



Dene K'éh Kusān ARU Bird Surveys

2023 Summary Report



TABLE OF CONTENTS

List of Tables and Figures: Page 3

Background: Page 4

ARU Survey Sites: Page 5

Total Recording Hours and Total Species
Detections: Page 6

Survey Results by Bird Group: Page 7

Waterbird and Waterfowl Species Detections:
Pages 8 – 9

Shorebird Species Detections: Pages 10 – 11

Raptor and Owl Species Detections: Pages 12 -
13

Landbird Species Detections: Pages 14 – 16

Photo Credits: Pages 17 - 19

LIST OF TABLES AND FIGURES

TABLE 1. ARU SURVEY SITE LOCATIONS: PAGE 5

TABLE 2. WATERBIRD AND WATERFOWL SPECIES
DETECTIONS FOR EACH ARU SURVEY SITE: PAGE
8

TABLE 3. SHOREBIRD SPECIES DETECTIONS FOR
EACH ARU SURVEY SITE: PAGE 10

TABLE 4. RAPTOR AND OWL SPECIES
DETECTIONS FOR EACH ARU SURVEY SITE: PAGE
12

TABLE 5. LANDBIRD SPECIES DETECTIONS FOR
EACH ARU SURVEY SITE: PAGE 14

FIGURE 1. STUDY AREA MAP: PAGE 5

FIGURE 2. NUMBER OF SPECIES DETECTED PER SURVEY SITE: PAGE 6

FIGURE 3. TOTAL RECORDING HOURS PER SURVEY SITE: PAGE 6

FIGURE 4. NUMBER OF SPECIES DETECTED PER RECORDING HOUR:
PAGE 6

FIGURE 5. NUMBER OF SPECIES DETECTIONS PER BIRID GROUP
ACROSS ALL SURVEY SITES: PAGE 7

FIGURE 6. TOTAL WATERBIRD AND WATERFOWL SPECIES DETECTIONS
BY SITE: PAGE 8

FIGURE 7. TOTAL SHOREBIRD SPECIES DETECTIONS BY SITE: PAGE 10

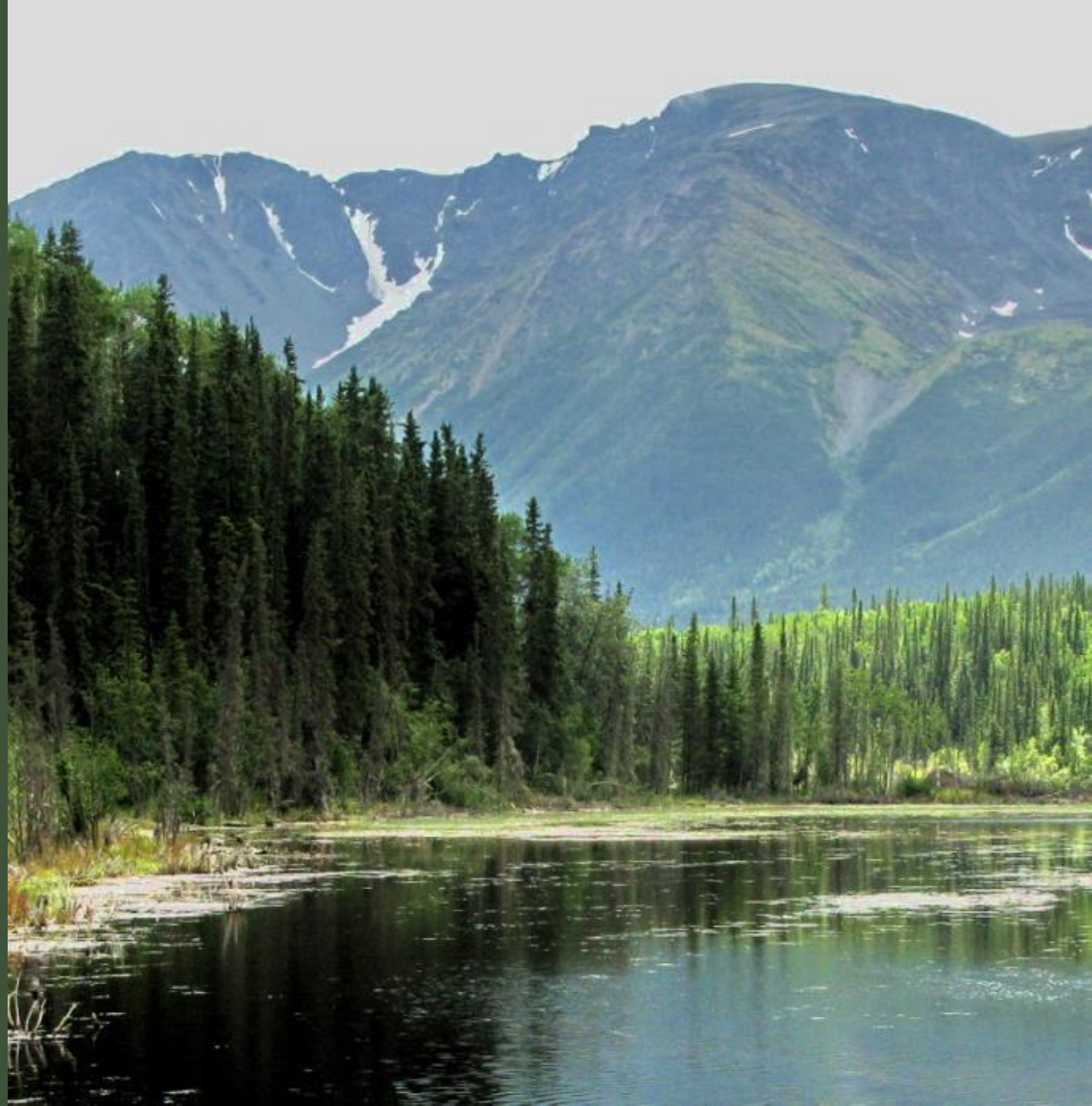
FIGURE 8. TOTAL RAPTOR AND OWL SPECIES DETECTIONS BY SITE:
PAGE 12

FIGURE 9. TOTAL LANDBIRD SPECIES DETECTIONS BY SITE: PAGE 14

BACKGROUND

During the summer of 2023, the Dena Kayeh Institute conducted bird surveys with Autonomous Recording Units (ARUs), in collaboration with the National Audubon Society's Boreal Conservation program. Surveys were conducted in the proposed Kaska Indigenous, Protected, and Conserved Area in northern British Columbia. The region is the Ancestral Territory of the Kaska Dena and the proposed area for protection encompasses approximately 40,000 km² within the Mackenzie River Basin.

ARUs allow for ongoing remote collection of audio data from the surrounding landscape, including bird songs and calls. ARUs record audio of the surrounding landscape at preprogrammed times and store the recordings until they can be retrieved at a later date. That data can later be analyzed to determine the presence of birds in the area and serve as an archive of the overall bioacoustics landscape that can be repeated and compared over time to help understand changes taking place within the ecological communities.



ARU Survey Sites

- ARU surveys were conducted at 3 sites within the Dene K'éh Kusān.

Table 1. ARU Survey Site Locations		
ARU Survey Site	Latitude	Longitude
DNY16	59.66167	-126.466
DNY20	59.79719	-129.133
DNY15	59.90999	-126.399

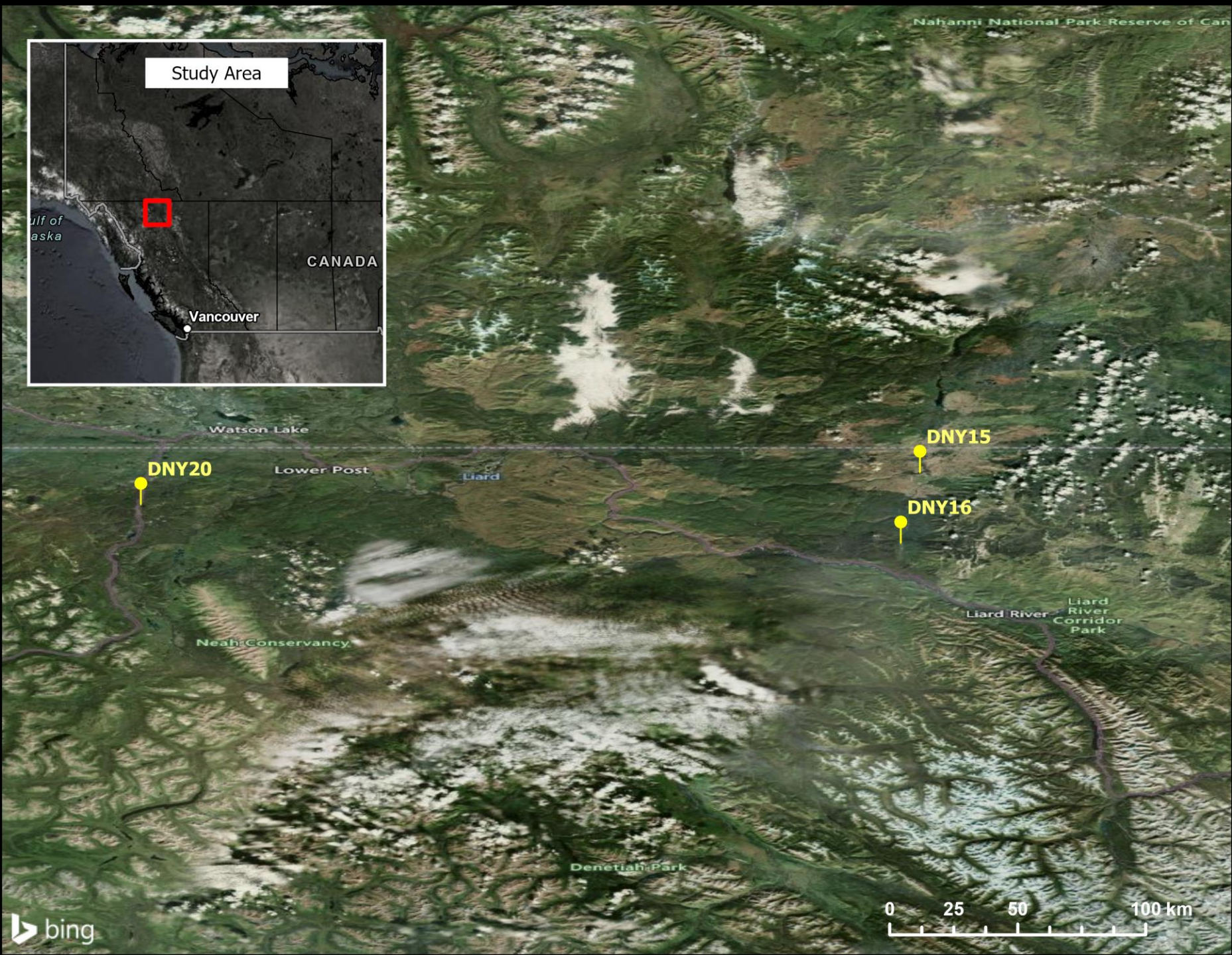


FIGURE 1. ARU SURVEY SITE LOCATIONS

ARU Recording Hours and Total Species Detected

- DNY16 and DNY15 had the greatest number of species detections (34 and 31, respectively) (Figure 2).
- DNY16 had the greatest number of total recording hours (311 hours) (Figure 3).
- DNY15 had the greatest number of species detections per recordings hours (Figure 4).

FIGURE 2. TOTAL SPECIES DETECTED PER SURVEY SITE

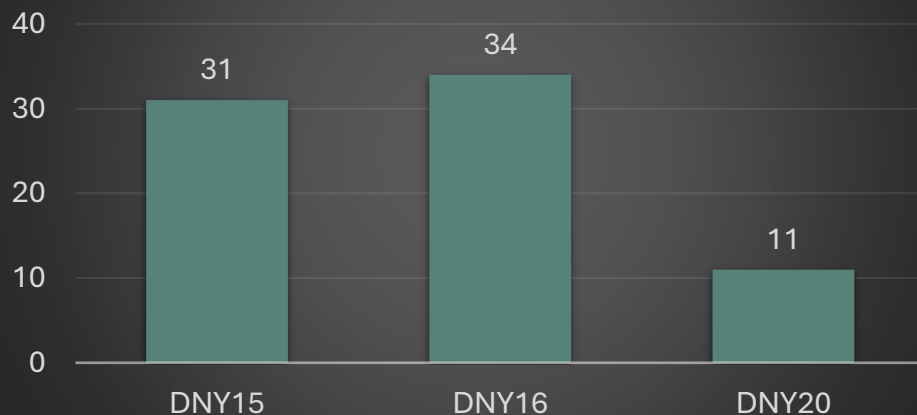


FIGURE 3. TOTAL RECORDING HOURS PER SURVEY SITE

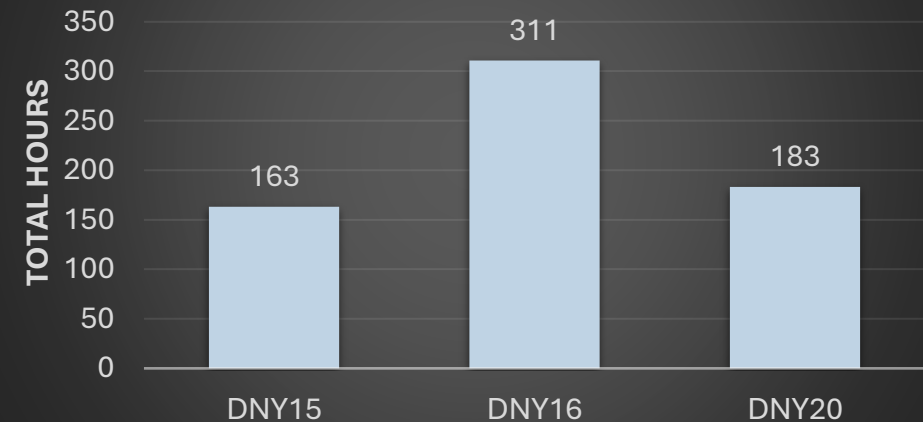
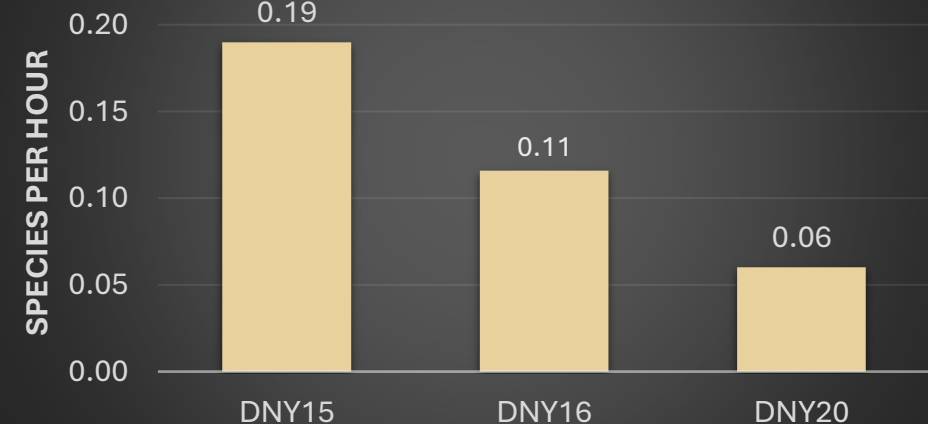


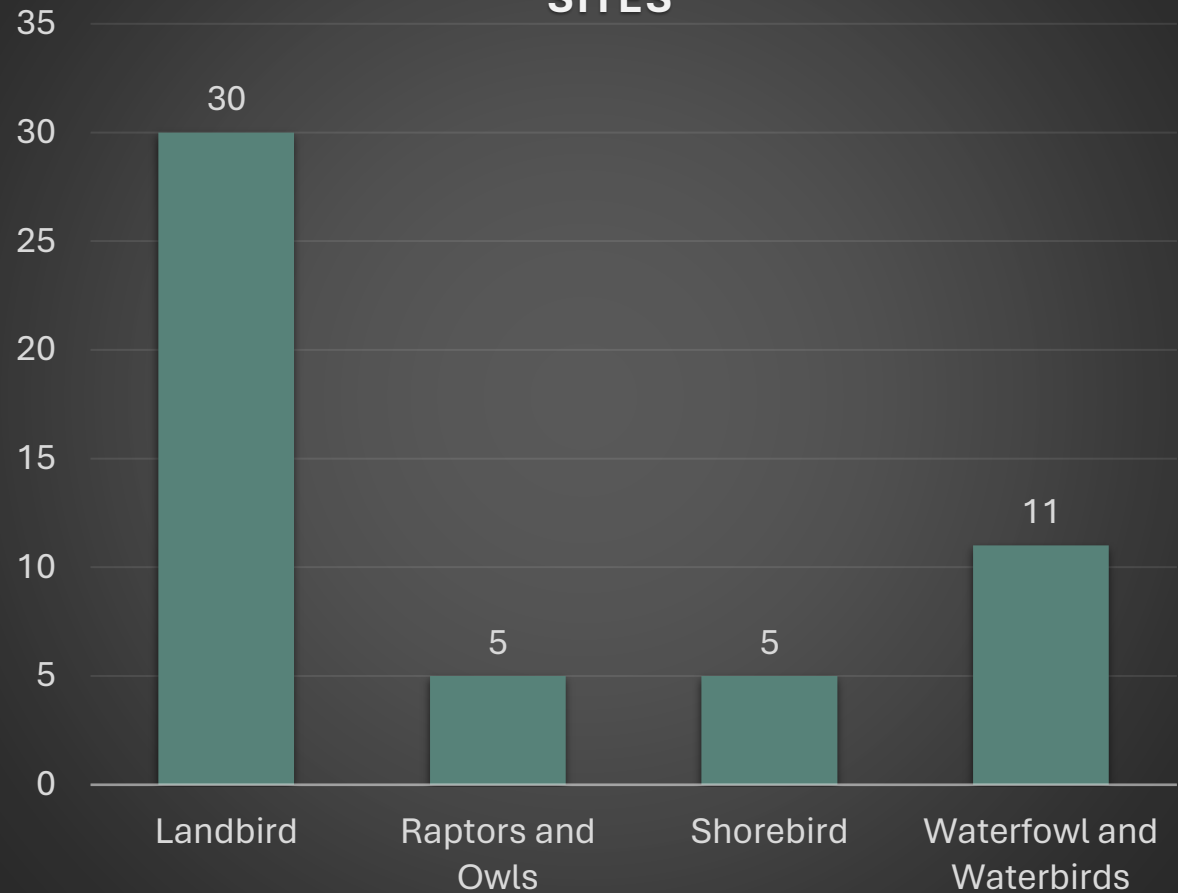
FIGURE 4. SPECIES DETECTION RATE PER RECORDING HOUR



ARU SURVEY RESULTS

- A total of 51 bird species were detected across the three survey sites, including: 30 landbird species, 5 raptor and owl species, 5 shorebird species, and 11 waterfowl and waterbird species.
- Two species detected are listed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), including: Common Nighthawk (Special Concern) and Lesser Yellowlegs (Threatened)

FIGURE 5. NUMBER OF SPECIES DETECTED PER BIRD GROUP ACROSS ALL SURVEY SITES



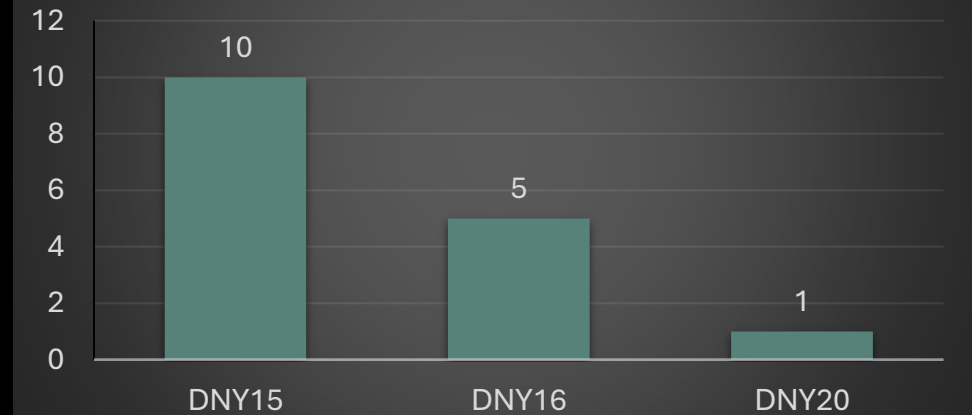
WATERBIRD AND WATERFOWL SPECIES DETECTIONS BY SURVEY SITE

- 11 waterfowl species were detected across the three survey sites
- Site DNY15 had the greatest diversity of waterbird and waterfowl species (n = 10)

TABLE 2. WATERFOWL SPECIES DETECTIONS FOR EACH ARU SURVEY SITE

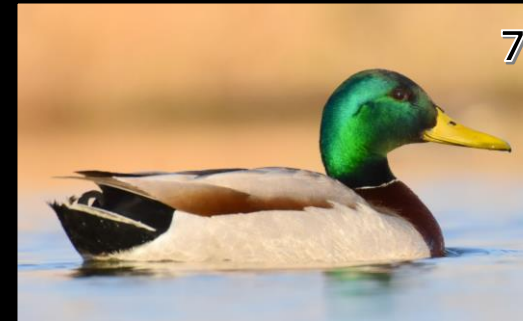
	Common Name	Latin Name	DNY15	DNY16	DNY20
1	American Wigeon	<i>Anas americana</i>	✓	✓	
2	Common Goldeneye	<i>Bucephala clangula</i>		✓	
3	Common Loon	<i>Gavia immer</i>	✓		✓
4	Greater White-fronted Goose	<i>Anser albifrons</i>	✓		
5	Green-winged Teal	<i>Anas crecca</i>	✓	✓	
6	Herring Gull	<i>Larus argentatus</i>	✓		
7	Mallard	<i>Anas platyrhynchos</i>	✓	✓	
8	Red-necked Grebe	<i>Podiceps grisegena</i>	✓		
9	Ring-necked Duck	<i>Aythya collaris</i>	✓		
10	Sandhill Crane	<i>Grus canadensis</i>	✓	✓	
11	Trumpeter Swan	<i>Cygnus buccinator</i>	✓		

FIGURE 6. WATERFOWL AND
WATERBIRD DETECTIONS BY SITE



Waterbirds and Waterfowl

1. American Wigeon
2. Common Goldeneye
3. Common Loon
4. Greater White-fronted Goose
5. Green-winged Teal
6. Herring Gull
7. Mallard
8. Red-necked Grebe
9. Ring-necked Duck
10. Sandhill Crane
11. Trumpeter Swan

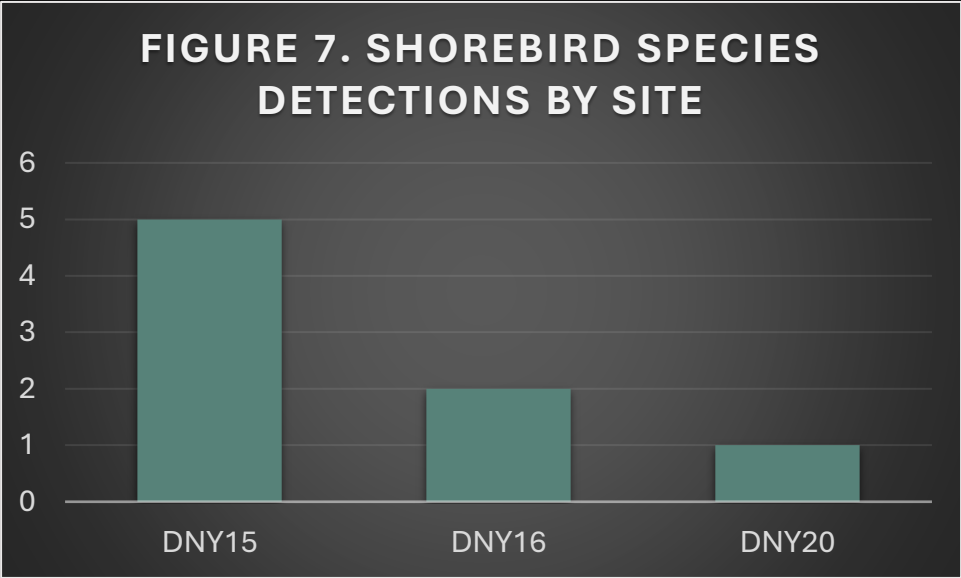


SHOREBIRD SPECIES DETECTIONS BY SURVEY SITE

- 5 shorebird species were detected across the three survey sites
- DNY15 had the greatest shorebird species diversity
- Solitary Sandpiper was detected at all three sites

TABLE 3. SHOREBIRD SPECIES DETECTIONS FOR EACH ARU SURVEY SITE

	Common Name	Latin Name	DNY15	DNY16	DNY20
1	Greater Yellowlegs	<i>Tringa melanoleuca</i>	✓		
2	Lesser Yellowlegs	<i>Tringa flavipes</i>	✓	✓	
3	Semipalmated Plover	<i>Charadrius semipalmatus</i>	✓		
4	Solitary Sandpiper	<i>Tringa solitaria</i>	✓	✓	✓
5	Spotted Sandpiper	<i>Actitis macularius</i>	✓		



Shorebirds

1. Greater Yellowlegs
2. Lesser Yellowlegs
3. Semipalmated Plover
4. Solitary Sandpiper
5. Spotted Sandpiper



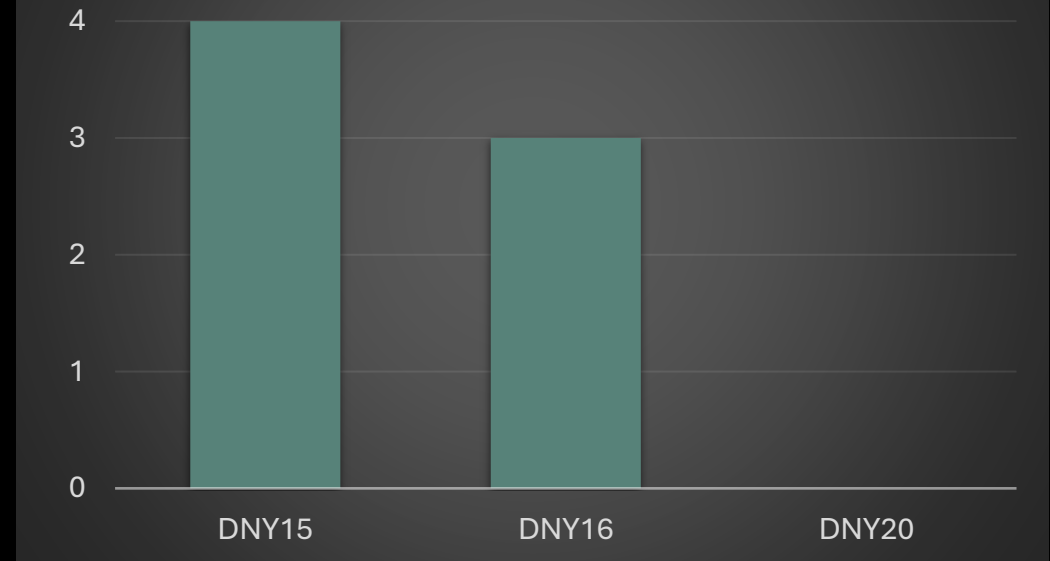
RAPTOR AND OWL SPECIES DETECTIONS BY SURVEY SITE

- 4 raptor species and 1 owl species was detected across two of the survey sites
- DNY15 had the greatest raptor and owl species detections (n = 4)
- No raptor or owl species were detected at DNY16

TABLE 4. RAPTOR AND OWL SPECIES DETECTIONS FOR EACH ARJ SURVEY SITE

	Common Name	Latin Name	DNY15	DNY16	DNY20
1	American Kestrel	<i>Falco sparverius</i>	✓		
2	Bald Eagle	<i>Haliaeetus leucocephalus</i>	✓	✓	
3	Great Horned Owl	<i>Bubo virginianus</i>	✓		
4	Merlin	<i>Falco columbarius</i>		✓	
5	Osprey	<i>Pandion haliaetus</i>	✓	✓	

FIGURE 8. RAPTOR AND OWL SPECIES DETECTIONS BY SITE



Raptors and Owls

1. American Kestrel
2. Bald Eagle
3. Great Horned Owl
4. Merlin
5. Osprey



LANDBIRD SPECIES DETECTIONS BY SURVEY SITE

- A total of 30 landbird species were detected across all three survey sites
- Site DNY16 had the greatest species diversity with 25 species detections

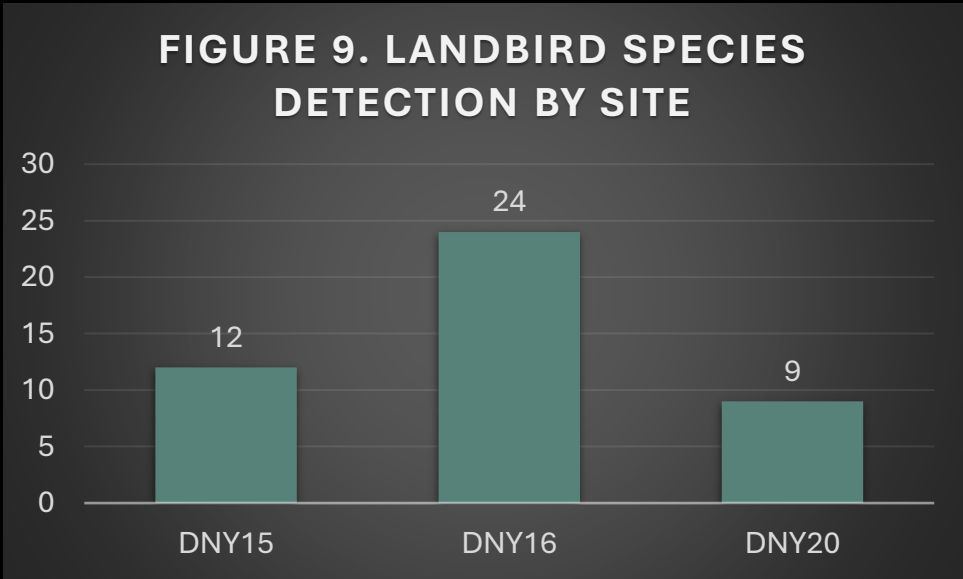


TABLE 5. LANDBIRD SPECIES DETECTIONS FOR EACH ARU SURVEY SITE

	Common Name	Latin Name	DNY15	DNY16	DNY20
1	Alder Flycatcher	<i>Empidonax alnorum</i>		✓	✓
2	American Crow	<i>Corvus brachyrhynchos</i>		✓	
3	American Pipit	<i>Anthus rubescens</i>	✓	✓	
4	American Robin	<i>Turdus migratorius</i>		✓	
5	American Three-toed Woodpecker	<i>Picoides dorsalis</i>		✓	
6	American Tree Sparrow	<i>Spizella arborea</i>		✓	
7	Belted Kingfisher	<i>Megaceryle alcyon</i>	✓	✓	
8	Black-backed Woodpecker	<i>Picoides arcticus</i>		✓	
9	Black-capped Chickadee	<i>Poecile atricapillus</i>		✓	
10	Bohemian Waxwing	<i>Bombycilla garrulus</i>	✓	✓	✓
11	Boreal Chickadee	<i>Poecile hudsonicus</i>	✓	✓	
12	Cedar Waxwing	<i>Bombycilla cedrorum</i>			✓
13	Common Nighthawk	<i>Chordeiles minor</i>	✓	✓	✓
14	Common Raven	<i>Corvus corax</i>	✓	✓	
15	Common Redpoll	<i>Acanthis flammea</i>		✓	✓
16	Dark-eyed Junco	<i>Junco hyemalis</i>	✓	✓	✓
17	Golden-crowned Kinglet	<i>Regulus satrapa</i>		✓	
18	Hairy Woodpecker	<i>Picoides villosus</i>		✓	
19	Lincoln's Sparrow	<i>Melospiza lincolnii</i>		✓	
20	Northern Waterthrush	<i>Parkesia noveboracensis</i>			✓
21	Pine Grosbeak	<i>Pinicola enucleator</i>		✓	
22	Red-breasted Nuthatch	<i>Sitta canadensis</i>	✓	✓	
23	Ruby-crowned Kinglet	<i>Regulus calendula</i>		✓	
24	Ruffed Grouse	<i>Bonasa umbellus</i>	✓		
25	Savannah Sparrow	<i>Passerculus sandwichensis</i>		✓	
26	Swainson's Thrush	<i>Catharus ustulatus</i>	✓		
27	Varied Thrush	<i>Ixoreus naevius</i>	✓	✓	
28	Western Wood-Pewee	<i>Contopus sordidulus</i>			✓
29	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>			✓
30	White-winged Crossbill	<i>Loxia leucoptera</i>	✓	✓	



1. Alder Flycatcher
2. American Crow
3. American Pipit
4. American Robin
5. American Three-toed Woodpecker
6. American Tree Sparrow
7. Belted Kingfisher
8. Black-backed Woodpecker



Landbirds

Page 1 of 2

9. Black-capped Chickadee
10. Bohemian Waxwing
11. Boreal Chickadee
12. Cedar Waxwing
13. Common Nighthawk
14. Common Raven
15. Common Redpoll
16. Dark-eyed Junco



Landbirds

Page 2 of 2



17



18

17. Golden-crowned Kinglet

18. Hairy Woodpecker

19. Lincoln's Sparrow

20. Northern Waterthrush

21. Pine Grosbeak

22. Red-breasted Nuthatch

23. Ruby-crowned Kinglet

24. Ruffed Grouse

25. Savannah Sparrow

26. Swainson's Thrush

27. Varied Thrush

28. Western Wood-Pewee

29. White-crowned Sparrow

30. White-winged Crossbill



26



27



29



28



19



22



20



21



23



24



25



30

Waterbirds and Waterfowl Photos

1. American Wigeon: Tom Koerner/USFWS
2. Common Goldeneye: Bill Thompson/USFWS
3. Common Loon: Gary J. Wege/USFWS
4. Greater White-fronted Goose: Charles Gates;
<https://www.flickr.com/people/124095129@N06/>
5. Green-winged Teal: Tom Koerner/USFWS
6. Herring Gull:
7. Mallard: Tom Koerner/USFWS
8. Red-necked Grebe: Lisa Hupp/USFWS
9. Ring-necked Duck: Marvin Ann Patterson/USFWS
10. Sandhill Crane: Larry Lamsa;
<https://www.flickr.com/people/larry1732/>
11. Trumpeter Swan: Tom Koerner/USFWS

Shorebird Photos

1. Greater Yellowlegs: Mike Carlo/USFWS
2. Lesser Yellowlegs: USFWS
3. Black-bellied Plover: Nigel;
<https://www.flickr.com/people/winnu/>
4. Solitary Sandpiper: Alex Galt/USFWS
5. Spotted Sandpiper: Charles McRae

Landbird Photos

1. Alder Flycatcher: Alan Schmierer;
<https://www.flickr.com/people/sloalan/>
2. American Crow: cuatrok77;
<https://www.flickr.com/people/cuatrok77/>
3. American Pipit: Channel City Camera Club;
<https://www.flickr.com/people/135081788@N03/>
4. American Robin: Grayson Smith/USFWS
5. American Three-toed Woodpecker:
6. American Tree Sparrow: Fyn Kynd;
<https://www.flickr.com/people/79452129@N02/>
7. Belted Kingfisher: Dona Hilkey;
<https://www.flickr.com/people/64391781@N00/>
8. Black-backed Woodpecker
9. Black-capped Chickadee: David Ellis/USFWS
10. Bohemian Waxwing: Lisa Hupp/USFWS
11. Boreal Chickadee: David Mitchell;
<https://www.flickr.com/people/firstmac/>
12. Cedar Waxwing: Bill Thompson/USFWS
13. Common Nighthawk: Tom Koerner/USFWS
14. Common Raven: Alan Schmierer/<https://www.flickr.com/people/sloalan/>
15. Common Redpoll: D. Faulder;
<https://www.flickr.com/people/dfaulder/>
16. Dark-eyed Junco

Landbird Photos

16. Golden-crowned Kinglet : N. Lewis/NPS

17. Hairy Woodpecker: Courtney Celley/USFWS

18. Lincoln's Sparrow: Andy Reago & Chrissy McClarren;
<https://www.flickr.com/people/wildreturn/>

19. Northern Waterthrush: Matthew Pimm

20. Pine Grosbeak: David A Mitchell;
<https://www.flickr.com/people/firstmac/>

21. Red-breasted Nuthatch: Eugene Beckes;
<https://www.flickr.com/people/121795831@N02/>

22. Ruby-crowned Kinglet: Nigel;
<https://www.flickr.com/people/winnu/>

23. Ruffed Grouse: Shenandoah National Park

24. Savannah Sparrow: Nii DeBraccio

25. Swainson's Thrush: Andy Reago & Chrissy McClarren;
<https://www.flickr.com/people/wildreturn/>

26. Varied Thrush: Mick Thompson

27. Western Wood-Pewee – Mick Thompson

28. White-crowned Sparrow: Andy Reago & Chrissy McClarren;
<https://www.flickr.com/people/wildreturn/>

29. White-winged Crossbill: Nick Saunders;
<https://www.flickr.com/people/nikovich/>