Branta canadensis*) probably are the primary *Branta* spp. in the transportation-corridor study area, but Cackling Geese (*B. hutchinsii*) may be present.
- Tundra Swans (*Cygnus columbianus*) probably are the primary swan species in the transportation-corridor study area, but Trumpeter Swans (*C. buccinator*) may be present.
- Greater Scaup (*Aythya marila*) probably are the primary scaup species in the transportation-corridor study area, but Lesser Scaup (*A. affinis*) may be present.
- Barrow's Goldeneye (*Bucephala islandica*) and Common Goldeneye (*B. clangula*) were not distinguished between during field data collection; both may be present.
- Greater Yellowlegs (*Tringa melanoluca*) probably are the primary yellowlegs species in the transportation-corridor study area, but Lesser Yellowlegs (*T. flavipes*) may be present.

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TABLE N-9.13

Numbers of Waterbirds by Species-group Observed during Spring and Fall Migration Surveys,
Transportation-corridor Study Area, 2004

Species-group	Spring				Fall				
	Apr 21	May 3-4	May 13-14	May 22-23	Sep 2-3	Sep 13-14	Sep 23-24	Oct 6-7	Oct 21
Geese	169	28	0	0	0	0	0	0	0
Swans	503	47	27	23	33	37	37	11	2
Ducks	939	1,578	1,294	686	748	996	757	1,042	725
Loons	1	7	10	8	32	8	3	2	0
Grebes	0	1	0	0	0	0	0	0	0
Cormorants	0	2	0	7	4	2	3	4	0
Cranes	0	1	0	0	5	6	0	0	0
Shorebirds	13	112	40	7	0	0	0	0	0
Gulls/Terns	8	120	244	50	81	296	406	696	118
Jaegers	0	0	1	0	0	0	0	0	0
TOTAL	1,633	1,896	1,616	781	903	1,345	1,206	1,755	845

TABLE N-9.14

Numbers of Waterbirds by Species-group Observed during Spring and Fall Migration Surveys, Transportation-corridor
Study Area, 2005

Species-group	Spring					Fall						
	Apr 20 ^a	Apr 24	May 3-4	May 13-15 ^b	May 21-23 ^b	Aug 18-19 ^b	Aug 27-29	Sep 6-8	Sep 13-14	Sep 29-30	Oct 6-7	Oct 11-12
Geese	84	123	105	10	0	0	0	0	0	0	0	0
Swans	225	535	66	34	40	85	20	17	20	18	18	6
Ducks	737	1,798	1,408	1,613	2,060	1,239	1,218	2,090	1,186	1,182	1,049	1,161
Loons	0	0	9	19	37	27	25	18	18	4	1	1
Grebes	0	0	0	0	0	0	0	0	3	8	0	1
Cormorants	0	0	0	9	1	4	7	2	0	3	2	0
Shorebirds	1	28	11	25	61	1	0	0	0	0	0	0
Gulls/Terns	0	71	212	174	185	208	655	1,490	1,076	1,090	446	503
Jaegers	0	0	0	0	1	0	0	0	0	0	0	0
TOTAL	1,047	2,555	1,811	1,884	2,385	1,564	1,925	3,617	2,303	2,305	1,516	1,672

Notes:

- Reconnaissance survey conducted by pilot only.
- Includes the survey lakes from Iliamna Lake to 2 kilometers inland between Upper Talarik Creek and the Newhalen River (Figure N-3.19).

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TABLE N-9.15

Numbers and Densities of Waterfowl Observed during Breeding-population Surveys, Transportation-corridor Study Area, 2004 and 2005

Year/ Species	Males	Pairs	Grouped Birds ^a	Indicated Total No. Birds ^b	Visibility Correction Factor ^c	Corrected Total No. Birds ^d	Density ^e (birds/ km ²)	Composition (% of total)
2004								
Mallard	6	2	0	16	4.01	64	1.6	30
Northern Shoveler	0	1	0	2	3.79	8	0.2	4
Northern Pintail	1	0	0	2	3.05	6	0.2	3
Unidentified scaup ^f	4	9	20	42	1.93	81	2.0	38
Unidentified scoter	0	1	0	2	1.17	2	0.1	1
Unidentified goldeneye	2	1	0	6	3.61	22	0.5	10
Unidentified merganser	1	2	16	22	1.27	28	0.7	13
TOTAL DUCKS						211	5.3	100
Unidentified swan ^f	1	2	0	5	1	5	0.1	
2005								
American Wigeon	0	3	0	6	3.84	23	0.3	4
Mallard	7	6	6	32	4.01	128	1.5	24
Northern Shoveler	0	1	0	2	3.79	8	0.1	1
Northern Pintail	1	1	5	9	3.05	27	0.3	5
Green-winged Teal	0	1	0	2	8.36	17	0.2	3
Unidentified scaup ^f	6	24	64	118	1.93	228	2.6	42
Unidentified scoter	0	9	32	50	1.17	59	0.7	11
Long-tailed Duck	0	1	0	2	1.87	4	<0.1	1
Unidentified goldeneye	2	3	0	10	3.61	36	0.4	7
Unidentified merganser	3	1	0	8	1.27	10	0.1	2
TOTAL DUCKS						539	6.1	100
Unidentified swan ^f	3	11	0	25	1	25	0.3	

Notes:

- Grouped birds are those that occurred in flocks; no assumptions as to the number of pairs were made.
- Indicated Total No. Birds = (number of males in groups [<5 birds] $\times 2$) + (number of pairs $\times 2$) + number of birds in groups >4 birds.
- Visibility Correction Factor developed by USFWS (Conant and Groves, 2004).
- Corrected Total No. Birds = Indicated Total No. Birds \times Visibility Correction Factor.
- Density based on corrected total number of birds in a 40.1-square-kilometer (km²) sample area in 2004 and a 88.1-km² sample area in 2005.
- Males and single birds not doubled in calculating indicated total number of birds.

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TABLE N-9.16
 Numbers of Harlequin Ducks Observed during Pre-nesting Aerial Surveys,
 Transportation- corridor Study Area, May 25-28, 2004

Location	Single Male	Single Female	Pairs	Total Birds^a
Canyon Creek	0	0	1	2
Chekok Creek East	0	0	0	0
Chekok Bay Creek	0	0	0	0
Chinkelyes Creek	1	0	0	1
Eagle Bay Creek East	0	0	1	2
Eagle Bay Creek West	0	0	0	0
Iliamna River	0	0	1	2
Knutson Creek	10	1	0	11
Newhalen River	1	1	3	8
Pile River	0	0	0	0
Roadhouse Creek	0	0	0	0
Stonehouse Lake Creek	0	0	0	0
West Newhalen Branch	0	0	0	0
TOTAL	12	2	6	26

Notes:

a. Total = (number of single males) + (number of single females) + (number of pairs x 2).

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TABLE N-9.17

Numbers of Harlequin Ducks Observed during Pre-nesting and Brood-rearing Aerial Surveys,
Transportation-corridor Study Area, 2005

Survey/ Location	Pre-nesting				Brood-rearing			
	Single Male	Single Female	Pairs	Total Birds ^a	Females	Young	Total Birds	No. Broods
First Survey^b								
Canyon Creek	0	0	1	2	0	0	0	—
Chekok Creek East	0	0	0	0	0	0	0	—
Chekok Creek West	0	0	0	0	0	0	0	—
Chekok Bay Creek	0	0	0	0	0	0	0	—
Chinkelyes Creek	0	0	0	0	3	0	3	—
Eagle Bay Creek East	0	0	1	2	0	0	0	—
Eagle Bay Creek West	0	0	0	0	0	0	0	—
Iliamna River	1	0	15	31	2	0	2	—
Knutson Creek	0	0	0	0	0	0	0	—
Newhalen River	3	0	5	13	0	0	0	—
Pile River	1	0	0	1	0	0	0	—
Roadhouse Creek	0	0	0	0	0	0	0	—
Stonehouse Lake Creek	0	0	0	0	0	0	0	—
West Newhalen Branch	0	0	0	0	0	0	0	—
TOTAL	5	0	22	49	5	0	5	—
Second Survey^c								
Canyon Creek	0	0	0	0	0	0	0	0
Chekok Creek East	0	0	0	0	0	0	0	0
Chekok Creek West	0	0	0	0	0	0	0	0
Chekok Bay Creek	0	0	0	0	0	0	0	0
Chinkelyes Creek	0	0	0	0	0	0	0	0
Eagle Bay Creek East	0	0	0	0	0	0	0	0
Eagle Bay Creek West	0	0	0	0	0	0	0	0
Iliamna River	2	0	5	12	1	4	5	1
Knutson Creek	0	0	0	0	0	0	0	0
Newhalen River	0	0	2	4	5	1	6	1
Pile River	0	0	0	0	1	3	4	1
Roadhouse Creek	0	0	0	0	0	0	0	0
Stonehouse Creek	0	0	0	0	2	16	18	2
West Newhalen Branch	0	0	0	0	0	0	0	0
TOTAL	2	0	7	16	9	24	33	5

Notes:

- Total = (number of single males) + (number of single females) + (number of pairs x 2).
- Pre-nesting survey was flown on May 23-25 and brood-rearing survey on July 28-29.
- Pre-nesting survey was flown on May 29-30 and brood-rearing survey on August 12 and 14.

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TABLE N-9.18

Numbers of Waterfowl Broods (Excluding Harlequin Ducks) Observed on Rivers during Brood-rearing Aerial Surveys for Harlequin Ducks, Transportation-corridor Study Area, 2005

Location	American Wigeon	Mallard	Northern Pintail	Green-winged Teal	Unidentified scaup	Unidentified scoter	Long-tailed Duck	Common Merganser	Red-breasted Merganser	Unidentified Merganser	Total
Canyon Creek									2		2
Chekok Creek East								1	1		2
Chekok Creek West		1									1
Chekok Bay Creek	1	2	1	1			1		3		9
Chinkelyes Creek								1	1		2
Eagle Bay Creek East											0
Eagle Bay Creek West			1	1	1	1			1		5
Iliamna River					1			1	5	2	9
Knutson Creek											0
Newhalen River	2							2	2	2	8
Pile River								2			2
Roadhouse Creek											0
Stonehouse Lake Creek											0
West Newhalen Branch			1						1		2
Total	3	3	3	2	2	1	1	7	16	4	42

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Table N-19.9
Numbers of Waterbirds Observed during
Spring and Fall Migration Surveys, Mine Study Area, 2004

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Table N-9.19

Numbers of Waterbirds (by species-group and species) Observed during Spring and Fall Migration Surveys,
Mine Study Area, 2004

SURVEY AREA Species-Group Species	Spring				Fall				
	Apr 21 ^a	May 4 ^b	May 14	May 23	Sep 2	Sep13	Sep 23	Oct 7	Oct 21
MINE^c									
Waterfowl									
Canada/Cackling Goose	2	0	0	0	0	0	0	0	0
Unidentified swan	2	10	11	16	25	28	16	17	5
American Wigeon	0	24	40	20	20	76	0	0	0
Mallard	13	38	31	22	60	113	103	66	41
Northern Shoveler	0	0	12	0	0	0	0	0	0
Northern Pintail	4	58	75	9	55	55	4	0	0
Green-winged Teal	0	31	33	7	11	24	3	2	0
Unidentified dabbling duck	0	3	0	0	172	123	6	0	0
Unidentified scaup	0	8	351	137	136	97	60	23	0
Harlequin Duck	0	0	2	0	0	0	0	0	0
Surf Scoter	0	0	0	2	0	0	0	0	6
White-winged Scoter	0	0	0	6	0	0	13	0	0
Black Scoter	0	0	10	27	0	0	4	1	0
Unidentified scoter	0	0	0	4	2	0	0	0	0
Unidentified goldeneye	1	30	39	45	19	6	0	0	0
Common Merganser	0	5	8	12	0	0	0	14	14
Red-breasted Merganser	0	0	31	5	0	0	0	43	30
Unidentified merganser	6	4	16	5	69	47	11	18	4
Unidentified diving duck	0	0	0	0	91	19	0	1	0
Unidentified duck	11	23	15	7	321	50	10	5	3
Waterfowl Total	39	234	674	324	981	638	230	190	103
Loons/Grebes									
Common Loon	0	0	9	5	7	4	0	0	0
Red-necked Grebe	0	0	0	0	2	0	0	0	0
Loon/Grebe Total	0	0	9	5	9	4	0	0	0
Shorebirds									
Black-bellied Plover	0	0	7	0	0	0	0	0	0
Unidentified yellowlegs	0	3	10	2	0	0	0	0	0
Whimbrel	0	2	0	0	0	0	0	0	0
Large shorebird	0	0	1	0	0	0	0	0	0
Medium shorebird	0	8	18	20	0	0	0	0	0
Small shorebird	0	2	5	1	0	0	0	0	0
Shorebird Total	0	15	41	23	0	0	0	0	0

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SURVEY AREA Species-Group Species	Spring				Fall				
	Apr 21 ^a	May 4 ^b	May 14	May 23	Sep 2	Sep 13	Sep 23	Oct 7	Oct 21
	Gulls/Terns/Jaegers								
Bonaparte's Gull	0	2	3	14	0	0	0	0	
Mew Gull	0	23	14	31	0	0	0	0	0
Glaucous-winged Gull	0	0	0	30	136	89	46	10	0
Unidentified gull	0	0	15	0	0	0	0	0	0
Arctic Tern	0	0	14	9	0	0	0	0	0
Parasitic Jaeger	0	0	0	2	0	0	0	0	0
Gull/Tern/Jaeger Total	0	25	46	85	136	89	47	10	0
SUBTOTAL MINE	39	274	770	437	990	642	230	190	103
SOUTH TALARIK^d									
Waterfowl									
Unidentified swan	—	2	5	1	2	2	31	44	—
American Wigeon	—	0	15	0	0	0	0	0	—
Mallard	—	9	6	9	0	3	69	43	—
Northern Shoveler	—	0	5	0	0	5	0	0	—
Northern Pintail	—	0	14	2	0	0	0	0	—
Green-winged Teal	—	3	4	0	0	0	0	8	—
Unidentified dabbling duck	—	0	0	0	64	10	0	0	—
Unidentified scaup	—	0	31	8	0	0	0	82	—
Harlequin Duck	—	0	0	2	0	0	0	0	—
Long-tailed Duck	—	0	0	2	0	0	0	0	—
Bufflehead	—	2	0	0	0	0	0	0	—
Unidentified goldeneye	—	1	3	2	0	2	0	0	—
Common Merganser	—	1	5	2	0	0	0	11	—
Red-breasted Merganser	—	0	4	0	0	0	0	14	—
Unidentified merganser	—	10	17	48	10	5	22	0	—
Unidentified duck	—	2	0	0	50	80	13	8	—
Waterfowl Total	—	30	109	76	126	107	135	120	—
Loons									
Pacific Loon	—	0	0	1	0	0	0	0	—
Cormorants									
Double-crested Cormorant	—	0	2	6	0	0	3	0	—
Shorebirds									
Black-bellied Plover	—	0	3	0	0	0	0	0	—
Large shorebird	—	0	2	2	0	0	0	0	—
Medium shorebird	—	0	8	0	0	0	0	0	—
Small shorebird	—	0	10	0	0	0	0	0	—
Shorebird Total	—	0	23	2	0	0	0	0	—

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Table N-9.20

Numbers of Waterbirds Observed during
Spring and Fall Migration Surveys, Mine Study Area, 2005

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Table N-9.20

Numbers of Waterbirds (by species-group/species) Observed during Spring and Fall Migration Surveys, Mine Study Area, 2005

SURVEY AREA Species-Group Species	Spring					Fall						
	Apr 21 ^a	Apr 24	May 3	May 14-15	May 21-23	Aug 17-19	Aug 27, 29	Sep 6, 8	Sep 13-14	Sep 30	Oct 7	Oct 12
MINE^b												
Waterfowl												
Unidentified swan		4	10	15	16	36	23	22	38	27	24	16
Gadwall				6	6							
American Wigeon			11	24	52	120	124	52	45	25		
Mallard		29	18	39	59	54	86	90	48	75	41	50
Northern Shoveler				23	19	79	4	84	7		1	
Northern Pintail		19	45	39	53	101	76	12	8	12		
Green-winged Teal			24	10	4	101	88	65	25	16	1	
Unidentified dabbling duck			4		2	5	30	4	29	2		10
Canvasback					3							
Unidentified scaup			4	377	458	281	303	397	423	350	73	38
Harlequin Duck				6		37	24	34	4			
Surf Scoter				6			18					
Black Scoter					40				31	28		
Unidentified scoter				4	99	15		44	4			
Long-tailed Duck				7	4							
Bufflehead							4					10
Unidentified goldeneye		12	15	49	47	9	120	103	82	20	27	20
Common Merganser				2	18						1	
Red-breasted Merganser					35						20	
Unidentified merganser			7	51	5	132	62	73	105	84		
Unidentified diving duck					4				3	1		
Unidentified duck	27	8	34	8	9	4			11	4	2	
Waterfowl Total	27	72	172	666	933	974	962	980	863	644	190	144

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SURVEY AREA Species-Group Species	Spring					Fall						
	Apr 21 ^a	Apr 24	May 3	May 14-15	May 21-23	Aug 17-19	Aug 27, 29	Sep 6, 8	Sep 13-14	Sep 30	Oct 7	Oct 12
Loon/Grebes												
Pacific Loon					3							
Common Loon				5	10	2	3	2	2			
Unidentified loon					1							
Red-necked Grebe									1	1	1	
Loon/Grebe Total				5	14	2	3	2	3	1	1	
Shorebirds												
Black-bellied Plover			2									
Unidentified yellowlegs			1	9	12	2						
Whimbrel				3								
Large shorebird			2									
Medium shorebird			3									
Small shorebird			14	8	12	10						
Shorebird Total			22	20	24	12						
Gulls/Terns												
Bonaparte's Gull				4								
Mew Gull			7	10	22	1						
Glaucous-winged Gull				22	7	1						
Unidentified gull			14	16	55							
Arctic Tern			13	28	20							
Gull/Tern Total			34	80	104	2						
SUBTOTAL MINE	27	72	228	771	1,075	990	965	982	866	645	191	144
SOUTH TALARIK^c												
Waterfowl												
Canada/Cackling Goose	6		9									
Unidentified swan	164	6	16	13	8	38					2	14

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SURVEY AREA Species-Group Species	Spring					Fall						
	Apr 21 ^a	Apr 24	May 3	May 14-15	May 21-23	Aug 17-19	Aug 27, 29	Sep 6, 8	Sep 13-14	Sep 30	Oct 7	Oct 12
Gadwall				2	4							
American Wigeon		10	10	46	25	62					7	
Mallard		18	26	14	9	167						3
Northern Shoveler			10	1	4	7						5
Northern Pintail			31	9	13	8					2	
Green-winged Teal			5			42						
Unidentified dabbling duck		20	2									
Ringed-neck Duck					1							
Unidentified scaup				101	182	25					12	
Harlequin Duck					1							
Black Scoter					3							
Unidentified scoter					114							
Long-tailed Duck				8								
Bufflehead			26									
Unidentified goldeneye		6	11	5	13							5
Common Merganser					20							
Red-breasted Merganser					41						23	
Unidentified merganser		4	72	23	99	23						8
Unidentified diving duck					1							1
Unidentified duck	90	154	17	1	6						1	150
Waterfowl Total	260	218	235	223	544	372					47	186
Loons												
Red-throated Loon			2									
Common Loon					6	1						
Loon Total			2		6	1						

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SURVEY AREA Species-Group Species	Spring					Fall						
	Apr 21 ^a	Apr 24	May 3	May 14-15	May 21-23	Aug 17-19	Aug 27, 29	Sep 6, 8	Sep 13-14	Sep 30	Oct 7	Oct 12
Cormorants												
Double-crested Cormorant				1								
Unidentified cormorant				1								
Cormorant Total				2								
Shorebirds												
Unidentified yellowlegs		1		1	11	2						
Medium shorebird			2									
Small shorebird			12	36	7	2						
Shorebird Total		1	14	37	18	4						
Gulls/Terns												
Bonaparte's Gull	1				6							
Mew Gull				24	5							
Glaucous-winged Gull				19	6	84					3	6
Unidentified gull		10	38	29	26							
Arctic Tern			36	161	41							
Gull/Tern Total	1	10	74	235	84	84					3	6
SUBTOTAL SOUTH TALARIK	261	229	325	495	652	461					50	192
NIKABUNA LAKES^d												
Waterfowl												
Greater White-fronted Goose		230	5	112		20						
Canada/Cackling Goose		136		4				6				
Unidentified goose	150	10										
Unidentified swan	400	165	8	6	14	40	70	17		6	167	333
Gadwall				8	6							
American Wigeon		4	52	123	87	819	387	381	69		173	
Mallard		115	17	56	90	1,077	501	225	47	8	78	186

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SURVEY AREA Species-Group Species	Spring					Fall						
	Apr 21 ^a	Apr 24	May 3	May 14-15	May 21-23	Aug 17-19	Aug 27, 29	Sep 6, 8	Sep 13-14	Sep 30	Oct 7	Oct 12
Northern Shoveler			9	58	92	49	223	226	8			10
Northern Pintail		236	53	59	14	32	214		16		2	2
Green-winged Teal			4	18	2	16	66	319	2		21	35
Unidentified dabbling duck		94							56	55		210
Canvasback		6	40									
Ringed-neck Duck			22	4								
Unidentified scaup		4	341	280	189	571	3,092	2,528	1,189	850	293	697
Surf Scoter			4	57	9			1,293			1	
White-winged Scoter				1				4		10	13	
Black Scoter					19				15			
Unidentified scoter					100		90					
Long-tailed Duck				14	2					8		
Bufflehead		6	25	4						30	43	47
Unidentified goldeneye		123	93	202	30	35	5	12	197	14	991	815
Hooded Merganser					1							
Common Merganser		27		3	15						42	
Red-breasted Merganser					31						7	
Unidentified merganser		25	3	75	10	54	81	9	12	13		409
Unidentified diving duck			1	5	3	4			310	660	8	159
Unidentified duck	350	181	57	22	19				139	840	271	568
Waterfowl Total	900	1,362	734	1,111	733	2,717	4,729	5,020	2,060	2,494	2,110	3,471
Loons/Grebes												
Red-throated Loon			4			12	2					
Pacific Loon					2							
Common Loon			3	2	3	5		1		1		
Unidentified loon							1					
Red-necked Grebe			27		1		1				1	

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SURVEY AREA Species-Group Species	Spring					Fall						
	Apr 21 ^a	Apr 24	May 3	May 14-15	May 21-23	Aug 17-19	Aug 27, 29	Sep 6, 8	Sep 13-14	Sep 30	Oct 7	Oct 12
Unidentified grebe				3								
Loon/Grebe Total			34	5	6	17	4	1		1	1	
Shorebirds												
Unidentified yellowlegs			9	23	26	4						
Medium shorebird				3								
Small shorebird				17	7	2						
Shorebird Total			9	43	33	6						
Gulls/Terns												
Bonaparte's Gull				1								
Mew Gull				3								
Glaucous-winged Gull					1							
Unidentified gull		8		4	3							3
Arctic Tern				1	3							
Gull/Tern Total		8		9	7							3
SUBTOTAL NIKABUNA LAKES	900	1,370	777	1,168	779	2,740	4,733	5,021	2,060	2,495	2,111	3,474
TOTAL	1,188	1,671	1,330	2,434	2,506	4,191	5,698	6,003	2,926	3,140	2,352	3,810

Notes:

- Reconnaissance survey conducted by pilot only.
- Includes lakes and rivers of the headwaters of Upper Talarik Creek and the north and south forks of the Kuktuli River (Figure N-3.2).
- Includes lakes and rivers south of Sharp Mountain (Figure N-3.2). No surveys flown from August 27 through September 30. Only Lower Talarik Creek surveyed on October 7 and 12.
- Includes Nikabuna and Long lakes and a section of the Chulitna River (Figure N-3.2).

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SURVEY AREA Species-Group Species	Spring				Fall				
	Apr 21 ^a	May 4 ^b	May 14	May 23	Sep 2	Sep 13	Sep 23	Oct 7	Oct 21
	Gulls/Terns								
Mew Gull	—	0	16	1	0	0	0	0	—
Glaucous-winged Gull	—	0	0	0	136	89	46	10	—
Unidentified gull	—	0	11	0	0	0	1	0	—
Arctic Tern	—	0	35	3	0	0	0	0	—
Gull/Tern Total	—	0	62	4	136	89	47	10	—
SUBTOTAL SOUTH TALARIK	—	30	196	89	262	196	185	220	—
NIKABUNA LAKES^e									
Waterfowl									
Unidentified swan	—	—	—	—	—	—	357	2	—
American Wigeon	—	—	—	—	—	—	84	0	—
Mallard	—	—	—	—	—	—	161	0	—
Green-winged Teal	—	—	—	—	—	—	10	6	—
Unidentified scaup	—	—	—	—	—	—	150	338	—
Unidentified scoter	—	—	—	—	—	—	8	0	—
Bufflehead	—	—	—	—	—	—	0	2	—
Common Merganser	—	—	—	—	—	—	0	125	—
Red-breasted Merganser	—	—	—	—	—	—	0	14	—
Unidentified merganser	—	—	—	—	—	—	6	148	—
Unidentified diving duck	—	—	—	—	—	—	0	11	—
Unidentified duck	—	—	—	—	—	—	535	251	—
Waterfowl Total	—	—	—	—	—	—	1,311	897	—
SUBTOTAL NIKABUNA LAKES	—	—	—	—	—	—	1,311	897	—
TOTAL^f	39	304	966	526	1,252	838	415	410	103

Notes:

- No survey was conducted of rivers in the South Talarik survey area.
- A partial survey of rivers in the South Talarik survey area was flown; river outlets were not surveyed due to fog.
- Includes lakes and rivers of the headwaters of Upper Talarik Creek and the north and south forks of the Koptuli River (Figure N-3.2).
- Includes the southern-most section (approximately 2.5 kilometers) of Upper Talarik Creek and all of Lower Talarik Creek (Figure N-3.2).
- September 23 and October 7 were reconnaissance surveys and the area surveyed covered only a part of that surveyed in 2005. Only swans and ducks were counted.
- Includes subtotals from mine and South Talarik survey areas; subtotals for Nikabuna Lakes survey area not included.

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Table N-9.21

Age Classes of Duck Broods Observed during
Ground Surveys, Mine Study Area, 2004 and 2005

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Table N-9.21

Age Classes of Duck Broods Observed during Ground Surveys, Mine Study Area, 2004 and 2005

Year/ Species	Brood Age Class (no. of days)							Total
	1A (1-7)	1B (8-13)	1C (14-18)	2A (19-27)	2B (28-36)	2C (37-42)	3 (43-55)	
2004								
American Wigeon	1	5	9	1			1	17
Mallard				1				1
Northern Shoveler	1			2	1			4
Northern Pintail				1	3		1	5
Green-winged Teal	2	2		2	1	3		10
Greater Scaup	1							1
Unidentified scaup	5	2	1					8
Black Scoter			2	1				3
Long-tailed Duck	1							1
Common Goldeneye			1					1
Unidentified duck							1	1
TOTAL	11	9	13	8	5	3	3	52
2005								
American Wigeon	2	12	9	7	4	1		35
Mallard	1	4		2	2	2		11
Northern Shoveler	2		6	2	2	1		13
Northern Pintail		1	5	7	4	10	9	36
Green-winged Teal	1	2	4	1	4	2	1	15
Greater Scaup	4	5						9
Unidentified scaup	4	10	3		1			18
Black Scoter							1	1
Long-tailed Duck		3	2					5
Unidentified goldeneye			1					1
Red-breasted Merganser					1			1
Unidentified merganser			2					2
Unidentified duck						1		1
TOTAL	14	37	32	19	18	17	11	148

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Table N-9.22

Numbers of Waterbirds Observed during Spring and
Fall Migration Surveys,
Transportation-corridor Study Area, 2004

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Table N-9.22

Numbers of Waterbirds (by Species-group and Species) Observed during Spring and Fall Migration Surveys,
Transportation-corridor Study Area, 2004

Species-group/ Species	Spring				Fall				
	Apr 21	May 3-4	May 13-14	May 22-23	Sep 2-3	Sep 13-14	Sep 23-24	Oct 6-7	Oct 21
Waterfowl									
Greater White-fronted Goose	20	16	0	0	0	0	0	0	0
Canada/Cackling Goose	69	0	0	0	0	0	0	0	0
Unidentified goose	80	12	0	0	0	0	0	0	0
Unidentified swan	503	47	27	23	33	37	37	11	2
American Wigeon	4	164	125	24	21	0	1	5	0
Mallard	120	188	75	151	34	89	74	171	178
Northern Shoveler	0	51	0	2	0	0	0	0	0
Northern Pintail	117	180	45	55	8	30	1	0	0
Green-winged Teal	0	161	33	13	0	28	0	20	5
Unidentified dabbling duck	0	5	2	10	65	105	0	0	0
Canvasback	0	1	0	0	0	0	0	0	0
Unidentified scaup	14	198	457	138	204	216	170	300	79
Harlequin Duck	0	0	0	4	0	0	0	0	0
Surf Scoter	0	2	4	0	0	0	0	0	0
White-winged Scoter	0	0	0	0	0	0	5	0	0
Black Scoter	0	0	17	0	0	5	19	5	0
Unidentified scoter	0	0	0	0	17	0	0	0	0
Long-tailed Duck	0	0	8	0	5	0	0	0	0
Bufflehead	0	74	24	2	0	0	0	0	0
Unidentified goldeneye	18	77	110	66	34	19	0	5	41
Common Merganser	47	37	23	15	0	0	0	98	152
Red-breasted Merganser	0	60	43	5	15	0	0	141	111
Unidentified merganser	157	165	259	182	97	72	390	231	46
Unidentified diving duck	8	0	2	6	9	29	17	10	0
Unidentified duck	454	215	67	13	239	403	80	56	113
Waterfowl Total	1,611	1,653	1,321	709	781	1,033	794	1,053	727
Loons/Grebes									
Pacific Loon	0	0	0	2	0	0	0	0	0
Common Loon	1	7	10	6	32	8	3	2	0
Red-necked Grebe	0	1	0	0	0	0	0	0	0
Loon/Grebe Total	1	8	10	8	32	8	3	2	0
Cormorants									
Double-crested Cormorant	0	1	0	7	0	0	3	4	0
Unidentified cormorant	0	1	0	0	4	2	0	0	0
Cormorant Total	0	2	0	7	4	2	3	4	0

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Species-group/ Species	Spring				Fall				
	Apr 21	May 3-4	May 13-14	May 22-23	Sep 2-3	Sep 13-14	Sep 23-24	Oct 6-7	Oct 21
Cranes									
Sandhill Crane	0	1	0	0	5	6	0	0	0
Shorebirds									
Unidentified yellowlegs	13	33	6	4	0	0	0	0	0
Large shorebird	0	8	3	1	0	0	0	0	0
Medium shorebird	0	30	28	1	0	0	0	0	0
Small shorebird	0	41	3	1	0	0	0	0	0
Shorebird Total	13	112	40	7	0	0	0	0	0
Gulls/Terns/Jaegers									
Bonaparte's Gull	0	24	12	9	0	0	0	0	0
Mew Gull	0	39	30	4	0	0	0	1	0
Glaucous-winged Gull	8	37	35	19	81	196	176	570	118
Unidentified gull	0	0	7	3	0	100	225	125	0
Arctic Tern	0	20	160	15	0	0	5	0	0
Parasitic Jaeger	0	0	1	0	0	0	0	0	0
Gull/Tern/Jaeger Total	8	120	245	50	81	296	406	696	118
TOTAL	1,633	1,896	1,616	781	903	1,345	1,206	1,755	845

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Table N-9.23

**Numbers of Waterbirds Observed during Spring and
Fall Migration Surveys,
Transportation-corridor Study Area, 2005**

**Preliminary Data Only
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Table N-9.23

Numbers of Waterbirds (by Species-group and Species) Observed during Spring and Fall Migration Surveys, Transportation-corridor Study Area, 2005

Species-group/ Species	Spring					Fall						
	Apr 20 ^a	Apr 24	May 3-4	May 13-15 ^b	May 21-23 ^b	Aug 18-19 ^b	Aug 27-29	Sep 6-8	Sep 13-14	Sep 29-30	Oct 6-7	Oct 11-12
Waterfowl												
Greater White-fronted Goose		40	67	8								
Canada/Cackling Goose		33	38	2								
Unidentified goose	84	50										
Unidentified swan	225	535	66	34	40	85	20	17	20	18	18	6
Gadwall				8	2						1	
American Wigeon		60	74	97	89	141	111	57	16	43	5	20
Mallard		219	101	187	130	140	98	411	149	79	183	155
Northern Shoveler		10	16	65	21	54	14	47				23
Northern Pintail		158	44	90	68	31	58	7	20	2	1	
Green-winged Teal		171	59	22	10	78	68	137	23	6	3	4
Unidentified dabbling duck		437	270			10			46			10
Ringed-neck Duck											1	
Unidentified scaup		15	62	480	517	315	239	561	199	582	454	411
Harlequin Duck		1	10	28	28	27		15	30	3		16
Surf Scoter				14	63	1		35				1
White-winged scoter				6	93			25	10			
Black Scoter					16				6			
Unidentified scoter				55	191		1					
Long-tailed Duck					3	2						
Bufflehead		14	8	1	1	0	28	40		8	13	4
Unidentified goldeneye		68	136	125	112	79	162	153	80	83	84	252

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Species-group/ Species	Spring					Fall						
	Apr 20 ^a	Apr 24	May 3-4	May 13-15 ^b	May 21-23 ^b	Aug 18-19 ^b	Aug 27-29	Sep 6-8	Sep 13-14	Sep 29-30	Oct 6-7	Oct 11-12
Common Merganser		132		2	84	18			25	2	55	7
Red-breasted Merganser		5		24	308			6	18		221	
Unidentified merganser		180	423	395	282	328	438	596	419	336		226
Unidentified diving duck		1		5	4	12	1		2			16
Unidentified duck	737	327	205	9	38	3			143	38	14	16
Waterfowl Total	1,046	2,456	1,579	1,657	2,100	1,324	1,238	2,107	1,206	1,200	1,067	1,167
Loons/Grebes												
Red-throated Loon								1				
Pacific Loon				2	3							
Common Loon			9	17	32	25	25	18	18	4	1	1
Unidentified loon					2	1						
Red-necked Grebe									3	8		1
Loon/Grebe Total	0	0	9	19	37	27	25	18	21	12	1	2
Cormorants												
Double-crested Cormorant							4	7	2		1	2
Unidentified cormorant				9	1						2	
Cormorant Total	0	0	0	9	1	4	7	2	0	3	2	0
Shorebirds												
Unidentified yellowlegs	1	28	11	19	43							
Medium shorebird				3								
Small shorebird				3	18	1						
Shorebird Total	1	28	11	25	61	1	0	0	0	0	0	0

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Species-group/ Species	Spring					Fall						
	Apr 20 ^a	Apr 24	May 3-4	May 13-15 ^b	May 21-23 ^b	Aug 18-19 ^b	Aug 27-29	Sep 6-8	Sep 13-14	Sep 29-30	Oct 6-7	Oct 11-12
Gulls/Terns/Jaegers												
Bonaparte's Gull		1	9	6	14							
Mew Gull		9	14	21	34			8				1
Herring Gull				4								
Glaucous-winged Gull		39	68	83	59	208	301	338	494	571	424	209
Unidentified gull		22	95	15	30		354	1144	582	519	22	293
Arctic Tern			26	45	48							
Unidentified jaeger					1							
Gull/Tern/Jaeger Total	0	71	212	174	186	208	655	1,490	1,076	1,090	446	503
TOTAL	1,047	2,555	1,811	1,884	2,385	1,564	1,925	3,617	2,303	2,305	1,516	1,672

Notes:

a. Reconnaissance survey conducted by pilot only.

b. Includes the survey lakes from Iliamna Lake to 2 kilometers inland between Upper Talarik Creek and the Newhalen River (Figure N-3.19).

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