**APPENDIX B: Environmental hazards you should know:**

There are many resources on physical safety that span Leave No Trace practices to building lab safety plans. The number of resources on physical safety is largely disproportionate to that on mental health. Additionally, these resources remain poorly integrated with mental health in the field. The goal of this RTK is to use pre-existing physical safety resources more effectively to better support mental health in the field. A foundation of safety comes from reducing risks that come from people as well as environmental conditions. A strong foundation of safety is vital for student development and self-actualization.

As discussed throughout the RTK, not all students will have equal experience or knowledge of outdoor safety. Laying out information for common environmental threats removes assumptions that everyone has prior experience in outdoor spaces. This is important to remember as we continue to diversify our field and work towards better supporting our students. In alignment with the overall goals of this document, students should be prepared and be aware of expectations beforehand. Knowing associated risks with field work allows students to give informed consent before participating in field work. Mitigation strategies for prevention and treatment also helps students be prepared to maintain their safety in the field.

Appendix B contains language for common environmental hazards found in the northeast. The purpose of this appendix is to collect and disseminate already available knowledge of environmental hazards so that the focus when creating RTK documents can remain on building and improving culture and mental health in the field. The goal of this section is that supervisors can pick and choose which environmental hazards are relevant and modify mitigation strategies as needed. Note that each environmental hazard contains a mitigation strategy for prevention and treatment.

Key resources for physical safety and increasing knowledge for outdoor recreation:

* [REI expert advice blogs](https://www.rei.com/learn/c/outdoor-basics)
* [UC Berkley’s Office of Environment, Health & Safety](https://ehs.berkeley.edu/field-research#fieldsafetyplan)
* Examples of Field Safety Plans
  + [University of Texas at Austin EHS](https://ehs.utexas.edu/sites/ehs.utexas.edu/files/FieldResearchers-SafetyGuidelines.pdf)
  + [University of South Florida EHS](https://www.usf.edu/administrative-services/environmental-health-safety/documents/labsafety-fieldsafetyguideupdated.pdf)
  + [Stanford University EHS](https://ehs.stanford.edu/forms-tools/field-safety-plan)

COMMON ENVIRONMENTAL HAZARDS

**A snake on a rock

Description automatically generated with low confidenceA picture containing reptile, snake, outdoor, wood

Description automatically generatedVenomous snake ID:**

|  |  |  |
| --- | --- | --- |
| Copperhead  (*Akistrodon contortrix*)  Species of conservation concern. **Reports of Centre and Union Co since 2013.**  Brown “hourglass” pattern on dorsum, although can resemble more irregularly shaped triangles  Juveniles will have bright yellow tail tip (“caudal lure”)  Inhabits deciduous forest, open fields and clearings, rock crops, rock ledges, open habitat with rock and vegetation. May be found under large logs, rocks, around brush piles rock crevices or slides | Timber Rattlesnake  (*Crotalus horridus*)  Species of conservation concern. **Reports of Centre and Union Co since 2013.**  Black and yellow color morphs in PA. Heavy-bodied snakes with bold pattern of dark brown, grey to black Chevron like “V" shaped body bands and blotches  Inhabits upland forest with rocky outcroppings, talus slops, rock crevices, rock ledges with vegetation, mature forest with numerous fallen logs, young forest with predominant leaf litter cover. | Eastern Massassuga Rattlesnake (*Crotalus catenatus*)  Species of conservation concern. No reports in Centre or Union Co.  Small to medium sized snake with grey background and rounded brown blotches running down the back  Inhabits swamps, marshes, bogs, peat lands, wet meadows, prairie lands, low lying poorly drained soil, dry open fields with lots of vegetation.  www.paherps.com |

Text

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**Text

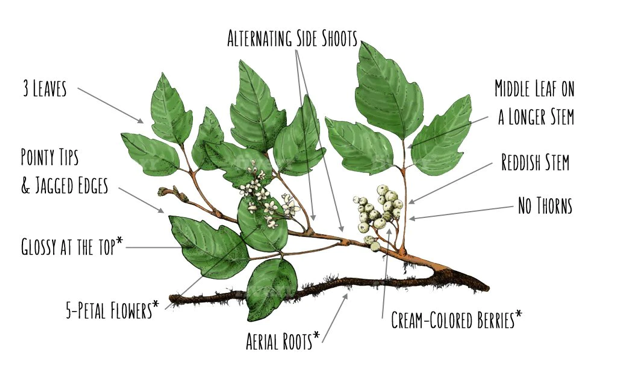
Description automatically generatedMitigation strategy (prevention):** Be able to identify venomous snakes that can be found at your study sites. In areas with low visibility (i.e. high grass or dense woody debris) snake gaiters may be appropriate. Hard, closed toed shoes (i.e. rubber boots) are also useful. In the event of a snake encounter, do not touch or provoke snakes, especially those that you cannot confidently identify. Maintain sufficient distance between yourself and the snake so that it can retreat if needed.

**Mitigation strategy (in the event of envenomation):**

See resource from PA Fish and Boat Commission

**Poison Ivy (*Toxicodendron radicans or T. rydbergii*):**

Poison ivy is a deciduous vine that can be found throughout the eastern US. All parts of the plant, alive or dead,cause dermatitis due to the oils the plant secretes Poison ivy has 3 leaflets or smaller leaves grouped together. Poison ivy may be confused with black raspberry (*Rubus occidentalis)* or Virginia creeper (*Parthenocissus quinquefolia*). For poison ivy, the top leaflet has an extended petiole whereas the bottom leaflets are attached directly. Along with the absence of thorns, leaflet arrangement can be used to differentiate poison ivy from black raspberry. The saying “leaves of 3, let it be” helps to differentiate poison ivy from Virginia creeper, which typically has 5 leaflets. Older vines contain arial roots that give the vine a hairy or fuzzy appearance, but younger vines often lack this trait. Leaf margins can either be lobed or smooth.



PC: Greenbelly Co.



Aerial roots

PC: UGA extension

**Mitigation strategy (prevention):** Be able to identify poison ivy during the season(s) in which you will be conducting field work. Remember that this plant will have different key features during different times of the year. Also be able to identify similar species. If encountered, avoid touching this plant. Never burn poison ivy.

**Mitigation strategy (in the event of dermatitis):** If you come into contact with poison ivy, wash the area with cold soapy water as soon as possible. Wash all clothes/gear that have been in contact with the oil. Take oral antihistamine if necessary.

**Lyme Disease and Deer ticks:**

Pennsylvania has the most reported cases of Lyme disease than any other state ([CDC](https://www.cdc.gov/lyme/datasurveillance/maps-recent.html), 2021). If you get a tick bite, it is important that you can identify it to species, as well as know the sex and life cycle of the individual. Adult females and nymph black-legged (aka Deer) ticks are the only ones that can transmit Lyme disease. In the mid-Atlantic region (PA), the encounter risk for adult females peaks during spring (Mar-Jun) and during fall (October-November), which is when we do fieldwork. Lyme disease is not the only transmissible disease by deer ticks, and there are other species of ticks in the region.



Picture from: [University of Rhode Island TickEncounter](https://web.uri.edu/tickencounter/species/blacklegged-tick/)

**Mitigation strategy (prevention):** Wear closed toed shoes and long pants. Hats and long-sleeved shirts also help. Tucking your pants into your socks also helps reduce the likelihood that a tick will bite. Applying bug spray or permethrin (clothes only!) can also reduce tick encounters. Make sure to completely check yourself after each time you go into the field. The [CDC](https://www.cdc.gov/ticks/tickbornediseases/tickID.html) says that the tick needs to be attached for at least 36 hours. Therefore, the risk of contracting Lyme decreases with vigilant tick checks.

**Mitigation strategy (in the event of a tick bite):** If you find a tick attached, grab the tick as close to your skin as possible with a pair of tweezers. Pull with even, slow pressure to avoid the tick’s head dethatching. If you cannot confidently identify the tick, take a photograph of it. University of Rhode Island has a great online resource for tick identification [here](https://web.uri.edu/tickencounter/tickspotters/). The wildlife disease lab at East Stroudsburg university will [test ticks](https://www.ticklab.org/) for free from any PA resident.

Monitor the bite site for the presence of a bullseye rash. If you are feeling nauseous, achy or running a fever, contact your doctor.

**Insect Bites & Stings**



Photos top to bottom: yellow jacket, carpenter bee, paper wasp, hornet. Photos from [Waltham Pest Services](https://www.walthamservices.com/pest-control/stinging-pest/)

Bees, wasps, hornets, and fire ants are the most common **stinging insects** that can cause allergic reactions.

Mosquitoes, kissing bugs, bedbugs, fleas, and certain flies are the most common **biting insects** that can cause allergic reactions.

Although most people do not develop severe reactions to bee stings, a life-threatening allergic reaction (anaphylaxis) may produce the following symptoms. If any of these occur, seek medical attention.

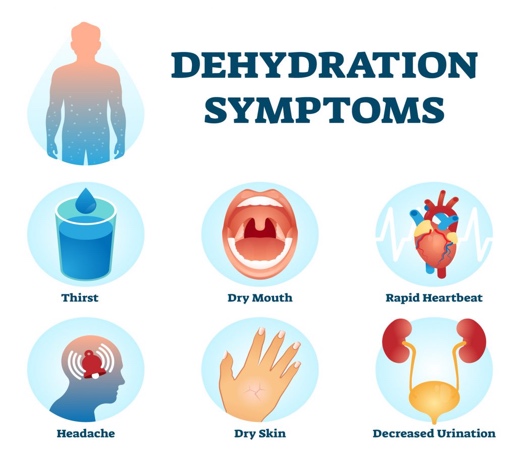
**Symptoms of anaphylaxis:**

* Severe skin rashes, itching, or hives
* Swelling of the lips, tongue or throat
* Shortness of breath, trouble breathing or wheezing
* Dizziness and/or fainting
* Stomach pain, vomiting, bloating or diarrhea.

**Mitigation Strategy (prevention):** Wear light-colored clothing, long pants and shoes that cover your whole foot. Avoid perfumed products. Be aware of your surroundings and flip coverboards slowly. If you see a bee, move slowly, and remain calm. Do not run or attempt to swat it away. If you are allergic or are unsure if you are allergic, carry appropriate antihistamines with you.

**Mitigation Strategy (in the event of an insect sting):** If you’ve been stung by a bee, carefully remove the stinger and closely monitor for more serious symptoms. Redness, itching, and minor swelling are common symptoms of insect bites and stings. When you return from the field, clean the wound site, apply a cold compress, and take antihistamine and/or pain medication to reduce swelling.

**Dehydration**



PC: aecliving.com

Dehydration occurs when more water is lost from the body than being taken in. Individuals that are working or exercising outside are more susceptible to dehydration. When people quickly loose water through sweat, vomiting or diarrhea, they are more susceptible to dehydration. People with medical conditions (e.g. diabetes), or people taking certain medicines (e.g. diuretics) are also more susceptible to dehydration. Mild symptoms, such as a headache, can begin with losing as little as 1.5% of your body’s water. Other mild symptoms of dehydration include dry mouth, dark-colored or strong-smelling pee, and fatigue. More severe symptoms include: a temperature of 103ºF or higher, muscle twitching, flushed or dry skin, nausea, rapid pulse, lack of sweating, confusion, or dizziness

**Mitigation strategy (prevention):** Come prepared for fieldwork. Make sure to bring and drink water throughout the day. Everyone should have water readily accessible during field work. Supplement water intake with fluids containing electrolytes. Caffeinated beverages and drinks with high sugar content are not ideal as primary sources of fluids. Supervisors should be contentious of weather conditions and well-being of their field teams, and they should remember to dedicate breaks for everyone to stay hydrated. The best way to prevent dehydration is to drink before you get thirsty.

**Mitigation strategy (in the event of dehydration symptoms):** Drink more fluids. Drink water and one with electrolytes if you are significantly sweating. Symptoms should improve in 5-10 minutes. More severe cases require intravenous (IV) fluids, and you should seek medical attention.

**A note on water filtration systems:**

Teams, especially those working in remote areas or performing multi-day trips, should have a water filtration system. Everyone should know how to use the water filtration system. There is a wide variety of filtration systems that can suit different uses (single hiker or day-use trips to group camping). Different systems will have different set-ups, but some general rules for filtration systems include:

1. Ideally, use flowing (not stagnant) water, but also not large rivers. When clear flowing water is not available, take from the calmest portion of water to avoid collecting/disturbing excess sediment.
   1. Let water settle in a cooking pot or 2nd dirty bag before filtering if water is especially murky.
   2. Wait a few hours after heavy rainstorms before collecting water to allow sediment to settle.
2. Some set-ups have dirty bags and clean storage containers for water. It is important that dirty (unfiltered) water does NOT come into contact with anything that touches clean (filtered) water.
   1. Dirty bags break! Have back-ups. Smart water bottles fit most screw-on filter systems (e.g. Sawyer) and are typically sturdier than regular plastic water bottles.
3. Chemical treatments (e.g. iodine tablets) are a cheap, lightweight back-up and can be used in addition to filtration systems. Boiling water at a rolling boil for at least 3 minutes will also kill bacteria.