



Bird Surveys at Klondike Gold Rush NHP

2023 Summary

A Klondike Gold Rush National Historical Park Publication





ON THIS PAGE

Coastal Waterbird Survey being done by Isabella Yallapragada and Braden Jones, 2june2023
(NPS /C.E.FURBISH)

ON THE COVER

An adult and immature bald eagle spotted perched above Dyea Road, 1sep2023
(NPS /JEFF BODENDORF)

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Executive Summary

Klondike Gold Rush National Historical Park (KLGO) conducted 4 bird monitoring programs in 2023. These programs are ongoing, multi-year efforts at continental, state, and park scales. A special analysis of recent CWS data was completed. Incidental bird sightings and Skagway bird data from non-KLGO sources were summarized.

The Coastal Waterbird Survey (CWS) is a KLGO-specific program designed to record bird use of near-shore habitats, with emphasis on migratory waterbirds. The 2023 data were collected during spring migration, mid-season breeding, and fall-migration periods. Fifty-two (52) species of waterbirds and 15 KLGO defined multi-species groups were identified. A total of 7,891 birds were counted throughout the entire season across 20 survey days.

A special CWS Comparative Analysis study tested whether a new protocol developed in 2021 significantly changed CWS spring migration data compared to the 3 most recent years under the old methods. The examination did not find a significant difference in overall species abundance or richness between the methods, which could indicate that the protocol change did not have an impact. However, the power of the test was very low, indicating a need for more data. The Marbled Murrelet was selected for a single species examination, and showed a similar outcome for abundance, despite high numbers observed in 2023.

The Breeding Bird Survey (BBS) is a continent-wide program designed to document the presence and abundance of species breeding in an area using road-based sampling. Data were collected on 15 June 2023 and will be available for download in January 2024 at www.pwrc.usgs.gov/BBS.

The Alaska Landbird Monitoring Survey (ALMS) is a state-wide program designed to document the presence and abundance of breeding landbird species using a similar sampling method to the BBS but off-road. The data were collected on 15 June 2023, finding 28 species.

Bald Eagle Nest Monitoring (BENM) is a KLGO specific program still under development. Incidental observations for 2 nests were recorded by KLGO staff doing the CWS. A Taiya River raft guide made numerous observations of 4 additional nests, a total of 6 nests were monitored. There was suspected or confirmed breeding activity at 3 nests and confirmed breeding success at 2 of those nests.

Incidental local bird observations accessed from the Skagway Bird Club forum and through the citizen science portals iNaturalist and eBird added depth to the 2023 species records, but caution regarding unusual species reports may be warranted. Data were also obtained from the Audubon Bird Migration Explorer platform, which showed 41 bird species moving through the Skagway area to or from 31 countries. While Skagway is not a critical bird migration area where massive flocks of migratory birds refuel or breed, it is an important passage node for migratory birds that travel from many locations in the western hemisphere to and from their arctic breeding grounds.

Acknowledgments

The authors would like to thank KLGO staff, local volunteers, and regional experts who were crucial to the completion of these surveys. CWS participants included Annika Christensen, Lynn Rhodes, Isabella Yallapragada, Jennifer Larson, Lexi Zolenski, Logan Johnson, Juliana Tenebawn, Rory Ornelas, Adrian DeLong, Christina Garcia, Kelsey Griffin, Braden Jones, Mike Konsler, and Alex Skowron. Deb Rudis, expert birder from Juneau, conducted the BBS and ALMS surveys. Bob Fink of Skagway Float Tours and multiple CWS field data collectors provided the observations for BENM.

Acronyms

ALMS Alaska Landbird Monitoring Survey

AOS American Ornithological Society

BENM Bald Eagle Nest Monitoring

BBS Breeding Bird Survey

CWS Coastal Waterbird Survey

KLGO Klondike Gold Rush National Historical Park

NPS National Park Service

PAGY National Weather Service Skagway Station Identifier

SIP Scientists in Park, NPS internship program

SKXA2 Meteorological Assimilation Data Ingest System Skagway Ferry Terminal Station Identifier

USGS United States Geological Survey

USFWS United States Fish and Wildlife Services

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 km² (13,191 acres). Despite its small size, KLGO has a unique geographical setting and climate which makes it a very biodiverse area (Pojar and Mackinnon 1994, MacDonald and Cook 1999).

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 rocky, low-vegetation mountain/icefield ecosystems (Demarchi 2011).

The four multi-year bird monitoring studies (CWS, BBS, ALMS, BENM) were active in Skagway and borough in 2023. They are a part of NPS long-term monitoring that provides managers with resource information critical for making scientifically informed decisions to protect natural resources 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).

Methods

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).

The current survey areas consist of 4 census units labeled A, B, C, and D which were established in 2021 and partially coincide with the old 8 units (Hahr and Trapp 2004). The old and current units are compared in Figure 1(a larger version of the current map is in Appendix A).

Unit A covers the mouth of the Skagway River and the nearby bay area which roughly corresponds to the old units 1 & 2. Unit B covers Nahku Bay which exactly corresponds to units 3 and 4. Unit C covers the Dyea Outer Bay which exactly corresponds to unit 5. Unit D covers the Taiya River Intertidal area which includes the mouth of the Taiya River up to the NPS campgrounds. Unit D corresponds very roughly to the old units 7 & 8 - not including the Nelson Slough, Dyea Flats, and the Taiya River between the NPS campgrounds and the Taiya River Bridge.

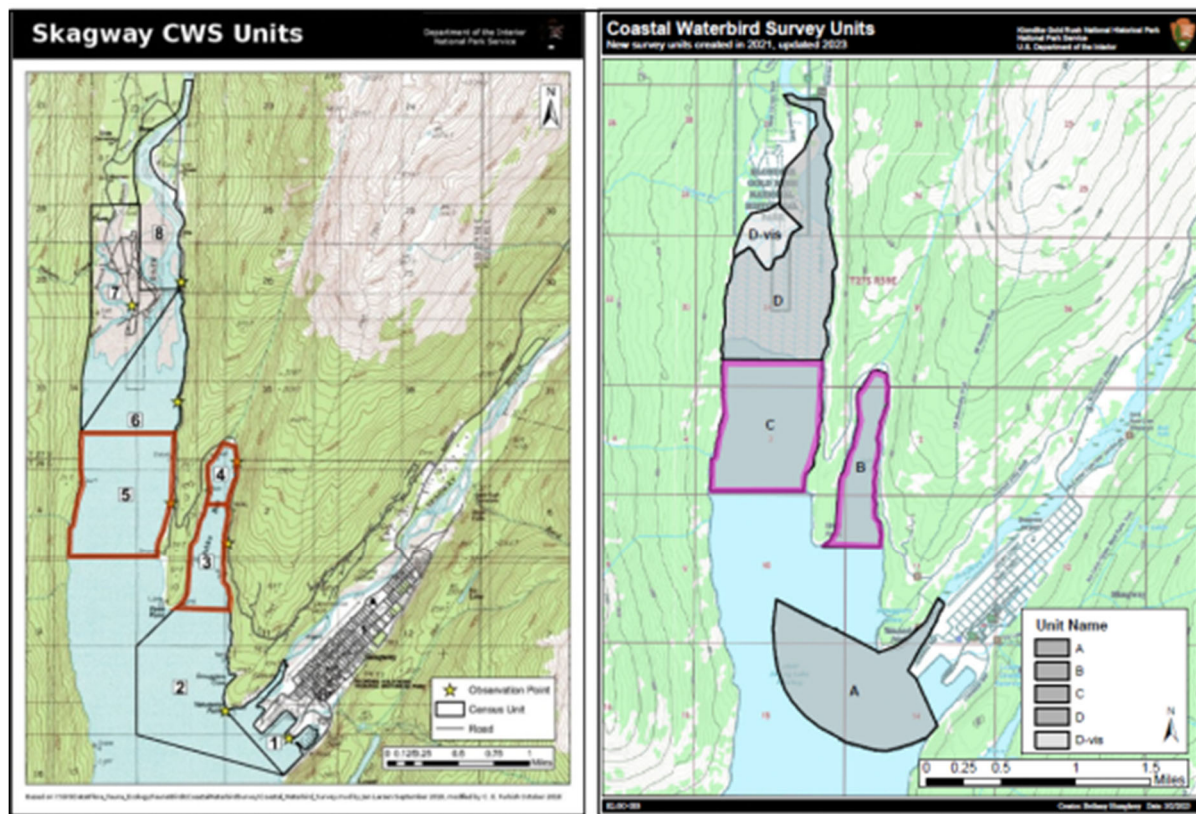


Figure 1: Maps of both the old and new units surveyed in the CWS

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 non-waterbirds using near shore resources, detected by sight or sound within the survey area were added to the data. Observers needed to be skilled in visually identifying bird species. A Vortex Razor HD 16-48X65mm spotting scope and a pair of working binoculars were used to keep the data reliable. Reference guides were brought along to aid in identification, such as the Sibley Guide to Birds (Sibley, 2001), the Shorebird Guide (O'Brien, 2006), and mobile phone apps such as Merlin and Audubon.

Observed birds were identified using standard 4 letter bird codes according to the American Ornithology Society (AOS) (Chesser 2023). If a bird was unable to be identified to species, it was included in a set of KLGO multi-species groupings of broader categories for certain birds.

Two data sheets were used: one for environmental conditions and one for species data. At each unit, environmental data were collected including cloud cover, precipitation, and wave formation. Once back from the field, tides, air temperature and wind parameters were added from local weather stations PAGY and SKXA2. All data collected were entered into a spread sheet and were verified according to the park's 2-person quality assurance procedure. Minor improvements were made to the data sheets for the 2024 season.

CWS Comparative Analysis

The study included 3 years of spring migration data under the new protocol (2021-2023) and the 3 most proximate years of data under the old protocol (2017-2019). Only units that were exact spatial matches between old and new were selected. Species richness was calculated per year, and overall abundance (individuals of all species) was calculated per unit/year. Marbled Murrelet numbers were calculated per year. Single factor ANOVA was used to test the null hypothesis of equal means at 0.05 significance level for overall species richness and abundance, and for Marbled Murrelet abundance.

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/BBS). The BBS is conducted mid-June in order to catch the peak breeding time for birds in Southeast Alaska.

The Skagway BBS route is approximately 25 miles long with stops every half mile (Appendix B). As per the BBS Standard 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.

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). The ALMS is conducted mid-June in order to catch the peak breeding time for birds in Southeast Alaska.

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 to 13 stops located at least 250 meters apart. Unfortunately, the Chilkoot Trail was closed this year due to flood damage, so only the Dyea route was sampled in 2023. All stops were surveyed for 10 minutes, and all species detected were documented. The survey began a half hour before sunrise - approximately 3:30am.

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 a work in progress at KLGO. A complete protocol has not been developed, KLGO staff have consistently used time during the CWS to record observations of two nests that lie within their survey units. Bob Fink, a Skagway Float Tours guide, kept a log of observations as he floated past nests CT01, CT02, TR02, and TR03. A map of the known and suspected nests is in Appendix D.

Incidental Observations and Other Data Sources

The citizen science platform, iNaturalist, provided incidental observations from KLGO staff and visitors (iNaturalist 2023). eBird is a citizen science platform specialized for birders to share their observations with scientists and the birding community (eBird 2023). For the first time in 2023, KLGO acquired an easily accessed eBird annual species list particular to Skagway as a region (municipality or borough). The Skagway Bird Club (Skagway Bird Club, 2023) a local birding group, maintains a forum of sightings and other information. The National Audubon Society released their Bird Migration Explorer digital platform in fall 2022 (Smith 2022). The interactive Explorer provides in-depth information on selected migratory birds. Data were acquired from these sources for January through September or October 2023.



Trumpeter Swan the Outer Dyca Flats, 14Apr2023 (Lexi Zolenski)

Results

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

CWS – Coastal Waterbird Survey

Twenty (20) surveys were conducted between 14 April and 29 September, 2023. Every survey had at least 1 proficient birder assisted by 2-3 field assistants who were composed of KLGO staff or volunteers.

Fifty-two (52) species of waterbirds were identified in 2023 with a total of 7,104 individual birds counted. Fifteen (15) KLGO multi-species groups were identified with a total of 787 individual birds. A total of 7,891 birds were counted throughout the entire season.

Table 1 gives the dates of each survey along with the corresponding migration and breeding periods. Table 2 gives the scientific and common names for each bird species or KLGO group, the total number of individuals per species or group, and the date of the survey that had the greatest number of birds seen in one day.

Table 1: CWS survey periods and dates for 2023

Period	Survey Dates in 2023
Spring migration Mid-April to end of May Weekly	April: 14, 21, 28 May: 5, 13, 19, 26
Summer breeding & rearing June, July & early August Every other week	June: 2, 16, 30 July: 14, 28
Fall migration Mid-August to Mid-September Weekly	August: 12, 18, 25 September: 1, 8, 15, 22, 29

Table 2: CWS list of waterbird species recorded during 2023

Scientific Name	Common Name	Total Number	Maximum Single Survey Number	Date of Maximum Survey
<i>Actitis macularius</i>	Spotted Sandpiper	8	4	5/19/2023
<i>Anas acuta</i>	Northern Pintail	82	53	4/28/2023
<i>Anas carolinensis</i>	Green-winged Teal	353	182	5/5/2023
<i>Anas platyrhynchos</i>	Mallard	431	135	4/28/2023
<i>Anser caerulescens</i>	Snow Goose	50	50	4/28/2023
<i>Anthus rubescens</i>	American Pipit	51	44	5/5/2023
<i>Ardea herodias</i>	Great Blue Heron	32	7	6/2/2023
<i>Aythya collaris</i>	Ring-necked Duck	36	22	5/5/2023
<i>Brachyramphus marmoratus</i>	Marbled Murrelet	421	83	7/14/2023
<i>Branta canadensis</i>	Canada Goose	3	3	5/26/2023
<i>Bucephala albeola</i>	Bufflehead	143	57	5/5/2023
<i>Bucephala clangula</i>	Common Goldeneye	25	23	4/21/2023
<i>Bucephala islandica</i>	Barrow's Goldeneye	95	63	5/5/2023
<i>Buteo jamaicensis</i>	Red-tailed Hawk	2	2	9/8/2023
<i>Calidris minutilla</i>	Least Sandpiper	8	8	5/5/2023
<i>Cephus columba</i>	Pigeon Guillemot	41	14	5/19/2023
<i>Charadrius semipalmatus</i>	Semipalmated Plover	2	2	7/28/2023
<i>Charadrius vociferus</i>	Killdeer	2	2	4/21/2023
<i>Chroicocephalus philadelphia</i>	Bonaparte's Gull	887	202	5/19/2023
<i>Circus hudsonius</i>	Northern Harrier	7	2	Multiple
<i>Clangula hyemalis</i>	Long-tailed Duck	30	30	5/26/2023
<i>Corvus caurinus</i>	Northwestern Crow (form of AMCR)	639	115	8/18/2023
<i>Corvus corax</i>	Common Raven	38	9	8/25/2023
<i>Cygnus buccinator</i>	Trumpeter Swan	4	4	4/14/2023
<i>Falco columbarius</i>	Merlin	2	1	Multiple
<i>Falco sparverius</i>	American Kestrel	2	2	9/15/2023
<i>Gallinago delicata</i>	Wilson's Snipe	4	4	5/5/2023
<i>Gavia immer</i>	Common Loon	1	1	6/2/2023
<i>Gavia stellata</i>	Red-throated Loon	4	2	Multiple
<i>Haliaeetus leucocapitalis</i>	Bald Eagle	132	20	9/29/2023
<i>Histrionicus histrionicus</i>	Harlequin Duck	127	19	9/22/2023
<i>Larus argentatus</i>	Herring Gull	473	95	4/14/2023
<i>Larus brachyrhynchus</i>	Short-billed Gull	1624	239	5/13/2023
<i>Larus glaucescens</i>	Glaucous-winged Gull	6	3	4/28/2023
<i>Larus thayeri</i>	Thayer's Gull (subsp of Iceland Gull)	3	2	6/16/2023
<i>Mareca americana</i>	American Wigeon	308	125	5/5/2023
<i>Mareca penelope</i>	Eurasian Wigeon	1	1	4/21/2023
<i>Mareca strepera</i>	Gadwall	24	21	8/18/2023
<i>Megaceryle alcyon</i>	Belted Kingfisher	15	3	5/5/2023
<i>Melanitta deglandi</i>	White-winged Scoter	3	2	5/19/2023

Scientific Name	Common Name	Total Number	Maximum Single Survey Number	Date of Maximum Survey
<i>Melanitta perspicillata</i>	Surf Scoter	198	82	6/2/2023
<i>Mergus merganser</i>	Common Merganser	85	21	5/13/2023
<i>Mergus serrator</i>	Red-breasted Merganser	77	23	5/19/2023
<i>Phalaropus lobatus</i>	Red-necked Phalarope	4	4	8/18/2023
<i>Pica hudsonia</i>	Black Billed Magpie	2	1	Multiple
<i>Podiceps auritus</i>	Horned Grebe	52	32	5/13/2023
<i>Podiceps grisegena</i>	Red-necked Grebe	27	20	5/5/2023
<i>Spatula clypeata</i>	Northern Shoveler	102	78	5/5/2023
<i>Spatula discors</i>	Blue-winged Teal	4	4	5/13/2023
<i>Sterna paradisaea</i>	Arctic Tern	277	90	5/5/2023
<i>Tringa incana</i>	Wandering Tattler	47	15	5/26/2023
<i>Tringa melanoleuca</i>	Greater Yellowlegs	2	2	7/28/2023
KLGO developed multi-species groups				
Accipitridae	hawk sp	1	1	9/15/2023
Anatidae	goldeneye sp	6	5	5/5/2023
Anatidae	scoter sp	26	17	5/5/2023
Anatidae	duck sp	44	13	4/14/2023
Anatidae	merganser sp	3	2	5/13/2023
Anatidae	scaup sp	11	4	Multiple
Gaviidae	loon sp	5	4	6/16/2023
Laridae	gull sp	393	116	4/28/2023
Laridae	large gull sp	128	35	4/28/2023
Laridae	small gull sp	5	4	8/18/2023
Scolopacidae	small sandpiper sp.	44	40	8/18/2023
Scolopacidae	small sandpiper sp. (2)	50	50	8/18/2023
Scolopacidae	sanderling sp	39	20	5/5/2023
	bird sp	14	10	5/13/2023
	shorebird sp	22	15	9/1/2023

The overall number of CWS birds counted during each survey session of 2023 is shown in Figure 2. The highest numbers were seen in late April and early May during spring migration. Figure 3 shows the richness of species that were identified throughout 2023. Similar to abundance, the highest numbers can be seen in spring migration.

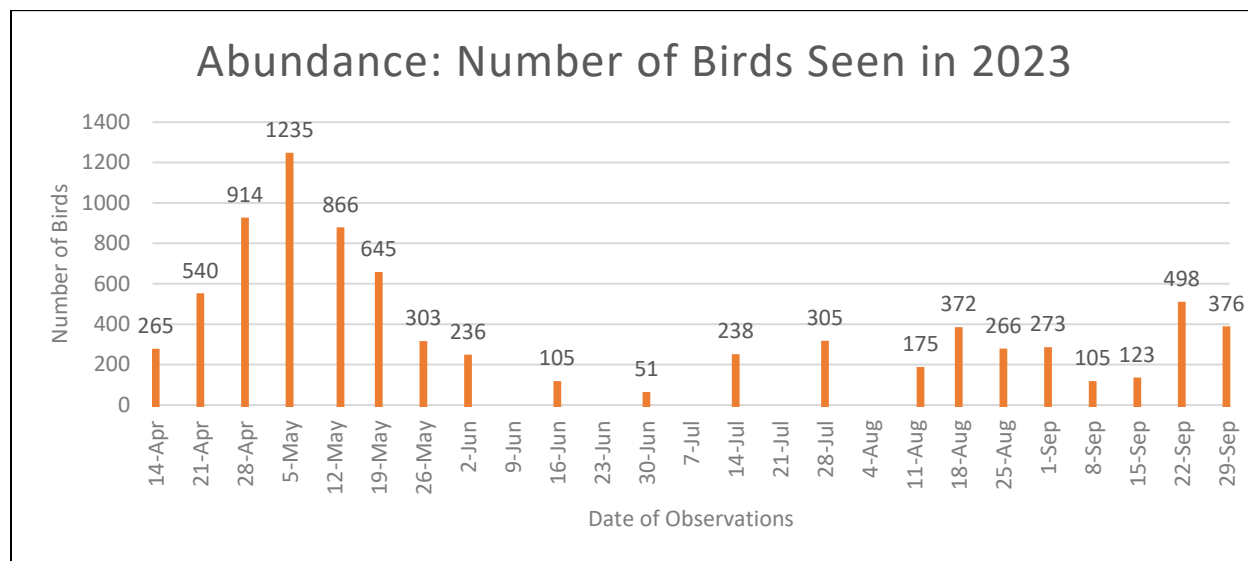


Figure 2: CWS abundance, number of individual birds seen during each survey of 2023

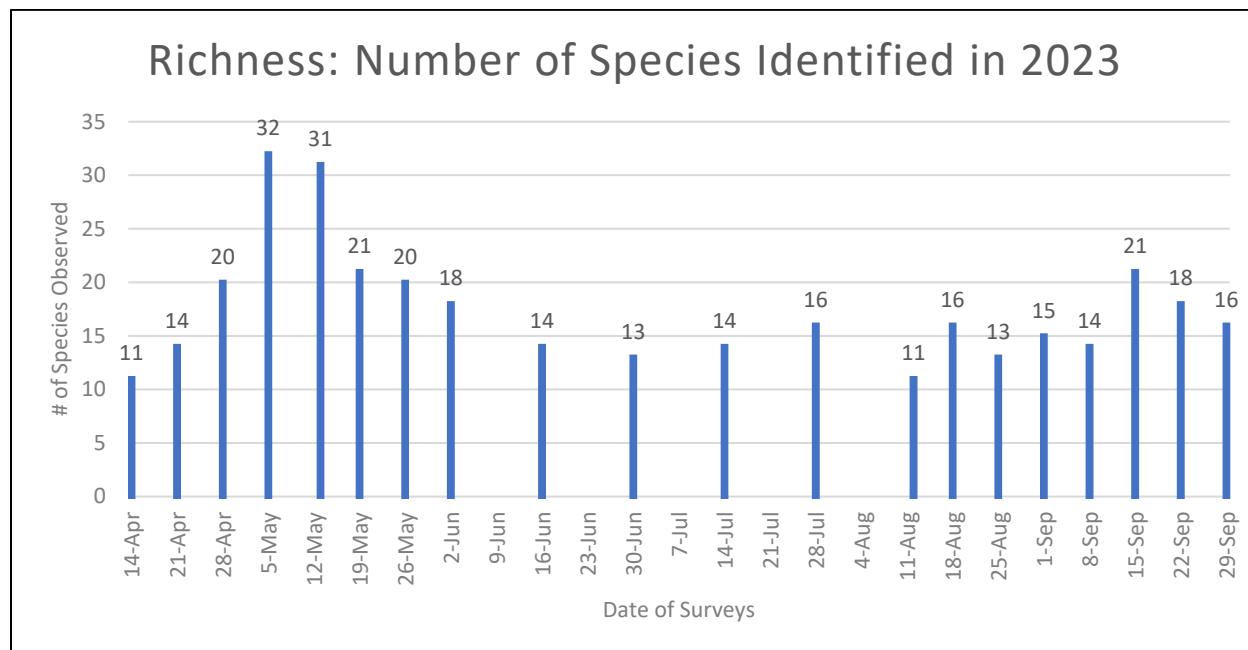


Figure 3: CWS richness, number of species identified during each survey in 2023

CWS Comparative Analysis

The examination did not find a significant difference in overall species abundance or richness between the methods, which could indicate that the protocol change did not affect the data. However, the power of the test was very low, which indicates a need for more data. The Marbled Murrelet was selected for a single species examination, and showed a similar outcome for abundance, despite high numbers seen in 2023. Figure 4 is the slide for overall species richness from the presentation created to convey the results of the study (Yallapragada, 2023).

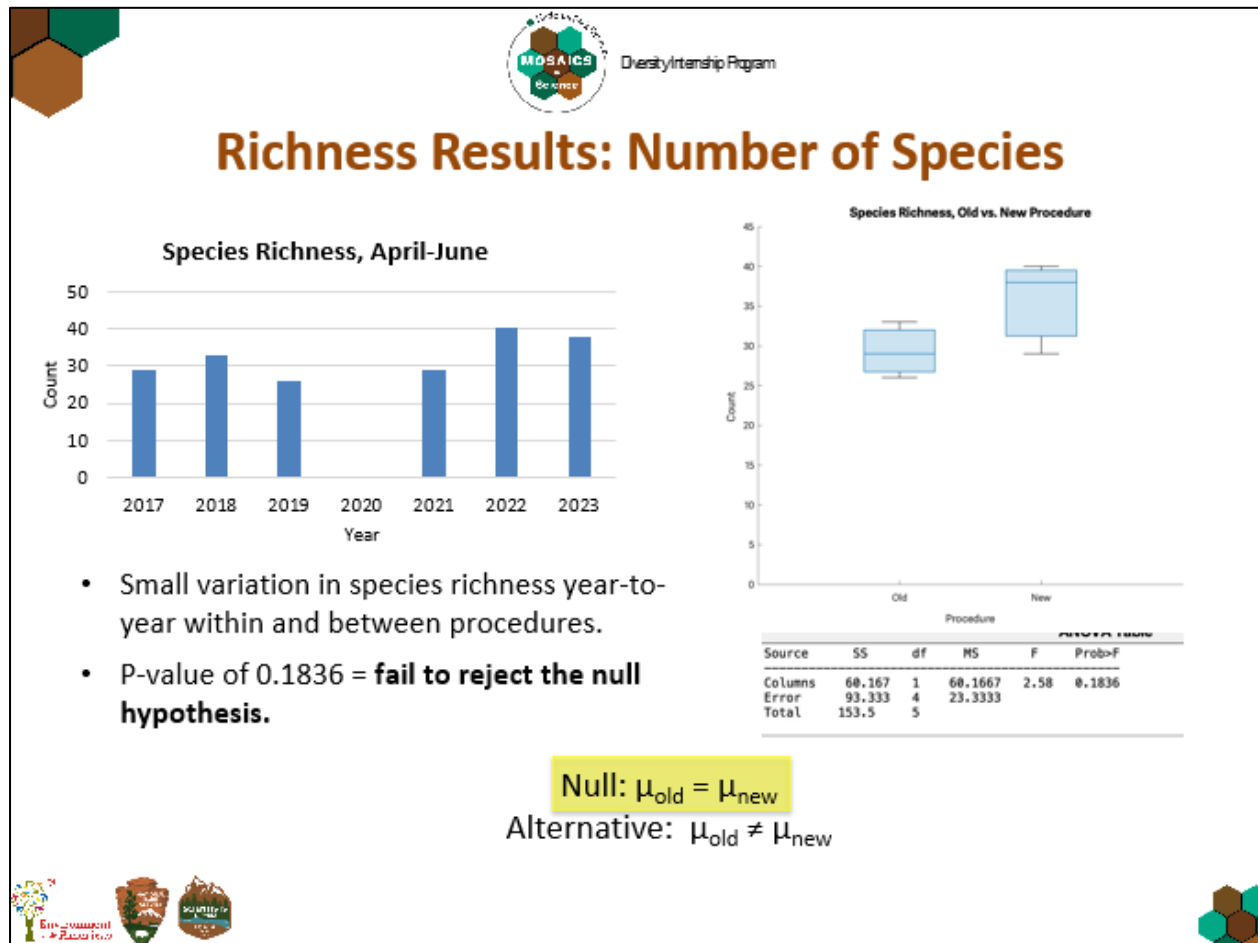


Figure 4: Analysis of the impact of old vs, current methods on CWS overall species richness

BBS – Breeding Bird Survey

The BBS data were collected by an expert birder on 15 June 2023. The data from the 2023 survey will be available come January 2024 and it can then be accessed at www.pwrc.usgs.gov/BBS.

ALMS – Alaska Landbird Monitoring Survey

The ALMS Dyea route was conducted on 15 June 2023. The survey was performed by a proficient birder with years of experience with the route. The survey documented 29 species of birds in 16 families. The species are presented in Table 3 by family group with scientific and common names.

Table 3: ALMS - Species List for Alaska Landbird Monitoring Survey, 15 June 2023

Family Name	Scientific Name	Common Name
Anatidae	<i>Anas crecca</i>	Green-winged Teal
Corvidae	<i>Corvus brachyrhynchos</i>	American Crow
Fringillidae	<i>Loxia curvirostra</i>	Red Crossbill
	<i>Spinus spinus</i>	Pine Siskin
Hirundinidae	<i>Tachycineta thalassina</i>	Violet-green Sparrow
Laridae	<i>Larus brachyrhynchus</i>	Short-billed Gull
Paridae	<i>Poecile rufescens</i>	Chestnut-backed Chickadee
Parulidae	<i>Geothlypis trichas</i>	Common Yellowthroat
	<i>Leiothlypis celata</i>	Orange-crowned Warbler
	<i>Setophaga coronata</i>	Yellow-rumped Warbler
	<i>Setophaga townsendi</i>	Townsend's Warbler
Passerellidae	<i>Junco hyemalis</i>	Dark-eyed Junco
	<i>Junco hyemalis hyemalis</i>	Slate-colored Junco
	<i>Junco hyemalis oregonus</i>	Oregon Junco
	<i>Melospiza lincolni</i>	Lincoln's Sparrow
	<i>Passerculus sandwichensis</i>	Savannah Sparrow
	<i>Spizella passerina</i>	Chipping Sparrow
Phasianidae	<i>Dendragapus fuliginosus</i>	Sooty Grouse
Picidae	<i>Sphyrapicus ruber</i>	Red-breasted Sapsucker
Regulidae	<i>Corthylio calendula</i>	Ruby-crowned Kinglet
	<i>Regulus satrapa</i>	Golden-crowned Kinglet
Scolopacidae	<i>Actitis macularius</i>	Spotted Sandpiper
Turdidae	<i>Catharus gustulatus</i>	Swainson's Thrush
	<i>Catharus guttatus</i>	Hermit Thrush
	<i>Ixoreus naevius</i>	Varied Thrush
Turdidae	<i>Turdus migratorius</i>	American Robin
Tyrannidae	<i>Empidonax difficilis</i>	Pacific-slope Flycatcher
Vireonidae	<i>Vireo gilvus</i>	Warbling Vireo

BENM – Bald Eagle Nest Monitoring

In 2023, no targeted survey was made for the BENM. However, 2 consistent sources of Bald Eagle nest observations were submitted: weekly or bi-monthly observations of 2 nests by CWS survey data collectors from April to September; and near daily and several times per day observations of 4 nests made by Bob Fink, a guide with Skagway Float Tours, from May to August. A total of 6 nests were monitored. See Appendix D for the Bald Eagles nest's location map.

Table 4 summarizes observations made during CWS surveys throughout 2023, at nests DY01 and DY02. One record of suspected breeding activity was described at nest DY01 (6/2/2023) with an eagle perched on the edge of the nest.

Table 4: Bald Eagle activity at 2 nests reported during the CWS in 2023

Date	DY01 (Dyea outer bay west side)	DY02 (Taiya River hillside southeast NPS campground)
4/28/2023	Adult caught duck & took it the nest & ate it	
5/19/2023	1 BAEA on a tree near the nest	
5/26/2023	1 BAEA in the nest	
6/2/2023	1 BAEA sitting on the edge of the nest	1 BAEA spotted at suspected nest east of known nest
6/16/2023	Activity near the nest	BAEA spotted north of nest
9/8/2023	Activity near the nest	
9/22/2023	1 BAEA in the tree next to the nest tree	
9/29/2023	1 BAEA sitting in the branch below the nest	

Bob Fink observed continuous breeding activity at nests TR02 and TR03 from 16 May through 30 August. His data confirmed breeding success at both eagle nests starting 27 July to 18 August, with chick or juvenile sightings. Full details are in Appendix D.

Incidental Observations and Other Data Sources

Additional bird data outside the 4 monitoring programs were available from citizen science and specialized bird data platforms. iNaturalist, eBird, Skagway Bird Club, and the Audubon Bird Migration Explorer were accessed for local data in 2023.

iNaturalist was used by a variety of people between 1 January 1 to 30 September, but only a small number of bird species were posted. The species were American Crow (Northwestern Crow), Bald Eagle, Chipping Sparrow, Common Raven, Harlequin Duck, Sooty Grouse, Steller's Jay, Violet-green Swallow, and a bird identified to the grouping of Crows, Jays, and Magpies.

eBird data specific to the Skagway region (as "Skagway Municipality") were easily obtained from the eBird website and is shown in Table 5. The Skagway area was listed as having 126 different species observed in 2023 as of 1 November.

Table 5: eBird bird species observed in Skagway January through October, 2023

Common Name		
Alder Flycatcher	Fox Sparrow	Ring-necked Duck
American Crow	Glaucous-winged Gull	Rock Pigeon
American Dipper	Golden-crowned Kinglet	Rock Ptarmigan
American Kestrel	Golden-crowned Sparrow	Ruby-crowned Kinglet
American Pipit	Gray-crowned Rosy-Finch	Rufous Hummingbird
American Redstart	Great Blue Heron	Rusty Blackbird
American Robin	Great Horned Owl	Savannah Sparrow
American Three-toed Woodpecker	Greater Scaup	Semipalmated Plover
American Wigeon	Greater Yellowlegs	Sharp-shinned Hawk
Arctic Tern	Hairy Woodpecker	Short-billed Gull
Bald Eagle	Hammond's Flycatcher	Snow Bunting
Bank Swallow	Harlequin Duck	Solitary Sandpiper
Barn Swallow	Hermit Thrush	Song Sparrow
Barrow's Goldeneye	Herring Gull	Sooty Grouse
Belted Kingfisher	House Sparrow	Spotted Sandpiper
Black Oystercatcher	Iceland Gull	Spruce Grouse
Black Turnstone	Lapland Longspur	Steller's Jay
Black-billed Magpie	Least Sandpiper	Surf Scoter
Black-capped Chickadee	Lesser Scaup	Surfbird
Black-legged Kittiwake	Lesser Yellowlegs	Swainson's Thrush
Blue-winged Teal	Lincoln's Sparrow	Tennessee Warbler
Bohemian Waxwing	MacGillivray's Warbler	Townsend's Solitaire
Bonaparte's Gull	Mallard	Townsend's Warbler
Brown Creeper	Marbled Murrelet	Tree Swallow
Bufflehead	Merlin	Trumpeter Swan
California Gull	Northern Flicker	Tufted Puffin
Canada Goose	Northern Shoveler	Varied Thrush
Cedar Waxwing	Northern Shrike	Vaux's Swift
Chestnut-backed Chickadee	Northern Waterthrush	Violet-green Swallow
Chipping Sparrow	Orange-crowned Warbler	Wandering Tattler
Cliff Swallow	Pacific Wren	Warbling Vireo
Common Goldeneye	Pigeon Guillemot	Western Flycatcher
Common Loon	Pine Grosbeak	Western Tanager
Common Merganser	Pine Siskin	Western Wood-Pewee
Common Murre	Red Crossbill	White-crowned Sparrow
Common Raven	Red-breasted Merganser	White-winged Crossbill
Common Redpoll	Red-breasted Nuthatch	White-winged Scoter
Common Yellowthroat	Red-breasted Sapsucker	Willow Ptarmigan
Dark-eyed Junco	Red-tailed Hawk	Wilson's Warbler
Eurasian Collared-Dove	Red-throated Loon	Yellow Warbler
European Starling	Red-winged Blackbird	Yellow-rumped Warbler

Skagway Bird Club members observed a total of 61 different species from 1 January to 1 November, 2023. Table 6 shows data collected by the Skagway Bird Club listed by common name.

Table 6: Skagway Bird Club species observed January through October 2023

Common Names	
American Dipper	Mountain Bluebird
American Crow (Northwestern Crow)	Northern Goshawk
American Pipit	Northern Harrier
American Robin	Northern Pintail
American Wigeon	Northern Shrike
Arctic Tern	Orange-crowned Warbler
Bald Eagle	Pacific Wren
Barrows Goldeneye	Pigeon Guillemot
Belted Kingfisher	Pine Grosbeak
Blue Heron	Pine Siskin
Bohemian Waxwing	Red Crossbill
Brambling	Red-breasted Sapsucker
Bufflehead	Red-winged Blackbird
Cedar Waxwing	Rough-legged Hawk
Chestnut-backed Chickadee	Rufous Hummingbird
Chipping Sparrow	Rusty Blackbird
Common Goldeneye	Say's Phoebe
Common Merganser	Sharp-shinned Hawk
Common Raven	Short-billed Gull
Dark-eyed Junco	Snow Bunting
Downy Woodpecker	Snow Goose
Glaucous Gull	Song Sparrow
Glaucous-winged Gull	Sooty Grouse
Golden-crowned Kinglet	Steller's Jay
Hairy Woodpecker	Townsend's Solitaire
Hermit Thrush	Townsend's Warbler
Herring Gull	Varied Thrush
House Sparrow	Western Kingbird
Mallard	White-winged Crossbill
Marbled Murrelet	Wilson's Warbler
Merlin	Yellow Warbler

The Audubon Bird Migration Explorer platform showed 41 bird species that moved through the Skagway area to or from 31 countries. Table 7 gives the source or destination countries for birds passing through Skagway. Countries are listed from hosting the highest to lowest number of Skagway species, with species number in parentheses. Figure 5 is the map of locations where birds passing through Skagway were found, with density of species at each location depicted by color.

Table 7: Source or destination countries of migratory birds passing through Skagway

(number of species found in country shown in parentheses)			
United States (40)	Colombia (2)	Grenada (1)	British Virgin Islands (1)
Canada (27)	Bolivia (2)	Guadeloupe (1)	Chile (1)
Mexico (6)	Dominican Republic (2)	Saint Lucia (1)	Curacao (1)
Brazil (3)	Peru (2)	Saint Vincent and Grenadines (1)	Honduras (1)
Cuba (3)	Suriname (2)	Argentina (1)	Jamaica (1)
Costa Rica (2)	Guyana (2)	Aruba (1)	Montserrat (1)
Venezuela (2)	Bahamas (1)	Barbados (1)	U.S. Virgin Islands (1)
El Salvador (2)	Trinidad and Tobago (1)	Bonaire, Sint Eustatius, and Saba (1)	

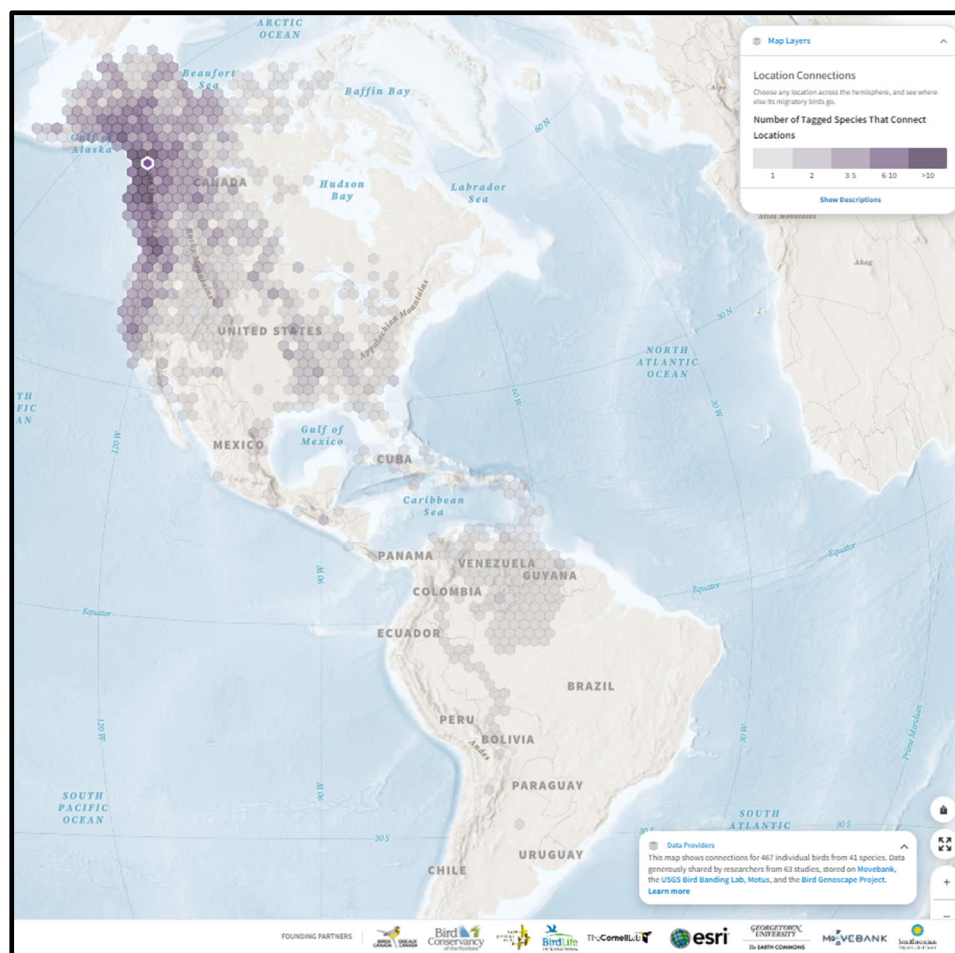


Figure 5: Locations associated with Skagway migratory birds, Bird Migration Explorer map.

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 continental and state programs 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 2 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.

CWS – Coastal Waterbird Survey

The KLGO CWS monitors bird use of near-shore habitats, with a 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 habitats, 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 CWS has an intensive monitoring schedule that requires trained field observers, ideally over multi-year periods. It has benefited from volunteers and the birding 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; the skills required to complete these surveys cannot be easily obtained through short-term on-the-job training.

Minor design changes to the field data sheets were made to prepare for use in 2024. The bird code sheet was updated to include new species seen in 2023. The environmental data sheet was modified to be easier to understand and to simplify calculations.

CWS Comparative Analysis

CWS data collected using old and current methods were not found to be significantly different during spring migration, but the power of the test indicated the result should be tentative and examined again with more data. In addition, several confounding factors must also be considered, including but not limited to trends over time such as reduced visibility at observation points, and increased noise, and increased human presence. The high number of Marbled Murrelets recorded during spring migration in 2023 should be investigated using the complete CWS data set and in conjunction with outside sources to appraise the status of this sensitive species that is dependent upon old-growth conifers for nesting.

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. At the local level, these programs can help the park understand the significance of changes seen in Skagway, and to separate local effects from larger influences. KLGO receives a high return on its investment with these programs by supporting a skilled, dedicated birder for a few days each year.

BENM – Bald Eagle Nest Monitoring

The BENM project is still in development, but status information for a few known nests in the Dyea area has been accomplished most years. Eager volunteer Bob Fink provided the observations that benefited from a standardized form of recording information through a park provided field logbook.

BENM operational protocols and a 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 also needed for KLGO environmental planning and compliance. Until full implementation of a structured protocol, this project could improve through development of a minimal framework and tools for data collection. More outreach efforts to foster volunteers early in the nesting season would improve KLGO Bald Eagle monitoring efforts.

Incidental Observations and Other Data Sources

Park employees, interns, and volunteers often contribute incidental observations made while working on other projects. Park visitors are provided with information on iNaturalist, and it is a widely used citizen science platform. Although iNaturalist is not a main birding site, it includes aids that help inexperienced observers pin down identifications.

The Skagway Bird Club forum is used by local birders, producing a reliable record of notable sightings, but does not generate information on distribution and abundance. eBird is a high-quality birder platform, designed to allow data creation that can be used to estimate distribution and abundance with enough user input, and includes identification aids. However, it has been widely adopted by birders of different abilities, and cruise ship passengers include birders unfamiliar with our regional birds who are only in Skagway for a few hours. A cursory review of the 2023 summary includes some ambiguous reports of bird species that would be quite unusual for Skagway but are common in areas the ships visit before coming to Skagway. More examination of the eBird data for the Skagway region is warranted.

The Audubon Bird Migration Explorer showed 41 bird species moving through the Skagway area to or from 31 countries. While Skagway is not a critical migratory area where massive flocks of migratory birds refuel or breed, it is an important passage node for migratory birds that travel from many locations in the western hemisphere to and from their arctic breeding grounds.

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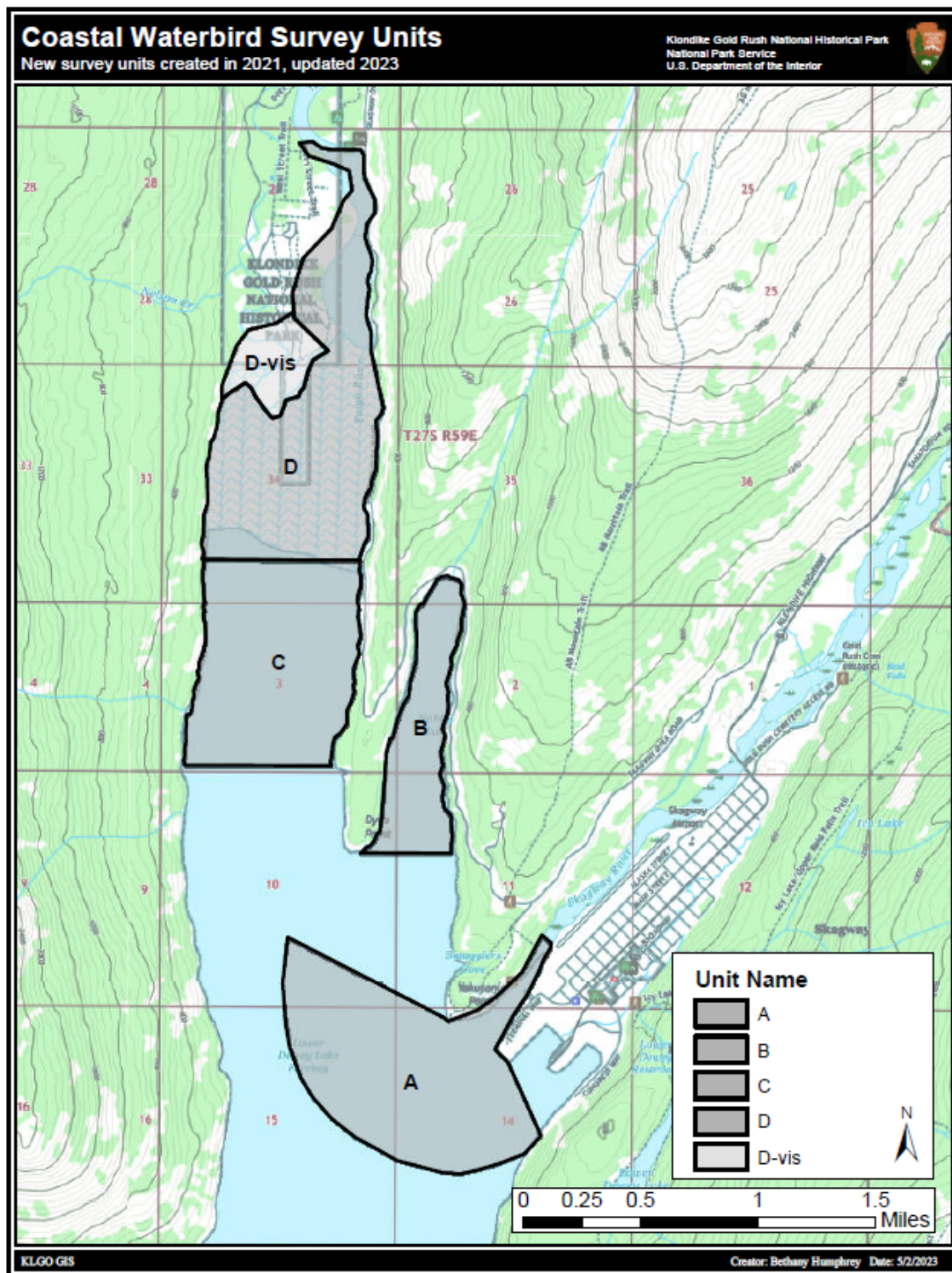
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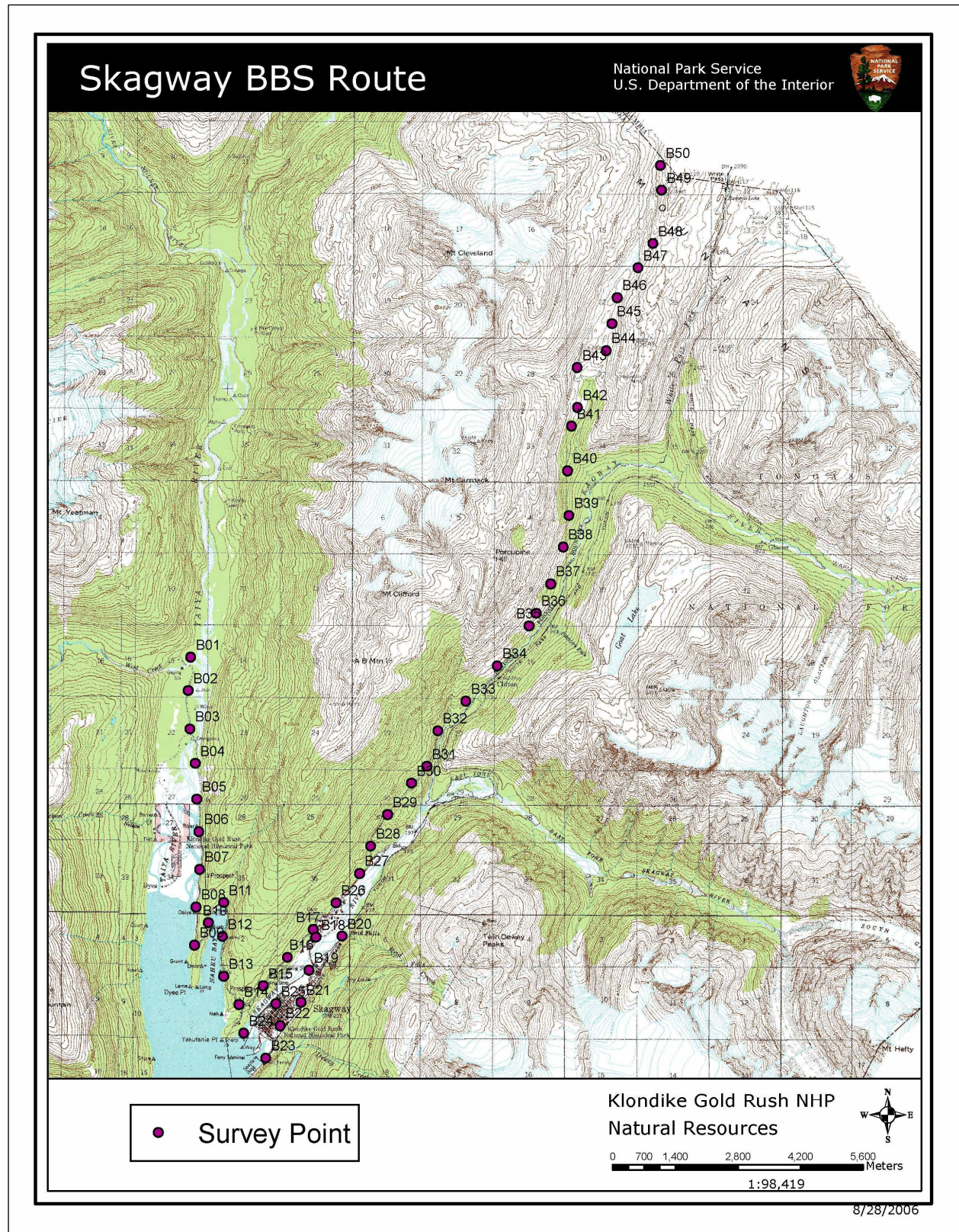
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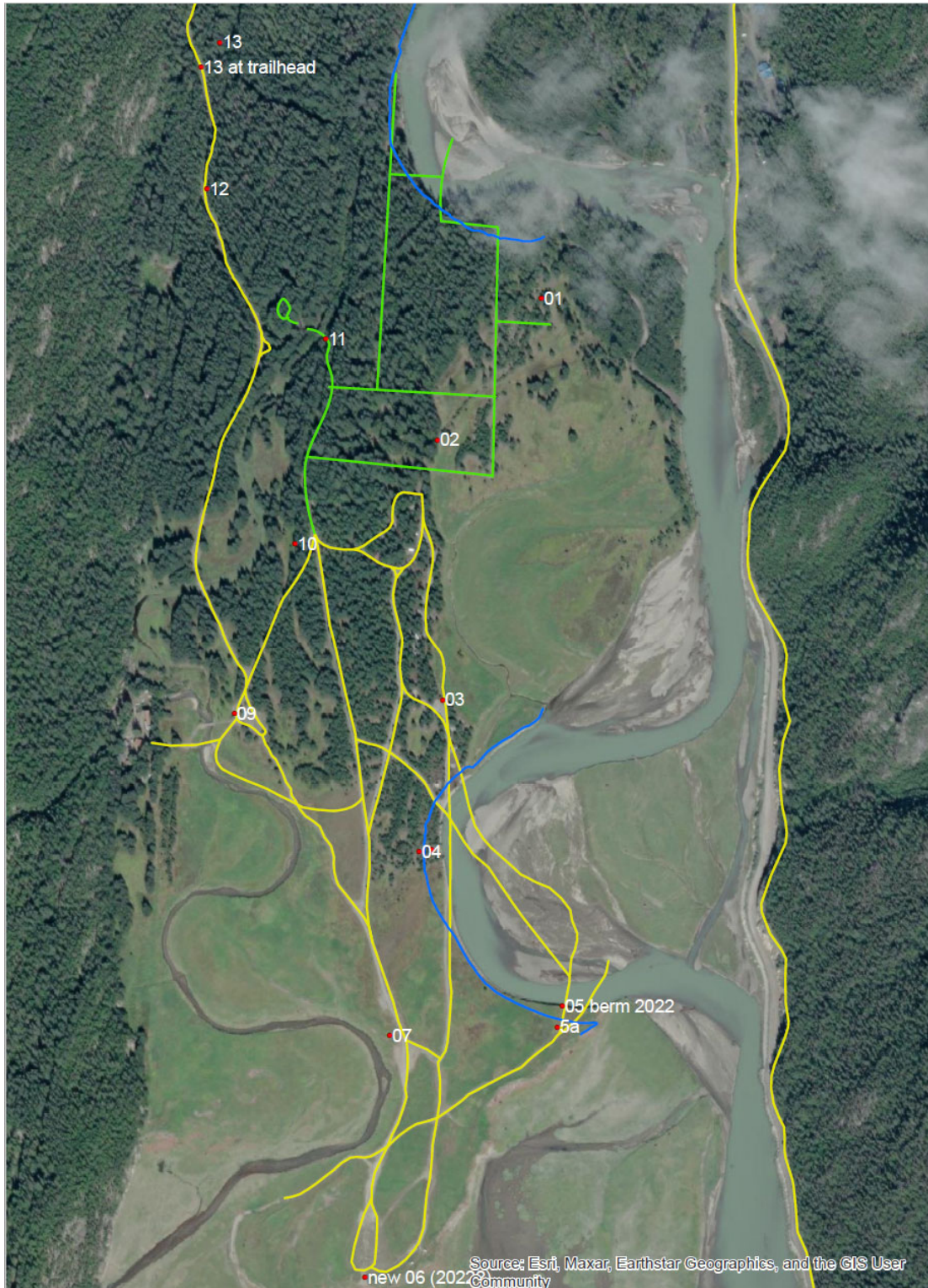
Appendix A: Coastal Waterbird Survey (CWS)



Appendix B: Breeding Bird Survey (BBS)



Appendix C: Alaska Landbird Monitoring Survey (ALMS), Dyea Route



Appendix D: Bald Eagle Nest Monitoring (BENM)



Table 8: Activity observed at two Bald Eagle nests reported by Bob Fink in 2023

Date	Time	Location/Info
16-May	2:05 PM	Both at TR03 nest; 1 inside and 1 on a limb nearby
20-May	12:15 PM	One Eagle in TR03
	12:30 PM	One eagle In TR02
	5:00 PM	One Eagle in TR03
	5:20 PM	One eagle In TR02
22-May	11:10 AM	One Eagle in TR03
	11:30 AM	One eagle In TR02
23-May	12:15 PM	One Eagle in TR03
	12:40 PM	One eagle In TR02
24-May	10:30 AM	One Eagle in TR03
	10:50 AM	One eagle In TR02
	5:00 PM	One Eagle in TR03
	5:25 PM	One eagle In TR02
25-May	2:30 PM	One Eagle in TR03
	2:55 PM	One eagle In TR02
26-May	1:30 PM	One eagle In TR02
29-May	12:05 PM	One eagle In TR02
	4:30 PM	One eagle In TR02
30-May	12:30 PM	Two eagles In TR02
	5:00 PM	One eagle In TR02
31-May	10:37 AM	Two Eagles in TR02; 1 inside and 1 on a tree nearby
	2:35 PM	One eagle In TR02
	3:00 PM	One Eagle in TR03
1-Jun	12:00 PM	One eagle In TR02
	5:35 PM	One Eagle in TR03
2-Jun	12:15 PM	One Eagle in TR03
	12:50 PM	One eagle In TR02
	4:35 PM	One Eagle in TR03
	5:15 PM	One eagle In TR02
3-Jun	4:35 PM	One Eagle in TR03
	5:15 PM	One eagle In TR02
4-Jul		One eagle near TR03
5-Jun	5:00 PM	One eagle In TR02
6-Jun	9:45 AM	One Eagle in TR03
	10:20 AM	One eagle In TR02
	2:25 PM	One Eagle in TR03
	2:58 PM	One eagle In TR02

Date	Time	Location/Info
7-Jun	12:00 PM	One eagle In TR02
	5:00 PM	One Eagle in TR03
	5:25 PM	One eagle In TR02
8-Jun	12:30 PM	One Eagle in TR03
	1:00 PM	One eagle In TR02
9-Jun	12:00 PM	One Eagle in TR03
	12:30 PM	One eagle In TR02
	2:15 PM	One Eagle in TR03
	2:45 PM	One eagle In TR02
13-Jun	9:41 AM	One Eagle in TR03
	10:00 AM	One eagle In TR02
	2:00 PM	One Eagle in TR03
	2:30 PM	One eagle In TR02
14-Jun	12:30 PM	One Eagle in TR03
	12:50 PM	One eagle In TR02
	5:15 PM	One Eagle in TR03
	5:45 PM	One eagle In TR02
15-Jun	11:30 AM	One Eagle in TR03
	12:00 PM	One eagle In TR02
	5:25 PM	One Eagle in TR03
	6:00 PM	Two eagles in TR02
16-Jun	12:00 PM	One eagle In TR02
	5:05 PM	One Eagle in TR03
	5:30 PM	One eagle In TR02
19-Jun	4:15 PM	One eagle In TR02
20-Jun	5:15 PM	One Eagle in TR03
21-Jun	12:15 PM	One eagle In TR02
	5:15 PM	One eagle In TR02
22-Jun	5:10 PM	One eagle In TR02
23-Jun	5:15 PM	One eagle in TR02; one flying nearby
26-Jun	11:15 PM	One eagle In TR02
27-Jun	2:15 PM	One eagle In TR02
28-Jun	12:15 PM	One eagle ~30 yards away from TR03
4-Jul		One Eagle in TR03
5-Jul	12:15 PM	One eagle In TR02
6-Jul	12:30 PM	One eagle In TR02
7-Jul	12:30 PM	One eagle In TR02
	5:00 PM	One eagle In TR02
10-Jul	2:30 PM	One Eagle in TR03
	3:00 PM	One eagle In TR02
11-Jul	2:30 PM	Two eagles in TR03

Date	Time	Location/Info
	3:00 PM	One eagle ~30 yards away from TR02
12-Jul	12:45 PM	One eagle in TR02
	5:00 PM	One eagle ~30 yards away from TR02
13-Jul	12:00 PM	Two eagles in TR03
	5:30 PM	One eagle In TR02
16-Jul	2:00 PM	One eagle In TR02
19-Jul	12:30 PM	One eagle In TR02
	5:30 PM	One eagle In TR02
20-Jul	11:15 AM	One eagle In TR02
	5:30 PM	Two eagles in TR02
21-Jul	5:15 PM	One eagle In TR02
25-Jul	2:00 PM	One eagle in TR03
26-Jul	10:30 AM	Immature in TR03
27-Jul	10:55 AM	Baby flapping its wings in TR02
	4:45 PM	One eagle in TR03
	5:05 PM	One baby standing in TR03
28-Jul	12:10 PM	Baby eagle in TR02
	4:50 PM	One eagle in TR03
	5:15 PM	Baby eagle in TR02
1-Aug	12:45 PM	Baby eagle in TR02
2-Aug	5:30 PM	Baby eagle in TR02
3-Aug	2:00 PM	2 adults eagles in TR03
7-Aug	2:00 PM	2 eagles in TR03; 1 adult and 1 immature (not third year)
	2:45 PM	One nestling in TR02
8-Aug	12:15 PM	One nestling in TR02
	5:10 PM	One nestling in TR02
9-Aug	11:15 AM	One nestling in TR02
	5:00 PM	One eagle in TR03
	5:25 PM	Two eagles near TR02
12-Aug	5:30 PM	Two eagles in TR02; 1 adult and 1 baby
15-Aug	2:15 PM	Two eagles in TR02; 1 adult and 1 baby
16-Aug	11:15 AM	Two eagles in TR02; 1 adult and 1 baby
	5:15 PM	Two eagles in TR02; 1 adult and 1 baby
17-Aug	1:45 PM	Two eagles in TR02; 1 adult and 1 baby
18-Aug	12:15 PM	Two eagles in TR02; 1 adult and 1 baby flapping its wings
23-Aug	5:15 PM	One eagle in TR03
24-Aug	2:15 PM	One eagle in TR03
	5:15 PM	One eagle near TR03
29-Aug	10:14 AM	One eagle near TR03
30-Aug	1:15 PM	One eagle in TR03
	1:40 PM	One eagle in TR02

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