

Environmental Sensor Workshop

Summary and Highlights

11 to 13 February 2020
Fort Good Hope, NWT

ABMI Bioacoustic Unit

Contents

Purpose	2
Workshop Collaborators	2
Development.....	3
Presenters	4
Participants	5
Location.....	5
Workshop Content.....	5
Digital Literacy for Using Environmental Sensors	5
Introduction to Sensors	6
Wildlife Camera Deployment.....	6
ARU Deployment.....	6
Data Management	6
Camera Photos Tagging	6
Bioacoustic Recording Transcription	6
Success and Challenges.....	6
Agenda	7

Purpose

The purpose of this workshop was to train participants from the Sahtú Region how to use wildlife cameras and autonomous recording units (ARUs) so that they can work with the Canadian Wildlife Service, Environment and Natural Resources (ENR), and other longer-term wildlife monitoring projects. This particular meeting emphasized getting participants ready to collect data in the Ts'udé Niljné Tuyeta protected area. In addition to field deployment information, participants were introduced to basic concepts of data management so that they can safely bring data back from the field and assist with data backup. The last part of the workshop introduced participants to WildTrax, an online application for processing both wildlife photos and bioacoustic recordings to show them how data is processed after it is collected.

Workshop Collaborators

The following organizations provided both monetary and in-kind contributions to make this workshop happen:

Organization	Contribution	People
NWT ESRF (Environmental Studies Research Fund)	<ul style="list-style-type: none"> Grant worth \$10,000 to support meeting and travel for UofA/ABMI 	<ul style="list-style-type: none"> Bruce Hanna
Government of the Northwest Territories, Department of Environment and Natural Resources (ENR)	<ul style="list-style-type: none"> Time from Kevin Chan Equipment to use for the workshop 	<ul style="list-style-type: none"> Claudia Haas Kevin Chan
Alberta Biodiversity Monitoring Institute (ABMI)	<ul style="list-style-type: none"> Time from Hedwig Lankau to create workshop materials, travel and run the workshop Time from David Evans to travel and run the workshop Equipment to use for workshop Printed materials 	<ul style="list-style-type: none"> Corrina Copp Hedwig Lankau Nakita Rubuliak David Evans
Sahtú Renewable Resources Board (SRRB)	<ul style="list-style-type: none"> Meeting space, access to printer Coordination of catering 	<ul style="list-style-type: none"> Lex Scully Daniel Jackson
Fort Good Hope Renewable Resources Council (RRC)	<ul style="list-style-type: none"> Indoor meeting space for the workshop (Sahtú Land Use Planning Board Room) 	<ul style="list-style-type: none"> Chris Pereira
Yamoga Land Corporation	<ul style="list-style-type: none"> Participant recruitment 	<ul style="list-style-type: none"> Danny Yalenka Others
Canadian Wildlife Service, Yellowknife Office (CWS)	<ul style="list-style-type: none"> Time from Amelie Roberta-Charron for travel, workshop materials and helping run the workshop Equipment to use for workshop 	<ul style="list-style-type: none"> Dr. Sam Hache Amelie Roberto-Charron
University of Alberta (U of A), Bayne Lab	<ul style="list-style-type: none"> Equipment to use for workshop 	<ul style="list-style-type: none"> Hedwig Lankau

Development

This workshop was intended to increase community capacity for biodiversity monitoring and data processing in the Sahtú Region, and was driven by the need for a community-based environmental monitoring framework within the region. Workshop content was developed using the following considerations:

- Prioritization of equipment deployment training in order to support March 2020 field work
- Digital literacy levels in the region
- A focus on the WildTrax data platform to enable participant understanding of what happens to data after it is collected

We delivered similar training in 2019 to three First Nations and Metis communities. This training relied on shorter workshops on the use of ARUs, and brief introductions to the WildTrax platform. A three-day

workshop in a remote community allowed us to rework our materials so that we could cover essential content in-depth, but also be flexible to the learning speed of the participants.

Scoping and delivery of the workshop was a collaborative effort with multiple organizations, including the Sahtu Renewable Resources Board (SRRB), the Fort Good Hope Renewable Resources Council, the Government of Northwest Territories, and the Canadian Wildlife Service. The three days of protocol training were part of a broader training effort being organized by this group in order to implement a community-delivered wildlife monitoring program for the Ts'udé Niljné Tuyeta protected area. The involvement of the SRRB On the Land Program Manager, Lex Scully, was critical to the success of this workshop.

Presenters

Amélie Roberto-Charron

Landbird Biologist, Canadian Wildlife Service, Northern Region
Environment and Climate Change Canada / Government of Canada amelie.roberto-charron@canada.ca /
Tel: 867-669-4734
Biologiste des oiseaux terrestres, Service canadien de la faune, Région du Nord
Environnement et Changement climatique Canada / Gouvernement du Canada amelie.roberto-charron@canada.ca / Tél. : 867-669-4734

Hedwig Lankau, MSc.

ABMI Bioacoustic Unit
University of Alberta
Edmonton, Alberta, Canada
Cell: 780-868-1909
E-mail: hedwig@ualberta.ca

David Evans, P. Biol.

Field Coordinator
Alberta Biodiversity Monitoring Institute
InnoTech Alberta
Hwy 16A & 75 St, Vegreville, AB T9C 1T4
Cell (587) 280-0208
E-mail David.Evans@InnoTechAlberta.ca

Alexa (Lex) Scully

On the Land Program Manager
Sahtú Renewable Resources Board
www.srrb.nt.ca
<http://www.facebook.com/SahtuWildlife>
Email: otl@srrb.nt.ca
Phone 867-588-4040

Participants

Eleven participants completed the entire workshop. Local leadership selected which community members attended the workshop. All participants were current residents of Fort Good Hope.

Participant feedback was generally positive. We had one participant volunteer that he emphasized this was a particularly useful workshop. Another commented that it was nice the days were not too long. A few elders stopped by to chat with us and observe. They also indicated interest in the content and saw value in community members being involved in monitoring. Our observations were that participants were enthusiastic about collecting data, especially the wildlife camera photos. They also took an interest in the bird song identification resources and many left very interested in looking up local birds. All participants were able to successfully complete equipment deployment protocols upon completion of the workshop.

At the end of the workshop, participants requested training certificates. We made and sent out a certificate of participation documenting that the participants had done the following training:

- 2 hours Acoustic Recording Unit field deployment
- 2 hours Wildlife Camera field deployment
- 2 hours photos and file management,
- 2-hour introduction to the WildTrax platform for wildlife camera photo tagging
- 2-hour introduction to using the WildTrax platform for transcription of bioacoustic recordings

Location

The workshop was held in Fort Good Hope, NWT in the SRRB building. The venue was set up with desks, a smart board and speakers. This equipment made presenting easy. The forest immediately behind the building made a good location for participants to practice setting up the equipment. Given that the temperatures were around -25 to -30 C, it was nice not to have to travel far for this component of the workshop.

ABMI and CWS staff stayed at a local bed and breakfast. Lex Scully rented a vehicle from a community member to travel within the town.

Workshop Content

The workshop was broken up into the following sections:

Digital Literacy for Using Environmental Sensors

The presentation on digital literacy guided participants through a few exercises to review computer tasks needed for the rest of the workshop. We went over basic laptop skills including using file explorer. We used internet browsers to look up information on bird and mammal species. We showed participants how to do the CIRA internet performance test (<https://performance.cira.ca/>) to check their internet connection. This is important because the data uploading and processing requires sufficient upload and download speed. Lastly, we told the participants about the program Audacity. Audacity is a free program that anyone can use to look at sound recordings. We thought it would be nice if anyone wanted to look at sound recordings and spectrograms at home rather than use WildTrax solely.

Introduction to Sensors

This presentation covered general information about wildlife cameras and ARUs. We discussed the benefits and challenges of using this new technology. We gave examples of research applications for both wildlife camera and ARUs.

Wildlife Camera Deployment

This presentation covered all the information required for field deployment of Reconyx brand cameras. We brought 6 wildlife cameras so that participants could work in pairs and practice basic camera functions in the classroom. Later we went outside, and participants worked in groups to set up cameras outside. We described how there are different ways to attach cameras to trees and to set them up in different habitats.

ARU Deployment

The workshop segment on ARU deployment covered all the information for using SM4 model Song Meters (made by Wildlife Acoustics) in the field. We covered different ways to set up ARUs (trees, tripods) and basic supplies needed for field work. After practicing basic ARU functions in the classroom, participants set up ARUs outside along with the wildlife cameras. In addition, we explained why unique naming of survey locations is important: by using the file naming function of the ARU, it is possible to have every file uniquely labelled so that it can be stored and linked back to the location where the data was collected.

Data Management

In this section, we walked participants through copying data from memory cards to the computer. For the wildlife camera photos, we provided a sample data set that they could copy to the computer and upload to the WildTrax website. We explained how the process for ARU sound recordings is similar, but the data files are too large to be uploaded via the website. The ARU data need to be sent to the University of Alberta to be uploaded to the secure servers before being available on the WildTrax website. As part of this section, participants were shown how to create a WildTrax account so that they could upload photos and access the training materials.

Camera Photos Tagging

Participants navigated back to the wildlife camera section of WildTrax. Then we walked them through how to process the photos. They learned how to take photos without wildlife different from those with wildlife and how to apply species tags.

Bioacoustic Recording Transcription

We started this section by teaching participants to access online bird song identification resources. We focussed on using Dendroica (<https://www.natureinstruct.org/dendroica/>), which has both photos and multiple recordings of bird calls. Next participants logged into the ARU section of WildTrax. We went to the demo project, selected individual tasks (recordings) to listen to and practiced how to use the analysis page to tag recordings.

Success and Challenges

Overall the workshop was successful in training participants in how to deploy the field equipment and for introducing them to the WildTrax platform. Preparation of printed materials (user manuals and presentations), computers, and field equipment in advance helped facilitate a flexible approach to the pace and schedule of the workshop. If participants had more questions or needed more time for a specific topic, we were able to accommodate that.

Several elements of the workshop contributed to its success. First, we focussed on making the workshop as hands-on as possible and on breaking up the presentations with activities. For example, participants were able to practice turning on the wildlife cameras in the classroom as we went through the instructions in the presentation. Secondly, having participants work in pairs for the computer related tasks worked out well because those who were more comfortable with digital technology could help those who were not as used to it. We also gave participants regular breaks so that they could stretch their legs and get coffee. Taking an hour for lunch was also important so that those with children could go home. Lastly, Having two ABMI staff taking turns presenting was successful because the second person could walk around the room and help participants with activities while the other presented.

Because the community had not collected any data yet, supplying the training data was important. This allowed us to give them hands on practice in uploading camera photos to WildTrax and tagging the species in the photos. The practice ARU recordings gave people a basic introduction to identifying and tagging birds in the recordings. An important component of the audio recording training was spending time on bird song identification and the basic concepts of how sound can be visualized using a spectrogram. We showed participants how species sound different and have unique visual patterns as well.

Several opportunities to improve future training initiatives were identified. These include:

- Improvement of training datasets: The data used in this training were either from the southern NWT (for birds) or Alberta (for cameras). Future training data should include a better representation of common local species through the development of standard NWT training datasets with representative data from different habitats. T
- Streamline WildTrax account set up: There were a few challenges with having participants create and use their own WildTrax accounts and uploading camera data to their account. We had guest accounts set up in advance so that all participants were able to use WildTrax; however we will need to work internally to streamline the process of account creation.

Agenda

Day 1: 11 February 2020

Time	Activity
9:00 AM	Prayer/Introductions
10:00 AM	Brief Workshop Overview
10:20 AM	BREAK
10:40 AM	Why are we here (Lex Scully, SRRB)

11:20	Monitoring in Tuyeta past, present and future (Amélie Roberto-Charron, CWS)
12:00 Noon	Lunch Break
1:00 PM	Digital Literacy for using environmental sensors (Hedwig Lankau, Bioacoustic Unit)
2:30 PM	BREAK
2:45 PM	Digital Literacy for using environmental sensors (Hedwig Lankau)
3:00 PM	Introduction to Environmental Sensors (Hedwig and Dave Evans, ABMI)
3:00 PM	How to deploy Cameras and ARUs (Dave and Hedwig)
4:00 PM	Optional: Creating Settings Files for ARUs and Cameras (Hedwig and Dave)

Day 2: 12 February 2020

Time	Activity
9:00 AM	Check in, time for questions
9:20 AM	How to deploy Cameras and ARUs (continued) (Dave and Hedwig)
10:15 AM	Break
10:30	Meet to get ready for field deployment
10:00 AM	Deploy and Retrieve Cameras and ARUs (Dave and Hedwig)
12:00 Noon	Lunch Break
1:00 PM	Deploy and Retrieve Cameras and ARUs if more time is needed, otherwise start with data uploading (Hedwig and Dave)
2:30 PM	BREAK
2:45 PM	Camera and ARU Data Uploading Workflow, will provide sample data
4:00 PM	End for day

Day 3: 13 February 2020

Time	Activity
9:00 AM	Check in, time for questions
9:20 AM	Introduction to WildTrax Camera Platform (Dave Evans, ABMI)
10:20 AM	BREAK
10:40 AM	Using WildTrax Camera Platform (Dave Evans, ABMI)
12:00 Noon	Lunch break
1:00 PM	Introduction to WildTrax Transcription (Hedwig Lankau, BU)
2:00 PM	Using WildTrax Transcription Platform (Hedwig Lankau, BU)
2:30 PM	BREAK
2:45 PM	Using WildTrax Transcription Platform (Hedwig Lankau, BU)
3:15 PM	Wrap Up
4:00 PM	End of Workshop