Fieldwork
Risk Assessment Guide

HAZARDS AND RISKS COMMONLY ENCOUNTERED WHEN CONDUCTING FIELDWORK

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Introduction

Risk assessments are a necessary part of conducting fieldwork – whether that be for teaching or research. Risk assessments are designed to encourage the fieldwork leader to consider the potential hazards that may be encountered, what risks these hazards may pose, and what protocols, procedures and equipment can be implemented to lessen the risk of damage or injury.

In principle, the approach to writing a risk assessment is the same for fieldwork as it is an experiment in a laboratory. However, anyone who has conducted fieldwork knows that there are exponentially more variables in play during fieldwork than in a laboratory environment. Not only does this mean that there are more hazards to account for, but also the ability to control these hazards is sometimes diminished or functionally non-existent. As a coordinator of fieldwork, it is your responsibility to do what you can to reduce the risk to person and property that these hazards can present. This is where risk assessments come in.

The writing of a risk assessment for the purpose of conducting fieldwork can be a confronting exercise, as the user is essentially tasked with listing any and all hazards one might encounter in the field, and then describe the measures the fieldworker will put in place to either eliminate or reduce the risk of these fieldwork-focused hazards.

1.1. PURPOSE

A reality is that the fieldworker may not be aware of some very real hazards they may be encountering in their fieldwork, with the risk of this being that relatively simple countermeasures will be missing in their fieldwork preparations. In fact, considering the immensely variable nature of working in the field, it is almost certain that some hazards will be missed.

The purpose of this document is to present a collated common hazards that are relevant and applicable to a number of different aspects of fieldwork.

From this document, the fieldwork coordinator, when compiling their risk assessment, is able to select the hazards that are relevant to them and their fieldwork. Hopefully, some hazards related to fieldwork that were not initially considered by the fieldworker will be made apparent.

This way, a wider range of hazards and risks will then be considered, further measures put into place to minimize these risks, resulting in an overall safer fieldwork campaign.

12. EXPECTATIONS IN USING THIS DOCUMENT

This document has been designed as a guide to help the identification of hazards and risks related to fieldwork – it does not act as a risk assessment in its own right. Not everything listed in this document may apply to your fieldwork, and some hazards and risks may not be present . While a large number of hazards and risks have been compiled into this document, not all of them will be applicable to your specific fieldwork. It is certain that some hazards and risks that are relevant to fieldwork in the Biology have been omitted from this document. There will also be risks and hazards that are specific to your fieldwork due to the specialized equipment you may be using, your fieldwork location, and so on.

The expectation is that the fieldwork coordinator considers their fieldwork carefully, and while using this document as a resource, is able to add or omit details that are applicable to their fieldwork. While hazards and risks have been provided, you still need to respond to them and implement measures to reduce risk. Identifying the hazards and risks in fieldwork is only part of the exercise in developing a risk assessment. As the fieldwork coordinator, it is your responsibility to elaborate on how you will reduce the risk each hazard presents.

It is acceptable to copy and paste relevant hazards and their controls from this document into the field plan iternary

- If they are not relevant, do not add them.
- If they are partially relevant, feel free to change and adapt the wording to suit.

As each fieldwork trip is considered unique, and subject to specific activities, personnel, environmental conditions among others, the control measures for each trip that address rather generic hazards and risks will be unique to that specific trip. As such, the risk assessment developer is expected to individually respond to the hazards and risks they have identified as relevant.

General fieldwork

21. ENVIRONMENTAL HAZARDS

Description of Hazard	Current Controls
Uneven ground or unsure footing causing trips, slips and falls	- Wear appropriate footwear at all times (e.g. high-ankle, enclosed, leather boots). - Be constantly vigilant of your surroundings and the ground while walking at all times. - Bring a light source such as a headlamp while working in low-light environments (e.g. caves or gullies) or outside of daylight hours. - Have available first aid equipment and the appropriate numbers of certified first-aiders at all times.
Concealed holes and/or animal burrows causing trips, slips and falls	- Visually survey the landscape prior to traversing. - Be constantly vigilant of your surroundings and the ground while walking at all times. - Bring a light source such as a headlamp while working in low-light environments (e.g. caves or gullies) or outside of daylight hours. - Have available first aid equipment and the appropriate numbers of certified first-aiders at all times.
Working near cliffs or precipices	- Be constantly vigilant of your surroundings and the ground while walking at all times. - Avoid being near (<4 metres) the edge whenever possible. - Avoid working or travelling on unsafe or unstable slopes. - Bring a light-source (e.g. headlamp or torch) if working in low-light environments.
Contaminated lands/waters	- If possible, avoid working in areas where biological/chemical contamination has occurred. - Do not handle contaminated soils/leaf litter/sediments/water unless trained, experienced and qualified to do so. - Wear PPE as appropriate. - Never ingest, or risk ingestion, of contaminated sediments or water.
Dangers of working in and around vegetation (e.g. cuts and scratches or falling tree limbs)	- Wear appropriate clothing, in particular thick long pants and sleeves. Consider further protection (e.g. gaiters and eye protection) - Visually assess surroundings prior to entering vegetated area looking for specific hazards such as sharp or thorn-bearing plants, or dead trees with branches/limbs that could present a falling hazard.
Inclement/weather not conducive with safe fieldwork	- No field work will be undertaken in advent of extreme weather forecasts as determined. - Have multiple forms of viable communication (e.g. mobile phone, satellite phone, EPIRB) on hand in case of changing weather conditions. Undertake daily checks of the day's weather reports to ensure forecast is conducive to fieldwork. - Pack clothing and supplies appropriate to the conditions, factoring in that conditions can change rapidly and dramatically.

22. ENVIRONMENTAL HEALTH HAZARDS

Description of Hazard	Current Controls
Sunburn	- Minimise bare skin (e.g. long pants and sleeves), and always wear a hat. - Work in shade. - Avoid working during peak UV intensity (e.g. 11am-2pm) - Apply and regularly reapply high SPF and water-resistant sunscreen. - Stay hydrated.
Fatigue	- Have plenty of food and water available. - Take regular breaks including one extended break (1 hour) in the middle of the day if possible. - Avoid working excessively long hours – limit the working day to 8 hours in total if possible. - Fieldworkers are to watch out for each other and identify if/when any others are showing signs of fatigue.
Heat exhaustion and dehydration	- Carry an excess of water at all times (i.e. at least 3-4 litres per person per day) - Take regular breaks including one extended break (1 hour) in the middle of the day if possible. - Avoid working excessively long hours – limit the working day to 8 hours in total to if possible. - Ensure an appropriate number of certified first-aiders and first-aid equipment are present at all times. - Aim to work during the morning and late afternoon, avoiding work during the hottest middle-hours of the day (e.g. 11am-2pm). - Have available first aid equipment and multiple certified first-aiders at all times. - Fieldworkers are to be aware of the signs of, and be able to identify if/when any others are showing signs of heat exhaustion or dehydration
Exposure to cold/hypothermia	- Avoid working in unnecessarily cold conditions. - Ensure fieldworkers are dressed appropriately for the conditions. - Have available first aid equipment and multiple certified first-aiders at all times. - Fieldworkers are to be aware of the signs of, and be able to identify if/when any others are showing signs of hypothermia. - Shelter (e.g. car, a building or tent) should be readily available whenever needed.
Encountering dangerous animals	- Prior to fieldwork, be aware of biting/stinging animals (including insects, reptiles and mammals) that might be encountered in the area. - Wear conditions-appropriate clothing (e.g. long pants and thick, sturdy footwear, gaiters). - Wear insect repellent/Bear Spary (carry these all the time and make sure it is accessible) - Be vigilant when working in areas inhabited by biting/stinging animals, and take care to not unnecessarily disturb locations biting/stinging invertebrates might be inhabiting (e.g. under rocks, in log hollows etc.). - Never deliberately provoke or agitate animals. - If biting/stinging animal is spotted, alert other fieldworkers to avoid the area. - Ensure an appropriate number of certified first-aiders and first-aid equipment are present at all times.
Tick bites	- Reduce the possibility of tick bites by wearing long pants and long sleeves, as well as insect repellent. -Avoid mammal dust bathing sites. Have fieldworkers visually inspect parts of their own body in areas prone to tick bites (e.g. arm pits, groin, behind the knees, in the scalp, along the waistline) each day.

	- look for the very small pinpoint sized dark specks, these are the nymph stage ticks - Carry first aid equipment to treat tick bites, like tick freeze. - Fieldworkers with tick bites are to be monitored for darkening of bite site and/or signs of fever.
Allergic reactions to bites or stings	- Never work alone. - Ensure an appropriate number of certified first-aiders and first-aid equipment are present at all times. - If a fieldworker is known to be allergic to any bites/stings, they are to inform the fieldwork leader prior to the fieldwork commencing. - The fieldwork leader should also take it upon themselves to check if any participants are allergic to any bites/stings. - In the first aid kit, include appropriate measures in the event of an allergic reaction – specifically Epipens and antihistamines. - Participants known to be allergic to bites/stings are responsible for bringing their own Epipens, however this does not preclude the fieldwork leader from bringing additional doses. - If allergy is severe, consideration should be given to whether it is safe for the participant to be part of the trip or should be excluded based on the risk.
Lack of environmental hygiene practices (e.g. vehicle, clothing) spreading weeds or pathogens	- Try to not move soil/plant material between sites. - Personal clothing and shoes will require regular cleaning. - Phytophera and Chitrid cleaning agents may also need to be used between wetland/forested sites. - Always wear clean latex gloves when handling amphibians. - If working in areas where there is a risk of disease transmission to other animals disinfect footwear and car tyres, and change clothing when moving between sites.
Working near roads or traffic	- Be aware of traffic and the direction of movement. - Always look both ways before crossing the road and use a pedestrian crossing if possible. - If possible work away from busy areas and roadways. - Wear high visibility clothing. - Ensure multiple reliable communications devices are available in case of incident. - Obtain advice about high traffic areas.

23. . REMOTE LAND-BASED FIELDWORK

Description of Hazard	Current Controls
Working in remote locations far from aid and/or assistance	- Register trip with university, including all necessary details of locations in which fieldwork is being undertaken, and have all necessary approvals attained. - Have a robust communication plan with a designated safety contact including regularly scheduled check-ins. - Take multiple reliable communication devices (e.g. mobile phones where reception can be relied upon, satellite phones, SPOT device etc.). - Take a locator beacon (e.g. EPIRB, PLB).

	- Ensure the presence of qualified first-aiders (including at least one with "remote First-Aid accreditation) and fully equipped first-aid kits. - All participants to abide by the control measures outlined in the trip's Risk Assessment and the Field Emergency Action Plan. - Where feasible, communicate details of trip with emergency services local to where fieldwork is going to be undertaken.
No reliability of food/water and consumable resources (e.g. medical supplies, petrol etc.)	- Pack an excess of what is required, particularly water, food and fuel. - Consider backup power sources (e.g. solar units, generators and inverters etc.). - Take multiple reliable communication devices (e.g. mobile phones where reception can be relied upon, satellite phones, SPOT device etc.). - Have up-to-date maps/GPS data, including extraction plans in the event of emergencies. - Ensure the presence of qualified first-aiders (including at least one with "remote First-Aid accreditation) and fully equipped first-aid kits. - Have a mobility plan to replenish supplies. - Consider bringing water purification equipment if working around waterbodies.
Exposure to mosquitos in malaria-present locations	- Medical advice will be sought prior to fieldwork being undertaken. - Appropriate anti-malarial medication will be taken by all fieldworkers as per medical advice. - Biting-insect management strategies will be implemented (e.g. long sleeves and pants, insect repellent, mosquito nets etc.).
Other region-specific infectious diseases	- Consult medical advice regarding inoculations, vaccinations etc. that may be required. - Consult WHO and other sources for further information regarding encountering potential pathogens. - Avoid risky behaviour (e.g. drinking creek/river water) where possible. - Pack additional antibiotics appropriate for potential diseases that might be encountered. - Wear insect repellent where necessary. - If fieldworkers are presenting serious disease symptoms immediately seek medical help.

24. UNDERTAKING TASKS AND USING EQUIPMENT

Description of Hazard	Current Controls
Back and/or knee injury from bending or kneeling constantly or for extended periods	- If kneeling for extended periods of time, use knee padding. - Maintain good posture and technique while bending over and lifting objects (heavy or otherwise). - Take regular breaks. - Rotate workers between tasks to share the workload. - Ensure team is aware of any existing injuries that may be exacerbated by the activity. Adjust workload to suit.
Manual handling and lifting of heavy objects causing injury	- Follow UWO Material Handling Guidelines.

	- Do not attempt to lift beyond your ability. Recommendations are for any object weighing >20kg requires a 2-person lift. However, never attempt to lift beyond your ability, regardless of actual weight in question. - Always ask for assistance if required. - Exercise proper technique and form (e.g. lift with your legs, avoid twisting). - Assess the lift and route prior to lifting object. - Use mechanical assistance (e.g. trolley, crane jack etc.) where available/practical.
Hazardous equipment, Use of spades/hammer and hand operated coring devices potentially resulting in injuries to fingers or feet.	- Care to be taken in handling and operating equipment. - Use equipment/machinery only for their intended purpose and according to the manufacturer's specifications. - Follow any SOP for the equipment in question. Should an appropriate SOP not be available, one should be developed before taking the equipment into the field.
Eye injuries or cuts from geological sampling with a hammer	- Wear sunglasses or safety glasses. - Place foot on rock (on the ground) and direct hammer strokes downwards - Alert field participants within the vicinity that you wish to hit a rock with a hammer and for them to avert their eyes. Maintain a safe distance (>5m) from other participants. - Hammering is not to take place below cliffs and under rock overhangs. - Do not hammer any more than what is necessary.
Hazards associated with mine sites (e.g. heavy machinery, vehicles, etc.)	- PPE (e.g. enclosed sturdy shoes and hard hats to be worn at all times). - Stay with qualified, experienced guides at all times. Where direct supervision is not feasible, arrange appropriate inductions with qualified and experienced guides beforehand to ensure policies and procedures are maintained, and hazards and risks have been made clear.
Hazards associated with excavation (e.g. digging into soils or sediments for archaeological purposes)	- The following does not include excavation for pipe or electrical installations. These should be handled by qualified/certified personnel/organisations. - All participants will be instructed on proper excavation practices, including lifting technique - Take regular rest and hydration breaks during the manual labour portions fieldwork. - Exercise appropriate lifting techniques for heavy loads
Wall collapse during excavation	- If excavation depth exceeds 1m, a ledge will be left at on the excavation wall to ensure that the wall is stable. - If necessary, sandbags will be placed along edge of the excavation pit to prevent collapse. - For deeper excavations, implement shoring practices according to appropriate excavation guidelines
Hazards associated with working with electrical equipment in the field	- Wear appropriate PPE at all times. - Keep electrical equipment in conditions-appropriate storage. - Keep electrical equipment away from water sources, and store in a dry and clean manner - Remove wet clothing when using electrical equipment. - Any outdoor electrical connections shall be made from approved Australian standard weather protection rated access point. - Power boards used outside will be contained in an approved outdoor weather protection box. - Inspect power cables for damage and do not use if there is insulation damage or exposed wires. - Protect cables from damage.

	- Ensure power source is sufficient for all equipment running. - Ensure RCD switches are fitted at the power supply board of any mobile laboratory or major electrical equipment. - Keep cables running above ground out of major walkways and neatly bundled to avoid trip hazards in walkways, entrance ways and high traffic areas. - For above ground sections of cable run, peg cable down to secure, or cover with an appropriate material like carpet. - Electrical and data cables should not be stretched or strained. - Follow manufactures instructions when using power tools. - Follow UWO electrical safety Guidelines where appropriate. - Seek guidance when using hand tools you are unfamiliar with, and never operate equipment you are unsure of using. - All electrical activities will occur on dry ground and away from encroaching tidal waters. - All people using the equipment are to be experienced and all safety measures will be put in place. - All electrical equipment should e-tagged and should be considered in-date of valid testing schedules.

25. . WORKING WITH PEOPLE

Description of Hazard	Current Controls
Contact with violent persons.	- Where possible try to not work alone. This is especially the case in an unknown or unfamiliar environment, location or workplace. - Carry multiple reliable communications devices and maintain regular contact with designated person. - Avoid suspicious people. - Relevant permissions have been sought prior to work and local land managers are informed. Communication between all appropriate stakeholders is maintained for the duration of the fieldwork/season.
Sexual harassment/assault during overnight fieldwork	- Participants will be encouraged to divide themselves into the available accommodation as they feel most comfortable (whether this is single-sex or mixed, or for those who identify as non-binary, to share the accommodation with whom they feel most comfortable). - All students to be advised of staff accommodations where help and support can be received. - All participants are made aware of the UWO Prevention of Sexual Harassment Policy.

Risks and hazards associated with alcohol and marijuana consumption	- As per UWO policy, no alcohol/marijuana in any quantity is to be consumed during hours in which work is being undertaken. - Under no circumstances is any person operating machinery, equipment or vehicles, nor anyone designated as first-aider or safety officer is to be under the influence of alcohol/marijuana at any point. - Any fieldworker under any designation (e.g. student, staff, volunteer etc.) is to conduct any form of work while exhibiting, or thought to be under the influence of alcohol/marijuana - Discourage the presence of alcohol/marijuana in any form during fieldwork, and consider banning the presence of alcohol/marijuana all together.

26. WORKING ALONE/IN SMALL GROUPS

Description of Hazard	Current Controls
Working alone	- Register trip with University through student away if available, and ensure all appropriate approvals have been attained. - Implement an effective communication plan for the duration of the fieldwork (e.g. regularly scheduled check-in with a designated contact). - Always communicate with supervisor and wider team where fieldwork will be conducted and inform them of expected arrival/departure times according to the ongoing communication plan. - Any deviations to the expected schedule must be communicated to all relevant stakeholders ASAP.
Separation from the group	- When working alone away from the main group, implement a regular communication plan to check-in confirming everything is OK. - Communication devices (e.g. mobile phone, air horn etc.) must be kept on the solo-fieldworker's person at all times, only used for scheduled check-ins or in emergencies). - At all times, the fieldwork leader is to be aware of the solo-fieldworker's location, and the solo-fieldworker should not deviate from this plan without communicating with the fieldwork leader.

27. WORKING IN BUSHFIRE-AFFECTED AREAS

Description of Hazard	Current Controls
Potential bushfires in the region	- Consider abandoning fieldwork when fire rating is 'Severe' or higher. Do not conduct fieldwork when fire rating is 'Extreme' or 'Catastrophic'. Check Rural Fire Service updates on fires occurring and fire danger ratings. - Install 'Firesfringe' app on smart phones, and regularly consult when working in areas with the potential to be affected by bushfires. Abandon fieldwork if bushfires encroach nearby.

	- Ensure a battery powered radio is available as backup in the event of power and mobile phone network failure. Tune to local radio for updates. - Consider not attending the site if air quality and visibility is low due to smoke in the area. - NEVER attempt to fight a bush fire. - Ensure multiple reliable communications devices are available in case of incident, and a robust communication plan in place. - Regularly assess and re-assess conditions and evaluate whether fieldwork will continue.
Working in areas of recent bushfire	- Participants will wear helmets at sites where time since fire has been within a month in case of compromised tree branches. - Maintain awareness of surroundings at all times, be particularly vigilant in windy conditions. - Be prepared to postpone activities if the winds or conditions in general are deemed dangerous. - Do not access a burnt site. - Install 'Firesfringe' app on smart phones, and regularly consult when working in areas with the potential to be affected by bushfires. Abandon fieldwork if bushfires encroach nearby. - Ensure a battery powered radio is available as backup in the event of power and mobile phone network failure. Tune to local radio for updates. - Ensure multiple reliable communications devices are available in case of incident, and a robust communication plan in place. - Regularly assess and re-assess conditions and evaluate whether fieldwork will continue.
Participants may be caught in bushfire and sustain fire-related injuries	- Fieldwork in 'Severe' conditions will be done only when in consultation with and following appropriate mesaures. - Fieldwork will always have at least one qualified first-aider, fully equipped first-aid kit and spare drinking water in the vehicle. - NEVER attempt to fight a bush fire. - Ensure multiple reliable communications devices are available in case of incident, and a robust communication plan in place. - Ensure a battery powered radio is available as backup in the event of power and mobile phone network failure. Tune to local radio for updates.
Tree limbs and branches weakened by bushfire falling	- Wait at least two weeks after the fire before accessing the sites. - Consult the advice of gov.ca staff to determine that the risk of tree fall has abated. - Be aware of the signs of branches and limbs at risk of falling. Avoid these areas. - All participants will wear a hard hat. - Have available first-aid equipment and certified first-aiders at all times.

Vehicles

31. GENERAL (ON-ROAD)

Description of Hazard	Current Controls
General driving	- All drivers will be properly licensed and vehicle use is approved through UWO/Biology protocols. - Pre-departure checks (e.g. fluid levels, tire pressure) will be conducted before vehicle use. - All drivers follow safe driving practices at all times. - The driver of any vehicle must obey all speed advisory and warning signs - Follow road laws of the state in which you are driving in. - Take due care when driving and transporting students. - Don't rush. - Ensure drivers are well rested before driving and take regular breaks. - Only stop vehicles at safe (for driver/passengers as well as other vehicles) locations.
Driver fatigue	- Do not drive if tired or fatigued. - Rest breaks every two hours if traveling longer than two hours. - No more than 8 hrs driving in a given day per driver. - Total driving time for all drivers in one day shall not exceed 12 hrs. - Have minimum two qualified drivers on long distance.
Driving in bad weather	- Drive to the conditions. - Obey changes in road rules due to inclement weather. - Consider not driving in the event of serious weather conditions (e.g. storms).
Poor quality roads	- Be vigilant of road conditions at all times. - Obey any and all signage. - Only authorised drivers permitted to drive vehicles.
Towing trailers	- Do not drive a vehicle towing a trailer unless you are suitably experienced and comfortable doing so. - Check tire pressure on trailer before use. - Do not over load trailers – excessive weight and poorly placed loads increases the possibility of fish-tailing. - Check all lights and connections on trailer before departing. Stop in a safe location to double check trailer connection before entering a freeway/motorway. - Change approaches to driving when towing as required.
Breakdown/Mechanical Failure	- Stop vehicle as soon as possible beside the road or track. If unable to move the vehicle off the road/track use hazard lights and have passengers move upstream of the vehicle to warn approaching traffic

Aquatic (marine and freshwater) activities

41. ENVIRONMENTAL HAZARDS

Description of Hazard	Current Controls
Unstable footing (e.g. slippery rock platforms, unconsolidated sands/muds)	- Be constantly vigilant of your surroundings and the ground while walking at all times. - Bring a light source such as a headlamp while working in low-light environments (e.g. caves or gullies) or outside of daylight hours. - Walk with care, and do not rush. - Wear appropriate footwear at all times (e.g. high-ankle, enclosed, leather boots, rubber-soled dive booties etc.). - Have available first aid equipment and the appropriate numbers of certified first-aiders at all times.
Being swept from rocks/shoreline	- Never work alone in aquatic environments, and work in close proximity to each other. - Use the buddy system to look out for each other. - Never turn your back on the ocean. - Do not venture below the intertidal zone. - Do not undertake aquatic fieldwork during adverse weather conditions (e.g. rain, high winds, storm surges). - Do a head count before and after activity. - Have multiple forms of viable communication on hand at all times and a robust communication plan already in place - Have available first aid equipment and the appropriate number of certified first-aiders at all times. - Undertake regular checks of the day's weather reports to ensure forecast is conducive to fieldwork.
Rising water levels (e.g. incoming tides, flood events)	- Fieldwork will not be undertaken during heavy rainfall or storms in areas considered to carry a flash flooding risk. - Never work alone in aquatic environments, and work in close proximity to each other. - Schedule fieldwork to safely account for high/low tides. - Do not undertake aquatic fieldwork during adverse weather conditions (e.g. rain, high winds, storm surges). - Reconsider undertaking fieldwork in the event of potentially hazardous weather patterns being a possibility. - Have available first aid equipment and the appropriate number of certified first-aiders at all times.
Crossing water bodies	- Ensure water depth is low enough to safely cross the entire extent of the river/creek/lake. - If necessary, walk the planned route to confirm water depth and to visually inspect for submerged hazards (e.g. logs, drop-offs, boulders etc.). - Consider the flow-speed of water. Do not attempt crossing if water speed is considered too fast to be safe for fieldworkers walking through (water speeds >1m/sec and <0.5m in depth are the limits of safely walking through, however consider each crossing event independently). - When in doubt, find an alternative route.

Working in and around areas with strong currents	- Consider not undertaking fieldwork (either on boats or adjacent to water bodies) where the flow of water is considered unnecessarily hazardous. - All participants should be confident and competent swimmers. - All participants should consider wearing approved personal flotation devices (e.g. life jackets) when near moving water bodies. - Never work alone in aquatic environments, and work in close proximity to each other. - Have available first aid equipment and the appropriate number of certified first-aiders at all times. - Have multiple forms of viable communication on hand at all times and a robust communication plan already in place (e.g. a complete and approved FEAP).
Stinging/biting organisms	- Never put hands in holes or rook pools that you cannot see into clearly. - Never pull out clumps of seaweed from rock pools with your bare hands. - Do not deliberately handle, agitate or disturb any living creature unless necessary, and only then if you are certain it poses no threat to you or others. - Never work alone in aquatic environments, and work in close proximity to each other. - Have available first aid equipment and the appropriate number of certified first-aiders at all times. - Have multiple forms of viable communication on hand at all times and a robust communication plan already in place (e.g. a complete and approved FEAP). - Follow local warning advice for swimming.

42. BOATING

Description of Hazard	Current Controls
Operating SEALS boats	- Only qualified and locally experienced skipper to master vessel (Coxswain for commercial motor vessels without an Exemption) and only when low seas and winds allow safe access. - All mandatory survey safety equipment checked, communication between vessel and Marine Rescue maintained via VHF radio. - All other standard/required safety procedures adhered to as required (Operation Manual for each vessel). - Drivers of any boats must have a valid boat license regardless of speed the boat will be travelling. - Master of the vessel to provide a safety briefing before setting off (this includes discussing or practicing emergency drills). - Master has been inducted and is appropriately licenced/trained for the particular vessel.
Rough weather (wind/waves)	- Do not operate Vessels in wind >21kts or swell >2m - (any conditions above #5 on the Beaufort Scale). - Check weather forecast including swell and wind direction regularly before departing. - Do not operate boats if conditions are rough, windy or visibility is low (these conditions can vary depending at which location you are working). - Recognise weather conditions can change with little to no warning, rapidly, and dramatically.
Boating related injury (e.g. slipping, propeller accident, anchor related accident, sinking/capsize)	- Master of the vessel to provide a safety briefing before setting off (this includes discussing or practicing emergency drills). - Master has been inducted and is appropriately licenced/trained for the particular vessel. - Employ correct boat handling procedures. - Always have a boat attendant (i.e. a person other than the Master and the field researcher) in exposed sites or under conditions above 'low risk'. - Diving without a boat attendant allowed only under low risk conditions. - Boat operator to be aware at all times of location of any divers at all times. - No boating or diving in adverse weather conditions. - Ensure the number of passengers is accordance with survey requirements (max 5 for work boat, 4 for diving [2/4 divers]).
Boat passenger falling overboard	- All participants must wear approved personal flotation devices (e.g. life jackets) at all times when on the boat. - Appropriate recovery equipment (e.g. life ring) is present on boat at all times. - Never boat alone, and all participants are to look out for each other. - Ensure someone keep visual contact with the personnel overboard and instruct the Master in retrieval. Throw life ring, or other floatation device to man over board and retrieve according to emergency drill for man over board.
Boat flooding, engine failure or other boat accident	- Approved personal flotation devices to be worn at all times in boats. - EPIRB to be carried at all times on all vessels. - Avoid going out in the boat in large waves or rough weather. - Have available first aid equipment and appropriate number of certified first-aiders at all times.

	- Have multiple forms of viable communication on hand at all times and a robust communication plan already in place (e.g. a complete and approved FEAP). - Ensure Master is appropriately training and inducted on the use of the vessel (this includes trouble shooting resources).
Deployment of anchor	- Maintain communication between driver and other personnel. - Ensure all personnel are away from anchor during deployment. - Use gloves, where required.
Fire onboard - Injury to people/damage to vessel and/or environment	- Ensure fire extinguisher is present on board. - Strictly enforce a no smoking policy. - Ensure emergency procedures are made known to all passengers.
Deployment of boat from trailer	- Boat deployment should only be conducted by capable users. - Competence must be demonstrated before using the boat. - Winch in place to slowly deploy boat. - Always drive the boat onto the trailer and shunt it off the trailer when launching. - Maintain communication between driver and other personnel. - Follow instruction in the Boat Trip Log for the vessel
Injury whilst cleaning the boat and flushing engine	- Be aware of the location of other people when hosing boat or flushing the engine. - Be extremely careful not to put your fingers in places where they might be injured whilst the engine is running. - Do not smoke or have naked flames near the boat when running the engine. - Ladder provided for ease of access into the boat on trailer
Exposure to cold/hypothermia	- Wear wet suit and booties and gloves in winter. - Take a change of dry clothes. - Check weather conditions as you would for any marine field work.

43. . KAYAKING

Description of Hazard	Current Controls
Manual handling of kayaks	- Do not attempt to lift beyond your ability. - Always ask for assistance if required. - A two-person lift is recommended for objects >20kg. - Exercise proper technique and form (e.g. lift with your legs, avoid twisting). - Assess the lift and route prior to lifting object. - Ensure you use the straps provided. - If packing kayaks into the trailer ensure they are tied down at different angles to ensure they don't slide out. Also ensure you use padding where the kayaks sit on the edge of the trailer. - Ensure the paddles are secure and not sitting under the heavy weight of the kayaks.

Damage to hull, paddles or equipment during transport	- Hull, paddles and equipment to be checked and recorded before each trip. - Follow SafeWork Procedures and check-list. - Reflective tape to be added to hull, equipment and paddle (where possible). - Ensure gear secured to vehicle/trailer with the tie-down straps provided. - Any sealed chambers must be checked to ensure watertight integrity. - Do not put paddles under the kayaks during transport unless kayaks are secure as they will be damaged.
Ergonomics of equipment design	- Approved personal flotation devices must be worn at all time whilst operating kayaks. - If snorkelling from kayak a wetsuit is suitable as a buoyancy device but carry approved personal flotation devices for use during any long paddles. - Equipment may impede and unbalance the operator. - Operators must have kayak experience and be capable swimmers. - Operators have thought about and planned appropriate techniques for using equipment and gathering data from a kayak.
Lack of training or instruction in kayaking	- Only participants with proper training/instruction will be allowed to operate the kayak. - Approved personal flotation devices must be worn at all time whilst operating kayaks. - Operators will be registered with the Boating Officer. - Operators/paddlers will be physically fit and in good medical condition. - A field trip risk assessment will be completed for each trip using the kayaks. - Each participant will have up-to-date first aid training.
Poor communication between participants	- Both paddlers need to have a communication system rehearsed including arm and paddle signals, marine whistle, phone and radio. - Paddler can have a set of marine smoke flares and EPIRB. - Paddlers must also take the marine Radio for safety and check-in with Marine Rescue if working near the coast. - Follow the checklist provided for safety equipment required.
Kayaking in unfamiliar waters	- Always have a kayaker with local experience and knowledge kayaking within the area (e.g. awareness of currents, navigation, wind conditions etc.). If this is unavailable ensure the Trip Leader has done their homework on these factors. - Kayaking should only be undertaken during low wind and swell conditions. - Have multiple forms of viable communication on hand at all times and a robust communication plan already in place (e.g. a complete and approved FEAP). - Have available first aid equipment and appropriate number of certified first-aiders at all times.
Rough weather (wind/waves)	- Do not operate kayaks in wind >16kts or swell >1m or anything above #4 on the Beaufort Wind Force Scale (wave height is the limiting factor). - Check weather forecast including swell and wind direction (and therefore which side of an island/field site will be sheltered) and any forecast change in wind/swell strength or direction greater than above. - Do not operate kayaks if conditions are rough, windy or visibility is low (these conditions can vary depending at which location you are working).

Drowning (capsize leading to drowning or near-drowning)	- Participants must be experienced swimmers and will be wearing approved personal flotation devices at all times. - Trip cancelled if weather is stormy and/or waves are considered >1m. - Tides and currents must be assessed and regularly reassessed as these can impact conditions. - Kayaking will be restricted to an area between waterline and a maximum distance of 300m offshore, in relatively shallow waters, during calm water. - Participants must always be on the lookout for potential dangers, including weather changes. - Have available first aid equipment and appropriate number of certified first-aiders at all times. - Have multiple forms of viable communication on hand at all times and a robust communication plan already in place (e.g. a complete and approved FEAP).
Entrapment under kayak due to capsize	- Conduct safety briefings and/or practice in the kayaks before departing for fieldwork. - Wear an approved personal flotation device (e.g. lifejacket) at all times or when travelling to and from site (for snorkelers leaving the kayak for shallow research a wet suit is sufficient).
Collision on water	- Be vigilant at all times of other boats, swimmers, PWC (e.g. jetski), sea walls, marinas, pylons etc. - High visibility equipment to be worn at all times. - Attach a high visibility flag to each kayak. Wave this flag if a vessel is approaching and you are unsure of its intentions.
Exposure to cold/hypothermia	- Avoid kayaking in unnecessarily cold conditions. - Ensure fieldworkers are dressed appropriately (e.g. wetsuit) for the conditions. - Have available first aid equipment and appropriate number of certified first-aiders at all times. - Fieldworkers are to be aware of the signs of, and be able to identify if/when any others are showing signs of hypothermia.

A note on international fieldwork

The specific hazards that can be encountered during fieldwork may be largely transferable between domestic and international contexts. A geological survey across Western might be identical to many other locations across the world. Similarly, benthic analyses in ocean waters may utilise the exact same methods and approaches no matter what the location may be. With this in mind, hazards and risks within this document can be therefore broadly applied equally to both domestic and international contexts.

There are a few hazards that should be highlighted that are particularly relevant to international fieldwork, or whose risk of injury or damage to property or person is amplified. These are listed below, with some points on how to minimise these risks.

5.1. SPECIFIC HAZARDS

Region-specific pathogens (e.g. diseases, viruses or infections)

Prior to fieldwork taking place, research what, if any, pathogens might be encountered during the international fieldwork. Consult resources for known pathogens that should be known about in the region you are looking to work in, and make the appropriate preparations. The risk of some pathogens can be nullified through readily available vaccinations (e.g. yellow fever), while others will require regular medication before, during and after fieldwork (e.g. malaria).

Region-specific animals and plants

As with the previous point, some animals and plants are endemic to certain or specific areas and can pose a risk to fieldwork. Research the region where fieldwork is being planned for and make all participants aware of any known animal- or plant-based hazards that might be encountered. Establish and communicate strategies to minimise the risk associated with these hazards before embarking on fieldwork.

5.2. STRATEGIES TO MINIMISE THE RISKS OF INTERNATIONAL FIELDWORK

A robust communication plan

Having a solid, well-informed communication plan prior to fieldwork being undertaken cannot be stressed enough. The distances and spatial isolation associated with remote fieldwork increases the amount of time required for emergency responders to access fieldworkers in trouble, as well as increasing the complexity of extracting any fieldworkers that need extraction. International fieldwork adds complexities of foreign languages, customs and cultures, diplomatic and political concerns, compounding the usual risks of remote fieldwork.

For international fieldwork, there are similar expectations for communication plans as there are for remote fieldwork. These include having multiple forms of reliable communication (e.g. satellite phones, EPIRBs, PLBs etc.). There is also an added role/responsibility for your designated safety contact at home. They should be briefed in detail of the location and schedule of fieldwork logistics, who is in the field and when, as well as being able to get in contact with the fieldworkers if necessary. Furthermore, this safety contact should be keeping an eye on news, events and developments that might impact the fieldworker's trip in any way, including travel home. The safety contact should also be actively looking into developments of the country in which the fieldworker is conducting work, as these events and happenings might not be known if only domestic media channels are relied upon. Also, news may not reach the fieldworkers for quite some time despite being in the same country. It should be a key responsibility of the safety contact to be appraised of events occurring in the country in which fieldwork is happening, and to actively report these events to the fieldworkers as soon as possible.

In this way, the safety contact at home is able to relay potentially critical information to the fieldworkers more promptly than the usual ways in which news is disseminated. With this information, the fieldworker is able to make informed decisions as quickly as possible.
The aim of planning for fieldwork is to be as prepared as possible for whatever might happen to you, your team and the gear you bring with you. However, it is impossible to account for everything. Conditions in the field change, unforeseeable injuries or illnesses can occur, and global events can result in continuing fieldwork being unfavourable or impossible. **In these instances, as fieldwork coordinator, it is your responsibility to make decisions regarding your team and fieldwork continuing.** Uncertainty is something that needs to be acknowledged. There is some degree of comfort in having a decision taken away from you, but sometimes it may be necessary to make proactive decisions. This is a rather extreme case but highlights the benefits of making proactive decisions. A similar case could be made for an injury occurring in the field requiring the whole team's extraction. A further example is an emergency back at home occurring forcing a fieldworker or team to end fieldwork and return home.

As a fieldwork coordinator, it is in your responsibility to be as prepared as possible to react to the situation and make the best most informed decision. This is especially true for international fieldwork. Ideally, from the field, you should be able to have critical information relayed to you efficiently and be able to collect more information if required.

Be prepared by:

- Having a robust communication plan in place.
- Ensuring your safety contact back home is informed and is actively keeping an eye on the happenings in the country in which you are working.
- Being ready and willing to make proactive decisions with the information you have, and if in doubt, seek further information or clarification.

Issues of Conduct and Ethical Considerations

Respect the rights of the public and property owners. In advance of going to the field, it is your responsibility to contact and obtain permission to enter and carry out your work from the owners or managers of the land base where you will be located. This may be a First Nations group, a provincial ministry (e.g. Ministry of Natural Resources, etc.), a licensee, a private owner, a company, or national or provincial parks service. Ask the proprietors to identify hazards they are aware of and establish a contact person. Other training and documentation may be required by the specific group in addition to what is required here. Developing relationships and gaining permission and training often takes much more time than anticipated – get started early.

Respect the environment and other organisms. For some studies there will be inevitable negative impacts to the environment and organisms that reside there. It is part of our ethical duty to minimize these: tread only where you need to tread to take samples; collect only as many samples as you need (and can process) for your study. Try to inform yourself of any threatened or endangered species in the area. In Ontario, go to: http://www.ontario.ca/environment-and-energy/species-risk-area for more information.

61. USEFUL TRAINING COURSES/INFO

https://www.uwo.ca/hr/learning/required/index.html

https://www.youtube.com/watch?v=q3FbacAazd4

https://youtu.be/s-zkGuh42l4?si=AjZIcZafRxAh1O-1

https://www.uwo.ca/hr/form_doc/health_safety/doc/procedures/working_near_water.pdf

62. USEFUL WEBSITES

https://travel.gc.ca/mobile

https://travel.state.gov/content/travel/en/traveladvisories/traveladvisories/canada-travel-advisory.html

https://www.ccohs.ca/oshanswers/hsprograms/alone/workingalone.html

https://www.uwo.ca/hr/form_doc/health_safety/doc/procedures/working_in_hot_environments.pdf

https://www.uwo.ca/hr/form_doc/health_safety/doc/procedures/working_near_water.pdf

https://www.uwo.ca/hr/form_doc/pay_admin/form/driver.pdf

https://www.healthunit.com/travel

63. RELEVANT POLICIES, GUIDELINES AND DOCUMENTS

https://www.ontario.ca/page/occupational-health-and-safety-act-ohsa

https://international.uwo.ca/learning/safety_abroad/

https://www.uwo.ca/hr/form_doc/health_safety/doc/policies/training_policy.pdf https://www.schulich.uwo.ca/medicine/postgraduate/current_learners/documents/PPE%20Requirements%20Poster.pdf

https://www.uwo.ca/hr/safety/topics/electrical.html

https://www.kings.uwo.ca/kings/assets/File/policies/SexualViolencePolicy.pdf https://www.uwo.ca/hr/safety/resources/procedures.html

General bear info and safety (4.17 minutes): https://www.youtube.com/watch?v=LM0OghpVaFY

Parks Canada video on using bear spray: https://www.youtube.com/watch?v=aIvpLzHiCrg

Reference: This document was adopted from the field risk assessment published by Univeristy of Australia.