

PAWS SUMMIT Proceedings



October 2020

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Introduction

Population Assessment of the World's Snow leopards (PAWS) is a collective initiative led by the 12 snow leopard range countries' governments with support of several partner organizations. It is coordinated by the Global Snow Leopard and Ecosystem Protection Program (GSLEP). Serious concerns regarding our understanding of the global population status of snow leopards were raised in the 2017 Bishkek Declaration, which was jointly endorsed by the snow leopard range countries. Subsequently, a PAWS [Action Plan](#) was prepared and a technical oversight panel was constituted by the GSLEP Steering Committee. The mandate of the panel was to oversee the goal of achieving robust global snow leopard population estimates by 2022.

2020 marks the mid-point of the implementation of PAWS. A virtual PAWS Summit was organized, on the sidelines of the GSLEP Steering Committee Meeting, to accelerate the rigorous assessment of snow leopard populations at the global level. **The PAWS Summit aimed** to bring PAWS partners including field practitioners, statisticians, snow leopard ecologists and Government representatives together in order to:

- Take stock of progress to date
- Provide a forum for problem solving and sharing PAWS best practices
- Look ahead to PAWS 2022

The Summit took place on October 29 and 30, 2020 and brought together range countries and organizations to showcase PAWS efforts so far, including survey efforts completed or underway since 2017. Using the [GSLEP Steering Committee online platform](#), partners from all snow leopard range countries and the world were able to join and share ideas. **This document summarizes the Proceedings from the PAWS Summit and related side events** and captures the key ideas that emerged during the events. Links to the presentations and meeting metrics are provided below.

1. PAWS Technical Advisory Panel meeting Oct 20th

[The PAWS Technical Advisory Panel](#) meeting took place on October 20, 2020. The meeting reviewed the PAWS progress in terms of survey coverage, capacity building efforts so far, and the development of methodological tools. Dr. Koustubh Sharma highlighted key gaps (including the possible bias in the coverage of contiguous rugged patches and high coverage of protected areas). The goals of PAWS were reviewed while emphasizing on how it could achieve wider goals- such as assessing conservation effectiveness across the range. The

importance of robust estimates at the country level was also stressed. Discussions about the PAWS Summit helped recognize this event as a unique opportunity to bring partners and countries together. Finally the Technical Advisory Panel proposed recommendation for a new member to the panel who could provide support for the genetic components.

2. GSLEP Steering Committee Meeting Oct 23rd

In preparation for the GSLEP Steering Committee Meeting, national focal points from the 12 snow leopard range countries were briefed about the progress on PAWS. They were requested to share consolidated information about PAWS Progress in their respective countries so it could be shared during the Steering Committee meeting. Information about PAWS surveys was received from national partners to be included in the consolidated update. **Appendix 1** outlines the format in which the data that was collated.

The Steering Committee Meeting included a dedicated segment on PAWS, where Dr. Justine Shanti Alexander presented the PAWS update based on the information shared by national focal points and other PAWS partners. Across all 12 snow leopard range countries, a total of 29 teams have been involved in conducting snow leopard abundance surveys. This represents 125 surveys sites- which have been identified by government and national teams and subsequently submitted to PAWS. Out of these, 79 surveys that met PAWS guidelines took place between 2017-2020. At a minimum these 79 sites cover roughly 133,300km²- which is approximately 6-10% of the currently known snow leopard distribution range. This is an extraordinary achievement- and Dr. Alexander stressed that a huge tribute was deserved to the many teams working at local and country level- contributing to this important program. As part of the PAWS initiative, there has been considerable progress in building the tools and capacities in each country- in snow leopard study design, planning and data analysis. Over 250 individual practitioners across the snow leopard range have been trained in PAWS best practices to date, and several training and capacity building toolkits have so far been prepared and uploaded on the GSLEP website. A number of methodological innovations and manuals have been developed in collaboration with experts from across the world.

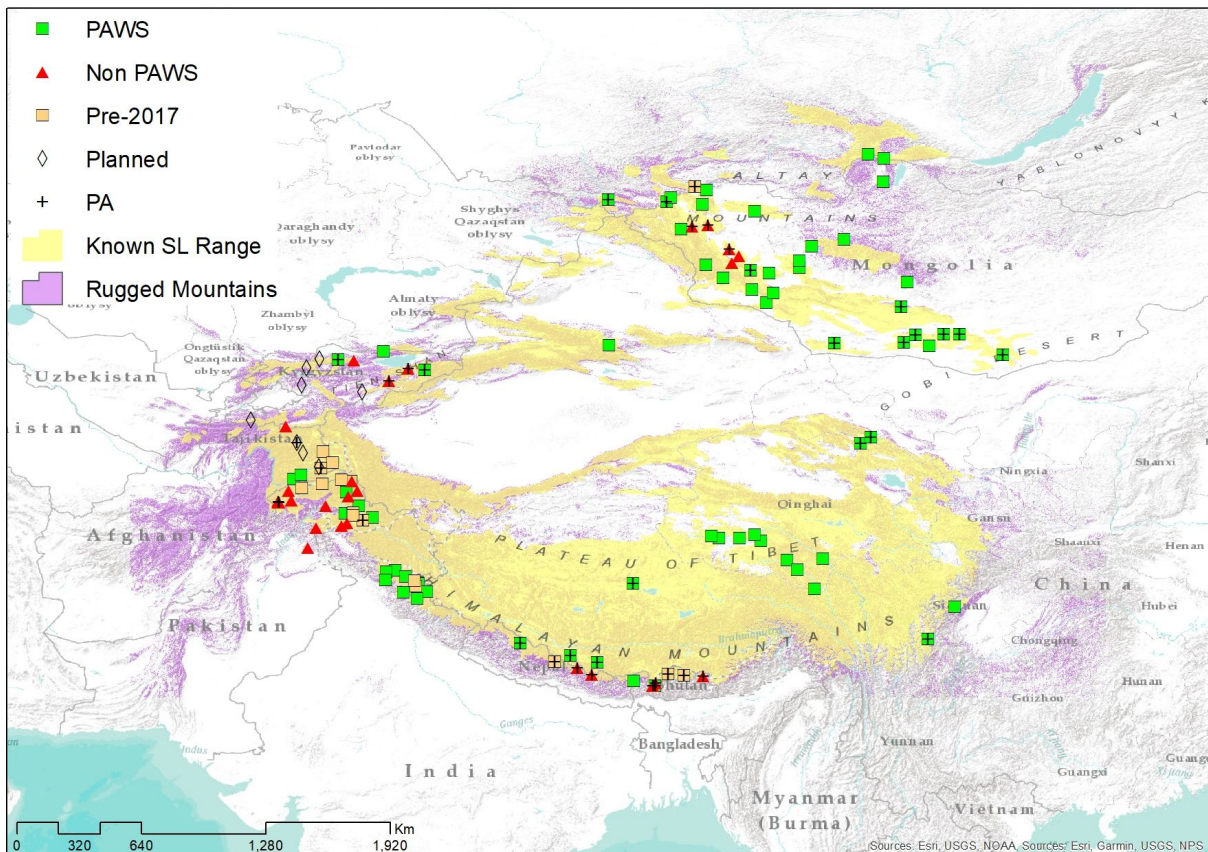


Figure 1: Snow leopard abundance survey locations that have completed, ongoing or planned PAWS compliant surveys between 2017-2020.

3. PAWS Summit Oct 29-30th

A total of 123 individuals registered for the PAWS Summit. The summit took place over two days and consisted of a mix of live engagement sessions along with live streamed sessions (See detailed schedule in **Appendix 2**).

Session 1a: ‘Solve my Problem’

In the first session of the PAWS Summit, a set of challenges were identified by PAWS partners to organize an interactive Problem Solving session. Individuals that signed up to the PAWS Summit were asked if they face particular challenges in the planning or implementation of PAWS. The challenges that emerged in this preliminary exchange formed the basis of the ‘Solve my Problem’ Sessions. We invited 10 technical experts as facilitators in breakout rooms for a set of 6 challenges. Topics that were covered included:

- [PAWS Study Design](#)
- [PAWS Data Processing](#)
- PAWS abundance data Analysis (includes low density sites)
- [Genetics sampling for PAWS surveys](#)
- [Complimentary surveys including prey and threats](#)
- [Funding opportunities](#)

Following the breakout sessions, topic facilitators summarized what each challenge represented and how they could be addressed in practice ([Link to discussions](#)). Overlaps amongst the different topics were identified and solutions discussed. The session engaged **79 participants** from across the world. The 10 facilitators also provided valuable suggestions on how PAWS could evolve to take on wider conservation and research agendas. These included:

- Promoting exchange between PAWS partners (i.e. establishing a PAWS Slack group)
- Developing an action plan with sampling guidance for the next two years based on current coverage data
- Setting up a network for conservation genetics
- Developing targeted capacity building strategy
- Strategically integrating prey and threat assessments into PAWS. Complementary surveys such as threats and prey should be reworded as an 'integral surveys so they could be systematically estimated.

Session 1b: Stories from the Field

The Stories from the Field session showcased videos and photographs from different teams or individuals across the snow leopard range- with a focus on collecting data related to the PAWS effort (camera trapping, genetic surveys, field visits). Stories also included camera trap pictures and videos. The material for this section was shared by registered participants voluntarily. We received submissions from 8 individuals and organizations working across the snow leopard range. The final session encompassed submissions from WWF Russia, Devika Rathore from India, Bikram Shrestha from Nepal, Baltistan Wildlife Conservation and Development Organization (BWEDO) and Snow Leopard Conservancy from Pakistan, Aga-Khan Agency for Habitat in Tajikistan, and OSI-Panthera from Kyrgyzstan. The session introduction was made by Dr. Raghu Chundawat with a short video showcasing his fieldwork from the early 1980s. The compiled video of all stories from the field is available at the following link: <https://youtu.be/Lzt9JJY5e2o>.

Session 2: GSLEP Updates and Way Forward

This Main session consisted of updates at the global level, updates from three snow leopard range countries (Mongolia, India and Bhutan) and a discussion forum for generating new ideas for the future of PAWS. This was the first opportunity to showcase the entire PAWS global efforts to date- including efforts being made across the 12 range countries. The session included the following updates:

- **Updates at the Global Level:** The session started with Dr. Justine Shanti Alexander making an in-depth presentation about the status of PAWS ([link to presentation](#)). This included an update on progress to date- taking stock of what teams across all snow leopard range countries had achieved so far and its implications.
- **Country Updates:** The [Mongolia](#) (Dr. Gantulaga Bayandonoi; WWF Mongolia), [India](#) (Dr. Manvi Sharma; Nature Conservation Foundation India) and [Bhutan](#) (Tandin Tandin Department of Forests and Park Services Bhutan) country updates highlighted how PAWS is being adapted at the local level to national context. These presentations also highlighted how national teams are adopting PAWS

recommendations in order to reduce biases towards favorable snow leopard habitats.

- **Wider benefits of PAWS:** Dr. Koustubh Sharma highlighted that to help with the implementation of PAWS across the range countries, experts have been brought on-board by the GSLEP Program to prepare a detailed [action plan](#), prepare [guidelines](#), define [best practices and protocols for collection and analysis of data](#), and develop [training material](#) and [capacity modules](#). He also described a range of completed, on-going and future developments and tools in the pipeline ([link to presentation](#)).
- **PAWS way forward:** Dr. David Borchers provided an overview presentation on how PAWS could be achieved, meeting required statistical standards and at the same time providing individual national estimates of snow leopard abundance ([link to presentation](#)).

The final part of the Session was dedicated to **an Ideas Forum**. Aimed at initiating a dialogue between the 48 participants on topics that had not yet been discussed during the Summit.

The forum discussed the following key issues::

- **Data privacy and sharing:** Dr. Ranjini Murali from the PAWS team shared some thoughts on how PAWS could support data sharing. We opened the discussion to understand the concerns of field practitioners, country representatives, statisticians and data managers towards data privacy guidelines and recommendations. More specifically, we sought comments on:
 - What are some teams apprehensive about when it comes to data sharing?
 - How can the PAWS team credit data owners?
 - Can PAWS team support the publication and dissemination of data?
 - How to offer authorship on PAWS products to all contributors?
 - Can PAWS develop policies for the reuse, distribution and archive of the paws data?
- **Capacity Building needs:** Dr. Justine Shanti Alexander **initiated discussions about supporting teams** for the next phase of PAWS. Specifically, the discussions included the following points:
 - Would teams benefit from more interactive online content? E.g. short YouTube videos that address specific challenges.
 - Could teams benefit from targeted capacity building efforts based on needs? This could be done at the national level to support teams step by step during the PAWS Process. Teams should feel open to reach out to the PAWS help desk for support.
 - Could organizations and networks (i.e. The Snow Leopard Network) continue the support to PAWS capacity building.
- **Networks:** Taking forward a key discussion point from the Solve my Problem Session, the forum discussed the need for an active PAWS network.

4. Side Events & Knowledge Kiosks

A number of additional presentations were live streamed during the PAWS Summit. In addition a virtual Knowledge Kiosk was set up on the GSLEP Steering Committee Virtual Platform to showcase some of the PAWS tools and capacity building efforts.

- [Presentation about the Why and the How of assessing Global snow leopard populations](#)
 - Our speakers, Dr. David Borchers and Dr. Koustubh Sharma, take us through the *Why* and the *How* of assessing the global snow leopard population.
- [Digital Wildlife Talk by David Borchers.](#)
 - Dr. David Borchers made a thorough presentation showcasing the developments in population ecology in a digital age, specifically showcasing the confluence of mathematical statistics, computer science, technology and ecology.
- [An innovative paper-based DNA technology for species detection by Natalie Schmitt](#)
 - Dr. Natalie Schmitt presented updates related to the development of a paper-based technology, that offers real-time, portable and inexpensive (~US\$1 per test) detection of wildlife from small samples of genetic material. Current, conventional laboratory approaches to DNA fingerprinting are expensive, time-consuming and complex. Conventional laboratory approaches are also difficult to apply in many developing countries due to restrictions on exporting genetic material to other countries for analyses, and lack of capacity to conduct genetic analyses locally.
 - With the support of GSLEP, we can ensure the technology gets to where it is most needed, for the conservation of snow leopards: <https://wildtechdna.com/gslp>
- [PAWS: Sampling Bias in Snow Leopard Estimation- Publication presentation](#)
 - Munib Khanyari presents the publication entitled "Sampling bias in snow leopard population estimation studies" by Kulbhushansingh et al. 2018.
- [PAWS Tools](#)
 - The GSLEP Secretariat and various partners have created a number of tools designed to help snow leopard scientists more effectively and efficiently collect and analyze population data, and to ensure that they are consistent with the recommendations of the PAWS Science Advisory Group.
 - <https://globalsnowleopard.org/gslp-projects/paws/paws-tools/>
- [Camera Trap Surveys: An on-line resource for practitioners](#)
 - The Snow Leopard Network and GSLEP present an online research and conservation training course. This course aims to equip participants with the knowledge and tools to plan and carry out a rigorous camera trap survey for assessing snow leopard population abundance/density. We share the latest recommended methods adopted by PAWS. The module covers key concepts underlying spatial capture recapture methods.
 - <https://snowleopardnetwork.org/module-1-camera-trap-surveys/>
- [Ungulate Surveys: An on-line resource for practitioners](#)
 - This online resource aims to equip participants with the knowledge and tools to plan and carry out robust mountain ungulate surveys using the Double-observer Method. We dive into understanding the fascinating ecology of these species based on the latest research. The training is divided into 4 parts and cover key concepts from planning surveys, conducting them, analysing data, and using outcomes for conservation action, publication and/or policy. Alongside we will have fascinating talks by subject experts, sharing their experiences and outputs. This is critical as conservation status assessment of any species requires rigorous monitoring of their abundances, which done over time, can provide knowledge of population trends.
 - <https://snowleopardnetwork.org/module-2-ungulate-surveys/>
- [Key Publications related to PAWS](#)
 - See **Appendix 3**

Conclusion

This virtual event provided a milestone at which national efforts to estimate the local, regional, national and global snow leopard populations were brought together and plans for the next phase stage were elaborate. GSLEP thanks all PAWS partners and participants in the PAWS Summit for joining this very first Summit on PAWS. Over 80 Partners and individuals practitioners joined the Sessions.

The way ahead has become more sharply defined thanks to contribution during the summit. Many of the priorities and challenges identified during the PAWS Summit will now be incorporated into the PAWS planning process. The information collated from partners will be reviewed to produce a more detailed map showing current survey efforts. An action plan for the remaining 2.5 years based on macro-selection of sites for balanced sampling will be produced to inform future action. Additionally, dialogue will be set up with the range countries to provide specific assistance to each in delivering the PAWS specific goals. As we were reminded during the Summit, the value of PAWS goes beyond a number and we will continue to incorporate these other dimensions into the work ahead.

Appendix 1 PAWS Information Sharing template

This table includes information for each snow leopard abundance survey location which have followed the PAWS guidelines. If the surveys did not follow the PAWS guidelines, please share relevant details still. If surveys are planned or underway do include these areas in the table below.

Country	Site Name*	Approx. Longitude (Format: WGS84)	Approx. Latitude (Format: WGS84)	Area of sampling frame# (km ²)	Year Surveyed	Method Used (Camera Traps/ Genetics)	Status (Completed/ Ongoing/ Planned)	Followed PAWS protocols? (Yes/No)**	Why was Site selected for survey?
<i>Example Country</i>	<i>Example Site Name</i>	<i>101.87</i>	<i>67.45</i>	<i>1,500</i>	<i>2018</i>	<i>Camera traps</i>	<i>Planned in Autumn 2020</i>	<i>Yes</i>	<i>It is a protected Area</i>

* Sites are defined as areas covered by cameras or genetic transects in one survey session

Area covered by a polygon drawn around the camera traps or genetic transects

**PAWS protocols: minimum 400 sqkm surveyed with a minimum number of 30 cameras or 30 genetic transects

Appendix 2 PAWS Summit Agenda

Day 1: Solve My Problem

Thursday October 29th, 2020

14:00-17:00 Bishkek, Kyrgyzstan time (3 hours)

Part 1

14:00-14:15: Opening Remarks of PAWS Summit

14:15-15:15: Solve my Problem Session. *Each Session will be led by a team of technical experts and take place in different breakout rooms.*

- **PAWS Study Design** (Ian Durbach & Chris Sutherland; *University of St Andrews*)
- **PAWS Data Processing** (Manvi Sharma, Abinand Reddy & Justine Shanti Alexander; *Nature Conservation Foundation-India & Snow Leopard Trust*)
- **PAWS Data Analysis** (David Borchers & Koustubh Sharma; *University of St Andrews & GSLEP*)
- **Genetic Surveys for PAWS** (Uma Ramakrishnan; *NCBS*)
- **Complimentary surveys (prey and threats)** (Gustaf Samelius & Munib Khanyari; *Snow leopard Trust & Nature Conservation Foundation-India*)
- **Fundraising Basics: Opportunities and Approaches** (Tom McCarthy; *Panthera*)

15:15-15:45: Summary feedback from the Breakout Sessions

15:45- 16:30: Solve my Problem Session Discussion

Part 2

16:30-17:00: Stories in the field

Day 2: PAWS Main Session

Friday October 30th, 2020

14:00-17:00 Bishkek, Kyrgyzstan time (3 hours)

Part 1

14:00-15:00: PAWS Progress Update

- PAWS Global Metadata Update (Justine Shanti Alexander, GSLEP)
- Updates from Mongolia (Gantulga Bayandonoi, WWF-Mongolia)
- Updates from India (Manvi Sharma, Nature Conservation Foundation-India)
- Updates from Bhutan (Sonam Wangdi, Ministry of Agriculture and Forests-Bhutan)

15:00-15:30: PAWS Progress Update Discussion

Part 2

15:30-16:15: PAWS Process and Way forward

- PAWS wider benefits (Koustubh Sharma, GSLEP)
- PAWS Way forward post 2020 (David Borchers, University of St Andrews)
- Discussion

16:15-17:00: Idea forum & open discussion (*open session to generate new perspectives and suggestions*)

Additional Side events!

- **13:00- 14:00 Thursday October 29th, 2020:** The Why and the How of PAWS by Koustubh Sharma & David Borchers
- **17:00- 18:00 Thursday October 29th, 2020:** Digital Wildlife Talk presented by David Borchers
- **13:30- 14:00 Friday October 30th, 2020:** Paper-based DNA technology for species detection by Natalie Schmitt
- **17:00- 17:15 Friday October 30th, 2020:** Sampling Bias in Snow Leopard Estimation by Munib Khanyari

Appendix 3 Key publications related to PAWS

- [Chetri, M., Odden, M., Sharma, K., Flagstad, Ø. and Wegge, P., 2019. Estimating snow leopard density using fecal DNA in a large landscape in north-central Nepal. *Global Ecology and Conservation*, 17, p.e00548.](#)
- [Dupont, G., Royle, J., Nawaz, M.A. and Sutherland, C., 2020. Towards optimal sampling design for spatial capture-recapture. *BioRxiv*.](#)
- [Durbach, I., Borchers, D., Sutherland, C., Sharma, K. Fast, flexible alternatives to regular grid designs for spatial capture–recapture. *Methods Ecol Evol.* 2020; 00: 1– 13.](#)
- [Ghoshal, A., Bhatnagar, Y.V., Pandav, B., Sharma, Koustubh, Mishra, C., Raghunath, R. and Suryawanshi, K.R., 2019. Assessing changes in distribution of the Endangered snow leopard *Panthera uncia* and its wild prey over 2 decades in the Indian Himalaya through interview-based occupancy surveys. *Oryx*, 53\(4\), pp.620-632.](#)
- [Johansson, Ö., Samelius, G., Wikberg, E., Chapron, G., Mishra, C. and Low, M., 2020. Identification errors in camera-trap studies result in systematic population overestimation. *Scientific reports*, 10\(1\), pp.1-10.](#)
- [Sharma, K., Fiechter, M., George, T., Young, J., Alexander, J.S., Bijoor, A., Suryawanshi, K.S., Mishra, C. 2020. Conservation and people: towards an ethical code of conduct for the use of camera traps in wildlife research. *Ecological Solutions and Evidence*. doi:10.1002/2688-8319.12033.](#)
- [Sharma, R.K., Sharma, K., Borchers, D., Bhatnagar, Y.V., Suryawanshi, K.R. and Mishra C. Spatial variation in population-density, movement and detectability of snow leopards in a multiple use landscape in Spiti Valley, Trans-Himalaya. *bioRxiv*; 2020. DOI:](#)
- [Suryawanshi, K.R., Khanyari, M., Sharma, K., Lkhagvajav, P. and Mishra, C., 2019. Sampling bias in snow leopard population estimation studies. *Population Ecology*, 61\(3\), pp.268-276.](#)
- [Taubmann, J., Sharma, K., Uulu, K.Z., Hines, J.E. and Mishra, C., 2016. Status assessment of the Endangered snow leopard *Panthera uncia* and other large mammals in the Kyrgyz Alay, using community knowledge corrected for imperfect detection. *Oryx*, 50\(2\), pp.220-230.](#)