



**The 42nd Society of Ethnobiology  
Annual Meeting,  
Vancouver, BC**

**May 8 – 11, 2019**

On the traditional, ancestral, and unceded territory of  
the hə́nqəmíṇəm-speaking Musqueam people

## CONFERENCE THEME AND LOGO

This year's conference theme, "Voices", honors the relationships between ethnobiology and language, song, stories, and activism. The importance of ethnobiology's role in a myriad of social, ecological, academic, and applied contexts is reflected by the breadth of presentations reflected in this program. In the 2019 SoE conference, we celebrate the many voices of ethnobiology, as well as our privilege to be part of this community of singers, story-tellers, native speakers, and activists.

Our conference logo, "Salmon People" was produced by Arianna Augustine, a Coast Salish artist from the Stz'uminus community. In one design, Arianna expresses the multi-dimensional theme of this year's conference.

The Salmon People design is based on the creation story as told by Stuart Pagaduan (Cowichan Tribe). This ancient story tells about how the creator, Xeel's, scooped up some of the salmon and released them to become the Gulf Islands. Xeel's said, "From now on you will provide for and take care of the people. You will provide them with food from your beaches and medicines from your forests." Xeel's then scooped up more salmon and said to them, "You are no longer Salmon, you are people. You will take care of the islands and you will tell others how the islands were created." The transformation was complete and still to this day, every fall when the Salmon travel to their spawning ground, they are happy to see their relatives, the Gulf Islands. When they travel up the river they are happy to see their other relatives, the people who live in the villages.

The design is in the shape of a spindle whorl, representing the cyclical nature of life. There are three internally tangent circles. The most internal circle, at the top of the design, is a representation of the face of the creator. The next circle outlines the creator's arms, both with the design of a salmon; one representing the people and the other representing the Gulf Islands. The wolf and eagle are in the outer circle, representing the feathered and four-legged.

## ACKNOWLEDGMENTS

We first acknowledge with gratitude the hən̓q̓əmin̓əŋ-speaking Musqueam people, on whose traditional, ancestral, and unceded territory this conference session takes place, for welcoming us and providing an opportunity to share knowledge together on your land. Many thanks to sʔəyətəq (Elder Larry Grant) for his words of welcome to Musqueam territory.

We also acknowledge Tseil-Waututh Nation, Stó:lō Nation, and Skwxwú7mesh Úxwumixw for hosting us in your territories. We give our thanks to Sts'ailes Nation, Stó:lō Nation, and Skwxwú7mesh Úxwumixw for sharing their knowledge through field trips.

At the University of British Columbia (UBC), several people have supported us in bringing this event about. We are especially grateful to Christine Wasiak at the First Nations House of Learning, Michael Blake and Eleanore Asuncion in the Dept. of Anthropology for the huge organizational help, Shelley Hall in the School of Music, James at the Carey Center, and Nelson Andrade with Xerox Canada. We are also grateful to our sponsors, who donated funds to support Indigenous involvement in our conference: Simon Fraser University (SFU) VP Academic, the Department of History at SFU, the Department of Archaeology at SFU, the Department of Anthropology at UBC, and the Faculty of Environment at SFU.

We acknowledge the many, many people who donated their time and good energy to make this event happen. For field trips, we are hugely thankful to Morgan Ritchie, Willie Charlie, Dave Schaepe, Bonny Graham, Sonny McHalsie, and Leigh Joseph. For our conference foods, and in particular our focus on local and Indigenous foods, we thank Jordan Benner, Curtis Björk, Leigh Joseph, Fiona Hamersley Chambers, Marianne Ignace, Spencer Greening, Robyn Humchitt, Kim-Ly Thompson, Nancy Turner, and Mark Wunsch. Thanks also to Arianna Ardenne and SPUD for our organic produce. For memorabilia, we thank Laurence Fisher at Wildwood on Lasqueti Island for the branch boxes, and Arianna Augustine for our conference logo.

We are also grateful to Chelsey Armstrong, Madeline Donald, Julie Nielson, Sarah Shaver, Megan O'Sullivan, and Nyomi Sherwin for workshop and session coordination, program assembly and design, and so much more. A huge thanks to Ken Lertzman, Denise Glover, and Gavia Lertzman-Lepofsky for bringing music to our reception, and to Ken for all kinds of support. Many thanks also to our workshop and lunchtime walk leaders for sharing their knowledge with us. They are, Cynthia Annett, Jonathan Amith, Heidi Bohan, Vanessa Campbell, Seth Friedman at the UBC Farm, Sarah Howard, Skwetsimeltxw Willard Buddy Joseph and Chepximiya Siyam Chief Janice George, Tara Moreau, Raleigh Seamster and Google Earth Outreach, Tusha Yakovleva, and Saskia Wolsak. A huge thank-you is also due to the numerous volunteers who are helping during the conference with set-ups, clean-ups, and the chaos of conference registrations!

As in all endeavours undertaken by Society of Ethnobiology members, we have been supported and aided by the wisdom and on the ground help of the society's board and staff. In particular, we thank Cissy Fowler, our President; Liz Olson, our Conference Coordinator (and in-coming Vice-President); Denise Glover, our treasurer; Ashley Blazina, our Awards Coordinator (and in-coming Conference Coordinator); Alex McAlvay, our Student Engagement Board member; Kali Wade, our social media guru (and in-coming Promotion and Outreach Board member); and Cheryl Takahashi, our web goddess. We also acknowledge Steven Wolverton for taking up more than his share of the *Journal of Ethnobiology* co-editor load while Dana was knee-deep in conference prep.

Finally, we acknowledge the global community of ethnobiologists -- whether you choose this moniker for yourself or not. We are proud to be part of a community of people who wakes up and goes to sleep each night thinking of ways to promote, preserve, and protect bio-cultural diversity. Our collective VOICES can make a difference.

- The organizing committee: Dana Lepofsky, Emily Purcell, Daisy Rosenblum, Alessandria Testani, and Sarah Walshaw





## *In Memory*

Kwaxsistalla Wathl'thla Chief Adam Dick 1929 - 2018

Jessica Mae Orozco 1987 - 2018

We dedicate this year's conference to two influential ethnobiologists who have just passed: Kwaxsistalla Wathl'thla Chief Adam Dick and Jessica Orozco. Both Kwaxsistalla and Jessica represent the depth, beauty, and potential of ethnobiology. During their lives, both did much to help us understand people's relationships with their surrounding environments. Adam did so as a foremost knowledge-holder, Elder, and Chief; Jessica as one of the up-and-coming leaders in ethnobiology who did so much to energize those around her. Their style of teaching and leading was very different, yet we have gained so very much from both of them. They will be dearly missed.

To learn more about the contributions of these ethnobiologists, please visit [http://archive.ecotrust.org/indigenousleaders/2011/chief\\_adam\\_dick.html](http://archive.ecotrust.org/indigenousleaders/2011/chief_adam_dick.html) and <https://kdminer.com/news/2018/nov/01/obituary-jessica-mae-orozco/>



Photo credit: Bert Crowfoot

**Kwaxsistalla Wathl'thla Chief Adam Dick**



**Jessica Orozco**

## A NOTE FROM OUR PRESIDENT

Greetings Ethnobiologists,

Welcome to the 42nd annual meeting of the Society of Ethnobiology! I am eager to “talk story” (borrowing a term from Hawaiian pidgin) with all of you whose minds, hearts, and souls have created ethnobiology and will shape the field’s future. As you will see in the enticing collection of presentations and posters, ethnobiologists have gathered here this May to give voice to diverse ethnobiological topics that are of both local and global significance. I offer my gratitude to all for voicing your knowledge during this year’s amazing conference.

We are fortunate to be gathering in the traditional, ancestral, and unceded territory of the hən̓q̓əmin̓əŋm-speaking Musqueam people where stands the University of British Columbia. Many thanks to the conference organizing team and to all of the generous persons are adding to the richness of this conference through their contributions to the Wednesday workshops, lunchtime walks, and Saturday fieldtrips as well as the Thursday night movie, and the Friday night banquet. These folks are providing us a myriad of ethnobiological learning opportunities. Please extend your gratitude to members of this great team when you interact with them this week.

Our beloved Society of Ethnobiology has been flourishing since we last met one year ago in Madison, Wisconsin. The Society’s heart beats because our scholarship program is supporting undergraduate and graduate students, and early- mid- and late-career ethnobiologists through a superb collection of graduate fellowships, an undergraduate and a lifetime achievement award, poster and presentation awards, travel scholarships, and conference waivers. In our incomparable publications division, the Society continues to distribute leading-edge ethnobiology in the stalwart *Journal of Ethnobiology* quarterly, the open-access *Ethnobiology Letters* periodical, the ebook *Contributions* monograph collection, the spirited *Forage!* blog, and our networking-powerhouse Facebook and Twitter accounts. While the Society’s official size has ranged from 300-400 members in 2018-2019, our publications division expands our reach to a much broader network: we have 4,767 Facebook followers plus another 1,384 Twitter followers. In the ethics arena, a team of ethics-minded ethnobiologists has been actively endeavoring to establish a Code of Conduct for Meetings. Moreover, the Society continues to expand its collaborations with likeminded professional organizations such as the Latin American Society of Ethnobiology, the International Society of Ethnobiology, and the American Association for the Advancement of Science with whom we are currently working to establish formal affiliation.

We have seen several new scholars join our leadership this year. Sarah Walshaw becomes President at the end of our 2019 conference and, I predict, will be an absolutely fantastic luminary. Jade Guedes has brought outstanding intelligence and stellar wisdom to the first year in her role as Secretary of the board. We also welcome four new members to the board: Liz Olson (President Elect), Mac Marston (Treasurer), Kali Wade (Publicity & Community Engagement Coordinator), and Sam Bosco (Student Engagement Coordinator). Simultaneous to onboarding new scholars, the Society has also, unfortunately, lost three beloved colleagues during the past year. The passing of Adam Dick, Jessica Mae Orozco, and Al Keali’i Chock has given us pause to reflect upon what we mean to one another. We are a strong community who cherishes each of our members and deeply mourns their departure. We will miss you Adam, Jessica, and Al. If the soul grows in dark places, then the architecture of my soul is more elaborate now than it was a year ago.

Serving as the Society’s President for the 2017-2019 term has been an honor and privilege. May 11, 2019 marks the conclusion of a 13-year term of service to the Society during which I served as the Book Review Editor for the *Journal of Ethnobiology*; Secretary; a founding Co-Editor for *Ethnobiology Letters*; Vice President; and finally President. My hope is that my work for the Society has bridged a temporal span between the stellar leaders who served before me and the rising leaders who will serve after me. This long-lived scholarly organization, founded by Steve Weber and Steve Emslie, consists of engaged members and, at the same time, transcends the engagement of any single individual. Our Society is thriving!

Carry forth and enjoy the conference!

*Cissy Fowler*, President of the Society of Ethnobiology

## CREATING SPACE FOR OUR ELDERS AND YOUTH

We have set aside spaces for our Elders and youth in the First Nations House of Learning. Please ask at the registration desk where they are located.

## A NOTE ABOUT RECYCLING AND WASTE REDUCTION

We recognize that the very gathering of people from distant places is counter to reducing our carbon footprint; we struggle with balancing this fact against the huge value of meeting with our community face-to-face. We also understand the value of small actions, even if they just empower us as individuals to take bigger and bolder actions. We have tried in this conference to reduce excess by doing things like reducing packaging, sourcing local and/or organic foods, using non-disposable or responsibly disposable cutlery and plates and cups, using previously used name tag holders, and video-recording some talks for people to remotely access them. We encourage all participants to pay careful attention to our recycling stations. We welcome suggestions on how our Society's conferences, and indeed our Society more generally, can be better global stewards.

## STATEMENT ON INCLUSIVITY AND DIVERSITY

We strove to create ways to encourage a range of respectful voices at our conference. One way we did this was by dramatically increasing our waivers and scholarships, especially to encourage local, Indigenous participation. Another way was to create a conference space that is welcoming to diverse communities and does not allow discrimination. To this end, we require all conference presenters to abide by the code of ethics adopted by our organization (<https://ethnobiology.org/about-society-ethnobiology/ethics>).

Please also note:

- There are gender-inclusive (single-stall) bathrooms in the conference venue.
- The conference venues are wheelchair accessible.
- There is a special, quiet space for Indigenous Elders and others who need safe space.
- There is a cozy space where children and their caregivers can congregate.
- There are non-traditional sessions for knowledge sharing (story-telling).
- We encourage attendance by caregivers; no registration fee is required.

## A NOTE ABOUT SOCIAL MEDIA ETHICS

To encourage this conference being a safe and inviting space for diverse voices and perspectives, we offer the following guidelines for respectful social media conversations:

- Only post content that represents your own thoughts.
- Act in a professional and constructive manner, especially regarding sensitive or meaningful topics.
- Show respect for others' opinions, and their rights to choose to participate or refrain from commenting in online discussions.
- Do not post presenters' ideas or data without the expressed permission of the presenter. In our conference, a presenter's permission to share ideas and data will be indicated by our "thumbs up" icon, or through direct permission from the author(s).

Our "Thumbs Up" icon:



If you see this icon on the title page or poster of a presentation, it means the author(s) have given permission to post images of their presentation online. If you do not see this icon, approach the author and ask permission about posting any information or images associated with the author before you share any information.

## 2019 SoE AWARD RECIPIENTS

*Congratulations to All!*

### Distinguished Ethnobiologist Award

**Nancy Turner** (Professor Emeritus, Environmental Studies, University of Victoria)

Dr. Turner is professor emeritus in the Environmental Studies Department at the University of Victoria in British Columbia. Dr. Turner is an ethnobotanist who has worked extensively with the Indigenous peoples of the Pacific Northwest for the past 40+ years. Dr. Turner's contributions to the field have been nothing short of prolific – her *condensed* curriculum vitae includes 26 pages of books and papers she's authored or co-authored, presentations she's made across the globe, and professional appointments she has held throughout her extensive career. To further highlight Dr. Turner's amazing contributions to the field, we've included a few excerpts from her nomination packet:



*"Nancy was at that forefront of a myriad of scholarly concepts and ideas that arose from her careful listening to and respect for Indigenous knowledge. A few of these concepts that have now become commonplace in scholarly conversations are: cultural keystone species and places, knowledge refugia, eco-cultural restoration, and Northwest Peoples as cultivators. The list is long and the impact great."*

*"Nancy's mentorship far surpasses the classroom, and her passion for plants, people, and place are shared freely and with the greatest humility, kindness, and integrity."*

*"She has now written a 'five-foot shelf' of works, almost all of them with First Nation coauthors as well as consultants."*

*"We believe that Nancy's greatest contribution to our Society, and indeed to the discipline of Ethnobiology, is that she inspires all of us to see the value and beauty in other people's knowledge, and to create a world where diversity – both ecological and cultural – is something that is embraced and protected."*

### Indigenous Ethnobiologist Graduate Fellowship

**Florencia Pech-Cardenas** (Natural Resources Science and Management, University of Minnesota)

Florencia is a Yucatecan Maya woman from the Yucatan Peninsula in Mexico. She is also a botanist and a current Ph.D. student at the University of Minnesota's College of Food, Agricultural and Natural Resource Sciences



(CFANS). Florencia's areas of interest include indigenous natural resource management, sustainability, international development and tourism. Florencia's research seeks to understand how handicraft production for the Yucatecan tourist market is influencing livelihoods and dry tropical forest management in Maya communities close to the World Heritage Site of Chichen Itza. Specifically, she is analyzing the social and environmental impacts of handicraft production by exploring ethnobotanical, ecological, socio-political and gender-related lenses of such production.



**Leigh Joseph** (Environmental Studies, University of Victoria)

I am a member of the *Skwxwú7mesh* (Squamish) First Nation. My ancestral name is *styawat* and I am an ethnobotanist by training. I completed an MSc in ethnobotany and I am currently pursuing my PhD in ethnobotany at the University of Victoria. My interest in the relationship between food and culture developed at an early age and was nourished by my visits with my great uncle, Chester Thomas, and my great auntie Eva at their home along the Nanaimo River. My memories of that time include watching him smoke the salmon he caught from his dugout canoe and sharing nourishing meals every time we'd visit. These early experiences developed my awareness of



how important the links between food, culture and family are. Having worked with a number of different First Nations communities within the field of ethnobotany over the past five years I am now focusing my doctoral work on exploring linkages between Indigenous plant relationships, land-based practices and health. Specifically I am focusing on how the Type 2 Diabetes crisis in two Indigenous Communities can be addressed through increased access to Indigenous foods, plant medicines and culturally related exercise.

I deeply value the importance of getting out onto the land and learning in a hands-on way about culturally important plants and

how they connect us to place. I am motivated to share this aspect of my own learning with the Indigenous communities that I work with.

## Urban Ethnobiology Graduate Fellowship

**David Colozza** (Department of Geography, King's College London - National University of Singapore)

Areas of interest: food systems change, traditional diets, Indigenous knowledge and practices related to food

[www.linkedin.com/in/davidcolozza](https://www.linkedin.com/in/davidcolozza)



David is a researcher on the Joint PhD Geography programme at King's College London and the National University of Singapore. His doctoral research focuses on studying the impact of socio-economic change, and particularly urbanisation, in Indonesia, on traditional local diets, knowledge and practices related to food. As part of his PhD research, David has conducted qualitative fieldwork in Yogyakarta, Indonesia, to study changes in dietary patterns over time, and to understand how and why traditional practices such as food self-production and sharing have persisted among local urban residents. David's broader research interests relate to the interactions between human and natural ecosystems, and particularly the links between agricultural production systems, biodiversity resources, and the local indigenous knowledge associated with these.

## Ecological Knowledge Research Graduate Fellowship



### **Josephine Tempesta** (Universidad Autonoma de Queretaro, Mexico)

Josephine is currently pursuing a Masters degree in the Universidad Autónoma de Querétaro in Mexico and conducting research on the medicinal plants used for women's reproductive health in the indigenous zone of ñähñu in the municipality of Amealco de Bonfil in Querétaro, Mexico. The health sovereignty of the population is vulnerable due to a loss of the language and culture, and the research's main objective is biocultural conservation. Josephine will use the SOE fellowship to host an open event to foster the exchange of experiences concerning traditional medicine and to strengthen management practices and preparation of medicinal plants.

## Undergraduate Ethnobiologist Award

### **Sydney Hunter** (Archaeology, Boston University)

Sydney is an undergraduate at Boston University studying archaeology with a focus on paleoethnobotany. Her current research focuses on the development of agricultural strategies in Central Asia using both micro and macrobotanical remains. Her undergraduate thesis examines early agriculture in the ancient city of Kath, Uzbekistan during a time of agricultural and economic transition. She hopes to attend graduate school in the near future to study agricultural sustainability and the role of trade networks throughout Central Asia in the historic periods. Sydney plans to apply her studies of sustainability in desert climates in the past to help modern societies adapt to climate change in the future. Through her position, Sydney hopes to make the Society of Ethnobiology more accessible to undergraduate students and to connect students with mentors to facilitate new opportunities for research within the field of ethnobiology.



## Majority World Conference Travel Award

### **Balram Awasthi, M.Sc. (T.U)** (Lecturer, Tribhuvan University, Siddhanath Science Campus, Kanchanpur, Nepal; PhD Scholar Xishuangbanna Tropical Botanical Garden, CAS, China)



Balram Awasthi, from Nepal, completed his masters degree from Central Department of Zoology, Tribhuvan University, Nepal. He has been a Lecturer of Zoology at Tribhuvan University, Siddhanath Science Campus Nepal since 2015. He teaches many courses, including one on Ethnobiology & Biodiversity conservation at the undergraduate level. Balram has supervised graduate-level project work on ethnobiology. Currently, Balram is completing his PhD work at the Xishuangbanna Tropical Botanical Garden, at the Chinese Academy of Sciences in China. Balram's research interest are mainly focused on the ecology and evolution of plant-animal Interactions, conservation biology and ethnobiology of Indigenous people and their role in biodiversity conservation.

## Indigenous Conference Travel Award

**Morgan Fluker** (Anthropology Department, University of South Carolina, Columbia)

Morgan is a registered citizen of the Kaw Nation Indian Tribe from Valley Center, Kansas in the United States. She is currently an Anthropology M.A. student at the University of South Carolina. Her research interests include paleoethnobotany, archaeology, environmental archaeology, and public awareness. Morgan's current research is focused on assessing Mississippian migration and Late Woodland cultural change in central South Carolina through changes in dietary practices. Morgan is a first-year master's student at the University of South Carolina, Columbia. Morgan's research centers in the fields of archaeology and paleoethnobotany.



## Graduate Student Conference Travel Award

**Mesulame J Tora** (Horticultural Science, Massey University (MU), New Zealand)



Mesu is an MSc student at MU School of Agriculture and Environment. His research interest lies on Pacific ethnobotany, agroforestry and conservation. For his MSc project Mesu is researching the role of indigenous knowledge in mitigating fungal threats to local ecosystems. His using the recent myrtle rust (*Austropuccinia psidii*) incursion to New Zealand as a case study where he is specifically focussing on the Maori community and the importance of *matauranga* (Maori knowledge retained orally and through cultural practices), *tikanga* (customs, traditions and protocols), *whakapapa* (species assemblages within a paradigm relative to human beings) and the practice of *kaitiaki* (the act of guardianship and protector of flora and fauna) to ethnobiology and the development of indigenous biosecurity measures to protect culturally important plant species.

## Undergraduate Student Conference Travel Award

**Adele Woodmansee** (Biology and Social Anthropology, Harvard University)

Adele Woodmansee is a fourth-year undergraduate at Harvard University who is completing a double major in Integrative Biology and Social Anthropology with a minor in Latin American Studies. Her senior thesis research looks at maize agriculture in a community in Oaxaca, Mexico, where she has been working for several years. She has conducted fieldwork in a Zapotec community in the Central Valleys of Oaxaca and is combining a genetic study to test for transgenic contamination in native maize varieties with ethnographic research on systems of value around native seeds and methods of economic adaptation to free trade agreements and drought. Her main research interests include subsistence agriculture, seed diversity, and immigration.



## CONFERENCE AWARD JUDGES

*With Thanks!*

### Barbara Lawrence Award

Darcy Matthews

Sonia Zarillo

Wendy Hodgson

### Best Poster Award

Julie Neilsen

Joyce LeCompte-Mastenbrook

Megan O'Sullivan

## SILENT AUCTION FUNDRAISER

On Thursday and Friday in the FNHL, place your bid on an assortment of ethnobiological items. All proceeds go to funding students and Indigenous scholars to attend future conferences. The auction closes at 3:00 pm on Friday. Collect your items and pay (in US cash or cheque) at that time.

## LUNCHTIME ETHNOBOTANY WALKS (THURSDAY AND FRIDAY)

On Thursday, join ethnobotanist Saskia Wolsak (UBC Anthropology), or on Friday join Tara Moreau (UBC Botanical Garden) and Vanessa Campbell (Musqueam Language and Culture) for lunchtime plant walks around the botanically diverse UBC Campus. Areas visited may include the arboretum, Asian gardens, the Beaty Biodiversity Research Centre's native plant courtyard, as well as gorgeous native forests and nearby beaches. Meet at 12:15 (after the morning sessions) outside the First Nations House of Learning (no need to register). Bring your own picnic lunch. Check out places to buy your lunch: <http://www.food.ubc.ca/places-to-eat/>

## OVERVIEW SCHEDULE

### WEDNESDAY, MAY 8

Time	Event	Location
All day	Workshops	Various. Visit conference website for details
6:00 – 9:30pm**	Opening reception, registration	Museum of Anthropology

**\*\*Want to keep visiting with your friends after the reception?** We have reserved the covered patio area in the **Koerner Pub – near the Museum**. We can't promise you more than ethically-sourced and fresh pub food, but they do have a great selection of local craft beers. Join us!

**A NOTE ABOUT BREAKS:** We are fortunate to have a record-breaking number of submissions for this year's conference. While wonderful, this meant we had to make some hard decisions about scheduling. We opted to reduce scheduled breaks so that we could have four instead of five (!) concurrent sessions. On Thursday and Friday, pre-session coffee and tea will be available in the First Nations House of Learning (FNHL) by 7:30 am. Snacks, traditional food treats, tea, and coffee will also be put out mid-morning and mid-afternoon in the FNHL for all to enjoy at their own timing.



**THURSDAY, MAY 9 – ALL EVENTS ARE AT THE UNIVERSITY OF BRITISH COLUMBIA**

Time	Geog 212	Geog101	Barnett (Music)	Geog 147	First Nations House of Learning (FNHL)
7:30					Coffee/Tea
7:45					Registration - all day
8:00					
8:15					Opening Words (8:15 - 9am)
8:30					
8:45					
9:00	Break	Break	Break	Break	
9:15	I.	II.	III.	IV.	Refreshments, Local Foods Book and Art Vendors Silent Auction (9:15 - 5pm)
9:30					
9:45					
10:00					
10:15					
10:30	V.		Break		
10:45		Break			
11:00					
11:15		VI.			
11:30					
11:45					
12:00					
12:15	Lunch on your own (12:15 - 1:30). See website for suggestions. Ethnobotany campus walk with Saskia Wolsak (meet at FNHL, bring your own lunch) Student Mentor Lunch (Geog 101)				
1:30	VII.		VIII	IX.	
1:45					
2:00					
2:15					
2:30		X.			
2:45	Break				
3:00	Break		XII.		
3:15	Break				
3:30					
3:45					
4:00	XI.				
4:15					
4:30					
4:45					
5:00					
5:15					
5:30	Student Social (5:30 - 6:30) - Koerner's Pub				
	Dinner on your own (5:30 – 7:30)- See conference website for suggestions				
7:30				Film. “All our Father’s Relations”; snacks (FNHL) <a href="http://allourfathersrelations.com/menu/">http://allourfathersrelations.com/menu/</a>	

\*Absolutely no food or drink (including water) allowed in Barnett Hall.

**FRIDAY, MAY 10 – ALL EVENTS ARE AT THE UNIVERSITY OF BRITISH COLUMBIA**

TIME	Geog 212	Geog 101	Barnett (Music)	Geog 100	First Nations House of Learning	
7:30					Coffee/Tea	
7:45					Registration - all day	
8:00	XIII.			XVI.		
8:15		XIV.				
8:30						
8:45						
9:00			XV.			
9:15						
9:30						
9:45						
10:00		Break	Break			Refreshments, Local Foods Book and Art Vendors Silent Auction (till 3pm)
10:15		XVII				
10:30	XVII.	XIX.	Break			
10:45			XX.			
11:00						
11:15						
11:30						
11:45						
12:00						
12:15	Lunch on your own (12:15 - 1:30). See conference website Ethnobotany campus walk with Tara Moreau (UBC Botanical Garden) and Vanessa Campbell (Musqueam Language and Culture) (meet at FNHL, bring your own lunch)					
1:30	XXI.	XXII.			XXIII. Poster Session - FNHL (2:15 - 4pm) Snacks	
1:45						
2:00						
2:15						
2:30						
2:45						
3:00						
3:15						
3:30						
3:45						
4:00	General Mtg, Awards All invited (4:00-5:30) Geography 100					
4:15						
4:30						
4:45						
5:00						
5:15						
5:30 - 9:30	Tour and Banquet Musqueam Reserve (first bus leaves ~5pm)					

\*Absolutely no food or drink (including water) allowed in Barnett Hall.

## LIST OF SESSIONS

- I. Women's Work in Indigenous Societies
- II. Ethnobiology Ethics Lab (eeLab)
- III. Engaging Ethnobiology through Communities and Practices
- IV. The Voices of Food: The Language, Conversations and Stories of Indigenous Food Knowledge and Renewal in the Pacific Northwest
- V. Cultivating Camas Connections
- VI. Sharing Stories, Sharing Songs
- VII. Conservation Ethnobiology: People and Places
- VIII. Indigenous Peoples Food Systems in Transition: How Can ideas from Ethnobiology Inform Work on Food Environments
- IX. What Language Does Your Land Speak? Indigenous languages as Archives of Biocultural Knowledge.
- X. Resource Use and Adaptations
- XI. Networking for Applied Ethnobiology-Ethnobotany Practitioners, Professionals and Scholars
- XII. Tonics, Textures, and Taste Buds: Global Perspectives in Ethnobotany
- XIII. Indigenous Peoples and Climate Change Impacts
- XIV. Placed-Based Spirituality and Religion in Ethnobiology
- XV. Ethnohistory, Environmental History, and Ethnobiology
- XVI. Ethnobiology Through Song
- XVII. Avian Voices in Song, Story, Wisdom, and Warning
- XVIII. Global Change/Global Health
- XIX. Indigenous Resource Management and Sovereignty in Western North America
- XX. Frontiers in Domestication Research
- XXI. Operationalizing Biocultural Indicators of Well-Being Across Scales
- XXII. Tambaroro. Ethnographic Film, Premiere Screening
- XXIII. Poster Session

## PRESENTATIONS BY SESSION

### **Thursday, 9 MAY, 2019**

#### **Welcome to Musqueam Territory (First Nations House of Learning)**

8:15 –  
9:00 sṭəyəłəq (Elder Larry Grant) (Musqueam Nation)

#### **I. Women's Work in Indigenous Societies (Geog 212)**

*In Honor of Jessica Mae Orozco*

9:15 – Baker, Janelle  
9:30 Ethnobiology and Reconciliation: Violence Against Women and the Land  
9:30 – Dolan, Jessica  
9:45 "What We Live On": Researching Common Edible and Medicinal Plants in Support of Women's Lifework in Haudenosaunee Communities  
9:45 – Olofsson, Ebba  
10:00 Sámi Women in Reindeer Herding Families – Identity Tied to Recognition of Work Status.  
10:00 – Ouarghidi, Abderrahim, and Gary Martin  
10:15 Gendered Perception and Priorities for Water Management in the High Atlas Mountains  
10:15 – Black Elk, Linda  
10:30 Berry Pickers and Medicine Makers: Rethinking Perceptions of Women in Traditional Native American Communities

## **II. Ethnobiology Ethics Lab (eeLab) (Geog 101)**

9:15 –  
10:45

## **III. Engaging Ethnobiology through Communities and Practices (Barnett Hall- Music Bldg)**

- 9:30 – Lepofsky, Dana, Jennifer Carpenter, Mark Wunsch, Nancy Turner, and Elroy White  
9:45 The Voices of Húyat
- 9:45 – Oberndorfer, Erica, Barry Andersen, Charlie Mae Dyson, and Carrie Cannon  
10:00 "Caribou Moss is the Boss": Plant Knowledge in Action in the Amazing Plant Race Makkovik  
Reid, Robin S., Casey L. Brown, Krista M. Heeringa, Orville Huntington, Brooke Woods, F. Stuart Chapin  
10:00 – III, Richard E. Hum, Todd J. Brinkman, and Interior Alaska Workshop Contributors  
10:15 Reinventing the Traditional Model of Science: Community-Driven Research on Traditional Harvest Practices of Rural Indigenous Communities in Interior Alaska
- 10:15 – Odonne, Guillaume, Damien Davy, and Alain Cuerrier  
10:30 When South Meets North, First Reflections from Ethnobiological Meetings Among First Nations from Quebec and French Guiana
- 10:30 – Kool, Anneleen  
10:45 Viking-assisted Plant Dispersal and the Role of Public Outreach in Research
- 11:00 – Thompson, Kim-Ly, Reece, Nikkita, Robinson, Nicole, Fisher, Havana-Jae, Ban, Natalie, Picard, Chris  
11:15 "We Monitor by Living Here": Social-ecological Monitoring Methods Grounded in Gitga'at Knowledge  
Ogura, Saori  
11:15 – An Arts-based Experiential Approach to Community Documentation and Revitalization of Indigenous and Drought-tolerant Drops  
11:30
- 11:30 – Cannon, Carrie  
11:45 Mescal Agave Use in the Grand Canyon; Hualapai Ethnohistory of Food, Fiber, and Vessel  
Astudillo, Fernando, Peter Stahl, Ross Jamieson, and, Florencio Delgado  
11:45 – Post-Archaeology World: The Aftermath of the Historical Ecology and Archaeology of the Galápagos Islands Project  
12:00
- 12:00 – Medinaceli, Armando  
12:15 Bridging Paradigms: Aiming for True Collaboration in Ethnobiological Research

## **IV. The Voices of Food: The Language, Conversations and Stories of Indigenous Food Knowledge and Renewal in the Pacific Northwest (Geog 147)**

- 9:15 – Hamersley Chambers, Fiona  
9:30 "Indian Spaghetti": A Story of the Many Roots of Springbank Clover (*Trifolium wormskioldii* Lehm)
- 9:30 – Joseph, Leigh  
9:45 Feeding Our Spirit: Connecting Plants, Health, Place, and Cultural Resurgence
- 9:45 – Spalding, Pamela  
10:00 Sovereignty is Mostly About the Food: Mapping Vancouver Island, British Columbia (BC) Straits Salish Traditional Food Systems for a Post-colonial Future
- 10:00 – Mathews, Darcy, and Paige Whitehead  
10:15 What the Soil Has to Say: Microbes as Active Agents in Indigenous Garden And Village Anthrosols
- 10:15 – Jackley, Julia, Lepofsky, Dana, Gavia Lertzman-Lepofsky, Nancy J. Turner, and Jennifer Carpenter  
10:30 Documenting Springbank Clover (*Trifolium wormskioldii*) at Húyat, A Cultural Keystone Place of the Heiltsuk Nation
- 10:45 – Maurice-Hammond, Isabelle  
11:00 Finding the Words: Renewing Knowledge about Pacific silverweed (*Argentina egedii*) and Springbank

clover (*Trifolium wormskindii*) Cultivation on Tl'chés, Songhees First Nations Territory \*

- 11:00 – Chisholm, Libby Jay, and Kenthen Thomas
- 11:15 Knucwentwecw: Learning about Land through Secwepemc Stsepkewll
- 11:15 – Smith, Tonya, Kwikws Eliza Peters, and Koskas Dan
- 11:30 Ntákmén at Nleḫcáalten\*
- 11:30 – Toniello, Ginevra, Carleen Thomas, and Maya Guttman
- 11:45 “When the Tide Goes Out, the Table is Set” – Tseil-Waututh Relationships with Clams

#### **V. Cultivating Camas Connections (Geog 212)**

- 10:30 – Beckwith, Brenda and Valerie Huff
- 10:45 Being Seen: Camas as a Focal Species in the West Kootenay, British Columbia
- 10:45 – Carney, Molly, Jade d'Alpoim Guedes, Kevin Lyons, and Melissa Goodman,
- 11:00 Ethnobotanical Knowledge and Gendered Spaces: Reconstructing a Menstrual Lodge in the Interior Northwest\*
- 11:00 – Davis, Matthew, and Anthony Davis
- 11:15 Determining the Effects of Fertilization and Temperature Manipulation on *Camassia* spp.
- 11:15 – Matthews, Kathryn
- 11:30 Restoration Strategies for *Camassia quamash* on the Weippe Prairie
- 11:30 – Storm, Linda
- 11:30 – Chehalis and Cowlitz Oral History, Origins of Camas Prairie Places, and Indigenous Resource
- 11:45 Management
- 11:45 – Bryce, Cheryl, Susan MacIsaac (Johnson), and Aimee Pelletier
- 12:00 Collaborative Pit Cook Celebrates Kwetlal (Camas) Food Systems and Garry Oak Restoration Success
- 12:00 – LeCompte, Joyce, Sarah Hamman, and Valerie Segrest
- 12:00 – Reinvigorating Tribal Relationships with South Puget Sound Camas Prairie Cultural Ecosystems Through
- 12:15 Participatory Action Research and Transdisciplinary Collaboration

#### **VI. Sharing Stories, Sharing Songs (Geog 101)**

- 11:15 – Chipps, Randy
- 11:45 We Are All One
- 11:45 – Yvette John, P'eq'sq'oyes Slha':li' (White Plume Woman)
- 12:15 Traditional Lifestyle of Medicine and Foods
- 1:30 – Evans, Annie
- 2:00 Stories of Home
- 2:00 – Chia, Richard
- 2:30 Know the Names of Plants: Teaching and Promoting Indigenous Knowledge of Tiv Flora through Songs

#### **VII. Conservation Ethnobiology: People and Places (Geog 212)**

- 1:30 – Jones, Rachel
- 1:45 Colorful Quinoa: A Miracle Cereal Put to Market\*
- 1:45 – Song, Yingjie
- 2:00 Network Analysis of Tartary Buckwheat (*Fagopyrum tataricum*) Seed Flow in Liangshan, China: A Traditional Method for On-farm Crop Conservation\*
- 2:00 – Hart, Robbie
- 2:15 Naxi Courtyard Gardens Conserving Himalayan Flora

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\* Barbara Lawrence Award submission

- 2:15 – Kirner, Kimberly  
 2:30 Relating to the Garden: Changes in Knowledge, Skill, and Worldview among Urban Farm Interns  
 Nelsen, Berit  
 2:30 – “Do You Even Dab?” The Masculinization of Cannabis Culture and Losses to Cannabis Biodiversity in the  
 2:45 State of Colorado  
 2:45 – Tora, Mesulame  
 3:00 The Role of Indigenous Knowledge in Mitigating Fungal Threats to Local Ecosystems  
 de Araújo, Maria Elisabeth , Nicole Malinconico, and Enrico Bernard  
 3:15 – Linguistic Adaptation of Management Plans: An Example with Artisanal Fishermen in a Brazilian  
 3:30 Protected Area  
 Bataille, Corinne, Sanna Malinen, Phil Lyver, and Nigel Scott  
 3:30 – Opening Locked Gates: Identifying Land Owners’ Attitudes to Kaitiakitanga (Māori Environmental  
 3:45 Guardianship)\*  
 3:45 – Eloheimo, Marja  
 4:00 Pacific Sámi Searvi: We are the Diaspora Seeking our Stories  
 Sehgal, Anju Batta  
 4:00 – Cultural Diversities and Unheard Voices of Himalayan Tribes—Exploring Kinnaur Distt. of Himachal  
 4:15 Pradesh  
 Mitchell, Todd and Nicole Casper  
 4:15 – Using Traditional Ecological Knowledge to Protect Wetlands: The Swinomish Tribe’s Wetlands Cultural  
 4:30 Assessment Project  
 4:30 – Hecht, David  
 4:45 Home-Ranges for Birds, Home-Ranges for Deities: Spatializing Ontologies of Conservation in Bhutan\*

#### **VIII. Indigenous Peoples Food Systems in Transition: How Can ideas from Ethnobiology Inform Work on Food Environments (Barnett Hall – Music Bldg)**

- 1:30 – Downs, Shauna, and Selena Ahmed  
 1:45 The Food Environment Transition Towards Sustainable Diets  
 Ahmed, Selena  
 1:45 – The Food Environment Transition in the Akha Uplands of Southwestern China and Implications for  
 2:00 Sustainability  
 Reyes-García, Victoria, Bronwen Powell, Isabel Díaz-Reviriego, Álvaro Fernández-Llamazares, Sandrine  
 2:00 – Gallois, and Maximilien Gueze,  
 2:15 Dietary Transitions Among Three Contemporary Hunter-Gatherers Across the Tropics  
 2:15 – Johns, Timothy  
 2:30 Ethnobiological Professionals within East African Food System Transition  
 2:30 – Powell, Bronwen, Zachary Goldberg, Katheryn Kirby, Yooinn Hong, and Mackenzie Lombardi  
 2:45 Cultural Preferences for Traditional Vegetables in East Africa  
 2:45 – McCune, Letitia, and Twila Cassadore  
 3:00 Methods for the Reintroduction of Traditional Foods  
 Bosco, Samuel  
 3:00 – Expanding Food Sovereignty Conversations at the Tuscarora Nation in NY, USA, Through Community  
 3:15 Engaged Research  
 3:30 – Linares, Edelmira, and Robert Bye  
 3:45 The "Quelites Pasados" - A Traditional Food Preservation Technique in Northern Mexico

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\* Barbara Lawrence Award submission

- 3:45 – Leweniqila, Ilisoni
- 4:00 Na Mate Ni Civa Au A Vakawaletaka: Kumala Crop Opportunity in Fiji
- 4:00 – Tait Neufeld, Hannah
- 4:15 Wisahkotewinowak Gardens: Indigenous Land-based Learning in Southwestern Ontario
- 4:15 – Sykes, Harvey, Debra Hopkins, and Tara Joly
- 4:30 Where are the Freshwater Mussels? Reflections on Learning Together using a Community-based Action Research Approach to Braid Indigenous Knowledge and Western Knowledge Systems
- 4:30 – Elliott, Cassandra
- 4:45 Inuvialuit Cultural Life - Out on the Land
- 4:45 – Sunderland, Terence
- 5:00 The Right to Food? Protected Areas, Access and Food Security
- 5:00 – Turner, Nancy
- 5:15 Threads Frayed But not Broken: Loss and Continuity in Indigenous Peoples' Food Systems in Western Canada – The Role of Government Laws and Policies
- 5:15 – Kuhnlein, Harriet
- 5:30 Discussant

#### **IX. What Language Does Your Land Speak? Indigenous languages as Archives of Biocultural Knowledge (Geog 147)**

- 1:30 – Campbell, Vanessa, and Tara Moreau
- 1:45 Integrating Indigenous Languages into UBC Botanical Garden
- 1:45 – Ignace, Ronald, and Marianne Ignace
- 2:00 Secwepemc Concepts and Narrative of Tmicw: Ancestral Deeds in our Sentient Landscape
- 2:00 – Kemper, Rudo
- 2:15 Participatory Mapping of Indigenous Place-Based Storytelling in the Amazon Rainforest using Terrastories.io
- 2:15 – Lyall, Andrea
- 2:30 K'aḱotłatłano'xw xa k'waḱwax'mas "We are Going to Learn About Plants": Documenting and Reclaiming Kwak'wala Plant Names on Canada's Northwest Coast
- 2:30 – Greening, Spencer, and Daisy Rosenblum
- 2:45 Ts'msyen Toponymy, TEK and Webs of Knowledge: Recognizing Gitga'at Meanings and History in Sm'algyax Place Names

#### **X. Resource Use and Adaptations (Geog 101)**

- 2:30 – Ojeda, Jaime, and Natalie Ban
- 2:45 Biocultural Interactions Between Yagan People and Mollusks in Sub-Antarctic Channels (Patagonia), Chile.
- 2:45 – McQuaid, Gary
- 3:00 Stakeholders and Manager Observations of Mountain Goat (*Oreamnos Americanus*) Health in the Skeena Region of British Columbia.
- 3:00 – Ward, Grace
- 3:15 Gathering and Tending in the Lower Mississippi Valley: Evidence for Persimmon (*Diospyros virginiana*) and Hickory (*Carya* spp.) Management during the Late Archaic
- 3:15 – d'Alpoim Guedes, Jade, and Kyle Bocinsky
- 3:30 Modelling the Spread of Crops Across Eurasia
- 3:30 – Allen, Susan, and Martha Wendel
- 3:45 Resilience and Adaptation in High Albania: Insights from Late Neolithic to Iron Age Plant Use in the Shkodër Valley

- 3:45 – Pierotti, Raymond  
 4:00 Ethnobiology and Evolution: Strong Links and Weak Invocation

#### **XI. Networking for Applied Ethnobiology-Ethnobotany Practitioners, Professionals and Scholars (Geog 101)**

- 4:00 –  
 5:30 Session organizers: Lisa Golin and Trish Flaster

#### **XII. Tonics, Textures, and Taste Buds: Global Perspectives in Ethnobotany (Geog 147)**

- 3:00 – Ellen, Roy  
 3:15 The Ethnobotany of Culturally Salient Polymorphisms in *Codiaeum variegatum*  
 3:15 – van 't Hooft, Anuschka, Claudia Heindorf, Juan Antonio Reyes-Agüero, and Javier Fortanelli-Martínez  
 3:30 Teenek Folk Taxonomy. The Categorizing of Corn, Squash, Bean, and Chayote  
 3:30 – Qiong, Fang  
 3:45 Ethnobotanical Study of the Yao Ethnic Group in Jianghua, Hunan, China\*\*  
 3:45 – Wagner, Gail  
 4:00 If Dessert is a Sweet Dish, What is a Condiment?  
 4:00 – O'Sullivan, Megan  
 4:15 Is It a Cuisine? Prehistoric and Contemporary Explorations of Native American Foodways  
 4:15 – Jernigan, Kevin  
 4:30 An Investigation of “Mouse Foods” on the Russian and Alaskan Sides of the Bering Strait  
 4:30 – Flachs, Andrew  
 4:45 Ethnobiologizing Fermentation Revivalism  
 4:45 – Toro, Fabian H., Tang Jigen, Patrick McGovern, and George Preti  
 5:00 Shang Dynasty Medicinal Food: Organic Residue Analysis of Sealed Fangyi Vessels from Anyang

#### **Friday, 10 MAY, 2019**

#### **XIII. Indigenous Peoples and Climate Change Impacts (Geog 212)**

- 8:00 – Panci, Hannah, Melonee Montano, Travis Bartnick, and Aaron Shultz  
 8:15 A Climate Change Vulnerability Assessment Integrating Traditional and Scientific Ecological Knowledge  
 8:15 – Li, Xiaoyue, and Victoria Reyes-García,  
 8:30 A Collaborative Approach to Understand Climate Change Impacts on Local Social-ecological Systems  
 8:30 – Stepp, John Richard  
 8:45 Highland Maya Medicinal Plants and Climate Change  
 8:45 – García del Amo, David, Graham P. Mortyn, and Victoria Reyes García  
 9:00 Including Indigenous and Local Knowledge in Climate Change Research. An Assessment of Scientists' Opinion  
 9:00 – Wyllie de Echeverria, Victoria  
 9:15 Using Local and Indigenous Ecological Knowledge to Examine Local-scale Perceptions, Effects of, and Adaptation to, Climate Change on Human/Landscape Interactions on the Pacific Coast of North America  
 9:15 – Cameron, Laura  
 9:30 “A Change of Heart”: Indigenous Perspectives from the Onjisay Aki Summit on Climate Change  
 9:30 – Roskrug, Nick  
 9:45 The Role of Traditional Knowledge for Food Systems in Cyclone Affected Polynesia  
 9:45 – Sherpa, Pasang

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\* Barbara Lawrence Award submission



10:00 Storying Climate Change for the Future

#### **XIV. Placed-Based Spirituality and Religion in Ethnobiology (Geog 101)**

- 8:15 – Davis, Dawn D.
- 8:30 Peyote Habitat Loss: An Examination of Threats Using GIS
- 8:30 – Paul, Andrew
- 8:45 Voices from the Invisible World: Role of Spirits in Traditional Karen Conservation Practice
- 8:45 – McDonald, Andrew
- 9:00 Ancient Waterlily Symbolism in Central Mexico
- 9:00 – Chandler-Ezell, Karol
- 9:15 Midnight Llamas, Death Fish, The Devil's Cattle, and Fear of Darkness in Ecuadorian Children's Legends
- 9:15 – Stein, Juliet
- 9:30 An Ethnobotanical Study of Ayahuasca and Entheogenic Tourism
- 9:30 – Arias-Bustamante, Jose
- 9:45 Mapuche Spirituality and Its Contribution to Climate Change Mitigation
- 9:45 – Thiel, Amanda, and Armando Medinaceli
- 10:00 Ethnopharmacology of Mal Ojo: Plant and Animal Remedies

#### **XV. Ethnohistory, Environmental History, and Ethnobiology (Barnett Hall – Music Bldg)**

- 9:00 – Kjesrud, Karoline
- 9:15 Plant Medicine in Medieval Scandinavia
- 9:15 – Walshaw, Sarah
- 9:30 Ethnobiology as Ethnohistory: Methods and Interdisciplinary Dialogue
- 9:30 – Wolverton, Steve and Robert Melchior Figueroa
- 9:45 Integration of Environmental Justice and Historical Ecology
- Wolsak, Saskia
- 9:45 – Bermuda's Bibby Tree: the forgotten history of palm wine in Bermuda and the possibility of Bermuda
- 10:00 palmettos as Culturally Modified Trees
- 10:00 – Bye, Robert, and Edelmira Linares
- 10:15 Ethnobotanical Continuity in North-Central New Spain-Mexico: 18th and 19th Centuries
- 10:15 – Flores, Fabio
- 10:30 Entomotherapy Among the Ancient Mayan Peoples of the Yucatan Peninsula, Mexico

#### **XVI. Ethnobiology Through Song (Geog 100)**

*In Honor of Kwaxsistalla Wathl'thla Chief Adam Dick*

- 8:00- Gosford, Bob and Mark Bonta
- 8:15 Firebirds, Funerals and Feathers: Maintaining Biocultural Knowledge of Garrkany Through Song
- Thornton, Thomas F., Mary Rudolph, William Geiger, and Amy Starbard
- 8:15 – A Song Remembered in Place: Tlingit Composer Mary Sheakley (Lxook) and Huna Tlingits in Glacier Bay
- 8:30 National Park, Alaska
- 8:30 – Chipps, Laura
- 8:45 Cosmos In Action
- 8:45 – Post, Jennifer
- 9:00 Songs, Settings, Sociality: Biodiversity and Wellbeing in Western Mongolia
- Welch, James R. and Marco Aurelio Serenho Ihi Xavante
- 9:00 – Xavante Hunting Calls: A Vocal Repertoire for Ethnozoological Communication and Coordination in the
- 9:15 Brazilian Cerrado

- 9:15 – Gordon, A. Ross
- 9:30 Tambaroro: Cryptic Song Lyrics and Songs as Teachings in the Aru Islands
- 9:30 – Fernández-Llamazares, Álvaro, and Victoria Reyes-García
- 9:45 Biocultural Knowledge Transmitted Through Song in Bolivian Amazonia
- 9:45 – Gillreath-Brown, Andrew
- 10:00 An Archaeomusicological Study of Turtle Shell Rattle Music Culture Across the Contiguous United States
- 10:00 – Glover, Denise M., and James Veteto
- 10:15 American Roots Music and Ethnobiology
- 10:15 – Recalma-Clutesi, Kim, Douglas Deur, Clan Chief Adam Dick watl'tla
- 10:30 Adam's Garden: The Power of Song in Recovering Knowledge of the Luxw'xi'wey

## **XVII. Avian Voices in Song, Story, Wisdom, and Warning (Geog 212)**

- 10:15 – Ignace, Marianne and Ronald Ignace
- 10:30 The Mystery of Songbirds in Secwepemc Narratives
- 10:30 – Forth, Gregory
- 10:45 Bad Mothers and Strange Offspring: Images of Scrubfowl and Sea Turtles in Eastern Indonesia
- 10:45 – Herron, Scott
- 11:00 Ethnoornithology of Cranes in North America: Anishinaabe and Myaamia Chieftain Clan Animal
- 11:00 – Fergus, Rob, Hull, Kerry
- 11:15 A Forest of Signs: Avian Warnings and Messaging among the Q'eqchi' Maya
- 11:15 – Hunn, Eugene
- 11:30 Columbia River Indians as Astute Birders
- 11:30 – Miller, Andrew
- 11:45 Plains Cree Waterfowl Hunting at a Prairie Wetland, Central Saskatchewan
- 11:45 – Rempel, Zachary and Iain Davidson-Hunt
- 12:00 Birds in Anishinaabe Texts Through Cosmology, Story, and Art
- 12:00 – Sault, Nicole
- 12:15 Bird Voices from Latin America: Stories of Trust, Warning, and Wisdom

## **XVIII. Global Change/Global Health (Geog 101)**

- Currey, Robin C. D., Jennifer Halpin, Colin M. Mahoney, Laura Valentine, Taryn D. Skinner, Micah A.
- 10:30 – Alden, Danica Abejon, Sean C. Flaherty, and John G. Van Hoesen
- 10:45 Lessons in Food System Localization from the Silk Road - The Geospatial Rapid Agricultural Biodiversity Survey for Dietary Diversity
- Lucio Cruz, Claudia Yarim, Lizeth Monzalvo Hernández, Martha Azucena Zuñiga Hernández, Jaime
- 10:45 – Pacheco-Trejo, Eliazar Aquino Torres, and Judith Prieto Méndez
- 11:00 Taxonomic Identification, Seed, and Vegetative Propagation of Two Overexploited Species of Litsea Lauraceae in Two Agroecosystems from Central Mexico
- 11:00 – Quinlan, Marsha B.
- 11:15 Ethnozoology of Dogs in Guatemalan Small-holder Farms
- 11:15 – Ragosta, Summer, Ivelyn Harris, Ntim Gyakari, Emmanuel Otoo, and Alex Asase
- 11:30 Participatory Ethnomedicinal Research with Fante-Akan Herbalists in Rural Ghana
- Sato, Yasuaki
- 11:30 – Changing Dietary Habits of Children in Central Uganda: Whereabouts of Traditional Food Knowledge in
- 11:45 Modernization
- 11:45 – Olson, Elizabeth

12:00 Discussant

**XIX. Indigenous Resource Management and Sovereignty in Western North America (Barnett Hall – Music Bldg)**

- 10:30 – McKechnie, Iain, Jacob Earnshaw, and Spencer Wood  
10:45 Mapping Marine and Terrestrial Interdependence from Taxonomic Use Webs in Nuu-chah-nulth and Makah territories
- 10:45 – Ogston, Lindsey  
11:00 Tsleil-Waututh Nation Environmental Stewardship in Burrard Inlet, Vancouver, BC.
- 11:00 – Sam-Stanley, Christina  
11:15 Kitsumkalum First Nation: A Tribe of the Tsimshian Nation
- 11:15 – Armstrong, Chelsey Geralda  
11:30 Land-Use is Dissent: Traditional Resource Management as Acts of Sovereignty in British Columbia
- 11:30 – Main Johnson, Leslie  
11:45 Managing Resources and Access through Customary Tenure and Law: Gitksan and Witsuwit'en Examples
- 11:45 – Tran, Tanya  
12:00 'Borders Don't Protect Areas, People Do': A Collaborative Case Study in Developing New Indigenous-led Protected and Conserved Areas in the Great Bear Rainforest
- 12:00 – Blazina, Ashley  
12:15 People and Fire in the Evergreen State: Historic and Current Ethnoecological Relationships
- 1:30 – Green, Scott  
1:45 A Tale of Two (Conflicting) Stories – Legacies of Scientific Resource Management constrain Xáxli'p of St'at'imc Nation Land Management Values and Practices
- 1:45 – Ritchie, Patrick  
2:00 Sts'ailes-Coast Salish Led Conservation Efforts of Culturally Important Plants and Places on Contested Crown Land
- 2:00 – Schaepe, Dave, Natasha Lyons, John Welch, and S'ólh Téméxw Stewardship Alliance  
2:15 Advancing Stó:lō Stewardship and Sovereignty in the Fraser Valley of British Columbia
- 2:15 – Stocks, Allison, Skye Augustine, Nathan Cardinal, Anne Salomon, WSANEC Clam Garden Traditional Knowledge Working Group, and Hul'q'umi'num' Clam Garden Traditional Knowledge Working Group  
2:30 Collaborative Eco-cultural Clam Garden Restoration: Assessing the Ecological Impacts of Large-scale Multispecies Mariculture
- 2:30 – McAlvay, Alex  
2:45 Toward a United Literature on Traditional Resource and Environmental Management: Implications for Resource Sovereignty and Understanding Human Subsistence
- 2:45 – Turner, Nancy  
3:00 Discussant

**XX. Frontiers in Domestication Research (Geog 100)**

- 10:45 – Long, Chunlin, Yujing Liu, Qiyi Lei, Hang Shu, Yuanyuan Ji, and Jun Yang  
11:00 Wild Food Plants Domesticated by Indigenous Peoples: Examples from Southwest China
- 11:00 – Hodgson, Wendy, and Andrew Salywon  
11:15 How Agave murpheyi Changed Our Understanding of the Interrelationship of Pre-Columbian People, Agaves, Landscapes in the Sonoran Desert
- 11:15 – Salywon, Andrew, and Wendy Hodgson  
11:30 Unravelling the Origins of Pre-Columbian Agave Domestication in Present Day Arizona
- 11:30 – Zarrillo, Sonia, Nilesh Gaikwad, Claire Lanaud, Terry Powis, Christopher Viot, Isabelle Lesur, Olivier Fouet,  
11:45 Xavier Argout, Erwan Guichoux, Franck Salin, Rey Loor Solorzano, Olivier Bouchez, Hélène Vignes, Patrick

Severts, Julio Hurtado, Alexandra Yopez, Louis Grivetti, Michael Blake, Francisco Valdez  
Early Cacao Use in the Upper Amazon of South America

11:45 – LeFebvre, Michelle, and Christina Giovas

12:00 The Biocultural Legacy of Amerindian Mammal Ethnophorsey in the Caribbean

12:00 – Yunhui, Yang, Li Guanhua, and Long Chunlin,

12:15 Ethnobotany of a Cucumber Landrace in Yunnan, China \*

## **XXI. Operationalizing Biocultural Indicators of Well-Being Across Scales (Geog 212)**

1:30 – Sterling, Eleanor and Joe McCarter

1:45 Using Biocultural Approaches for Indicator Development in Solomon Islands

1:45 – Pascua, Pua'ala, Eleanor Sterling, and Joe McCarter

2:00 Developing and Implementing Biocultural Indicators of Well-being

2:00 – Rodríguez, Mariana and Iain Davidson-Hunt

2:15 Biocultural Design as a Tool to Identify Livelihood Opportunities \*

Silvano, Renato

2:15 – A 'Window to the Past': Quantitative Analyses of Fishers' Knowledge to Evaluate Temporal Changes on  
2:30 Fishing Resources in Tropical Freshwater and Coastal Ecosystems

## **XXII. Tambaroro. Ethnographic Film Premiere Screening (Geog 101)**

1:30 –

2:15

## **XXIII. Poster Session 2:15 – 4:00 (First Nations House of Learning)**

### **Deep Time**

Dolinar, Liz

Reconnecting Indigenous Knowledge to the Sunlight Basin of Northwestern Wyoming: Integrating Traditional Ecological Knowledge and Archaeology

Gillreath-Brown, Andrew, Aaron Deter-Wolf, Karen Adams, Valerie Lynch-Holm, Samantha Fulgham, Shannon Tushingham, William D. Lipe, and R.G. Matson

Oldest Tattoo Tool in Western North America from the Turkey Pen Site, Utah

Hebda, Chris

The Earth Speaks: Multi-Proxy Scientific and Indigenous Approaches to Ecological Continuity with Late Glacial Palaeoenvironments in Coastal British Columbia

Letham, Bryn, Spencer Greening, Justin Clifton, Donald Reece, Mark Wunsch, Jacob Earnshaw, and Dana Lepofsky  
Deep-Time Histories of Landscape Change and Human Occupation at Laxgalts'ap (Old Town), A Gitga'at Cultural Keystone Place on the Northwest Coast of British Columbia

Payne, Neal

Reevaluating Colonialism and Cultural Change Through Food in Roman Britain

Testani, Alessandria

Zooarchaeology of Predatory Mammals at Tse'K'wa

### **Water Worlds**

Ball, Alyssa, and Iain McKechnie

Revisiting Archaeological Fish Scales as a Metric for Contextualizing Ancient Indigenous Fisheries

Cruz, Octavio

Clam Garden Bivalve Dietary Patterns and Condition

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\* Barbara Lawrence Award submission

Efford, Meaghan and Iain McKechnie

Gooseneck Barnacles and the Archaeology of Nuu-chah-nulth Shellfish Management

He, Jianwu

Ethnobiological Study of Pickled Fish in Dong Communities of China\*

### **Paleo Plants**

Furlotte, Brett

Paleoindian Plant-Fuel Utilization at the Cuncaicha-1 Rock Shelter Site, Department of Arequipa, Peru

Gauvreau, Alisha

Paleoethnobotanical Research of EkTb-9, Triquet Island, Nuláwitxv Tribal Area

Guedes, Jade d'Alpoim, Katrina Cantu, Clara Dawson, Shelby Jones Cervantes, Arianna Garvin, Brandon Gay, Isabel

Hermesmyer, Matthew Howland, Xiyuan Huang, Bridget Lawrence, Brady Liss, Sunyoung Park, Eric Rodriguez,

Julianna Santillan-Goode, Sarah Sheridan, Luke Stroth, Anthony Tamberino, Isabell Villasana, Emma Villegas,

Zhen Yu, and Thomas E. Levy

The Archaeobotany of an Early Copper Production Site in the Fanyan, Jordan

Leonard-Doll, Katy, and Paloma Sánchez

Seeds of Survivance: Investigating Grand Ronde Foodways through Archaeobotany

Marston, John M., Sydney A. Hunter, and Elizabeth Baker Brite

Macrobotanical Perspectives on Agriculture in the Islamic Golden Age City of Kath

Sekulic, Annalee, Sarah Ivory, and Joy McCorriston,

Hydraxes in Human Landscapes of the Arabian Desert\*

Villasana, Isabell

The Origins of "Weeds" at Harappa 3300 B.C- 1700 B.C

Wade, Kali R., Emily Brown, Melissa S. Cradic, and John M. Marston

Plant Use and Elite Burial Customs at Middle Bronze Age Tel Megiddo, Israel

### **Education and Environment**

Belarbi, Nejma

Voices for Biodiversity

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Fungal Network Genesis at Ferris State University: Mycology Club Evolution and Research

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\* Barbara Lawrence Award submission

## ABSTRACTS

Ahmed, Selena. **The Food Environment Transition in the Akha Uplands of Southwestern China and Implications for Sustainability** (Session VIII)

Globalization, urbanization, and income growth have spurred a rapid food environment transition throughout China with implications for food choices, dietary quality, and planetary health. This presentation depicts the food environment transition in an indigenous Akha community in the uplands of Southwestern China using ethnobiological data on land-use and dietary changes over a ten-year period. Traditional Akha diets are primarily plant-based with reliance on wild and natural food environments from a diversified mosaic of agro-forests, forests, home gardens, mixed crop fields, and paddies. With increased commercialization of natural resources, road building, and other pressures, traditional Akha food environments are shifting towards increased reliance on market food environments with greater consumption of processed food, away-from-home food, animal products, and sugar-sweetened beverages. Results highlight that ecological knowledge and management of natural food environments can provide sustainable food system strategies that reconcile food procurement with planetary health in the context of global change.

Allen, Susan and Martha Wendel. **Resilience and Adaptation in High Albania: Insights from Late Neolithic to Iron Age Plant Use in the Shkodër Valley** (Session X)

From 2013 – 2015, the Projekti Arkeologjik i Shkodrës (PASH) conducted regional surface survey and excavation at several sites in the Shkodër province of northern Albania. Two settlements, Gajtan and Zagorës, are fortified hilltop sites that preserved intact deposits with well-preserved macrobotanical remains. Gajtan, one of the largest hill forts in Albania, was occupied from the Late Neolithic to the Late Bronze Age (LBA), while Zagorës was occupied from the Eneolithic to the LBA. Here we discuss here macrobotanical evidence for shifts in resource use and management. Woody taxa include beech, fir, and other types, while crop taxa are limited to the cereals einkorn wheat, spelt, two-row barley, and millet, and the pulses lentil, pea, and bitter vetch. This dataset provides insight into landscape dynamics and the resilient and adaptive resource use and management strategies over the course of the period from the late fifth to early first millennium BCE.

Arbogast, Drew, Abigail Buffington, and Joy McCorriston. **Establishing a Phytolith Reference Collection for the Vegetation Communities of the Mountains of Dhufar, Oman** (Session XXIII)\*

The Dhufar Mountains region features high ecological diversity in discrete zones largely due to the effect of waning summer monsoon cloud precipitation. Broadly, the Ancient Socio-Ecological Systems in Oman (ASOM) project examines how climate fluctuation in prehistory impacted human settlement and how this dynamic integrates with the emergence of territoriality. One paleoecological proxy is phytoliths, silicon dioxide microfossils formed in the cellular and intercellular spaces of living vascular plants, which previous research demonstrates are well preserved in the sediments of the region. Due to uneven rates of formation based on plant family, it is best to study phytoliths on the assemblage-scale using a reference collection reflecting the local vegetation. To this end, I collected thirty-eight specimens from herbaria and field survey, based on two criteria 1) indication of zone, and 2) phytolith production potential. Post-field lab analysis enabled me to investigate morphotypes unique to specific taxa and ecological zones.

Arias-Bustamante, Jose. **Mapuche Spirituality and Its Contribution to Climate Change Mitigation** (Session XIV)

Undoubtedly, the Chilean forestry sector is one of the most successful in the world, however, its exponential development is based on Mapuche ancestral territories. Access to these territories was obtained through titles assigned during the Chilean military dictatorship (1973-1989). As a result, the native forest associated with these lands has been subjected to selective harvests, forest fires, and the introduction of industrial timber plantations (PFI). This has not only caused severe impacts on the environment and the communities that depend on it, but it

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\* Barbara Lawrence Award submission

has also determined the spiritual disconnection between people and nature. Mainly, due to the loss of sacred spaces that have been destroyed, determining the disappearance of the spirits or ngen, protectors of those spaces. Thus, this research discusses the role of Mapuche spirituality in the recuperation processes of lands, sacred spaces and forest ecosystems, and its contribution to climate change mitigation.

Armstrong, Chelsey Geralda. **Land-Use is Dissent: Traditional Resource Management as Acts of Sovereignty in British Columbia** (Session XIX)

Ethnobiologists are capable of making transformative scientific contributions when they participate in localized actions and acts of colonial dissent. Direct actions like protests, checkpoints, and re-occupations assert Indigenous sovereignty and are an alternative to the wildly expensive and oppressive Canadian justice system. In the examples presented here, traditional land-use and management practices are unequivocally tied to actions of colonial dissent. Simply being on one's land, tending gardens, harvesting, and hunting, challenge attempts of continuous colonization by government and extractive industry (mining, oil and gas). The history of Indigenous dissent in British Columbia is inextricably tied to resource management and ethnobiologists are dared to explore this deep connection between Indigenous existence and resistance.

Astudillo, Fernando, Peter Stahl, Ross Jamieson, and Florencio Delgado. **Post-Archaeology World: The Aftermath of the Historical Ecology and Archaeology of the Galápagos Islands Project** (Session III)

During the summers of 2014 to 2018, we conducted an archaeological project in the rural town of El Progreso. It is the site of a sugarcane plantation which operated from the 1880s to the 1920s, and became one of the most important companies in Ecuador. The legacy of the plantation molded local identities of Galápagos despite conflicting considerations of the past. After our project, the local past began to attract attention. Local collaboration on our project including local authorities and community leaders, none of them related to the original occupants of the island or the plantation. Today, the local community is trying to build its identity based on the historical importance of the plantation. We examine the non-academic social outcomes of our project, discuss the lessons learned from interaction between archaeologists, authorities, government, and the local community, and evaluate the consequences of implementing an archaeology project in the Galápagos Islands.

Baker, Janelle. **Ethnobiology and Reconciliation: Violence Against Women and the Land** (Session I)

I have noticed in my research on wild food contamination with *sakâwiyiniwak* (Northern Bush Cree) communities in Canada's oil sands region that almost every family I know has a female member who is missing or murdered. This is difficult to ignore while doing ethnographic and ethnobiological research and I consider how ethnobiological knowledge is affected when there is violence against women. The Truth and Reconciliation Commission (TRC) of Canada released reports and calls to action in 2015 in order to redress the legacy of residential schools and advance the process of Canadian reconciliation. In this paper, I review these documents along with the currently available transcripts from the National Inquiry into Missing and Murdered Indigenous Women and Girls and present women's ethnobiological knowledge from them. I then provide a list of ways that ethnobiologists can further commitments to reconciliation. In loving memory of Jessica Orozco.

Ball, Alyssa and Iain McKechnie. **Revisiting Archaeological Fish Scales as a Metric for Contextualizing Ancient Indigenous Fisheries** (Session XXIII)

Archaeological fisheries data are increasingly recognized as important ecological archives but zooarchaeological identifications often cannot obtain biologically relevant parameters such as age, species, and size. Here, we build on a thread of earlier scholarship and conduct an analysis of fish scales from ancient Indigenous settlement sites in Tseshaht territory on Western Vancouver Island. We make recommendations for recovery, documentation, and species level identification from fish scales and provide estimates of age at harvest for approximately 30 scales. These data expand perspective on preindustrial Tseshaht fisheries and indicate that archaeological fish scale analysis can yield useful information for contemporary fisheries conservation and management. We conclude with recommendations for integrating these data with community driven fisheries management initiatives and monitoring programs.



Bataille, Corinne, Sanna Malinen, Phil Lyver, and Nigel Scott. **Opening Locked Gates: Identifying Land Owners' Attitudes to Kaitiakitanga (Māori Environmental Guardianship)** (Session VII)\*

We examined psychological factors affecting the ability of iwi (Māori tribe, New Zealand) to practice kaitiakitanga, focusing on mahinga kai (customary harvest and management of waterfowl and wetlands). 25 participants from two groups, iwi (Ngāi Tahu customary practitioners and harvesters); and land owners, were interviewed. Findings suggest that access to or through privately owned land is a major barrier to iwi practicing kaitiakitanga and customary harvest. Affect (e.g. trust; fear) plays a primary role in land owners' willingness to grant access onto their property. Other barriers include cognitive factors (e.g. lack of knowledge of kaitiakitanga practices among land owners) and social factors (e.g., quality of social contact between land owners and iwi). The research suggests that (1) positive intergroup contact may reduce fear, increase trust and promote positive intergroup perceptions; (2) both land owners and iwi may achieve their own goals through collaboration and the adoption of a shared affiliation.

Beckwith, Brenda and Valerie Huff. **Being Seen: Camas as a Focal Species in the West Kootenay, British Columbia** (Session V)

The inability to see plants leads to undervaluing plants and their importance to life on earth. Alleviating plant blindness through re-establishing peoples' relationships with plants is vital to both human and ecological communities. We formed the Kootenay Camas Project in 2012 to bring awareness to common camas (*Camassia quamash*), an ecologically and culturally valuable being in the BC Interior. We present challenges/successes from our initiatives including citizen science mapping, seasonal outreach, salvage, propagation, school programs, and research and restoration projects. Through our consistent presence and knowledge-sharing within the community and people's interaction with this charismatic plant over time, residents are excited to know and learn from camas. School kids are enthusiastic advocates, residents grow it in their gardens, and a conservation area was established. After eight years of outreach, camas has become an ambassador for people-plant connection in our region. Its light blue flowers have drawn our focus.

Belarbi, Nejma. **Voices for Biodiversity** (Session XXIII)

Loss of biodiversity and biocultural diversity is one of the biggest threats facing our planet and our species. Voices for Biodiversity (V4B) is a nonprofit organization that gives a voice to people living in the midst of biodiversity loss: the youth who sees the environment that feeds her family being destroyed or the Elder who notices that there are fewer birds, fewer rabbits and fewer bees. As a multimedia platform, Voices for Biodiversity supports our contributors in telling their story, through the publication of articles, photography and video to connect us with each other and our environment. The marvel of storytelling is that, once heard, we are empowered in our work, and the majority of our storytellers go on to do much in the field of conservation. In this poster, we share our story and process with you and invite you to join us in being a voice for biodiversity.

Black Elk, Linda. **Berry Pickers and Medicine Makers: Rethinking Perceptions of Women in Traditional Native American Communities** (Session I)

The famous stereotype that precolonial Native American women were devalued and mistreated within their communities is still wreaking havoc on our people to this day. Early anthropologists often misinterpreted and misrepresented various cultural norms and behaviors due to issues such as racism, exoticism, and preconceptions. For example, many early researchers claimed that tribal menstrual rites were an avoidance of "dirty" or "polluted" women, still others made traditional relationships between men and women seem abusive or exploitative. These falsehoods have contributed to the extensive and systemic devaluation of Native American women by mainstream society. Interviews conducted with Native American elders and other knowledge holders shed new light on the roles and worth of women in Native and First Nations societies, and may serve to correct misconceptions and stereotyping by non-Natives.

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\* Barbara Lawrence Award submission

Blazina, Ashley. **People and Fire in the Evergreen State: Historic and Current Ethnoecological Relationships** (Session XIX)

Fire has been an active component in Pacific Northwest landscapes since time immemorial. For millenia, fire was viewed as a tool by people in Washington state. Today, many residents view fire as a force of destruction, or something to combat and suppress at all costs. However, recent studies show that, despite our modern record-breaking wildfires, most areas of the state continue to burn less frequently now than they did for many thousands of years. As conditions continue to become warmer and drier, fire is only expected to increase in the Pacific Northwest. This talk will provide an overview of people/fire relationships in Washington state, and will highlight a few communities that are re-learning how to effectively use and live with fire.

Bosco, Samuel. **Expanding Food Sovereignty Conversations at the Tuscarora Nation in NY, USA, Through Community Engaged Research** (Session VIII)

In this presentation I describe the initiation and ongoing relationship building between PhD student, Sam Bosco, and members of the Tuscarora Nation in New York State developing multigenerational workshops that explore the significance of nut trees in Tuscarora food sovereignty - past, present, and future. As one of the most nutritionally dense plant-based foods, nuts were important components of food economies among Indigenous peoples in the Eastern Woodlands, notably the Haudenosaunee (aka Iroquois Confederacy, of which the Tuscarora are a part). Archaeological and historical evidence indicates that the Haudenosaunee may have managed forests to favor such nut trees. However, contemporary food sovereignty efforts have mostly focused on corn. Building on this, nuts can play an important role in food systems within contemporary Haudenosaunee communities. The benefits and constraints of community engaged research as a transformational methodology between Indigenous nations and Settler institutions will be interrogated.

Bowcutt, Frederica. **Undergraduate Researchers Support Restoration of Camas Prairies through Creation of a Field Guide to Plants** (Session XXIII)

Since 2003, Evergreen students have been conducting field, herbarium and library research for a natural history guide to the plants found in the camas prairies of the southern Salish Sea region. Published in 2016, the guide includes over a hundred of their botanical illustrations and hundreds of herbarium specimens which can be accessed online and in the Evergreen Herbarium. Short essays covering various aspects of these unique prairies and associated oak woodland ecosystems are included by students and professional scientists from Evergreen, Centralia College, and the Center for Natural Lands Management. The second edition, slated for publication in 2022, will include roughly one hundred more plant species and additional essays. The field guide is written for a lay audience and provides support to researchers and others involved in restoring these threatened ecosystems in our region. We hope it will aid greater collaboration with local tribes in the future.

Bridgeman, Beth. **The Antioch College Apothecary: Place-Based, Experiential Learning** (Session XXIII)

Ohio has a long tradition of honoring plant-based indigenous medicine, from the Cincinnati-based 19th century Eclectic movement to today's Appalachia-based United Plant Savers' botanical sanctuary movement. Antioch College, in Yellow Springs, Ohio has a 175-year old tradition of democratic learning and experiential education. The Antioch Apothecary: Teas and Tinctures, Syrups and Salves, is a hands-on course where students make plant medicine for the student-run Antioch Apothecary; harvesting and foraging from the student-run Antioch Farm, the campus, and nearby woods as well as maintaining a campus apothecary garden. Students make teas, tinctures, balms, vinegars, tonics, syrups, salves, poultices and healing plant-based foods for treating many common ailments. They learn basic herbal-medicine traditions and plant communication and the role that women across cultures have played in healing traditions throughout history. Commensality is included in each lesson; re-creating the commons across food and plant medicine.

Bryce, Cheryl, Susan MacIsaac (Johnson), and Aimee Pelletier. **Collaborative Pit Cook Celebrates Kwetlal (Camas) Food Systems and Garry Oak Restoration Success** (Session V)

Cheryl Bryce, from Songhees Nation, has been working to build awareness of Kwetlal (Camas) Food Systems, her whole life. For the past eight years, Parks Canada has worked together with Cheryl, and other Songhees and Esquimalt community members, as well as many volunteers, to restore one acre of lawn at Fort Rodd Hill and Fisgard Lighthouse National Historic Sites, to a diverse Garry Oak meadow that includes important traditional medicine and food plants, like Camas. In fall 2018, we celebrated this achievement by hosting a Coast Salish Pit Cook led by Cheryl Bryce. The community came together to share a meal that had been eight years in the making, including the opportunity to sample traditional foods such as Camas, that were grown onsite in a Conservation Nursery. Working together to combine science and traditional knowledge has helped us learn from one another, deepening our appreciation of nature and each other.

Bye, Robert and Edelmira Linares. **Ethnobotanical Continuity in North-Central New Spain-Mexico: 18th and 19th Centuries** (Session XV)

Ethnobotanical continuity (persistence of botanical elements in their cultural context) of plants is part of our program of biocultural resource rescue and conservation. Despite colonial oppression and bellicose interactions since the mid-1500s in contemporary Chihuahua, New Mexico and adjacent Texas, the official Spanish colonial surveys (Relaciones Topográficas) and later field observations of North American commercial and military travelers (e.g., Z. Pike, J. Gregg, A. Wislizenus, etc.) between mid-1700s and mid-1800s record almost 200 plants for their importance as food, medicine, forage, fuel, construction material, fiber, poisons and environmental services. Occidental scientific taxonomic identities for these plants were determined based upon historical herbarium collections, constituents of contemporary ethnobotanical complexes, and our field work. The biocultural importance of native plants of the region has diminished to 30% of the species while that of exotic plants endures.

Cameron, Laura. **“A Change of Heart”: Indigenous Perspectives from the Onjisay Aki Summit on Climate Change** (Session XIII)

In June 2017, Turtle Lodge – an Indigenous knowledge centre in Sagkeeng First Nation, Manitoba – convened the Onjisay Aki International Climate Summit, a cross-cultural dialogue on climate change led by Indigenous Knowledge Keepers from around the world. In collaboration with Turtle Lodge, our research team supported the documentation, synthesis, and communication of the knowledge shared at the Summit using collaborative written and video methods. The discussion centred around impacts, understandings, and solutions to climate change, suggesting that addressing the problem requires a shift in human values. The Knowledge Keepers emphasized that their diverse knowledges and traditions – embedded in their spiritual ways of life – can provide guidance for this cultural shift. This underscores the need for a new approach to engaging with Indigenous knowledge in climate research, not only as a source of observations but a wealth of values and worldviews to inform action and research more broadly.

Campbell, Vanessa, Tara Moreau. **Integrating Indigenous Languages into UBC Botanical Garden** (Session IX)

UBC Botanical Garden is located on the traditional and unceded land of the xʷməθkʷəy̓əm (Musqueam) First Nation. The 2019 UN International Year of Indigenous Language (<https://en.iyl2019.org/>) draws attention to the critical global loss of indigenous languages and highlights the urgent need to preserve, revitalize and promote them. As stewards of plant and biodiversity conservation, botanical and public gardens are well positioned to engage their guests and the broader public in understanding important connections between plants, people, language and culture. The goal of this proposed session is to build awareness of the 2019 UN Year of Indigenous Language and to share stories of how UBC Botanical Garden is collaborating with the Musqueam Language Department to promote public awareness of hə́nqə́mínə́m, the Musqueam language, history and culture through its collections, displays, research, education and outreach programs.

Cannon, Carrie. **Mescal Agave Use in the Grand Canyon; Hualapai Ethnohistory of Food, Fiber, and Vessel** (Session III)

On an annual basis, the Hualapai Tribe's Cultural Department embarks on a two week river rafting trip in the Grand Canyon where Tribal elders and youth engage in resource monitoring activities related to botany, archaeology and cultural resources. One plant in particular, the mescal agave, is always given special attention due to its long history of use. The agave was used for numerous utilitarian items that were used by virtually all members of the tribe. Mescal also served as a valuable food source that is still being harvested and prepared to this day. This presentation shares about the Tribe's annual river trip, the life history of mescal, and the multitude of Tribal uses of this intriguing plant from centuries ago to the modern era. The river trips provide an opportunity to teach the ancient knowledge of the landscape better understood through hands on activities within the ancestral homelands.

Cannon, Carrie. **Revitalizing Hualapai Tribal Survival Arts** (Session XXIII)

For millennia, education for the Hualapai was learned through intergenerational lessons that provided younger generations with the skills and knowledge needed to thrive in harsh desert environments. Over the past centuries, tribal education has undergone numerous transitions. Colonial influences and education paradigms have in many ways eliminated transmission of traditional ecological knowledge. Currently, the Hualapai Tribe's Cultural Center holds Culture Arts and Languages Classes on Fridays throughout the school year for the Tribal community focusing on teaching Tribal language and survival arts. Few people in the community remain who remember how to manufacture rabbit skin blankets, hand woven yucca fiber rabbit harvesting nets, or traditional cradleboards made from desert plants. In some cases these items exist only in museums. Through weekly classes throughout the year we are harvesting the materials and recreating these items so the knowledge of their construction and use will remain for future generations of Tribal members.

Carney, Molly, Jade d'Alpoim Guedes, Kevin Lyons, and Melissa Goodman. **Ethnobotanical Knowledge and Gendered Spaces: Reconstructing a Menstrual Lodge in the Interior Northwest** (Session V)\*

The 2014 and 2015 excavations of a burned structure located on the Kalispel Tribe of Indians ancestral lands in northeastern Washington revealed uniquely stratified deposits with an absence of artifacts. Although the structure initially appeared strikingly similar to the earth oven features common throughout the region, in our reconstruction of the site's sequence of events we suggest this space was once a nondomestic structure. Drawing on ethnographic, paleoethnobotanical, and geoarchaeological data, we show that the structure burned at a relatively low temperature, was buried soon afterwards with imported rubified sediment, and was exposed to seasonal river inundation. Subsequently, a second fire consumed a unique assemblage of plant remains, including *Camassia quamash*. By incorporating ethnobotanical knowledge and ethnographic sources we argue that this structure was a menstrual or menarche lodge. This interpretation highlights the time depth of distinctive Plateau practices, extending ethnographic voices and patterns back into the past.

Chandler-Ezell, Karol. **Midnight Llamas, Death Fish, The Devil's Cattle, and Fear of Darkness in Ecuadorian Children's Legends** (Session XIV)

Animals, plants, and environmental features are important elements given sinister meaning in a set of legends collected by children in La Libertad and Santa Elena, Ecuador. This paper presents these salient ethnobiological characters and ways that darkness and danger are communicated to and through the children. Why do we tell our children such scary stories? Theme and content analysis of the legends reveals the scary, supernatural nature of these tales as well as a set of cultural and environmental dangers. There may be some evolutionary benefit to scaring our children, especially at a time when they are prone to wandering farther away from the protection of parents. Scary stories help to provide the thrill of dangerous adventure in entertainment form while embedding warnings to those who deviate from safe places, people, and practices. These stories warn of very real dangers that supernatural midnight llamas, demon cattle, and death fish represent.

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\* Barbara Lawrence Award submission

Chia, Richard. **Know the Names of Plants: Teaching and Promoting Indigenous Knowledge of Tiv Flora through Songs** (Session VI)

The Tiv of central Nigeria have an old tradition of communicating in songs and riddles the names of trees and shrubs. Common among such songs is, “fa ikyon ati” (know the names of plants). This song, like many others, teaches and promotes the knowledge of Tiv flora among children and youths. Young people are taught riddles and songs like this while on the paths to and from the farms, or on the farms. Fa ikyon ati for example, is so popular that in the 1960s, 1970s, and 1980s, it was used in Elementary Schools to teach pupils about plants in the Tiv areas of Benue State, including in my own. I will share this song as well as my own experiences of learning plants through it. In doing so, I will demonstrate the efficacy of songs and riddles in transmitting Tiv botanical knowledge to successive generations.

Chipps, Laura. **Cosmos In Action** (Session XVI)

Randy’s of West Coast NuChaNulth ancestry through his father, Coast Salish Clallum ancestry through his mother. Born in 1943, his grandmother raised him in Kyuqut village as an Ooshtikay, in the language, cultural, spiritual and healing traditions of his ancestors. Randy experienced living as a demonized ‘Indian’ in a Christian village; having an unskilled mother with no permission to love her “Indian” child; blessings and abuses at Residential School. “It was my language and deep connection to Creator that gave me strength to endure”. Coast Salish Longhouse and NuChaNulth Dance traditions bless him. His journey home and abroad gifted countless opportunities to assist Indigenous and Non-Indigenous peoples and communities. West Coast NuChaNulth History has over 3,000 years of travelling and coming together to share legends and songs. Randy has a vast repertoire. Respect towards the natural world remains a fundamental belief. Randy is grateful his cousin Chief Adam Dick is honored.

Chipps, Randy. **We Are All One** (Session VI)

Randy’s of West Coast NuChaNulth ancestry through his father, Coast Salish Clallum ancestry through his mother. Born in 1943, his grandmother raised him in Kyuqut village as Ooshtikay, in the language, cultural, spiritual and healing traditions of his ancestors. Randy experienced living as a demonized ‘Indian’ in a Christian village; having an unskilled mother with no love for her “Indian” child; blessings and abuses at Residential School. “It was my language and deep connection to Creator that gave me strength to endure”. Coast Salish Longhouse and NuChaNulth Dance traditions bless him. His journey home and abroad, gifted countless opportunities to assist Indigenous and Non-Indigenous peoples and communities. Burial Traditions highlight Indigenous connections to the world, like Randy’s culture’s outdoor burial in relation to all the creatures; and burial cairns with added purposes of land preparation for ecological process while providing for the spiritual, social and physical needs of the community.

Chisholm, Libby Jay, Kenthen Thomas. **Knucwentwecw: Learning about Land through Secwepemc Stsepkewll** (Session IV)

There is a growing network of Indigenous-led projects working to revitalize Indigenous food systems; using Indigenous knowledge(s) to guide community-based eco-cultural restoration and land use management, and reviving seed saving practices with Indigenous plant foods. Following declines in qualities and quantities of several culturally important plant species in Secwepemculecw, community-led projects from Neskonlith’s Switzmalph community are prioritizing restoring knowledge of how to cultivate these plants, and learning from Stsepkewll (the legends that teach morals) and Slexe’yem (the stories that many families tell) about relational responsibilities between plants and people. This talk is a collaboration between Secwepemc storyteller and educator Kenthen Thomas and ethnobotany student Libby Chisholm, and will focus on how Stsepkewll teach important lessons about what it means to be suitable caretakers of the plants, and what decolonizing ethnobotanical work looks like in this time of resurgence, restoration, and renewing relationships with land.

Chitrai Vadivel, Chittibabu, Guruprasad A, Santhanapandi P and Boominathan. **Inventories on the Traditional Siddha Medicines and Contemporary Ethnomedicines of Eastern Ghats of South India** (Session XXIII)

The herbals enshrined in the treatise “Arunthamizh Maruthuvam 500” and the contemporary ethnomedicines of six different hills in the Eastern Ghats of south India were inventoried. A total of 71 medicinal plants belonging to 42 plant families listed in the verses 485 to 500 of the treatise found dwindled in the ethnobotanical field studies conducted during June to August 2018 with a total of 54 (76%) medicinal plants belonging to 34 families. However, in both the inventories, Fabaceae (nine and five ethnomedicines) followed by Euphorbiaceae and Solanaceae (four each in both) were the dominant families, indicating their pharmacognostic significance. The leaves (25%) and paste form (46%) are the predominant plant part and drug type used respectively in the hills surveyed. The findings of single ethnomedicine families (70%) and the overall depletion (24%) call for the conservation traditional Siddha medicines.

Colarusso, Alec. **Psychic Plants and Where to Find Them: A Cross-Sectional Analysis of Spiritual Flora** (Session XXIII)

Modern Psychics, Healers, and Mediums are known to implement plants into their practices and rituals. Plants have long been believed to possess spiritual attributes from Calendula manifesting healing abilities to Elder awakening intuition. Many have a variety of uses and are actively being used in psychic communities today. Spiritual healing is so well-known, a new branch of medicine has emerged known as holistic medicine, which can focus on a plant’s ability to heal. Therefore, a cross-sectional analysis between holistic doctors and psychics/healers could grant insight into how the spiritual and medicinal uses of plants have changed from the traditional cultural use. The analysis will include a phytochemical report of the plants and their application attempting to discover if holistic doctors and psychics usage coordinates to the biomedical uses. Furthermore, an exposition of the plant’s chemical effects on the human body will be conducted to further systematize the results.

Cruz, Octavio. **Clam Garden Bivalve Dietary Patterns and Condition** (Session XXIII)

The main purpose of this research project is to examine clam diets, environmental stressors, and sources within First Nations clam garden structures in the traditional territories of the Laich-Kwil-Tach and Coast Salish First Nations on Quadra Island, British Columbia, Canada. I aim to determine which environmental factors and food sources lead to increased health indices for bivalves in Kanish Bay. I will work within cultural parameters during our work and strive for open communication with communities during the research period. I will aim to determine main dietary and abiotic factors associated increased Butter clam (*Saxidomus giganteus*) health of Quadra Island beaches. Stable isotope, fatty acid, and abiotic environmental data will be compared against condition indices for bivalves according to beach dynamics. Data analysis will be conducted using Multiple Regression and MDS-SIMPER modeling to examine how variables affect individual condition, and mechanisms relating to bivalve growth in clam gardens.

Currey, Robin C. D., Jennifer Halpin, Colin M. Mahoney, Laura Valentine, Taryn D. Skinner, Micah A. Alden, Danica Abejon, Sean C. Flaherty, and John G. Van Hoesen. **Lessons in Food System Localization from the Silk Road - The Geospatial Rapid Agricultural Biodiversity Survey for Dietary Diversity** (Session XVIII)

77% of Kyrgyzstan’s fruits and berries and 52% of its vegetables come from home gardens that average only 0.10 hectares. Local food systems and home gardens are looked to as a possible solution to food insecurity in both urban and rural environments in the United States as local food systems may increase access to healthy foods and improve dietary diversity. Yet models of what localized food systems should look like for a sustainable food system are sparse. This presentation demonstrates a new geospatial mapping survey and a food system model from Kyrgyzstan that illustrates what can be planted and raised in home gardens to meet household nutritional needs, with a focus on linking agricultural diversity and nutritional diversity.

d'Alpoim Guedes, Jade and Kyle Bocinsky. **Modelling the Spread of Crops Across Eurasia** (Session X)

Ancient farmers experienced climate change at the local level through variations in the yields of their staple crops. However, archaeologists have had difficulty in determining where, when, and how changes in climate affected ancient farmers. We model how several key transitions in temperature affected the productivity of six grain crops across Eurasia and document human responses to these events such as crop diversification, storage, investment in pastoral strategies and the development of long distance networks of trade in grain. By translating changes in climatic variables into factors that mattered to ancient farmers, we situate the adaptive strategies they developed to deal with variance in crop returns in the context of environmental and climatic changes.

d'Alpoim Guedes, Jade, Katrina Cantu, Clara Dawson, Shelby Jones Cervantes, Arianna Garvin, Brandon Gay, Isabel Hermsmeyer, Matthew Howland, Xiyuan Huang, Bridget Lawrence, Brady Liss, Sunyoung Park, Eric Rodriguez, Julianna Santillan-Goode, Sarah Sheridan, Luke Stroth, Anthony Tamberino, Isabell Villasana, Emma Villegas, Zhen Yu, and Thomas E. Levy. **The Archaeobotany of an Early Copper Production Site in the Fanyan, Jordan** (Session XXIII)

Archaeobotanical analysis has only rarely focused on industrial sites, yet the ways in which workers at these sites engaged in food provisioning and consumption may hold important lessons for understanding ancient patterns of trade and social organization. We present the results of an archaeobotanical analysis carried out at the copper production site of Khirbat al Jariya (12th-10th centuries BC) in the arid Fanyan region, Jordan. A wide variety of plant remains have been unearthed at the site (such as grapes and wheat and barley) that may not have been locally grown and that may highlight trade routes to coastal areas, trade routes which have been already revealed through the analysis of copper ingots that travelled over 300 km away to coast near Neve Yam in Israel.

Davis, Dawn D. **Peyote Habitat Loss: An Examination of Threats Using GIS** (Session XIV)

The peyote cactus (*Lophophora williamsii*) which is ingested for its medicinal qualities have been a conservation concern for peyotists and members of the Native American Church (NAC) since 1976. In 2010, the Natural Resources Conservation Service in the United States identified peyote as a plant of cultural concern due to destruction of habitat in south Texas, the only area within the United States where peyote grows. The country of Mexico has also created a federal regulation which considers peyote a subject of special protection, and justly so as 80 percent of the peyote habitat exists in Mexico. The primary threat to long-term conservation is overharvesting due to increased demands by members of the NAC and improper harvesting techniques of peyote distributors. This presentation includes an examination of the spatial distribution of peyote as it relates to course scale fragmentation of habitat today through digitization of published distribution maps using GIS.

Davis, Matthew and Anthony Davis. **Determining the Effects of Fertilization and Temperature Manipulation on *Camassia* spp.** (Session V)

Because *Camassia quamash* and *C. leichtlinii* are among western North America's most culturally significant native plants, their propagation for restoration projects is warranted. *C. leichtlinii* grows and takes up nitrogen in the spring following a cubic function. Most of the new nitrogen is allocated to its leaves and roots prior to the leaves reaching their mature size and to the daughter bulb thereafter. Spring fertilizer applications have a small impact on the growth of *C. leichtlinii* in the year they are applied. During its summer rest period the daughter bulb and roots of *C. leichtlinii* develop at the expense of its mother bulb. During the winter rest period *C. quamash* and *C. leichtlinii* have a chilling requirement that must be met prior to leaf emergence. These findings offer insight to native plant propagators and may suggest the effects of indigenous management practices.

de Araújo, Maria Elisabeth, Nicole Malinconico, and Enrico Bernard. **Linguistic Adaptation of Management Plans: An Example with Artisanal Fishermen in a Brazilian Protected Area** (Session VII)

Our objective was to develop a linguistic adaptation of the conservation actions in a Protected Area (PA) from Northeast-Brazil, considering the assimilation of the technical content of management plans to permit the real participation of artisanal fishermen. Through semi-structured interviews, fishermen, chosen by the "snowball" method, collaborated with the process of linguistic correspondence. The results provided comparative elements

between the terms contained in the PA documents and the understanding of the fishermen (practically illiterates). The only action taken by unanimity was the “inspection”, although the word “environmental monitoring” was also understood as a form of supervision. “Environmental education” appeared to be restricted to lectures and “relationship between institutions” were understood as talks between managers, demonstrating their sense of exclusion. The language correspondence is an urgent tool for coastal management that aims effective environmental conservation through the participation of local communities mainly in third countries.

Deelen, Evelien. **Behind the Chutes: Traditional Equestrian Knowledge of Rodeo Bronc Riding.** (Session XXIII)  
Animal rights activist often argue that rodeos are cruel and promote animal abuse. Are rodeo’s nothing more than an eight second battle between man and beast, ending in the domination of one or the other? Or does the public only see a fraction of the relationship between cowboys and their broncs? My research aims to understand, through an ethnographic study of the human-horse relationship, how traditional equestrian knowledge shapes the value and meaning of rodeo bronc riding and horses as agents in our contemporary society. Within this framework I focus on knowledge transition and cultural constructs of partnership & equine agency. My poster presentation will demonstrate the results of a pilot study for my dissertation research, for which I imply the conventional ethnographic methods of participant observation and semi-structured interviews.

Dolan, Jessica. **"What We Live On": Researching Common Edible and Medicinal Plants in Support of Women's Lifework in Haudenosaunee Communities** (Session I)

How does learning about traditional knowledge of plants imbue life with meaning? How can restoring knowledge empower women in our relationships with one other and our communities? I will present here on my current research to write an ethnobotanical field guide to common edible and medicinal Haudenosaunee plants. In the process of gathering archival materials, I have noticed that the collections implicitly convey historical and scientific data as men's collections of men's knowledge. But as gardeners, gatherers, and caretakers of family, much cultural knowledge of plants is Haudenosaunee women's knowledge. Haudenosaunee female archetypal roles are seed keepers, gardeners, processors of food, and gatherers of medicine. I will share how I am shaping the processes of research and applied elements of this project, so that it rematriates archival and ecological knowledge to women in Haudenosaunee communities, in alignment with their lifework as botanists, herbalists, midwives, gardeners, mothers, daughters, and seed keepers.

Dolinar, Liz. **Reconnecting Indigenous Knowledge to the Sunlight Basin of Northwestern Wyoming: Integrating Traditional Ecological Knowledge and Archaeology** (Session XXIII)

The Eastern Shoshone and Crow communities, amongst others Indigenous communities traditionally inhabited the regions surrounding the Sunlight Basin of northwest Wyoming and archaeological site 48PA551. This project begins to develop a synthesized body of work that includes the traditional ecological knowledge of the Eastern Shoshone Tribe and the Crow Tribe, supported by historic ethnographic research, contemporary ethnographic interviews, plant surveys, and paleoethnobotanical analysis. Following the 2018 excavations at 48PA551 the paleoethnobotanical assemblage was examined from multiple features at the site. Micro- (starch) and macrobotanical analysis in addition to contemporary interviews and examinations of past ethnographic inquiry were utilized to identify plant foods. The traditional ecological knowledge of Indigenous peoples is a vital source for the contextualization and full understanding of past human environmental relationships. These lines of investigation can uplift and support the traditional ecological knowledge of local and Indigenous communities.

Downs, Shauna, Selena Ahmed. **The Food Environment Transition Towards Sustainable Diets** (Session VIII)  
Food procurement has notably shifted over the past few decades from subsistence- to market-food environments in what we term the ‘food environment transition’. We share a conceptual framework for characterizing the food environment transition. Our framework is supported by food environment typologies and metrics while being aligned with the nutrition transition framework. Through case studies, we illustrate that as populations and communities move through the different stages of the food environment transition, there is a shift from mainly relying on natural food environments to market environments. We use the five original patterns of the nutrition



transition framework as well as a sixth pattern focused on sustainable diets for supporting planetary health. It is expected that understanding the food environment transition and identifying ways to measure this transition will better inform the design, implementation, and evaluation of policies and programs aimed at supporting healthy diets from sustainable food systems.

Efford, Meaghan and Iain McKechnie. **Gooseneck Barnacles and the Archaeology of Nuu-chah-nulth Shellfish Management** (Session XXIII)

Shellfish are a vital marine resource on the Pacific Northwest Coast, as evidenced by massive shell midden sites throughout the region, and yet shellfish assemblages are often under analysed reflecting a status as secondary or tertiary resources in the archaeological record. Aside from clams, mussels, and barnacles, most shellfish are considered rare or insignificant archaeologically due to their comparative low abundance value. This presentation re-examines previously analyzed shellfish assemblages including over 500 samples from across 19 archaeological sites on western Vancouver Island using a non-proportional approach to shellfish quantification that quantifies frequency of occurrence (ubiquity). Through this, we document that a much wider range of shellfish species was regularly harvested, managed, and consumed than indicated from a weight-based proportionality. This revised archaeological harvest profile broadens perspectives on intertidal resource management practices and has the potential to connect archaeological data to contemporary Indigenous rights and resource management issues.

Ellen, Roy. **The Ethnobotany of Culturally Salient Polymorphisms in *Codiaeum variegatum*** (Session XII)

*Codiaeum variegatum* has become a well-known ornamental plant in Europe and North America, and has long been culturally significant in Southeast Asia and the Pacific. This paper shows, firstly, how variations in foliage are managed and valued in one population (Nuauulu people on the island of Seram, eastern Indonesia), and the uses to which these are put. Secondly, the paper reviews the ethnobotanical literature on *C. variegatum* throughout its natural range with a view to hypothesizing its biocultural evolution. It is noted that the features that evolved in its area of endemism are those that make it attractive as an ornamental globally, but that colour variations in foliage combine genotypic cultivar differences, clonal differences and age-dependent differences, to produce phenotypic instability which is not a problem for Nuauulu but which is a problem for ornamental plant producers in a commercial context.

Elliott, Cassandra. **Inuvialuit Cultural Life - Out on the Land** (Session VIII)

For the Inuvialuit, harvesting wildlife and plants have been essential to survival in the Canadian Arctic since time immemorial. The primary importance of harvesting is often explained to be food security. There are many aspects of harvest and harvesting that contribute positivity to an Inuvialuit's way of life, but these have not been captured holistically. For this project, 113 Inuvialuit participants were interviewed from the six communities in the Inuvialuit Settlement Region, Canada. Results from the project outline how time spent out on the land harvesting not only contributes to an individual's subsistence but also to: education; culture and lifestyle; wellbeing including both mental health and physical health; and relationships with both family and community. Inuvialuit Cultural Life – Out on the Land is the first regional research project that provides a complete analysis of how harvesting is not just an activity for Inuvialuit, but a way of life.

Eloheimo, Marja. **Pacific Sámi Searvi: We are the Diaspora Seeking our Stories** (Session VII)

In 2012, a group of individuals who identified as having Indigenous Sámi ancestry gathered to create an organization, the mission of which is "...to honor, cultivate, and expand understanding of Sámi culture, heritage, and contemporary issues." I joined the Board of the Pacific Sámi Searvi in 2018. In this presentation, I introduce Sámi culture(s); colonization of Sápmi (Sámi homeland) across the Fennoscandian nation-states; and Sámi efforts regarding representation, resistance, and revitalization, including climate change impacts on traditional reindeer herding. I then address questions, hopes, and issues facing the Sámi diaspora relative to Sámi People in Sápmi and Indigenous Peoples in North America. As one Pacific Sámi Searvi Board member — who discovered her Norwegian-Sámi ancestry a decade ago — stated, "We are the diaspora seeking our stories." This presentation brings consideration of the Indigenous Sámi in northern Europe and the Sámi diaspora in North America.

Evans, Annie. **Stories of Home** (Session VI)

Annie Evans is an Elder from Adlavik Bay living in the Inuit Community of Makkovik, Nunatsiavut (Labrador). She was raised at her winter home in Adlavik Bay, and spent summers at family fishing places in October Harbour and Strawberry Harbour. At seven years old, Annie Evans went to mandatory boarding/residential school in Makkovik. Her family moved permanently to Makkovik when she was ten. Elder Evans has many different stories to tell about her early years in Adlavik, learning from her family, her time working in the Manse with Moravian Missionaries, her years in Makkovik and at Ben's Cove, and the lessons she has learned through all parts of her life.

Fackler, Chlöe. **Eat the Weeds: Human Relations with Invasive Garlic Mustard (*Alliaria petiolata*) in the Lower Saint Lawrence River Valley** (Session XXIII)

Since its introduction as a garden edible in the late 19th century, the invasive plant *Alliaria petiolata* (Garlic Mustard) has gradually overgrown forests, fields, and urban spaces alike across Eastern and Central North America. Owing its success to its chemical ecology and lack of native predators, its advance has proven to be difficult and costly to manage. However, in addition to its allelopathic and strong antifeedant abilities, its phytochemistry also demonstrates a potential benefit towards human nutrition and health, predominantly in the form of glucosinolates. The need for control, combined with its ethnobotanical significance, makes *A. petiolata* an excellent candidate for the use of foraging as a supplementary management strategy. This research aims to understand how the impacts of human activity, specifically foot-traffic, affect the phytochemistry of *A. petiolata*, and ultimately how this could improve upon both its control and nutritional benefit.

Fergus, Rob, Kerry Hull. **A Forest of Signs: Avian Warnings and Messaging among the Q'eqchi' Maya** (Session XVII)

In addition to sharing an original homeland, the Q'eqchi' Maya of Alta Verapaz and of southern Belize also hold in high regard the signals and messages provided by birds. Based upon our fieldwork data among both groups, we describe the intricate knowledge of many Q'eqchi' speakers on the meanings of various bird calls, flight patterns, and observed physical orientations. We discuss the key role of birds in weather forecasting, both those that signal the coming of rain and those that are said to signal dry weather. We also describe how birds foretell death in various ways, either by their call or by people dreaming of certain types of birds. Finally, we detail the role of birds play in Q'eqchi' hunting activities, both as helpers who indicate the presence of game, or at times foes who warn game of the approaching hunters.

Fernández-Llamazares, Álvaro, Victoria Reyes-García. **Biocultural Knowledge Transmitted Through Song in Bolivian Amazonia** (Session XVI)

Very few works have analyzed the biocultural knowledge transmitted through song. In this presentation, we examine the role of traditional songs in transmitting Indigenous Knowledge amongst the Tsimane' of Bolivian Amazonia. We use the corpus of traditional Tsimane' songs compiled by J. Riester in the 1970s and our ethnographic work on the area to examine the content and context of traditional Tsimane' songs in relation to wildlife and hunting. Fifty-two of the 140 songs compiled by Riester speak about wildlife and/or hunting, featuring a total of 28 different wildlife species. Songs include either rich descriptions of wildlife characteristics or information about hunting social practices. Ritual songs help regulate human-animal interactions and teach about inappropriate behaviors to wildlife. Many of the songs examined reveal conceptualizations of nature-culture inter-relations differing substantially from Western epistemologies. We conclude discussing options to revitalize traditional music-making amongst contemporary Indigenous Peoples exposed to rapid sociocultural changes.

Flachs, Andrew. **Ethnobiologizing Fermentation Revivalism** (Session XII)

Ethnobiologists can contribute to the study of fermentation because we attend to place- and practice-based knowledge, local flora and microbial taxa, are sensitive to cultural and ecological conditions, and our research illuminates the interactions through which communities shape and are shaped by the world around them. In this presentation, I discuss findings from an ongoing project to document fermentation from a biocultural perspective,

including collecting sociocultural food narratives, microbial samples from fermented foods in the form of brine or food matters, and microbial samples from the humans who consume them in the form of human stools. Themes from 16 hours of recorded conversation and interviews conducted during an event ethnography at a fermentation revivalist workshop include the pursuit of terroir, an embrace of tactile and creative work, a search for natural and restorative relationships, and an embrace of probiotic foods as healing.

Flores, Fabio. **Entomotherapy Among the Ancient Mayan Peoples of the Yucatan Peninsula, Mexico** (Session XV)  
Since the old ages, arthropods and products extracted from these animals have been used by medical systems in many cultures with therapeutical purposes. Results from various ethnohistorical sources such as the Chilim Balam, Cixil, Kaua, Na, the Pérez codex and especially from the Chan Cah, have permitted to identify over 20 insects and other arthropods used to cure diseases before the Spanish Conquest of Mexico, and during the early Colonial years. The showing of the wide empirical knowledge and the importance of these organisms among Peninsular Mayan people is supported by data obtained by the parts of the animals used, its preparation and the therapeutical methods put into practice. Nowadays, many of such entomotherapy practices have been confirmed via ethnographical data.

Fluker, Morgan. **Kanza Subsistence Patterns and Cultural Change 1724-1873** (Session XXIII)  
The Kanza Indians resided in the northeastern corner of what is now Kansas in the Midwest region of the United States during the late seventeenth century until 1873 when they were removed to Indian Territory. They remained mobile while in Kansas, annually travelling between their hunting grounds and sedentary villages. Through the use of ethnohistorical research focusing on the Kanza use of natural resources, I have assembled a tentative timeline of the Kanza tribe's settlements and movements through northeastern Kansas. An emphasis was placed on native plants harvested near the village, and wild animals hunted at each location. I originally hypothesized that that the resources associated with the villages would change with each new location. I discovered, instead, that native resources utilized were consistent while the tribe resided in northeastern Kansas due to the Kanza people's knowledge of the land and choice of village locations.

Forth, Gregory. **Bad Mothers and Strange Offspring: Images of Scrubfowl and Sea Turtles in Eastern Indonesia** (Session XVII)

One way birds communicate knowledge to humans or among humans is through metaphors. In a recent book (Forth, in press) I discuss 566 animal metaphors used by the Nage people of Flores (eastern Indonesia). 178 of these employ birds as their vehicles, encompassing nearly 50 folk-generic kinds. As applied to human beings and human behaviours, however, bird metaphors reveal considerable overlap with other animal metaphors. Indeed, understanding how people anywhere appreciate birds is not fully possible without considering their views of other sorts of non-human animals. Emphasizing also how knowledge of birds is always shaped in some degree by an extra-cultural empirical experience of the creatures, the paper discusses similar representations of a bird, the Scrubfowl (specifically the Orange-footed scrubfowl *Megapodius reinwardt*) and a marine reptile—the sea turtle—among people in several parts of eastern Indonesia.

Furlotte, Brett. **Paleoindian Plant-Fuel Utilization at the Cuncaicha-1 Rock Shelter Site, Department of Arequipa, Peru** (Session XXIII)

No empirical evidence currently informs our understanding of the interrelationships between plants and early hunter-gatherer societies in the South-Central Andes for the period of initial Pleistocene arrival. With discrete occupation components dated to the Terminal Pleistocene (12,500 to 11,200 cal. yr BP) and Early Holocene (9,500 to 9,000 cal. yr BP), the Cuncaicha-1 rock shelter, located on the high-elevation *puna* in the department of Arequipa, Peru, is an ideal site from which to pursue such investigations. This work, focused on the recovery, identification, and interpretation of macrobotanical remains, provides insight into early high-Andean fuel utilization strategies. Local shrubs (*Parastrephia quadrangularis*), hardwood trees (*Polylepis besseri*), and dense cushion-plants (*Azorella compacta*) were employed as plant-fuels by the site's early occupants. As each have unique combustion qualities and ecological distributions, differences in recovery likely reflect the implementation

of early plant-fuel selection and/or management strategies.

García del Amo, David, Graham P. Mortyn, and Victoria Reyes García. **Including Indigenous and Local Knowledge in Climate Change Research. An Assessment of Scientists' Opinion** (Session XIII)

Research documenting indicators of climate change impacts reported by Indigenous People and Local Communities shows these indicators overlapping with scientific measurements. However, the complete inclusion of Indigenous and Local Knowledge in international climate fora continues to be pending. To explore scientists' opinion on the relevance to include local knowledge, we conducted an online survey with climate change researchers from universities and research centres in Spain (n=191). We asked about the possibility of integrating information from local knowledge in 68 groups of climate change indicators derived from the literature. Results show a decoupling between scientists' opinions about the local indicators with more potential to be included in climate research and the indicators on which local communities are asked. While scientists considered that local knowledge could contribute most to detect climate change impacts on the biological and socioeconomic systems, most research has focused on local indicators on the climatic and physical systems.

Gauvreau, Alisha. **Paleoethnobotanical Research of EkTb-9, Triquet Island, NÚláwítǵv Tribal Area** (Session XXIII)  
"EkTb-9" is an outer coastal island wet-site located in Haítzaqv (Heiltsuk) Traditional Territory, NÚláwítǵv Tribal Area (Hakai West region). It is one of the oldest and longest occupied archaeological sites on the Northwest Coast of North America. Archaeological investigation of the wet site resulted in the recovery of a diverse assemblage of early to mid-Holocene wood artifacts and archaeobotanical remains. This poster was developed through ongoing collaboration with members of the Haítzaqv Integrated Resource Management Department (HIRMD) and members of the Haítzaqv Language Program. We present the preliminary findings of the paleoethnobotanical research of EkTb-9, examining ancestral Haítzaqv use of plants through time.

Gillreath-Brown, Andrew, Aaron Deter-Wolf, Karen Adams, Valerie Lynch-Holm, Samantha Fulgham, Shannon Tushingham, William D. Lipe, and R.G. Matson. **Oldest Tattoo Tool in Western North America from the Turkey Pen Site, Utah** (Session XXIII)

Tattoo traditions of Native North America are integral aspects of Indigenous cultural expression, which have been long undervalued by Western scholars. Iconographic evidence suggests tattoo practices dated to as early as AD 1000 in the southwestern United States. However, few tattoo tools have been identified in the archaeological record to date. Therefore, the full temporal span of tattoo traditions in the region is unknown. We recently discovered a unique perishable tattoo tool from the Turkey Pen site, Utah, which dates to the Basketmaker II period (500 BC–AD 500). We present the results of rigorous and comprehensive analysis of the Turkey Pen tool, including scanning electron microscopy, portable X-ray fluorescence, energy dispersive X-ray spectroscopy, and experimental tattooing. This tool is the oldest tattooing artifact identified in western North America and provides evidence extending the antiquity of Native American tattooing in the southwestern United States back to the first century AD.

Gillreath-Brown, Andrew. **An Archaeomusicological Study of Turtle Shell Rattle Music Culture Across the Contiguous United States** (Session XVI)

Throughout North America, Indigenous groups have used turtle shell rattles since at least the Archaic period (ca. 8000–1000 BC). Many North American Indigenous groups have foundational, cosmological beliefs about turtles, such as the world was formed upon the Turtle's back. These beliefs provide a greater understanding of why turtles are incorporated into ceremonies and dances and why they are used as rattles to keep rhythm, which in turn provides a basis for spiritual energy and experience. Here, I present a comprehensive analysis and review of the turtle shell rattle music culture across the contiguous United States. Indigenous groups have used and continue to use turtle shell rattles in song and dance, which are manifested in many ways across the United States. Evidence suggests that turtle shell rattles are related to spiritual concepts of sound and carry symbolic meaning, which reveals important insights into the musical knowledge of prehistoric communities.

Glover, Denise M. and James Veteto. **American Roots Music and Ethnobiology** (Session XVI)

American Roots Music includes traditional music from Appalachia, New England, Midwest, Texas, Ozarks, and other regions/microregions. Significant in this style of music are connections to place and multi-species living beings. Knowledge of the non-human natural world is encoded in lyrical content, sounds of birds & animals can be replicated harmonically, and instrumentation is largely acoustic, with the use of wood-based stringed instruments being predominant. The 21st Century “revival” of ARM can be seen in part as a desire to rekindle connection to place and place-based knowledge, and to lifeways more centered on a localized system of engagement with landscape and communities of multi-species beings. We analyze a variety of ARM, both historical and contemporary, situating it within ethnomusicological and ethnobiological theory, and suggest that the types of music that humans play and listen to both reflects their socioecological setting and has potential and ongoing contributions to conservation practice.

Gordon, A. Ross. **Tambaroro: Cryptic Song Lyrics and Songs as Teachings in the Aru Islands** (Session XVI)

In the Aru Islands of eastern Indonesia, Batuley villages hold a ‘tambaroro sea ritual’ to open the pearl diving and sea cucumber collection seasons. A sea-side all-night festival of song, drumming, and dance preludes offerings made in the sea and on land. Some songs must be led by expert song leaders in correct sequences. Many lyrics seem simple, but reference complex biocultural and historical knowledge held by elders and transmitted accurately over centuries. In the course of documenting the Batuley language, the authors filmed a tambaroro event and interviews with elders about song meanings. A 45-minute documentary film, *Tambaroro*, is being released in 2019. In our conference presentation we discuss ‘songs as teachings’ in the transmission of Batuley biocultural knowledge and practices through ‘cryptic lyrics’, which do not openly tell the story, yet bridge in-community differences and vitalize local culture.

Gordon, Ross and Sonny A. Djonler. **Tambaroro. Ethnographic Film. Premiere Screening** (Session XXII)

Vitalizing oral culture and ritual in a remote Gwatle (Batuley) fishing community in Aru, Indonesia, the ethnographic film, *Tambaroro*, explores songs and stories as teachings of mindful living. A Gwatle man, Sonny Djonler, returns to the village he left as a child to find inspiration in his culture’s tolerance, environmental management, and cooperation. Set amid the stark beauty of the Arafura Sea shore, the film follows Sonny’s cultural journey into his heritage. Village elders share ancient custom in all-night ritual to launch the sea cucumber harvest and later explain the meanings to Sonny. In the words of a Batuley elder: “Every teaching is put into a song. It reminds us of how to live, because the world is dry”. Old Gwatle language is extinct, but *Tambaroro* festival songs use the old language to teach Gwatle youth how to live in a modern world. Produced by A. Ross Gordon and Sonny A. Djonler <http://researchresultsmedia.ca/>

Gosford, Bob and Mark Bonta. **Firebirds, Funerals and Feathers: Maintaining Biocultural Knowledge of Garrkany Through Song** (Session XVI)

Building on earlier research, we recently conducted field-work and interviews with traditional Aboriginal knowledge-holders from language groups across central Arnhem Land in the Northern Territory. During one of our meetings, two senior members of the Dalabon language group made an impromptu performance of a song from the Lorrkon, a funerary ceremony once widely practised across Arnhem Land. That song records and celebrates the central role of Garrkany (the Brown Falcon, *Falco berigora*) in the Lorrkon ceremony and reveals the importance of Garrkany to local knowledge holders and land managers. We will present video and audio recordings of the Garrkany song performance and related knowledge with a brief analysis of the role that the bird plays in the Lorrkon ceremony and fire cultural traditions across Arnhem Land.

Green, Scott. **A Tale of Two (Conflicting) Stories – Legacies of Scientific Resource Management constrain Xáxl’p of St’at’imc Nation Land Management Values and Practices** (Session XIX)

Colonization of Indigenous Peoples in Canada must also be understood as a corresponding colonization of Indigenous Lands – the imposition of the progressive ideal of “*Improvement*”, making land productive, stable and predictable to support the Resource Economy. My presentation examines legacies of institutional land

management imposed upon Xáxli'p Survival Territory in southwestern British Columbia that have homogenized diverse habitats supported by Xaxli'p traditional management practices. These legacies have created conditions for catastrophic wildfire throughout the Survival Territory, threatening the continuation of Xáxli'p cultural existence. Our community-directed partnership with Xáxli'p supports reconceptualization of Indigenous land-management reflecting Xáxli'p values grounded in *relationality*. Ultimately, reconciling these conflicting paradigms to facilitate landscape restoration to support Xáxli'p self-determination and cultural continuance requires an institutional shift in perception and understanding of Xáxli'p values leading to shared decision-making power.

Greening, Spencer and Daisy Rosenblum. **Ts'msyen Toponymy, TEK and Webs of Knowledge: Recognizing Gitga'at Meanings and History in Sm'algyax Place Names** (Session IX)

Placenames are commonly understood to contain Traditional Ecological Knowledge and reference to landscape, but our approach to this information is often structured by a worldview which sees places as dots on a map, placenames as objects in isolation, and knowledge as an extractable resource. Focusing on one of the longest occupied watersheds of the Gitga'at of the Pacific Northwest Coast of British Columbia, Spencer Greening (La'goot)'s home community, this paper looks closely at Sm'algyax placenames in context and in relationship to each other, within stories and situated in Gitga'at territory. For example, *Ha'liluumootk*, translated as "time or place when safe," refers to a mountain of refuge during stories of the flood, connecting human history to migration, environmental change, and the resilience of Gitga'at Knowledge. By bringing together field-based research, cartography, linguistic analysis and oral traditions, we better understand histories of human relationship with places and the beings within them.

Hamersley Chambers, Fiona. **"Indian Spaghetti": A Story of the Many Roots of Springbank Clover (*Trifolium wormskioldii* Lehm)** (Session IV)

Recent scientific research as well as archaeological and ethnographic evidence highlight how First Peoples enhanced productivity of key food plants, including root crops like springbank clover (*Trifolium wormskioldii*). Today, while vestiges of these once extensive cultivation systems remain, few traditional management practices are still followed, and culturally-important plants such as springbank clover are increasingly rare and even unrecognized. Beginning with a 4 cm root-cutting sourced near Victoria's Clover Point, this research brings traditional knowledge into practice to tell the story of how springbank clover responds to human management. Lessons on cultivation practices are learned from controlled experimental plots, with the goal of repopularizing this traditionally important food. The story of this courageous plant, from its loss to its renewal, has much to teach us all and is an inspirational call to what is possible when a plant has many roots and enjoys a reciprocal relationship with humans.

Hart, Robbie. **Naxi Courtyard Gardens Conserving Himalayan Flora** (Session VII)

From the summits of Yulong Mountain, in Southwest China, elevation drops almost 3000m to Lijiang Valley in <20km. The diverse habitats along this gradient support superlative plant richness and define the heartland of the indigenous Naxi people. Plant culture has long been a center of Naxi domestic life, as families cultivate a microcosm of the area's floral diversity in lush courtyard gardens. We documented the identity, origins, nomenclature and uses of Naxi courtyard garden plants in 60 households along an elevational gradient to address how indigenous plants, uses, and names are interwoven, whether wild collection drives use patterns, and how urbanization affects botanical and ethnobotanical composition. Our results show that while historical events and new plants and practices have driven changes, Naxi gardens remain repositories of the unique local flora. These patterns of use inform theories about how ethnobotanical knowledge is generated, conserved and transmitted across the Himalayan region.

He, Jianwu. **Ethnobiological Study of Pickled Fish in Dong Communities of China** (Session XXIII) \*

The Dong people in southwest China have a long history making pickled fish for culinary, medicinal, social, and ritualistic purposes. However, little ethnobiological research related to the pickled fish has been published. This study uses ethnobiology, microbiology, food science, and cultural anthropology approaches to examine the rich traditional knowledge of making pickled fish by the Dong people. Plants as fermentation starters played an important role in the process of making pickled fish. The nutritional components and the degradation of heavy metals during different fermentation stages of fish pickling were analyzed, and the safety of the final product was evaluated. The pickled fish is one of the most important foods with multiple purposes in the Dong communities. Further studies are needed to reveal more information about this special ethnic food.

Hebda, Chris. **The Earth Speaks: Multi-Proxy Scientific and Indigenous Approaches to Ecological Continuity with Late Glacial Palaeoenvironments in Coastal British Columbia** (Session XXIII)

Since time immemorial, Indigenous people have and continue to maintain close relationships with the diverse plants and animals of coastal British Columbia. Over the past several decades, scientific researchers investigating ancient environments along the coast have begun to realize this ancient connection as well. This study combines modern palaeoenvironmental techniques including ancient environmental DNA and pollen analyses of sedimentary records from two lakes on northern Vancouver Island with ethnographic data and the voices of elders. Such multiproxy analysis allows us to demonstrate the continuous presence of culturally important species of both plants (pollen, eDNA) and animals (eDNA) on Vancouver Island extending back to deep time. Culturally and economically significant species attested by knowledge keepers including alder, cottonwood, several species of berry, salmon, trout, and grizzly bear are all corroborated in late Pleistocene deposits using multiproxy approaches. This study demonstrates the continued importance of connecting scientific and Indigenous knowledges in academia.

Hecht, David. **Home-Ranges for Birds, Home-Ranges for Deities: Spatializing Ontologies of Conservation in Bhutan** (Session VII) \*

Bhutan is a land deeply interwoven with religious and spiritual histories, where pre-Buddhist beliefs in place-based deity “citadel(s)”, presiding over forests, marshes, rivers, and mountains, animate and mediate relationships between communities and their local environments. These lived cultural realities have significant bearing on conservation and natural resource management in the country. Habitat and protected area management for two birds of conservation concern and significant cultural reverence, the White-bellied Heron and the Black-necked Crane, are focal species of conservation initiatives within the country. Despite community-oriented strategies, few studies explore the influence of local ontologies on protected area management and species-driven conservation in a spatial capacity. While ethnographic field data and collaborative mapping initiatives reveal salient local spatialities and socio-cultural complexities that could inform protected area planning for these species, more research is required to understand the dynamic range, extent, and scale of avian home-ranges with protected deity citadel “home-ranges”.

Heckelsmiller, Cynthia and Jaime Chambers. **Who's Counting? Meta-Analysis of Quantitative Methods in Ethnobiology** (Session XXIII)

The replication crisis in social sciences conjures questions about research design and publication standards in all sciences, and calls on researchers to reexamine their methods and analyses in order to produce quality data and conclusions. We present a brief overview of lessons from the replication crisis with a view toward potential applications in ethnobiology. To provide context in contemporary research in ethnobiology, we include a meta-analysis of articles describing work with living populations (non-archaeological studies) published in the last decade in the *Journal of Ethnobiology* and others. We base our analysis on Reyes-Garcia et al 2007, and include reported sampling strategies, informant types, analysis strategies, limitations, and reported statistics. We present

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our findings in order to spark conversation over future directions in quantitative ethnobiology. By understanding the present state of research, we work toward making methods and analyses more understandable and accessible for researchers and audiences.

Herron, Scott. **Ethnoornithology of Cranes in North America: Anishinaabe and Myaamia Chieftain Clan Animal** (Session XVII)

Among all the non-raptor birds of North America, there is no other as revered among tribal nations as the crane. The *Anishinaabe* culture of the Ojibwe had 5 original clans including the crane, catfish, loon, bear, and marten, with the crane clan being the most vocal, recognized as the chieftain clan. The *Baswenaazhi* "Echo-maker" was *Ajijaak*, Sandhill Crane in Ojibwe. This migratory bird nests in Michigan, Wisconsin, and Ontario, and winters in Florida, Georgia, and Texas. The migratory route brings sandhill cranes into *Myaamia* (Miami) territory after leaving the gulf coastal region in April. The *Myaamia* call April *Cecaahkwa kiilhsa*: Sandhill Crane Moon. This ecological cue signaled to the Myaamia the beginning of summer when they needed to return from winter hunting to summer villages. This is when they would begin gathering firewood and prepping fields for *Wiikhoowia kiilhsa*: Whipporwill Moon (May) planting of maize.

Hodgson, Wendy and Andrew Salywon. **How Agave murpheyi Changed Our Understanding of the Interrelationship of Pre-Columbian People, Agaves, Landscapes in the Sonoran Desert** (Session XX)

Agave murpheyi Gibson (Agavaceae) was described as a rare, new species from south-central Arizona in 1935, within the prehistoric homeland of the Hohokam people. The Hohokam developed a sophisticated and intensive agriculture system along major river systems from ca. A.D. 300–1450, which enabled them to become one of the largest population concentrations in the prehistoric American Southwest. Since the 1970s, researchers suspected A. murpheyi to be an ancient Hohokam cultivar, because it was only found growing near archaeological settlements or features. Collaborative research with botanists and archaeologists has led to a fuller understanding of the agaves in the Hohokam context. We now recognize A. murpheyi as a pre-Columbian fully domesticated species that provides unparalleled opportunities for discovering and studying other agave domesticates in Arizona that otherwise would have been overlooked. We discuss A. murpheyi's natural history, role in Hohokam subsistence patterns, putative origins, and impact on ongoing research.

Hunn, Eugene. **Columbia River Indians as Astute Birders** (Session XVII)

Columbia River Indians (Sahaptin-speakers) are not to be compared with avocational "birders." Contemporary hobbyists take pride in naming every species of local bird they encounter. By contrast Indigenous residents of the Columbia Plateau were more selective in their nomenclatural recognition of local birds. However, when adequately motivated -- whether by practical, spiritual, or aesthetic interests -- they proved to be highly perceptive observers of patterns in nature. Nomenclature and mythology provide impressive examples. Onomatopoetic names closely mimic characteristic vocalizations, while mythology suggests that they clearly perceived evolutionary and ecological relationships. One key example is the mistranslation of k'ámamul as "raven." The narrative details leave no doubt the bird intended was the Bald Eagle. I will examine this and other examples from native language texts dictated by Indian elders in the late 1920's to the linguist Melville Jacobs in order to show the quality of Sahaptin Indian ethno-ornithological expertise.

Hunter, Sydney A., Kali R. Wade, Elizabeth Baker Brite, and John M. Marston. **Phytolith Perspectives on Agriculture in the Islamic Golden Age city of Kath** (Session XXIII)

In 2018, the archaeological site of Sim-Ata, a fortified site located on the outskirts of the ancient city of Kath, was excavated in Khorezm, Uzbekistan. The city of Kath was founded in the 4th c. CE and rose to prominence in the Islamic Golden Age as an important agricultural hub with Silk Road connections. Excavations at surrounding sites suggest that complex agricultural practices developed earlier than previously believed and 2018 excavations revealed complex architecture built off large mudbrick fortification walls. Here we present the results of microbotanical (phytolith) analysis from Sim-Ata providing evidence of complex agricultural practices, change in plant use through time, and questions of preservation. Preliminary phytolith analyses reveal a high percentage of



dicot plant material and of the inflorescences of grasses. Phytolith analysis has also revealed a significant amount of weathering and the presence of diatoms suggesting river action may have affected phytolith preservation at Sim-Ata.

Ignace, Marianne and Ronald Ignace. **The Mystery of Songbirds in Secwepemc Narratives** (Session XVII)

In 1900-1904, ethnographer James Teit recorded more than one hundred Secwepemc stsptekwll - oral narratives that include Coyote stories, historic transformer narratives and “stories of transformations.” Many of these include protagonists as shapeshifting people with bird characteristics and vice-versa. Unfortunately, these narratives were rendered in English only, as told by Sxwílecken from Xgéttem and Sisyúlecw from Simpcw. Through collaborative work with Secwepemc elders we have “unpacked” these narratives, identifying the Secwepemc names of the bird protagonists, their ecology, behaviour and interactions with humans and animals, as we have re-claimed the stsptekwll and bird names into Secwepemctsin (Shuswap language). We will draw on examples from these narratives and show how they integrate subtle knowledge about bird etiology and ecology in turn connected to symbolic and spiritual associations. Keenly aware how this knowledge connects to language revitalization, we will show how bird knowledge in voice and art connects to language revitalization.

Ignace, Ronald and Marianne Ignace. **Secwepemc Concepts and Narrative of Tmicw: Ancestral Deeds in our Sentient Landscape** (Session IX)

In this presentation we focus on Secwépemc sense of place as tmicw – our homeland as it refers to geographic place, but also embodies humans, plants, animals and their interactions as sentient beings in the landscape. As a cultural, historical and spiritual landscape it is a storied landscape whose meaning derives from the deeds or experiences of our ancestors marked on the land, what we call stsqéy: The way our land was marked for us by our ancestors, still visible in features of the postglacial landscape itself, in pictographs and rock formations, but also commemorated in stsptekwll (oral narrative) and place-naming. For us as Secwépemc, stsqéy furthermore articulates these ancestral deeds as our Indigenous law, our legitimate possession to land, our rights. Based on these concepts of sentient and history-laden landscape, we discuss the implications that dispossession and irreversible changes to landscape have had, and will have for Secwepemc people.

Jackley, Julia, Dana Lepofsky, Gavia Lertzman-Lepofsky, Nancy J. Turner, and Jennifer Carpenter. **Documenting Springbank Clover (*Trifolium wormskioldii*) at Húyat, A Cultural Keystone Place of the Heiltsuk Nation** (Session IV)

The cultivation of springbank clover (*Trifolium wormskioldii* Lehm.), coast silverweed (*Potentilla egedii* Wormsk.) and other root vegetables within estuarine root gardens is well documented within the ethnographic literature of the Pacific Northwest. However, because of the subtle imprint of these practices on the landscape, the remains of root gardens are often overlooked by ecologists and archaeologists. To understand the parameters of root vegetable cultivation, we conducted surveys at various spatial scales in Húyat, a cultural keystone place of the Heiltsuk Nation, on the Central Coast of BC. We focus on clover because it's the most reliant on people to flourish. Our transects reveal that clover is located within a narrow elevational range in the upper intertidal zone, and that the density and distribution of clover corresponds with settlements. In identifying the legacy of intertidal cultivation, we support Heiltsuk's ongoing efforts to document the history of ecosystem management within their territory.

Johns, Timothy. **Ethnobiological Professionals within East African Food System Transition** (Session VIII)

Converging recognition of social and nutrition values of traditional foods within a multi-ethnic context is central to transition of East African food systems in policy and practice. Drawing on a foundation of colonial-era sciences and institutions, ethnobiological research over the past four decades has emerged as a primarily African undertaking delineated by international development funding, but also by indigenous cultural and social values and knowledge. While the combined leadership of ethnobiologists, agriculturalists and nutritionists in shaping food system transition is pragmatic and empirical, inherent in successful initiatives at the national level are in-common cultural links to food, as well as distinct food identify and heritage of individuals. Professionals at the forefront of

the transition process reflect the values and actions of the greater populace within an emerging market-orientation. At the same time they are essential to outreach supporting the environmental, economic and health importance of traditional foods within sustainable systems.

Jones, Rachel. **Colorful Quinoa: A Miracle Cereal Put to Market** (Session VII)\*

This paper examines the relationship between identity in the agricultural Altiplano of South America and the global quinoa market. Commodification of the pseudo-cereal results in further marginalization of Andean peoples by racializing and exotifying both plant and curator, threatening existing practices and genomes, and undermining regional food sovereignty. Capitalizing on the intellectual and genetic property of Altiplano peoples serves neocolonial powers and their corporate economies, often producing meager to no return for the rightful owners. I will discuss the language surrounding this global market by presenting and evaluating discourse involving various interested parties; I'll go on to offer methods of follow up through allyship for anthropologists working with at risk communities.

Joseph, Leigh. **Feeding Our Spirit: Connecting Plants, Health, Place and Cultural Resurgence** (Session IV)

We are in a time of Indigenous Resurgence in Canada. Increasingly, Indigenous Peoples are finding renewed strength, pride and grounding through cultural practices. Included in this resurgence are the relationships between people and plants. This time of renewal comes on the back of generations of Indigenous Peoples who suffered unimaginable trauma and who fought to pass on parts of their culture to future generations. As an Indigenous person and scholar I find myself caught between the pain of my own experiences with intergenerational trauma and my drive to contribute my voice and perspectives to the field of ethnobotany. Plants connect Indigenous People to place in a very specific and meaningful way. A phrase commonly used within Indigenous communities "our food is our medicine" speaks to the intertwined nature of culturally important plants and health. Understanding the role of plants in cultural resurgence is foundational to the field of ethnobotany.

Kahn-Abrams, Maya and Lalita Calabria. **Nucleoside Content in Commercial Supplements of the Medicinal Fungi *Cordyceps militaris*** (Session XXIII)

An estimated three-quarters of the world's population rely on herbs and traditional folk medicines to treat diseases like cancer. *Cordyceps* is a fungus used in Asia containing cordycepin, a bioactive nucleoside inhibiting tumor growth and metastasis. Recently *Cordyceps militaris* has become a popular commercially available supplement as the medicinal fungus industry experiences enormous growth with few quality control standards. There are no universally recognized methods for quality determination of *Cordyceps* resulting in concern with identity, purity and overall quality. We compared twelve supplements, verifying product identity via DNA analysis. Presence of cordycepin and four medicinal nucleosides was determined, and concentration assessed using semi-quantitative thin-layer chromatography. Aqueous-extracts were sonicated, filtered, and purified via hexane-methylene chloride- n-butanol fractionation or with a C18 silica cartridge. Results were compared with a cordycepin standard on silica gel plates with solvent systems: methylene chloride: methanol (60:15) and chloroform: ethylacetate: isopropanol: H<sub>2</sub>O: triethylamine (40:8:32:2:8).

Kemper, Rudo. **Participatory Mapping of Indigenous Place-Based Storytelling in the Amazon Rainforest using Terrastories.io** (Session IX)

For many forest communities in South America, survival has always depended on an intimate and sacred knowledge of their territory, passed down by their ancestors. Place-based stories help determine where food or resources are located, or where dangers lie hidden, thereby capturing invaluable local knowledge on forest biodiversity. Importantly, the oral histories also reinforce their historical and cultural connection to their homelands, which in turn informs their collective identity. In addition, new research demonstrates that storytelling encourages indigenous peoples to conserve their environments. With the Amazon rainforest facing

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record-high rates of deforestation and oral history traditions at risk of disappearing, the task of helping forest communities preserve their storytelling traditions is more urgent than ever. I will share experiences and lessons learned working with three forest communities from Colombia, Suriname, and Brazil to help them record and map their oral histories using the novel open-source, offline-compatible geostorytelling application *Terrastories.io*.

Kirner, Kimberly. **Relating to the Garden: Changes in Knowledge, Skill, and Worldview among Urban Farm Interns** (Session VII)

Local ecological knowledge (LEK) is a key factor in sustainability and conservation of biodiversity and is differentiated from formal, classroom-based education (and Western science) by its interactive, hands-on, field-based learning process. Urban community and home garden programs, grounded in LEK, have sprung up across the United States to encourage better nutrition, sustainable agriculture, greater equity in food security, and conservation (such as increased plants for pollinators). This project combined autoethnography and grounded theory analysis of 40 urban farm interns' blogs, located at a single bioregenerative farm internship program that ran for three years in the Greater Los Angeles area, California. Full immersion of the researcher into the urban farmer training program combined with studying the reflections of other urban farm interns, in their own words, illuminated the ways in which intensive experiential learning in the garden shifted individual participants' motivation, cultural models of food and nature, and their skills.

Kjesrud, Karoline. **Plant Medicine in Medieval Scandinavia** (Session XV)

In Scandinavia, practical knowledge about plants and their medicinal effects was first put into written format in the middle ages. The Danish medieval doctor, Henrik Harpestreng (died in 1244), authored several plant books in his life time. He was influenced by the continental sources of Macrú Floridus' *De viribus herbarum* and Constantinus Africanus's *De gradibus simplicum*, but he also created a local herbal on local plant species, their characteristics and their medicinal benefits. Additionally two medieval medicinal books are known from medieval Scandinavia, developing knowledge on medicinal cures. All these medicinal texts were written in vernacular language, which implicates that the books had broader scope than within monastic circles. In this paper, the transmission history of Scandinavian medieval herbals will be investigated as sources to the development of Scandinavian medicinal practice and its local variances.

Kool, Anneleen. **Viking-Assisted Plant Dispersal and the Role of Public Outreach in Research** (Session III)

The Viking Age is perhaps the most well known era in Scandinavian history. People's mobility during the Viking Age was likely due to a favourable climate and did not only result in extensive raiding and trading, but also in plants being moved around and beyond Europe. In this project we are taking a two-fold approach that combines research with public outreach. On the one hand, we have established a Viking Garden at the Oslo Botanical Garden that showcases the variety of plants that were important during the Viking Age. It is used as a platform to discuss migration, oral traditions, agrobiodiversity, traditional food plants and invasive species with the general public. On the other hand, the establishment of the Viking Garden has resulted in a number of externally funded research projects. In this talk I would like to present the research aspects, and how this is combined with the outreach.

Krizanova, Eva, Hoa Thi Tran, and Zbyněk Polesný. **Ethnobotany of Wild Edible Plants in Huu Lien Nature Reserve, Vietnam** (Session XXIII)

The Huu Lien Nature Reserve is located in a high biodiversity karst zone in northeast Vietnam. It is one of the poorest regions with strong dependence on forest resources that are particularly valuable for ethnic minorities. This ethnobotanical study aims to document the diversity and use of plant resources with focus on wild food plants, to assess the distribution of the local traditional knowledge and to preserve it. Randomly chosen participants were interviewed using free-listing and semi-structured questionnaires. Several quantitative indices as Relative frequency of citation, Smith's salience and Use value were calculated to analyze the cultural importance of recorded species. A total of 58 species were cited as edible, used mostly as fruits (72%). Several interesting species as e.g. *Xerospermum noronhianum* (Sapindaceae) have been identified. Documentation of these useful species will provide basic information for conservation and possibly for further exploitation to help

the local communities.

Kuhnlein, Harriet. **Discussant** (Session VIII)

LeCompte, Joyce, Sarah Hamman, and Valerie Segrest. **Reinvigorating Tribal Relationships with South Puget Sound Camas Prairie Cultural Ecosystems Through Participatory Action Research and Transdisciplinary Collaboration** (Session V)

Camas is one of the most important cultural foods of the Northwest Coast. There is a strong desire in Washington State among tribal communities to reintegrate camas harvest and consumption into daily life. Because the ~3% of remaining ecosystems exist within a patchwork of private, public, and tribal lands, reinvigorating tribal relationships with camas requires meaningful collaboration. It is often said in Coast Salish territory that plants are our first teachers. The knowledge required to harvest, process, and store camas, and to properly care for camas prairies relies on many interdependent relationships. With tribal members leading the way, and supported by non-tribal accomplices, camas prairies teach us how to work together to reignite tribal relationships with camas. In doing so, we support Indigenous self determination – the capacity of a community to adapt to social and environmental change while maintaining the well being of that community, or collective continuance.

LeFebvre, Michelle and Christina Giovas. **The Biocultural Legacy of Amerindian Mammal Ethnophoresy in the Caribbean** (Session XX)

Ethnophoresy, the human translocation and introduction of animals to new landscapes, is an ancient practice with a diverse and global history. In this presentation, we summarize mammal translocations in the Caribbean Archipelago during the Ceramic Age (ca. 500 BC-AD 1500) as part of this wider phenomenon. Archaeological evidence indicates that both Caribbean-native and South American mammals were intentionally relocated beyond their natural ranges in spatially heterogeneous, asynchronous events. We discuss the ethno-biological significance of this practice, highlighting recent data and interpretations linking the translocation of mammals to human adaptations, processes of animal management, and possible incipient domestication. Our findings have implications for how we understand contemporary Caribbean mammalian biodiversity and the historical ecology of islands in general.

Leonard-Doll, Katy and Paloma Sánchez. **Seeds of Survivance: Investigating Grand Ronde Foodways through Archaeobotany** (Session XXIII)

Our research uses archaeobotany to examine the relationship that late 19th to early 20th century Grand Ronde community members had with their landscape, and the impacts of colonization on their diet. Focusing on one of the first reservation habitation sites following removal, analysis of charred seeds and changes in their composition over time and space will give us a better understanding which plants the community may have been using and how that was adapted on the reservation. The methods for our research include processing soil samples, sorting, and identifying charred seeds. Our research will provide a protocol for identifying charred macrobotanical remains and a reference collection of seeds present in the area during this time that can be applied to future research. This research also adds to the conversation of first foods revitalization in the Grand Ronde community by exploring how the community used plants once on the reservation.

Lepofsky, Dana, Jennifer Carpenter, Mark Wunsch, Nancy Turner, and Elroy White. **The Voices of Húyat** (Session III)

Inspired by the conference theme (and indeed the conference theme was in part inspired by this project), we share some of the voices of the landscape of Húyat — a cultural keystone place of Heiltsuk Nation in central BC coast. The voices of Húyat can be heard in Heiltsuk songs, language, place names, oral traditions, archaeological sites, and memories. We bring together these voices in a web site designed with and for the Heiltsuk ([www.hauyat.ca](http://www.hauyat.ca)). The website reflects the culmination of eight years of community-centred research on the millennia-old history of Húyat documented through ethnoecological, archaeological, anthropological, and audio-visual techniques. We discuss here how in creating the website we grappled with how to represent the diverse

voices and techniques in respectful, honest, and engaging ways.

Letham, Bryn, Spencer Greening, Justin Clifton, Donald Reece, Mark Wunsch, Jacob Earnshaw, and Dana Lepofsky.

**Deep-Time Histories of Landscape Change and Human Occupation at Laxgalts'ap (Old Town), a Gitga'at Cultural Keystone Place on the Northwest Coast of British Columbia** (Session XXIII)

*Laxgalts'ap* (Old Town) is a cultural keystone place for the Gitga'at Tsimshian peoples on the northern Coast of British Columbia, a powerful landscape that is deeply interwoven with Gitga'at cultural identity. As the main village until the mid-1800s, and an important fishing, hunting, and gathering place routinely occupied until the 1950s, Gitga'at Elders have lived experiences at and memories of Old Town, and oral records recall a history of occupation deep into the past. *Laxgalts'ap* is a geomorphologically active landscape, constantly being transformed by changing sea levels and fluvial processes. We present results of a study that reconstructs the deep-time histories of landscape change at *Laxgalts'ap* that plant and animal inhabitants would have experienced since deglaciation of the area after the Last Ice Age. We present archaeological evidence for nearly 9000 years of human occupation of this dynamic landscape, adding another "voice" to the record of its cultural significance.

Leweniqila, Ilisoni. **Na Mate Ni Civa Au A Vakawaletaka: Kumala Crop Opportunity in Fiji** (Session VIII)

The Fijian parable "Na mate ni Civa au a vakawaletaka," translates to "the pearl has been neglected" meaning that 'their' purpose has not been recognised. In this case 'their' refers to sweetpotato (*Ipomoea batatas* L.) or kumala, often referred to as the "forgotten crop" which has potential to become a significant crop for food security as well as subsistence in the South Pacific and an avenue for Climate Smart Agriculture leading rural economic development. While kumala has a strong traditional base in Fiji, its potential social, cultural and economic value is currently under-recognised across Polynesia. Trials assessing yield values for kumala are being undertaken using the Fijian Vanua Research Framework (FVRF) an indigenous framework developed for use when researching with indigenous Fijian communities and considered as the most effective tool for indigenous development in Fiji especially in an agricultural context aligned to future food security and climate change issues.

Li, Xiaoyue and Victoria Reyes-Garcia. **A Collaborative Approach to Understand Climate Change Impacts on Local Social-ecological Systems** (Session XIII)

Place-based research on climate change impacts gains attention as evidence shows that global climate datasets fail to detect impacts on local social-ecological systems. However, the transferability, integration, and upscaling of place-based research from the local to the global calls for the articulation of strong networks of collaboration working at multiple scales and across different knowledge systems. Building such a community of practice requires the operationalization of a common conceptual framework, underpinned by a common language. Based on a literature review on local impacts of climate change, we categorize local indicators of climate change impacts. The indicators found often lack the accuracy of instrumental measures, but they reflect local understandings of climate change impacts upon social-ecological systems. The establishment of a global network around the concept of "local indicators of climate change impacts" can significantly advance climate research and help to bridge the gap between place-based and global climate research.

Linares, Edelmira and Robert Bye. **The "Quelites Pasados" - A Traditional Food Preservation Technique in Northern Mexico** (Session VIII)

Given the increase of droughts in the Sierra Tarahumara of Chihuahua, Mexico, traditional techniques of food preservation are an important part of our collaborative agrobiodiversity program. In response to our Rarámuri collaborators, we are generating bilingual videos that focus on the traditional production, preparation and consumption of the principal Rarámuri foods so that new generations will be continue these practices. Today, the Rarámuri children attend boarding schools away from their families and are abandoning traditional foodways. Quelites (spontaneous edible greens in the milpa) are available during a short period of the limited cultivation cycle (3-4 months/year). In order to have native vegetables available during the rest of the year, they are specially processed to retain their organoleptic properties and flexibility. Rarámuri elders want the younger generation to know that "if people continue to prepare their food in this way, they will not go hungry".

Long, Chunlin, Yujing Liu, Qiyi Lei, Hang Shu, Yuanyuan Ji, and Jun Yang. **Wild food Plants Domesticated by Indigenous Peoples: Examples from Southwest China** (Session XX)

While the domestication of wild plants began about 10,000 years ago, it still continues today, particularly in areas where local people bring wild plants into their cultivated production systems. Few published studies have provided cases that reveal driving factors of wild plant domestication in recent decades. Based on ethnobotanical methods and other approaches in 2010-2018, four food plant species were investigated, including *Baccaurea ramiflora* (fruit), *Colocasia gigantea* (vegetable), *Acorus macrospadiceus* (spice) and *Hedychium flavum* (spice). Results showed that indigenous peoples in China are still domesticating wild food plants. More species have been domesticated in southwest China, the region with richest biocultural diversity in the country. The tastes, favors, odors, and demands of market and social activities are the main driving factors for wild food plant domestication. Easier accessibility and better social networks have accelerated the dispersal of newly domesticated crops.

Lucio Cruz, Claudia Yarim, Lizeth Monzalvo Hernández, Martha Azucena Zuñiga Hernández, Jaime Pacheco-Trejo, Eliazar Aquino Torres, and Judith Prieto Méndez. **Taxonomic Identification, Seed, and Vegetative Propagation of Two Overexploited Species of *Litsea* Lauraceae in Two Agroecosystems from Central Mexico** (Session XVIII)

The bay leaf is an important non-woody resource in several Mexican regions, and it is sold in markets during all year. Usually it is not cultivated, thus the natural populations are facing several problems because it is extracted illegally. Also, little is known about the distribution, and propagation of some species. In the present project we collected vegetative, and reproductive *Litsea* samples from individuals of two different agroecosystems, located in the Mexican state of Hidalgo. The samples were taken for taxonomic identification, seed propagation experimentation, and asexual propagation air layering, and hardwood cuttings. Like result, we identified two *Litsea* species, *L. pringlei* and *L. schaffneri*. The air layering method looks like a good option to propagate the species of *Litsea* studied.

Luo, Binsheng. **The Renaissance of Bamboo Weaving and Anti-poverty in Sansui, Southwest China** (Session XXIII)\*

Abstract: The traditional Sansui bamboo weaving is a renowned intangible cultural heritage. Like other traditional handicrafts in China, it had suffered a downfall in such a fast developing period. Under the joint efforts by local government, bamboo weaving companies and bamboo weavers, Sansui bamboo weaving is embracing a renaissance. Based on field investigations, 17 bamboo species for weaving were recorded and analysed. Different bamboo species has been used for different weaving purposes. *Phyllostachys edulis* is the most popular one locally. Additionally, the reason of the renaissance of Sansui bamboo weaving are comprehensively understood, in which the good governance played a vital role to support local bamboo weaving industry. The innovation of the bamboo weaving itself is also the key reason. Some suggestions for better development of Sansui bamboo weaving and other Chinese traditional handicrafts were proposed at the end of the present paper.

Lyall, Andrea. **K'akot'at'ano'xw xa kwakwax'mas "We are Going to Learn About Plants": Documenting and Reclaiming Kwak'waka Plant Names on Canada's Northwest Coast** (Session IX)

This paper is situated within the Kwak'waka Indigenous language spoken by the Kwakwaka'wakw People of the midcoast of present-day British Columbia, Canada. In this paper, the author describes the methods and development of a land-based language reclamation project as an outcome of praxis-based research. Drawing from a community-based research design, the author studies the Kwak'waka language from previously published materials as well as new documentation with Elders. The research focuses on the biocultural and indigenous knowledge found about trees and plants within Kwak'waka by looking at examples from the language's words, verbs, and sentences. The author will conclude with approaches and opportunities for sustained cross-disciplinary and community-based dialogue.

Mackay, Rosslyn. **Ancient Celtic Ethnobotanical Garden Design** (Session XXIII)

My poster presentation will showcase Celtic ethnobotanical garden designs. The design of gardens reflects

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\* Barbara Lawrence Award submission

traditions, culture, landscape design, herbal medicines, and native plants. By promoting culture and its relationship with the natural world, ethnobotanical gardens can illuminate ancestral stories of the past to present day. Using examples from Celtic gardens, I show how gardens are an interactive way for all people to experience Indigenous culture and regain a sense of awe for our natural environment.

Main Johnson, Leslie. **Managing Resources and Access Through Customary Tenure and Law: Gitxsan and Witsuwit'en Examples** (Session XIX)

I examine aspects of traditional tenure and governance among Gitxsan and Witsuwit'en in Northwestern BC to consider how House and Clan territories and owned resource sites work/ have worked to regulate access to and enhance key resources. This work synthesizes earlier work on conservation, aboriginal burning, berry patch ethnecology and maintenance, tenure and the ordering of owned resource sites, and most recently, propagation and tending of Pacific crabapple. My sources of information have been predominantly Elders and Chiefs. I briefly consider more recent examples, especially the Madii Lii blockade in the Suskwa drainage (Gitxsan) and its relationship to access to huckleberry patches (2015), and the Unistoten encampment on Gilseyu Dark House Territory (Witsuwit'en) which has sought management of access and development in critical habitats (Widzin Kwe) drainage (2015-2019).

Marston, John M., Sydney A. Hunter, and Elizabeth Baker Brite. **Macrobotanical Perspectives on Agriculture in the Islamic Golden Age City of Kath** (Session XXIII)

In 2018, the archaeological site of Sim-Ata, a fortified site located on the outskirts of the ancient city of Kath, was excavated in Khorezm, Uzbekistan. The city of Kath was founded in the 4th c. CE and rose to prominence in the Islamic Golden Age as an important agricultural hub with Silk Road connections. Excavations at surrounding sites suggest that complex agricultural practices developed earlier than previously believed and 2018 excavations revealed complex architecture built off large mudbrick fortification walls. Here we present the results of macrobotanical (seed and plant parts) analysis from Sim-Ata which indicate the presence of irrigated summer crops: naked wheat, broomcorn millet, and pulses. Both wood and ruminant animal dung were used for fuel. The high density of carbonized chenopodiaceous seeds introduced through dung fuel burning reflects animal grazing in steppe and desert landscapes adjacent to the Amu Darya river valley.

Mathews, Darcy and Paige Whitehead. **What the Soil Has to Say: Microbes as Active Agents in Indigenous Garden And Village Anthrosols** (Session IV)

The anthrosols of indigenous gardens and villages are a highly productive living legacy of past human–soil relationships. We call on the voice of biodiverse, highly productive soils from cultural sites on the archipelago of Tl'ches, off southern Vancouver Island, which present us with an emerging story of these interactions. Archaeological sites in British Columbia contain significant stores of charcoal, and using Scanning Electron Microscopy and FTIR spectroscopy, we examine biologically active indigenous soils from traditional garden and village sites to consider charcoal as not only an abiotic soil amendment, but as matrices for supporting and concentrating beneficial microbial communities. We present initial results concerning the process and outcomes of charcoal and microbial contributions to soils through long-term anthropogenic soil creation. We conclude with ideas on how Tl'ches-like soils might be created—and degraded soils improved— by understanding indigenous soil formation processes and employing living anthrosols as microbial inoculants.

Matthews, Kathryn. **Restoration Strategies for Camassia quamash on the Weippe Prairie** (Session V)

Camas (*Camassia quamash* (Pursh) Greene) is a facultative wetland hydrophyte that is culturally important to the Nez Perce and other Native American tribes of the Columbia Plateau. An important, traditional Nez Perce harvest site for camas is Weippe Prairie, located in central Idaho. Like many wetland prairies across the United States, much of Weippe Prairie was converted for agricultural use in the 19th century. Rehabilitation of camas prairies will serve in both repairing the functionality of these ecosystems as well as restoring lands that are culturally significant. After three years of research identifying the specific habitat criteria required by camas and evaluating different restoration techniques such as seeding and outplanting, this study will aid in the development of a

restoration protocol for camas that can be applied to camas meadows across the plants' North American habitat.

Maurice-Hammond, Isabelle. **Finding the Words: Renewing Knowledge About Pacific Silverweed (*Argentina egedii*) and Springbank Clover (*Trifolium wormskindii*) Cultivation on Tl'ché's, Songhees First Nations Territory** (Session IV)\*

Though there is much contemporary knowledge in Songhees about the traditional consumption and trade of root crops, there is no surviving traditional ecological knowledge (TEK) about specific cultivation areas and practices on their territories. On the islands of Tl'ché's (Chatham and Discovery), the recent identification of an intertidal root gardens offers the opportunity to re-open dialogues about this ancient practice and examine ways of re-engaging Songhees youth and community members in the cultivation of these ancient food crops, while providing the first opportunity to study root garden cultivation on the south coast of British Columbia. In doing so, this work seeks to develop a method for the identification of intertidal root gardens in areas where, due to the ongoing violence of colonialism, they are no longer rooted in community knowledge and oral histories. How do we find the words?

McAlvay, Alex. **Toward a United Literature on Traditional Resource and Environmental Management: Implications for Resource Sovereignty and Understanding Human Subsistence** (Session XIX)

Extended coexistence between cultures and landscapes have resulted in incredibly diverse management practices to increase the availability and productivity of otherwise wild biotic resources. Burning, pruning, transplanting, and other technologies appear to have developed independently in many geographic regions. Communication may be hampered between researchers studying similar management phenomena in different regions, cultures, and ecosystem types. The connectivity of research on traditional management was investigated using bibliometric analyses. There appears to be limited communication between scholars working in geographically disparate areas and strong partitioning at the scales of journals, institutions, authors, and articles. Limited cross-citation not only limits our understanding of human subsistence worldwide, but also our ability to share the ways that documentation of traditional management practices can support traditional land rights and resource claims. Examples from Mexico and Canada are reviewed and potential for reciprocal benefits from increased dialogue are outlined.

McCune, Letitia and Twila Cassadore. **Methods for the Reintroduction of Traditional Foods** (Session VIII)

The reintroduction of traditional foods can encompass many techniques and disciplines. This presentation focuses on methods from workshops of the 2017 Native American Nutrition (NANC) conference and The Traditional Western Apache Diet Project. Participants of the NANC workshops described nonjudgmental recipes (ex. local berry sauces with fry bread or spam), photos of local sports heroes or Elders on informative flyers or banners and creating hands-on workshops for cooking and gathering traditional foods that includes local customs, traditional language and transportation. The Traditional Western Apache Diet Project emphasizes a cultural sense of wellness that incorporates techniques for reintroduction of traditional foods that include creating contemporary recipes, gathering plant foods and traditional hunting workshops/excursions, creating posters and books that document animals and plants, gathering nutrient data for use in school and diet programs as well as art and calendars that include gathering stories and harvest schedules emphasizing traditional names and methods.

McDonald, Andrew. **Ancient Waterlily Symbolism in Central Mexico** (Session XIV)

The role of waterlilies (*Nymphaea* spp.) in Maya iconography and ritual has been explored comprehensively and found to relate symbolically to various divine motifs and universal principles of ancient Mesoamerica. Among these are included the feathered serpent, a cosmic bird, various sun-gods and cosmogenic time. Few investigations have explored, however, closely related roles of this iconic plant among civilizations in Central Mexico. A systematic investigation of floral symbolism among urban centers of the Toltecs, Mixtecs and Aztecs reveals similar and parallel uses of water lily imagery in the Valley of Mexico and environs. Analysis of iconographic conventions among historical sites constructed under both Mayan and Central Mexican influences --

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such as Teotihuacan, Xochicalco, Cacaxtla and Chichen Itza -- demonstrate that distant cultures were plainly aware of their shared practices in iconographic and religious expression. These conclusions identify water lily symbolism as a unifying feature of Mesoamerican culture and history.

McKechnie, Iain, Jacob Earnshaw, and Spencer Wood. **Mapping Marine and Terrestrial Interdependence from Taxonomic Use Webs in Nuu-chah-nulth and Makah territories** (Session XIX)

Northwest Coast Indigenous people's knowledge of coastal environments has been a focus of anthropological, archaeological and ethnobiological research for over a century. Such efforts however are rarely synthesized and reconciled across marine and terrestrial ecosystems and alongside archaeological data. This presentation compiles existing ethnographically documented plant and animal taxa among Nuu-chah-nulth and Makah peoples on western Vancouver Island (Canada) and Washington State (USA). Our observations document a very wide range of cultural uses for marine and terrestrial taxa, and a proportionally dominant use of terrestrial plants. We present visualizations of relationships between humans use of plants, particularly western redcedar (*Thuja plicata*), and a wide array of marine animal harvesting practices. These relationships are then plotted alongside archaeological location data from 50,000 CMTs and 2,000 coastal settlements. We interpret this combination of ethnobiological and archaeological data as an example of a long-term reliance of coastal communities on terrestrial rainforests.

McQuaid, Gary. **Stakeholders and Manager Observations of Mountain Goat (*Oreamnos americanus*) Health in the Skeena Region of British Columbia.** (Session X)

In 2015, British Columbia's provincial conservation status for mountain goats (*Oreamnos Americanus*) declined from "apparently secure" to "special concern, vulnerable to extirpation or extinction". The northwestern Skeena Region, in particular, has already experienced extirpations of certain populations. Anthropogenic factors including, alpine development (ski lodges, mining), climate change (melting glaciers), and expanding forestry, are attributed to this decline. To address this concern, I take a broad ethnobiological and historical-ecological approach to better understand how multiple stakeholders and institutions perceive and deal with aspects of mountain goat harvest and management. By combining interviews with hunters, guides, First Nations, and government managers, as well as reviewing historical, scientific, and grey literature, I will present my current findings, which include a significant and consistent decline in goat sightings. There is also concern, especially by guides, that the substantial field experience by non-government stakeholders is not being sourced or accounted for in governmental management regimes.

Medinaceli, Armando. **Bridging Paradigms: Aiming for True Collaboration in Ethnobiological Research** (Session III)

This study implements and proposes a research approach based on the combined use of conventional anthropological methodologies and indigenous methodologies, in search of 'true collaboration' between researcher and local indigenous communities. I analyze the collaborative ethnography and indigenous epistemologies paradigms, then use my experiences collaborating with the Tsimane' people of Bolivian Amazonia while studying Tsimane' traditional hunting to bridge components from both paradigms. Results demonstrate that identifying and combining indigenous methodologies, such as so'baqui, with the use of participant observation, interviewing, and focus groups (based on local formats for discussion), creates a comfortable and familiar environment for the local people while maintaining the rigor and structure of academic research. I conclude that a true collaborative approach bridging both academic paradigms results in relevant and beneficial research for everyone involved.

Miller, Andrew. **Plains Cree Waterfowl Hunting at a Prairie Wetland, Central Saskatchewan** (Session XVII)

This research paper describes the seasonal use of prairie waterfowl, wildlife and plant resources around kâ-takwahiminânâhtikoscâk – Plains Cree for "many chokecherry bushes", a prairie lake and wetland in central Saskatchewan. Elders' traditional knowledge of environmental signals link climate, plant phenology and animal behavior enabling the sustainable harvest of American coot (*Fulica Americana*), mallard (*Anas platyrhynchos*), American antelope (*Antilocapra americana*) and the collection of chokecherry (*Prunus virginiana*). Abundant archeological evidence suggests this site was part of the seasonal migratory round of the people of the

Touchwood Hills for hundreds of years. Community-based research with members of the Touchwood Hills Tribal Council provides insight into colonial processes resulting in the disenfranchisement of Cree, Saulteaux and Métis people from this traditional hunting areas.

Mitchell, Todd and Nicole Casper. **Using Traditional Ecological Knowledge to Protect Wetlands: The Swinomish Tribe's Wetlands Cultural Assessment Project** (Session VII)

Traditional wetland physical assessments do not adequately identify tribal cultural values of wetlands and thus not adequately protecting for cultural uses. The Swinomish Wetlands Cultural Assessment Project has developed a cultural module that can be incorporated into wetland assessments to better inform wetland protections. Local native knowledge was gathered about the traditional uses of 99 plant species. A cultural module was developed based on the presence of plants in several use categories including: construction, ceremonial, subsistence, medicinal, common use, plant rarity, and place of value for each wetland. The combined score of the cultural and physical modules provides an overall wetland score that relates to proscribed buffer protection widths through the Tribe's wetland protection law. We hope this innovative method can serve as a model in combining traditional cultural values with scientific methods to help promote the breath of knowledge our ancestors possessed into modern practical environmental protection.

Moo, Sawshabwe. **In Harmony with Nature: Indigenous Karen Conservation of Wild Orchids in the Kheshtor Forest, Karen State, Burma** (Session XXIII)

Between 2012 and 2016, the Karen Environmental and Social Action Network and Indigenous Karen women researchers conducted a study of wild orchid diversity in the *Kheshtor* forest, within the recently-established Salween Peace Park. This study, relying on Karen women's traditional knowledge of orchids and their forest habitat, identified 121 species from 37 genera. Four of these species were previously unknown to local people. One species (*Paphiopedilum villosum*) is classified as Vulnerable on the IUCN Red List and 95 are listed under the Convention on International Trade in Endangered Species (CITES). In Karen tradition, orchids are used to mark the seasons, for religious ceremonies and for beauty. Traditional taboos prohibit trade in orchids. My poster presentation will showcase the close relationship between Karen villagers and the forest, which has contributed to the long-lasting conservation of orchids. The international community should support this mobilization of Karen Indigenous knowledge for conservation.

Nelsen, Berit. **"Do You Even Dab?" The Masculinization of Cannabis Culture and Losses to Cannabis Biodiversity in the State of Colorado** (Session VII)

From June 2017 to September 2018, a pilot study was conducted in which cannabis industry employees in state-legal facilities in Colorado were interviewed regarding cannabis strain preferences. The data from these interviews suggests that participants often favor strains with high THCA content, as THCA results in the production of large crystals or 'diamonds' within cannabis concentrates. 'Dabbing diamonds' was felt by participants to represent an individual's 'fit' in cannabis culture, as it indicated the ability to consume large amounts of THC. As the over-consumption of THC is a performance of masculinity (Dahl and Sandberg 2014), this study suggests that there is a distinct masculinization of cannabis culture occurring within the Colorado cannabis industry and that this may be leading to the over-selection of THCA-rich strains by cannabis growers, resulting in potential losses to cannabis biodiversity.

O'Sullivan, Megan. **Is It a Cuisine? Prehistoric and Contemporary Explorations of Native American Foodways** (Session XII)

Cuisine is derived from a sense of place. It is the story of the land on a plate, a growing system, an ecology. Indigenous food systems encompass vast plant diversity, terrain, geographic borders, and cultural signifiers. These factors are also used toward understanding a cuisine. Prehistoric Native American foodways may not have an ecology that can support a full diet with a variety of dishes. But an inability to define a diet as a cuisine does not take away from the importance of the food from the people. Determination of cuisine does not undermine the validity of traditional foodways and indigenous practices.

Oberndorfer, Erica, Barry Andersen, Charlie Mae Dyson, and Carrie Cannon. **"Caribou Moss is the Boss": Plant knowledge in Action in the Amazing Plant Race Makkovik** (Session III)

Since 2012, we have been learning about cultural and ecological relationships between people and plants in the Inuit Community of Makkovik (Nunatsiavut; Labrador, Canada). This work focuses on understanding how cultural practices shape plant communities in a sub-Arctic region, and on communicating the knowledge of plant mentors more widely within Makkovik. Regional approaches for teaching and learning plant knowledge have shifted over time in response to changes in community settlement patterns and education systems. More recent approaches to connecting youth with their community's plant knowledge include plant-themed treasure hunts, photos safaris, weekly nature nights, illustrated calendars, and a youth plant book. In this presentation, we feature The Amazing Plant Race Makkovik, a racing challenge based on The Amazing Race format of deciphering clues, solving puzzles, and completing active challenges as an innovative teaching approach for the next generation of Makkovik plant mentors.

Odonne, Guillaume, Damien Davy, and Alain Cuerrier. **When South Meets North, First Reflections from Ethnobiological Meetings Among First Nations from Quebec and French Guiana** (Session III)

As part of a Franco-Canadian project aiming at fostering our respective reflections, several discussions were enthused by a team of Teko, Palikur, Wabenaki, Innu, Cree, and ethnoecologists, from French Guiana and Quebec. Our objectives were 1) empowerment First Nations through meetings and experience sharing, 2) implementation of Indigenous methodologies in French Guianese communities inspired by Canadian experiences, 3) definition of a shared research agenda between ethnobiologists and First Nations. Meetings were organized in Odanak, Mashteuiatsh with a visit in Oujé-Bougoumou and this year meeting will happen in French Guiana. Differences and similarities among Nations resulted in shared tools to cope with problems. Implementing fair processes of knowledge access and benefit sharing is wanting in French Guiana, but Canadian communities offered stories that resonated with Teko and Palikur members. Priorities in terms of research are mapping and land claims, natural resource management, conflicts over mining, traditional medicine recognition, and transmission of knowledge.

Ogston, Lindsey. **Tsleil-Waututh Nation Environmental Stewardship in Burrard Inlet, Vancouver, BC.** (Session XIX)

Tsleil-Waututh Nation (TWN) are "People of the Inlet," and have occupied the lands and waters surrounding Burrard Inlet since time out of mind. Many Tsleil-Waututh villages once existed along the shores, and Tsleil-Waututh people were sustained for millennia from the bountiful marine resources. Over the past 240 years, colonial industrial development has had a harmful affect on the health of the inlet and the ability of TWN to practice cultural activities and harvest traditional foods. TWN holds a sacred obligation and responsibility to be Stewards of their lands, waters and resources. TWN Stewardship initiatives aim to protect and restore the health of Burrard Inlet so that Tsleil-Waututh people can once again harvest wild marine foods, and practice cultural and ceremonial activities in clean water. TWN is a leader in combining Indigenous science and values with western science, and in finding creative solutions to advance TWN Stewardship initiatives.

Ogura, Saori. **An Arts-based Experiential Approach to Community Documentation and Revitalization of Indigenous and Drought-tolerant Crops** (Session III)

Indigenous knowledge and traditional practices around indigenous small grains are critical tools in the quest to improve food sovereignty and to adapt to climate change. As a scholar and an artist, I work with Indigenous communities in Sikkim in the Indian Himalayas and in Mazvihwa, Zimbabwe, documenting Indigenous small grains using arts-based methodologies, such as drawing. In Sikkim, I documented 36 neglected traditional food plants, including 16 traditional cultivated crops such as millet and rice varieties, and 20 gathered plants, representing 14 different plant families. In Mazvihwa, I conducted drawing workshops, created an opportunity for community members to reconnect to the neglected plants, and provided a space for the elders to talk about the plants with the youth. My project builds a collective community resource as communities reflect on their traditional skills and knowledge around neglected small grains, contributing to maintaining agricultural biodiversity and in improving their food sovereignty.

Ojeda, Jaime and Natalie Ban. **Biocultural Interactions Between Yagan People and Mollusks in Sub-Antarctic Channels (Patagonia), Chile.** (Session X)

For millennia the Yagan people in the high latitudes of South America have interacted with biodiversity. This study aims to understand the relationship between Yagan people and mollusks, especially mussels, in order to inform Indigenous stewardship. Mussels have importance for food, ceremonial, spiritual purposes. At the request of Yagan partners, we conducted a review of ecological, ethnoecological and philosophical aspects of the Yagan-mussel relationship. We found mussels showed low seasonal variability in abundance, –crucial to the subsistence of the Yagan people–, but recently mussels are being affected by red tide. Mollusks are culturally important for the Yagan people and are integrated into their worldview. For example, mollusks are a source of food, aesthetic, and materials, and thus have intrinsic and relational values. Furthermore, oral storytelling indicates ethical rules and taboos associated with limpet and mussels harvesting. Yagan’s cultural traditions offer key opportunities for meaningful stewardship and management.

Olofsson, Ebba. **Sámi Women in Reindeer Herding Families – Identity Tied to Recognition of Work Status.** (Session I)

This presentation aims to understand how the role and the status of Sámi women in the kinship system and the reindeer herding were transformed over time in Norway and Sweden. Reindeer herding has become a dominant male occupation with the implementation of the nation-states' reindeer herding legislation. The younger generation in reindeer herding families often links the Sámi identity to the work of the father in the family, in addition, the Swedish legislation makes it difficult for women to take up reindeer herding. The situation in the reindeer herding family is further complicated when the father is of Sámi descent and the mother is of Swedish descent. This research proposes that the ascribed ethnic identity of the Sámi women became linked to the identity of the brothers and husbands with the implementation of the modern legislation, and still is, although Sweden and Norway are striving to be gender equalitarian societies.

Olson, Elizabeth. **Discussant** (Session XVIII)

Ouarghidi, Abderrahim and Gary Martin. **Gendered Perception and Priorities for Water Management in the High Atlas Mountains** (Session I)

Understanding indigenous’ and gendered perceptions of water access and management is essential to dealing with increasing water scarcity in Morocco. Participatory and qualitative methods were used to discussions with men and women their perception of water availability, management and priorities for water use. Our results highlight difficult trade-offs between two main uses for water: agricultural irrigation and drinking/ domestic water. Water used for agricultural irrigation is exclusively overseen and controlled by men. In the face of water scarcity, men are diverting more water to agricultural irrigation. The result is that women must walk longer distances to collect domestic water. Rather than being marginalized by change, women are becoming more vocal advocates for themselves and their households’ need for clean drinking water in the face of water scarcity.

Panci, Hannah, Melonee Montano, Travis Bartnick, and Aaron Shultz. **A Climate Change Vulnerability Assessment Integrating Traditional and Scientific Ecological Knowledge** (Session XIII)

Climate change threatens many natural resources on which Ojibwe member tribes of the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) depend to meet spiritual, cultural, medicinal, subsistence, and economic needs. We integrated Traditional Ecological Knowledge (TEK) and Scientific Ecological Knowledge (SEK) to complete a climate change vulnerability assessment of over 60 beings (species) of interest to GLIFWC’s 11 member tribes in the upper Great Lakes region. To assess vulnerability, we conducted TEK interviews with elders, harvesters, and other knowledge holders, and combined interview results with results from NatureServe’s Climate Change Vulnerability Index. Manoomin, or wild rice, has tremendous cultural importance and was the most vulnerable being in the assessment. We found that the combination of TEK and SEK broadened our understanding of climate change impacts on these beings and will help GLIFWC respond to climate change in accordance with the

cultural values of its member tribes.

Pascua, Pua'ala, Eleanor Sterling, and Joe McCarter. **Developing and Implementing Biocultural Indicators of Well-being** (Session XXI)

In natural resource management, indicators help to describe complex information in a concise manner, track change within and across systems, and understand drivers of change. However, choice and measurement methods can impact management approaches, sustainability outcomes, and the ability of Indigenous and local communities to realize their self-determined visions. We emphasize a biocultural approach, which encompasses feedbacks between social and ecological systems and begins with an understanding of locally grounded priorities to inform natural resource stewardship. We discuss lessons learned through continued collaborations with Indigenous and local practitioners from around the world on how indicators are designed, measured, and used in resource management, especially within the context of commitments that span local to global scales. We provide examples of metrics that are culturally appropriate, monitored in a way that is coordinated with and respects peoples' livelihood strategies and time limitations, and provide information that is relevant for local community decision-making.

Paul, Andrew. **Voices from the Invisible World: Role of Spirits in Traditional Karen Conservation Practice** (Session XIV)

The roles of spiritual agency and ceremonial protocol in mediating human-environment relationships remain underappreciated in many fields of enquiry. In this paper, I present results from community-based ethnographic research conducted in collaboration with the Karen Environmental and Social Action Network in Karen State, Burma. In Karen cosmology, villagers must maintain reciprocal ceremonial obligations to the spiritual owners of the waters, lands, forests, and mountains. I describe several categories of spirits in the Karen world, together with associated ceremonies and protocols, and I argue that it is impossible to understand Karen conservation practices without acknowledging these spiritual relationships and the spirits' agency within these relationships. The paper concludes by discussing how Indigenous Karen villagers are mobilizing spiritual protocols to create the Salween Peace Park, a 5400-sq. km area dedicated to peace, self-determination, conservation, and cultural renewal.

Payne, Neal. **Reevaluating Colonialism and Cultural Change Through Food in Roman Britain** (Session XXIII)

The Roman conquest of Britain instigated a profound moment of cultural contact, an interaction that has long been framed through the theoretical framework of 'Romanization' – the intentional act of making the other Roman. My research embraces recent efforts to deconstruct Romanization by centralizing the complexity of change that occurred during this transitional period. I present a survey of the archaeological evidence of foodways in Britain's Roman period, highlighting patterns of change in Roman and non-Roman food choice and consumption. Several aspects of change will be emphasized, these being: regional differences, imported foods, and wild resource usage. Through the complexity of foodways change demonstrated in this research I hope to contribute to the deconstructing of the problematic and enduring concept of Romanization.

Pierotti, Raymond. **Ethnobiology and Evolution: Strong Links and Weak Invocation** (Session X)

Attempts exist to examine Ethnobiology from an Evolutionary Perspective employ unstated assumptions, i.e., Cultural evolution is equivalent to Biological evolution. Biologists struggle to fit Cultural evolution within the evolutionary process. Ethnobiological discussions of evolution focus on human populations, or human impacts upon plants used for a variety of purposes. Little acknowledgment is made of changing Biological evolution in the 21st Century, which may fit well within Ethnobiology. Recent developments in Evolutionary thinking that could effectively integrate into Ethnobiology include Niche Construction, i.e. organisms shape their own environments and those of other species; Increased importance of individuals in population dynamics and microevolutionary change; and Reticulate evolution where different species exchange genetic material. These ideas relate well to Indigenous conceptions of ecosystem functioning, i.e., *All Things are Connected* and *All life forms are Related*.

Ethnobiology's strengths lie in behavior and ecology, fields neglected by molecular approaches to understanding evolution.

Post, Jennifer. **Songs, Settings, Sociality: Biodiversity and Wellbeing in Western Mongolia** (Session XVI)

In western Mongolian alpine forests and grasslands, resident Kazakh mobile pastoralists move seasonally seeking grazing land for their livestock. They rely on diverse resources available in this protected area, part of the Altai Sayan Ecoregion known for its rich biodiversity. Sound practices that engage them with the landscape and its resources, along with songs shared in tightly constructed social settings, contribute to maintaining ecological knowledge and valuing conservation. While devastating ecological, economic, and social changes have occurred in recent years, rupturing ecosystems and family structures, efforts to sustain pastoralist lifeways continue, in part due to information in songs shared at local gatherings. This study focuses on songs that use sensory, ecological, and social information to embrace the shared roles of people, livestock, wildlife, and plant life and, in conjunction with other narrative information, reveal Kazakh pastoralists' attitudes toward human and environmental health and wellbeing.

Powell, Bronwen, Zachary Goldberg, Katheryn Kirby, Yooinn Hong, and Mackenzie Lombardi. **Cultural Preferences for Traditional Vegetables in East Africa** (Session VIII)

While food aversions are largely innate, preferences are strongly shaped by culture. We generally know little of how cultural preferences for foods have evolved over time, with the exception of a few well documented cases of genes and diets co-evolution. In East Africa, preference for bitter or slimy vegetables is a marker ethnic group belonging. To understand preference for slimy and bitter vegetables, we conducted a literature review of vegetable preferences for 73 East African ethnic groups that had records in the ethnographic database D-Place. Ethnic groups who prefer bitter vegetables all live in areas with a high prevalence of malaria. Most ethnic groups who prefer slimy vegetables are Nilotic speakers who are not pure pastoralists (i.e. also practice some form of agriculture). Both slimy and bitter vegetables may have biologically adaptive properties: loss of these culturally-bond traditional foods could have negative implications for health and nutrition.

Purcell, Emily M., Rosa M. Albert, Francesco Berna, and Morgan Ritchie. **The Potential of Phytoliths, Diatoms, and Sponges as Paleoenvironmental Proxies in a Riverine Context: A Case Study in Sts'ailes Traditional Territory** (Session XXIII)

Researchers are increasingly recognizing the significant impacts of human influence on environments previously thought to be natural or untouched. Interpretations of human-environmental interactions in the Pacific Northwest have often relied on charred seeds or faunal remains. Phytoliths, diatoms, and sponges have been successfully used to understand these relationships in other parts of the world, but more research is necessary for these environmental proxies to be better understood in the Pacific Northwest. We need to determine the potential and limitations of this type of evidence before they can be applied to the interpretation of anthropogenic changes on the landscape. In this research, we will explore these questions in the context of archaeological sites along the Harrison River, in the traditional territory of the Sts'ailes, in southern BC. Examination of these remains, their deposition, and their preservation provides grounding for future inferences regarding the environmental context in which people lived.

Qiong, Fang. **Ethnobotanical Study of the Yao Ethnic Group in Jianghua, Hunan, China** (Session XII) \*

Jianghua is the biggest autonomous county of the Yao ethnic group in China. It has the most famous herbal medicinal market during the Dragon Boat Festival. In order to understand and conserve its traditional botanical knowledge, we conducted an ethnobotanical survey, using participant observations, semi-structured and key informant interviews to investigate its herbal, culinary, ornamental, and cultural plants. A total of 376 species were documented, 64.9% of them are medicines and over 20 species are culturally significant. Interestingly, there are many wild edible flowers and weeds. Some plants have multiple uses as medicines, foods and ornamentals.

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\* Barbara Lawrence Award submission

Plants play an indispensable role in all aspects of the Yao people's life.

Quinlan, Marsha B. **Ethnozoology of Dogs in Guatemalan Small-holder Farms** (Session XVIII)

Animal keeping provides obvious nutritious and social benefits to humans while also creating financial cost and additional disease risks. Dog-keeping attitudes and behaviors are important to understand because even the poorest people on Earth live with dogs, apparently outweighing the benefits of dog partnership with their personal and health costs. Yet, little anthropology addresses domestic dogs. I present results of pilot research conducted among small-holder family farmers from two southern Guatemalan communities, one indigenous K'iche' Mayan village, and a mixed-heritage Ladino village. Mixed methods data include quantitative survey results of two cognitive tests, the Animal Attitude Scale-5, and the Satisfaction with Life -5, and demographic questions about the respondent and his/her farm. Participant-observation and a dozen in-depth, qualitative interviews in each community inform farm lifeways, with a specific focus on human-animal interaction, particularly ethnozoology of dogs.

Ragosta, Summer, Ivelyn Harris, Ntim Gyakari, Emmanuel Otoo, and Alex Asase. **Participatory Ethnomedicinal Research with Fante-Akan Herbalists in Rural Ghana** (Session XVIII)

An ethnomedicinal study was initiated with herbalists in coastal Central Region Ghana to explore how cancer is defined, diagnosed, and treated within a traditional Fante-Akan context. The participatory, service-oriented investigation included international collaboration with herbalists and traditional plant experts. Ten cancer ethnopharmacopoeia plants were identified, most of which are species considered native to tropical Africa. Fante Akan herbalists listed various types of cancers they treat with herbal remedies, along with ethnomedicinal descriptions of disease etiology, diagnoses, and treatments. The most common cancer type mentioned was "breast cancer." Topical application was the most often cited method of administering remedies.

Recalma-Clutesi, Kim, Douglas Deur, and Clan Chief Adam Dick wat'l'tla. **Adam's Garden: The Power of Song in Recovering Knowledge of the Luxw'xi'wey** (Session XVI)

"Clam gardens" represent a keystone Northwest Coast resource management tradition. Called luxw'xi'wey in Kwak'waka, they were constructed by moving rocks in the intertidal zone, creating cultivated clam beds. The technology was nearly forgotten as children were forced into residential schools. The academic rediscovery of this technology emanates from the teachings of Clan Chief Kwaxsistalla, Adam Dick. Hidden at Deep Harbour in the Broughton Archipelago, B.C. – a place encircled by naturally formed clam gardens – receiving years of specialized training in chiefly knowledge, resource traditions and values. Kwakwaka'wakw ecological knowledge was often transmitted through children, songs serving as a key mechanism. Trained in this way, Chief Kwaxsistalla first revealed the location and meaning of this special place by sharing the luxw'xi'wey song. With such knowledge, Chief Kwaxsistalla launched a rediscovery of the clam gardens – showing how the power of song, even throughout precarious times, sustains such sacred knowledge.

Reid, Robin S., Casey L. Brown, Krista M. Heeringa, Orville Huntington, Brooke Woods, F. Stuart Chapin III, Richard E. Hum, Todd J. Brinkman, and Interior Alaska Workshop Contributors. **Reinventing the Traditional Model of Science: Community-Driven Research on Traditional Harvest Practices of Rural Indigenous Communities in Interior Alaska** (Session III)

Much of science, including some of ethnobiology, is driven by the intellectual curiosity of scientists than by community needs and learning goals. In many Indigenous communities, this is compounded by the history of colonization, which included imposition of a top-down, western paradigm of science. Here, our goal was to reinvent this scientific paradigm by developing community-university partnerships that supported six Alaskan Native communities to work with Indigenous and non-Indigenous students on the research identified by communities. Communities chose to work on the effects of climate change on the availability of berries and on moose habitat and hunting success, traditional place name mapping, food security and sovereignty, and local and non-local hunting competition. Here, we describe how communities defined sustainable harvest practices, their

findings and how they intend to use their results. We then describe the challenges of community-university partnerships and how to improve them in the future.

Rempel, Zachary and Iain Davidson-Hunt. **Birds in Anishinaabe Texts Through Cosmology, Story, and Art** (Session XVII)

The purpose of this paper is to explore the traditional relationship between the Anishinaabe and birds as expressed in a selection of texts. This relationship reflects a holistic Anishinaabe ontology in which aspects of cosmology, symbolism and land-based practices are intertwined. Various local bird species are traditionally understood to embody distinct spiritual characteristics, roles, and behaviours and communicate with the Anishinaabe in both physical and spiritual manifestations. Thunderbirds, who are responsible for thunderstorms, are central figures of Anishinaabe cosmology and epitomize the profound connection between birds and cosmology. Anishinaabe stories and artwork provide a window into the traditional worldview and also illustrate the role of birds in the Anishinaabe texts. Additionally, an examination of Anishinaabe language texts supplements our understanding of how birds are viewed and listened to through language.

Reyes-García, Victoria, Bronwen Powell, Isabel Díaz-Reviriego, Álvaro Fernández-Llamazares, Sandrine Gallois, and Maximilien Guez. **Dietary Transitions Among Three Contemporary Hunter-Gatherers Across the Tropics** (Session VIII)

The diets of contemporary hunter-gatherers are diverse and nutritious, but rapidly changing. To explore pathways through which food availability and accessibility might alter contemporary hunter-gatherers' diets, we analyse the diets and sources of foods of three groups: the Baka, Cameroon (n=160), the Tsimane', Bolivia (n=124) and the Punan Tubu, Indonesia (n=109). People living in isolated villages have more diverse diets than those living in villages closer to markets and availability of nutritionally important foods (i.e., fruits, vegetables and animal foods) decreases with increasing market integration, while fats and sweets availability increases. Differences relate to changes in the food environment (e.g., seasonality and village access to wild and/or market foods), rather than to individual characteristics (e.g., time allocation or income), probably because food sharing smooths individual differences in food consumption. We conclude discussing the sociocultural importance of traditional food systems for healthy biocultural landscapes and the ethnobiological implications of food transitions.

Ritchie, Morgan. **Sts'ailes-Coast Salish Led Conservation Efforts of Culturally Important Plants and Places on Contested Crown Land** (Session XIX)

For over 1,500 years the ancestors of the Sts'ailes people lived in villages along the shores of the Harrison River and Harrison Lake in southwestern British Columbia, both supported by, and creating, one of the most productive ecological regions in North America. Today, this long-term interactive and beneficial relationship between people and plants is challenging to discern, requiring a trained eye and investigation to detect subtle traces of intentional transplanting, cultivation, and ecosystem management. Although the Sts'ailes community now lives on a reserve that is only 0.6% of their territory, persistent efforts are made to use and regain access to culturally important but highly vulnerable plants and places. For the Sts'ailes, this involves a multi-year process of formally defining large tracts of land that contain vestiges of their ancestors land use legacies, including important plant communities and archaeological sites, in order to conserve and use them productively again.

Robert, Jeyachandran and S.R. Senthilkumar. **Antimicrobial Validation and Phytochemical Analysis of *Cyclea peltata* Hook.F. & Thoms.** (Session XXIII)

The plant *Cyclea peltata* has great medicinal value and is used for medicinal purpose, both, internally as well as externally. External application of the paste of its roots and leaves is extremely beneficial, in infected wounds, sinuses and skin diseases. A study concerning antimicrobial activity and phytochemical analysis was carried out. The results revealed the following important findings: Solvent extracts of *Cyclea peltata* showed prominent inhibition zones against *Klebsiella pneumonia* and *Staphylococcus aureus* as compared to all other bacterial cultures. Different solvents with leaf extracts of *Cyclea peltata* exhibited remarkable antifungal activity in all the organisms tested. Phytochemical characterization revealed the presence of amides, alkyl halides, aliphatic amines



and alkanes. Based on the present investigation, *Cyclea peltata* seems to be a potential herbal medicine for future commercial exploitation.

Rodríguez, Mariana and Iain Davidson-Hunt. **Biocultural Design as a Tool to Identify Livelihood Opportunities** (Session XXI)\*

Cocoa agroforestry systems (CAFS) are a type of managed ecosystem for which cultural, economic, and ecological importance is significant. In the Talamanca region of Costa Rica, conservation and development programs have recognized the importance of CAFS, leading to the implementation of projects focused on improving cocoa yields. Despite these efforts, CAFS have spatially declined in recent years. We present our work with Bribri community members to undertake a biocultural design project. Biocultural design is a process that begins with understanding the capabilities of biocultural heritage, in this case, associated with CAFS, as well as people's needs, values, and aspirations. We present the results of the process through three phases: inspiration (identification of problem or opportunity), ideation (generation of ideas), and implementation (execution of prototypes). Biocultural design provides an approach that allows creativity to emerge out of the capabilities found within biocultural heritage to support new livelihood opportunities.

Roskrue, Nick. **The Role of Traditional Knowledge for Food Systems in Cyclone Affected Polynesia** (Session XIII)  
Traditional knowledge is an imperative within Polynesian society and is applied in very specific actions or locations aligned to food systems and other activities. Polynesian society has developed a broad knowledge base which has been sufficiently adaptable throughout, and since, colonization to ensure their continued sustenance and survival. The most recent threat to this knowledge base is the consequence of climate change including more intense cyclone events, salinization of soils, flooding events and changing plant behaviour. The challenge of climate change affects even the remotest corners of Polynesia; as an example Tropical Cyclone Winstone devastated parts of Fiji in 2016 including Koro Island 137 kilometres from the main Island and capital Suva. The use of traditional knowledge to rebuild communities through cropping for income generation is occurring with an emphasis on adapting crop and food systems to contemporary environmental limitations.

Salywon, Andrew and Wendy Hodgson. **Unravelling the Origins of Pre-Columbian Agave Domestication in Present Day Arizona** (Session XX)

Botanical exploration over the last thirty years in Arizona has revealed at least six putative domesticated agaves still surviving in their archaeological context. Because of the importance of corn, beans and squash to the pre-Columbian peoples of this region it might be assumed that the agaves are also of Mesoamerican origin. In order to identify the ancestors of these domesticated agaves we have undertaken traditional Sanger, and Next-Gen, sequencing to infer the evolutionary relationships. Our phylogenetic data show that the domesticates are resolved in four distinct clades and only one, *Agave murpheyi*, has a sister relationship with Mesoamerican taxa; the other are in clades with local wild species or in the case of *A. delamateri* still unresolved. Expanded sampling of wild species and collaboration with archaeologist to determine when and where these domesticated taxa originated is needed for a better understanding of this new secondary center of plant domestication.

Sam-Stanley, Christina. **Kitsumkalum First Nation: A Tribe of the Tsimshian Nation** (Session XIX)

Kitsumkalum-Gits'mk'eelm (People of the Plateau) is a Tsimshian village of about 700 members located 6km west of Terrace BC at the confluence of the Skeena and Kalum River. It is a matrilineal exogamous chieftainship society that has been greatly affected by Colonial intervention. Potlatch practice, culture, traditions, and harvest of resources were interrupted. Efforts to revitalize practices have been ongoing since the early 1980s. This presentation will review how our community has enhanced our traditions, through our Waap (house) groups, and our collective research efforts. As Waap Historian of Łagaax, I reflect on how we are asserting our relationship to our land and resources through revitalization.

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\* Barbara Lawrence Award submission

Sato, Yasuaki. **Changing Dietary Habits of Children in Central Uganda: Whereabouts of Traditional Food Knowledge in Modernization** (Session XVIII)

In Central Uganda, people make their livelihoods by intensively using bananas as a principal starchy food, alongside a wide variety of other crops. In recent years, their rich food culture has been at risk from the influence of a cash economy and reduction in banana production. It is essential to understand how parental generations can hand their food knowledge (health, techniques, manners, and thoughts) down to their children. This study describes the current state of children's dietary habits. Focusing on senior pupils at a primary school, diet surveys were conducted, students' lunch boxes were recorded and their drawings of home dining scenes were collected. These revealed that primary school education is separated from home in terms of diet. We need to develop ways to incorporate traditional knowledge into the food education of schools.

Sault, Nicole. **Bird Voices from Latin America: Stories of Trust, Warning, and Wisdom** (Session XVII)

The sounds of birds include songs and calls, but there are other ways that birds are heard. Many cultures recognize birds as social actors with voices expressing intentions, desires, and responsibilities. Avian voices are interpreted according to cultural context, kinship affiliation, and personal experience such as dreams. When birds are understood as an integral part of creation, there are consequences for failing to heed both their voices and their silences. Examples from Mexico, Costa Rica, and Peru illustrate how birds are heeded as messengers, harbingers, advisors, and teachers.

Saurini, Anton. **Fungal Network Genesis at Ferris State University: Mycology Club Evolution and Research** (Session XXIII)

In the absence of any established Mycology curriculum, a handful of students gathered to generate a platform in the pursuit of mycological exploration. Budding mycologists founded the club on the ideas of philanthropy, lab cultivation, and wild foraging. Under the supervision of Dr. Scott Herron, Ferris State's mycelial network flourished as members began working with liquid cultures of mycelium to inoculate sterilized grain bags. After 100% colonization, these bags were then expanded to a species dependent substrate, like straw, for fruiting. An automated fruiting chamber was erected to maintain ideal light, temperature, humidity, and oxygen/carbon dioxide levels. Coinciding with indoor cultivation, knowledgeable mycologists from the community have facilitated foraging forays identifying numerous wild gourmet mushrooms along with a slew of medicinal and toxic fungi. Currently, club members are researching the inconsistencies between medicinal compounds of lab cultivated and wild forged Reishi mushrooms.

Schaepe, Dave, Natasha Lyons, John Welch, and Stewardship Alliance S'ólh Téméxw. **Advancing Stó:lō Stewardship and Sovereignty in the Fraser Valley of British Columbia** (Session XIX)

The creation of sustainable societies and economies rests on both reconciling and re-conceiving the terms of engagement between colonial and First Nation states. In British Columbia, as in other settler contexts, the land and resource base are a principal nexus for reconciliation dialogue. In this paper, we describe a *Collaborative Resource Stewardship Framework* co-designed by the S'ólh Téméxw Stewardship Alliance (STSA), a collective of 16 First Nations of Stó:lō located in southwestern British Columbia, and the provincial government of British Columbia. This framework is part of the broader Stó:lō Strategic Engagement Agreement—a form of Reconciliation Agreement—that sets out parameters for government to government collaborative resource management in Stó:lō territory. The agreement looks to bridge the gap between the current status of land-use and resource management in S'ólh Téméxw (Stó:lō territory) and the desired futures for these lands, as well as working to reconcile Stó:lō and Xwelítem (settler) worldviews.

Sehgal, Anju Batta. **Cultural Diversities and Unheard Voices of Himalayan Tribes—Exploring Kinnaur Distt. of Himachal Pradesh** (Session VII)

Apart from its rich biodiversity, mountain regions also exhibit diversity of cultures resulting from the niche-specificity of steep mountainous topographies, their relative isolation, and necessity to maximize production while minimizing risk and conserving resources. The isolation bred by high mountain ranges has helped nurture

multiplicity of tribes in the Himalayan region. Frequent waves of migration and the melding of ethnic groups have resulted in lifestyles that are at once very different and yet similar. Each tribe also has its own arts and crafts and certain invaluable traditional knowledge systems. This talk presents information on some of major Himalayan tribes and their distinctive characteristics. I explore the convergence of mountain cultural diversity with issues of sustainable and equitable development in highland areas, shedding light on the diversity of dialects and languages, the unheard stories, and the innumerable ways in which the local culture can help to implement sustainable development programmes.

Sekulic, Annalee, Sarah Ivory, and Joy McCorriston. **Hydraxes in Human Landscapes of the Arabian Desert** (Session XXIII)\*

By observing temporal changes in vegetation, we can better understand how vegetation is altered by natural and anthropogenic processes. As climates change, environmental resources for subsistence are altered. Human responses may include social changes which feedback into desert vegetation. This study tests the hypothesis that there have been vegetation changes within the Dhofar over the past 1500 years BP. From 19 middens samples, I extracted identifiable macrofossils. I use incident light microscopy and digital camera to compare specimens with modern reference. By identifying the fragmented macro-botanical plants, I will assess the past vegetation. My preliminary analysis of 5 of the 19 middens samples suggests that the plant vegetation has diversified. My results suggest that there is no large structural change but change within the composition of taxa. These comparisons between proxy records suggest that the vegetation developed for stable arid climates.

Sherpa, Pasang. **Storying Climate Change for the Future** (Session XIII)

This presentation revisits Maggio's (2014:103) question: "How can anthropologists use storytelling as a new way of engaging wider audiences?" Following Crate's (2018) call for "Storying Climate Change," it explores how entering into personal and collective experiences with climate change can unravel local and regional web of change for an informed engagement with the processes of adaptation and transformation. Thus, this presentation shares a personal story about the first two decades of the twenty-first century when climate change came to our village in the Mount Everest region in Nepal, crafted for the daughter of my daughter, yet to be born. It shows how this process of looking back at the present time from an imagined future, 30 years from now, opens up new ways of viewing and valuing the environment. It illustrates how storytelling as a method allows creative weaving of environmental intimacies with lessons of social justice and optimistic feminism.

Silvano, Renato. **A 'Window to the Past': Quantitative Analyses of Fishers' Knowledge to Evaluate Temporal Changes on Fishing Resources in Tropical Freshwater and Coastal Ecosystems** (Session XXI)

The lack of long-term series of fisheries data makes it difficult to evaluate influences of environmental changes or management measures on tropical small-scale fisheries. This study compares applications of fishers' local ecological knowledge to reconstruct temporal variation on abundance, composition and size of fishing resources in Brazilian coastal and freshwater ecosystems, through three approaches. First, by asking fishers about their perceptions about changes along a given period of time, which could be some important event in the past (building of a dam), a remarkable period in fishers' life or a set time frame. Second, by asking the same question to fishers of distinct ages and then checking for differences on answers between younger and older fishers. Third, to interview fishers in distinct periods of time and ask the same or similar questions about fish catches. These approaches have provided invaluable indicators of change on poorly known tropical fisheries.

Smith, Erin, Selena Ahmed, Carmen Byker Shanks, and Virgil Dupuis. **Contribution of Wild Foods to Diets, Food Security, and Cultural Identity on the Flathead Reservation of the Confederated Salish and Kootenai Tribes in the Context of Environmental Change** (Session XXIII)

Wild foods contribute to resilient food systems through the availability of local, diverse, and non-market food sources to support food security. This study investigates the role of wild foods for contributing to food security

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\* Barbara Lawrence Award submission

and cultural identity within the context of environmental change on the Flathead Indian Reservation in Northwestern Montana. Structured interview responses were analyzed for frequency and, open-ended responses were coded to identify prevalent themes. Findings indicate that half of the respondents were food insecure and those who engaged in one or more wild food procurement activity experienced lower levels of food insecurity than those who did not procure wild foods. Findings highlight the multidimensional valuation of wild foods for taste, freshness, nutritional quality, as well as being a traditional practice that provides a sense of self-sufficiency. Results further indicate that environmental change is impacting wild foods with increased variability in seasonality and precipitation, increased fires, and overharvesting.

Smith, Tonya, Kwikws Eliza Peters, and Koskas Dan. **Ntákmen at Nleḗcálten** (Session IV)\*

Ntákmen, in Ucwalmícwts (the language of the Lílwat First Nation) means 'Our Way'. Nleḗcálten means garden. Nleḗcálten is a sharing space to restore Indigenous community food security using approaches based in respect and relationship. Centered in the spirit of profound care, Nleḗcálten is a living laboratory for Indigenous resurgence and allyship. Our work has documented over 100 species of plants used as Lílwat foods and medicines, to be featured in an upcoming cookbook. At Nleḗcálten, traditional Lílwat medicinal and food plants are being cultivated to revitalize their role in community health. Through increasing the accessibility of these foods, the pressure on commercial harvesting may be decreased, allowing non-human animals the space they need to thrive. We share findings of our work that relate to Lílwat ways of being and knowing, climate change mitigation and adaptation, cross-cultural and intergenerational learning, Indigenous language revitalization and land stewardship.

Song, Yingjie. **Network Analysis of Tartary buckwheat (*Fagopyrum tataricum*) Seed Flow in Liangshan, China: A Traditional Method for On-farm Crop Conservation** (Session VII)\*

In Liangshan Prefecture of Sichuan, Southwest China, the Yi ethnic group have cultivated Tartary buckwheat (*Fagopyrum tataricum*) (TB) for a thousand years. They have maintained a traditional seed management system. To understand the practices of on-farm conservation and TB seed circulation, we conducted an informal case study of a seed system in Liangshan. Field work and society network analytical tools were used to analyze seed sources, and to draw a network map. Farm-saved, exchanging with neighbors and relatives and purchasing from market were the main means to save and exchange in all villages of the villages in this study. The flow of seed within villages was dominant. Wedding dowry was an important pathway for seed flow among all villages. Among 13 TB landraces, 4 landraces were exchanged frequently. These findings highlight that nodal households play an important role in the conservation and on-farm management of TB landraces.

Spalding, Pamela. **Sovereignty is Mostly About the Food: Mapping Vancouver Island, British Columbia (BC) Straits Salish Traditional Food Systems for a Post-colonial Future** (Session IV)

Plant communities and habitats reflect Indigenous interests in traditional food systems. T'Sou-ke First Nation in southern BC are working to reclaim their food sovereignty and self-determination by re-examining their long history with plants. Plant abundance, proximity to village sites, and species presence in unlikely ecosystems, relay significant information about past anthropogenic landscapes. Plant communities become a strong voice through which to amplify Indigenous rights and responsibilities to plants and lands today. I will discuss two methods that I am developing to highlight past and present Indigenous plant interests. The first is to establish a baseline ethnobotany and historical sketch map that reveals the different patterns of use between Straits Salish people and plant communities at the time of contact. From this historic ethnobotany, I then show how a terrestrial ecosystem mapping system can be used to amplify Indigenous food sovereignty interests within BC's environmental assessment processes and in shared decision-making.

Stein, Juliet. **An Ethnobotanical Study of Ayahuasca and Entheogenic Tourism** (Session XIV)

Ayahuasca, a psychoactive decoction brewed from two plants of the northwest Amazon, *Psychotria viridis* (Ruiz

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\* Barbara Lawrence Award submission

&Paz) and *Banisteriopsis caapi* (Spruce ex Griseb. C. V. Morton), has traditionally been ingested by indigenous South Americans as a religious sacrament, for divination, and spiritual as well as physical healing. Western interest in ayahuasca has grown in recent years as word of its potential medicinal and psychological benefits has spread, spawning "ayahuasca tourism" as non-native Americans travel to retreats located in previously remote parts of the Amazon. In this paper, I will explore the plant medicine pilgrimages undertaken by ayahuasca tourists who believe enlightenment and happiness can be found through participation in ceremonies and the accompanying experiences of faux-poverty and denial of technological comforts. I argue that the act of pilgrimage aids in the anticipation of enlightenment, which in turn informs the phenomenology, perceived efficacy, and long-term curation of the psychedelic experience.

Stepp, John Richard. **Highland Maya Medicinal Plants and Climate Change** (Session XIII)

The Highland Maya of Chiapas, Mexico have widespread generalized knowledge of medicinal plants. Highland Maya self-administer treatments and rely on clinics and/or specialized healers on rare occasions for very serious conditions. This paper explores the potential impact of climate change on medicinal plant knowledge and procurement strategies. Much of the medicinal flora has a wide range across successional stages and altitudinal gradients. Distribution of medicinal plants falls off sharply in forested areas. Different communities in the region tend to favor particular ecological zones at particular altitudes for harvesting medicinal plants. Based on predictive climate models for the region, distribution for some medicinal plants will likely shift. While this will change availability for certain species, there is some redundancy in the ethnoflora and preferred species may be substituted. Implications for general conservation, medicinal plant conservation, and the relationship between health and the biophysical environment in Chiapas, Mexico are discussed.

Sterling, Eleanor and Joe McCarter. **Using Biocultural Approaches for Indicator Development in Solomon Islands** (Session XXI)

Biocultural approaches are increasingly important in global resource management. In this talk, we present a case study from Solomon Islands, where we have used a biocultural approach to assess and support place-based resource management goals. Biocultural approaches are highly relevant in Solomon Islands, where resource management is characterized by diversity, customary tenure, and the central role of local and indigenous rights holders. We worked at four sites in Western Province, and began by exploring local needs and priorities using arts-based approaches. We then collaboratively developed localized indicators of success, assessed indicator baselines, and catalysed management actions, including development of ethnobotanical resources. While there have been several challenges, this approach has fostered discussion and a nuanced understanding of well-being at the sites, and has potential to feed into national policy development. We conclude by outlining how the lessons learned in our work can support the translation of values across scales.

Storm, Linda. **Chehalis and Cowlitz Oral History, Origins of Camas Prairie Places, and Indigenous Resource Management** (Session V)

Upper Chehalis and Cowlitz Oral traditions describe a time when yawa'ltəmx• (earthquake woman) dug camas at Lequato prairie. While cooking camas, she was struck in the stomach by a hot rock and gave birth to Moon, the transformer. When he grew up, he made the world the way it is today by naming all the prairie places and placing the plants that grow upon them. Coast Salish origin stories describe not only how camas prairies were formed, but the role of fire to maintain them. Oral history of great floods, battles with giant animals, and illusions to a tsunami shed light on the past in ways western science is just beginning to understand. Recovery of camas places to indigenous access and management re-weaves the bonds between people and places, connecting the past with the future, and integrating resource management to secure indigenous food sovereignty.

Sunderland, Terence. **The Right to Food? Protected Areas, Access and Food Security** (Session VIII)

Recent research has highlighted the relative contributions of forests and tree-based systems to both dietary diversity and nutrition. Wild foods provide a significant nutritional contribution to the diets of rural dwellers, the majority of whom would be classified as some of the world's poorest. In addition, it is known that agricultural

systems in proximity of natural forest formations can often have greater productivity in terms of both yield and resilience to environmental shocks. Yet, despite the important human-forest interactions and relative degrees of dependency, increasingly, access to much of the global forest estate is regulated under the guise of biodiversity conservation. How this restricted access plays out when the “right to food” is a deeply enshrined human right has been deeply contested. This paper will outline the critical issues related to the right to food and the growing call for the annexation of land for conservation.

Sykes, Harvey, Debra Hopkins, and Tara Joly. **Where are the Freshwater Mussels? Reflections on Learning Together using a Community-based Action Research Approach to Braid Indigenous Knowledge and Western Knowledge Systems** (Session VIII)

In recent decades, Fort McMurray Métis Elders observed a decrease in the population density of freshwater mussels (known locally as clams) in the lower Athabasca region (LAR). In this paper we discuss the methodological approach of the clam research project that seeks to address questions about freshwater clam health in a locally relevant and culturally appropriate way. We use community-based participatory research to facilitate partnerships and create safe ethical spaces for Indigenous and western knowledge holders. This study demonstrates the importance of prioritizing Indigenous Knowledge to answer questions that may not have been considered by western knowledge systems, and shows how these ways of knowing can be braided to create new learnings together. We maintain that by learning together we can understand complex problems in ways that are more meaningful and insightful than they would be if Indigenous communities, government scientists, or research consultants studied them alone.

Tait Neufeld, Hannah. **Wisahkotewinowak Gardens: Indigenous Land-based Learning in Southwestern Ontario** (Session VIII)

The relationship Indigenous peoples have with their unique local ecology encourages practices that perpetuate healthy communities. Populations are becoming more urban and younger. There is a need to do food systems research in community that addresses the needs of these sectors across the life course. Groups living in more populated regions of Canada have not previously been investigated as extensively, although lower incomes, high unemployment and loss of traditional food environments have been similarly found to contribute to food insecurity. Momentum is building and communities are engaged in addressing urban economic challenges, and decreased opportunities for social interactions around food. In collaboration with faculty, students and a growing urban network, gardens are being expanded to strengthen land-based relationships. Using food as a starting point for action, a community-based research program is underway to promote conversations and opportunities across geographic and social spaces to forge relationships focused on traditional foodways.

Teixidor-Toneu, Irene, Fiona Jordan, and Julie Hawkins. **Comparative Phylogenetic Methods and the Cultural Evolution of Medicinal Plant Use** (Session XXIII)

Human life depends on plant biodiversity, and the ways in which plants are used are culturally determined. In the context of an increasingly theory-driven field of ethnobotany and the availability of larger datasets, frameworks for macro-analyses are currently being discussed. Here we describe how PCMs in particular, and cultural evolutionary theory in general, provide a framework to study the diversity of plant applications cross-culturally, and to infer changes in plant use through time. Anthropologists have used phylogenetic comparative methods (PCMs) to gain increasingly sophisticated understanding of the evolution of political, religious, social and material culture, but to date plant use has been almost entirely neglected. These methods account for the non-independence of data when testing for ecological or cultural drivers of plant use. With cultural, biological and linguistic diversity under threat, gaining a deeper and broader understanding of the variation of plant use through time and space is pressing.

Testani, Alessandria. **Zooarchaeology of Predatory Mammals at Tse’K’wa** (Session XXIII)

The site of Tse’K’wa holds a well-preserved archaeological record of 12,000 years of human relationships with the land. Located near Fort St. John in Northeastern British Columbia, Tse’K’wa is on the territory of the Dunne-zaa

people. We have conducted morphological and ZooMS analyses of archaeological fauna from Tse'K'wa dating from 9,000 years ago to 1950 CE. The remains of predatory mammals have been found during this study, including those of bear (*Ursus sp.*, Dunne-zaa: *sas*), red fox (*Vulpes vulpes*), wolf (*Canis lupus*, Dunne-zaa: *ch'one'*), lynx (*Lynx canadensis*, Dunne-zaa: *nódaa*), wolverine (*Gulo gulo*), fisher (*Martes pennanti*), and marten (*Martes americana*, Dunne-zaa: *ēbaa*). By studying the faunal remains at Tse'K'wa, this study examines the long-term hunting and fishing practices of the ancestral Dene people, as well as the ecology of the Peace River Valley.

Thiel, Amanda and Armando Medinaceli. **Ethnopharmacology of Mal Ojo: Plant and Animal Remedies** (Session XIV)

Mal ojo is the idea that harm can be inflicted on someone by the gaze of another. According to Maya Q'eqchi' villagers, mal ojo is passed from pregnant or menstruating women to children, babies, and sometimes domestic animals. Some treatments are shared with other areas in Latin America (i.e., rue), but others appear unique (i.e., cacao, collared peccari). We describe treatments and corresponding pharmacological data when available, and reflect on the social factors potentially affecting the presence and expression of mal ojo. Ultimately, we see mal ojo as an illness concept likely to persist as a component of the Maya Q'eqchi' traditional knowledge, partly due to its lack of corresponding biomedical classification and treatment, and also because of the high prevalence of social inequality in this area. We see the preservation of ethnopharmacological knowledge related to mal ojo as an important step in local cultural revitalization and continuity.

Thompson, Kim-Ly, Nikkita Reece, Nicole Robinson, Havana-Jae Fisher, Natalie Ban, and Chris Picard. **"We Monitor by Living Here": Social-ecological Monitoring Methods Grounded in Gitga'at Knowledge** (Session III)

This research grew from the Gitga'at First Nation's Oceans and Lands Department desire to formally include the knowledge and observations of their land and sea users as part of contemporary stewardship initiatives. We used a participatory case study approach to design data collection methods that would meet Gitga'at objectives of monitoring to inform stewardship and climate change adaptation, intergenerational knowledge transfer, health and wellness programming, and support Gitga'at Rights and Title. We iteratively tested these methods over the course of two traditional food harvest seasons. Key outcomes are a harvest logbook and interview guide that continue to be administered by community researchers. An interconnected set of social-ecological concepts and indicators also emerged, highlighting the importance of maintaining and revitalizing Indigenous knowledge and harvesting practices in order to continue social-ecological monitoring, and encouraging scientific monitoring approaches to situate themselves within Indigenous frameworks and priorities.

Thornton, Thomas F., Mary Rudolph, William Geiger, and Amy Starbard. **A Song Remembered in Place: Tlingit Composer Mary Sheakley (Lxook) and Huna Tlingits in Glacier Bay National Park, Alaska** (Session XVI)

Tlingits of Alaska are known for oratory and singing, which are often combined to achieve important social ends. Matrilineal "clan songs" are deployed at memorial potlatches and other ceremonial occasions, the audience for which includes guests of the opposite moiety and even ancestral and other-than-human spirits, who balance them with reciprocations. In contrast to these heavy songs are "happy songs," which help transition from the mourning part of the memorial potlatch to the celebratory succession stage. These songs may also convey important events on the land. Mary Sheakley's song, featured here, is among this corpus for the Chookaneidí clan of Glacier Bay. It was remembered and sung by a descendant of the singer, Amy Marvin, near the place it was composed a century prior. This paper analyzes the ethnobiological and broader cultural context for Amy Marvin's recalling, orating, and singing Mary Sheakley's song on a 1996 berry picking trip to Glacier Bay National Park.

Toniello, Ginevra and Maya Guttmann. **"When the Tide Goes Out, the Table is Set" – Tsleil-Waututh Relationships with Clams** (Session IV)

Clams have been an important aspect of Tsleil-Waututh Nation (TWN) culture since time out of mind. The abundance of clam shells and clam processing features in archaeological sites attests to the importance of clams to Tsleil-Waututh people over the past 2,500+ years. In recent years, TWN have maintained a close relationship with clams despite colonial prohibitions and industrial development that resulted in polluted waters, shellfish

harvesting closures, decreased clam productivity, and limited access to clam resources. The recollection of the abundance of healthy clam resources remains strong within the living memory of TWN today, with stories of clam harvesting being passed down through generations, and few elders participating in clam harvests as children. Through ongoing TWN marine stewardship initiatives, sustainable TWN clam management persists today and has resulted in two recent clam harvests despite a 47-year contamination closure in Burrard Inlet.

Tora, Mesulame. **The Role of Indigenous Knowledge in Mitigating Fungal Threats to Local Ecosystems** (Session VII)

Within Aotearoa/New Zealand biosecurity risk and threats are becoming common and the role of indigenous (Maori) knowledge in mitigating these threats needs support. The recent Myrtle Rust (*Austropuccinia psidii*) incursion presents an enormous risk to the biodiversity of culturally important plants and native Myrtaceae species and Myrtaceae dominated ecosystems. The relationship between ethnobiology and traditional knowledge (TK) is critical in the area of indigenous biosecurity across Polynesia. Indigenous knowledge in the South Pacific exists within a holistic environment that conceptualizes two worldviews and, in the New Zealand context, emphasizes the importance of *matauranga* (Maori knowledge retained orally and through cultural practices), *tikanga* (customs, traditions and protocols), *whakapapa* (species assemblages within a paradigm relative to human beings) and the practice of *kaitiaki* (the act of guardianship and protector of flora and fauna) to ethnobiology and the development of indigenous biosecurity measures to protect culturally important plant species.

Toro, Fabian H., Tang Jigen, Patrick McGovern, and George Preti. **Shang Dynasty Medicinal Food: Organic Residue Analysis of Sealed Fangyi Vessels from Anyang** (Session XII)

Traditional Chinese Herbal preparations include a diverse spectrum of food items that were widely consumed during the Shang Dynasty. Few scientific studies have examined organic residues in ritual bronzes from this period, many of which are generically interpreted as “wine vessels” despite their diversity. Our study uses a suite of chromatographic techniques to examine the contents of two sealed fangyi type vessels from the burials at the site of Yinxu in Anyang (~1200BCE). The resulting biomarker profile was compared with phytochemical databases as well as Traditional Chinese materia medica. Our results did not conclusively identify the presence of a fermented beverage; however, we identified a high proportion of ursolic and oleanolic acids suggesting the contents had hepatoprotective properties. These properties are alluded to in older Chinese material medica, as well as contemporary TCM practices and pharmacological literature. We contend that the analyzed vessels had a dual dietary and medicinal role.

Tran, Tanya. **‘Borders Don’t Protect Areas, People Do’: A Collaborative Case Study in Developing New Indigenous-led Protected and Conserved Areas in the Great Bear Rainforest** (Session XIX)

Indigenous-led Protected and Conserved Areas (IPCAs) have gained global attention in recent years due to renewed interest in improving and creating protected areas during a time of Indigenous resurgence. Academic and institutional publications have demonstrated potential social and ecological benefits of IPCAs; however, it is important that their creation, maintenance, recognition, and support follows the vision set forth by Indigenous Peoples. There are few published studies that focus on Indigenous perspectives in the development of IPCA initiatives. Our preliminary findings from a collaborative case study with the Kitasoo/Xai’xais First Nations illustrate the development of a new kind of land-and-sea IPCA that highlights the perspective of an Indigenous stewardship organization, in what is currently known as the Great Bear Rainforest in British Columbia, Canada. This case study offers a model and insight for other Indigenous Peoples interested in pursuing their own IPCA initiatives and to external actors wish to support them.

Turner, Nancy. **Discussant** (Session XIX)



Turner, Nancy. **Threads Frayed but Not Broken: Loss and Continuity in Indigenous Peoples' Food Systems in Western Canada – The Role of Government Laws and Policies** (Session VIII)

Western Canadian Indigenous Peoples' diets, originally healthy, have changed dramatically since European settlement. The newcomers saw their foods as superior and set about to convert First Peoples' diets and food production systems to align with their own. Their agricultural imperative is evident in many aspects of government laws and policies, from residential schools to the potlatch ban, to incentives for farming or ranching. The result was a drastic decline in harvesting and using traditional foods, with concomitant adoption of new foods, ultimately resulting in declines in health and well-being of many Indigenous People. The disregard for Indigenous food systems in legal structures continues today. We examine this trend in laws and policies and the inevitable results, but we also highlight the resilience of First Peoples in maintaining and reclaiming their original foods and restoring not only some of these foods but also the cultural knowledge and practices that accompany them.

van 't Hooft, Anuschka, Claudia Heindorf, Juan Antonio Reyes-Agüero, and Javier Fortanelli-Martínez. **Teenek Folk Taxonomy. The Categorizing of Corn, Squash, Bean, and Chayote** (Session XII)

The Teenek are an indigenous people living in the subtropical Huasteca area in Mexico. The Teenek name, characterize and distinguish crops and their variants based on color, texture, shape, and stages and ways of growth. In this presentation we demonstrate this classification system with four crops: corn, squash, bean and chayote. Information was gathered through observations in three different agricultural systems in three localities (ranging in altitude from 60m to 1200m) and ten markets, as well as interviews with local farmers and merchants. Additionally, we organized participatory workshops and group discussions with local experts aimed to discuss our findings. Our work shows that (i) similar to other traditional classifications, Teenek assign a generic, specific and varietal name to plants, yet (ii) some plants receive more attributes than others; also, (iii) there is a high degree of taxonomic overlap between communities, though discrepancies exist at this level and among individual persons.

Villasana, Isabell. **The Origins of “Weeds” at Harappa 3300 B.C- 1700 B.C** (Session XXIII)

Large numbers of charred wild seeds have been unearthed alongside domesticated crops at Harappa, a major Indus civilization site occupied from 3300 B.C-1700 B.C (Kenoyer and Meadow 2016). Previous studies carried out on Indus civilization plant remains have interpreted such wild seeds as agricultural weeds that entered the archeological assemblage via crop processing (Fuller and Stevens 2009; Bates, Singh, & Petrie 2016). However, it is also possible that these weeds entered the archaeobotanical assemblage via dung burning (James 2018). By comparing the flowering periods of weeds and key grain crops it may be possible to ascertain if these weeds entered the assemblage at the same time as grains that were harvested (Bogaard et al. 2001). This study presents the comparisons of weed flowering time to key grain crop flowering time. Determining the formation processes responsible for the deposition of these wild seeds will dictate future archaeobotanical studies at Harappa.

Wade, Kali R., Emily Brown, Melissa S. Cradic, and John M. Marston. **Plant Use and Elite Burial Customs at Middle Bronze Age Tel Megiddo, Israel** (Session XXIII)

While ethnography describes numerous examples of plants used in funerary rituals, the remains of plants have been rarely described in archaeological contexts absent exceptional preservation conditions, rendering this component of past human-plant interactions nearly invisible. Study of phytoliths, durable silica bodies produced by plants, overcomes some of this preservation bias. Here we present the results of integrated study of phytoliths and carbonized seeds recovered from a Middle Bronze Age (~1600-1550 B.C.E.) tomb at Tel Megiddo, northern Israel. The tomb stands out due to its excellent preservation and elaborate assemblage of high-status grave goods, including jewelry, ceramics, and animal and plant remains. Carbonized plant remains include nuts, olives, legumes, and cereals, evidently burned in the tomb during the funerary ritual. Phytolith results provide evidence of reeds and sedges, interpreted as baskets or mats. Together, these remains provide insight to how and why specific plants were chosen for this mortuary ritual.

Wagner, Gail. **If Dessert is a Sweet Dish, What is a Condiment?** (Session XII)

If desert is a sweet dish at the end of a meal, and if ingredient is an edible substance mixed with other edible

substances to make a food or food dish, what is a condiment? Based on 140 interviews of adults, condiment is more frequently defined by script (context) than by taxonomy (description) when the question is primed (as above) for a script-based definition. Sequential card sorts indicate overlap between the domains of condiment and sauce, and illustrate low utility of the category of condiment. Free-lists of most-used condiments and food pairings highlight differences in favorite condiments by age, as well as correlations between particular foods and the condiments paired with those foods.

Walshaw, Sarah. **Ethnobiology as Ethnohistory: Methods and Interdisciplinary Dialogue** (Session XV)

Ethnobiology, as an interdisciplinary study of human inter-relationships with the biological world, can contribute theoretical principles and methods to the study of History more broadly, and in particular to the subfields of Environmental History and Ethnohistory. Ethnobiological approaches allow greater access to Indigenous worldviews and logics of the natural world. Here I consider Islamic and European travel accounts of Swahili foodways in eastern Africa. Food was reported according to the cultural and biological knowledge of the exogenous writer. I propose that we can use a historical ecological framework to use anthropological and archaeological data alongside oral histories (where these exist) and documentary evidence to infer local plant knowledge and practice. Specifically I will consider botanical misidentifications, reports of feast foods by Muslim visitors, and the introduction of maize by the Portuguese. He who reported the plant gets to tell the story; so what voices and stories are we missing?

Ward, Grace. **Gathering and Tending in the Lower Mississippi Valley: Evidence for Persimmon (*Diospyros virginiana*) and Hickory (*Carya* spp.) Management during the Late Archaic** (Session X)

The Late Archaic stage (ca. 4200-3000 yrs B.P.) was a time of significant social innovation in the Lower Mississippi Valley (LMV) of the southeastern United States, characterized by the resurgence of the region's iconic monumental earthen architecture tradition, extensive networks of exchange, and cycles of mass aggregation. However, a paucity of paleoethnobotanical data from Late Archaic sites has limited our understanding of economic structure and people-plant relations during this critical period of southeastern Indigenous history. Recent paleoethnobotanical analysis of material from the Jaketown site in the Yazoo Basin of Mississippi suggests intensive, long-term interaction with key food-producing perennials: persimmon (*Diospyros virginiana*) and hickories (*Carya* spp.). As a possible case of management in the absence of domesticate-based agriculture, the Jaketown data invite us to discuss the Late Archaic LMV as an anthropogenic landscape.

Welch, James R. and Marco Aurelio Serenho Ihi Xavante. **Xavante Hunting Calls: A Vocal Repertoire for Ethnozoological Communication and Coordination in the Brazilian Cerrado** (Session XVI)

Group hunting is a productive subsistence activity for many Indigenous peoples with adequate access to territorial and game resources. Indigenous Xavante hunters in the Brazilian cerrado communicate over long distances with hunting calls that encode rich ethnozoological information. Based on recordings provided in 2006 by the late Xavante elder and leader Tsidowi Wai'adzatse', we explore the range and depth of information communicated by Xavante hunting calls. Our data address vocal expressions used to coordinate efforts involving the pursuit, sharing, and carrying of giant anteater (*Myrmecophaga tridactyla*), giant armadillo (*Priodontes maximus*), marsh deer (*Blastocerus dichotomus*), tapir (*Tapirus terrestris*), and white-lipped peccary (*Tayassu pecari*). These calls communicate deep and contextually variable cultural information about animal movements, hunting cooperation, meat sharing rights, and social responsibilities. This paper seeks to respond to concerns expressed to us by Tsidowi Wai'adzatse' that these calls be remembered.

Wolsak, Saskia. **Bermuda's Bibby Tree: the forgotten history of palm wine in Bermuda and the possibility of Bermuda palmettos as Culturally Modified Trees** (Session XV)

When enslaved people from Africa came to Bermuda in the 17th century, they brought their ethnobotanical traditions with them. Foremost among these was the practice of tapping palms for wine ('bibby'), adapted to the endemic palmetto. Palm wine is a culturally important beverage in many African cultures, and likely held similar value to early Bermudians. The primary record of palm wine in Bermuda is found in the lawbooks of the times.

These records lend insight into the adaptation and persecution of plant knowledge according to the shifting political times, highlighted by the direct correlation between the prohibition of palm tapping and the rise of Bermuda's slave society. This talk will explore the rise and fall of bibby in Bermuda. It will also posit the possibility that scars on some of the oldest palmettos mark them as Culturally Modified Trees, an idea not yet explored in any Bermudian nor Caribbean literature.

Wolverton, Steve and Robert Melchior Figueroa. **Integration of Environmental Justice and Historical Ecology** (Session XV)

Environmental justice scholars provide a framework for interdisciplinary research and advocacy in the realm of cultural heritage. Ethnobiologists are no strangers to the heritage arena as our scholarship commonly concerns "cultural keystone places," which are rich with meaning for one or more groups of people. Several core concepts of environmental justice scholarship can serve as guideposts to research centering on these significant places. On the side of the scholarship, and perhaps more important to disciplines now attempting to escape a colonial history, is how these framing environmental justice concepts align and intersect with core principles of historical ecology. This presentation is an initial attempt to highlight how environmental justice and historical ecology can be conceptually integrated, which holds important meaning for "action ethnobiology."

Woodmansee, Adele. **Native Maize Varieties and Ideas of Purity and Contamination in Local Crops in San Miguel del Valle, Oaxaca** (Session XXIII)

The state of Oaxaca, Mexico is the center for the origin and diversity of maize (*Zea mays*). This diversity has been threatened as free trade agreements and climate change limit the ability of many communities to continue their subsistence agricultural practices. My research seeks to understand how ideas of contamination and localness shape rural Oaxacans' perspectives on their seeds and efforts to conserve them despite the decreasing practice of subsistence agriculture. I conducted ethnographic research and collected maize samples from farmers in San Miguel del Valle, a Zapotec community in the Central Valleys of Oaxaca. By combining a genetic study to test for transgenic contamination in native maize varieties with ethnographic accounts of seed saving practices and perspectives on local crops and agricultural practices, this project aims to provide insight into how conceptions of crop locality and purity shape community members' agricultural practices and feelings about their seeds and food.

Wyllie de Echeverria, Victoria. **Using Local and Indigenous Ecological Knowledge to Examine Local-scale Perceptions, Effects of, and Adaptation to, Climate Change on Human/Landscape Interactions on the Pacific Coast of North America** (Session XIII)

In this study we investigate the perceptions and impacts of climate change on 11 Indigenous communities in Northern British Columbia and Southeast Alaska. Ninety-six Elders and resource users were interviewed about TEK and observations regarding weather, landscape, and resource changes. Our findings show that participants are aware of significant environmental changes over their lifetimes, and an acceleration in changes over the last 15-20 years, not only in weather patterns, but also in the behaviour, distributions, and availability of important plants and animals. In addition to general environmental knowledge, we also delineate specific knowledge on three functional groups, which we use to illustrate a new concept we term 'Cultural Keystone Indicator Species' (CKIS). These are species which are important ecological and cultural keystone and indicator species. In the conclusion, we suggest ways this specific knowledge can assist communities in responding to future environmental changes using a range of place-based adaptation modes.

Yunhui, Yang, Li Guanhua, and Long Chunlin. **Ethnobotany of a Cucumber Landrace in Yunnan, China** (Session XX)<sup>\*</sup>  
Ethnic people in China including Dai, Wa, Bulang, Jinuo and others have been living in Xishuangbanna in southern Yunnan Province for centuries. The Xishuangbanna cucumber (XC) is a landrace of *Cucumis sativus* var. *xishuangbannaensis*. There is little ethnobotanical record about XC landrace although it is a significant crop variety

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<sup>\*</sup> Barbara Lawrence Award submission

in local communities. An ethnobotanical investigation was conducted from 2016-2018. The results show that traditionally, XC landrace was cultivated in slash-and-burn fields without irrigation and fertilization. The fruit is characterized by its shelf life, good flavor and large size. XC is a favorite edible fruit for local people, and this landrace has been used for sacrificial offerings by Wa and Bulang people. The XC landrace seeds have been traditionally used as bridal dowries by Dai, Jinuo and Wa. This tradition plays an important role in the conservation of XC diversity and traditional cultures in Xishuangbanna.

Yvette John, P'eq'sq'oyes Slha':li' (White Plume Woman). **Traditional Lifestyle of Medicine and Foods** (Session VI)  
My interest is to educate and share out wonderful healing foods and medicine for a healthier happier life. The abstract I am willing to share is about Identifying Indigenous Wild Plants, their use for Medicine and Food and also for Cultural Traditional ways of life. I will be presenting photos and samples of fresh plants, natural made medicine, teas, and sheep wool dyed with natural plant dyes. I have had a keen interest in plants as I am the third generation to have learned from a Grandmother and my Mother, and now teaching my children. We naturally eat wild plants, wild salmon, wild game as a way of life as much as possible. We are still hunter, fisher woman and plan/berry gatherers on a yearly basis. All my Relations P'eq'sq'oyes Slha':li', Clinical Herbalist

Zarrillo, Sonia, Nilesh Gaikwad, Claire Lanaud, Terry Powis, Christopher Viot, Isabelle Lesur, Olivier Fouet, Xavier Argout, Erwan Guichoux, Franck Salin, Rey Llor Solorzano, Olivier Bouchez, Hélène Vignes, Patrick Severts, Julio Hurtado, Alexandra Yepez, Louis Grivetti, Michael Blake, and Francisco Valdez. **Early Cacao Use in the Upper Amazon of South America** (Session XX)

The archaeological site of Santa Ana-La Florida (SALF), located in the Ecuadorian upper Amazon, is in the region of *Theobroma* spp. greatest genetic diversity, thus making it ideal to investigate the origins of domestication of this enigmatic tree. We present research showing that the residents of SALF were involved in the domestication of cacao, traditionally thought to have been first domesticated in Mesoamerica and/or Central America. We used three independent lines of evidence—starch grains, theobromine residues and ancient DNA—dating from approximately 5,300 years ago, to establish the earliest evidence of *T. cacao* use in the Americas, the first unequivocal archaeological example of its pre-Columbian use in South America and reveal the upper Amazon region as the oldest centre of cacao domestication yet identified. We suggest that new paleoethnobotanical research will expand our knowledge of this process, including the timing, locations, and uses of cacao by Indigenous South Americans.

Zavala, Brisa and Marsha Quinlan. **Maize, Nextamalli, and Aid to the "Developing World"** (Session XXIII)

Pre-contact, indigenous peoples of the Americas processed corn in various ways to exploit its nutrients. Nahuas traditionally boil dry corn kernels with lime, producing nextamalli, widely known in Mexico as nixtamal. This process chemically modifies the corn making a larger percentage of corn's nutritional value available. Larger cities alter this practice; incorrectly processing corn results in non-nutritional food products. Innutritious corn products are problematic in Mexico, Latin American countries, and African countries. Industrial countries export corn as food aid and crop to impose a sedentary lifestyle. Previous research has demonstrated that imposing a sedentary lifestyle on pastoralist or hunter-gatherer societies negatively affects their health and wellbeing. This paper explores the health impacts of non-lime processed corn by reviewing existing literature. Understanding how varying corn processing methods impacts the nutritional value of food will have a great impact in public health sectors as well as future government aid to "developing countries."

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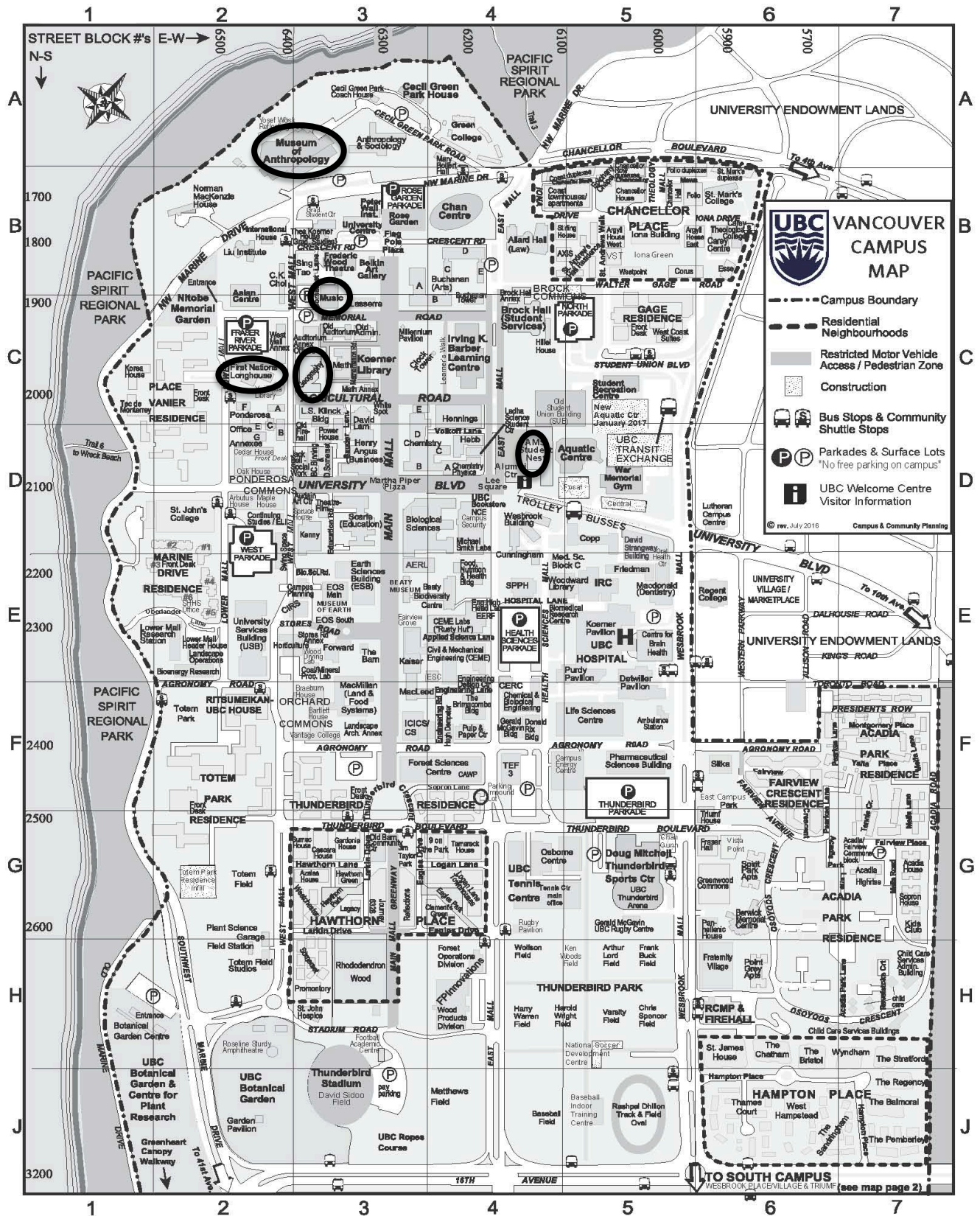
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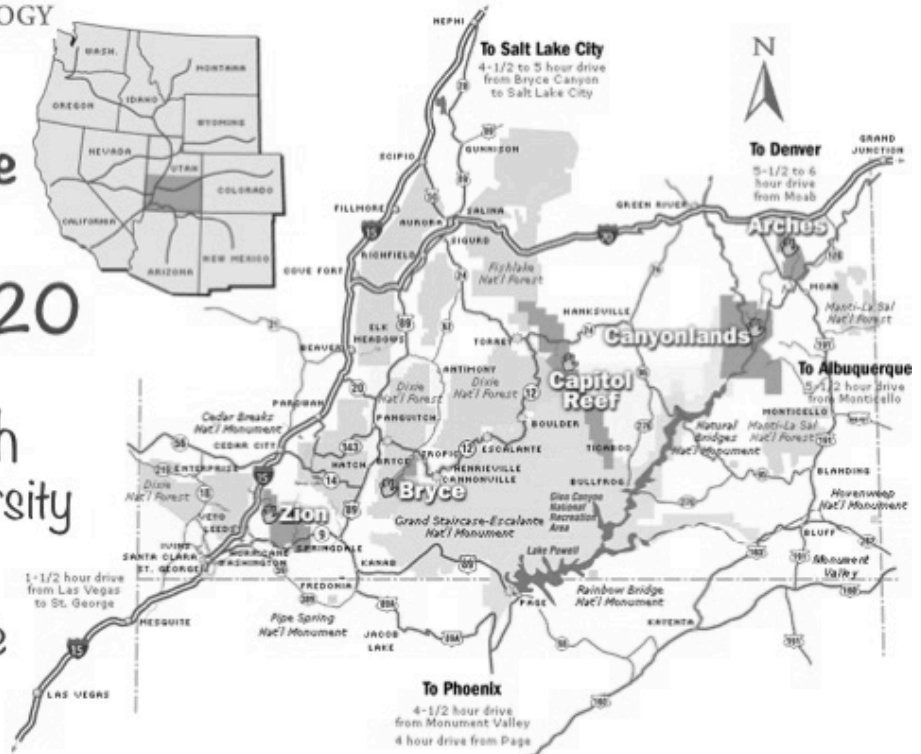
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