

Cassiar Stone's Sheep Project – Health Assessment and Habitat Use – Year 3 June 2020 Update

2020 Accomplishments and Goals:

Research team continues to download GPS data, conduct analyses, summarize health conditions, write-up findings, and communicate research

January

✓ Oral presentation at the SCI - Northern Alberta Chapter Horn Scoring Event in Edmonton, AB

February

✓ Collaboration with University of Alberta USchool to create a workshop for elementary school students in the Edmonton Area

March

✓ Oral presentation at R.E. Peter Conference in Edmonton, Alberta
✓ Oral presentation by Bill Jex at the Wild Sheep Society of BC
✓ Oral presentations for BCTWS and ACTWS 2020 Conferences
*March events were cancelled due to COVID19 pandemic

April

✓ Poster presentation for the Northern Wild Sheep & Goat Council Symposium 2020 in Canmore, AB
*Postponed due to COVID19 pandemic
✓ First project update of Year 3

May

✓ Estimate lambing events by analyzing movement behaviours of GPS-collared ewes

June

✓ Lamb survey fieldwork cancelled to comply with COVID19 prevention
✓ Continue lambing estimations

July

✓ Field work to retrieve trail cameras and GPS-collars in mortality
✓ Analyze trail camera pictures

August

✓ Dr. Caeley Thacker anticipated M.Sc. defense and thesis completion

September

✓ Field work to retrieve remaining GPS-collars
✓ Webinar for ACTWS members on Stone's sheep habitat selection

October & November

✓ Presentation at the Northern Wild Sheep & Goat Council Symposium 2020 in Canmore, Alberta

December

✓ Grace Enns anticipated M.Sc. defense and thesis completion

Despite the dramatic changes the COVID19 pandemic has had on the world, our Cassiar Stone's Sheep Project heads into its third summer and continues pushing forward! Our lead researchers, Dr. Caeley Thacker (University of Calgary, Veterinary M.Sc. student), Grace Enns (M.Sc. student, University of Alberta), Dr. Helen Schwantje (Provincial Wildlife Veterinarian), and Bill Jex (Provincial Wild Sheep & Mountain Goat Specialist), continue to work remotely on data analyses, writing up research findings, planning summer fieldwork, and organizing project outreach. COVID19 may have had most of us staying inside, but that's definitely not the case for our collared sheep! Take a look at our 11 collared ewes moving around the Cassiar Mountains over the past two months (Figure 1)!

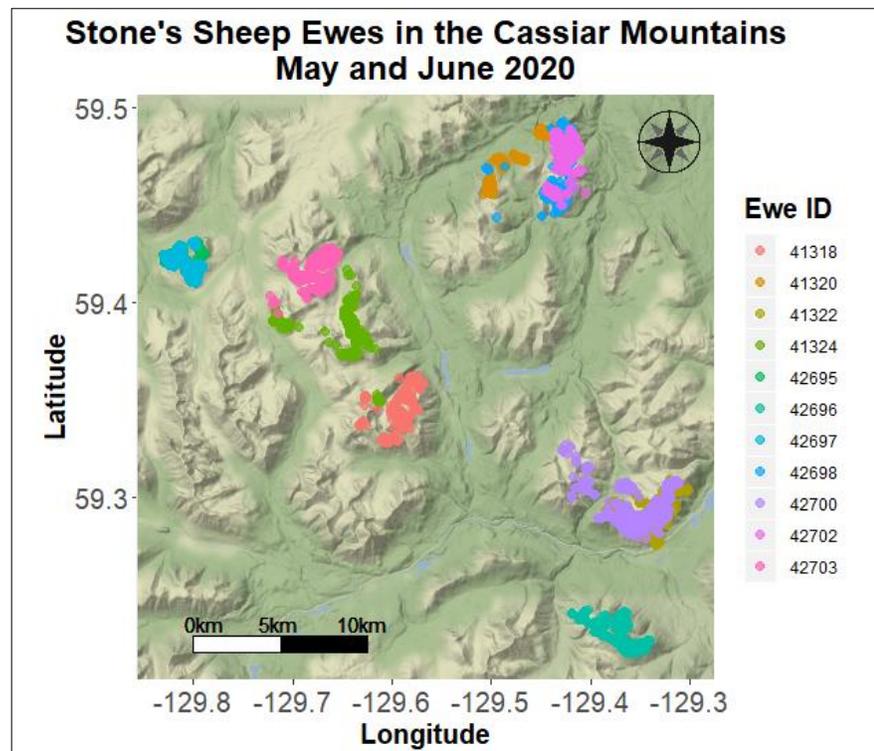


Figure 1. GPS locations from 11 GPS-collared ewes in the Cassiar Mountains from May 1st to June 20th, 2020.

2020 Field work

Fieldwork planning is well underway for our third summer field season! Since our last project update in April 2020, we have made the difficult decision to cancel our lamb surveys to reduce the risk of one of us travellers transmitting COVID19 to the communities of Dease Lake and Good Hope Lake; this was one of multiple fieldwork tasks scheduled this summer. Fortunately, we still plan for most field activities to be completed this summer by project lead, Bill Jex, along with Dease River First Nation Wildlife/Land Guardians. These activities include retrieving GPS collars in mortality mode, and collecting the ten trail cameras we previously deployed on high-trafficked sheep trails

throughout the Cassiar Mountains. In late July 2020 we will analyze the trail camera photos for the presence or absence of a lamb-at-heel with our GPS-collared ewes. Identifying ewes with and without a lamb-at-heel will better inform our understanding of Stone's sheep ewe habitat selection.

Our final fieldwork of the year is scheduled for September 2020 and consists of dropping and retrieving all remaining GPS-collars. Currently, 12 out of the 20 GPS-collars deployed in 2018 (n=4/9) and 2019 (n=8/11) are functioning well and continue to collect location data. After retrieving these collars in September, our project will have collected relocation data from Cassiar Stone's sheep every one or two hours over a period of 30 months; this project is one of the first in BC to use such a high fix-rate. These data will be used by the research team to better understand habitat selected by Stone's sheep ewes during various seasons in the Cassiar Mountains, with a very high degree of certainty. In future we can also use this data to better understand fix-rate limitations and habitat inferences, since many projects only use 6 hour fix-rates to help determine habitat selection, so this study will help greatly improve the understanding of trade-offs made between high fix-rates and battery life for scientific studies overall.

Habitat Use Update

One focus of our research is to investigate the timing of lambing events and the habitat characteristics selected for during lambing. Lamb fitness and survival can be improved or hindered depending on the date a lamb is born, and thus impact a herd's population dynamics. As we know, the Cassiar Stone's sheep population is relatively small and in an apparent decline, so our research on the lambing times and the habitat ewes occupy during lambing is essential to better understand possible limitations of their habitat and the sustainability of the Cassiar herd itself! We previously estimated the date and time of lambing events in 2018 and 2019, by analyzing the changes in each ewe's movement rates, determined from GPS locations and data assessed from the vaginal implant transmitters (VITs). Using this patterned information as a template, we can forecast if any of our collared ewes likely had lambs this year, even though we do not have VIT data to confirm it. Preliminary results for the 2020 lambing season have detected 6 out of 11 collared ewes have given birth between May 1 – June 10, with the approximate births occurring on May 13th, May 16th, May 18th, June 2nd, and two births on June 5th. We will continue to closely monitor ewe movement rates to estimate additional lambing events through until the end of June.



Figure 2. Bill installing a trail camera on a sheep trail used by our ewes. There were not many trees in the alpine, so for some sites we secured the trail cameras to large boulders using wire.



Figure 3. Stone's sheep ewe and lamb (not one of our collared ewes) in summer 2018. Photo courtesy of Krystal Kriss.

Health Assessment Update

Lead researchers, Dr. Caeley Thacker and Dr. Helen Schwantje, have been conducting a comprehensive health survey of thinhorn sheep that is linked to our Cassiar study. From 2017 to 2020 the team has captured and collected health samples from 46 Stone's sheep in the Skeena and Peace regions of BC, and 67 Dall's sheep in the Talkeetna and Chugach mountains of Alaska. Caeley has also analyzed samples from 63 hunter-harvested Stone's rams collected through a wildlife health monitoring collaboration between the Tahlthán Guide and Outfitters Association and the Province of BC initiated in 2016.

To date, *M. ovi* infections or exposure in live-captured Stone's sheep in BC have not been detected. There has also been little evidence of exposure to most bacterial and viral respiratory pathogens common to domestic small ruminants such as domestic sheep and goats, in Stone's sheep in BC. The research also examines non-infectious indicators of health, such as nutritional status, pregnancy, stress, and expression of specific genetic markers. Through this work we learned that Stone's ewes are not pregnant every year, but pregnancy rates are still within range of what has been previously reported for other thinhorn sheep populations. The findings suggest that Stone's sheep are relatively naïve to diseases carried by domestic ruminants and other wildlife species. Caeley's research provides a baseline for continued health monitoring to allow for early detection of disease introductions, chronic stress, nutritional limitations, or other factors influencing populations.

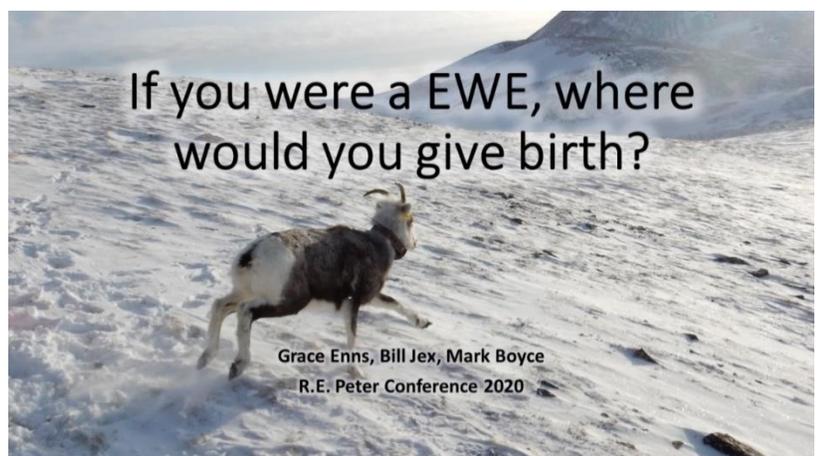


Figure 4. Collecting health samples from a Stone's ewe in the Cassiar Mountains in winter 2018. Field crew (l-R): Dr. Helen Schwantje, Dr. Caeley Thacker, Fraser MacDonald, Krystal Kriss (pilot Bill Oestreich, and Bill Jex not in phot). Photo courtesy of Bill Jex

Project Outreach Update

Our team has been working hard to share our work with the public, interested groups, funding partners and the scientific community to communicate our project's importance and research findings! Over the past 6 months, Grace has been collaborating with the University of Alberta's *USchool*, to create an engaging workshop designed for elementary students in grades 3-6 from Indigenous, rural and schools in low-income zones within the Edmonton Area. She held multiple workshops throughout the 2020 school semester, and each class left with knowledge on how to age sheep horns, what sheep poop really looks like, why sheep have two toes, and possibly a new career aspiration as a wildlife biologist!

In late January 2020, Grace presented on Cassiar Stone's sheep habitat use at the Safari Club International Northern Alberta Chapter's Horn Scoring Event. Additionally, Grace presented at the R.E. Peter Conference in Edmonton, Alberta on March 13th and received first place recognition for



her oral presentation titled, "If you were a EWE, where would you give birth?". On the weekend of November 8-9, Bill gave a presentation on the Cassiar Stone's sheep project at the Northern Wildlife Symposium in Dease Lake.

Our team was excited to share our work at the British Columbia Chapter of the Wildlife Society (BCTWS) and the Alberta Chapter of the Wildlife Society (ACTWS) Annual Conferences this March 2020, but these conferences were cancelled due to the COVID19-pandemic, as was our presentation to the Wild Sheep Society of BC at their AGM. Grace's presentation at the ACTWS Annual Conference has now been rescheduled as a public webinar in September 2020. Although the pandemic has made communicating our research more challenging, our team remains committed to sharing what we have learned from the Cassiar Stone's Sheep Project!

On behalf of our team, I would like to extend a huge thank you to our partners; the Wild Sheep Society of BC & the Jurassic Classic fundraiser, Wild Sheep Foundation & Outer Circle Bunch, Abbotsford Rod & Gun Club, Safari Club International Northern Alberta Chapter, BC Habitat Conservation Trust Foundation, University of Alberta, Northwest Guide Outfitter Association, Tahltan Guide Outfitters Association, the Province; and the Dease River First Nation people and Good Hope community. Without your continued support, interest and encouragement, this project would not be possible - thank you!

*Written by Grace Enns,
M.Sc. student, University of Alberta*