



2nd International Historical Ecology Meeting
November 13-15, 2015



About The Meeting

In November 2014 a small group of students from various disciplines (ecology, archaeology, economics, history and anthropology) met in Uppsala, Sweden to discuss their research and how they integrate the historical ecology research program in their work. What was meant as a one-time meeting, sponsored by the Integrated History and Future of Peoples on Earth (IHOPE – ihopenet.org), grew into a network of graduate students pursuing applied historical ecology research wanting to connect with the world around them.

The attendees of the first meeting initiated a process to determine the 50 key questions for historical ecology. Participants self-organized into seven thematic working groups titled: communication and time between disciplines, mobilizing local knowledge, food and politics, the practice of historical ecology, ethics and biodiversity, communication and new media, and models and landscapes. Much discussion was generated and we reflected on how historical ecology is practiced and wondered what were the important questions for the historical ecology program to answer? It became obvious that historical ecology attracts a diverse group of people whose interests populate many different theoretical and methodological scopes. The challenge now is to bring more voices to the discussion, and determine what issues unite us.

A global survey is currently circulating to collect a broad list of questions that are relevant to historical ecology. On Friday, November 13th, everyone will present their research and Saturday we will host small morning workshops on science communication and interdisciplinary facilitation. Finally, we will break into working groups to discuss, debate and edit the *50 Questions for Historical Ecology*.

Acknowledgments

We would like to acknowledge that for the duration of this meeting we will be occupying unceded Coast Salish territories which include: *səlilwətaʔ* (Tsleil-Waututh), *Skwxwú7mesh* (Squamish), and *xʷməθkʷəy̓əm* (Musqueam) people. We thank these communities for hosting us on their land.

Overview Schedule

Friday, November 13, 2015

Time	Event	Venue
8:30-9:00am	Registration	Halpern Centre
9:00am	Welcome & Introduction	Halpern Centre
9:15am	Plenary Session	Halpern Centre
10:30am	Break	Halpern Centre
10:40am	Plenary Session	
11:20am	Speed Talks	Halpern Centre
12:00pm	Lunch (provided)	Museum of Archaeology and Ethnology
1:00pm	Speed Talks	Halpern Centre
2:10pm	Break	
2:20pm	Speed Talks	Halpern Centre
4:00pm	Adjourn	
6:00pm	Banquet and Keynote	Diamond Alumni Centre

Overview Schedule

Saturday, November 14, 2015

Time	Event	Venue
9:00-10:00	Poster Session and Breakfast	Saywell
10:00-10:30	Workshop A	Saywell
10:30-11:30	Workshop B	Saywell
11:30-12:30	Lunch	
12:30-4:30	Workshop 3 (self-organized)	Saywell

Sunday, November 15, 2015 (Optional)

Time	Event	Venue
9:00-4:00	Workshop C (continued)	Saywell

Oral Presentations

Friday, November 13, 2015

Introductions

9:00am Cease Weiss (Tsleil-Waututh) Chelsey and Anna

Plenary Session

9:30-9:50 Steve Wolverton

The Goldilocks Dilemma in Mesa Verde Archaeology: Identity and Environmental Justice

9:50-10:10

David Egan

Reference Conditions and Ecological Forest Restoration: A Real-life Historical Ecology Application

10:10-10:30

Peter Stahl

What Things Would you Bring to a Desert Island? Historic Landscape Transformation in the Galápagos

10:30-10:40

Break

10:40-11:00

Dana Lepofsky

Historical Ecology of Cultural Keystone Places of the Northwest Coast

11:00-11:20

Iain McKechnie

The Contemporary Relevance of Ancient Hunting and Fishing Traditions on the Northwest Coast

Speed Talks A - Cultural Landscapes

11:20-11:30

Oliver Boles

Past Herders in Modern Landscapes: Enamel Isotopes and the Anthropogenic Savannah

11:30-11:40

Chelsey Geralda Armstrong

Orcharding in the Pacific Northwest: The Historical Ecology of Dalth Gyilakyaw

11:40-11:50

Anna Shoemaker

500 Years of Human Settlement and Landscape Interaction in the Amboseli Basin

11:50-12:00

Tony Marks-Block

Contemporary Anthropogenic Fire as a Window to the Past: The Eco-Cultural Landscape of Indigenous California

12:00-1:00 Lunch

Speed Talks B Resource and Environmental Management

1:00-1:10 Lynn Lee

Shifting Baselines of a Rocky Reef Community: Why Place and Time Matter to Northern Abalone Conservation

1:10-1:20 Sarah Walshaw

Ancient and Modern Farming on Songo Mnara, Tanzania

1:20-1:30 Tom Royle

Ancient DNA Analysis of Late Period (3500 to 200 cal. years BP) Archaeological Fish Remains from the Interior Plateau Region of British Columbia, Canada

1:30-1:40 Eréndira Quintana Morales

Change and Continuity in the 1200-year Archaeological Record of Fishing in the Eastern African Coastal Region

1:40-1:50 Sarah Buckley

Detecting Extinction in Historically Exploited Coral Reef Fish

Speed Talks C Historical Ecology Method and Theory

1:50-2:00 Adam Novick

The Colourful and Unresolved History of Disequilibrium Ecology

2:00-2:10 Joyce LaCompte

Material-Semiotics: Towards a Post-Colonial Historical Ecology

2:10-2:20 Break

Speed Talks D Historical Ethnobiology

2:20-2:30 Leslie Main Johnson

Historical Ecology and Landscape Ethnoecology: Considering the Past, Present and Future of Gitxsan and Witsuwit'en Homelands and Waters

2:30-2:40 Alex McAlvay

Adopting and Adapting: Local Use and Management of Invasive nabitos (*Brassica rapa* L.) in Mexico and Consequences for their Evolution

- 2:40-2:50 Gene Anderson
Historical Ecology and Yuan Dynasty Ethnobiology
- 2:50-3:00 Jana Vamosi
Ecophylogenetic Approaches to Studying Ethnobotanical Properties of Plants
- Speed Talks E Shifting Ecologies*
- 3:10-3:20 Aleksandra Ibragimow and Grzegorz Podruczny
The Battle of Kunersdorf as an Example of Human-Environmental Interactions
- 3:20-3:30 Philina English
Flying down the food web: isotope signatures in museum specimens suggest long-term change in diet of a nocturnal aerial insectivore
- 3:20-3:30 Fernando J. Astudillo
Historical Ecology of the Galápagos Islands: Paleoethnobotany of Hacienda El Progreso, 1887-1904
- 3:30-3:40 Kevin Gibbons
Agricultural Heritage in Iceland: The Historical Ecology of Livestock Improvement
- 3:40-3:50 Nik Petek
Revisiting the Rift Valley Granary: From sustainable livelihoods to a degraded landscape
- 6:00-9:00 Banquet and Keynote Carole Crumley
A Tour of the Horizon

Poster Presentations

Saturday, November 14, 2015

Stephen Chastain

Carbon Dynamics and Shoreline Resilience- A Case Study from Pacific Rim National Park, Canada

Julia Jackley

Mountain Top to Ocean Floor: The Eco-cultural History of Hauyat

Angelina Christina Lara

To shape whilst moulding itself: manual mining, water source, and landscape in a small rural village at Minas Gerais State, Brazil.

Mary Lynn Tobiasz

Spatial Analysis of Settlement and Shoreline Characteristics on the Central Coast

Ginevra Toniello

Assessing the Productivity of Ancient Clam Gardens on Northern Quadra Island, British Columbia

Antonia Rodriquez

Rock Fish

Workshops

Saturday, November 14, 2015

Grace McRae-Okine and Tracy Giesz Ramsay

The Secrets of Storytelling in the Digital Age

Sâkhitowin Awâsis

Facilitation Something

[Self-Organized]

Editing the 50 Questions for Historical Ecology

Abstracts

ANDERSON, Eugene N. (University of California Riverside)

Historical Ecology and Yuan Dynasty Ethnobiology

The Mongols conquered China in the 13th century, and held it till 1368. This led to various ecological results, ranging from taming the Yellow River to introducing the orange carrot. A court manual of nutrition and dietetics survives from the 1330s, and about a sixth of a huge encyclopedia of western medicine for Chinese remains from the same period. Among other things, these documents allow us to see much more clearly than before how much central Asia and the Near East influenced Chinese ethnobiology and ecology. Chinese attitudes toward nature, landscape, and the wild also evolved in the direction of heightened appreciation for wild, remote landscapes and for nature in general. Attitudes can be inferred from paintings, poems, and other documents. Historical ecology thus moves into the study of food, visual and verbal art, and other cultural forms.

ARMSTRONG, Chelsey Geralda (Simon Fraser University), Dana Lepofsky (Simon Fraser University), TURNER, Nancy (University of Victoria)

Orcharding in the Pacific Northwest: The Historical Ecology of the Dálth Gyilakyaw Landscape

Robin Town is the site of the Gitsm'geelm (Ts'msyen) creation story in Northwestern British Columbia. The legacy of generations of lives lived on the landscape are visible today in impressive archaeological features, modified ecosystems, and remnant orchard gardens. Many Gitsm'geelm have strong cultural ties to Robin Town as it was only recently abandoned in the early 20th century. However, much of the deep time history of this place and how the landscape was managed are out of memory. Using a variety of approaches, including archaeological and paleoecological methods, botanical inventories, historic maps and community member interviews, we reconstruct how the Gitsm'geelm managed the Robin Town landscape. We focus particularly on the remnant crabapple and hazelnut orchards associated with the ancient settlements. For Gitsm'geelm First Nation, documenting the subtle footprint of ancient management techniques is the foundation for modern cultural resource management and for revivifying the age-old tradition of gardening berry, root and nut foods.

ASTUDILLO, Fernando, J. (Simon Fraser University)

Historical Ecology of the Galápagos Islands: Paleoethnobotany of Hacienda El Progreso, 1887-1904

It is believed that the Galápagos archipelago was unoccupied by humans before its discovery in 1535. The first human settlement of San Cristóbal Island was a large plantation called Hacienda El Progreso, which was one of the largest and most advanced companies of Ecuador during the late 19th century. Refined sugar, alcohol, and coffee were the main products exported to coastal South America. As result, vast areas of the island were deforested in order to create agricultural parcels and grasslands required for large scale production. During its active years (1887-1904), a series of cultural events modified the natural landscape of the island. Historical Ecology is concerned with an understanding of the effects of initial human activities and paleoethnobotany explores the relationships between human and plants in the past. This combined approach is currently applied in a study of Hacienda El Progreso history and its resulting ecological effects on San Cristóbal Island. This paper presents some initial inferences of the paleoethnobotanical research. Charcoal and Phytoliths analysis are currently combined in order to

explore the characteristics of the native flora and the resulting ecological effects of human activities in this delicate ecosystem.

BOLES, Oliver (University College London)

Past herders in modern landscapes: enamel isotopes and the anthropogenic savannah

That the ecology of the African savannah today has, over recent millennia, been shaped by the presence of pastoralist communities is now commonly acknowledged; nutrient-rich and biologically diverse patches, or glades, are legacies of herder settlements, a consequence of the dense accumulation and degradation of livestock dung. This concentration of nutrients in particular locations is accompanied by the depletion of soil nutrients in the pastures on which animals are grazed, such that pastoralists are implicated in a complex cycle of nutrient transfer that visibly impacts local ecologies, manifest in vegetation patterns and wild animal behaviour. These processes are, however, only superficially understood by policy-makers and landholders in African states, with herders frequently excluded from ecosystems they both rely on and support.

This paper will explore how we might better understand the historical development of modern savannah landscapes using isotopic analyses of livestock tooth enamel. It will be argued that certain herding behaviours can be linked to particular forms of herder settlement and patterns of landscape exploitation. A set of isotope 'scenarios', expectations for what isotope data might look like given various herding practices, will provide the basis for discussion of how an understanding of these past behaviours might contribute to contemporary debate surrounding pastoralists in Africa.

BUCKLEY, Sarah (University of Queensland), Tim McClanahan (Wildlife Conservation Society), Erendira M Quintana Morales (Muséum National d'Histoire Naturelle), Victor Mwakha (Kenya Marine Fisheries Research Institute), Levy Otwoma (Kenya Marine Fisheries Research Institute), Jane Nyanapah (Wildlife Conservation Society) and Pandolfi John M (University of Queensland)

Detecting Extinction in Historically Exploited Coral Reef Fish

Without an understanding of historical baselines, dramatic declines in population abundance and even extinctions can occur undetected. In particular, the historical exploitation and susceptibility of tropical marine species to extinction is rarely investigated. By comparing archaeological records (750-1500AD) with contemporary catch (1995-2013) and underwater visual censuses (UVC) (1987-2013) from coastal Kenya, we revealed that 22 of the tropical marine fish species that were historically exploited are now absent. We established a list of threatened coral reef fish species by conducting presence/absence tests using combinations of the catch data, archaeological records, and UVC with the modern species list. We verified the historical decline and disappearance of historically exploited fish species using 288 interviews with fishers, divers and fish traders and corroborated with UVC (2013-2014). Determining historically exploited species level of extinction enabled us to predict the contemporary exploited species that exhibit similar vulnerability to extinction using fuzzy logic analysis. Knowledge gained from this research will contribute to ongoing local conservation priorities by raising awareness amongst stakeholders of species at most risk to local extinction. The results are also relevant for species-specific management and prioritization of species for conservation.

CHASTAIN, Stephen (Simon Fraser University), Karen Kohfeld (SFU School of Resource & Environmental Management), Marlow Pellatt (Parks Canada) Dana Lepofsky (Simon Fraser University)

Carbon Dynamics and Shoreline Resilience- A Case Study from Pacific Rim National Park, Canada

[poster]

A growing number of climate scientists recognize the high carbon sequestration potential of coastal, vegetated, 'blue carbon' ecosystems such as salt marshes. Conserving these important habitats is a cost-effective part of a broader climate change mitigation strategy. These salt marshes have also recently been recognized (in the past 25 years) for their eco-cultural significance. Ethnographic sources attest to intensive modification of upper marshes, with pre-contact Nuu-chah-nulth gardeners constructing large terraces containing artificial, tilled soils. These garden platforms were used to grow edible root vegetables, suggesting that these marshes had considerable potential as nutrient and carbon stores. Owing to the platforms' shape and their high agricultural productivity, we expect to find that they still affect the carbon dynamics and shoreline resilience of marshes to this day.

The goal of the project is to produce usable estimates of the soil carbon content of the marshes and 'garden' archaeological features in and around Pacific Rim National Park and Tofino, British Columbia. Additionally, building a more complete picture of prehistoric landscape modification in the coastal Pacific Northwest can stimulate further research into innovative, low-impact conservation techniques and contribute to the emerging body of literature on the cultivation practices of Pacific Northwestern First Nations.

CRUMLEY, Carole (University of North Carolina-Chapel Hill and Executive Director of the Integrated History and Future of People on Earth [IHOPE] initiative)

A Tour of the Horizon

[keynote]

As the pragmatic framework of historical ecology has gained practitioners throughout the world, its reach into more and more disciplines and the support it offers for diverse communities of practice (e.g., local and traditional knowledge, specialized professional activities, heritage and environmental management, and many others) continues to increase. What can we expect the future of historical ecology to be? What particular characteristics of historical ecology will prove especially important? How will historical ecology be useful in an uncertain future?

EGAN, David (Northern Arizona University)

Reference Conditions and Ecological Forest Restoration: A Real-life Historical Ecology Application

[panel]

Since the late 1990s, the Ecological Restoration Institute (ERI) at Northern Arizona University has been a leading source of ecological and social science information about restoring the ponderosa pine ecosystem of the American Southwest. A core principle of the ERI's ecological research has been use historical ecology to develop reference conditions to guide the design and implementation of forest restoration treatments. As such, they have used written and photographic records as well as various scientific studies (e.g., dendrochronology, phytoliths, soil types) to identify the characteristic ecological processes, species, and structural composition of pre-European settlement ponderosa pine forests in the region. This knowledge continues to serve as a guide to the landscape-scale, collaborative forest

restoration process now underway on federal forest lands in Arizona (i.e., Four Forest Restoration Initiative). In this talk, I will 1) describe the historical ecology applications that have been and continue to be used, 2) how the resulting information was developed into a restoration-oriented narrative for policymakers and the general public, and 3) how the historical ecology information and the ERI restoration narrative interacted with other viewpoints and perspectives (e.g., environmental, bureaucratic, economic) that are part of the collaborative planning/implementation process.

ENGLISH, Philina (Simon Fraser University), GREEN, David J. (Simon Fraser University) and NOCERA, Joseph J. (Trent University)

Flying down the food web: isotope signatures in museum specimens suggest long-term change in diet of a nocturnal aerial insectivore

Aerial insectivores, dietary specialists that rely on flying insects, are exhibiting some of the steepest population declines of any group of birds in North America. One hypothesis for the decline is a change in food availability; however long-term data on insect abundances and avian diet are generally lacking. The eastern whip-poor-will (*Antrostomus vociferous*) is a nocturnal aerial insectivore that eats moths and beetles. We look for evidence of temporal change in the diet of Ontario's eastern whip-poor-wills using museum specimens collected between 1880 and 2000, and samples from breeding individuals in 2012. Nitrogen isotope ratios ($\delta^{15}\text{N}$) are known to increase with trophic level and diet quality. We compare temporal changes in $\delta^{15}\text{N}$ of whip-poor-will tissues grown in winter (claw) and during breeding season (feathers) with $\delta^{15}\text{N}$ of 3 potential prey insect species (*Biston betularia*, *Phyllophaga anxia*, *Colymbetes sculptilis*) collected from the same region and time period. We found significant declines in $\delta^{15}\text{N}$ in both winter and summer tissues of adults and in nestlings over the past 100 years. Nitrogen isotopes of both winter-grown claws and summer-molted feathers did not differ between sexes or breeding sites. Nestlings have lower feather $\delta^{15}\text{N}$ levels than adults. None of the insect prey species sampled show any temporal trend in $\delta^{15}\text{N}$ suggesting that the pattern found in bird tissues is not the result of broad-scale changes in N fertilizer inputs. These results are consistent with the hypothesis that aerial insectivore populations are declining due to changes in abundance of high quality, higher trophic level prey.

GIBBONS, Kevin (University of Maryland)

Agricultural Heritage in Iceland: The Historical Ecology of Livestock Improvement

In the early settlement of Iceland, Scandinavian pioneers brought their social knowledge alongside herds of livestock to the untamed island and in turn initiated a millennium-long tradition of livestock husbandry and survivorship in a harsh and unpredictable environment. Decades of integrated historical ecological research across Iceland allows for an exploration of the complex human ecodynamics of this marginal European outpost in the North Atlantic. Comparative osteometrical data from multiple sites from Iceland's settlement to the modern period suggest Icelandic livestock were subjected to breeding improvements during the late medieval period – before the conventional initiation of these practices during the Second Agricultural Revolution on continental Europe. These osteometrical data have the potential to be coupled with ancient genetic material retrieved from faunal remains to begin untangling the social, environmental, and ecological processes that shaped agricultural heritage and resource management practices through time.

IBRAGIMOW, Aleksandra (Polish-German Research Institute at Collegium Polonicum UAM in Poland and EUV in Germany), PODRUCZNY, Grzegorz (Polish-German Research Institute at Collegium Polonicum UAM in Poland and EUV in Germany), MICKIEWICZ, Adam (European University Viadrina Frankfurt)

The Battle of Kunersdorf as an Example of Human-Environmental Interactions

Historic battles were an important part of human activity that had direct impact on the landscape. They live on today, especially through memorials, fortifications and trenches. Furthermore, archaeological findings have been stuck in the top layers of the soil surface in the area of battlefields and they can be easily found even hundreds of years after the battle. In the past the impact of great historic battles on the environment gained little interest. This can be surprising because the principal basic raw material for small arms was lead - nowadays considered as one of the most toxic, carcinogenic and mutagenic metals found in the environment. A spectacular example is the Kunersdorf battlefield, now located in western Poland some 10 km (6.2 mi) from the German border, that witnessed in 1795 one of the bloodiest battles of the Seven Years War (1756 – 1763). At the time it was a part of eastern Prussia and the Province of Brandenburg from 1815 until 1945. The archaeological investigation that has been carried out in this area during the last eight years has shown that archaeological findings made of lead can on the one hand provide us with - significant information about the course of the battle and its terrain and on the other hand, secondary lead minerals can cause further changes in the environment for the next hundreds of years. During the lecture the main outcomes of archaeological investigation and main objectives of the planned interdisciplinary project will be presented.

JACKLEY, Julia (Simon Fraser University), LEPOFSKY, Dana (Simon Fraser University), CARPENTER, Jennifer (HIRMD), TURNER, Nancy J. (University of Victoria)

[Poster]

Mountain Top to Ocean Floor: The Eco-cultural History of Hauyat

The Mountain Top to Ocean Floor Project is a collaborative undertaking by the Heiltsuk First Nation, Simon Fraser University, and University of Victoria that seeks to document and explore the unique cultural and ecological history of Hauyat, a landscape in Heiltsuk traditional territory on the Central Coast of British Columbia. Over the millennia, Hauyat has been transformed by a complex web of relationships between people, plants, animals and ecosystems. The rich and deep history of this place is known through Heiltsuk oral history and is also reflected in the number and diversity of archaeological sites and eco-cultural features. Ranging from the lower intertidal to the subalpine, the landscape has been modified to include clam gardens, fish traps, root gardens, berry patches, orchards, settlements, rock art, and defensive sites. These features are suggestive of long-term resource management systems that likely worked together to provide food, materials, and medicines for past communities.

JOHNSON, Leslie Main (Athabasca University)

Historical ecology and landscape ethnoecology: considering the past, present and future of Gitksan and Witsuwit'en homelands and waters

There are three strands to my ongoing research with Gitksan and Witsuwit'en people. First, I have been involved in research about anthropogenic firing, and its uses for the creation and maintenance of certain key plant resources (black huckleberry, lowbush blueberry, rice-root lily) and its effects on habitats used by animal species (enhancing productivity of areas used by wildlife). This research has implications for contemporary landscape management. Secondly, I have been interested in evidence for potential anthropogenic distributions of a couple of important traditional foods: Pacific crabapple, and rice-root lily, both of which have their main distributions in more coastal environments. The third strand of concern is more at the conceptual level: how do we intellectually and practically deal with food sovereignty and food security when key food species have ranges far larger than the territories (lands and waters) of specific groups, particularly in the context of large scale resource/infrastructure developments which are sited in key areas for the maintenance and survival of these populations? A particular concern is the siting of port facilities for the proposed LNG pipelines at Lulu Island, Prince Rupert Harbour, where all of the Skeena and Nass River anadromous salmon stocks undergo their transformation from freshwater to saltwater metabolism. Another global scale concern for the sustainability of these species is the impact of rising ocean temperatures in the mid-Pacific, which appears to be depressing the productivity particularly of sockeye stocks, with lower than predicted returns and reduced size of returning fish.

LARA, Angelina Christina (Simon Fraser University)

To shape whilst moulding itself: manual mining, water source, and landscape in a small rural village at Minas Gerais State, Brazil.

[poster]

Integrating the environmental impact assessment of the Jequitai I Reservoir Project (municipality of Jequitai, a small town in Minas Gerais State, Southeast Brazil), it was held an etno arqueological study concerning the diamond and crystal mining activity in the areas of influence of this project. Based on data source and field work (10 days in total, between September and October 2014) this research was carried out by an anthropologist and an ecologist, guided by a local key informant, former miner. There were conducted many crossings by active and inactive mining areas, and 16 interviews (13 men and 3 women; active and old miners, and family members of relevant local persons in the past of this activity). Mining areas and their associated structures were identified and localized (GPS), and environmental features were described. Results allow the understanding of local mining history, the identification of stakeholders and social relations; highlight traditions, techniques, materials, equipment; significant natural resources from the miners perspective and the influence on the current landscape (topography, water courses conformation, water availability, local vegetation pattern, local native plant occurrence). Severe drought and past water management effects have been forcing the emergence of new water management strategies in mining areas. Besides, the Jequitai I Reservoir Project is about to create a Natural Reserve in one of the last active mining areas. The relationship between mining and landscape highlights key elements that can contribute to conservation and socioeconomic projects in this region.

LECOMPTE, Joyce (University of Washington)

Material-Semiotics: Towards a Post-Colonial Historical Ecology

Focusing on processes of nourishing and being nourished, this presentation gives a material-semiotic reading of historic people-plant-place relations situated in the montane Coast Salish territories of Washington State. In doing so, I offer an alternative reading to the dialectics of landscape change as a mode of bridging (or overcoming) conceptual binaries that include history versus ecology, evolutionism versus historicism, scientism versus humanism, etc. These variations on the mind-matter dialectic, while opposed, are still two sides of the same coin forged from particular histories of western intellectual inquiry. As a form of process-relational ontology, material-semiotics offers a heuristic for understanding matter and mind not as conjoined as in two sides of the same coin, but as an emergent property of animate, dwelt-in worlds. Such a perspective does not require abandonment of either ecology or history; rather, material-semiotics is a form of "radical empiricism" that has the potential to literally enliven our understandings of the relations between them. In particular, material-semiotics as ontology and as praxis resonates with Coast Salish understandings of history, temporality, and people-place-plant relations. However, while charged with ethical potential, a material-semiotic approach does not inevitably address a second problematic of historical ecology – the discipline's focus on the "metaphysics of presence." This is a challenge that must also be addressed if the discipline is to better articulate with the post-colonial landscapes it seeks to understand.

LEE, Lynn (Simon Fraser University), SALOMON, Anne (Simon Fraser University)

Shifting baselines of a rocky reef community: Why place and time matter to northern abalone conservation

Shifting and arbitrary baselines elicit vexing conservation challenges when society comes to value attributes of an altered ecosystem and perceives it as "normal". Northern abalone, a marine snail in British Columbia rocky reefs, present one such case where sea otters, important abalone predators, were hunted to ecological extirpation over a century ago. Without otters, populations of their benthic macroinvertebrate prey increased dramatically. Poor fisheries management then led to precipitous declines in northern abalone abundance, its listing as a threatened species, and recent uplisting to endangered status. Re-introduction and range expansion of sea otters in recent decades is again shifting the macroinvertebrate and kelp community. Using multiple lines of evidence from traditional knowledge, local knowledge, historical and fisheries records, and scientific knowledge, we present a historical timeline of abalone and kelp forest communities to demonstrate the magnitude of change that has occurred in an ecosystem that co-evolved with sea otters and First Nations people. Persistence of abalone over eons attests to their resilience, yet dependent on ecological and social context, abalone abundances varied widely across spatial and temporal scales. Historical ecological context challenges us to re-think the status of northern abalone and targets for conservation.

MARKS-BLOCK, Tony (Stanford University)

Contemporary anthropogenic fire as a window to the past: the eco-cultural landscape of indigenous California

The history of anthropogenic fire in California is contested, along with the extent to which fire is currently used for land management and the maintenance of ecological functionality. While historical aerial photographs and dendrochronology can provide excellent evidence of the seasonality, frequency and size of historical fires, contemporary burning in Indigenous communities can also provide important insights. In Yurok territory in the Klamath River basin, fire is seen as an important and necessary activity to

exercise sovereignty and to maintain the Yurok identity. Currently, fire is primarily used to catalyze the epicormic growth of straight, non-branching stems of hazelnut (*Corylus cornuta* ssp. *californica*) for use in basketry. Additionally, fire is used to reduce oak acorn infestation and to eliminate understory growth that creates hazardous fuel conditions. Contemporary ethnographic and ecological data of anthropogenic fire imply that it improves accessibility and efficiency of foraging, suggesting that burning is an adaptive measure. This framework predicts that the use of broadcast fire as niche construction has created co-evolutionary relationships and an eco-cultural landscape, and should be integrated into historical analyses and land management decisions.

MCALVAY, Alex (University of Wisconsin-Madison)

Adopting and adapting: local use and management of invasive nabitos (Brassica rapa L.) in Mexico and consequences for their evolution

Cultural reactions to biological invasions are not universally negative. While some cultures eschew invasive biota, others embrace useful species and incorporate them into local subsistence. Weedy field mustard (*Brassica rapa* L.) was introduced into the Americas from Eurasia soon after the arrival of Spanish colonists. At least two dozen Indigenous groups from northwestern Mexico to southern Argentina have since adopted this exotic plant as a food, medicine and/or animal fodder. Our research seeks to address two features of plant-human interactions: (1) How cultures adopt newly encountered plants and (2) How plants adapt to newly encountered cultures. We integrate data from ethnographic interviews, plant population genetics, historical research, transplant experiments, and species distribution modelling to investigate the diversity of human interactions with field mustard in Mexico, the origins of Mexican *B. rapa*, and the possibility of human-induced selection on managed populations. We present research showing wide cultural variation in uses, preferences, and management techniques. There is substantial phenotypic variation between regions, suggesting that populations may have been differentiated by humans and other environmental agents. We expect our investigation of this unique system to have implications for understanding cultural responses to plant invasions and the selective potential of traditional resource management practices. This particular invasive species is an abundant and nutritious vegetable that contributes to food security in many parts of Mexico. The indiscriminate eradication of invasive plants by herbicide use and mechanized agriculture could limit access to this resource.

MCKECHNIE, Iain (University of Oregon & Simon Fraser University - Hakai Institute)

The Contemporary Relevance of Ancient Hunting and Fishing Traditions on the Northwest Coast [panel]

This talk explores archaeological patterning in Indigenous hunting and fishing traditions on the Pacific Northwest Coast using zooarchaeological data and map-based spatial visualizations. I adopt a historical ecological and landscape perspective to show how animal bone assemblages recovered from ancient coastal settlements both contrast with and contextualize patterns of abundance in contemporary animal populations. I highlight three examples to showcase the potential of this approach: culturally distinct mammal hunting on the south coast of British Columbia, a coast-wide examination of archaeological fisheries data, and the zooarchaeology of sea otter populations before the contact-era maritime fur trade. I argue this information reveals the breadth, persistence, and ecosystem consequences of Indigenous resource harvesting

practices and demonstrates the importance of using archaeological data to address contemporary conservation and resource management issues.

MORALES, Eréndira Quintana (Rice University)

Change and continuity in the 1200-year archaeological record of fishing in the eastern African coastal region

Between the 3rd and 15th centuries CE, the eastern African coastline saw the rise of several large urban cosmopolitan trading centres. Several key cultural changes mark the transition from the first to the second millennium in this region, notably the more widespread use of coral-stone architecture, Islamic practice, and intensified trade, along with an increasing consumption of rice and domesticated bovids. Nonetheless, fish contribute a large portion of the protein consumed by the inhabitants of these coastal settlements, as attested by large quantities of fish remains excavated in this region. Recent analysis of over 12,000 identified fish remains documents the exploitation of marine fish during this 1200-year span at nine coastal and island settlements, allowing us to explore changing fishing practices during key cultural transitions. The majority of the identified taxa occur near coral and rocky habitats, indicating the continuing importance of coral reefs located in proximity to these settlements. Within a general pattern of nearshore habitat exploitation, variation in the predominant species across the region demonstrates the use of flexible strategies to exploit locally available marine resources. Wide size ranges and high diversity of fish taxa indicate that fishers were skilled in the construction, use and maintenance of various fishing gears. The second millennium is marked by a significant increase in outer-reef/offshore fishing. The exploitation of emperor fish (Lethrinidae) is more prevalent in later periods, and available diachronic data document an increase in the relative abundance of these fish throughout the first millennium.

NOVICK, Adam (University of Oregon)

The Colorful and Unresolved History of Disequilibrium Ecology

Elsewhere, I (2013) have offered theory and some evidence that humans inadvertently risk exacerbating the loss of maintenance-dependent species on private land by using species-based land-use regulation to seek other benefits. Specifically, drawing evidence primarily from the US, I argued that such regulation poses a risk to species whose survival depends on actively managing private land, such as to control invasive exotic vegetation; that humans routinely disregard this risk; and that this disregard widely serves to defend the power of individuals and organizations to use such regulation to seek other benefits. In part, I offered evidence that this disregard occurs through widespread and persistent distortion in the theory and application of ecology; that this distortion includes misleading rhetoric and false or questionable beliefs that indiscriminately equate conservation with limiting human action; and that this distortion persists, despite increasing recognition that species populations do not necessarily persist in the absence of human action, which some have referred to as disequilibrium ecology. Here, reviewing this evidence in historical perspective, I further argue that the history of disequilibrium ecology is colorful, in that the means of this distortion are richly varied and vividly distinct, and unresolved, in that humans still widely overlook potential implications of disequilibrium ecology for species conservation policy and its potential consequences for landscapes and have even to settle on a name for this aspect of nature.

PETEK, Nik (Uppsala University)

Revisiting the Rift Valley Granary: From sustainable livelihoods to a degraded landscape

This paper discusses the ongoing historical-ecological work taking place in the Lake Baringo lowlands in Kenya's Rift Valley, where the Ilchamus ethnic community was once famous for establishing a granary by developing well-adapted and sustainable irrigation farming. They also practiced pastoralism, some effects of which have been shown to be beneficial for the regeneration of the land. But the Ilchamus now live in one of the most degraded areas of Kenya, where the land's inability to sustain Baringo's population with enough food continues to be a matter of concern. Combining previous historical, anthropological, and current archaeological work, I wish to explore how the people's subsistence practices fit into the narrative of land degradation and establish what the consequences of these practices were over the past two centuries. Current knowledge on past livelihoods is shallow, and it is necessary to extend the horizon of human-environment interaction in Baringo to new depths.

ROYLE, Thomas C., NICHOLAS, G., YANG, D.Y. (Simon Fraser University)*Ancient DNA analysis of Late Period (3500 to 200 cal. years BP) archaeological fish remains from the Interior Plateau region of British Columbia, Canada*

EeRb-144 is a large Early (>7000 cal. years BP) to Late Period (3500 to 200 cal. years BP) campsite located on a river terrace in the Interior Plateau region of British Columbia, Canada. A multi-year excavation of the site conducted as part of the Secwepemc Cultural Education Society-Simon Fraser University Archaeological Field School has recovered a large number of fragmented fish remains associated with the Late Period occupations of the site. This fragmentation has generally precluded the identification of these remains through morphological analysis to a taxonomic level lower than class. Consequently, little is known about the taxonomic focus and breadth of the Late Period fishery at EeRb-144. This study sought to identify the focus of this fishery by employing ancient DNA (aDNA) analysis to assign species identifications to a sample of Late Period fish remains from the site. The results indicate EeRb-144's Late Period fishery probably focused on largescale sucker (*Catostomus macrocheilus*), but also harvested a variety of other locally abundant fish species in smaller quantities. Ethnographic accounts of indigenous fishing activities in the region and the ecology of the identified species suggest this fishery may have occurred during the spring and summer. This study also highlights how aDNA analysis can be used to identify fish remains that are difficult to identify morphologically due to a lack of species specific morphological features.

SHOEMAKER, Anna (Uppsala University)*500 years of human settlement and landscape interaction in the Amboseli basin*

My ongoing PhD research in the Amboseli basin, Kenya uses the landscape as the primary unit of analysis for exploring the pre-colonial history of the region. Today the Amboseli is a landscape constructed by various stakeholders including agriculturalists, pastoralists, conservations, and entrepreneurs, whose perspectives on land management are often in conflict. The narratives invoked by these various communities regarding approaches to sustainable livelihoods often include reference to Amboseli being a previously equilibrial pastoral ecosystem. Through the incorporation of multiple methods including pollen and dung fungal spore analysis, archival data, archaeological survey and excavation, GIS, aerial photography, and participatory mapping a more nuanced understanding of the history of human-environmental interactions in this space is made possible. Preliminary results indicate

the character of resource utilization in Amboseli over the past 500 years has incorporated flexible production strategies articulated with wider regional networks of trade.

STAHL, Peter (University of Victoria)

What Things Would you Bring to a Desert Island? Historic Landscape Transformation in the Galápagos
[panel]

An important first postulate of historical ecology contends that the affects of human activity are almost globally pervasive. What can we learn from the initial colonization attempts of areas that, to the best of our knowledge, had experienced little or no prior human activity? The Galápagos Islands offer an interesting and instructive example of historical landscape transformation by and for colonizing humans who actively recreate familiar settings that, although necessarily informed by local ecological exigency, are predicated on established cultural acceptability.

TOBIASZ, Mary Lynn (McMaster University)

Spatial Analysis of Settlement and Shoreline Characteristics on the Central Coast
[poster]

This poster presents results from a systematic analysis of the environmental setting of shell midden sites on the Central Coast of British Columbia. Shell middens represents an array of settlements, including, but not limited to, major residential bases and specialized resource camps. The dimensions of these sites are reflective in some measure of settlement activities and intensity of use based on the accumulation of midden material. I evaluated site distribution through the creation of a GIS model that combined environmental data with the provincial inventory of archaeological sites. Results indicate there is a strong association between the size of shell middens and the physical characteristics of the surrounding shoreline (i.e. beach substrate and size of the intertidal zone). These features impact which animals can survive there based on the species' specific habitat requirements. Large shell middens are more likely to have a larger intertidal zone and sandy substrate. This corroborates the findings of other investigations regarding the location of major residential sites in immediate proximity to productive shellfish habitats.

TONIELLO, Ginevra (Simon Fraser University), LEPOFSKY, Dana (Simon Fraser University), ROWELL, Kristen

Assessing the Productivity of Ancient Clam Gardens on Northern Quadra Island, British Columbia
[poster]

Clam gardens are a form of ancient mariculture and are documented along the Northwest Coast of North America from Alaska to Washington. A dense concentration of clam gardens on northern Quadra Island, British Columbia had a significant impact on past ecological and social landscapes. The construction of clam gardens not only increased the area of clam habitat but also enhanced shellfish ecology, ultimately aiding in clam growth. The bivalve productivity of clam gardens is assessed through (1) documenting overall increase in clam habitat, and (2) comparing the growth rate of clam shells from clam gardens and natural contexts. This analysis will expand our ecological understanding of clam gardens, and will also enhance our understanding of the extensive ecological knowledge of marine environments held by coastal First Nations.

VAMOSI, Jana (University of Calgary)

Ecophylogenetic Approaches to Studying Ethnobotanical Properties of Plants

Understanding the evolution of specialization in plant use is often hindered by the complexity of ecological systems. Flowering communities offer humans varying numbers and proportions of floral resources, and the uniformity observed in these floral resources is, to some degree, due to shared ancestry. Here, I summarize the parallels between two approaches in ecophylogenetics to examine the specialization and ecosystem function of historical plant use in the family Rosaceae by the First Peoples of British Columbia. First, humans have used related plant species more so than expected by chance, exhibiting strong “phylogenetic specificity”. Functional traits of plants influence these patterns with specific plant uses strengthening the level of phylogenetic constraints on plant use. Second, I examine the contribution that geographical differences in floral composition make to predictions of historical plant use.

WALSHAW, Sarah (Simon Fraser University)

Ancient and Modern Farming on Songo Mnara, Tanzania

Songo Mnara is an island off the southern coast of Tanzania where today people engage in marginal farming and fishing economies, in the absence of community health facilities, electricity or running water. In fact, fresh water is a precious resource and rain-fed rice fields are in danger of salinization from nearby mangrove swamps, a threat that has been met by agricultural innovations. The poverty experienced on the island today stands in contrast to the wealthy Swahili stonetown that was built 600 years ago, with significant resources invested in constructing stone coral houses, mosques, and mortuary architecture. Ancient plant remains from Songo Mnara reveal a diet based on African grains sorghum and pearl millet, Asian rice, and local fruits such as baobab. In this paper I consider how similar and different agricultural strategies may have been on Songo Mnara through the centuries. How analogous are current non-mechanized farming techniques to ancient practices, given the changes (some known; many yet to be documented) experienced by farmers in the recent and deeper past? And, how can social scientists work together and with local communities to better illuminate farming practices past, and promote locally desired changes in the present?

**WOLVERTON, Steve (University of North Texas), Robert Figueroa (Oregon State University),
Porter Swentzell (Institute of American Indian Arts)**

The Goldilocks Dilemma in Mesa Verde Archaeology: Identity and Environmental Justice

[panel]

Multiple environmental identities collide in Mesa Verde archaeology. From the perspective of archaeological science, archaeologists have engaged research questions for the last half century, leading to cultural reconstructive summaries about how Pueblo people lived prior to migrating out of the Mesa Verde region. The importance of this narrative centers on the identity of the archaeologist within which the archaeological stories of the Mesa Verde past are worth telling because archaeological science is important. However, this identity assumes a preeminent role of science over other perspectives. An under-recognized narrative among archaeologists is that of Pueblo environmental identity, in which contemporary pueblo people claim Mesa Verde pueblo villages and landscapes as ancestral homes that were not abandoned. Indeed, the narrative goes that ancestors still inhabit these places. Generally speaking, pueblo people and archaeologists navigate separate moral terrains producing a minimum of two narratives. These do not easily allow archaeologists or Pueblo people to co-inhabit Mesa Verde, past and present, which we describe as a goldilocks dilemma for the archaeologist. A conceptual framework

from environmental philosophy centering on restorative justice using the concept of moral terrain provides a relational narrative that empowers pueblo identity and recalibrates archaeology. This environmental justice lens is applied to two archaeological research narratives, one centering on chemical analysis of biomolecular artifact residues and the other on paleohydrology and pueblo farming.

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