**Bates IACUC Best Practices for Field Studies Involving Vertebrates**

*Updated: February 2025\**

\*This manual is intended to serve as best practices/guidance on how to safely work in the field. These best practices are subject to change and develop over time. Updates to this manual will be communicated. When leading a field study at Bates College, it is the responsibility of the trip leader to be familiar with the most recent version of this manual. This manual can be found on the Bates College Vivarium website and in the "IACUC Forms for Faculty" google drive folder all PIs should have access to.

\*This manual covers **ONLY** field studies that do not have direct contact with any wild animals. It was developed by the IACUC for field wok involving vertebrate species; it is not meant to encompass every project that may see members of Bates College going out into the field. For ACUPs that propose direct contact with wild animals, PIs must submit an additional plan to the IACUC describing how safety will be maintained in those scenarios.

\*All field studies should follow all Bates College Title IX and Civil Rights Compliance Office policies.

Contents

Bears

Insect Exposure

Communication Device Guidance

Evacuation Guidance

Field Kitchens

First-Aid Guidance

Leave No Trace

Lightning

Lost Person Guidance

PFD’s

Water Treatment Guidance

Hunter Orange

2

2

4

4

5

5

7

8

8

10

10

11

Bears

*“In Maine, black bears are found nearly statewide, but are most common in northern and eastern Maine”- ME Dept. Inland Fisheries & Wildlife*

Aim to prevent bear encounters by hiking in groups and staying together. When camping, ensure the kitchen, food storage, and tents are all >100 yards from each other. All food in addition to lotions, toiletries, and other scented items should be stored in a locked vehicle, a bear safe container, or suspended from a tree >12 ft. from the ground, 6ft from the limb, 6ft from the trunk.

**In the event of a bear encounter**: do NOT approach a bear. Back away slowly, staying together with others and refrain from threatening the bear. If the bear approaches you make noise, back away slowly, and make yourself appear larger. If the bear charges you, stand your ground and remain calm. If the bear attacks, fight back using anything within reach (knives, rocks, your backpack etc.)

Insect Exposure

When working outside, there is potential for insect exposure (ex: mosquitoes, ticks), which may lead to disease. Participants should take steps to reduce their exposure (wearing light colored, loose long sleeves and pants, tucking your pants into your socks, using EPA registered insect repellent, etc) and be on the lookout for any signs of bites.

Mosquitoes:

Mosquito bites may result in a small, raised bump that may have a dark spot in the center. Mosquitoes are most active at dusk or dawn, and during the warmer months (starting in April and through the fall). If conditions are especially wet, or you are working near bodies of standing water, there is a high chance of mosquitoes also being present.

Some mosquitos in Maine may carry diseases that may make people ill such as Eastern Equine Encephalitis (EEE), West Nile Virus (WNV) and Jamestown Canyon Virus (JCV). Mosquito-borne illnesses are rare in humans in Maine, but can range in severity. Symptoms may include flu-like symptoms, severe headaches, behavior changes and/or serious drowsiness. If you experience any of the above symptoms, please reach out to a healthcare provider.

Ticks:

Tick bites look similar to mosquito bites, but may also come with redness around the bite that may be 1-2 inches in diameter. Ticks are most active during the warmer months, so it is especially important to be aware of them during this time. Ticks do not always attach immediately, so after returning indoors it is important to conduct a thorough check, especially in areas such as behind your knees, your armpits and in your hair.

Deer ticks (pictured to the [right](https://mhir.org/?page_id=3618)) are considered more dangerous than dog ticks, due to the fact they are more likely to cause disease. In Maine, dog ticks are not known to carry pathogens that cause disease.

If you do find a tick attached, remove it using the following steps:

1. Use clean, fine-tipped tweezers to grasp the tick as close to the skin as possible.
2. Pull upward with steady and even pressure. Take care not to twist or jerk the tick, as this can cause the mouth parts to break off and remain in the tissue. If the mouth parts break off and remain in the skin, remove them if possible with tweezers. If they cannot be easily removed, leave it alone and let the skin heal.
3. After removing the tick, thoroughly clean the bite area and your hands with rubbing alcohol or soap and water.
4. Never crush a tick with your fingers. Dispose of it by putting it in alcohol, placing it in a sealed bag/container, wrapping it tightly in tape or flushing it down the toilet.

If a tick bite is also accompanied by a bullseye rash, this is can be an indicator of disease. The most commonly reported tick-borne diseases in Maine include Lyme disease, anaplasmosis and babesiosis. Transmission of Lyme disease usually starts between 24-72 hours of tick attachment; transmission of anaplasmosis may take less than 24 hours of attachment; and babesiosis transmission may take less than 36 hours and increases with attachment time. Signs and symptoms of a tick-borne disease usually include flu-like symptoms such as fever, headache, chills, and muscle pains. If you have had a tick attached and experience these symptoms, please reach out to a healthcare provider. Let them know that you were recently bit by a tick, where the bite occurred and where it happened.

Communication Device Guidance:

Backcountry:

Leaders of backcountry trips must bring at least one cell phone (the number for which should be listed on the trip itinerary) as well as one backup method. Backups could be an additional phone that is kept off to conserve battery or a portable charger. Areas are considered backcountry when there is no to very limited interaction with modern infrastructure (roads, buildings, running water, electricity, stores, etc). Backcountry indicates a setting that is remote, undeveloped, and difficult to access.

Note: The capabilities of smart-phones in the backcountry have changed immensely in recent years and will continue to advance. Smart-phones can be a powerful tool for offline maps, recording medical treatment, and communication. The biggest downsides to smart-phones are the limits of battery life and their fragile nature, and as such they should never be used as the only source of critical information (i.e. maps, emergency contact information).

Frontcountry:

When traveling in areas with reasonably reliable cell-phone service and access to charging, all trips must bring at least one cell phone. The phone number of the person in charge must be listed on the trip itinerary and emergency contact information should still be taken in hard copy. Frontcountry describes an area that is relatively easy to access, has a higher number of visitors, and allows for access to modern infrastructure.

Evacuation Guidance

In the event of a medical emergency that threatens life or limb (red level), the trip leader with

the highest level of medical training should follow rapid\* evacuation guidance according to their

training. In the event of non-emergent (yellow level) medical evacuations, decisions will be made in coordination with Bates Health Services and other professional staff as applicable.

Mental Health/Behavioral evacuation decisions can be complex and should consider, among other things, the following:

* Is the person a danger to themselves or others?
* Is the person responsive to feedback about their behavior and working towards improvement?
* Are the leaders able to provide appropriate support to the person while still responsibly managing the rest of the group?
* Is the behavior having a significant negative impact on the rest of the group?

\*No evacuation EVER warrants putting more members of the group at risk. In the wilderness medicine context, a rapid evacuation may still take hours if not days.

Field Kitchens

The most relevant hazards in a field kitchen are knives being used on improper cutting surfaces, boiling water, and fire. The following practices can help minimize those risks, but it is important to always stay alert when in the kitchen. It is common for the kitchen to become a social place, making it even more important to set clear zones and boundaries for cooking vs. socializing.

* Never light a stove inside a tent. Use of a tarp for providing shelter from rain is OK, as long as there is reasonable ventilation to avoid Carbon Monoxide poisoning.
* Stoves should be set up on a level, steady surface.
* Establish a “Ring of fire” of at least a 3 ft radius around stoves that only the kitchen crew is allowed in to prevent knocking over stoves or spilling boiling water.
* Keep all fuel that is not being used outside of the ring of fire.
* Never leave lit stove unattended.
* Never cut against your body or into your hand, cut on a cutting board (best for your knives) or on a flat surface in front of you.
* Spilled boiling water is one of the most common kitchen hazards and as such cooks should always be extra cautious around boiling water.
	+ Use a “dip cup” when transferring boiling water into different vessels to prevent burns from a spilled cup.
	+ Do not pour boiling water into any container being held by a person.
	+ Avoid filling pots to the very top.
	+ Test pot-grip hold before committing to lifting a pot of water.
* Maintain an active position while cooking (i.e. avoid sitting cross-legged in front of a pot of boiling water). Cooks may be attending to stoves for a long period of time, so this position can change as long as cooks remain attentive and alert.
	+ The goal is to be able to react quickly in case of a spill or fire, accordingly cooks should ensure they have room to move in case of a quick reaction.

First Aid Guidance

For trips on campus, in urban areas (e.g. in Lewiston), it is encouraged but not required that leaders hold an active WFA (Wilderness First Aid) certification or higher. All students, leaders or participants, may only provide medical care to the level of their individual wilderness medical training. The primary caregiver in any medical care should be the person with the highest level of training.

Allergies & EpiPen’s:

For participants in field work who have allergies (especially environmental allergies such as bees, grass, etc.), it is that participant's responsibility to carry their own unexpired EpiPen.

Safe Needle Storage:

If a field study participant needs to carry sharps on their person for any medical reason (ex: Type 1 Diabetes), sharps should be stored securely in a closed container, such as a capped soda bottle.

Heat Illness:

When working in the field, participants may be exposed to a variety of environments and

temperatures. Heat emergencies have three stages- heat cramps, heat exhaustion and heat stroke. Heat emergencies can be reduced or prevented by maintaining hydration, wearing light colored, loose and lightweight clothing on hot days, and avoiding strenuous activity during the hottest times of the day (3 PM- 6 PM). Participants should take frequent breaks and rest in cool, shaded areas, and address any warning signs of heat illness before they progress to a more serious stage.

Heat cramps are the mildest form of illness and consist of painful muscle cramps and spasms that occur most often during or after intense exercise and sweating in high heat conditions. If a participant is experiencing heat cramps, they should move to a cool place and rest, place cool cloths on skin and fan skin, drink cool sports drinks containing electrolytes and sugar, and stretch cramped muscles slowly and gently.

Heat exhaustion is the next stage, and more severe than heat cramps and results from a loss of water and electrolytes in the body. It occurs in conditions of extreme heat and excessive sweating without adequate replacement of fluids and electrolytes. Heat exhaustion occurs when the body is unable to cool itself properly, and, if left untreated, can progress to heat stroke. Symptoms include muscle cramps, pale and moist skin, a fever, nausea/vomiting, diarrhea, headache, fatigue, weakness and anxiety. The treatment is the same as for heat cramps, but if a participant has no improvement or is unable to take in fluids, they should be given immediate medical attention, as it may be necessary for them to be given IV fluids.

Heat stroke is the last and most severe stage of heat illness, and occurs when the body’s heat regulatory system is completely overwhelmed by excessive heat. Symptoms include warm and dry skin, fever, rapid heart rate, loss of appetite, nausea/vomiting, headache, fatigue, confusion, agitation, lethargy, and stupor. Seizures and/or a coma may occur, and death is possible. **Heat stroke is a life-threatening emergency and requires immediate medical attention. If you suspect a participant has heat stroke, emergency medical services should be contacted immediately**. Participants should be moved immediately to a cool place to rest, should drink cool fluids only if they are alert and able, excess clothes should be removed and skin should be drenched in cool water. Ice bags should be placed on the armpits and groin area if available.

Hypothermia:

When working in the field, participants may be exposed to a variety of environments and

temperatures. Hypothermia can occur after exposure to cold, wet or windy conditions. When you’re exposed to cold conditions, your body must spend energy to keep you warm; after extended periods of time, your energy stores are depleted and you can no longer maintain your internal body temperature (98.6 F, on average). Most cases occur at very cold temperatures. But hypothermia can occur even in temperatures above 40 F if certain environmental conditions are met. This includes becoming chilled from sweat, rain or submersion in cold water. These conditions can cause a person’s body to lose more heat than it can generate. Hypothermia has 3 stages- mild, moderate and severe.

Hypothermia risks can be reduced by wearing appropriate outerwear when working outside, moving around when you feel cold, eating and drinking warm food and beverages, avoiding substances that are known to contribute to hypothermia (alcohol and certain medications), and taking breaks to warm up whenever spending time outside.

Mild hypothermia indicates your body temperature is between 95 F and 89.6 F, and signs include shivering or chattering teeth, exhaustion, clumsiness, sleepiness, weak pulse, fast heart rate, rapid breathing, pale skin color, confusion, excessive urination and trouble speaking.

Moderate hypothermia indicates your body temperature is between 89.6 F and 82.4 F. Signs include a slowing in breathing, blood pressure and heart rate, abnormal heart rate, slurred speech, decline in mental function, hallucinations, decreased shivering, a bluish color to the skin, increased muscle stiffness, dilated pupils, weakened reflexes and loss of consciousness.

For mild and moderate hypothermia, a person should be moved to a warm and dry location, wet clothing should be removed and replaced with dry clothing, and they should be covered as much as possible to conserve heat. If external heat sources are available (heat lamp or hot pack), they should be applied to skin, through a barrier (cloth, towel, etc). If hypothermia reaches the moderate stage, medical services should be contacted.

Severe hypothermia indicates your body temperature is below 82.4 F. Signs include a loss of shivering, low blood pressure, fluid in the lungs, no reflexes, complete muscle stiffness, loss of voluntary motion, low urine output, cardiac arrest, a coma that may mimic death, and death. If a participant has severe hypothermia it is a serious medical emergency, and you should contact healthcare services immediately, as they may need to administer warm fluids and warm oxygen.

Leave No Trace

All participants in Bates Outdoor Programs (including ACUPs that see researchers and/or students going out into the field) are expected to adhere to Leave No Trace Principles of low impact camping both in and out of wilderness settings. Large groups in particular are expected to be conscious of the impact they are having on not only the natural resources around them but on other users of public lands as well.

Lightning

Emphasis should be placed on minimizing exposure in the event of lightning. Checking forecasts before leaving for a trip, monitoring changing weather conditions, and using sensory clues like cloud development and thunder can all assist in the management of potential lightning danger.

In case of electrical storm:

* In urban areas seek safety in buildings (not small sheds) and vehicles.
* Outdoors there are places with greater or lesser risk, but there is no safe place in a lightning storm.
	+ Know the local weather patterns.
	+ Plan wisely to avoid being exposed in dangerous places.
	+ Pick campsites with prevention in mind; a uniform stand of trees or low rolling hills is optimal.
	+ Know when to seek a better location.
	+ Monitor approaching storms. Lightning can strike miles ahead or behind a storm.
	+ Avoid dangerous locations.
		- Places higher than surrounding terrain: Peaks, ridges, hills.
		- Isolated tall objects such as lone trees.
		- Open terrain such as meadows.
		- Large bodies of water, especially the shoreline.
		- Shallow overhangs and caves.
		- Long conductors: Pipes, wires, wire fences, wet ropes.
	+ Seek uniform cover: Trees about the same height and rolling hills,
	+ Insulate yourself from ground current, stay low (lightning position), disperse a group to limit casualties.

Lost Person Guidance

**Prevention:**

* Teach [staying found](https://outdoorblueprint.com/read/staying-found/) on the first day of a trip
* Avoid solo travel
* If for some reason the group must split up, each group should be at least 3 people and should have with them a shelter, a kitchen and food (an appropriate amount of food and water for the expected duration of the trip), a communication device, navigation tools, and a med kit (the contents of the trip med kit can be split up so each group has some basic supplies).

**If a member of your group is lost:**

* Stay calm- a calm head, the ability to stay organized, and a well-thought out plan are the most important rescue skills
* Designate clear leadership and roles including a scribe
	+ The scribe should start a timeline and gather information including:
		- Point last seen (PLS)- mark on a map
		- Description of the missing person (including what they were wearing)
		- What resources does the missing person have?
		- What was the last known mental/emotional status of the missing person?
* Perform a “hasty search”
	+ Leader and/or group members go in pairs alternating between yelling for the missing person and listening for a response
		- Group members should only be involved in a search if it does not put them in danger of also becoming lost
	+ Set a turnaround time- (i.e. walk for 5 minutes down the trail and then return)
* If the missing person(s) is/are still not found, trip leaders must contact Bates College (Campus Safety or other professional staff members as necessary)
	+ They will coordinate with you, other college staff and emergency services to initiate a response
	+ Set a schedule of times to check in with college staff member with information
* Perform an in-depth search
	+ Do not continue to search without assistance from Bates College staff or local authorities (warden, ranger, police, search and rescue team)
	+ Mark PLS on the map
	+ Mark any clues from the map and your knowledge of the terrain (poorly marked trail junctions, likely accident area, etc.)
	+ Make the group’s location known
		- Hike back along the route and leave notes or markers
		- Make the campsite as visible as possible (light a fire)
	+ Divide the search area into segments using geographical features, rivers, ridges etc.
	+ Record your search efforts
	+ Do NOT search at night

**If you are lost:**

* Stay calm, keep a positive mental attitude, establish leadership if you are not alone, focus on staying warm, fed and hydrated
* If you are not alone, DO NOT SPLIT UP
* Attempt to orient yourself using landmarks
* Backtrack the route to a point where location was last definitively known (if you are not sure of which way you came from, STAY PUT)
* If possible, set up camp on or near established trails, on the shore of large lakes, or in open meadows to be visible to group searchers and possibly aircraft
* Attend to basic needs
* Build large, smoky fires (fresh/green wood will create more smoke)
* Listen for sounds of searchers or other people. Make noise by singing, whistling, shouting, etc. to attract attention
* If separated for multiple days, expect an air search
	+ Bright flashes of light are most easily seen from the air
	+ People are most visible when moving through an open area rather than standing still or in forested area
	+ In open area, laying down or laying out brightly colored items will be more visible from an aircraft than standing and waving your arms. Geometric patterns are more discernible than bright colors from the air

PFDs

<https://www.boatus.org/life-jackets/care/>

**River Travel:** Personal Flotation Devices (PFDs) will be worn, zipped, and buckled at all times when traveling on water in canoes, kayaks, rafts, or stand up paddle boards. PFDs will also be worn when scouting rapids or when swimming in current strong enough to carry the swimmer downstream. PFD use when conducting other shoreline activities should be intentional and consider participant swimming ability.

**Flatwater:** PFDs will be worn, zipped, and buckled at all times when traveling on water in canoes, kayaks, or any other small crafts. Non-swimmers should wear PFDs when swimming or when participating in shoreline activities with a moderate risk of falling (ex. climbing on rocky shoreline). PFDs provide many benefits including but not limited to: buoyancy assistance for conscious as well as unconscious or injured swimmers, temperature regulation, protection from impacts with blunt objects such as rocks, and something for someone else to grab onto in a rescue situation. PFDs should always be in good condition with functioning buckles and zippers, free from rips or tears, and free from lumps or hardened buoyancy material. PFDs should be fitted to each individual user so that when pulling the PFD up by the shoulders it does not go up past the wearer’s ears.

Water Treatment Guidance

All water from natural sources consumed on field trips must be treated. If you are not sure if water is potable, air on the side of caution and treat. The primary means of water treatment is AquaMira (Chlorine Dioxide). AquaMira should be used according to the directions on the package.

For 1 liter (approximately 32 oz) of water: Mix 7 drops of Part A with 7 Drops of Part B in a separate container (the cap works very well). Wait 5 minutes until the mixture turns bright yellow in color. Add the mixture to the water bottle and wait 15 -30 minutes before drinking. Colder water needs more time to be purified. Make sure to “thread” water bottles to ensure no untreated water is lingering in/on mouth pieces.

In the case that AquaMira is not a viable option- water can be boiled. To do so, fill a pot with water and put it over a heat source until it reaches a rolling boil.

*Note: boiling water poses its own risk, and should be done according to the Field Kitchen Guidance found in this manual.*

Hunter Orange

All field study participants should wear some sort of hunter orange (ex: vest, hat, etc). Hunting season for a variety of different species ranges from as early as the end of August to as late as May, with the most intense activity occurring during the fall. This is also the most likely time for Bates students/staff/faculty to be in the field due to preferable weather conditions. It is reasonable to assume that field study participants can expect to share the woods and should wear hunter orange to further distinguish themselves from the landscape/animals.