



Breeding Bird Survey, Off Road Breeding Bird Surveys, Waterbird Surveys,  
and Eagle Nest Monitoring



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## **Abstract**

Base funding from Klondike Gold Rush National Historical Park and HPAI H5N1 project funding were used to conduct park-wide waterbird (loons, grebes, cormorants, herons, ducks and geese, plovers and sandpipers, gulls, alcids, and kingfishers) surveys in 2009. These surveys served to document avian habitat use and to aid in the early detection of HPAI H5N1. The Breeding Bird Survey (BBS) and Off Road Breeding Bird Survey (ORBBS) were conducted as part of a continuous monitoring program to document the diversity and number of avian species breeding in the area. Eagle nest monitoring began anew this season. Opportunistic bird sightings were also recorded. Owl surveys were not conducted this year, although the Southeast Alaska Owl Network produced a final report that is now available.

## **Key Words**

Waterbird, Breeding Bird, Owl, Klondike Gold Rush National Historical Park, Survey, Alaska

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## **Introduction**

Base funding from Klondike Gold Rush National Historical Park was used to conduct waterbird (loons, grebes, cormorants, herons, ducks and geese, plovers and sandpipers, and alcids) surveys in Dyea, along the Dyea road, and in the Skagway vicinity in 2009. Additional species were documented as opportunistic sightings when observed by NPS biologists and other knowledgeable birders. The number of individuals and diversity of species utilizing the Taiya Inlet as a migratory corridor or stop-over site indicates its importance to migratory waterbirds.

Several agencies, concerned about the potential presence of HPAI (Highly Pathenogenic Avian Influenza) H5N1 in North America, have started to implement early detection plans. The Southeast Alaska Network (SEAN) early detection plan was reinstated in 2007, when the mortality kits were also updated. The kits are located in the Mascot garage and should be checked and maintained before every season, including a sufficient stock of blue ice bags.

Southeast Alaska Owl Network surveys were not conducted this year, as the data and monitoring protocol were being analyzed. A final report has been completed (Kissling and Lewis, 2009)

The BBS (Breeding Bird Survey) route and two ORBBS (Off Road Breeding Bird Survey) routes were again sampled by Deb Rudis from the US Fish and Wildlife Service Ecological Services Division in Juneau, assisted by the author.

Monitoring of eagle nests in the Dyea and lower Chilkoot Trail area took place this year for the first time since 2006.

## **Methods**

### **Waterbird Surveys**

Eight survey areas, previously defined by Hahr and Trapp (2004) (Appendix B), were assessed during the 2009 field season. All waterbirds (loons, grebes, cormorants, herons, ducks and geese, plovers and sandpipers, gulls, alcids, and kingfishers), crows, ravens, swallows, and raptors detected by sight or sound within a survey area were recorded. Opportunistic sightings between survey areas were also recorded, but identified as such in the data. Counts were made by scanning each survey area with 10x42 Bushnell Legend binoculars and a Nikon 20-60 x 80 mm spotting scope until all waterbirds had been counted, to the best of the surveyor's knowledge. Surveys were conducted once per week between 8 April and 21 May, once every two weeks between 4 June and 12 August (the author/surveyor had to leave prematurely on 26 August, and the survey period was consequently cut short). They were conducted in the best weather available, which sometimes meant unfavorably high winds and significant wave troughs in the water. It was ideal, but not always possible, to schedule surveys around a rising tide at Census Unit 7 so that the unit survey began two hours prior to high tide. This allowed for the maximum number of feeding shorebirds and dabblers, while keeping them relatively concentrated for counting. At the same time, this provided consistency for the surveys of CU7, but not necessarily the other seven units. Similarly, beginning the surveys early in the morning when the wind was calm and there were not yet heat waves over the water was desirable but not always feasible. All

information was recorded in a field notebook based on standardized data sheets adapted from Collins et al. (2001). The data was then immediately entered into the Coastal Waterbird Microsoft Access database (T:\NRM\Birds\Coastal Waterbird Surveys\Data\Coastal\_Waterbird\_Database). The methods are described in greater detail by Hahr and Trapp (2004).

### **HPAI H5N1 Surveys**

The Avian Influenza Early Detection Plan (Appendix C), as written by Lewis Sharman (GLBA Ecologist), Geof Smith (SITK Natural Resources Program Manager), and Kevin Payne (previous KLGGO Biological Technician), was used again this year. The survey areas and equipment used for HPAI H5N1 survey duties were the same as those used in the waterbird surveys.

### **BBS and ORBBS**

The standard BBS route is approximately 25 miles long with stops at half mile intervals. A three minute point count is conducted at each of the 50 designated survey points and all birds seen and heard within a quarter mile radius are recorded. The survey begins ½ hour before official sunrise. Additional information on the standardized methods for conducting this survey can be found at <http://www.pwrc.usgs.gov/BBS/>.

There are two ORBBS routes in and around the park. Each survey consists of 12 stops located at least 250 m apart. Each point is surveyed for ten minutes (divided into three, five, eight, and ten minute time periods) and all species detected are recorded. The survey start time is ½ hour before official sunrise. Additional information on the standardized methods for conducting this survey can be found on the Resources drive at T:\NRM\Birds\ORBBS&ALMS.

### **Eagle Nest Monitoring**

No standard protocol has been written for monitoring eagle nests in the park. Because nest monitoring has taken place in the past, previously known nests were relocated (Appendix B) and observed opportunistically during waterbird surveys or whenever field work took place in Dyea. Each nest was observed for a minimum of five minutes during each visit. The number of adults, immature, juveniles, and nestlings visible were recorded, as well as behavioral observations of each. The data was then entered into a new Microsoft Access Database (T:\NRM\Birds\Eagles\Eagle\_Nests).

## **Results**

### **Waterbird Surveys**

A total of 14 surveys were conducted this year. Census Unit 1 was surveyed in its entirety once before the arrival of the cruise ships on 4 May. After that date, only the Skagway River and river mouth were surveyed until the end of the season, due to cruise ships impeding the view of the harbor area. No surveys were conducted during the winter in 2009.

A total of 16,664 waterbirds comprised of 53 species in 10 families were documented during waterbird surveys (Table 1), as well as four other water related species (Table 2) and five raptor species (Table 3).

The author was trained in and performed several waterbird surveys in 2007 as a volunteer in the park, and independently conducted all waterbird surveys in 2008. Thus, the author had an improved knowledge of the survey areas, local species, and survey techniques in 2009.

Significant sightings from waterbird surveys include counts of up to four red-necked grebes in a single CU in Taiya Inlet, a pair of semi-palmated plovers at the southern tip of the Dyea tidal flats, a pair of pectoral sandpipers on Nelson Creek, a Wilson’s snipe in the Dyea flats, a pair of wandering tattlers in east Dyea flats, 14 trumpeter swans on the Taiya River, and a pair of horned grebes seen regularly in the Taiya Inlet where a pair has been recorded in previous years. It should be noted that many of the gulls identified as herring gulls this season may in fact be glaucous-winged gulls, based on the large counts of glaucous-winged gulls in previous years.

The waterbird data from 2003 to 2007 was converted from Microsoft Excel spreadsheets to a Microsoft Access database in 2008, and all 2009 data was entered directly into this database. All future data should be entered into this database.

**Table 1.** Waterbird species observed during the 2009 Upper Taiya Inlet waterbird inventory (n=53), and the maximum number counted in a single census date (indication of peak presence).

<b>Species</b>	<b>Maximum Number</b>	<b>Date</b>
<b>Family Gaviidae</b>		
Common Loon	1	5/13/09
Red-Throated Loon	8	7/1/09
Pacific Loon	2	7/29/09
<b>Family Podicipedidae</b>		
Red-Necked Grebe	20	5/13/09
Horned Grebe	83	5/5/09
<b>Family Phalacrocoracidae</b>		
Double-Crested Cormorant	2	5/5/09, 5/21/09
<b>Family Ardeidae</b>		
Great Blue Heron	8	4/29/09
<b>Family Anatidae</b>		
Trumpeter Swan	9	4/15/09
Canada Goose	2	4/29/09
Greater White-Fronted Goose	23	4/29/09, 5/5/09
Mallard	106	4/29/09
Gadwall	2	5/5/09
Northern Pintail	45	4/29/09

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American Wigeon	115	5/5/09
Eurasian Wigeon	2	5/13/09
Northern Shoveler	96	5/13/09
Blue-Winged Teal	2	5/13/09
American Green-Winged Teal	53	5/13/09
Canvasback	1	5/13/09
Ring-Necked Duck	9	5/13/09
Greater Scaup	3	5/13/09
Lesser Scaup	1	5/5/09
Scaup Sp.	106	5/13/09
Harlequin Duck	47	5/21/09
Long-Tailed Duck	8	5/13/09
Surf Scoter	1011	5/13/09
White-Winged Scoter	10	5/13/09
Scoter Sp.	200	6/4/09
Common Goldeneye	67	4/8/09
Barrow's Goldeneye	76	4/8/09
Bufflehead	70	4/29/09
Common Merganser	35	4/8/09
Red-Breasted Merganser	92	5/13/09
<b>Family Charadriidae</b>		
Semipalmated Plover	9	5/21/09
<b>Family Scolopacidae</b>		
Lesser Yellowlegs	10	5/13/09
Solitary Sandpiper	10	5/13/09
Spotted Sandpiper	16	7/1/09
Whimbrel	1	5/21/09
Hudsonian Godwit	1	6/4/09
Surfbird	2	8/12/09
Wandering Tattler	5	6/4/09
Pectoral Sandpiper	24	5/13/09
Least Sandpiper	7	5/21/09
Dowitcher Sp.	10	5/13/09
Common Snipe	1	4/29/09
<b>Family Laridae</b>		
Bonaparte's Gull	182	5/5/09
Mew Gull	148	7/1/09
Herring Gull	44	4/8/09
Larus Gull Sp.	1319	5/13/09
Arctic Tern	50	7/29/09
<b>Family Alcidae</b>		
Pigeon Guillemot	26	4/22/09
Marbled Murrelet	2235	7/29/09
<b>Family Alcedinidae</b>		
Belted Kingfisher	3	7/16/09

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**Table 2.** Other water related species observed during the 2009 Upper Taiya Inlet waterbird inventory (n=4), and the maximum number counted in a single census date (indication of peak presence).

<b>Species</b>	<b>Maximum Number</b>	<b>Date</b>
<b>Family Corvidae</b>		
Northwestern Crow	66	8/12/09
Common Raven	6	7/29/09
<b>Family Hirundinidae</b>		
Barn Swallow	6	8/12/09
Violet-Green Swallow	2	7/14/09

**Table 3.** Raptor species observed during the 2009 Upper Taiya Inlet waterbird inventory and incidentally (n=5), and the maximum number counted on a single date (indication of peak presence).

<b>Species</b>	<b>Maximum Number</b>	<b>Date</b>
<b>Family Accipitridae</b>		
Northern Harrier	2	4/15/09
Sharp-shinned Hawk	1	8/12/09
American Kestrel	1	unknown
Merlin	1	unknown
Bald Eagle	28	4/15/09, 5/21/09

**Table 4.** Number of birds observed during the 2009 Upper Taiya Inlet waterbird inventory by species (n=17,067) (indication of local relative abundance).

Marbled Murrelet	5703	White-Winged Scoter	26
Unknown Larus Gull	3286	Solitary Sandpiper	26
Surf Scoter	2564	Ring-Necked Duck	21
Mew Gull	871	Trumpeter Swan	19
Bonaparte's Gull	830	Belted Kingfisher	18
Mallard	279	Red-Throated Loon	17
Barrow's Goldeneye	262	Semi-Palmated Plover	15
Bufflehead	260	Lesser Yellowlegs	14
Northwestern Crow	229	Dowitcher sp.	13
American Wigeon	223	Barn Swallow	9
Red-Breasted Merganser	217	Long-Tailed Duck	9
Arctic Tern	213	Wandering Tattler	9
Scoter sp.	200	Merganser sp.	8
Common Goldeneye	162	Greater Scaup	7
Scaup sp.	153	Double-Crested Cormorant	4
American Green-Winged Teal	140	Blue-Winged Teal	3
Horned Grebe	137	Violet-Green Swallow	3
Northern Shoveler	126	Pacific Loon	3

Bald Eagle	125	Eurasian Wigeon	3
Common Merganser	124	Northern Harrier	3
Harlequin Duck	112	Gadwall	2
Herring Gull	110	Surfbird	2
Pigeon Guillemot	103	Canada Goose	2
Northern Pintail	82	Sharp-Shinned Hawk	1
Spotted Sandpiper	57	Canvasback	1
Red-Necked Grebe	54	Redhead	1
Least Sandpiper	51	Hudsonian Godwit	1
Greater White-Fronted Goose	46	Common Snipe	1
Great Blue Heron	35	Whimbrel	1
Common Raven	33	Lesser Scaup	1
Pectoral Sandpiper	27	Common Loon	1

**Table 5.** Number of surveys in which each species was detected (indication of local frequency).

Mew Gull	14	Northern Shoveler	4
Unknown Larus Gull	14	Scaup sp.	4
Marbled Murrelet	13	White-winged Scoter	4
Bald Eagle	12	Greater Scaup	3
Belted Kingfisher	11	Red-throated Loon	3
Common Raven	11	Barn Swallow	2
Northwestern Crow	11	Blue-winged Teal	2
Pigeon Guillemot	10	Double-crested Cormorant	2
Surf Scoter	10	Eurasian Wigeon	2
Arctic Tern	9	Greater White-fronted Goose	2
Common Merganser	9	Long-tailed Duck	2
Harlequin Duck	9	Northern Harrier	2
Barrow's Goldeneye	8	Pacific Loon	2
Bufflehead	8	Pectoral Sandpiper	2
Common Goldeneye	8	Semipalmated Plover	2
Mallard	8	Dowitcher sp.	2
American Green-Winged Teal	7	Violet-green Swallow	2
Red-Breasted Merganser	7	Wandering Tattler	2
Solitary Sandpiper	7	Canada Goose	1
Spotted Sandpiper	7	Canvasback	1
American Wigeon	6	Common Loon	1
Least Sandpiper	5	Common Snipe	1
Northern Pintail	5	Gadwall	1
Ring-necked Duck	5	Hudsonian Godwit	1
Red-necked Grebe	5	Lesser Scaup	1
Trumpeter Swan	5	Sharp-Shinned Hawk	1
Herring Gull	4	Surfbird	1
Horned Grebe	4	Whimbrel	1
Lesser Yellowlegs	4		

## HPAI H5N1 Surveys

The waterbird surveys served as the HPAI H5N1 surveys this season. Opportunistic surveys were conducted from the vehicle each time a biologist traveled the Dyea Road, which was four days per week on average. No extra time was spent surveying for morbidity or mortality events. Neither type of event was observed or documented.

**Table 6.** A summary of the waterbird surveys conducted in relation to HPAI H5N1.

Date	Units Surveyed	Begin	End	Time to Complete	Mortalities Observed
4/6/09	2	11:25	12:15	0:50	0
4/8/09	2-8	10:40	16:15	5:35	0
4/15/09	All	10:10	18:20	8:10	0
4/22/09	All*	13:30	18:00	4:30	0
4/29/09	All*	14:00	20:55	6:55	0
5/5/09	All*	10:45	17:30	6:45	0
5/13/09	All*	9:30	18:00	8:30	0
5/21/09	All*	9:50	16:15	6:25	0
6/4/09	All*	11:10	17:10	7:00	0
7/1/09	All*	9:05	14:25	5:20	0
7/14/09	1-2*	9:45	10:30	0:45	0
7/16/09	All*	9:10	15:15	6:05	0
7/29/09	All*	10:05	16:40	6:35	0
8/12/09	All*	9:35	16:00	6:25	0
<b>Total time =</b>				<b>79:50</b>	<b>0</b>

\*Only Skagway River and river mouth were surveyed in CU1

The Alaska Natural Heritage Program is further investigating the likelihood of Eurasian migrant species carrying avian influenza into Alaska during migration to summer breeding grounds. They have identified 36 species as the most probable carriers of the virus (Tracey Gotthardt, personal communication, 2008). Species previously recorded in Skagway are highlighted. Unconfirmed sightings are in shown in green.

**Table 7.** Probable carriers of the avian influenza virus.

Yellow-Billed Loon	King Eider	Glaucous-Winged Gull
Steller's Eider	Dunlin	Glaucous Gull
Northern Pintail	Sharp-Tailed Sandpiper	Gyr Falcon
Lesser Snow Goose	Bar-Tailed Godwit	Eastern Yellow Wagtail
Emperor Goose	Ruddy Turnstone	Arctic Warbler
Spectacled Eider	Pectoral Sandpiper	Gray-Cheeked Thrush
Black Brant	Red Knot	Olive-Sided Flycatcher
Lesser Sandhill Crane	Long-Billed Dowitcher	Blackpoll Warbler
Tundra Swan	Rock Sandpiper	Smith's Longspur
Long-Tailed Duck	Pacific Golden Plover	Cackling Geese
Aleutian Canada Goose	Buff-Breasted Sandpiper	Kittlitz's Murrelet
Pacific Common Eider	Aleutian Tern	Rusty Blackbird

### BBS and ORBBS

The BBS and ORBBS are conducted every year. This year the BBS survey documented the presence of 477 individuals of 46 different species, 11 more species than last year.

**Table 8.** Bird species observed during 2009 BBS.

Green-Winged Teal	Swainson's Thrush
Greater Scaup	Hermit Thrush
Harlequin Duck	American Robin
Common Merganser	Varied Thrush
Bald Eagle	Cedar Waxwing
Wandering Tattler	Warbling Vireo
Spotted Sandpiper	Tennessee Warbler
Mew Gull	Orange-Crowned Warbler
Glaucous-Winged Gull	Yellow Warbler
Arctic Tern	Myrtle Warbler
Marbled Murrelet	Townsend's Warbler
Rufous Hummingbird	American Redstart
Alder Flycatcher	MacGillivray's Warbler
Least Flycatcher	Common Yellowthroat
Hammond's Flycatcher	Wilson's Warbler
Pacific-Slope Flycatcher	Western Tanager
Violet-Green Swallow	American Tree Sparrow
Steller's Jay	Savannah Sparrow
Northwestern Crow	White-Crowned Sparrow
Common Raven	Oregon Junco
Chestnut-Backed Chickadee	Slate-Colored Junco
Winter Wren	Common Redpoll
Ruby-Crowned Kinglet	Pine Siskin

The Dyea ORBBS documented 155 individuals from 26 different species, while the Chilkoot Trail ORBBS documented 102 individuals from 21 different species. The data was sent to Colleen Handel at the USGS Alaska Science Center.

**Table 9.** Bird species observed during 2009 ORBBS.

Great Blue Heron	Ruby-crowned Kinglet
Bald Eagle	Swainson's Thrush
Blue Grouse	Hermit Thrush
Spotted Sandpiper	American Robin
Glaucous-winged Gull	Varied Thrush
Arctic Tern	Warbling Vireo
Rufous Hummingbird	Yellow-Rumped (Myrtle's) Warbler
Belted Kingfisher	Townsend's Warbler
Red-breasted Sapsucker	Blackpoll Warbler
Alder Flycatcher	American Redstart
Least Flycatcher	Northern Waterthrush
Hammond's Flycatcher	Common Yellowthroat
Pacific Slope Flycatcher	Wilson's Warbler
Northwestern Crow	Chipping Sparrow
Common Raven	Savannah Sparrow
Chestnut-backed Chickadee	Song Sparrow
Winter Wren	Lincoln's Sparrow
Golden-crowned Kinglet	Dark-eyed Junco (Oregon)

### **Eagle Nest Observations**

Four of the five eagle nests that had been previously documented in and around the park were relocated and observed. The nests were labeled TR01, TR02, TR03, and CT01 (Appendix B). The fifth nest was initially documented across the inlet from Dyea Point and waterbird CU 5, but it could not be located with the use of binoculars or spotting scope this season.

A single juvenile was observed in TR01 until August 25, at which point it was still present at the nest. There was no activity at TR02 during the observation period. There was adult activity at TR02 that suggested incubation until June 15, but no nestlings were seen and the nest appeared to be abandoned by July 10. CT01 was only briefly observed once early in the season when it was first found. No further observation took place because of the time required to hike to a viewing point and the poor visibility resulting from full summer vegetation.

### **Incidental Observations**

Incidental observations of significance included sightings of a pair of horned larks in the Dyea flats; a pair of tundra swans on the lower Taiya River; a female wood duck in the McDermott's driveway (in Dyea, just south of the Kalvick House); a redhead duck at the Skagway River footbridge; two horned larks and four snow buntings observed by the author in the Dyea tidal flats; and five sandhill cranes on the ground in the Dyea tidal flats.

## Discussion

### Waterbird Surveys

There was a dramatic increase in the number of species detected this year. The fact that 12 more species were observed this year can be largely attributed to the increased frequency and intensity of surveys conducted during the spring migration (April 15 – May 15). During this period in 2009, surveys of all census units took place weekly, while in 2008 they took place biweekly and oftentimes not all units were surveyed on the same day.

Census Unit 1 was only surveyed in its entirety outside of the cruise ship season when vision was unimpaired by ships. This unit should no longer be surveyed during the cruise ship season unless an index can be made to adjust for the obstruction caused by the ships. However, the Skagway River and river mouth are well used by a variety of bird species and are unobstructed by cruise ships. This area should continue to be surveyed as part of the regular census route, and possibly assigned a different census unit number to differentiate between it and the entire harbor area covered in CU 1.

While the cruise ships make it impossible to survey CU 1 under the same conditions as the other units, it would be interesting to assess the effects of the ships on the waterbirds by comparing the presence and abundance of species around the docks during and outside of the cruise ship season (May 4-September 23 in 2009). Unfortunately, most of the migratory species will have departed by the end of September. If comparative surveys could be conducted from April 15 to May 5, and from May 5 to May 25, that might provide a preliminary view into the impacts of cruise ship traffic and a decision could then be made whether the data warrants another year of comparative surveys. In all likelihood, this will only show that the waterbirds present before the arrival of the cruise ships are displaced by the physical space that the cruise ships occupy. However, over a few years this count data might be used to create an index so that surveys can continue in CU1, with the count being adjusted according to the index during the cruise ship season. One considerable challenge will be finding a vantage point for effective surveys during the cruise ship season.

Raptors were counted as a regular part of the survey this season, and counting them should continue to be considered a permanent addition to the methods. Counts and densities of predators are often used to assess the health of prey populations, which include waterfowl and passerines, and this raptor data will have similar value after several years of data collection. Because most raptor species are relatively rare in the area, there should be little worry of double-counting between census units. Only frequently soaring raptors, such as red-tailed hawks, would pose a problem, and there is less than one sighting per year of them on average.

The surveyor had to depart prematurely this season, and without a replacement surveyor the waterbird surveys ended in late August. Unfortunately this means that the fall migration was not observed entirely, and the species data is probably lacking accordingly.

There was concern in 2008 about the probability of double-counting taking place due to the length of time needed to complete each survey unit. This is more probable with a small subset of waterbird species, including the murrelets and scoters. These birds, especially the murrelets, tend

to fly or swim in subgroups both within and across survey units during a survey period. There can be several group merging and diverging events during each survey period. Additionally, they tend to be the most abundant species in the area. Because the few species posing the greatest threat to count accuracy represent such a small percentage of the total species identified, it would be unwise to change the survey methods in a way that would make the inventory less comprehensive (e.g., the previous suggestion of shortening the survey periods). To quantify any double-counting for these species, it might be feasible to conduct two contemporaneous surveys, one according to the established waterbird survey protocol, and the other only counting the target species and taking place in the shortest time frame possible. A maximum acceptable time for minimizing the possibility of double-counts would have to be determined for the full survey.

Many of the species encountered in the waterbird surveys cannot be broken down into sex and age classes in the field with the tools and time available. The following table outlines the degree of difficulty in identifying these classes (Age = Adult or Juvenile/Immature; Composition = Male or Female) in the field during the breeding season for the species regularly encountered in the surveys. This assumes close proximity to the bird in question and does not take into account the increased difficulties that environmental conditions may impose. For composition, comparison difficulty is for adults only as juvenile sexes cannot be distinguished during the breeding season. Some species, such as the horned grebe, have no juveniles present while the adults are in breeding plumage. These are labeled as “n/a”. Gulls’ age classes become increasingly difficult to decipher as they mature over a multi-year period. Many juvenile male ducks, indistinguishable from females during most of the summer, become identifiable in the fall as they begin to molt into breeding plumage. These cases are marked with an asterisk.

**Table 10.** Difficulty level of applying age and composition classes to breeding waterbird species.

<b>Species</b>	<b>Age</b>	<b>Composition</b>
Common Loon	Easy	Cannot
Red-Throated Loon	Easy	Cannot
Red-Necked Grebe	Medium	Cannot
Horned Grebe	N/A	Cannot
Great Blue Heron	Medium	Cannot
Trumpeter Swan	Medium	Cannot
Mallard	Very Difficult*	Easy
Northern Pintail	Very Difficult	Easy
American Wigeon	Very Difficult	Easy
Northern Shoveler	Very Difficult	Easy
Green-Winged Teal	Very Difficult	Easy
Ring-Necked Duck	Very Difficult	Easy
Scaup Sp.	Difficult	Easy
Harlequin Duck	Very Difficult	Easy
Long-Tailed Duck	Difficult	Easy
Surf Scoter	Very Difficult*	Easy
White-Winged Scoter	Very Difficult*	Easy
Bufflehead	Difficult*	Easy
Barrow's Goldeneye	Difficult*	Easy
Common Goldeneye	Difficult*	Easy

Common Merganser	Medium	Easy
Red-Breasted Merganser	Medium	Easy
Semipalmated Plover	Medium	Cannot
Greater Yellowlegs	Very High	Cannot
Lesser Yellowlegs	Very High	Cannot
Solitary Sandpiper	Very High	Cannot
Least Sandpiper	Very High	Cannot
Spotted Sandpiper	Medium	Cannot
Wandering Tattler	Medium	Cannot
Pectoral Sandpiper	Very High	Cannot
Semipalmated Sandpiper	Very High	Cannot
Common Snipe	Very High	Cannot
Bonaparte's Gull	Easy	Cannot
Mew Gull	Easy	Cannot
Herring Gull	Easy	Cannot
Thayer's Gull	Easy	Cannot
Glaucous-Winged Gull	Easy	Cannot
Glaucous Gull	Medium	Cannot
Arctic Tern	Medium	Cannot
Pigeon Guillemot	Easy	Cannot
Marbled Murrelet	Medium	Cannot
Belted Kingfisher	Very Difficult	Easy
Common Raven	Difficult	Cannot
Northwestern Crow	Difficult	Cannot

\*Juvenile males are distinguishable from females beginning in the fall.

### **Recommendations**

Waterbird surveys should continue if further baseline data on occurrence, distribution, abundance, and habitat association is needed, or if the surveys are considered an integral part of the early HPAI H5N1 detection plan. Surveys should again be conducted once per week from 15 April – 15 May and from 10 August – 15 September, in order to best document the spring and fall migrations, and the late April eulachon run.

The COASST program is an initiative to establish beach transects and baseline mortality data so that the impact of natural and human-caused disasters on seabirds can be assessed. It would be great to begin participating in this program, possibly with a NPS employee getting certified as a trainer who would then educate members of the Skagway Bird Club to assume the duties. The requirements include a committed and trained surveyor, and a beach transect of the surveyor's choice. For the Skagway area, there might be a combined transect of the Dyea, Nahku Bay, and Skagway River mouth waterfronts. More information can be found at <http://depts.washington.edu/coasst/>

Except for incidental observations, there is currently no way to record passerine species documented at waterbird survey points. With the regularity of waterbird surveys in place, an efficient way to collect passerine data would be to conduct brief point-count surveys at a selection of waterbird survey points during routine surveys. This would require a high level of expertise in aural identification of birds.

Eagle nest monitoring should continue with a more rigid schedule and better defined goals. Once goals have been defined, a protocol with SOPs should be written, stating the frequency of site visits, efforts to survey for new nests, specific data categories to be recorded, etc. At minimum, the known nest sites should be revisited to check for activity.

### Waterbird Data Entry

Waterbird data should be entered as soon as possible after the survey has been completed. This ensures that all unwritten comments are fresh in the mind, that questionable identifications are reviewed immediately, and that any missing field data can be rectified.

All data should now be entered into the Access database (T:\NRM\Birds\Coastal Waterbird Surveys\Data\Coastal Waterbird Database), *not* into Excel spreadsheets. Be sure to use the spacious “Notes” entry field for any useful comments that did not make it onto the hard copy datasheets.

The field data entries are to be parsed out so that only one classification (M/F; Ad/Juv; Pair/Individual) is entered for each category (Age, Composition, Breeding) cell. For instance, an observation of three mallards consisting of a pair (adult male, adult female) and a juvenile of unknown sex would be as follows:

Species	Num	Age	Comp	Breed	Notes
MALL	1	Ad	M	P	Paired. Pair with Juv.
MALL	1	Ad	F	P	Paired. Pair with Juv.
MALL	1	Juv	Unk	X	With pair.

An observation of three mallards consisting of an adult male and two juveniles would be as follows:

Species	Num	Age	Comp	Breed	Notes
MALL	1	Ad	M	X	With 2 Juv.
MALL	2	Juv	Unk	X	With Ad M.

Valid entries for Age are: Ad (Adult), Imm (Immature), Juv (Juvenile), Mix (Mixed Flock), and Unk (Unknown). Immature should only be used for species with multi-year maturation periods, such as mew and herring gulls, and bald eagles. It refers to any age class between 1<sup>st</sup> winter (earlier is Juvenile) and adulthood. If 2<sup>nd</sup>, 3<sup>rd</sup>, or 4<sup>th</sup> year is known, it should be specified in the “Notes” field. The use of Mixed should be avoided if a count is possible. It exists for instances of large groups of scoters, gulls, and flying birds, when separating age classes is not feasible.

Valid entries for Composition are: M (Male), F (Female), F/Juv (Female/Juvenile), Mix (Mixed Flock), and Unk (Unknown). Female/Juvenile is used for species like mallards and most other waterfowl, when the juvenile males are still indistinguishable from the females. Mixed Flock should only be used for large groups when classifying all individuals is not possible. Even then, as many should be classified as possible and the remainder can be labeled as mixed.

Raptors are to be entered in the same manner as waterbirds. Marine mammals should be entered using the designated four letter codes (HASE = Harbor Seal, HBWH = Humpback Whale, HAPO = Harbor Porpoise, RIOT = River Otter), except that age and composition will usually be unknown and breeding status should not be filled. Any other unusual bird sightings should be recorded in the same manner as waterbirds. This type of entry should be done sparingly! It is up to the surveyor to decide what qualifies as unusual, but past examples include rusty blackbird, red-winged blackbird, and northern shrike.

Any incidental sightings of rare birds outside of the survey units should be entered in the same manner as waterbirds during a survey, except that the Location field should be "Other" and none of the time or weather parameters should be filled unless actually measured. Instead, make detailed comments in the Notes field including time, specific location, field markings and behavior used in identification, and observation conditions (e.g., seen around 9:00 from car while driving, used spotting scope/binoculars, etc.).

## **Literature Cited**

Alaska Interagency HPAI Bird Surveillance Working Group. 2006. Sampling protocol for highly pathogenic Asian H5N1 avian influenza in migratory birds in Alaska. Interagency planning report, Anchorage, AK.

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.

Kissling, M.L., and S.B. Lewis. 2009. Distribution, abundance, and ecology of forest owls in Southeast Alaska. U.S. Fish and Wildlife Service, Juneau Field Office, Alaska, and Alaska Department of Fish and Game, Division of Wildlife Conservation, Douglas, Alaska. 215 pp.

Appendix A

**Waterbird Monitoring Protocol for Klondike Gold Rush National Historical Park, Skagway, Alaska**

**Standard Operating Procedure (SOP) # 3**

**Conducting the Waterbird Survey Transect**

**Version 1.00 (April 9, 2009)**

**Revision History Log:**

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

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

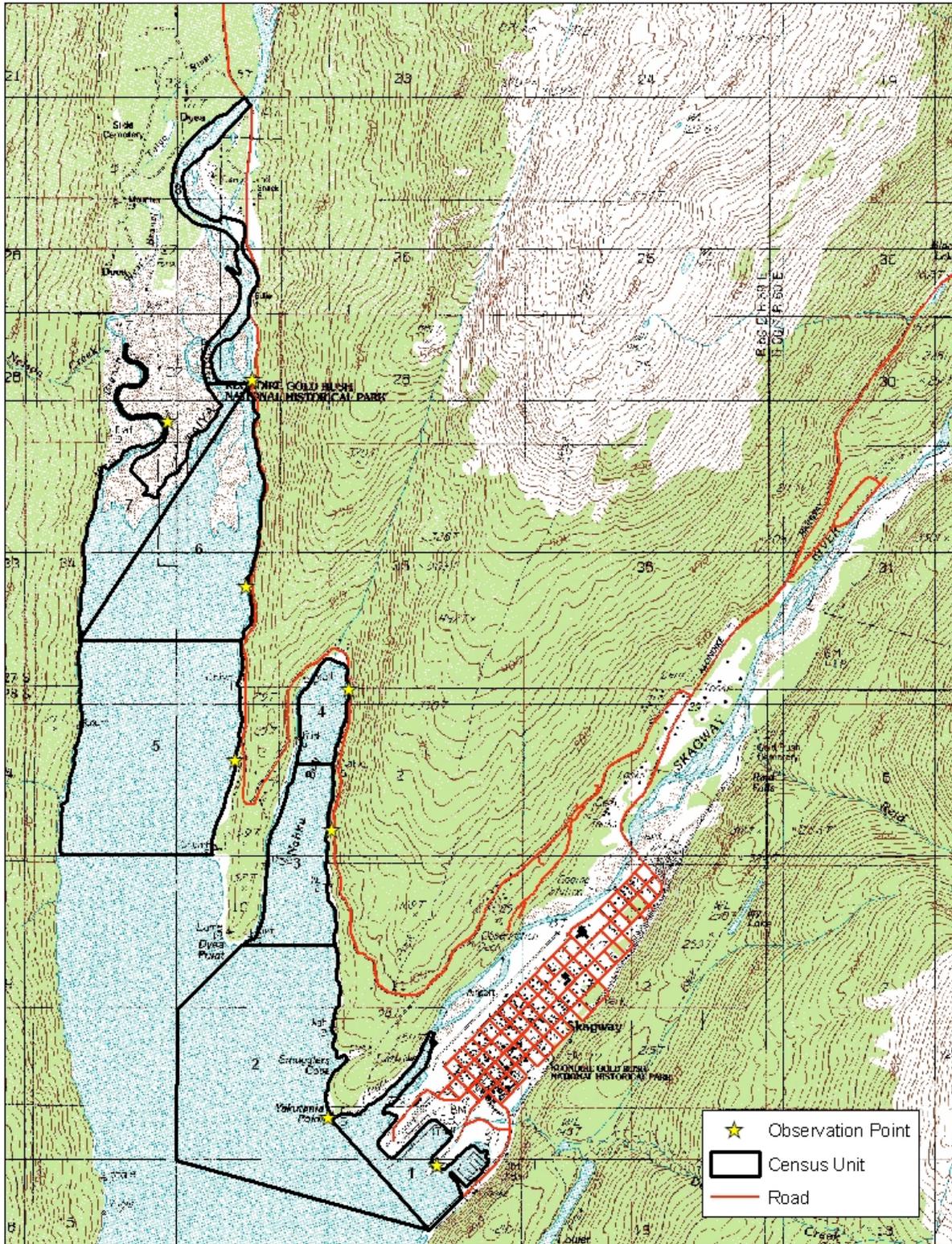
**Procedures:**

1. Prior to the day of the survey, determine the times of high and low tides as well as the weather forecast. Wind is the most problematic weather variable in Skagway. Because it is typically lightest in the morning, and because convection heat waves over water increase through the day, surveys are best conducted as early as daylight and tide will allow.
2. Sampling should be scheduled around a high tide in Dyea such that the survey of Census Unit #7 begins approximately two hours before high tide. The tidal flats in Dyea can be very expansive during low tide, inhibiting the ability of the surveyor to accurately count all shorebirds in the area. By conducting the survey on a rising mid-tide, the surveyor gains the advantage of having the greatest number of shorebirds using the tidal habitat in a more concentrated area for counting. This scheduling also means that Census Unit 1 is conducted during low tide, which allows for the most expansive, yet manageable, intertidal foraging area at the Skagway River mouth.
3. Avoid conducting surveys in high winds or heavy precipitation. These conditions inhibit bird activity and impair your ability to see and hear birds. In general, counts should not be conducted if wind strength on the Beaufort Scale is a sustained 5 or greater (see Table 5.01.1), or if it is raining hard or snowing (rain code  $\geq 6$  in Table 5.01.2). If you encounter these conditions, wait until the weather improves or else cancel the sampling

for the day and try again on another day. If conditions do not improve during the week of scheduled surveys, it may be necessary to endure such weather, especially during migration periods when the possibility of identifying rare species outweighs the cost of relatively inaccurate counts.

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

Figure 4.01.1 KLGO Waterbird Census Units



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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Composition (Sex):** Record the sex (Male, Female, Female/Juvenile, Mixed, Unknown) of the individuals counted. "Female/Juvenile" can be used for species with juvenile males so close in appearance to adult females that distinguishing between the two is not possible.

“Mixed” should be used only when multiple age groups are present and individual identification is not possible, such as large feeding groups of scoters.

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

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

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

## **BREEDING CRITERIA CODES:**

**Code**<sup>1</sup> — Evidence

### **OBSERVED:**

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

### **POSSIBLE:**

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

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

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

### **PROBABLE:**

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

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

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

**C**—**Courtship** behavior or **copulation**.

**N**—Visiting probable **nest-site**.

**A**—**Agitated** behavior or anxiety calls from adult.

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

### **CONFIRMED:**

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

**NB**—**Nest building** at the actual nest-site.

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

**DD**—**Distraction display** or injury feigning.

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

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

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

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

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

**FY**—Adult feeding recently **fledged** young.

**FS**—Adult carrying fecal **sac**.

**NE**—**Nest** with **egg(s)**.<sup>2</sup>

**NY**—**Nest** with young **seen** or heard.<sup>2</sup>

### **Notes:**

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

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

**Example for filling in the field data form**

**KLGO Coastal Waterbird Survey Data Form**

Observer(s) Dashiell Feierabend

Census Unit #  Tide State:

Date 

Mont	h
0	4

 / 

Day	
0	8

 / 

Year	
0	9

 Start Time 

0	9	1	5
---	---	---	---

 (24 hours)  
End Time 

1	0	2	0
---	---	---	---

 (24 hours) Temp 

0	4
---	---

 °C

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

WDir 

1	9	0
---	---	---

 ° Wave Height: 0  2 3 4 5 Event Notes: Numerous boats traveling through census unit during survey

Species	Number	Age & Composition	Breeding Status	Observations
MALL	2	1 Ad M; 1 Ad F	P	Pair with Juvenile.
MALL	1	1 Juv Unk	O	Juvenile with Pair.
BAEA	1	Imm Unk	O	2 <sup>nd</sup> year plumage in southwest corner of Dyea flats.
CORA	1	Unk	O	Auditory only. East side of flats.

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



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

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

**TIDE STATE:**

R	Rising
F	Falling
U	Unknown

**CLOUD COVER CODES:**

0	Clear, less than 10 percent cloud cover.
1	Scattered, 10-50 percent cloud cover.
2	Broken, 50-90 percent cloud cover.
3	Overcast, more than 90 percent cloud cover over entire sky.

**PRECIPITATION CODES:**

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

**WAVE/SWELL HEIGHT CODES:**

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

**BREEDING CRITERIA CODES:**

**Code<sup>1</sup> — Evidence**

**OBSERVED:**

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**A**—**Agitated** behavior or anxiety calls from adult.

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

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**DD**—**Distraction display** or injury feigning.

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

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

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

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

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

**FY**—Adult feeding recently **fledged** young.

**FS**—Adult carrying fecal **sac**.

**NE**—**Nest with egg(s)**.<sup>2</sup>

**NY**—**Nest with young** seen or heard.<sup>2</sup>

**Notes:**

1. The **letter code** is entered by the field workers in the appropriate space on the field report form. **Possible** and **Probable** categories are represented by single letters or a symbol.

**Confirmed** by double letters. Letters have been selected as a mnemonic aid, keyed to bolded words in criteria definitions.

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

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

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1	1 to 3	Direction of wind shown by smoke drift but not by wind vanes.
2	4 to 7	Wind felt on face; leaves rustle; wind vanes moved by wind.
3	8 to 12	Leaves and small twigs in constant motion; wind extends light flag.
4	13 to 18	Raises dust, loose paper; small branches are moved.
5	19 to 24	Small trees in leaf begin to sway; crested wavelets form on inland waters.

**TIDE STATE:**

- R Rising
- F Falling
- U Unknown

**CLOUD COVER CODES:**

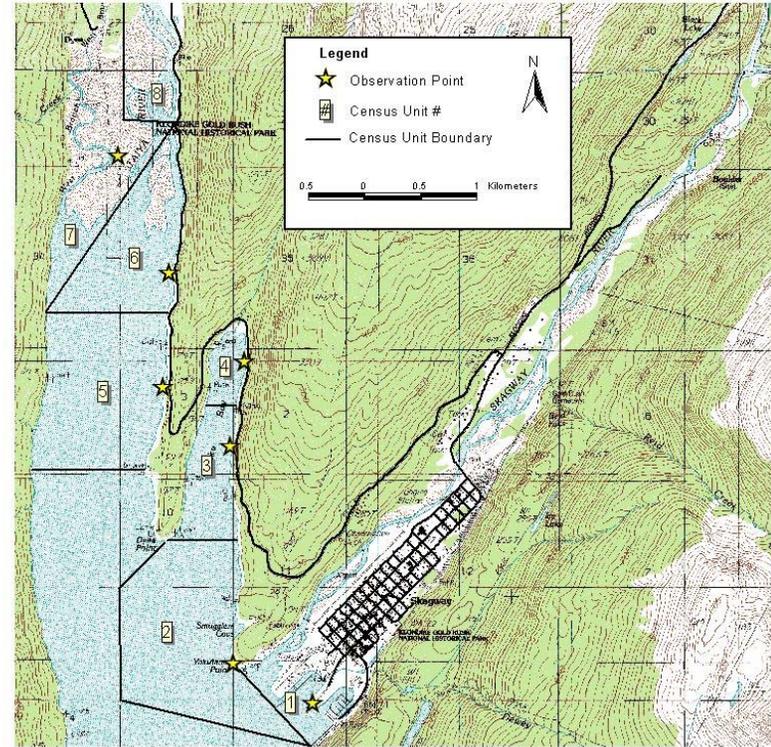
- 0 Clear, less than 10 percent cloud cover.
- 1 Scattered, 10-50 percent cloud cover.
- 2 Broken, 50-90 percent cloud cover.
- 3 Overcast, more than 90 percent cloud cover over entire sky.

**PRECIPITATION CODES:**

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

**WAVE/SWELL HEIGHT CODES:**

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



## **KLGO COASTAL WATERBIRD SURVEY Census Unit Descriptions**

### **CENSUS UNIT #1**

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

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

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

#### *Survey Tips*

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

### **CENSUS UNIT #2**

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

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

#### *Survey Tips*

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

### **CENSUS UNIT #3**

*Outer Nahku Bay.*--The observation point for this section is at the northern end of the large pullout at Mile 5 of the Dyea Road. There is a rock promontory on the other side of the guard rail that provides a good overlook. Survey the outer two-thirds of the bay beginning at the entrance to the bay demarcated by Dyea Point to the large rock

outcrop on the west shore directly below the black house on the ridge above. Survey the outer bay to the point where the outcrop breaks the small bench along the shore.

#### *Survey Tips*

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

#### **CENSUS UNIT #4**

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

#### *Survey Tips*

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

#### **CENSUS UNIT #5**

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

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

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

#### *Survey Tips*

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

#### **CENSUS UNIT #6**

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

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

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

#### *Survey Tips*

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

#### **CENSUS UNIT #8**

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

#### *Survey Tips*

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

#### **CENSUS UNIT #7**

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

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

### *Survey Tips*

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

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

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

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

## Appendix B

### Eagle Nest Monitoring Sites

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

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

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

*TR01* – The nest is located near the top of a cottonwood tree approximately 30 m above ground level on the west bank of the Taiya River, across from the NPS Dyea Campground. The nest is approximately 4 ft in diameter (widest point at outer rim) and 3 ft deep (external base to top or rim). It can be viewed without disturbance from the east at the TR01 boreal toad monitoring site adjacent to the Taiya River. It can also be viewed at a greater distance from the river bank west of the Dyea Road, just south of the NPS Dyea Campground turnoff. Larger nestlings can be seen from these viewing points, but eggs are too low in the nest to be seen.

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

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

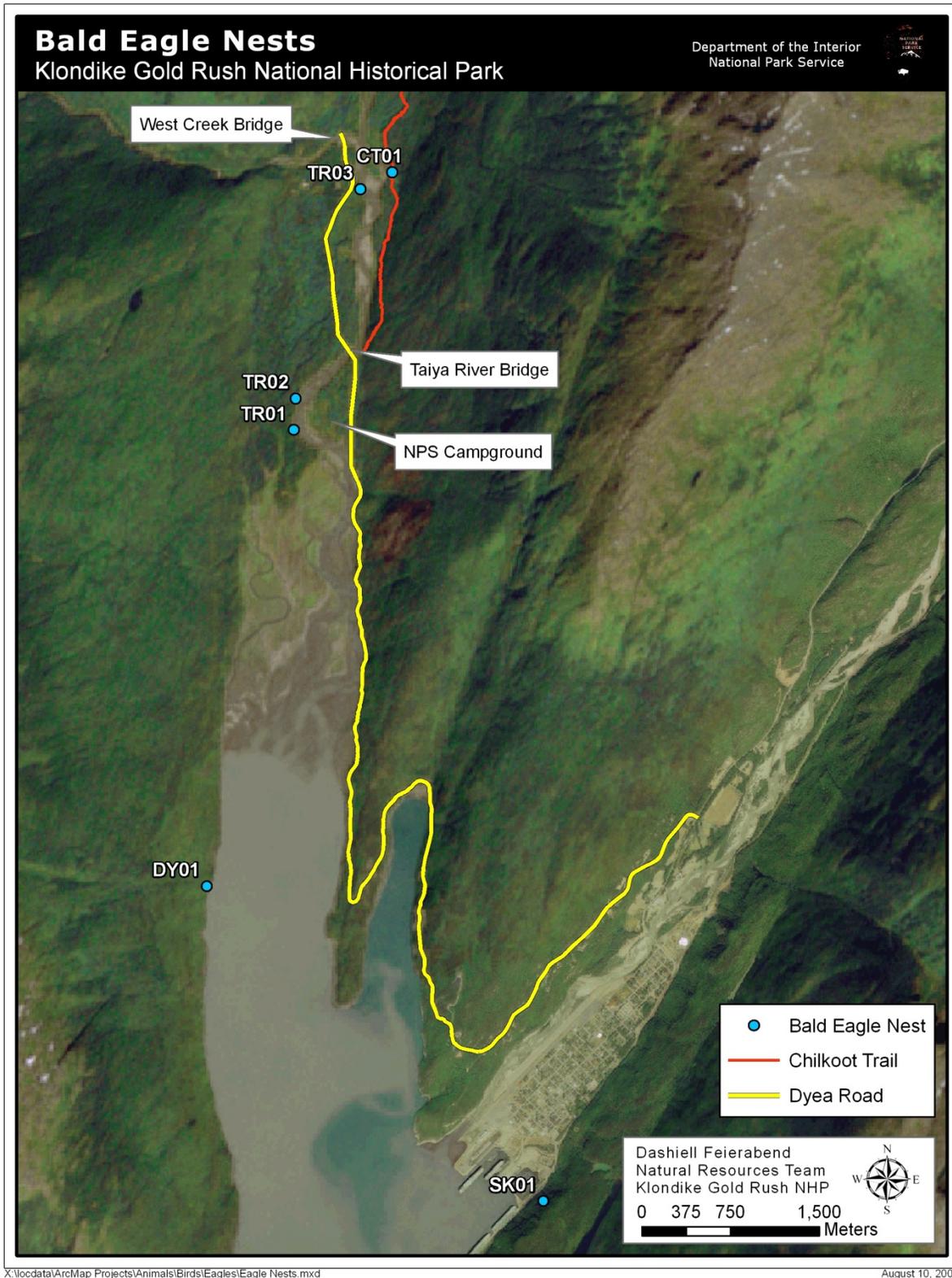


Figure 1. Bald eagle nests in the Skagway area from 2009 and earlier.

## Appendix C

# **Avian Influenza Early Detection Plan**

Glacier Bay National Park and Preserve (GLBA)  
Klondike Gold Rush National Historical Park (KLGO)  
Sitka National Historical Park (SITK)

August 22, 2006

### **Purpose**

This plan describes how GLBA, KLGO, and SITK will determine whether, when, and where avian influenza (H5N1) first arrives at the parks via wild birds.

### **Background**

Scientists are concerned that wild birds are carriers of the highly pathogenic avian influenza (HPAI) referred to as Asian H5N1 Avian Influenza, and that migrating birds may distribute this virus from Eurasia across the Pacific to North America. HPAI may mutate into a form of human influenza that could assume pandemic proportions. Alaska has been identified as the North American location where wild-bird-carried HPAI is most likely to first arrive. HPAI, if introduced into Alaska National Parklands, poses a health risk to visitors, employees, and wildlife. Early detection is crucial. The NPS Alaska Region has developed a statewide surveillance plan that involves monitoring for dead/moribund birds in Alaska parks. Birds will be collected and sent to a laboratory for analyses. The Regional plan proposes general tasks and levels of effort with associated costs for the various parks in Alaska. GLBA has been budgeted to receive \$29,048 in FY06 for avian influenza early detection (see Budget below).

### **Overall Structure**

Supported by the funding described below, designated existing park staff (biologists/rangers) will monitor park lands (see the Methodology section below) for the arrival of wild birds infected with highly pathogenic avian influenza (HPAI). Observations of dead/moribund birds will be called in to Cathy Tracy at the avian influenza hotline(1-866-5BRDFLU). Dead/moribund birds in acceptable condition, especially those species known to be highly vulnerable, will be (using the standard Interagency Avian Influenza Working Group 2006 Sampling Protocol) collected, processed, and sent off to an approved laboratory for analyses. Consistent with guidance received during the May 16, 2006 training, Sharman, Capra, and Payne (see Personnel list below) may provide basic training to other selected park field staff (biologists/rangers) in order to ensure prompt collection (only) of dead birds in the best possible condition from remote areas of the

backcountry. In the case of an outbreak or mass mortality event, Sharman/Capra/Payne/Smith will be available to respond, both within GLBA/KLGO/SITK and elsewhere within the Alaska Region. All program-related activities and effort will be described/documented for reporting and accountability purposes. Additionally, a designated Education Specialist at GLBA will be involved to assist with an internal and public outreach/education component; those activities/products will be shared with KLGO and SITK. A primary education/outreach component will be to encourage members of the public to report sick/dead birds directly to the BRDFLU hotline. More general components will focus on educating park employees, park visitors, and the local general public (e.g., for GLBA, the Gustavus community) about avian influenza using email, listserves, and flyers/posters. Most of this will involve targeted distribution/recycling of outreach products already developed by others.

### **Personnel**

Lewis Sharman (GLBA Ecologist)\*  
Jim Capra (GLBA – Dry Bay Preserve – Ranger)\*  
Fawn Bauer (GLBA Education Specialist)  
Kevin Payne (KLGO seasonal biotech)\*  
Geof Smith (SITK Natural Resources Program Manager)\*

\* Attended May 16 training session in Anchorage

### **Methodology**

#### *A) Observation and Detection (monitoring/sampling)*

At GLBA, regular and opportunistic monitoring efforts will be conducted by NPS backcountry rangers and interpreters. In Glacier Bay proper, South Marble Island, which hosts a summertime breeding seabird rookery including glaucous and glaucous-winged gulls, will be observed daily (visual scan of 1-3 minutes) by interpreters trained by Sharman to detect and report on observed dead/moribund gulls. A tour vessel with an interpreter on board visits this rookery daily as part of its traditional daily sightseeing route. Each day the vessel interpreter will populate a paper form with fields for time/date, observer, location, observations, and effort. Elsewhere in the Bay, backcountry rangers similarly trained to observe and report on dead/moribund birds will opportunistically monitor beaches and the ocean surface during regular patrols. Locations visited and level of effort will be recorded. It is impossible to estimate the frequency of these monitoring observations, until the end of the field season. These rangers (only) will be trained by Sharman to safely and properly collect/ document (only) dead birds and transport them back to Park Headquarters where Sharman will prepare them for shipment. In the Preserve (Dry Bay), Capra will conduct bi-weekly beach surveys from the Alsek River to Grand Plateau Glacier and the East Alsek/Doame River estuary, again recording locations visited and level of monitoring effort. Capra will collect/document/ship dead/moribund birds as appropriate. Comprehensive HPAI sampling Field Kits (including both regular Field Surveillance/ Sampling and Mass

Mortality Event response capabilities) will be positioned at Park Headquarters, aboard a ranger patrol vessel, and in Dry Bay.

At KLG0, regular and opportunistic monitoring efforts will be conducted by the natural resources staff. Regular monitoring efforts designed to document the waterbird populations utilizing the upper Taiya River Valley will incorporate HPAI monitoring activities. These surveys will be conducted by Payne, from mid-April until late September, on an approximately weekly schedule. These surveys, conducted using binoculars and a spotting scope, include the Skagway Harbor, Nahku (Long) Bay, and the upper Taiya Inlet from Dyea Point to the Taiya River Bridge. The survey area includes approximately 13,400m of shoreline and will require for completion approximately 1,600m of travel on foot and 17,000m of vehicular travel. Opportunistic surveys along the Dyea road will be conducted two times per week. This same area will be opportunistically surveyed by Payne twice weekly, from mid-April until late September. The Dyea road opportunistic surveys are not likely to detect single mortalities but should be sufficient to detect mass mortality events. Additional opportunistic surveys and the collection and shipping of samples will be conducted by Payne or other properly trained staff. Locations visited, hours spent surveying, a summary of species detected, and all unexplained avian mortalities will be recorded. Comprehensive HPAI sampling kits will be stationed in the Mascot garage.

At SITK, regular and opportunistic monitoring efforts will be conducted in the park by the resource management staff, law enforcement rangers, maintenance staff, and interpreters. A migratory bird reconnaissance and river survey will be conducted at least three times a week when the Biologist (Smith) is present. A thorough scanning of the approximately-50-acre intertidal zone for migratory birds – and to detect any dead or sick birds - will be performed on the same schedule. The staff will be on the lookout for dead birds while working and patrolling in the park and will be alert for reports of dead birds by visitors. During May through September, interpretive rangers are present in the park conducting roving patrols for approximately four hours per day, and law enforcement rangers are present for approximately eight hours per day. In addition, park maintenance staff will have some presence in the park during their working hours of 6:30AM – 3:30PM. The biologist and/or LE personnel will be notified and dispatched to the scene to retrieve and package any dead birds found in the park so that they can be shipped to the USGS-National Wildlife Health Center in Madison, Wisconsin. One HPAI sampling Field Surveillance/Sampling Kit will be located at the visitor center.

#### *B) Outbreak*

In the case of an apparent large-scale HPAI outbreak and morbidity/mortality event, Sharman, Capra, Payne, and/or Smith will - through communication with experts - confirm a likely HPAI origin. They will then inform each other and others in the Alaska NPS network and be available to respond as needed for large-scale sampling duties.

#### *C) Documentation*

At all parks, a careful record will be kept of all activities associated with this program, including specific nature and details of the activity, personnel involved, date(s), location(s), and amount of time spent. These records will be available for end-of-year project reporting, as well as payroll accountability. Along with this documentation of

effort, observations of dead/sick birds will be summarized and forwarded to the Regional Wildlife Biologist. Sharman will work with the Regional Wildlife Biologist to draft applicable portions of the NPS Alaska H5N1 annual report. Since the funds are for two years, no effort will be made to expend all monies in 2006; instead, funds will be drawn to cover personnel time specifically directed to the program. Funding will not be drawn to augment salaries of personnel conducting their normal duties; the account will be charged only to cover time spent by personnel actively conducting surveys or other activities specific to H5N1 early detection. Similarly, funds for vessel support will be drawn only to support vessel operations directed specifically toward H5N1 early detection.

*D) Outreach and Education*

At GLBA, Bauer will oversee and be the conduit for internal (park) and public outreach and education. This means reviewing and distributing park-specific and open-source information about avian influenza in general and targeted park activities in particular. Media venues could include simple emails, forwarded electronic documents and notifications, handouts, posters, brochures, interpretive talks, and audio and video broadcasts, as necessary and appropriate. All products/communications will be shared with KLGO and SITK.