

# ABMI Data Platforms: Making ABMI Data Work for You

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*ABMI Information Forum  
January 30, 2019*

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*Alberta Biodiversity Monitoring Institute*



# Meeting Business Needs



*Recognize the need to deliver data and information to users in a format and/or context that meets their business needs.*

- **ABMI Data & Analytics Portal**
- Online Reporting
- **WildTrax**
- ABMI NatureLynx
- **Biodiversity Data Query Tool (custom reporting)**



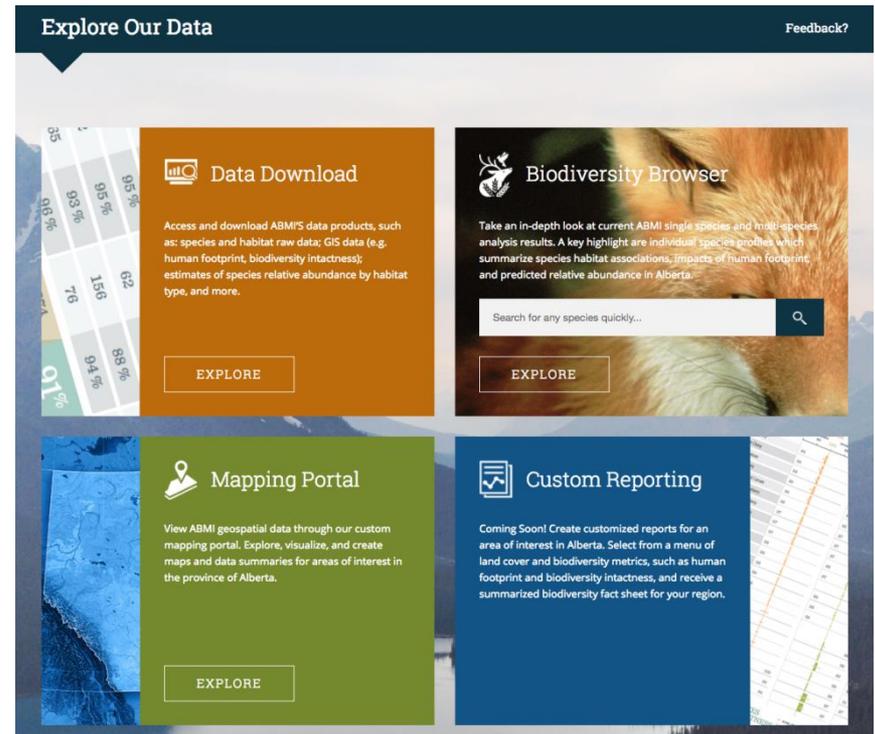
# Making ABMI Data Accessible



*ABMI Data & Analytics Portal: One stop shop for ABMI data and information*

Four modules:

1. Data download: raw data and derived data products; GIS data layers
2. Biodiversity Browser: 350+ (and growing) complete species profiles
3. Mapping portal: interactive web-based map viewer
4. Biodiversity Data Query Tool (in development)



Visit [abmi.ca/data](https://abmi.ca/data)

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# Biodiversity Browser



*Goal: to be the go-to reference as “Alberta’s Encyclopedia of Life”*

**Biodiversity Browser**

Find out about the wide variety of species that make their homes in Alberta, what habitats they're found in, and how our land use activities impact their populations. You can also investigate the current status of biodiversity through our multi-species analysis. Start browsing!

Quick Species Search

3,014 Species Detected

**Birds**  
(257 Species Detected)

EXPLORE

Choose a Multiple Species Analysis

- All Taxa
- Birds
- Old-forest Birds
- Mammals
- Non-native Vascular Plants
- Vascular Plants
- Bryophytes

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# Biodiversity Browser





## Alder Flycatcher

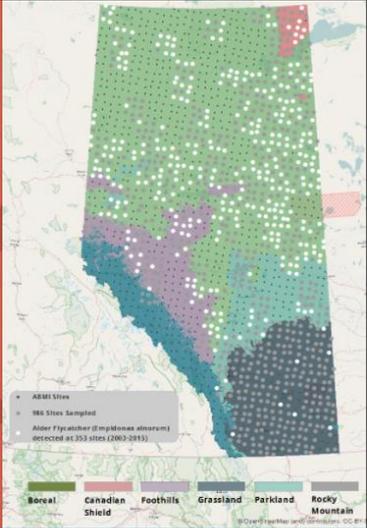
*Empidonax alnorum*

The Alder Flycatcher is a small, plainly coloured bird commonly found in wet shrub habitats and early seral forests in the Boreal Forest, Foothills, and Parkland Natural Regions.

Conservation Status: AEP - Secure

Data Summary: Full

[Download Report](#)



Legend:

- ABMI Sites
- 986 Sites Sampled
- Alder Flycatcher (*Empidonax alnorum*) detected at 353 sites (2003-2019)

Regions: Boreal, Canadian Shield, Foothills, Grassland, Parkland, Rocky Mountain

[Introduction](#) | [Habitat & Human Footprint Associations](#) | [Impacts of Human Footprint](#) | [Predicted Relative Abundance](#) | [References & Credits](#)

## Introduction

Over its decade-plus of operations, the ABMI has generated a comprehensive dataset on Alberta's species, their habitats, and the extent and type of human footprint across the province. With this information, the ABMI has developed analyses to predict species' relative abundances and examine species' responses to vegetation and soil types, as well as human footprint in Alberta. These methods have been applied to hundreds of species; this profile provides summary results for one.

[Read More](#) ▾

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# Biodiversity Browser

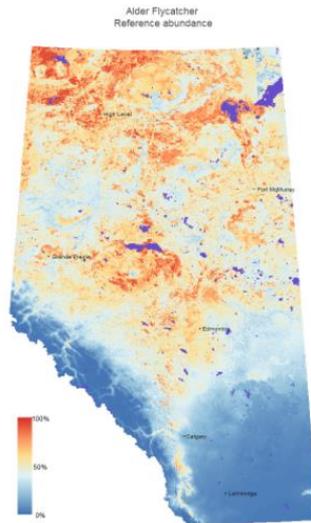


Methods ▾

Limitations ▾

Interpreting the Maps ▾

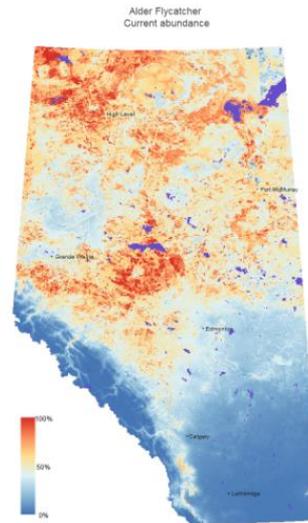
## Reference Conditions



[Download GIS Data](#)

- The reference condition shows the predicted relative abundance of the Alder Flycatcher after all human footprint had been backfilled based on native vegetation in the surrounding area.

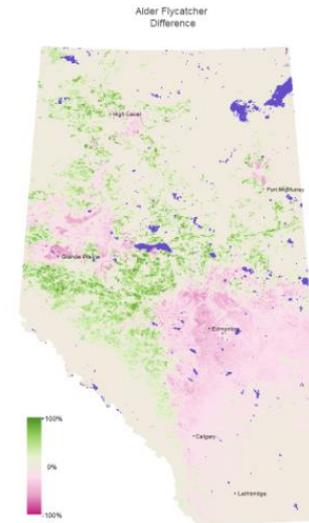
## Current Conditions



[Download GIS Data](#)

- The current condition is the predicted relative abundance of the Alder Flycatcher taking current human footprint (circa 2012) into account.

## Difference Conditions



[Download GIS Data](#)

- The Alder Flycatcher is predicted to be more abundant than expected across much of its range compared to reference conditions in the Boreal and Foothills Natural Regions. In the Parkland Natural Region, it is predicted to have lower abundance.

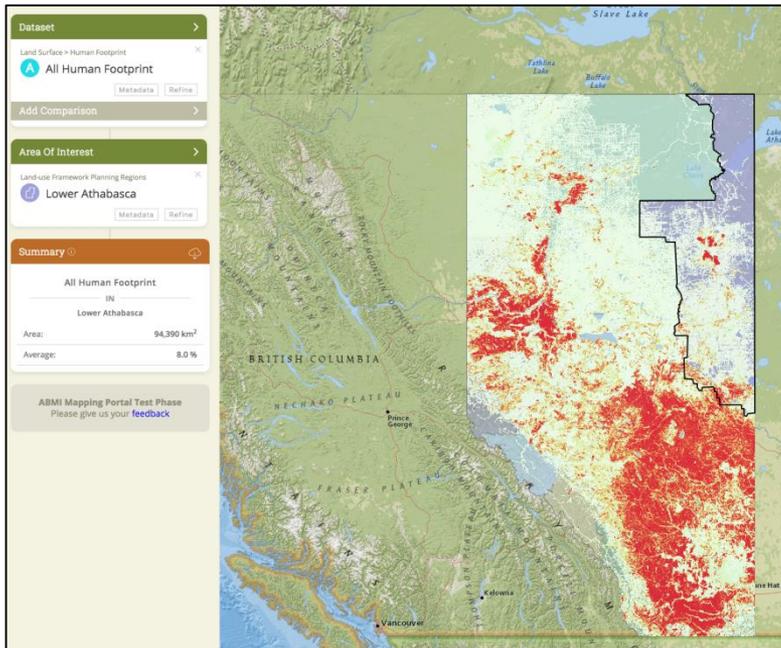
[Batch Download GIS Data](#)

[View in Mapping Portal](#)

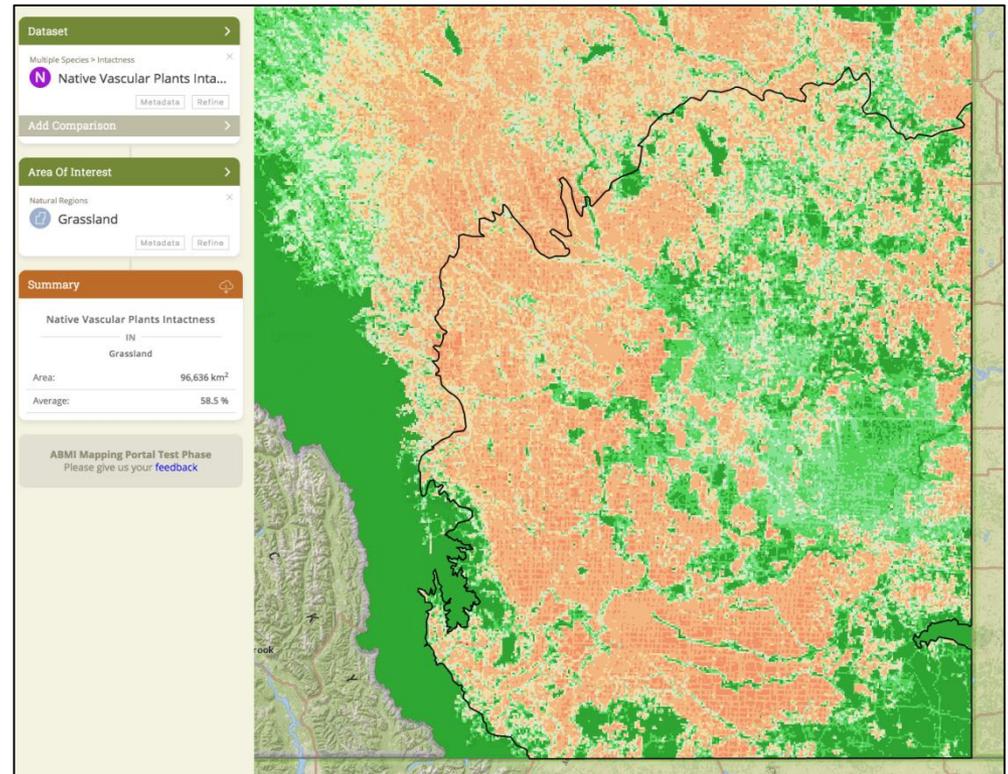
# Mapping Portal 1.0 (current)



## Interactive Web-based map viewer



Human Footprint Intensity in the Lower Athabasca Region



Native Vascular Plant Intactness in the Grassland Natural Region

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# Enhancing Mapping Portal Functionality



*Driven by stakeholder feedback (needs assessment workshops fall 2017)*

Users want to:

- Load and manipulate multiple layers
- Identify custom areas of interest
- Share data between ABMI platforms
- Upload user data

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# Mapping Portal 2.0 (implementation underway)



The screenshot displays the Mapping Portal 2.0 interface. At the top is a toolbar with icons for Share Link, Export Map, Export Report, Build Summary, Lock Map, Zoom In, Zoom Out, Full Extent, GPS Locate, Legal Locate, Draw AOI, Data Grid, and User Account. On the left is a layers panel with a search bar and categories: Standard ABMI Layers, Datasets, Areas of Interest, Base Layers, Base Maps, My Layers (highlighted in red), and Recently Selected Layers. The main map area shows a topographic map of Alberta, Canada, with a red and yellow heatmap overlay. Key geographical features labeled include the Fraser Plateau, Nechako Plateau, and the border with Saskatchewan. Major cities like Vancouver, Kelowna, Prince George, and Regina are marked. A scale bar at the bottom right indicates 100 km and 50 mi. At the bottom of the map, it says 'App by Tesera Systems Inc. Powered by Esri & Leaflet. Maps by National Geographic, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, Increment P Corp.'

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# Mapping Portal 2.0 (implementation underway)



The screenshot displays the Mapping Portal 2.0 interface. At the top is a toolbar with icons for Share Link, Export Map, Export Report, Build Summary, Lock Map, Zoom In, Zoom Out, Full Extent, GPS Locate, Legal Locate, Draw AOI, Data Grid, and User Account. Below the toolbar is a 'Layers' panel on the left and a 'Settings' panel on the right. The main map area shows a map of Alberta with a red overlay representing the 'Twisted Horseshoe... - Pasture' layer. A summary table is visible in the right-hand panel.

Layer Name	Area	Average
Twisted Horseshoe... - Pasture	4 km2	5.2%
Mineable Region	N/A	N/A
Cold Lake Oil Sands Area	—	—
Athabasca Oil Sands Area	—	—
Province of Alberta	—	—

The map also shows a legend for 'All Human Footprint 2014' with a color scale from 0 to 100 % / km2. The map includes labels for various locations in Alberta and Saskatchewan, such as Fort Smith, Lake Athabasca, La Loche, Buffalo Narrows, La Ronge, Prince Albert, North Battleford, Saskatoon, Moose Jaw, Regina, Kamloops, Thompson Plateau, Kelowna, and Lake Louise. A scale bar at the bottom right indicates 100 km and 50 mi.

# Supporting Data Integration



- WildTrax is a web-based environmental sensor network (and the platform to support it) 
- Supports third-party projects and initiatives
- Facilitates data storage, management, and processing



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# WildTrax Alberta Biodiversity – See, Hear, Know



WildTrax

Explore Your Backyard Alberta

What is Wildtrax?

Environmental sensors are increasingly being used to monitor environmental and ecological attributes across broad geographic scales, such as monitoring changes to biodiversity. These sensors allow for the a complete collection of data over extended periods of time resulting in the accumulation of large amounts of valuable data. We offer data for the following, across our web interface of such data. [Learn more](#)

Log In to View Sensors | Sign Up to Contribute

WildTrax

Explore our data

Discover where our sensors have been deployed. Click on a map marker to find out more about a sensor deployment.

ALL | ARUS | REMOTE CAMERAS

Explore our data

Discover where our sensors have been deployed. Click on a map marker to find out more about a sensor deployment.

Map showing sensor deployment locations across Canada with red shaded areas and black map markers.

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### Project Management

- Project sponsors can identify project managers
- Managers can add/delete projects
- Managers can add/delete/manage taggers/transcribers

The screenshot displays the WildTrax web interface. At the top, there is a navigation bar with the WildTrax logo, a user greeting 'WELCOME CORRINA | LOGOUT', and a 'MY PROJECT' button. Below the navigation bar, there are tabs for 'UPDATE PROJECT' and 'USER ASSIGNMENT'. A modal window titled 'Add User to Project' is open, showing a list of 'AVAILABLE USERS' and 'ASSIGNED USERS'. The 'ASSIGNED USERS' list includes: guest@blah.com, rachel.buxton@colostate.edu, Alex MacPhail (Manager), Jeff Allen, and Mike Packer (Manager). Below the modal, there is a table with columns for YEAR, PROJECT NAME, DUE DATE, STATUS, TOTAL TASKS, COMPLETED TASKS, and DETAILS. The table contains one record for the year 2018, project name 'ABMI Demo', status 'Active', 28 total tasks, and 1 completed task. A 'Filter by' dropdown is set to 'ABMI Demo' and a 'Select status' dropdown is visible.

YEAR	PROJECT NAME	DUE DATE	STATUS	TOTAL TASKS	COMPLETED TASKS	DETAILS
2018	ABMI Demo		Active	28	1	



## Data Analysis and Processing

### Wildlife Cameras

Home / ARUs / AIEES-Wetland Project /

**ABMI-0272** [Edit](#) [Filter](#) [Search](#) Select All Update All Untagged

Date & Time: 2016-06-21 05:34:00

1 2 3 [Hide Number Panel](#) 1 2 3 4 ... 150

1 Staff/setup | VNA | VNA

2 Staff/setup | VNA | VNA

3 Staff/setup | VNA | VNA

4 Staff/setup | VNA | VNA

5 Untagged

6 Untagged

7 Untagged

8 Untagged

9 Untagged

Another Info Block | VNA | VNA

Camera Capture

### ARUs

Home / ARUs / AIEES-Wetland Project /

**ABMI-0272-NE\_20160621\_053400** STATUS: Complete Next Task --

Date & Time: 2016-06-21 05:34:00

[SPECTROGRAMS](#) [MAPS & PHOTOS](#)

Info

Open

Look Delete

REPLICATE 1 ASSIGNMENT 50

TRANSCRIBER Choose an Transcriber

METHOD 14 | 3 min w fixed time

COMBO VOLUME 0 Level

RAIN Level

WIND Level

INDUSTRY Level

NOISE Level

AUDIO QUALITY

0.0s of 3m Sam Smith Samantha Smithsonian Bram Brith

#### Logged Sounds

SPECIES	INDIVIDUAL	CONFIDENCE	START	DURATION	AC	VT
Light wind	Sam Smith	50%	0.5s	7.9s	-	-
Light wind	Sam Smith	50%	0.5s	7.9s	-	-
Light wind	Sam Smith	50%	0.5s	7.9s	-	-

bioacoustic unit



WildTrax

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### ***Benefits of WildTrax Cameras***

- Reduced per project tagging time (estimated at 90% reduction)
  - Pre-processing provided by autotaggers
  - Context dependent tagging: subsampling within a series
  - Simultaneous multiple-image tagging
- Reduced error rate through two-stage QAQC process
- Easy data download (step-by-step process)



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# WildTrax Data Visualization (Platform Integration)



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# Custom Reporting (In Development)



*Driven by stakeholder feedback (needs assessment workshops fall 2017)*

Users want to:

- Obtain basic summary information for their AOI (e.g. % human footprint)
- Understand where high value biodiversity areas to:
  - Guide development away from these areas
  - Prioritize areas for reclamation
- Run custom queries (e.g. Identify the region that meets the following criteria: seismic line density is  $<0.5 \text{ km/km}^2$ , high quality caribou habitat, high relative abundance of rusty blackbird)
- Generate an associated pdf and/or shapefile

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# Biodiversity Data Query Tool (In Development)



ABMI BIODIVERSITY DATA QUERY TOOL | BASIC SUMMARIES | HIGH VALUE BIODIVERSITY AREAS | USER-DEFINED QUERIES

WELCOME TO THE ABMI BIODIVERSITY DATA QUERY TOOL

Introduction: What is it the BDQT and how to use it.

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

**BASIC SUMMARIES**

How to Use This Tool

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

**HIGH VALUE BIODIVERSITY AREAS**

How to Use This Tool

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

**USER-DEFINED QUERIES**

How to Use This Tool

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

Shopping cart icon

# Biodiversity Data Query Tool (In Development)



**ABMI BIODIVERSITY DATA QUERY TOOL**    **BASIC SUMMARIES**    HIGH VALUE BIODIVERSITY AREAS    USER-DEFINED QUERIES

**BASIC SUMMARIES**

SELECT FROM A PRE-DEFINED AREA ▾

OR DEFINE AN AREA

SELECT FILE    **UPLOAD**

**SELECT METRICS** ▲

- ✓ Example Checklist Item
- ✓ Example Checklist Item
- ✓ Example Checklist Item
- Example Checklist Item
- Example Checklist Item

**RUN QUERY**

Show apps



**ADD TO CART**

Continue Query >



# Biodiversity Data Query Tool (In Development)



## ABMI BIODIVERSITY DATA QUERY TOOL

BASIC SUMMARIES    HIGH VALUE BIODIVERSITY AREAS    USER-DEFINED QUERIES

**BASIC SUMMARIES**

SELECT FROM A PRE-DEFINED AREA ▾

OR DEFINE AN AREA

SELECT FILE    **UPLOAD**

**SELECT METRICS** ▲

- ✓ Example Checklist Item
- ✓ Example Checklist Item
- ✓ Example Checklist Item
- Example Checklist Item
- Example Checklist Item

**RUN QUERY**

Show apps



**ADD TO CART**

Continue Query >



# Biodiversity Data Query Tool (In Development)



A screenshot of a shopping cart interface. The cart is titled "CART (3)" and contains three items. Each item has a title "Example Cart Item" and a description: "Descriptor about data set... Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat." The second item has a "VIEW IN PORTAL" button. At the bottom of the cart, there is an "END / DOWNLOAD" button. A shopping cart icon is visible on the left side of the interface.

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# User-defined Queries



*Backend Database Under Construction; User Interface in Development*

Example:

Show me areas where seismic line density is  $<0.5 \text{ km/km}^2$  and overlaps caribou range and rusty blackbird habitat:

Query:

```
select o.lineardensity, o.geom
from onesqkm_39attr_aoi o
inner join aoi on o.aoiid = aoi.objectid
where aoi.type = 'caribou'
and o.lineardensity < 0.0005
```

Total query runtime: 1 secs 11 msec.  
54065 rows affected.

When records are consolidated with ST\_Collect:

```
select ST_Collect(o.geom)
from onesqkm_39attr_aoi o
inner join aoi on o.aoiid = aoi.objectid
where aoi.type = 'caribou'
and o.lineardensity < 0.0005
```

Total query runtime: 1 secs 168 msec.  
1 rows affected.

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# How can we make ABMI data work for you?

