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APPENDIX A. NUMBERS OF WATERBIRDS BY SPECIES OBSERVED DURING SPRING AND FALL MIGRATION SURVEYS, 2013.

Survey Area/ Species	Spring Migration							Fall Migration										
	April		May					August			September					October		
	23	29	5	11	18–19	23–24	28–29	14–18	23–25	29–30	4–6	10–12	16–18	22–23	27–29	4–6	10–12	17–18
Dam/Camp Area																		
Trumpeter Swan	0	0	0	0	0	0	0	2	2	0	0	0	2	0	0	0	0	0
American Wigeon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0
Mallard	0	0	0	0	0	0	2	0	0	0	5	0	1	9	0	0	0	0
Northern Pintail	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Green-winged Teal	0	0	0	0	0	0	14	7	0	0	0	0	0	0	0	2	0	0
Unidentified dabbling	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
Ring-necked Duck	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
Unidentified scaup	0	0	0	0	0	0	0	0	0	0	0	1	3	8	4	6	0	0
Harlequin Duck	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
Surf Scoter	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
White-winged Scoter	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Bufflehead	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Unidentified goldeneye	0	0	0	0	0	0	2	6	0	4	3	7	7	2	8	2	0	3
Red-breasted Merganser	0	0	0	0	0	0	4	0	0	3	0	0	0	3	0	0	0	0
Unidentified duck	0	0	0	0	0	0	0	0	6	1	0	0	0	0	0	0	0	0
Pacific Loon	0	0	0	0	0	0	0	1	2	6	2	0	0	0	0	0	0	0
Dam/Camp Area Total	0	0	0	0	0	0	29	16	16	14	11	9	13	22	12	13	0	3
Watana Reservoir																		
Greater White-fronted Goose	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Canada Goose	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trumpeter Swan	0	0	2	14	15	23	15	19	10	8	12	8	16	12	21	8	5	3
American Wigeon	0	0	0	40	81	45	60	38	15	10	17	41	137	2	23	20	0	0
Mallard	0	0	0	32	96	37	50	32	14	17	53	42	43	36	33	108	8	6
Northern Shoveler	0	0	0	16	4	35	36	16	0	5	16	7	10	1	0	0	0	0
Northern Pintail	0	0	2	30	64	73	38	40	24	10	15	50	42	8	12	5	0	0
Green-winged Teal	0	0	0	58	14	65	46	70	32	11	9	64	117	1	7	12	0	0
Unidentified teal	0	0	0	6	4	5	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified dabbling	0	0	0	0	58	0	2	18	0	0	0	0	0	0	0	0	0	0
Ring-necked Duck	0	0	0	2	8	12	16	38	36	21	9	24	37	37	0	14	0	1
Unidentified scaup	0	0	0	0	10	74	283	418	250	509	505	420	357	251	232	144	8	28

Survey Area/ Species	Spring Migration							Fall Migration										
	April		May					August			September					October		
	23	29	5	11	18–19	23–24	28–29	14–18	23–25	29–30	4–6	10–12	16–18	22–23	27–29	4–6	10–12	17–18
Harlequin Duck	0	0	0	0	11	238	78	0	0	0	0	0	0	0	0	0	0	0
Watana Reservoir (continued)																		
Surf Scoter	0	0	0	0	0	0	35	36	31	58	39	44	14	31	23	3	0	4
White-winged Scoter	0	0	0	0	0	0	38	18	8	9	17	17	20	4	5	7	0	10
Black Scoter	0	0	0	0	0	0	0	12	10	26	12	11	8	9	11	12	0	0
Unidentified scoter	0	0	0	0	0	0	0	0	7	10	0	0	0	0	0	0	0	0
Long-tailed Duck	0	0	0	0	0	0	45	17	10	15	12	5	13	9	11	9	0	0
Bufflehead	0	0	2	5	16	7	12	16	15	11	13	17	25	16	25	32	18	14
Unidentified goldeneye	0	0	0	16	41	49	34	70	27	53	27	45	48	54	62	70	2	27
Common Merganser	0	0	0	3	0	10	0	0	0	0	0	0	0	0	0	0	0	0
Red-breasted Merganser	0	0	0	0	2	11	2	11	15	15	0	9	6	1	8	0	0	0
Unidentified merganser	0	0	0	0	7	2	0	0	0	0	0	0	3	0	0	0	0	0
Unidentified duck	0	0	0	0	6	13	8	45	26	8	0	0	7	6	1	0	0	1
Red-throated Loon	0	0	0	0	0	0	1	5	0	3	0	0	0	0	0	0	0	0
Pacific Loon	0	0	0	0	0	0	0	3	0	2	1	0	0	0	0	0	0	0
Common Loon	0	0	0	0	0	0	0	7	6	9	3	4	4	0	3	2	0	0
Horned Grebe	0	0	0	0	0	5	1	2	0	1	3	4	2	0	3	3	0	2
Red-necked Grebe	0	0	0	0	0	0	0	3	5	1	1	1	0	0	0	0	1	0
Unidentified grebe	0	0	0	0	0	0	0	2	0	5	0	0	0	0	0	0	0	0
Unidentified diver	0	0	0	0	0	0	0	0	4	0	2	1	1	0	1	0	0	2
Bonaparte's Gull	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0
Mew Gull	0	0	0	44	1	5	16	1	0	0	0	0	0	0	0	0	0	0
Unidentified gull	0	0	0	0	0	21	0	2	0	0	0	0	0	0	0	0	0	0
Watana Reservoir Total	0	0	6	270	438	733	817	940	545	817	766	814	910	478	481	449	42	100
Denali Corridor																		
Canada Goose	0	0	0	10	7	19	3	0	0	0	0	0	0	0	0	0	0	0
Trumpeter Swan	0	1	13	12	18	15	27	40	47	57	46	45	47	28	24	30	4	7
Unidentified swan	0	0	0	6	12	20	0	0	0	0	0	0	0	0	0	0	0	0
American Wigeon	0	0	0	62	76	118	80	263	302	255	266	304	98	15	43	54	0	0
Mallard	0	8	0	61	64	87	20	148	99	93	62	50	39	4	41	55	1	0
Northern Shoveler	0	0	9	46	40	46	18	43	16	29	22	21	19	0	0	3	0	0

Survey Area/ Species		Spring Migration						Fall Migration											
		April		May				August			September					October			
		23	29	5	11	18–19	23–24	28–29	14–18	23–25	29–30	4–6	10–12	16–18	22–23	27–29	4–6	10–12	17–18
Northern Pintail		0	0	0	83	80	145	106	121	54	186	68	99	79	6	8	17	0	0
Green-winged Teal		0	0	0	22	22	31	37	236	140	112	87	236	131	3	3	12	0	0
Unidentified teal		0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified dabbler		0	0	0	4	15	0	0	13	0	0	0	0	0	0	0	0	0	0
Redhead		0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
Denali Corridor (continued)																			
Ring-necked Duck		0	0	0	0	0	3	23	33	33	49	13	0	9	7	2	0	0	0
Unidentified scaup		0	0	0	0	0	18	186	435	399	384	349	360	323	171	123	45	16	14
Harlequin Duck		0	0	0	0	0	20	59	0	0	0	0	0	0	0	0	0	0	0
Surf Scoter		0	0	0	0	0	0	28	0	1	6	0	2	0	3	2	0	0	0
White-winged Scoter		0	0	0	0	0	0	20	0	0	2	0	0	0	0	0	0	0	5
Black Scoter		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
Long-tailed Duck		0	0	0	0	0	0	23	49	48	37	27	19	11	1	0	0	0	0
Bufflehead		0	0	0	0	4	25	15	9	20	13	10	16	31	18	10	4	4	2
Unidentified goldeneye		0	0	0	4	9	12	16	21	20	21	22	18	22	11	16	151	1	1
Common Merganser		0	0	0	3	9	1	3	8	19	0	7	0	0	0	0	0	0	0
Red-breasted Merganser		0	0	0	0	2	4	22	8	12	19	16	1	0	0	1	5	0	0
Unidentified merganser		0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	15	0
Unidentified duck		0	0	0	0	8	2	8	20	9	1	0	0	0	0	0	0	0	0
Red-throated Loon		0	0	0	0	0	0	4	2	7	3	0	2	2	0	0	0	0	0
Common Loon		0	0	0	0	0	0	1	3	4	3	0	3	0	0	0	0	0	0
Yellow-billed Loon		0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Horned Grebe		0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0
Red-necked Grebe		0	0	0	0	0	0	0	0	9	0	0	2	0	0	0	0	0	2
Unidentified grebe		0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0
Unidentified diver		0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Sandhill Crane		0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0
Bonaparte's Gull		0	0	0	2	0	0	4	2	0	0	0	0	0	0	0	0	0	0
Mew Gull		0	0	0	31	6	14	19	0	0	0	0	0	0	0	0	0	0	0
Herring Gull		0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
Denali Corridor Total		0	9	22	361	376	580	727	1,455	1,241	1,274	995	1,178	812	267	290	376	47	31

Survey Area/ Species	Spring Migration							Fall Migration										
	April		May					August			September					October		
	23	29	5	11	18–19	23–24	28–29	14–18	23–25	29–30	4–6	10–12	16–18	22–23	27–29	4–6	10–12	17–18
Chulitna Corridor																		
Trumpeter Swan	0	5	8	0	2	4	3	5	4	4	7	2	2	2	2	6	0	0
American Wigeon	0	0	0	2	2	2	7	0	1	0	0	0	5	0	0	0	0	0
Mallard	0	2	5	4	6	10	8	15	3	8	1	20	13	0	2	9	0	0
Northern Shoveler	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0	0	0	0
Northern Pintail	0	0	8	0	0	7	2	0	2	0	3	0	1	11	0	0	0	0
Green-winged Teal	0	0	0	0	6	6	5	6	4	1	11	19	12	0	0	2	0	0
Ring-necked Duck	0	0	0	10	6	0	10	10	7	6	4	0	0	0	0	4	0	0
Unidentified scaup	0	0	0	0	4	4	7	58	35	52	40	47	25	17	0	0	7	27
Chulitna Corridor (continued)																		
Harlequin Duck	0	0	0	0	0	6	12	0	0	0	0	0	0	0	0	0	0	0
Surf Scoter	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	1
Long-tailed Duck	0	0	0	0	0	0	0	19	14	10	12	14	2	0	0	0	0	0
Bufflehead	0	5	10	5	8	5	4	0	0	3	4	3	2	0	0	2	9	0
Unidentified goldeneye	2	6	6	6	2	11	12	36	26	36	40	40	17	7	0	5	20	0
Common Merganser	1	2	3	4	0	7	13	0	0	0	0	0	0	0	0	0	0	0
Red-breasted Merganser	0	0	0	0	0	0	1	4	4	7	0	6	5	0	0	0	1	0
Unidentified merganser	0	0	0	0	0	2	0	0	0	0	0	0	0	31	0	0	0	0
Unidentified duck	0	0	0	4	0	0	0	0	16	1	0	0	0	0	0	0	0	0
Red-throated Loon	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
Pacific Loon	0	0	0	0	0	0	0	1	0	3	3	2	1	1	0	0	0	0
Common Loon	0	0	0	0	0	0	0	7	10	4	5	9	5	1	0	1	0	2
Horned Grebe	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
Red-necked Grebe	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Mew Gull	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
Chulitna Corridor Total	3	20	40	35	38	67	90	162	127	135	130	164	90	71	5	29	39	33
Gold Creek Corridor																		
Canada Goose	0	0	0	0	5	2	0											
Trumpeter Swan	2	6	7	12	16	10	7	20	4	24	15	13	11	8	10	1	15	4
Unidentified swan	0	0	0	0	0	0	0	0	10	0	10	14	21	76	69	65	0	0
American Wigeon	0	0	0	76	18	52	18	35	41	86	23	49	58	142	168	73	15	29

Survey Area/ Species	Spring Migration							Fall Migration										
	April		May					August			September					October		
	23	29	5	11	18–19	23–24	28–29	14–18	23–25	29–30	4–6	10–12	16–18	22–23	27–29	4–6	10–12	17–18
Mallard	2	2	4	58	34	49	28	27	22	51	24	25	21	56	133	159	77	125
Northern Shoveler	0	0	0	8	23	28	10	5	0	1	0	0	4	0	0	0	20	0
Northern Pintail	0	0	16	50	8	38	5	31	12	23	14	3	16	0	29	34	0	26
Green-winged Teal	0	0	0	34	6	20	12	5	8	15	17	18	10	0	22	4	4	0
Unidentified teal	0	0	0	22	11	2	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified dabbling	0	0	0	4	4	30	2	0	0	0	0	0	0	0	0	0	0	0
Canvasback	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Ring-necked Duck	0	0	0	2	28	33	13	37	15	22	19	18	31	5	13	26	20	1
Unidentified scap	0	0	0	0	110	94	186	95	103	135	127	125	184	175	221	223	66	119
Harlequin Duck	0	0	0	2	9	289	34	0	0	0	0	0	0	0	0	0	0	0
Surf Scoter	0	0	0	0	0	0	10	41	3	23	10	25	15	3	13	1	27	7
White-winged Scoter	0	0	0	0	0	0	5	0	0	4	0	0	0	9	7	6	9	9
Black Scoter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	43	0
Gold Creek Corridor (continued)																		
Unidentified scoter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Long-tailed Duck	0	0	0	0	0	0	33	0	1	5	6	6	1	0	0	0	0	0
Bufflehead	0	0	2	4	14	77	2	0	0	0	1	5	0	9	8	13	22	10
Unidentified goldeneye	0	0	3	38	36	86	31	50	44	51	40	49	54	91	95	100	74	41
Common Merganser	0	0	2	4	17	2	7	0	0	0	0	0	0	0	0	0	0	0
Red-breasted Merganser	0	0	0	0	1	39	1	10	21	17	23	24	16	6	19	9	0	2
Unidentified merganser	0	0	0	0	8	13	3	3	0	18	0	0	4	5	3	4	38	0
Unidentified duck	0	0	0	7	19	33	2	0	5	2	0	0	0	23	0	0	0	0
Red-throated Loon	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0
Pacific Loon	0	0	0	0	0	0	0	14	6	10	6	7	4	1	0	1	0	1
Common Loon	0	0	0	0	0	0	2	7	4	9	5	2	2	0	0	0	0	0
Horned Grebe	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	1	0	1
Red-necked Grebe	0	0	0	0	0	0	1	2	4	0	0	1	1	0	0	0	3	1
Unidentified grebe	0	0	0	0	0	0	0	2	0	7	0	0	0	0	0	0	0	0
Bonaparte's Gull	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0
Mew Gull	0	0	2	34	6	9	8	2	0	0	1	0	0	0	0	0	0	0
Herring Gull	0	0	0	0	0	9	1	2	0	0	0	0	0	0	0	0	0	0
Unidentified gull	0	0	0	0	0	3	1	0	0	0	0	0	0	1	0	0	0	0

Survey Area/ Species	Spring Migration							Fall Migration										
	April		May					August			September					October		
	23	29	5	11	18–19	23–24	28–29	14–18	23–25	29–30	4–6	10–12	16–18	22–23	27–29	4–6	10–12	17–18
Arctic Tern	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Gold Creek Corridor Total	4	8	36	356	375	919	427	390	303	503	343	384	455	611	815	724	433	382
All Survey Areas																		
Greater White-fronted Goose	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Canada Goose	0	0	0	14	12	21	3	0	0	0	0	0	0	0	0	0	0	0
Trumpeter Swan	2	12	30	38	51	52	52	86	67	93	80	68	78	50	57	45	24	14
Unidentified swan	0	0	0	6	12	20	0	0	10	0	10	14	21	76	69	65	0	0
American Wigeon	0	0	0	180	177	217	165	336	359	351	306	394	298	159	234	150	15	29
Mallard	2	12	9	155	200	183	108	222	138	169	145	137	117	105	209	331	86	131
Northern Shoveler	0	0	9	70	69	111	66	64	16	35	38	28	33	1	0	3	20	0
Northern Pintail	0	0	26	163	152	263	151	192	93	219	100	152	138	25	49	56	0	26
Green-winged Teal	0	0	0	114	48	122	114	324	184	139	124	337	270	4	32	32	4	11
Unidentified teal	0	0	0	43	15	7	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified dabbler	0	0	0	8	77	30	8	31	0	0	0	0	0	0	0	0	0	0
Canvasback	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
All Survey Areas (continued)																		
Redhead	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
Ring-necked Duck	0	0	0	14	42	48	62	118	95	98	45	42	77	49	15	44	20	2
Unidentified scaup	0	0	0	0	124	190	662	1,006	787	1,080	1,021	953	892	622	580	418	97	188
Harlequin Duck	0	0	0	2	20	553	186	0	0	0	0	0	0	0	0	0	0	0
Surf Scoter	0	0	0	0	0	0	73	77	35	87	49	72	29	38	39	4	29	12
White-winged Scoter	0	0	0	0	0	0	63	18	8	15	18	17	20	13	12	13	9	24
Black Scoter	0	0	0	0	0	0	0	12	10	26	12	11	8	9	15	16	49	
Unidentified scoter	0	0	0	0	0	0	0	0	7	10	0	0	0	0	1	0	0	0
Long-tailed Duck	0	0	0	0	0	0	101	85	73	67	57	44	27	10	11	9	0	0
Bufflehead	0	5	14	14	42	114	33	25	36	27	28	41	58	43	43	51	53	26
Unidentified goldeneye	2	6	9	64	88	158	95	183	117	165	132	159	148	165	181	328	97	72
Common Merganser	1	2	5	14	26	20	23	8	19	0	7	0	0	0	0	0	0	0
Red-breasted Merganser	0	0	0	0	5	54	30	33	52	61	39	40	27	10	28	14	1	2
Unidentified merganser	0	0	0	0	15	17	3	3	0	22	0	0	7	36	3	4	53	
Unidentified duck	0	0	0	11	33	48	18	65	62	13	0	0	7	29	1	0	0	1

Survey Area/ Species	Spring Migration							Fall Migration										
	April		May					August			September					October		
	23	29	5	11	18–19	23–24	28–29	14–18	23–25	29–30	4–6	10–12	16–18	22–23	27–29	4–6	10–12	17–18
Red-throated Loon	0	0	0	0	0	0	8	8	8	6	1	2	2	0	0	0	0	
Pacific Loon	0	0	0	0	0	0	0	19	8	21	12	9	5	2		1	0	1
Common Loon	0	0	0	0	0	0	3	24	24	25	13	18	11	1	3	3	0	2
Yellow-billed Loon	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
Horned Grebe	0	0	0	0	0	6	4	2	0	1	4	4	4	1	4	4	0	3
Red-necked Grebe	0	0	0	0	0	0	1	5	18	1	1	6	1	0	0	0	4	3
Unidentified grebe	0	0	0	0	0	0	0	5	2	12	0	0	0	0	0	0	0	0
Unidentified diver	0	0	0	0	0	0	0	0	4	0	2	1	2	0	1	0	0	2
Sandhill Crane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0
Bonaparte's Gull	0	0	0	3	0	4	7	2	0	0	0	0	0	0	0	0	0	0
Mew Gull	0	0	2	109	13	28	46	3	0	0	1	0	0	0	0	0	0	0
Herring Gull	0	0	0	0	0	9	3	2	0	0	0	0	0	0	0	0	0	0
Unidentified gull	0	0	0	0	0	24	1	2	0	0	0	0	0	1	0	0	0	0
Arctic Tern	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Total All Survey Areas	7	37	104	1,022	1,227	2,299	2,090	2,963	2,232	2,743	2,245	2,549	2,280	1,449	1,603	1,591	561	549

APPENDIX B. NUMBERS OF WATERBIRDS BY SPECIES OBSERVED DURING SPRING AND FALL MIGRATION SURVEYS, 2014.

Survey Area/ Species	Spring Migration					Fall Migration									
	April		May			August		September					October		
	23	29	5-6	11-12	17-18	24-26	30-Sep 1	5-7	11-13	17-19	23-25	29-Oct 1	5-6	11-12	17-18
Dam/Camp Area															
Trumpeter Swan	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
American Wigeon	0	0	0	3	2	0	0	0	0	3	0	0	0	0	0
Mallard	0	0	2	0	2	1	7	0	0	0	0	3	0	6	11
Northern Shoveler	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Northern Pintail	0	0	0	0	4	0	0	1	0	0	0	0	0	0	0
Green-winged Teal	0	0	14	0	0	5	1	0	0	1	0	0	0	0	0
Ring-necked Duck	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0
Unidentified scaup	0	0	0	0	11	2	3	4	3	2	0	4	0	12	12
Surf Scoter	0	0	0	0	4	1	0	0	0	0	0	0	0	0	0
Bufflehead	0	0	0	0	10	0	1	1	0	1	0	0	0	0	0
Unidentified goldeneye	0	0	0	0	4	1	5	0	3	0	0	1	0	0	0
Red-breasted Merganser	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Pacific Loon	0	0	0	0	4	1	0	2	0	0	0	0	0	0	0
Horned Grebe	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0
Red-necked Grebe	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0
Unidentified diver	0	0	0	0	0	3	1	1	0	0	0	0	0	0	0
Dam/Camp Area Total	0	0	16	3	53	14	18	11	6	9	0	8	0	18	23
Watana Reservoir															
Trumpeter Swan	0	2	9	14	3	19	21	27	25	24	20	17	7	2	4
Gadwall	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
American Wigeon	0	2	96	136	81	53	71	98	72	91	12	11	0	1	0
Mallard	0	65	40	49	37	86	34	50	54	22	28	70	15	15	10
Northern Shoveler	0	0	7	77	51	0	0	29	0	15	0	0	0	0	0
Northern Pintail	0	26	71	89	78	61	22	59	26	4	6	12	0	0	0
Green-winged Teal	0	4	76	147	57	60	40	51	38	48	7	3	3	0	0
Unidentified dabbling	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0
Canvasback	0	0	0	4	2	0	0	0	0	0	0	0	0	0	0
Ring-necked Duck	0	0	8	22	64	43	0	45	38	41	0	14	6	0	0
Unidentified scaup	0	0	0	71	284	335	383	407	298	312	194	121	3	52	0
Surf Scoter	0	0	0	43	95	52	23	10	2	59	0	0	5	0	0
White-winged Scoter	0	0	0	0	25	1	0	15	0	0	0	0	0	0	1
Black Scoter	0	0	0	0	17	6	0	6	0	18	2	1	0	0	0

Survey Area/ Species	Spring Migration					Fall Migration									
	April		May			August		September					October		
	23	29	5-6	11-12	17-18	24-26	30-Sep 1	5-7	11-13	17-19	23-25	29-Oct 1	5-6	11-12	17-18
Unidentified scoter	0	0	0	0	0	0	0	13	0	0	0	0	0	0	0
Long-tailed Duck	0	4	0	1	35	8	62	9	1	13	6	2	0	1	0
Bufflehead	0	5	9	26	42	26	35	24	7	35	13	70	3	6	2
Barrow's Goldeneye	0	0	7	31	35	0	0	0	0	0	0	0	0	2	0
Unidentified goldeneye	0	4	3	11	10	71	57	72	81	70	38	99	10	4	0
Red-breasted Merganser	0	0	0	1	0	2	2	0	4	0	2	0	0	0	4
Unidentified merganser	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0
Unidentified duck	0	0	0	0	0	4	0	2	1	0	0	0	0	0	0
Red-throated Loon	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0
Pacific Loon	0	0	0	0	1	1	6	3	0	2	0	0	0	0	0
Common Loon	0	0	0	1	5	8	7	6	3	4	3	0	0	0	0
Horned Grebe	0	0	1	5	12	20	4	19	3	0	5	0	0	0	0
Red-necked Grebe	0	0	0	0	2	0	2	4	5	10	0	0	0	0	0
Unidentified grebe	0	0	0	0	0	1	3	0	0	3	0	0	0	0	0
Unidentified diver	0	0	0	0	0	19	11	11	0	0	1	0	0	0	0
Sandhill Crane	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Mew Gull	0	0	10	12	4	0	0	0	0	0	0	0	0	0	0
Herring Gull	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
Unidentified gull-large	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Unidentified gull	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Watana Reservoir Total	0	112	339	742	945	878	784	964	658	776	337	420	52	83	21
Denali West															
Greater White-fronted Goose	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
Snow Goose	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Canada Goose	0	0	4	7	0	0	0	0	0	0	0	0	0	0	0
Trumpeter Swan	0	13	36	33	33	78	70	77	83	73	72	36	2	2	0
American Wigeon	0	0	90	154	111	229	223	227	214	295	26	18	0	0	0
Mallard	0	6	88	88	55	81	63	46	80	69	49	95	0	30	37
Northern Shoveler	0	0	28	42	95	0	19	1	0	14	0	0	0	0	0
Northern Pintail	0	60	93	224	128	89	72	31	36	71	8	4	0	0	0
Green-winged Teal	0	0	71	193	117	122	144	115	124	95	2	2	0	0	0
Canvasback	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0
Ring-necked Duck	0	0	16	40	80	17	22	23	16	9	4	0	0	0	0

Survey Area/ Species	Spring Migration					Fall Migration									
	April		May			August		September					October		
	23	29	5-6	11-12	17-18	24-26	30-Sep 1	5-7	11-13	17-19	23-25	29-Oct 1	5-6	11-12	17-18
Unidentified scaup	0	0	4	41	130	340	275	300	362	199	153	87	27	14	4
Harlequin Duck	0	0	0	0	27	11	0	9	7	3	4	5	0	0	0
Surf Scoter	0	0	1	0	0	0	0	0	2	2	0	0	0	0	0
White-winged Scoter	0	0	0	0	0	1	0	0	0	0	0	0	0	0	6
Black Scoter	0	0	0	0	4	0	0	0	1	5	0	0	0	0	0
Unidentified scoter	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0
Long-tailed Duck	0	2	0	2	4	13	13	13	7	1	2	0	0	0	0
Bufflehead	0	0	18	46	32	12	11	19	20	15	19	0	0	0	1
Common Goldeneye	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0
Barrow's Goldeneye	0	0	6	24	11	0	0	0	0	0	0	0	0	0	0
Unidentified goldeneye	0	0	4	6	4	21	20	31	22	39	7	5	0	0	0
Common Merganser	0	0	0	0	0	3	0	6	0	0	10	0	0	0	0
Red-breasted Merganser	0	0	0	0	8	16	6	13	11	2	4	4	0	0	3
Unidentified merganser	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0
Unidentified duck	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
Red-throated Loon	0	0	0	1	7	2	1	4	0	0	0	0	0	0	0
Pacific Loon	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Common Loon	0	0	0	0	1	3	4	3	5	4	0	0	0	0	0
Horned Grebe	0	0	24	2	3	0	0	3	0	0	0	0	0	0	0
Red-necked Grebe	0	0	0	0	0	0	1	10	5	0	0	0	0	0	0
Unidentified grebe	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Unidentified diver	0	0	0	0	0	8	1	2	3	0	1	0	0	0	0
Bonaparte's Gull	0	0	2	7	4	0	0	0	0	0	0	0	0	0	0
Mew Gull	0	3	10	17	15	0	0	0	0	0	0	0	0	0	0
Arctic Tern	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
Denali West Total	0	84	497	937	874	1,052	945	933	998	919	361	256	29	46	51
Denali East															
Trumpeter Swan	0	0	2	4	2	8	12	6	7	2	4	2	0	0	0
American Wigeon	0	0	3	5	2	26	27	6	3	49	0	26	0	0	0
Mallard	0	0	2	5	4	15	35	24	11	5	3	0	0	0	0
Northern Shoveler	0	0	0	0	8	0	1	0	3	0	0	0	0	0	0
Northern Pintail	0	0	4	12	18	27	15	11	5	0	0	0	0	0	0
Green-winged Teal	0	0	0	60	4	14	27	4	9	7	2	0	0	0	0

Survey Area/ Species	Spring Migration					Fall Migration									
	April		May			August		September					October		
	23	29	5-6	11-12	17-18	24-26	30-Sep 1	5-7	11-13	17-19	23-25	29-Oct 1	5-6	11-12	17-18
Ring-necked Duck	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Unidentified scaup	0	0	0	0	42	30	42	15	18	12	2	6	0	0	1
Surf Scoter	0	0	0	0	5	4	4	0	0	0	0	0	0	0	0
White-winged Scoter	0	0	0	0	0	0	0	3	0	0	8	0	0	0	0
Black Scoter	0	0	0	0	0	4	0	0	3	0	2	0	0	0	0
Long-tailed Duck	0	0	0	0	22	9	29	23	10	5	3	0	0	0	0
Bufflehead	0	0	0	4	7	3	0	14	3	1	8	0	0	0	0
Unidentified goldeneye	0	0	0	0	0	0	6	4	5	9	8	0	0	0	0
Unidentified duck	0	0	0	0	0	5	0	0	0	0	3	0	0	0	0
Horned Grebe	0	0	0	0	0	0	1	8	0	0	0	0	0	0	0
Red-necked Grebe	0	0	0	0	3	0	2	0	0	0	0	0	0	0	0
Unidentified grebe	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
Unidentified diver	0	0	0	0	0	1	1	0	7	0	0	0	0	0	0
Mew Gull	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0
Denali East Total	0	0	11	91	122	146	206	118	84	90	43	34	0	0	1
Chulitna Corridor															
Trumpeter Swan	0	0	0	0	2	0	2	7	7	2	6	0	0	0	0
American Wigeon	0	0	0	10	2	0	17	0	6	0	0	1	2	0	0
Mallard	0	0	0	2	0	4	0	0	4	3	0	13	23	0	0
Northern Shoveler	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0
Green-winged Teal	0	0	0	4	0	0	0	0	0	0	0	1	0	0	0
Ring-necked Duck	0	0	0	10	25	0	0	0	0	0	0	2	0	0	0
Unidentified scaup	0	0	0	0	1	6	4	21	12	4	15	0	0	4	1
White-winged Scoter	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Black Scoter	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0
Long-tailed Duck	0	0	0	0	3	0	0	0	0	0	0	1	0	0	0
Bufflehead	0	0	0	0	5	0	0	0	0	0	0	3	0	3	0
Barrow's Goldeneye	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0
Unidentified goldeneye	0	0	0	0	1	0	2	5	1	1	2	1	0	0	1
Common Merganser	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
Red-breasted Merganser	0	0	0	0	2	0	3	0	0	0	0	0	0	0	0
Common Loon	0	0	0	0	2	7	6	9	6	6	6	3	0	1	0
Horned Grebe	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0

Survey Area/ Species	Spring Migration					Fall Migration									
	April		May			August		September					October		
	23	29	5-6	11-12	17-18	24-26	30-Sep 1	5-7	11-13	17-19	23-25	29-Oct 1	5-6	11-12	17-18
Red-necked Grebe	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Unidentified diver	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Chulitna Corridor Total	0	0	0	27	51	23	34	43	38	16	29	28	25	8	2
Gold Creek															
Canada Goose	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Trumpeter Swan	11	5	10	8	11	9	15	15	15	23	49	112	112	102	7
American Wigeon	0	3	25	49	11	91	39	43	35	102	53	43	64	21	2
Mallard	0	85	19	23	21	61	78	50	52	39	95	169	162	179	169
Northern Shoveler	0	0	4	14	9	0	0	40	2	19	2	0	0	0	0
Northern Pintail	0	19	10	3	17	53	14	8	1	14	1	0	0	2	0
Green-winged Teal	0	21	24	46	10	13	30	18	5	13	5	7	22	0	2
Unidentified dabbler	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
Ring-necked Duck	0	0	19	8	18	10	0	28	31	7	49	31	0	29	10
Unidentified scaup	0	0	0	80	131	122	133	168	160	127	174	127	221	148	117
Harlequin Duck	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0
Surf Scoter	0	0	0	13	33	19	26	5	15	0	4	0	0	0	0
White-winged Scoter	0	0	0	0	21	1	0	10	0	0	6	0	4	36	5
Black Scoter	0	0	0	0	2	13	14	3	1	7	4	8	12	0	0
Unidentified scoter	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Long-tailed Duck	0	0	0	0	10	2	4	1	6	0	0	8	0	0	0
Bufflehead	0	2	4	24	18	0	1	0	0	0	4	21	29	23	28
Common Goldeneye	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2
Barrow's Goldeneye	0	4	34	24	22	0	0	0	0	0	0	0	0	2	8
Unidentified goldeneye	0	18	0	9	0	45	57	50	82	161	80	118	82	132	66
Common Merganser	1	4	0	0	9	0	0	0	27	0	8	0	0	0	0
Red-breasted Merganser	0	1	0	11	2	60	6	27	15	0	35	28	0	3	4
Unidentified Merganser	0	0	0	0	0	0	0	0	0	6	0	0	60	0	0
Red-throated Loon	0	0	0	2	2	5	0	0	0	0	0	0	0	0	0
Pacific Loon	0	0	0	0	0	9	2	7	2	0	0	0	0	0	0
Common Loon	0	0	0	3	7	6	7	6	1	2	0	0	0	0	0
Horned Grebe	0	0	0	3	4	0	2	0	2	0	4	1	0	0	1
Red-necked Grebe	0	0	0	2	6	0	0	4	3	5	0	1	0	0	0
Unidentified grebe	0	0	0	1	0	0	7	0	0	0	0	0	0	0	0

Survey Area/ Species	Spring Migration					Fall Migration									
	April		May			August		September					October		
	23	29	5–6	11–12	17–18	24–26	30–Sep 1	5–7	11–13	17–19	23–25	29–Oct 1	5–6	11–12	17–18
Unidentified diver	0	0	0	0	0	3	11	0	4	0	0	0	0	1	0
Sandhill Crane	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0
Bonaparte's Gull	0	0	4	2	3	0	0	0	0	0	0	0	0	0	0
Mew Gull	0	1	25	3	10	0	0	0	0	0	0	0	0	0	0
Herring Gull	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Gull	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Gold Creek Total	12	163	192	328	377	527	449	487	459	525	573	675	768	684	421
All Survey Areas															
Greater White-fronted Goose	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
Snow Goose	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Canada Goose	0	0	4	7	0	0	0	0	0	0	0	1	0	0	0
Trumpeter Swan	11	20	57	59	51	114	120	134	137	124	151	167	121	106	11
Gadwall	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
American Wigeon	0	5	214	357	209	399	377	374	330	540	91	99	66	22	2
Mallard	0	156	151	167	119	248	217	170	201	138	175	350	200	230	227
Northern Shoveler	0	0	39	133	169	0	20	70	5	48	2	0	0	0	0
Northern Pintail	0	105	178	328	245	230	123	110	68	89	15	16	0	2	0
Green-winged Teal	0	25	185	450	188	214	242	188	176	164	16	13	25	0	2
Unidentified dabbler	0	0	0	0	0	5	1	4	0	0	0	0	0	0	0
Canvasback	0	0	2	6	3	0	0	0	0	0	0	0	0	0	0
Ring-necked Duck	0	0	43	80	190	70	22	96	85	59	53	47	6	29	10
Unidentified scaup	0	0	4	192	599	835	840	915	853	656	538	345	251	230	135
Harlequin Duck	0	0	10	0	27	11	0	9	7	3	4	5	0	0	0
Surf Scoter	0	0	1	56	137	76	53	15	19	61	4	0	5	0	0
White-winged Scoter	0	0	0	0	46	3	0	29	0	0	14	0	4	36	12
Black Scoter	0	0	0	0	23	23	14	9	5	30	8	12	12	0	0
Unidentified Scoter	0	0	0	0	0	0	0	14	0	5	0	0	0	0	0
Long-tailed Duck	0	6	0	3	74	32	108	46	24	19	11	11	0	1	0
Bufflehead	0	7	31	100	114	41	48	58	30	52	44	94	32	32	31
Common Goldeneye	0	0	0	1	2	0	0	0	0	0	0	0	0	6	2
Barrow's Goldeneye	0	4	47	80	70	0	0	0	0	0	0	0	0	4	8
Unidentified goldeneye	0	22	7	26	19	138	147	162	194	280	135	224	92	136	67
Common Merganser	1	4	0	0	9	9	0	6	27	0	18	0	0	0	0

Survey Area/ Species	Spring Migration					Fall Migration									
	April		May			August		September					October		
	23	29	5-6	11-12	17-18	24-26	30-Sep 1	5-7	11-13	17-19	23-25	29-Oct 1	5-6	11-12	17-18
Red-breasted Merganser	0	1	0	12	14	78	17	40	30	2	41	32	0	3	11
Unidentified merganser	0	0	0	0	0	0	0	0	0	26	0	0	60	0	0
Unidentified duck	0	0	0	0	0	14	0	2	1	0	3	0	0	0	0
Red-throated Loon	0	0	0	3	12	7	1	4	0	0	0	0	0	0	0
Pacific Loon	0	0	0	0	5	12	8	12	2	2	0	0	0	0	0
Common Loon	0	0	0	4	15	24	24	24	15	16	9	3	0	1	0
Horned Grebe	0	0	25	10	22	20	7	30	6	0	9	1	0	0	1
Red-necked Grebe	0	0	0	2	16	0	5	18	13	15	0	1	0	0	0
Unidentified grebe	0	0	0	1	0	1	14	0	0	5	0	0	0	0	0
Unidentified diver	0	0	0	0	0	34	25	14	15	0	2	0	0	1	0
Sandhill Crane	0	0	0	0	0	2	3	3	0	0	0	0	0	0	0
Bonaparte's Gull	0	0	6	9	7	0	0	0	0	0	0	0	0	0	0
Mew Gull	0	4	45	33	33	0	0	0	0	0	0	0	0	0	0
Herring Gull	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0
Unidentified gull-large	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Unidentified gull	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
Arctic Tern	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
Total All Survey Areas	12	359	1,055	2,128	2,422	2,640	2,436	2,556	2,243	2,335	1,343	1,421	874	839	519

APPENDIX C: ABUNDANCE AND PERCENTAGES OF BIRDS RECORDED DURING DIURNAL AUDIO-VISUAL OBSERVATIONS IN SPRING AND FALL 2013.

Species-group/ Common name	Scientific name	Season							
		Spring				Fall			
		Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals	Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals
Waterfowl		229	9.68	2,658	32.46	37	3.00	372	5.77
Greater White-fronted Goose	<i>Anser albifrons</i>	12	0.51	166	2.03	0	0.00	0	0.00
Canada Goose	<i>Branta canadensis</i>	12	0.51	74	0.90	2	0.16	19	0.29
Unidentified Goose		12	0.51	68	0.83	0	0.00	0	0.00
Trumpeter Swan	<i>Cygnus buccinator</i>	20	0.85	55	0.67	8	0.65	59	0.92
Tundra Swan	<i>Cygnus columbianus</i>	38	1.61	934	11.41	3	0.24	26	0.40
Unidentified Swan		14	0.59	97	1.18	19	1.54	216	3.35
American Wigeon	<i>Anas americana</i>	1	0.04	5	0.06	0	0.00	0	0.00
Mallard	<i>Anas platyrhynchos</i>	12	0.51	43	0.53	0	0.00	0	0.00
Northern Shoveler	<i>Anas clypeata</i>	4	0.17	33	0.40	0	0.00	0	0.00
Northern Pintail	<i>Anas acuta</i>	2	0.08	4	0.05	0	0.00	0	0.00
Greater Scaup	<i>Aythya marila</i>	1	0.04	3	0.04	0	0.00	0	0.00
Surf Scoter	<i>Melanitta perspicillata</i>	8	0.34	145	1.77	0	0.00	0	0.00
White-winged Scoter	<i>Melanitta fusca</i>	7	0.30	100	1.22	0	0.00	0	0.00
Black Scoter	<i>Melanitta americana</i>	2	0.08	28	0.34	0	0.00	0	0.00

Species-group/ Common name	Scientific name	Season							
		Spring				Fall			
		Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals	Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals
Common Goldeneye	<i>Bucephala clangula</i>	1	0.04	7	0.09	0	0.00	0	0.00
Barrow's Goldeneye	<i>Bucephala islandica</i>	1	0.04	2	0.02	0	0.00	0	0.00
Common Merganser	<i>Mergus merganser</i>	1	0.04	10	0.12	0	0.00	0	0.00
Red-breasted Merganser	<i>Mergus serrator</i>	2	0.08	9	0.11	0	0.00	0	0.00
Unidentified Duck		76	3.21	747	9.12	1	0.08	3	0.05
Unidentified Waterfowl		3	0.13	128	1.56	4	0.32	49	0.76
Grouse		1	0.04	2	0.02	1	0.08	1	0.02
Unidentified Ptarmigan		1	0.04	2	0.02	0	0.00	0	0.00
Unidentified Grouse		0	0.00	0	0.00	1	0.08	1	0.02
Loons		23	0.97	23	0.28	5	0.41	7	0.11
Red-throated Loon	<i>Gavia stellata</i>	1	0.04	1	0.01	0	0.00	0	0.00
Pacific Loon	<i>Gavia pacifica</i>	2	0.08	2	0.02	0	0.00	0	0.00
Common Loon	<i>Gavia immer</i>	12	0.51	12	0.15	2	0.16	2	0.03
Unidentified Loon		8	0.34	8	0.10	3	0.24	5	0.08

Species-group/ Common name	Scientific name	Season							
		Spring				Fall			
		Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals	Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals
Falconiforms		422	17.84	461	5.63	159	12.88	171	2.65
Osprey	<i>Pandion haliaetus</i>	8	0.34	8	0.10	1	0.08	1	0.02
Bald Eagle	<i>Haliaeetus leucocephalus</i>	84	3.55	94	1.15	32	2.59	37	0.57
Northern Harrier	<i>Circus cyaneus</i>	47	1.99	48	0.59	5	0.41	5	0.08
Sharp-shinned Hawk	<i>Accipiter striatus</i>	28	1.18	32	0.39	22	1.78	22	0.34
Northern Goshawk	<i>Accipiter gentilis</i>	3	0.13	3	0.04	4	0.32	4	0.06
Unidentified Accipiter		0	0.00	0	0.00	1	0.08	1	0.02
Red-tailed Hawk	<i>Buteo jamaicensis</i>	3	0.13	3	0.04	8	0.65	9	0.14
Rough-legged Hawk	<i>Buteo lagopus</i>	25	1.06	27	0.33	8	0.65	10	0.16
Unidentified Buteo		5	0.21	5	0.06	10	0.81	10	0.16
Golden Eagle	<i>Aquila chrysaetos</i>	95	4.02	101	1.23	14	1.13	14	0.22
Unidentified Eagle		18	0.76	20	0.24	1	0.08	1	0.02
American Kestrel	<i>Falco sparverius</i>	1	0.04	1	0.01	0	0.00	0	0.00
Merlin	<i>Falco columbarius</i>	27	1.14	31	0.38	15	1.22	16	0.25
Gyr Falcon	<i>Falco rusticolus</i>	6	0.25	9	0.11	3	0.24	3	0.05

Species-group/ Common name	Scientific name	Season							
		Spring				Fall			
		Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals	Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals
Peregrine Falcon	<i>Falco peregrinus</i>	33	1.39	36	0.44	23	1.86	25	0.39
Unidentified Falcon		7	0.30	8	0.10	0	0.00	0	0.00
Unidentified Raptor		32	1.35	35	0.43	12	0.97	13	0.20
Cranes		12	0.51	23	0.28	33	2.67	1,754	27.21
Sandhill Crane	<i>Grus canadensis</i>	12	0.51	23	0.28	33	2.67	1,754	27.21
Shorebirds		188	7.95	1,181	14.42	0	0.00	0	0.00
American Golden Plover	<i>Pluvialis dominica</i>	4	0.17	19	0.23	0	0.00	0	0.00
Semipalmated Plover	<i>Charadrius semipalmatus</i>	1	0.04	3	0.04	0	0.00	0	0.00
Spotted Sandpiper	<i>Actitis macularius</i>	1	0.04	3	0.04	0	0.00	0	0.00
Solitary Sandpiper	<i>Tringa solitaria</i>	2	0.08	2	0.02	0	0.00	0	0.00
Lesser Yellowlegs	<i>Tringa flavipes</i>	4	0.17	5	0.06	0	0.00	0	0.00
Whimbrel	<i>Numenius phaeopus</i>	15	0.63	32	0.39	0	0.00	0	0.00
Pectoral Sandpiper	<i>Calidris melanotos</i>	12	0.51	68	0.83	0	0.00	0	0.00
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>	7	0.30	23	0.28	0	0.00	0	0.00

Species-group/ Common name	Scientific name	Season							
		Spring				Fall			
		Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals	Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals
Wilson's Snipe	<i>Gallinago delicata</i>	64	2.70	87	1.06	0	0.00	0	0.00
Red-necked Phalarope	<i>Phalaropus lobatus</i>	2	0.08	5	0.06	0	0.00	0	0.00
Unidentified Shorebird		76	3.21	934	11.41	0	0.00	0	0.00
Larids		111	4.69	333	4.07	3	0.24	3	0.05
Mew Gull	<i>Larus canus</i>	18	0.76	23	0.28	0	0.00	0	0.00
Herring Gull	<i>Larus argentatus</i>	63	2.66	183	2.23	1	0.08	1	0.02
Unidentified Gull		24	1.01	58	0.71	2	0.16	2	0.03
Arctic Tern	<i>Sterna paradisaea</i>	4	0.17	66	0.81	0	0.00	0	0.00
Long-tailed Jaeger	<i>Stercorarius longicaudus</i>	2	0.08	3	0.04	0	0.00	0	0.00
Owls		7	0.30	7	0.09	2	0.16	2	0.03
Northern Hawk Owl	<i>Surnia ulula</i>	0	0.00	0	0.00	2	0.16	2	0.03
Short-eared Owl	<i>Asio flammeus</i>	5	0.21	5	0.06	0	0.00	0	0.00
Boreal Owl	<i>Aegolius funereus</i>	2	0.08	2	0.02	0	0.00	0	0.00
Woodpeckers		19	0.80	21	0.26	3	0.24	3	0.05

Species-group/ Common name	Scientific name	Season							
		Spring				Fall			
		Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals	Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals
Hairy Woodpecker	<i>Picoides villosus</i>	0	0.00	0	0.00	1	0.08	1	0.02
Northern Flicker	<i>Colaptes auratus</i>	18	0.76	20	0.24	0	0.00	0	0.00
Unidentified Woodpecker		1	0.04	1	0.01	2	0.16	2	0.03
Corvids		149	6.30	199	2.43	200	16.21	331	5.14
Gray Jay	<i>Perisoreus canadensis</i>	41	1.73	60	0.73	84	6.81	111	1.72
Black-billed Magpie	<i>Pica hudsonia</i>	20	0.85	30	0.37	8	0.65	9	0.14
Common Raven	<i>Corvus corax</i>	88	3.72	109	1.33	108	8.75	211	3.27
Passerines (Non-Corvids)		1,204	50.89	3,279	40.05	790	64.02	3,793	58.85
Alder Flycatcher	<i>Empidonax alnorum</i>	2	0.08	2	0.02	2	0.16	2	0.03
Northern Shrike	<i>Lanius excubitor</i>	1	0.04	1	0.01	30	2.43	34	0.53
Tree Swallow	<i>Tachycineta bicolor</i>	31	1.31	59	0.72	0	0.00	0	0.00
Violet-green Swallow	<i>Tachycineta thalassina</i>	9	0.38	12	0.15	0	0.00	0	0.00
Bank Swallow	<i>Riparia riparia</i>	22	0.93	38	0.46	0	0.00	0	0.00
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	1	0.04	1	0.01	0	0.00	0	0.00

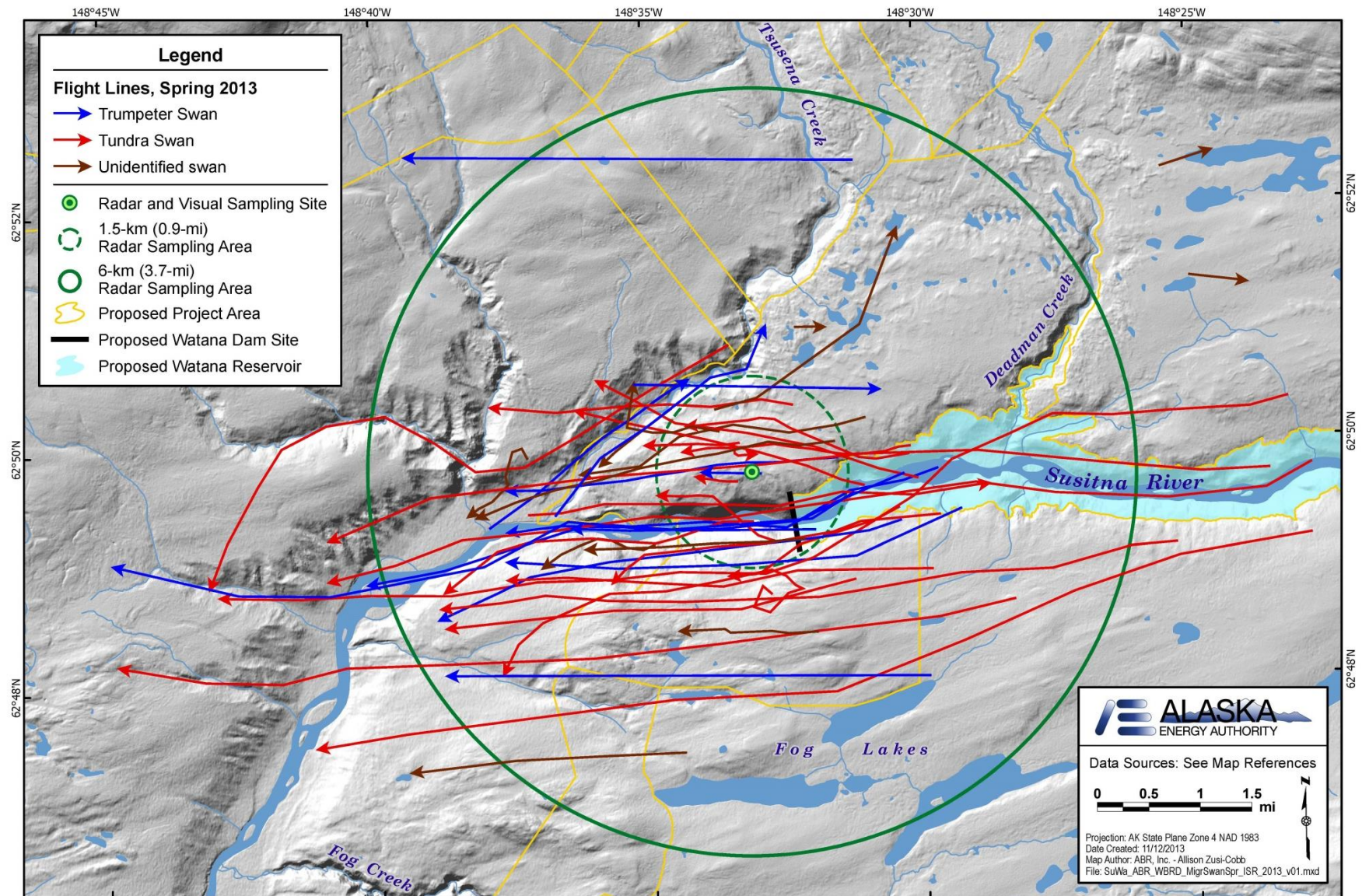
Species-group/ Common name	Scientific name	Season							
		Spring				Fall			
		Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals	Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals
Black-capped Chickadee	<i>Poecile atricapillus</i>	0	0.00	0	0.00	1	0.08	1	0.02
Boreal Chickadee	<i>Poecile hudsonicus</i>	12	0.51	18	0.22	10	0.81	16	0.25
Ruby-crowned Kinglet	<i>Regulus calendula</i>	14	0.59	18	0.22	1	0.08	1	0.02
Northern Wheatear	<i>Oenanthe oenanthe</i>	6	0.25	39	0.48	0	0.00	0	0.00
Townsend's Solitaire	<i>Myadestes townsendi</i>	6	0.25	7	0.09	3	0.24	3	0.05
Gray-cheeked Thrush	<i>Catharus minimus</i>	6	0.25	7	0.09	1	0.08	1	0.02
Swainson's Thrush	<i>Catharus ustulatus</i>	13	0.55	14	0.17	2	0.16	6	0.09
Hermit Thrush	<i>Catharus guttatus</i>	10	0.42	11	0.13	14	1.13	29	0.45
American Robin	<i>Turdus migratorius</i>	91	3.85	210	2.56	71	5.75	230	3.57
Varied Thrush	<i>Ixoreus naevius</i>	28	1.18	31	0.38	18	1.46	19	0.29
American Pipit	<i>Anthus rubescens</i>	17	0.72	32	0.39	4	0.32	5	0.08
Bohemian Waxwing	<i>Bombycilla garrulus</i>	32	1.35	140	1.71	12	0.97	156	2.42
Orange-crowned Warbler	<i>Oreothlypis celata</i>	11	0.46	13	0.16	8	0.65	12	0.19
Yellow Warbler	<i>Dendroica petechia</i>	0	0.00	0	0.00	2	0.16	2	0.03
Yellow-rumped Warbler	<i>Setophaga coronata</i>	66	2.79	93	1.14	42	3.40	73	1.13

Species-group/ Common name	Scientific name	Season							
		Spring				Fall			
		Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals	Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals
Blackpoll Warbler	<i>Setophaga striata</i>	15	0.63	15	0.18	2	0.16	4	0.06
Wilson's Warbler	<i>Cardellina pusilla</i>	29	1.23	35	0.43	13	1.05	20	0.31
American Tree Sparrow	<i>Spizella arborea</i>	11	0.46	23	0.28	1	0.08	1	0.02
Savannah Sparrow	<i>Passerculus sandwichensis</i>	11	0.46	13	0.16	1	0.08	1	0.02
Fox Sparrow	<i>Passerella iliaca</i>	28	1.18	64	0.78	27	2.19	32	0.50
Lincoln's Sparrow	<i>Melospiza lincolni</i>	0	0.00	0	0.00	1	0.08	1	0.02
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	46	1.94	133	1.62	41	3.32	72	1.12
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	2	0.08	3	0.04	2	0.16	3	0.05
Dark-eyed Junco	<i>Junco hyemalis</i>	30	1.27	55	0.67	29	2.35	65	1.01
Lapland Longspur	<i>Calcarius lapponicus</i>	17	0.72	339	4.14	0	0.00	0	0.00
Smith's Longspur	<i>Calcarius pictus</i>	2	0.08	21	0.26	0	0.00	0	0.00
Snow Bunting	<i>Plectrophenax nivalis</i>	14	0.59	36	0.44	0	0.00	0	0.00
Rusty Blackbird	<i>Euphagus carolinus</i>	36	1.52	74	0.90	3	0.24	10	0.16
Gray-crowned Rosy-finch	<i>Leucosticte tephrocotis</i>	7	0.30	44	0.54	0	0.00	0	0.00
Pine Grosbeak	<i>Pinicola enucleator</i>	12	0.51	21	0.26	1	0.08	2	0.03

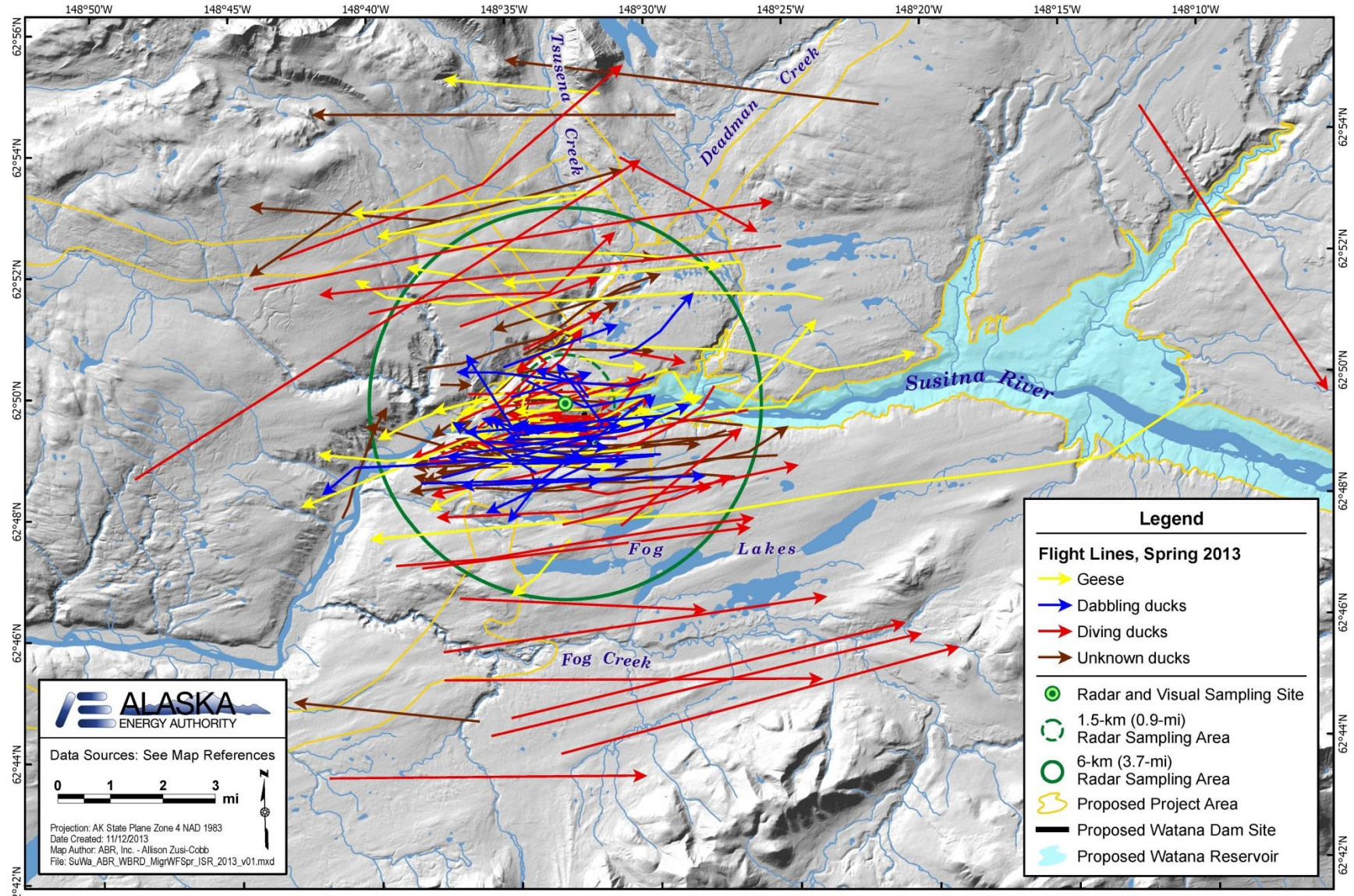
Species-group/ Common name	Scientific name	Season							
		Spring				Fall			
		Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals	Sum of Flocks	% Flocks	Sum of Individuals ¹	% Individuals
White-winged Crossbill	<i>Loxia leucoptera</i>	9	0.38	181	2.21	1	0.08	6	0.09
Common Redpoll	<i>Acanthis flammea</i>	100	4.23	404	4.93	231	18.72	1,992	30.91
Pine Siskin	<i>Spinus pinus</i>	4	0.17	5	0.06	0	0.00	0	0.00
Unidentified Passerine		453	19.15	1,067	13.03	216	17.50	994	15.42
Unidentified Birds		1	0.04	1	0.01	1	0.08	8	0.12
Total Birds		2,366	100.00	8,188	100.00	1,234	100.00	6,445	100.00

1 Audio-only records assumed to be one individual unless otherwise designated.

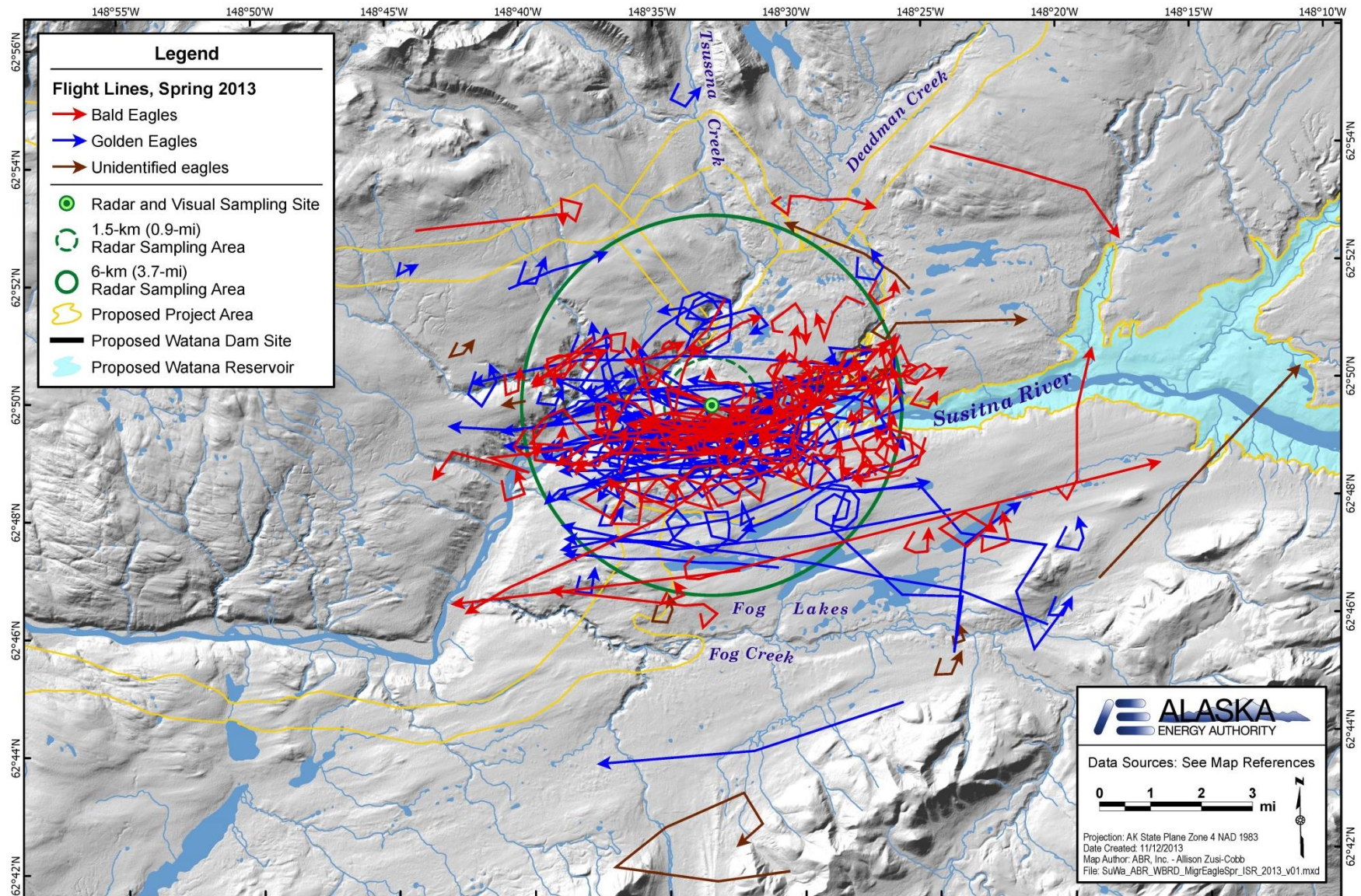
APPENDIX D: FLIGHT LINES FOR SWANS OBSERVED DURING SPRING DIURNAL VISUAL SURVEYS.



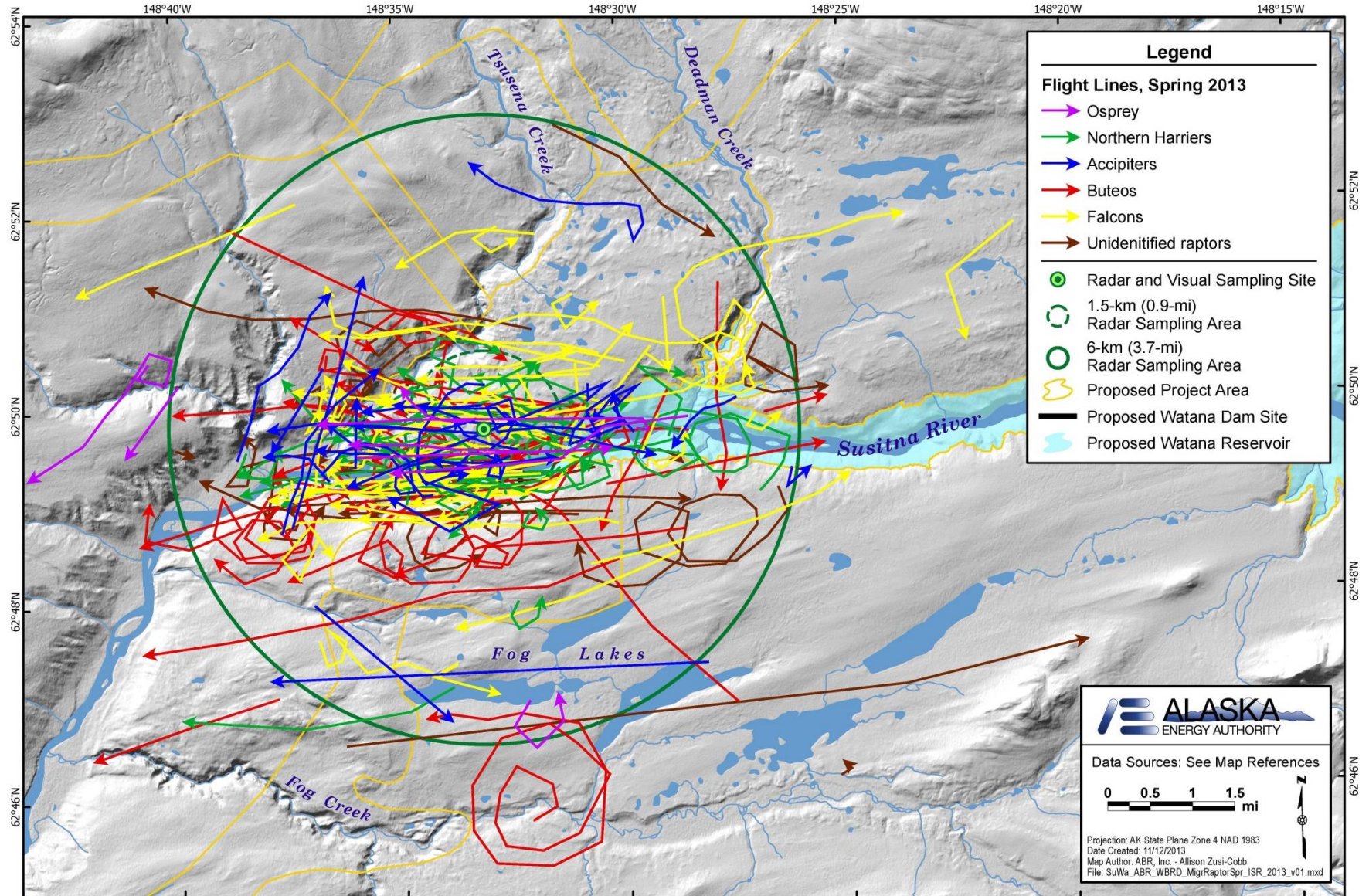
APPENDIX E: FLIGHT LINES FOR WATERFOWL (EXCEPT SWANS) OBSERVED DURING SPRING DIURNAL VISUAL SURVEYS.



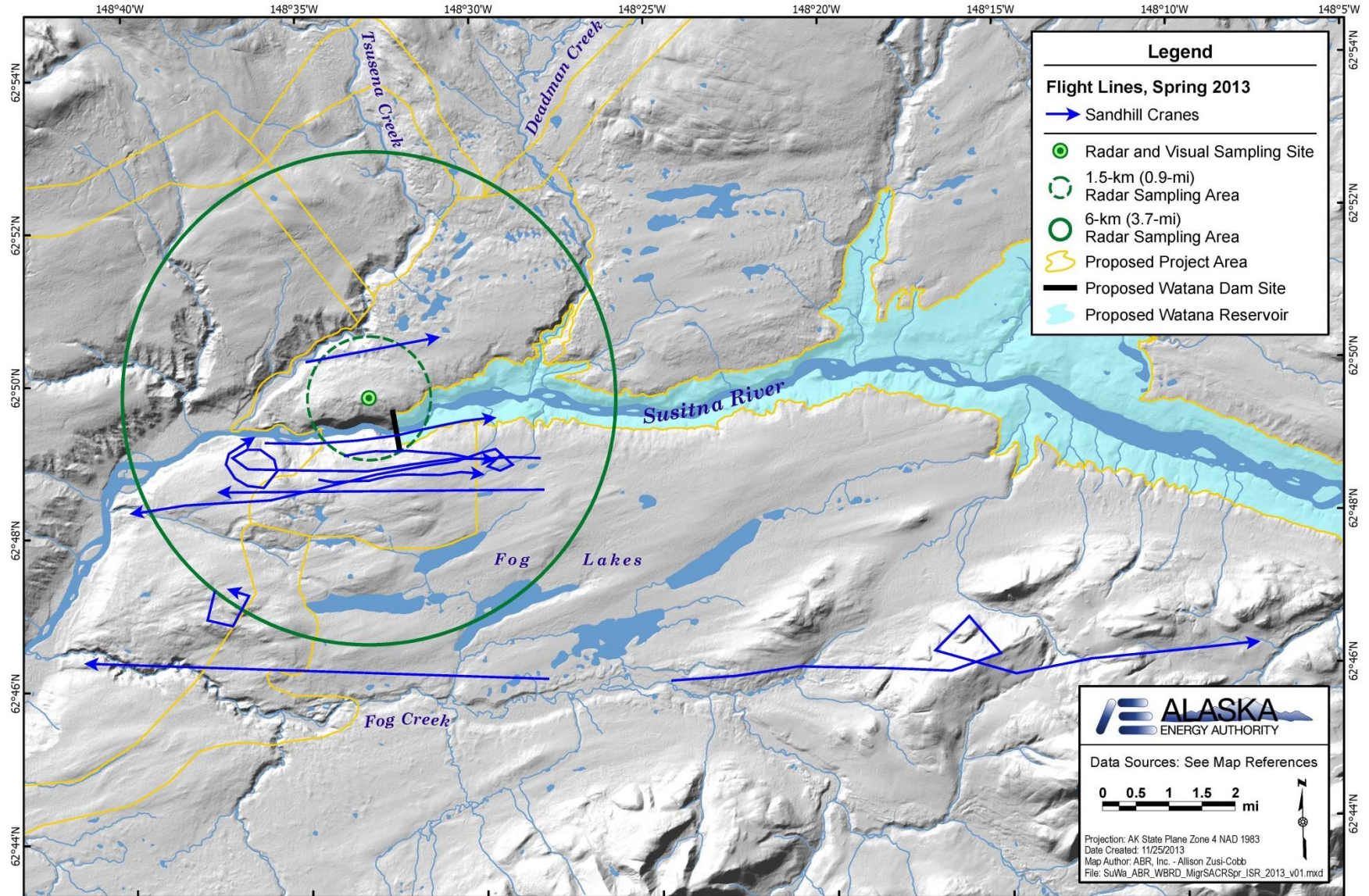
APPENDIX F: FLIGHT LINES FOR EAGLES OBSERVED DURING SPRING DIURNAL VISUAL SURVEYS.



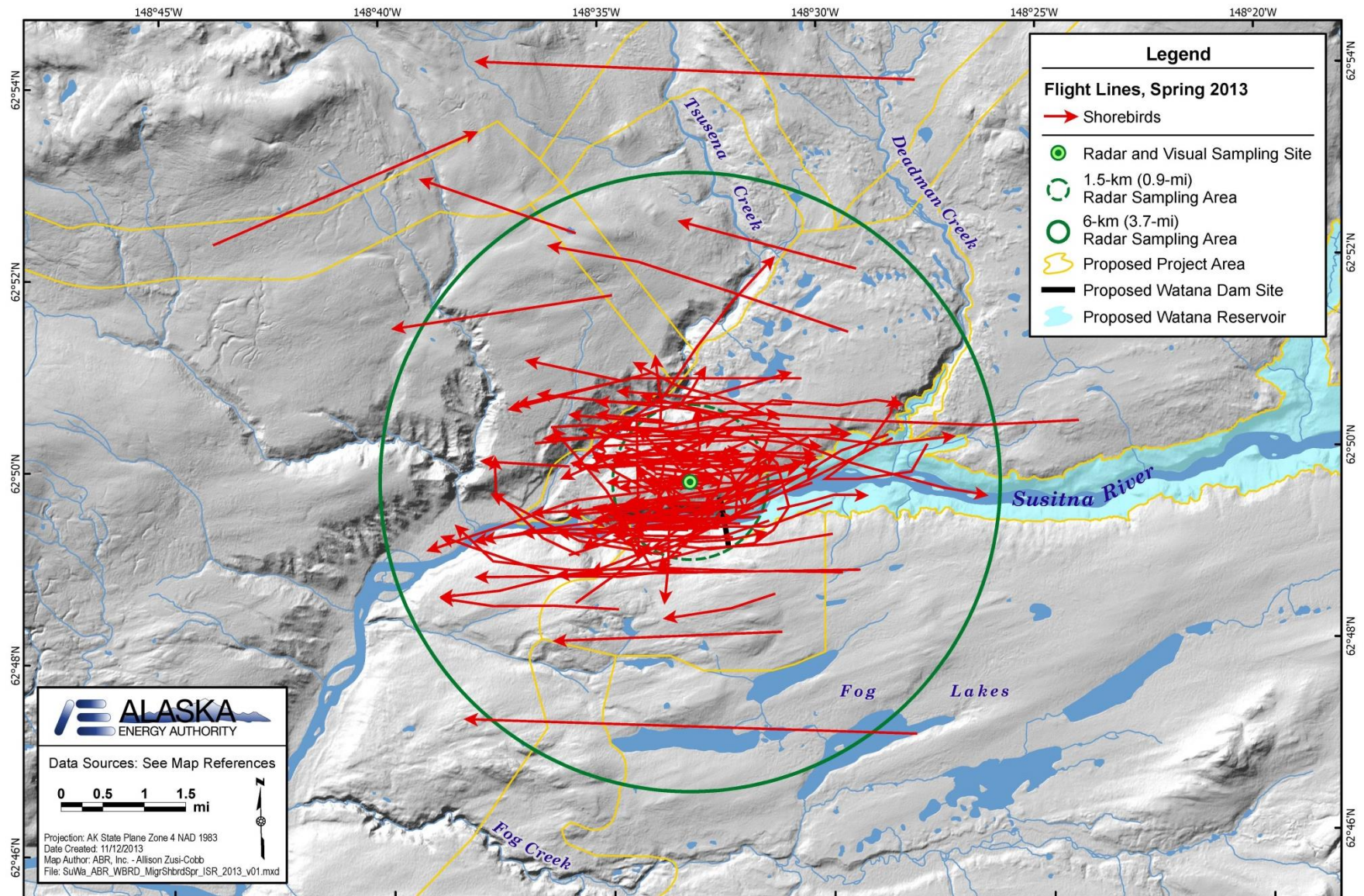
APPENDIX G: FLIGHT LINES FOR RAPTORS (EXCEPT EAGLES) OBSERVED DURING SPRING DIURNAL VISUAL SURVEYS.



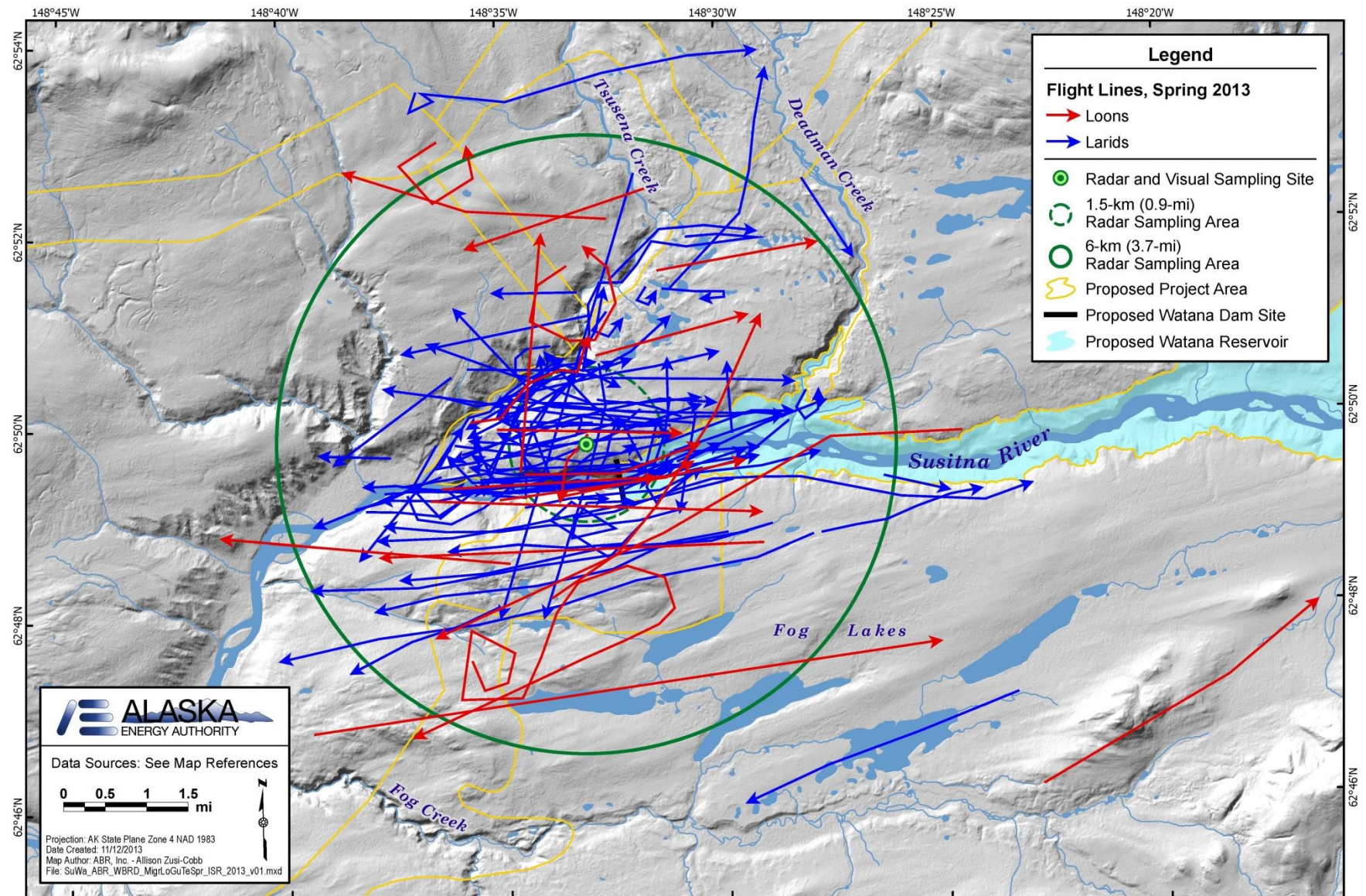
APPENDIX H: FLIGHT LINES FOR SANDHILL CRANES OBSERVED DURING SPRING DIURNAL VISUAL SURVEYS.



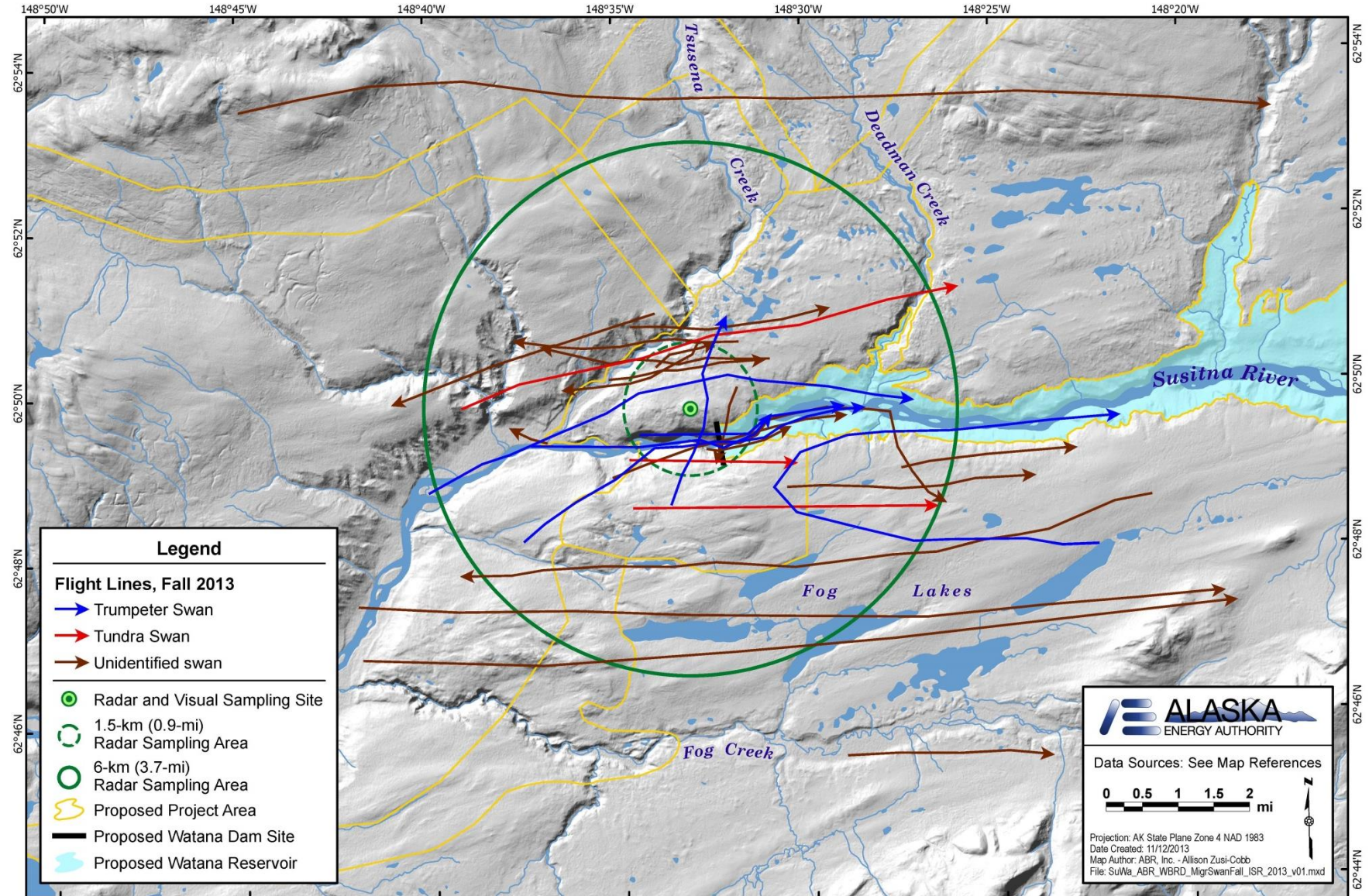
APPENDIX I: FLIGHT LINES FOR SHOREBIRDS OBSERVED DURING SPRING DIURNAL VISUAL SURVEYS.



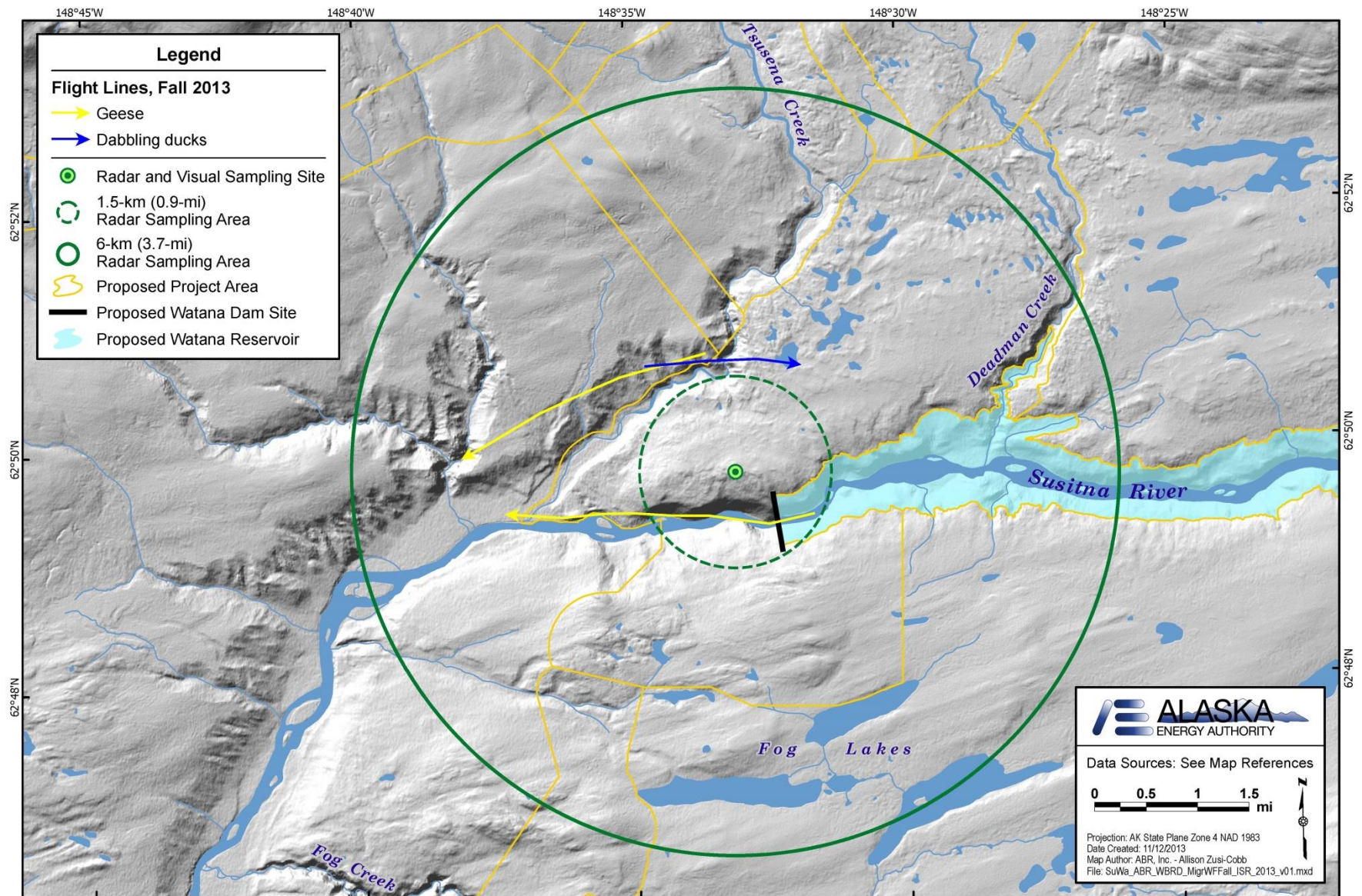
APPENDIX J: FLIGHT LINES FOR LOONS AND LARIDS OBSERVED DURING SPRING DIURNAL VISUAL SURVEYS.



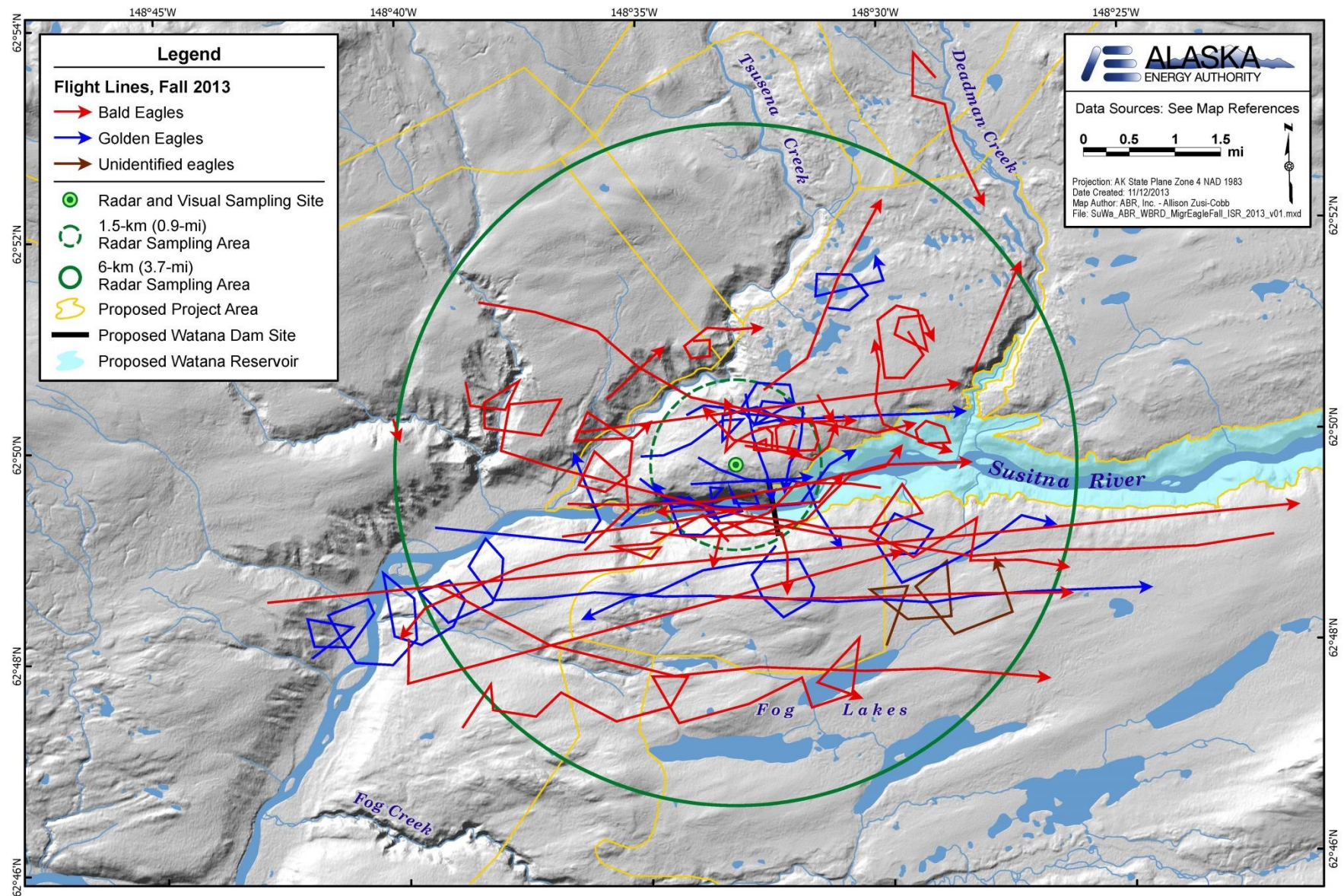
APPENDIX K: FLIGHT LINES FOR SWANS OBSERVED DURING FALL DIURNAL VISUAL SURVEYS.



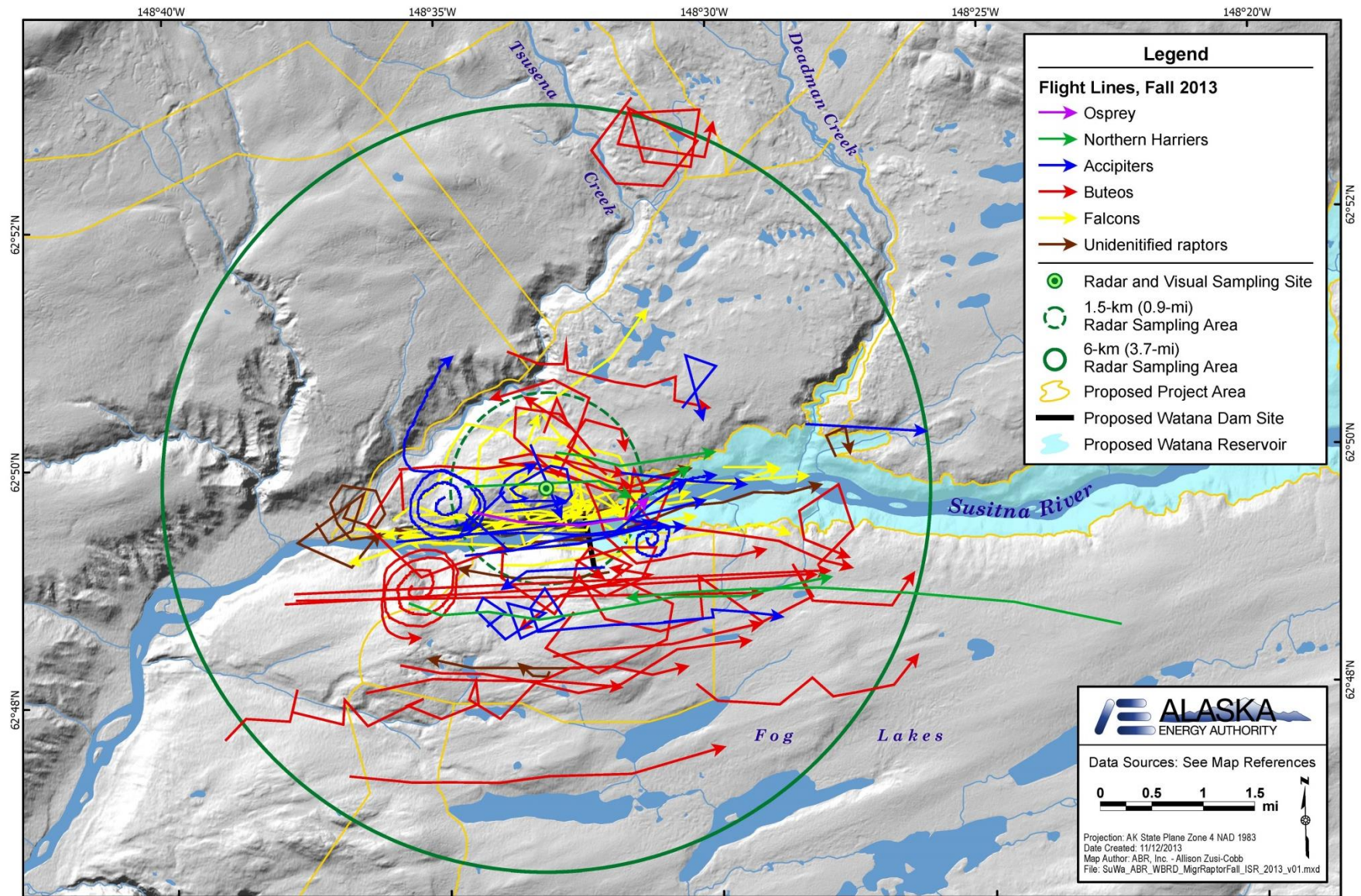
APPENDIX L: FLIGHT LINES FOR WATERFOWL (EXCEPT SWANS) OBSERVED DURING FALL DIURNAL VISUAL SURVEYS.



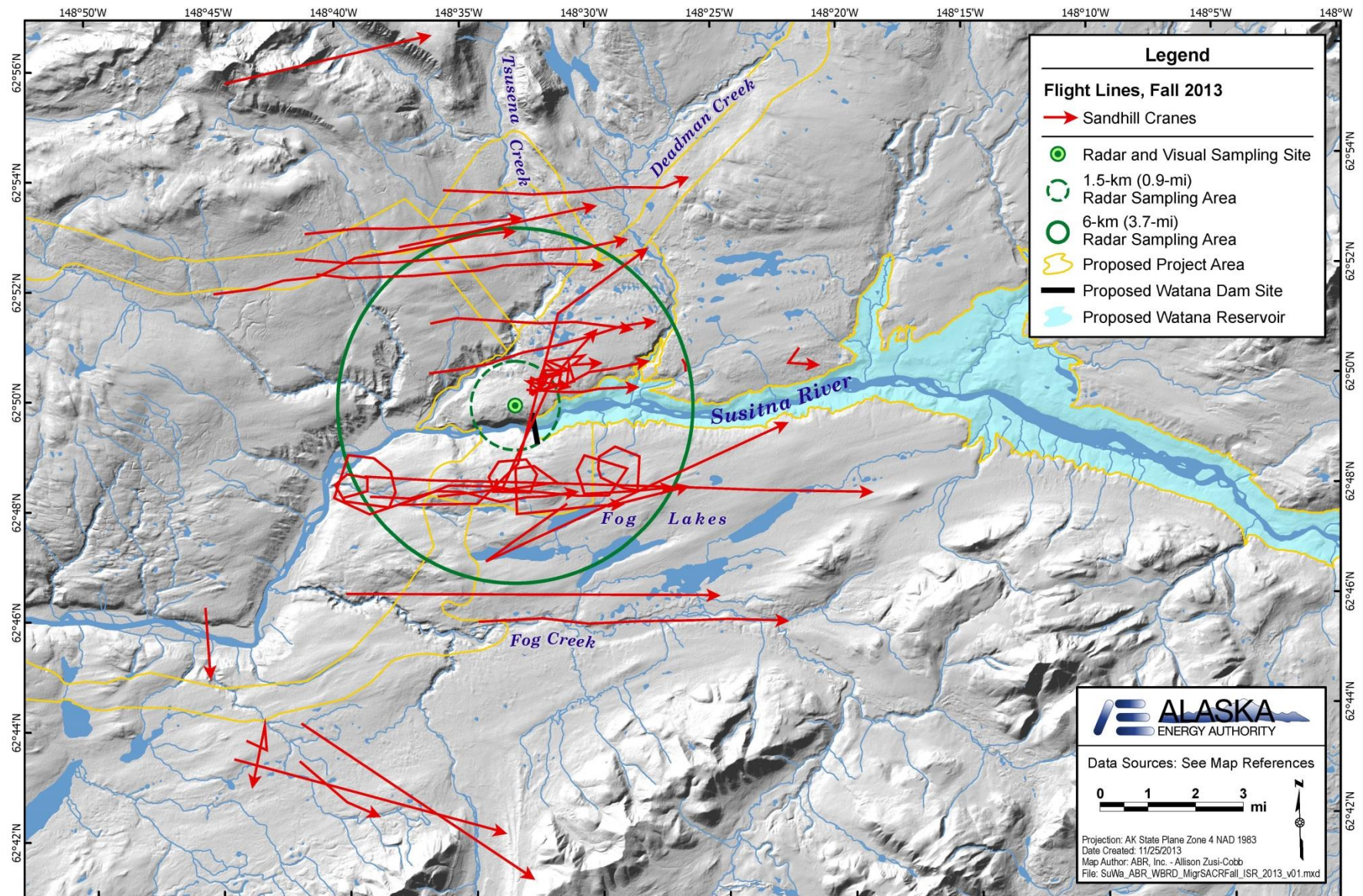
APPENDIX M: FLIGHT LINES FOR EAGLES OBSERVED DURING FALL DIURNAL VISUAL SURVEYS.



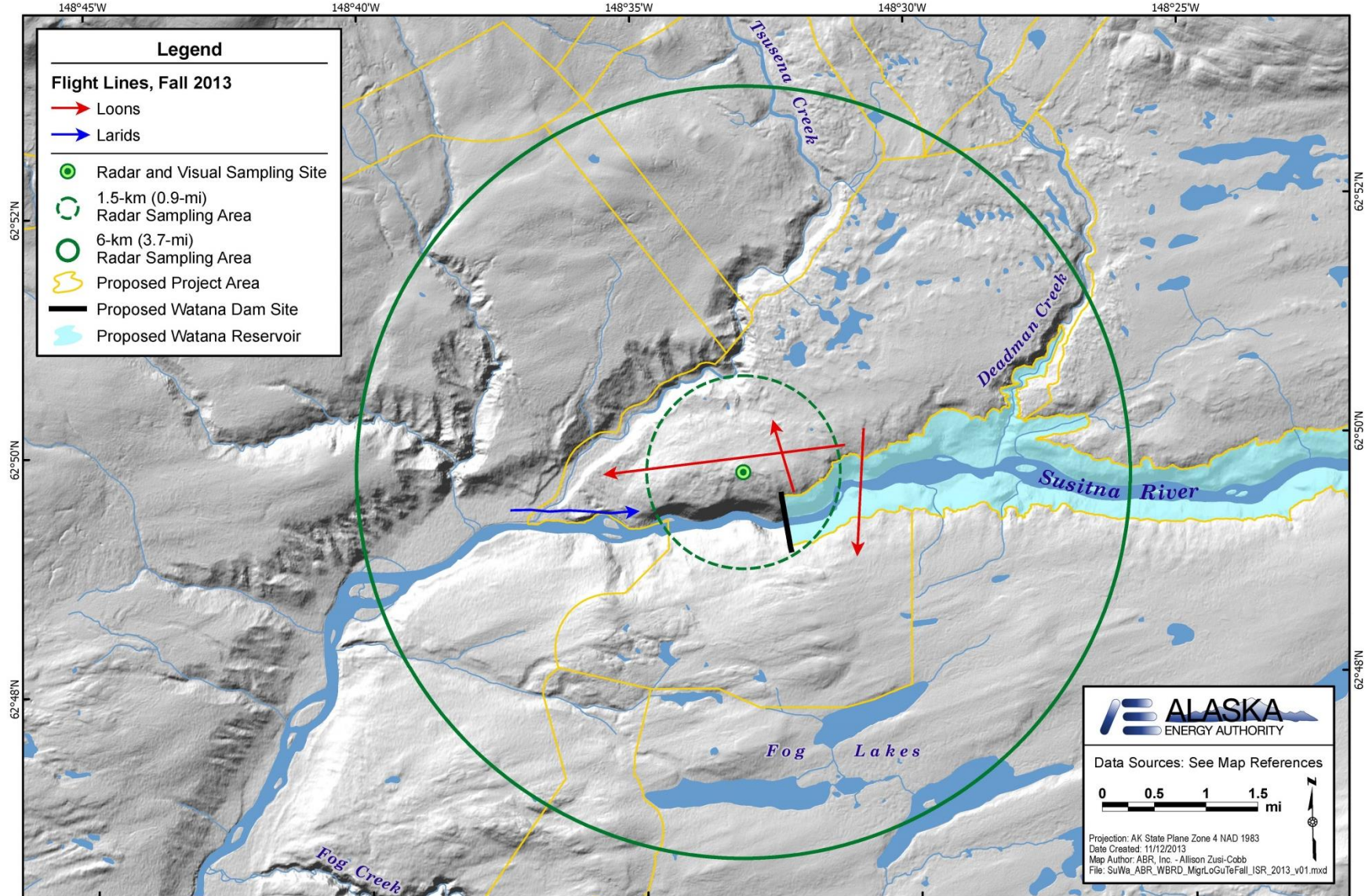
APPENDIX N: FLIGHT LINES FOR RAPTORS (EXCEPT EAGLES) OBSERVED DURING FALL DIURNAL VISUAL SURVEYS.



APPENDIX O: FLIGHT LINES FOR SANDHILL CRANES OBSERVED DURING FALL DIURNAL VISUAL SURVEYS.



APPENDIX P: FLIGHT LINES FOR LOONS AND LARIDS OBSERVED DURING FALL DIURNAL VISUAL SURVEYS.



APPENDIX Q: RELATIVE ABUNDANCE AND PEAK DATES OF OCCURRENCE OF AVIAN SPECIES GROUPS FROM SELECTED ALASKA SPRING MIGRATION STUDIES.

Species-group Species-subgroup	Study Location							
	Watana Dam Site ¹	Eva Creek ²	Tok ³	Gulkana ⁴	Delta River ⁵	Delta Junction ⁶	GVEA Intertie ⁷	Fire Island ⁸
Waterfowl	2,658 (5/5)	1,797 ⁹ (nr)	20,248–33,883 (nr)	2,177–13,647 (nr)	15 (nr)	23,795 (nr)	11,331 ⁹ (nr)	22,684 (4/19)
Swans	1,086 (5/5 ¹⁰)	1,622 (4/26)	3,994–14,369 (4/24–4/27)	1,289–8,907 (4/23–4/26)	2 (nr)	13,851 (nr)	3,236 (5/15)	100 (4/23)
Geese	308 (5/7)	nr	6,827–15,428 (4/24–4/26)	127–978 (4/23–4/26)	0 (nr)	6,921 (nr)	5,055 (nr)	22,407 (4/19)
Ducks	1,136 (5/28)	nr	3,239–7,771 (4/25–4/27)	761–3,762 (4/28–4/29)	13 (nr)	252 (nr)	5,357 (nr)	125 (5/11)
Raptors	468 (5/21)	nr	797–1,196 (4/22–4/29)	201–563 (4/28–4/29)	49 (4/30)	156 (nr)	159 (4/25)	362 (4/28)
Eagles	215 (5/21)	26 (nr)	nr	nr	9 (nr)	20 (nr)	56 (nr)	243 (nr)
Other raptors	218 (5/9)	102 (nr)	nr	nr	nr	nr	79 (nr)	91 (nr)
Cranes	23 (5/9)	12,757 (5/4)	31,311–113,167 (5/4–5/10)	nr	339 (5/5)	31,163 (5/6)	30,509 (5/11)	83 (4/23)
Shorebirds	1,181 (5/17)	44 (nr)	668–4,115 (5/15–5/18)	69–147 (5/10–5/11)	8 (nr)	50 (nr)	37 (nr)	502 (5/11)
Passerines	3,369 ¹¹ (5/17)	493 ¹¹ (nr)	7,030–9,290 (4/30–5/11)	357–912 (4/29–5/6)	270 (5/7)	911 (nr)	797 ¹¹ (nr)	1,967 ¹¹ (4/24)

1 This study (April 20–June 3, 2013, 45 days).

2 Shook et al. 2011 (April 25–May 16, 2010, 21 days).

3 Cooper et al. 1991 (April 20–May 24, 1987, 45 days; April 5–May 21, 1988, 47 days; April 5–May 25, 1989, 50 days); values are ranges across 3 years of study.

4 Cooper et al. 1991 (April 16–May 15, 1987, 26 days; April 16–May 13, 1988, 28 days; April 16–May 15, 1989, 30 days); values are ranges across 3 years of study.

5 ABR 2010 (April 30–May 9, 2009, 10 days).

6 Parrett and Day 2009 (April 27–May 6, 2009, 9 days).

7 Day et al. 2011 (April 23–May 15, 2000, 18 days).

8 Day et al. 2005 (April 17–May 13, 2004, 22 days).

9 Excluding swans.

10 More flocks heard on May 3; individual count lower due to poor visibility.

11 Excluding ravens.

APPENDIX R: RELATIVE ABUNDANCE AND PEAK DATES OF OCCURRENCE OF AVIAN SPECIES GROUPS FROM SELECTED ALASKA FALL MIGRATION STUDIES.

Species-group Species-subgroup	Study Location						
	Watana Dam Site ¹	Eva Creek ²	Tok ³	Gulkana ⁴	Delta River ⁵	GVEA Intertie ⁶	Fire Island ⁷
Waterfowl	372 (9/23)	1,958 (nr)	31,392–37,212 (nr)	919–2,975 (nr)	100 (10/2)	1,186 ⁸ (nr)	3,636 (10/16)
Swans	301 (9/30)	1,693 (9/7)	7,836–20,440 (9/28–10/11)	853–2,383 (10/8–10/13)	100 (nr)	12,304 (9/11)	206 (10/16)
Geese	19 (9/23)	nr	9,434–28,511 (8/20–9/8)	3–230 (8/22–10/10)	0 (nr)	139 (nr)	3,218 (10/16)
Ducks	3 (10/2)	nr	683–2,325 (9/8–10/11)	63–362 (9/9–10/5)	0 (nr)	961 (nr)	171 (10/17)
Raptors	173 (9/28)	275 (9/11)	1,237–1,787 (9/13–9/16)	179–279 (9/28–9/30)	99 (9/30)	442 (9/11)	351 (9/14)
Eagles	52 (9/28)	57 (nr)	nr	nr	17 (nr)	132 (nr)	163 (nr)
Other raptors	108 (9/28)	nr	nr	nr	nr	259 (nr)	134 (nr)
Cranes	1,754 (9/24)	48,276 (9/10)	43,442–97,988 (9/13–9/15)	nr	200 (9/10)	84,979 (9/23)	111 (9/23)
Shorebirds	0	8 (nr)	31–54 (8/27–10/8)	2–15 (9/8–10/5)	0 (nr)	6 (nr)	32 (nr)
Passerines	3,913 ⁹ (9/12)	1,252 ⁹ (9/10)	5,959–9,318 (8/29–10/14)	600–866 (9/4–10/13)	460 (9/15)	2,116 ⁹ (nr)	2,546 ⁹ (9/11)

1 This study (August 16–October 15, 2013, 61 days).

2 Shook et al. 2011 (August 26–October 7, 2010, 43 days).

3 Cooper et al. 1991 (August 16–October 6, 1987, 52 days; August 16–October 17, 1988, 33 days; August 16–October 18, 1989, 64 days); values are ranges across 3 years of study.

4 Cooper et al. 1991 (September 1–October 23, 1987, 46 days; September 3–October 19, 1988, 47 days; September 6–October 18, 1989, 43 days); values are ranges across 3 years of study.

5 ABR 2010 (September 9–19 and September 30–October 6, 2009, 18 days).

6 Day et al. 2011 (September 9–19 and September 29–October 9, 1999, 22 days).

7 Day et al. 2005 (September 2–October 17, 2004, 31 days).

8 Excluding swans.

9 Excluding ravens.

APPENDIX S: FLIGHT ALTITUDES OF AVIAN SPECIES FROM VISUAL OBSERVATIONS DURING SELECTED ALASKA MIGRATION STUDIES.

Season/Avian group	Study Location					
	Watana Dam Site ¹	Eva Creek ²	Tok ³	Tok ³	Tok ³	Fire Island ⁴
Spring						
Waterfowl	160.7 ± 29.8 (41) ⁵	319.4 ± 0.65 (9) ⁵				
Swans	248.8 ± 38.0 (21)	266.7 ± 2.2 (29)	126 ± 10 (60)	138 ± 11 (73)	89 ± 8 (147)	142.3 ± 137.9 (353)
Geese			170 ± 11 (91)	147 ± 11 (59)	109 ± 9 (83)	47.3 ± 24.7 (9)
Ducks			63 ± 9 (139)	56 ± 9 (162)	47 ± 7 (231)	158.5 ± 138.5 (308)
Raptors			82 ± 10 (365)	67 ± 10 (309)	52 ± 9 (252)	16.9 ± 24.6 (34)
Eagles	204.9 ± 23.3(51)	148.8 ± 2.0 (26)				46.6 ± 55.5 (275)
Other raptors	104.8 ± 14.1(101)	49.1 ± 6.7 (66)				none reported
Cranes	100 (1)	364.0 ± 6.6 (103)	173 ± 10 (127)	201 ± 11 (44)	113 ± 10 (43)	76.6 ± 40.9 (19)
Shorebirds	77.4 ± 10.3 (90)		53 ± 8 (182)	32 ± 7 (192)	30 ± 7 (626)	24.7 ± 33.6 (17)
Passerines	50.7 ± 2.6 (677) ⁶	28.5 ± 15.4 (100) ⁶	17 ± 5 (1567)	21 ± 5 (1362)	17 ± 5 (2466)	16.1 ± 33.8 (189)
Fall						
Waterfowl	100 (1) ⁵	620 ± 247.3 (5) ⁵				59.2 ± 81.0 (118)
Swans	149.0 ± 80.2 (10)	248.9 ± 35.1 (36)	143 ± 11 (48)	204 ± 13 (317)	150 ± 13 (125)	125.5 ± 141.8 (10)
Geese			353 ± 16 (73)	354 ± 16 (61)	294 ± 15 (120)	76.5 ± 80.2 (67)
Ducks			49 ± 8 (12)	108 ± 13 (72)	27 ± 7 (30)	14.3 ± 21.2 (36)
Raptors			80 ± 12 (664)	123 ± 14 (609)	63 ± 11 (533)	30.4 ± 57.3 (286)
Eagles	204.3 ± 56.4 (21)	363.5 ± 61.7(41)				none reported

Season/Avian group	Study Location					
	Watana Dam Site ¹	Eva Creek ²	Tok ³	Tok ³	Tok ³	Fire Island ⁴
Other raptors	65.7 ± 15.8 (51)	108.2 ± 15.1(139)				
Cranes	335.0 ± 142.2 (5)	248.7 ± 14.7(287)	224 ± 13 (61)	349 ± 16 (23)	155 ± 11 (25)	106.7 ± 40.7 (3)
Shorebirds	none reported	none reported	71 ± 12 (19)	59 ± 12 (18)	12 ± 4 (20)	none reported
Passerines	26.8 ± 2.1 (401) ⁶	38.4 ± 4.5(164) ⁶	32 ± 8 (1001)	23 ± 6 (1534)	27 ± 6 (2251)	18.6 ± 19.7 (613)

1 This study (Spring: April 20–June 3, 2013, 45 days; Fall: August 16–October 15, 2013, 61 days).

2 Shook et al. 2011 (Spring: April 25–May 16 2010, 21 days; Fall: August 26–October 7, 2010, 43 days).

3 Cooper and Ritchie 1995 (Spring: April 10–May 24 1987, 45 days; April 5–May 21, 1988, 47 days; April 5–May 25, 1989, 50 days; Fall: August 16–October 6, 1987, 52 days; August 16–October 17, 1988, 33 days; August 16–October 18, 1989, 64 days).

4 Day et al. 2011 (Spring: April 17–May 13, 2004, 22 days; Fall: August 2–October 17, 2004, 31 days).

5 Excluding swans.

6 Excluding ravens.