

DILLON
CONSULTING

NATURAL FORCES DEVELOPMENTS LP

Wildlife Surveys

Benjamins Mill Wind Project - Appendix F

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1.0

Introduction

The Proponent engaged the expertise of Dillon Consulting Ltd. (Dillon) to conduct biophysical surveys for the Benjamins Mill Wind Project (BMWP or Project) including identify wildlife species that exist or that may exist throughout the Project site and throughout any other areas which may be impacted by the development. Dillon's qualified professionals (biologists and botanists, etc.) have been involved in several resource development projects in Atlantic Canada and have assisted many Proponents through the provincial environmental assessment processes.

Due to the complexity of the specific assessments conducted for birds and bats, the details those surveys is included in their respective dedicated sections. These studies are reported separately in the Valued Environmental Component Appendix Reports for Bird and Acoustic Bat Surveys.

This appendix details the methods and results of the baseline wildlife surveys that were conducted for the Project. As with all forms of infrastructure development, the conservation and preservation of habitat is an important consideration when siting and designing wind power projects. Field surveys were carried out to develop a baseline understanding of the wildlife and wildlife habitat that could be present within the Project development area.

1.1

Scope of Work

The scope of work for the wildlife and wildlife habitat surveys is based upon an understanding of the nature of the proposed project and project area, as well as the field biologists experience in assessing similar landscapes. For the purposes of this report, Wildlife and wildlife Habitat (excluding bats and birds) includes terrestrial wildlife species and their habitats that have the potential to be affected by the Project activities.







Based on the recommended protocols outlined in the "Guide to Addressing Wildlife Species and Habitat in an EA Registration Document" (NSE 2009), and feedback from the consultation process, the following scope of work was completed as part of the terrestrial wildlife and habitat surveys for the proposed project. The scope of work included:

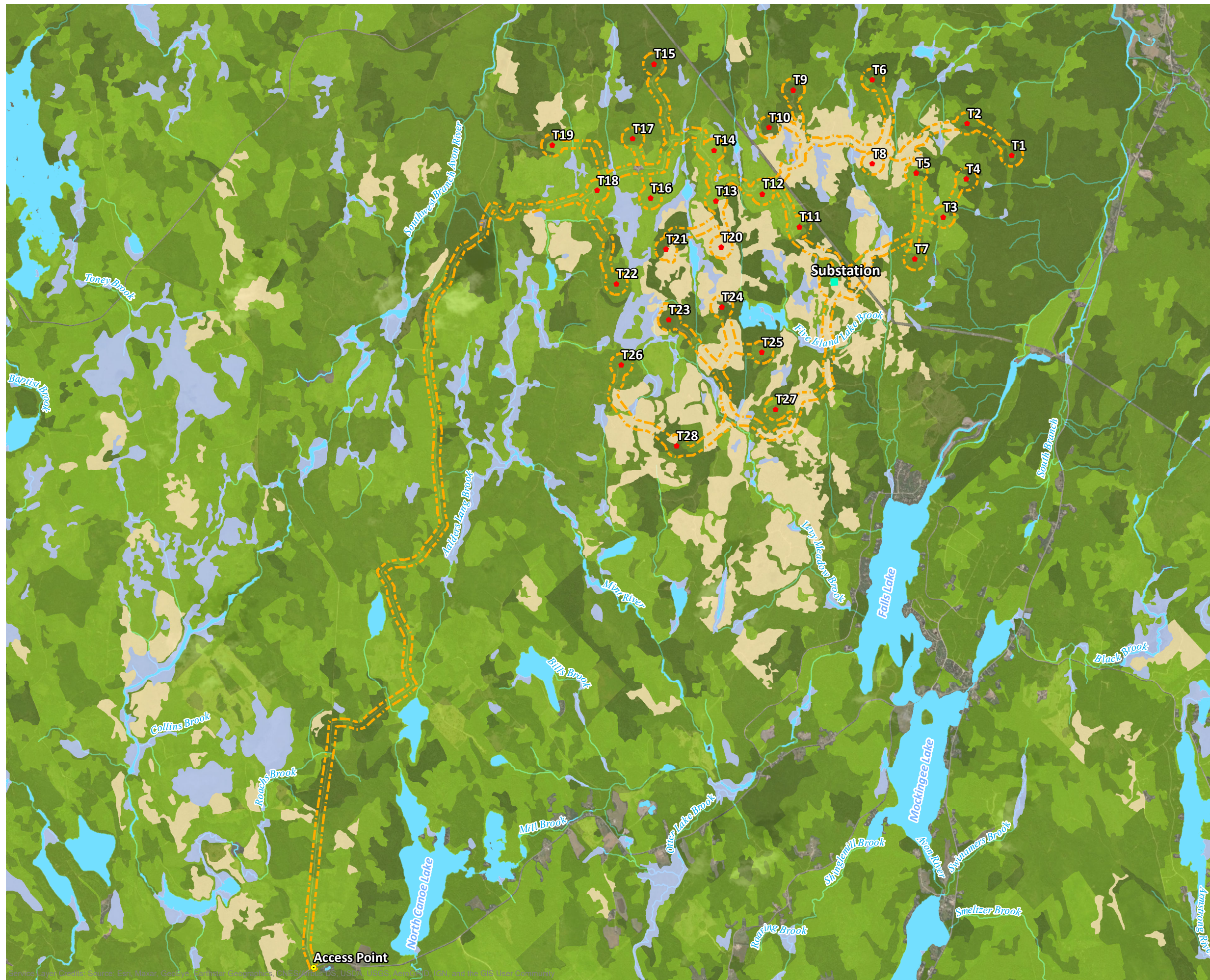
- Background and desktop analysis;
- Targeted habitat searches of reptiles and amphibians; and
- Incidental observations of terrestrial wildlife, signs and habitat documentation during the 2021 field surveys.

For the purpose of this assessment, the spatial boundaries (i.e., the assessment area) have been identified as the Terrestrial Local Assessment Area (LAA) (i.e., a 150 m buffer surrounding the project footprint of the proposed turbine locations, substation, and a 50 m buffer surrounding connector lines, road upgrades and transmission line corridor), as shown on Figure F-1.

**TERRESTRIAL ENVIRONMENT
LOCAL ASSESSMENT AREA**

FIGURE F-1

-  Proposed Access Point
 -  Proposed Turbine Location
 -  Substation
 -  Watercourse
 -  Waterbody
 -  Local Assessment Area
- Habitat**
-  Conifer - Dominant Forest
 -  Mixed - Wood Forest
 -  Hardwood - Dominant Forest
 -  Recently Cut Area
 -  Wetland



MAP DRAWING INFORMATION:
DATA PROVIDED BY DILLON CONSULTING, GEONB, NATURAL FORCES

MAP CREATED BY: MEC
MAP CHECKED BY: KB
MAP PROJECTION: NAD 1983 UTM ZONE 20N

Service Layer Credits: Source: Esri, Maxar, GeoEye, DigitalGlobe, GeoEye, IGN, CNES, Airbus DS, USDA, USDA, AeroGRID, IGN, and the GIS User Community

2.0 Field Survey

Field studies of terrestrial habitats were conducted between April and October 2021, in collaboration with other targeted field surveys (i.e., avian surveys, wetlands, watercourses, baseline vegetation and rare plants), summarized below in Table F-1. Biologists focused on the general characterization of available terrestrial habitats within the survey area, as well as the potential for sensitive species or their critical habitats occurring in the survey area. The following criteria were documented:

- Occurrence of species at risk/species of conservation concern;
- Potential habitat for species at risk/species of conservation concern; and
- Incidental observation and documentation of observed wildlife (regardless of conservation status), signs of wildlife and their habitat.

Targeted searches for reptile and amphibian species were carried out in concert with the wetland field surveys, as well as during the bird surveys when suitable reptile and amphibian habitat was encountered. During the wetland surveys, encountered watercourses and waterbodies were assessed visually for signs of turtles and frogs (i.e., direct observations or evidence of nesting). In addition, field staff gently turned over several rocks and woody debris items, as encountered, to check for terrestrial reptiles and amphibians. The targeted searches for reptiles and amphibians occurred between June 1 and September 30, 2021.

Table F-1: Wildlife and Incidental Surveys

Date	Primary Survey Type	Wildlife Observations
2021-04-29	Bird survey	American Black Bear tracks
2021-05-02	Bird survey	Direct observation of a Fisher and an American Black Bear
2021-05-04	Bird survey	Fresh tracks and direct observation of White-tailed Deer
2021-05-05	Bird survey	Fresh deer tracks and a direct observation of a North American Porcupine
2021-05-10	Bird survey	Fresh tracks and direct observation of White-tailed Deer and a direct observation of a Northern Flying Squirrel
2021-05-11	Bird survey	Fresh tracks and scat of deer
2021-05-19	Bird survey	Fresh deer tracks
2021-05-25	Bird survey	Fresh deer tracks
2021-05-28	Bird survey	Fresh deer tracks and direct observation of a North American Porcupine and White-tailed Deer

Date	Primary Survey Type	Wildlife Observations
2021-06-02	Bird survey	Fresh tracks, scat and direct observations of White-tailed Deer
2021-06-03	Bird survey	Fresh deer tracks and a direct observation of a Northern Leopard Frog
2021-06-24	Bird surveys and downloading data from acoustic bat meters	Fresh bear and deer tracks and direct observations of a White-tailed Deer, Pickerel Frog and Green Frog
2021-06-29	Bird survey	Fresh deer tracks and direct observation of a Northern Ring-neck Snake and a Snowshoe Hare
2021-07-21	Bird Surveys and downloading data from acoustic bat meters	Bear signs (i.e., young cherry trees pulled into road for feeding, scat. Bite marks on bat monitor case) A direct observation on an American Black Bear, many Green Frogs, Wood Frog tadpoles, several White-tailed Deer with a fawns, and one Snowshoe Hare,
2021-07-23	Wetland surveys, targeted amphibian searches	Direct observation of one Snowshoe Hare, one American Black Bare, one Pickerel Frog, and fresh deer tracks.
2021-08-05	Downloading data from acoustic bat meters	Bear scat in four locations
2021-08-12	Bird counts and wetland surveys, and targeted amphibian searches	Bear scat containing blueberries and direct observations of Green, Northern Leopard and Wood Frogs
2021-08-24	Bird counts, wetland surveys, and targeted amphibian searches	Direct observation on a Northern Leopard Frog and a White-tailed Deer, bear scat and deer tracks.
2021-08-26	Bird Surveys and downloading data from acoustic bat meters	Deer scat and 3 location of bear scat. Direct observations of a White-tailed deer with a fawn, a Pickerel Frog and a Maritime Garter Snake
2021-08-31	Bird counts, wetland surveys, and targeted amphibian searches	Direct Observation 2 Northern Leopard Frogs, a Green Frog and a Striped Skunk
2021-09-01	Bird counts, wetland surveys, and targeted amphibian searches	Recent beaver-chewed sticks and stumps. Direct Observation 2 Green Frogs, a Pickerel Frog and a Maritime Garter Snake
2021-09-11	Bird counts, wetland surveys, and targeted amphibian searches	Bear scat and deer tracks

Date	Primary Survey Type	Wildlife Observations
2021-09-13	Bird counts, wetland surveys, and targeted amphibian searches	Fresh deer tracks. Direct observation of 4 Green Frogs and 2 Mink Frogs
2021-09-14	Bird counts, wetland surveys and downloading data from acoustic bat meters	Fresh deer tracks. Direct observation of 3 Green Frogs and a yearling American Black Bear cub
2021-09-21	Bird counts, wetland surveys, and targeted amphibian searches	Fresh deer tracks. Direct observation of 2 Northern Leopard Frogs
2021-10-04	Watercourse survey	Recently built beaver dam and recent chew evidence. Direct observation of a Northern Leopard and Pickerel Frog
2021-10-06	Bird counts and watercourse survey	Deer-chewed vegetation and fresh bear scat in 3 locations
2021-10-07	Watercourse survey	Fresh deer tracks
2021-10-18	Bird survey	Fresh deer tracks. Direct observation of 2 Green Frogs and a Maritime Garter Snake

During the 2021 terrestrial field surveys, Dillon biologists recorded incidental observations or detections of wildlife during the course of other survey efforts and when possible, photographs were taken (see the photo plate included in this appendix for representative photos). Such detections are rarely direct observations or vocalizations, but rather proxy evidence that is left behind and remains identifiable to species for some time after the animal has moved on. This includes more readily detectable indicators such as animal tracks in snow/mud or animal scat, but also less obvious indicators such as browse marks, dens and/or burrow structures, and owl pellets to name a few.

The methodologies used for the scope of the desktop analysis and field surveys listed above are outlined within the following sections.

2.1 Methods and Sources

Prior to completing the terrestrial field surveys, Dillon reviewed readily available information from reputable sources. The information was reviewed to evaluate the potential for moose and moose habitat within the general area of the proposed project and to assist in scoping the field program. The information was reviewed, along with information on habitats present in the general area of the proposed project to determine preliminary potential for at risk wildlife species and/or their critical habitat. Dillon completed a review of the following sources and data lists prior to completing the field surveys:

- Data from the Atlantic Canada Conservation Data Centre,
- NS DNRR forest inventory database;
- NS DNRR ownership and restricted/limited land-use database;

- NS DNRR Wet Area Mapping (WAM);
- NS Provincial Landscape Viewer; and
- Google Earth satellite imagery.

3.0

Results

A list of recorded observations of wildlife from the 2021 surveys (excluding bats and birds) is presented in Table F-2. A total of eleven mammal, six amphibian species and two reptile species were detected within the assessment area during the terrestrial field studies conducted in 2021.

The mammal species observed, or detected, include:

- American Beaver (*Castor canadensis*);
- American Black Bear (*Ursus americanus*);
- Fisher (*Pekania pennanti*);
- Eastern Chipmunk (*Tamias striatus*);
- Eastern Coyote (*Canis latrans*);
- North American Porcupine (*Erethizon dorsatum*);
- Northern Flying Squirrel (*Glaucomys sabrinus*);
- Red Squirrel (*Tamiasciurus hudsonicus*);
- Snowshoe Hare (*Lepus americanus*);
- Striped Skunk (*Mephitis mephitis*); and,
- White-tailed Deer (*Odocoileus virginianus*).

A deer wintering area (DWA) is located adjacent to the Project site, on the north side of the West Branch of the Avon River. During the winter, White-tailed Deer congregate in high density groups in areas with which provide shelter from the prevailing wind, offer maximum exposure to the sun and offer cover as well as access to vegetation for browse (NSDNR 2012). DWAs are identified by NSDNRR for identifying areas for special management practices in Nova Scotia. Although no designated DWAs on the Project site, there is potential for deer to winter in uncut forested areas, generally located on the east side of the project site.

Reptiles and amphibians observed, or detected, include:

- Eastern Red-backed Salamander (*Plethodon cinereus*);
- Green Frog (*Lithobates clamitans*);
- Maritime Garter Snake (*Thamnophis sirtalis pallidulus*);
- Northern Ringneck Snake (*Diadophis punctatus edwardsii*);
- Northern Leopard Frog (*Lithobates pipiens*);
- Pickerel Frog (*Lithobates palustris*);
- Spring Peeper (*Pseudacris crucifer*); and,

- Wood Frog (*Lithobates sylvaticus*).

The encountered wildlife species listed above have populations in Nova Scotia that are considered secure according to the ACCDC (2021) with the exception of one fisher. The fisher is ranked S3 or Vulnerable by the ACCDC and is therefore included with the SoCC discussion in Section 6.2.3 of the main document.

Although not encountered, the eastern painted turtle and mainland moose were reported by the ACCDC as being observed within 10 km of the BMWP site and potential habitat is available at the site. Dillon personnel checked accessible water bodies, when encountered as part of the wetland and watercourse surveys, for the presence turtles. Dillon biologists were aware of the potential for moose to be present in the LAA and to record signs of moose if encountered. Such signs include scat, tracks, high browse and shed antlers; however, there were no observations or signs of moose reported during the 2021 field surveys.

Table F-2: Wildlife Observations from 2021 Field Surveys (Excluding Bat and Birds)

Species	S-Rank	Date	Observations
White-tailed Deer (<i>Odocoileus virginianus</i>)	S5	2021-05-04	Fresh tracks
		2021-05-04	Direct observation
		2021-05-05	Fresh tracks
		2021-05-05	Fresh tracks
		2021-05-10	Direct observation
		2021-05-11	Fresh tracks
		2021-05-19	Fresh tracks
		2021-05-25	Fresh tracks
		2021-05-28	Fresh tracks
		2021-05-28	Fresh tracks
		2021-05-28	Direct Observation
		2021-06-02	Fresh tracks
		2021-06-02	Direct observation
		2021-06-03	Fresh tracks
		2021-06-03	Fresh tracks
		2021-06-24	Fresh tracks
		2021-06-24	Fresh tracks
		2021-06-24	Fresh tracks
		2021-06-24	Direct observation
		2021-06-29	Fresh tracks
		2021-06-29	Fresh tracks
		2021-07-21	Direct observation - Doe with fawn
		2021-07-21	Direct observation - Doe with fawn
		2021-08-24	Fresh tracks
		2021-08-24	Direct observation
		2021-08-26	Doe with fawn
		2021-09-11	Fresh tracks
		2021-09-13	Fresh tracks
		2021-09-13	Direct observation
		2021-09-13	Fresh tracks
		2021-09-14	Fresh tracks
		2021-09-14	Direct observation
		2021-09-14	Direct observation
2021-09-14	Fresh tracks		
2021-09-21	Fresh tracks		
2021-09-21	Fresh tracks		
2021-10-18	Fresh tracks		

American Beaver (<i>Castor canadensis</i>)	S5	2021-09-01	Recent beaver chewed sticks, stumps
		2021-10-04	Recently built dam and recent chew evidence
		2021-10-06	Recent chew
Eastern Coyote (<i>Canis latrans</i>)	S5	2021-05-05	Fresh tracks
		2021-05-10	Fresh tracks
		2021-05-10	Fresh tracks
		2021-05-11	Fresh scat
		2021-05-28	Fresh tracks
		2021-06-02	Fresh scat
		2021-07-23	Fresh tracks
		2021-08-26	Fresh scat
		2021-10-07	Fresh tracks
		2021-10-07	Fresh tracks
		American Black Bear (<i>Ursus americanus</i>)	S5
2021-05-02	Direct observation		
2021-06-24	Fresh tracks		
2021-06-24	Fresh tracks		
2021-07-21	Appears to be pulling young cherry trees into road and feeding.		
2021-07-21	Bear scat		
2021-07-21	Bear left bite marks in Bat monitor case		
2021-07-21	Direct observation		
2021-07-21	Fresh bear scat		
2021-07-21	Direct observation		
2021-07-23	Scat		
2021-08-05	Scat		
2021-08-05	Scat		
2021-08-05	Scat		
2021-08-12	Fresh scat contained blueberries		
2021-08-24	Fresh bear scat		
2021-08-24	Fresh scat		
2021-08-26	Fresh scat		
2021-08-26	Fresh scat		
2021-08-26	Fresh scat		
2021-09-11	Fresh scat		
2021-09-14	Yearling, observed on an access road		
2021-10-06	Fresh scat		
2021-10-06	Fresh scat		
2021-10-06	Fresh scat		

Northern Flying Squirrel (<i>Glaucomys sabrinus</i>)	S5	2021-05-10	Direct Observation
Fisher (<i>Pekania pennanti</i>)	S3	2021-05-02	Direct Observation
North American Porcupine (<i>Erethizon dorsatum</i>)	S5	2021-05-05	Direct observation
		2021-05-28	Direct Observation
Striped Skunk (<i>Mephitis mephitis</i>)	S5	2021-08-31	Direct Observation
Snowshoe Hare (<i>Lepus americanus</i>)	S5	2021-06-29	Direct observation
		2021-07-21	Direct observation
		2021-07-23	Direct observation
Maritime Garter Snake (<i>Thamnophis sirtalis pallidulus</i>)	S5	2021-08-26	Direct observation
		2021-09-01	Direct observation
		2021-10-18	Direct observation
Northern Ringneck Snake (<i>Diadophis punctatus edwardsii</i>)	S5	2021-06-29	Direct Observation
Green Frog (<i>Lithobates clamitans</i>)	S5	2021-06-24	Direct Observation
		2021-07-21	Direct Observation, many frogs
		2021-07-21	Direct Observation
		2021-08-12	Direct Observation
		2021-08-31	Direct Observation
		2021-09-01	Direct Observation
		2021-09-01	Direct Observation
		2021-09-13	Direct Observation
		2021-09-13	Direct Observation
		2021-09-13	Direct Observation
		2021-09-13	Direct Observation
		2021-09-14	Direct Observation
		2021-09-14	Direct Observation
		2021-09-14	Direct Observation
		2021-10-18	Direct Observation
2021-10-18	Direct Observation		
Northern Leopard Frog (<i>Lithobates pipiens</i>)	S5	2021-06-03	Direct Observation
		2021-08-12	Direct Observation
		2021-08-24	Direct Observation
		2021-08-31	Two Direct Observations
		2021-09-21	Direct Observation
		2021-09-21	Direct Observation
		2021-10-04	Direct Observation

Pickerel Frog (<i>Lithobates palustris</i>)	S5	2021-06-24	Direct Observation
		2021-07-23	Direct Observation
		2021-08-26	Direct Observation
		2021-09-01	Direct Observation
		2021-10-04	Direct Observation
Mink Frog (<i>Lithobates septentrionalis</i>)	S5	2021-09-13	Direct Observation
		2021-09-13	Direct Observation
Wood Frog (<i>Lithobates sylvaticus</i>)	S5	2021-07-21	Direct Observation, tadpoles
		2021-08-12	Direct Observation

Photo Plate

American Black Bear



Scat on Hingley Rd.
October 6, 2021



Tracks
April 29, 2021



Scat
August 12, 2021

Eastern Coyote



Tracks
May 5, 2021

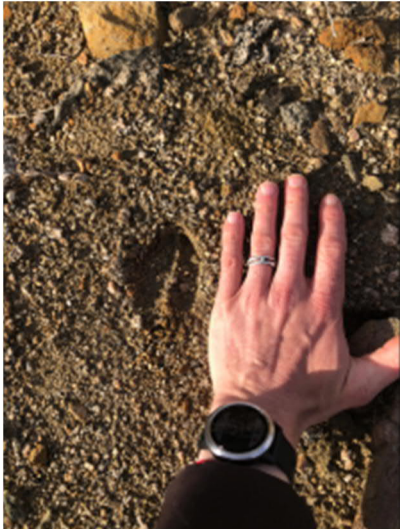


Tracks
May 10, 2021



Scat
May 11, 2021

White-tailed Deer



Tracks
May 5, 2021



Tracks
May 5, 2021

Red Fox (potentially)



Scat
May 14, 2021

American Beaver



Chewed sticks
September 1, 2021

Frogs



Northern Leopard Frog
June 3, 2021



Northern Leopard Frog
August 24, 2021

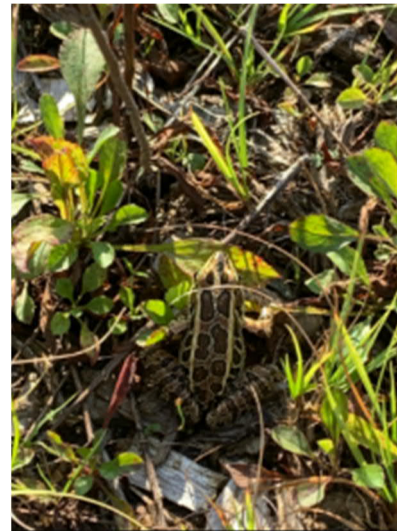
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Mink Frog
September 13, 2021



Wood Frog
August 12, 2021



Pickerel Frog
August 26, 2021



Pickerel Frog
June 24, 2021



Green Frog
September 13, 2021

Snakes



Maritime Garter Snake
August 26, 2021



Northern Ringneck Snake
June 29

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