A Guide to Fieldwork Safety for MSU Entomologists

Spring 2021

This document was created by Jacquelyn Perkins with input from many others in the department.
Some references to COVID-19 pandemic-specific practices may not be required later.

This guide can be shared with new employees before fieldwork starts.

INTRODUCTION

Fieldwork is a necessary part of many entomological research programs. This guide is intended to help you plan and prepare for health and safety issues you might encounter while conducting work in field settings. The following safety guidelines are for any type of fieldwork and can be used to help develop your own personal safety plan for each field activity. Since each research project is unique, the specific hazards of each project need to be addressed in a specific safety plan. This is not an exhaustive list of hazards, so some additional research may be needed to determine the specific hazards of each study location or research activity. For more specific information on fieldwork hazards and precautions, talk to your supervisor, view the resources at the end of this document, or contact Environmental Health and Safety at MSU (ehs.msu.edu).

TRAVEL AUTHORIZATION AND REQUIRED TRAININGS

1) Every employee of the Department of Entomology that plans to travel in a university vehicle to field sites is required to have an Employee Driver Certification Form approved by the department. This certification form needs to be renewed every calendar year.

2) Every entomology employee is required to undergo site-specific training for any lab or other research space they will work in. This includes the required online trainings pertinent to an individual's research that can be accessed at https://ora.msu.edu/train/ (includes chemical hygiene, hazardous waste, greenhouse, power tools, etc.)

3) Anyone who works on farms, in greenhouses, at the Entomology Farm, or in other areas where pesticides are applied is required to take the federal Worker Protection Standard (WPS) training before starting work in those areas. This training must be provided by a certified pesticide applicator and needs to be renewed annually. Site-specific training for every research farm, greenhouse, etc. that you may work at is also required under the WPS. The manager of each location (farmer, greenhouse manager, farm manager, etc.) will be able to provide that training.

TRAVEL TO FIELD SITES

Fieldwork often takes us to different areas around the state, sometimes to remote field sites that are many hours' drive from campus. It is crucial to know where you are going (have maps, GPS, etc.), to notify the land owners before each visit, and to have all necessary safety items in your work vehicle before leaving campus.

1) All university vehicles should have a vehicle safety kit which provides the following items:
    a. List of medical facilities near common field work locations
    b. Water jug (one gallon for each person)
    c. Eye rinse
    d. Paper towels
    e. Hand soap
    f. Hand sanitizer
    g. Baby wipes

h. Tyvek coveralls (at least one for each person)
i. First aid kit
j. Poison Ivy soap
k. Benadryl
l. Sunscreen
m. Bug spray
n. Gatorade or Pedialyte
o. Box of gloves
p. Change of clothes in case of pesticide contamination (sweatpants and t-shirts)

It is also a good idea for each person to have identifying MSU logos on the vehicle, and on your clothing that identifies you as a MSU employee. This can include MSU hats, T-shirts, or reflective work vests. Talk to your supervisor about purchasing these for your team to ensure you are identifiable as a university employee.

2) Accident kits are provided in each university vehicle with instruction on what to do if you are in an accident and the relevant paperwork. These documents are required in every vehicle and should be located in the glove box. Familiarize yourself with where the documentation is held so it can be easily found when needed.

3) While in university vehicles you are representing MSU. The vehicles are clearly marked with MSU stickers and decals and each vehicle is assigned a unique identifying number. The public can call and report anyone driving recklessly and identify the vehicle using this number. Please drive responsibly and act appropriately on the road.
    a. Obey all traffic laws
    b. Wear your seatbelt
    c. Don't speed or drive recklessly
    d. Don't engage in road rage
    e. Don't text and drive

4) You must always have your driver's license on you when driving in a university vehicle. Carry also a copy of your signed COVID-19 travel waiver (if applicable).

5) No smoking in MSU vehicles. Keep vehicles clean – they belong to MSU they are not your personal vehicle.

6) Avoid driving in areas where you might get the vehicle stuck, such as mud, loose sand, or steep slopes. If available, remember to use 4-wheel drive when needed.

7) For long journeys, it is best to be prepared with coffee, snacks, water etc. to maintain alertness during your trip. If you feel tired, stop and take a rest.

If you are pulled over by the police it is recommended to follow these safety tips.

1) Slow down and pull your vehicle over as soon as it is safe.

2) Stay inside the vehicle with your hands on the steering wheel.

3) The officer will ask to see your driver's license, proof of insurance and vehicle registration. You must produce these items for inspection. Inform the officer when retrieving documentation before moving your hands off of the steering wheel. Don't search for your license or registration until you are asked to provide it.

4) Don't disrespect the officer. Although you have a constitutional right to do so, it could lead to your arrest.

5) Don't refuse to sign a ticket. You can be arrested for it.

6) Don't attempt to bribe the police.

7) If they want to search you or your vehicle, don't physically resist a search.

8) Follow the verbal directions of the officer and answer truthfully. The side of the road is not the place to debate with the officer. If you feel that you have been wronged, you will have the opportunity to present your side in court.

PREPARING FOR FIELDWORK

Research in the field can often be unpredictable. Making sure you have the right supplies with you every day is crucial for maintaining safe field research practices. Follow these recommendations to make your field days as smooth as possible:

1) Let your supervisor know where you are going and when you plan to return to campus. A quick text message can be used to let them know you returned safely.

2) Make sure to check with land owners, farmers, or other interested parties prior to going on to private land. This is especially important because pesticide applications may be planned in farms, and because since neighbors may call if an unfamiliar vehicle/pole are visiting a site.

3) Plan ahead for bathroom breaks. Identify easy, accessible places to stop at regular intervals during the day so that everyone has a chance to use the bathroom when needed. Don't be afraid to ask to stop if you need a bathroom break.

4) Bring LOTS of water, particularly on warm days. Many field sites are in remote locations and it can be hard to find places to refill water bottles. Do not drink water from irrigation ponds, or rivers/streams/lakes, as it may be unsafe for drinking. Placing a water bottle that's 80% full into the freezer overnight can provide a cold drink through the day and

could also serve as a coolpack for your lunch. Also consider purchasing a larger cooler for refills that can be placed in the back of the truck.

5) Bring a lunch and snacks since it is not always possible to get to a restaurant or store for food during the day.

6) If you need allergy or other specific medicines, bring those with you. If you are comfortable, disclose medical needs to your supervisor (peanut allergy, bee sting sensitivity, etc). If you are allergic to bees, discuss getting an epi-pen prescription from a doctor prior to fieldwork, and carry that with you. Also alert your co-workers so they know where it is and how to administer it. Review this video for detailed instructions on how to use an epi-pen: https://www.youtube.com/watch?v=FXlqSuzzrws

7) Have your phone charged and bring a spare charger with you if needed in case you need to make an emergency call. Share your cellphone number with work colleagues.

8) Have maps to all field locations, GPS, etc. Whatever you need to be sure you are navigating to the right place.

9) Wear appropriate field attire:
    a. Long pants and closed toed shoes are required by law on any farm where pesticides are used.
        a. Quick dry, light hiking pants are the best for summer.
        b. Hiking boots with tread and ankle support are also recommended.
    b. Recommended to bring a hat and sunglasses to protect your eyes and face from harmful rays.
    c. Recommended to wear sunscreen and reapply if you are in direct sunlight for an extended period of time.
    d. Recommended to wear layers in case of unpredictable weather, especially rain gear. Weather in Michigan is typically unpredictable but a check of www.weatherunderground.org or a similar site should give you a view of the likely conditions during your fieldwork and can alert you to potentially risky weather.

POTENTIAL ENVIRONMENTAL HAZARDS

Follow these recommended tips to help minimize potential hazards in the field.

1) Ticks and mosquitos
    a. Wear insect repellent and/or clothing designed to reduce insect bites
    b. Tuck pants into boots and socks to reduce tick issues
    c. Consider treating your field clothes and boots with permethrin for warding off ticks or purchase pre-treated clothing.
    d. Thoroughly check for ticks at the end of every field day
    e. When you get home, take a shower and do a thorough full body tick check
    f. Download the "Tick App" from https://thetickapp.org/ which provides information on ways to prevent tick exposure, shows how to identify different

kinds of ticks and the diseases they transmit, and allows you to contribute to citizen science research regarding ticks in Michigan.

g. See additional resources for identifying ticks at the end of this document.

2) Poison ivy, oak, and sumac

a. Practice identifying poisonous plants to better avoid accidental contact with them.
b. If very sensitive or if you know you will be exposed, use pre-exposure lotion.
c. If you think you came in contact with poison ivy, rub Technu (or other soaps that will dissolve toxic oils) on any exposed areas as soon as you can, and then wash off.
d. Wash clothes and skin with soap and water.
e. See additional resources for identifying poisonous plants at the end of this document.

3) Heat exhaustion and dehydration

Heat exhaustion is a significant risk on long hot field days, and should be actively self-checked as well as being something that field crew leaders should be vigilant for. People with slurred speech, dizziness, nausea, fast pulse, or hot skin may be experiencing heatstroke without realizing. Get them into the shade, or an air-conditioned vehicle, ensure they drink water or a Gatorade-type of drink.

a. Drink plenty of water - at least 2 quarts a day (more if strenuous activity or in hot weather).
b. Take frequent breaks as needed.
c. Know the symptoms of heat exhaustion: heavy sweating, cold/pale/clammy skin, nausea or vomiting, muscle cramps, tiredness or weakness, dizziness, headache, and fainting. If you or a co-worker are experiencing heat exhaustion:
    i. Move to a cool place
    ii. Loosen clothing
    iii. Put cool, wet cloths on body
    iv. Sip water
    v. Seek medical attention if conditions persist

4) Pesticide Exposure

a. Make sure to contact growers before entering a field where pesticides may have been applied. They will tell you if the Re-Entry Interval has passed and if the field is safe to enter, or what PPE must be worn.
b. Know the symptoms of pesticide poisoning: excessive sweating, salivation, narrowing of pupils, nausea/vomiting/diarrhea, muscle twitching/hand tremors, convulsions, unconsciousness, allergic reactions, blurred vision.
    i. Seek medical attention if experiencing symptoms of pesticide exposure
c. Make sure there is at least 1 gallon of water in the truck for each person to rinse off in the event of pesticide exposure. Vehicles should also have eye rinse solutions and a change of clothes available.

5) **Extreme weather**
    a. Michigan summer weather can include tornadoes and intense rainfall, and in the winter there can be very cold conditions.
    b. Plan out your day by first looking at the weather forecast and check during fieldwork – cancel or adjust plans as needed.
    c. Extreme weather alerts can be sent to your phone – sign up for these online.

6) **Hunting season**
    a. Know the important hunting dates for your research area
        i. Michigan deer archery season is Oct 1- Nov 14 and Dec 1-Jan 1
        ii. Michigan deer regular firearm season is Nov 15-30
        iii. Check DNR website waterfowl, small game, bird, etc.
    b. Wear appropriately colored safety clothing (i.e. "hunter orange")
    c. Contact land owners and get permission before going to the field
    d. Avoid animal-like behavior (ex: hiding in thickets)
    e. Avoid field activities during peak hunting times (dawn and dusk)

7) **Bees, wasps, stinging insects**
    a. Carefully look for stinging insects before placing your hands, feet or body in areas where they may live or hide (wood piles, crevices, etc.).
    b. Bring medication if you have an allergy
    c. Keep scented foods, drinks and meats covered
    d. Wear shoes outside
    e. Avoid wearing bright colors, flower prints and perfume
    f. Move slowly or stand still (don't swat at insects)

8) **Snakes**

    There is only one species of venomous snake in Michigan, the Eastern Massasauga rattlesnake. They are found in shallow wetlands and the adjacent uplands. They are shy and quite rare, but they will bite if threatened.
    a. Walk in open areas
    b. Wear heavy boots
    c. Use a stick to disturb the brush in front of you
    d. Do not pick up, disturb, or corner a snake
    e. Back away from a snake
    f. Seek immediate medical attention if bitten

SAFE FIELDWORK STRATEGIES FOR ALL

We acknowledge that members of our department may feel different levels of safety during fieldwork. As stated by Demery and Pipkin (2020): At-risk individuals include minority identities of the following: race/ethnicity, sexual orientation, disability, gender identity and/or religion. When individuals from these backgrounds enter unfamiliar communities in the course of fieldwork, they may be placed in an uncomfortable. and potentially unsafe 'othered' position, and prejudice may manifest against them". To proactively address this, supervisors and their employees should discuss how best to minimize these concerns through an open discussion about field safety, and with supervisors being aware of the potential for greater risk for their trainees than they may experience.

The following recommendations are taken from: Demery, A.J.C. and Pipkin, M.A., 2021. Safe fieldwork strategies for at-risk individuals, their supervisors and institutions. Nature Ecology & Evolution, 5, 5-9.

What can research teams do to mitigate potential risks that arise from prejudice:

1) Review and agree upon fieldwork and safety plans before any fieldwork begins.

2) At established field sites, introduce researchers (via e-mail or in-person) to the manager of those locations, if they exist. If there are multiple managers, researchers should be introduced to each manager to minimize any miscommunication that could lead to increased risk.

3) Show new researchers established field locations, teach them about the specific concerns of that field location, and inform them of the resources in accordance with established safety plans. The resources should have contact information about field site personnel relevant to research and safety (for example, contact information of the local police department).

4) Ensure field course locations and housing are appropriate, safe, and equitable for all identities. Lab leaders should solicit regular, anonymized feedback from field researchers to determine the climate and safety of field sites and accommodations.

5) Provide materials to clearly identify researchers and their purpose (for example, signs for vehicles and field sites, safety vests, MSU hats and so on). These items should be provided for researchers so that their use is easily implemented.

6) Supply an official letter of support for researchers doing fieldwork with contact information. This provides additional credibility to the researcher, if and when they are approached and challenged.

7) Lab leaders should self-educate on the experience of your team member's identity, and the corresponding risk that they may encounter in the field. Furthermore, self-educate on the politics, demographics and culture of the areas surrounding established field site(s), in order to be fully aware of potential risks.

8) Create a time and space to talk to research team members specifically about fieldwork safety concerns in advance of the field season, and touch base with them throughout the season to address new concerns. As a reminder, this is an uncomfortable reality and merits the need to establish a space and time for both parties (researcher and supervisor) to be ready and willing to engage in this important discussion.

What can field researchers do to mitigate potential risks that arise from prejudice:

1) Talk with colleagues and supervisors about the risks, preparations to minimize risk, and reporting mechanisms. Be aware that the conversation will likely be difficult and will require mental and emotional readiness by both parties. If a supervisor is dismissive of this conversation, individuals should be aware that they can and should reach out to additional mentors, institutional or industry advocates (for example, an ombudsman, Equal Employment Opportunity officer, Diversity and Inclusion administrators, Student Disability Services or other trusted professionals to have this conversation).

2) Contact others (especially those who share an at-risk identity) that have previously used a field site at a location where there is a history of risk. It is recommended that researchers document all known cases of risk at that location.

3) Take advantage of training opportunities to increase field safety and promote awareness (for example, self-defense courses, first aid, safety aids and cultural history courses about the location of the field site).

4) Know who manages the field site(s) and inform the field managers when and where you will be at those locations.

5) Introduce yourself to the neighbors surrounding the field property, or leave a short note informing neighbors about research being conducted at nearby locations and who will be conducting the research. It is advisable to also include contact information, preferably information that clearly demonstrates affiliation with the research institution to provide additional credibility.

6) Engage in fieldwork with another person, when possible. When this is not possible, have a point of contact (preferably the supervisor) who is aware of your whereabouts and expected schedule on a given day. A written communication plan that gives notice of field plans is another way to maintain communication with a point of contact.

7) Always carry credentials in case someone challenges why you are at the field site. These include photo identification (driver's license, passports, institution identification) and relevant permits. Any additional form of identification that clearly demonstrates affiliation with the research institution can also be helpful (that is, university apparel, institution bumper stickers or car magnets, and so on).

If at any time you feel unsafe, you should contact your supervisor to discuss ways to modify the project. While supervisors may work closely with researchers, they often do so outside of the

field site, and therefore may not know of the risks and dangers encountered therein. It is paramount that at-risk individuals advocate for themselves.

ADDITIONAL RESOURCES

There are many resources available that may provide more in-depth information regarding your research environment. Please use the references in this section for further information on many of the topics discussed**.**

MSU Environmental Health and Safety:
Website - ehs.msu.edu
Phone - 517-355-0153
Email - ehs@msu.edu

MSU Public Safety and Police Services:
Website – police.msu.edu
Phone - (517) 355-2221
Email – info@police.msu.edu

MSU Office of the University Ombudsperson
Website- www.ombud.msu.edu
Phone - (517) 353-8830
E-mail- ombud@msu.edu

MSU Resource Center for Persons with Disabilities
Website - https://www.rcpd.msu.edu

Michigan DNR:
Hunting season calendar - https://www.michigan.gov/dnr/0,4570,7-350-79119_79147_82106---,00.html

CDC:
Travel - http://wwwn.cdc.gov/travel/default.aspx
Waterborne diseases - http://www.cdc.gov/healthywater/

National Weather Service:
Extreme weather safety - http://weather.gov/safety.html

US Forest Service:
Outdoor activity safety - http://www.fs.fed.us/safety/outdoor/

American Lyme Disease Foundation
Lyme disease info - http://www.aldf.com

Safe fieldwork strategies for at-risk individuals, their supervisors and institutions:
https://www.nature.com/articles/s41559-020-01328-5

MDHHS
Michigan Department of Health & Human Services

Michigan's Five Most Common Ticks

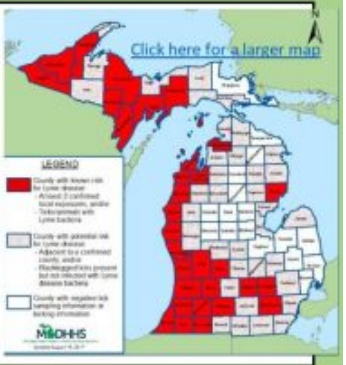
Ticks are significant carriers of pathogens that cause human and animal disease. Listed here is a ranked order of the ticks most likely to bite humans in Michigan.

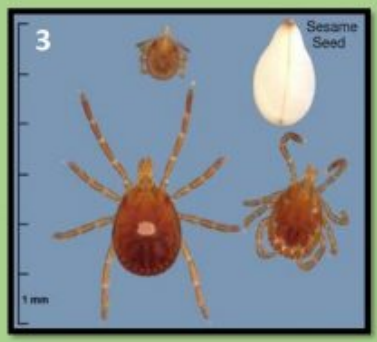
1. American dog tick (*Dermacentor variabilis*)

Distribution: Widespread throughout Michigan forests and grassy areas
Key Facts: These ticks are active from early May-November, and will bite both humans and companion animals.
Diseases: Diseases associated with the American dog tick are rare in Michigan, but may include Rocky Mountain spotted fever and tularemia.

2. Blacklegged tick (*Ixodes scapularis*)

Distribution: Emerging in Michigan, see map at right
Key Facts: Found on low forest vegetation, often along human and animal trails.
Diseases: Lyme disease is the most common tick-borne disease in Michigan. Other rare diseases include: anaplasmosis, babesiosis, deer-tick virus, and ehrlichiosis.





3. Lone star tick (*Amblyomma americanum*)

Distribution: Occasionally found in wooded and grassy areas across the state
Key Facts: An aggressive biter of humans and companion animals, adult females have distinctive "Lone Star" mark
Diseases: Ehrlichiosis, rocky mountain spotted fever, tularemia

4. Woodchuck tick (*Ixodes cookei*)

Distribution: Found most commonly on pets throughout Michigan
Key Facts: Usually found near dens of skunks and woodchucks, will bite companion animals near animal dens and occasionally humans
Diseases: Powassan encephalitis

5. Brown dog tick (*Rhipecephalus sanguineus*)

Distribution: Occasionally found in Michigan.
Key Facts: can uniquely survive and breed in indoor environments, has been associated with kennel, shelter, and breeding facilities. Good hygiene practices can prevent indoor infestations.
Diseases: Rocky mountain spotted fever, canine babesiosis, canine ehrlichiosis

Tick Bite and Tick-Borne Disease Prevention

- Use insect repellents containing no more than 30 percent DEET.
- Use repellents that contain permethrin on clothing.
- After spending time outdoors, check your skin and clothes for ticks.
- See your healthcare provider if you have symptoms of fever, rash, body aches or fatigue.

For more information visit: www.michigan.gov/emergingdiseases
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Poison Ivy in Michigan

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We have all likely heard the saying "leaves of three, let it be" in reference to poison ivy. This is a helpful starting point, but additional details and background are important for identification. Two different plant species in Michigan are referred to as poison ivy; both are members of the mostly tropical family that contains mangoes, cashews, and sumacs: Anacardiaceae. Eastern poison ivy *(Toxicodendron radicans)* is concentrated in the lower half of the Lower Peninsula (Figure 1) and often grows as a vine with aerial roots (Drife, 2015; Reznicek et al., 2011) (Figures 2 and 3). Western poison ivy *(Toxicodendron rydbergii)* can be found in the Upper Peninsula and the northern and western portions of the Lower Peninsula. Western poison ivy has an upright growth habit (Figures 4 and 5); it does not climb and does not have aerial roots.

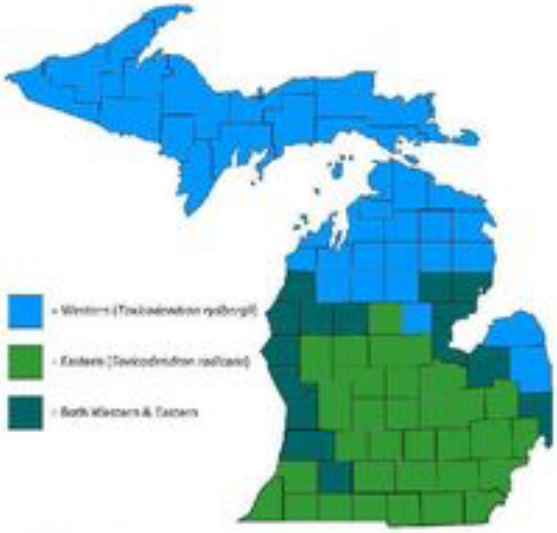
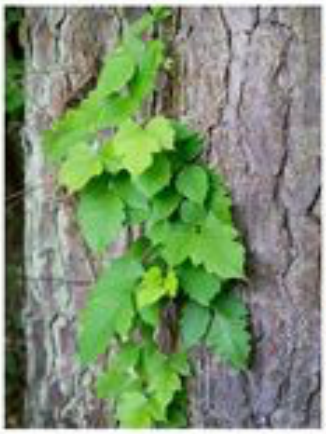
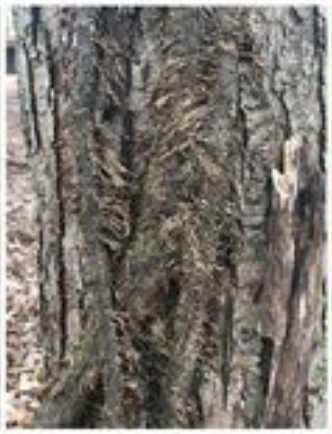
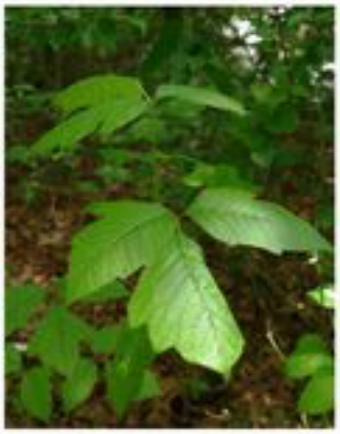


Figure 1. Distribution of Western and Eastern poison ivy (*Toxicodendron rydbergii* and *T. radicans*, respectively) based on Michigan herbaria records from Michigan Flora Online. (Figure by Erin Hill)





Figures 2 and 3. Eastern poison ivy has a vining growth habit and aerial roots to secure it to trees and other objects. (Figure 3 photo by Angela Tenney)



Figures 4 and 5. Western poison ivy has an upright growth habit with no aerial roots (Figure 4) and can often be seen as patches on the forest floor (Figure 5). (Figure 5 photo by Jennifer Yakey-Ault)