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SECONDMENT REPORT: Exchanged knowledge and best practices on biodiversity monitoring through large carnivore fieldwork between Yucatan State and British Columbia Province

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BRITISH
COLUMBIA



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INTRODUCTION

DESCRIPTION, CONTEXT AND OBJECTIVES

The government of Yucatan is currently working with biodiversity monitoring, specially of large carnivores or umbrella species like jaguars (an emblematic specie for the region), aiming to accelerate the effective conservation and regeneration of biodiversity and ecosystem health by strengthening the monitoring, conservation, and understanding of the effects of climate change on priority ecosystems and species in the State and within the Peninsula. Therefore, it was important to get to know how peers are working in biodiversity monitoring, managing data and how to improve monitoring work.

The secondment funded by the Under2 arranged travel for two government staff members of Yucatán to the peer Under2 member government of British Columbia with the expectation of furthering knowledge and best practice exchange on biodiversity monitoring through large carnivore fieldwork. The Government of Yucatan, British Columbia and Climate Group collaborates to facilitate knowledge and best practice sharing, enhance engagement within the coalition and showcase the outcomes to the wider coalition.

The secondment took place from June 30th to July 16th, 2023, in the Province of British Columbia visiting the cities of Vancouver, Castielgar, Nelson, East Kootenys, and Victoria, where they could go on field work with pairs to later have meetings where they can exchange information on biodiversity monitoring.

The main objectives of the secondment were:

- Exchange knowledge and best practices on biodiversity monitoring through large carnivore fieldwork.
- Build capacity to improve the strategy for ecosystem conservation and restoration that Yucatan already has through public policies and programs, community engagement and biodiversity monitoring for the State of Yucatán, Mexico.
- Developed a long-standing bilateral relationship to enable further collaboration withing the two members Yucatan and British Columbia.

DAY 1

VANCOUVER - June 30th, 2023

On the first day it was mainly traveling but they had the opportunity to stay that night on Vancouver where they were able to see Capilano Suspension Bridge Park at North Vancouver which committed to preserving and presenting its history, culture, and

nature. They could see an ecosystem that is different from the one they used to and to see how they have sustainable use of natural resources such as this natural park.



DAY 2

CASTLEGAR-NELSON - July 1st, 2023

On the morning of the second day, the Yucatan team traveled from Vancouver to Castlegar. On their arrival they met with Garth Mowat, the specialist in large carnivores, and Marie Odille who picked them up at the airport and spent the night at their house. They talked about the work and activities that each one does in their units, on their regions and in their respective departments, including the different biodiversity monitoring projects being conducted in Yucatan as well as the "South Rockies Grizzly Bear Project" (SRGBP).

The Grizzly Bear monitoring project is conducted by the British Columbia Ministry of Forests, Lands, Natural Resources Operations and Rural Development together with local universities, volunteers, and other allies. Dr. Mowat talked to them about the monitoring activities that would be conducted in FlatHead Valley as part of SRGBP during the following week.

As part of this day, they also assessed equipment that would be useful in field activities such as bicycles and other gear needed. They also met Brendan Cell Wilson, Professor of Geographic Information Systems, Integrated Environmental Planning and Forest Technology at Selkirk College who talked to them about the research projects they are doing with the support of the master's students, including the identification of the status of forest harvesting zones.

During this day they also get to know the city of Nelson and attended a small festival in Rotary Lakeside Park to commemorate the anniversary of Canada's independence. They got to try a variety of gastronomic samples and experience an exhibition of local musicians, where they got to know part of the culture and traditions of Canada.





DAY 3

NELSON - July 2nd, 2023

During this day, the team spent the day preparing and packing everything they needed for the week of field work in FlatHead Valley, for this they separated all the necessary clothing and accessories. Dr. Mowat helped them to get special clothing such as coats, pants and boots since the weather conditions were quite different from those in Yucatan.

As part of the preparations Dr. Mowat asked the Yucatan team to watch a short training video called "Staying Safe in Bear Country" which deals with the behavior that a person should have in case of direct contact with a bear, as well as the protocol that should be followed to be safe. Also, the Yucatan team was given a bear repellent spray as part of their safety and work equipment.

This day was also dedicated to defining the logistics of the field work for the entire week, which consisted of dividing the entire work area into eleven sections to be monitored.

The complete field team was Dr. Garth Mowat, Laura Smith Wildlife Technician, Toshio Yokoyama, Director of Natural Resources Management and Conservation of the Government of Yucatan and Esteban Ramirez Project Leader of Natural Resources Management and Conservation of the Government of Yucatan.

During these next days, three main monitoring activities we conducted:

1. Camera traps maintenance: Information collection, maintenance (change of memory cards, batteries or even equipment, cleaning of the site) and data collection (camera position, distance from the road, camera height, battery percentage, camera angle, among others).
2. Rub trees check (trees where bears rub on): Collection of hair samples (for later DNA analysis in the laboratory), maintenance of wire for hair collection, superficial burning of the bark (to eliminate traces of past DNA), placement of bait and data collection (count how many samples were found, location of the trees, how often they were burned, with what substance the bait was placed, among others).
3. Buffalo Berries counting: Identification of the bushes to be sampled, counting of berries, data collection (height and width of the bush, number of branches, number of berries, condition of berries, vegetation cover, among others).

All these activities were recorded into an app that will later collect all necessary data for analysis. The data collected was the location of the sample, or camera, who pick it

up, conditions or particulars of the recollection, as well as the particular of each activity mentioned above.

This day they also visited Slocan Lake, particularly the Valhalla Provincial Park area, where they hiked the trails of the reserve to learn about the ecosystem where there will be working and about how the Government of British Columbia oversees the management, administration, and surveillance of nature reserves.





DAY 4

EAST KOOTENYS - July 3rd, 2023

On this day, the team made the trip to the fieldwork site at FlatHead Valley in the South Rockies Mountains, East Kootenys. They met with Laura Smith and began the trip, which involved a stop in Cranbrook to purchase food and supplies for the week. They arrived at the camp around 4:00 pm, unpacked and installed all their equipment in the cabins and started cleaning the facilities.

Later that day they took a walk in the surrounding areas of the camp for reconnaissance of the area, especially for the Yucatan team. In the path of these trails was the first of the camera traps so they collected the information and then reviewed the first images in the cabin.

Finally, they reviewed and defined the final logistical details for the following days and how the team would be divided into pairs to take walks covering two sections of the work area per day, each pair was made up of a local specialist and a member of the Yucatan team, alternating each day.







DAY 5

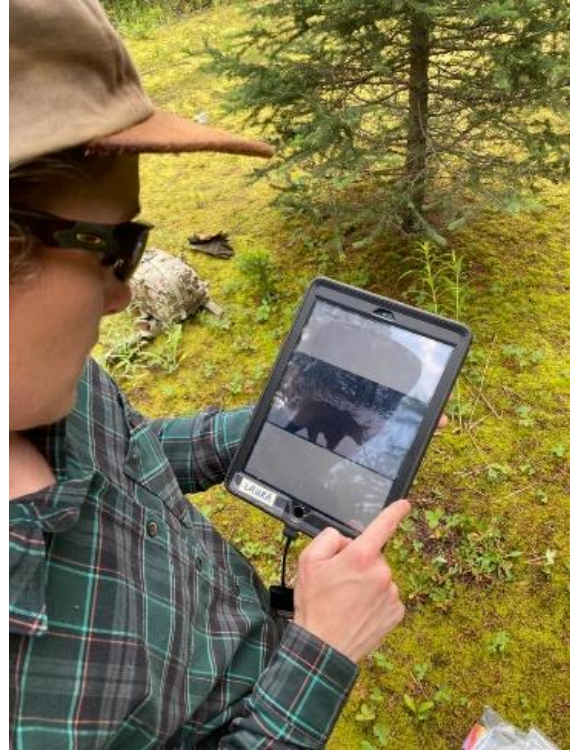
EAST KOOTENYS -July 4th, 2023

This was the first day of sectional work. The teams were divided as follows for the day: Team 1 Garth Mowat and Toshio Yokoyama and Team 2 Laura Smith and Esteban Ramirez.

On this day, the teams visited several points of Camera traps and Rub Trees, in this case the access to the section was by vehicle and we hiked to reach the points of interest. We performed the activities mentioned above in the logistics of work and identified traces of wildlife such as wolves, deer and directly observed an individual black bear.







DAY 6

EAST KOOTENYS - July 5th, 2023

On the second day of work by sections. The teams were divided as follows: Team 1 Garth Mowat and Esteban Ramirez and Team 2 Laura Smith and Toshio Yokoyama.

The teams visited the Camera Traps, Berry Counting and Rub Trees. The access to the sections was by vehicle and then hiked to reach the points of interest. During the morning after leaving the camp we observed Grizzly Bear tracks around five hundred meters from the camp.

At the end of the day's work, a bonfire was made during dinner for the team to get together and talk about the work experience so far.







DAY 7

EAST KOOTENYS - July 6th, 2023

This was the third day of work by sections. The teams were divided as follows: Team 1 Garth Mowat and Toshio Yokoyama and Team 2 Laura Smith and Esteban Ramirez.

The teams took this day they visited the points of Camera Traps, Berry Counting and Rub Trees, on this day the access to the sections was by vehicle, they hiked as well as cycled around 6km to reach the points of interest, they performed the activities mentioned above in the logistics of work. The team also had to cross a river in Elko Valley to get to two berry counting points.





DAY 8

EAST KOOTENYS - July 7th, 2023

This was the fourth day of section work. This time they were organized into a single team formed by Garth Mowat, Laura Smith, Toshio Yokoyama, and Esteban Ramirez.

On this day we visited the points of Camera Traps, Berry Counting and Rub Trees, the access to the sections was by vehicle and then we hiked to reach the points of interest, we conducted the activities mentioned above in the work logistics. This day was the last day of work for Laura Smith due to other activities scheduled as part of the project.

The team also had to collect and cut firewood to maintain a warm temperature during the night in the cabin due to the drop in temperature.







DAY 9

EAST KOOTENYS - July 8th, 2023

This was the fifth and last day of work by sections. This time they were organized into a single team formed by Garth Mowat, Toshio Yokoyama, and Esteban Ramirez.

On this day we visited points of Berry Counting and Rub Trees, the access to the sections was by vehicle and we hiked to reach the points of interest, we conducted the activities mentioned above in the logistics of work.

We also visited a site where forestry use was

conducted and observed the actions that must be taken to mitigate the negative impacts that this activity generates. As part of the field work, we also visited a waterfall area where wildlife comes to drink water and cool off. Several deer, a pair of beavers and a black bear were observed.

On the same day, the camp was cleaned, and the main cabin was maintained for the correct functioning in future field work (repair of the connection to the solar panel, repair of the refrigerator gas leak, fixing up the cabin with paint).





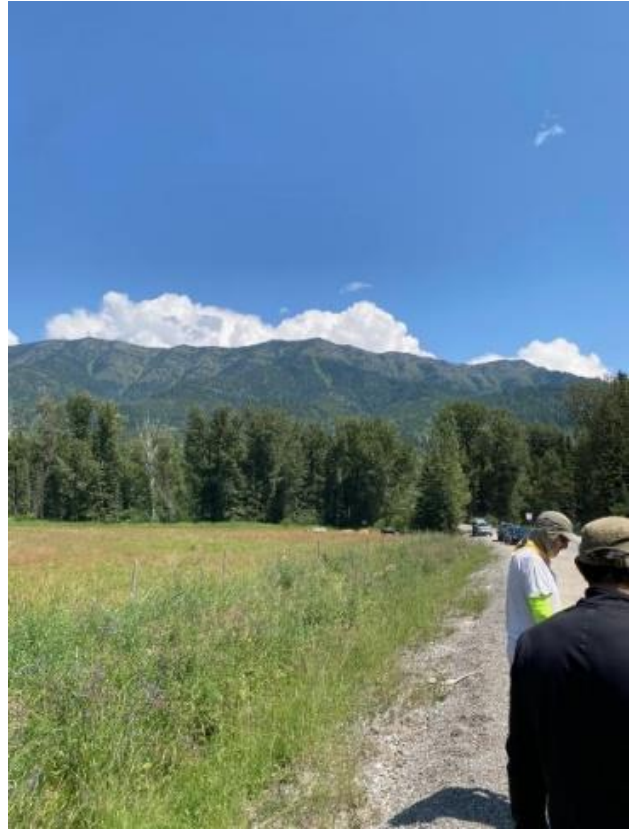
DAY 10

EAST KOOTENYS - July 9th, 2023

During the morning of this day, everyone's luggage and equipment was gathered, and a final cleaning of the facilities was done. After that, a final count of berries was made and the journey back to Dr. Mowat home began.

After arriving at the destination point at approximately 4:00 pm, they unpacked and sorted the equipment, and the rest of the afternoon was spent resting from the long trip.

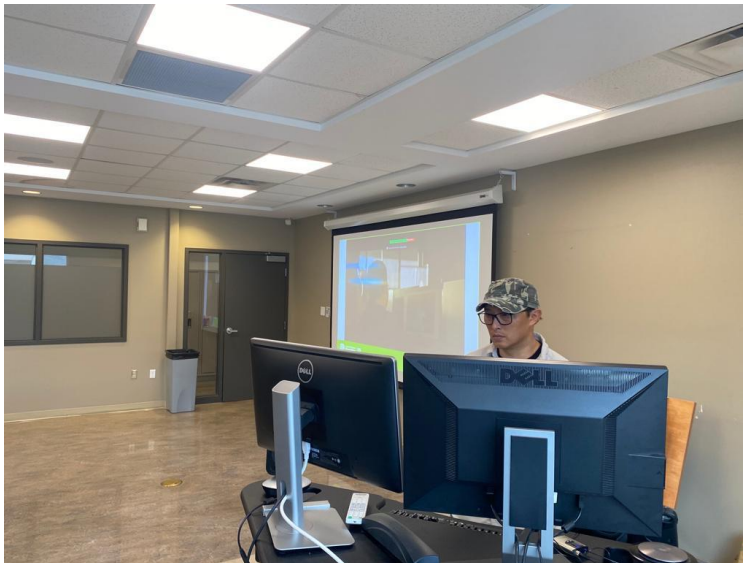
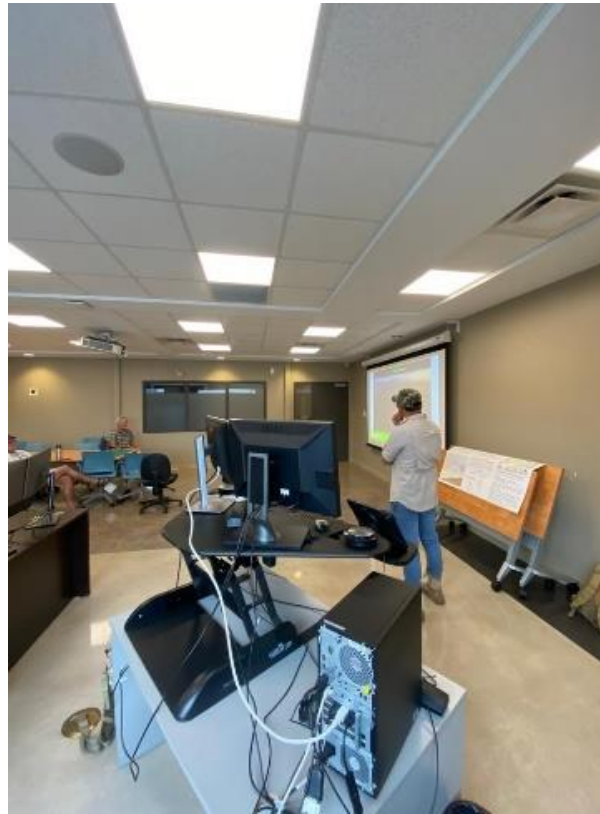




DAY 11

CASTLEGAR - July 10th, 2023

On this day, a visit to Selkirk College was planned along with Professor Brendan Cell Wilson, who gave them a tour of the facilities and told them about the university's study and exchange programs. Afterwards, a talk was given to Master and PhD students about the biodiversity monitoring projects being conducted in Yucatan. There was an exchange of ideas with the students about what actions related to Geographic Information Systems could be applied in these projects.



DAY 12

NELSON - July 11th, 2023

This day we visited the facilities of the Ministry of Forest, Lands, Natural Resource Operations and Rural Development in Nelson where there was a presentation of the actions that Yucatan conducts for biodiversity monitoring, in each of the topics there was an exchange of ideas and experiences with experts from the ministry.

Data from the monitoring conducted in Yucatan was shared in order to be able to make an analysis with the tools used by the Ministry of British Columbia and have a new perspective of the data.

In the evening Dr. Mowat organized a dinner with his family, as a farewell for the Yucatan team, they talked about the importance of the actions that each of these institutions conduct in their countries and how they can support each other. They thanked each other for the fruitful days of work and talked about how to organize next steps of collaboration to increase and improve biodiversity monitoring actions.







DAY 13

VICTORIA - July 12th, 2023

During the morning of this day the Yucatan team finished packing their belongings and departed for Castlegar airport to get to their next destination, Victoria. It was a long trip because there were two flights, Castlegar-Vancouver and then Vancouver-Victoria with a long waiting time between the connections.

They arrived at Victoria around 3:00 pm and were met by Ann Eastman from Intergovernmental Relations of British Columbia. She gave them a short tour of downtown Victoria to identify places to eat and visit, told them the logistics of work for the next day and left them at their hotel so they could unpack and get some rest.



DAY 14

VICTORIA – July 13th, 2023

This day they visited the offices of the Ministry of Forest, Lands, Natural Resource Operations and Rural Development in Victoria and held a Biodiversity Research and Policy Forum British Columbia- Yucatan, where we presented the different topics in which Yucatan monitors Biodiversity (sea turtles, crocodiles, migratory birds, fauna in caves and cenotes, community monitoring and the Tech4Nature project) as well as the Biodiversity Recovery and Conservation Strategy that seeks to recover and preserve ecosystems, which seeks to promote restoration projects and address the emerging issue of the Voluntary Carbon Market in Yucatan.

Later in the forum, they presented projects being carried out in British Columbia such as the Together4Wildlife Strategy, BC Parks INaturalist, B.C. Conservation Data Centre, Modelling Forest Characteristics for Forest and Habitat Management, Atmospheric River 2021-Ecosystem Recovery, Mesocarnivore Monitoring in BC (Fishers), Socio-Economic Analysis Decision Support Tool for Fisher Management, Ecosystem Health Biodiversity Framework.

There was an exchange of experiences and knowledge with the speakers (Avril Nagel-Manager, Sharilynn Wardrop-Manager, Jacqueline Clare-Manager, Lea Gelling-Program Zoologist, Tyler Muhly-Team Lead, Mark Phillipotts- Aquatic Habitat Recovery Coordinator, Joanna Burgar-Carnivore Conservation Specialist, Marian Weber-Manager and Sagarila Saha-Director) and discussed how these tools could be applied in Yucatan, followed by a friendly lunch and during the afternoon the Yucatan team took the opportunity to visit Victoria's Downtown and Harbor.





DAY 15

VICTORIA - July 14th, 2023

During the day the Yucatan team met with Eddy Adra- Chief Executive Officer and Meghan Saunders Senior Project Manager of Coast Funds and Merv Child Executive Director at Nanwakolas Council to discuss the Finance Project For Permanence for Great Bear Rainforest what are the lessons learned and experiences they had in starting this project 20 years ago and recommendations to follow for the PFP project for State Natural Protected Areas that is just beginning in Yucatan.

In the evening the Yucatan team was invited to a dinner with Biologists (Eric Loffrot-

Boreas Ecological, Scott Yaeger- Fisher Conservation Program Lead, Chris Ritchie- Caribou Conservation Alliance, Hellen Davis-Artemis Wildlife Consultants) who work in Private Initiative and the Government of British Columbia for an exchange of knowledge and experiences they have had in their different areas of work and to share with them about the Yucatan projects.

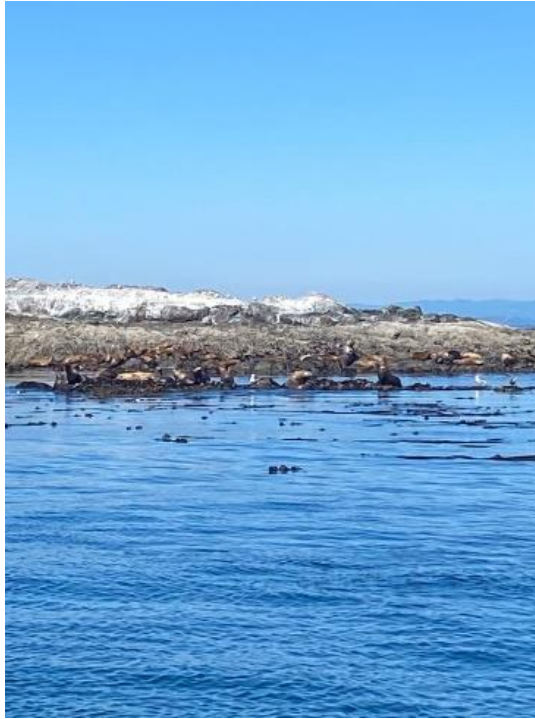


DAY 16

VICTORIA - July 15th, 2023

During this day, the Yucatan team took the opportunity to sightsee and get to know Victoria's Downtown and Harbor, as well as take a tour to see humpback whales, orcas, seals, and sea lions, with this tour they were able to observe good practices for sustainable tourism use of natural resources, always respecting the space and dynamics of wildlife and the territory of the First Nations.





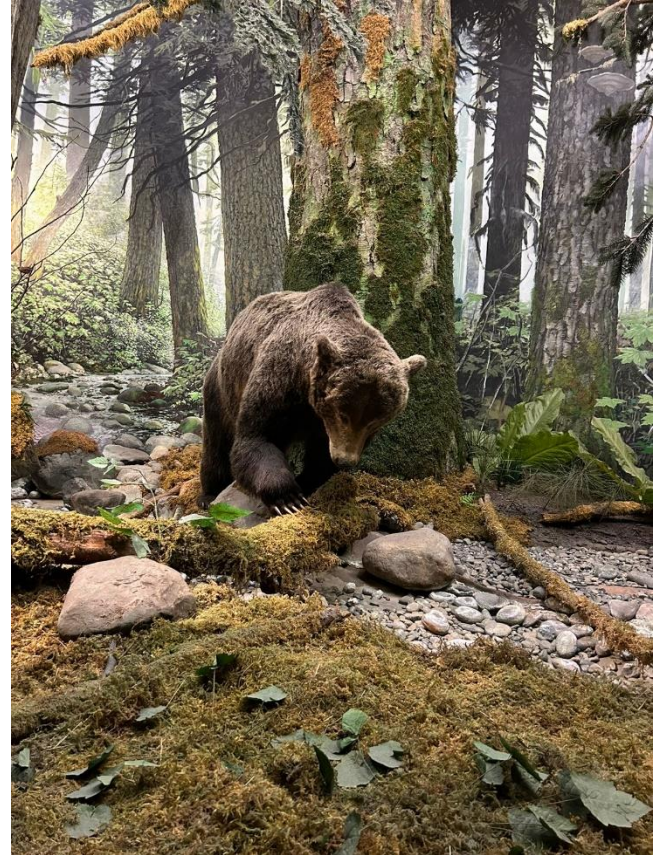
DAY 17

VICTORIA - July 16th, 2023

During the morning of this day the Yucatan team visited the Royal BC Museum where they learned a little about the culture and importance of the First Nations as well as the natural history of the ecosystems in the area.

After lunch, the team transferred to Victoria airport where they began their return trip back home, arriving home in the morning of the following day.





CONCLUSION

TECHNICAL INFORMATION AND LEARNINGS

The secondment helped us a lot because we realized that the way we store and manage our data could be improved significantly. We are learning how to store data properly and how to collect it in a more standardized way. For example, when you check a camera trap, you have to check the information like where the camera was located, register the camera number and peculiarities, collect the SD card, save the information, change the SD card and check the batteries, the distance at which the camera was placed, the angle at which it was placed, if the terrain needs to be cleaned, and so on. All these actions are recorded in a form within an application. We learn the importance of keeping a proper record of these peculiarities. For example, this camera has been using the same batteries for 4 months, so maybe next time it would be better to change them because they have been there for a long time.

Since we returned to Yucatan, we have applied this to our monitoring. For example, we realized that we had to check not only the batteries, but the whole camera, because this check helps us notice if there is a camera that could fail, not now, but in the future, and information could be lost. Now we have a record of all our cameras,

their peculiarities, and the peculiarities of the terrain. We also now know the easiest way to organize all the collected data, from organizing the information into folders by year, then by month, and then the information from each camera in its own folder. We also learned that we could not just have this information on 1 hard drive because if we lost it, we would have no backup. So now our internal process is that we store the information on three different hard drives to make sure that we have all the information backed up on not just two but three different computers.

They show us that they use a software application that gives each of the photos a code and can also identify the species. They said they upload the information, like a on cloud, and this software automatically helps them to detect the presence or absence of an individual. What we need to check is whether this software can be used for the region and whether it is adapted to the local species here or not, or to the ecosystems here, whether it has problems with the type and abundance of vegetation that we have or not. Something that was remarkably interesting to us was that they told us that since they had identified presence or absence with the software, there were photos with presence that they uploaded to a public cloud. Then they organized special events where the cloud is open to the public so that anyone can go in and help them identify the species. Of course, this will then be checked by specialists to confirm the identification, but this can reduce the workload and save a lot of time for the researchers, which is a great idea!

The BC team showed us that the biodiversity monitoring they already do is specific to bears. So it could be that the camera takes 10,000 photos, but in the end, they are only going to use 5 or 10 photos. So, what do they do with all the other information that has already been captured and is not going to be thrown away or deleted? They upload it to the government's public clouds so that anyone who is doing research with wolves, rabbits, deer, or any other species that was captured by the camera can use that information or take that information. Something incredibly good for conservation and research that we also think we could implement and use to feed the Biodiversity Observatory of the Yucatan State Government. We are thinking of creating a platform where all this information can be made available to the public.

Another interesting thing was that they have a data generation department just for conservation. They generate data only for conservation issues, like tracking natural resources, ecosystem information, degradation, among others that are relevant information for decision making. Here in Yucatán, we get data from other institutions, like scientific institutions or NGOs. But it is not always information that easy to obtain or that could take a lot of time to get it. So, as a state government, we have an estimate number, but we do not have a study or a process or data that we can use for decision making. We believe that with the structure and the information that they have from this department, they are generating information that can be used later to

make conscious decisions or develop public policy based on more accurate information. It would be great if we could have such a department in Yucatan.

The biggest difference we have noticed during this secondment is the consideration of the economic situation of both countries, because there is a big difference in financial resources for some issues.

The Yucatán team was also able to share information about the state's natural protected areas, as well as the biodiversity monitoring projects, they are currently working on, such as sea turtle monitoring, crocodile monitoring, migratory bird monitoring, cenote and cavern biodiversity monitoring, biodiversity community monitoring with their Voluntary Designated Areas for Conservation, and Tech4Nature biodiversity monitoring. As well as the Ecosystem Conservation and Restoration Strategy being developed by the Secretariat of Sustainable Development of the Government of Yucatán to promote restoration projects and address the emerging issue of the Voluntary Carbon Market in Yucatán.

Some of the data like pictures and videos from the Camera Traps in Yucatán was sent to the British Columbia team for them to help with the better use and management of data that was taught during the secondment.

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