



EARTHWATCH 2017

RESTORING FIRE, WOLVES, AND BISON TO THE CANADIAN ROCKIES



2018 briefing begins on page 27.

DEAR EARTHWATCHER,

Welcome to the *Restoring Fire, Wolves, and Bison to the Canadian Rockies* field research expedition! You are going into one of the wildest, most intact places in North America, the Crown of the Continent Ecosystem. It contains all the species present in 1800, with the exception of bison—including wolves, grizzly bears, wolverines, cougars, and lynx. Consequently, your time on this project will be an adventure filled with compelling data, remarkable wildlife observations, and keen insights about the powerful relationships that shape food webs.

Our long-term research looks at three essential forces of nature—fire, wolves, and bison—and how they interact with aspen and prairie plant communities. These ecological forces were present in ecosystems throughout much of North America until humans decided it was easier to live without them. Although it took nearly a century, we eventually realized that it was an enormous mistake to remove three of the most important factors that keep many North American ecosystems healthy. Conservation biologists refer to removal of fire, wolves, and bison as “dewilding,” and to their return as “rewilding.”

On this expedition, you’ll help document the effects of fire and wolves in Waterton Lakes National Park, Alberta—a landscape in which wolves have been allowed to return to a healthy population size, fire has been reintroduced via prescribed burning, and a bison reintroduction is being considered. But as Darwin astutely pointed out in the mid-1850s, nature is a tangled bank. Untangling the effects of these keystone forces of nature is anything but simple, leads to unexpected “aha” moments afield, and to the realization that everything is connected, sometimes in surprising ways. Our research has global relevance, because we’re finding that ecosystems that contain top predators and fire are more resilient to climate change. We are additionally collecting data that will help managers understand the historical and current role of bison in shaping this grassland-aspen system.

My colleagues Curtis Edson and David Hibbs and I look forward to having you join us afield. Together we’ll collect data to improve our understanding as a society of the critical role fire and wolves play. Data you collect will help enable better coexistence with both and will directly inform management of the Crown of the Continent Ecosystem.

So let the wild rumpus begin! Be prepared to work hard and have many astonishing experiences as we delve into nature’s tangled bank and help rewild the earth.

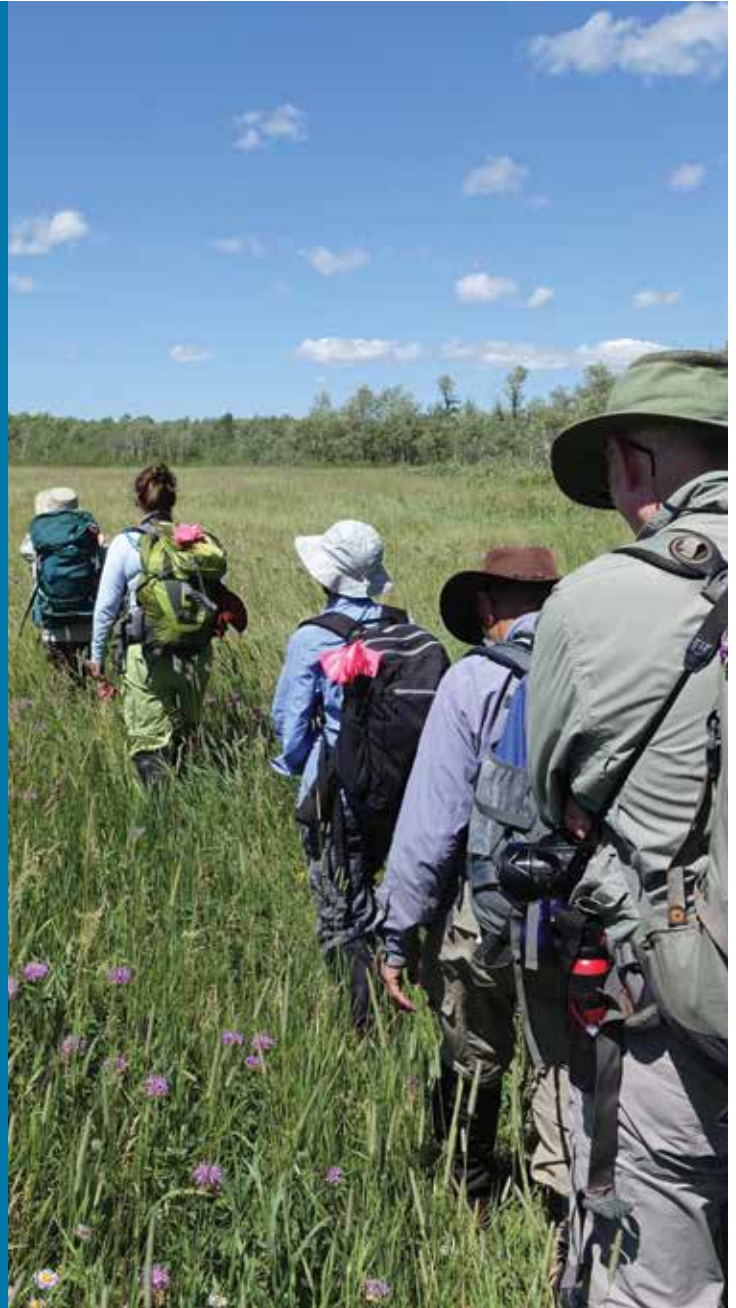
Sincerely,

Dr. Cristina Eisenberg
Chief Scientist, Earthwatch



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GENERAL INFORMATION

RESTORING FIRE, WOLVES, AND BISON TO THE CANADIAN ROCKIES



EARTHWATCH SCIENTISTS

Dr. Cristina Eisenberg, PI, Chief Scientist, Earthwatch Institute

Dr. Curtis Edson, Co-PI, Assistant Professor, Michigan Technological University

Brenda McComb, Co-PI, Professor Emeritus, College of Forestry, Oregon State University

Dr. David Hibbs, Co-PI, Professor Emeritus, College of Forestry, Oregon State University

RESEARCH SITE

Waterton Lakes National Park in Alberta, Canada

EXPEDITION DATES

Team 1: May 1–10, 2017

Team 2: May 13–22, 2017

Team 3: May 25–June 3, 2017

Team 4: June 3–12, 2017

Team 5: June 12–21, 2017

Team 6: June 21–30, 2017

Team 7: July 3–9, 2017

Team 8: July 12–21, 2017

Team 9: July 24–30, 2017

Team 10: Aug. 2–11, 2017

Team 11: Aug. 14–20, 2017

Team 12: Aug. 23–Sept. 1, 2017

Team 13: Sep. 4–13, 2017

DURATION

10 days

10 days

10 days

10 days

10 days

10 days

7 days*

10 days—Shorter distances

7 days*

10 days—Shorter distances

7 days*

10 days

10 days

Complete travel information is not available in this version of the briefing.

Please contact Earthwatch with any questions.

*Volunteers on 7-day teams (teams 7, 9, and 11) have the opportunity to field back-to-back with a team on the Climate Change, Huckleberries, and Grizzly Bears in Montana project scheduled to run immediately after. Contact your Earthwatch expedition advisor for more information!



TRIP PLANNER

RESTORING FIRE, WOLVES, AND BISON TO THE CANADIAN ROCKIES

DEPARTURE

IMMEDIATELY

- Make sure you understand and agree to Earthwatch's **Terms and Conditions** and the **Participant Code of Conduct**.
- If you plan to purchase additional travel insurance, note that some policies require purchase when your expedition is booked.

90 DAYS PRIOR TO EXPEDITION

- Log in at earthwatch.org to complete your volunteer forms.
- Pay any outstanding balance for your expedition.
- Book travel arrangements (see the Travel Planning section for details).
- If traveling internationally, make sure your passport is current and, if necessary, obtain a visa for your destination country.

60 DAYS PRIOR TO EXPEDITION

- Make sure you have all the necessary vaccinations for your project site.
- Review the Packing Checklist to make sure you have all the clothing, personal supplies and equipment needed.

30 DAYS PRIOR TO EXPEDITION

- Leave the Earthwatch 24-hour helpline number with a relative or friend.
- Leave copies of your passport, visa, and airline tickets with a relative or friend.

Read this expedition briefing thoroughly. It provides the most accurate information available at the time of your Earthwatch scientist's project planning, and will likely answer any questions you have about the project. However, please also keep in mind that research requires improvisation, and you may need to be flexible. Research plans evolve in response to new findings, as well as to unpredictable factors such as weather, equipment failure, and travel challenges. To enjoy your expedition to the fullest, remember to expect the unexpected, be tolerant of repetitive tasks, and try to find humor in difficult situations. If there are any major changes in the research plan or field logistics, Earthwatch will make every effort to keep you well informed before you go into the field



THE RESEARCH

RESTORING FIRE, WOLVES, AND BISON TO THE CANADIAN ROCKIES



THE STORY

For nearly one hundred years, ecologists have recognized the powerful link between wolves (*Canis lupus*), elk (*Cervus elaphus*), aspen (*Populus tremuloides*), grass, and fire [Leopold et al., 1947]. Large carnivores, such as wolves, and disturbances, such as fire, have been identified as forces of nature that increase biodiversity, create more resilient ecosystems, and help energy to cycle more vigorously through communities [Eisenberg et al. 2013]. These cascading direct and indirect food web interactions affect songbird and invertebrate species diversity, and are called *trophic cascades*.

By the 1920s, as was the case in much of North America, wolves had been killed by humans to the point that they were practically extinct. Without wolves preying on them, elk and deer exploded in number. Burgeoning elk populations ravaged plant communities, including aspen forests (an important elk food). Literally eating themselves out of house and home, elk damaged aspen to the point that few saplings survived to grow into mature trees. At the same time that we wiped out wolves, we eliminated fire and bison (*Bison bison*).

Beginning in the mid-1970s, with the passage of powerful environmental laws in the US and Canada, we began to conserve wolves and other large carnivores. We also began to realize that fire is as important of an ecological force as wolves. With the return of wolves, we're noticing changes in elk behavior and density [Smith et al. 2003]. This means that elk may not be eating aspen in places where wolves are present, because it is more difficult to escape a wolf in an aspen thicket than on open terrain [Eisenberg et al. 2014]. This effect is called "the ecology of fear" [Brown et al. 1999]." We're also finding that wolves in some places reduce elk numbers to a more sustainable level. With the return of fire we're noticing that aspen are sprouting more vigorously and growing faster. The combination of wolves and fire is leading to aspen rapidly growing above the height that elk can eat them and into the forest canopy. However, lacking bison and frequent fire, the aspen are encroaching on shortgrass prairie.



RESEARCH AIMS

Our overarching goal is to learn more about trophic cascades and how fire, wolves, and bison can help us create healthier, more resilient grassland and aspen forest communities (Estes et al. 2011).

Our study area, Waterton Lakes National Park (WLNP), is in one of the most intact temperate ecosystems in North America. This ecosystem contains all the large carnivore species present at the time of the Lewis and Clark Expedition and six million acres of protected wilderness and reserves. As such, it makes the perfect natural laboratory to investigate the complex interactions between apex forces of nature—fire and wolves—on a landscape scale, and to explore what would happen if bison returned. A bison reintroduction is underway in Banff to the north, and is being planned by the linnii Initiative for the Badger-Two Medicine area and Chief Mountain, just south of WLNP.

Within this ecosystem, our research takes place in WLNP in two sites: the Eskerine Complex Prescribed Fire, which burned 852 hectares in 2014 (scheduled for re-burning in 2017); and the Y-Camp Prescribed Fires, which burned 835 hectares in April 2008, and 762 hectares in April 2015.

Our study sites lie in primary elk winter range in this park, where elk density is very high from September-May. Indeed, the elk density recorded here is among the highest recorded in North America. This historically was an important bison range. Additionally, we are working on the Blood (Blackfoot) Timber Limit—a lush timber land immediately adjacent to the park. Indeed, our research would not be possible without a rich collaboration with the Kainai First Nations (also known as the Blackfoot), and WLNP and Parks Canada.

To learn about how food web relationships between top predators and their prey – also known as “trophic cascades” (Paine 1980)—operate in a grassland-aspen community, we’ll measure the dynamics of each food web link in our study—wolves, elk, aspen—and the presence and severity of fire. Fire severity has a positive relationship with post-fire aspen sprout density. We’re focusing on elk and wolves because they are key players in food-web effects involving grasslands and aspen. None of the other large herbivores or carnivores currently present in our study area play a significant role in the elk-aspen interaction.

We’ll achieve our goal of learning about how fire, predation, and herbivory operate in grassland-aspen communities via the following steps:

1. Test the effects of prescribed fire on aspen regeneration and recruitment
2. Measure elk presence and feeding behavior in WLNP
3. Investigate the effects of elk herbivory on post-fire aspen regeneration and recruitment
4. Examine the potential for wolves to influence elk feeding choices
5. Map the aspen stands using a hand-held professional-grade GPS and an unmanned aerial system (UAS)
6. Identify the species of native and non-native grasses present in aspen and on the prairie

Like most ecological communities, aspen forests are influenced by a synergy of bottom-up (resources-driven) and top-down (predator-driven) processes. Bottom-up effects that contribute to aspen ecology include drought, fire suppression, and disease. Top-down effects include ungulate herbivory and carnivore predation on ungulates (Paine 1980; Swanson et al. 2010).

Scientists have hypothesized that returning wolves to ecosystems enables aspen to grow into the forest overstory (called “recruitment”), via the effects of wolves on their ungulate prey, primarily elk (Ripple and Beschta 2007). Further, with wolves present on a landscape scale, elk avoid burned areas, which may have higher predation risk due to the greater impediments to detecting and escaping wolves, such as more downed trees that accumulate following fires..

To study trophic cascades and fire science as it pertains to the WLNP Y-Camp and Eskerine Complex Prescribed Burns, we are asking the following scientific questions:

- Q1:** How has the extent of aspen cover changed?
- Q2:** How have fire and herbivory by elk changed aspen demography (e.g., the ability of aspen to grow into the forest canopy)?
- Q3:** How does the presence of an apex predator (the wolf) influence elk consumption of aspen?
- Q4:** What quality of bison habitat does this landscape provide?
- Q5:** Do distance to stand edge, aspen regeneration density, and the amount of standing (dead or alive) aspen or downed woody debris influence elk browse?
- Q6:** Does prescribed fire impact above-ground biomass significantly?





Answering the above questions will help us meet our project objectives of learning how elk are responding to a prescribed fire in an aspen community, identifying the effects of elk herbivory on post-fire aspen regeneration and recruitment, determining whether wolves may be moderating these relationships, and evaluating bison habitat.

We are answering these questions by measuring the dynamics of each food web link in our study, as follows:

- (Q1)** by re-measuring an existing network of aspen plots;
- (Q2)** by assessing aspen size/age structure geospatially; and
- (Q3)** by conducting wolf surveys, measuring elk presence and herbivory in this landscape on a fine scale, and analyzing elk diet.
- (Q4)** by assessing the grass community within aspen stands and on the prairie
- (Q5, Q6)** by mapping aspen stands using a Trimble UX5 unmanned aerial system (UAS)

Our study builds on a rich body of data previously gathered in WLNP by the PI since 2006, which includes pellet transect, elk GPS-collar, focal animal, and aspen ecology data.

HOW YOU WILL HELP

From the inception of our research in 2007, we've incorporated volunteers on each field crew. As volunteers, you'll be conducting three types of surveys:

1. **TRACK TRANSECTS:** These spring surveys take place in May between snowmelt and greenup, before the grass grows tall. Track transects require 6–12 miles of walking per day, working off-trail on level, uneven terrain in 2017. We'll be collecting data on the presence of all the large carnivores and their prey, and also locating and investigating the carcasses of wolf-killed animals. Wildlife encounters and viewings are frequent during these surveys. This is very physical work in at-times winter conditions.
2. **ASPEN SURVEYS:** These surveys can take place from early July to mid-September, after trees leaf out and begin to grow. In 2017, aspen surveys require 6–12 miles of walking per day on level and sloping uneven terrain, working off-trail. Data collection involves measuring aspen sapling height, shrub diversity, shrub height and percent cover, elk and deer browsing on the aspen, aspen encroachment on the grassland, and forest community characteristics.
3. **WOLF SURVEYS:** Visits to wolf rendezvous sites and travel corridors can take place at any time throughout the project. We do all we can to avoid disturbing wolves on our project. Field days when we track will require 3–12 miles of walking per day on uneven terrain, working off-trail. We conduct wolf surveys one day per week.

Specifically, you'll be able to assist with the following research tasks:

1. Pulling transect tapes and marking plots.
2. Measuring understory characteristics, such as aspen sapling heights, tree diameters, shrub cover, browsing, and grass presence.
3. Measuring overstory characteristics, such as canopy cover, tree mortality, and tree diameters at breast height.
4. Tracking ungulates and carnivores in established transects.
5. Tracking wolves in high wolf-use areas.



Here is some detail on the data we'll be collecting together:

TRACK TRANSECTS

Track transects are used to measure the activity of large herbivores (deer, elk, moose) and the species that prey on them (wolves, grizzly bears, black bears, cougars) in a site that has been repeatedly burned to improve habitat for these species. Data consist of large herbivore pellets and carnivore scats. We also locate and investigate any carcasses of herbivores killed by carnivores, particularly wolves. These data are collected in the same transects and plots we use to measure aspen overstory and understory dynamics. Track transects provide a noninvasive survey method that provides data that resembles GPS-collar data in terms of accuracy and usefulness, but leaves no trace and minimally disturbs wildlife. We'll be comparing data from track transects with data collected in previous years in this area, and comparing it as well to herbivory data collected in summer 2015 and 2016 by Earthwatch volunteers.

ASPEN SAMPLING

Our project involves a resurvey of transects and plots in an aspen parkland burned by prescribed fire. We've been surveying some of these transects and plots since 2008. We're tracking the effects of fire over time and whether elk herbivory suppresses sprouting stimulated by the fire, particularly in plots that burned with a high severity, thereby diminishing aspen cover and increasing the grassland extent. We have pre-burn data for all of the known aspen stands in WLNP to which we're able to compare post-fire data.

Aspen data are gathered in permanently marked transects surveyed annually. The transects are four meters wide and vary in length, based on the size of the stand. In these transects you'll collect data about how the forest is growing, called "overstory dynamics."

Within the transects we've placed circular plots that are two meters in radius, and are located 20 meters apart along the transect line. In the plots you'll collect data about community ecology—how aspen are growing, the biodiversity of the plant community, and whether predation risk by wolves is affecting the feeding choices elk make. To do this you'll measure elk browsing on understory saplings and shrubs. Technicians will survey grasses.

WOLF SURVEYS

Wolf surveys consist of visits to sites identified by Parks Canada camera trap data as hotspots of wolf activity. Wolf activity data are gathered systematically; with periodic (e.g., bi-weekly) re-visits to wolf activity hotspots, using leave-no-trace methods. Data collected includes all evidence of wolf presence (e.g., scats, tracks, wolf hair, carcasses) and activity.

We use only noninvasive methods of tracking wolves, in order to minimize impacts on wolves. We do not have any radio-collared individuals. This means relying on camera trap data to identify their travel corridors and other hotspots of wolf activity and then going there to further document wolf presence. At no time do we observe wolves, and we do all we can to avoid running into wolves, as we do not want to disturb and stress them. This is completely noninvasive wolf monitoring. Project participants are required to keep all wolf survey data confidential, especially information about locations of wolf dens, to protect the wolves.

MAPPING AND GEOSPATIAL DATA

WLNP management objectives include reducing the extent of aspen cover while improving the health of aging stands by stimulating regeneration. Managers believe that aspen stand reduction will contribute to their goal of restoring and maintaining the historical range of native shortgrass prairie. Prescribed fire, elk foraging habits and wolf predation are all thought to contribute to the park's goals and objectives. In 2017 we will deploy Global Positioning Systems (GPS) and Unmanned Aerial Systems (UAS) to map aspen stand locations and changes in the extent of mature aspen, aspen regeneration, and associated shrubs. Researchers will use GPS and UAS to delineate area features, overlay them in a Geographic Information System (GIS), analyze and map changes over time, and use 3D modeling techniques enabled by the UAS to monitor carbon sequestration. We will ensure the UAS is programmed to fly on WLNP approved flight plans, and volunteers will help identify and map vegetation features (e.g., shrubs, regenerating aspen, canopy trees) and observe Trimble UX5 deployment.

DAILY LIFE IN THE FIELD

PLANS FOR YOUR TEAM



Upon arrival, we'll take you shopping as needed for any missing required personal field gear (see gear list on p. 18). You'll travel by project vehicle to the Waterton research house, where upon arriving, you'll receive an orientation and room assignment. Next, we'll prepare dinner together. After dinner you'll receive an introductory lecture on research methods and equipment. You'll also receive a safety and logistics briefing. In the morning you'll receive a bear safety briefing. You'll then proceed to help us collect data on how fire and wolves are shaping food web relationships in this ecosystem. On the last day after dinner, we'll talk about the results and trends we're finding and the relevance of the data collected. We'll also discuss coexisting with apex predators. In general, research days will include up to eight hours per day in the field, plus one hour of briefings. Informative lectures will often be conducted in the field, during lunchtime, or during dinner.

DAILY ACTIVITIES

Each morning, we'll make our own breakfast and prepare a packed lunch before gathering in one room to "gear up." Gearing up is a tradition on this project, during which the crew leader briefs everyone on logistics, weather, hazards, field objectives, and methods, and distributes field gear. The crew leader will also check in with everyone to ensure that each person is feeling well and able to go into the field. All volunteers will be expected to get up in the morning at 6:00 a.m. in order to go into the field between 7:00–8:00 a.m., depending on conditions.

Each day during lunch we'll discuss pertinent topics, such as the ecological history of the area and how predator extirpation and fire suppression—and the return of both—are shaping the patterns we see in this landscape. We'll also discuss the ecological and cultural role of bison in this landscape and grassland restoration. In the field (and once or twice per week after dinner) we'll discuss data quality.

After a long day of fieldwork and data collection, we'll all return to the research house for showers and to cook dinner together and relax. Then, we'll convene for a group dinner and evening wrap up of the day's events. Some evenings you'll have the opportunity to assist with data entry or attend community lectures, if you wish.

Volunteers on teams 1–3 (10-day teams) will spend all of their time tracking wildlife (elk, deer, moose, wolves, bears, cougars, and coyotes). Volunteers on the project for one week (Teams 7, 9, and 10) will spend all day for four days measuring plants (trees and shrubs) to document how fire and wolves are impacting that ecosystem and one day per week tracking wolves. Volunteers in the field for the remaining 10-day teams will spend all day for seven days measuring aspen and one day tracking wolves. During all but Teams 1–3, a portion of the fieldwork may take place on the Blood (Blackfoot) Timber Limit.



ITINERARY

The following itinerary is subject to change due to weather and wildlife hazards.

7-DAY TEAMS

DAY 1: ARRIVAL AND INTRO

- Arrive at the rendezvous airport and meet project staff
- General intro to research background during drive. 7-day team volunteers will stop at the popular Montana House for a public lecture conducted by field staff.
- Arrive at accommodations in Waterton
- Unpack and settle before having a welcome dinner in the research house
- Briefing on research, field methods and equipment

DAY 2: TRAINING

- Introduction to field work
- AM: bear safety training
- PM: data collection techniques

DAYS 3–5: FIELD WORK: DATA COLLECTION

- Plant/ecosystem surveys

DAY 6: FIELD WORK: OBSERVATION

- Wolf tracking
- Evening: program summary

DAY 7: DEPARTURE

- Depart for the airport @ ~6:00 a.m.
- 2-week program participants are transported to the rendezvous for the Climate Change, Huckleberries,

and Grizzly Bears in Montana project

10-DAY TEAMS

DAY 1: ARRIVAL AND INTRO

- Arrive at the rendezvous airport and meet project staff
- General intro to research background during drive
- Arrive at accommodations in Waterton
- Unpack and settle before having a welcome dinner in the research house
- Briefing on research, field methods and equipment

DAY 2: TRAINING

- Introduction to field work
- AM: bear safety training
- PM: data collection techniques

DAYS 3–8: FIELD WORK: DATA COLLECTION

- Plant/ecosystem surveys

DAY 9: FIELD WORK: OBSERVATION

- Wolf tracking
- Evening: program summary

DAY 10: DEPARTURE

- Depart for the airport @ ~6:00 am

NOTE: Teams 1–3 consist of wildlife tracking all day every day on days 2–9.



ACCOMMODATIONS AND FOOD

ABOUT YOUR HOME IN THE FIELD



SLEEPING

You'll be staying at the Waterton Lakes National Park research house, a Parks Canada located in a premiere site in town and exclusively available for our project's use during the late spring and full summer. The research house is fully furnished and has a large kitchen for group cooking. There are five bedrooms with a total of ten beds. Genders will be roomed separately. Couples accommodation may be arranged, depending upon availability. We are unable to provide private rooms.

BATHROOMS

There are two shared bathrooms with hot water showers and conventional toilets. There is also a laundry room with a washer and dryer available to volunteers at no additional cost.

ELECTRICITY

You are welcome to bring electrical equipment. All facilities have standard electrical outlets. The Canadian standard voltage used for small appliances, hair dryers, electronic equipment, etc. is 120 volts, 60Hz, supplied through type A or B sockets

PERSONAL COMMUNICATIONS

There is unreliable WIFI access at the accommodations. WIFI is available at a local café—please bring your own laptop if you plan to use this. If you plan to use your cell phone, please obtain an international data plan through your cell service provider. Depending on your mobile phone carrier, cell service can be found near the accommodations, but is highly variable in the region.

Please note that personal communication with outsiders is not always possible while participating in an expedition. Earthwatch encourages volunteers to minimize outgoing calls and immerse themselves in the experience; likewise, family and friends should restrict calls to urgent messages only.



FACILITIES AND AMENITIES

There is no television in the research house. Within walking distance of the research house is a movie theater, and numerous restaurants, boutiques, and other attractions.

DISTANCE TO THE FIELD SITE

Our field sites within the park are within 10 miles of the accommodations. Our field sites on the Blood Timber Limit are 15 miles of the accommodations—you are never very far from home!



FOOD AND WATER

Everyone will take turns to help prepare and clean up from meals. Planned menus will be provided, and will include as many local ingredients as possible, including bison, elk, and salmon. Due to the high caloric demands of this project's hiking-based fieldwork, a strong focus is placed on providing volunteers and staff with plenty of quality high-protein, high fat, and mineral-rich foods. The following is a sample menu, which may change with dietary preferences of the team and ingredient availability.

TYPICAL MEALS

BREAKFAST	Cereal or granola, yogurt with fruit, eggs/egg dishes, juice, fair-trade coffee
LUNCH	Sandwiches (peanut butter or deli meats), dinner leftovers
DINNER	Salad, antipasto, maple-baked wild salmon, parmesan risotto, bison spaghetti, roasted vegetables, homemade pizzas, elk loaf with caramelized onions, garlic mashed potatoes, Thai curry with organic free-range chicken, jasmine rice, elk lasagna, crepes Provencale, various delicious veggies
DESSERT	Oatmeal chocolate chip cookies, carrot cake, baked lemon pudding, homemade apple pie, fruit cobbler, ice cream
BEVERAGES	Water (tap water comes straight from a glacial aquifer), juice, coffee, tea

SPECIAL DIETARY REQUIREMENTS

Please alert Earthwatch to any special dietary requirements (e.g., diabetes, lactose intolerance, nut or other food allergies, vegetarian or vegan diets) as soon as possible, and note them in the space provided on your volunteer forms.

Vegetarian, gluten-free and lactose-free diets can be accommodated with advance notice.

NOTE: This project cannot easily cater to the full nutritional needs of vegan diets in this high-intensity work environment. If you are vegan, please plan to bring a supply of supplemental high-fat, high-protein foods to allow for an approximately 7000-calorie day. We are unable to meet the needs of individuals with celiac disease or severe nut allergies, or other restrictions that require a cross-contamination-free kitchen, due to our close quarters



PROJECT CONDITIONS

THE FIELD ENVIRONMENT

Summer conditions can be hot, with thunderstorms in the afternoons. However, because the research site is in the Rocky Mountains, and lies on the Continental Divide, the weather can change unexpectedly and without any prior warning. Frost and snow have occurred in our field site during every month of the year. Mosquitoes are present, mainly in July, and are moderate. Research is conducted on rolling terrain, off-trail. We gather data if it is raining, but do not work during thunderstorms.

For track transects (May teams), expect winter conditions, with snow possible at all times. This is the most physically active of all the surveys, with high potential for hypothermia. All participants are required to be in good physical condition, have heavy-duty winter gear with them, and a larger-capacity pack (50 liters) in order to be able to carry extra winter clothing layers, including gloves and a hat. Additional recommendations will be provided in the packing list and in a letter to all volunteers two months prior to fielding. Note that wildlife encounters and viewing are more likely during track transect work, but can occur at any time.

GENERAL CONDITIONS

HUMIDITY: 25%–90%

TEMPERATURE RANGE:

DAY: 50° F to 95° F (10° C to 35° C)

NIGHT: 20° F to 45° F (-7° C to 7° C)

RAINFALL: Summer average: 3 in (76 mm)

ALTITUDE: 1,290 meters (4,232 ft.) asl

ESSENTIAL ELIGIBILITY REQUIREMENTS:

All participants must be able to:

- Follow verbal and/or visual instructions independently or with the assistance of a companion.
- Enjoy being outdoors all day in all types of weather.
- Hike throughout the day, off-trail, or uphill on slippery vegetation and uneven terrain. Totalling about 6–12 miles per day. “Light teams” involve hiking throughout the day, off-trail, or uphill on slippery vegetation and uneven terrain for 3–6 miles per day.
- With training provided, be prepared for likely encounters with wild animals, including grizzly bears. This involves carrying bear spray and a radio, and during an encounter following instructions exactly in order to leave the area calmly, but quickly, in a group, so as to not upset the bear and not to endanger teammates.
- Be able to keep up with the team as we move in and out of the

field, for safety reasons (e.g., avoiding grizzly bear encounters).

- Complete all required transects in timely manner to avoid putting strain on the rest of team.
- Tolerate the presence of insects such as mosquitos and wasps.
- Independently carry personal equipment (food, water, various layers of clothing), as well as a small amount of research equipment (up to ten additional pounds per person), totaling 30 lbs. Be able to wear pack all day, including while gathering data, for safety reasons (see packing list suggestions for appropriate backpacks for this).
- Protect oneself from dehydration and exposure to sun and heat by carrying two liters of water and drinking plenty of water throughout the day and wearing appropriate clothing and sunscreen.
- Sit on the ground to eat lunch or record data; designated rest places (e.g., benches) are not available.
- Get low to the ground while taking measurements, while wearing a pack.
- Be comfortable with the idea of encountering, and investigating, animal carcasses in the field. They will provide important information about the carnivores in the area.
- Get oneself up into and down out of a vehicle and ride, seated, with seatbelt fastened.
- Remain respectful of the wildlife we’re studying, as well as their habitat. This includes not approaching any wildlife we see, such as elk, grizzly bears, or wolves, and not photographing wildlife during fieldwork (you will have non-research-time opportunities to photograph local wildlife).
- Be comfortable to be trained in the use of a GPS, compass, rangefinder, clinometer, diameter-at-breast-height tape, leveling rod, and other equipment.
- Be responsible for carrying and keeping track of the assigned field equipment listed above.

ALCOHOL CONSUMPTION

Alcohol consumption in moderation is allowed on this project. Please limit alcohol consumption to 1-2 glasses of beer or wine with dinner, or to 1-2 drinks at any of the local pubs. Persons under the age of 21 will not be allowed to drink alcoholic beverages. No consumption of alcohol is allowed outdoors at the research house property, because this is a federally-owned building and our research team, including all Earthwatch volunteers, is expected to behave in an exemplary professional manner. As stated in the Earthwatch Participant Code of Conduct, excessive consumption of alcohol or underage drinking are grounds for dismissal from this project.



POTENTIAL HAZARDS

RESTORING FIRE, WOLVES, AND BISON TO THE CANADIAN ROCKIES

HAZARD TYPE	ASSOCIATED RISKS AND PRECAUTIONS
Transportation	Only project technicians and the principal investigator will transport participants in project vehicles. Seat belts must be worn at all times. Volunteers are not permitted to drive. Field staff will avoid driving at night or while tired. While driving, staff will maintain appropriate distance between vehicles and travel at safe speeds to allow stopping when necessary. Cell phone, first-aid kit and water will be in the vehicle in case of accident/break down on road. No operation of cell phone is permitted while driving. Participants susceptible to motion sickness are to consider taking medication as appropriate.
Hiking/ Bushwhacking	Participants will be advised to walk carefully, wear heavy-duty hiking boots (suitable for backpacking) with ankle support. Persons with existing injuries (e.g., knee injuries) will not be allowed in the field. Staff will encourage participants to inform a staff member immediately if feeling tired or ill, and to take regular breaks and to avoid overexerting themselves. Participants will be monitored for general health and ability to keep up with the group at all times.
Altitude	Participants sensitive to small altitude changes may need a few days to acclimatize. Participants will be reminded frequently to stay well hydrated and to apply sunscreen regularly. Participants are to not overexert themselves and to inform a staff member when feeling tired or ill. Staff will encourage participants to carefully monitor their own condition and report any symptoms (headaches, lethargy, appetite loss, nausea, etc.) to project staff. Participants should be aware of illnesses that may be aggravated by altitude (sickle cell and chronic heart and lung diseases) prior to fielding.
Dehydration	All project staff are Wilderness First Aid certified (at a minimum). Some field technicians are Wilderness First Responder certified. Participants will be instructed (and reminded frequently) to drink plenty of water throughout the day and to bring at least two liters of water into the field each day; to wear high-factor sunscreen and appropriate clothing, including sunglasses, a wide-brimmed hat and/or scarf; to not overwork when jet lagged or tired, and to inform a staff member when feeling tired or ill. Team will take regular breaks as needed, and monitor participants for general health at all times.
Hypothermia	Hypothermia is a frequent hazard on this project. It has snowed in our study area, often with no forecast, due to the site location on a notch in the Continental Divide, during every month of the year. The weather is unpredictable, with frequent abrupt changes that include snow in May, June, July, and August. The gear required reflects the need for everyone to have multiple layers, dry feet and body, and a warm head and hands, which are key preventative measures for hypothermia. Participant's gear will be checked to ensure that everyone has adequate winter gear.
Animals	Project staff will explain protocols and safety measures during orientation for addressing any encounters with wildlife such as grizzly bears, cougars, and elk. No photography is allowed in the field when encountering wildlife. Radios are to be worn at all times to communicate about wildlife hazards. Participants are encouraged to carry binoculars to help spot wildlife hazards (e.g., bears) at a safe distance. Trained staff will carry pepper spray. Additionally, adult participants will be trained in the transport and use of wildlife pepper spray, and will be encouraged to carry pepper spray canisters in the field.
Forest fires	Participants should be aware of the risk of forest fires, particularly later in the season during dry conditions. Smoke from fires can make breathing more difficult and can cause a minor burning sensation in the eyes, throat and lungs. Participants will be instructed in the prevention of forest fires; PIs and staff will model appropriate behavior.
Plants	Participants will be instructed on identification and avoidance of barbed vegetation. Participants with allergies to hay, sage, or other common Western US plants should bring appropriate medications (antihistamines, etc.).
Insects	Participants will be instructed to check carefully for ticks after they've been outside, checking places such as the back of the neck and the backs of legs and clothing where ticks might hide. Everyone will use insect repellent containing DEET or picaridin in order to prevent insect bites. Participants with allergies to biting and/or stinging insects must bring medications (antihistamines, at least two Epi-Pens, etc.) as appropriate.
Personal Security	Participants should take standard precautions such as keeping aware of money and personal belongings, especially in crowded places (e.g. airport).
Distance from Medical Care	The nearest full-service hospital is 80 miles from most field sites (1.5 hour drive), with a smaller hospital located 30 miles away (40 minute drive). It may take up to two hours to arrange transport and reach the full-service hospital. If you have a chronic condition, which could require immediate urgent medical care (e.g. heart conditions, kidney problems, severe asthma, etc.) or if you are pregnant, please discuss your participation on this expedition with your physician.



SAFETY

HEALTH INFORMATION

EMERGENCIES IN THE FIELD

Accommodations and vehicles all have first aid kits. In the event of a medical emergency, the Earthwatch scientists will administer first aid, and depending on the seriousness of the injury or condition, either take the volunteer to the hospital using one of the project vehicles (always available) or call emergency services by cellphone. While in the field, the scientists will carry a park radio; portable two-way project radios and each will carry a cell phone for emergency communication. Volunteers will also be encouraged to bring cellphones into the field for emergency use. If a volunteer has to leave the expedition early for emergency reasons, the Earthwatch scientists will determine the most appropriate form of transport to the airport (either one of the project vehicles or ambulance).

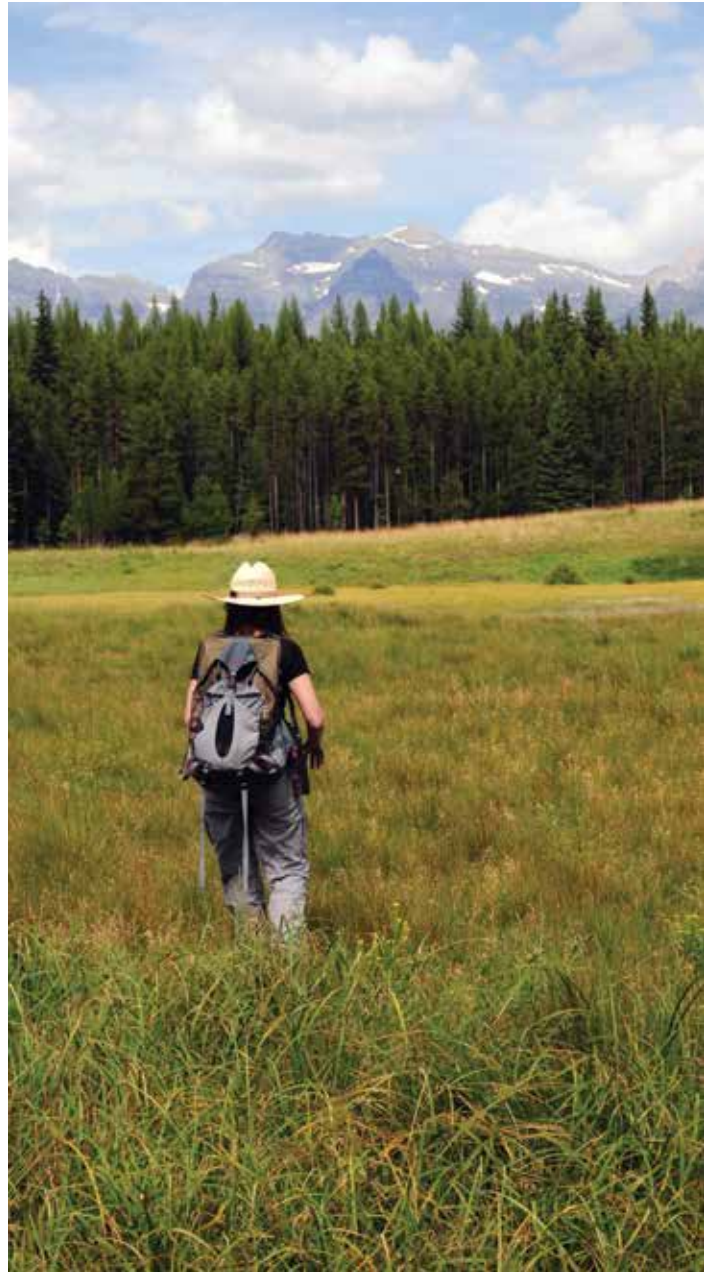
For emergency assistance in the field, please contact Earthwatch's 24-hour emergency hotline number on the last page of this briefing. Earthwatch is available to assist you 24 hours a day, 7 days a week; someone is always on call to respond to messages that come into our live answering service.

IMMUNIZATIONS

Please be sure your routine immunizations are up-to-date (for example: diphtheria, pertussis, tetanus, polio, measles, mumps, rubella and varicella). Medical decisions are the responsibility of each volunteer and his or her doctor, and the following are recommendations only. Visit the Healix Travel Oracle website through the "Travel Assistance and Advice" page in your Earthwatch portal, cdc.gov or who.int for guidance on immunizations.

PROJECT VACCINATIONS

REQUIRED: If traveling from countries or region where yellow fever is endemic, you must have a certificate of vaccination. You may need to present this certificate when you arrive in country.



TRAVEL TIPS

SUGGESTIONS FOR THE ROAD



YOUR DESTINATION

LANGUAGE: English

TIME ZONE: Mountain Standard Time (MST), which equals GMT/UTC -6 hours in the summer months.

CULTURAL CONSIDERATIONS: Casual, modest dress is acceptable nearly everywhere. Tipping restaurant wait staff, taxi drivers, airport curbside baggage handlers, and hotel bellhops is customary.

MONEY MATTERS

LOCAL CURRENCY: Canadian dollar (CAD). US dollars can also be used at most locations, but the exchange rate is not the best.

PERSONAL FUNDS: \$100 should suffice if you'd like to purchase additional food or supplies. You can walk to an ATM from the field house, and most locations accept credit cards. International volunteers should plan to exchange currency at the airport before joining the project. Because we'll return to Waterton each day, you'll always have access to an ATM.

PASSPORTS AND VISAS

Passport and visa requirements are subject to change. Check with your travel advisor, embassy or consulate in your home country for requirements specific to your circumstances. Generally, passports must be valid for at least six months from the date of entry and a return ticket is required.

CITIZENSHIP	PASSPORT REQUIRED?	VISA REQUIRED?
United States	Yes	No
United Kingdom	Yes	No
Europe	Yes	No
Australia	Yes	No
Japan	Yes	No

If a visa is required, participants should apply for a TOURIST visa. Please note that obtaining a visa can take weeks or even months. We strongly recommend using a visa agency, which can both expedite and simplify the process.

CONTACT INFORMATION

You may be required to list the following contact information on your visa application and immigration form, or if your luggage does not make it to baggage claim at your destination:

Dr. Cristina Eisenberg — Earthwatch

C/O Waterton Lakes National Park

113 Vimy Avenue

Waterton, AB T0K 2M0



EXPEDITION PACKING LIST

WHAT TO BRING

EXPEDITION PACKING CHECKLIST

The PI recommends checking out Sierra Trading Post (www.sierratradingpost.com) for good deals on the high-quality gear necessary for maximum comfort and safety on this project.

NOTE: All field equipment marked with an asterisk (*) is absolutely required on this project, exactly as specified, with no exceptions due to safety considerations as well as comfort. Your gear will be checked upon arrival. Volunteers will need to wear or carry this equipment in their packs daily, plus lunch/snacks and some field equipment.

GENERAL

- This expedition briefing
- Your travel plans, rendezvous details, and Earthwatch's emergency contact information
- Photocopies of your passport, flight itinerary, and credit cards in case the originals are lost or stolen; the copies should be packed separately from the original documents
- Passport and/or visa (if necessary)
- Certification of vaccination (if necessary)
- Documentation for travel by minors (if necessary)

CLOTHING/FOOTWEAR FOR FIELDWORK

- Earthwatch T-shirt
- Gore-Tex rain gear tops and bottoms*
- Gore-Tex gaiters (Outdoor Research brand is good)*
- Completely waterproof heavy-duty, all-leather backpacking boots (a couple good brands to consider are Lowa, Asolo, Zamberlan, and La Sportiva)*
- For track transects (May teams), we recommend mountaineering boots with a rubber toe, for greater stability on the wet, rough, uneven terrain typical at this time of year (See www.lowaboos.com/mens/backpacking-hunting/baffin-pro; www.zamberlanusa.com/catalog/index.php?lang=en&pg=prod&idprod=211&idcat=1). However, heavy-duty, all-leather backpacking boots will do.
- Clothing suitable for keeping you comfortable in 20–90°F temperatures (lots of layers)*
- Field clothes that will not tear easily during bushwhacking*
- Wide brimmed hat for sun protection

CLOTHING/FOOTWEAR FOR LEISURE

- At least one set of clothing to keep clean for end of expedition
- Comfortable shoes to change into after conducting field work

FIELD SUPPLIES

- 35 liter capacity (minimum) backpack for all-day use in the field that are well-structured and comfortable to wear all day (a couple good brands are Osprey and Gregory)*(NOTE: a 50 liter pack is recommended for May team, to allow for extra winter gear/layers).
- Hydration system or water bottles sufficient to hold two liters of water*
- Binoculars*
- Sunscreen lotion with SPF 30 or higher*
- Insect repellent*
- Personal first aid kit (e.g., anti-diarrhea pills, antibiotics, antiseptic, itch-relief, pain reliever, bandages, blister covers, etc.) and medications *
- Sunglasses

BEDDING AND BATHING

- Sleeping bag*
- Small travel pillow and pillowcase
- Bath towel(s)*

PERSONAL SUPPLIES

- Personal toiletries (biodegradable soaps and shampoos are encouraged)
- Antibacterial wipes or lotion (good for cleaning hands while in the field)
- Spending money

OPTIONAL ITEMS

- Laptop for personal use
- Compass with a mirror
- Pocket knife (remember to pack in your checked luggage!)
- Field guides to plants and animal tracks
- Camera, film or memory card(s), extra camera battery
- Hardware for sharing digital photographs at the end of the expedition
- Dry bag or plastic sealable bags (e.g. Ziploc) to protect equipment like cameras from dust, humidity, and water
- Books, games, art supplies, etc. for free time
- Earplugs for light sleepers

NOTE: Do not bring more luggage than you can carry and handle on your own. If traveling by air and checking your luggage, we advise you to pack an extra set of field clothing and personal essentials in your carry-on bag in case your luggage is lost or delayed.



PROJECT STAFF

YOUR RESOURCES IN THE FIELD



NOTE: Staff schedules are subject to change.

DR. CRISTINA EISENBERG, Principal Investigator, is the Chief Scientist at Earthwatch (earthwatch.org/scientific-research/our-scientists/cristina-eisenberg) and faculty at Oregon State University and Michigan Technological University. For more than a decade she's studied how wolves affect ecosystems. A Smithsonian Research Associate and Boone and Crockett Club professional member, she serves on the editorial board of the Ecological Society of America and Oregon State University and has written two books: *The Carnivore Way*, *The Wolf's Tooth*, and the forthcoming *Taking the Heat: Wildlife, Food Webs, and Extinction in a Warming World*. **TEAMS 1, 4, 7 and 13.**



DR. CURTIS EDSON, Co-PI, is a retired Army Engineer Officer with a passion for the environment and geospatial information science. He has served in most regions of the United States and globally in Honduras, Korea, Germany, Bosnia-Herzegovina and Afghanistan. The last several years of his Army career was spent teaching geospatial information science at the United States Military Academy, West Point. He is currently an assistant professor specializing in remote sensing in the School of Forest Resources and Environmental Science at Michigan Technological University. **Teams TBD.**



DR. DAVID HIBBS, Co-PI, has interests focus in forest community ecology that extend into the application of ecology: silviculture. He has worked in both tropical and temperate forest systems. Current research is focused on ecological processes of riparian forests, ecology of post-fire forest dynamics, and management of red alder (Hardwood Silviculture Cooperative). He has had a finger into projects on scale-effects of plant diversity controls, food webs in riparian systems, and the autecology of Willamette Valley savanna tree species. **One team, TBD.**



CHRIS ANDERSON, LEAD FIELD TECHNICIAN, is currently a master's student at Michigan Technological University. He is studying the geospatial impacts of fire in aspen communities. He is interested in trophic cascades and predator-prey interactions in large mammal communities, and how these relationships influence whole ecosystems. He also enjoys food and wine. Before he began studying biology he worked in the restaurant industry. You could say his three loves are ecology, the outdoors, and food/wine.

TEAMS 1-12



ELLIOT FOX, SENIOR FIELD TECHNICIAN, is a member of the Kainai First Nation (Blood Tribe—Blackfoot Confederacy) from the Blood Reserve in southwest Alberta, Canada and is currently completing a bachelor of science at the University of Lethbridge in Environmental Science. His previous work involved monitoring terrestrial and aquatic keystone predators—wolves and bull trout—in southwest Alberta where wolf populations were absent and recently recolonized after 40 years and bull trout populations were threatened and declining. Elliot is interested in the restoration and monitoring of trophic cascades in the Crown of the Continent Ecosystem, assisted recently with recolonized wolf packs and fire and the impacts on the larger natural landscape. He is concerned about climate change and its effects on the Crown Ecosystem and elsewhere and hopes to assist with future landscape monitoring and management adaptations. Elliot enjoys spending time with his family in and around traditional Blackfoot Territory, the Crown Ecosystem and travelling; hunting and fishing; and advocating for the return of bison to the natural landscape and the sustainment of the Blackfoot culture and language. **ALL TEAMS.**



PROJECT STAFF (CONT.)

YOUR RESOURCES IN THE FIELD



DIANDRA (DJ) BRUISED HEAD, FIELD TECHNICIAN, was born and raised on the Blood Reserve in Southern Alberta, growing up as part of the Blackfoot culture. She has completed the Renewable Resource Management program at Lethbridge College, and is pursuing further post-secondary in Environmental Sciences. DJ has worked as a manager with the Aboriginal Junior Forest Rangers in Northern Alberta and on her own reserve, and worked as a forestry technician in Northern Manitoba. She is very interested in Traditional Ecological Knowledge and studying the dynamic relationships of nature. DJ enjoys playing hockey, hiking, reading, knitting, and long romantic walks along the Old Man River identifying vegetation and animals. **ALL TEAMS**



MONICA BARTHA, FIELD TECHNICIAN, was born and raised in the Northern Rocky Mountains, She has a range of environmental experience with a focus on wildlife and vegetation management. She has been involved in various wildlife habitat conservation efforts from working with wolves and teaching about their importance in an ecological setting to completing various Species at Risk surveys such as Ord's Kangaroo Rat surveys at the darkest time of the early morning hours. A Lethbridge College Renewable Resource Management alumnus, she is currently pursuing a BSc. She has worked in consulting, and for a variety of regulatory and conservation organization. When not working, Monica is found exploring the outdoors. **ALL TEAMS.**



HANNAH KIRKLAND, FIELD TECHNICIAN, has experience in a range of conservation areas, from biodiversity surveys and socio-economic interviews in the Peruvian Amazon to primate rehabilitation in Costa Rica. She also has experience in fundraising and communication. She holds a Master's degree in Conservation Biology from the Durrell Institute of Conservation and Ecology, Kent University, UK. Her thesis was: Game species survival in an agricultural landscape: the case of the Kukama-Kukamilla of the Peruvian Amazon. **Teams 1-3.**



MAIRE KIRKLAND, FIELD TECHNICIAN, has a master's degree in Conservation from University College London. She has conducted fieldwork in Peruvian and Mexican rainforests, exploring the effects of socio-economic, climatic and environmental changes on wildlife populations and local indigenous livelihoods. She is now carrying out her PhD at Durham University on the drivers of nature-based tourism. **Teams 1-2.**



RECOMMENDED READING

YOUR RESOURCES AT HOME

RESOURCES

ARTICLES

- Eisenberg, C., D. E. Hibbs, W. J. Ripple, and H. Salwasser. 2014. Context dependence of elk vigilance and wolf predation risk. *Canadian Journal of Zoology* 92:727-736.
- Eisenberg, C., S. T. Seager, and D. E. Hibbs. 2013. Wolf, elk, and aspen food web relationships: Context and complexity. *Forest Ecology and Management* 299:70-80.
- Sanderson, E. W., et al. 2008. The ecological future of the North American bison: conceiving long-term, large-scale conservation in wildlife. *Conservation Biology* 22(2):252-265.
- Romme, W. H., M. G. Turner, L.L. Wallace, and J.S. Walker. 1995. Aspen, elk, and fire in the northern range of Yellowstone National Park. *Ecology* 76:2097-2106.
- McComb, Brenda, et al. 2010. *Monitoring Wildlife Populations and their Habitats: A Practitioner's Guide*. CRC Press, New York, NY.
- Peacock, Doug. 1996. *Grizzly Years: In Search of the American Wilderness*. Holt, New York.

PROJECT-RELATED WEBSITES

- Cristina Eisenberg's website: cristinaeisenberg.com/
- Cristina Eisenberg's Huffington Post blog: huffingtonpost.com/cristina-eisenberg/

EARTHWATCH SOCIAL MEDIA

FACEBOOK: [facebook.com/Earthwatch](https://www.facebook.com/Earthwatch)

TWITTER: twitter.com/earthwatch_org

INSTAGRAM: [instagram.com/earthwatch](https://www.instagram.com/earthwatch)

BLOG: earthwatchunlocked.wordpress.com

YOUTUBE: [youtube.com/earthwatchinstitute](https://www.youtube.com/earthwatchinstitute)

BOOKS

- Baker, W. L. 2009. *Fire Ecology in Rocky Mountain Landscapes*. Island Press, Washington, DC.
- Eisenberg, Cristina. 2010. *The Wolf's Tooth: Keystone Predators, Trophic Cascades, and Biodiversity*. Island Press, Washington, DC.
- Eisenberg, Cristina, and Curtis Edson 2014. *The Carnivore Way: Coexisting with and Conserving North America's Carnivores*. Island Press, Washington, DC.
- McComb, Brenda. 2015. *Wildlife Management: Concepts and Applications in Forestry*. Second edition. CRC Press, New York, NY.



LITERATURE CITED

LITERATURE

- Brown, J. S., W. Laundré, and M. Gurung. 1999. The ecology of fear: Optimal foraging game theory and trophic interactions. *Journal of Mammalogy* 80(2):385-399
- Eisenberg, C., S. T. Seager, and D. E. Hibbs. 2013. Wolf, elk, and aspen food web relationships: Context and complexity. *Forest Ecology and Management* 299:70-80.
- Eisenberg, C., D. E. Hibbs, W. J. Ripple, and H. Salwasser. 2014. Context dependence of elk vigilance and wolf predation risk. *Canadian Journal of Zoology* 92:727-736.
- Estes, J. A., J. A. Terborgh, J. S. Brashares, M. E. Power, J. Berger, W. J. Bond, S. R. Carpenter, T. E. Essington, R. D. Holt, J. B. C. Jackson, R. J. Marquis, L. Oksanen, T. Oksanen, R. T. 2011. Trophic downgrading of planet Earth. *science*, 333(6040): 301-306.
- Leopold, A., L. K. Sowls, and D. L. Spencer. 1947. A survey of over-populated deer ranges in the United States. *Journal of Wildlife Management* 11(2):162-183.
- Paine, R. T. 1980. Food webs: Linkage, interaction strength and community infrastructure. *Journal of Animal Ecology* 49:667-685.
- Ripple, W. J., and Beschta, R. L. 2007. Restoring Yellowstone's aspen with wolves. *Ecological Conservation* 138:514-519.
- Smith, D. W., R. O. Peterson, and D. B. Houston. 2003. Yellowstone after wolves. *Bioscience* 53(4): 330-340.
- Swanson, M. E., J. F. Franklin, R. L. Beschta, C. M. Crisafulli, D. A. DellaSala, R. L. Hutto, D. B. Lindenmayer, and F. J. Swanson. 2010. The forgotten stage of forest succession: Early successional ecosystems on forest sites. *Frontiers in Ecology* 9:117-125.



EMERGENCY NUMBERS

AROUND-THE-CLOCK SUPPORT



EARTHWATCH'S 24-HOUR EMERGENCY HOTLINE

Call Earthwatch's 24-hour on-call duty officer in the U.S.:

+1 (978) 461.0081

+1 (800) 776.0188 (toll-free for calls placed from within the U.S.)

After business hours, leave a message with our live answering service. State that you have an emergency and give the name of your expedition, your name, the location from which you are calling, and if possible, a phone number where you can be reached. An Earthwatch staff member will respond to your call within one hour.

TRAVEL ASSISTANCE PROVIDER: HEALIX INTERNATIONAL

+44.20.3667.8991 (collect calls and reverse charges accepted)

U.S. TOLL FREE: +1.877.759.3917

U.K. FREE PHONE: 0.800.19.5180

E-MAIL: earthwatch@healix.com

You may contact Healix International at any time. They can assist in the event of a medical or evacuation emergency or for routine medical and travel advice, such as advice on visas and vaccine requirements.

FOR VOLUNTEERS BOOKED THROUGH THE EARTHWATCH AUSTRALIA OFFICE:

Earthwatch Australia 24-Hour Emergency Helpline

+61.0.3.8508.5537



MESSAGE FROM EARTHWATCH

DEAR EARTHWATCHER,

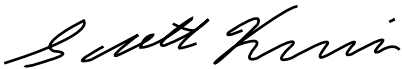
Thank you for joining this expedition! We greatly appreciate your decision to contribute to hands-on environmental science and conservation. It is volunteers like you who fuel our mission and inspire our work.

While at Earthwatch, I've had the opportunity to field on a few expeditions, most recently in Kenya with one of my daughters. Each expedition has touched me deeply, and made me proud to be able to roll up my sleeves alongside my fellow volunteers and contribute to such meaningful work.

As an Earthwatch volunteer, you have the opportunity to create positive change. And while you're out in the field working toward that change, we are committed to caring for your safety. Although risk is an inherent part of the environments in which we work, we've been providing volunteer field experiences with careful risk management and diligent planning for nearly 45 years. You're in good hands.

If you have questions as you prepare for your expedition, we encourage you to contact your Earthwatch office. Thank you for your support, and enjoy your expedition!

Sincerely,

A handwritten signature in black ink, reading "Scott Kania". The signature is fluid and cursive, with the first name "Scott" and last name "Kania" clearly legible.

Scott Kania
President and CEO, Earthwatch



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