

PPRL Field Research Safety

Fieldwork is an important part of the research at the Poisonous Plant Research Laboratory. Since fieldwork takes you away from the lab for a day or extended periods of time, this plan is designed to help you plan and prepare for health and safety problems you might encounter in the field. For specific information on fieldwork hazards and precautions, talk with your supervisor or contact the PPRL Safety Team.

Note: Specific first aid procedures are not covered in this booklet. A first aid kit and manual should be carried on *all* field excursions and should be referred to in case of injury or illness.

BEFORE YOU LEAVE

One of the most important phases of your fieldwork is planning and preparation before you leave. Here are some suggestions for a safe trip:

- Fill out the travel authorization request form found on the PPRL server. Also prepare a written plan of your trip and leave with your supervisor or the secretaries. List things such as who is going, where you'll be working and staying, what you'll be doing, and who to contact in an emergency. For longer stays, give names of people at or near your worksite who can reach you if necessary. Set up a check-in schedule, such as calling into the lab every other day.
- Learn about potential hazards in the area such as plants, animals, insects, terrain, and weather conditions.
- Take a wilderness First Aid course in addition to CPR classes.
- Check that there is a stocked first aid kit in the vehicle you'll be taking to the field. In addition, make sure to bring any medications you regularly take.
- PPRL provides sunscreen and mosquito/tick repellent. Make sure to bring them along.
- Wear protective clothing: hat to protect from the sun, gloves when pulling or cutting plants, eye protection, work boots, etc.
- Check that there is a vehicle emergency kit that includes a flashlight and flares. Also make sure the tools in the pickup or trailer will work for roadside repairs.
- Check out a cell phone from Jason or be sure your personal cell phone has coverage in the area you'll be working in.
- Whenever possible, fieldwork activities should be done in teams of at least two people.

MEDICAL CARE AND FIRST AID

Emergency Medical Care

A first aid kit must be kept at all times in the vehicle and at the field site. Make sure to check that it is stocked *before* you leave on the field trip. Each kit should contain a booklet demonstrating basic first aid techniques. In addition, first aid courses are offered through the American Red

Cross, Utah State University, and (infrequently) the location safety committee. A special wilderness first aid class is also offered through USU; for those spending extended time in the field, please consider taking this course. Know where the nearest clinic, emergency room, and/or hospital is to your field location. USDA employees are covered by Worker's Comp if injured on the job or travelling to/from the worksite.

First Aid Kits

All vehicles have a first aid kit; please check that it is there before you take off. Terrie (CDSO) and Al (Vehicle Manager) will check the kits periodically to make sure they are well-stocked and to replace used or out-of-date supplies.

PESTS

A number of pests may be encountered in fieldwork. Follow these general guidelines to prevent close encounters of the painful kind.

- Keep garbage in rodent-proof containers and stored away from your campsite or work area. Food crumbs and debris may attract insects and animals.
- Thoroughly shake all clothing and bedding before use.
- Do not camp or sleep near obvious animal nests or burrows (especially those of field mice due to the possible presence of hantavirus).
- Carefully look for pests before placing your hands, feet, or body in areas where pests live or hide (wood piles, crevices, etc.).
- Avoid contact with sick or dead animals.
- Wear clothes made of tightly woven materials, and tuck pants into boots.
- Wear insect repellent.
- Minimize the amount of time you use lights after dark in your camp or work site, as they may attract pests and animals.
- Use netting to keep pests away from food and people.
- Carry a first aid manual and kit with you on any excursion so you can treat bites or stings. If the pest is poisonous or if the bite does not appear to heal properly, seek medical attention immediately.
- Be aware of the appearance and habitat of pests likely to be found, such as those described on the following pages.

Spiders — Black widow or brown recluse spiders may be found in shady protected rock piles, under logs or bark, in outdoor privies, and in old buildings. Both spiders can inflict painful bites which can cause local reactions, sweating, nausea, muscle cramps, fever, and chills.

Scorpions — Scorpions normally hide during the day and emerge at night. They might be attracted to your camp or work site to feed on other bugs drawn by light or food crumbs. Commonly found in lumber piles, firewood piled in dark corners, and under the bark of old tree stumps, scorpions can inflict a painful wasp-like sting. In some species, the bite can be deadly.

Bees, Wasps, Hornets — Bees, wasps, hornets, and yellow jackets may be attracted to scented materials or food (hornets and yellow jackets are especially attracted to meat). All can inflict stings that are seriously or fatally allergic to some people. This is the most frequent cause of serious medical problems among fieldworkers after trauma (falls, vehicular accidents, cuts). If you know you are allergic, contact your doctor to discuss whether it is advisable to take medicine with you. If you do have a known allergy, let your coworkers know what to do if you are stung.

Fleas, Ticks — Fleas and ticks commonly inhabit animals and their nests and trails. Both are blood suckers, and their bites can spread diseases such as bubonic plague (flea) and Lyme Disease or Rocky Mountain Spotted Fever (tick). More information can be found in the “Diseases” section. When outdoors, wear clothing of tightly woven materials, tuck pants into boots, and stay on the widest part of paths and trails. When possible, avoid walking through brush on animal trails. When you select a camp or work site, you can check for these insects by dragging a piece of cloth or a light-colored garment over grass and shrubs, then examining it for fleas and ticks. Bear in mind that both pests can detect you coming from a long way off; while fleas can jump onto you from a distance, ticks must wait until they are in direct contact with you to attach themselves.

Snakes — Several species of poisonous snakes are found throughout the West. All are from the rattlesnake family. They generally stay under shady brush, particularly in hot areas. To avoid snakes, walk in open areas, wear heavy boots or snake chaps/gaiters, and as you walk, use a stick to disturb the brush in front of you. If you are bitten, perform appropriate first aid and seek professional medical help immediately.

- Wash the bite with soap and water.
- Immobilize the bitten area and keep it lower than the heart.
- Get medical help.
 - If a victim is unable to reach medical care within 30 minutes, a bandage wrapped two to four inches above the bite may help slow venom. The bandage should not cut off blood flow from a vein or artery. Make the bandage loose enough that a finger can slip under it.
- A suction device may be placed over the bite to help draw venom out of the wound without making cuts. Snakebite kits are included in the vehicle first aid kits.

OTHER ENVIRONMENTAL HAZARDS

In addition to pests, other fieldwork exposures can be hazardous. These include:

Poisonous Oak, Ivy — This common “shrub” or vine is characterized by a triple leaf pattern with prominent veins and shiny surfaces. The leaves are green in spring, yellow-green to pink or red in summer, red or russet brown in fall, and lose their leaves in winter. All parts of the plant contain a potent allergen that can cause a reaction anywhere from several hours to two weeks after exposure. The allergen is spread by:

- Contact with the plant itself.

- Touching other objects which have touched a plant (hoes, rakes, cutters).
- Inhaling smoke from burning the plant.
- Touching other areas of the body after touching the plant.

To prevent exposure, learn to recognize and avoid the plant, and wear clothing such as pants and long-sleeved shirts. If you come in contact with poison oak or ivy, wash clothes and skin with soap and water as soon as possible. Extremely sensitive people can be treated before exposure by “desensitization”; contact the CDSO for more information.

Impure Water — A variety of potentially harmful organisms and pathogens can live in natural water sources such as streams, lakes, springs, and rivers. Drinking impure water can cause more than just gastrointestinal problems. Waterborne toxins can also cause hepatitis, Giardia, and certain viral diseases. If you are not going to be near a municipal or treated water source, carry your own water. Never drink straight from a natural source.

If you must use natural sources, treat the water first by using water purification tablets, boiling it for three minutes, or using a special purification filter (available from sporting goods stores).

Exposure to the Elements — *Sunburn* is a common and easily preventable hazard. Chronic exposure to the sun can increase one’s risk of skin cancer. People differ in their susceptibility to sun due to their skin pigmentation (redheads and blondes are more susceptible to skin cancer than are brunettes). Certain drugs, such as sulfonamides, oral antibiotics, certain diuretics, most tetracyclines, barbiturates, and biotionol (an ingredient in soaps and many first aid creams) can also increase sensitivity to the sun. To prevent sunburn, cover exposed skin and liberally apply sunblock creams. These creams come with skin protection factor (SPF) ratings from 5-50. Generally SPF 15 is adequate. Wearing a long-sleeved shirt and wide-brimmed hat (not a cap) will also provide protection from the sun.

Heat exhaustion, which can even affect individuals in excellent physical condition, is caused by prolonged physical exertion in a hot environment (such as strenuous work in the desert during summer). Symptoms include fatigue, excessive thirst, heavy sweating, and cool and clammy skin, and are similar to shock symptoms. If these symptoms are present, cool the victim, treat for shock, and give water or electrolyte replacement slowly but steadily if the victim is conscious and can drink. If heat exhaustion is not treated, the victim can suffer heat stroke.

Heat stroke is far more serious than heat exhaustion. The blood vessels in the skin can become so dilated that the blood supply to the brain and other vital organs is reduced to inadequate levels, causing the individual to become exhausted and faint. The skin becomes bright red and very warm to the touch. This is a potentially fatal condition that requires immediate attention. Cool the victim at once, in any way possible, replenish fluids, and seek medical attention immediately. Failure to gradually acclimate to heat, or even minor degrees of dehydration or salt deficiency make an individual more susceptible to heat exhaustion. To prevent heat exhaustion, drink plenty of liquids (water or electrolyte replacers) and take frequent rest breaks. Salt tablets are not recommended for preventing dehydration.

Hypothermia — On any trip, even a one-day excursion, sudden changes in weather can occur. Prolonged exposure to excessive cold can lead to hypothermia, a lowering of the body temperature. However, in the mountains getting wet in a summer afternoon rain shower followed by a cool breeze can also lead to hypothermia when temperatures are still in the 50's and 60's. Symptoms include shivering, numbness, slurred speech, and excessive fatigue. Long pants, a long-sleeved shirt or sweater, a windbreaker or down jacket, and a cap are the minimal clothing essentials. In cold (below freezing) or icy weather, it is best to wear clothing made of material that will wick moisture away from the body (wool or polypropylene instead of cotton). Wear several layers of clothing to allow adjustment to differing levels of physical activity. Avoid getting damp from perspiration.

DISEASES

Tetanus — The spores of this disease-producing organism can enter the body through puncture wounds, lacerations, or burns that become contaminated with soil or excrement. This potentially fatal disease causes painful muscle contractions and spasms. The incubation period varies from four days to three weeks, depending on the extent and location of the wound. Fieldworkers should be sure that their tetanus shots are up to date, and should immediately perform first aid on any wound to prevent tetanus.

Rabies — Several wild and domestic animal species are reservoirs for rabies, including foxes, wolves, bats, coyotes, raccoons, skunks, dogs, and cats. A bite from an infected animal can pass the generally fatal disease to humans. The disease attacks the nervous system; clinical symptoms of rabies infection include a sense of apprehension, headache, fever, and malaise. The disease progresses to paralysis and often includes muscle spasms when swallowing, which leads to hydrophobia. Eventually the infected person will undergo delirium and convulsions. The cause of death is respiratory paralysis. The period prior to the onset of symptoms is typically between 3-6 weeks; however, there can be wide variations. To prevent exposure, avoid contact with any wild animals, particularly sick or dead ones. Anyone whose work involves a risk of animal bites should consider immunization against rabies. If you are bitten by an animal, perform appropriate first aid and seek medical attention *immediately*, even if you have been immunized.

Lyme Disease — Lyme disease occurs in the northeastern, north central, and Pacific coastal regions of the United States as well as into Canada. The disease is spread by the bite of an infected tick; symptoms appear within about one week. Symptoms include a donut-shaped red discoloration around the bite, joint pain, fever, chills, headache, and malaise. Untreated Lyme Disease can appear to go away, only to return in more serious form later. Secondary stages can include heart complications and meningitis-like symptoms. Months to years later, an arthritis can appear, and the later stages can involve paralysis and dementia. **Rocky Mountain Spotted Fever** is another tick-borne disease that is found primarily along the Atlantic seaboard and the southeast. It is rarely found in the West.

Plague — This disease has been found throughout the West. Plague may be contracted through the bites from a rodent flea or by contact with infected animal tissues or inhalation of the bacteria of the animals. Infected fleas may leave a sick dead animal host and bite people. Symptoms of

bubonic plague include swollen lymph glands, high fever, headache, and nausea. The symptoms may appear from two to six days after infection. Untreated bubonic plague is fatal in about half of all reported cases. You should discuss immunization against plague with your doctor or OMSP (Occupational Medical Surveillance Program) physician if you work in a plague-infected area or are likely to come into contact with fleas carrying the bacteria.

Hantavirus Pulmonary Syndrome (HPS) — Hantavirus pulmonary syndrome is a zoonotic respiratory disease by hantavirus that is typically transmitted by the deer mouse. While the risk of transmission appears to be low, HPS is difficult to diagnose and treat, and has a relatively high fatality rate (approximately 60%). The source of the infection is breathing dust or aerosols containing feces, urine, or saliva from deer mice. The most likely ways to acquire the disease are by entering or working in buildings where there has been a heavy mice infestation, by excavating rodent burrows or sites very nearby them, or by directly handling the rodents or their carcasses. The buildings with highest risk are those that have been unoccupied for long periods, such as storage areas or seasonally occupied buildings like cabins.

The disease has an onset of 4-45 days. The initial phase consists of flu-like symptoms such as head or body aches, fever, cough, and less commonly, stomach cramps, nausea, vomiting, or diarrhea. The second phase is characterized by severe difficulty in breathing caused by fluid in the lungs. Anyone who develops the flu-like symptoms listed above within 45 days of a possible hantavirus exposure must seek medical attention at once. Tell the physician of the possibility of hantavirus exposure.

The precautions against infection are the same for any method of exposure. Use a HEPA-filtered mask or respirator. When handling rodents and traps, wear eye protection, gloves, and outerwear. Wet mop, rather than sweep or vacuum, when cleaning buildings prior to use. Follow the protocol found in the PPRL Biosafety Plan for cleaning areas that could harbor hantavirus-contaminated material.

West Nile Virus (WNV) — This virus was first found on the east coast of the United States in 1999 and has moved west. It arrived in Utah in 2003 and has been found in each of the 48 contiguous states. It is most commonly contracted through the bite of an infected mosquito. Laboratory workers have also acquired it through a needle stick when working with a sample from an infected bird. In most cases, people have a very mild form of the disease and may not even be aware of the symptoms. However, in about 20% of the cases, people have definite flu-like symptoms (fever, body aches, and possibly a rash). Of those 20%, the disease can proceed to the more severe form involving the neurological system (about 0.1 to 0.7%) and resulting in permanent health impairment or death.

There is no vaccine against WNV for humans. The best prevention is personal protection. If you must be outside between dusk and dawn, wear long-sleeved shirts and pants, and use a CDC-approved insect repellent such as DEET (available from the CDSO). If you develop a high fever, severe headache, and muscle weakness or confusion 3-14 days after being bitten by a mosquito, see a doctor immediately.