



UNIVERSITY of HAWAII®

MĀNOA

Fieldwork Safety Guidelines

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1.0 A CLIMATE OF CARE

The following guidelines focus on establishing a climate in which the safety of the University personnel has primacy, where faculty, staff, and students know the policies, procedures, and guidelines to help create safe practices. Principal Investigators (PIs) may elect to manage the risks involved with their fieldwork in a different manner to these guidelines. Still, alternative approaches must provide at least equivalent or better levels of safety. There is no successful method of guaranteeing the safety of personnel. These guidelines attempt to provide a framework in which it is customary that all possible precautions have been taken and all proper responsibilities met. The major requirements of assessment of risks, planning, training, equipment, communication, responsibilities are addressed in this document.

2.0 APPLICATION AND SCOPE

“Fieldwork” consists of activities authorized by the University, conducted for study, research, or teaching, which are undertaken by faculty, staff, students, and authorized volunteers of the University at a location outside the geographical boundaries of the University campuses. Fieldwork activities, such as those involving isolated or remote areas; extreme weather conditions; hazardous terrain; dangerous wildlife; or lack of ready access to emergency services, can expose participants to significant risks to their health, safety or well-being, at locations outside the direct supervisory control of the University.

These guidelines intend to ensure that before undertaking fieldwork:

- 1) all concerned parties are aware of their responsibilities;
- 2) a risk assessment is carried out to identify potential hazards associated with fieldwork and to establish appropriate controls to eliminate or minimize such hazards;
- 3) all participants have an informed understanding of the associated risks and provide their consent to the means for dealing with such risks.

Under normal circumstances, these guidelines are not intended for organized off-campus activities such as:

- 1) Supervised study or work placements at external institutions which are affiliated with the University or which the University department has designated to be an approved placement center; or
- 2) Travel for conferences, seminars, meetings, or visits to other institutions. For all off-campus activities conducted on the premises of or under the control of another organization or institution,

Principal Investigators (PIs) must ensure that the local safety procedures of that organization or institution are appropriate to the type of activities being conducted, are in compliance with local laws and regulations, and are consistent with the safety standards and practices of the University of Hawai'i.

3.0 RESPONSIBILITIES

The responsibilities of the following: 1) Deans, Directors, and Department Chairs; 2) Departmental Safety Coordinators; 3) Principal Investigators/Supervisors; 4) Employees and Students and; 5) Environmental Health and Safety should be consistent with the responsibilities outlined in the [University of Hawai'i at Mānoa Departmental Health and Safety Guide](#).

For fieldwork, the following additional responsibilities are:

- 1) **TEAM LEADER:** The Team Leader may be the Principal Investigator (PI) or may, in the absence of the PI, be another member of the team who has been designated as such by the PI. The Team Leader is responsible for:
 - a) ensuring implementation of the control established by the PI, including the use of appropriate safety equipment, safety procedures, and medical precautions by team members during field-work;
 - b) conducting ongoing risk assessments during fieldwork and reporting any new hazards to the PI;
 - c) dealing with and receiving any safety concerns which arise in the field;
 - d) maintaining regular contact with the PI and/or departmental contact;
 - e) informing the PI and/or departmental contact of all accidents, illnesses, or emergencies that occur in the field; and
 - f) ensuring team members have received adequate health and safety training as applicable and must retain training records.

- 2) **TEAM MEMBERS:** Each member of the fieldwork is responsible for:
 - a) acknowledging the risks of the particular field project;
 - b) using the appropriate protective equipment provided and following the procedures established by the PI;
 - c) working safely and in a manner to prevent harm to themselves or others;
 - d) understanding the Requirements for Reasonable Care outlined in Section 4.3;
 - e) reporting any identified hazards to the Team Leader or PI; and
 - f) reporting all accidents, illnesses, or emergencies to the Team Leader.

4.0 REQUIREMENTS FOR REASONABLE CARE

Those involved in fieldwork must exercise reasonable care to ensure safety include, but are not restricted to, the following:

- A) Only staff, students, and approved volunteers authorized by the PI may assist with fieldwork. Friends, pets, and children are prohibited from accompanying field teams. Employees of the county, state, and federal agencies of official business connected with the project may accompany people working in the field. Researchers or other colleagues from other institutions not authorized by the PI are not allowed to accompany field teams. Always consult with your PI if you are uncertain regarding someone's eligibility to accompany you in the field.
- B) Availability of appropriate first-aid supplies and expertise; and accessibility to emergency medical treatment;
- C) Availability of appropriate personal protective equipment(PPE) and field equipment to support the research;
- D) Availability of appropriate food and accommodations, and during travel to and from the site;
- E) Arrangements of appropriate transportation to, at, and returning from the location of the fieldwork; vehicles must be operated in a manner consistent with Standard Operating Procedures (SOPs) for vehicles for the agency whose vehicle you are driving. Personnel should ask the PI for a briefing on the procedures before you operate the vehicle for the first time;
- F) Before departure and continuingly on the site, the tasks and responsibilities assigned to each participant must be communicated;
- G) Knowledge of all health and safety standards and requirements applicable to the jurisdiction in which the fieldwork is being conducted;
- H) Provision of appropriate information and training regarding the risks associated with fieldwork activities, materials, equipment, and environment, and proper control measures for dealing with them;
- I) Provision of appropriate information and training for responding to and reporting of accidents involving injuries, damage to property and equipment, and spills, leaks, or release of hazardous materials;
- J) Recognition of the right and responsibility of an individual to exercise personal judgment in acting to avoid harm in situations of apparent danger; in this regard, students should be informed of the general nature, requirements, and location of their fieldwork; and
- K) Availability of procedures for contacting the University to obtain assistance in an emergency.

5.0 SOLITARY FIELDWORK

Working alone is strongly discouraged, particularly when remote or hazardous locations, high-risk activities, or other unusual conditions are involved. However, when solitary work is deemed necessary and unavoidable, a stringent code of practice must be established to address worker competency, procedures for regular reporting, emergency procedures, and other precautions and procedures appropriate to the type of activities involved.

In such situations, the Solitary Field Researcher will assume the responsibilities of the Team Leader and Team Member. A solitary field researcher should be certified in first aid and aware of all hazards (plants, animals, terrain, weather) in the area they will be working. Always carry personal photo identification. The field member must ensure that a local contact, responsible and trustworthy, is aware of your field location every day and knows when you are expected to return each day. Provide this person with contact information for those who should be informed if you do not return.

6.0 REFUSAL OF UNSAFE WORK

Any individual member of a fieldwork team may refuse to participate in any activity they feel may endanger their health and safety or that of another person.

Workers have the right to refuse to do a job if they believe in good faith that they are exposed to an imminent danger. "Good faith" means that even if an imminent danger is not found to exist, the worker had reasonable grounds to believe that it did exist. Where possible, ask the supervisor to eliminate or correct the hazard or look into how the work in the field can be addressed without the possibility of imminent danger. If the supervisor disagrees about the extent of the hazard, contact EHSO to review the SOP of the fieldwork and how the hazards of working in the field can be addressed.

7.0 GENERAL GUIDELINES

Before fieldwork is conducted, the PI should develop standard operating procedures specific to their fieldwork. The SOPs should include, at a minimum, information required in the following sections.

7.1 Preparation

Before individual(s) leave, one of the most important phases of a fieldwork experience is planning and preparation. Here are some suggestions before a person departs:

- A) Prepare a written plan of the trip, complete the [UH Manoa Field Research Safety Plan Form](#), and leave this with a responsible party. Include the following:
 - 1) Your itinerary: locations, arrival and departure dates, names, addresses, and phone numbers of all fieldwork participants.
 - 2) Contact person: Name and phone number of a person to contact in case of emergency.
 - 3) Activities: General nature of activities being conducted. Determine risks and hazards specific to your research or tasks.
 - 4) Local contacts: Names of people at or near your fieldwork site who can reach you if necessary, as well as your check-in/check-out arrangements. Fieldworkers should regularly check in with their group office and advise of any changes in schedule or points of contact. If possible, field-workers should also inform someone in their work locale (for example, local search and rescue personnel, police, sheriff, or motel employee) each day about the daily fieldwork location and the approximate time of return. The local contact should be provided with people's telephone numbers (group office, University contact, etc.) if the workers do not return or report within a predetermined interval of the scheduled return time.
- B) Learn about potentially hazardous plants, animals, terrain, and weather conditions in the areas where fieldwork is conducted.
- C) Take a CPR/First Aid Class.
- D) Assemble safety equipment and other provisions and check everything before you leave; make a list of necessary safety equipment (see section 8.0).
- E) Whenever possible, fieldwork activities should be done in teams of at least two people. The "buddy" system is the safest way to work.
- F) Ask your health insurance provider about how your coverage applies to medical treatment in the fieldwork locale, should that become necessary. Find out where you can go for emergency care.
- G) Obtain authorization for access to state, federal, and private lands.
- H) Obtain permits for any sample collection from respective agencies (i.e., DLNR, NFWS, etc.)

7.2 Medical Care and First Aid

The first aid kit must be maintained at all times during the operation or exercise. At least one employee who is trained in first aid must be present during operations. At least one field crew member shall carry a first aid kit while in the field. Additionally, each vehicle should have a fully stocked first aid kit and a survival kit. There shall be at least one (1) individual per field crew with a current standard first-aid certificate.

Any job-related or field research injury or illness suffered by a University employee must complete the Accident Injury, and Illness Report provided in [Appendix 11](#) and reported to the unit's Human Resource (HR) officer immediately to determine any Worker Compensation system or OSHA injury and illness recordkeeping requirements, if applicable.

7.3 Travel on Foot

- A) Wear proper safety gear.
- B) Always carry a first aid kit, radio, and water.
- C) Be sure that equipment and supplies are carried in a manner consistent with safe travel over rough terrain. Backpacks should be in good repair and fit properly; **DO NOT OVERESTIMATE YOUR LOAD CAPACITY.**
- D) Always be aware of what's around you (on the ground and overhead).
- E) Be conscious of surroundings – when disoriented, familiar objects can set you on track. Carry a compass and an area (field) map showing locations of pertinent transects, roads, and trails, and other landmarks, especially in unfamiliar surroundings and when fog, rain, or darkness set in.
- F) Always be sure someone in the laboratory/research group knows where you are and when you are expected to return.
- G) Never overextend your capabilities.
- H) Be sure permission is granted before entering private property.
- I) Report accidents immediately to your supervisor.
- J) Use common sense.
- K) If you do get lost or become disoriented, **STAY WHERE YOU ARE.** You may be overcome by panic. Sit down and quietly organize your thoughts on where you are. A few moments of recollection may clarify your situation. If not, find a comfortable place to rest. Use your whistle or other means to attract the attention of anyone around you. Do not try to leave the area if there are no signs of where to go. Do not follow a stream downhill; it will almost certainly go over a waterfall at some time. Do not travel at night.

7.4 Other Transportation

7.4.1 Use of Vehicles

Only licensed and appropriately trained drivers should be in charge of field vehicles. The PI should ensure a system for checking for appropriate and current driving licenses, placing restrictions on the use of vehicles (e.g., for untrained and inexperienced persons), and giving express permission for vehicle use. The PI should have guidelines on the use and limitations of vehicles. Only registered vehicles are to be used. Vehicles used for fieldwork should be well-maintained according to the manufacturer's service specifications and equipped with adequate spare parts and tools, according to the area and length of the trip. When loading vehicles, care must be taken to maintain as low a center of gravity as possible and to secure items adequately in a cabin. Vehicles must be driven with caution and attention to prevailing road and weather conditions. The vehicle should be selected for the type of terrain likely to be encountered. Drivers should be familiar with the vehicle before setting out on the trip. Drivers intending to use four-wheel drive (4WD) vehicles should receive training in 4WH or demonstrate experience in driving such vehicles.

Drivers should be familiar with routine maintenance procedures such as checking oil, water, tire pressure, coolant, battery, and charging tires. Drivers should also be aware of the fuel capacity and range of the vehicle. Before setting out on the trip, the driver should check the vehicle to ensure it has been adequately maintained and has all the necessary tools, spare parts, and special equipment for the trip. In addition, a check should be made that luggage and other equipment are secure. Rest stops and fuel stops should be used to check that the vehicle is operating normally with respect to tire pressure, engine leaks, etc. and that luggage and equipment remain secure. Every day, before setting out, check oil, water, fuel, battery fluid, coolant, brake fluid, and tire pressures and that controls are working.

Driving times and distances should be planned to prevent fatigue. A driver should take periodic breaks after driving for a few hours. During the break, some light physical activity such as walking should be incorporated. Driving at night is more hazardous than during the daytime because of reduced visibility and fatigue and should be minimized. Drivers should always heed applicable road rules, including those pertaining to the consumption of alcohol. Driving should always be done at safe and legal speeds. Safe speeds depend upon the road and weather conditions, the experience of the driver, time of day, alertness of the driver, and the vehicle itself. Unfamiliarity with the road or

conditions and the presence of nocturnal animals contribute to driving hazards.

Important Safety Equipment To Bring in Your Vehicle:

- Jumper cables
- Tire gauge
- Spare tire, jack
- Map/Directions
- Flashlight or Headlamp
- Reflective vest, safety glasses, grip gloves
- Field Radio or Satellite Communication Devices, extra batteries or charger (cellular phones should be used as a back-up only due to potential lack of reliable services in the field).
- Fire extinguisher
- Extra dry clothing, blankets
- Useful supplies: Tools (pliers, hex wrench, screwdriver), duct tape, bungee cords, large plastic bags

7.4.2 Use of Boats

When boats are used, the PI in charge must be familiar with relevant state and federal boating laws. Personnel in charge of boats are responsible for ensuring that the appropriate licenses and any appropriate boat registrations are obtained.

Boats should be well-maintained and equipped with adequate spare parts and tools, according to the area worked and the length of the trip.

Prior to setting out, check the vessel for safety equipment, personal flotation devices, fully charged battery, fuel, spark plugs, cotter pins, anchor, and a small bucket for bailing.

Vessel operators out of Hawaii Institute of Marine Biology (HIMB) need to consult with the Marine Safety Officer and follow the requirements of the HIMB Boating Safety Manual.

7.4.3 Helicopter Operations

A) All field personnel involved in work that required the use of helicopters must have completed a National Park Service B-1 Helicopter Safety Course within the last 3 years.

B) All field workers involved in sling-load helicopter operations must have also completed the appropriate course within the last 3 to 5 years.

C) Personnel may only fly Department of Interior Office of Aircraft Safety certified helicopters flown by OAS Certified pilots.

D) For helicopter operations involving flight over the ocean, all persons involved must have had training in the ocean-ditching protocol within the last two years. Taking the course for two years in a row is recommended for new employees.

E) All personnel involved in any way with helicopter operations must use the appropriate flight suits, gloves, hard hats with chin straps or helmets, leather boots, and other prescribed protective and safety clothing. In addition, personnel flying a helicopter must wear appropriate fire-repellent clothing and a communication helmet.

7.5 SCUBA Diving

Diving can only be authorized when done in accordance with the University of Hawaii Diving Safety Manual administered by the University's Diving Safety Officer.

Before diving, the PI must contact the [University's Diving Safety Office](#) (DSO) to ensure the requirements set forth in the UH Diving Safety Manual can be met.

7.6 Working In Water

Precautions required for aquatic fieldwork vary according to the type of environment and likely weather conditions, including possible weather extremes which may be encountered. Coastal, estuarine, streams, rivers, and open ocean environments present different hazards. Therefore, the PI should develop standard operating procedures (SOPs) for each type of aquatic fieldwork it conducts. Fieldwork personnel should receive training on SOPs relevant to the environment being visited.

When planning work in aquatic environments, information about atmospheric and oceanographic conditions should be considered. These include weather forecast, tides, currents, swell/surf break. Also, for rivers and streams, check the most recent gauge height and discharge rates.

7.6.1 Snorkeling and Breath-Hold Diving

Background:

Snorkeling vs. Breath-Hold Diving (e.g., freediving, skin diving)

When snorkeling and breath-hold diving for University of Hawaii sponsored activities, UH Manoa establishes the following distinctions:

Snorkeling: swimming on the surface of the water, using any combination of mask, snorkel, and/or fins, without any breath-holding or submersion.

Breath-hold diving: swimming on or under the surface of the water, using any combination of mask, snorkel, and/or fins, with occasional or repeated breath-holding excursions to any depth.

Protocols for Snorkeling and Breath-Hold Diving Safety:

General Restrictions:

Unless specifically recommended by the University of Hawaii, snorkeling/breath-hold diving generally should not be conducted:

- In areas with potential underwater entanglements
- In areas without immediate access to the surface
- In seas greater than 3-5 feet
- In current greater than 0.5 knots

Equipment Specifications:

Unless expressly authorized by the team leader for the unique characteristics of the activity or environment, each snorkeler/breath-hold diver should be equipped with:

- Mask
- Fins
- Snorkel
- The ability to achieve permanent, positive floatation on the surface (e.g., life jacket, snorkeling vest, wetsuit)
- A dive flag conforming to Hawaii state regulations

Snorkeling Procedures:

- A. Team Members are encouraged to objectively evaluate their level of personal fitness, watermanship, and appropriate experience before engaging in any in-water activity.
- B. The swimming ability of the snorkeler should be assessed or verified as part of the operational planning process (expected currents, waves, distances from exit, etc.).
 - a. Team Leaders may require individuals to wear life jackets, snorkeling vests, or wetsuits if there is any doubt of an individual's swimming ability.

- b. Non-swimmers should only participate while wearing a life jacket, a permanently inflated snorkel vest, or a wetsuit.
- C. Use the buddy system (i.e., two or more comparably skilled individuals in constant communication at all times). See section 5.0, Solitary Fieldwork, if this guidance cannot be met.
- D. Wear personal protective equipment such as closed-toed footwear, gloves, wetsuit, or similar protection.
- E. Team Leaders should be familiarized with in-water rescue techniques. If a single buddy pair is conducting activities, both members of the pair should have the skills and fitness to safely complete the planned activity, including being prepared to provide assistance or rescue to their buddy.
- F. Be aware of and monitor vessel traffic. Hawaii State law ([Hawaii Administrative Rules 13-245-9](#)) requires the use of dive flags in the water or on the vessel being used for snorkeling/breath-hold diving activities. Users are required to stay within 100 feet of the flag, but it is recommended to stay closer to the flag in areas of high vessel traffic. Additionally, areas such as navigational channels should be avoided for these activities.
- G. Notify appropriate personnel before engaging in activities, especially near working waterfronts.
- H. In general, snorkel/breath-hold dive during daylight hours only. If activities are conducted during non-daylight hours, individuals should have a water-proof light and an illuminated dive flag. A shore/boat-based contact that can help identify the exit location and assist in monitoring divers is strongly advised.
- I. The Dive Propulsion Vehicle (DPV) is a specialized tool that should only be used in unique circumstances to achieve a specific research goal. Safety personnel should be consulted before purchase or use. This type of equipment should only be used for transport on the water's surface. It is not recommended that a DPV be used for descent or ascent as this could cause an increased risk of barotrauma injuries. The DPV is not a substitute for a boat, and safety consideration of distance from shore should be considered before going to a particular location.

Breath-hold Diving Procedures:

- A. Follow the above guidelines.
- B. Team Leaders should assess or verify the breath-hold diver's abilities for the task(s) at hand.

- C. Breath-hold diving should not be conducted to depths greater than 30 feet or for a duration longer than one minute per dive.
- D. Use the buddy system with 1 diver up and 1 diver down.
 - a. If the workload requires repetitive diving, consider a three-person buddy system to allow recovery time between dives. Three-person buddy teams should only have 1 diver down at all times.
- E. No breath-hold diver should dive to a depth greater than that from which their buddy is capable of recovering them.
- F. If you are unable to equalize your ears and sinuses, do not breath-hold dive. Likewise, if your buddy is unable to equalize their ears, they are unable to assist you in a rescue situation, and you should limit your breath-hold diving for the day.
- G. Avoid breath-hold diving when water conditions do not allow constant visual contact between a submerged diver and their topside buddy. These conditions can be caused by poor underwater visibility or a sea state above the recommended limits.
- H. Excessive work while breath-hold diving should be avoided. Consider using SCUBA if additional work, tasks, or equipment are needed. See section 7.5 for additional information regarding the University of Hawaii SCUBA Diving requirements.
- I. Breath-hold diving after compressed gas diving activities is not recommended.
- J. It is recommended that a cutting device be available in case of entanglement. This cutting device should be easily accessible in a timely manner based on the activity.

7.6.2 Coastal and Estuarine Work

When planning coastal and estuarine work, the status of tides, currents, weather, and other safety factors must be considered. The PI should develop standard operating procedures for areas worked, including: above the high tide zone, within the intertidal zone, and in the water. The PI should consider the swimming ability of all personnel working in the water or the intertidal zone. If the work area does not have lifeguards on duty, consider how you would extract a team member out of the water without assistance. Ensure that appropriate clothing and footwear are worn by all personnel.

7.6.3 Streams

When working in streams, always be aware of the weather conditions, especially when heavy rains are forecast. Other precautions to consider are:

- A) Wear footwear appropriate for the tasks, e.g., rubber boots, tabis (i.e., those designed for wading). Do not jump from rock to rock. Always ensure that your footing is safe.
- B) If, after working in a stream or in some way associated with water, you come down with flu-like symptoms that persist, consult your physician and inform them that you may have been exposed to leptospirosis. In addition, if you have a break in your skin that could be exposed to water, let your supervisor know to take protective measures or assign you to other duties.
- C) Never drink untreated water from streams or any source other than a municipal supply. If you suffer from diarrhea and have a hydrogen sulfide taste in your mouth after belching, consult your doctor and inform them of the possibility of your having **giardiasis or amoebic dysentery, or other waterborne diseases**. If your doctor confirms that you are suffering from such diseases, you must notify your supervisor immediately. You will not be allowed to work in the field until your doctor has confirmed that you are free of the disease.

7.7 Terrestrial Fieldwork

Precautions required for terrestrial fieldwork vary according to the type of environment and likely weather conditions, including possible weather extremes, encountered. Rainforest, caves, and mountain environments present different hazards. The PI should develop standard operating procedures (SOPs) for each type of terrestrial fieldwork it conducts. Fieldwork personnel should receive training on SOPs relevant to the environment being visited.

7.8 Working in Caves

Depending on the nature of their research, field personnel may need to enter cave systems to survey, monitor, sample, or evaluate cultural and natural organisms and their habitats from time to time.

Caves in Hawaii occur primarily in volcanic substrates and consist of lava tubes or lava blisters formed in pahoehoe (smooth lava) flows. Tube widths can range from a few feet to thirty (30) feet, and tubes or systems of tubes can extend up to several miles. Skylights or collapsed roof sections are common in tubes, which rarely extend

intact for more than 100m. All tubes and blisters that field researchers enter should be prehistoric and have long since attained a cooled, non-toxic, and stable condition. Tubes near active volcanic structures, as on Big Island, should not be entered without special training. If there is any question about the safety of the tube, do not enter it. Do not enter a cave or tube if you are claustrophobic. Always file a "Cave Work Plan" with your supervisor/PI or local law enforcement.

A variety of animals may use caves. For example, honey bees and paper wasps may nest overhangs at entrances. Move slowly and stay 10-15 feet away. Goats, sheep, and pigs resting in caves may bolt for the opening when startled and may dispute your right to stand in it, so approach a cave slowly.

Protocol for cave visits:

General Concepts:

- A) Treat caves with respect. Many are sacred places.
- B) Move slowly and softly. Careless movement may damage irreplaceable archeological, geological, or biological resources.
- C) Do not move or remove cave material, except recent garbage. Do not dig, as this may destroy stratified deposits. Do not change air flows as this may alter the cave's climate.
- D) Do not smoke in the cave.
- E) Take extreme care in transition and deep (lightless) cave environments; do not touch mineral deposits, animals, organic ooze, cave slime or tree roots.

Procedures:

- A) Approach cave entrances carefully and do not make a trail or trample vegetation. Avoid stepping on stone structures or plants.
- B) Allow 10 to 15 minutes for your eyes to adjust to the cave.
- C) Carry or wear the following (each cave): durable trousers, light jacket, shirt, hard hat, leather gloves, and good quality walking shoes with reasonable ankle support and thick soles. Knee and elbow pads, if rough or confining conditions are expected.
- D) Each person should have a whistle and at least one flashlight (at least two D or four C cell flashlights) plus an extra set of batteries. Chemical light sticks (cyalumes) should be carried as a backup because they provide several hours of illumination. There should be at least one strong, extra flashlight for every three people. Headlights should be used in preference to handheld lamps. In addition, carry one quart of water and food snacks.

- E) Each person should carry: 1) two-way radio; 2) compass; 3) flagging tape; 4) first aid kit; 5) Insect sting kit; 6) navigation log book; 7) watch; 8) entrance-marker flag.
- F) Never enter a cave alone. The minimum crew is two.
- G) Leave a filled-out “Cave Work Plan” or “Field Research Safety Plan” (pgs 25-27) with a responsible individual. The plan should include who is in the field party, vehicle use, location of the cave (if known only on arrival, call in on radio to your supervisor/PI), date, planned times to depart and return to base camp, planned time inside the cave and purpose of cave mission.
- H) Mark cave entrance with a visible flag before entering.
- I) Never separate in the cave; stay within eyesight of one another.
- J) Move slowly and stand up even slower. Watch for hazards overhead and underfoot.

7.9 Use of Firearms

- A) If your work requires you to carry a firearm, you must have passed the federal firearms certification provided by the National Park Service or another federally approved program (e.g., N.R.A.). This certification must be repeated each year. In addition, you must obtain approval from the landowner to carry a firearm on their property.
- B) You must abide by all state and federal laws.
- C) Firearms must always be returned to the firearm’s cache on returning from the field.
- D) You must ensure that the firearm is properly maintained.
- E) You must account for all ammunition used.

7.10 Use of pesticides/Other Chemicals

- A) If your work requires you to use pesticides, you must either work under the supervision of a person who has a pesticide application certificate or a current certificate yourself. In addition, you must abide by the instructions on the pesticide label.
- B) You must wear the appropriate safety equipment and clothing at all times and are responsible for maintaining your equipment and clothing.

- C) Know the [University's Chemical Hygiene Plan](#) or [Hazard Communication Program](#) requirements as it applies to your work; contact [UH EHSO Chemical Hygiene Officer](#) (CHO) or [Occupational Health and Safety Program Manager](#) for these requirements.
- D) In case of an accident, notify the supervisor immediately, especially in which chemicals on the skin are involved.

7.11 Working on State and Federal Lands

If you are working in a national park, wildlife refuge or state forest reserve and there is an emergency, e.g., volcanic eruption, wildfire, you may be required to participate in emergency operations. Obey the incident commander or other responsible official(s). Participation in such emergencies is optional, but you are encouraged to support the emergency operation. During the period of the emergency, you will be covered under the emergency regulations.

7.12 Working With or Around Animals

Check with the Office of Research Compliance, [Biological Safety Office](#), and the [Institutional Animal Care Use Committee](#) (IACUC) for additional approval and guidance when anticipating working with or around animals.

Rodents (rats and mice), cats, and other animals are known to carry a variety of diseases, most of which have not been reported from Hawaii. If you are working with animals or areas that their dropping may have contaminated, you are required to take the following precautions.

Exposure to body fluids:

If you may be exposed to body fluids from these animals, you must take a variety of precautions during trapping, tagging, or removal. All direct contact with animals should be through barriers. If you must handle live animals (this should be avoided except when required), use protective bite-proof gloves with disposable gloves underneath. Use non-allergic disposable gloves for handling carcasses. Dispose of gloves afterward by enclosing them in a plastic bag, like a "Ziploc" bag.

If you are not leaving the carcass in the field, place it in a sealed bag. If you are examining stomach samples or other body parts, use disposable gloves, eye or lab glasses with side covers, and a mask to prevent fluids from hitting your eyes, nose, and mouth. Any contact with fluids on the skin should be washed off with an antibacterial soap. Contact with eyes, nose, or mouth should be washed out with saline solution (eyes) or regular water (mouth). Such examinations should take place in a well-vented room or outside. People with suppressed immune systems or who are pregnant should avoid close contact with cats, alive or dead, due to the risk of toxoplasmosis.

Exposure to Airborne Disease:

If you are cleaning an enclosed area (cave, historical structure) with rodents, bad or cat droppings, **DO NOT** sweep them. Use disposable gloves if touching contaminated areas. The area should be mopped down with commercial chlorine bleach solution. The person doing the cleaning should wear gloves and respiratory protection. Similarly, any mouse or cat traps bedding should be handled only in the open, not inside an enclosed area. The droppings may carry leptospirosis and other diseases, so they should be treated as potentially infectious and buried away from streams and water sources or double-bagged and disposed of according to local regulations at sanitary landfills.

7.13 Pests

A number of pests may be encountered in fieldwork. Follow these general guidelines to prevent injury and illness:

- A) Keep garbage in rodent-proof containers and stored away from your campsite or work area. Food crumbs and debris may attract insects and animals.
- B) Thoroughly shake all clothing and bedding before use.
- C) Do not camp or sleep near obvious animal nests or burrows.
- D) Carefully look for pests before placing your hands, feet, or body in areas where pests live or hide (e.g., woodpiles, crevices, etc.)
- E) Avoid contact with sick and dead animals.
- F) Wear clothes made of tightly woven materials and tuck pants into boots.
- G) Wear insect repellent.
- H) Minimize the amount of time you use lights after dark in your camp or worksite, as they may attract pests and animals.
- I) Use netting to keep pests away from food and people.
- J) Carry a first aid manual and kit with you on an excursion so you can treat bites or stings. If bitten, If the pest is poisonous, or if the bite does not appear to heal properly, seek medical attention immediately.
- K) Be aware of the appearance and habitat of pests likely to be found.

7.14 Other Environmental Hazards

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

- A) **Poisonous Plants** – plants like “poison oak” may contain a potent allergen that can cause a reaction anywhere from several hours to two (2) weeks after exposure. The allergen may spread by: contact with the plant itself, touching objects which have touched a plant (tools, for example); inhaling smoke from a burning plant; and/or 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 long pants and long-sleeved shirts. If you come in contact with these plants, wash clothes and skin with soap and water as soon as possible.

- B) **Impure Water** – A variety of potentially harmful organisms and pathogens can live in “natural” water sources such as streams, lakes, 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 these sources, treat the water first by using water purification tablets, boiling it for three (3) minutes, or using a special purification filter (available from sporting goods stores).
- C) **Exposure to 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 the sun due to their skin pigmentation. Certain drugs, such as sulfonamide, oral antibiotics, certain diuretics, most tetracycline, barbiturates, and biothionol (ingredients in soaps and many first aid creams) can also increase susceptibility to the sun. To prevent sunburn, cover exposed skin and liberally apply sunblock creams. Wearing a long-sleeved shirt and hat will also provide protection from the sun.
- D) **Heat Exhaustion** – which can even affect individuals in excellent physical condition, is caused by prolonged physical exertion in a hot environment (such as strenuous hiking in the desert during the summer). Heat exhaustion 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 the shock, and give water or electrolyte replacement slowly but steadily if the victim can drink. If heat exhaustion is not treated, the victim can suffer heatstroke. Heatstroke is far more severe than heat exhaustion. The blood vessels in the skin can become so dilated that the blood vessels to the brain and other vital organs are 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 as with heat exhaustion, and seek medical attention immediately.

Failure to gradually acclimate to heat or even minor degrees of dehydration or salt deficiency makes an individual more susceptible to heat exhaustion. To prevent heat exhaustion, drink plenty of liquids (electrolyte replacers) and take frequent rest breaks.

- E) Excessive Cold – On any trip, even a one-day excursion, where sudden weather changes can occur, adequate clothing must be worn or carried. Prolonged exposure to excessive cold can lead to hypothermia, a lowering of the body temperature; symptoms include shivering, numbness, slurred speech, and excessive fatigue. The minimum essentials are long pants, a long-sleeved shirt or sweater, a windbreaker or down jacket, and a cap. It is best to wear clothing made of material that will wick moisture away from the body (e.g., wool or polypropylene instead of cotton). Wear several layers of clothing to allow adjustments to differing levels of physical activity. Avoid getting damp from perspiration.
- F) Wildlife Safety - To protect yourself and stay safe in the field, know the potential wild animals you may come upon while doing fieldwork, understand their behavior, and prepare yourself for potential encounters. Wild animals generally avoid human contact, but if you encounter them in the wild, maintain your distance as best as possible. Do not attempt to feed, catch or pet a wild animal. Never approach wild animal babies as the mother may be nearby and may be protective of their young. Do not run; move away slowly. In the ocean, know the state and federal regulations and species-specific laws when interacting or encountering ocean animals or marine mammals. Be prepared for stings, bites, and encounters with wild animals on land or in the ocean.

8.0 EQUIPMENT AND COMMUNICATION

8.1 Equipment

Safety equipment must be inspected and tested prior to the trip to ensure that it is in good operating condition, with fully charged batteries (if applicable), sufficient fuel (if applicable), and that all appropriate parts, tools, and manuals are available.

Ensure that the equipment and material needed has been carefully thought about, made available and that everyone knows how to use it. If anyone in the group has specific medical conditions requiring medication or has allergies to anything that may occur during the work, make sure someone else knows.

Assemble safety equipment and other provisions and check everything before leaving. These may include (but are not limited to):

- First aid kit and first aid manual
- Medications taken on a regular basis
- Allergy treatments as needed
- Sunscreen and hat
- Water purification tablets or filter devices
- Water Canteen
- Personal protective equipment (PPE) such as safety glasses/goggles, gloves, hard hats, work boots, etc.
- Flashlight or Headlamp, extra batteries
- Whistle, Signal/Mirror
- Matches
- Field Radio or Satellite Communication Devices, extra batteries or charger (cellular phones should be used as a back-up only due to potential lack of reliable services in the field).
- Map, Compass, or GPS
- Knife or Multi-tool
- Extra food and snacks
- Insect repellent
- Seasickness tablets
- Your field safety plan with emergency procedures

8.2 Personal Protective Equipment

Depending on the type of work, the area to be visited, and the likely weather conditions, special Personal Protective Equipment (PPE) may be required. This may

include such items as hard hats, steel toe boots, safety glasses, gloves, respirators, etc. The PI [should select PPE](#) based on the evaluation of hazards expected.

8.3 Communication Equipment

Training and licensing are required for the use of certain types of radios. Where these are the main form of communication, all members of the fieldwork group must be trained and licensed in their use.

If cellular phones are used, everyone must know how to use them properly and must have access to the relevant contact numbers. Battery power for communication equipment should be sufficient to last beyond the expected duration of the fieldwork.

8.4 Contacts and Continuity of Contact

No trip may take place without properly informed and competent designated contacts both within the fieldwork team and at the University base.

Before setting out to fieldwork, the schedules and methods for maintaining contact with the University and other contacts must be established and understood by everyone involved. Contacts at the University and elsewhere must be informed about the fieldwork location, the expected duration of work, how to contact field personnel, the planned time of return, and at what time a subsequent alarm will be raised.

For long fieldwork, arrangements must be made to make contact on a regular basis, such as daily or some other regular interval if daily contact is impractical. The frequency of the regular contacts will depend on the length of the trip and where it is, how many personnel are involved, and what sort of communication is actually available.

If a scheduled communication is not made, the contact at the University or home must be able to raise the alarm. If plans change, members of the fieldwork team should alert their designated contact to prevent false alarms and waste of time.

Before any trip, contacts and field team members must have agreed on how an alarm would be given under any worst-case scenario (e.g., the boat sinks, a vehicle fire) when the planned means of communication is no longer feasible. An alternative means of communication should be agreed upon, and a trial run conducted to test its effectiveness.

The University Department of Public Safety's telephone number (808-956-6911), monitored 24 hours a day, should be displayed in all vehicles and used as a last resort should other University-based contacts fail.

9.0 EMERGENCY PLAN

Contacts at the University, at home, and at a location near the fieldwork should be notified of the intended route(s), timing and number of people involved in the work, etc., to provide the information and help to direct search and rescue attempts. Maps and plans showing the locations of work should be provided to the designated contact person(s).

Anyone designated as the contact person for particular fieldwork must be organized and know what is required.

Schedules for communication, the timing, and method of raising alarms if contact is not made, the circumstances of the work (e.g. the registration numbers of vehicles, or boats, the place where boats are to be launched) should be documented so that the contact person(s) can find them quickly if required.

No designated contact may pass on the responsibility simply by leaving a message for someone else to take over – if something changes, the new contact must be told personally and all the relevant information provided so that there is no break in the continuity of the contact. The fieldwork team leader must also be informed of the change of contact person.

Suggested SOP for emergencies may follow the following:

- a) Contact person initiates the emergency alert if the fieldwork team fails to return when scheduled. The response may involve the following steps:
 - Call 911 and give the name(s), location, type of emergency, and required help.
 - Notify any supervisory personnel and provide them with the same information. If working in a national park or wildlife refuge, notify the local manager.
- b) Thirty (30) minutes from call-in time, an alert is issued. Contact person or another person should stay near the phone at the fieldworker's office or lab.
- c) One hour from call-in time, search procedures should begin.
- d) One person should remain near the phone, and one familiar with the field area should begin tracking the scheduled route.
- e) Tracking person should call back to the lab/office every 20 minutes to see if the fieldworker has made contact.
- f) Tracking continues until the person is found or word is received that they are safe.

UH Manoa Fillable Field Research Safety Plan Form

University of Hawaii at Manoa

Field Research Safety Plan Form (page 1)

This form may be used by the Principal Investigator (PI) to assist with the development of a Safety Plan. The completed Safety Plan serves to supplement the information provided in this guide and should be shared with all members of the research team and kept on file with the PI or Department Chair. Multiple trips to the same location can be covered by a single Safety Plan provided there are no significant changes such as location and scope of research, which result in revision of the original plan. EHSO is available to assist in the completion or review of the Safety Plan (956-3204).

Principal Investigator:	Department:
Phone Number:	E-mail Address:
Dates of Scheduled Fieldwork (Multiple dates may be entered):	
Location of Field Research: Outer Island/State: _____ Geographical Site: _____ Nearest City: _____ (Name, Distance from site) Nearest Hospital: _____ (Location, Distance from Site)	

Field Research Plan Continued (Page 2)

Field Research: (Please include a brief description of the field work.)	
University Contact (Name and phone no.):	Local (Field) Contact (Name and phone no.):
Emergency Procedures: (Please include detailed plans for field location, including evacuation and emergency communication). Attach a separate sheet if necessary.	
First Aid Training: (Please list any team members who are trained in first aid and the type of training received).	

Field Research Safety Plan continued (page 3)

Physical Demands: (Please list any physical demands required for this field research; e.g. high altitude, heat stress, climbing, hiking, etc.)

Risk Assessment: Please list identified risks associated with the activity or the physical environment (e.g., extreme heat and cold, wild animals, firearms, zoonotic diseases). List appropriate measures to be taken to reduce the risks. Include a separate sheet if necessary.

Identified Risk	Control of Risk
1.	
2.	
3.	
4.	
5.	

Travel Immunizations: (Please list required if any):

Field Team Membership: (Please list the names of all members of the field research team, and identify the Field Team Leader.)

Field Research Safety Plan prepared by:

Name: _____ Job Title: _____

Signature: _____ Date: _____