



Bird Surveys at Klondike Gold Rush NHP

2015 Summary

Natural Resource Report NPS/KLGO/NRR—2017/1442



ON THE COVER

Photograph of a Common Yellowthroat (*Geothlypis trichas*) seen on July 8th, 2015 in the West Creek Valley.
Photograph courtesy of the National Park Service/ S. Millard.

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Abstract

Coastal Waterbird Surveys (loons, grebes, cormorants, herons, ducks and geese, plovers and sandpipers, gulls, alcids, and kingfishers) were conducted at Klondike Gold Rush National Historic Park in 2015. The surveys serve to document avian distribution and abundance throughout the Park. Fourteen surveys were conducted from April 23rd to September 9th and 54 waterbird species were detected. The North American Breeding Bird Survey (BBS) and Alaska Landbird Monitoring Survey (ALMS) were conducted as part of a continuous monitoring program to document the diversity and abundance of avian species breeding in the area (Photo 1). Conducted in late June, the BBS detected 44 species and the ALMS detected 41 species. Bald Eagle nest monitoring continued at five historically active nests, one of which successfully produced a fledgling.

In addition to the results of systematic surveys, this report documents opportunistic bird sightings, mortalities, and notable events from the Skagway and Dyea areas.



Photo 1. Deb Rudis and Jami Belt spotting birds during the North American Breeding Bird Survey on June 25th (left). A Greater Yellowlegs seen on the Taiya River on May 1st (center). Elaine Furbish and Alicia Beverage conducting a Coastal Waterbird Survey on April 29th (right). Photos courtesy of the National Park Service - S. Surdyk.

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I would also like to acknowledge all of the former wildlife technicians who initiated, expanded, and improved the bird monitoring program at Klondike Gold Rush NHP and whose research and data are reflected in this report.

Introduction

Klondike Gold Rush National Historical Park (KLGO) is located at the northern terminus of Alaska's Inside Passage. KLGO was established in 1976 to preserve the historic structures and trails associated with the Klondike Gold Rush of 1898-99. The Park also contains dynamic and diverse natural resources. The Park is relatively small by Alaska standards with scattered landholdings in three separate units totaling 53 km² (13,191 acres). Despite its size, the Park's unique geographic setting and climate make it one of the most biologically diverse areas in Alaska (Pojar and MacKinnon 1994, MacDonald and Cook 1999).

Although KLGO is located within the Northern Pacific Rainforest Bird Conservation Region (BCR), it also borders the Northwestern Interior Forest BCR, placing the park in a transition zone between two ecologically divergent geographic regions with distinct associations of avifauna (NABCI 2000). The Northern Pacific Rainforest BCR is characterized by a temperate maritime climate and extensive coniferous forests dominated by western hemlock (*Tsuga heterophylla*) and Sitka spruce (*Picea sitchensis*). The predominantly steep, rocky coastline is periodically interrupted by river valleys and estuarine and freshwater wetlands that provide critically important breeding, migration, and wintering habitat for populations of both waterbirds and landbirds (NABCI 2000). The Northwestern Interior Forest BCR is an ecologically diverse region with an array of habitats including boreal forests dominated by black spruce (*Picea mariana*), white spruce (*Picea glauca*), paper birch (*Betula papyrifera*), and poplars (*Populus* spp.). There are also extensive areas of non-forest including tall shrub, alpine dwarf scrub, and shrub-graminoid communities. This BCR supports internationally significant populations of breeding shorebirds, waterfowl, and passerines (NABCI 2000). The portion of the Northwestern Interior Forest BCR bordering KLGO is characterized by high-elevation, mountainous terrain and alpine plant communities. These areas provide breeding habitat for several landbird species that rarely breed in the cool, wet coastal rainforests of Southeast Alaska.

Long-term monitoring and baseline inventories help managers to make decisions that meet the National Park Service goal to maintain intact ecosystems in their natural state (Hahr and Trapp 2004). Base funding from KLGO was used to conduct Coastal Waterbird Surveys (CWS), targeting loons (*Gaviidae*), grebes (*Podicipedidae*), cormorants (*Phalacrocoracidae*), herons (*Ardeidae*), ducks and geese (*Anatidae*), plovers (*Charadriidae*), sandpipers (*Scolopacidae*), gulls (*Laridae*) and alcids (*Alcidae*) along the coastline from Skagway to Dyea, covering the Skagway and Taiya River mouths and Nahku Bay. Additional species were documented as opportunistic sightings when observed by NPS biologists and other knowledgeable birders. The Skagway Bird Club list-serve and the Cornell Lab of Ornithology's citizen-science project eBird are two important sources of local bird observations, whose data were reviewed for this report.

The North American Breeding Bird Survey (BBS) route and two Alaska Landbird Monitoring Survey (ALMS) routes were sampled as part of state and nation-wide efforts to collect annual data of breeding bird abundance during the peak of the breeding season.

Lastly, the monitoring of five previously documented Bald Eagle nests in the Dyea and lower

Chilkoot Trail areas continued this season. In order to enhance the data of future Bald Eagle nest monitoring, the preparation of a Standard Operating Protocol was initiated at the end of the 2015 season.

Methods

Coastal Waterbird Surveys

The Coastal Waterbird Survey (CWS) has been conducted every year at KLGO from 2003 to the present. However, there has been variation in the number of surveys and length of monitoring season between years. In 2009, surveys were conducted during every month of the year, as opposed to only April through September. In 2010, surveys were only conducted sporadically, because there was no seasonal technician on staff whose duty was to conduct the surveys. In 2014, the first surveys did not occur until May 22nd (about a month later than usual) and thus the diversity and abundance of the spring migration was not captured in the data. A detailed field protocol was developed (**Appendix A**) in 2004, and revised in 2009, which outlines the methods used to conduct waterbird survey transects, and recommends a field season of Mid-April to Mid-September.

During the 2015 field season, eight survey areas, previously defined by Hahr and Trapp (2004), were assessed. Surveys were conducted once per week from April 23 to May 21, once every two weeks from June 1 to July 28, and again weekly from August 12 to September 9. All waterbirds (loons, grebes, cormorants, herons, ducks and geese, plovers and sandpipers, gulls, alcids, and kingfishers) detected by sight or sound within the survey area were recorded. Occasionally during previous years, Census Unit 1 (CU1) was only partially surveyed or dropped altogether. In 2015, the entire area of CU1 was surveyed completely during every CWS.

Counts of waterbirds were made by scanning each survey area with Bushnell Legend 8x32 binoculars and a Bausch & Lomb 20-60 x 70 mm spotting scope until all waterbirds had been counted. All surveys were conducted in the best weather available and scheduled around a rising tide at Census Unit 7 such that the survey began two hours prior to high tide. This allowed for the maximum number of feeding shorebirds and waterfowl while keeping them relatively concentrated for identification and counting. Similarly, surveys were ideally conducted early in the morning when the wind was calm and there were not yet heat waves over the water. All data were recorded in a field notebook or field note pages, then transcribed to standardized data sheets adapted from Collins et al. (2001) back in the office. All data were entered into the Coastal Waterbird Microsoft Access database (T:\NRM\Birds\CoastalWaterbirdSurveys\Data\Coastal_Waterbird_Database). The methods are described in greater detail by Hahr and Trapp (2004). These data are shared with the National Park Service Southeast Alaska Network (SEAN) Inventory & Monitoring Program.

North American Breeding Bird Survey & Alaska Landbird Monitoring Survey

This year, the North American Breeding Bird Survey (BBS) was conducted on June 25, 2015. The standard BBS route is approximately 25 miles long with stops at half mile intervals (**Appendix B. BBS Route Map**). A three minute point count is conducted at each of the 50 designated survey points and all birds seen and heard within a quarter mile radius are recorded. The survey begins ½ hour before sunrise. Additional information on the standardized methods for conducting this survey can be found at <http://www.pwrc.usgs.gov/BBS>.

There are two Alaska Landbird Monitoring Survey (ALMS) routes in and around the Park. This year, they were surveyed on June 23 and 24, 2015. Each survey consists of 12 stops located at least 250 m

apart (Appendix C. ALMS – Dyea Map, and Appdendix C. ALMS Chilkoot Map). Each point is surveyed for ten minutes (divided into three, five, eight, and ten minute time intervals) and all species detected are recorded. The survey begins ½ hour before sunrise. Additional information on the standardized methods for conducting the survey can be found on the Resources drive at T:\NRM\Birds\ORBBS&ALMS.

Bald Eagle Nest Monitoring

No standardized protocol had been established for monitoring Bald Eagle nests in the Park. Five historically known nests (CT01, DY01, DY02, TR02, TR03) were relocated (Appendix A. Maps: Bald Eagle Nests in Klondike Gold Rush NHP) and observed this year. Each nest was observed for up to 10 minutes per visit. The number and age of visible birds were recorded in a field notebook, as well as any behavioral observations. The data were then entered into a Microsoft Access Database (T:\NRM\Birds\Eagles\Eagle_Nests).

Results

Coastal Waterbird Surveys

A total of 14 surveys were conducted from April 23 to September 9, 2015. A sum total of 24,695 waterbirds, comprising 54 species from nine families, were documented (Table 1). The peak spring waterbird migration (greatest abundance and species richness) occurred between April 29th and May 9th. While no species documented this year were new to the park, 2015 represents the greatest number of waterbird species detected in a single season since monitoring began in 2003 (Figures 1 and 2). Additionally, we detected 8 species of non-waterbirds during surveys.

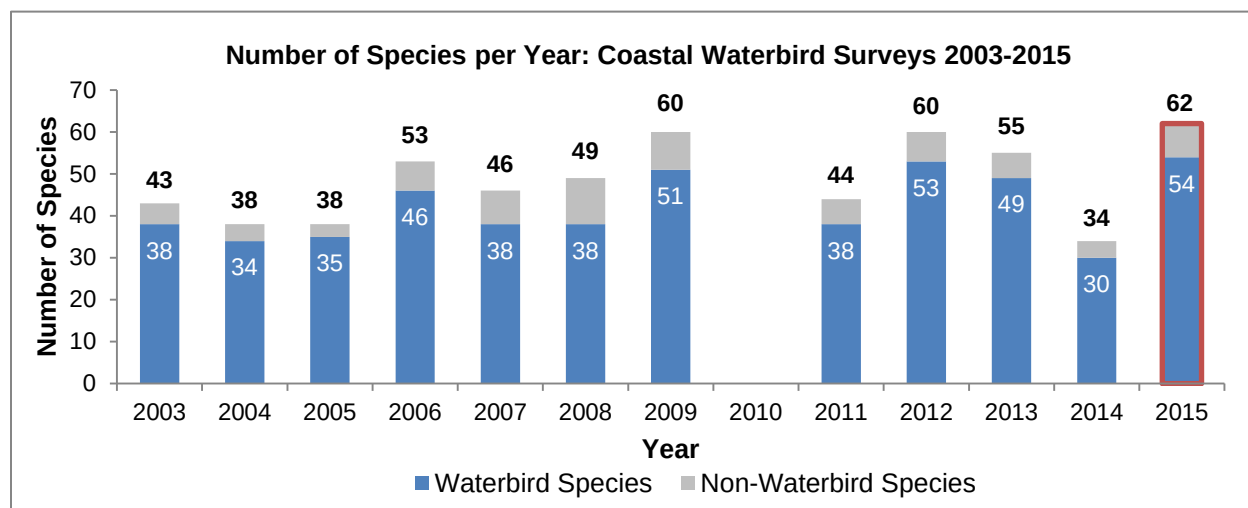


Figure 1. Number of waterbird species identified per year (blue with white labels), number of non-waterbird species identified per year (gray), and total number of species identified per year (black labels). The data from 2010 is omitted from this graph because there was no technician on staff that season responsible for the Coastal Waterbird Survey and thus surveys were only conducted sporadically.

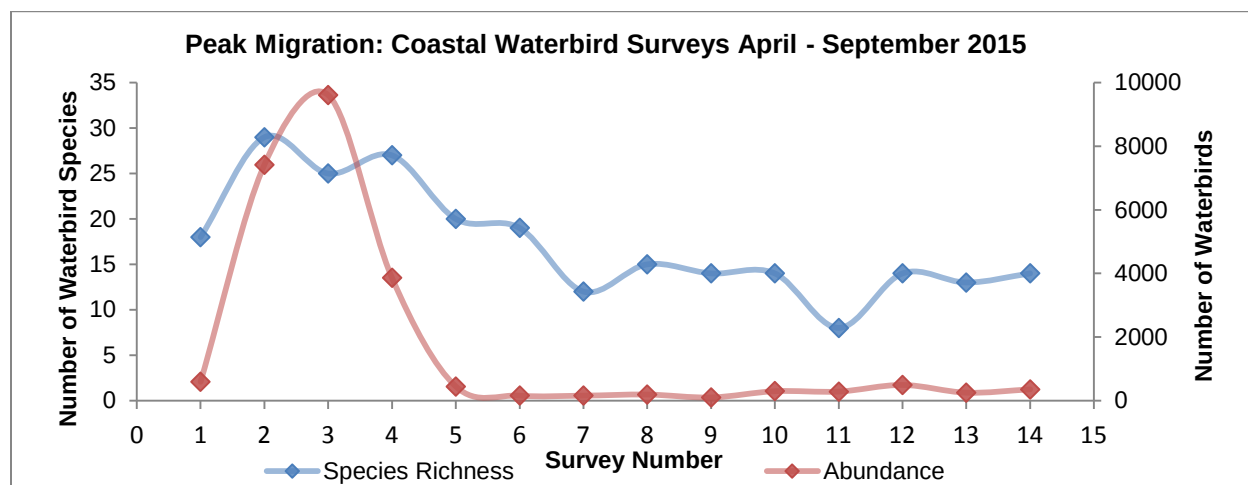


Figure 2. Number of waterbird species identified per survey (blue) and number of individual waterbirds counted per survey (red) during the 2015 monitoring season: Survey1 = 23 April, Survey14 = 9 Sept.

Table 1. Waterbird species observed during the 2015 Upper Taiya Inlet Coastal Waterbird Surveys.

Scientific Name	Common Name	Individuals Observed	Max. Number	Date of Max	# Surveys Detected
Order Anseriformes					
Family Anatidae					
Subfamily Anserinae					
<i>Anser caerulescens</i>	Snow Goose	50	50	29 April	1
<i>Anser albifrons</i>	Greater White-fronted Goose	3	3	24 April	1
<i>Cygnus buccinator</i>	Trumpeter Swan	2	1	29 April, 12 May	2
Subfamily Anatinae					
<i>Spatula discors</i>	Blue-winged Teal	30	12	9 Sept	4
<i>Spatula clypeata</i>	Northern Shoveler	135	111	7 May	5
<i>Mareca penelope</i>	Eurasian Wigeon	1	1	29 April	1
<i>Mareca americana</i>	American Wigeon	162	57	6, 7 May	7
<i>Anas platyrhynchos</i>	Mallard	664	279	24 April	11
<i>Anas acuta</i>	Northern Pintail	122	92	29 April	3
<i>Anas crecca</i>	Green-winged Teal	352	234	7 May	10
<i>Aythya americana</i>	Redhead	1	1	29 April	1
<i>Aythya collaris</i>	Ring-necked Duck	3	2	24 April	2
<i>Aythya affinis</i>	Lesser Scaup	11	5	12 May	3
<i>Histrionicus histrionicus</i>	Harlequin Duck	150	29	6 May	9
<i>Melanitta perspicillata</i>	Surf Scoter	2955	1192	29, 30 April	9
<i>Melanitta fusca</i>	White-winged Scoter	43	22	21 May	4
<i>Clangula hyemalis</i>	Long-tailed Duck	7	7	21 May	1
<i>Bucephala albeola</i>	Bufflehead	175	87	29, 30 April	4
<i>Bucephala clangula</i>	Common Goldeneye	18	8	30 April	3
<i>Bucephala islandica</i>	Barrow's Goldeneye	276	95	23, 24 April	4
<i>Mergus merganser</i>	Common Merganser	103	33	1 June	9
<i>Mergus serrator</i>	Red-breasted Merganser	282	168	12 May	10
Order Podicipediformes					
Family Podicipedidae					
<i>Podiceps auritus</i>	Horned Grebe	29	13	12 May	4
<i>Podiceps grisegena</i>	Red-necked Grebe	4	2	12 May	2
Order Charadriiformes					
Family Charadriidae					
Subfamily Charadriinae					
<i>Pluvialis squatarola</i>	Black-bellied Plover	3	3	29 April	3
<i>Charadrius semipalmatus</i>	Semipalmated Plover	1	1	14 July	1
Family Scolopacidae					
Subfamily Limosinae					
<i>Limosa haemastica</i>	Hudsonian Godwit	48	48	29 April	1
Subfamily Arenariinae					
<i>Calidris alba</i>	Sanderling	5	5	14 July	1
<i>Calidris alpina</i>	Dunlin	5	5	29 April	1
<i>Calidris minutilla</i>	Least Sandpiper	1	1	21 Aug	1
<i>Calidris melanotos</i>	Pectoral Sandpiper	3	3	2 Sept	1
<i>Calidris pusilla</i>	Semipalmated Sandpiper	31	17	28 July	3
<i>Calidris mauri</i>	Western Sandpiper	1	1	12 Aug	1

Table 1 (continued). Waterbird species observed during the 2015 Upper Taiya Inlet Coastal Waterbird Surveys.

Scientific Name	Common Name	Individuals Observed	Max. Number	Date of Max	# Surveys Detected
Subfamily Scolopacinae					
<i>Limnodromus scolopaceus</i>	Long-billed Dowitcher	5	5	12 May	1
Subfamily Tringinae					
<i>Actitis macularius</i>	Spotted Sandpiper	27	7	21 May	8
<i>Tringa solitaria</i>	Solitary Sandpiper	1	1	12 May	1
<i>Tringa incana</i>	Wandering Tattler	15	6	12,13 May	4
<i>Tringa flavipes</i>	Lesser Yellowlegs	35	24	28 July	4
<i>Tringa melanoleuca</i>	Greater Yellowlegs	1	1	7 May	1
Family Alcidae					
<i>Cepphus columba</i>	Pigeon Guillemot	28	8	21 May	8
<i>Brachyramphus marmoratus</i>	Marbled Murrelet	210	76	14,15,17 June	14
Family Laridae					
Subfamily Larinae					
<i>Chroicocephalus philadelphia</i>	Bonaparte's Gull	1117	394	29,30 April	13
<i>Larus canus</i>	Mew Gull	5701	3247	29,30 April	14
<i>Larus delawarensis</i>	Ring-billed Gull	1	1	2 July	1
<i>Larus argentatus</i>	Herring Gull	1491	852	12,13 May	12
<i>Larus glaucooides thayeri</i>	Thayer's Gull	1	1	21 Aug	1
<i>Larus argentatus X glaucescens</i>	Herring Gull X Glaucous-winged Gull Hybrid	1	1	1 June	1
<i>Larus glaucescens</i>	Glaucous-winged Gull	1872	1698	29, 30 April	7
Subfamily Sterninae					
<i>Sterna paradisaea</i>	Arctic Tern	50	16	6,7 May	5
Order Gaviiformes					
Family Gaviidae					
<i>Gavia stellata</i>	Red-throated Loon	18	8	1 June	7
<i>Gavia immer</i>	Common Loon	1	1	14 June	1
<i>Gavia adamsii</i>	Yellow-billed Loon	1	1	1 June	1
Order Pelicaniformes					
Family Ardeidae					
<i>Ardea herodias</i>	Great Blue Heron	50	15	6,7 May	12
Order Coraciiformes					
Family Alcedinidae					
<i>Megasceryle alcyon</i>	Belted Kingfisher	23	10	14,15,17 June	9

* Species listed in Table 1 have been organized in taxonomic sequence according to the 2017 American Ornithological Society's Checklist Supplement.

The Natural Resource Condition Assessment prepared for KLGO by Bernatz (2011), provides a summary analysis of various forms of observer bias that may be influencing trends in CWS data from 2003-2009. An analysis of CWS data from 2003-2016 (prepared by the author of this report) shows that there is significant trend of increasing species richness, but could also be attributable to observer bias or change in detection (Figure 3). When 2014 is excluded from the analysis (surveys began 1 month later than usual that year) we see a linear regression with an R-squared value > 0.5 (Figure 4).

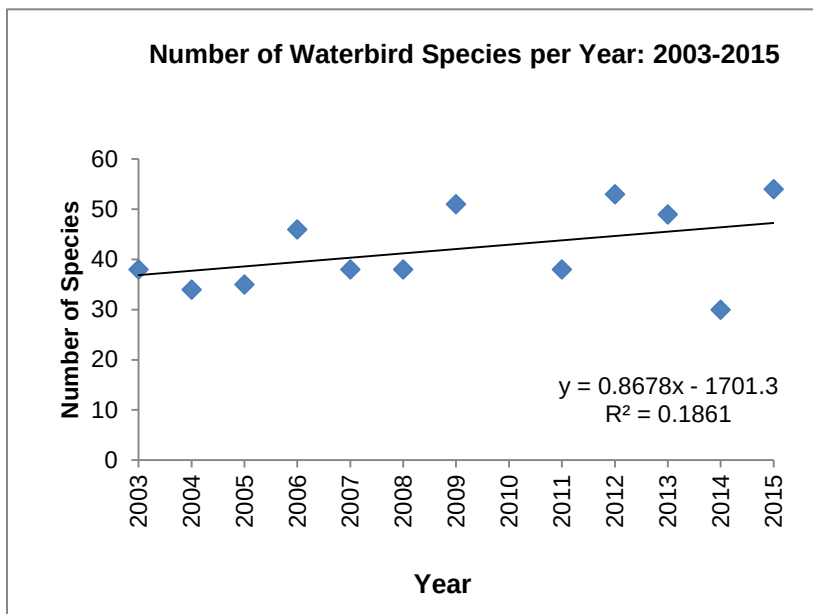


Figure 3. Number of waterbird species detected during each year of the Coastal Waterbird Survey 2003-2015.

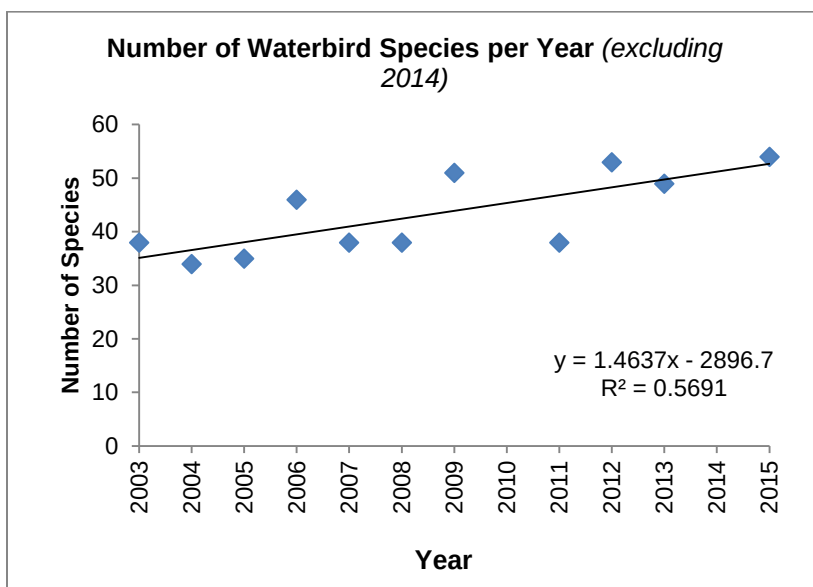


Figure 4. The same graph as Figure 3, but excluding 2014.

North American Breeding Bird Survey & Alaska Landbird Monitoring Survey

The North American Breeding Bird Survey (BBS) documented the presence of 44 species (Table 2) and the Alaska Landbird Monitoring Survey (ALMS) documented the presence of 41 species (Table 3). A total of 59 species were documented between the two surveys.

Table 2. Species detected during the Breeding Bird Survey conducted on June 25, 2015.

Scientific Name	Common Name
<i>Setophaga ruticilla</i>	American Redstart
<i>Turdus migratorius</i>	American Robin
<i>Spizella arborea</i>	American Tree Sparrow
<i>Haliaeetus leucocephalus</i>	Bald Eagle
<i>Setophaga striata</i>	Blackpoll Warbler
<i>Bombycilla garrulus</i>	Bohemian Waxwing
<i>Poecile rufescens</i>	Chestnut-backed Chickadee
<i>Spizella passerina</i>	Chipping Sparrow
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow
<i>Corvus corax</i>	Common Raven
<i>Geothlypis trichas</i>	Common Yellowthroat
<i>Junco hyemalis</i>	Dark-eyed Junco
<i>Passerella iliaca</i>	Fox Sparrow
<i>Larus glaucescens</i>	Glaucous-winged Gull
<i>Aquila chrysaetos</i>	Golden Eagle
<i>Regulus satrapa</i>	Golden-crowned Sparrow
<i>Ardea Herodias</i>	Great Blue Heron
<i>Catharus guttatus</i>	Hermit Thrush
<i>Empidonax minimus</i>	Least Flycatcher
<i>Melospiza lincolni</i>	Lincoln's Sparrow
<i>Larus canus</i>	Mew Gull
<i>Corvus caurinus</i>	Northwestern Crow
<i>Oreothlypis celata</i>	Orange-crowned Warbler
<i>Troglodytes pacificus</i>	Pacific Wren
<i>Empidonax difficilis</i>	Pacific-slope Flycatcher
<i>Spinus pinus</i>	Pine Siskin
<i>Loxia curvirostra</i>	Red Crossbill
<i>Sphyrapicus ruber</i>	Red-breasted Sapsucker
<i>Regulus calendula</i>	Ruby-crowned Kinglet
<i>Selasphorus rufus</i>	Rufous Hummingbird
<i>Passerculus sandwichensis</i>	Savannah Sparrow
<i>Dendragapus fuliginosus</i>	Sooty Grouse
<i>Actitis macularius</i>	Spotted Sandpiper
<i>Cyanocitta stelleri</i>	Steller's Jay
<i>Catharus ustulatus</i>	Swainson's Thrush

Table 2 (continued). Species detected during the Breeding Bird Survey conducted on June 25, 2015.

Scientific Name	Common Name
<i>Oreothlypis peregrina</i>	Tennessee Warbler
<i>Setophaga townsendi</i>	Townsend's Warbler
<i>Ixoreus naevius</i>	Varied Thrush
<i>Tachycineta thalassina</i>	Violet-green Swallow
<i>Vireo gilvus</i>	Warbling Vireo
<i>Piranga ludoviciana</i>	Western Tanager
<i>Cardellina pusilla</i>	Wilson's Warbler
<i>Setophaga petechia</i>	Yellow Warbler
<i>Setophaga coronata</i>	Yellow-rumped Warbler

Table 3. Species detected during the Alaska Landbird Monitoring Survey conducted on June 23 and 24, 2015.

Scientific Name	Common Name
<i>Setophaga ruticilla</i>	American Redstart
<i>Turdus migratorius</i>	American Robin
<i>Haliaeetus leucocephalus</i>	Bald Eagle
<i>Certhia americana</i>	Brown Creeper
<i>Vireo cassinii</i>	Cassin's Vireo
<i>Poecile rufescens</i>	Chestnut-backed Chickadee
<i>Spizella passerina</i>	Chipping Sparrow
<i>Gavia immer</i>	Common Loon
<i>Mergus merganser</i>	Common Merganser
<i>Corvus corax</i>	Common Raven
<i>Geothlypis trichas</i>	Common Yellowthroat
<i>Junco hyemalis</i>	Dark-eyed Junco (Oregon)
<i>Regulus satrapa</i>	Golden-crowned Kinglet
<i>Empidonax hammondi</i>	Hammond's Flycatcher
<i>Catharus guttatus</i>	Hermit Thrush
<i>Melospiza lincolnii</i>	Lincoln's Sparrow
<i>Anas platyrhynchos</i>	Mallard
<i>Parkesia noveboracensis</i>	Northern Waterthrush
<i>Corvus caurinus</i>	Northwestern Crow
<i>Oreothlypis celata</i>	Orange Crowned Warbler
<i>Troglodytes pacificus</i>	Pacific Wren
<i>Empidonax difficilis</i>	Pacific-slope Flycatcher
<i>Spinus pinus</i>	Pine Siskin
<i>Sphyrapicus ruber</i>	Red-breasted Sapsucker
<i>Regulus calendula</i>	Ruby-crowned Kinglet
<i>Selasphorus rufus</i>	Rufous Hummingbird
<i>Passerculus sandwichensis</i>	Savannah Sparrow

* These two species were detected between observation points.

Table 3 (continued). Species detected during the Alaska Landbird Monitoring Survey conducted on June 23 and 24, 2015.

Scientific Name	Common Name
<i>Accipiter striatus</i>	Sharp-shinned Hawk
<i>Dendragapus fuliginosus</i>	Sooty Grouse
<i>Actitis macularius</i>	Spotted Sandpiper
<i>Catharus ustulatus</i>	Swainson's Thrush
<i>Melanitta perspicillata</i>	Surf Scoter
<i>Setophaga townsendi</i>	Townsend's Warbler
<i>Ixoreus naevius</i>	Varied Thrush
<i>Tyrannus verticalis</i>	Western Kingbird
<i>Piranga ludoviciana</i>	Western Tanager
<i>Cardellina pusilla</i>	Wilson's Warbler
<i>Setophaga coronata</i>	Yellow-rumped Warbler
<i>Megaceryle alcyon</i>	Belted Kingfisher *
<i>Pinicola enucleator</i>	Pine Grosbeak *

* These two species were detected between observation points.

Bald Eagle Nest Monitoring

Nest observations occurred between April 21st and September 9th, for a total of 36 observations between all five nests. Breeding activity was detected at two of the nests, TR03 and DY01, but only DY01 successfully produced offspring.

TR03

A total of 13 official observations were made of TR03 between April 21st and August 24th, 2015. Only one observation point was used for viewing the nest this season: the West bank of the Taiya River, just South of West Creek/Taiya River confluence. An adult Bald Eagle was first observed on the nest May 8th, but local rafting guides reported seeing an adult on the nest four days earlier, during their float tours on May 4th. Every observation between May 8th and June 16th, documented a single adult Bald Eagle sitting on the nest, displaying signs of incubation (Photo 2). No Bald Eagle was seen at the nest on June 26th, and no activity was detected during any of the three remaining observations conducted between July 6th and August 24th.



Photo 2. Bald Eagle Nest TR03 as seen through a spotting scope on June 10th, 2015 (left). An adult Bald Eagle in TR03 seen on May 14th turning around in a circle, and then settling down, chest first, with tail wagging in the air, indicating the incubation of an egg (right). NPS Photos by S. Surdyk.

DY01

A total of 10 official observations of DY01 were made between April 30th and September 9th, 2015. Three observation points were used for viewing the nest this season:

- 1) Yakutania Point (CWS Census Unit 2, Observation Point 1)
- 2) Kalen's Landing road overlook (CWS Census Unit 5, Observation Point 1)
- 3) The deck of Betsy Albecker's house at Kalen's Landing (only viewed from this location once, with Betsy's permission.)

An adult Bald Eagle was first observed on DY01 on April 30th. During 3 of the 4 observations made between May 6th and July 10th, a single adult Bald Eagle continued to be seen at the nest. No activity was detected at the nest on June 10th, but that is likely because the nest is entirely obscured by branches when viewed from the CWS CU5 observation point. If an adult was sitting low in the nest, and did not have its head raised, it would not have been seen.

On July 14th, two adult Bald Eagles were observed on the nest (viewed from Yakutania) and one was bobbing its head, possibly feeding a chick (Photo 3 left). The nest remained active until August 21st, when a juvenile was observed practicing flight at the nest (Photo 3 right). From the CWS CU5 observation point, the dark brown juvenile (no white molting patterns) was seen perched on a branch above the nest, opening its wings ("feeling the wind"), taking small "flights" to another branch 5-6 feet away, and then hopping back to the nest, over and over again for the entire observation period (10 minutes). Three days later, neither adults nor juveniles were detected at the nest. On September 9th, during the final Coastal Waterbird Survey of the season, an adult Bald Eagle was seen on the ground at the base of the DY01 nest tree, bobbing its head, possibly feeding a juvenile not yet fully capable of flight.



Photo 3. Bald Eagle Nest DY01 as seen through a spotting scope on June 14th, 2015 from Yakutania Point (left). A juvenile Bald Eagle practicing flight at DY01 on August 21st, 2015, as seen through a spotting scope from the Coastal Waterbird Survey Census Unit 5 observation point (right). NPS Photo by S. Surdyk.

Discussion

Coastal Waterbird Surveys

Since the CWS began in 2003, it has been suspected that peak spring waterbird migration occurs in tandem with the spring eulachon run (Hahr and Trapp, 2004). This year, the peak of spring eulachon run in the Skagway and Taiya Rivers corresponded with the second CWS on April 29th and 30th. While there is currently no population index for annual eulachon runs in Skagway and Dyea, life-time resident and avid naturalist of Skagway, John McDermott, reported this as the best eulachon run in 40 years. The success of the eulachon run this year may have been in a casual factor in the high numbers of waterbirds and waterbird species detected this season.

It should be noted that comparative analysis of the waterbird data is difficult based on the high turnover rate of observers and variation in level of experience identifying birds. Species detection tends to increase as observers gain knowledge of local species and their habitat use. Furthermore, the date of earliest survey, length of monitoring season, frequency of surveys, and other measures of observer “effort” have varied between years. These factors may have also influenced the 2015 results.

North American Breeding Bird Survey & Alaska Landbird Monitoring Survey

This year the BBS and ALMS were conducted by Deb Rudis, a retired biologist (previously with the US Fish and Wildlife Service, USFWS, in Juneau). Deb has been the primary observer for both surveys for most years that they have taken place. In 2014, however, she was unable to conduct the surveys and Matt Klostermann, another biologist and former US Fish and Wildlife Service employee from Juneau, conducted them instead. While it is valuable that the annual surveys continued without interruption, observer variation should be taken into consideration when comparing data across seasons. USFWS has created an accessible database that will allow contributing parks and agencies to access their long-term data, enabling further analysis in future years.

Bald Eagle Nest Monitoring

In maps of Bald Eagle nests prepared during previous years (Appendix E), seven nests have been recorded, only 5 of which were located and observed during the 2015 monitoring season.

One of the nests that was not located or monitored in 2015 (TR01) has not been found or observed by a technician since 2009. In the 2012 KLGO annual bird report, it is stated that the nest tree fell into the river and that TR01 was “no longer an intact nest.” I contacted the technician, Jami Welfelt, who conducted birds surveys 2011-2013, who said that she had never actually seen the TR01 nest tree (upright or in the river) or the TR01 nest (intact or not). The stated fact that it fell into the river was an assumption. I also contacted the former Resource Manager Dave Schirokauer, who said he recalled no additional details about the nest. During the 2015 season, I heard a rumor in the “natural history grapevine” that a Skagway resident, Kathy Hosford, had become concerned about the nest (sometime prior to 2009), because the river bank on which the nest tree grew was being undercut by the Taiya River. Hosford wanted to have the nest “rescued” and put on display at the Skagway City Museum, before it fell into the river. Additionally, the acting Chief of Resources Dael Davenport

provided me with a folder of documents that she found in the CR office, related to discussions about rescuing a Bald Eagle nest in Dyea. I contacted the director of the Skagway City Museum, Judy Munns, who recalled Hosford contacting her (couldn't recall the year) about "a nest along the Dyea road," but Munns said that "the museum was never interested in going out and looking at the nest," or creating a display of it at the Skagway City Museum, due to the permitting and labor requirements. I suspect that the TR01 & TR02 were actually the same nest, just viewed from two different observation points. Regardless of whether or not they were the same nest, today there is only one nest in the vicinity, so I recommend removing TR01 from the Bald Eagle nest map.

For another previously mapped nest (SK01), no records of observation exist and every technician since 2006 has reported that they have been unable to locate the nest. A letter from former Resource Manager Elaine Furbish in 2003 indicates that SK01 was originally mapped as a "potential nest location," but that no nest was ever actually observed. Therefore, I recommend displaying SK01 as an historic nest on the map.

Incidental Bird Sightings

A black-backed woodpecker was sighted on April 6th half a mile South of US customs on the Klondike Highway by expert Yukon birder Mary Whitley. Her observation was the first local sighting of this species, and it was the only new species to be added to the Skagway Bird Club list in 2015.

A summary of other the rare sightings from the Skagway area are published in the *Summary of Southeast Alaska Bird Observations, Spring Report: March-May 2015* (prepared by Steven C. Heintz & Andrew W. Piston).

The following is a list of rare or notable non-raptor bird sightings from the Upper Taiya Inlet, not included in Heintz & Piston's summary or elsewhere in this report:

- An injured Leach's Storm-petrel was found on the deck of the Volendam Cruiseship after docking in Skagway on September 19th. The Skagway Bird Rescue Group responded, and after the bird recovered (no obvious signs of injury), it was released at the Small Boat Harbor.
- Two Wilson's Snipes were seen by Joanne and Andrew Beierly in their backyard in Skagway on April 27th.
- A lone Sandhill Crane was seen on the Dyea flats by Shelby Surdyk on May 19th during a field trip with the Skagway School 5th/6th grade class. John McDermott also reported seeing a Sandhill Crane in Dyea the same day.
- Eurasian Collared Doves were seen multiple times throughout the summer. The first sighting was on the Klondike Highway in early May by Suzanne Kennedy. They were sighted again in Skagway in mid-June by Kennedy and C.E. Furbish (separate sighting), and then in Dyea

on July 13th by John McDermott. Eurasian Collared Doves were included in GPRA reporting as invasive animals present in KLGO.

- Flocks of Rusty Blackbirds were seen around Dyea and Skagway for about two weeks from early to mid-September. The largest count was of at least 18 Rusty Blackbirds seen by Shelby Surdyk on September 11th. The Yukon Bird Club reports that Rusty Blackbirds have declined “more than any other once common landbird,” and they are a rare visitor in Skagway.
- Two SBC members reported seeing a Black-footed Albatross in Skagway on September 14th, however this sighting have not been reviewed by regional experts (Steve Heintz & Andy Piston), nor added the SBC Skagway Bird Checklist.

Raptors

The abundance, density, and richness of predatory avian species are often used to assess the health of prey populations, which include waterfowl and passerines. While the focus of the CWS is to track distribution and abundance of waterbird species, an inventory of raptor species may help managers to monitor ecosystem change over time. For this reason, two lists of raptor species (one of owls and one of non-owls) observed in the Skagway, Dyea, and White Pass areas between March and September 2015 have been compiled (Tables 4, 5; Photos 4, 5). These lists include observations from systematic surveys (CWS, BBS, ALMS), as well as opportunistic observations reported on the Skagway Bird Club list-serve and eBird.

Table 4. Nine (9) bird of prey species (not including owls) were documented in KLGO and surrounding areas between Mar.-Sept. 2015

AOU Common Name	Date	Location	Observer	Source
American Kestrel	29 April	Dyea	Shelby Surdyk	CWS
Bald Eagle	23 April	Skagway	Shelby Surdyk	CWS
Golden Eagle	25 June	Klondike Highway	Deb Rudis	BBS
Merlin	21 July	Skagway	C.E. Furbish	SBC
Northern Goshawk	13 Aug	Yakutania Point Trail	C.E. Furbish	SBC
Northern Harrier	23 April	Dyea	Shelby Surdyk	CWS
Red-tailed Hawk	7 Sept	Yakutania Point Trail	Suzanne Kennedy	eBird
Rough-legged Hawk	16 May	Lower Dewey Lake Trail	Annette Dreier	eBird
Sharp-shinned Hawk	23 June	Chilkoot Trail	Deb Rudis	ALMS



Photo 4. A Merlin family was frequently observed by C.E. Furbish on her property in Skagway this summer. She was able to photograph both an adult (left) and a juvenile (right) on July 21st, 2015.

Table 5. Five (5) owl species documented in KLGO and the surrounding areas between Mar.-Sept. 2015

AOU Common Name	Date	Location	Observer	Source
Barred Owl	1 July	Dyea	Jami Belt	SBC
Great Gray Owl	4 Aug	Dyea	Lorna McDermott	SBC
Northern Hawk Owl	20 Mar	Klondike Highway	Cameron Eckert	eBird
Northern Saw-whet	26 Aug	Skagway	Emily Willis	SBC
Snowy Owl	13 Apr	Dyea	John McDermott	SBC



Photo 5. A Northern Saw-whet Owl photographed by Emily Willis in her backyard on August 26th, 2015 (left). A Northern Hawk Owl photographed by Cameron Eckert at the “South Lookout” on the Klondike Highway, March 20th, 2015 (right).

Mortalities

Two Bald Eagle mortalities were documented this year. The first was reported by the KLGO Chief of Resources, Dael Daavenport, in April. She had seen the scavenged remains of an adult Bald Eagle on the beach at Sturgill’s Landing earlier that Spring. Due to the condition of the carcass, it was not collected for the National Eagle Repository. The second Bald Eagle mortality was reported by Mike Konsler in early June, who saw the carcass of a dead immature floating in the water below the railroad docks. NPS staff were unable to locate the carcass or collect it.

One Trumpeter Swan mortality was documented in Dyea this year. Reported by John McDermott in April, the cause of death is unknown. It may have been the same solitary, adult Trumpeter Swan that was seen along the Taiya River during the first two Coastal Waterbird Surveys this season.

An “unusually high” number of Northwestern Crow mortalities and injured juveniles were observed by the Skagway Bird Club and Skagway Bird Rescue Group this season (pers. comm., Elaine Furbish). Six Northwestern Crow rescue summaries from April-August 2015 are reported on the Skagway Bird Club site (<https://sites.google.com/site/skagwaybirdclub/home-1/bird-rescue-group>).

Arctic Tern Nesting Habitat and Municipality of Skagway Migratory Bird Working Group (Ad Hoc Committee)

In August 2015, the Municipality of Skagway (MOS) established a Migratory Bird Working Group (MBWG) in response to local concerns about the failure of an Arctic Tern nesting colony near the mouth of the Skagway River. Coastal Waterbird Survey data collected by KLGO was shared with the Skagway Bird Club, which published a detailed account Arctic Tern observations and disturbances to the nesting colony in 2015 (Appendix G). CWS data from 2005-2015 show that Arctic Terns

dispersed from the area earlier than previous years (Figure 5), and were not present at the nesting site long enough for a complete cycle (approximately 60 days) of egg laying, incubation, and young rearing (Hatch, 2002). Eggs are known to have been laid at the nesting site this year (Photo 6), but no chicks were observed. While the cause of colony failure is not known, the site no longer appears to be suitable nesting habitat due to anthropogenic disturbances (Photo 6).

The need for reliable data and documentation of Arctic Tern colony nesting failure this year reveals one of the practical applications and importance of long-term CWS data, collected and maintained at KLGO. NPS will continue to play a role in providing technical assistance to the MBWG as they develop recommendations for the MOS regarding best practices for minimizing disturbance to migratory birds.

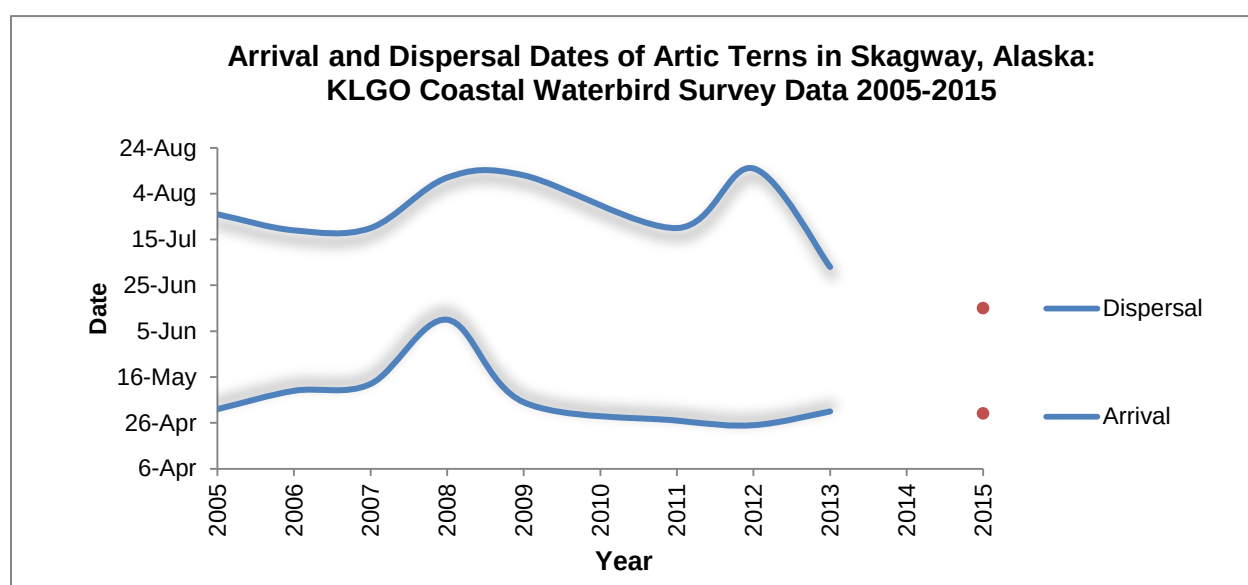


Figure 5. The range of first and last detections of Arctic terns during Coastal Waterbird Surveys 2005-2015. Note: 2014 data was excluded from this graph because surveys began one month later than usual.



Photo 6. An Arctic Tern seen at the usual colony nesting location east of the Skagway River mouth on May 5th, photo by Shelby Surdyk (left). A large pile of gravel staged at the former Arctic Tern nesting location in June, photo by Shelby Surdyk (top right). Arctic Tern eggs seen at the usual colony nesting location, prior to gravel being staged there, photo by Gary Heger (bottom right).

Conclusions & Recommendations

Coastal Waterbird Surveys should continue for further baseline data on the occurrence, distribution, abundance, and habitat association of species. Surveys should be conducted weekly from April 15 to May 15 and from August 10 to September 15 in order to best document the spring and fall migrations. I also recommend that a future technician and the Natural Resource Program Manager review the protocol for assigning “Breeding Status” for birds counted during CWS. There appears to have been inconsistencies over the years, particularly when assigning the status of “possible” (O) or “probable” (X).

In previous reports, inconsistencies and difficulties in gull identification have been cited as a problem for the CWS. In 2015, we adopted two strategies for identifying gulls. First, during the spring migration, when “mega-flocks” of thousands of gulls were present in Dyea and Skagway, we adopted strategy of estimating the size of the entire flock, and then recording proportions of unidentified “large adult *larus* gulls,” “small adult *larus* gulls,” “large immature gulls,” and “small immature gulls.” Outside of the spring migration mega-flocks, gulls were only identified to species when in close enough range for a long enough time to get a confident look at key features (size, head shape, wing tips, legs, beak, and eyes), otherwise they were recorded as ULGU (unidentified *larus* gull), such as in the case of fly-bys or when too far away. We recommend that this strategy continue to be employed in the future.

Currently there is no protocol established for recording passerine species detected at Coastal Waterbird Survey points. In past years, it has been recommended that if observers are reliably experienced, they could conduct brief point-count surveys in conjunction with the CWS to begin establishing baseline passerine data across the entire season for the Skagway area. I recommend that future technicians review this idea the Natural Resource Program Manager. Before implementing a new passerine monitoring effort, the following questions ought to be considered: How much of a time commitment would it add to field work (including the time spent reviewing reference materials for unsure identifications) and office work (data entry, management, reporting)?; Where would the data be stored (a new access database?) and how would it be shared or reported?; Would the turnover rate of seasonal technicians allow for meaningful analysis of the data in the long-term?

At the end of this season, the preparation of a draft protocol for Bald Eagle Monitoring was initiated. Ideally, this protocol would contain 6 parts:

- SOP 1. Field Methods and Routine Spot Checks
- SOP 2. Bald Eagle Nest Locations and Observation Points
- SOP 3. Field Preparation
- SOP 4. Data Entry, Verification, and Editing
- SOP 5. Database Management
- SOP 6. Data Analysis and Reporting.

In addition to finishing the remaining SOPs, it is recommended that a future technician populate the nest characteristic fields in the Nest ID table in the database (Eagle_Nest.mdb). Further, a regional

Bald Eagle biologist with USFWS should be contacted to review the draft SOPs and establish a plan for sharing data/results of Bald Eagle monitoring efforts in KLGO.

It is probable that there are undocumented Bald Eagle nests in the Skagway/Dyea area. This year, a local river guide from Skagway Float Tours reported that he had seen Bald Eagles carrying nesting material (branches) into the trees on the hill south of the raft take-out in Dyea on three separate occasions, and he suspects that there is a nest somewhere near there. No Bald Eagle activity was observed at DY02 this year, so this suggests that there may be a new nest somewhere on the Dyea Road. In mid-April, Shelby Surdyk saw an adult Bald Eagle carrying a branch south of the railroad dock. The Bald Eagle flew south, around the tip of the East hillside and out of site. In August, Elaine Furbish and Shelby Surdyk saw an adult Bald Eagle fly East over Nahku Bay carrying a branch. If searches for new nests are conducted in the future, the hillsides around Nahku Bay, Sturgill's Landing, and the Dyea road might be good places to start.

A Note on Data Entry

While entering 2015 CWS and Bald Eagle nest observations into their respective databases, I realized the 2014 CWS data was missing, as was 2013 Bald Eagle nest observations. I obtained copies of the 2014 CWS datasheets from the KLGO museum and entered the data, but have not yet entered the 2013 Bald Eagle nest observations. A scanned copy of the field notebook from that year is available on the T-Drive containing records of the nest observations from that year, and they should be entered into the database in the future.

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Appendix A. Waterbird monitoring protocol for Klondike Gold Rush NHP, SOP3: conducting the waterbird survey transects

Version 1.00 (April 9, 2009)

Revision History Log:

Previous Version #	Revision Date	Author	Changes Made	Reason for Change	New Version #

This SOP gives step-by-step instructions for conducting waterbird surveys by census unit at Klondike Gold Rush NHP, including data collection and completion of the data form “KLGO Coastal Waterbird Survey Data Form” (Form 1).

Procedures:

Step 1.

Prior to the day of the survey, determine the times of high and low tides as well as the weather forecast. Wind is the most problematic weather variable in Skagway. Because it is typically lightest in the morning, and because convection heat waves over water increase through the day, surveys are best conducted as early as daylight and tide will allow.

Step 2.

Sampling should be scheduled around a high tide in Dyea such that the survey of Census Unit #7 begins approximately two hours before high tide. The tidal flats in Dyea can be very expansive during low tide, inhibiting the ability of the surveyor to accurately count all shorebirds in the area. By conducting the survey on a rising mid-tide, the surveyor gains the advantage of having the greatest number of shorebirds using the tidal habitat in a more concentrated area for counting. This scheduling also means that Census Unit 1 is conducted during low tide, which allows for the most expansive, yet manageable, intertidal foraging area at the Skagway River mouth.

Step 3.

Avoid conducting surveys in high winds or heavy precipitation. These conditions inhibit bird activity and impair your ability to see and hear birds. In general, counts should not be conducted if wind strength on the Beaufort Scale is a sustained 5 or greater (see Table 5.01.1), or if it is raining hard or snowing (rain code ≥ 6 in Table 5.01.2). If you encounter these conditions, wait until the weather improves or else cancel the sampling for the day and try again on another day. If conditions

do not improve during the week of scheduled surveys, it may be necessary to endure such weather, especially during migration periods when the possibility of identifying rare species outweighs the cost of relatively inaccurate counts.

Step 4.

Begin the census at either CU1 (CU2 if CU1 is not being surveyed due to cruise ship interference) in Skagway or CU7 in Dyea, navigating to the starting point using the survey map (Figure 4.01.1). The order of units surveyed then is 1,2,3,4,5,6,8,7, or the inverse. CU8 is surveyed between CU6 and CU7 because of its proximity to the Dyea road. It is important that the surveys take place in this sequence in order to minimize double counting by reducing travel time between units. Take into account the tides and drive time when choosing the starting census unit.

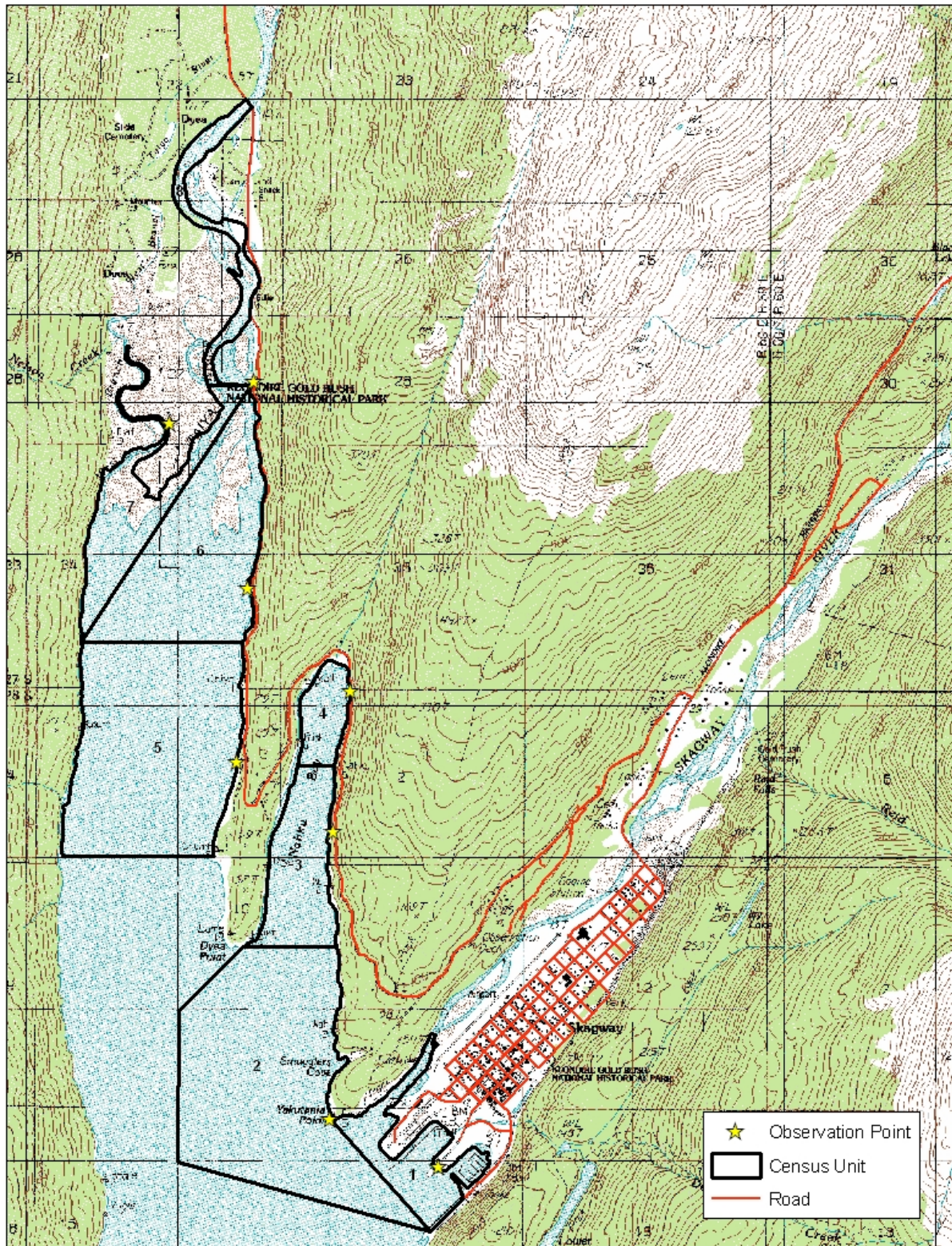


Figure 4.01.1 KLGO Waterbird Census Units

Step 5.

Once you arrive at the starting observation point, begin the count as soon as possible. You can fill in the following location, event, and weather conditions information at the top of the form at the beginning or end of the census unit.

Observers: Record the first and last names of primary and secondary observers.

Census Unit: Record the number of the census unit being surveyed.

Tide State: Record the tide state (High/Mid/Low; Rising/Falling) at the start of the census unit survey. High and low tide are separated by approximately six hours. The high tide category extends from two hours before to two hours after high tide. Similarly, the low tide category extends from two hours before to two hours after low tide. Mid tide consists of the two hours between the high and low tide categories. A rising tide begins at the exact time of low tide and ends at the apex of high tide. A falling tide begins at the exact time of high tide and ends at the nadir of low tide. You may temporarily record “Unknown” in the field, but tides should be referenced and the appropriate categories reentered on the data sheet upon returning to the office.

Temperature: Record the temperature at the starting point of the census unit, rounded to the nearest degree Celsius.

Date (MM/DD/YY): Record the date of the survey in the form Month/Day/Year.

Start Time (24 hour HH/MM): Record the time at start of the census unit survey in 24 hour format using four digits (e.g. 9:00 AM is recorded as 09:00, and 1:00 PM is recorded as 13:00).

End Time (24 hour HH/MM): Record the time at end of the census unit survey in 24 hour format using four digits.

Cloud (0-3): Record the cloud code (0 through 3) from the following Table 4.01.1 as it applies to the cloud cover at the start of the census unit survey. If there is a considerable change in conditions (e.g. greater than two codes), describe the change in the Event Notes section.

Table 4.01.1. Codes used to record cloud cover during bird counts.

Cloud Code	Explanation
0	<i>Clear</i> , less than 10 percent cloud cover
1	<i>Scattered</i> , 10-50 percent cloud cover
2	<i>Broken</i> , 50-90 percent cloud cover
3	<i>Overcast</i> , more than 90 percent cloud cover over entire sky

Precipitation (0-10): Record the precipitation code (0 through 10) from the following Table 4.01.2 as it applies to conditions during the census unit survey. If there is a considerable change in conditions (e.g. greater than two codes), describe the change in the Event Notes section.

Table 4.01.2. Codes used to record precipitation codes during bird counts.

Precipitation Code	Explanation
0	<i>None</i>
1	<i>Fog</i>
2	<i>Drizzle</i>
3	<i>Showers</i> (intermittent rain)
4	<i>Light rain</i>
5	<i>Moderate</i> (steady) <i>rain</i>
6	<i>Heavy rain</i>
7	<i>Sleet</i>
8	<i>Light snow</i>
9	<i>Moderate snow</i>
10	<i>Heavy snow</i>

Wind Speed (0-5): Record the wind code (0 through 5) from the following Table 4.01.3 as it applies to the strength of the wind during the census unit survey. Record the average wind condition during the survey, not the maximum condition (do not worry about gusts).

Table 4.01.3. Codes (Beaufort scale) used to record wind strength during bird counts.

Wind Code	Wind Speed (miles/hour)	Explanation
0	Less than 1	Air calm; smoke rises vertically
1	1 to 3	Direction of wind shown by smoke drift
2	4 to 7	Wind felt on face; leaves rustle; wind vanes moved by wind
3	8 to 12	Leaves and small twigs in constant motion; wind extends light flag
4	13 to 18	Raises dust, loose paper; small branches are moved
5	19 to 24	Small trees in leaf begin to sway; crested wavelets form on inland waters

Wind Direction: Record the direction from which the wind is coming during the census unit survey in degrees, to the nearest 5 degrees (e.g. 353 degrees should be recorded at 355 degrees, and 352 degrees should be recorded as 350 degrees). For an exact north wind, use 0 degrees instead of 360 degrees.

Wave Height (0-5): Record the wave height code (0 through 5) from the following Table 4.01.4 that applies to the conditions during the census unit survey.

Table 4.01.4. Codes used to record wave height during bird counts.

Wave Height	Explanation
0	<i>Calm</i> , sea surface smooth and mirror-like
1	<i>0.1 m</i> , scaly ripples, no foam crests
2	<i>0.1-0.5 m</i> , small wavelets, crests glassy, no breaking
3	<i>0.5-1.0 m</i> , large wavelets, crests begin to break, scattered whitecaps
4	<i>1.0-1.5 m</i> , small waves, becoming longer, numerous whitecaps
5	<i>1.5-2.0 m</i> , moderate waves, taking longer form, many whitecaps, some spray

Event Notes: Record any significant notes about the census unit survey, such as a considerable change in weather, visibility impediments, breaks in the survey, or cancellation of the survey.

Step 6.

Both binoculars and spotting scope should be used. It is often best to do an initial scan with binoculars in order to quickly note the positions of birds before any movement occurs. If possible, scan continuously from one end of the census unit to the other before doubling back to check unsure identifications. The spotting scope is necessary for viewing the far sides of all census units, so it should be carried in all census units. Make sure to listen for bird calls and frequently scan your surroundings with a naked eye, as flyovers are often missed when using only magnified lenses. Waterbirds that are only aurally detected should be recorded as such if identifiable.

Step 7.

For each bird heard or seen, record the following information on the "KLGO Coastal Waterbird Survey Data Form":

Species: Record the four letter AOU common name code of the species detected (e.g. BAEA for Bald Eagle). Codes for species known to occur in Klondike Gold Rush NHP are listed in Appendix ? of the protocol narrative. A full list of AOU codes can be found at T:\NRM\Birds\Misc\Alpha Codes. Several individuals of a single species can be recorded on more than one line if needed.

Number: Record the number of individuals counted for each species detected.

Age: Record the age category (Adult, Immature, Juvenile, Mixed, Unknown) of the individuals counted. "Immature" is used for species with multi-year maturation periods such as gulls and eagles, as well as male ducks in 1st winter plumage. If the year of immaturity is known, record in the notes for that individual (e.g. 1st; 2nd; 3rd; 1st winter). "Mixed" should be used only when multiple age groups are present and individual identification is not possible, such as large feeding groups of diving ducks.

Composition (Sex): Record the sex (Male, Female, Female/Juvenile, Mixed, Unknown) of the individuals counted. “Female/Juvenile” can be used for species with juvenile males so close in appearance to adult females that distinguishing between the two is not possible. “Mixed” should be used only when multiple age groups are present and individual identification is not possible, such as large feeding groups of scoters.

Breeding Status: Record the breeding criteria code (see Appendix ?) for the individuals counted. If multiple pairs are discernible within a larger group of individuals, note the number of pairs separate from the other individuals.

Observations: Record any noteworthy behavioral observations, identifying features, or general comments that seem appropriate and that might help someone interpret and analyze the data correctly.

Step 8.

If an unidentified species was seen in the field and characteristics were recorded for later identification, that process should take place in the office immediately following the survey using reference materials.

Breeding criteria codes:

Code¹ — Evidence

OBSERVED:

O—Species (male or female) observed in a block during its breeding season, but no evidence of breeding. Not in suitable nesting habitat. Includes wide ranging species such as vultures or raptors, or a colonial nesting species not at the nesting colony.

POSSIBLE:

X—Species (male or female) observed in suitable nesting habitat during its breeding season.

XS—Singing/drumming/booming male present in suitable nesting habitat during its breeding season.

XT—Multiple singing males of a species, evenly spaced in suitable nesting habitat during their breeding season.

PROBABLE:

P—Pair observed in suitable habitat during its breeding season.

S—Permanent territory presumed through song at same location on at least two occasions 7 days or more apart.

T—Permanent territory presumed through defense of territory (chasing individuals of the same species).

C—Courtship behavior or copulation.

N—Visiting probable nest-site.

A—Agitated behavior or anxiety calls from adult.

B—Nest building by wrens or excavation of holes by woodpeckers.

CONFIRMED:

CN—Carrying nesting material, such as sticks or other material. Please submit full details including location within the block of the observation.

NB—Nest building at the actual nest-site.

PE—Physiological evidence of breeding (e.g. highly vascularized, edematous incubation [brood] patch or egg in oviduct based on bird in hand. To be used by experienced bird banders on local birds during the nesting season).

DD—Distraction display or injury feigning.

UN—Used nests or eggshells found. Caution: these must be carefully identified, if they are to be accepted.

PY—Precocial young. Flightless young of precocial species restricted to the natal area by dependence on adults or limited ability.

FL—Recently fledged young (either precocial or altricial) incapable of sustained flight, restricted to natal area by dependence on adults or limited mobility.

ON—Occupied nest: adults entering or leaving a nest site in circumstances indicating occupied nest. To be used for nests which are too high (eg the tops of trees) or enclosed (eg chimneys) for the contents to be seen.

CF—Carrying food: adult carrying food for the young.

FY—Adult feeding recently fledged young.

FS—Adult carrying fecal sac.

NE—Nest with egg(s).²

NY—Nest with young seen or heard.²

Notes:

1. The letter code is entered by the field workers in the appropriate space on the field report form. Possible and Probable categories are represented by single letters or a symbol. Confirmed by double letters. Letters have been selected as a mnemonic aid, keyed to bolded words in criteria definitions.

2. Presence of cowbird eggs or young is confirmation of both cowbird and host species.

Observer(s) Dashiell Feierabend

Census Unit # / Tide State: HIGH-TIDE MID-TIDE LOW-TIDE R F U

Date

Month	Day	Year
04	08	09

 Start Time

09	15
(24 hours)	

 End Time

10	20
(24 hours)	

 Temp

04

 °C

Wind: 012345 Cloud: 01(2)3 Precip: (0)12345678910

Wdir:

190

 ° Wave Height: 012345 Event Notes: Numerous boats traveling through cen

In the example above, five birds were detected. In the first record, two adult Mallards (MALL) – a male and a female – were seen together along with a juvenile of unknown sex. Next, an immature Bald Eagle (BAEA) was observed in southwest Dyea flats. It was determined to have 2nd year plumage, and was described as such in the Observations field. Because it was an immature bird, it was given the breeding status O (observed) despite the fact that it was an appropriate breeding habitat during the breeding season. Finally, a Common Raven (CORA) was heard but not visually seen in the east side of the flats, and the observation notes describe that.

KLGO Coastal Waterbird Survey Data Form

Observer(s)

Census Unit #	Tide State:	HIGH-TIDE	MID-TIDE	LOW-TIDE	R	F	U

[illegible]

Wind:	0	1	2	3	4	5	Cloud:	0	1	2	3	Precip:	0	1	2	3	4	5	6	7	8	9	10
-------	---	---	---	---	---	---	--------	---	---	---	---	---------	---	---	---	---	---	---	---	---	---	---	----

WDir				°			
Wave Height:	0	1	2	3	4	5	Event Notes:

[illegible]

WIND SPEED CODES: (Enter Beaufort numbers, not m.p.h.)

Beaufort Number	Wind Speed (miles/hr)	Indicators of Wind Speed
0	Less than 1	Air calm; smoke rises vertically.
1	1 to 3	Direction of wind shown by smoke drift but not by wind vanes.
2	4 to 7	Wind felt on face; leaves rustle; wind vanes moved by wind.
3	8 to 12	Leaves and small twigs in constant motion; wind extends light flag.
4	13 to 18	Raises dust; loose paper; small branches are moved.
5	19 to 24	Small trees in leaf begin to sway; crested wavelets form on inland waters.

TIDE STATE:

CLOUD COVER CODES:

R	F	U	0	1	2	3
<i>Rising</i>	<i>Falling</i>	<i>Unknown</i>	<i>Clear</i> , less than 10 percent cloud cover.	<i>Scattered</i> , 10-50 percent cloud cover.	<i>Broken</i> , 50-90 percent cloud cover.	<i>Overcast</i> , more than 90 percent cloud cover over entire sky.

PRECIPITATION CODES:

0	None.	6	Heavy rain.
1	Fog.	7	Sleet.
2	Drizzle.	8	Light snow.
3	Showers (intermittent rain).	9	Moderate snow.
4	Light rain.	10	Heavy snow.
5	Moderate (steady) rain.		

WAVE/SWELL HEIGHT CODES:

0	Calm, sea surface smooth and mirror-like.
1	0.1 m, scaly ripples, no foam crests.
2	0.1-0.5 m, small wavelets, crests glassy, no breaking.
3	0.5-1.0 m, large wavelets, crests begin to break, scattered whitecaps.
4	1.0-1.5 m, small waves, becoming longer, numerous whitecaps.
5	1.5-2.0 m, moderate waves, taking longer form, many whitecaps, some spray.

BREEDING CRITERIA CODES:

Code – Evidence

OBSERVED:

O—Species (male or female) observed in a block during its breeding season, but no evidence of breeding. Not in suitable nesting habitat. Includes wide ranging species such as vultures or raptors, or a colonial nesting species not at the nesting colony.

POSSIBLE:

X—Species (male or female) observed in suitable nesting habitat during its breeding season.

XS—Singing/drumming/booming male present in suitable nesting habitat during its breeding season.

XT—Multiple singing males of a species, evenly spaced in suitable nesting habitat during their breeding season.

PROBABLE:

P—Pair observed in suitable habitat during its breeding season.

S—Permanent territory presumed through song at same location on at least two occasions 7 days or more apart.

T—Permanent territory presumed through defense of territory (chasing individuals of the same species).

C—Courtship behavior or copulation.

N—Visiting probable nest-site.

A—Agitated behavior or anxiety calls from adult.

B—Nest building by wrens or excavation of holes by woodpeckers.

CONTRADICTORY:

CN—Carrying nesting material, such as sticks or other material. Please submit full details including location within the block of the observation.

NB—Nest building at the actual nest-site.

PE—Physiological evidence of breeding (e.g. highly vascularized, edematous incubation [brood] patch or egg in oviduct based on bird in hand. To be used by experienced bird banders on local birds during the nesting season).

DD—Distraction display or injury feigning.

UN—Used nests or eggshells found. Caution: these must be carefully identified, if they are to be accepted.

PY—Precocial young. Flightless young of precocial species restricted to the natal area by dependence on adults or limited ability.

FL—Recently fledged young (either precocial or altricial) incapable of sustained flight, restricted to natal area by dependence on adults or limited mobility.

ON—Occupied nest: adults entering or leaving a nest site in circumstances indicating occupied nest. To be used for nests which are too high (eg the tops of trees) or enclosed (eg chimneys) for the contents to be seen.

CF—Carrying food: adult carrying food for the young.

FY—Adult feeding recently fledged young.

FS—Adult carrying fecal sac.

NE—Nest with eggs(s) ?

NY—Nest with young seen or heard ?

Note:

1. The letter code is entered by the field workers in the appropriate space on the field report form. Possible and Probable categories are represented by single letters or a symbol confirmed by double letters. Letters have been selected as a mnemonic aid, keyed to bolded words in criteria definitions.

2. Presence of cowbird eggs or young is confirmation of both cowbird and host species.

WIND SPEED CODES: (Enter Beaufort numbers, not m.p.h.)

Beaufort Number	Wind Speed (miles/hr)	Indicators of Wind Speed
0	Less than 1	Air calm; smoke rises vertically.
1	1 to 3	Direction of wind shown by smoke drift but not by wind vanes.
2	4 to 7	Wind felt on face; leaves rustle; wind vanes moved by wind.
3	8 to 12	Leaves and small twigs in constant motion; wind extends light flag.
4	13 to 18	Raises dust; loose paper; small branches are moved.
5	19 to 24	Small trees in leaf begin to sway; created wavelets form on inland waters.

TIDE STATE:

R	Rising	0	Clear, less than 10 percent cloud cover.
F	Falling	1	Scattered, 10-50 percent cloud cover.
U	Unknown	2	Broken, 50-90 percent cloud cover.
		3	Overcast, more than 90 percent cloud cover over entire sky.

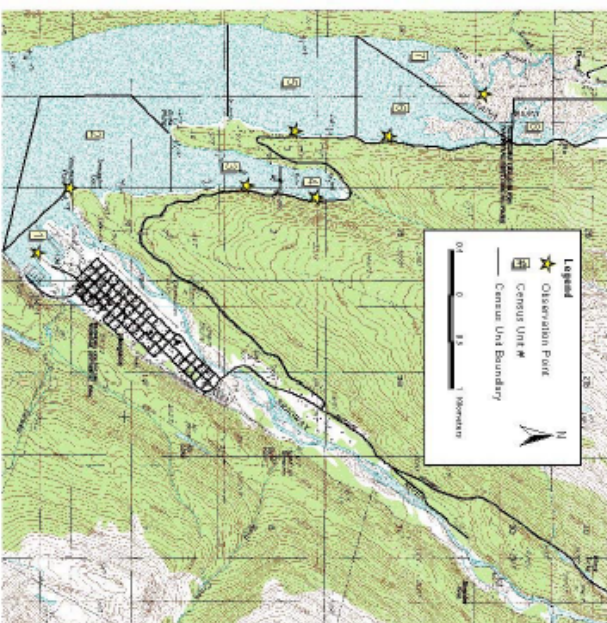
CLOUD COVER CODES:

PRECIPITATION CODES:

0	None.	6	Heavy rain.
1	Fog.	7	Sleet.
2	Drizzle.	8	Light snow.
3	Showers (intermittent rain).	9	Moderate snow.
4	Light rain.	10	Heavy snow.
5	Moderate (steady) rain.		

WAVE/SWELL HEIGHT CODES:

0	Calm, sea surface smooth and mirror-like.
1	0.1 m, scaly ripples, no foam crests.
2	0.1-0.5 m, small wavelets, crests glassy, no breaking.
3	0.5-1.0 m, large wavelets, crests begin to break, scattered whitecaps.
4	1.0-1.5 m, small waves, becoming longer, numerous whitecaps.
5	1.5-2.0 m, moderate waves, taking longer form, many whitecaps, some spray.



KLGO coastal waterbird survey

Census Unit Descriptions

Census unit #1

Skagway Harbor Area and River Mouth.--Start the survey by walking from the Harbor Master's office down the small boat harbor access ramp south to the docks. Continue walking along the east dock to the end looking down each slip sequentially (make sure to look for gulls on the tops of poles). Turn right and continue to the end of the south dock to the small boat harbor entrance. From there, turn around and walk back up the south ramp and out onto the harbor breakwall to near the end. Scan the outer harbor area to just beyond the east ship dock where the shoreline curves inward and disappears from view (make sure to look for waterfowl beneath the dock amongst the pilings).

When finished, walk back along Congress Way around the small boat harbor to the State Ferry Terminal parking lot. From there, walk around the north end of the ship harbor scanning beneath the pilings and then back along the west sidewalk south to the northwest corner of the Ferry Terminal. Scan the rest of the outer harbor area out parallel to Yakutania Point. Then, take a quick walk around the Terminal out onto the Ferry dock.

Next, walk back up Broadway and take the sidewalk along the railroad tracks northwest to the Skagway River foot bridge that goes to Yakutania Point. Survey up river to the end of the airport runway and downstream to the river mouth (look for shorebirds on the east side of the river below Temsko Helicopters where there is a small tidal wetland area). Continue walking across the foot bridge and down the foot path toward Yakutania Point. Where the path turns right to go to Yakutania Point, continue straight ahead out onto the rocky point on the west side of the river. This gives a good view of the river mouth and the small beach area to the north. This completes this section of the survey.

Survey Tips

- Surveying from the south side of the weather station beyond the airport terminal parking lot provides a wide view of the river mouth.
- Watch for shorebirds (spotted sandpipers, solitary sandpipers, and wandering tattlers) in the rocks at the river mouth. They can be difficult to see.
- Look carefully for mergansers upriver from the foot bridge. They are often resting on gravel bars or eddies.

Census unit #2

Yakutania Point.--Walk out onto the end of Yakutania Point and survey the area in a line out to just beyond the end of the east ship dock where the shoreline curves inward and is not visible from the harbor area in a triangle approximately 1.6 km southwest of Yakutania Point. Continue scanning out 1.6 km west of the point in an arc to Dyea Point and across the mouth of Nahku Bay.

After surveying this section, walk across the gravel beach immediately to the north of Yakutania Point and up onto the large rock outcrop. From the top of the rock outcrop, survey the rest of the shoreline and small cove not visible from the point. This completes this section of the survey.

Survey Tips

- Survey from as far out on the rocky point as possible in order to maximize your field of vision.
- Scoters, scaup, and red-necked grebes are often along the west shore of Taiya Inlet at the limit of visibility with the spotting scope.
- Arctic terns and gulls frequently fly overhead across the point, so be aware of your immediate surroundings.
- Spotted sandpipers are sometimes on the rocks in the small cove north of the point proper.
- Marbled murrelets are usually scattered throughout the entire census unit and are difficult to see if significant waves are present.

Census unit #3

Outer Nahku Bay.--The observation point for this section is at the northern end of the large pullout at Mile 5 of the Dyea Road. There is a rock promontory on the other side of the guard rail that provides a good overlook. Survey the outer two-thirds of the bay beginning at the entrance to the bay demarcated by Dyea Point to the large rock outcrop on the west shore directly below the black house on the ridge above. Survey the outer bay to the point where the outcrop breaks the small bench along the shore.

Survey Tips

- Marbled murrelets are usually near the mouth of the bay and can be difficult to see.
- Harlequin ducks are sometimes resting on the west shore of the bay.
- Spotted sandpipers are sometimes feeding along the west shore of the bay – it is important to scan the entire west shoreline for these and other birds.
- Bald eagles are often perched higher up in the trees on the west slope above the bay.

Census unit #4

Inner Nahku Bay.--The observation point for this section is at the last little pullout on the west side of the road (actually just a small widening of the road) before the beach. Survey the inner one-third of the bay beginning at the large rock outcrop on the west shore directly below the black house on the ridge above.

Survey Tips

- Spotted sandpipers are sometimes feeding along the west shore of the bay, and shorebirds are often on the beach at the end of the bay – it is important to scan the entire shoreline.

Census unit #5

Upper Taiya Inlet.--This section is best surveyed when the water is calm and glassy as many waterbirds prefer the west shore. It is also best to survey this section at low tide when the birds are concentrated.

Begin by parking at the small pullout next to a rock promontory on the west side of the Dyea Road at Mile 7. Walk south along the road approximately 30 m to the side road on the west. Walk down the side road a short distance to a gate and then walk west to the edge of the ridge along the Inlet. Follow the ridge south about 20 m to a large open rock outcrop with the remains of a large old wooden tripod probably used as a boom or hoist of some kind. This is the primary observation point for this section. Begin the survey from an east-west line directly across from the southernmost visible point on the east shore (i.e., the next point north of Dyea Point). Survey the upper Inlet to an east-west line directly across from the derelict trespass cabin. This point is roughly demarcated by a rock outcrop on the west shore where a section of rock has fallen away revealing reddish-toned rock beneath.

Survey the east shore that is not visible from the tripod for this section from the rock promontory at the parking pullout. This completes this section of the survey.

Survey Tips

- There are typically large numbers of marbled murrelets in this census unit. They can be difficult to see if significant waves are present.
- Look for red-necked grebes, horned grebes, loons, and other divers along the very west side of the inlet at the limit of visibility with the spotting scope.
- Look for spotted sandpipers, mergansers, harlequin ducks, and other birds on the rocks along the east shore, south of the observation point.

Census unit #6

Taiya River Mouth.--Just north of the derelict trespass cabin there is a large pullout on the east side of the road at a utility pole. Directly kiddy-corner from this pullout there is a small pullout (actually just a small widening of the road) on the west side of the road approximately 30m north. Park here and walk down a fairly steep embankment to the shoreline. There is a large flat rock exposed during low tide just to the south that provides a good vantage point of the upper Inlet. The observer may also pick another suitable vantage point if the rock slab is not accessible. Survey the triangle formed by a northeast line beginning on the west shore directly across from the trespass cabin demarcated by a rock outcrop on the west shore where a section of rock has fallen away revealing reddish-toned rock beneath to the southwest corner of the Taiya River mouth. This observation point gives a good view of the head of the Inlet.

Drive north along the Inlet from the pullout, looking for birds along the shoreline below that was not visible from the last observation point. Continue past a large pullout on the west side of the road above the mouth of the river to several small pullouts (actually just small widenings of the road) on the west past the last shrubs that block the view. Survey the mouth of the river from here. The determination of the mouth of the river will depend on the tide.

The end of this section is upstream to the point where the river starts to curve to the west in a large S-curve and a vegetated cut-bank begins on the west bank. Toward the end of the S-curve, a higher-benched cut-bank begins.

Survey Tips

- Another route to the first observation point is to park at the large pullout on the east side of the road as it begins to turn left at the beginning of the S-curve. Walk 20 m south to the west side of the road where there is a culvert. Descend the road bank just north of the culvert and make your way through the trees to the shoreline where there is a relatively flat rock that serves as the first observation point.
- Another suggested observation point is from the north end of the pullout with an interpretive sign, on the west side of the road just before the descent to the river. This is a great place to count the gulls that gather in large groups on the southern spits of sand and gravel.
- It is also suggested that the surveyor use the small knoll at the south end of Hackett Hill as the final observation point for this census unit (and as the first observation point for CU8). Use the first pullout on the west side of the road after beginning the ascent up Hackett Hill.
- During lower tides, take care not to accidentally count birds that in fact are in CU7. Avoid this by drawing an imaginary line between the reddish rock face and the south end of Hackett Hill.
- Look for bald eagles perched in the trees on the east side of the inlet along the roadway.

- Look for spotted sandpipers, solitary sandpipers, and other shorebirds along the shorelines at the mouth of the river.

Census unit #7

Nelson Creek Mouth and Taiya Flats.--Drive along the dirt road out onto the flats and park at the point where the road goes alongside Nelson Creek, at a bend in the creek just before a sharp dip in the road. From here, walk along the east side of the creek to its mouth, surveying the creek as well as the flats. Survey the triangle at the head of the Inlet formed by a line beginning at a rock outcrop on the west shore where a section of rock has fallen away revealing reddish-toned rock beneath, directly across from the derelict trespass cabin on the eastern shore, to the southwest corner of the Taiya River mouth. If the upper Inlet was surveyed at low tide, most birds except dabblers near the creek mouth will have been counted.

Continue walking the shoreline east of the creek mouth along the beach dunes in a wide circle back to the parking area. Dabbling ducks in this section will be flighty, so it is best to get counts from a distance before birds are flushed. This completes this section.

Survey Tips

- Look for spotted sandpipers, solitary sandpipers, yellowlegs, and least sandpipers along the edge of the creek near the start of the census unit. Also look well ahead for mallards, teal, and other dabblers before accidentally flushing them.
- Look for belted kingfishers near the waterfall in the southwest corner of the flats.
- Look for bald eagles in the trees above the southwest flats.
- Look for plovers, least sandpipers, and rare shorebirds along the south and southeast shores of the flats. Many uncommon sightings were in this area.
- Walk along the shore at water's edge in the southeast flats to flush any peeps and snipes that are not readily visible.

Survey Notes.--The Skagway harbor and River mouth, and Yakutania Point can be surveyed in 3-4 hours. It is best to survey this area very early in the morning before cruise ship passenger, boat, and helicopter traffic picks up. Currently, the harbor area from the railroad dock to the ore dock in Census Unit 1 should not be surveyed while cruise ships are present. However, the Skagway River and river mouth should continue to be surveyed as usual, noted as such on the data sheets.

Nahku Bay, upper Taiya Inlet, Taiya River, Nelson Creek, and Taiya Flats can be surveyed in 5-8 hours depending on the number of birds present. While it is less than desirable to complete the census over the course of two days, it is absolutely essential that the upper Inlet, Taiya River, Nelson Creek, and Taiya Flats be surveyed on the same day. It is best to start surveying the upper Inlet on a rising mid tide when tidal habitat is abundant but birds are concentrated. The ideal time would be two hours before high tide.

These surveys are best conducted on sunny, calm days when visibility is excellent. However, Skagway is hardly known for having agreeable weather, and winds tend to pick up mid- to late morning. Therefore, it is best to start as early as possible, taking into consideration the tide and daylight, and avoiding the convection waves that form over the water in the heat of the day. It is easy to see and count birds, especially small species such as the marbled murrelet, or distant birds, when the water is glassy. It is equally easy to miss these birds when the waves have picked up and the wind is shaking the spotting scope.

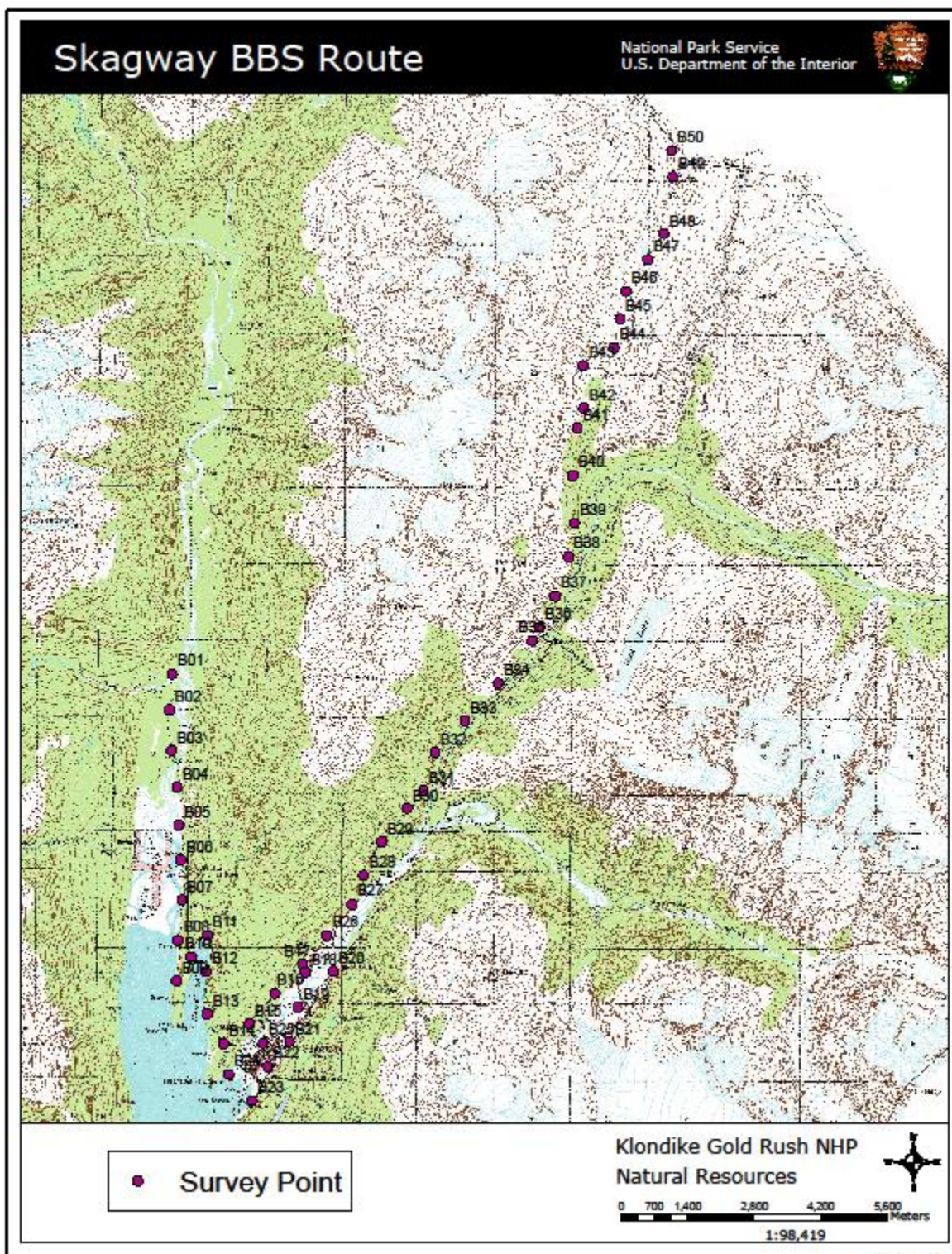
Census unit #8

Taiya River.--Survey from where a large S-curve begins as described above in the section Taiya River Mouth. This section ends at the farthest point upstream visible from the Chilkoot Trailhead at the Taiya River Bridge. Note birds as being either below or above the bridge.

Survey Tips

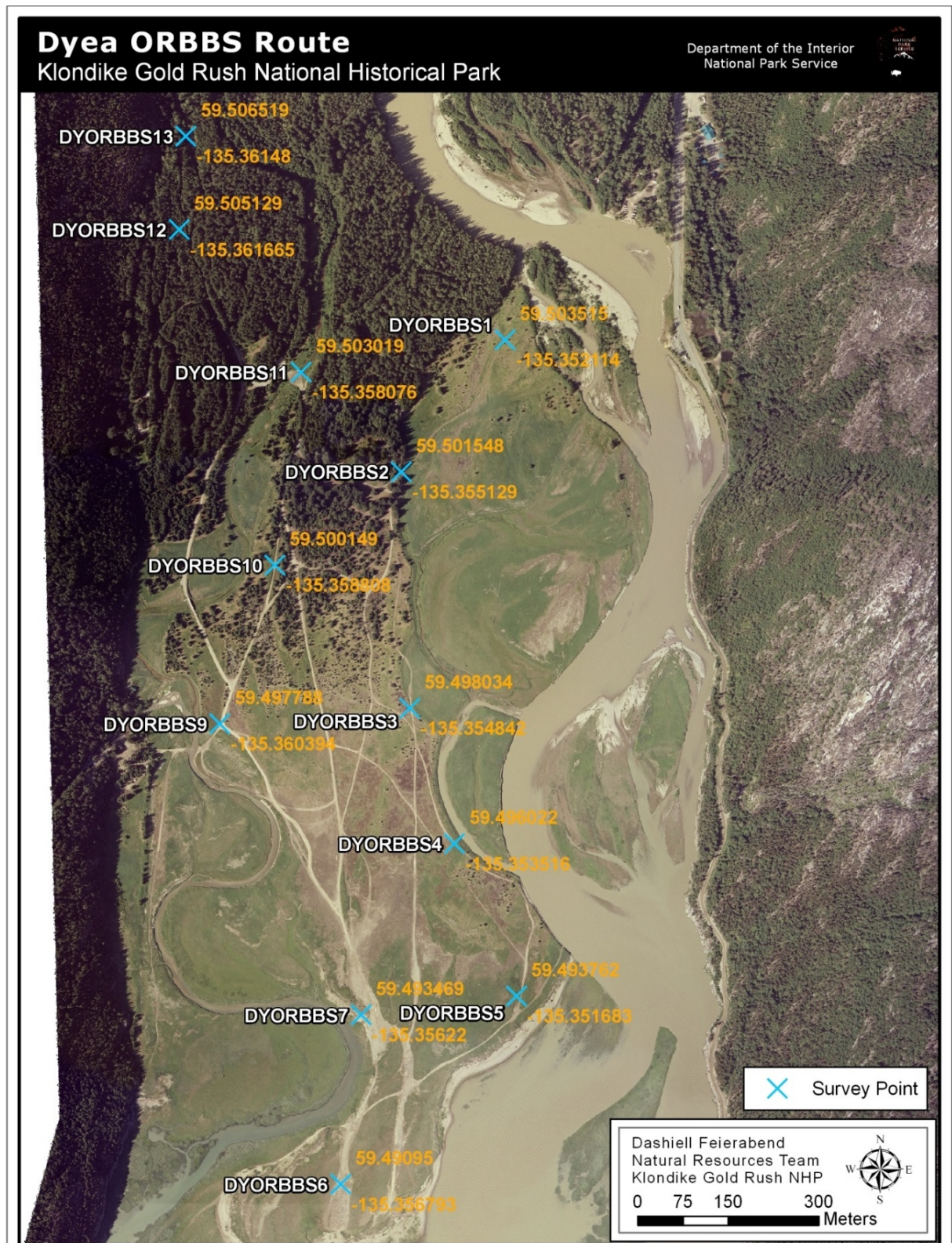
- While at first glance this may seem like a rather empty census unit, the seasoned surveyor will usually find a good number of birds by thoroughly searching the banks of the river.
- Suggested observation points include the last point in CU6; the last pullout on the west side of the road before reaching the bottom of Hackett Hill on the north side; the east bank around the rafter's pullout; the Chilkoot Trail trailhead; and the Taiya River bridge, facing south.
- Look for mallards resting on the river banks at the south end of the census unit.
- Look for spotted sandpipers, solitary sandpipers, and yellowlegs along the east rockwall at the south end of the census unit, in the wetlands in the same area, and along all shorelines north to the Dyea campground area.
- Look for teal and other dabblers in the wetlands mentioned above.
- Look for mergansers north of the rafter's pullout and north of the Taiya River bridge.
- Look for bald eagles in and around the two nests west of the Dyea campground area on the west side of the river.
- Look for belted kingfishers just north of the Taiya River bridge.

Appendix B. Skagway Breeding Bird Survey Route Map

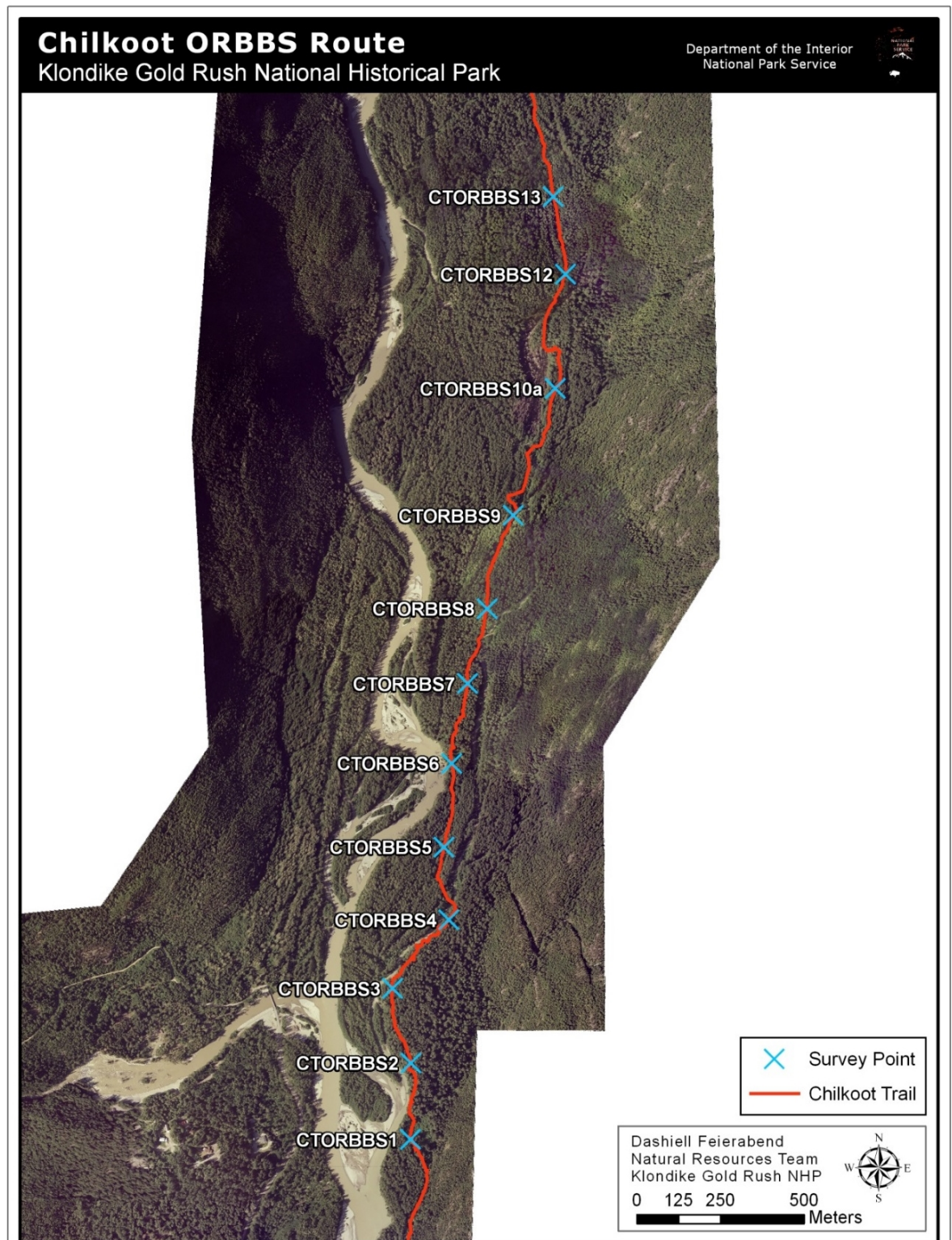


8/28/2006

Appendix C. Alaska Landbird Monitoring Survey – Dyea Map



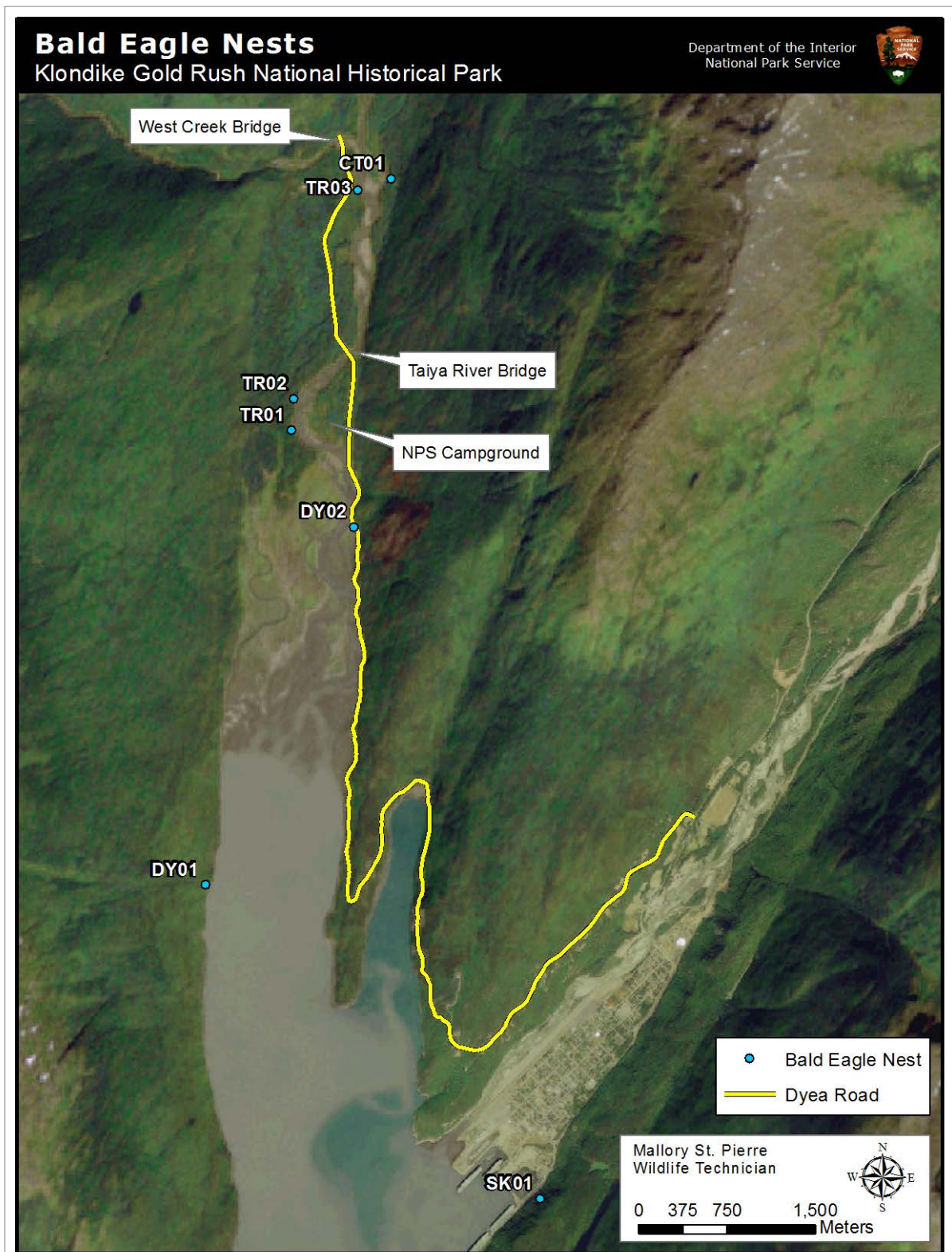
Appendix D. Alaska Landbird Monitoring Survey – Chilkoot Map



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July 23, 2009

Appendix E. Bald Eagle Nest Map



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August 10, 2009

Appendix F. Historic Bald Eagle Nest Site Descriptions

CT01 – The nest is located in a cottonwood tree on the east side of the Chilkoot Trail, approximately 1.5 miles from the trailhead. It is very difficult to see and is best sighted before the leaves come out on the vegetation. Walk just north of the second wooden bridge on the trail, then look east-southeast to find it. It may not be observable later in the summer because of the thick vegetation.

DY01 – The nest was mapped almost directly across the Taiya Inlet from the coastal waterbird census unit 5 observation point. It could not be located in 2009 or 2011.

DY02- Newly constructed in 2014, this nest is located just north of Hackett Hill, on the East side of the Dyea road.

SK01 – The nest was mapped east of the Skagway small boat harbor but could not be located in 2009 or 2011.

TR01 – The nest is located near the top of a cottonwood tree approximately 30 m above ground level on the west bank of the Taiya River, across from the NPS Dyea Campground. The nest is approximately 4 ft in diameter (widest point at outer rim) and 3 ft deep (external base to top or rim). It can be viewed without disturbance from the east at the TR01 boreal toad monitoring site adjacent to the Taiya River. It can also be viewed at a greater distance from the river bank west of the Dyea Road, just south of the NPS Dyea Campground turnoff. Larger nestlings can be seen from these viewing points, but eggs are too low in the nest to be seen. TR01 could not be located in 2011, and appears that the nest or nest tree is no longer standing.

TR02 – The nest is located in a cottonwood tree on the west bank of the Taiya River, just north of the NPS Dyea Campground. It can be viewed from east on the Taiya River Bridge. Nestlings can probably be seen from this viewing point, although eggs are too low in the nest to be seen.

TR03 – The nest is located in a cottonwood tree approximately 20 m above the ground on the west bank of the Taiya River, south of the West Creek confluence and north of the Kalvick House. The nest is approximately 6 ft in diameter and 4 ft deep. It can be viewed from the north on the west bank of the Taiya River, which is approached through the gravel quarry on the east side of the Dyea Road just south of the West Creek Bridge. Nestlings can probably be seen from this viewing point, although eggs are likely too low in the nest to be seen.

Appendix G. Skagway Bird Club arctic tern press release

Press Release, 1 July 2015

Skagway Bird Club

<http://sites.google.com/site/skagwaybirdclub> contact: SBC@aptalaska.net

Arctic Terns in Skagway, 2015

Humans aren't the only ones that come from great distances to visit Skagway each summer. A small colony of Arctic Terns travels all the way from Antarctica every year to raise their young here. Our tern colony has nested for many years next to the chain-link fence on the west side of the Ore Terminal, between the helicopter operation and the tank farm. At that location, they have become conditioned to periodic human disturbances and have successfully reproduced for many summers. It is the only place in Skagway Borough where people can easily watch tern nests and witness chicks growing from fuzzy balls to elegant adults.



Arctic Tern, Skagway, 2009 (Dashiell Feierabend)

This summer the nesting colony failed and the terns abandoned the site in early June. At about the same time, they were exposed to several large disturbances, the most intense being grading and stockpiling of gravel at the colony site. The colony may have experienced other stressors, including predation, overheating, and low-level human disturbances.

The Skagway Bird Club is not a political or advocacy group. “Opinions among our members about what should be done for the Arctic Tern colony are as varied as those within the whole community” said Elaine Furbish of the Skagway Bird Club.

As a group, the Skagway Bird Club offers this information about Arctic Tern biology and Bird Club observations to help people better understand these remarkable birds, and to help the community reach a consensus on what to do about our Arctic Terns.

“These amazing birds are expert flyers and beautiful to watch as they hover and plunge-dive for tiny fish to eat,” said Shelby Surdyk of the Skagway Bird Club. The terns mate for life and live into their mid-30s.^[1] During their lifetimes, they will migrate a distance equivalent to traveling from the Earth to the Moon three times over! ^[2]

Reproduction

Arctic Terns start reproducing around their 3rd year, and usually return to the area where they hatched to find their life-mate and start laying eggs.^[3] Their “nest” is just a scrape on gravelly ground, and they usually occupy their nests for 10-25 days before laying. ^[1] Both parents incubate the clutch of 1-3 eggs, trading places so the eggs are rarely exposed,^[1] until eggs hatch after 20-23 days.^[4] If the parents are flushed from the nests during this time period, hatching can take up to 34 days.^[1] Chicks can stand and take food within 2-3 hours after hatching.^[1] After 1-3 days, they leave the nest and find places to hide nearby.^[4] Both parents bring food and protect the young.^[4] The chicks practice flying about 22 days after hatching, and 4-5 days later will start flying away from disturbances rather than running to hide.^[1]



Arctic Tern with 2 chicks at Skagway Ore Terminal colony site, 2011 (M. Konsler)

Predators and Disturbances

Arctic Tern colonies can be affected by a number of predators – including fox, weasels, and river otters on land; and gulls, ravens and crows from the air.^[1] The terns prefer nesting sites on sparsely vegetated islands, remote beaches or gravel bars to avoid land predators.^[5]

Without pressure from land predators, spacing between nests is about 1-9 yards apart, with land predators it increases up to about 55 yards apart.^[1] The spacing of nests at the Ore Terminal nesting site indicates that the terns were protected from land predators at that location.

If an individual tern nest is destroyed early in the season, some terns may re-lay within a week or two.^[1] Arctic Tern colonies are good at adapting to predictable human activity, but may desert a colony if subjected to an unusual, intense, one-time disturbance.^[1]

History in Skagway

Arctic Terns have undoubtedly nested in the Skagway area for millennia. The earliest written record noting the presence of Arctic Terns here is from the year 1899.^[6]

In the early 1960s, two Skagway residents remember being dive-bombed by Arctic Terns while strolling along the Skagway River. They started at the river mouth, walked upstream for about ½ mile, and were dive-bombed by terns when they got too close to certain gravel bars.

Several Skagway Bird Club members recall that terns used to nest on the Skagway riverbed until the 1990's flood control and airstrip improvement projects, after which they concentrated on the Ore Dock peninsula. After the helicopter operation occupied the far end of the peninsula, the tern nesting area contracted to the fringes of the Ore Terminal staging area – the present location. The Klondike Gold Rush N.H. Park initiated a waterbird survey in 2003, and recorded Arctic Terns near this area every year from 2003 to the present.^[6]

Conservation Status

Arctic Terns spend half the year in the arctic and the other half in the antarctic,^[3] thus can be affected by habitat destruction at either locale. Their overall population size appears to be slowly decreasing, but their global range size and population size are extremely large, so they are evaluated as a species of “Least Concern” by the International Union for Conservation of Nature.^[7]

Arctic Terns are protected under the Migratory Bird Treaty Act,^[8] which prohibits *taking* of listed birds.^[9] *Take* means to pursue, hunt, shoot, wound, kill, trap, capture, or collect - or attempt to carry out these activities ^[9] - including intentional activities and unintentional activities that result from, but are not the purpose of, an otherwise legal activity.^[10] This is usually interpreted to mean that *take* does not include habitat destruction or alteration when there is not a direct presence of birds, active nests, or eggs.^[11]

What happened this year – Observations

The Skagway Bird Club's earliest Arctic Tern record for this year is approximately 5 terns seen in the vicinity of the Ore Dock on 1 May.



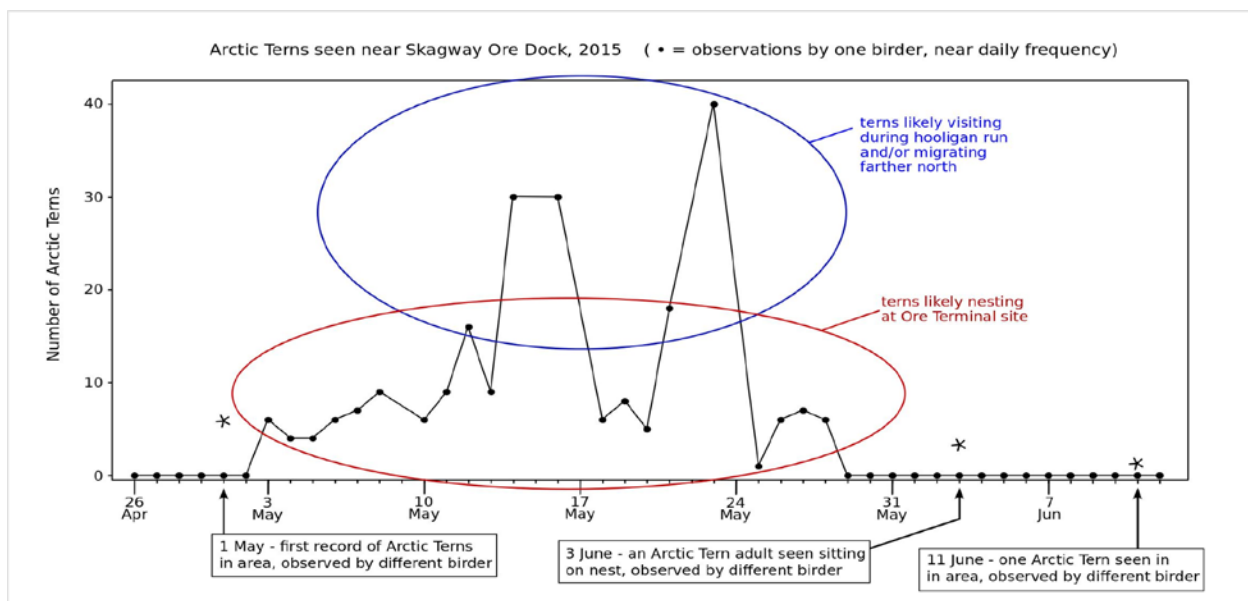
Arctic Tern eggs, mid-May 2015, at Skagway Ore Terminal colony site (G. Heger)

In mid-May, a Bird Club member noted Arctic Tern eggs in a scrape at the edge of the colony nesting site. The nest was re-checked around 3 June, and an adult was sitting – incubating the eggs.

A different Bird Club member recorded birds seen in the vicinity of the Ore Dock, not specifically at the colony nesting site, for about 6 days per week, starting mid-April 2015. This data set shows consistent tern presence from 3 to 28 May.

One Arctic Tern was seen near the Ore Dock by a visitor on 11 June. Some additional sightings of terns were made during the last half of June, but no consistent presence of terns was recorded.

The graph below shows that the Arctic Tern colony failed this year, since the birds were only consistently seen at or near the nesting site for about 30-34 days - not sufficient time occupying the nesting site to fledge chicks. The minimum time period needed to successfully raise chicks would be about 55 days: pre-laying occupation (10 days) + incubation (20 days) + ability to fly (25 days). A more typical time period would be about 63 days.



What happened this year – Disturbances

Around 1 June, heavy machinery was staged at the colony nesting site during an asphalt paving project nearby. Smaller vehicles sometimes parked at the same location without affecting the terns, but the larger, noisier vehicles using the area for a longer time period could have displaced some terns. However, the terns have been occasionally exposed to this type of disturbance in past years without resulting in abandonment of the site.

Sometime prior to 9 June, the tern nesting area was graded. On 9 June, gravel began to be stockpiled at the colony nesting site. These were large, intense, unpredictable disturbances – the type of disturbance that would destroy any nests and chicks occupying the same space, and would cause the colony to be deserted.



Gravel stockpile, Skagway Ore Terminal June 2015 (C.E.Furbish)

In addition to the large disturbances described above, individual nests, eggs or chicks could be lost to predation at any time. During a hooligan run from about 25 Apr to 15 May, thousands of gulls were in the area – gulls that might have harassed tern adults or eaten tern eggs, although gulping hooligan would have been easier for the gulls than facing off with adult terns protecting their nests.

Also, the unusually hot summer temperatures combined with any lower level disturbance that flushed brooding adults from nests may have overheated some eggs.

Without information from closer monitoring, it is not possible to know exactly what factors, or combination of factors, caused the colony to fail this year. Particularly, we cannot know with certainty whether viable nests and eggs were present or absent when the grading and gravel operations began.

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