National Park Service
U.S. Department of the Interior

Natural Resource Stewardship and Science

# Bird Surveys at Klondike Gold Rush NHP

*2020-2022 Summary*

A Klondike Gold Rush National Historical Park Publication

**ON THIS PAGE**
Coastal Waterbird Survey team J.Hamill, O.Varga and A.Wakeen, at Nahku Bay, 20may2022.
(NPS /C. E. FURBISH)

**ON THE COVER**
Female Hooded Merganser with ducklings at the Chilkoot Trail beaver pond, 18jun2022.
(NPS /C. E. FURBISH)

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# Contents

Page

Figures....iv

Table....iv

Appendices....v

Executive Summary....vi

Acknowledgments....vii

Acronyms....vii

Introduction....1

Methods....2

2020 Bird Use at a Small Site in Dyea....2

CWS - Coastal Waterbird Survey....2

BBS - Breeding Bird Survey....4

ALMS - Alaska Landbird Monitoring Survey....5

BENM - Bald Eagle Nest Monitoring....5

Miscellaneous Activities....5

Results....6

2020 Bird Use at a Small Site in Dyea....6

CWS - Coastal Waterbird Surveys....6

BBS - Breeding Bird Survey....11

ALMS - Alaska Landbird Monitoring Survey....11

BENM - Bald Eagle Nest Monitoring....11

Miscellaneous Activities....13

Community and Citizen Science Observations....13

Arctic Tern....13

Assistance to Other Organizations....15

Discussion & Recommendations....17

2020 Bird Use at a Small Site in Dyea....17

CWS – Coastal Waterbird Survey ..... 17

BBS – Breeding Bird Survey and ALMS – Alaska Landbird Monitoring Survey ..... 18

BENM – Bald Eagle Nest Monitoring ..... 18

Miscellaneous Activities ..... 19

Literature Cited ..... 20

## Figures

Page

Figure 1. CWS units: original 2004-2019 (left) compared to new 2021-2022 (right). ..... 3

Figure 2. CWS total number of birds counted in 2021 and 2022, separated by unit. ..... 9

Figure 3. CWS species richness (number per unit) in 2021 and 2022. ..... 10

Figure 4. Digestive pellet with bones found under suspected active Bald Eagle nest tree. (NPS /Alex Leigh) ..... 12

Figure 5. Bald Eagle remains found in wrack at Nahku Bay 11march2023 (NPS /C. E. Furbish) ..... 15

## Table

Page

Table 1. CWS survey periods and dates for 2021 and 2022. ..... 6

Table 2. CWS list of waterbird species recorded in 2021 and 2022. ..... 6

Table 3. CWS number of individual birds by unit in 2021 and 2022. ..... 9

Table 4. Species richness (species per unit) in 2021 and 2022. ..... 10

Table 5. Activity at two Bald Eagle nests reported during CWS in 2021 and 2022. ..... 11

Table 6. Other reports of Bald Eagle nest activity in 2021 and 2022. ..... 12

# Appendices

Page

Appendix A. CWS - Coastal Waterbird Survey ..... 22

Appendix B. BBS - Breeding Bird Survey ..... 26

Appendix C. ALMS - Alaska Landbird Monitoring Survey ..... 27

Appendix D. BENM - Bald Eagle Nest Monitoring ..... 29

# Executive Summary

Klondike Gold Rush National Historical Park (KLGO) usually conducts 4 bird monitoring studies each year. These monitoring programs are ongoing, multi-year efforts at continental, state, and park scales. In 2020, none of the studies were performed due to COVID-19 protection measures and staff vacancies, however, a special bird use survey of a site in Dyea was accomplished by contract. In 2021 and 2022, the four monitoring studies resumed, some at reduced levels.

CWS – Coastal Waterbird Survey, a KLGO specific program. The CWS is designed to describe bird use of near-shore habitats, with emphasis on migratory waterbirds. In 2021, spatial scope and methodology changes to the CWS were tested, and in 2022 the new methods were established. Fifty-five (55) species of birds and 13 KLGO species groups were counted between 2021 and 2022. Full protocols, data management, analysis and reporting are needed to complete the CWS transition.

BBS – (North American) Breeding Bird Survey, a continent-wide program. The BBS documents the presence and abundance of bird species breeding in a local area using a one day, road-based sampling scheme. Data are designed to be consolidated and analyzed at very large-area scales. Data were collected in June 2021 and 2022 and sent to the program managers.

ALMS – Alaska Landbird Monitoring Survey, an Alaska state-wide program. The ALMS uses a BBS-type sampling scheme, but off-road. It is designed for Alaska or Alaska region analysis. Data were collected in June 2021 and 2022 and sent to the program managers.

BENM – Bald Eagle Nest Monitoring, a KLGO specific program. The BENM is still under development, no systematic surveys were conducted in 2021 or 2022. However, observations of 2 nests in Dyea were made regularly during the CWS survey. Combined with Skagway Bird Club member observations, potential breeding behavior was seen at 4 nests, and breeding success was confirmed at 1 nest when a young juvenile was observed at the nest.

Incidental bird observations are available from other sources, such as the Skagway Bird Club, eBird, iNaturalist, Facebook pages, and KLGO staff, but only minimal sightings were gathered in 2021-2022. Observations on Bald Eagle nests and Arctic Tern breeding sites were gleaned from Skagway Bird Club for 2021 and 2022. A one-time volunteer project to collect Arctic Tern nesting observations was added in 2022. Terns were recorded regularly using a protected tern breeding site in May and June 2022, but no chicks were observed.

In addition, KLGO assisted other agencies with bird-related incidents. In 2021, KLGO collected and transported a dead Bald Eagle to US Fish and Wildlife Service (USFWS) Juneau. In 2022, KLGO and the Skagway Bird Club collected bird behavior observations and bird carcasses in Skagway during the outbreak of Highly Pathogenic Avian Influenza (HPAI). Although behavioral symptoms associated with HPIA were observed, none of the carcasses tested positive for HPAI.

## Acknowledgments

The authors thank KLGO park staff, local volunteers, and regional experts who were crucial to the completion of these surveys. KLGO acting Natural Resource Manager Mary Hake coordinated contracting for the 2020 bird use report. CWS field and data activities in 2021 and 2022 were accomplished with the help of Jennifer Larsen, Annyssa Interante, Mary Hake, Adrian Wakeen, Yuan Li, Jay Hamill, Olivia Varga, Melissa Kramer, and Mike Konsler. Deb Rudis conducted the BBS and ALMS surveys in 2021 and 2022 with assistance from Alex Leigh, Adrian Wakeen, Olivia Varga and Jay Hamill. Volunteer Rys Henning recorded regular observations at a protected Arctic Tern nesting area in 2022. Special thanks to the members of the Skagway Bird Club for their many observations each year.

## Acronyms

ALMS Alaska Landbird Monitoring Survey

AOS American Ornithological Society

BENM Bald Eagle Nest Monitoring

BBS (North American) Breeding Bird Survey

COASST Coastal Observation and Seabird Survey Team, University of Washington

CWS Coastal Waterbird Survey

GPS Global Positioning System

GIS Geospatial Information System

HPAI Highly Pathogenic Avian Influenza

KLGO Klondike Gold Rush National Historical Park

NOAA National Oceanic and Atmospheric Administration

NWS-PAGY National Weather Service, “PAGY” Skagway weather station

NPS National Park Service

RAWS-DWSA2 Remote Automatic Weather Station, “DWSA2” at Taiya River bridge

SCA Student Conservation Association

SIP Scientists in Parks, NPS internship program

STC Skagway Traditional Council

USFWS United States Fish and Wildlife Service

USGS United States Geological Service

# 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. Relatively small by Alaska standards, the park has scattered landholdings in three separate units totaling 53 $km^2$ (13,191 acres).

KLGO is located entirely within the Skagway and Taiya River valleys of the Skagway Borough. Skagway is located at the terminus of a long fjord which brings saltwater deep into the heart of the coastal mountain range. Short, steep valleys where coastal and interior ecosystems mix create a patchwork of landcover habitats (Flagstad and Boucher 2015) and fosters high biodiversity of flora and fauna (Bernatz 2010). The Taiya and Skagway valleys are the only place in southeast Alaska where coastal temperate rainforest abuts an interior boreal forest ecosystem - all other southeast Alaska lands are separated from boreal forest by rugged, low-vegetation mountain/icefield ecosystems (Demarchi 2011).

The 4 KLGO bird monitoring studies (CWS, BBS, ALMS and BENM) are part of long-term monitoring and baseline inventories that help managers to make decisions that meet the National Park Service goal to maintain intact ecosystems in their natural state (Hahr and Trapp 2004).

In addition to the monitoring programs, special surveys are occasionally added to address management or scientific needs, or through opportunities with interested volunteers. When possible, compilations of sightings from other sources have often been included to augment or compliment the regular monitoring programs.

Other bird-related KLGO activities are included in the bird survey reports, such as injured bird rescues, testing dead birds for avian disease, or collecting Bald Eagle remains for the National Eagle Repository to be distributed to federally recognized tribes.

# Methods

### 2020 Bird Use at a Small Site in Dyea

An in-depth look at bird use and habitat in a small, 14-acre bottomland site in Dyea was done in 2020. All bird use of the area was recorded with detailed information provided for songbird nesting habitat and behavior. The methodology was adapted from BBS and ALMS point count protocols. Data were collected during the dawn chorus from late April to the end of July. Birds were identified by song or sight, and additional sightings outside the dawn chorus were included (Furbish 2020).

### CWS - Coastal Waterbird Survey

The CWS was developed by KLGO as part of a comprehensive program to monitor the occurrence, distribution, abundance, and habitat associations of birds in the Skagway area (Hahr and Trapp 2004). A primary goal was to gather information on the status of migratory and breeding birds in the Taiya Inlet (Payne 2004).

From 2003 to 2019, CWS was completed following survey methodology described in "Waterbird Monitoring Protocol for Klondike Gold Rush National Historical Park, Skagway, Alaska" found in the Bird Monitoring Protocol, version 1.0, July 2003. The Bird Monitoring Protocol had 7 Standard Operating Procedures (SOPs) developed or revised in 2009. Pre-season preparations, field data collection, and post-season maintenance were covered by SOPs 1, 2, 3 and 6. The data management, reporting and protocol revisions found in SOPs 4, 5 and 7 had become obsolete and not use. The survey area consisted of 8 census units (Hahr and Trapp 2004). The units covered almost all the fjord shoreline at the terminus of Taiya Inlet, including the lower reaches of rivers and streams.

In 2021, significant changes were made to the CWS. Larger trees and shrubs and docked cruise ships made it difficult to make annual observation at some viewpoints. Visual access had been reduced by changes such as growing shrubs and trees, or more frequent docked cruise ships. A preliminary review of survey data indicated that fewer spatial units could provide adequate annual monitoring information to detect large changes in overall waterbird abundance. However, estimates of species richness would likely be affected by surveying fewer spatial units.

A new strategy was developed in 2021 to reduce survey data parameters, spatial extent and labor (effort) annually, combined with the option to collect more detailed parameters and/or more spatial units, similar to the 2009 SOPs, at longer intervals (5 or 10 years) or when targeted information for a particular species is desired. In 2021, spatial extent was modified to 4 units, and prototype data sheets, standardized KLGO codes were created for multi-species groups, and observation methods were developed and field tested. In 2022, methods were stabilized which were largely consistent between 2021 and 2022.

The 4 new survey units were designed to reduce effort, maximize access points, prioritize areas of interest, and partially correlate with the original 8 survey units. To avoid confusion with the numerically designated original units, the new units were established and differentiated with letters A, B, C, and D (Figure 1). See Appendix A for a full-page map of the new survey units.

Unit A – Skagway River - encompasses the mouth of the Skagway River and the near bay area, which correlates roughly to parts of Units 1 and 2.

Unit B – Nahku Bay - correlates exactly with the combined Units 3 and 4.

Unit C – Dyea Outer Bay - correlates exactly with Unit 5.

Unit D – Taiya River Intertidal - encompasses the Dyea intertidal area and mouth of the Taiya River up to the NPS campground, roughly correlating to Units 7 and 8 minus Nelson Slough, Dyea Flats and the Taiya River between the NPS campground and the Taiya River bridge.

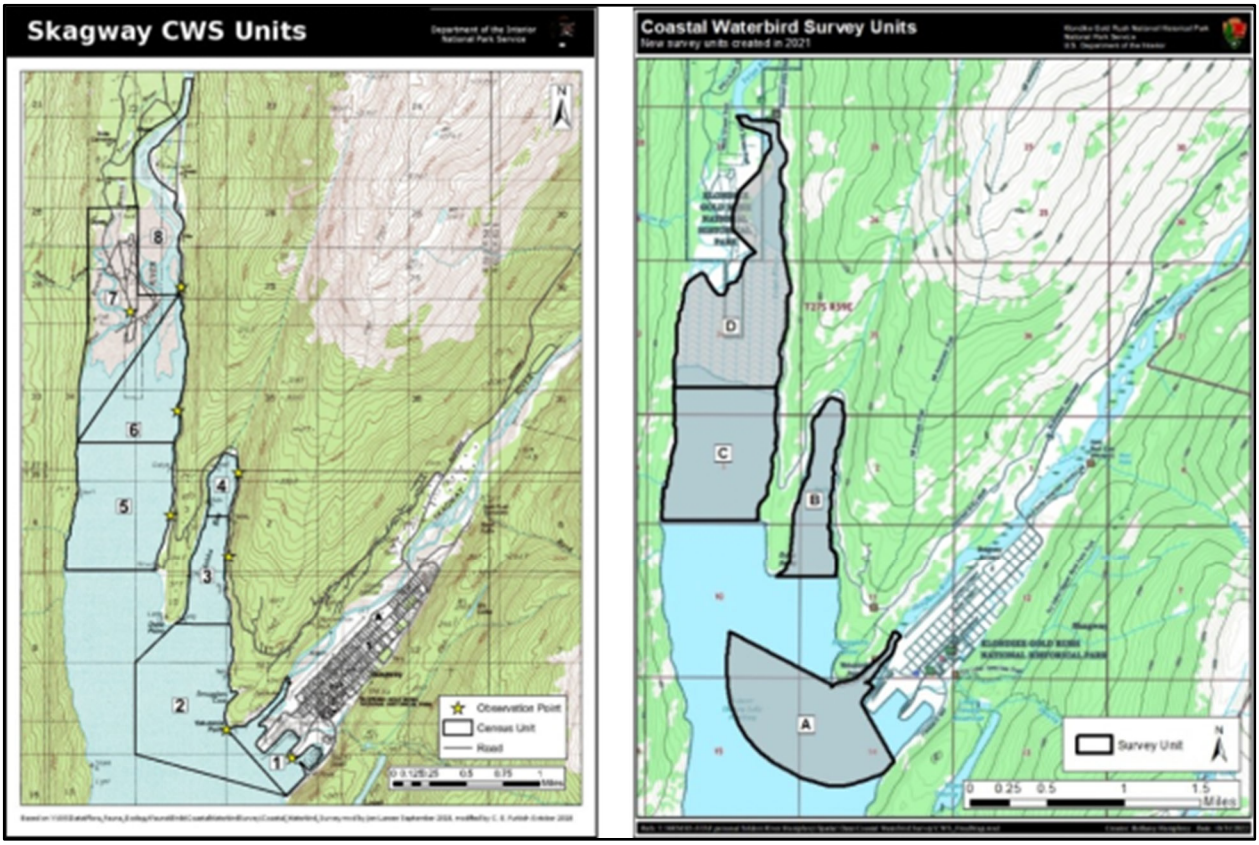


Figure 1. CWS units: original 2004-2019 (left) compared to new 2021-2022 (right).

Survey schedule windows were designed to capture 3 general periods:

- spring migration, weekly from mid-April to the end of May,
- mid-season during breeding and rearing, every two weeks in June, July and early August, and
- fall migration, weekly from mid-August to the end of September.

All waterbirds, and landbirds using aquatic resources, that were detected by sight or sound within the survey area were recorded. Data collection relied on bird identification skills of observers, using

Eagle Optics Ranger ED 8x42 binoculars and a Vortex Razor HD 16-48X65mm spotting scope. The Sibley Guide to Birds was used as the primary reference (Sibley 2001).

The field reference sheet for CWS birds and bird codes was updated with AOS nomenclature and code changes. Some codes for recently lumped species were retained at the pre-lumped code to keep consistency in the CWS data set and allow flexibility to analyze at the subspecies or species level. KLGO-specific codes for multi-species groups were standardized. A new version of the CWS Bird Code List was prepared for 2023 (Appendix A).

After testing prototypes in 2021 and 2022, two new field data sheets were developed to record environmental information, and bird species counts (Appendix A). Changes from previous versions included:

- air temperature from the NWS-PAGY automated weather station at the mouth of the Skagway River replaced data collection within each unit using a metal rod handheld thermometer,
- wind direction from the NWS-PAGY automated weather station replaced data collection within each unit using a handheld anemometer and/or a compass and tell-tale ribbon,
- tide phases and movements calculated from NOAA Tide Predictions for Skagway replaced visual categorical assessment within each unit, and
- breeding status indicators (plumage, behavior) for individual birds was dropped.

In addition, the weather from the Taiya River bridge RAWS-DWSA2 was recorded to determine if it would be a better source of data for Units C and D. Alternate weather stations were identified for both PAGY and DWSA2 in the event the primary weather station was out of service.

In 2022, a spreadsheet was created to manage digitized CWS data. All data from 2021 and 2022 were manually entered and verified in accordance with the park's 2-person quality assurance and quality control procedure. The spreadsheet included simple summation tables and charts.

### BBS - Breeding Bird Survey

The BBS is a cooperative effort between the U.S. Geological Survey's (USGS) Patuxent Wildlife Research Center and Environment Canada's Canadian Wildlife Service to monitor the status and trends of North American bird populations using standardized survey routes along existing roads. (www.pwrc.usgs.gov/NABBS).

The Skagway BBS route is approximately 25 miles long with stops every half mile (Appendix B). As per theBBSStandard Procedures, a 3-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 documented. The survey begins a half hour before sunrise - at our latitude of 59.5N, approximately 3:30am.

Additional information on the standardized methods for conducting this survey can be found at the Patuxent Wildlife Research Center web site above.

### ALMS - Alaska Landbird Monitoring Survey

The ALMS is coordinated by USGS Alaska Science Center (www.usgs.gov/centers/asc/science/alaska-landbird-monitoring-survey). It was developed by Boreal Partners in Flight, a consortium of agencies and individuals, to monitor breeding populations of Alaska landbirds in roadless areas as a complement to data collected from the roadside BBS. (www.usgs.gov/centers/asc/science/about-boreal-partners-flight)

Two ALMS routes are sponsored by KLGO. The Dyea route is located on the Dyea Flats in river delta habitat of meadows transitioning to successional woodland. The Chilkoot route is located near the beginning of the Chilkoot Trail in river valley forest habitat. Each route consists of 12 stops located at least 250 meters apart. Each stop is surveyed for 10 minutes, and all species detected are documented. The survey begins a half hour before sunrise - approximately 3:30am.

In 2022, KLGO provided a handheld field mapping tablet with georeferenced maps to assist finding survey points and GPS capability to record changes. Updated maps are given in Appendix C.

Additional information on the standardized methods for conducting this survey can be found at the USGS Alaska Landbird Monitoring Survey website above.

### BENM - Bald Eagle Nest Monitoring

The BENM project at KLGO was initiated to monitor the presence and nesting success of Bald Eagles, and to bring consistency to the many observations of eagle nests that had been contributed by interested park staff, community members and visitors to Skagway over the years (Surdyk 2017).

The BENM project is still a work in progress at KLGO. A map of known, historical and suspected eagle nests is given in Appendix D. A protocol has not been completed; however observations are recorded by KLGO staff during CWS surveys. In addition, observations from interested parties are encouraged and make up the bulk of data for some years prior to 2020. In 2021 and 2022, consistent observations made on two nests during CWS surveys, and a few community sightings were received.

### Miscellaneous Activities

Records of bird sightings are often contributed by staff or made available from the community every year. Citizen Science projects such as eBird and iNaturalist provide platforms for enthusiastic birders. The Skagway Bird Club members and the Facebook page “Skagway, Naturally!” have also been sources of additional local information. Some limited observations were obtained from park staff and the Skagway Bird Club in 2021-2022.

Arctic Tern nesting colonies in Skagway attract interest when they nest near easily viewed areas or near the airstrip. In 2022, a KLGO volunteer visited a roped-off and signed area on the Ore Peninsula designated for tern nesting. The area was visited when the volunteer’s schedule allowed from 27 May to 15 July. Presence/absence of terns, and behaviors indicating courtship or nesting were recorded.

# Results

All bird names used in this report follow the standardized American Ornithological Society unique common names for North American birds unless otherwise indicated (Chesser 2023).

### 2020 Bird Use at a Small Site in Dyea

An in-depth look at bird use and habitat in a 14-acre bottomland site in Dyea was accomplished in 2020. Forty-six (46) species were identified at the survey site, 29 species had some level of conservation concern with the State of Alaska and/or bird conservation organizations. The Chestnut-backed Chickadee, a species of high vulnerability for population decline, was among the 28 species confirmed breeding within the site. Birds that prefer edge habitat, interior habitat, and habitat generalists were associated with the site. (Furbish 2020).

### CWS - Coastal Waterbird Surveys

Coastal Waterbird Surveys were accomplished in 2021 and 2022. In 2021, 6 people participated in 14 CWS surveys, most often 1 or 2 at a time. Due to logistical problems, only one survey was completed in September 2021. In 2022, 8 people participated in 18 surveys, most often 2 or 3 at a time. The full targeted season from mid-April to the end of September was covered in 2022 (Table 1).

Table 1. CWS survey periods and dates for 2021 and 2022.

| Time period | 2021 | 2022 |
|---|---|---|
| Spring migration<br>Mid-April to end of May<br>weekly | April 16, 23<br>May 1, 7, 14, 21 | April 15, 22, 28<br>May 6, 13, 17, 20 |
| Summer breeding & rearing<br>June, July and early August<br>every other week | June 11<br>July 10, 23<br>August 7 | June 6, 24<br>July 8, 22 |
| Fall migration<br>mid August to mid September<br>weekly | August 14, 21, 27<br>Sept 3 | August 12, 19, 26<br>Sept 4, 9, 17, 30 |

Fifty-five (55) species of birds and 13 KLGO species groups, were counted between 2021 and 2022. Table 2 presents species and species groups by name and indicates presence by year. The Sharp-tailed Sandpiper was the first record of this species for Skagway.

Table 2. CWS list of waterbird species recorded in 2021 and 2022.

| Species common name or KLGO species group | 2021<br>X=present | 2022<br>X=present |
|---|---|---|
| American Pipit | X | X |
| American Wigeon | X | X |
| Arctic Tern | X | X |
| Bald Eagle | X | X |
| Barrow's Goldeneye | X | X |

| Species common name or KLGO species group | 2021 X=present | 2022 X=present |
|---|---|---|
| Belted Kingfisher | X | X |
| Black Scoter | | X |
| Blue-winged Teal | X | X |
| Bonaparte's Gull | X | X |
| Bufflehead | X | X |
| Canvasback | | X |
| Common Goldeneye | X | X |
| Common Loon | X | X |
| Common Merganser | X | X |
| Common Raven | X | X |
| duck species (KLGO species group) | X | X |
| Dunlin | X | |
| Gadwall | | X |
| Glaucous-winged Gull | X | X |
| Glaucous Gull | | X |
| goldeneye species (KLGO species group) | | X |
| Great Blue Heron | X | X |
| Greater Scaup | X | X |
| Greater White-fronted Goose | | X |
| Greater Yellowlegs | X | X |
| grebe species (KLGO species group) | | X |
| Green-winged Teal | X | X |
| gull species (KLGO Species group) | X | X |
| Harlequin Duck | X | X |
| Herring Gull | X | X |
| Herring x Glaucous-Wing gull hybrid (KLGO species group) | | X |
| Horned Grebe | X | X |
| large gull species (KLGO species group) | X | X |
| Lesser Scaup | | X |
| Lesser Yellowlegs | X | X |
| Long-tailed Duck | X | |
| loon species (KLGO species group) | X | |
| Mallard | X | X |
| Marbled Murrelet | X | X |
| Merlin | | X |
| Northern Harrier | X | X |
| Northern Pintail | X | X |
| Northern Shoveler | X | X |
| Northwestern Crow (form of AMCR) | X | X |
| Pectoral Sandpiper | | X |
| Pigeon Guillemot | X | X |

| Species common name or KLGO species group | 2021 X=present | 2022 X=present |
|---|---|---|
| Red-breasted Merganser | X | X |
| Red-necked Grebe | X | X |
| Red-throated Loon | X | X |
| Ring-necked Duck | X | X |
| scaup species (KLGO species group) | X | X |
| scoter species (KLGO species group) | X | |
| Semipalmated Plover | X | X |
| Semipalmated Sandpiper | X | X |
| Sharp-tailed Sandpiper | | X |
| shorebird species (KLGO species group) | X | X |
| Short-billed Gull | X | X |
| small gull species (KLGO species group) | | X |
| small sandpiper species (KLGO species group) | X | X |
| Snow Goose | | X |
| Solitary Sandpiper | X | X |
| Spotted Sandpiper | X | X |
| Surf Scoter | X | X |
| Thayer's Gull (subspecies of Iceland Gull) | X | |
| Trumpeter Swan | X | X |
| Wandering Tattler | X | X |
| White-winged Scoter | X | X |
| yellowlegs species (KLGO species group) | X | |

Snow Geese at mouth of Skagway River, 7may2022 (Mike Konsler)

The total number of individual birds varied by unit (Figure 4 & Table 3). For both survey years, the highest number of birds was counted in unit D – the Taiya River Intertidal area. The lowest number of birds for both years was found in unit B - Nahku Bay.

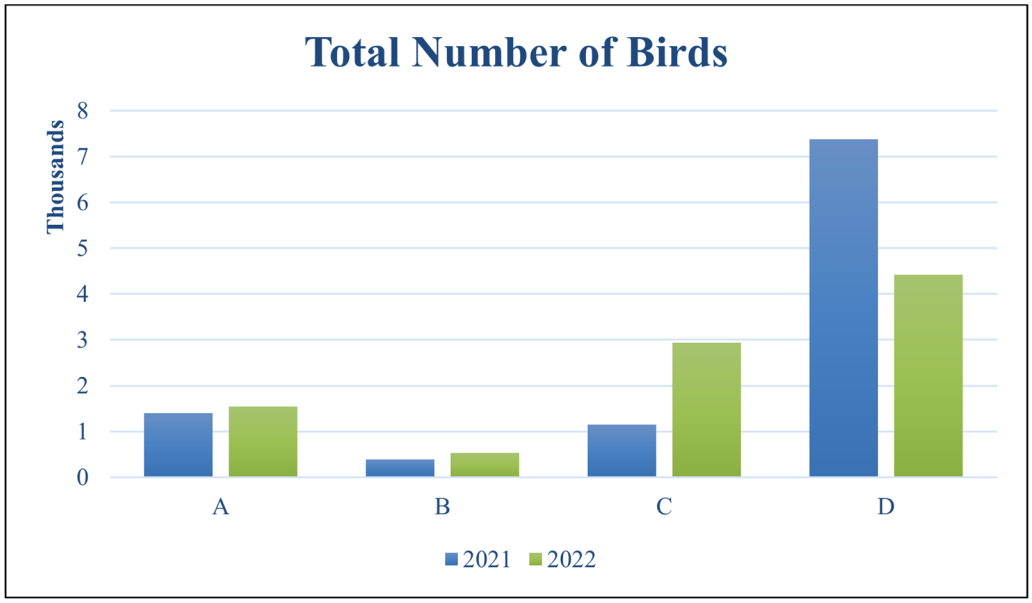


Figure 2. CWS total number of birds counted in 2021 and 2022, separated by unit.

Table 3. CWS number of individual birds by unit in 2021 and 2022.

| Unit | 2021 Total Number of Birds | 2022 Total Number of Birds |
|---|---|---|
| A – Skagway River | 1391 | 1548 |
| B – Nahku Bay | 384 | 529 |
| C – Dyea Outer Bay | 1148 | 2935 |
| D – Taiya River Intertidal | 7369 | 4423 |

Species richness, the number of species in an area, varied by unit and between years, following roughly the same relative pattern (Figure 5 & Table 4). The highest species richness was found in units D and A for both 2021 and 2022.

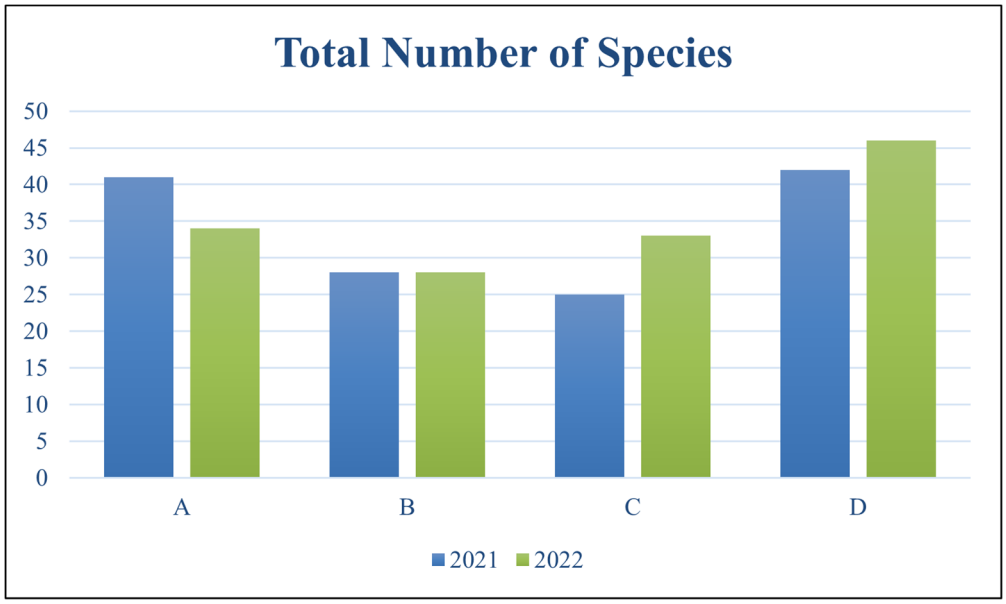


Figure 3. CWS species richness (number per unit) in 2021 and 2022.

Table 4. Species richness (species per unit) in 2021 and 2022.

| Unit | 2021 Number Species | 2022 Number of Species |
|---|---|---|
| A – Skagway River | 41 | 34 |
| B – Nahku Bay | 28 | 28 |
| C – Dyea Outer Bay | 25 | 33 |
| D – Taiya River Intertidal | 42 | 46 |

### BBS - Breeding Bird Survey

No BBS survey was done in 2020. The 2021 and 2022 BBS surveys were accomplished by a proficient birder with many years of experience with the route, assisted by KLGO staff.

The 2021 survey was performed on 11 June, the 2022 survey on 16 June. Data were submitted to the U.S. Geological Survey's (USGS) Patuxent Wildlife Research Center and archived at KLGO. Data are made available to researchers for analysis and reporting.

### ALMS - Alaska Landbird Monitoring Survey

KLGO hosts 2 ALMS routes: the Chilkoot route and the Dyea route. No ALMS surveys were done in 2020. In 2021 and 2022 the surveys for both routes were performed by a proficient birder with many years of experience with the routes, assisted by KLGO staff. In addition, the survey points on both routes were updated during data collection in 2022 using georeferenced field maps and GPS field checks.

The Chilkoot Route was surveyed on 17 June 2021 and on 15 June 2022. The Dyea Route was surveyed on 18 June 2021 and on 14 June 2022. Data and updated route maps were submitted to ALMS program administrator Collen Handel, Research Wildlife Biologist, USGS Alaska Region.

### BENM - Bald Eagle Nest Monitoring

No systematic survey of eagle nests was made in 2020, 2021 or 2022. When CWS surveys resumed in 2021 and 2022, two eagle nests were checked for activity during each survey. Those nests were DY01 and DY02 (see map, Appendix D). Table 5 presents the dates and observations for Bald Eagle nests seen during the CWS survey.

Table 5. Activity at two Bald Eagle nests reported during CWS in 2021 and 2022.

| Date | DY01 (Dyea outer bay west side) | DY02 (Taiya River hillside southeast NPS campground) |
|---|---|---|
| 2021 April 23 | | 1 adult sitting on nest |
| May 01 | | 1 adult sitting on nest |
| May 07 | | 1 adult sitting on nest |
| May 14 | | 1 adult sitting on nest |
| May 21 | 1 adult sitting on nest | 1 adult sitting on nest |
| June 11 | 1 adult sitting on nest | 1 adult sitting on nest |
| Aug 21 | 1 adult in tree next to nest tree | |
| Aug 27 | 1 juvenile perched on edge of nest | |
| | | |
| 2022 May 27 | 2 adults perched near nest | |
| July 08 | 2 adults at nest | |
| July 22 | 1 adult perched near nest | |
| | | |

A few additional sightings of Bald Eagle activity at some nests were received in 2021 and 2022 by other KLGO staff or through the Skagway Bird Club (SBC) forum and are listed in Table 6.

Table 6. Other reports of Bald Eagle nest activity in 2021 and 2022.

| Date | Source | Nest | Activity |
|---|---|---|---|
| **2021** Apr 23 | SBC | DY02 (nest up by "Hackett Hill) | 1 adult eagle tending to nest, behavior matching sitting on egg. Second adult eagle perched in nearby tree. |
| July 08 | SBC | DY01 (Dyea outer bay west side) | 2 adults on nest, one dropping head down several times into center of nest. |
| July 10 | KLGO | TR02 (Taiya River west side, across from NPS campground) | 1 adult sitting in tree near nest, no eagles at nest |
| Sept 24 | SBC | nest on Taiya River, south of West Creek (DY03, CT01 or CT02) | 1 adult adding a branch to a nest that had partially fallen down a couple of years ago |
| Oct 4 | KLGO | Nest near Kinneyville (DY03, CT01 or CT02) | Tree with large & small eagle feathers, trunk stained by droppings, pellets with large bones on ground |
| **2022** Apr 16 | SBC | TR02 (Taiya River west side, south of Taiya River bridge) | 1 adult with dried grass in talons, landed in nest |
| Apr 25 | SBC | DY02 (Dyea nest above road) | Pair of adult eagles in nest. |

CWS and incidental sightings together record adult behavior at some eagle nests consistent with breeding activity. However, DY01 in 2021 was the only nest with the confirmation of successful breeding sighting of a juvenile at a nest. Strong adult breeding behavior indications at DY02 in 2021 were noted, making it likely that breeding was attempted at that nest.

Figure 4. Digestive pellet with bones found under suspected active Bald Eagle nest tree. (NPS /Alex Leigh)

## Miscellaneous Activities

### *Community and Citizen Science Observations*

Records of bird sightings are often contributed or made available from the community every year. At least one active Facebook page, "Skagway, Naturally!" includes posts and photos about local birds. The Skagway Bird Club members are also a source of additional information. Citizen Science projects such as eBird and iNaturalist provide platforms for enthusiastic birders. Some efforts were made to enhance citizen science to support Skagway community and KLGO Natural Resource Management (NRM) program.

In January 2022, the NRM program asked eBird to add Skagway to their county (borough) list so that more local community birders would be attracted to use eBird. Skagway is lumped with Gustavus, Hoonah, Pelican, Angoon and other towns closer to the outer coast, making it difficult for Skagway birders to find each other's sightings. Unfortunately, eBird did not respond to the request.

In spring 2022, the NRM program produced an informational flyer about iNaturalist for distribution at the KLGO visitor center and Trail Center. The flyer explained how to use iNaturalist and provided a QR code for easy access to the site for visitors.

No consolidation of general bird sighting records from the sources above was made from 2020 to 2022. However, some Skagway Bird Club sightings were acquired for Bald Eagle nests and Arctic Tern breeding colonies.

### *Arctic Tern*

Arctic Tern nesting colonies in Skagway attract interest when they nest in easily viewed sites. The Skagway Bird Club has periodically monitored these areas since 2016. In 2021 and 2022, the Bird Club documented nesting activity in two areas: a large nesting colony site on a partially vegetated gravel river bar adjacent to the airstrip (airstrip bar), and a few nests within a special roped-off protected area on the Ore Peninsula designated by the Municipality of Skagway as an Arctic Tern nesting area (protected area).

In late April and May 2021, the Bird Club recorded high tern nesting activity at the airstrip bar, with approximately 65 adult terns showing nesting behavior at the site. However, a series of high river events in June displaced the terns to a nearby bar, and by the end of June the terns abandoned the area. At the protected area in May 2021, a few tern pairs displayed nesting behavior, but no observations to confirm successful breeding were recorded.

In May 2022, Skagway Bird Club members recorded a few terns showing nesting behavior in the protected area, and a few terns showing nesting behavior and one egg at a nearby Ore Peninsula site. The egg was not found the day after it was reported. The airstrip bar had been flooded and was no longer present at the former colony site. Later that year, the Club received a report about a new large Arctic Tern nesting colony in 2022 at a site on the Skagway River north of town.

Also in 2022, a KLGO volunteer visited the Ore Peninsula protected area periodically and reported on Arctic Tern activity (Table 6)

**Table 7. Arctic Tern activity at Ore Peninsula protected area, 2022.**

| Date 2022 | Start Time | Duration (minutes) | Observation |
|---|---|---|---|
| May 27 | 11:00 am | 45 | -Tern spotted flying up from ground near chain-link fence across from Temsco.<br>-Male and female pair sitting together in the protected area, seen leaving and returning together<br>-Pair seen hovering together over the protected area briefly before departing |
| May 31 | 2:30 pm | 30 | -Four terns spotted circling above the protected area upon approach<br>-One tern landed briefly in the protected area before taking off |
| June 10 | 1:15 pm | 25 | -One tern flying circles around the protected area. Chases off crows coming near. Remains overhead the entire visit<br>-Two terns seen chasing each other around. One is carrying a fish. Both land together within the protected area and stay<br>-One sentinel tern seen on fence at back of protected area |
| June 15 | 2:00 pm | 20 | -One tern sitting on a nest in protected area. Number of eggs is unknown |
| June 22 | 4:30 pm | 20 | -No terns observed |
| June 25 | 5:20 pm | 20 | -No terns observed |
| June 29 | 5:00 pm | 15 | -No terns observed |
| July 02 | 5:15 pm | 25 | -No terns observed<br>-Scent of decay nearby |
| July 08 | 12:00 pm | 10 | -No terns observed |
| July14 | 6:20 pm | 15 | -No terns observed |
| July 15 | 5:25 pm | 15 | -No terns observed |

The combined Skagway Bird Club and KLGO volunteer reports on Arctic Tern nesting indicate the terns continue to show some interest in the Ore Peninsula protected area each year, had abandoned the airstrip bar after it was flooded in 2021, and that a larger colony had moved to a river bar north of town by 2022.

***Assistance to Other Organizations***

In 2021, KLGO assisted the U.S. Fish and Wildlife Service (USFWS) with collection and transport of a dead Bald Eagle. The eagle remains were found frozen in wrack and wood at Nahku Bay by participants in the COASST beached bird citizen science monitoring program. KLGO documented, collected, and transported a dead Bald Eagle to USFWS-Juneau, where it was sent to the National Eagle Repository which distributes dead Golden and Bald Eagle parts and feathers to Native Americans and Alaska Natives who are enrolled members of federally recognized tribes throughout the United States.

Figure 5. Bald Eagle remains found in wrack at Nahku Bay 11march2023 (NPS /C. E. Furbish)

In 2022, KLGO and the Skagway Bird Club coordinated collection of bird behavior observations and bird carcasses in Skagway during an Alaska outbreak of Highly Pathogenic Avian Influenza (HPAI). KLGO documented 5 American Crows, 1 Steller's Jay and 1 Rufous Hummingbird. KLGO packaged and transported the dead birds with assistance of the USFWS in Juneau and Anchorage. The birds were processed by USFWS-Anchorage and forwarded to the Alaska State Veterinarian for testing. During the time when the dead birds were collected, other birds exhibited behavioral symptoms associated with HPAI. However, none of the carcasses tested positive for HPAI.

Pigeon Guillemot pair near Skagway Ore dock, 21august2021 (Ray Tsang)

# Discussion & Recommendations

The established bird monitoring programs currently ongoing at KLGO work together to provide long-term essential information about park avian resources. Special bird studies provide short-term intensive investigations of birds when needed to address management, scientific or conservation needs. Birds and the habitats they use are important natural resources and indicators of environmental health and change. They are also popular and interesting to park visitors and a part of the "wild Alaska" mystique that contributes to the local tourism economy.

The BBS and ALMS long-term continental and state programs, respectively, are designed to produce population status information across large spatial areas. The two park-specific programs, CWS and BENM, are designed to produce more detailed local information on two very visible, ecologically important, and potentially at-risk avian resources: coastal waterbirds and the near-shore habitats they use; and Bald Eagle nests and breeding success. The 2020 special bird study targeted a specific habitat in Dyea to support planning for visitor services improvements.

### 2020 Bird Use at a Small Site in Dyea

An in-depth look at bird use and habitat in a small, 14-acre bottomland site in Dyea was accomplished in 2020. The report, "Bird Use Survey of a Small Bottomland Wooded Habitat in the Dyea Management Unit of of Klondike Gold Rush National Historical Park, September 2020" described density and diversity of breeding birds in the area, analysis of the nesting habitat distribution of generalist, edge-preference, and interior-preference birds (Furbish 2020).

### CWS – Coastal Waterbird Survey

The KLGO CWS monitors bird use of near-shore habitats, with focus on migratory waterbirds. Near-shore habitats are crucial for many species, not just birds, and are spatially limited in Skagway. Despite the lack of vast intertidal or wetland areas, the area is used by a diversity of waterbirds, some under threat due to population decline. The CWS provides critical information on the status of waterbirds at KLGO.

The North American Bird Conservation Initiative (NABCI), a coalition of state and federal government agencies, private organizations, and bird initiatives, reported in 2022 that bird populations in the United States are declining overall in every habitat except in wetlands (NABCI 2022). In particular, sea duck and shorebird populations have declined by a third since the 1970s. While other waterbirds strongly linked to wetland habitat have increased overall, tipping point species have experienced steep declines. Tipping point species were defined as having lost half or more of their breeding population since 1970, and are on track to lose another half or more in the next 50 years. Six (6) tipping point waterbird species have been recorded in the KLGO CWS: American Golden-Plover, Hudsonian Godwit, Lesser Yellowlegs, Semipalmated Sandpiper, Wandering Tattler, and Yellow-Billed Loon.

The CWS has an intensive monitoring schedule that requires trained field observers, ideally over multi-year periods. It has benefited from volunteers among park staff and the community to assist with field data collection, particularly members of the Skagway Bird Club who have developed

multi-year interest in the survey. It is essential to have at least one highly trained staff, contractor, or volunteer with bird identification skills to maintain the consistency of data and scientific integrity of this program, as the skills required to complete these surveys cannot be easily obtained through short-term on-the-job training.

Recognizing the CWS need for fundamental design review and updated operational procedures, KLGO requested Technical Assistance from NPS Alaska Regional Office experts for an Operational Design Review. The KLGO annual bird report for year 2018 presented extensive recommendations for changes to the CWS in Appendix B (Furbish and Larsen 2019). The modifications made to the CWS in 2021 and 2022 address some of the preliminary results of the review and the recommendations in the 2018 report by focusing on detecting large population shifts through annual species counts at targeted high-value habitat areas. However, the more extensive data on sex distribution, maturity, plumage, and breeding behavior that had become part of the CWS should be performed for at-risk species of concern when needed, and repeated periodically at 5-10 year intervals for long-term comparisons. Immediate needs include updated protocols and a data management spreadsheet or database.

### BBS – Breeding Bird Survey and ALMS – Alaska Landbird Monitoring Survey

Through sponsorship of the BBS and ALMS programs, KLGO participates in efforts to understand regional and continental changes in bird populations. All birds are recorded; however, the survey is timed to detect migratory breeding birds. Of breeding birds that occur at KLGO, at least 29 species have some level of conservation concern with the State of Alaska and/or bird conservation organizations. One breeding songbird, the Chestnut-backed Chickadee, was identified as under threat due to overall high vulnerability for population decline at regional, state and national levels (Furbish 2020).

The BBS and ALMS provide the only consistent systematic data on breeding birds at KLGO and surrounding area. At the local level, these programs can help the park understand the significance of changes seen in Skagway Borough and to separate local effects from larger influences. KLGO gets a high return on its investment with these programs by supporting a skilled, dedicated birder for a few days each year. KLGO should continue to support these programs.

### BENM – Bald Eagle Nest Monitoring

The BENM project has nest descriptions and locations for the river delta areas, some historic records, several annual observations for some nests, and the benefit of eager volunteers when KLGO can provide them with a mechanism to report their observations.

BENM operational protocols and database have not been completed. Preliminary protocols from 2018 were intended to be reviewed by and made compatible with USFWS Standard Operating Procedures for Bald Eagle monitoring to promote data sharing between the NPS and USFWS (Surdyk and Evans 2018). This would facilitate KLGO consultation and/or permitting with the USFWS when indicated by the Bald and Golden Eagle Protection Act.

Reliable and current information on the location and status of Bald Eagle nests is needed for KLGO environmental planning and compliance. Until full development and implementation of a structured protocol, this project could improve through development of a minimal framework and tools for data collection, increased natural resource staffing to take on the workload, and outreach efforts by existing staff to acquire volunteers early in the nesting season to assist NPS in monitoring efforts.

### Miscellaneous Activities

Social media pages and citizen science portals continue to be the most comfortable venue for KLGO staff and visitors to report bird sightings. The NRM program should continue to engage eBird when possible and produce a framework for allowing KLGO staff to use iNaturalist.

Although Arctic Tern colony monitoring is not part of KLGO bird surveys, NRM can contribute to the Skagway Bird Club effort to monitor the status of tern reproduction when a KLGO volunteer is available to visit easy-to-access locations like the Ore Peninsula protected area.

As a federal resource management entity, KLGO should continue the role of support to other agencies or organizations concerned with conservation of avian resources.

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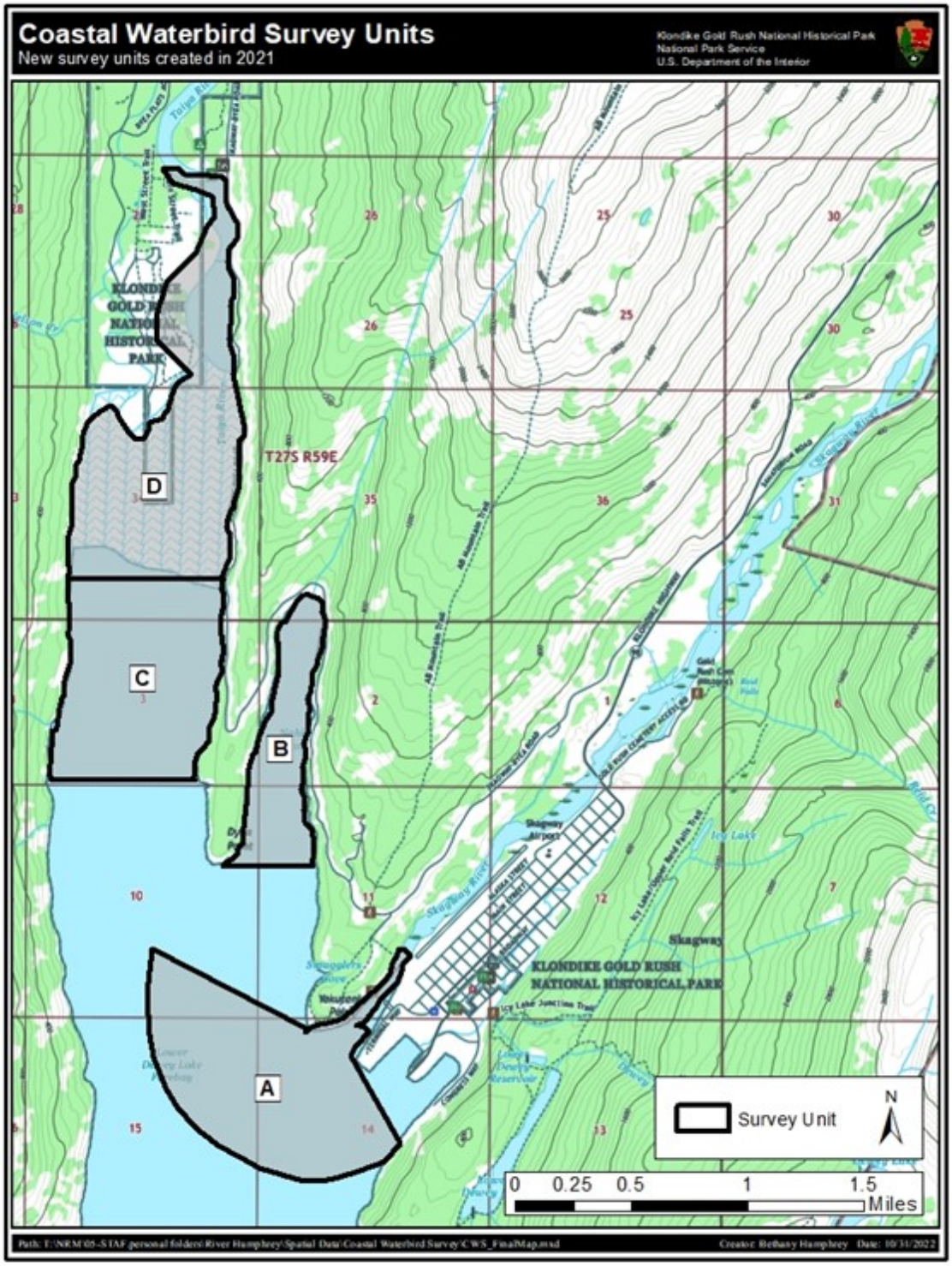
# Appendix A. CWS - Coastal Waterbird Survey



KGLO CWS - environment field data (2022 v.4)

DATE:_____

| Unit | A Skagway River | B Nahku Bay | C Dyea Outer Bay | D southeast Flats + Taiya River |
|---|---|---|---|---|
| start time (to 5 min) | | | | |
| stop time (to 5 min) | | | | |

FIELD (codes) - predominant for unit

| | | | | |
|---|---|---|---|---|
| sky | | | | |
| precip | | | | |
| wave | | | | |

TIDE code - calculate from predicted tides

| | | | | |
|---|---|---|---|---|
| tide | | | | |

WEATHER (codes) - post field, to nearest hour

| unit | A | B | C | D | C | D |
|---|---|---|---|---|---|---|
| 1° station | PAGY | PAGY | PAGY | PAGY | DWSA2 | DWSA2 |
| (alt-station) | | | | | | |
| air temp (F) | | | | | | |
| wind avg (mph) | | | | | | |
| wind gust (mph) | | | | | | |
| wind dir (cardinal 8) | | | | | | |

**SKY**

1) clear, 0-10% clouds
2) scattered,11-50%
3) broken, 51-90%
4) overcast, 91-100%

**PRECIP – PRECIPITATION**

1) none
2) fog

3) drizzle
4) showers (intermittent)
5) light rain (steady)
6) heavy rain (steady)

7) sleet
8) light snow
9) heavy snow

**TIDE**

HI = high tide +/- 1.5 hours
MED = between HI and LO
LO = low tide +/- 1.5 hours

**WAVE – WAVE FORM**

0) calm, mirror-like
1) scaly ripples

2) small wavelets, glassy crests, no breaking

3) large wavelets, crests begin to break scattered whitecaps

4) small waves, numerous whitecaps

5) moderate waves, many whitecaps, chance spray

6) large waves, extensive whitecaps everywhere, some spray

7) large waves, crests break with spray briefly blowing in wind direction, foam from crests forming streaks on water

8) large, high waves, crests break into spray blown in wind direction, foam forms well-marked long streaks on water in wind direction

Predicted Tides (bracket survey)

high _____ am pm low _____ am pm

high _____ am pm low _____ am pm

(alt-station) alternate weather station

alt for PAGY: SKXA2 = ferry terminal
alt for PAGY: SKTA2 = ore dock

alt for DWSA2: TYAA2 = TaiyaR HADS
(air temp only)

other? put in comments

COMMENTS:

KGLO CWS - species field data (v.2022)

DATE:_____

Observers: page ____ of ____

| comment # | species code | row total | TALLY and/or + # (no elevens!) unit A – Skagway river B – Nahku bay C – Dyea outer bay D – Flats and Taiya river |
|---|---|---|---|
| | --- or unit change --- | | |
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Comments

## KLGO CWS - BIRD CODES LIST - STANDARD 4-LETTER CODES v.1 -- 2022

------- *In general, code lettering follows these rules* -------

If name is one word, then code is first four letters.
MALL Mallard

If name is two unhyphenated words, then code is first two letters of each word.
ARTE Arctic Tern

If name is a word and pair of hyphenated words, then code is first letters of hyphenated words and first two letters of unhyphenated word
BWTE Blue-winged Teal
AMGP American Golden-Plover

If name is three words, then code is the first letter of each of the first two words, and the first two letters of the third word.
GBHE Great Blue Heron

When two or more species would have the same code, one or both is given a unique, ad hoc code.
BANS Bank Swallow
BARS Barn Swallow

Often mistaken: unique codes highlighted in gray below, and regular codes in italics and very light gray.

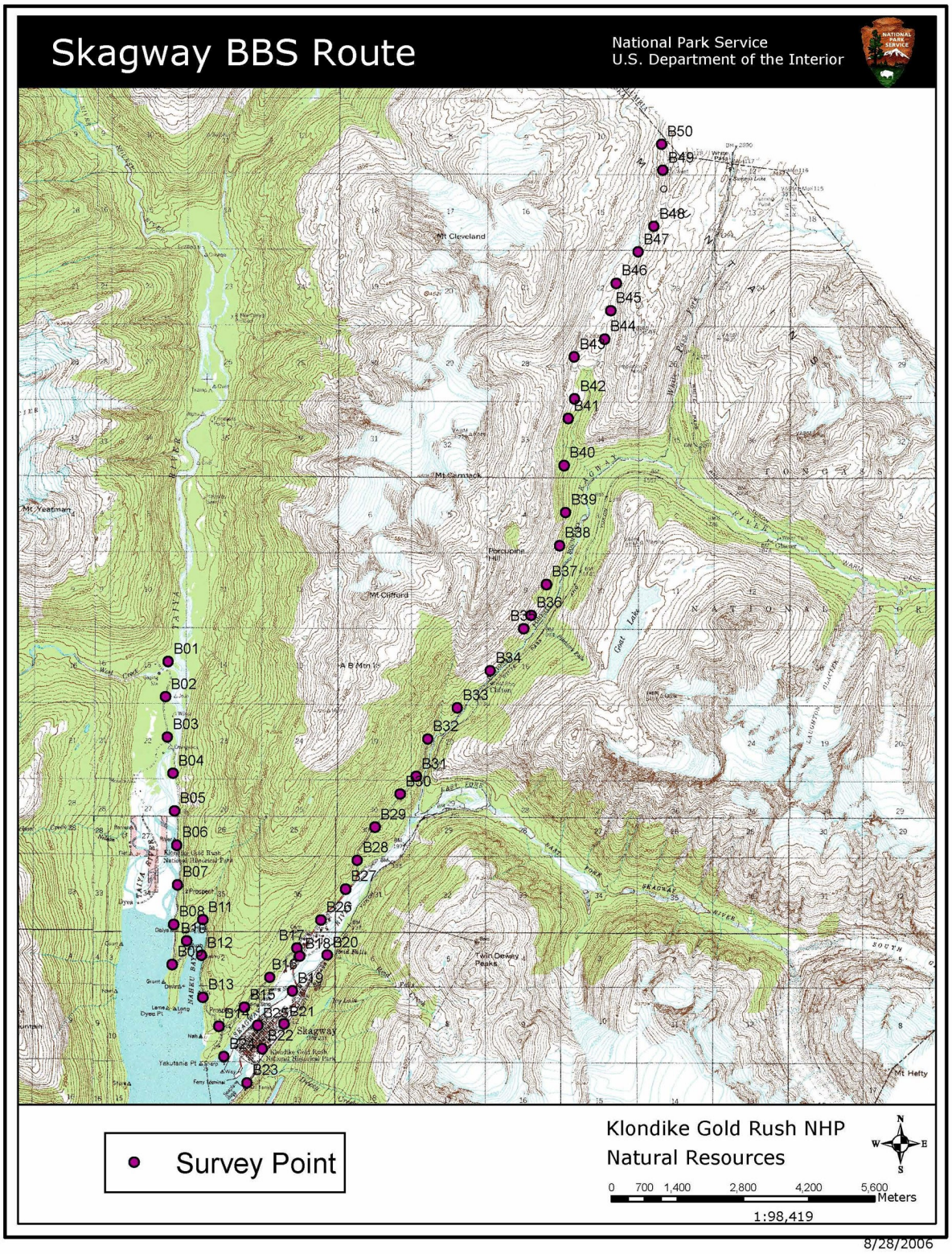
| code | common name |
|---|---|
| AMDI | American Dipper |
| AMGP | American Golden-Plover |
| *AMKE* | *American Kestrel* |
| AMPI | American Pipit |
| AMRO | American Robin |
| AMWI | American Wigeon |
| ARTE | Arctic Tern |
| BAEA | Bald Eagle |
| BANS | Bank Swallow |
| BARS | Barn Swallow |
| BAGO | Barrow's Goldeneye |
| BEKI | Belted Kingfisher |
| SBLOY | Black Oystercatcher |
| BLSC | Black Scoter |
| BBPL | Black-bellied Plover |
| BLTU | Black Turnstone |
| BOGU | Bonaparte's Gull |
| BUFF | Bufflehead |
| BWTE | Blue-winged Teal |
| CACG | Cackling Goose (subsp of CANG) |
| CANG | Canada Goose |
| CANV | Canvasback |
| CATE | Caspian Tern |
| CLSW | Cliff Swallow |
| COGO | Common Goldeneye |
| COLO | Common Loon |
| COME | Common Merganser |
| CORA | Common Raven |
| (~~COSN~~) | (Common Snipe) renamed: WISN |
| DCCO | Double-crested Cormorant |
| DUNL | Dunlin |
| EUWI | Eurasian Wigeon |
| GADW | Gadwall |
| GLGU | Glaucous Gull |
| GWGU | Glacous-winged Gull |
| GBHE | Great Blue Heron |
| GRSC | Greater Scaup |
| GRYE | Greater Yellowlegs |
| GWFG | Greater White-fronted Goose |
| GWTE | Green-winged Teal |
| HALH | Harlan's Hawk (subsp of RTHA) |
| HADU | Harlequin Duck |
| HERG | Herring Gull |
| HOGR | Horned Grebe |

| code | common name |
|---|---|
| HOLA | Horned Lark |
| HOME | Hooded Merganser |
| HUGO | Hudsonian Godwit |
| KILL | Killdeer |
| LBDO | Long-billed Dowitcher |
| LESA | Least Sandpiper |
| LESC | Lesser Scaup |
| LEYE | Lesser Yellowlegs |
| LTDU | Long-tailed Duck |
| MALL | Mallard |
| MAMU | Marbled Murrelet |
| (~~MEGU~~) | (Mew Gull) renamed: SBGU |
| MERL | Merlin |
| *NOCR* | *Northwestern Crow (form of AMCR)* |
| NOHA | Northern Harrier |
| NOPI | Northern Pintail |
| NSHO | Northern Shoveler |
| NSHR | Northern Shrike |
| OSPR | Osprey |
| PAGP | Pacific Golden-Plover |
| PALO | Pacific Loon |
| PEFA | Peregrine Falcon |
| PESA | Pectoral Sandpiper |
| PIGU | Pigeon Guillemot |
| PISI | Pine Siskin |
| RBGU | Ring-billed Gull |
| RBME | Red-breasted Merganser |
| REDH | Redhead |
| RNDU | Ring-necked Duck |
| RNGR | Red-necked Grebe |
| RTHA | Red-tailed Hawk |
| RTLO | Red-throated Loon |
| RUBL | Rusty Blackbird |
| RWBL | Red-winged Blackbird |
| SACR | Sandhill Crane |
| SAPH | Say's Phoebe |
| SAVS | Savannah Sparrow |
| SBDO | Short-billed Dowitcher |
| SBGU | Short-billed Gull |
| SEOW | Short-eared Owl |
| SEPL | Semipalmated Plover |
| SESA | Semipalmated Sandpiper |
| SNBU | Snow Bunting |
| *SNGO* | *Snow Goose* |

| code | common name |
|---|---|
| SOSA | Solitary Sandpiper |
| SPSA | Spotted Sandpiper |
| SSHA | Sharp-shinned Hawk |
| SURF | Surfbird |
| SUSC | Surf Scoter |
| THGU | Thayer's Gull (subsp of Iceland Gull) |
| TRES | Tree Swallow |
| TRUS | Trumpeter Swan |
| TUPU | Tufted Puffin |
| TUSW | Tundra Swan |
| VGSW | Violet-green Swallow |
| WATA | Wandering Tattler |
| WESA | Western Sandpiper |
| WHIM | Whimbrel |
| WISN | Wilson's Snipe |
| WWSC | White-winged Scoter |
| YBLO | Yellow-billed Loon |
| **KLGO >species groups & hybrids: 6-letter codes** | |
| DUCK sp | duck species |
| GBPL sp | golden or blackbellied plover sp |
| GOLD sp | goldeneye sp |
| GOOS sp | goose sp |
| GOPL sp | golden-plover sp |
| GREB sp | grebe sp |
| GULL sp | gull sp |
| HAWK sp | hawk sp |
| LGGU sp | large gull sp |
| LOON sp | loon sp |
| MERG sp | merganser sp |
| SAND sp | sanderling sp |
| SCAU sp | scaup sp |
| SHOR sp | shorebird sp |
| SMGU sp | small gull sp |
| SPAR sp | sparrow sp |
| SWAL sp | swallow sp |
| SWAN sp | swan sp |
| YLEG sp | yellowlegs sp |
| | |
| HExGW | herring x glaucous-wing gull hybrid |
| | |
| | |
| | |
| | |

Not on list? Follow rules and enter a code, **but also write out name** in comment section of data sheet! Check later for standard code

# Appendix B. BBS - Breeding Bird Survey



# Appendix C. ALMS - Alaska Landbird Monitoring Survey

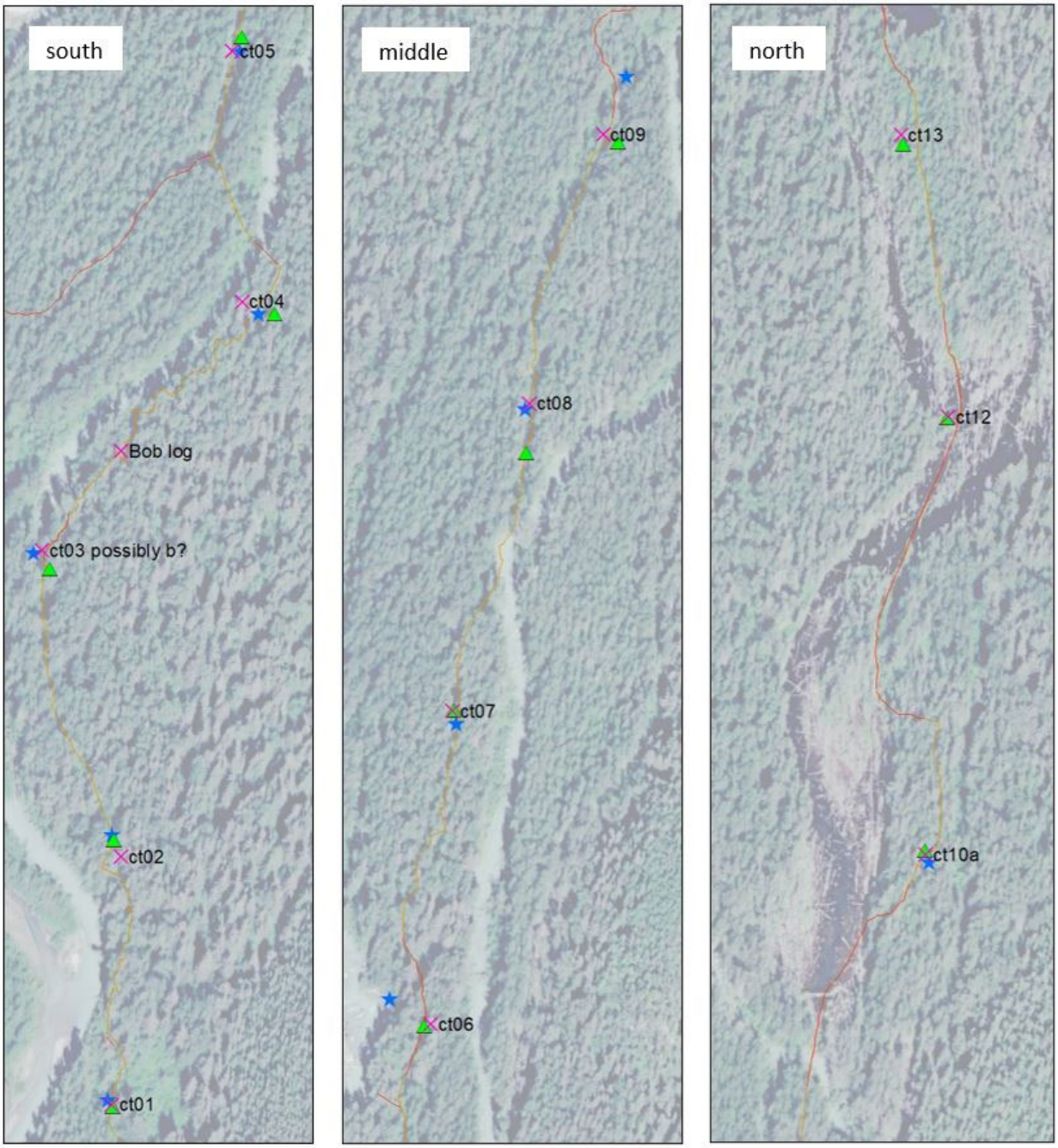
### Chilkoot ALMS Route 2022 point updates

blue star = 2009 ALMS point
green triangle = 2017-18 ALMS point
pink cross = 2022 ALMS point or nearby reference point

brown line = Chilkoot Trail

basemap image 2014 – KLGO GIS

scale 1:4,000 north ↑



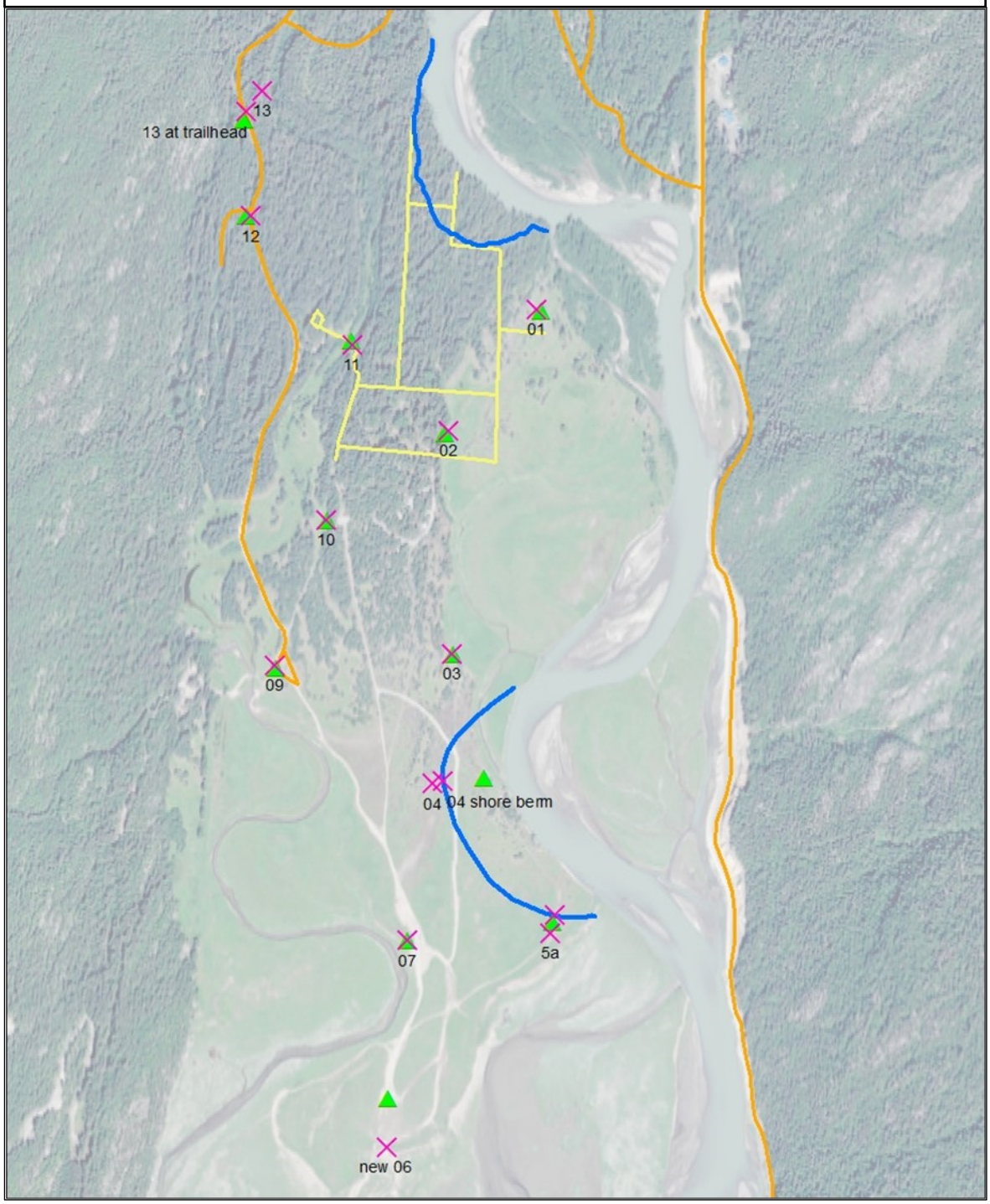
## Dyea ALMS Route 2022 point updates

pink cross = 2022 ALMS point or nearby reference point
green triangle = 2018 ALMS point

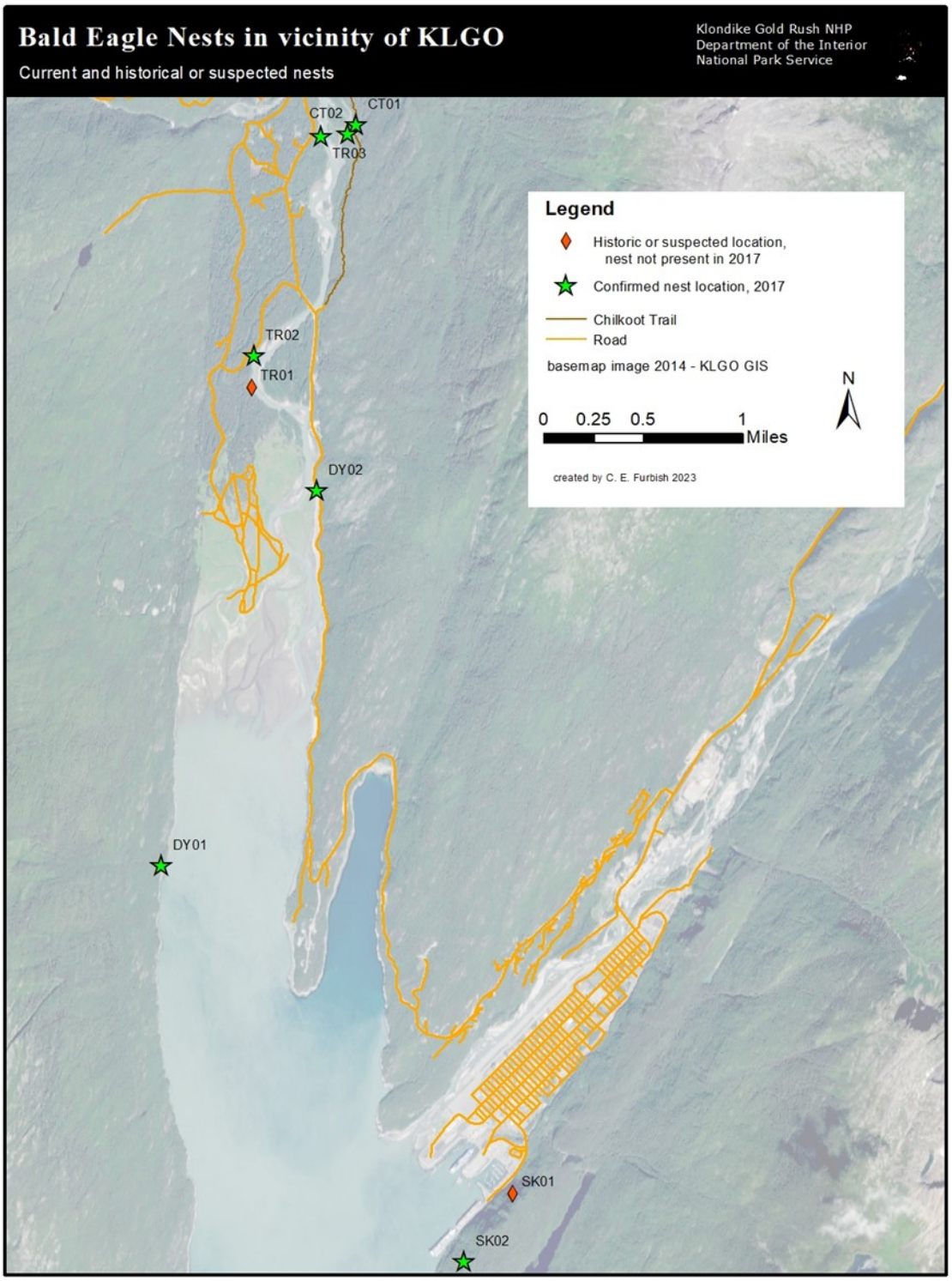
blue line = rapidly eroding shoreline
orange line = road
yellow line = trail

basemap image 2014 – KLGO GIS

scale 1: 12000 north ↑



# Appendix D. BENM - Bald Eagle Nest Monitoring



The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

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