

**Fire Ecology Lab
Field Safety Document
May 20, 2020**

Activities

Field work is essential for our research, but safety is our first priority. Potential dangers include vehicle accidents, slips, trips and falls, dehydration, sun exposure, temperature extremes, lightning and other severe weather, machinery hazards, hunting season, falling trees or tree parts, vertebrates (bears and mountain lions), invertebrates (snakes, bees, spiders), and fire. Field activities require bushwhacking through brush, climbing over large down woody debris, hammering rebar, wiring tags, and using sharp increment borers to core trees.

New in 2020 We have added new protocols this year to avoid transmission of Covid-19 (p. 4).

Comfort Level

No person should participate in any activity that makes them feel personally unsafe. If circumstances or activities exceed what participants believe they can safely accomplish, they should “sit this one out” after consulting with the project leaders.

Safety Equipment

At all sites, sturdy footwear must be worn – no open toe shoes of any kind. Hard hats are required in areas with high snag densities, or in forested areas during windy conditions. Hats and glasses are recommended at all times to avoid eye injury from shrubs and small trees. Gloves are always a good idea. Long pants must be worn at all times, and long sleeved shirts are recommended for protection. Your ears are also important for safety – no personal stereos or earpieces that would block your hearing.

Mandatory Supplies

Every day, every person should carry:

- sufficient water, sufficient food, a rain jacket, and a warm hat

Each team will carry:

- a GPS unit: the location of the truck should be marked on the GPS every day
- an inReach communication device
- a compass and a detailed map of the study area

Emergency

If you have cell service, dial 911. An emergency contact sheet should also be available to each crew. See inReach instructions for emergency communications in areas without cell service.

First Aid

A first aid kit should be carried in the field. Participants taking any prescription medications, prone to allergies, or with any other medical issues should indicate that before field work starts.

Communication

Crews will be equipped with inReach communication devices. Crews **must** check in every night with a designated person using these devices.

Driving

Vehicle accidents can occur from driver fatigue or error, roadway or vehicle factors or driver impairment. Obey speed limits at all times. Engage 4WD when turning onto muddy dirt roads. Disengage 4WD when turning onto paved roads. When parking, back into a parking spot so that the vehicle is pointing toward the way out in case of emergency. If a driver is showing signs of stress or fatigue, that person should switch out with another driver.

Slips, Trips and Falls

Take care when walking: the footing is often loose. Do not jump off logs or rocks – carefully place feet on the ground so as to avoid hidden holes or irregularities. Walk around obstacles when necessary. We will be traveling in steep terrain. Be aware of your footing and step cautiously. Be aware of those around you and be courteous.

Dehydration

To prevent dehydration, fieldwork participants should consume at least three to four liters of water per day. When working strenuously, or in extreme heat, electrolyte beverages should be consumed in addition to water. When working in remote areas, pre-planning for water supply and sources is crucial. Researchers should also avoid excess consumption of caffeinated beverages, and take frequent breaks to avoid dehydration. Symptoms of dehydration include increased thirst, dry mouth, flushed skin, dizziness, headache, weakness, muscle cramps and dark urine. Additionally, avoid excessive water intake, which may dilute blood sodium and lead to **hyponatremia**, or water intoxication. Symptoms of hyponatremia include headache, fatigue, swelling, nausea and or/vomiting, and clear urine output. To treat, halt all fluid intake, rest until symptoms subside, and consider eating salty snacks.

Sun Exposure

Outdoor work, especially in desert and high altitude regions, can result in extreme sun exposure and sunburn. Wear brimmed hats and cover exposed skin with light colored clothing and apply sun block with a sun protection factor (spf) of 30 or greater to minimize sunburn risk.

Temperature extremes

When conducting field research, high and low temperatures should be researched and proper clothing selected. **Heat exhaustion** symptoms: fatigue, excessive thirst, heavy sweating, cool, clammy skin. Prevention: hydrate, acclimate to heat gradually, take frequent breaks. First Aid: cool patient, treat for shock, slowly replace fluids with water and/or electrolytes. **Heat stroke** symptoms: exhaustion, light-headedness, bright red, warm skin. Prevention: hydrate, acclimate to heat gradually, take frequent breaks. First Aid: cool patient at once, replace fluids, seek medical attention immediately. **Frostbite** symptoms: waxy, whitish numb skin, swelling, itching, burning and deep pain as skin warms. Prevention: dress in layers, cover all exposed skin and extremities with warm clothing. First Aid: slowly warm the affected areas (do not rub), seek medical attention immediately. **Hypothermia** symptoms: shivering, numbness, slurred speech, excessive fatigue. Prevention: dress in layers, wear appropriate clothing, avoid getting damp from perspiration. First Aid: remove cold, wet clothes, put on dry clothes, use blanket or skin-to-skin contact, drink warm liquids, seek medical attention immediately.

Lightning and other severe weather

Severe weather can result in physical injury or death. To the extent possible, follow local weather forecasts. Be aware of special weather concerns and bring appropriate equipment to deal with severe weather. In the event of snow storms, heavy rain, lightning, tornadoes or hurricanes, seek shelter immediately.

Tools

To age trees and look for disturbance, age and climate-related growth trends, we take cores from trees using **increment borers**. The borers are very sharp and must be handled carefully to prevent injury and damage to the borers. Never walk with the borer out of its handle. Use care when trying to “unstick” a stuck borer. The use of **chainsaws** results in thousands of injuries and deaths annually in the United States. Training is required before operating a chainsaw.

Hunting season

A hunting accident can result in serious injury or death. Be sure to avoid hunting areas during hunting season. Wear appropriately colored safety clothing when working in areas frequented by hunters, and avoid behaviors that could be mistaken for animal movements such as using foliage for a screen.

Falling trees or tree parts

Be aware of your surroundings. Look up and take note of dead branches, leaning trees, or snags in your vicinity. Don't work directly below such hazards. Leave an area of high snag density when winds are active.

Vertebrates (bears, mountain lions)

Bears: To avoid encounters, never approach a bear or bear cub. Wear a bell, or other noisemaker while working in bear country. Keep food and fragrant items out of sleeping areas and in bear boxes or bear canisters. Stay away from bears' natural food sources. If you encounter a bear, do not run. Move slowly and speak in a low, soft voice. If attacked, assume the fetal position and play dead, protecting your head.

Mountain lions: To avoid a mountain lion encounter, avoid activities during times when mountain lions are most active: dawn, dusk, at night. Avoid walking near dense growth, or rock outcroppings. Be aware of the surrounding area above and behind you. In the event of a mountain lion encounter, do not run. Make yourself appear larger by waving your arms (and if possible, jacket) above your head. Use a loud voice, throw sticks and rocks and look the animal in the eye in an attempt to scare it away. If attacked, protect your head and neck and use your thumbs to poke the animal in the eyes.

Invertebrates (snakes, spiders, bees)

Snakes: To avoid snake encounters, walk in open areas, wear heavy boots and use a walking stick to disturb brush in front of you. In the event you are bitten, let the wound bleed freely for 30 seconds. Keep calm and keep the area immobilized at heart level. Seek medical attention immediately, phoning ahead if possible.

Spiders: In North America, the Black Widow and Brown Recluse are the most common venomous spiders encountered. To avoid contact, use caution when disturbing rock piles, logs, bark, gardens, outdoor privies and old buildings. Wear gloves, and shake out bedding and

clothing before use. If bitten, clean the wound, and keep area immobilized at heart level. Seek medical attention immediately.

Bees: Fieldwork participants with known bee allergies should make co-workers aware of their allergy and bring medication. To avoid contact with bees and wasps, keep scented drinks and food covered. Wear shoes to avoid stings to the feet. Avoid wearing bright colors, floral prints and perfume. Move slowly or stand still.

Fire

- No campfires or warming fires except in designated sites with supervisor's permission.
- It is your responsibility to be aware of current agency fire restrictions at any field site.
- Use great caution with any kind of matches or combustibles (lanterns, etc.).
- Do not use fire to dispose of trash or toilet paper. Pack toilet paper out of backcountry sites.
- Back into parking spot so your vehicle is facing toward the way out.
- Do not part a hot vehicle in dead grass.
- Be familiar with the roads and evacuation routes in the area.
- Glance at the horizon often to check for columns of smoke. If you see smoke, quickly but safely evacuate the area.

Covid-19 Precautions

Personnel: Twice per day the temperature of each crew member will be taken to ensure they do not have an elevated body temperature. We will avoid taking temperature readings immediately after crew members have physically exerted themselves in the hot sun. Any researcher who exhibits a fever or other symptoms of Covid-19 will immediately communicate this to the rest of the team, research will be halted, and the drive back to Logan will begin as soon as possible. Upon arrival, self-quarantine will be required until the person is healthy.

Social distancing of 6-10 feet is recommended at all times between crew members. If 6-10 feet is not possible (for example in the truck), masks must be worn.

Equipment will be assigned to each crew member for the entirety of one trip. This means each piece of equipment (for example GPS, compass, camera) will be touched by only one person per trip.

Clorox wipes and hand sanitizer will be available for the crew members to sanitize their belongings and their hands. In addition, a hand washing station will be set up at camp sites. Crew members will be required to wash their hands before preparing food. For lunches occurring in the field, crew members should use hand sanitizer.

Vehicle: If more than one person is in a vehicle, everyone must wear masks. Clorox wipes will be available in the truck and should be used regularly on surfaces touched by crew members: steering wheel, door handles, window controls, radio buttons, etc. To minimize the spread of illness, crew members should not frequently switch seats in the truck. However, because driving while sleepy is also dangerous, it may be necessary to change positions occasionally. If this is necessary, all surfaces should be wiped down with Clorox wipes at the transition. When a gas refill is necessary, crew members will wear masks when out of the vehicle, stay >6 feet from other people, and sanitize the gas pump, the truck's gas cap, and the truck door handles.

Accommodations: Each crew member will supply her or his own tent and camping equipment, not to be shared and to be spaced at an appropriate distance from other tents each night.

Food: Each person will individually purchase her/his own food prior to leaving on a trip. We will supply a separate food storage box for each person to minimize contact. We will also ask each person to cook and eat separately, using separate kitchen equipment and eating utensils.

Unforeseen Circumstances: It is possible that nothing will go awry this summer. However, it is also possible that an unplanned event will occur, such as an injury in the field or a flat tire that will need to be repaired. If our crew is required to come into close contact with each other or with someone outside of the crew due to one of these unplanned events, they will have the supplies necessary to keep themselves as safe as possible, including masks, gloves, and cleaning supplies.