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1. INTRODUCTION

This manual contains information and procedures applicable to field work involving all staff, students and volunteers of Faculty of Education, Health, Science and the Environment (EHSE) at Charles Darwin University engaged in field work activities.

The Faculty has a policy that all field trip participants must be provided with as much information (and applicable safety resources) pertinent to field work before proceeding on any field trip. As it is not always practical for this information to be delivered prior to the start of some field trips, this manual has been developed to assist.

Safety in the field is an important part of your work at CDU and you must have read and understood the contents of this manual before you commence any fieldwork activities.

This manual covers aspects of safety involved in terrestrial and aquatic (including freshwater and inshore marine) field work. Information has been kept fairly generic so it can be applied to a range of locations, however as the majority of work by CDU staff and students is conducted in the Northern Territory, most examples used are NT focussed.

The manual contains relevant information, some ideas and suggestions of risk management in that topic and some references to other information or resources which you should peruse or use.

The information contained within this manual is fairly comprehensive, but not exhaustive, and you may need to do further research/reading of other material to ensure all contingencies are covered for your specific trip and work.
2. OHS LEGISLATION, CDU POLICY AND RESPONSIBILITIES

OHS Legislation
As an employer, Charles Darwin University must comply with Work Health and Safety (National Uniform Legislation) Act 2011 and Regulations.
All staff, students and volunteers must also comply with the NT Act and Regulations above.

CDU Policy
All staff, students and volunteers involved in field activities should be familiar with and comply with Charles Darwin University’s Work Health and Safety Policy. Particular attention must be paid to the specific responsibilities section of that policy. All relevant Charles Darwin University policies, procedures and guidelines must be adhered to - these may be University-wide or area specific.

International field work activities must additionally comply with the University’s Off-Campus Learning Activities and In-Country Study Program Policy and associated processes and with the Commonwealth Department of Foreign Affairs and Trade (DFAT) requirements.

More information can be found at CDU Health, Safety and Environment

CDU staff and students may be required to undertake collaborative field work with another organisation. This should only occur if the Occupational Health and Safety policies and procedures of the other organisation are of equivalent, or better, level of safety of CDU practices.

Responsibilities
Each member of the University community is responsible for ensuring their own work environment and activities within or on behalf of the University are safe and any risk to health is eliminated or minimised.

Head of Department – Head of School/Director/PVC
It is the responsibility of this person to ensure that satisfactory provisions for safety and health are made for field activities being undertaken within their department. This responsibility for ensuring satisfactory provisions for field work health and safety is not delegable and this person must be satisfied that the Onsite Activity Leader and the OAL’s Supervisor are suitably experienced and competent and have done all that is reasonably practicable to address processes for safe field work.

Responsibilities within the EHSE fieldwork process include:
- Review and approve/disapprove relevant Risk Assessments, Fieldwork Plans and Movement Requests
- Consult experts in the area of fieldwork being conducted if required for advice on adequacy of the Risk Assessment
- Reject Fieldwork Plan forms or movement requests submitted without adequate notice
- Lodge approved fieldwork documents via email with ehsefieldwork@cdu.edu.au
- Return rejected fieldwork documents with explanation to the Onsite Activity Leader
Onsite Activity Leader's Supervisor

This person is the direct supervisor (usually Line Manager) of the Onsite Activity Leader and is responsible for thoroughly checking that field work hazard identification and risk assessment has occurred and all controls are appropriate and in place for the foreseeable risks. They must also ensure that all safety procedures are appropriate and in place and discuss any other situations/risks prior to departure with the Onsite Activity Leader.

Note: where a HDR student is in the capacity of OAL, the OAL Supervisor is usually the primary supervisor. This can be delegated to a co-supervisor but usually only in the case of absence of primary supervisor or where the co-supervisor may have more relevant experience.

Responsibilities within the EHSE fieldwork process include:
- Review and indicate support/lack of support for relevant Risk Assessments, Fieldwork Plans and Movement Requests received from direct reports
- Reject Fieldwork Plan forms or movement requests submitted without adequate notice
- Accept and follow up communication with the Onsite Activity Leader while they are out in the field
- Ensure nominated check-in contact is appropriate (suitable local authority or sufficiently senior and knowledgeable CDU staff member not beholden to Onsite Activity Leader)
- If also acting as regular check-in contact, follow up missed check-ins appropriately
- If advised of potential changes to the Fieldwork Plan or itinerary from parties in the field, assist onsite activity leader to re-assess risks and determine appropriate
- Forward this information to ehsefieldwork@cdu.edu.au as soon as reasonably practicable
- Ensure accidents, incidents and injuries or near misses sustained in field are reported by Onsite Activity Leader, provide information about corrective action on Accident Incident Injury Report form, and ensure appropriate debrief and Risk Assessment amendments occur.

Onsite Activity Leader - OAL

The Onsite Activity Leader is the staff member in charge of field activity. This person is responsible for completion and collation of all forms/paperwork for the trip.

They must be onsite at all times and are to ensure that the risks associated with field activities are managed effectively. To do this they must:

Identify and assess, as far as reasonably practicable, the possible hazards and risks that may be encountered during the activity by completing the Field Work Risk Assessment

Incorporate appropriate control measures and strategies to minimise the risks to safety and health of all participants.

Ensure that appropriate information, instruction and training (including the responsibilities for OHS) are communicated to all participants

The OAL may delegate the supervision or training of a student to a suitably qualified and/or experienced person as appropriate for the task. However, the OAL is responsible for ensuring that each participant has received appropriate information and training and has gained sufficient competence to undertake the task.

Responsibilities within the EHSE fieldwork process include:
- Conduct a quality Risk Assessment and submit to supervisor well in advance of fieldwork, where possible with input from relevant participants or experts
- Brief all participants and ensure they have received adequate training and understand relevant emergency procedures
- Complete an accurate Fieldwork Plan form and submit to supervisor at least two weeks before fieldwork trip
• In exceptional circumstances fieldwork plan may be submitted three working days before commencement however the approved risk assessment must make provision for conducting field trips safely on short notice
• Complete and sign a Participant Form, or ensure previously submitted form is still valid
• Ensure they have been trained in first aid and have been trained in any areas required for the fieldwork activity
• Ensure their regular check-in contact has been briefed and is available to receive check-ins, and is prepared to follow up missed check-ins
• Contact their offsite supervisor and regular check-in contact at the prearranged time each day while in field
• Ensure they have a valid signed Participant Form and Movement Request as required from each participant
• Seek approval for fieldwork approved and signed Risk Assessment from the Supervisor or Head of School/Director/PVC, as well as all Participant forms, Fieldwork Plan form and Movement Request forms
• Escalate and seek approval for ‘high’ level risk assessments from the Head of School/Director and PVC-EHSE/VC
• Ensure all equipment is organised and costs are approved and sorted
• Report all accidents, incidents or injuries sustained during fieldwork as soon as reasonably practicable to the University
• Conduct necessary debriefing with participants and supervisors, and ensure Risk Assessments are updated to reflect newly identified risks or risk treatments in the event of accidents or near misses

Higher Degree by Research (HDR) – includes Postgraduate, Masters or Honours students

In a field work situation where a HDR student is in charge of the field work (in other words, is the OAL), it is their Supervisor’s “duty of care” responsibility to instruct the HDR student in their responsibilities and to ensure that all relevant process followed and adhered to in the field.

Students who do not comply with safety directives shall not be permitted to participate in the activity.

Participants (staff, students, volunteers, external collaborators)

Each participant in a field trip is responsible for ensuring their own work environment and activities are safe and any risk to health is eliminated or minimised. This includes, but is not limited to, the following:
• Inform the Onsite Activity Leader of any health conditions that may affect ability to participate safely in fieldwork activities
• Complete and sign a Participant Form and submit to the Onsite Activity Leader, or ensure previously submitted form is still valid, and complete and submit to the Onsite Activity Leader a Movement Request for Travel form if travelling further than 50km
• Ensure they have been briefed sufficiently for fieldwork
• Complete any required training for the fieldwork activity and related emergency procedures
• Have appropriate input into the Risk Assessment
• Consult the Fieldwork Manual or the Fieldwork Site and Visit Guide for information on the paperwork process or activities and hazards of fieldwork
• Comply with all University Work Health and Safety policies, procedures, guidelines and area specific instructions or information and taking appropriate action to eliminate or minimise hazards and risks
- Follow safe work practices at all times and encourage others to do same
- Notify OAL/management immediately if/when a potential hazard, dangerous equipment; or unsafe work practice or work environment is identified
- Wear appropriate dress for the activity being performed including protective clothing
- Utilise all safety devices and personal protective equipment strictly as directed or required to maintain health and safety

Other references

Work Health and Safety (National Uniform Legislation) Act 2011 and Regulations

CDU Policies

CDU Processes and Guidelines

CDU Health, Safety and Environment

3. DEFINITIONS

**Field Work** means any work carried out by staff or students of the University, for the purposes of research and/or teaching, in locations which are not necessarily under the direct control of the University, but where the University is responsible for the health and safety of staff, students and others exposed to its activities.

**Head of Department** means a person heading up a faculty, school, theme or department of Charles Darwin University. This can include Theme Leader, Project Leader, Head of School, Director, Pro-Vice Chancellor or member of CDU Executive (DVC, VC etc) and the person may be in an acting role or a delegate.

**Higher Degree by Research (HDR)** means a person enrolled at the University and undertaking a unit and/or course of study leading to a University recognised award at Postgraduate, Masters or Honours level.

**Nominated contact person** means the CDU person to be contacted in case of an emergency. This person cannot be on the trip at any point and must be contactable at any time. It is usually a line manager, senior member of the group undertaking the activity or other person with faculty/school/department specific responsibility for emergency response. For in-country/international study programs means the Deputy Vice-Chancellor.

**Onsite Activity Leader (OAL)** means the person leading the field trip who is in charge and is onsite at all times.

**Onsite Activity Leader’s Supervisor** means the Onsite Activity Leader’s direct line manager. In the case of HDR students it is the Primary Supervisor. In the case of undergraduate field trips it is the Unit Coordinator or academic directly teaching that unit.

**Participant** means all persons undertaking the field work activity whether that is for the entire trip or part thereof. Includes all staff, students, volunteers and external persons.

**Staff** means everyone employed by, or associated with, the University on a permanent, casual, adjunct, honorary, voluntary or contractual basis, whether full-time or part-time.

**Student** means a person enrolled at the University and undertaking a unit and/or course of study leading to a University recognised award. This also includes attendance at workshops held on campus.

**University or CDU** means Charles Darwin University.
4. PREPARATIONS

This section contains information about general preparations applicable to field work involving all staff, students and volunteers of Faculty of Education, Health, Science and the Environment (EHSE) at Charles Darwin University engaged in field work activities.

General Preparations

Regardless of the nature of the proposed fieldwork, thorough and careful preparation is important in prevention of issues. It is vital that all participants are briefed on all aspects of the proposed trip, the environment, the work involved and the rules they must follow. This includes, but is not limited to:

**Preparation and submission of paperwork** – NO field work is to be undertaken without all paperwork being in place (within the required deadlines for submission) before the trip.

NOTE: Paperwork is not just limited to the forms in the Appendices of this Field Manual and others may be required – e.g. Chemical - Safe Work Procedures, Hazardous Substances Risk assessments; CDU – Movement Requisitions, Application to Use CDU Vehicle etc.

**Dissemination of information** – including such topics as hazards and controls (risk assessments), emergency procedures, behavioural expectations, work regimes etc. This may take the form of verbal or electronic communication. Because of the diverse nature of activities and groups participating it is not possible to dictate the best form of communication to use, therefore, you are expected to address this issue for your trip on a case-by case basis. Forms distribution process is covered in the section Guide to Paperwork.

**Training** – It is vital that participants are trained in the relevant aspects of the work being undertaken. Any applicable licences, permits or certifications are to be obtained prior to participation in any field work.

**Research, read, and abide by** EHSE Field Manual, CDU Policy and procedures, Australian Standards, Codes of Practice or other advisory information related to your field work.

**Consult** other persons who have been in the field doing same or similar work to discuss strategies and options for managing risks in that environment.

**Always conduct pre-use checks** - of all vehicles, plant and equipment. This will go a long way towards ensuring that potential hazards are identified before they cause harm.

**Consider developing and implementing a specific trip Emergency Plan** in place including safety and rescue equipment.
Communication and first aid equipment – Every trip must have communication equipment and First Aid provisions (appropriate kit and trained first aider). Ensure all relevant equipment supplied is fully functional.
5. COMMUNICATIONS

Communication with the field party is central to the management of EHSE field work. It is therefore a mandatory requirement to have fully operational (and tested) communication and signalling devices such as satellite phones, mobile phones, radio's, SPOT Messengers and EPIRB's on all field trips.

A two way channel of communication must be maintained between the field party and base at all times. This requires the Field Party to send a message to the CDU contact and the CDU Contact person must acknowledge receipt of that message. The details supplied in the Field Trip Plan will be vital in an emergency situation and it is critical all contact details (including accommodation places and changes to the Daily Movement Plan) are kept up to date.

Check-in time is to be nominated the following applies:

For trips spanning multiple days or return after hours (i.e. after 4:21pm):
- Daily check-in is between 6-7pm daily unless otherwise arranged and written on the form.
- End of trip – when you actually return to base.

For trips that return to base on the same day as departure and within normal working hours (8am-4:21pm)
- End of trip only - e.g. For a day trip of 9am – 3pm, check-in time will be 3pm

DO NOT DELAY IN MAKING CONTACT - There is a 45 minute window allowed in which to make contact with the nominated contact person (e.g. if your check-in time is 6pm then you have until 6:45pm to actually make contact.). This time allowance has been made to allow for minor delays you may experience that are not emergency situations, but stop you from being able to call in at the exact time nominated.

Once the 45 minute window has elapsed, the Field Work – Failure to Check-in Response Procedure will be enacted. This involves:
- Emergency Contact trying to call OAL or other participants – if no response then;
- Emergency Contact trying to call all other contacts (accommodation, car hire etc.) or checking the site (if within 30 minutes of current location) – if no response or party found then;
- Calling Emergency Services to report missing persons and arrange search; call OAL’s supervisor and Head of Department to inform of incident

Establishing and maintaining the routine scheduled contact is critical for keeping field parties and the nominated CDU Contact Person up to date with trip status and issues and just as importantly, to avoid unnecessary and costly searches.
6. GUIDE TO PAPERWORK

The whole paperwork process is shown in a Flowchart (Appendix 1). This flowchart outlines the decisions to be made by staff/students about which forms they are required to complete and submit for approval prior to engaging in field work.

All staff/students should review this flowchart and read the following prior to completing the field work forms. The following is an explanation of the purpose of each form and a guide to completing each form.

FORMS

Field Work Risk Assessment – Appendix 2

This is the principal form to be completed by staff/students prior to field work and should be completed by the Onsite Activity Leader. The process is partially designed to document risk, but is also a mechanism for preventing injury by making all members of the Field Work Party aware of the risk and to ensure that consideration has been given to mitigating these risks. As such all members of the field work party should be given opportunity to review and make a contribution to this process.

The Risk Assessment document has been designed to be a form that can be applicable to a particular set of work and it is compulsory to undertake this process and complete one of these forms prior to commencing any field work. However some conditions have been placed on these forms that must be followed. Note: If successive field trips will be made in which the same tasks are to be conducted, a single approved risk assessment is sufficient. However, individual staff/students should seek advice on this matter on a case by case basis.

A Field Work Risk Assessment is only applicable for a maximum period of 12 months and the following conditions apply:

i) Activity and participants must remain the same. Any variation to the activity (nature or level of risk) will require the Onsite Activity Leader to re-assess the risk and submit an email documenting the variations to their supervisor. The approval of the amendment will then be attached to the original forms.

ii) Applicable for a period of 12 months. For ongoing (e.g. a long term project that spans several years) the Onsite Activity Leader is required to submit a revised/updated version for approval before commencement of the new activity each year.

Step 1 - Identify potential hazards.

To assist in this process a checklist of possible sources of hazard with possible controls has been provided – Appendix 10. This list is provided to assist in the identification of possible hazards and controls for field work. Because of the diverse nature of activities at Charles Darwin University, this checklist is not comprehensive or exhaustive. You are expected to address all hazards and controls for your work on a case-by-case basis. Appendix 10 is arranged in the same order as the Risk Assessment to allow for ease of cross-reference.

Each category on the Risk Assessment has a corresponding section in the EHSE Field Manual (Sections 7-29 inclusive) which contains information in more detail and is to be used in conjunction with the form to assist in the process.
**Step 2 - Assess the Risk**

The accepted method of ‘Risk Assessment’ is to score a risk on the basis of an assessment of ‘Consequence’ of something happening and the ‘Likelihood’ of the occurrence. These individual scores are then used with the ‘Risk Matrix’ to determine the Risk Score - Low, Medium or High. Where a hazard and associated consequences have been identified, controls should be put in place to remove or reduce the level of risk according to the Hierarchy of Control.

**Step 3 – Control the Risk**

Appropriate controls are to be developed and implemented according to the Hierarchy of Control.

**Hierarchy of Control** – always work from 1 to 6 and implement the most applicable control(s)

1. Elimination (remove the hazard)
2. Substitution (use an alternative)
3. Isolate (separation from hazard)
4. Redesign (change equipment or process)
5. Administration (change work practice)
6. Personal Protective Equipment (i.e. gloves, glasses, hearing protection etc.)

Note: In order to fully manage the risk, controls may be needed at several levels of the Hierarchy of Control.

**Field Work Plan – Appendix 3**

It is compulsory to complete one of these forms prior to embarking on every field trip. All the details in this form are vital when dealing with emergency situations in relation to your field work. If the information is not provided then assistance may be hampered.

You must provide all the details of the trip including:

- **Field Work Description** - The description must be able to be matched to the Field Work Risk Assessment. Be descriptive, but not exhaustive and the information should be sufficient enough to allow the approver(s) to make an informed decision when approving the field work

- **Departure and Return date(s)/time(s)** – This is the actual date(s) and time(s) for the trip. Times can be estimated, but the estimate should be as close as possible to the reality (e.g. if you are likely to return around 5pm put 5pm, knowing that if you are not back within 45 minutes of this time the Emergency Action Plan will be enacted.

- **Onsite Activity Leader and OAL supervisor contact details** – ensure all relevant phone numbers are given and they have all the correct number of digits

- **CDU Contact Person** - This is your supervisor unless they are a participant on this trip. This person is the monitor of the trip as it is underway. It must be a CDU contact unless prior approval given by HoS/Director/PVC. NOTE: Check in time is at the end of the trip or between 6-7pm daily unless otherwise arranged and written on this form

- **Location(s) and Travel route(s)** – Attach map(s) attached indicating location/GPS points/map references of site(s) and map(s) attached indicating exact route(s) to site(s)

- **Vehicle details** – this is the details of the primary vehicle being taken on the trip. Add details of any other vehicles separately.

- **Participant details** - Must include all participants including Onsite Activity Leader. If more than ten participants – attach a separate list. Note: If this is a trip for undergraduate teaching unit –
attach a copy of current class list indicating only the actual participants and enter on one line as: (UNIT CODE) class list (see attached) e.g. ENV101 class list (see attached)

- **Daily movement plan** – This is the itinerary and accommodation details: This is designed to provide information for emergency services to passed on in the event that you have an incident. Please bear this in mind when you fill out this section.

- **Details of other authorities and contacts** - must include all other possible contact persons or companies who must be made aware of the activity taking place, its location or have some other interest in it. Example: Local Park Ranger, Local Police, Fire Station, Indigenous Community Liaison, Landowners, Government Department, Private Company

**Participant Form – Appendix 4**

This form **must** be completed by all field work participants. Each member of the field party is required to submit one of these forms for each individual field trip they participate in.

Note: Undergraduate students **do not** complete this form – they complete GEN114 Field Placement

**Medical Declaration**

Please note that any participants travelling without prior written approval by the Head of School/Director/PVC are not covered by CDU insurance policy. **Please ensure you make all participants aware of this.**

The form requires:

1. **Participant Name and Category of work/study** – Full name and nominate as either Staff, HDR student (Masters or PhD only) or Volunteer/other (all non-CDU participants)

2. **Supervisor name and Phone** – Full Name and relevant phone details

3. **In Case of Emergency** – usually a Next of Kin. Preferably in Australia, but can be international. This is for the relevant authorities to notify them if something happens to you and will only be done as/if required.

4. **Declaration** – acknowledgement by participant of health disclosure, responsibilities, compliance with policy and procedure and check-in process

**Other forms**

- **CDU Movement Requisition for Official Travel**

This form **must** be completed by all participants on a field trip where travel is greater than 50km from base in addition to Appendix 2-4. You can enter the details of the trip on the Movement Req as first date/time and last date/time and refer to attached (and attach the EHSE paperwork).

Trips under 50km (from base) **do not** need a CDU Movement Requisition.

If a Movement requisition for official travel has not been completed and signed by the appropriate cost centre manager prior to travel, the travel will be deemed to be unauthorised.

**Procurement will accept one Movement Request for a group of travellers** travelling to the same location on the same dates in the same vehicle. In this case complete one Movement Request with traveller details and attach the names of other travellers on the same itinerary.

• **DFAT Memo - Appendix 5**

This form must be completed by all participants on a field trip in a destination other than Australian territories.

**Please ensure you make all participants aware of the following:**

Any participants travelling without prior written approval by the Vice-Chancellor are not covered by CDU insurance policy.

• **Dive Forms – Appendix XX**

This form **must** be completed by all participants on a field trip where diving is involved. Refer to the Diving section of Section XX Water or Immersion in for further details.

**APPROVALS, SUBMISSION and DISTRIBUTION OF FORMS**

All forms are to be processed as per the Field Work paperwork flowchart.

Note: GEN114 forms are to be carried on the trip by the OAL and not submitted as part of this process. Upon completion of the trip, all GEN114 forms are to be sent to Student Records for processing. You must attach a note stating that the forms are to be entered into Callista. DO NOT DESTROY these forms as they are part of a student’s record and must be retained.
7. EMERGENCIES (INCLUDING FIRST AID AND MEDICAL ASSISTANCE)

This section contains information about how to deal with emergency type situations applicable to field work involving all staff, students and volunteers of Faculty of Education, Health, Science and the Environment (EHSE) at Charles Darwin University engaged in field work activities.

An emergency can develop from a number of causes including major accident (death/serious injury), fire and/or explosion, adverse weather, release of chemical, biological or radioactive material, gas leakage, civil disorder or other circumstances.

A prompt and organised response by those onsite in such an emergency is essential for the welfare of field workers and for the preservation of life and assets.

Emergency Plans and response procedures
CDU Emergency Management Plan establishes a framework for the effective handling of emergencies and/or disasters, and management of the return to normality. Adherence to this framework is intended to: avoid or minimise loss of life and property; ensure any emergency can be effectively dealt with; support a prompt response to any emergency; direct key people to act on specific tasks and provide direction; provide response mechanisms that support business continuity during/after an emergency.

Because most field trips are different it is not possible to develop a generic plan to cover all events and possible scenarios. As part of the risk management/risk assessment process, consider developing and implementing a specific trip Emergency Plan including safety and rescue equipment for your trip.

Emergency Response procedures have been developed for those nominated as CDU Contacts and Emergency Response persons. These procedures establish a framework for the effective handling of emergencies and/or non-response and are directly related to the Faculty processes for fieldwork.

First Aid and Medical assistance
Every trip must have First Aid provisions (first aid kit and trained first aider). Ensure all relevant equipment supplied is in enough quantity to service the group, not expired and fully functional. Taking a few bandages, a roll of tape, a pair of rusty scissors and some out of date antiseptic isn’t going to be much use when someone gets bitten by a snake. The Onsite Activity Leader must also ensure all first aid qualifications are appropriate and current.

In the event of a medical emergency the person discovering the emergency should stay with the injured person and send someone for a first aid officer (if person discovering is not a first aid officer) and inform the Onsite Activity Leader. Refer to First Person On Scene Procedures for further information.

If the injured person needs first aid only then provide first aid assistance. Monitor the casualty’s condition and seek further medical help if the situation deteriorates.
If the person appears to need urgent medical attention (that is, the person’s condition is uncertain or possibly life threatening), then Emergency Services should be called requesting an ambulance.

You must then contact the CDU Emergency person in your school (http://www.cdu.edu.au/sites/default/files/EHSEFieldWorkContacts.pdf) for notification and further assistance.

Notification and Reporting Accidents, Incidents and Injuries

It is the Onsite Activity Leaders responsibility to ensure the full reporting of all Accidents, Incidents and Injuries as soon as possible after the occurrence. CDU policy is to report such things within 24 hours to their relevant supervisor or the University’s Health Safety and Environment branch.

Quite often these things happen in places that do not have ready access to all the forms and process needed to comply fully with CDU policy/guidelines immediately. In the first instance, notification can be made by any means necessary (phone call, text message etc.) and followed up with the required paperwork needs at a later date but as soon as practicable – i.e. on the first day after return to base.

- Accident, Incident and Injury Report (the casualty); and/or
- Witness to Accident/Injury Report

If any first aid equipment is used this should also be recorded in the first aid kit records.

Regardless of the nature of the proposed fieldwork, thorough and careful preparation is important in prevention of issues and response to emergency situations. It is therefore vital that all participants are briefed on all aspects of the proposed trip, the environment, the work involved and the rules they must follow to minimise the risk of harm.

Some things to consider and ideas that may assist in managing risk in relation to Emergencies are:

- Be prepared for an emergency situation – it might be a medical situation (injury/illness), vehicle breakdown, adverse weather, changing road conditions, flooding etc.
- Carry a copy of the Faculty Contacts Register
- Ensure all communications equipment is available and that everyone knows how to use it.
- Carry plenty of spares: water, food, vehicle parts/tyres, clothing etc.
- Consider the contents of the first aid kit you are taking. It must have enough relevant contents to be able to deal with first aid needs of several persons for most circumstances i.e. you should not take a 2 person kit on a trip for 30 participants
- Ensure first aid training and qualifications are current
- Wait for help if you can do so safely – do not walk for help unless you are within a couple of kilometres of a main road that has a lot of traffic or a population centre (town, city etc) that you know is inhabited
- Develop and implement a specific emergency plan for your trip
- Ensure all participants are aware of the emergency procedures
Remember: you are not alone in the field! There is a network of emergency contacts in the faculty able to assist you. You only need to make contact with them and the assistance can be given. INSERT THE LINK TO THE CONTACTS REGISTER
8. SURVIVAL

Survival is a serious issue and so you must familiarise yourself with information for the areas in which you will be travelling and working and this may involve learning some marine and/or terrestrial survival techniques.

The climate and the relative scarcity of surface fresh water pose the greatest threat to field workers who find themselves stranded. Remote areas with a low population density and roads that are seldom travelled provide a potential danger. Even if you are only a few kilometres off the highway, if nobody ever goes there survival can become a challenge. It’s also very easy to get lost in the network of bush tracks. Dehydration and heat exhaustion are very real effects that can affect the unwary and under-prepared worker.

Although this broad subject cannot be properly covered by the scope of this field safety manual, some precautions are mentioned below and in more detail in several sections of this manual.

Top 5 tips for Survival on Field Work

1. **Stick to your Field Trip Plan and follow the protocols for contact.** If you do not check-in as scheduled a process for finding you is enacted. If you raise an alarm, emergency management process will be enacted and someone will go looking for you.
2. **Take some form of communication** (mobile phone – check coverage, satellite phone) to call for help if something goes wrong. Carry an EPIRB (Emergency Position Indicating Radio Beacon) – it will assist in locating you. Ensure it is fully functioning and reliable.
3. **Take enough water.** The single most important thing is water. As long as you have water you will live. Don’t carry just two litres per person per day, carry plenty more (upwards of 10L per person/day).
4. **Know the vehicle and its capabilities.** Make sure you know how to drive the vehicle. People have nearly died when all they had to do to become unstuck was engage the four wheel drive transmission and lock the hubs or deflate the tyres a bit to get out of soft sand.
5. **Stay with your vehicle.** A vehicle is much easier to find in the bush than a person. Walking will cost energy that you might need and you will lose more moisture than if you just rest in the shade of your vehicle.

Some things to consider and ideas that may assist in managing risk in relation to survival are:

- Be prepared for an emergency situation – it might be a medical situation (injury/illness), vehicle breakdown, adverse weather, changing road conditions, flooding etc.
- Carry plenty of spares: water, food, vehicle parts/tyres, clothing etc.
- Consider making a basic survival pack containing such items as a small torch, waterproof matches, small knife, a bit of food, heliograph/small mirror, whistle, water canteen, sunscreen, insect repellent, antiseptic cream, adhesive plasters, a couple of bandages, pain relief tablets, rain poncho etc. Store in a sealed container that is easily opened in emergency.
- Wait for help if you can do so safely – do not walk for help unless you are within a couple of kilometres of a main road that has a lot of traffic or a population centre (town, city etc) that you know is inhabited.
• Move your vehicle (if you can) to an open spot so it can be seen and open the bonnet so it's obvious that you are in trouble
• If you aren't alone take turns keeping watch for rescuers
• Create a signal – SOS in the dirt, light a controlled fire, arrow made of rocks/sticks etc.
• Work in the cool of the evening or early morning to preserve body fluids and energy
9. FIELD WORK PARTY

Experience in the field plays a significant part in safety on field trips. Those who do field work more routinely or the activity being done are usually more able to manage risks without really thinking about it. However, it is vital that even these persons don’t get complacent when it comes to the work being conducted and their roles and responsibilities in the field.

Depending on the nature of the activity the size of the field party may be a single or several participant(s). Field work may involve volunteers and contractors working alongside staff and students.

The University is bound by legal requirements to look after the health and safety of these workers as if they were University employees. The University’s legal obligations “to protect the health and safety of employees” applies no matter the location.

It is important to recognize that no staff members, visitors or students can absolve the University of its OHS responsibilities and carry the risks themselves. The University may not accept such an assumption of risk.

**Supervision**

The OAL has full responsibility for the health and safety of all those involved in the trip.

Supervision is a key consideration when working in the field. The level of supervision provided should be suitable to the knowledge and experience of participants involved.

Direct Supervision: this means that the OAL or suitably experienced delegate is at the specific location of the activity, giving supervision and instruction to each person involved. Direct supervision should occur for all persons who have not previously worked in the field or who have limited experience in field work.

Indirect Supervision: this means that the OAL is in the area overseeing the total activity. It is general supervision normally only used when all persons have previous experience working in the field and in the particular environment.

**Working alone**

Solo fieldwork is any activity conducted by an individual who is out of visual or audible range of other people for the duration of that activity. It may cover the entire field trip or just a part of a trip involving multiple participants in different site locations.
Solo work is not advisable for activities which have been assessed as ‘high risk’ or where the activities are undertaken at a remote location. In these circumstances there should be at least two people undertaking the activity. Solo work has to be approved by the OAL and Supervisor as part of the Field Work Risk Assessment process.

If a person is to work alone in the field then regularly scheduled contact should be made with the relevant contact person (as per the Field Trip Plan) or an onsite checking plan.

The risk of being injured and the danger of not being able to reach required assistance is increased when personnel work alone. The Faculty has therefore determined that any persons engaged in field work are not to work alone in the field unless the risk is deemed suitably low through the Field Work Risk Assessment process.

**Fitness and Medical conditions**

Consideration must be made for the level of fitness of individuals and also account for any pre-existing medical conditions. Ideally all participants will be in perfect health before, during and after any field trip.

Medical information is to be documented on GEN114 for Undergraduate students and for all other participants is to be disclosed to the OAL prior to the start of the trip. The information about participant medical conditions/information is to be held securely by the OAL and treated confidentially. Disclosure to others is permitted, however it should be only if needed for emergency dealings (e.g. there may be two academic staff involved in a trip with some undergraduate students – one academic is the nominated OAL and the other is co-supervisor. It would make sense that any medical conditions are then disclosed to both supervisors on the trip.)

It is important to disclose information of this nature as early as possible in the planning stages of a trip so that it can be taken into full consideration in a risk management process. For example, tasks can be allocated appropriately without creating hazards or escalating risk in addition to OAL/first aider having the knowledge of what to do in emergency situations.
10. TRAVEL

Travel by air
In the improbable event of an emergency, the clothes you are wearing can play a significant role in your safety. The best preparation is to be aware of your closest exits, be ready to follow flight and cabin crew instructions, and wear clothes made of natural fibres and slide friendly shoes, and leave all your possessions behind.

- Pay attention to the safety demonstration during the pre-flight briefing.
- Keep a supply of important medication in your hand luggage in case your check-in luggage goes missing.
- Continue taking your prescribed medication.
- Factor the effects of jet lag into your itinerary.
- If you've been scuba diving, don't travel in an aircraft for at least 24 hours after your final dive.

To help avoid deep vein thrombosis (DVT):

- drink plenty of fluids (but avoid alcohol and caffeine)
- stretch your feet and lower legs while seated
- walk around the cabin at regular intervals.

Travel by Road
Safe travel involves accounting for many things including safe speeds, the vehicle, road type and conditions, environmental conditions, your experience, and fatigue. Stop and rest at least every two hours, change drivers, take a walk, drink some water.

Familiarise yourself with the vehicle’s handling characteristics. You must test its behaviour at safe low speeds for control in general steering, cornering and especially braking characteristics. Some vehicles such as sedans and light utilities are much less stable than others.

Night driving is discouraged as it is more hazardous than day driving. It is preferable and sensible to stop, sleep and rest until daylight. There are three main reasons for avoiding driving at night:

- Driver fatigue – a good rule of thumb is not to drive in the hours that you would normally be asleep. Drivers travelling alone are recommended not to drive for longer than 3 hours without a break away from the vehicle for at least 20 minutes. When driving is shared, it is recommended drivers change over every 2 hours.
- Driving at night is more difficult and more tiring. Driving is an activity that requires high concentration levels and all senses must be on the task. Bush roads, tracks and river crossings pose difficulties often due to their poor condition. If travel must be attempted at night, speed must be reduced – perhaps to 75% of less of day speed.
- Animal behaviour and sudden movement – many animals are dazzled by the lights of a vehicle and often appear to move towards a vehicle. It is sometimes very difficult to see these animals in the periphery of the lit area and they can come into the path of vehicles.it is prudent to avoid driving at night on roads with unfenced stock.
Dusk is especially dangerous and a driver must deliberately check their speed. There is often more animal activity and movement. The position of the setting sun can also be quite blinding to the driver. Visibility is failing while it is not yet dark enough to benefit from headlights.

Road trains are a feature of our roads. Road trains are up to 50 metres long and 2.4 metres wide. Take care when overtaking road trains. To pass safely you should be able to see at least one kilometre of clear road ahead.

Often certain roads in the NT are dusty, or prone to flash flooding. Check the depth and force of water and possibility of hidden obstructions before moving through. If unsure wait until the water level drops. Vehicles on unsealed roads can raise a dust cloud that can obscure your vision. Slow down or stop until the dust settles. Watch for approaching vehicles throwing up stones that may break your windscreen. Only overtake if your vision is clear.

**Travel Cross-Country by Vehicle**

Driving cross-country is possible in many parts of the NT and Australia. Field parties are encouraged to use tracks and roads that exist before venturing into cross-country travel. Cross-country travel is only encouraged where vegetation is not thick and the ground is visible and generally solid (exception is sand/beach travel). Cross-country driving should not be undertaken except in a 4WD vehicle. Even with a 4WD vehicle it calls for cautious judgement and experience. Any driver who intends to travel across country should address these two questions:

- How knowledgeable and practiced are you in vehicle recovery?
- What would be your predicament if you had a major breakdown, or could not recover the vehicle?

In some circumstances you might judge it unwarranted or actually unsafe to proceed. It may be necessary in some cross-country terrain to travel in the company of a second vehicle. The route must be carefully chosen to avoid broken ground, rocks, washouts. There are many dangers that can arise from hitting the undercarriage on rocks, knocking trees, getting bogged etc. If driving cross-country, avoid grasping the steering wheel all the way around with your thumbs. If a hidden obstacle is hit and the front wheel quickly turns, spinning the steering wheel, it could result in broken thumbs.

Before taking any CDU 4WD vehicles you must have completed a CDU 4WD course. You also must read and complete both an “Application to Drive a University Vehicle”. Faculty policy is that all vehicles must be handed over in a clean state with all rubbish removed and the exterior clean or washed down after use.

Vehicles taken into remote areas should be equipped as follows:

- Diesel powered
- Tools, appropriate spare parts and recovery kit
- Four wheel drive equipped with a bull bar and powered winch including appropriate wire rope and shackles
- Dual spare wheels and tyres – not fitted to all vehicles
- Have sufficient fuel to cover the journey (e.g. long range fuel tanks when required)
- Air-conditioning
- Driving lights
• Recovery jack and shovel**
• Fresh water supply. (This is the driver’s responsibility to provide.)
• Adequate supplies of emergency rations
• Satellite telephone and optional EPIRB
• First Aid kit
• Some four wheel drives are specifically equipped to cater for special needs. Eg dual battery, high lift jack and water tanks, and if this facility is required then it needs to be specified.

Cross-Country by Foot
Many field activities take place well away from the vehicle you arrived in. When you leave your vehicle to traverse some distance across country, your circumstances change considerably. It is essential that you carry with you a day pack that includes the first aid, food, water, survival, communication and signalling devices that you would require should you become lost, incapacitated or for some reason not be able to return to the vehicle when you expected.

A variety of risks exist that include the possibility of becoming lost, suffering severe exhaustion (especially heat exhaustion) and a range of accidental dangers potentially causing incapacitation or injury, such as snake bite, being hit by falling trees or falling on loose stones on steep ground.

You should not work alone. Continuously review your progress to keep control of your known location. Judge carefully the time and effort required for your return to the vehicle. Monitor your food and water supplies.

Details that need to be checked before starting the traverse:
• Minimum equipment to be carried should include a compass, a map or comparable documentation such as air photographs, and a watch
• Correct identification of the starting point on the map
• Clothing appropriate to the planned route, the terrain and the vegetation anticipated. This includes a wide brim hat and suitably strong, comfortable footwear. Long trousers and long-sleeved shirts are recommended.
• Careful estimation of the time required for the traverse.
• Well-judged provisions necessary for the conditions and length of the traverse – emergency food and water. Minimise activity between 11am and 2pm in very hot conditions. Sun exposure can cause severe sunburn and dehydration. Include sunscreens with at least SPF 15+.
• Emergency gear – matches, snake bite outfit, and knife. A medical kit may not be judged necessary but minor items might be selected such as adhesive plaster and a bandage.
• In the case of an overnight traverse, appropriate camping and cooking gear and selected food.
• Provide details of the planned traverse to help direction of a possible search. For example, leave a detailed note or even a copy of a map with route details visible inside the vehicle, and park the vehicle in a conspicuous place.

The use of GPS is advisable for certain activities. Do not try to learn the device in the field as this is likely to lead to problems – training must be done prior to going on the trip.
References
11. OVERSEAS

Every year Australian travellers become ill, or even die, while travelling overseas. Make an appointment with your doctor or travel clinic for a basic health check-up at least eight weeks before you depart. Embassies can advise whether any medication you plan to take is legal at your destination.

Infectious diseases that cause some of the overseas illnesses are often preventable through vaccinations. It's important that you discuss your personal travel plans with a health professional to ensure you have the correct vaccinations for your trip and any booster doses of childhood vaccinations you may need.

- Vaccinations may be an entry requirement of some countries so check with the embassy or consulate of the countries you are intending to visit or transit. In some countries you may be refused entry or required to have the vaccination at the border. We recommend you seek medical advice from your GP or travel clinic doctor and have any vaccinations prior to leaving Australia.
- It's never too late to vaccinate; however, some vaccines require a long period to take effect and more than one dose may be needed.
- Health risks within a country can vary from one region to another and local authorities may be slow to announce outbreaks of disease.

If you plan to take medicines overseas:

- discuss with your doctor the medication you'll need to take
- carry a letter from your doctor detailing what the medication is, how much you’ll be taking with you, and stating that it’s for your own personal use
- leave the medication in its original packaging so it’s clearly labelled with your name and dosage instructions.

If you’re travelling with medication, make sure it’s legal in the countries you’re visiting by contacting the relevant embassy or consulate in Australia.

If you need to travel with large quantities of medication, it’s good practice to divide portions among different pieces of your luggage in case bags go missing. Keep all medication in the original, labelled container to avoid customs problems.

If you have to inject your medication, it may be preferable to carry your own needles and syringes if permissible in the countries you’re visiting. If you buy needles and syringes overseas, ensure they are sealed and sterile.

Take enough medication to cover the length of your trip. If you need to purchase medication at your destination, be careful to avoid imitation or counterfeit medications and prescription drugs, and always check the strength of a medication with a doctor. Be aware that packaging and labelling may be similar to those available in Australia, but the strength and active ingredients can vary from country to country.

New diseases can appear and spread suddenly, as happened with the outbreak of the pandemic influenza (H1N1) in 2009. Check the latest travel advice and travel bulletins for your destination before you depart and while travelling so you can ensure you have the latest information.
Common illnesses that travellers can pick up include those that result from eating or drinking contaminated food or water. Water-borne, food-borne, parasitic and other infectious diseases (including cholera, hepatitis, tuberculosis, typhoid and rabies) are common, with more serious outbreaks occurring from time to time. You should consider having vaccinations before travelling. In some destinations, you should boil or treat all drinking water or drink only bottled water and avoid ice cubes. To treat unclean water, you can use water-purifying tablets, portable water filters. You must consider the following questions when travelling overseas:

- Is the local water supply clean and reliable?
- If not, how will I secure enough clean water?
- What equipment (e.g. containers for carrying water, stove) or supplies (e.g. iodine tablets, fuel, water filter) will I need for this and how will I maintain them?

It is also important to be cautious when purchasing and consuming local foods, and avoid raw and undercooked food. If you are not sure on how it has been prepared or what is in it, it is safest not to consume it. Having general supplies in case of a lack of food options is suggested. Beware of swimming in fresh water as it could mean exposure to parasitic diseases such as schistosomiasis (bilharzia).

There are a number of mosquito-borne diseases that affect travellers visiting warm climates (including malaria, dengue fever and Japanese encephalitis). Consider taking prophylaxis against malaria. Take measures to avoid insect bites, including using an insect repellent at all times, wearing long, loose fitting, light coloured clothing and ensuring your accommodation is mosquito proof.

It is important to look after your personal wellbeing and mental health. Sleeping hours may be very different to normal depending on the activity to be conducted. Ensuring your body gets enough sleep is necessary to maintain good health. If visiting less developed countries, toilet facilities are likely to be different from home. It is vital to maintain hygienic practices such as hand washing. This is also apparent with drinking water. The quality of clean drinking water will vary between countries, however it is essential to ensure the water you drink has been treated.

References

12. URBAN SURVEY

Field work need not always mean working in rural and remote areas. Urban surveys and other ‘near base’ activities can carry some of the same risks as more conventional types of field work, but can also present some other risks particular to working in urban and built environments.

For the purposes of this manual Urban Survey is defined as any work conducted in a built environment where there is interaction with a resident population.

People can tend to be more relaxed in an urban setting as they feel they know more about it. For example, someone who resides in a city and is going to conduct their survey in that same place may believe they are so familiar with their “home environment” that they may perceive risks as lower although the actual risks may be as high as working in other more unfamiliar areas.

While most risks are covered in other sections of this manual they need to be reconsidered in the context of conducting an urban survey and like activities. Urban surveys often involve an interaction with the resident population (directly – home visits or indirectly – traffic etc.). It can also involve the field party breaking into smaller groups which will be outside visual or audible contact to cover a wide survey site, which presents its own sets of risk factors.

Performing urban surveys may involve entering private property. This can present legal issues and personal safety risks. It is imperative to get permission to enter property and be polite and courteous to all those you encounter as this can go a long way to establishing a productive interaction and in turn may minimise other risks.

It is essential that you are always alert and aware of your surroundings. Some things to consider and ideas that may assist in managing risk in urban environments are:

- Be alert at all times. If you feel unsafe, head for a well-populated area.
- Where possible work with at least one other person.
- Visit the study area for a reconnaissance before commencing the actual survey to assess possible hazards.
- Walk confidently and keep to well-lit and populated areas. Preferably schedule activity during daylight hours.
- A central meeting or rally point should be appointed for groups to gather at the end of the activity and/or in case of emergency.
- Do not enter any property unless permitted by the owner.
- Do not enter a private residence unless all the occupants are well known to you
- Carry some identification or an information sheet that clearly states your name, organisation and the purpose of your visit. It is preferable to only use your first name.
- Walk against the flow of traffic
- Leave a specific and detailed itinerary including streets, routes and times
- Communication plan - carry a mobile phone and have regular check-ins with supervisor.
- Be wary if someone in a car stops and asks you for directions. Keep a safe distance from the car.
- Be aware of your increased vulnerability when wearing personal headphones.
• Do not use ATM's in isolated or dark locations and do not let anyone see you enter your PIN and avoid carrying or withdrawing large amounts of money from ATMs.
• Check timetables to limit waiting periods at public transport stops.
• Report any suspicious, offensive or illegal behaviour immediately to the police.
• Leave any area safely if there is any form of violence or civil unrest underway or there is an imminent possibility of that threat.
• Keep your bag, wallet and mobile phone where you can see them at all times. Always keep your bag closed and secured.
• Watch for animals (refer to Section 31 Animal Hazards – indirect and direct contact)
13. VEHICLES PLANT AND MACHINERY

Vehicles
Before the start of a journey it is sensible to inspect quickly all features of a vehicle you are using. Get clues from the vehicle maintenance staff when you pick it up about any idiosyncrasies you should look for.

- Is the load well settled and secured?
- Has the engine temperature stabilised properly?
- Are the tyre levels correct?
- Is everything looking satisfactory?

In the course of the journey repeat this routine at every stop. Along the way listen for any changes in vehicle noise, and look out for any change in how it seems to be driving.

If field work includes cross-country and on-road driving, stop and inspect your vehicle for any damage when you return to sealed roads from cross-country driving, looking underneath for leaking fluids, carefully making sure the steering wheel has not been impaired, that the tyres are not damaged or deflated.

Whenever you drive through water remember your brakes will be wet and will not respond properly if you need them. Always dry them out by driving slowly applying the foot brake gently until they are again working properly (it should only take a minute or so to achieve this).

Confirm beforehand where fuel can be obtained on a journey and plan safe refuelling stops. Extra fuel in jerry cans may be necessary for some parts of the country; it is sensible to carry some spare fuel in any case.

Packing the vehicle needs to be taken seriously. It is prudent to make a check list of all items to be taken and check them off as they are packed. Tools and spares are important, as is the condition of the spare tyre. A vehicle should be packed properly to prevent:

- Accidental loss of items (e.g. blown or thrown out of an open utility)
- Serious or fatal injury caused by flying objects inside a vehicle in the event of a collision
- Instability – the centre of gravity should be kept low by packing only light objects on the roof rack.
- Lack of food and water for the journey. Water is most critical, and you may need water for the vehicle as well as the people travelling. A minimum per person in the NT is 10 litres/day. This should be a safe standby for the first 24 hours. Much more, such as 40 litres, is suggested in sparsely inhabited areas where water is scarce. As much as 20 litres may be needed for the vehicle itself in some circumstances.

Boats and small craft
Users of small craft must hold a current Coxswain’s Certificate of Competency or above for water bodies (fresh water lagoons, rivers and the coastal waters). A coxswain should be present in the boat should the researcher or Onsite Activity Leader not possess such a qualification.
Boat operations are to be undertaken in fine and clear weather with calm or slight wind. The boat speed and wind speed added together with spray can quickly make conditions intolerable. Operations in higher wind speed should only be undertaken at the discretion of an experienced operator. The boat is never to be taken out with a crew less than two.

Before each boating journey, engines are to be thoroughly checked and test run for at least five minutes. Fuel and oil are to be checked and filled before each trip. It is important to assign a member of the crew as captain, whom will have complete authority over all crew members. All cargo must be loaded evenly and be careful not to overload the boat.

The following equipment should be considered any boat operation:

- Bailers
- Oars
- Container of fresh water
- Waterproof clothing
- Approved Personal Flotation Devices fitted to the individuals in the crew and in good condition
- Compass and map
- Marine distress signals
- Sea anchor
- Spare bung
- Two days rations per person
- Matches
- Cooking stove, fuel
- Signal mirror
- Field radio
- EPIRB
- GPS
- Sleeping bag in waterproof covering per person

As a guide to the amount of fuel to carry, find out the consumption of the motor under the anticipated load and weather conditions for the length of time of your return journey. Twice this amount of fuel should be carried. The charts for many areas are unsatisfactory for inshore research over what can be classified as ‘foul ground’, here the advice of knowledgeable users of the area should be sought. In motoring over foul ground, take extreme care and motor on a rising tide to avoid lengthy periods of being stuck fast or damaging a propeller.

**Road vehicles**

School/University Vehicles must be driven only by properly licensed staff and students. Mechanical breakdowns can be minimised by repeated inspections and regular maintenance. Before starting the vehicle, check the condition of the tyres, secure or remove any loose objects and confirm the windscreen is clean.
Stock animals and wildlife are a particular hazard at dusk and may suddenly run into your path from the bush. Do not swerve to avoid them. You should brake in a straight line to avoid a roll over.

When using the vehicle to travel off road it is important to keep watch on the warning gauges and to do daily checks of fuel, oil, and water. When travelling over uneven or rough terrain, check the tightness of the wheel nuts. An inspection for oil, water or fuel line leaks or loose components and anything else that seems unusual should be completed, as well as inspection of tyres for stakes and cuts which may cause a blow-out at high speed.

After a long hot drive, idle the engine for one minute before turning off the ignition. In Darwin’s hot weather, you must watch the temperature gauge as the engine may overheat.

The following equipment should be considered any road vehicle operations in remote areas:

**Items for both Petrol & Diesel Engines**
- Drive belts (eg. fan & power steering belts etc.)
- Radiator and heater hoses
- Oil Filter
- Fuel filter
- Brake
- Wire
- Fuses and fusible link
- Globes
- Oil seals for input/output shafts
- Wheel bearings
- Tyres and tubes
- Valves for rubes
- Tyre/tube patches, glue etc.
- Spare wheel*

**Lubricants etc.**
- Engine oil
- Transmission oil
- Distilled water
- Water - enough to fill radiator in addition
to drinking water

**Tools**
- Wheel brace/spanner*
• Comprehensive tool kit
  • (with all necessary size sockets & spanners)
• Jack (standard)* and base plate
• Jumper leads
• Tyre pump
• Tyre pressure gauge
• Tyre levers
• Rubber mallet
• Spare tube
• Tub patch kit
• Hacksaw and blades
• G Clamp
• Drill - hand or 12 volt and set of drill bits
• Soldering iron (12 volt) and solder
• Wire brush
• Electrical circuit tester

**Miscellaneous Repair Items**
• Spare nuts
• Bolts
• Aero start
• Washers etc.
• Gasket cement
• PVC fuel hose
• Contact cement
• Silicone adhesive
• Araldite, Plastibond etc.
• Radiator stop leak
• Fencing wire
• Dewatering fluid (eg. CRC)
• Duct of Gaffers tape
• Self amalgamating tape
• Insulation tape
Recovery Equipment

- High lift jack
- Leather gloves
- Snatch strap
- Rope

The following procedures and guidelines will assist in potential situations while conducting field work with a 4WD, and are described in the appendices:

- Process for jacking and wheel changing
- Process for tyre repairs
- Guide for vehicle recovery operations
- Process for water crossing

References:
14. PERSONAL ETIQUETTE AND BEHAVIOUR

Fieldwork necessarily involves working on different private properties, in National Parks, on Crown Land, in Forestry or Aboriginal Land. You must inform yourself about the land on which you propose to work and seek appropriate permission. This might involve special Aboriginal lands/Government sanction or permit. For certain National Parks and/or working within their boundaries, you will to approach the relevant land council well in advance. Some months may be required to cross or work on their land.

In relation to other private property, it is also very important that you seek permission. It is proper to telephone or write to the landowner in advance of the planned visit, to explain the proposal and its purpose, and just who you are and your formal connection to the University. In some cases it may prove necessary to make this request by visiting the property ‘homestead’, hoping you will find the owner or person in charge there. If this person is not there, you have a problem should you propose to conduct your investigations unannounced. At an accidental meeting, you can only expect hostility or even an order to leave the property. There are a few graziers who are hostile and you should be careful to find out about them in advance, and how to obtain their permission and help. Properly approached, there are probably extremely few people ion the bush who won’t be interested in what you are studying and prepared to help you as well as giving their permission.

Even with prior permission, it is good etiquette to visit the station by arrangement to introduce yourself and confirm that you are starting the work. It is also a good opportunity to explain your itinerary and seek information and advice about access. Ask if there is any special care you need to take, any places they don’t want you to go (they might be mustering, or have sensitive stock in a particular paddock). Fire risks?

You must leave all gates as you find them, and you must be scrupulous about putting out your campfire before you leave and removing all rubbish. You should leave your camping sites virtually unmarked. If you observe anything that you consider untoward, inform the station homestead.

References
15. HEALTH AND HYGIENE

Health:
Staff and students participating in fieldwork must inform the team leader and supervisor of any pre-existing medical conditions and update their Participant Form. Adequate supplies of all medications the user may require must be taken on the trip. Staff and students completing remote fieldwork should be reasonably fit. CDU Procedure requires that all University vehicles used in rural areas, remote locations and off-campus trips including boats, should carry a first aid kit appropriate to the needs of the location and needs of the group accessing it. Personal first aid kits should be carried at all times when working away from the vehicle. It is vital that you replace any used items and regularly check the kits contents for items that may have passed their use-by-date. Royal Flying Doctor Service (RFDS) first aid kits should be considered when working in remote locations for extended periods of time.

Some health questions you may consider when planning fieldwork and assessing risks include:

- Are there any illnesses endemic to the area?
- How will I manage prevention of these?
- Where is the nearest hospital and doctor?
- Do I know how to get there, quickly?
- Do I have a plant to get back home if I need to?
- Have I made a will and given instructions for what is to be done to my research, notes etc if I die in the field?
- If I am travelling long distance, does someone at the other end know I am coming, who can inform people about an accident if it occurs?

First Aid:
In all emergencies, follow the DRABC principle outlined below:

DRABC

- **Danger**: Evaluate the potential danger in your surroundings, and only proceed if it is safe to do so. Ensure that no one else gets injured and if possible, move the casualty to a safer position.
- **Response**: Check if the casualty is conscious. If they are conscious, manage any bleeding and ask for a response from the casualty. If unconscious, roll/turn the casualty onto their side.
- **Airway**: With the casualty on their side, check for and foreign objects in the airways and remove it if any with your fingers.
- **Breathing**: Look and listen for breathing. If there is no sign of breathing turn the casualty on their back and commence Expired Air Resuscitation (EAR), also known as mouth to mouth resuscitation. In this process, tilt the head back and with a pistol grip, give one breath every four seconds while checking for a pulse every two minutes.
- **Circulation**: Feel for a pulse in the neck or wrist. If there is a pulse continue to manage the bleeding, however if there is no pulse, commence Cardiopulmonary Resuscitation (CPR). To do this, place one hand on the lower half of the casualty’s sternum and grasp the wrist area with your other hand. Push down on the sternum vertically 4-5cm and check for a pulse after one minute and again every two minutes.
<table>
<thead>
<tr>
<th>One Operator</th>
<th>Two Operators</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 breaths in 5 seconds</td>
<td>1 breath every 5 compressions</td>
</tr>
<tr>
<td>15 compressions in 10 seconds</td>
<td>1 compression every second</td>
</tr>
<tr>
<td>Repeat 4 times per minute</td>
<td>Repeat 12 times per minute</td>
</tr>
<tr>
<td></td>
<td>Compression operator must count aloud</td>
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</tbody>
</table>

Hygiene:

It is the responsibility of the onsite activity leader to guarantee that fieldwork participants are provided with hygienic and wholesome food. Food must be prepared in as hygienic manner as practicable. If food is not handled or prepared in a hygienic manner, gastrointestinal illness could affect an entire group of participants. The following should occur when in the field:

- Food should be chosen and prepared carefully. Fruit should be washed and peeled before consumption, and raw foods such as meats, salads, seafood etc, should be avoided when travelling in many parts of the world. If you are in doubt, food should be cooked thoroughly to kill any contaminating organisms.
- All foods must be prepared hygienically using clean hands and clean utensils.
- An adequate supply of safe hand washing and drinking water should be available. Drinking unclean water on a regular basis can lead to long-term low level health problems. If the water is not safe to drink, then boiling, filtration or purification tablets should be used.
- Cuts and sores should be covered. Smoking, coughing or sneezing near food must be avoided.

References:

16. PERSONAL PROTECTIVE EQUIPMENT (PPE)

The appropriate kind of safety equipment and clothing of an occupational nature for the field trip should be dictated by the hazards identified in the proposed field work, together with experience and common sense.

Students should be advised of their obligation to ensure their own work environment and activities within or on behalf of the University are safe and any risk to health is eliminated or minimised.

Personal Protective Equipment should be maintained and regularly checked for any repairs or cleaning. Certain PPE will require cleaning after use and hygienic practices should be exercised when using or storing PPE.

**Footwear**
For most fieldwork, hiking boots that provide good ankle support and traction are recommended. Gaiters protect your feet and lower legs from various hazards including snakebite, stakes left by track cutters, low scrub and spinifex. Long pants will also provide some protection.

**Hearing Protection**
The louder a noise, the shorter the duration necessary to damage your hearing is. To prevent hearing loss, avoid loud areas, and utilise ear muffs or ear plugs.

**Eye Protection**
Protect your vision whenever you perform a job that might endanger your eyesight. Wear safety glasses with eye shields. This is particularly necessary when handling hazardous chemicals or materials. Wear safety sunglasses whenever you work in conditions that expose your eyes to extra amounts of ultraviolet light.

**Hard Hats**
Wear an approved hard hat whenever you work in situations that present danger from falling or flying objects such as sampling at cliff faces or on steep slopes.

**Dust Masks (Respiratory Masks)**
Use dust masks to protect your lungs from airborne fumes and dusts.

**Clothing**
The type of clothing that is suitable for fieldwork depends on climatic conditions and terrain. Clothing should be visible and provide protection from various environmental hazards. These include heat, cold, rain, snow, UV radiation and insects. Always carry wet weather gear and warm clothing when working in high altitudes as the weather can deteriorate rapidly. Wool retains warmth when wet. Down provides insulation only when dry. Cotton is an excellent material for warm and humid climates but not suitable for cold conditions.

**Skin Protection**
Using sun blocks and insect repellents are recommended. Wide brimmed hats should be worn at all times. For added protection from the sun, it is recommended that all personnel working in the field wear long sleeved shirts and long trousers.

References:
17. WEATHER

Working in the field often means working outdoors in a variety of weather conditions. It is vital that field workers take into consideration all the variations of weather that may be encountered on a trip as conditions can change abruptly.

The Australian Government Bureau of Meteorology website is a recommended source of current weather information.

Charles Darwin University issues cyclone action advices and notices through internal email and on the radio - 104.1 FM. These are instructions for all CDU community members (staff, students, visitors) on current developments and corporate actions in the event of a cyclone (e.g. shut down, reopening etc.)

The pattern of weather in the NT is most commonly known as the “Wet Season” and the “Dry Season”.

**The Wet Season**

During the Wet Season (November to April) the humidity rises markedly and the heat can become oppressive for some. The Top End (north of Katherine) gets hot with high humidity levels and rain. Daytime temperatures range from 30-34 ºC and night-time temps are from 18-26ºC.

The Central Australian region usually gets the heat without the humidity – daytime temperatures average 30-36ºC, night-time temperatures of 15-20ºC. There are also extended periods between November- March when temperatures can be above 40ºC for several weeks field work in this area should not be undertaken if this is the case.

**The Dry Season**

The Dry Season is characterised by significant drop in humidity with extensive periods (months) of no rain, blue (cloudless) skies and lower average temperatures. The Top End (north of Katherine) has daytime temperatures ranging from 25-30ºC and night-time temps are from 15-25ºC.

The Central Australian region usually gets colder – daytime temperatures average 20-30ºC, night-time temperatures of 0-15ºC.

**Weather forecasts**

Keeping an eye on the weather is critical at all stages of a trip. Knowing the actual (and forecast) general and local weather conditions can go a long way to having a safe and successful field trip.

**Severe Weather including storms and cyclones**

Storms and rainfall are generally more prevalent and consistent in the Wet Season. Rainfall in the NT is commonly sporadic in its distribution, but can be from very heavy downpours in short periods which results in large amounts of water entering the environment that can cause flooding. Specific rain activity may be restricted to any part of a catchment and local conditions may be relatively dry but flash flooding emanating from elsewhere in the catchment can cause an unexpected hazard. It is important to choose field work sites and campsites with consideration of general, as well as local, weather patterns.
Cyclones and tropical lows are severe weather events that affect the northern part of Australia from about November to April. Cyclonic systems (and tropical lows) can “dump” large amounts of rain into wide areas that can cause flooding. Cyclonic conditions are never to be underestimated and all precautions must be taken. All University and government issued advices and warnings must be obeyed.

NOTE: Fieldwork must not take place in the event of a cyclone watch or warning. No field work paperwork will be approved during any cyclone period and all Onsite Activity Leaders of current trips must be contacted to advise them of watch/warning status and to arrange any assistance in preparations for return to base or other safe location.

Floods and warnings

Flood conditions can develop abruptly, and a flooded crossing or bridge be encountered unexpectedly. Road conditions can change and even sealed and well maintained roads can become impassable in adverse weather. When heavy downpours occur there can be sudden severe flooding some distance from the storm event.

Signage indicating a flood situation or road closure may or may not be present. It is important to observe all signage and/or instructions from road crews, emergency services etc when confronted by a flood or imminent threat of such a situation. In many areas large road signage is posted at the start of a highway with selected places along that highway showing the road conditions along at those points.

More information in:
Section 17 - Temperature
Section 18 - Water or Immersion In

Some things to consider and ideas that may assist in managing risk in relation to weather are:

- Wear appropriate clothing for the environment or personal protective equipment suited to the task
- Monitor environmental conditions – keep an eye on the weather and/or monitor updates on Bureau of Meteorology
- Develop a site specific emergency plan for flooding and in case of severe weather events such as cyclones
- Cease work if conditions get too extreme to continue working safely
- Choose field work sites and campsites with consideration of weather patterns
- Implement appropriate work-rest regimes relative to the physical fitness and general health of worker(s)
- Take your own notes, observing the weather patterns, rainfall etc.

Other references

18. TEMPERATURE

Field workers often experience extremes in exposure to temperature in hot or cold working environments. Work outdoors may expose a person to the sun’s radiation, or to wind chill. Work with hot plant (e.g. generator), in hot surroundings (e.g. working outdoors) creates the potential for heat-related illness. Work with cold plant (e.g. cold-room), in cold environments (such as working outdoors), or with cold substances (e.g. ice or cryogens) also creates the potential for cold-related illness.

Thermal discomfort may be experienced even when there is little likelihood of a medical condition developing.

- *Heat exhaustion* is related to lack of fluids, or a rapid loss of body fluids.
- *Heat stress* is more serious, and can lead to death. It is more likely to occur in conditions of high humidity, and to affect non-acclimatised persons i.e. those unused to the conditions.
- *Heat stroke* is an uncommon and more severe form of heat illness, which is a medical emergency. It occurs when the body can no longer control the body temperature and it rises to temperatures where mental function is seriously impaired.
- *Hypothermia* is where a person gets an abnormally low body temperature as a result of exposure to cold environments. It is a serious condition which can lead to death.

Preventive steps should aim to reduce thermal discomfort as much as is practicable, and to develop working conditions and work practices which will not give rise to more serious problems.

Fire is a very real risk that can result in fatality if not considered and managed appropriately. Fires can originate from many sources and cause considerable damage to life, property and the environment.

The pattern of weather in the NT is most commonly known as the “Wet Season” and the “Dry Season”. During the Wet Season (November to April) the humidity rises markedly and the heat can become oppressive for some. The Dry Season is characterised by significant drop in humidity with extensive periods (months) of no rain, blue (cloudless) skies and lower average temperatures.

In general:

- Where possible work with at least one other person.
- Visit the study area for a reconnaissance before commencing the actual survey to assess possible hazards.
- A central meeting or rally point should be appointed for groups to gather at the end of the activity and/or in case of emergency.
- Report any suspicious, offensive or illegal behaviour immediately to the police.
- Wear appropriate clothing for the environment or personal protective equipment suited to the task
- Provide protection from the wind and rain (e.g. shelter)
- Monitor environmental conditions – keep an eye on the weather and/or monitor updates on BoM
- Cease work if temperatures get too extreme to continue working safely
- Implement appropriate work-rest regimes relative to the physical fitness and general health of worker(s)
• Assess medications and drugs applicable to each worker to determine possible effect of thermal exposure

**Sun exposure and dehydration**

Solar UV radiation is at its greatest intensity between the hours of 10.00 am and 2.00pm, although dangerous levels of UV radiation can still be experienced outside those hours. All persons are at risk of harm from solar UV radiation exposure. While certain skin types are associated with an increased risk, it is important that everyone protects their skin from exposure regardless of skin type.

Sun exposure is well established as the major cause of skin cancer in Australia. It is the ultraviolet (UV) radiation component of sunlight which is harmful and the level of UV radiation is not directly related to temperature or brightness of sunlight. This means that harm can still occur on cool or cloudy days during the peak UV periods of the year. In addition to skin cancer, solar UV exposure is a major cause of eye damage.

Other factors to consider in relation to solar UV radiation:
• the effect on individuals who have certain photosensitive medical conditions
• the reaction with drugs/treatments prescribed for some medical conditions
• the effects of some chemicals and solar UV exposure
• the elevated risk to people who have already had a skin cancer diagnosed.

In general:
• Wear appropriate clothing for the environment – e.g. long sleeved shirt, long pants, wide brimmed hat, sunglasses.
• Wear sunscreen – SPF 30+ minimum
• Work outside the middle of the day (e.g. 10am-2pm)
• Implement appropriate work-rest regimes relative to the physical fitness and general health of worker(s)
• Implement a hydration plan – this will vary by nature of the activity however a commonly accepted plan is approximately 500mL per hour per person in hot environments


Guidance Note (Safe Work Australia)

**Fire**

Some fires throughout northern Australia are deliberately burned (managed burns); others result from natural sources (e.g. lightning strike) or through acts of humans (arson, campfire, cigarettes). Some of these fires can develop into bushfires that cover vast distances and cause major damage to the
environment and property. It is important to remove yourself from a fire risk as quickly and as safely as possible. If you cannot extinguish a fire then move to a safe area as quickly as possible.

In general:

- Be aware of current fire restrictions
- Do not enter smoky areas as you may lose visibility and become disoriented.
- Slow down in a vehicle if you are approaching smoke across the road.
- Extinguish all campfires appropriately
- Leave the area safely if there is a fire or there is an imminent possibility of that threat.
- Always extinguish cigarettes and dispose of cigarette butts responsibly.
- Use dedicated cooking spaces and equipment
- Ensure adequate ventilation or smoke extraction is provided
- Check for vegetation build-up under vehicles
- Do not carry fuels inside vehicles

**BUSHFIRE**

Finding yourself surrounded by smoke can be alarming, but is seldom as dangerous as first appears. For many years the NT has experienced frequent low intensity fires, especially during the Dry Season. Bushfires in Top End savannas generally do not burn as hot or move as quickly as forest fires in southern Australia. Basically, Top End fires are grassfires which sometimes scorch trees and flare in places where there is a lot of fuel. Nevertheless, locally intense fires can be beyond the survival threshold for an unprotected human body.

**CAMP FIRE**

Campfires are a common source of accidental fire. Never add any flammable liquids to a fire. Soaking timber or spraying with flammable liquids will most likely result in an uncontrolled or excessive fire.

Extinguish all fires at least 30 minutes before you leave using water, sand or soil. Check the fire site just prior to leaving to ensure there are no burning embers or chance of the fire reigniting. It is also advisable to scatter unused wood and tinder back into the surrounding area so as to not create an unnecessary pile of fuel.

**VEHICLE FIRE**

Fire in a vehicle is an event for which every driver must be prepared. A fire extinguisher must be carried and be easily accessible (not blocked by gear) and you must know where it is.

The risk of engine fire is greatest when the vehicle is stationary or when the engine is running badly or having starting trouble. Vehicle exhaust systems can become hot enough to burn grass or spinifex and start a fire. If a vehicle is stalled in, parked in or travelling through long grass, contact with hot exhaust in increased and the chance of fire elevated. This can be prevented by stopping where vegetation growth is stunted. If a route has been forced through long grass, and this grass accumulates in the vicinity of the exhaust systems, a fire can start under the vehicle. Periodically check for the accumulation and safely remove any build up before continuing your journey.
Work sometimes requires extensive time away from the vehicle you arrived in. Sometimes the vehicle is parked in off-road or bush environments. Where possible park the vehicle on clear ground and in such a way to allow for a safe exit from a fire threat (e.g. park facing the exit route to avoid having to manoeuvre the vehicle to escape).

Care must also be taken with packing extra fuel to ensure it does not become a hazard as fatal explosion accidents have occurred upon starting vehicles because of leaking petrol. Always transport fuel in specially designed fuel containers and never carry fuel containers inside a vehicle.

**Cooking – oils, fats and heated water**

Some field trips involve using oils, fats and hot water to cook or clean. Oils, fats and heated water can reach temperatures approaching or exceeding 100 °C and cause serious burns and scalds.

It is vital to treat any injury suffered as a result of cooking oils/fat or heated water as per current prescribed First Aid practices or seek professional medical advice or treatment.

**Smoking**

Cigarettes which have been discarded irresponsibly have the capacity to ignite any combustible material. If a cigarette butt is simply dropped on the ground it can smoulder for up to 3 hours. Flicked butts can and do cause fires. The Australian Fire Authorities Council estimates that more than a dozen fires each day are caused by cigarettes or smoking materials.

Cigarette butts also contain hazardous chemicals that when burnt are released into the environment. Butts can also be carried by wind into aquatic ecosystems where the toxic chemicals can leach into the water causing damage to the wildlife and water quality.

**Cold**

Cold temperatures can be experienced in several ways from cold climates to cryogenic substances. When working in cold climates or with cryogens it is imperative to wear appropriate protective clothing and have access to a warm environment when you are finished working or if recovery is required. A shelter, such as a hut or the cabin of a vehicle, will offer relief from extreme conditions. When working in cold weather the risks increase when low temperatures combine with wet and windy conditions.

Physical and medical conditions, medications and drugs and previous adverse reactions can also make a person more likely to be affected by cold.

It is important to take adequate breaks from exposure to cold. The length of exposure and the break required will be dependent on the nature of the exposure.

It is also important to get acclimatised to the cold as prolonged exposure to heat or cold can lead to fatigue, lowered concentration, slowed reflexes and loss of physical coordination. Any one of these
things increases the possibility of an injury occurring. If exposure to cold leads to fatigue or discomfort, this could impair decision-making and affect the ability to follow safe working procedures.

Some things to consider and ideas that may assist in managing risk in relation to temperature are:

**Other references**
19. WATER OR IMMERSION IN

Working in the field sometimes means working and travelling on or near water bodies. It may be fresh or salt water creeks, rivers, billabongs, wetlands or oceans. You may simply be traversing these enroute to a destination or needing to conduct your work in or around these aquatic environments.

The following activities are covered in this section: boating; swimming and diving; collecting in or near; camping near; inundation and flooding; tides; rivers and crossings.

**Boating**

Boats come in a range of sizes and are used for different purposes and can access different environments. It is important to choose a vessel that is suited (or closely suited) to the activity and number of participants needing to be on the vessel. A lot of activities using boats are done in calm protected waters and during good weather. However, conditions can change rapidly and a small vessel can get into difficulties which can result in a serious threat to passengers. You should always watch out when boating around other vessels.

It is important to use trained or authorised operators; wear personal flotation devices (PFD’s); carry all regulated safety equipment; carry communication devices; EPIRB’s; have suitable navigation lights and always check weather conditions – before and during activity.

Other items that might be required but are not actually required by law include: flashlight, first aid kit, paddles, whistles, anchor and rope, engine spares, bilge pump etc.

It is vital that checks are made on the operability of the vessel and all equipment being taken before departure from base. Also ensure all gear is stowed correctly and weight evenly distributed.

The “master” of the vessel is responsible for the safety of all persons while they are onboard. They should ensure that all passengers receive a briefing about what to do should an emergency arise, including how to raise an alarm and use communication or signalling devices.

*More information can be found in Section 13 Vehicles, Plant and Machinery.*

**Swimming and Diving**

Swimming in natural water bodies is not encouraged in NT due to the presence of crocodiles and other dangerous marine creatures. Even if the location is not sign posted for the presence of these dangers you should avoid swimming.

If entering a water body to traverse it or collect specimens, precautions must be taken to avoid or minimise harm.
Diving

Diving is any activity requiring a participant to be submerged under water for the purposes of carrying out a task.

Snorkelling is permitted in certain situations and conditions.

SCUBA diving may be a requirement of research or postgraduate studies. It is not normally used in undergraduate teaching. A diving certificate will be needed before you can go SCUBA diving and SCUBA diving must not be undertaken alone. The Faculty of EHSE uses AS/NZS 2299.2:2002 Occupational diving operations - Scientific diving as its diving standard. It must be adhered to when doing SCUBA diving.

The Diving Officer is responsible for approving all diving activities and associated dive plans.

Dr. Michael Guinea is the diving officer. He can be contacted on Phone: 8946 6707 or email: michael.guinea@cdu.edu.au

Camping near water

Camping near water bodies must be done with an element of caution. Animals frequently access water sources to drink or bathe and can enter a campsite inadvertently and cause chaos and harm to camp occupants. They can also see a campsite as a place for a “free feed” (they come in after your food or even you!). Locate your site as far away from spoor and the edge of a water body as possible to avoid being harmed by animal intrusion.

There is also the risk of your campsite being inundated by floodwaters or affected by tidal flows. Ensure you are camped well above the high water mark or in an area unlikely to be affected by flooding. Never camp in a dry creek bed as flash flooding can occur.

Inundation and Flooding

Rainfall in the NT is commonly sporadic in its distribution, but can be from very heavy downpours in short periods which results in large amounts of water entering the environment that can cause flooding. Storms and rainfall are generally more consistent in the Wet Season. Specific activity may be restricted to any part of a catchment and local conditions may be relatively dry but flash flooding emanating from elsewhere in the catchment can cause an unexpected hazard. It is important to choose field work sites and campsites with consideration of general, as well as local, weather patterns.

Cyclones are severe weather events that affect the northern part of Australia from about November to April. Cyclonic conditions are never to be underestimated and all precautions must be taken and CDU and government issued advices and warnings obeyed. Cyclonic systems (and tropical lows) can “dump” large amounts of rain into wide areas that can cause flooding.

NOTE: Fieldwork must not take place in the event of a cyclone watch or warning. No field work paperwork will be approved during any cyclone period and all Onsite Activity Leaders of current trips must be contacted to advise them of watch/warning status and to arrange any assistance in preparations for return to base or other safe location.
Communication with CDU contact must be established and maintained through cyclone periods to ensure situation updates are satisfactory and completed and participants are fully accounted for.

**Tides**

Tides are of special importance in coastal waterways. A change in tide can turn a placid creek mouth into an area of disorder with standing waves and strong currents. Use extreme caution in creek mouths. Tidal bores (where the leading edge of a tide forms a wave that travels up a river against the current) are experienced during spring tides in several rivers. They can reach up to 1m in height and have the ability to seriously unsettle or even capsize a boat if not navigated correctly. The Daly River (one of the more frequented CDU fieldwork locations) is one such river in NT which experiences this phenomenon. Check with local users of these rivers as to what to expect and then expect the unexpected. Use tide charts and tables for the area in which you are working. It is also a good idea to take notes for yourself of observations on the times and the height of the tide at which obstacles are covered.

Coastal salt-flats or sand beaches offer enticing timesaving routes. However serious consideration must be given to the following:

1. Can the surface really sustain a vehicle's weight without bogging it?
2. If it bogs, can the vehicle be recovered quickly enough and manoeuvred away from a high tide situation?

A thorough inspection of the entire route must be made on foot, before proceeding cautiously. It may be much quicker to leave the vehicle on safe, dry ground, and walk to the study site.

**WARNING:** If it is deemed absolutely necessary to traverse tidal flats in a vehicle - DO NOT STOP as a stationary vehicle can sink to the axles and become so stuck that tidal inundation and major damage occurs to the vehicle. The vehicle and contents may become fully submerged and the field party are now unable to either continue on or return to base.

Some things to consider and ideas that may assist in managing risk in relation to working or travelling in or near water are:

**Boating**

- Always have plenty of fuel onboard. Allow for the journey to and from the destination and enough for if you had to detour and take another route in an emergency.
- Wear Personal Flotation Devices according to local regulations. In some states this is mandatory by law.
- Do not overload any vessel. Carry only the number of passengers and comply to total weight designated for that vessel.
- Check that engine/outboard motor is fully operational and all batteries are fully charged before departing base
- Carry all regulated safety equipment for the location you are in
- Carry emergency contact numbers for the local area – e.g. coastguard, water police.
- Stick to posted speed limits or a lower safe speed in your boat. Adjust your speed to the conditions and traffic at the time.
- Do not operate any vessel under the influence of alcohol or drugs.
- Do not refuel in the water unless in an emergency situation. You should always refuel your vessel on land.
- Develop an emergency plan for if someone does fall into the water, the boat is tipped or submerged.
- Monitor the weather conditions and forecasted boating conditions

### Swimming and diving
- Wear appropriate clothing for the environment or personal protective equipment suited to the task
- Observe all signage – if signs are present then obey the instructions
- Never swim by yourself – Always take a buddy with you when you swim
- Have adequate supervision - Supervisors should be paying attention at all times and not be distracted by anything.
- Always make sure the area is safe - avoid swimming in oceans, lakes or rivers with strong currents. Be sure there are no branches, sharp rocks or other dangerous obstacles underwater.
- Never dive into any water body when you cannot see the bottom
- Avoid swimming in places such as abandoned quarries where the water might be contaminated with waste.
- Never mix alcohol and drugs with swimming - alcohol is a factor in up to half of all reported swimming deaths.
- Use prescribed flotation devices – water toys or any item marked “Not a flotation device” are not a substitute for proper safety equipment
- Monitor environmental conditions – keep an eye on the weather and/or monitor updates on Bureau of Meteorology
- Cease work if conditions get too extreme to continue working safely
- Implement appropriate work-rest regimes relative to the physical fitness and general health of worker(s)
- Assess medications and drugs applicable to each worker to determine possible effect on ability to participate.

### Camping
- Camp well away from the edge of water bodies or possible flood ways
- Be aware of animals in the area that may enter your campsite – deliberately or inadvertently

### Inundation and floods
- Monitor environmental conditions – keep an eye on the weather and/or monitor updates on Bureau of Meteorology
- Develop a site specific emergency plan for flooding and in case of severe weather events such as cyclones
- Cease work if conditions get too extreme to continue working safely
- Choose field work sites and campsites with consideration of weather patterns

### Rivers
- Study the river carefully and look for: depth and flow rate; submerged rocks and trees; bottom stability conditions; predatory animals such as crocodiles or other animals being carried along in the floodwaters or stranded
- Look for a safer crossing point
- Wait for the river/flood to subside
- Monitor environmental conditions – keep an eye on the weather and/or monitor updates on Bureau of Meteorology
- If you are to cross in a vehicle – plan the track of the vehicle and move at a reasonable pace to maintain forward momentum without losing control.
- Upon exiting the water – park in a safe location and thoroughly check the condition of the vehicle before setting off.

**Tides**
- Use tide charts and tables for the area in which you are working.
- Check with locals on tidal conditions and particular local issues
- Take your own notes, observing the times and the height of the tide at which obstacles are covered.
- Monitor environmental conditions – keep an eye on the weather and/or monitor updates on Bureau of Meteorology

**Other references**
http://www.australianexplorer.com/boating/boating_safety.htm

**Chemicals**
- handling
- quantity
- storage conditions
- transport
- carcinogens, genotoxins (mutagens, teratogens)
- sensitizing agents
- flammable substances
- corrosive agents
- irritants
- toxic/harmful substances (poisons)
- cryogenic substances
- smoke and/or fumes

- Safe Work Procedure completed and available
- Hazardous substances Risk Assessment completed and available
- Full MSDS available
- PPE appropriate and available (Specify the PPE needed)
- dangerous goods transport packaging and placarding appropriate and in place
- Emergency Plan in place including safety and rescue equipment

**Cryogenic substances**
- Use specific cryogenic equipment
- “Buddy” system
20. SLIPS, TRIPS, FALLS AND ENTANGLEMENT

SAFEWORK:

Slips and trips result in thousands of injuries every year. The most common injuries to occur are musculoskeletal injuries, bruises, cuts, dislocations and fractures; however more serious injuries also occur. Falls can result from a slip or trip but many also occur during falls from low heights such as falling off an elevated platform, or into a hole or ditch or into a body of water.

Liz:

The potential for slips, trips, falls and entanglement is high in field work activities as there are many uncontrolled hazards. Travelling through the bush by foot presents the risk of tripping on plantation or sticks. Walking from wet surfaces to dry surfaces or on muddy ground presents the risk of slipping. Working on elevated platforms or boats presents the risk of falling. If ropes are left unravelled on the floor of the boat, the risk of entanglement is present. Each risk can be minimised by using preventative measures. For example, wearing the correct footwear while travelling by foot and paying attention to the ground in front of you will decrease the likelihood of you tripping, as you are allowing yourself to be aware and identify potential trip hazards. By rolling up the loose rope in the boat you are preventing entanglement by removing the hazard.

Reference:

21. MANUAL HANDLING

Some field work tasks involve carrying out some type of manual work, e.g. loading and unloaded vehicles, and accidents due to poor manual handling techniques can be common. Manual handling is any activity that requires a person to lift, lower, push, pull, carry or otherwise move, hold or restrain any person, animal or thing and involves one or more of the following: repetitive or sustained force; high or sudden force; repetitive movement; sustained or awkward posture; or exposure to vibration. Training is available from Charles Darwin University’s Workplace Health & Safety department.

These factors can directly stress the body and can lead to injury which occurs suddenly or over time. It is critical that proper procedures are put in place to manage the risks associated with all manual handling and manual tasks.

Some manual tasks are hazardous and may cause musculoskeletal disorders (MSD) – an injury to, or disease of, the musculoskeletal system. MSD’s do not include injury caused by crushing, entrapment (such as fractures and dislocations) or cutting.

You should carry out a risk assessment for any manual tasks that you have identified as being hazardous, unless the risk is well known and you know how to control it. A risk assessment can help you determine which postures, movements and forces of the task pose a risk; at what point during the task they pose a risk; and what control measures are needed to minimise the risk.

The National Code of Practice for Manual Handling has specific recommendations for manual handling based on weight restrictions:

- 4.5 Kg or less - can be done in seated position
- 16-20 Kg – standing position only, depends on load size/weight and strength of individual
- 16-55 Kg – standing position only, use mechanical assistance and/or team lifts
- 55 Kg and above – no person to lift, carry or lower any item unless mechanical aids are provided or team lifting used.

Some things to consider and ideas that may assist in managing risk in relation to manual handling are:

- Assess all tasks before doing them
- Develop and implement a safe plan for any lift
- Store and carry loads at waist height
- Change the object/load size – repackage into smaller lots etc.
- Assess the path of travel and ensure access and egress is obstruction free and easily navigable
- Team lift – get help where possible or necessary
- Use mechanical aids – trolleys, jacks, forklifts, cranes, winch etc.
- Wear appropriate clothing and/or personal protective equipment suited to the task
- Implement appropriate work-rest regimes relative to the physical fitness and general health of worker(s)
- Implement a safe and secure method of transport of items
Other references

- Code of Practice - Hazardous Manual Tasks
- National Code of Practice for Manual Handling
- National Standard for Manual Tasks
- Assessing and Controlling Risks from Manual Tasks
- CDU - Manual Handling Risk Assessment Checklist
22. CUTTING, STABBING & PUNCTURING

The nature of scientific field work often requires the use of implements and tools which are sharp and dangerous. There are also objects in the natural environment which present risks related to cutting, stabbing or puncturing injuries.

Be sure your equipment is in good repair, you have the read and understood the manufacturer’s instructions and are using the recommended safety equipment for each piece of equipment. You must also ensure that you are using the correct tool for the job. Using tools that are oversized or overpowered tools may increase the risk of injury.

Check your site before you start doing any work so you can try to remove any hazards.

Some things to consider and ideas that may assist in managing risk in relation to cutting, stabbing and puncturing are:

- Remove debris or sharp objects from a field site or workspace
- Carefully pack gear and equipment in vehicles to limit the risk of sharp objects contacting participants.
- Substitute or upgrade the risky object/tool for a safer option or model.
- Roping or taping off areas with inherent risks
- Cover sharp edges of items
- Remove or retract all blades when item not in use
- Store tools safely on site - using sheaths and ensuring protective covers are on tools, needles and implements.
- Provide sharps containers for needles, scalpel blades.
- Provision of manuals/instructions for equipment and tools
- Briefings or training in the correct (and safe) use of tools in the field.
- Provision of appropriate Personal Protective Equipment (PPE).
23. RADIATION

There are two types of radiation: ionising and non-ionising radiation. Both can be harmful to organisms and can also result in changes to the environment. In general, ionising radiation is far more harmful to living organisms per unit of energy deposited than non-ionising radiation. This is because the ions produced by ionising radiation have the potential to cause DNA damage.

Solar Radiation

Whilst working outdoors, the most commonly encountered form of radiation is Ultraviolet from the sun. Solar UV radiation is at its greatest intensity between the hours of 10.00 am and 2.00pm, although dangerous levels of UV radiation can still be experienced outside those hours. All persons are at risk of harm from exposure to UV radiation. While certain skin types are associated with an increased risk, it is important that everyone protects their skin from exposure regardless of skin type.

Sun exposure is well established as the major cause of skin cancer in Australia. It is the ultraviolet (UV) radiation component of sunlight which is harmful and the level of UV radiation is not directly related to temperature or brightness of sunlight. This means that harm can still occur on cool or cloudy days during the peak UV periods of the year. In addition to skin cancer, solar UV exposure is a major cause of eye damage. Other factors to consider in relation to solar UV radiation: the effect on individuals who have certain photosensitive medical conditions; the reaction with drugs/treatments prescribed for some medical conditions; the effects of some chemicals and solar UV exposure; the elevated risk to people who have already had a skin cancer diagnosed.

The SunSmart UV Alert can be found on the Bureau of Meteorology website at http://www.bom.gov.au.

Background radiation

Background radiation is the ionizing radiation constantly present in the natural environment of the Earth, which is emitted by natural and artificial sources.

In Australia people receive about 1.5 - 2.0 millisieverts (mSv) of natural background ionising radiation of every year. This is the general Australian level and low exposure to ionising radiation is not harmful.

Notably in the Northern Territory, Kakadu National Park has a higher level of background radiation (2-3 mSv) than the Australian average due to the occurrence of uranium and the associated mining operations there. This varies across the area according to location, however, the levels are not considered excessively high. As a precaution you should not camp on site in this area but in Jabriu as radon gas is heavier than air.

Other radiation sources

The legislation that authorises the sale, acquisition, possession, use, storage, transport and disposal of radioactive materials and radiation apparatus is the Radiation Protection Act and Radiation Protection...
Further information on the application of this legislation is the **Radiation Protection Act - fact sheet**.

Unauthorised use of radiation is not permitted. All persons working with radiation sources must have received appropriate training in relation to the hazard and the radiation work to be conducted must first have a risk assessment performed on it.

Each individual user is responsible for taking reasonably practicable steps to ensure their own safety and personal security when working with radiation including:

- Ensure relevant radiation users have the appropriate licenses or are under the supervision of a licensed user (if allowed).
- Conduct a risk assessment for the work.
- Ensure that the regulator is fully informed of all radiation usage.
- Ensure that appropriate safety devices, equipment, radiation monitoring and surveying devices are available, regularly tested and in good order.
- Maintain all records required by the Act and Regulations to be kept by the registrant.
- Ensure that any conditions imposed on the registration are complied with.
- Evaluate the radiation dose received by any person who is unnecessarily exposed.
- Notify the authority of radiation doses exceeding limits or any unusual or unplanned exposures.
- Ensure all other workers are informed of the use of radioactive materials.

**Other references**

- **ERA 2011 Annual Report;** p.27
24. ELECTRICAL

All sources of electricity are to be considered hazardous and due respect is to be afforded.

Contact of any part of the body with any source of electricity can cause a sufficient current to pass through the skin, muscles, or hair to cause either electrical shock, burns or electrocution.

The most likely sources of electricity encountered on field trips are Mains power – 240V, Batteries – 12 or 24V, Power generation equipment (generators) – 240V and High voltage transmission lines and equipment (>1000 volts AC or 1500 volts DC).

The legislation that governs electrical safety in the NT is the Electricity Reform Act and (Safety and Technical) Regulations.

All persons working with electrical sources must have received appropriate training in relation to the hazard and the work to be conducted must first have a risk assessment performed on it.

Each individual user is responsible for taking reasonably practicable steps to ensure their own safety and that of others when working with electricity including:

- Employ qualified, licensed personnel to carry out any electrical installation or repair. Do not perform any electrical work without a licence.
- Conduct a risk assessment for the work or equipment being used.
- Ensure that appropriate safety devices, equipment, monitoring devices are available, regularly tested and in good order. Ensure frayed or damaged cords are repaired or replaced.
- Ensure testing and tagging of items is conducted as per schedules in current Australian Standard.
- Ensure operating instructions are read and understood before using any electrical device.
- Notify the OAL of any issues related to unusual or unplanned electrical contact.
- Ensure all other workers are informed of the use of electrical devices/equipment.
- Put all electrical cords out of trafficked areas – do not put them across walkways, corridors etc.
- Eliminate overloaded outlets/circuits.
- Never use metal ladders for electrical work – use timber or plastic type without exposed metal reinforcement wires.
- Never use wet equipment or touch equipment or wires with wet hands or feet. Do not stand on a damp floor or wet grass when operating power tools.
- Always disconnect an appliance by pulling the plug, not by tugging the cord.
- Turn off direct power supply before replacing burnt-out bulbs.
- Always use extension cords that are properly rated for the load and never break off or bypass the grounding prong on a three-pronged plug.
- Don’t work or stand near electrical structures such as power poles, substations, meters, transformers or guy wires unless absolutely necessary.
- Never prune or cut down a tree near a power line.
- Obey all safety signs and warnings.
- If you see a fallen power line, do not approach the area and call the electric company. Warn others of the danger and to stay away.
- DIAL BEFORE YOU DIG – Call 1100. You could hit a buried cable, conduit or gas pipeline and run the risk of loss of life or damage to property.
- Always unplug power tools when they are not in use or when changing an attachment on them.
- Turn off all appliances and lights on the circuit before changing a fuse. Replace the blown fuse with one of the correct rating - never with a higher one.

Other references
- Electricity Reform Act and (Safety and Technical) Regulations
- NT Work Safe - Bulletins - Electrical
- Australian Standard - AS/NZS 3760:2010
25. CHEMICALS

Chemical use in the field can be in many ways; preservative solutions (e.g. ethanol for sample collection), fuel sources (petrol, diesel, LPG); pesticides/herbicides; reagents for testing or calibration of equipment, cleaning (acetone, acids, cleaning products etc), cryogens (for samples), gas provision (air, acetylene, CO₂ etc).

Any use of chemicals requires a Safe Work Procedure and where applicable a Hazardous Substance Risk Assessment to be completed before any transport or use of those products.

Full Material Safety Data Sheets (MSDS) are required to be available at all times where the use or transport is occurring.

It can sometimes be just as risky to transport a chemical as it is to use it.

All the details about a chemical are to be found on the MSDS and all the information within that document must be followed.

When dealing with chemicals in the field preventive steps should aim to reduce chemical transport and usage as much as is practicable, and to develop working practices which will not give rise to more serious problems as a result of that usage.

Some chemicals pose a very real risk of causing or resulting in a fatality if not considered and managed appropriately. The risk can originate from many sources and cause considerable damage to life, property and the environment.

Transport of dangerous goods

Dangerous Goods are regulated for transport and the rules must be abided by.

The Australian Dangerous Goods Code defines the rules for transport of chemicals and these must be followed at all times. It is not only you and the rest of your field party who will benefit, but the rest of the road users and the environment in the case of accidents.

Placarding is an important part of transporting chemicals and in some cases is not required. It is usually dependant on the volume or type of chemical you’re transporting so it is important to check the Code.

Restrictions

Some chemicals cannot be taken into certain areas or transported through them at all. It is vital you know where these areas are and what is excluded.
For example, there are alcohol restrictions in place across the Northern Territory and as such all and any form of alcohol is not permitted in the prescribed exclusion areas. In effect this is generally thought of as the alcohol you consume (beer, wine, spirits) but in actual fact includes any substance that is an alcohol (e.g. ethanol, methanol, propanol etc).

There are also restrictions on aromatic fuels in some communities.


Some things to consider and ideas that may assist in managing risk in relation to chemicals are:

- Complete a Safe Work Procedure and Hazardous Substance Risk Assessment (where applicable)
- Limit the carriage and/or use of chemicals
- No chemical should be in the passenger compartment of the vehicle
- Where possible reduce the volume of chemicals taken or used
- Work with at least one other person
- Wear appropriate clothing for the task or personal protective equipment suited to the task
- Monitor experiments
- Be aware of current restrictions
- Always use approved disposal/waste management practices
- Ensure adequate ventilation or fume extraction is provided where necessary
- Do not carry fuels inside vehicles
- Do not carry compressed gases or cryogenic liquids in the passenger compartment of the vehicle
- Do not eat drink or smoke around chemicals or chemical processes
- Do not carry chemicals in food containers

Other references

26. NOISE

Hazardous noise can diminish the ability to hear clearly and also make it increasingly difficult to hear sounds essential for working safely, such as instructions or warning signals. The degree of hearing loss that occurs is dependent on how loud the noise is, and for how long someone is exposed to it. There is also the factor of individual susceptibility. The frequency or pitch may also have an effect on hearing loss. Permanent hearing loss can occur suddenly if a person is exposed to very loud impact or explosive sounds.

Hearing loss can be caused by field activities if incorrect protective gear is worn such as long hours on an airboat or shooting a firearm. These activities produce either constant noise or an explosive sound. Both can cause hearing loss if preventative measures are not put into place. Ear muffs are to be worn when both operating an airboat or as a passenger on an airboat, and shooting a firearm. They are also suggested to be worn when operating an All-Terrain Vehicle (ATV).

Reference:
27. CRUSHING, STRUCK BY & STRIKING AGAINST

This category covers a wide range of circumstances and possibilities that may be encountered in the field with relation to crushing and striking injuries. Risk of a crushing or striking injury is present whenever any object is moving, being moved, has the potential to move and extends to forces generated by participants themselves as they move around in the field (see also Section 13 - Vehicles, Plant and Machinery)

The danger may be from a variety of sources including, but not limited to, falling tree branches, rock falls, vehicles, boats and machinery. It can also come from lightning strikes, tunnel or trench collapse or objects falling from height.

Some things to consider and ideas that may assist in managing risk in relation to crushing and striking are:

- Removing objects from height
- Store and transport equipment safely – use restraints or tie-downs
- Substitute heavy objects or equipment for lighter models or types.
- Fencing off or roping off the object or risky area
- Increase the salience (visibility) of dangerous objects by flagging or brightly colouring
- Ensure adequate lighting/visibility
- Ensure adequate access and egress
- Safety and induction briefings to the field site including those for other sites such as (e.g. mine sites)
- Installation of signage
- Provision and use of appropriate Personal Protective Equipment (PPE)
- Never work in the field during electrical storms
- Never stand between vehicles
- Stay well clear of the path of vehicles
- Wear hi-visibility clothing so you can be seen by all
28. FIREARMS AND WEAPONS

Firearms and weapons take many forms and can range from guns and rifles (including spear guns and dart guns), knives or indigenous weapons such as spears, boomerangs and nulla nullas.

Firearms

The use of firearms is restricted to essential use only and then only to a very few activities.

RIEL has firearms of different types for safety reasons. These are available to licensed and trained researchers only who have a valid reason for carrying them in the field. Users must hold a current Firearms Employee License.

Requests for the use of firearms on field trips should be directed to Clive McMahon as the RIEL firearms licence holder responsible for the firearms held by RIEL.

Weapons

The use of any weapon is discouraged unless deemed fundamental to the outcome of the field exercise. Knives and other sharp-bladed instruments are to be used to perform the task they are designed for, so unless you need it for a specific purpose, leave it at home.

The use of indigenous weaponry is limited to ceremonial or display purposes only. Exceptions can only be granted by the PVC – Faculty of EHSE.

Some things to consider and ideas that may assist in managing risk in relation to firearms and weapons are:

- Licence holders and authorised users only
- Wear appropriate clothing and/or personal protective equipment suited to the task
- Ensure all permits are possessed and available for inspections by authorities
- Safe and secure storage of firearms/weapons and ammunition
- Implement a safe and secure method of transport of items
- Ensure pre-use condition checks if all items are made
- Develop a site specific emergency plan for situations such as accidental shootings
- Consider using an external provider to perform any firearms or weapons use instead of you doing it

Other references


Firearms Act Northern Territory Sept 2011

Firearms Regulations Northern Territory Nov 2007

29. ANIMAL HAZARDS – INDIRECT AND DIRECT CONTACT

Remember that there will be little likelihood of medical help immediately and your preparation is your only protection.

Undertaking fieldwork involves encounters with animals in one form or another and contact may be unintentional or intentional (trapping, handling). Contact may involve predatory and non-predatory species and harm may result from that contact.

There are usually animal hazards wherever the university conducts its field work. There are animals from most classes including insects (mosquitoes, spiders etc.), reptiles (crocodiles, snakes etc.), birds, feral species (pigs, camels etc.), marine species (sharks, jellyfish etc.), domestic (cats, dogs etc.), and livestock (farm stock).

First Aid or medical treatment

A suitably stocked first aid kit must be taken on all trips. A trained first aid person is to be nominated for all trips and this person should be the one to apply first aid in all instances, unless they are the patient.

Unintentional contact:

Unintentional contact is when you encounter an animal that you may not have been aware is in the location. It can be direct or indirect contact. Examples of direct unintentional contact are bites, stings, hitting with vehicles. Indirect contact is a sighting of the animal or evidence of recent presence (tracks, scat, nest etc.).

When entering the natural environment you must follow the instructions and advice of your Onsite Activity Leader. Report any sightings or encounters immediately and clearly without creating a further hazard (e.g. Do not shout as that may alarm the animal and they may defensively attack).

Injuries may result either from predatory attack, e.g. crocodiles, sharks and box-jellyfish, or from defensive attacks e.g. snakes, wasps. You must always be aware of your surroundings, be alert and watch where you are walking, stepping, swimming or climbing.

To protect against unintentional contact, all persons working in the field need to be aware of their environment and take precautions. These include:

- Do not enter any natural water body, especially in estuarine areas, as there is never any certainty predatory animal (e.g. crocodiles, sharks etc) are not present. Stay well clear of the waters edge and observe all warning signage
- Ask locals for information and advice
- Always wear appropriate clothing including thick, hard soled footwear and long clothing. Stinger suits where appropriate
- Apply good quality insect repellent
- Conducting daily checks on your clothing and skin to check for and remove ticks.
- Never place your hands in dark holes or crevices – use a stick or pole to probe the space.
- Keep arms and legs inside vehicles and boats
- If you see evidence of animals advise the Onsite Activity Leader and/or others in the party as soon as possible.
- Do not unnecessarily agitate animal(s) – e.g. do not shout, throw rocks, hit with sticks, lure with bait.
- The best thing to do is assume all snakes are venomous and leave them alone. When collecting wood, wear gloves, and never put your hand under anything without rolling it over with your boot.
- If you have been bitten by a snake, do not panic and avoid unnecessary movement. Immediately apply a Pressure Immobilisation Bandage.

If you think that you have been stung, cut or bitten by an animal, advise the Onsite Activity Leader immediately and they will ensure that appropriate first aid treatment is supplied or medical assistance sought.

**Intentional contact: including collection of animals for study**

Intentional contact with animals for the purposes of study can be dangerous. The tools you need to collect specimens must be “fit for purpose” (ie. suited to the work) and operationally reliable in order to control the risks.

Animals can be unpredictable and aggressive and all precautions taken. Traps, cages ropes and wires must be inspected to ensure integrity and correct operation.

Strategies must be worked out for appropriate handling, transport and release of animals. Control measures appropriate to the activity must be employed to control any risks identified (e.g. Wearing PPE; wearing different clothing and footwear at each activity site and washing/disinfecting clothing/footwear between sites; cleaning mist nets, traps, cages, and other equipment of faecal material, blood, or other matter between animals and/or sites).

**Allergens/allergic reactions**

Persons with a history of severe allergic responses may react severely and adversely to stings or bites from animals. If you have a known allergy or have previously reacted violently to a sting or bite then advise the Onsite Activity Leader so that appropriate precautions may be taken to minimise the risk or deal with it.

**Disease, zoonoses and infections**

People doing fieldwork in the northern parts of Australia and South East Asia face different pathological and microbiological hazards to a lot of other areas in the world.
There are many diseases and pathogens that affect humans. A zoonosis is any infectious disease that can be transmitted between species (in some instances, by a vector) from animals to humans or from humans to animals. The effect of these infections can range from mildly debilitating to fatal.

You can be infected either through direct contact with the animal (bites, stings, scratches, body fluids etc.), a vector (a carrier of the infection – e.g. mosquito) or via contact with water, soil or vegetation contaminated with animal body fluids or excreted material.

Further information on the more prevalent zoonotic diseases and controls for those diseases can be sourced:
- Northern Territory
- Australia and International destinations

Other infections can be caused by the failure to remove animal spines, stingers, barbs etc. from the body which can lead to severe bacterial infections. Some animal bites can cause infection at the bite site with no other adverse effects (e.g. no pain, but infected wound results).

It is vital to treat any injury suffered as a result of contact with any animal as per current prescribed First Aid practices or seek professional medical advice or treatment.
30. SALTWATER CROCODILES (CROCODYLUS POROSUS)

1.1. Background
Saltwater crocodiles can be found in virtually any tidal, non-tidal, and floodplain habitat within 200km of the coast, particularly during the wet season in areas of inundation. They are equally comfortably in freshwater and saltwater. They regularly move around the coast usually within 100m of the shore, and can consequently be found in any fringing coastal habitat.

Extreme caution should be used when working in potential crocodile habitat.

- All saltwater crocodiles are potentially dangerous.
- It must be assumed that any body of water in northern Australia may contain large and potentially dangerous estuarine crocodiles. This includes small, muddy pools particularly during or shortly after the wet season.
- Although crocodiles are most active at night, they may also be active by day.
- Saltwater crocodiles can be more aggressive during the breeding season, from September to April. Statistically, attacks on humans are greatest during these months.
- Female crocodiles can be particularly aggressive when defending their nests and young hatchlings. Nesting generally occurs during the wet season and incubation can take around 90 days.
- Saltwater crocodiles can camouflage themselves well in lagoons, swamps and waterways and every care must be taken when travelling in these areas, especially when walking in tall grass. They can be completely invisible submerged in less than a foot of water.

1.1.1. Common signs that can indicate crocodile activity

- Visual sighting of crocodile
- Slide marks and tracks where crocodiles have been coming in and out of the water to bask in the sun
- Crocodile scat associated with slide marks (a white, bird-like scat with more solid excreta).
- Dead animals/carcasses, or parts of, could indicate a crocodile has been recently feeding. Crocodiles could congregate and become aggressive around these food sources.
- Crocodiles moving underwater often disturb gases trapped in sediment and create a small trail of bubbles that may give away their movement

1.1.2. Some known aggressive behaviour of crocodiles
Larger males can become aggressive – particularly during the breeding season. If aggressive behaviour is directed at you leave the area immediately. Some signs to look for include

- Approaches you and your activities
- Crocodile puffs up and displays its size – lifting tail to show length (usually done in water and accompanied by a loud hissing)
- Blows large amounts of bubbles
- Growling
- Jaw claps (forcefully "biting" the water producing a sound like a car door being slammed, followed by hissing)

1.2. Working in or around crocodile habitats
Treat all waterways, billabongs and pools as if they are inhabited by crocodiles – keep out of the water and obey crocodile warning signs if present.

Carry out visual inspection of the area you intend to work in looking for signs of crocodiles and recent activity. Whenever possible get advice from community rangers and trusted locals on the presence of crocodile and any known problem crocodiles in the area.

Stay well back from any signs of crocodile activity as they may still be close by and may approach people, boats or vehicles. Leave the area if aggressive crocodile behaviour is displayed.

Never provoke, harass or interfere with crocodiles, even small ones. Never knowingly approach a crocodile.

When working in crocodile habitats, always work in groups of at least two, with one person who has work experience in crocodile habitats as a dedicated observer. Everyone MUST carry some form of communications equipment and know how to use it. Working at night requires additional care. If you must work at night, ensure you are wearing a head spotlight and have at least one person check for the presence of crocodile eyeshine or other signs of crocodile frequently.

If confronted by an aggressive crocodile:

- Most scenarios can be resolved by leaving the area immediately taking due care in doing so. Crocodiles do not give chase over long distances, and moving out of the immediate area at a brisk walk or jog is usually sufficient to end the encounter.
- If in imminent danger of attack, retreat quickly, get to higher ground if possible, climb a tree in emergencies or retreat to a safe location (e.g. vehicle).
- If you become trapped in a dangerous situation, crocodiles can usually be dissuaded with repeated blows to the head with a heavy pole or branch.
- Raise the alarm and identify location of crocodile to others.
- Ensure all team members are accounted for and uninjured.
- Use communications to inform others.

Ensure you have the necessary resources to carry out fieldwork in estuarine crocodile habitats.

- One dedicated, experienced observer per group
- Satellite phone and EPIRB
- Head spotlight / boat spotlight (if working at night)
- Net poles
- First aid field kit
- Appropriate foot wear
- Firearms should only be considered in exceptional scenarios, and then should only be used in dire emergency and by suitably trained and licensed personnel in line with CDU’s Firearm Policy, with prior approval of the Head of School and PVC.

1.2.1. Land based activities around crocodile habitats

Crocodiles do venture onto land and can be found in moist areas, like wallows and muddy puddles well away from permanent water.

Be careful when walking through long grass near waterways, especially floodplains and during the breeding season. If signs of crocodiles are discovered, or sounds of disturbance in the undergrowth are heard, leave the area immediately.
Minimum safety distance from a crocodile is at least 25 metres, noting that a large crocodile can launch itself from water at speeds up to 40km/hr.

Vehicles must never be at a stop within 10 metres of a crocodile. Where ever possible park vehicles at least 10 meters from the water’s edge and in a clear area to avoid surprises. Always check for the presence of crocodiles before alighting.

If camping, pitch your tent at least 100 metres from any water or high tide line. In coastal areas, a security fence is recommended within 200m of any beach.

- Do not leave discarded rubbish or food scraps, including fish, around your camp site.
- Do not prepare food, wash dishes or pursue any other activities near the water’s edge or adjacent sloping banks.
- Do not collect water from the same location every day. Always try to obtain water from shallow flowing water sites. Attach a rope to a bucket to collect water from deeper water if no shallow areas available.
- If fishing, stand at least a few metres back from the water's edge and do not stand on logs, branches or rocks that overhang deep pools.

1.2.2. Water based activities in crocodile habitats

Before approaching any waterway conduct an initial assessment for signs of crocodiles. If the signs indicate dangerous conditions (concentration of crocodiles around carcasses) or aggressive crocodile behaviour is observed then do not approach the water’s edge.

Only approach the water’s edge, or enter shallows (no more than 30cm, or up to 60cm with clear and wide visibility), if there is currently no sign of a saltwater crocodile nearby, and water depth and clarity enable clear visibility to ensure crocodiles are there is no crocodile activity nearby to your location. Always have a designated crocodile spotter present to ensure crocodiles do not approach.

In water with reduced visibility (deep or turbid) keep hands and limbs out of the water at all times. Use a pole when collecting water samples or retrieving nets and equipment.

When launching and retrieving boats minimise entry into the water and minimise the time spent in or near the water. Boats must never be brought intentionally within 10 metres of a crocodile. Boats must be a minimum of 3 metres in length. If crocodiles display aggressive behaviour towards you whilst in a boat, leave the area immediately.

Only cross rivers at shallow water sites or rocky areas in the narrowest section. Do not cross the river if the water depth and clarity limit visibility. If shallow water with limited visibility must be approached or crossed for any reason, check the area thoroughly first with a long pole.

Never ride an all-terrain vehicle (ATV) through flood water greater than 30cm. Never swim through any water in the area.

1.3. Working requirements not covered by this procedure

Any works to be completed that do not comply with the procedures outlined above need to be covered in your risk assessment and approved by the Pro Vice Chancellor

1.4 References

http://www.epa.qld.gov.au/parks_and_forests/great_walks/wet_tropics/walk_safely_and_softly/
# APPENDIX 1: EHSE FIELD WORK CONTACTS

## EMERGENCY SERVICES
000 or 112 (mobile phone only)
(Police, Fire or Ambulance)

## EHSE EMERGENCY CONTACTS

<table>
<thead>
<tr>
<th>Area</th>
<th>Contact person</th>
<th>From satellite phone</th>
<th>From landline/mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>RIEL</td>
<td>Business Manager or delegate</td>
<td>0061 8 8946 6574</td>
<td>8946 6574</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0061 447 030 329</td>
<td>0447 030 329</td>
</tr>
<tr>
<td>SPCS</td>
<td>Senior Technical Officer</td>
<td>0061 8 8946 6787</td>
<td>8946 6787</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0061 439 817 245</td>
<td>0439 817 245</td>
</tr>
<tr>
<td>Health</td>
<td>Executive Assistant to Head of School</td>
<td>0061 8 8946 6443</td>
<td>8946 6443</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0061 409 703 005</td>
<td>0409 703 005</td>
</tr>
<tr>
<td>Engineering &amp; IT</td>
<td>Senior Technical Officer</td>
<td>0061 8 8946 6373</td>
<td>8946 6373</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0061 407 425 387</td>
<td>0407 425 387</td>
</tr>
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</table>

## CHARLES DARWIN UNIVERSITY CONTACTS

<table>
<thead>
<tr>
<th>Area</th>
<th>From satellite phone</th>
<th>From landline/mobile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security – Casuarina</td>
<td>0061 8 8946 7777</td>
<td>1800 646 501</td>
</tr>
<tr>
<td>Facilities &amp; Asset Services (FAS)</td>
<td>0061 8 8946 6500</td>
<td></td>
</tr>
<tr>
<td>Health, Safety &amp; Environment (HSE)</td>
<td>0061 8 8946 6473</td>
<td>8946 6473</td>
</tr>
<tr>
<td></td>
<td>0061 8 8946 6904</td>
<td>8946 6904</td>
</tr>
<tr>
<td>CDU Switchboard (8:00-16:30pm)</td>
<td>0061 8 8946 6666</td>
<td>8946 6666</td>
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## EHSE SATELLITE PHONES

<table>
<thead>
<tr>
<th>Telephone ID</th>
<th>From landline/mobile</th>
<th>From another satellite phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>#3 – RIEL</td>
<td>0011 8816 3143 0911</td>
<td>00 8816 3143 0911</td>
</tr>
<tr>
<td>#5 – RIEL</td>
<td>0011 8816 2248 9252</td>
<td>00 8816 2248 9252</td>
</tr>
<tr>
<td>#6 – RIEL</td>
<td>0011 8816 3143 0846</td>
<td>00 8816 3143 0846</td>
</tr>
<tr>
<td>#7 – RIEL</td>
<td>0011 8816 2141 3516</td>
<td>00 8816 2141 3516</td>
</tr>
<tr>
<td>A – SPCS</td>
<td>0011 8816 3145 1437</td>
<td>00 8816 3145 1437</td>
</tr>
<tr>
<td>LETTER</td>
<td>SPCS</td>
<td>PHONE NUMBER 1</td>
</tr>
<tr>
<td>--------</td>
<td>------</td>
<td>---------------</td>
</tr>
<tr>
<td>B – SPCS</td>
<td>0011 8816 3145 1392</td>
<td>00 8816 3145 1392</td>
</tr>
<tr>
<td>C – SPCS</td>
<td>0011 8816 3145 1391</td>
<td>00 8816 3145 1391</td>
</tr>
<tr>
<td>D – SPCS</td>
<td>0147 156 625</td>
<td>0147 156 625</td>
</tr>
<tr>
<td>E – SPCS</td>
<td>0147 162 419</td>
<td>0147 162 419</td>
</tr>
<tr>
<td>F – SPCS</td>
<td>0147 148 227</td>
<td>0147 148 227</td>
</tr>
</tbody>
</table>

**OTHER USEFUL NUMBERS**

<table>
<thead>
<tr>
<th>Service</th>
<th>Phone number</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT Police – 24hr assistance</td>
<td>131 444</td>
</tr>
<tr>
<td>Bushfires NT</td>
<td>8922 0844 Darwin</td>
</tr>
<tr>
<td></td>
<td>8922 0829 Arnhem</td>
</tr>
<tr>
<td></td>
<td>8973 8871 Katherine</td>
</tr>
<tr>
<td></td>
<td>8973 8870 Victoria River District</td>
</tr>
<tr>
<td></td>
<td>8952 3066 Alice Springs</td>
</tr>
<tr>
<td></td>
<td>8962 4577 Tennant Ck / Barkly</td>
</tr>
<tr>
<td>Crocodile call out</td>
<td>0419 822 859 Darwin</td>
</tr>
<tr>
<td></td>
<td>0407 958 405 Katherine</td>
</tr>
<tr>
<td>Cyclone information</td>
<td>0419 659 211</td>
</tr>
<tr>
<td>Centre for Disease Control</td>
<td>1800 008 002</td>
</tr>
<tr>
<td>Hospitals – general contact</td>
<td>8922 8888 Darwin – RDH</td>
</tr>
<tr>
<td></td>
<td>8973 9211 Katherine</td>
</tr>
<tr>
<td></td>
<td>8951 7777 Alice Springs</td>
</tr>
<tr>
<td></td>
<td>8987 0211 Gove</td>
</tr>
<tr>
<td></td>
<td>8962 4399 Tennant Creek</td>
</tr>
<tr>
<td>Marina Safety</td>
<td>8924 7100</td>
</tr>
<tr>
<td>NT Government Switchboard</td>
<td>8999 5511</td>
</tr>
<tr>
<td>NT WorkSafe</td>
<td>1800 019 115</td>
</tr>
<tr>
<td>Poisons Information</td>
<td>131 126</td>
</tr>
<tr>
<td>Power Water Corporation</td>
<td>1800 245 092</td>
</tr>
<tr>
<td>Road Conditions NT (24hr)</td>
<td>1800 246 199</td>
</tr>
<tr>
<td>Snake call out</td>
<td>1800 453 210 Darwin</td>
</tr>
<tr>
<td></td>
<td>0407 983 276 Alice Springs</td>
</tr>
<tr>
<td></td>
<td>0407 934 252 Katherine</td>
</tr>
<tr>
<td>Wildlife Rescue</td>
<td>0409 090 840 Darwin</td>
</tr>
<tr>
<td></td>
<td>0419 221 128 Alice Springs</td>
</tr>
<tr>
<td></td>
<td>0412 955 336 Katherine</td>
</tr>
<tr>
<td></td>
<td>8962 4599 Tennant Creek</td>
</tr>
</tbody>
</table>
This list is provided to assist in the identification of possible hazards and controls for field work. It is for reference purposes only and is **not to be submitted**. Because of the diverse nature of activities at Charles Darwin University, this document is not intended to be comprehensive or exhaustive. You are expected to address all hazards and controls for your work on a case-by-case basis.

### APPENDIX 2: HAZARD CATEGORIES AND EXAMPLES CHECKLIST

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>Possible hazards and associated risks</th>
<th>Control measures that may apply</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Field Work party</strong></td>
<td>size</td>
<td>limit numbers</td>
</tr>
<tr>
<td></td>
<td>composition</td>
<td>supervision ratio</td>
</tr>
<tr>
<td></td>
<td>novice/experienced</td>
<td>training</td>
</tr>
<tr>
<td></td>
<td>fitness</td>
<td>briefings</td>
</tr>
<tr>
<td></td>
<td>medical conditions</td>
<td>mentor system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“buddy” system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pre-commencement “fitness”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“wellness” check</td>
</tr>
<tr>
<td><strong>Travel</strong></td>
<td>route location</td>
<td>Plan your trip</td>
</tr>
<tr>
<td></td>
<td>location and distance</td>
<td>Maps</td>
</tr>
<tr>
<td></td>
<td>time to get there/return</td>
<td>Mark your trail</td>
</tr>
<tr>
<td></td>
<td>lost</td>
<td>leave a note with the vehicle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>use a local guide</td>
</tr>
<tr>
<td><strong>Overseas</strong></td>
<td>cultural considerations</td>
<td>Check local customs and cultural etiquette</td>
</tr>
<tr>
<td></td>
<td>disease</td>
<td>Register on SmartTraveller</td>
</tr>
<tr>
<td></td>
<td>political climate</td>
<td>get vaccinations</td>
</tr>
<tr>
<td></td>
<td>personal security and safety</td>
<td>get permissions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>read and abide by CDU Code of Conduct</td>
</tr>
<tr>
<td></td>
<td></td>
<td>check use/carriage rules for alcohol and other drugs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maintain high level of vigilance and security</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Buddy” system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do not travel or work alone</td>
</tr>
<tr>
<td><strong>Urban survey</strong></td>
<td>Location and distance</td>
<td>Be alert at all times. If you feel unsafe, head for a well-populated area.</td>
</tr>
<tr>
<td></td>
<td>Lost</td>
<td>Where possible work with at least one other person.</td>
</tr>
<tr>
<td></td>
<td>Local cultural etiquette</td>
<td>Walk confidently and keep to well-lit and populated areas.</td>
</tr>
<tr>
<td></td>
<td>General behaviour</td>
<td>Organise a central meeting or rally point for groups to gather at the end of the activity and/or in case of emergency.</td>
</tr>
<tr>
<td></td>
<td>Permission to enter</td>
<td>Leave any area safely if there is any form of violence or civil unrest underway or there is an imminent possibility of that threat.</td>
</tr>
<tr>
<td></td>
<td>Personal security and safety</td>
<td>Do not enter any property unless permitted by the owner.</td>
</tr>
<tr>
<td></td>
<td>Harassment, assault</td>
<td>Do not enter a private residence unless all the occupants are well known to you</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>Walk against the flow of traffic</td>
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<tr>
<td></td>
<td></td>
<td>Be wary if someone in a car stops and asks you for directions and keep a safe distance from the car.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check timetables to limit waiting periods at public transport stops.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Report any suspicious, offensive or illegal behaviour immediately to the police.</td>
</tr>
<tr>
<td><strong>Vehicles, plant and machinery</strong></td>
<td>Four wheel drive</td>
<td>Licenced or appropriately trained operator</td>
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<tr>
<td></td>
<td>Boat</td>
<td>pre-use condition check</td>
</tr>
<tr>
<td></td>
<td>quad bike/ ATV</td>
<td>take regular breaks to avoid fatigue (20 minutes every hour)</td>
</tr>
<tr>
<td></td>
<td>trailer</td>
<td>drive no more than 8 hours per day during</td>
</tr>
<tr>
<td>CATEGORY</td>
<td>Possible hazards and associated risks</td>
<td>Control measures that may apply</td>
</tr>
<tr>
<td>----------</td>
<td>--------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td></td>
<td>□ bus and heavy vehicle</td>
<td>daylight hours when possible</td>
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<tr>
<td></td>
<td>□ scientific equipment</td>
<td>□ any other general control</td>
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<tr>
<td></td>
<td>□ motorised equipment</td>
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<tr>
<td></td>
<td>□ equipment in motion</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal etiquette and behaviour</td>
<td>□ local cultural etiquette</td>
<td>□ Check local customs and cultural etiquette</td>
</tr>
<tr>
<td></td>
<td>□ general behaviour</td>
<td>□ get permissions</td>
</tr>
<tr>
<td></td>
<td>□ permission to enter - private property, sacred areas, government land</td>
<td>□ read and abide by CDU Code of Conduct</td>
</tr>
<tr>
<td></td>
<td>□ use/carryage of alcohol and other drugs</td>
<td>□ check use/carryage rules for alcohol and other drugs</td>
</tr>
<tr>
<td></td>
<td>□ personal security and safety</td>
<td>□ Maintain high level of vigilance and security</td>
</tr>
<tr>
<td></td>
<td>- theft, harassment, assault and hostile persons</td>
<td>□ &quot;Buddy&quot; system</td>
</tr>
<tr>
<td></td>
<td>□ privacy</td>
<td>□ Do not travel or work alone</td>
</tr>
<tr>
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</tr>
<tr>
<td>Health and Hygiene</td>
<td>□ personal – toileting, showering etc.</td>
<td>□ personal hygiene products – soap, toothpaste, deodorant, toilet paper</td>
</tr>
<tr>
<td></td>
<td>□ food storage and preparation</td>
<td>□ food storage containers, eskies, and prep items (chopping boards etc.)</td>
</tr>
<tr>
<td></td>
<td>□ access to potable water</td>
<td>□ arrange access to facilities</td>
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<tr>
<td></td>
<td>□ utensils – cleaning and storage</td>
<td>□ rubbish removal procedure</td>
</tr>
<tr>
<td></td>
<td>□ rubbish removal</td>
<td>□ lockable case for medications storage</td>
</tr>
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<td></td>
<td>□ medications – storage/security</td>
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<tr>
<td></td>
<td>□ stress – thermal (hot or cold), mental, physical</td>
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<tr>
<td></td>
<td>□ allergies – food, animal, chemical etc.</td>
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</tr>
<tr>
<td></td>
<td>□ personal security and safety</td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td>Weather</td>
<td>□ weather forecasts</td>
<td>□ Check and consistently update yourself with environmental and weather conditions</td>
</tr>
<tr>
<td></td>
<td>□ severe weather (storms)</td>
<td>□ develop plan for adverse environmental and weather events</td>
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<tr>
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<td>□ cyclone and warnings</td>
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<td></td>
<td>□ floods and warnings</td>
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<tr>
<td>Temperature</td>
<td>□ heat stress</td>
<td>□ be aware of fire restrictions</td>
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<tr>
<td></td>
<td>□ sunburn</td>
<td>□ Use dedicated cooking spaces and equipment if possible</td>
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<tr>
<td></td>
<td>□ cold stress</td>
<td>□ ventilation and extraction</td>
</tr>
<tr>
<td></td>
<td>□ fire including bushfires</td>
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</tr>
<tr>
<td></td>
<td>□ cooking - oils/fats, hot water</td>
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</tr>
<tr>
<td>Heat Stress/sunburn</td>
<td>□ Clothing – long sleeve shirt, long pants, wide brimmed hat</td>
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<td></td>
<td>□ Sunscreen (SPF 30 minimum)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Sunglasses</td>
<td></td>
</tr>
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<td></td>
<td>□ Work outside of middle of day (avoid 11am – 2pm)</td>
<td></td>
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<tr>
<td></td>
<td>□ Hydration plan</td>
<td></td>
</tr>
<tr>
<td>CATEGORY</td>
<td>Possible hazards and associated risks</td>
<td>Control measures that may apply</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Water or Immersion in</strong></td>
<td>□ boating</td>
<td>□ Licenced or appropriately trained vehicle operator</td>
</tr>
<tr>
<td></td>
<td>□ swimming and diving</td>
<td>□ use defined paths and roads</td>
</tr>
<tr>
<td></td>
<td>□ collecting in water</td>
<td>□ wear solid footwear with non-slip soles</td>
</tr>
<tr>
<td></td>
<td>□ travelling near water</td>
<td>□ traverse with caution</td>
</tr>
<tr>
<td></td>
<td>□ camping near water</td>
<td>□ check environmental and weather conditions</td>
</tr>
<tr>
<td></td>
<td>□ inundation and flooding</td>
<td>□ check tide times and heights</td>
</tr>
<tr>
<td></td>
<td>□ tides</td>
<td>□ check river crossing details</td>
</tr>
<tr>
<td></td>
<td>□ rivers and crossings</td>
<td>□ divert around risk areas where possible</td>
</tr>
<tr>
<td></td>
<td>□ licensed or appropriately trained vehicle operator</td>
<td>□ Dive Plan completed and lodged with Dive Officer and available</td>
</tr>
<tr>
<td><strong>Slips, trips, falls and entanglement</strong></td>
<td>□ ropes and wires</td>
<td>□ flag on ropes and wires</td>
</tr>
<tr>
<td></td>
<td>□ terrain – uneven, wet, muddy, loose surface, undefined paths</td>
<td>□ use defined paths</td>
</tr>
<tr>
<td></td>
<td>□ working at height – ladders, climbing trees/towers</td>
<td>□ wear solid footwear with non-slip soles</td>
</tr>
<tr>
<td></td>
<td>□ plant and equipment</td>
<td>□ traverse slowly</td>
</tr>
<tr>
<td></td>
<td>□ clothing</td>
<td>□ working at height – ladders tied off, climbing harness</td>
</tr>
<tr>
<td></td>
<td>□ thorny bush, vines, grass</td>
<td>□ secure loose clothing</td>
</tr>
<tr>
<td></td>
<td>□ flag on ropes and wires</td>
<td>□ divert around risk areas where possible</td>
</tr>
<tr>
<td></td>
<td>□ use defined paths</td>
<td>□ use mechanical device</td>
</tr>
<tr>
<td></td>
<td>□ wear solid footwear with non-slip soles</td>
<td>□ team lift</td>
</tr>
<tr>
<td></td>
<td>□ traverse slowly</td>
<td>□ Warm up</td>
</tr>
<tr>
<td></td>
<td>□ working at height – ladders tied off, climbing harness</td>
<td>□ manual handling risk assessment</td>
</tr>
<tr>
<td><strong>Manual handling</strong></td>
<td>□ lifting</td>
<td>□ use mechanical device</td>
</tr>
<tr>
<td></td>
<td>□ large load</td>
<td>□ team lift</td>
</tr>
<tr>
<td></td>
<td>□ heavy load</td>
<td>□ Warm up</td>
</tr>
<tr>
<td></td>
<td>□ pushing</td>
<td>□ manual handling risk assessment</td>
</tr>
<tr>
<td></td>
<td>□ pulling</td>
<td>□ use mechanical device</td>
</tr>
<tr>
<td></td>
<td>□ repetitive movement</td>
<td>□ team lift</td>
</tr>
<tr>
<td><strong>Cutting, stabbing, puncturing</strong></td>
<td>□ blades, knives, scalpels</td>
<td>□ Licenced or appropriately trained operator</td>
</tr>
<tr>
<td></td>
<td>□ sharpened tools</td>
<td>□ abatement through physical means (guards, knife block, sheath)</td>
</tr>
<tr>
<td></td>
<td>□ equipment – sharp edges/points</td>
<td>□ sharps containment and disposal strategy</td>
</tr>
<tr>
<td></td>
<td>□ sharps – needles, pins</td>
<td>□ housekeeping</td>
</tr>
<tr>
<td></td>
<td>□ glass</td>
<td>□ sharps containment and disposal strategy</td>
</tr>
<tr>
<td></td>
<td>□ splinters and swarf (metal shavings)</td>
<td>□ housekeeping</td>
</tr>
<tr>
<td></td>
<td>□ environmental - flora</td>
<td>□ Sharps containment and disposal strategy</td>
</tr>
<tr>
<td></td>
<td>□ Warm up</td>
<td>□ housekeeping</td>
</tr>
<tr>
<td></td>
<td>□ manual handling risk assessment</td>
<td>□ Sharps containment and disposal strategy</td>
</tr>
<tr>
<td></td>
<td>□ use mechanical device</td>
<td>□ housekeeping</td>
</tr>
<tr>
<td></td>
<td>□ team lift</td>
<td>□ Warm up</td>
</tr>
<tr>
<td><strong>Radiation</strong></td>
<td>□ ultraviolet</td>
<td>□ Licenced or appropriately trained operator</td>
</tr>
<tr>
<td></td>
<td>□ ionising source</td>
<td>□ abatement through physical means (guards, knife block, sheath)</td>
</tr>
<tr>
<td></td>
<td>□ non-ionising source</td>
<td>□ sharps containment and disposal strategy</td>
</tr>
<tr>
<td></td>
<td>□ a laser</td>
<td>□ housekeeping</td>
</tr>
<tr>
<td></td>
<td>□ a radio frequency</td>
<td>□ Sharps containment and disposal strategy</td>
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<td>□ electromagnetic</td>
<td>□ housekeeping</td>
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<td><strong>For exposure to UV from sunlight</strong></td>
<td>□ Clothing – long sleeve shirt, long pants, wide brimmed hat</td>
<td>□ Warm up</td>
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<td></td>
<td>□ Sunscreen (SPF 30 minimum)</td>
<td>□ manual handling risk assessment</td>
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<td>□ Sunglasses</td>
<td>□ use mechanical device</td>
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<td>□ For all other exposure to radiation sources</td>
<td>□ team lift</td>
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<td></td>
<td>□ Safe Work Procedure completed and available</td>
<td>□ Warm up</td>
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<td>□ Hazardous substances Risk Assessment completed and available</td>
<td>□ manual handling risk assessment</td>
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<td>□ Full MSDS available</td>
<td>□ use mechanical device</td>
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<td>□ PPE appropriate and available (Specify the PPE needed)</td>
<td>□ team lift</td>
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<td>□ dangerous goods transport packaging and placarding appropriate and in place</td>
<td>□ Warm up</td>
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<td>CATEGORY</td>
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<td>Control measures that may apply</td>
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<td><strong>Electrical</strong></td>
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<td>□ High voltage</td>
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<td>□ Batteries – 12/24V</td>
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<td>□ Power generation equipment – 240V</td>
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<td>□ Safe Work Procedure</td>
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<td>□ Emergency Plan in place including safety and rescue equipment</td>
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<td><strong>Chemicals</strong></td>
<td>□ handling</td>
<td>□ Emergency Plan in place including safety and rescue equipment</td>
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<td>□ transport</td>
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<td>□ carcinogens, genotoxins (mutagens, teratogens)</td>
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<td>□ toxic/harmful substances (poisons)</td>
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<td>□ cryogenic substances</td>
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<td>□ smoke and/or fumes</td>
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<td>□ Safe Work Procedure completed and available</td>
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<td><strong>Pressurised vessels or equipment (includes compressed air and gas bottles)</strong></td>
<td>□ handling</td>
<td>□ Emergency Plan in place including safety and rescue equipment</td>
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<td>□ LPG</td>
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<td><strong>Vibration</strong></td>
<td>□ vehicles, boats and machinery</td>
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<td>□ equipment in motion – e.g. conveyor</td>
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<td>□ vibrating equipment – e.g. jackhammer</td>
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<td>□ length of use or contact</td>
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<td>□ generation of dust</td>
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<td></td>
<td>□ environmental – earthquakes, land slippage</td>
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<td></td>
<td>□ pre-use condition check of equipment</td>
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<td>□ abatement through physical means (e.g. dampers)</td>
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<td>□ Work roster to reduce exposure</td>
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<td>□ Minimise persons in or near the risk areas and equipment</td>
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<td>□ Check environmental and weather conditions</td>
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<td>CATEGORY</td>
<td>Possible hazards and associated risks</td>
<td>Control measures that may apply</td>
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<td><strong>Noise</strong></td>
<td>□ environmental</td>
<td>□ abatement through physical means (e.g. soundproofing)</td>
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<td>□ vehicles, boats and machinery</td>
<td>□ Check environmental and weather conditions</td>
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<td></td>
<td>□ amplifying devices, loudspeakers</td>
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<td></td>
<td>□ length of use or contact</td>
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<tr>
<td><strong>Inhalation or suffocation</strong></td>
<td>□ smoke</td>
<td>□ monitoring equipment e.g. gas sensors</td>
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<td>□ dust</td>
<td>□ waste material diversion</td>
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<td>□ fumes from plant/ equipment</td>
<td>□ ventilation and extraction</td>
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<td></td>
<td>□ welding vapours</td>
<td>□ Check environmental and weather conditions</td>
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<td></td>
<td>□ generation of dust</td>
<td>□ Confined Space training</td>
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<td></td>
<td>□ environmental – earthquakes, avalanche, land slippage</td>
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<td>□ tunnels</td>
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<td>□ confined space</td>
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<td><strong>Crushing, struck by or striking against</strong></td>
<td>□ falling tree branches</td>
<td>□ Check environmental and weather conditions</td>
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<td>□ lightning</td>
<td>□ Confined Space training</td>
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<td></td>
<td>□ environmental – rock fall, falling tree branch</td>
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<td>□ vehicles, boats and machinery</td>
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<td>□ tunnel or trench collapse</td>
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<td><strong>Firearms and weapons</strong></td>
<td>□ firearms</td>
<td>□ Licenced or appropriately trained operator</td>
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<td>□ archery</td>
<td>□ use external professional</td>
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<td>□ spear gun</td>
<td>□ permits</td>
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<td>□ dart gun</td>
<td>□ safe and secure storage</td>
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<td>□ indigenous</td>
<td>□ safe transport</td>
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<td>□ pre-use condition check</td>
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<tr>
<td><strong>Animals – indirect or direct contact</strong></td>
<td>□ insects - mosquitoes, spiders, ticks, leeches</td>
<td>□ Animal Ethics Approval</td>
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<td></td>
<td>□ reptiles – crocodiles, snakes, frogs, toads</td>
<td>□ pre-commencement check of site, traps and equipment</td>
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<td>□ birds</td>
<td>□ abatement through physical means (e.g. fencing off)</td>
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<td></td>
<td>□ ferals - wild pigs, buffalo, cattle, camels etc</td>
<td>□ Minimise persons in or near the risk areas</td>
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<td>□ marine – sharks, jellyfish, stonefish, cone shells, stingrays</td>
<td>□ Check environmental and weather conditions – pollen counts etc.</td>
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<td>□ bats</td>
<td>□ Obtain vaccinations</td>
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<td>□ domestic – cat, dog etc.</td>
<td>□ use appropriate trapping and containment devices (cage, bag, tank, box)</td>
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<td>□ livestock – cattle, sheep, horses, pigs, fowl</td>
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<td>□ allergens/allergic reactions</td>
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<td>□ disease and zoonoses</td>
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<tr>
<td>CATEGORY</td>
<td>Possible hazards and associated risks</td>
<td>Control measures that may apply</td>
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<td>trap construction/use</td>
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<td>handling and care of species</td>
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<td>transport strategy/method</td>
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<td>release strategy/method</td>
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PROCEDURE FOR JACKING AND WHEEL CHANGING

The safest method of jacking a vehicle is to use the standard hydraulic bottle jack that comes with the vehicle. Never crawl under a jacked-up vehicle for any reason unless it is also supported stably on blocks (or on level ground).

Jacking Procedure Using a Bottle Jack

1. Park the vehicle on a firm and level surface.
2. Engage first gear and apply the hand brake.
3. Place a chock ahead and behind the wheel diagonally opposite to the wheel to be changed.
4. Remove wheel-changing gear (jack, wheel nut spanner) from the vehicle.
5. Check that the spare wheel is serviceable, and place it near the wheel to be changed.
6. Place the jack in a stable position underneath the vehicle in the vehicle manufacturer’s recommended jacking position.
7. Raise the jack to just take the weight of the vehicle.
8. Slacken off wheel nuts so they can be turned by hand.
9. Jack the vehicle high enough so that the spare can be fitted.
10. Remove all wheel nuts, and take off the wheel.
11. Fit the spare wheel to the studs, using the wheel spanner as a lever if necessary.
12. Screws on all the wheel nuts, first finger-tight, checking that the nuts are correctly centred, then tighten the nuts with the wheel spanner.
13. Lower the jack, pull it out from under the vehicle, and tighten all wheel nuts with the wheel spanner. Then check that the nuts are tight, going completely around the wheel.
14. Place the wheel removed in the spare wheel position.
15. Remove chocks, wind the jack completely down and place the jack and tools in their proper storage place.
16. Check the area for any items, which may be left behind. Resume travel.
17. Have the defective wheel repaired ASAP and check wheel nut tightness regularly.
18. Check all wheel nuts once the vehicle has been lowered. Exercise common sense when tightening wheel nuts. Over tightening can result in studs breaking off. Too loose, and you cause damage to the rim which will result in the wheel being damaged and possibly falling off.

Procedure for Using a ‘Kangaroo’ or Highlift Jack

“Kangaroo” or Highlift Jacks are Potentially Dangerous. Incorrect Operation may Result in Serious Injury. It is recommended that a bottle jack be used as a first preference if jacking on a flat surface.

If you do not know how to use a Highlift Jack ask someone that does. Do not experiment.

1. Do not jack a fully laden vehicle.
2. Ensure the hand brake is on.
3. Chock wheels.
4. Ensure jack has a firm footing preferably on a wooden block.
5. Clean and lubricate the jacking mechanism.
6. Ensure the jacking mechanism has free movement before using.
7. Use only the marked jacking points on the vehicle.
8. Place foot of jack in jack point and lever slowly.
9. Move the lever to the side of the body and NOT under the chin.
10. Do not place hand on jack upright whilst jacking as there is potential to jam fingers.
11. Ensure vehicle raises vertically and jack does not slip, if it does lower jack and immediately repeat procedure.
PROCEDURE FOR TYRE REPAIRS

Equipment required is a tarpaulin at least two metres square, tyre levers, a tyre pressure gauge, valve core removing key, chalk or a felt pen, bead breaker, rubber-headed hammer, puncture repair kit, pump, rim restraint straps, and a container of water. The repair should be carried out in a level area, on the tarpaulin, so that the tube remains clean and tools are not lost.

The stages are:
1. Clean excess dust from the tyre, and remove any stones in the tread. Remove the valve cap and core and mark the position of the valve stem on the tyre wall with chalk or felt pen.
2. Break the bead seal on both sides of the tyre, using the bead breaker.
3. Remove the split rim, push the valve stem in and take the tyre and tube off the rim.
4. Remove the tube and rubber flap from the rim.
5. Inspect the tube for holes and splits and mark these, then repair them with the puncture repair kit.
6. Replace the valve core and partially inflate the tube, then test for further leaks in water.
7. Deflate the tube, and then repair any further leaks with the puncture repair kit. Repeat stage 6 to make sure all leaks have been repaired.
8. Check the inside and outside of the tyre (particularly in the points where the leaks were found) for the cause(s) of the punctures. Remove the cause and repair the tyre.
9. Clean all debris from the inside of the tyre, put the tube in the tyre, replace the rubber flap, and put the tyre on the rim using the valve mark on the tyre to get it back in its original place.
10. Refit the split rim on to the wheel, with the split opposite the valve stem, put on the rim restraint straps and partially inflate the tube. Ensure that the bead is setting correctly on the rim.
11. Inflate the tyre to the correct pressure, using the pressure gauge (use 40 psi if in doubt).
12. Return the wheel to its correct place and put away all tools.

Split rims can kill. Never attempt to fully inflate a tyre with a split rim without restraints in place.
GUIDELINES FOR VEHICLE RECOVERY OPERATIONS

It is best practice to avoid those situations that may lead to you having to recover a vehicle that is stuck. Park the vehicle well clear of any problem area and walk across the boggy, steep or rough section. After inspecting the problem area, consider these questions.

- Can the vehicle do the job?
- Can the driver do the job?
- Does the job have to be done?

If the answer to any of the three questions is ‘no’, then avoid the problem area and find another route. However, if for whatever reason the vehicle is or becomes stuck, then recovery procedures are required.

In a boggy area, or where there is no wheel traction (e.g. the body is resting on uneven ground), some combination of jacking and packing under the wheels, and/or winching with the portable (Tirfor) or vehicle-mounted winch, will be required.

Careless winch operation can result in serious injury or property damage. Read and understand all safety precautions and operating instructions before operating the winch.

Guideline for Recovery by Jacking

Recovery by jacking requires a shovel, mattock or pick, possibly an axe, a jack and a solid timber base plate, and some timber or stones to pack into the wheel ruts. The procedure is:

- Place the vehicle in low gear with the hand brake on.
- Dig away the mud or soil beside and in front of the bogged wheels to minimise resistance to forward movement.
- Lift the vehicle using the jack, placing the base of the jack on a level timber base plate.
- Fill in the wheel ruts with timber or stones, and then lower the jack.
- Let down the jack completely, replace it and the other tools in the vehicle, and then travel on.

Procedure for Using Snatch Strap

An alternative to winching, but only for lightly bogged vehicles, is to use a Snatch Strap. In practice, the strap is attached between the towing and bogged vehicles: the towing vehicle backs toward the stuck vehicle for about one-third the length of the strap and then accelerates away. The strap stretches under tension, thus increasing the energy being applied to the bogged vehicle.

Warning: Snatch Straps can kill if used with a poor quality towbar or if connected to towing hooks, bullbars and towbars that are not secured with quality, high-tensile bolts. People have been killed as the hooks, and even complete bull bar assemblies have become projectiles and gone through windscreen or toward onlookers.

Procedure for Recovery by Vehicle Winch

Careless winch operation can result in serious injury or property damage. Read and understand all safety precautions and operating instructions before operating the winch.

Winches are hazardous to use, must be well maintained and must be fitted to a vehicle only in an approved position and secured with rated high tensile bolts. In winching systems, a weak link is built in so that it will break before something expensive does: this is the brass or alloy shear pin, designed to shear when stress gets to a certain level. Do not replace it with a bolt. Carry several spare shear pins.

Recovery by winching requires gloves, a winch and wire rope, about 1.5 m length of chain with a large link at each end, bow shackles, a tree protector strap, a snatch block, spare winch shear pins and tools to replace these pins. Gloves should be worn when handling wire ropes.
If a tree is used as an anchor, ensure that the trunk is not rotted. Attach a cable to living trees only after first wrapping a tree protector strap around the trunk. Any other form of attachment will ring bark the tree and kill it.

Keep all onlookers well distant from an operating winch line. A laden 4wd (about 2.5 tonnes) stuck in clay on a slight gradient may require over 5 tonnes strain to extract it, thus, a lot of force is applied to a winch cable, and if it breaks, it whips through the air and will sever limbs or kill.

The winching procedure is:

- First dig away the soil or mud beside and in front of the wheels. If necessary jack up the vehicle and pack under the wheels to clear any solid obstruction to forward travel.
- Do not have the remote control lead plugged into the winch while free spooling, rigging, or sitting idle. Have the remote control lead plugged in only during the actual winching operation.
- Never handle the wire rope or rigging while anyone else is at the control switch or during the winching operation.
- Never touch rope or hook while they are in tension or under load.
- Always stand clear of the wire rope and load during the winching operation. If a wire rope pulls loose or breaks under load, it can lash back with tremendous force.
- Always be certain that the anchor you intend to use is capable of withstanding the load.
- Always use a choker chain, wire choker rope, or tree trunk protector on the anchor.
- Never put the winch wire rope around an object and hook back to it; this will cause damage to wire rope.
- Never winch with less than five wraps of wire around the winch drum. With fewer wraps the wire rope could break loose from the drum under heavy load.
- Always unspool as much wire rope as possible when preparing rigging.
- Double line with a snatch block or pick an anchor as far away as practical. This will minimise wire rope damage, such as mashing and kinking, caused from top layers pulling down into the bottom layers when short pulls are made.
- Always pull as straight as possible to minimise the build-up of wire rope on only one end of the drum.
- Always inspect and carefully rewind the wire rope after use. Advise your supervisor if any damage to wire is observed.
- Always wear heavy leather gloves when handling wire rope. Do not let the wire rope slip through your hands.
- When anchoring the pulling vehicle, apply the parking brake and chock the wheels. Place automatic and manual transmission in neutral.
- Increase the vehicle engine idle speed if using an electric winch; this slows the flattening of the battery.
- When retrieving or spooling in wire rope, be sure to distribute the wire rope evenly and tightly on the drum. This prevents the top layers of wire rope from being drawn into the bottom layers and creating a ‘bind’.
- Always release the switch when the hook is a minimum of 1.5m from the fairlead.
- If your winch is equipped with a clutch, unplug the remote control lead, release the clutch and rotate the drum by hand to retrieve the remainder of the wire rope. Re-engage the clutch.
- If your winch is not equipped with a clutch, place the hook on a suitable spot on the mounting kit.
- Then, keeping your hands completely clear of the hook, the wire rope, and the fairlead, jog the switch intermittently to take up the slack. Do not over-tighten or damage may occur to the wire rope.
Snatch Block
This is a pulley through which the winch cable is run to double the winch’s effective power. Use pulleys, the largest diameter available. They create the least flexing stress on the wire rope or cable wrapped around them.

On no account should you winch with a snatch block in combination with a Snatch Strap.

Using Snatch Blocks:

**Single Line Pull**

Uses one snatch block:
Doubles the forces, but halves the winching speed

**Two-part line**

Uses one snatch block:
Doubles the forces, but halves the winching speed

**Three-part line**

Uses two snatch blocks:
Triples the pulling force, but has only one-third the winching speed

**Four-part line**

Uses either three single snatch clocks, or one single and one double sheave block:
Gives slow winching, high power
PROCEDURE FOR WATER CROSSING

Before entering the water decide on a plan of action. Make certain the passengers know what to do if something goes wrong.

To determine if the water level is rising, falling, or stationary in a flooded creek, place a stick at the stream edge and observe the ebb and flow at that point. You can then estimate if a safe crossing will be possible within a reasonable length of time.

1. Be cautious when you cross streams. Check both upstream and down-stream for some distance to determine if there is a better place to cross. Get out of your vehicle and walk across to check the water depth, firmness of the stream bed and for hidden hazards. Creeks in northern Australia may be inhabited by crocodiles, in which case do not check the water depth by wading across. Where possible, choose an alternative route and do not enter the water either in or out of your vehicle.

2. If the water is too deep for a safe crossing (above tyre height), look for an alternative route. If none is available wrap the front of the vehicle with a ground sheet before entering the creek. This will prevent water flowing back around the radiator and drowning the engine. You may need to disconnect the fan to reduce the risk of radiator damage.

3. If the car has central locking, make sure it is **not** engaged and that the windows are wound down, if the car stalls and the electrics short or fail, you will be trapped inside.

4. Lock in the hubs and select 4wd low second gear, then enter the water slowly and proceed at a constant speed. Do not slip the clutch or attempt to change gear as this will lead to a continuously slipping clutch and possibly stop the vehicle.

5. If the exit is steep or soft or both, keep going by gunning the engine once clear of the water until higher ground is reached.

6. If the vehicle stalls in the water and you cannot immediately restart it, stop trying. You will have to winch or be towed out.
REFERENCES AND LINKS

CDU POLICIES AND PROCEDURES

Fire Arms

First Aid

First Person on Scene

NT ACTS/REGS/BYLAWS/RULES

http://notes.nt.gov.au/dcm/legislat/legislat.nsf/64117dddb0b89f482561cf0017e56f?OpenView

SAFE WORK AUSTRALIA

NATIONAL STANDARDS

National Standard for Manual Tasks
Published Date: July 2007

Regulatory Impact Statement for the National Standard for Licensing Persons Performing High Risk Work (Archived)
Published Date: February 2006

National Standard for Licensing Persons Performing High Risk Work
Published Date: December 2005

Published Date: December 2004

Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008 (2004)]
Published Date: December 2003

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Laser classification and potential hazards
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Hazardous chemicals register fact sheet
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Safe handling and use of carbon nanotubes in the workplace information sheet
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Published Date: January 2011

Transport and Storage Fact Sheet
Published Date: January 2011

Jurisdictional progress against targets fact sheet
Published Date: January 2011

Priority Mechanisms Fact Sheet
Published Date: January 2011
Code of Practice

The following Codes of Practice are approved under the Work Health and Safety (National Uniform Legislation) Act 2011. A Code of Practice is a practical guide to achieve the standards of health and safety required under the legislation. Codes of Practice provide duty holders with guidance on effective ways to manage work health and safety risks.

Confined Spaces

Construction Work

Control and Safe Use of Inorganic Lead at Work

Fatigue Management

First Aid in the Workplace

Hazardous Manual Tasks
How to Manage and Control Asbestos in the Workplace

How to Manage Work Health and Safety Risks

How to Safely Remove Asbestos

Labelling of Workplace Hazardous Chemicals

Managing Noise and Preventing Hearing Loss at Work

Managing the Risk of Falls at Workplaces

Managing the Work Environment and Facilities

Precast, Tilt-up and Concrete Elements in Building Construction

Preparation of Safety Data Sheets for Hazardous Chemicals

Preventing Falls in Housing Construction

Prevention of Falls in General Construction

Work Health and Safety Consultation, Co-operation and Co-ordination