Takshanuk Watershed Council

Avian Monitoring Program

Summary Report – March 2021

Chilkat Estuary at high tide on September 15. (Looking toward Jones Point). Photo by Stacie Evans.

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Acknowledgements

TWC would like to thank Audubon Alaska for all of the work that they do to conserve Alaska's wonderful birds, as well as for providing funding for this report. Many thanks as well to Klondike Gold Rush National Historical Park for sharing very detailed methods for their Coastal Waterbird Survey. By adapting these methods, we hope that our results are comparable and that we might achieve a better understanding of avian communities in the Upper Lynn Canal. We also greatly appreciate the work of Pam Randles, who kept an eye on the bald eagles of the Chilkat Valley for many years and provided the data to prove it. She has long been an advocate for the conservation of wild things and has inspired this ethic in many others. Lastly, we are forever grateful for the Jilk̲áat K̲wáan and Jilk̲oot K̲wáan who took great care of these watersheds for millennia before the Western concept of conservation was devised, and continue to do so today.

Gull flock in front of Pyramid Harbor during eulachon run on May 4, 2020. Photo by Derek Poinsette.

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Introduction

It is Takshanuk Watershed Council's (TWC's) mission to "…provide stewardship of the Chilkat, Chilkoot, and Ferebee River systems through restoration, education, and research". Bird species are relatively easy to observe and monitor, and their sensitivity to environmental disturbance makes them an excellent indicator of ecosystem health (Morrison 1986). Monitoring local avifauna is a convenient, yet largely neglected, strategy for implementing TWC's three-pronged approach to conservation. By continuing to develop our avian monitoring program, TWC will be better able to identify areas in need of restoration, educate the public about local avian communities, and research how environmental factors may be affecting bird species locally. Insights gained from this program will also contribute to the broader effort to study avifauna regionally and globally.

The mud and sand flats at the mouth of the Chilkat River, including Pyramid Island, are a major migratory stopover site for waterfowl, shorebirds, and gulls. In early spring, shorebirds from up and down the coast, as well as birds that have spent the winter in saltwater bays, inlets, and the open ocean, begin funneling from Chatham and Icy Straits, into Lynn Canal, hopping along beaches and coastlines until they reach the mouth of the Chilkat. Here there is a rich and expansive estuary where they can rest, feed, and are safe from predators. The peak of this migration also coincides with the annual eulachon run, so food is especially abundant for gulls, bald eagles, and other piscivorous birds. The migrants then wait on the flats for favorable weather conditions and full stomachs before heading up the valley and over the mountains to the Shakwak Trench, and other routes to the northern breeding grounds.

Most of the Chilkat Valley bottomland has been protected as the Alaska Chilkat Bald Eagle Preserve; a unit of the Alaska State Parks system, as well as an Audubon Important Bird Area (IBA). Each fall it hosts the largest gathering of bald eagles in the world as eagles congregate on the Chilkat River to feed on a rare winter run of chum salmon. This run is made possible by groundwater upwellings near the Tlingit village of Klukwan that keep the river ice-free throughout the year. The Chilkat Valley also lies at a nexus of Pacific coast trumpeter swan habitat and supports a sizeable resident population as well as seasonally migrating individuals of this once-endangered species.

In order to better understand avian communities in the Chilkat Valley, TWC is developing programs for the long-term monitoring of bird migration, breeding, and seasonal habitat use in the Chilkat Valley. To date, these include bird surveys conducted during spring and fall migration on the Chilkat Estuary, and bald eagle surveys conducted throughout the valley during the fall and winter months. This report summarizes results from the preliminary Chilkat Estuary survey completed in 2020. Recommendations for future surveys are included in this report as well as for management strategies.

Chilkat Estuary Bird Surveys

Pyramid Island at low tide during eulachon run on April 30, 2020. Photo by Derek Poinsette.

Project Background

Population declines among most bird species are widespread and severe. One recent study showed that North American bird populations have declined by nearly 30% since the 1970s (Rosenberg et al. 2019). This staggering loss spans every biome in the U.S. and Canada, indicating a greater need to protect habitat from loss or degradation. While the Chilkat Valley's ecosystems are relatively intact, it is important that they are maintained as refugia for imperiled species.

The Alaska Chilkat Bald Eagle Preserve and the Audubon IBA do not extend to the estuarine mud and sand flats from 8-mile Haines Highway to Pyramid Island (mouth of the Chilkat River), nor do they protect key nesting habitat along the banks of the estuary, leaving this rich and expansive habitat vulnerable to industrial and urban development. Although the Chilkat Valley is increasingly recognized as a remarkable hot spot of biodiversity, very little data are collected about our avian communities. TWC initiated an avian monitoring program early in 2020 to fill this data gap and provide empirical evidence in support of better protection for the Chilkat Estuary.

TWC recently acquired a 50-acre property adjacent to the Chilkat Estuary. Formerly an industrial site, we placed a majority of the property into a conservation easement, and are actively cleaning up and restoring fish and wildlife habitats on the remainder. The property is always open to public use for birding, hiking, and sport and subsistence fishing for eulachon and salmon. The property's location along the river mouth and tidelands not only provides protection for multiple types of bird habitat, but also makes it an ideal focal point for investigation.

By field testing methods last spring, we were able to design a study to measure abundance, species richness, composition, and phenology of avian species that use a portion of the estuary during spring and fall migration. If implemented consistently over subsequent years, the study will allow us to document unusual or catastrophic events and potentially trends over time. Results may be used to identify potential threats, inform managers, educate the public, and ultimately advocate for the conservation of local avian communities and the habitat on which they depend.

Study Area

The Chilkat River originates in British Columbia, Canada and empties into the Pacific Ocean near Haines, Alaska. The large glacial basin is comprised of steep mountainous terrain at its northern and western edges, and broad floodplain divided by braided channels at its bottomland. Finally, its southern terminus flows into the northern end of the Inside Passage where an expansive estuary is formed.

The survey boundary encompasses roughly 4.7 km^2 of the Chilkat Estuary and extends from Jones Point to Pyramid Island, following the beach trail along the northeastern boarder. At low tide, the area is dominated by bare sand and mud flats that are channelized by braided river. At high tide, the river becomes flooded with sea water to varying degrees depending on the magnitude of the tide. The intertidal zone within the survey boundary includes roughly equivalent portions of sand and cobble, grassland, and salt marsh habitats.

Chilkat Estuary at mid tide on April 14 (left) and at high tide June 9, 2020 (right). Looking toward Pyramid Island.

Peeps and ducks feeding in a marshy area of the Chilkat Estuary on May 15, 2020. Photos by Stacie Evans.

Figure 1. Chilkat Pass migration route and Chilkat Estuary survey study area.

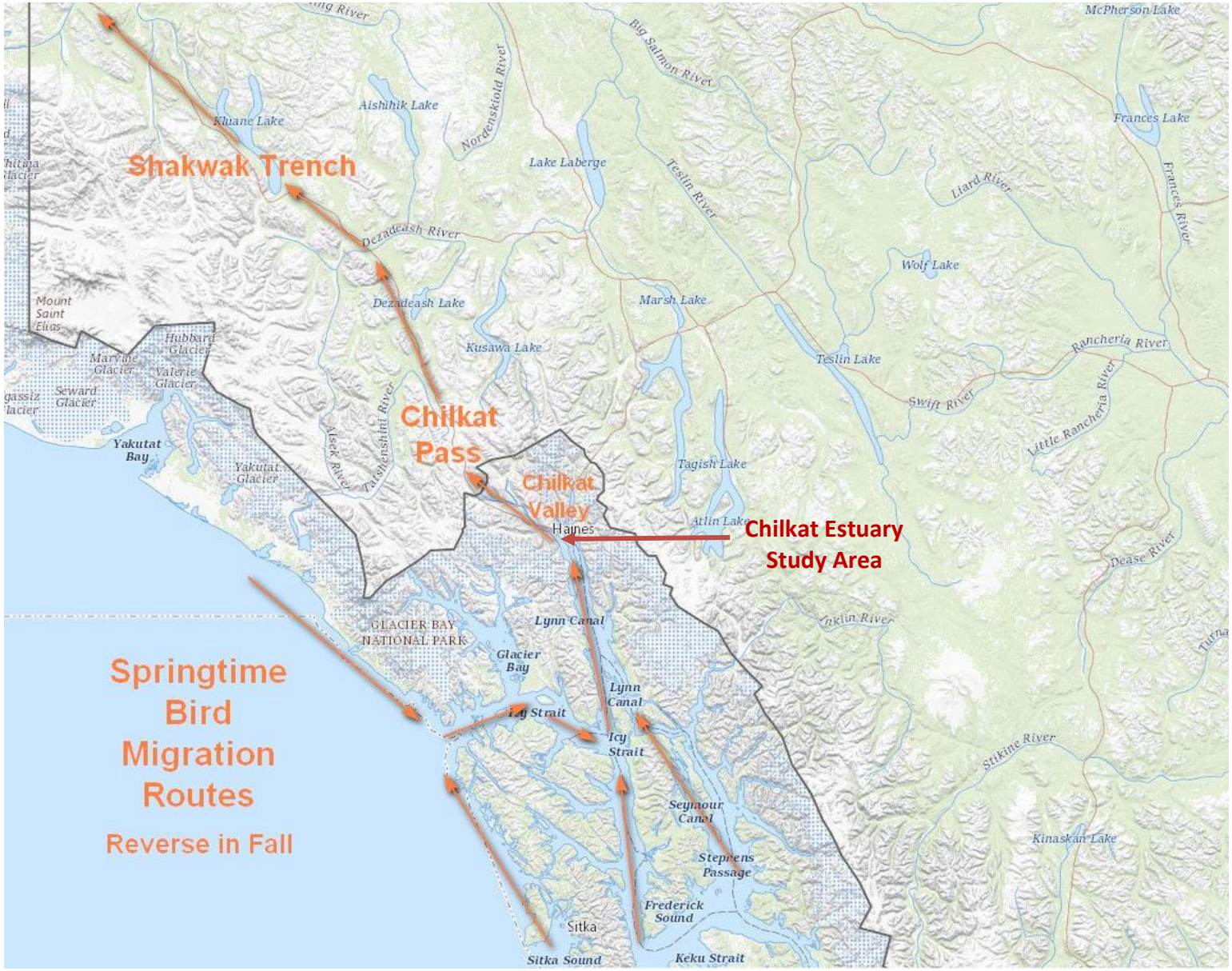


Figure 2. Chilkat Estuary survey study area.

The survey area extends along the wrack line from Jones Point, to a group of dark boulders directly across from Pyramid Island. The far border extends from a point 1km directly out from Jones Point to the edge of the coniferous vegetation on Pyramid Island. Landmarks were used to visualize the far border in 2020, however, markers will be installed in the future to ensure consistency as surveyors may change.

Methods

In order to produce results comparable to a nearby study, methods were adapted from the Klondike Gold Rush National Historical Park's (KLGO) Coastal Waterbird Survey (Surdyk and Evans 2018). This survey occurs annually and takes place roughly 17 miles north of the Chilkat Estuary.

Data Collection

Surveys were scheduled once per week mid-April through May, every two weeks in June and July, and again once per week in August and September. This timing was planned to capture periods of peak abundance during spring and fall migration. Some longer gaps occurred during periods of low abundance due to inclement weather and staff availability. The Chilkat tidal flats are expansive during low tide, inhibiting the ability of the surveyor to accurately count all shorebirds in the area, so surveys were only conducted during periods when the estuary was flooded and birds were more concentrated in tidal habitat. No surveys were conducted in heavy precipitation or winds sustained above 5 on the Beaufort Scale. The ultimate goal of each survey was to conduct a complete census of birds within the survey area. A scope and binoculars were used to aid identification, although aural and unassisted visual detections were accepted as well. No birds were deliberately flushed to aid detection and every precaution was taken to avoid flushing birds to the extent possible.

The surveyor(s) began at Jones Point and slowly walked the beach to the point directly across from Pyramid Island, stopping as frequently as necessary to count and identify all visible or audible birds in the survey area. Seven points were established along the route where the surveyor(s) was obligated to stop and scan with the scope. Every bird detection within the boundary was documented and individuals were identified to the lowest taxonomic classification possible. Guesses and speculation were not accepted in the data, however, they were sometimes included in the notes. Double counting was avoided as much as possible by disregarding birds flying into view from behind the surveyor(s), unless the bird was a species not previously documented that day. Large and mobile flocks of larus gulls and calidris shorebirds (peeps) were categorized by genus in order to prioritize accuracy. Totals for these flocks were achieved by counting 100 individuals and using this visual to estimate the entire size of the flock.

Data Summarization

Data were recorded on datasheets for each survey and later entered into an Excel spreadsheet. The number of species detected was totaled for each survey as well for the entire season. Birds identified to genus level were only included in these totals if no other individuals defined by that genus were identified to species level. The number of individuals observed for the entire season and the maximum number of individuals counted in a single day were summed for each species as well as for a grand total of all birds. Total observations throughout the season were also categorized by the three most abundant families (ducks and geese, shorebirds, and gulls and terns). The remainder was categorized as "other". A table containing all observations was generated for this report and summary graphs were produced in Excel for abundance, species richness, and composition. Yearly comparison graphs will be included in future reports.

Results

Totals

A total of fifteen surveys were conducted from 14 April to 21 September 2020. Stacie Evans was the primary observer for all surveys. Derek Poinsette assisted on April 14 and May 7, and Dan Schultz assisted on May 1. 55 bird species and a total of 10,322 individual birds were detected over the fifteen surveys. Two genera (dowitchers and scaups) were included in the species total because no individuals defined by these genera were identified to species at any time.

Table 1. List of species observed during Chilkat Estuary surveys from April 14 – September 21, 2020. Presented according to the 2020 AOS Checklist taxonomic order (Chesser et al. 2020).

Scientific Name	Common Name	Total # Observed	Single Day Max #	Date Max # Observed	# Surveys Detected
Anatidae (ducks and geese)					
Anser caerulescens	Snow Goose	278	109	5/15/2020	4
Anser albifrons	Greater White-fronted Goose	7	5	4/24/2020	3
Branta canadensis	Canada Goose	1	1	4/14/2020	1
Anas clypeata	Northern Shoveler	147	70	5/1/2020	6
Anas penelope	Eurasian Wigeon	1	1	5/1/2020	1
Anas americana	American Wigeon	436	119	5/1/2020	10
Anas platyrhynchos	Mallard	95	52	5/1/2020	7
Anas acuta	Northern Pintail	130	85	5/1/2020	4
Anas crecca	Green-winged Teal	368	193	5/1/2020	11
Anas sp.	Duck sp.	8	8	5/1/2020	1
Aythya collaris	Ring-necked Duck	2	2	5/1/2020	1
Aythya sp.	Scaup sp.	6	6	5/1/2020	1
Melanitta perspicillata	Surf Scoter	74	42	5/1/2020	5
Melanitta deglandi	White-winged Scoter	15	15	5/1/2020	1
Bucephala albeola	Bufflehead	22	20	5/1/2020	2
Bucephala islandica	Barrow's Goldeneye	20	17	5/1/2020	3
Mergus serrator	Red-breasted Merganser	178	86	5/1/2020	5
Podicipedidae (grebes)					
Podiceps auritus	Horned Grebe	25	17	5/1/2020	4
Charadriidae (plovers)					
Pluvialis squatarola	Black-bellied Plover	16	8	4/24/2020 5/1/2020	2
Charadrius vociferus	Killdeer	1	1	7/15/2020	1
Charadrius semipalmatus	Semipalmated Plover	66	24	5/1/2020	7

*Maximum numbers were observed when flocks of gulls or peeps were too large and mobile to count individuals for each species. Individuals were categorized by genus for those surveys to prioritize accuracy.

Table 1 (continued). List of species observed during Chilkat Estuary surveys from April 14 – September 21, 2020. Presented according to the 2020 AOS Checklist taxonomic order (Chesser et al. 2020).

Scientific Name	Common Name	Total # Observed	Single Day Max #	Date Max # Observed	# Surveys Detected
Scolopacidae (sandpipers)					
Numenius phaeopus	Whimbrel	3	3	9/15/2020	3
Limosa haemastica	Hudsonian Godwit	2	1	5/1/2020 5/15/2020	1
Calidris alba	Sanderling	1	1	5/7/2020	1
Calidris alpina	Dunlin	459	400	5/1/2020	3
Calidris minutilla	Least Sandpiper*	-	-	-	-
Calidris melanotos	Pectoral Sandpiper	50	45	5/15/20	2
Calidris pusilla	Semipalmated Sandpiper*	-	-	-	-
Calidris mauri	Western Sandpiper*	-	-	-	-
Calidris sp.	Peep sp.	1789	1249	5/1/2020	5
Limnodromus sp.	Dowitcher sp.	13	8	5/15/2020	2
Actitis macularius	Spotted Sandpiper	14	3	6/9/2020 7/15/2020	8
Tringa incana	Wandering Tattler	1	1	5/15/2020	1
Tringa melanoleuca	Greater Yellowlegs	10	3	7/15/2020	5
Tringa sp.	Yellowlegs sp.	1	1	5/7/2020	1
-	Shorebird sp.	11	9	8/5/2020	3
Alcidae (alcids)					
Brachyramphus marmoratus	Marbled Murrelet	2	2	4/24/2020	2
Laridae (gulls and terns)					
Larus philadelphia	Bonaparte's Gull	1051	930	5/1/2020	5
Larus canus	Mew Gull*	-	-	-	-
Larus argentatus	Herring Gull*	-	-	-	-
Laurus glaucescens	Glaucous-winged Gull*	-	-	-	-
Larus sp.	Larus Gull sp.	4169	2250	5/1/2020	10
Sterna paradisaea	Arctic Tern	38	13	4/24/2020	7
Phalacrocoracidae (cormorants)					
Phalacrocorax auritus	Double-crested Cormorant	1	1	5/15/2020	1
Ardeidae (herons)					
Ardea herodias	Great Blue Heron	4	2	5/15/2020	3

*Maximum numbers were observed when flocks of gulls or peeps were too large and mobile to count individuals for each species. Individuals were categorized by genus for those surveys to prioritize accuracy.

Table 1 (continued). List of species observed during Chilkat Estuary surveys from April 14 – September 21, 2020. Presented according to the 2020 AOS Checklist taxonomic order (Chesser et al. 2020).

Scientific Name	Common Name	Total # Observed	Single Day Max #	Date Max # Observed	# Surveys Detected
Accipitridae (hawks and eagles)					
Circus cyaneus	Northern Harrier	2	2	4/24/2020	2
Accipiter striatus	Sharp-shinned Hawk	2	1	9/10/2020 9/21/2020	2
Haliaeetus leucocephalus	Bald Eagle	161	34	5/15/2020	15
Alcedinidae (kingfishers)					
Ceryle alcyon	Belted Kingfisher	6	2	4/24/2020 5/1/2020	4
Falconidae (falcons)					
Falco sparverius	American Kestrel	1	1	9/10/2020	1
Corvidae (crows and jays)					
Pica hudsonia	Black-billed Magpie	9	6	9/15/2020	2
Corvus caurinus	Northwest Crow	77	31	4/24/2020	8
Corvus corax	Common Raven	62	15	6/30/2020	12
Hirundinidae (swallows)					
Tachycineta thalassina	Violet-green Swallow	22	14	5/15/2020	3
Turdidae (thrushes)					
Turdus migratorius	American Robin	1	1	6/9/2020	1
Motacillidae (pipits)					
Anthus rubescens	American Pipit	18	12	5/7/2020	5
Calcariidae (longspurs)					
Calcarius lapponicus	Lapland Longspur	36	36	5/1/2020	1
Passerellidae (new world sparrows)					
Passerculus sandwichensis	Savannah Sparrow	122	34	8/5/2020	11
Melospiza melodia	Song Sparrow	1	1	7/15/2020	1
Parulidae (new world warblers)					
Setophaga coronata	Yellow-rumped Warbler	10	10	5/7/2020	1

*Maximum numbers were observed when flocks of gulls or peeps were too large and mobile to count individuals for each species. Individuals were categorized by genus for those surveys to prioritize accuracy.

Summaries

Peak abundance occurred on May 1 when 5,768 individual birds were detected, accounting for over half of the grand total. Species richness also peaked on this day with 35 different species observed. The May 1 survey coincided with the annual eulachon run, which attracts gulls and other piscivorous fish by the thousands. Abundance dropped precipitously after spring migration and picked up again slightly during fall migration in September. The peak count for fall migration occurred on September 10 when 146 individual birds and 16 species were detected. Anatidae (ducks and geese), scolopacidae (sandpipers), and laridae (gulls and terns) were the three most abundant avian families documented in the survey area.

Figure 3. Abundance & Species Richness. The number of individuals detected (abundance) and number of species detected (species richness) for each survey.

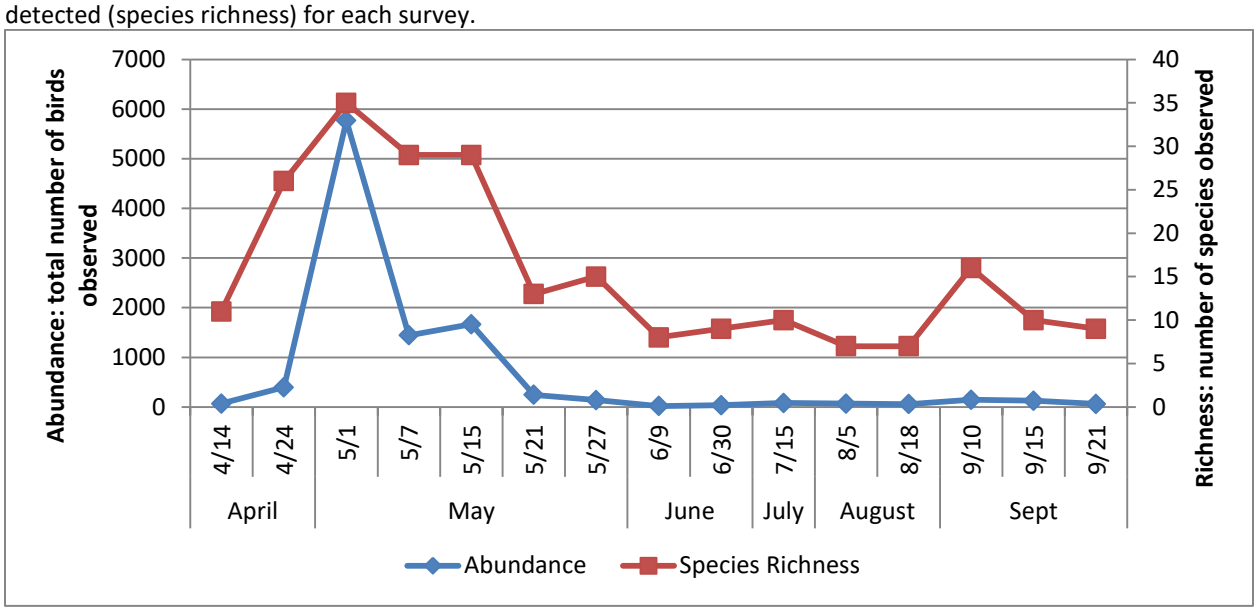
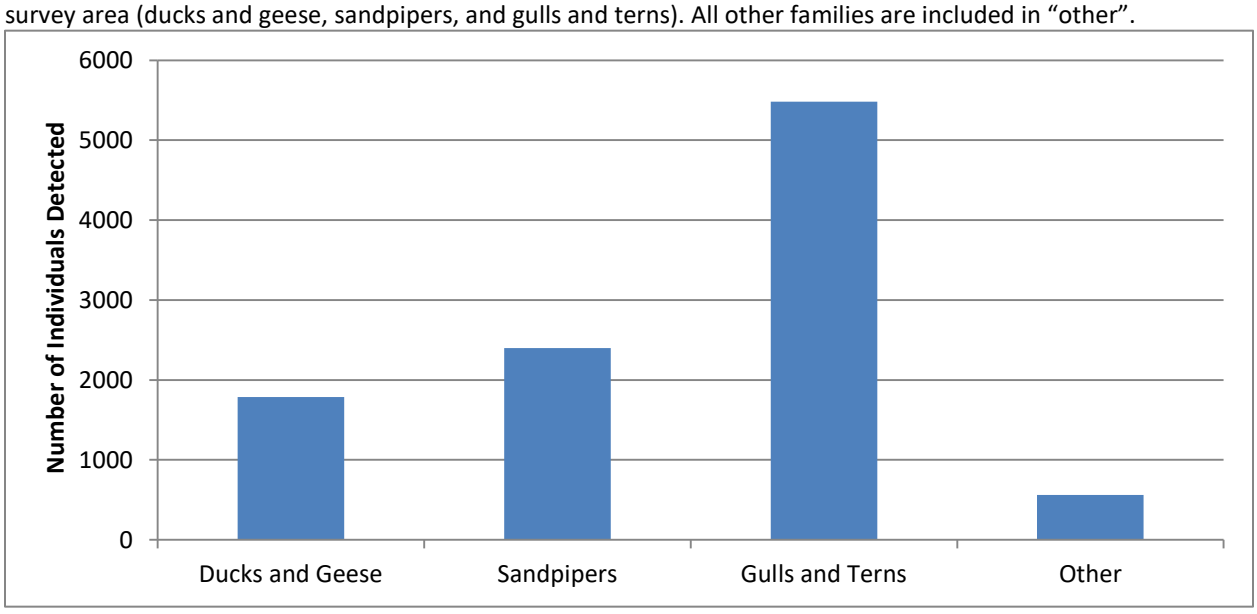


Figure 4. Composition. Total number of individuals detected for the three most abundant avian families in the survey area (ducks and geese, sandpipers, and gulls and terns). All other families are included in "other".



Anecdotal Observations

While passerines were not prevalent within the survey area, several species were documented using estuarine habitat regularly. The most notable resident species, the savannah sparrow, was observed during every survey after May 15. No savannah sparrow nests were documented, but fledglings were frequently observed in the survey area during July and August. A small flock of yellow-rumped warblers was observed foraging in the wrack line on May 7. Crows and ravens could also regularly be seen foraging in the wrack line throughout the season, and feeding on eulachon in late April and early May. Black-billed magpies were not observed in the study area until September 15.

Lapland longspurs were only documented during one survey when a flock swiftly made its way through the survey area on May 1, however, the species was observed in the study area several times outside of official survey periods. The first unofficial sighting occurred on March 24 when virtually no other birds were present.

Age and breeding status were not determined for this survey due to time restraints, but juveniles were opportunistically documented for the following species: greater yellowlegs, spotted sandpiper, mew gull, herring gull, bald eagle, northwest crow, common raven, and savannah sparrow. A pair of Wilson's snipes was frequently observed just off the trail leading to the survey area from mid April to mid May.

Bald Eagle Observations

The bald eagle was the most abundant species in the survey area not included in the three most common families (anatidae, scolopacidae, and laridae). A total of 161 individuals were counted over 15 surveys and a maximum of 34 were documented on May 15. The bald eagle was the only species detected during all 15 surveys. Anecdotally, the survey area was not the most densely populated part of the Chilkat Estuary for bald eagles. Individuals were often concentrated just outside of the survey area, especially during the eulachon run in April and May, and during salmon runs in September. Up to 50 individuals were spotted on the beach directly across the river from the survey area at any one time during those runs. Multiple nests line the western border of the survey area and individuals were often perched just outside of this border. A high count of 20 individuals (16 adults and 4 juveniles) were observed in the trees behind survey points 2 and 3 on July 15.

Recommendations

This pilot study provided a useful snapshot of abundance, species richness, composition, and migratory phenology of avifauna using the Chilkat Estuary. It also established a baseline dataset that may allow us to detect changes in these parameters over time. We make the following recommendations to improve methods and ensure consistency for future surveys:

Boundary markers
The same surveyor was present for all 2020 surveys, so it was possible to consistently delineate the survey boundaries with landmarks. Installing a visible survey marker at the northwest corner of the survey area will promote consistency between surveys in the future. Additional markers may also be useful if the logistics for installation prove to be uncomplicated.

Additional observers
Most surveys were completed with only one observer, however, an additional observer assisted during peak abundance. Help with photo documentation, gear management, and identification proved to be essential during the chaotic process of quantifying large flocks of gulls and peeps. In order to promote optimal and consistent data collection, we recommend that a minimum of two people trained in bird identification conduct surveys from late April through mid May each year.

Thayer's gulls
Gulls flocked to the study area by the thousands during the spring eulachon run. These large and mobile flocks were extremely difficult to quantify, especially when similarly sized flocks of peeps were also present. Apart from the distinctive Bonaparte's gull, gulls were only identified to genus level on these days to prioritize accuracy. Thayer's gulls are known to feed on eulachon in nearby locations, such as Berner's Bay and the Dyea Flats near Skagway, and it is likely that they are present on the Chilkat Estuary during the eulachon run as well. The lack of time to inspect large flocks during periods of peak abundance and the Thayer's gull's similar appearance to the herring gull probably explains why Thayer's gulls were not documented during surveys. We therefore recommend that either an additional observer join the crew, or that an extra survey is conducted during busy weeks to specifically inspect large flocks of gulls for less common species.

Bald eagles
The bald eagle was the only species observed during each of the 15 surveys. The Chilkat Estuary and adjacent forest clearly provided important nesting and feeding habitat for resident eagles, as well as food resources for migratory and nomadic individuals during the eulachon and salmon runs. In order to better quantify these observations, we recommend that a count of all eagles visible 360˚ from Jones Point is conducted each survey. In addition, a nest survey along the established route should be conducted once or twice per summer when chicks are large enough to be visible in the nest.

Discussion

Results from the 2020 Chilkat Estuary bird surveys confirm that the study area provides substantial resources for migratory and resident birds. While the estuary does not host the sheer numbers of birds that are found in some parts of Southeast Alaska, it supports a relatively high density of bird populations with roughly 1,230 birds per km^2 within the survey area during peak abundance. It is likely that density estimates are conservative because surveys were conducted when the study area was flooded by the tide. This factor should be considered when comparing these results to other studies. Similarly, the estuary yields significant biodiversity among avian communities, with 55 bird species detected within the survey area and 92 bird species recorded over 40 checklists on eBird (Hotspot: Haines – Chilkat River Flats).

Perhaps most importantly, the Chilkat Estuary is uniquely valuable for birds migrating via the Chilkat Pass. It contains the most salt marsh habitat in the Upper Lynn Canal (Smith 2016) and offers a final opportunity for migratory species to feed on marine invertebrates and forage fish before transitioning to interior mainland habitat types. Without this resource, it is conceivable that migration over the Chilkat Pass would not be viable for some species.

Results from the survey, along with anecdotal observations, also confirmed that the Chilkat Estuary provides abundant resources for bald eagles. While the highest concentration of bald eagles occurs north of the estuary at the confluence of the Chilkat and Tsirku Rivers in early winter, eagles are more concentrated at the Chilkat Estuary in the spring when eulachon are present, and in the fall when most salmon are running. Adjacent forest also provides excellent breeding habitat where adults are able to access plentiful resources a few meters from their nests.

In its “Ecological Atlas of Southeast Alaska”, Audubon estimated that the Chilkat River Complex faced the greatest cumulative ecological risk in the region (Smith 2016). This index factored in the combined effects of historic activity such as logging and urban development, with the possibility of future development under current management and conservation systems. While the current IBA and Alaska Chilkat Bald Eagle Preserve provide most of the Chilkat River and part of the Chilkoot River with some protections against these risks, they do not contain the last eight miles of the Chilkat River, including the estuary.

The threats to this under-protected potion of the Chilkat River are substantial. Just downstream from the IBA and Preserve, the Chilkat River and Estuary are bordered to the southwest by University of Alaska (UA) owned land containing wetlands, old growth spruce-hemlock, mixed cottonwood-spruce, and cottonwood riparian habitats. A large-scale clear-cut and export timber sale was proposed for roughly 3,500 acres of this land in 2017. Negotiations with a timber buyer are ongoing. The estuary is also bordered to the northeast by the Haines town site, where industrial, light industrial, residential, rural settlement, and recreation zones are slated for future growth (Haines Borough Parcel Viewer 2020). Invasive plant encroachment associated with urban development is already pervasive on that

side of the estuary and frequent flushing events caused by unleashed dogs have been observed in the area. About 35 miles upstream, Constantine Metal Resources LLC and Dowa Metals and Mining Co. are exploring a massive sulfide deposit for the development of a full-scale mine at the headwaters of Glacier Creek, a tributary of the Chilkat River. And finally, recent efforts led by TWC to monitor temperature in the estuary revealed temperatures that regularly exceeded the Alaska Department of Environmental Conservation's limits for the protection of fish in 2020 (ADEC 2020).

Because the Chilkat Estuary provides potentially critical foraging and staging habitat for birds migrating through the Chilkat Pass, as well as supports high concentrations of bald eagles in the spring and fall, TWC recommends that the southern border of the existing IBA be extended to Pyramid Island so that it includes the Chilkat Estuary. An IBA designation for this area could facilitate more robust monitoring efforts and ultimately lay the framework for better protection against the imminent threats of urban and industrial development, as well as climate change.

There is also an economic argument for extending the IBA to include the Chilkat Estuary. A 2011 economic assessment conducted by the US Fish and Wildlife Service found that bird watchers in the United States spent $26 billion on equipment and $14.9 billion on food, lodging, and transportation that year (Carver 2013). These expenditures created 666,000 jobs in areas where bird watching is popular and generated $107 billion in total industry output. The Chilkat Estuary has been deemed a "hotspot" on the popular online database eBird and is a designated stop on Audubon Alaska's Southeast Alaska Birding Trail. An IBA designation would be another flag to attract relatively high income and low impact tourists to the community.

To learn more about birdlife on the Chilkat Estuary and Audubon IBAs, please visit the following websites:

Audubon – Important Bird Areas: https://www.audubon.org/important-bird-areas

Audubon – Alaska (Southeast Alaska Birding Trails – Chilkat River Flats): https://ak.audubon.org/southeast-alaska-birding-trail-town/chilkat-river-flats

eBird (Hotspot: Haines – Chilkat River Flats): https://ebird.org/hotspot/L1551951

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