



Bird Surveys at Klondike Gold Rush NHP

2018 Summary

Natural Resource Report NPS/KLGO/NRR—2019/1866





ON THIS PAGE

Mew Gull with normal coloration (left) and leucistic Mew Gull (right), 22April2018
(MIKE KONSLEER)

ON THE COVER

Trumpeter Swan feeding on emergent aquatic vegetation during spring migration, 3May2018
(ANDREW BEIERLY)

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Contents

	Page
Figures.....	v
Tables.....	v
Appendices or Appendixes	v
Abstract.....	vi
Acknowledgments.....	vii
Introduction.....	1
Methods.....	2
CWS - Coastal Waterbird Survey.....	2
BBS - North American Breeding Bird Survey	3
ALMS - Alaska Landbird Monitoring Survey	5
BENM - Bald Eagle Nest Monitoring.....	6
Results.....	7
CWS - Coastal Waterbird Surveys	7
BBS - North American Breeding Bird Survey	15
ALMS - Alaska Landbird Monitoring Survey	16
BENM - Bald Eagle Nest Monitoring.....	17
Incidental Observations	18
Discussion.....	20
CWS - Coastal Waterbird Surveys	20
BBS - Breeding Bird Survey and ALMS - Alaska Landbird Monitoring Survey.....	20
BENM - Bald Eagle Nest Monitoring.....	21
Conclusions & Recommendations	22
Literature Cited	24

Figures

	Page
Figure 1. CWS Species by Year 2003-2018.	13
Figure 2. CWS Peak Migration 2018.....	13
Figure 3. CWS Waterbird Species over Time 2003 – 2018.....	14
Figure 4. Hooded Merganser female carrying 2 chicks, June 2018.....	19

Tables

	Page
Table 1. CWS - List of Waterbird Species, Coastal Waterbird Survey, 2018.	8
Table 2. CWS - List of Landbird Species using Near-shore Resources, Coastal Waterbird Survey, 2018.	11
Table 3. CWS - List of Birds Identified to Genus or Family Level, Coastal Waterbird Survey, 2018.	12
Table 4. BBS - Species List for Breeding Bird Survey conducted on 14 June 2018.....	15
Table 5. ALMS - Species List for Alaska Landbird Monitoring Survey conducted on 12 and 13 June 2018.	16
Table 6. BENM- Observations List for Bald Eagle Nest Monitoring, 2018.....	17
Table 7. Selection of Notable Incidental Bird Observations, April to September 2018.....	19

Appendices or Appendixes

	Page
Appendix A. Maps	26
Appendix B. CWS and BENM suggestions	31

Abstract

Klondike Gold Rush National Historical Park (KLGO) conducted 4 bird monitoring programs in 2018. These programs are ongoing, multi-year efforts at continental, state, and park scales. In addition, selected notable incidental bird sightings were documented.

The Coastal Waterbird Survey (CWS) is a park-specific program designed to monitor bird use of near-shore habitats, with emphasis on migratory waterbirds. Data were collected from 14 April to 12 September, covering spring migration, mid-season, and fall migration periods. Fifty-six species of waterbirds and 13 species of non-waterbirds (landbirds) were recorded. A total of 15,271 individual birds were documented using the near-shore habitats on 20 survey days.

The North American Breeding Bird Survey (BBS) and Alaska Landbird Monitoring Survey (ALMS) are designed to document the presence and abundance of landbird species breeding in the area as part of continent-wide and state-wide programs. Conducted in mid-June, the BBS surveyor detected 32 species of birds, and ALMS surveyors detected 34 species.

Bald Eagle Nest Monitoring (BENM) is a park-specific program still under development. No systematic surveys were conducted, but opportunistic observations were received from park staff and community volunteers. Twenty-five reports were received on 5 eagle nests. Evidence of one chick was given, but there were no observations of successful fledging.

Notable incidental bird sightings not associated with the 4 monitoring programs were reported from in and around KLGO. These included the first confirmed breeding documentation for Hooded Mergansers in Skagway. A female Hooded Merganser carrying chicks was seen in a beaver pond on the Chilkoot Trail near the lower Taiya River.

Improvements were made to the CWS through updated GIS maps including georeferenced observation points, field-testing of new data sheet prototypes, and an auxiliary database to partially automate end-of-season data analysis and reporting.

- Suggestions for operational improvements to the CWS and BENM programs for the 2019 season are presented. Recommendations for long-term improvements to the CWS are discussed and summarized.

Acknowledgments

The authors thank KLGO park staff, local volunteers, and regional experts who were crucial to the completion of these surveys. CWS surveys depended on help from Skagway Bird Club volunteers Mike Konsler and Nora Zimmerly, and KLGO park staff: Linda MacIntyre, Rowan Afflerbach, Andreas Santi Laabes, Jami Belt and Annie Matsov. Cameron Eckert offered much appreciated, expert advice on species identification. Accomplished birder Deb Rudis performed the BBS and ALMS surveys, assisted by Jami Belt. Field observations of Bald Eagle nests were contributed by CWS field data collectors and KLGO biological technicians. In addition, Bob Fink of Skagway Hike and Float provided many valuable observations of eagle nests on the Taiya River. List of Terms, Small Glossary, Acronyms, or Contacts

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 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).

Four multi-year bird monitoring programs were active at KLGO during 2018:

- CWS – Coastal Waterbird Survey, a KLGO specific program,
- BBS – North American Breeding Bird Survey, a continent-wide program,
- ALMS – Alaska Landbird Monitoring Survey, an Alaska state-wide program, and
- BENM – Bald Eagle Nest Monitoring, a KLGO specific program.

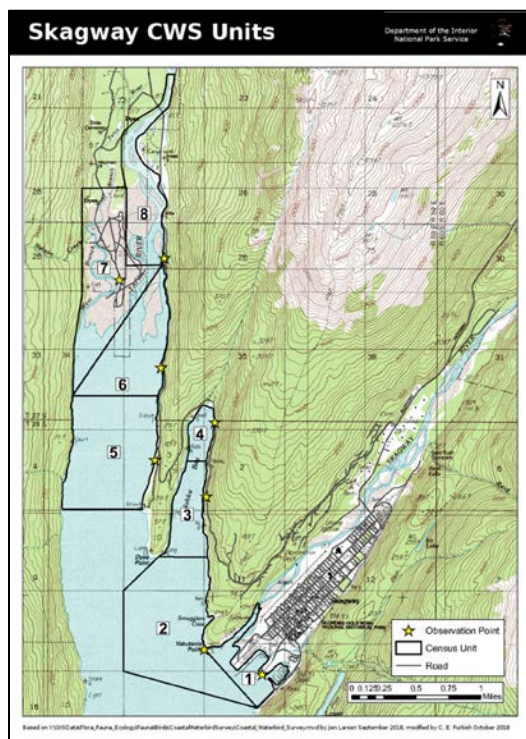
Notable incidental bird observations made outside the monitoring programs are also documented here.

Methods

CWS - Coastal Waterbird Survey

The Coastal Waterbird Survey (CWS) was developed by Klondike Gold Rush NHP (KLGO) as part of a comprehensive program to monitor the occurrence, distribution, abundance, and habitat associations of birds (Hahr and Trapp 2004). A primary goal was to gather information on the status of migrant and breeding birds in the Taiya Inlet (Payne, 2004).

Survey methodology is 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 (T:\NRM\Birds\Coastal Waterbird Surveys\Protocol). Within the Bird Monitoring Protocol, there are 7 Standard Operating Procedures (SOPs) developed or revised in 2009. SOPs 1, 2, 3 and 6, covering pre-season preparations, field data collection, and post-season maintenance guided these activities in 2018. SOPs 4, 5 and 7 covering data management, reporting and protocol revision are obsolete or have fallen out of use.



Thumbnail of CWS map (full-page map in Appendix A - Map A1)

The survey area consists of eight census units previously defined by Hahr and Trapp (2004). The units cover almost all of the fjord shoreline at the terminus of Taiya Inlet, including the lower reaches of rivers and streams. The reference map given in the body of the protocol did not match the reference map with the field data sheets (SOP 3, Appendix A), and led to confusion in the field early in the season. The protocol map also shows a “starting” or anchor observation point for most units,

but GIS data was not available for those points. Occasionally during previous years, census Unit 1 was only partially surveyed or dropped altogether due to cruise ship traffic. For the past several years, however, field data collectors have found that including Unit 1 was practical and productive. Therefore, Unit 1 was included in 2018 as described in the protocol (SOP 3).

SOP 1 recommends surveys be conducted once per week during spring migration (15 April to 15 May), every two weeks mid-season (15 May to 10 August), and weekly during fall migration (10 August to 15 September). The 2018 spring migration period was more spread out compared to previous years which had a distinctive migratory spike. Roughly weekly surveys were carried out from 14 April to 28 June. Mid-season surveys were performed about every 2 weeks from 28 June to 22 August. Surveys were done about weekly from 22 August to 12 September.

All waterbirds, and any non-waterbirds (landbirds) using near-shore resources, that were detected by sight or sound within the survey area were recorded. The protocol describes collection of data on taxonomic group, number of individuals, sex, maturity, and breeding status (SOP 3). During 2018, some surveys were recorded using the field data sheets used during recent years, or recorded in a notebook and later transferred to the data sheets. Following early season discussions about updating the data sheets, data collectors associated with the Skagway Bird Club developed and tested prototypes of an alternative set of field data sheets, and these were used for other surveys.

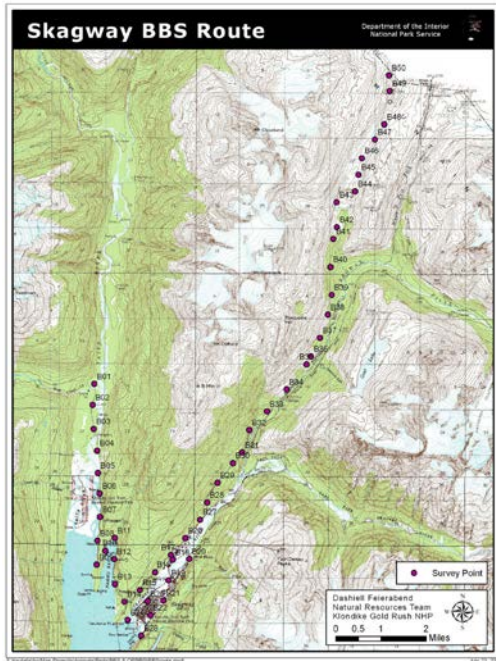
The protocol recommends doing Unit 7, Dyea Flats, during the 2 hours before a high tide (SOP 3). Due to chronic confusion about this during previous years and again this year, some surveys included Unit 7 during the 2 hours after a high tide.

All data were entered into the Coastal Waterbird MSAccess database at
T:\NRM\Birds\CoastalWaterbirdSurveys\Data\Coastal_Waterbird_Database.

BBS - North American Breeding Bird Survey

The North American Breeding Bird Survey (BBS) is a cooperative effort between the U.S. Geological Survey's 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/BBS).

The Skagway BBS route is approximately 25 miles long with stops every half mile. As per the BBS Standard Procedures, 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 documented. The survey begins a half hour before sunrise - at our latitude of 59.5N, approximately 3:30am. This survey was performed on June 14.



Thumbnail of BBS map (full-page map in Appendix A - Map A2)

Additional information on the standardized methods for conducting this survey can be found at the Patuxent Wildlife Research Center web site above. Copies of the completed datasheets from 2018 are digitally archived on the KLGO computer network at T:\NRM\Birds\BBS\BBS Data.

ALMS - Alaska Landbird Monitoring Survey

The Alaska Landbird Monitoring Survey (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)



Left: thumbnail of ALMS Dyea map (full-page map in Appendix A - Map A3). Right: thumbnail of ALMS Chilkoot map (full-page map in Appendix A - Map A4)

There are two ALMS routes 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 m apart. Each stop is surveyed for ten minutes and all species detected are documented. The survey begins a half hour before sunrise - approximately 3:30am at our latitude of 59.5N. These surveys were performed on 12 and 13 June.

Additional information on the standardized methods for conducting this survey can be found at the USGS Alaska Landbird Monitoring Survey website above. Copies of the completed datasheets from 2018 are digitally archived on the KLGO computer network at T:\NRM\Birds\ORBBS&ALMS\ORBBS Data\ORBBS data 2018.

BENM - Bald Eagle Nest Monitoring

The Bald Eagle Nest Monitoring (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). Bald Eagle nest locations range from the eastern hillside of Skagway to the western hillside of Dyea.



Thumbnail of BENM map (full-page map in Appendix A - Map A5)

The BENM project is a work in progress at KLGO. A preliminary protocol was drafted in 2015, and is presently still under development. Considerable investigative effort was required to consolidate conflicting historic reports of nest locations in 2015 (Surdyk, 2017). A MSAccess database of nests and observations was created in 2016 (Surdyk and Evans, 2018). Extensive work to document and map nest locations was accomplished in 2017 (Surdyk et al., 2018) culminating in GIS data and a Bald Eagle Nest Book.

During 2018, no additional work on the draft protocol was possible due to staffing shortages. Observations of known eagle nests were contributed by park staff and volunteers, which were entered into the database located in the KLGO computer network at T:\NRM\Birds\Eagles\Eagle_Nests.

Results

CWS - Coastal Waterbird Surveys

Twenty surveys were conducted from April 14 to September 12, 2018. At least one of two primary field observers (the authors) was present during each survey. They were often accompanied by one or more of 7 field assistants comprised of KLGO staff or volunteers from the Skagway Bird Club.

Fifty six waterbirds were identified to the species level, with 12,097 individual birds counted in this group. Thirteen non-waterbirds (landbirds) using near-shore resources were identified to the species level, with a total of 1,317 individual birds. Ten kinds of birds that were only identified to the family or genus level were recorded, with a total of 1,857 of these birds.

A grand total of 15,271 birds were recorded. These data are presented in Tables 1-3 below, following taxonomic order of the 2018 AOS Checklist of North American Birds. (Chesser, 2018).

Table 1. CWS - List of Waterbird Species, Coastal Waterbird Survey, 2018.

Family	Scientific name	Common name	Total number	Maximum survey number	Date of maximum survey	Count of surveys
Anatidae (geese, ducks)	<i>Anas crecca</i>	Green-winged Teal	513	235	5/6/2018	12
	<i>Aythya collaris</i>	Ring-necked Duck	3	1	multiple	3
	<i>Aythya affinis</i>	Lesser Scaup	4	3	5/12/2018	2
	<i>Bucephala clangula</i>	Common Goldeneye	72	25	5/6/2018	4
	<i>Anas Penelope</i>	Eurasian Wigeon	2	1	multiple	2
	<i>Mergus serrator</i>	Red-breasted Merganser	130	40	5/12/2018	12
	<i>Chen caerulescens</i>	Snow Goose	39	22	5/6/2018	2
	<i>Melanitta perspicillata</i>	Surf Scoter	4783	1608	5/12/2018	12
	<i>Bucephala islandica</i>	Barrow's Goldeneye	167	60	4/14/2018	5
	<i>Cygnus buccinators</i>	Trumpeter Swan	14	11	4/22/2018	4
	<i>Anas Americana</i>	American Wigeon	337	228	5/6/2018	8
	<i>Anas discors</i>	Blue-winged Teal	11	5	7/5/2018	4
	<i>Histrionicus histrionicus</i>	Harlequin Duck	170	29	multiple	13
	<i>Lophodytes cucullatus</i>	Hooded Merganser	4	2	4/29/2018	3
	<i>Branta Canadensis</i>	Canada Goose	10	5	5/12/2018	3
	<i>Anser albifrons</i>	Greater White-fronted Goose	94	80	5/6/2018	3
	<i>Melanitta fusca</i>	White-winged Scoter	9	3	5/31/2018	5
	<i>Mergus merganser</i>	Common Merganser	151	37	4/14/2018	12
	<i>Clangula hyemalis</i>	Long-tailed Duck	4	2	multiple	2
	<i>Anas clypeata</i>	Northern Shoveler	137	73	5/6/2018	7
	<i>Aythya marila</i>	Greater Scaup	16	8	5/20/2018	3
	<i>Anas acuta</i>	Northern Pintail	205	134	5/6/2018	5
	<i>Anas platyrhynchos</i>	Mallard	882	380	5/6/2018	15

Table 1 (continued). CWS - List of Waterbird Species, Coastal Waterbird Survey, 2018.

Family	Scientific name	Common name	Total number	Maximum survey number	Date of maximum survey	Count of surveys
Anatidae , continued (geese, ducks)	<i>Bucephala albeola</i>	Bufflehead	189	70	5/6/2018	5
	<i>Melanitta nigra</i>	Black Scoter	1	1	8/22/2018	1
Podicipedidae (grebes)	<i>Podiceps auritus</i>	Horned Grebe	137	133	5/12/2018	3
	<i>Podiceps grisegena</i>	Red-necked Grebe	33	15	5/12/2018	6
Charadriidae (plovers)	<i>Pluvialis squatarola</i>	Black-bellied Plover	1	1	5/6/2018	1
	<i>Charadrius semipalmatus</i>	Semipalmated Plover	6	4	5/20/2018	3
	<i>Pluvialis fulva</i>	Pacific Golden-Plover	1	1	5/12/2018	1
	<i>Charadrius vociferus</i>	Killdeer	1	1	4/29/2018	1
Scolopacidae (sandpipers)	<i>Calidris alba</i>	Sanderling	30	30	5/6/2018	1
	<i>Tringa incana</i>	Wandering Tattler	33	11	5/31/2018	8
	<i>Tringa melanoleuca</i>	Greater Yellowlegs	19	9	4/29/2018	3
	<i>Tringa solitaria</i>	Solitary Sandpiper	2	2	8/22/2018	1
	<i>Calidris pusilla</i>	Semipalmated Sandpiper	7	3	5/20/2018	3
	<i>Limnodromus griseus</i>	Short-billed Dowitcher	2	2	5/6/2018	1
	<i>Limosa haemastica</i>	Hudsonian Godwit	1	1	5/6/2018	1
	<i>Calidris melanotos</i>	Pectoral Sandpiper	1	1	5/6/2018	1
	<i>Calidris alpine</i>	Dunlin	25	25	5/6/2018	1
	<i>Actitis macularius</i>	Spotted Sandpiper	6	2	multiple	3
	<i>Tringa flavipes</i>	Lesser Yellowlegs	2	2	5/6/2018	1
Alcidae (alcids)	<i>Cephus Columba</i>	Pigeon Guillemot	26	7	multiple	6
	<i>Brachyramphus marmoratus</i>	Marbled Murrelet	194	27	5/20/2018	18

Table 1 (continued). CWS - List of Waterbird Species, Coastal Waterbird Survey, 2018.

Family	Scientific name	Common name	Total number	Maximum survey number	Date of maximum survey	Count of surveys
Laridae (gulls, terns)	<i>Larus thayeri</i> *	Thayer's Gull *	87	81	4/14/2018	2
	<i>Larus philadelphia</i>	Bonaparte's Gull	1004	354	5/12/2018	16
	<i>Larus glaucescens</i>	Glaucous-winged Gull	23	10	4/14/2018	4
	<i>Sterna paradisaea</i>	Arctic Tern	563	105	5/12/2018	12
	<i>Larus argentatus</i>	Herring Gull	478	241	4/22/2018	16
	<i>Larus canus</i>	Mew Gull	1403	271	4/22/2018	20
	<i>Larus californicus</i>	California Gull	2	2	9/12/2018	1
Gaviidae (loons)	<i>Gavia immer</i>	Common Loon	8	5	7/26/2018	3
	<i>Gavia pacifica</i>	Pacific Loon	2	2	5/25/2018	1
	<i>Gavia stellata</i>	Red-throated Loon	9	6	7/12/2018	3
Ardeidae (herons)	<i>Ardea herodias</i>	Great Blue Heron	30	7	multiple	12
Alcedinidae (kingfishers)	<i>Ceryle alcyon</i>	Belted Kingfisher	14	3	5/20/2018	10
sum:			12097	—	—	—

* Thayer's Gull has been reclassified as a subspecies of Iceland Gull. It is listed here in accordance with the 2018 KLGO data as recorded. In the future, it should be recorded as "Iceland Gull (Thayer's)".

Table 2. CWS - List of Landbird Species using Near-shore Resources, Coastal Waterbird Survey, 2018.

Family	Scientific name	Common name	Total number	Maximum survey number	Date of maximum survey	Count of surveys
Accipitridae (hawks, eagles)	<i>Haliaeetus leucocephalus</i>	Bald Eagle	113	11	4/29/2018	20
	<i>Circus cyaneus</i>	Northern Harrier	11	3	multiple	6
Falconidae (falcons)	<i>Falco columbarius</i>	Merlin	2	1	multiple	2
	<i>Falco sparverius</i>	American Kestrel	3	2	4/29/2018	2
Corvidae (crows, jays)	<i>Corvus caurinus</i>	Northwestern Crow	857	150	9/12/2018	20
	<i>Corvus corax</i>	Common Raven	56	28	8/22/2018	14
	<i>Pica hudsonia</i>	Black-billed Magpie	1	1	9/12/2018	1
Hirundinidae (swallows)	<i>Tachycineta thalassina</i>	Violet-green Swallow	8	4	7/12/2018	3
	<i>Tachycineta bicolor</i>	Tree Swallow	7	5	6/7/2018	2
	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow	6	4	7/12/2018	2
	<i>Hirundo rustica</i>	Barn Swallow	7	2	multiple	4
Cinclidae (dipper)	<i>Cinclus mexicanus</i>	American Dipper	3	1	multiple	3
Motacillidae (pipits)	<i>Anthus rubescens</i>	American Pipit	243	80	4/29/2018	7
sum:			1317	–	–	–

Table 3. CWS - List of Birds Identified to Genus or Family Level, Coastal Waterbird Survey, 2018.

Family	Category	Common name	Total number	Maximum survey number	Date of maximum survey	Count of surveys
Anatidae (ducks)	Waterbird	Duck Sp	6	6	7/5/2018	1
	Waterbird	Scaup Sp	2	2	5/12/2018	1
	Waterbird	Goldeneye Sp	5	4	4/22/2018	2
	waterbird	Merganser Sp	4	2	5/31/2018	3
Scolopacidae (sandpipers)	waterbird	Shorebird Sp	4	1	multiiple	4
	waterbird	Sandpiper Sp	52	15	5/12/2018	6
Laridae (gulls)	waterbird	Gull Sp	212	106	4/14/2018	7
	waterbird	Small Gull Sp	588	575	5/12/2018	6
	waterbird	Large Gull Sp	983	426	5/12/2018	18
Accipitridae (hawks)	landbird	Buteo Sp	1	1	5/31/2018	1
sum:			1857	–	–	–

The volume of CWS birds identified to the species level per year is presented in Figure 1. The total number of species using near-shore resources (both waterbirds and landbirds), and the number of waterbird species are shown numerically. A number of influences affect these numbers, which may or may not indicate an actual increase in species over time (see Discussion). Figure 2 presents waterbird species richness and abundance in 2018 by survey date, showing an extended peak in richness from the end of April to mid-May, and a peak in abundance on or about 12 May.

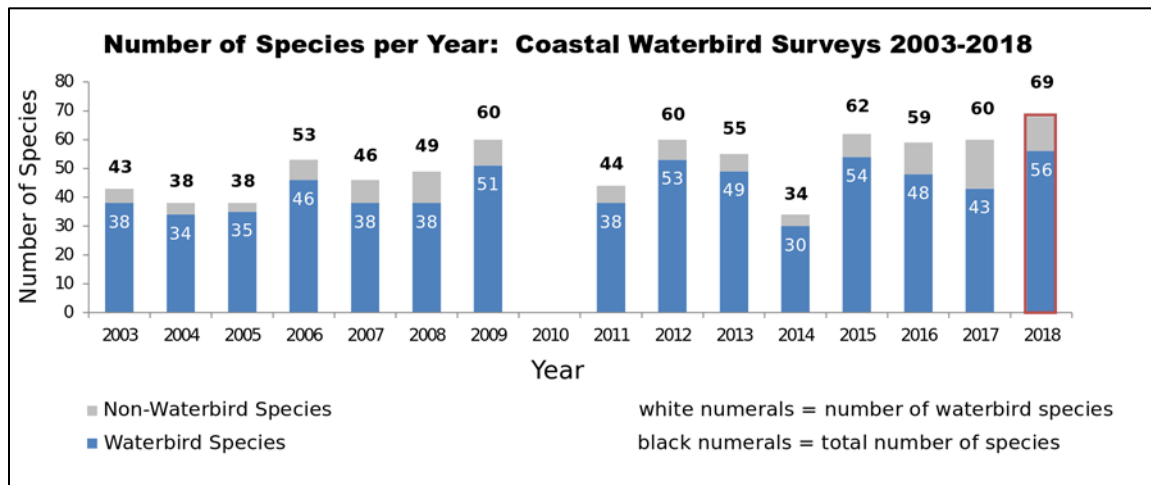


Figure 1. CWS Species by Year 2003-2018. Number of waterbird species, non-waterbird species, and total bird species identified per year. Insufficient data were collected during 2010 due to staffing shortages. The data from 2014 are incomplete due to missing surveys during the peak migration period.

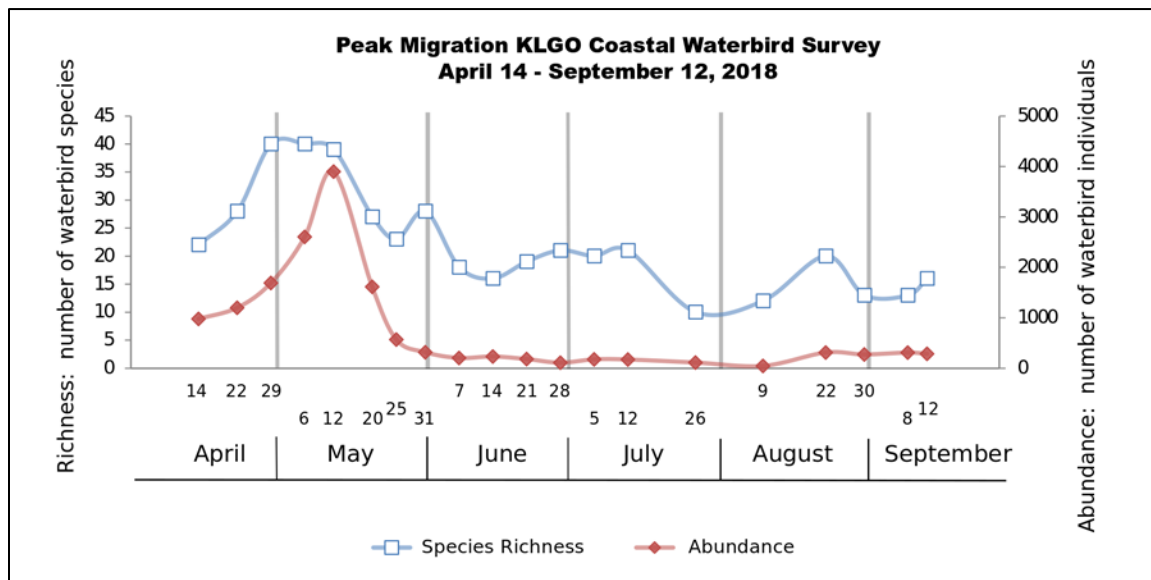


Figure 2. CWS Peak Migration 2018. Number of waterbird species identified per survey and number of individual waterbirds identified to species level per survey, 2018.

The Natural Resource Condition Assessment prepared for KLGO by Bernatz et al. (2010) provided a summary analysis of various observer biases that may have influenced trends in CWS data from 2003-2009. A linear regression of CWS data from 2003-2018, following Bernatz et al. methodology, shows a positive relationship between the number of species identified and year (Figure 3). In other words, as the years progressed, more waterbird species were identified. A number of influences likely contribute to this relationship, only one of which may be an actual increase in species richness over time (see Discussion).

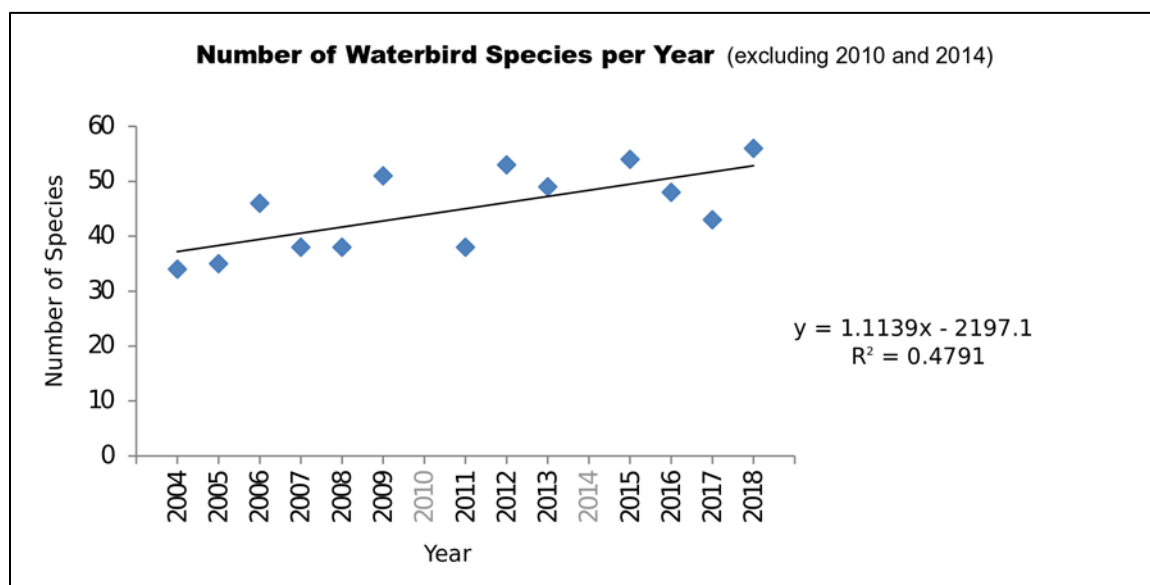


Figure 3. CWS Waterbird Species over Time 2003 – 2018. Number of waterbird species detected during each year of KLGO's CWS 2003-2018. Data from 2010 and 2014 were incomplete, thus not included.

In addition, several operational improvements were accomplished in 2018. Confusion over unit boundaries was removed from the CWS unit map, and the anchor observation point for each unit was added after being georeferenced using GPS. Both were updated in the KLGO Geographic Information System.

Prototype data sheets developed by CWS volunteers associated with the Skagway Bird Club were tested and modified over the course of the season. Field data collectors generally liked the new formats for ease of use in the field, consolidation of environmental (event) data, and layout of bird data. These modified data sheets should be considered a work in progress.

One primary observer noticed little difference between doing Unit 7 (Dyea Flats) in the 2 hours before vs. in the 2 hours after high tide, with a slight impression that more birds moved into the area on the falling tide as mudflats were exposed for renewed feeding. An examination of CWS data to assess the relationship between tidal stage and bird counts for Unit 7 may provide more clarity.

A small auxiliary MSAccess database (CWS split4report.accdb) was created that partially automates generation of end-of-season report tables and output for MSExcel spreadsheet charts and graphs.

BBS - North American Breeding Bird Survey

The Breeding Bird Survey was conducted on 14 June 2018 by a proficient birder with many years experience with the route. The survey documented 32 species of birds in 14 families. Species are presented in Table 4, following taxonomic order of the 2018 AOS Checklist of North American Birds. (Chesser, 2018)

Table 4. BBS - Species List for Breeding Bird Survey conducted on 14 June 2018.

Family	Scientific Name	Common Name
Anatidae (geese, ducks)	<i>Anas platyrhynchos</i>	Mallard
Phasianidae (grouse, ptarmigan)	<i>Dendragapus fuliginosus</i>	Sooty Grouse
Laridae (gulls, terns)	<i>Larus canus</i>	Mew Gull
	<i>Larus argentatus</i>	Herring Gull
	<i>Larus glaucescens</i>	Glaucous-winged Gull
	<i>Sterna paradisaea</i>	Arctic Tern
Tyrannidae (tyrant flycatchers)	<i>Empidonax difficilis</i>	Pacific-slope Flycatcher
Vireonidae (vireos)	<i>Vireo gilvus</i>	Warbling Vireo
Corvidae (jays, crows, ravens)	<i>Cyanocitta stelleri</i>	Steller's Jay
	<i>Corvus caurinus</i>	Northwestern crow
	<i>Corvus corax</i>	Common Raven
Hirundinidae (swallows)	<i>Tachycineta thalassina</i>	Violet-green Swallow
Paridae (chickadees)	<i>Poecile rufescens</i>	Chestnut-backed Chickadee
Regulidae (kinglets)	<i>Regulus satrapa</i>	Golden-crowned Kinglet
	<i>Regulus calendula</i>	Ruby-crowned Kinglet
Turdidae (thrushes)	<i>Catharus ustulatus</i>	Swainson's Thrush
	<i>Catharus guttatus</i>	Hermit Thrush
	<i>Turdus migratorius</i>	American Robin
	<i>Ixoreus naevius</i>	Varied Thrush
Motacillidae (pipits)	<i>Anthus rubescens</i>	American Pipit
Fringillidae (finches)	<i>Spinus pinus</i>	Pine Siskin
Passerellidae (new world sparrows)	<i>Passerculus sandwichensis</i>	Savannah Sparrow
	<i>Junco hyemalis</i>	Dark-eyed Junco (Oregon)
Parulidae (new world warblers)	<i>Seiurus noveboracensis</i>	Northern Waterthrush
	<i>Oreothlypis celata</i>	Orange-crowned Warbler
	<i>Geothlypis trichas</i>	Common Yellowthroat
	<i>Setophaga ruticilla</i>	American Redstart
	<i>Setophaga petechia</i>	Yellow Warbler
	<i>Setophaga coronate</i>	Yellow-rumped Warbler (Myrtle)
	<i>Setophaga townsendi</i>	Townsend's Warbler

Table 4 (continued). BBS - Species List for Breeding Bird Survey conducted on 14 June 2018.

Family	Scientific Name	Common Name
Parulidae , continued (new world warblers)	<i>Cardellina pusilla</i>	Wilson's Warbler
	<i>Piranga ludoviciana</i>	Western Tanager

ALMS - Alaska Landbird Monitoring Survey

The Alaska Landbird Monitoring Survey (ALMS) routes were conducted on 12 and 13 June 2018. The surveys were performed by a proficient birder with many years of experience with the routes, assisted by the KLGO natural resource manager. The surveys documented 34 species of birds in 20 families. The forest habitat Chilkoot route had 23 species, while the river delta habitat Dyea route produced 24 species. Ten species were found in both routes. Species are presented in Table 5, following taxonomic order of the 2018 AOS Checklist of North American Birds. (Chesser, 2018)

Table 5. ALMS - Species List for Alaska Landbird Monitoring Survey conducted on 12 and 13 June 2018.

Family	Scientific Name	Common Name	Chilkoot Route	Dyea Route
Anatidae (geese, ducks)	<i>Anas platyrhynchos</i>	Mallard	–	X
Phasianidae (grouse)	<i>Dendragapus fuliginosus</i>	Sooty Grouse	X	X
Scolopacidae (sandpipers)	<i>Actitis macularius</i>	Spotted Sandpiper	–	X
	<i>Tringa incana</i>	Wandering Tattler	–	X
Laridae (gulls, terns)	<i>Sterna paradisaea</i>	Arctic Tern	–	X
Ardeidae (herons, egrets)	<i>Ardea herodias</i>	Great Blue Heron	–	X
Alcedinidae (kingfishers)	<i>Ceryle alcyon</i>	Belted Kingfisher	X	–
Picidae (woodpeckers)	<i>Sphyrapicus ruber</i>	Red-breasted Sapsucker	X	–
Tyrannidae (tyrant flycatchers)	<i>Empidonax difficilis</i>	Pacific-slope Flycatcher	X	–
Vireonidae (vireos)	<i>Vireo gilvus</i>	Warbling Vireo	–	X
Corvidae (jays, crows, ravens)	<i>Corvus caurinus</i>	Northwestern crow	–	X
Hirundinidae (swallows)	<i>Tachycineta thalassina</i>	Violet-green Swallow	–	X
Paridae (chickadees)	<i>Poecile rufescens</i>	Chestnut-backed Chickadee	X	X
Sittidae (nuthatches)	<i>Sitta canadensis</i>	Red-breasted Nuthatch	X	–
Certhiidae (creeper)	<i>Certhia americana</i>	Brown Creeper	X	–
Troglodytidae (wrens)	<i>Troglodytes pacificus</i>	Pacific Wren	X	–
Regulidae (kinglets)	<i>Regulus satrapa</i>	Golden-crowned Kinglet	–	X
	<i>Regulus calendula</i>	Ruby-crowned Kinglet	X	X
Turdidae (thrushes)	<i>Catharus ustulatus</i>	Swainson's Thrush	X	X
	<i>Catharus guttatus</i>	Hermit Thrush	X	X
	<i>Turdus migratorius</i>	American Robin	X	X
	<i>Ixoreus naevius</i>	Varied Thrush	X	X

Table 5 (continued). ALMS - Species List for Alaska Landbird Monitoring Survey conducted on 12 and 13 June 2018.

Family	Scientific Name	Common Name	Chilkoot Route	Dyea Route
Fringillidae (finches)	<i>Spinus pinus</i>	Pine Siskin	–	X
Passerellidae (new world sparrows)	<i>Spizella passerina</i>	Chipping Sparrow	X	–
	<i>Passerculus sandwichensis</i>	Savannah Sparrow	–	X
	<i>Melospiza lincolni</i>	Lincoln's Sparrow	–	X
	<i>Junco hyemalis</i>	Dark-eyed Junco (Oregon)	X	X
Parulidae (new world warblers)	<i>Seiurus noveboracensis</i>	Northern Waterthrush	X	–
	<i>Oreothlypis celata</i>	Orange-crowned Warbler	X	X
	<i>Geothlypis trichas</i>	Common Yellowthroat	X	–
	<i>Setophaga petechia</i>	Yellow Warbler	X	–
	<i>Setophaga coronata</i>	Yellow-rumped Warbler (Myrtle)	X	X
	<i>Setophaga townsendi</i>	Townsend's Warbler	X	X
	<i>Cardellina pusilla</i>	Wilson's Warbler	X	–
	<i>Piranga ludoviciana</i>	Western Tanager	X	X

BENM - Bald Eagle Nest Monitoring

No systematic survey of eagle nests was made in 2018. Opportunistic reports were contributed from CWS observers, other park staff, and interested volunteers (Table 6). Twenty-five reports were received on 5 eagle nests. Two records for nest CT02 with missing dates refer to a photo of a chick. Behavior of adults on nests CT02 and TR03 indicated probable presence of chicks in the nests. There were no records of fledgling eagles.

Table 6. BENM- Observations List for Bald Eagle Nest Monitoring, 2018.

Nest	Date	Nest Status	Eagles Seen *	Activity
CT01	7/26/2018	Unknown	–	Bob Fink reported seeing "no activity at the nest since his last report, although periodically some in the trees on the same side of the river, but they've been doing that for years before the nest."
CT02	6/2/2018	Unknown	–	One eagle in the trees upstream of the new nest on east side of the river.
CT02	7/17/2018	Active	A1, A2	Bob Fink reported seeing "eagles in the new nest on the east side of the river. Tues, 10am both with heads down acting like they were tending to the young. 1st sighting there since I last noted you."
CT02	-	Unknown	–	July 2018? Bob Fink: "No activity at the eagle nest since 2 days after I told you about getting picture of a chick. No adults at all near the nest of trees, I'm afraid they've gone."

* A= adult, I=immature, J=juvenile, C=chick

Table 6 (continued). BENM- Observations List for Bald Eagle Nest Monitoring, 2018.

Nest	Date	Nest Status	Eagles Seen *	Activity
CT02	9/11/2018	Active	–	Eagle in the new nest Tues afternoon on east side of river below West Creek.
CT02	–	Unknown	–	Unknown date. Bob Fink: "Definitely saw & got a picture of young eagle sitting up in a nest looking strong."
DY01	4/29/2018	Active	A1, A2	1 perched in tree next to nest ,1 sitting on nest.
DY01	5/6/2018	Unknown	–	No eagles on or perched near nest.
DY01	5/12/2018	Unknown	–	Eagle nest not occupied.
DY01	5/20/2018	Unknown	–	Both perched upright (not brooding) right at edge of nest.
DY01	5/25/2018	Unknown	–	Perched in tree next to nest tree, only one eagle seen.
DY01	5/31/2018	Unknown	–	No eagles seen at nest near waterfall on west wall.
DY01	6/7/2018	Unknown	–	No sign of activity at eagle nest
DY01	6/21/2018	Unknown	–	No BAEA activity near or in nest.
DY01	7/26/2018	Unknown	–	No eagles on nest activity.
DY01	8/9/2018	Unknown	–	No eagles on nest activity.
TR02	5/25/2018	Unknown	A1, A2	2 adults perched in tree near tree with old nest. Flew together over river, swooping up and down, wings almost touching then back to same perch. Across from NPS campground.
TR02	5/28/2018	Active	–	Bob Fink reported seeing one eagle in the nest across from the campground.
TR02	6/7/2018	Unknown	–	No eagles near eagle nest
TR02	6/14/2018	Unknown	–	No eagles in nest.
TR02	6/21/2018	Unknown	–	No bald eagles in nest.
TR02	7/26/2018	Unknown	–	No eagles on nest activity.
TR02	8/9/2018	Unknown	–	No eagles on nest activity.
TR03	5/28/2018	Active	–	Bob Fink of reported seeing "one eagle with tail up and head down in the active nest river left down from West Creek. Looking like it's tending the young."
TR03	9/2/2018	Active	A1, A2	June 2, 2018. 2 Eagles in t old nest below West Creek. Merlin flying by.

* A= adult, I=immature, J=juvenile, C=chick

Incidental Observations

Many birds were recorded outside monitoring programs by KLGO staff, local birders and the many tourists that visit Skagway each spring, summer and fall. Selected notable observations are listed in Table 7, with highlights below. In addition to what is presented here, numerous sightings are entered into eBird (<https://www.eBird.org>) by summer visitors to Skagway.

Jami Belt, KLGO natural resource manager, made an exciting observation of an adult female Hooded Merganser with chicks on June 9 (Figure 4). The female was carrying 2 chicks on her back as she

swam in a beaver pond on the lower Chilkoot Trail. This is the first confirmed evidence of breeding for this species in Skagway.



Figure 4. Hooded Merganser female carrying 2 chicks, June 2018.

One Rock Dove (city pigeon) was observed with Skagway’s established flock of Eurasian Collared-Doves on 11 June. Skagway resident Debbie Ackerman noted that the Rock Dove integrated into the Collared-Dove flock and was seen with them well into autumn.

Several observers noted a larger than normal flock of breeding Arctic Terns on the Skagway River. The maximum number reported was 125 terns on 3 July.

A family of “Black” Merlins was described by Skagway resident Mike Konsler on July 24. This is the first report of the dark subspecies of Merlin for the Skagway area.

KLGO trail ranger Alex Matsov observed a possible Golden Eagle at Sheep Camp on the Chilkoot Trail in mid-August. This eagle is rarely seen in Skagway, where Bald Eagles predominate.

Table 7. Selection of Notable Incidental Bird Observations, April to September 2018.

Date	Bird	Observer	Source*	Note
10 April	1 Mountain Bluebird	Kim Burnham	Heinl	unusually low number
29 April	1 Canvasback	Renald Jauvin	Heinl	rare migrant
10 May	1 Say’s Phoebe	C.E. Furbish	Heinl	casual migrant
9 June	3 Hooded Mergansers	Jami Belt	KLGO	first confirmed breeding
10 June	1 Olive-sided Flycatcher	C.E. Furbish	SBC	locally uncommon
11 June	1 Rock Dove (pigeon)	Debbie Ackerman	SBC	locally rare
3 July	125 Arctic Terns	C.E. Furbish	SBC	unusually high number
24 July	4 Merlin – Pacific subspecies	Mike Konsler	SBC	first description of subspecies
mid Aug	1 Golden Eagle	Alex Matsov	KLGO	rare, pending review
6 Sept	1 Wilson’s Snipe	Susan Fredericks	SBC	locally uncommon

* Heinl = southeast Alaska regional documentation (Heinl, 2018);

SBC = Skagway local documentation (Skagway Bird Club, 2018);

KLGO = Klondike Gold Rush N.H.P. internal documentation

Discussion

CWS - Coastal Waterbird Surveys

The number of species of waterbirds observed during the 2018 CWS was high compared to previous years. This is in keeping with the trend of increasing species richness throughout the span of the CWS, and was examined by Bernatz et al. (2010) for observer effects or biases. In addition to variation among the observers and the development of identification skills for those with multi-year experience, other factors may contribute to the increasing number of species identified this year, such as the total number of surveys accomplished within the season. However, an actual increase in species richness could be contributing to the increases recorded over the years.

As the data set for this study grows, more definitive investigation of trends in species richness will be possible. Techniques that look at some birds as groups of species or at the genus level may help eliminate some observer bias effects. Also, examination of the CWS results in conjunction with other programs that operate at a regional level could be helpful.

Three species were recorded for the first time within the CWS in 2018. The California Gull is usually a more southern species, but has occasionally been recorded in Skagway in previous years. The Cliff Swallow is a common species and has likely been present many years over the CWS. Lack of records in previous years may have been due to confusion among field observers about whether recording swallows was appropriate. The Pacific Golden-Plover was seen in the CWS for the first time, but it has been recorded in Skagway in the past. It can be confused with the Black-bellied Plover and the American Golden-Plover, both of which have been previously recorded. Each of the three plovers have distinctive characteristics, so good field identification notes can be used to validate these types of observations.

An obvious peak spring waterbird migration occurs in tandem with the spring eulachon fish run (Hahr and Trapp 2004). A eulachon (*Thaleichthys pacificus*) monitoring program was implemented by KLGO in 2017, and continued during 2018. CWS observers noted a strong, distinctive fish run during 2017, and a weak, spread-out run during 2018. There will be a valuable opportunity to examine CWS data in relation to eulachon data when results from the eulachon study are available.

BBS - Breeding Bird Survey and ALMS - Alaska Landbird Monitoring Survey

Klondike Gold Rush NHP does not systematically analyze the results of the BBS or ALMS. The program coordinators periodically release analyses, publish scientific articles and make the data available to researchers. An on-line data portal for ALMS was being developed in 2017, but was not released as of this writing. Colleen Handel, ALMS program coordinator, and John Sauer, BBS program scientist, recently published a paper in *The Condor* that investigated overall trends in population for 84 bird species monitored during BBS and 31 species recorded during ALMS across the state of Alaska (Handel and Sauer 2017).

BENM - Bald Eagle Nest Monitoring

No quantitative data were obtained during 2018. However, enthusiastic volunteers, increasingly refined quality of observations, and the foundational work in the past few years on nest descriptions, locations, and historic data make this project ready for improvement.

Conclusions & Recommendations

The established bird monitoring programs currently ongoing at Klondike Gold Rush NHP (KLGO) work together to provide essential information about park resources. 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.

Four multi-year bird monitoring programs were active at KLGO during 2018:

- CWS – Coastal Waterbird Survey, a KLGO specific program,
- BBS – North American Breeding Bird Survey, a continent-wide program,
- ALMS – Alaska Landbird Monitoring Survey, an Alaska state-wide program, and
- BENM – Bald Eagle Nest Monitoring, a KLGO specific program.

Through sponsorship of the BBS and ALMS programs, KLGO participates in efforts to understand regional and continental changes in bird populations. At the local level, these programs help the park understand the significance of changes seen in Skagway, and separate local effects from larger influences. KLGO gets the best return on its investment with these programs by providing logistical support (lodging, meals, transportation) to a highly skilled, dedicated birder for only a few days each year. These programs should continue to receive KLGO support.

The two park-specific programs, CWS and BENM, are designed to produce more detailed information on two very visible, ecologically important, and potentially at-risk avian resources: Bald Eagles and their nests, and migratory waterbirds and the near-shore habitats they use. Both of these programs should continue, and both are in need of further development.

The 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 quite limited in extent in Skagway. 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 critical to have highly trained staff or contractors 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 on-the-job training.

No formal analysis of the CWS protocol and data have been conducted since the onset of the monitoring program. The CWS needs both fundamental operational design review, and updated operational procedures. A Technical Assistance Request to NPS Alaska Regional Office experts for an operational design review was underway in 2018 (T:\resources\NRM\Technical Assistance Requests\Coatal Waterbird Review_FY18_TAR 6987.pdf), and preliminary findings should be available in spring 2019. Suggestions on modifications to the CWS from the authors are presented in Appendix B - CWS Major Changes. In the meantime, the authors offer minor adjustments in appendix B – CWS Minor Changes. The minor changes to data collection, data management, and

reporting - largely within the current protocols - can be implemented in 2019 to reduce errors and greatly decrease the time and effort needed for this project each year.

The BENM project is still in early stages, but much foundational work on nest descriptions, locations, and historic records has been accomplished. The operational protocols and database should be completed, and should be standardized to make them compatible with US Fish and Wildlife Service (USFWS) Standard Operating Procedures for Bald Eagle monitoring. This will facilitate the completion of National Environmental Protection Act compliance requirements to address the Bald and golden Eagle Protection Act and completion of monitoring and reporting requirements that accompany permits obtained from USFWS for planned nest disturbance. Eager volunteers, particularly Bob Fink, collect valuable data on their own initiative. The charisma of Bald Eagles is likely to attract other volunteers in the community if they are given the opportunity and a data collection structure to focus their efforts. Some modest changes that can be implemented in 2019 to greatly improve the data collection and management until operational protocols can be developed are given in Appendix B - BENM changes for 2019.



Ducks galore: Mallard, Green-winged Teal, American Wigeon and Northern Pintail at mouth of Skagway River, May 4, 2018 (ANDREW BEIERLY)

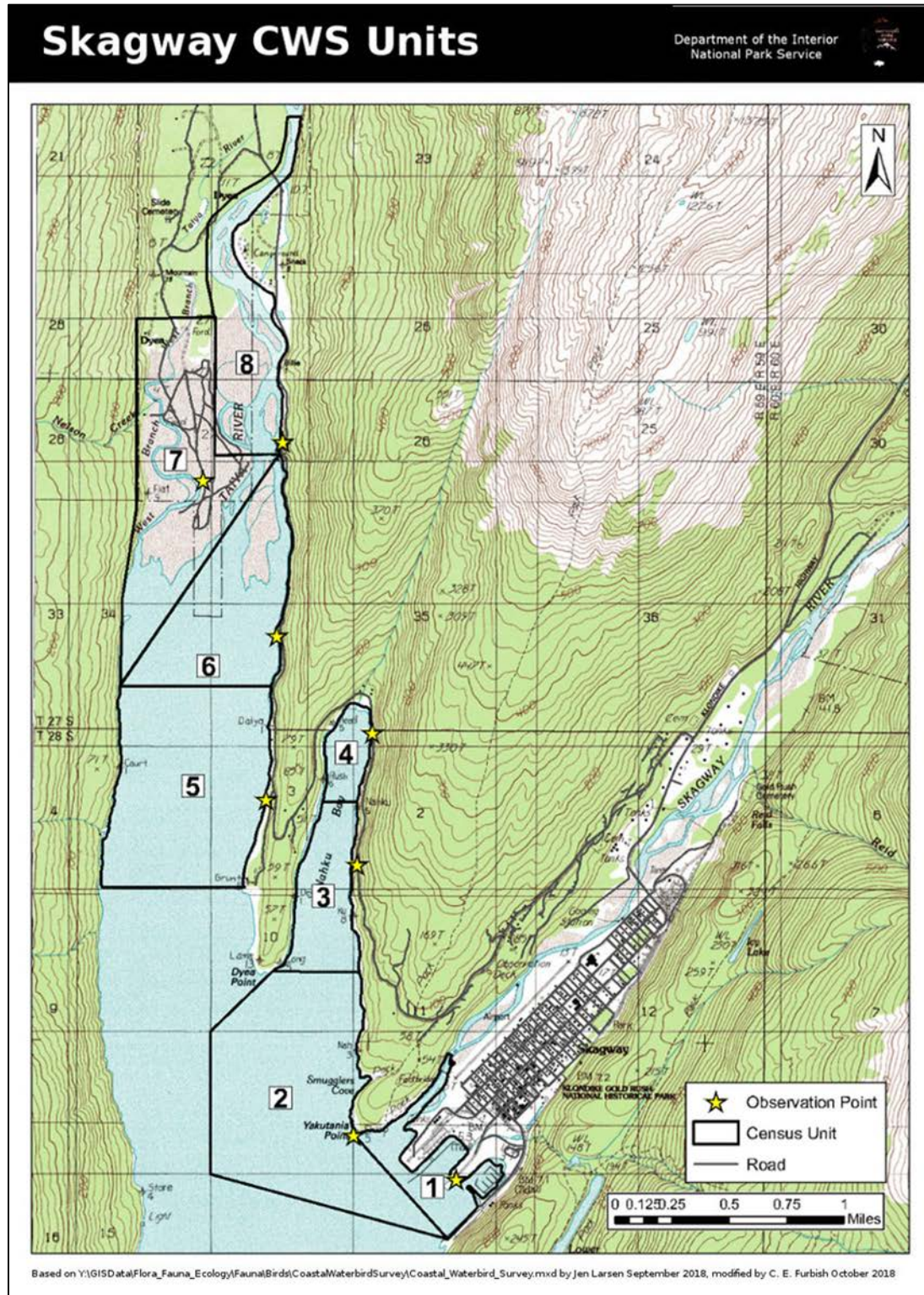
Literature Cited

- Bernatz, G. C., A. G. Robertson, and B. W. Draskowski. 2010. Klondike Gold Rush National Historical Park: Natural resource condition assessment. Natural Resource Report NPS/NRPC/WRD/NRR—2010/288. National Park Service, Fort Collins, Colorado.
- Chesser, R. T., K. J. Burns, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V. Remsen, Jr., D. F. Stotz, B. M. Winger, and K. Winker. 2018. Check-list of North American Birds (online). American Ornithological Society. <http://checklist.aou.org/taxa>.
- Hahr, M., and T.W. Trapp. 2004. Waterbird and breeding landbird inventories in Klondike Gold Rush National Historical Park, SE Alaska Inventory and Monitoring Network, National Park Service, Alaska Region. Inventory and Monitoring Program Final Report, Klondike Gold Rush National Historical Park, Skagway, Alaska. 44 pp.
- Handel, C. M. and J. R. Sauer. 2017. Combined analysis of roadside and off-road breeding bird survey data to assess population change in Alaska. *The Condor: Ornithological Applications* 119:557-575.
- Heinl, S. C. 2018. Summary of southeast Alaska bird observations, Spring: March–May 2018. 2603 4th Avenue, Ketchikan, AK 99901, posted at <http://www.juneau-audubon-society.org>.
- MacDonald, S. O. and J. A. Cook. 1999. The mammal fauna of Southeast Alaska. University of Alaska Museum, Fairbanks, AK. 141 pp.
- NABCI. 2000. North American Bird Conservation Initiative (NABCI) Bird Conservation Region Map and Descriptions. USDI, U.S. Fish and Wildlife Service, Arlington, VA.
- Payne, K. J. 2004. Waterbird Surveys and Opportunistic Bird Sightings in Klondike Gold Rush National Historical Park. Final Report, Klondike Gold Rush National Historical Park, Skagway, Alaska.
- Pojar, J. and A. MacKinnon. 1994. *Plants of the Pacific Northwest Coast: Washington, Oregon and Alaska*. Lone Pine Press, British Columbia, Canada. 527 pp.
- Skagway Bird Club. 2018. <https://sites.google.com/site/skagwaybirdclub>.
- Surdyk, S. L. 2017. Bird surveys at Klondike Gold Rush NHP: 2015 summary. Natural Resource Report NPS/KLGO/NRR—2017/1442. National Park Service, Fort Collins, Colorado.
- Surdyk, S. L., and S. A. Evans. 2018. Bird surveys at Klondike Gold Rush NHP: 2016 summary. Natural Resource Report NPS/KLGO/NRR—2018/1590. National Park Service, Fort Collins, Colorado.

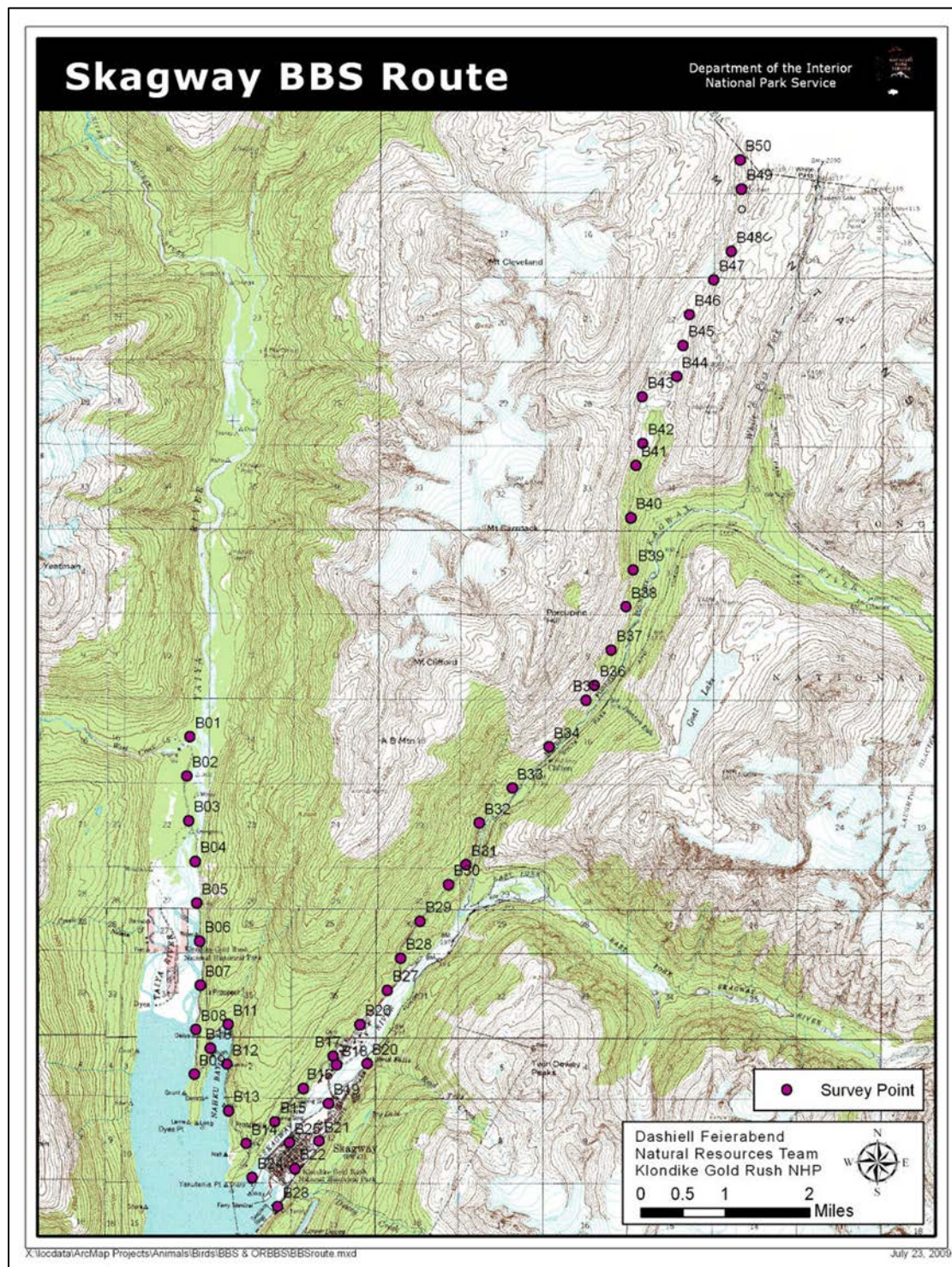
Surdyk, S., Larsen, J. H., and Waldo, A. 2018. DRAFT- Bird Surveys at Klondike Gold Rush NHP: 2017 Summary. Natural Resource Report NPS/XXXX/NRR—20XX/XXX. National Park Service, Fort Collins, Colorado.

Appendix A. Maps

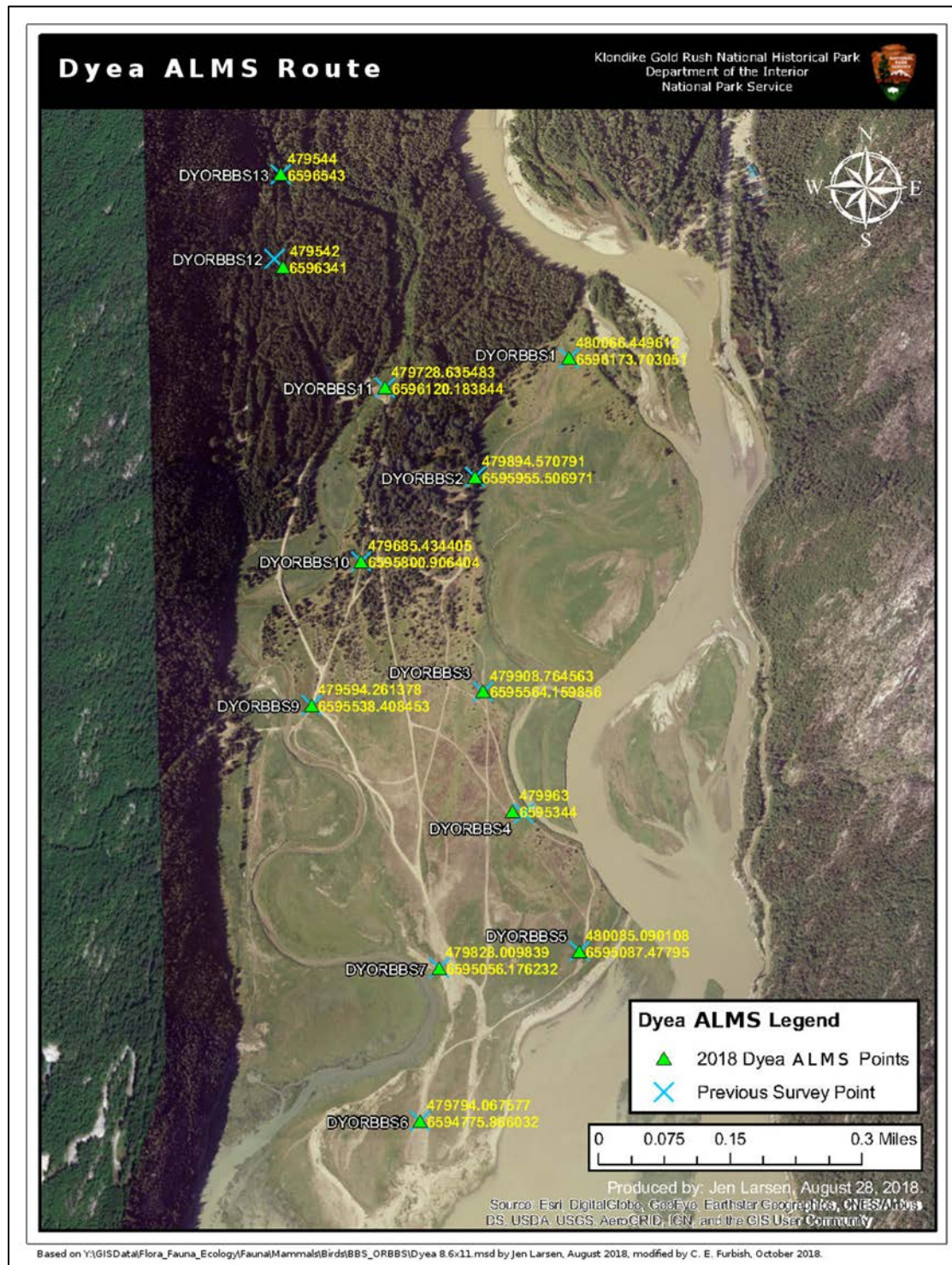
A1. CWS (Coastal Waterbird Survey) Units Map



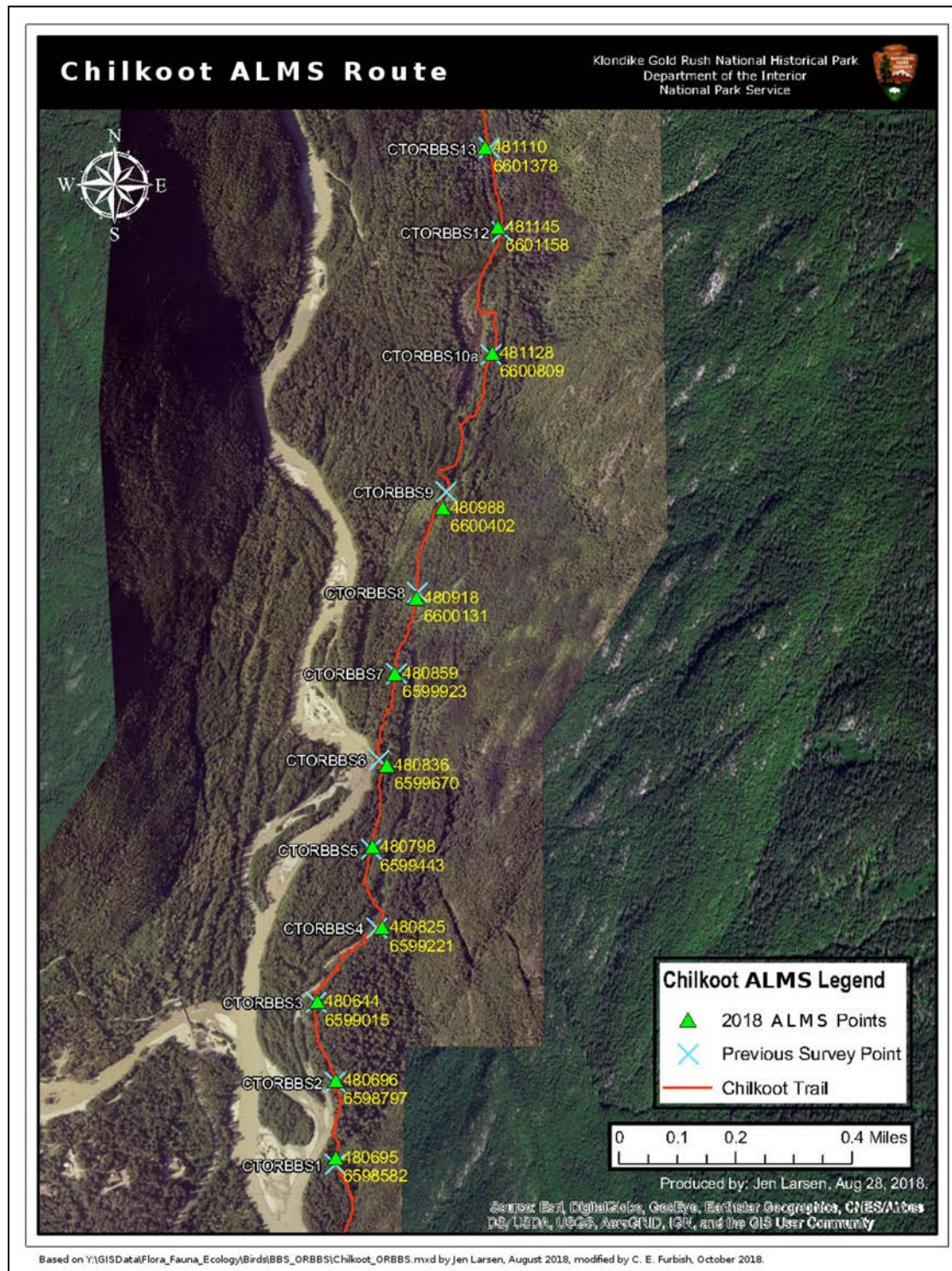
A2. BBS (North American Breeding Bird Survey) Route Map



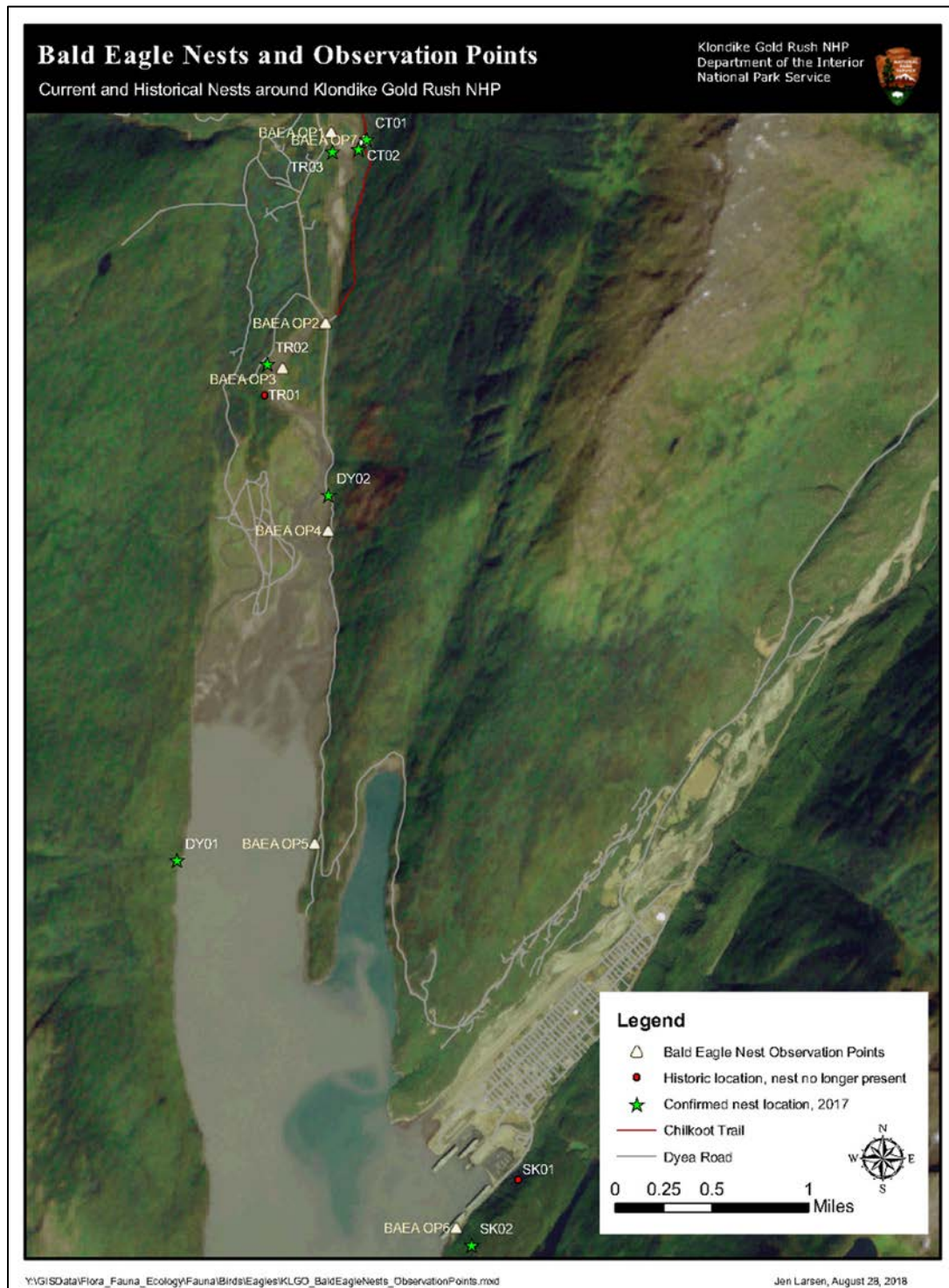
A3. ALMS (Alaska Landbird Monitoring Survey) Dyea Route Map



A4. ALMS (Alaska Landbird Monitoring Survey) Chilkoot Route Map



A5. BENM (Bald Eagle Nest Monitoring) Nests and Observation Points Map



Appendix B. CWS and BENM suggestions

CWS Major Changes

The primary CWS objective is to monitor the abundance, distribution and condition of waterbirds in near-shore habitats. A secondary objective is to document non-waterbird (landbird) use of those same near-shore habitats. The following summary of procedural changes over time is based on quick perusal of SOPs, annual reports and the database, combined with the authors' personal experiences. A more thorough record of this information should be compiled and made available for multi-year data analyses.

Procedures used and data collected have varied from year to year, with the CWS occasionally being used to document mammals, raptors, or upland songbirds. Sometimes landbirds actively using the near-shore habitats were included, sometimes not or only partially included. Methods have shifted over time, with changes from year-to-year that sometimes appear to reverse prior changes. Several sets of field data sheets seem to have been developed, been replaced, been resurrected, were completed in different ways, etc. A milestone occurred in 2008-09 when a series of operational protocols were written, a set of field data sheets were developed, and an MSAccess database was created. However, data sheets apparently developed in 2006 have been used in recent years. Data sheets have at times been completed in different ways from year to year, and from observer to observer. Similarly, interpretation of the SOPs tended to drift over the years, as successive technicians struggled to fit field realities to the data sheets and database structures.

A major difficulty is a disconnect between the SOPs and the data collection and data management tools. A condensed version of methods information from the SOPs has not been available to field data collectors, leading to misinterpretation of the data sheets. Similarly, data entry instruction from the SOPs was not built into the database, leading to misinterpretation of data entry procedures. There is a lack of synchronicity between field data sheets and database data-entry screens. The combined effect has been inconsistent field data collection and database records.

A chronic difficulty with the program is the need for quick and efficient field data collection, flexible enough to accommodate the dramatically variable numbers of birds that can be encountered during migration periods, easily 3 to 4 orders of magnitude difference. Also, producing end-of-season tables and charts was not built into the database, prompting technicians to create their own solutions year to year, leading to a jumble of queries and tables in both the database interface frontend file and in the main data repository file. Finally, routine charts and graphs used for the end-of-season reports can easily be misinterpreted by viewer, even with cautionary statements.

A fundamental decision for this program is to settle on the depth of quantitative and qualitative information of interest for long-term monitoring. Planning documents and protocols indicate an interest in quantitatively monitoring the condition of waterbirds. Qualitative categories cannot adequately capture that information, and quickly become cumbersome. A simple example is breeding vs. non-breeding plumage. Both can occur in members of a species seen in a unit. Even the most basic categories of "breeding", "non-breeding", "mixed" or "not applicable" will either force field data collectors to make difficult judgment calls (what proportion of observed birds qualifies

assignment of the whole group to the “breeding” category if other categories are also present) or will produce so many “mixed” category assignments that the data lose much of their value. The reality of field data collection is that evaluation of sex, maturity and breeding plumage is required to identify birds to species level. It is easier and quicker to identify and count birds as they are observed, rather than process them into categories in real time or later. Therefore, consistent methods should be developed for counting maturity, sex and plumage attributes, and assigning breeding status categories. Field data sheets and the database should be revised to accommodate the data set.

The following suggestions are offered for consideration.

Scope

The CWS should include all waterbirds observed in the near-shore habitats, and only those landbird species that are seen using the near-shore habitats. A clear and consistent definition of near-shore habitats should be provided to make that distinction. For example, songbirds in the trees behind a rocky shore would not be included; songbirds feeding on exposed mussel beds at low tide would be included. Raptors soaring over distant mountain tops would not be included; raptors hunting or resting at the near-shore habitats would be included. A vehicle for recording unusual or notable birds outside the scope of the CWS and capturing them in a database should be developed and made available to technicians and volunteers.

Data organization

The current field data sheets separate information at the unit level. The database separates information into event information and bird information. The database structure works well and should be fully adopted to allow smooth data flow from the field, through the database, and into analysis and reporting. Quantitative data should be the basis for maturity, sex and breeding plumage. Categories for breeding status should be reduced and tailored to the objectives of this program.

Data parameters

Data at the event level (unit, date, observer, times, environmental conditions) are stable. A series of codes adequately covers all environmental conditions. Methods or instruments used to record the event data may change, but the data are consistently recorded. Data at the bird species level (maturity, sex, breeding indicators) are inconsistent in how they are recorded or whether they are collected at all. This is partially due to difficulties using field data sheets, uncertainty in making categorical assignments and the limitations of data entry into the database. Both data sheets and database structure should be updated to clarify quantitative data collection and promote consistency.

Timing

Separate or augmented data sheets and methodologies should be developed for peak spring migration, when the quantity of birds can jump to the tens of thousands. In particular, proportional estimations rather than counting of individuals is appropriate and has already been used by field data collectors out of necessity.

Field data sheets

The prototype field data sheets developed in 2018 to make field operations easier also, serendipitously, separated event data and bird data onto two different pages – which brings them closer to matching the current database structure. These data sheets should be further refined to sync completely with the database once it is updated (see below), and vice-a-versa. After this is accomplished, consider digital data recorders (for example, iPads using Survey 123 or similar platform) rather than field data sheets to eliminate the time spent on data entry in the office, while placing more emphasis on data review and quality control.

Database functionality

The MSAccess database should be modified to allow full data entry of the field data, eliminate sources of error, make quality review easier, and automate the routine yearly data extractions needed for end-of-season reports. Data entry screen forms should match the field data as collected, particularly numeric information for maturity, sex and plumage, and appropriate categories for breeding status. A separate QA/QC form in table layout would make data review quicker and reduce errors.

Database data

Records in the database for mammals and birds not within the scope of the CWS should be removed and archived elsewhere, in order to facilitate multi-year analyses of the CWS data. The rest of the historic data should be updated with recent taxonomic changes and to consolidate each non-species level name under one unique code and name. The data for 2018 should be reworked to include more records with numeric information for maturity, sex and plumage. The data for prior years should be spot checked against archived data sheets to assure complete data entry. Obsolete or superfluous tables, queries, and forms should be removed.

Database routine analyses

Integration of an improved version of the auxiliary database “CWS split4report.accdb” into the main database should be such that the routine yearly data summaries are fully automated. The database output should be in report form, with integrated Excel charts. Consider a new set of charts and graphs that are less likely to be improperly interpreted by the viewer.

Species names and codes

The CWS needs consistent internal naming conventions, and periodic updates linked to the most recent AOS official lists.

Internal documentation

A thorough effort to track changes, especially changes affecting data quality, is needed. Past changes should be investigated and consolidated for reference in a way that makes them available for multi-year data analyses. A revision system in place at the SOP level and within the database is not being used. A system for more easily tracking future changes should be developed.

CWS Minor Changes for 2019

Minor adjustments are recommended for the 2019 season. These changes to improve data collection, data management, and reporting - largely within the current protocols - should reduce errors and

greatly decrease the time and effort needed for this project each year. They should also make it easier to adopt major changes after programmatic review is complete.

All adjustments made for the 2019 season should be fully documented so that they can be clearly understood for the review and consolidation of changes in SOPs described in CWS Major Changes.

Field data sheets

These should be separated into two types: event/environmental data and bird data. The prototype 2018 data sheets developed by bird club volunteers made progress on these improvements – they should be further refined and adopted. Refinements should assure that the data sheets and the database are in sync.

The bird data sheet should be modified to allow quick and clear recording of bird data by 4-letter code, maturity, sex, plumage, breeding status, and general comments in a flexible way that accommodates numeric data. The data sheets should be tested and refined until bird species data is smoothly recorded. Develop and test an augmented data sheet to handle tens of thousands of birds during peak migration.

The event/environmental data sheet should consolidate observer, date/time and environmental data for all units on one page, with environmental reference codes.

Field references sheets

Only the most recent unit map should be given to field observers. All outdated versions of the map should be archived in KLGO's computer network to prevent confusion.

A page with up-to-date 4-letter naming codes should be included with the field data sheets. The codes should include only species previously recorded in the CWS, and a standardized code for each previously recorded non-species level type. Consider creating identification codes for small groups of species that are easily misidentified with each other, and flag these species as needing notes on field identification characteristics. For example, the three plovers with similar breeding plumage that were seen in 2018 (Black-bellied Plover, Pacific Golden-Plover and American Golden-Plover).

Succinct statements on field procedures known to cause confusion should be included with the field data sheets. For example, a clear explanation that non-waterbirds (landbirds) should be included when they are using near-shore resources, including a definition of what constitutes the near-shore area.

Information with breeding codes appropriate to the CWS should be included (see database section below).

Survey Units

Include all of Unit 1 (Skagway harbor waterfront) in the survey throughout the season. Perspective on the impact of cruise ships in this area has changed from considering them as an interference, to viewing them as part of the environment. This has become the convention in recent years, and the

information from Unit 1 may contribute to understanding the effect of an industrial and cruise ship harbor on bird distributions.

Unit 3 (outer Nahku Bay) viewing positions have become more obscured by vegetation with each successive year. Less than half of the water surface and shoreline viewable in the early years of the CWS is now viewable. If time allows, new viewing positions should be explored along the east side of Nahku Bay and perhaps along the relatively new road on the west side.

Consideration should be given to adjusting the timing of Unit 7 (Dyea flats) to be within 2 hours before OR 2 hours after high tide, but not AT high tide, based on the observation of one of the 2018 primary data collectors. If time allows, two sets of data could be collected in 2019 to compare the time period before vs. the time period after high tide.

Database

The MSAccess database data-entry screen form should be modified to reduce errors and remove inappropriate default values. For example, 4-letter codes should, at minimum, be updated with the taxonomic changes of the past few years. If possible, the entry box for species code should be changed to an editable pick-list of existing codes, not a lookup table to an out-of-date hemispheric list. Breeding status codes should be reduced to those applicable to the CWS, removing most of the “possible” and “probable” entries. All categories should differentiate between “undetermined” and “no data”, with picklists lists and defaults adjusted accordingly.

Generating routine tables and charts

The auxiliary database developed in 2018 that partially automates the production of yearly summary data (CWS split4report.accdb) should be placed with the main database in the park’s computer network, and used to generate tables for the end-of-season report and data for charts in the Excel spreadsheet.

BENM changes for 2019

While protocols for this program are still under development, a few simple changes can make gathering information on eagle nests more consistent.

Bob Fink

This highly-motivated volunteer sends in notes on scraps of paper about his observations throughout the season, but the information is inconsistent. In the past, efforts to provide some form of guided data recording to him haven’t been productive. Another effort to find the method that works for him is warranted, perhaps a very simple data sheet, or a small sized “booklet” of tear-out pages (could simply be pages stapled together). A drop place for the observations should be set up, perhaps at the Dyea campground. Alternatively, a small booklet designed to be turned in at the end of the season could be used.

Database

Add a field for “observer name” to the database. Insert this information for observations produced by people such as the CWS field data collectors.

Soliciting volunteers

If time allows, a few more steps could be taken to increase coverage of eagle nests during breeding season. There may be other enthusiastic volunteers who have opportunity to see a particular eagle nest often during their regular weekly activities. Volunteers could be solicited at a public presentation early in the season, designed for tour guides, or any other seasonal workers or community members with an interest. An effort along these lines in the past wasn't very productive, but the tools that have been developed recently, such as the Bald Eagle Nest Book produced in 2017, may help encourage volunteers. Perhaps one or more individuals could focus on a particular nest. With data recording support similar to that described above, and with an emphasis placed on the weeks most likely for nesting, chick rearing and fledgling, multiple observations per week could be achieved.

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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