Data Request Overview

Type of Terrestrial Data Requested

On Tuesday, June 9, 2015 at 16:57:47 Coordinated Universal Time, you requested the following Terrestrial data from the Alberta Biodiversity Monitoring Institute (ABMI):
1. The Raw Breeding Birds dataset from Prototype, Rotation 1.
2. The Methodology and Metadata describing above data set(s).

Spatial Distribution

The spatial distribution of the data you requested is:
1. Core site locations systematically distributed across the Alberta in a 1656 site grid, of which 852 been surveyed to date using terrestrial sampling protocols.
2. Off-grid site locations, especially selected across Alberta for their unique or otherwise important environmental characteristics, of which 237 have been surveyed to date using terrestrial sampling protocols.

Delivered Files

1. T01A Site Physical Characteristics (A_T01A_Site_Physical_Characteristics_AllYear_AB_1468300879819042673.csv-1142KB) has 13590 rows
2. T01B Site Suitability (A_T01B_Site_Suitability_AllYear_AB_5828583783192171099.csv-9291KB) has 90266 rows
3. T01C Site Capability (A_T01C_Site_Capability_AllYear_AB_7248548287629119451.csv-3257KB) has 46827 rows
4. T01D Ground Cover (A_T01D_Ground_Cover_AllYear_AB_1771992121705419771.csv-914KB) has 15462 rows
5. T01E Site Disturbance (A_T01E_Site_Disturbance_AllYear_AB_5060379166702800336.csv-1554KB) has 27066 rows
6. T02A Surface Substrate (A_T02A_Surface_Substrate_AllYear_AB_7709378938830535969.csv-2057KB) has 34436 rows
7. T26 Breeding Birds (A_T26_Breeding_Birds_AllYear_AB_1526736139096682945.csv-23222KB) has 168123 rows
8. T02B Surface Substrate Disturbance (A_T02B_Surface_Substrate_Disturbance_AllYear_AB_6715368039791605141.csv-106KB) has 1971 rows

Terms of Use

Please conform to the following terms of use for all ABMI information products.

Acknowledgement

Use of ABMI data or information products requires that the ABMI be acknowledged as the source of information. Acknowledgements should be structured to include the Institute's name, website

address, and the type of information used. For example, the ABMI might be acknowledged using the following format:

> Raw breeding bird data (2004-2006 inclusive) from the Alberta Biodiversity Monitoring Institute was used, in whole or part, to create this product. More information on the Institute can be found at: http://www.abmi.ca.

Disclosure

The ABMI strongly recommends that any use of the Institute's information products include the following statements of disclosure:
1. the version and type of ABMI data used,
2. if appropriate, the type and source of additional, non-ABMI data used in analysis,
3. a full description of data analysis, and
4. the person(s) or organization(s) conducting the analysis.

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Contact Information

If you have questions or concerns about your data request, please contact:

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![Alberta Biodiversity Monitoring Institute logo]

Terrestrial Survey Methods

We had our sample design and methods extensively peer reviewed by the greater scientific community to ensure scientific credibility. Starting in May through to the end of June, we implemented spring terrestrial data collection protocols at each of the 1656 ABMI permanent monitoring sites. At this time, we sampled breeding birds, soil arthropods (springtails and mites), site capability, physical characteristics, downed woody materials and trees. Starting at the end of June through to the first week in August, we implemented summer terrestrial data collection protocols at each site to assess vascular plants, moss, lichen, tree ages, cover, and surface substrate (detailed terrestrial data collection protocols are available from the ABMI website: ABMI 10001—Terrestrial Data Collection Protocols). We implemented terrestrial protocols in the same way at all sites in each sampling year, except where protocol updates are noted.

Terrestrial Survey Sites

We characterized habitat suitability, ecosite capability, ground cover, and site disturbance at site centre, or bird point count station #1, and at each additional station surrounding site centre (Figure OB00004).

Physical Characteristics

We determined elevation using hand-held GPS units, aspect using a hand-held compass, and site slope using a clinometer. We identified the ABMI site centre in the field using hand-held GPS units. We used site centre as the reference point for all subsequent terrestrial protocols. We use the term "central hectare" to describe the 100 × 100 m area centered on site centre. We use the term "quadrant" to describe the four 0.25 ha (50 × 50 m) plots that subdivide the central hectare and originate from site centre.

> **Protocol Update:** Data from 2003–7 include elevation, slope and aspect at site centre (point count station 1) only. Data from 2008 do not include elevation, and slope and aspect were collected at each of the 9 point count stations.
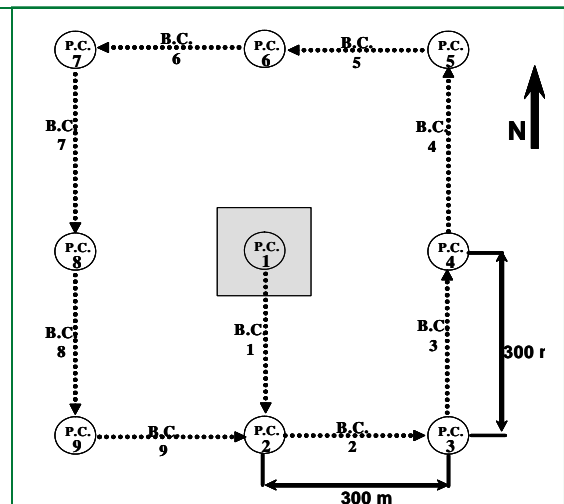
Figure OB00004. Point count stations for breeding birds at terrestrial monitoring sites.

Site Capability

Site capability was used to broadly describe the ecological habitat potential at each site and was described using dominant vegetative communities (ecological site classification; Beckingham and Archibald 1996). We modified Beckingham and Archibald (1996) to derive generalized eco-type categories (Table OB00002). We classified the primary and secondary ecosite/structural stage within a 150 m radius around each point count station and estimated the proportion of each ecosite in 10% increments. We only recorded secondary ecosites if they were in continuous habitat ≥ 0.1 ha (i.e.,

minimum 35 m in diameter). The sum of primary and secondary ecosite proportions could not add to more than 100%, but could have been less than 100% if more than two ecotypes were present.

> **Protocol Update:** Data from the Prototype Rotation (2003–6) include a primary and secondary ecological site (ecosite) classification for current conditions. Data from 2007 and later include the primary ecological site classification for current conditions, and primary and secondary ecosites for historical conditions.

Each ABMI site was assigned two ecosite designations. First, sites were classified according to AGRASID and GVI land and soil type. Second, sites were classified based on forested conditions. To classify this ecosite type, we first determined whether the location was upland or wetland. We then determined the moisture and nutrient category based on the understory vegetative community. We assigned a tree species modifier and structural stage to the classification; in non-tree-dominated structural stages, we used the "none" modifier. When the location was altered by human disturbance (e.g., agriculture, well pad, road, cutline, etc.), we based the classification on data collected outside the quadrant; therefore, the ecosite classification was based on pre-disturbance conditions (i.e., original stand conditions).

Table OB00002. ABMI Simplified Ecological Site Classification (Site Capability)

Dominant Shrub/Herb/Ground Cover	Nutr./ Moist. Code [1]	Tree Species Modifier	Tree Species Composition [2] (In an area without human disturbance)	Structural Stage [3]
Upland Vegetation Communities				
Bearberry/Lichen Bog Cranberry common at some sites	1 - PX	(1a) Pine	Pj + Fd > 80%	**A. Tree Dominated Ecosites** *(Trees ≥10% cover)* – Add 4-letter code combining tree height, density, and arrangement. <u>Tree Height</u> (TS) Short – ≥50% of canopy cover <10 m tall. (TT) Tall – >50% of canopy cover ≥10 m tall. <u>Tree Density</u> (D) Dense – Trees ≥1.3 m tall are ≤2 m apart. (S) Sparse – Trees ≥1.3 m tall are >2 m apart. <u>Tree Arrangement</u> (C) Complex (Spatially) – Tallest trees ≥10 m apart, with smaller trees (~ ½ height) between that receive direct sunlight from above. (N) Non-complex (Spatially) – Tallest trees <10 m apart, with few or no smaller trees (~ ½ height) between, that receive direct light from above.
Labrador Tea / Feather Moss Bog Cranberry, Bilberry, Grouse-berry common at some sites	2 - PM	(2a) Pine	Pj + Pl > 50%	
		(2b) Other	Aw + Sw + Se +Fa +Pw > 50%	
		(2c) Sb	Sb > 50%	
Hairy Wild Rye Bearberry, Canada Buffalo-berry, Feather Moss common at some sites	3 - MX	(3a) None	No Trees	
		(3b) Pine	Pj + Pl > 50%	
		(3c) AwMix	Aw > 20%	
		(3d) Spruce	Sw + Se + La >50%	
Low-bush Cranberry / Canada Buffalo-berry Blueberry, Rose, Alder, Labrador Tea, Bearberry, Thimbleberry, Bog Cranberry, Feather Moss common at some sites	4 -MM	(4a) Pine	Pj + Pl + Fa >50%	**B. Non-Tree Dominated Ecosites** *(Trees <10% cover)* Non-Vegetated *(<10% Vegetation Cover)* – Add 2-letter code describing dominant substrate type. (NR) – Bedrock, cliff, talus, bolder (NS) – Sand bar in river/stream (cobble, gravel, sand) (NM) – Mineral soil any other reason (NO) – Organic soil any other reason Note: If standing water is present, refer to Open Water Communities
		(4b) PjMix	Aw + Bp + Sw ≥20%, AND Pj ≥20%	
		(4c) Aw	Aw > 50%	
		(4d) AwMix	Aw ≥20% AND Sw + Sb + Pl > 20%	
		(4e) Sw	Sw > 50%	
Horsetail Dogwood, Rose, Willow, Feather Moss common at some sites	5 - MG	(5a) PbMix	Pb + Aw > 50%	
		(5b) Spruce	Sw + Se > 50%	
		(5c) Sb	Sb > 50%	
Dogwood / Fern / Feather Moss Rose, Alder, Bracted Honeysuckle, Devil's Club Fir common at some sites	6 - RG	(6a) Pl	Pl > 50%	Only Ground Vegetation Present *(Shrubs <10%; Trees <10%; Other Vasc. >10%)* – Add 3-letter code combining dominant vegetation type and density <u>Vegetation Type</u> (GB) Bryoid/Lichen – Bryophyte and lichen (GF) Forb – Non-graminoid herbs and ferns (GG) Graminoid – grasses, sedges (GR) Marsh – reeds, and rushes <u>Vegetation Density</u> (D) Dense – Cover >75% (M) Moderate – Cover 25-75% (S) Sparse – Cover <25%
		(6b) PbMix	Pb + Aw > 50%	
		(6c) Spruce	Sw + Se + Fa > 50%	
Not Treed	7 - NT	(7a) Alpine	Elevation above tree line	
		(7b) Flood	Site disturbed frequently by flooding	Shrubs Present *(Shrubs >10%; Trees <10%)* – Add 3 letter code combining shrub height and density. <u>Shrub Height</u> (SL) Low – Shrubby vegetation <2 m tall
		(7c) Ice	Site disturbed frequently by ice or snow	
		(7d) Dry	Site disturbed frequently by drought	
		(7e) Geo	Geological features not suitable for tree growth	

Dominant Shrub/Herb/Ground Cover	Nutr./ Moist. Code [1]	Tree Species Modifier	Tree Species Composition [2] (In an area without human disturbance)	Structural Stage [3]
Lowland/Wetland Vegetation Communities				(ST) Tall – Shrubby vegetation >2 m tall Shrub Density (D) Dense – Shrubs cover >75% (M) Moderate – Shrubs cover 25-75% (S) Sparse – Shrubs cover <25% **C. Open Water Dominated Communities** *(Emergent Vegetation <10%)* – Add 4-letter code combining dominant vegetation type, height and density Vegetation Type (OV) Vegetated – Floating or submerged plants ≥ 10% cover (ON) Non-Vegetated – Floating or submerged plants < 10% cover (note that only a 2-letter code is used for this category → vegetation height and density are not added to the code) Vegetation Height (S) Short Submerged – ≥50% of vegetation extending 0.0 – <0.3 m above the substrate (M) Medium Submerged – ≥50% of vegetation extending 0.3 – 1.3 m above the substrate (T) Tall Submerged – ≥50% of vegetation extending >1.3 m above the substrate (F) Floating – ≥50% of vegetation with floating leaves on the water surface. Vegetation Density (D) Dense – Aquatic vegetation covering >75% of the substrate. (M) Moderate – Aquatic vegetation covering 25-75% of the substrate. (S) Sparse – Aquatic vegetation covering <25% of the substrate.
Bog - Labrador Tea / Peat Moss / Lichen Bog cranberry and cloudberry may also be present (Soil saturated for part or all the year)	8 - PD	8a SbLt	≥10% tree cover (may only be in shrub/ground strata) Sb + Lt > 50%	
		(8b) Shrub	<10% tree cover	
Poor Fen - Labrador Tea / Peat Moss / Sedge Bog cranberry, dwarf birch and river alder may also be present (Soil saturated for part or all the year)	9 - MD	(9a) SbLt	≥10% tree cover (may only be in shrub/ground strata) Sb + Lt > 50%	
		(9b) Shrub	<10% tree cover	
Rich Fen - Dwarf Birch / Willow / Sedge / Grass / Moss (Soil saturated for part or all the year; includes floating mats of vegetation)	10-RD	(10a) SbLt	≥10% tree cover (may only be in shrub/ground strata) Sb + Lt ≥ 50%	
		(10b) Shrub	<10% tree cover AND ≥10% shrub cover	
		(10c) None	<10% tree cover AND <10% shrub cover	
Marsh – Cattail / Rush /Reed (Water is above the rooting zone for most or all of the year)	11-VD	(11a) None	usually along a water body edge ≥10% emergent vegetation cover <10% tree cover	
Open Water	12-OW	(12a) Lake	In standing water, <10% emergent vegetation cover	
		(12b) River	In flowing water, <10% emergent vegetation cover	

Classifications are based on Dominant Shrub/Herb/Ground Cover before determining the Tree Species Modifier and Structural Stage. Tree species compositions in the tables are the "simplified categories" for the ABMI - these may not fit perfectly with what is seen at the site (see Appendix 3 of [ABMI 10001—Terrestrial Data Collection Protocols](#) for details).

1. Note that moisture nutrient category names are approximate and the category often also includes adjacent nutrient and moisture categories (see Appendix 3 for details; Nutrient Status: P=Poor, M=Medium, R=Rich, V=Very Rich; Moisture Status: X=Xeric, M=Mesic, G=Hygric, D=Hydric, OW=Open Water)
2. Tree species composition is determined from both the dominant/co-dominant (canopy) and intermediate/suppressed (sub-canopy) trees, giving more weight to the dominant and co-dominant trees. Trees are trembling aspen (Aw), balsam poplar (Pb), paper birch (Bp), Alaska birch (Ba), lodgepole pine (Pl), jack pine (Pj), white spruce (Sw), black spruce (Sb), engelmann spruce (Se), subalpine fir (Fa), Douglas fir (Fd), balsam fir (Fb), and tamarack (Lt), Western White Pine (Pw).
3. Structural stage is determined after ecological-site type is determined.

Site Capability Compiled Data

Ecosite data is condensed from three data fields: Nutrient/Moisture Code, Tree Species Modifier, and Structural Stage, to one data field: Ecological Site Classification, and site disturbance data was added to create the compiled Site Capability data file.

Site Suitability   1 file

Site suitability was used to broadly describe the current habitat conditions in a 150 m radius around each bird point count station. We recorded characteristics of veteran trees, dominant and co-dominant (canopy trees), and intermediate/suppressed (sub-canopy) trees. We estimated tree species composition (in 10% increments), average distance between trees (in 1 m increments), and average height of trees (to the nearest 5 m category) for all trees (excluding dead trees) within the following stratification categories:

- Veteran Trees—Trees that are considerably older than the rest of the stand, usually remnant from a previous forest.

- Dominant and Co-dominant Trees (Canopy Trees)—Trees with well developed crowns extending slightly above the general level of surrounding trees (dominant trees), receiving full light from above and partly from the side and/or trees with crowns (slightly smaller than dominant and crowded from the sides) forming the general level of surrounding trees, receiving full light from above and little from the side.

- Intermediate and Suppressed Trees (Sub-canopy Trees)—Trees with crowns (usually small and quite crowded) below, but extending to, the general level of surrounding trees, receiving little light from above and none from the sides and/or trees with crowns entirely below the general level of the surrounding trees, receiving no direct light from above or the side.

Site Suitability Compiled Data
Field collection (field date and crew initials) details are omitted.

Site Disturbance   1 file

At each site we recorded human-caused disturbances within a 150 m radius including: harvest (e.g., clear-cut, partial-cut, understory retention, etc.), linear disturbance (e.g., cutline, seismic, pipeline, powerline, etc.), energy well pad, roads or trails, agricultural disturbance, urban or residential development, industrial development, and bare ground for which the cause cannot be determined. We also recorded natural disturbances including evidence of fire, wind damage, erosion, flooding, insect damage, and diseases.

> **Protocol Update:** Data from the Prototype Rotation (2003–6) include Rank of Disturbance where more than one disturbance type was noted. Data collected in 2007 and later does not include rank of disturbance. See ABMI Terrestrial Data Collection Protocols for detailed information

Site Disturbance Compiled Data
Site disturbance data was added to the compiled Site Capability data file.

Ground Cover   1 file

In a 150 m radius around each bird point count station, we recorded characteristics of herbaceous cover and type of ground cover. We identified the most common shrub species in two height categories (< 1.3 m, and > 1.3 m) and estimated shrub cover for each height in four percentage categories (<25%, 25-50%, 51-75%, >75%). We also estimated percent cover for dead herbaceous cover in the same four percentage categories. For dead herbaceous vegetation, we also determined the predominant height. Finally, we identified the most common ground vegetation by functional group

(grass, herbs, moss, lichens, and shrubs), and estimated the percent cover of bare ground and water in 10% increments.

Ground Cover Compiled Data
Field collection (field date and crew initials) details are omitted.

Surface Substrate

We measured the depth of organic content using two 30 m transects paralleling the NE and SW quadrant boundaries (Figure OB0003). We started transects 55 m north and south of the site centre, and sampled in a clockwise direction to ensure soil inside the quadrant was not disturbed. We measured the depth of organic matter and/or buried wood every 2 m along each 30 m transect (totaling 15 sampling points per transect). Using a 5 m long soil probe, we recorded the depth of organic matter, to the nearest 0.5 cm, to mineral soil, or other impenetrable substrate, such as rock or a frozen layer.

We defined organic matter as the litter, fermented, and humus (LFH) layer of the soil horizon. We defined buried wood as downed wood in all decay stages (see Downed Woody Material in ABMI 10001—Terrestrial Data Collection Protocols) and at least 50% below the ground surface. If organic matter had developed over the wood (i.e., decay stage 5) and the wood was <10 cm thick, we classified it as organic matter. In areas where the LFH was indistinct, such as grasslands, we
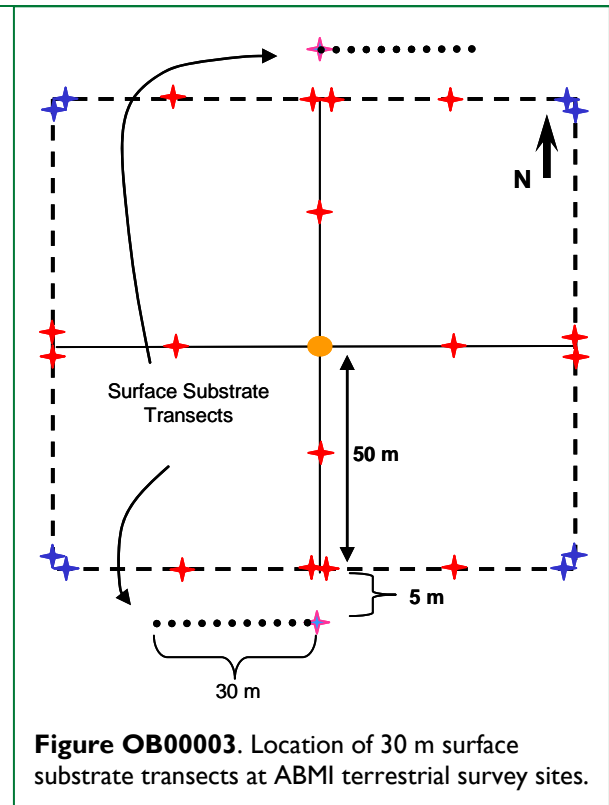
Figure OB00003. Location of 30 m surface substrate transects at ABMI terrestrial survey sites.

included the plant roots in the LFH. When no LFH layer was visible (e.g., cultivated agriculture areas), we only measured the litter layer (if present). In lowland areas (i.e., black spruce bogs) where organic matter was deeper than 40 cm, we recorded depth every 4 m along each transect. When sample points were positioned directly on rock or over standing water with a surface area greater than 1 m^2, we took no measurements. When rocks or water were less than 1 m^2, or the sample point landed on an impenetrable downed log or stump (above the ground surface) we moved the sample point in a direction as close to south as possible in order to measure LFH . Finally, we indicated when only partial measurements could be obtained (e.g., hit frost, root, or rock).

Surface Substrate Compiled
We calculated the average depth (cm) of the organic layer of the soil, including the litter, fermented, and humus horizons at each site by first calculating an average value at each transect. We then averaged values from the two transects to arrive at a site mean.

Breeding Birds

Breeding birds were measured at nine point count stations. Point count stations were in a grid pattern with point count station #1 located at site-centre and the remaining stations located 300 m apart surrounding site centre (Figure OB00004). We conducted breeding bird surveys from one half hour before sunrise to 10:00 hrs.

We recorded vocalizations of birds for 10 minutes at each point count station using an omni-directional microphone (CZM microphone; River Forks Research Corp.) mounted at ear level on a professional tripod and connected to a mini hard drive recorder. We recorded birds on a Marantz PM D670 or PM D660 Solid State recorder at 320 kbps in .mp3 format. We calibrated the recorder volume to be in the mid ranges.

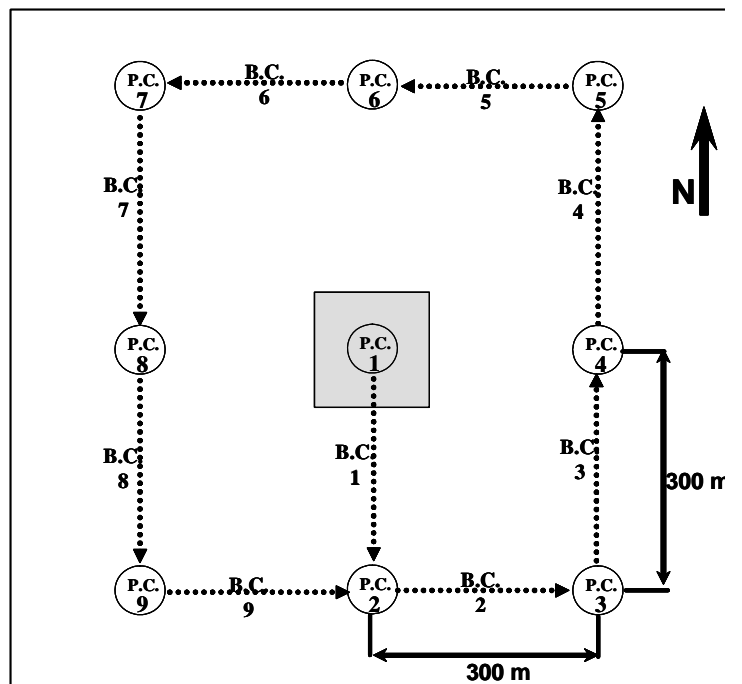**Figure OB00004**. Point count stations for breeding birds at ABMI terrestrial monitoring sites.

While conducting the 10 minute bird recordings, we scanned the areas surrounding the point count station for all birds (even those vocalizing), noting species, number of individuals (including flock sizes of birds flying overhead), and distance from the point count station, for all bird observations. We also noted factors that potentially bias bird recordings, such as wind speed and precipitation. Bird recordings were later analyzed by bird identification specialists in a laboratory setting.

If a bird point fell in open water, we established a new point if we were able to get within 100 m of the original point, recording distance and direction from that original point. If it was not possible to get within 100 m of the original point (i.e., <200 m from the last point), we conducted a 10 minute visual point count of the waterbody recording observations into the microphone. We may not have sampled certain points because they were inaccessible (e.g., a stream made access hazardous or impossible).

We analyzed bird recordings in a laboratory setting. We identified the species, time of first detection (within 10 second intervals), behaviour (e.g., singing, calling, or alarm-calling), and the time interval that individual birds were detected. We recognized 3 time intervals: Interval 1 (0–200 seconds), Interval 2 (201–400 seconds), and Interval 3 (401–600 seconds). Individual birds were detected in 1, 2, or 3 of the time intervals. We identified red squirrel (*Tamiasciurus hudsonicus*) vocalizations in addition to bird vocalizations. Bird recordings are randomly sampled and verified by other experts in bird identification to ensure accuracy (See Processing Terrestrial Bird Recordings).

Birds Compiled

For each species detected, we calculated the average number of detections per point count station.

Metadata

Metadata is simply "information about data" (Michener 2006). While there may be different levels of detail and structure to metadata, at its most basic, metadata provides the information required to understand a particular data set (e.g. structure and content) to ensure its accessibility (Michener et al. 1997; Michener 2006). This appendix provides the metadata for the data files that you requested from the Alberta Biodiversity Monitoring Institute.

General Codes

Throughout ABMI raw data files, the following codes and definitions are applied.

None or 0
None or "0" is applied to any variable that **was examined** by field crews and found to be absent. "None" is used for text entries and "0" is used for numerical entries. For example, when field crews examine the canopy and find no "Veteran" trees in the canopy, this is recorded as "None." When there is no slope at the survey site, slope is recorded as "0." The numeral "0" can also be used as a nominal code—for example, wind conditions can be recorded as "0."

VNA—Variable Not Applicable
Some ABMI data is collected in a nested manner. For example Tree Species is a parent variable. This variable has a number of child variables that are used to describe the parent variable in more detail (e.g., condition, DBH, decay stage). When the parent variable is recorded as "None," child variables are no longer applied and are recorded as "VNA." VNA is also used when the protocol calls for a modified sampling procedure based on site conditions (e.g., surface substrate protocol variant for hydric site conditions). The use of VNA implies that users of the data **should not expect** that any data could be present.

DNC—Did Not Collect
 "DNC" is used to describe variables that should have been collected but were not. There are a number of reasons that data might not have been collected (e.g., staff oversight, equipment failure, safety concerns, environmental conditions, or time constraints). Regardless of the reason data was not collected, if under ideal conditions it should have been, the record in the data entry file reads "DNC." The use of DNC implies that users **should expect** the data to be present—though it is not.

PNA—Protocol Not Available
The ABMI's protocols were, and continue to be, implemented in a staged manner. As a result, the collection of many variables began in years subsequent to the start of the prototype or operational phases or where discontinued after a few years of trial. When a variable was not collected because the protocol had yet to be implemented by the ABMI (or was discontinued by the ABMI), the data entry record reads "PNA." This is a global constraint to the data (i.e., a protocol was not implemented until 2006, therefore, previous years cannot have this variable). PNA is to be used to describe the lack of data collection for entire years.

SNI—Species Not Identified
In various fields related to species identification, "SNI" is used to indicate that the organism was not identified. Some possible reasons that identification was not possible include insufficient or deficient sample collected and lack of field time.

Terrestrial T01A Site Physical Characteristics Raw Data Metadata

Rotation

Unique ID	T01A_IC00001
Attribute Definition	Reference describing when data was collected at a broad level (i.e., Prototype, Rotation 1).
Value Type	Text
Code	Prototype = 2003--2006 | Rotation 1 = 2007--2014

ABMI Site

Unique ID	T01A_IC00003
Attribute Definition	Reference number given to each ABMI data collection site.
Value Type	Number
Format	1 to 4 digits
Range	1-1656

Year

Unique ID	T01A_IC00002
Attribute Definition	Collection year.
Value Type	Date
Format	YYYY

Field Date

Unique ID	T01A_IC00015
Attribute Definition	Day, month, and year data was collected.
Value Type	Date
Format	DD-Mon-YYYY

Field Crew Member(s)

Unique ID	T01A_IC00379
Attribute Definition	Initials for the field technicians collecting the field data.
Value Type	Text
Format	2 or 3 letters (UPPERCASE) and 1 number (if necessary); 1 set of initials or a combination of many

Missing Values   DNC = Did Not Collect

Nearest Town

Unique ID   T01A_IC00218
Attribute Definition   Nearest town to ABMI site in which field crews have accommodation.
Value Type   Text

Public Latitude

Unique ID   T01A_IC00256
Attribute Definition   Geographic coordinates (Northing) for the segment location.
Value Type   Number
Format   6 or more digits
Unit   degree
Missing Values   DNC = Did Not Collect

Public Longitude

Unique ID   T01A_IC00257
Attribute Definition   Geographic coordinates (Easting) for the segment location.
Value Type   Number
Format   6 or more digits
Unit   degree
Missing Values   DNC = Did Not Collect

Point Count Station

Unique ID   T01A_IC00248
Attribute Definition   Location where site suitability information was recorded. There are 9 point count stations established per ABMI site with #1 being site centre and the remainder of the stations arranged around site centre at 300 m intervals.
Value Type   Number
Format   1 digit
Code   1 = point count station 1 | 2 = point count station 2 | 3 = point count station 3 | 4 = point count station 4 | 5 = point count station 5 | 6 = point count station 6 | 7 = point count station 7 | 8 = point count station 8 | 9 = point count station 9

Subpoint

Unique ID	T01A_IC01009
Attribute Definition	P=Primary S=Secondary
Value Type	Text

Elevation (metres)

Unique ID	T01A_IC00295
Attribute Definition	Height of the ABMI site above sea level. Obtained from Alberta Sustainable Resource Development Digital Elevation Model (DEM).
Value Type	Number
Unit	metres
Missing Values	DNC = Did Not Collect	VNA = Variable Not Applicable

Slope (degrees)

Unique ID	T01A_IC00297
Attribute Definition	Percent slope gradient, measured with a clinometer or compass.
Value Type	Number
Range	0-89
Unit	degree
Missing Values	DNC = Did Not Collect

Aspect (degrees)

Unique ID	T01A_IC00101
Attribute Definition	Direction of the slope, measured by a compass.
Value Type	Number
Range	0-359
Unit	degree
Missing Values	DNC = Did Not Collect	VNA = Variable Not Applicable

Terrestrial T01B Site Suitability Raw Data Metadata

Rotation

Unique ID	T01B_IC00001
Attribute Definition	Reference describing when data was collected at a broad level (i.e., Prototype, Rotation 1).
Value Type	Text
Code	Prototype = 2003--2006 | Rotation 1 = 2007--2014

ABMI Site

Unique ID	T01B_IC00003
Attribute Definition	Reference number given to each ABMI data collection site.
Value Type	Number
Format	1 to 4 digits
Range	1-1656

Year

Unique ID	T01B_IC00002
Attribute Definition	Collection year.
Value Type	Date
Format	YYYY

Field Date

Unique ID	T01B_IC00015
Attribute Definition	Day, month, and year data was collected.
Value Type	Date
Format	DD-Mon-YYYY

Field Crew Member(s)

Unique ID	T01B_IC00379
Attribute Definition	Initials for the field technicians collecting the field data.
Value Type	Text
Format	2 or 3 letters (UPPERCASE) and 1 number (if necessary); 1 set of initials or a combination of many

Missing Values	DNC = Did Not Collect

Point Count Station

Unique ID	T01B_IC00248
Attribute Definition	Location where site suitability information was recorded. There are 9 point count stations established per ABMI site with #1 being site centre and the remainder of the stations arranged around site centre at 300 m intervals.
Value Type	Number
Format	1 digit
Code	1 = point count station 1 | 2 = point count station 2 | 3 = point count station 3 | 4 = point count station 4 | 5 = point count station 5 | 6 = point count station 6 | 7 = point count station 7 | 8 = point count station 8 | 9 = point count station 9

Subpoint

Unique ID	T01B_IC01009
Attribute Definition	P=Primary S=Secondary
Value Type	Text

Canopy Layer

Unique ID	T01B_IC00117
Attribute Definition	Canopy layer of trees (veteran, dominant, and suppressed) and shrubs (>1.3 m, <1.3 m).
Value Type	Code
Code	Veteran | Dominant | Suppressed | Predominant shrub >1.3 m | Predominant shrub < 1.3 m

Common Name

Unique ID	T01B_IC00122
Attribute Definition	Common name of trees and shrubs.
Value Type	Text
Missing Values	DNC = Did Not Collect | NONE = None present | VNA = Variable not applicable | SNI = Species Not Identified

Scientific Name

Unique ID	T01B_IC00286
Attribute Definition	Scientific name of trees and shrubs.
Value Type	Text
Missing Values	DNC = Did Not Collect	NONE = None present	VNA = Variable not applicable	SNI = Species Not Identified

Taxonomic Resolution

Unique ID	T01B_IC00310
Attribute Definition	Resolution to which trees and shrubs were identified (e.g. Family, Genus, Species etc.).
Value Type	Text
Missing Values	VNA = Variable Not Applicable

Unique Taxonomic Identification Number

Unique ID	T01B_IC00357
Attribute Definition	Globally unique identifier of trees and shrubs. Unique taxonomic identifiers are generally taken from the International Taxonomic Information System (ITIS; http://www.itis.gov/).
Value Type	Number
Missing Values	VNA = Variable Not Applicable

Percent Composition of Tree Species (Dominant Strata)

Unique ID	T01B_IC01072
Attribute Definition	Percent composition of the tree species in 5% increments. See the field "Crown Class" under Medium Trees/Snags/Stumps for definition of Veteran, Dominant, and Suppressed trees.
Value Type	Number
Format	1 or 2 digits
Unit	percent
Missing Values	DNC = Did Not Collect	VNA = Variable Not Applicable

Rank in Canopy

Unique ID	T01B_IC00264
Attribute Definition	For each canopy layer (e.g. veteran trees), it is the rank abundance of species for that layer.

Value Type	Code
Format	1 digit
Code	1 = most abundant species | 2 = second most abundant species | 3 = third most abundant species | 4 = fourth most abundant species
Missing Values	DNC = Did Not Collect | VNA = Variable Not Applicable | NONE = Absent from site

Average Distance (metres) between Trees

Unique ID	T01B_IC01073
Attribute Definition	Estimation of distance (in metres) between trees within a canopy layer (e.g. distance between veteran trees) in the dominant stand type.
Value Type	Number
Range	<0.5 and up, not 0
Unit	metre
Missing Values	DNC = Did Not Collect | VNA = Variable Not Applicable

Height of Trees (metres)

Unique ID	T01B_IC00185
Attribute Definition	Estimate of height (in metres) within 5 general categories for a particular tree.
Value Type	Number
Code	<5 = less than 5 m in height | 5-10 m = between 5 and 10 m in height | 10-15 = between 10 and 15 m in height | 15-20 = between 15 to 20 m in height | 20-25 = between 20 and 25 m in height | >25 = greater than 25 m in height
Missing Values	DNC = Did Not Collect | VNA = Variable Not Applicable

Percent Cover (Shrubs Only)

Unique ID	T01B_IC01074
Attribute Definition	Estimate of cover (closure) for shrubs >1.3 m and shrubs <1.3 m.
Value Type	Code
Code	<25 = less than 25% cover | 25-50 = between 25% and 50% cover | 51-75 = between 51 and 75% | >75 = greater than 75% cover
Missing Values	DNC = Did not collect | PNA = Protocol not applicable | VNA = Variable not applicable

Terrestrial T01C Site Capability Raw Data Metadata

Rotation

Unique ID	T01C_IC00001
Attribute Definition	Reference describing when data was collected at a broad level (i.e., Prototype, Rotation 1).
Value Type	Text
Code	Prototype = 2003--2006 | Rotation 1 = 2007--2014

ABMI Site

Unique ID	T01C_IC00003
Attribute Definition	Reference number given to each ABMI data collection site.
Value Type	Number
Format	1 to 4 digits
Range	1-1656

Year

Unique ID	T01C_IC00002
Attribute Definition	Collection year.
Value Type	Date
Format	YYYY

Field Date

Unique ID	T01C_IC00015
Attribute Definition	Day, month, and year data was collected.
Value Type	Date
Format	DD-Mon-YYYY

Field Crew Member(s)

Unique ID	T01C_IC00379
Attribute Definition	Initials for the field technicians collecting the field data.
Value Type	Text
Format	2 or 3 letters (UPPERCASE) and 1 number (if necessary); 1 set of initials or a combination of many

Missing Values   DNC = Did Not Collect

Point Count Station

Unique ID   T01C_IC00248

Attribute Definition   Location where site capability information was recorded. There are 9 point count stations established per ABMI site with #1 being site centre and the remainder of the stations arranged around site centre at 300 m intervals.

Value Type   Number

Format   1 digit

Code   1 = point count station 1 | 2 = point count station 2 | 3 = point count station 3 | 4 = point count station 4 | 5 = point count station 5 | 6 = point count station 6 | 7 = point count station 7 | 8 = point count station 8 | 9 = point count station 9

Subpoint

Unique ID   T01C_IC01009

Attribute Definition   P=Primary
                        S=Secondary

Value Type   Text

Primary/Secondary Historical/Current Ecological Site Classification

Unique ID   T01C_IC00254

Attribute Definition   Indicates whether the ecological site classification corresponds to a current primary, current secondary, historical primary or historical secondary classification.

Value Type   Code

Code   1 = Current Primary Ecological Site Classification | 2 = Current Secondary Ecological Site Classification | 3 = Historical Primary Ecological Site Classification | 4 = Historical Secondary Ecological Site Classification

Missing Values   DNC = Did Not Collect | VNA = Variable Not Applicable

Ecosite - Nutrient/Moisture Code

Unique ID   T01C_IC00162

Attribute Definition   Nutrient and moisture code for the ecological site classification of a vegetated site based on the dominant vegetation community that is present.

Value Type   Code

Code   1 - PX = Poor/Xeric - Bearberry/Lichen: Bog Cranberry and Juniper may be common at some sites. | 2 - PM = Poor/Mesic - Labrador Tea/Feather Moss: Bog Cranberry, Bilberry, and Grouse-berry may be common at some sites. | 3 - MX = Medium/Xeric - Hairy Wild Rye: Bearberry, Canada Buffalo-berry, and Feather Moss may be common at some sites. | 4 - MM = Medium/Mesic - Low-bush Cranberry/Canada Buffalo-berry: Blueberry, Alder, Rose, Saskatoon, Labrador Tea, Bearberry, Thimbleberry, Bog Cranberry, Willow, Fir, and Feather Moss may be common at some sites. | 5 - MG = Medium/Hygric - Horsetail: Dogwood, Alder, Rose, Low-bush Cranberry, Labrador Tea, Willow, and Feather Moss may be common at some sites. | 6 - RG = Rich/Hygric - Dogwood/Fern/Feather Moss: Rose, Alder, Bracted Honeysuckle, Devil¿s Club and Fir may be common at some sites. | 7 - NT = Not Treed. | 8 - PD = Poor/Hydric - Bog - Labrador Tea/Peat Moss/Lichen (soil saturated for part or all of the year): Bog Cranberry and Cloudberry may be common at some sites. | 9 - MD = Medium/Hydric - Poor Fen - Labrador Tea/Peat Moss/Sedge (soil saturated for part or all of the year): Bog Cranberry, Dwarf Birch and River Alder may be common at some sites. | 10 - RD = Rich/Hydric - Rich Fen - Dwarf Birch/Willow/Sedge/Grass/Moss (soil saturated for part or all of the year; includes floating mats of vegetation). | 11 - VD = Very Rich/Hydric - Marsh - Cattail/Rush/Reed (water is above the rooting zone for part or all of the year; water salinity is less than 15mS/cm). | 12 - SD = Swamp - (water is above the rooting zone for some of the year; water salinity is less than 15mS/cm): trees and shrubs present. | 13 - AD = Alkali - White salt flats at water's edge: Saltwater Widgeon Grass dominates (water is above the rooting zone for most of the year; water salinity is more than 15mS/cm). | 14 - OW = Open Water - No trees.

Missing Values   DNC = Did not collect | PNA = Protocol not applicable | VNA = Variable not applicable

Ecosite - Tree Species Modifier

Unique ID   T01C_IC00164

Attribute Definition   At every vegetation sampling location, the tree species modifier is used to classify the site if trees are present and is combined with the moisture/nutrient category to give an ecological site classification.

Value Type   Code

Code	01a Pine = Jack Pine + Douglas Fir >80% | 02a Pine = Jack Pine + Lodgepole Pine >50% | 02b Other = Aspen + White Spruce + Engelmann Spruce + Subalpine Fir + Western White Pine >50% | 02c Sb = Black Spruce >50% | 03a None = No Trees | 03b Pine = Jack Pine + Lodgepole Pine >50% | 03c AwMix = Aspen >20% | 03d Spruce = White Spruce + Engelmann Spruce + Alpine Larch >50% | 04a Pine = Jack Pine + Lodgepole Pine + Subalpine Fir >50% | 04b PjMix = Aspen + White Birch + White Spruce > 20% AND Jack Pine >/=20% | 04c Aw = Aspen >50% | 04d AwMix = Aspen > 20% AND White Spruce + Black Spruce + Lodgepole Pine >20% | 04e Spruce = White Spruce >50% | 05a Poplar = Balsom Poplar + Aspen >50% | 05b Spruce = White Spruce + Engelmann Spruce >50% | 05c Sb = Black Spruce >50% | 06a Pine = Lodgepole Pine >50% | 06b Poplar = White Birch + Aspen >50% | 06c Spruce = White Spruce + Engelmann Spruce + Subalpine Fir >50% | 07a Alpine = Elevation above tree line | 07b Flood = Site disturbed frequently by flooding | 07c Ice = Site disturbed frequently by ice or snow | 07d Dry = Site disturbed frequently by drought | 07e Geo = Geological features not suitable for tree growth | 07f Human = Site disturbed recently by humans | 08a Sb = >/=10% tree cover (may only in in shrub/ground strata), Black Spruce + Tamarack >50% | 08b Shrub = <10% tree cover | 09a SbLt = >/=10% tree cover (may only in in shrub/ground strata), Black Spruce + Tamarack >50% | 09b Shrub = <10% tree cover | 10a SbLt = >/=10% tree cover (may only in in shrub/ground strata), Black Spruce + Tamarack >50% | 10b Shrub = <10% tree cover AND >/=10% shrub cover | 10c None = <10% tree cover AND <10% shrub cover | 11a None = usually along a water body edge >/=10% emergent vegetation cover, <10% tree cover | 12a Tree = >10% tree cover | 12b Shrub = <10% tree cover | 13a None = <10% shrub/tree cover | 14a Lake = In standing water <10% emergent vegetation cover | 14b River = In flowing water <10% emergent vegetation cover
Missing Values	DNC = Did Not Collect | VNA = Variable Not Applicable

Ecosite - Structural Stage

Unique ID	T01C_IC00163
Attribute Definition	Describes the structure stage of the ecosite, as determined after the ecological-site type has been designated i.e. the nutrient/moisture code designation and tree species modifier. The structure stage code starts with a number that defines 1) tree-dominated, 2) non-tree dominated, or 3) open water ecosites. The subsequent letter codes further describe the ecosite structure, in terms of type of vegetation (or dominant substrate type for non-vegetated sites), as well as height and density of vegetation.
Value Type	Code

Code	For full explanation of the code definitions, see Appendix: Detailed Terrestrial Meta Data Code Definitions. 1) = Tree Dominated Ecosites	Tree Height: TS = Short	TT = Tall	Tree Density: D = Dense	S = Sparse	Tree Arrangement: C = Complex	N = Non-Complex	2) = Non-Tree Dominated Ecosites	N = Non-Vegetated	Substrate Type: R = Rock	S = Sand	B = Beach	M = Mineral Soil	O = Organic Soil	G = Ground Vegetation Only:	Vegetation Type: B = Bryoid/Lichen	F = Forbs	G = Graminoid	R = Reeds and Rushes (Marsh)	Vegetation Density: D = Dense	M = Moderate	S = Sparse	S = Shrubs present	Shrub Height: L = Low	T = Tall	Shrub Density: D = Dense	M = Moderate	S = Sparse	3) = Open Water Dominated Communities	Vegetation Type: OV = Vegetated	ON = Non-Vegetated	Vegetation Height: S = Short Submerged	M = Medium Submerged	T = Tall Submerged	F = Floating	Vegetation Density: D = Dense	M = Moderate	S = Sparse
Missing Values	DNC = Did Not Collect	VNA = Variable Not Applicable

Percent Area of Ecological Site Classification

Unique ID	T01C_IC00226
Attribute Definition	Percent of the area surrounding the ABMI site/point count station described by the primary and secondary ecological site classification (10% increments).
Value Type	Number
Format	2 digits
Range	10%-100%
Unit	percent
Missing Values	DNC = Did Not Collect	VNA = Variable Not Applicable

Percent Area of Ecological Site Classification

Unique ID	T01C_IC01075
Attribute Definition	Percent of the area surrounding the ABMI site/point count station described by the primary and secondary ecological site classification (10% increments).
Value Type	Number
Format	2 digits
Range	0-100%
Unit	percent
Missing Values	DNC = Did not collect	PNA = Protocol not applicable	VNA = Variable not applicable

Terrestrial T01D Ground Cover Raw Data Metadata

Rotation

Unique ID	T01D_IC00001
Attribute Definition	Reference describing when data was collected at a broad level (i.e., Prototype, Rotation 1).
Value Type	Text
Code	Prototype = 2003--2006 | Rotation 1 = 2007--2014

ABMI Site

Unique ID	T01D_IC00003
Attribute Definition	Reference number given to each ABMI data collection site.
Value Type	Number
Format	1 to 4 digits
Range	1-1656

Year

Unique ID	T01D_IC00002
Attribute Definition	Collection year.
Value Type	Date
Format	YYYY

Field Date

Unique ID	T01D_IC00015
Attribute Definition	Day, month, and year data was collected.
Value Type	Date
Format	DD-Mon-YYYY

Field Crew Member(s)

Unique ID	T01D_IC00379
Attribute Definition	Initials for the field technicians collecting the field data.
Value Type	Text
Format	2 or 3 letters (UPPERCASE) and 1 number (if necessary); 1 set of initials or a combination of many

Missing Values   DNC = Did Not Collect

Point Count Station

Unique ID   T01D_IC00248

Attribute Definition   Location where ground cover information was recorded. There are 9 point count stations established per ABMI site with #1 being site centre and the remainder of the stations arranged around site centre at 300 m intervals.

Value Type   Number

Format   1 digit

Code   1 = point count station 1 | 2 = point count station 2 | 3 = point count station 3 | 4 = point count station 4 | 5 = point count station 5 | 6 = point count station 6 | 7 = point count station 7 | 8 = point count station 8 | 9 = point count station 9

Subpoint

Unique ID   T01D_IC01009

Attribute Definition   P=Primary
S=Secondary

Value Type   Text

Percent Cover of Standing Dead Herbaceous

Unique ID   T01D_IC01033

Attribute Definition   Cover estimate of standing dead herbaceous cover in 4 general categories that would be obtained if a photograph had been taken from a height of 2.0 m.

Value Type   Number

Code   <25 = less than 25% cover of standing dead herbaceous vegetation | 25-50 = between 25% and 50% cover of standing dead herbaceous vegetation | 51-75 = between 51 and 75% cover of standing dead herbaceous vegetation | >75 = greater than 75% cover of standing dead herbaceous vegetation.

Missing Values   DNC = Did Not Collect | VNA = Variable Not Applicable

Height of Standing Dead Herbaceous (metres)

Unique ID   T01D_IC00183

Attribute Definition   Estimate of height (in metres) of standing dead herbaceous cover in 0.1 m increments.

Value Type   Number

Unit   metre
Missing Values   DNC = Did Not Collect | VNA = Variable Not Applicable

Predominant Type of Live Herbaceous

Unique ID   T01D_IC00250
Attribute Definition   Low vegetation, <0.5 m tall, that is or will be most abundant in the quadrant; listed in general categories.
Value Type   Code
Code   Crop | Grass | Herb | Lichen | Moss | Rush | Sedge | Shrub | Weed
Missing Values   DNC = Did Not Collect | VNA = Variable Not Applicable

Percent Cover of Bare Ground

Unique ID   T01D_IC01036
Attribute Definition   Percent cover estimate of bare ground in the quadrant in 5% increments.
Value Type   Number
Range   0-100%
Unit   percent
Missing Values   DNC = Did Not Collect | VNA = Variable Not Applicable

Percent Cover of Water

Unique ID   T01D_IC01037
Attribute Definition   Percent cover estimate of water covering the quadrant in 5% increments.
Value Type   Number
Range   0-100%
Unit   percent
Missing Values   DNC = Did Not Collect | VNA = Variable Not Applicable

Terrestrial T01E Site Disturbance Raw Data Metadata

Rotation

Unique ID	T01E_IC00001
Attribute Definition	Reference describing when data was collected at a broad level (i.e., Prototype, Rotation 1).
Value Type	Text
Code	Prototype = 2003--2006 | Rotation 1 = 2007--2014

ABMI Site

Unique ID	T01E_IC00003
Attribute Definition	Reference number given to each ABMI data collection site.
Value Type	Number
Format	1 to 4 digits
Range	1-1656

Year

Unique ID	T01E_IC00002
Attribute Definition	Collection year.
Value Type	Date
Format	YYYY

Field Date

Unique ID	T01E_IC00015
Attribute Definition	Day, month, and year data was collected.
Value Type	Date
Format	DD-Mon-YYYY

Field Crew Member(s)

Unique ID	T01E_IC00379
Attribute Definition	Initials for the field technicians collecting the field data.
Value Type	Text
Format	2 or 3 letters (UPPERCASE) and 1 number (if necessary); 1 set of initials or a combination of many

Missing Values	DNC = Did Not Collect

Point Count Station

Unique ID	T01E_IC00248
Attribute Definition	Location where site capability information was recorded. There are 9 point count stations established per ABMI site with #1 being site centre and the remainder of the stations arranged around site centre at 300 m intervals.
Value Type	Number
Format	1 digit
Code	1 = point count station 1 | 2 = point count station 2 | 3 = point count station 3 | 4 = point count station 4 | 5 = point count station 5 | 6 = point count station 6 | 7 = point count station 7 | 8 = point count station 8 | 9 = point count station 9

Subpoint

Unique ID	T01E_IC01009
Attribute Definition	P=Primary S=Secondary
Value Type	Text

Human or Natural Disturbance

Unique ID	T01E_IC00997
Attribute Definition	Disturbance can be due to human activity or natural processes.
Value Type	Code
Code	Human | Natural
Missing Values	DNC = Did Not Collect | VNA = Variable Not Applicable

Disturbance Type (terrestrial)

Unique ID	T01E_IC00994
Attribute Definition	Evidence of human-caused or natural stand disturbances; note all minor to extensive disturbance caused by humans (logging debris or stumps, agricultural/livestock activity, seismic lines, roads, trails etc) or naturally caused (e.g. fire scars, insect defoliation, wind caused mortality/blow down).
Value Type	Code

Code   BARE = Bare - Human caused bare ground for which the cause cannot be determined | CULT = Cultivated Crop/Field - Any type of cultivated field that is used to grow agriculture crops | HARV = Harvest - Any type of forest harvesting (i.e., clear-cut, partial-cut, understory retention, etc.) <30 years old) | IND = Industrial - Any type of building, roadway, yard, etc associated with industrial development | PAST = Pasture - Any type of pasture (tame or native), grazing reserve, etc. | PIPE = Linear - Pipeline | POWER = Linear - Powerline | RAIL = Linear - Railline | RES = Residential Rural - Any type of human dwelling, farm building, or farm yard in a rural or acreage setting | ROADG = Linear - Road Gravel - Any type of road with an unpaved but improved (i.e. gravel) surface | ROADP = Linear - Road Paved - Any type of road with paved surface | SEIS = Linear - Seismic or Cutline of any type | TRAIL = Linear - Road Other - Any type of truck or ATV trail with an unimproved surface | URB = Urban - Any type of human dwelling, associated building, or yard/driveway/road in an urban setting | WELL = Well Pad - Any type of area cleared for oil/gas/CBM pump jacks or well heads | BEAV = Any evidence of beaver activity altering the landscape or vegetation | DISEASE = Disease - Any evidence of vegetation experiencing disease outbreak | EROS = Erosion - Evidence of wearing away of soil by precipitation or wind | FIRE = Fire - Any evidence of fire damage, scarring or burning (<30 years old) | FLOOD = Flood - Evidence of flooding including high water mark, dead trees, etc. | ICE = Snow/Ice - Evidence of vegetation breakage caused by snow or ice | INSECT = Insect - Any evidence of vegetation experiencing insect attack | WIND = Wind Throw - Evidence of wind damage including snapped or uprooted trees | OTHER = Other disturbance | UNKN = Unknown disturbance | NONE = No disturbance

Missing Values   DNC = Did Not Collect | VNA = Variable Not Applicable

Disturbance Type (%) (terrestrial)

Unique ID   T01E_IC00996
Attribute Definition   % of area disturbed
Value Type   Code
Code   0 | < 1 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100
Missing Values   DNC = Did Not Collect | VNA = Variable Not Applicable

Terrestrial T02A Surface Substrate Raw Data Metadata

Rotation

Unique ID	T02A_IC00001
Attribute Definition	Reference describing when data was collected at a broad level (i.e., Prototype, Rotation 1).
Value Type	Text
Code	Prototype = 2003--2006	Rotation 1 = 2007--2014

ABMI Site

Unique ID	T02A_IC00003
Attribute Definition	Reference number given to each ABMI data collection site.
Value Type	Number
Format	1 to 4 digits
Range	1-1656

Year

Unique ID	T02A_IC00002
Attribute Definition	Collection year.
Value Type	Date
Format	YYYY

Field Date

Unique ID	T02A_IC00015
Attribute Definition	Day, month, and year data was collected.
Value Type	Date
Format	DD-Mon-YYYY

Field Crew Member(s)

Unique ID	T02A_IC00379
Attribute Definition	Initials for the field technicians collecting the field data.
Value Type	Text
Format	2 or 3 letters (UPPERCASE) and 1 number (if necessary); 1 set of initials or a combination of many

Missing Values   DNC = Did Not Collect

Transect (North/South)

Unique ID	T02A_IC00340
Attribute Definition	Indicates the transect (north or south) where the surface substrate was sampled.
Value Type	Code
Format	1 letter (UPPERCASE)
Code	N = north | S = South
Missing Values	DNC = Did Not Collect

Sample Position (metres)

Unique ID	T02A_IC00284
Attribute Definition	Location along the 30 metre transect where surface substrate was measured. In lowland areas (i.e., black spruce bogs) we recorded depth every 4 metres along each transect rather than every 2 metres.
Value Type	Code
Format	1-2 digits
Code	Start | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30

Organic Depth (centimetres)

Unique ID	T02A_IC00224
Attribute Definition	Depth (in centimetres) of the organic layer of soil, taken in 0.5 cm increments. We defined organic matter as the litter, fermented, and humus (LFH) layer of the soil horizon. Variations in methodology apply.
Value Type	Number
Format	2-4 digits
Range	0.0-500.0
Unit	centimetre
Missing Values	DNC = Did Not Collect | VNA = Variable Not Applicable

Buried Wood Depth (centimetres)

Unique ID	T02A_IC00114

Attribute Definition	Depth (in centimetres) of wood in all decay stages found >50% below the surface. Wood that has organic material growing over it (i.e. decay stage 5) and is <10 centimetres thick is considered organics.
Value Type	Number
Format	2-4 digits
Range	0.0-500.0
Unit	centimetre
Missing Values	DNC = Did Not Collect | VNA = Variable Not Applicable

Description

Unique ID	T02A_IC01077
Attribute Definition	Description of reason for partial sample.
Value Type	Text
Format	1-7 letters (Uppercase)
Code	B = Bedrock | B-S = Bedrock - Side Sample | D = Large Down Woody Material (DWM) | D-S = Large DWM - Side Sample | HF = Hit Frost | HO = Hit Object | M = Mineral Soil | M-S = Mineral Soil - Side Sample | R = Rocks, Cobbles and Stones | R-S = Rock - Side Sample | W = Water | W-S = Water - Side Sample | None = Full Sample Taken | LFH>40 = LFH layer is greater than 40cm deep, measurements taken every 4 metres
Missing Values	DNC = Did Not Collect | VNA = Variable Not Applicable

Slope

Unique ID	T02A_IC01038
Attribute Definition	Position of the transect with respect to the slope.
Value Type	Code
Code	C = Crest - situated in a relatively level area on the top of a hill | S1 = Slope - situated on the side of a hill, a modifier of 1 indicates slopes of 2-5 degrees, | S2 = Slope - situated on the side of a hill, a modifier of 2 indicates slopes of 6-10 degrees, | S3 = Slope - situated on the side of a hill, a modifier of 3 indicates slopes of 11-30 degrees, | S4 = Slope - situated on the side of a hill, a modifier of 4 indicates slopes of >30 degrees, | T = Toe - situated at the bottom of a hill where the ground surface transitions from a slope to level | L = Level - situated in an area with <2 degrees slope | D = Depression - situated in an area that accumulates water after rains
Missing Values	DNC = Did not collect | PNA = Protocol not applicable | VNA = Variable not applicable

Aspect (degrees)

Unique ID	T02A_IC01039
Attribute Definition	Direction of the slope, measured by a compass.
Value Type	Number
Range	0-359
Unit	degree
Missing Values	DNC = Did not collect | PNA = Protocol not applicable | VNA = Variable not applicable

Terrestrial T26 Breeding Birds Raw Data Metadata

Rotation

Unique ID	T26_IC00001
Attribute Definition	Reference describing when data was collected at a broad level (i.e., Prototype, Rotation 1).
Value Type	Text
Code	Prototype = 2003--2006 | Rotation 1 = 2007--2014

ABMI Site

Unique ID	T26_IC00003
Attribute Definition	Reference number given to each ABMI data collection site.
Value Type	Number
Format	1 to 4 digits
Range	1-1656

Year

Unique ID	T26_IC00002
Attribute Definition	Collection year.
Value Type	Date
Format	YYYY

Field Date

Unique ID	T26_IC00015
Attribute Definition	Day, month, and year data was collected.
Value Type	Date
Format	DD-Mon-YYYY

Field Crew Member(s)

Unique ID	T26_IC00379
Attribute Definition	Initials for the field technicians collecting the field data.
Value Type	Text
Format	2 or 3 letters (UPPERCASE) and 1 number (if necessary); 1 set of initials or a combination of many

Missing Values   DNC = Did Not Collect

Identification Date

Unique ID   T26_IC00192
Attribute Definition   Day, month, and year data was analyzed by specialist.
Value Type   Date
Format   DD-Mon-YYYY

Identification Analyst

Unique ID   T26_IC00012
Attribute Definition   Initials for the technicians/specialists identifying the specimens.
Value Type   Code
Format   2-3 letter code (UPPERCASE) and 1 digit if necessary

Point Count Station

Unique ID   T26_IC00248
Attribute Definition   Point count station where recording was made: 9 stations were
                         located around each ABMI site.
Value Type   Number
Format   1 digit
Code   1 = point count station 1 | 2 = point count station 2 | 3 = point
                         count station 3 | 4 = point count station 4 | 5 = point count
                         station 5 | 6 = point count station 6 | 7 = point count station 7 |
                         8 = point count station 8 | 9 = point count station 9

Wind Conditions

Unique ID   T26_IC00372
Attribute Definition   Estimate of wind conditions on a scale of 0-5.
Value Type   Code
Format   1 digit
Code   0 = no wind | 1 = calm | 2 = leaves rustling | 3 small branches
                         moving | 4 = large branches moving | 5 = large branches
                         moving and the tree is swaying
Missing Values   DNC = Did Not Collect

Precipitation

Unique ID	T26_IC00249
Attribute Definition	Classification for precipitation conditions in 5 categories.
Value Type	Code
Code	Drizzle | Fog | Rain | Sleet | Snow | None
Missing Values	DNC = Did Not Collect

Start of Point Count (24 hour clock)

Unique ID	T26_IC00304
Attribute Definition	Time of day recording was started.
Value Type	Date
Format	0:00
Missing Values	DNC = Did Not Collect

End of Point Count (24-hr clock)

Unique ID	T26_IC00168
Attribute Definition	Time of day recording was finished.
Value Type	Date
Format	0:00
Missing Values	DNC = Did Not Collect | VNA = Variable Not Applicable

Common Name

Unique ID	T26_IC00122
Attribute Definition	Common name of bird species detected during point counts.
Value Type	Text
Missing Values	DNC = Did Not Collect | NONE = None present | VNA = Variable not applicable | SNI = Species Not Identified

Scientific Name

Unique ID	T26_IC00286
Attribute Definition	Scientific name of bird species detected during point count.
Value Type	Text
Missing Values	DNC = Did Not Collect | NONE = None present | VNA = Variable not applicable | SNI = Species Not Identified

Taxonomic Resolution

Unique ID	T26_IC00310
Attribute Definition	Resolution to which bird species was identified (e.g. Family, Genus, Species etc.).
Value Type	Text
Missing Values	VNA = Variable Not Applicable

Unique Taxonomic Identification Number

Unique ID	T26_IC00357
Attribute Definition	Globally unique identifier of bird species detected during point count. Unique taxonomic identifiers are generally taken from the International Taxonomic Information System (ITIS; http://www.itis.gov/).
Value Type	Number
Missing Values	VNA = Variable Not Applicable

Time First Detected (seconds)

Unique ID	T26_IC00314
Attribute Definition	Approximate time the bird analyst first detects a bird species from the recording; listed in 10-second intervals.
Value Type	Date
Missing Values	DNC = Did Not Collect | VNA = Variable Not Applicable

Interval 1 (0-200 seconds)

Unique ID	T26_IC00194
Attribute Definition	First time interval of the 10-minute point count (0-200 seconds) when bird species are detected and identified.
Value Type	Code
Code	1 = Species was detected during this period
Missing Values	DNC = Did Not Collect | VNA = Variable Not Applicable

Interval 2 (201-400 seconds)

Unique ID	T26_IC00194_2
Attribute Definition	Middle time interval of the 10-minute point count (201-400 seconds) when bird species are detected or re-detected.
Value Type	Code

Code	1 = Species was detected during this period
Missing Values	DNC = Did Not Collect | VNA = Variable Not Applicable

Interval 3 (401-600 seconds)

Unique ID	T26_IC00194_3
Attribute Definition	Last time interval of the 10-minute point count (401-600 seconds) when bird species are detected or re-detected.
Value Type	Code
Code	1 = Species was detected during this period
Missing Values	DNC = Did Not Collect | VNA = Variable Not Applicable

Behaviour

Unique ID	T26_IC00113
Attribute Definition	Classification given to each species detection (if possible).
Value Type	Code
Code	AC = Alarm Calling | C = Calling | CS = Counter-singing | DR = Drumming | FO = Fly Over | FL = Flaking Bark | OBS = Observed | S = Singing | WN = Wing Noise | None = No bird species identified from recording | FS = Foot Stomping | BC = Begging
Missing Values	DNC = Did Not Collect | VNA = Variable Not Applicable

Terrestrial T02B Surface Substrate Disturbance Raw Data Metadata

Rotation

Unique ID	T02B_IC00001
Attribute Definition	Reference describing when data was collected at a broad level (i.e., Prototype, Rotation 1).
Value Type	Text
Code	Prototype = 2003--2006 | Rotation 1 = 2007--2014

ABMI Site

Unique ID	T02B_IC00003
Attribute Definition	Reference number given to each ABMI data collection site.
Value Type	Number
Format	1 to 4 digits
Range	1-1656

Year

Unique ID	T02B_IC00002
Attribute Definition	Collection year.
Value Type	Date
Format	YYYY

Field Date

Unique ID	T02B_IC00015
Attribute Definition	Day, month, and year data was collected.
Value Type	Date
Format	DD-Mon-YYYY

Field Crew Member(s)

Unique ID	T02B_IC00379
Attribute Definition	Initials for the field technicians collecting the field data.
Value Type	Text

Format   2 or 3 letters (UPPERCASE) and 1 number (if necessary); 1 set of initials or a combination of many

Missing Values   DNC = Did Not Collect

Transect (North/South)

Unique ID   T02B_IC00340

Attribute Definition   Indicates the transect (north or south) where the surface substrate was sampled.

Value Type   Code

Format   1 letter (UPPERCASE)

Code   N = north | S = South

Missing Values   DNC = Did Not Collect

Human or Natural Disturbance

Unique ID   T02B_IC00997

Attribute Definition   Disturbance can be due to human activity or natural processes.

Value Type   Code

Code   Human | Natural

Missing Values   DNC = Did Not Collect | VNA = Variable Not Applicable

Disturbance Type (terrestrial)

Unique ID   T02B_IC00994

Attribute Definition   Evidence of human-caused or natural stand disturbances; note all minor to extensive disturbance caused by humans (logging debris or stumps, agricultural/livestock activity, seismic lines, roads, trails etc) or naturally caused (e.g. fire scars, insect defoliation, wind caused mortality/blow down).

Value Type   Code

Code	BARE = Bare - Human caused bare ground for which the cause cannot be determined	CULT = Cultivated Crop/Field - Any type of cultivated field that is used to grow agriculture crops	HARV = Harvest - Any type of forest harvesting (i.e., clear-cut, partial-cut, understory retention, etc.) <30 years old)	IND = Industrial - Any type of building, roadway, yard, etc associated with industrial development	PAST = Pasture - Any type of pasture (tame or native), grazing reserve, etc.	PIPE = Linear - Pipeline	POWER = Linear - Powerline	RAIL = Linear - Railline	RES = Residential Rural - Any type of human dwelling, farm building, or farm yard in a rural or acreage setting	ROADG = Linear - Road Gravel - Any type of road with an unpaved but improved (i.e. gravel) surface	ROADP = Linear - Road Paved - Any type of road with paved surface	SEIS = Linear - Seismic or Cutline of any type	TRAIL = Linear - Road Other - Any type of truck or ATV trail with an unimproved surface	URB = Urban - Any type of human dwelling, associated building, or yard/driveway/road in an urban setting	WELL = Well Pad - Any type of area cleared for oil/gas/CBM pump jacks or well heads	BEAV = Any evidence of beaver activity altering the landscape or vegetation	DISEASE = Disease - Any evidence of vegetation experiencing disease outbreak	EROS = Erosion - Evidence of wearing away of soil by precipitation or wind	FIRE = Fire - Any evidence of fire damage, scarring or burning (<30 years old)	FLOOD = Flood - Evidence of flooding including high water mark, dead trees, etc.	ICE = Snow/Ice - Evidence of vegetation breakage caused by snow or ice	INSECT = Insect - Any evidence of vegetation experiencing insect attack	WIND = Wind Throw - Evidence of wind damage including snapped or uprooted trees	OTHER = Other disturbance	UNKN = Unknown disturbance	NONE = No disturbance
Missing Values	DNC = Did Not Collect	VNA = Variable Not Applicable

Disturbance Type (%)

Unique ID	T02B_IC00996
Attribute Definition	% of area disturbed
Value Type	Code
Code	0	< 1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Missing Values	DNC = Did Not Collect	VNA = Variable Not Applicable

Terrestrial Metadata Appendix: Detailed Code Definitions

Ecosite – Structural Stage

Unique ID	IC00236 in Site Capability Raw Data (RAW_T01C_SiteCapability)
Unique ID	IC00658 in Shrub Cover--Ecological Site Classification (RAW_T12A_2DCoverSiteChar)
Unique ID	IC00765 in Soil Arthropods Springtails and Mites Collection (RAW_T23_SoilArthropodsCollection)
Attribute Definition	Describes the structure stage of the ecosite, as determined after the ecological-site type has been designated i.e. the nutrient/moisture code designation and tree species modifier. The structure stage code starts with a number that defines 1) tree-dominated, 2) non-tree dominated, or 3) open water ecosites. The subsequent letter codes further describe the ecosite structure, in terms of type of vegetation (or dominant substrate type for non-vegetated sites), as well as height and density of vegetation.
Code Definition	1) TS = Tree height is Short | TT = Tree height is Tall: D = Dense | S = Sparse: C = Complex arrangement | N = Non-complex arrangement. 2) N = Non-vegetated: R = substrate of Rock | S = substrate of Sand | M = substrate of Mineral soil | O = substrate of Organic soil; G = Ground vegetation only: B = bryoid/lichen | F = forbs | G = graminoid | R = Reeds and rushes (marsh): D = Dense | M = Moderate density | S = sparse; S = Shrubs: L = Low height | T = Tall; D = Dense | M = moderately Dense | S = sparse. 3) ON = non-vegetated | OV = vegetated: S = short | M = medium | T = Tall: D = Dense | M = Moderate | Sparse.

Detailed Code Definition

1. TSDC = For tree dominated ecosites (trees ≥10% cover), tree height (TS) is Short (≥50% of canopy cover <10 m tall), tree density (D) is Dense (trees ≥1.3 m tall are ≤2 m apart), tree arrangement (C) is Complex (tallest trees ≥10 m apart, with smaller trees - approximately half height - between that receive direct sunlight from above).

1. TSDN = For tree dominated ecosites (trees ≥10% cover), tree height (TS) is Short (≥50% of canopy cover <10 m tall), tree density (D) is Dense (trees ≥1.3 m tall are ≤2 m apart), tree arrangement (N) is Non-complex (tallest trees <10 m apart, with

few or no smaller trees - approximately half height - between that receive direct sunlight from above).

1. TSSC = For tree dominated ecosites (trees ≥10% cover), tree height (TS) is Short (≥50% of canopy cover <10 m tall), tree density (S) is Sparse (trees ≥1.3 m tall are >2 m apart), tree arrangement (C) is Complex (tallest trees ≥10 m apart, with smaller trees - approximately half height - between that receive direct sunlight from above).

1. TSSN = For tree dominated ecosites (trees ≥10% cover), tree height (TS) is Short (≥50% of canopy cover <10 m tall), tree density (S) is Sparse (trees ≥1.3 m tall are >2 m apart), tree arrangement (N) is Non-complex (tallest trees <10 m apart, with few or no smaller trees - approximately half height - between that receive direct sunlight from above).

1. TTDC = For tree dominated ecosites (trees ≥10% cover), tree height (TT) is Tall (>50% of canopy cover ≥10 m tall), tree density (D) is Dense (trees ≥1.3 m tall are ≤2 m apart), tree arrangement (C) is Complex (tallest trees ≥10 m apart, with smaller trees - approximately half height - between that receive direct sunlight from above).

1. TTDN = For tree dominated ecosites (trees ≥10% cover), tree height (TT) is Tall (>50% of canopy cover ≥10 m tall), tree density (D) is Dense (trees ≥1.3 m tall are ≤2 m apart), tree arrangement (N) is Non-complex (tallest trees <10 m apart, with few or no smaller trees - approximately half height - between that receive direct sunlight from above).

1. TTSC = For tree dominated ecosites (trees ≥10% cover), tree height (TT) is Tall (>50% of canopy cover ≥10 m tall), tree density (S) is Sparse (trees ≥1.3 m tall are >2 m apart), tree arrangement (C) is Complex (tallest trees ≥10 m apart, with smaller trees - approximately half height - between that receive direct sunlight from above).

1. TTSN = For tree dominated ecosites (trees ≥10% cover), tree height (TT) is Tall (>50% of canopy cover ≥10 m tall), tree density (S) is Sparse (trees ≥1.3 m tall are >2 m apart), tree arrangement (N) is Non-complex (tallest trees <10 m apart, with few or no smaller trees - approximately half height - between that receive direct sunlight from above).

2. NR = For non-tree dominated (trees <10% cover), non-vegetated (<10% vegetation cover) ecosites, dominant substrate type (NR) is Bedrock, cliff, talus, or boulder

2. NS = For non-tree dominated (trees <10% cover), non-vegetated (<10% vegetation cover) ecosites, dominant substrate type (NS) is Sand bar in river/stream (cobble, gravel, sand)

2. NM = For non-tree dominated (trees <10% cover), non-vegetated (<10% vegetation cover) ecosites, dominant substrate type (NM) is Mineral soil due to any other reason

2. NO = For non-tree dominated (trees <10% cover), non-vegetated (<10% vegetation cover) ecosites, dominant substrate type (NO) is Organic soil

2. GBD = For non-tree dominated (trees <10% cover) ecosites, where only ground vegetation (shrubs <10%; trees <10%; other vascular plants >10%) is present, vegetation type (GB) is Bryoid/Lichen (Bryophyte and lichen), vegetation density (D) is Dense (cover >75%)

2. GBM = For non-tree dominated (trees <10% cover) ecosites, where only ground vegetation (shrubs <10%; trees <10%; other vascular plants >10%) is present, vegetation type (GB) is Bryoid/Lichen (Bryophyte and lichen), vegetation density (M) is Moderate (cover is between 25-75%)

2. GBS = For non-tree dominated (trees <10% cover) ecosites, where only ground vegetation (shrubs <10%; trees <10%; other vascular plants >10%) is present, vegetation type (GB) is Bryoid/Lichen (Bryophyte and lichen), vegetation density (S) is Sparse (cover is <25%)

2. GFD = For non-tree dominated (trees <10% cover) ecosites, where only ground vegetation (shrubs <10%; trees <10%; other vascular plants >10%) is present, vegetation type (GF) is Forb (non-graminoid herbs and ferns), vegetation density (D) is Dense (cover >75%)

2. GFM = For non-tree dominated (trees <10% cover) ecosites, where only ground vegetation (shrubs <10%; trees <10%; other vascular plants >10%) is present, vegetation type (GF) is Forb (non-graminoid herbs and ferns), vegetation density (M) is Moderate (cover is between 25-75%)

2. GFS = For non-tree dominated (trees <10% cover) ecosites, where only ground vegetation (shrubs <10%; trees <10%; other vascular plants >10%) is present, vegetation type (GF) is Forb (non-graminoid herbs and ferns), vegetation density (S) is Sparse (cover is <25%)

2. GGD = For non-tree dominated (trees <10% cover) ecosites, where only ground vegetation (shrubs <10%; trees <10%; other vascular plants >10%) is present, vegetation type (GG) is Graminoid (grasses, sedges), vegetation density (D) is Dense (cover >75%)

2. GGM = For non-tree dominated (trees <10% cover) ecosites, where only ground vegetation (shrubs <10%; trees <10%; other vascular plants >10%) is present, vegetation type (GG) is Graminoid (grasses, sedges), vegetation density (M) is Moderate (cover is between 25-75%)

2. GGS = For non-tree dominated (trees <10% cover) ecosites, where only ground vegetation (shrubs <10%; trees <10%; other vascular plants >10%) is present, vegetation type (GG) is Graminoid (grasses, sedges), vegetation density (S) is Sparse (cover is <25%)

2. GRD = For non-tree dominated (trees <10% cover) ecosites, where only ground vegetation (shrubs <10%; trees <10%; other vascular plants >10%) is present, vegetation type (GR) is Marsh (reeds and rushes), vegetation density (D) is Dense (cover >75%)

2. GRM = For non-tree dominated (trees <10% cover) ecosites, where only ground vegetation (shrubs <10%; trees <10%; other vascular plants >10%) is present, vegetation type (GR) is Marsh (reeds and rushes), vegetation density (M) is Moderate (cover is between 25-75%)

2. GRS = For non-tree dominated (trees <10% cover) ecosites, where only ground vegetation (shrubs <10%; trees <10%; other vascular plants >10%) is present, vegetation type (GR) is Marsh (reeds and rushes), vegetation density (S) is Sparse (cover is <25%)

2. SLD = For non-tree dominated (trees <10% cover) ecosites, where shrubs (shrubs >10%; trees <10%) are present, shrub height (SL) is Low (shrubby vegetation <2 m tall), shrub density (D) is Dense (shrubs cover >75%)

2. SLM = For non-tree dominated (trees <10% cover) ecosites, where shrubs (shrubs >10%; trees <10%) are present, shrub height (SL) is Low (shrubby vegetation <2 m tall), shrub density (M) is Moderate (shrubs cover is between 25-75%)

2. SLS = For non-tree dominated (trees <10% cover) ecosites, where shrubs (shrubs >10%; trees <10%) are present, shrub height (SL) is Low (shrubby vegetation <2 m tall), shrub density (S) is Sparse (shrubs cover <25%)

2. STD = For non-tree dominated (trees <10% cover) ecosites, where shrubs (shrubs >10%; trees <10%) are present, shrub height (ST) is Tall (shrubby vegetation >2 m tall), shrub density (D) is Dense (shrubs cover >75%)

2. STM = For non-tree dominated (trees <10% cover) ecosites, where shrubs (shrubs >10%; trees <10%) are present, shrub height (ST) is Tall (shrubby vegetation >2 m tall), shrub density (M) is Moderate (shrubs cover is between 25-75%)

2. STS = For non-tree dominated (trees <10% cover) ecosites, where shrubs (shrubs >10%; trees <10%) are present, shrub height (ST) is Tall (shrubby vegetation >2 m tall), shrub density (S) is Sparse (shrubs cover <25%)

3. ON = For open water dominated ecosites (emergent vegetation <10%), vegetation type (ON) is Non-vegetated

3. OVSD = For open water dominated ecosites (emergent vegetation <10%), vegetation type (OV) is Vegetated (floating and submerged plants ≥ 10% cover), vegetation height (S) is Short submerged (≥50% of vegetation extends 0.0 - <0.3 m above the substrate), vegetation density (D) is Dense (aquatic vegetation covers >75% of the substrate)

3. OVSM = For open water dominated ecosites (emergent vegetation <10%), vegetation type (OV) is Vegetated (floating and submerged plants ≥ 10% cover), vegetation height (S) is Short submerged (≥50% of vegetation extends 0.0 - <0.3 m above the substrate), vegetation density (M) is Moderate (aquatic vegetation covers 25-75% of the substrate)

3. OVSS = For open water dominated ecosites (emergent vegetation <10%), vegetation type (OV) is Vegetated (floating and submerged plants ≥ 10% cover), vegetation height (S) is Short submerged (≥50% of vegetation extends 0.0 - <0.3 m above the substrate), vegetation density (S) is Sparse (aquatic vegetation covers <25% of the substrate)

3. OVMD = For open water dominated ecosites (emergent vegetation <10%), vegetation type (OV) is Vegetated (floating and submerged plants ≥ 10% cover), vegetation height (M) is Medium submerged (≥50% of vegetation extends 0.3 - 1.3 m above the substrate), vegetation density (D) is Dense (aquatic vegetation covers >75% of the substrate)

3. OVMM = For open water dominated ecosites (emergent vegetation <10%), vegetation type (OV) is Vegetated (floating and submerged plants ≥ 10% cover), vegetation height (M) is Medium submerged (≥50% of vegetation extends 0.3 - 1.3 m

above the substrate), vegetation density (M) is Moderate (aquatic vegetation covers 25-75% of the substrate)

3. OVMS = For open water dominated ecosites (emergent vegetation <10%), vegetation type (OV) is Vegetated (floating and submerged plants ≥ 10% cover), vegetation height (M) is Medium submerged (≥50% of vegetation extends 0.3 - 1.3 m above the substrate), vegetation density (S) is Sparse (aquatic vegetation covers <25% of the substrate)

3. OVTD = For open water dominated ecosites (emergent vegetation <10%), vegetation type (OV) is Vegetated (floating and submerged plants ≥ 10% cover), vegetation height (T) is Tall submerged (≥50% of vegetation extends >1.3 m above the substrate), vegetation density (D) is Dense (aquatic vegetation covers >75% of the substrate)

3. OVTM = For open water dominated ecosites (emergent vegetation <10%), vegetation type (OV) is Vegetated (floating and submerged plants ≥ 10% cover), vegetation height (T) is Tall submerged (≥50% of vegetation extends >1.3 m above the substrate), vegetation density (M) is Moderate (aquatic vegetation covers 25-75% of the substrate)

3. OVTS = For open water dominated ecosites (emergent vegetation <10%), vegetation type (OV) is Vegetated (floating and submerged plants ≥ 10% cover), vegetation height (T) is Tall submerged (≥50% of vegetation extends >1.3 m above the substrate), vegetation density (S) is Sparse (aquatic vegetation covers <25% of the substrate)

3. OVFD = For open water dominated ecosites (emergent vegetation <10%), vegetation type (OV) is Vegetated (floating and submerged plants ≥ 10% cover), vegetation height (F) is Floating (≥50% of vegetation with floating leaves on water surface), vegetation density (D) is Dense (aquatic vegetation covers >75% of the substrate)

3. OVFM = For open water dominated ecosites (emergent vegetation <10%), vegetation type (OV) is Vegetated (floating and submerged plants ≥ 10% cover), vegetation height (F) is Floating (≥50% of vegetation with floating leaves on water surface), vegetation density (M) is Moderate (aquatic vegetation covers 25-75% of the substrate)

3. OVFS = For open water dominated ecosites (emergent vegetation <10%), vegetation type (OV) is Vegetated (floating and submerged plants ≥ 10% cover), vegetation height (F) is Floating (≥50% of vegetation with floating leaves on water surface), vegetation density (S) is Sparse (aquatic vegetation covers <25% of the substrate)