



North American Bat Monitoring Program Regional Protocol for Surveying with Stationary Deployments of Echolocation Recording Devices

Standard Operating Procedure 2: Safety

Version 1.0

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Revision History Log

Original Version #	Date of Revision	Revised By	Changes	Justification	Page #'s Affected	New Version #

1. Version numbers increase incrementally by tenths (e.g., version 1.1, version 1.2 ...etc.) for minor changes. Major revisions should be designated with the next whole number (e.g., version 2.0, 3.0, 4.0 ...). Record the previous version number, date of revision, author of the revision, identify paragraphs and pages where changes are made, and the reason for making the changes along with the new version number.
2. Notify the Bat Hub Coordinator of any changes to the SOP so that the new version number can be incorporated in the Metadata of the project database.
3. Post new versions on the internet and forward copies to all individuals with a previous version of the SOP.

This Standard Operating Procedure is available in digital format from the NPS Data Store at:

[\[https://irma.nps.gov/DataStore/Reference/Profile/2265548\]](https://irma.nps.gov/DataStore/Reference/Profile/2265548).

Purpose

Although these safety protocols and procedures are designed to avoid serious emergencies in the field, it is essential that field personnel are prepared and informed on how to react in an emergency situation in the backcountry or otherwise. The collaborative nature of this project requires that field crews are constantly traveling across different land ownerships, thus field personnel should communicate with regional offices of the associated land management agency where appropriate to abide by local safety procedures. In most instances, though, a general emergency procedure and chain of command specific to the local agency conducting surveys is necessary. This Safety SOP specifies a functional chain of command in reference to the structure of the Northwest Bat Hub at OSU-Cascades; however, the structure is generalized and easily adaptable to any agency referring to this protocol. An annual establishment or review of a chain of command and general emergency procedure should be a priority before any field operations occur. Proper CPR/AED and first aid training in conjunction with this SOP for reference will prepare field crews appropriately for most emergencies they could encounter.

Roles and Responsibilities

The following is meant to delegate responsibilities to the various roles represented in the chain of command in Figure SOP2-1, and to make safety communication a fluid process both before and during seasonal field operations. Prior to the beginning of the season, certain safety protocols, including Job Hazard Analyses (JHA), will need to be reviewed and signed by all members of the field crew to raise risk awareness. Throughout the field season, field crews will send a weekly itinerary to the Hub Coordinator as an additional safety measure. In addition, all personnel involved should be familiar with the chain of command and how to react in an emergency situation.

Director

- Establish a culture of safety and communicate vision clearly and continually.
- Incorporate safety as a critical result in supervisors' and employees' performance plans.
- Ensure requests are submitted for adequate funding of safety programs and training.
- Help all employees take responsibility for safety, understand human error and accident causation, manage stress, evaluate risk, maximize situational awareness, make appropriate decisions, communicate effectively, and be assertive regarding safety in the workplace.
- Ensure Hub Coordinator and Field Crew members understand their roles and responsibilities in implementing a safety program.

Hub Coordinator

- Monitor employee/crew performance, recognize successes, and take corrective actions when needed.
- Incorporate safety into all decision-making processes.
- Ensure all employees are aware of job hazards.
- Continuously develop and improve Job Hazard Analyses or Guidelines for all tasks.

- Integrate audit findings into existing performance management and training processes.
- Empower field crew members to take responsibility for their own safety.
- Investigate any accidents and near misses, and implement prevention for the future.
- Participate in de-briefings with field crews several times throughout the season.

Field Crew Leader

- Ensure that all decisions in the field are made with safety as the ultimate priority.
- Submit weekly itineraries to the Hub Coordinator and conduct Daily Check-ins.
- Report all near misses to the Hub Coordinator and discuss their future prevention.
- Feel comfortable improvising plans if the safety of the team or any individual is compromised.
- Feel comfortable balancing safety and work load.

Field Crew

- Thoroughly review and sign all provided safety information prior to the start of the season.
- Communicate with the Field Crew Leader and Hub Coordinator on a regular basis about safety or any concerns regarding safety.
- Help remind the crew leader that weekly itineraries must be sent in BEFORE heading into the field.
- Complete daily check-ins.

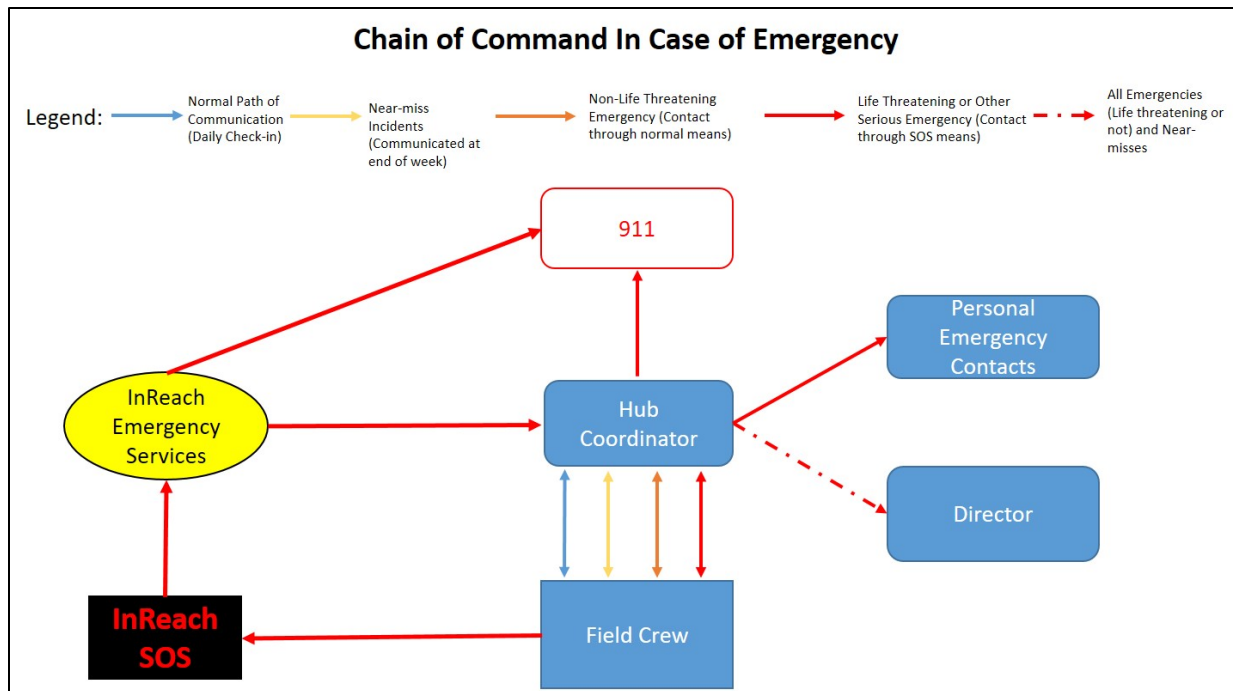


Figure SOP 2-1. The chain of command in the event of an emergency.

Knowledge of Standard Operating Procedures

Reading and understanding the protocol and in particular, the SOPs, are crucial prior to initiating fieldwork. This basic understanding of the protocol and the ability to recognize bad data in the field can improve safety by enabling teams to address errors before leaving the sample unit, eliminating unnecessary sampling trips, and reducing unnecessary exposure to risk. Recognition of data errors on site allows for immediate adjustment in the field. The crew leader will allow adequate time for all field crewmembers to become familiar with SOPs and check their work in the field. Field-related SOPs will also be covered as part of the hands-on training.

General Safety Preparation

It is necessary for the Hub Coordinator and Crew Leads to begin safety preparations and training well before the field season begins to allow adequate time for thorough understanding of field procedures and to obtain any additional training, such as first aid and CPR. Some field crews may not have the chance to return to the Bat Hub's headquarters in Bend, OR, so they must be comfortable operating independently, or with minimal (only via phone) interaction with the Hub Coordinator. This may include independent operation in case of an emergency. For that reason, Field crews must be familiar with the general safety protocol in the following sections and complete any required training before starting field work.

Weather and Field Gear

Field crews will be working in a wide variety of locations that range in ruggedness, elevation, vegetation, and remoteness. It is essential that Crew Leads feel comfortable considering the risks in a given terrain that come with inclement weather and use these considerations to inform decisions

about daily field operations. These decisions will in turn affect the overall safety and moral of the field crew. Thunderstorms and lightning can move quickly in the summer time, so field crews should also be prepared for any inclement weather at any given point, especially when operating in the backcountry. Good rain gear, clothes for a range of temperatures, sunhats, sunscreen, and protection from mosquitoes and biting insects are a must.

First Aid and CPR

Field crews will be required to operate independently for extended periods of time. For this reason, training and documented certification in basic first aid and CPR are required for all field crew members. Once acquired, most First Aid and CPR certifications are valid for two years. Protocol leads should plan for those needing training far in advance to the start of the field season.

Driver Safety

Driving comprises roughly 70% of the time spent working as a crew member and is also the most dangerous task. It is essential that all crew members are educated on and comfortable with how to respond in the case of a driving-related emergency. In order to prepare for these situations, field crews will receive a briefing at the beginning of the season on how to operate emergency communication devices (e.g., Garmin InReach), how to perform basic maintenance on the provided vehicles, and policies on how vehicle maintenance will be paid for. When field crews do encounter a driving related emergency, they must first evaluate its severity. If the incident is something as simple as a flat tire, the crew may follow its training and change the flat tire then go to the nearest tire repair shop to patch it. In situations where a field vehicle is stuck and in need of towing in order to free it, field crews will refer to the chain of command and contact the Hub Coordinator BEFORE making arrangements with a third party for towing. In life-threatening emergencies related to driving, field crews should immediately contact 911 or if out of cellphone reception, utilize the SOS feature of the provided communication device (i.e., refer to the chain of command, Figure SOP2-1), which will alert both the Hub Coordinator and 911 EMS services. Accidents and damage to vehicles should be immediately notified to the Bat Hub Coordinator and OSU Motor Pool should be subsequently contacted.

In addition to the procedures described above and in the Driving Safety Job Hazard Analysis, field crews will focus heavily on prevention of these incidents. They will follow speed limits, driving advisories, and parking requirements of the overseeing agency for the area they are operating. Particularly when operating on dirt roads in remote areas, it is essential to follow operational requirements designated by overseeing agencies or the provided JHA. Following these directions will help crews to avoid situations in which they will need assistance of a third party.

Working in Small Teams

Field staff will primarily work in teams of two when operating in the field. Field staff should only be required to work individually when absolutely necessary and when both members are comfortable. Before separating, field crews should have a clear understanding of when and where they are going to meet back up and what they are going to do if the other does not show up within a reasonable time

limit. If working independently, field staff must also carry their own satellite communication device so that they may communicate both with each other and with the Hub Coordinator.

Varied Weather Conditions

As mentioned above, field crews will be operating across a variety of terrains and conditions. Snow, heavy rain, thunderstorms with lightning, high winds, or hot and sunny conditions can occur during field operations with little warning. Field crews should watch the skyline for cumulonimbus cloud development and avoid being on the exposed hillslopes if thunderstorms and lightning are threatening. As a result, fieldwork requires preparation for this range of conditions. Hypothermia and heat-related injuries are possible. Extreme weather can also contribute to fatigue and increase the risk of injury from falls. Field crew leads should check the National Weather Service website for an up-to-date forecast before initiating fieldwork in any given location. In addition, field crews should be prepared with equipment for as many different weather scenarios as is possible at any given time.

Fire Safety

Field crews will be operating in the field during the height of the fire season and should be highly familiar with the primary causes of forest fires and how to react if they accidentally start any small fires. Field crews will be equipped with various equipment that can help mitigate any accidental ignitions including a Hydro-pack, shovel, and fire extinguisher. Training will include information on the common causes of forest fires and how to react to them prior to the beginning of the season.

Incidents, Accidents, and Emergency Contact Information

All Emergency Contact Information will be collected from active field personnel before heading into the field. In the event of an accident or incident, get immediate medical attention first if required. If confronted with a medical emergency in the back-country, crew members should not hesitate to use the SOS feature of their Garmin In-Reach device (instructions provided below). This will immediately put them in touch with EMS, as well as alert other supervisors that are registered on the account (displayed in the diagram above). In some front-country scenarios, the Garmin In-Reach may not be necessary, but may still be utilized if needed. Otherwise, crews can first contact 911 before calling the Hub Coordinator to inform him or her of the emergency.

In the event that an emergency is not an imminent threat to the health or well-being of a crew member, crews should first consult the Hub Coordinator before making decisions of how to proceed. This includes any incidents with the provided field vehicle.

Field Communications

Established lines of communication and a Check-in/Check-out procedure are essential to employee safety and in ensuring timely assistance in case of a mishap or delay. Upon arrival at a work site, establish a clear procedure of communication between field team members and the Hub Coordinator. Cell phone coverage in the back-country is intermittent and should not be relied upon in case of an emergency. Crews will carry Garmin In-Reach devices in order to communicate with the Hub Coordinator or each other when working separately. Both crew members should be able to access their Garmin In-reach device at any time.

Itineraries

Itineraries will be constructed and communicated to the Hub Coordinator by the Crew Leads weekly before leaving for the field. These itineraries will reflect as the following as accurately as possible before heading into the field: the general area the crew will be working in (e.g., national forest, national park, wildlife district), what sample units field crews will be surveying, the survey dates, and where crews will be traveling or staying in between survey periods. Itineraries will also contain contact information for all active crew members and a description of check-in procedure for field crews. Although these documents are flexible, and may be amended after submission, it is essential that they are as accurate as possible in case of an emergency or more than two missed points of contact between field crews and the hub coordinator. Once two points of contact are missed, the Bat Hub will initiate emergency protocol for locating field crews. For an example of these itineraries, please see Appendix 2-A.

Job Hazard Analyses

Fieldwork requires an awareness of potential hazards and knowledge of basic safety procedures. Advanced planning can reduce or eliminate many safety hazards. This protocol uses Job Hazard Analyses (JHAs) to critically examine tasks, identify specific hazards, and reduce or eliminate these risks. A set of these documents is created for each protocol, is reviewed prior to field implementation, and evolves with the input of subsequent employees to remain a current and effective safety tool. All employees are expected to know, understand, and contribute to these documents. A general field work JHA and a driving-specific JHA may be found in Appendix 2-B and 2-C, respectively.

Appendix SOP 2-A. Field itinerary form

FIELD ITINERARY FORM

OSU-HERS Lab

To be submitted to HERS Lab Director and Bat Hub Coordinator at least one week prior to planned trip.

This form may contain confidential information and must be kept secure.

Individual or task	Name or description
Field Crew Supervisor (i.e., Bat Hub Coordinator)	Roger R., OSU-Cascades
NABat Monitoring Project	Bat acoustic monitoring at Olympic NF and Gifford Pinchot NF
Field work description	Passive acoustic monitor deployment and collection
Dates of field work	[08/14/2018-08/23/2018]
Transportation arrangements	The OSU survey team will travel by OSU motor pool truck to the Survey Units and will camp or lodge during the evenings near the sample unit. Access to detector locations will be via foot from the nearest trailhead or road.
What will be the contact arrangement with the local study site contact?	The teams (WA: Trent & Natalie and OR: Erin & Sara) will send text messages via cell phone or the satellite InReach device to both Roger R.'s cell phone at (817) XXX-XXXX and Tom R.'s cell phone at (541) XXX-XXXX once per day to confirm personal safety and project progress. The team will call or visit [LOCAL CONTACT Name] to check in and out of the field at the beginning and end of the study duration if field work requires backcountry travel. If schedules change, the team will communicate this via text or phone to Roger R. and [LOCAL CONTACT] where needed. Other contacts: [NAME]: [PHONE]
What shall the survey team do if two check-ins are missed?	If two check-ins are missed, the team will call Roger R.'s cell phone at (817) XXX-XXXX. If no contact can be made with Roger, then the team will contact Bat Hub Directors, Matt S. at (541) XXX-XXXX or Tom R. at (541) XXX-XXXX.
What shall the OSU supervisor do if no contact is made with the field?	If no contact can be made, Roger will contact the team at crewmembers' cell numbers. If no contact is made, Matt S. will activate search and rescue via local sheriff's office.

DETAILS OF PARTICIPANTS

NAME/CONTACT	STATUS HERS Lab Staff, Others employees, students, volunteers
Erin B. 541-XXX-XXXX	OSU-HERS Lab staff
Trent H. 404- XXX-XXXX	OSU-HERS Lab staff
Sara R. 541- XXX-XXXX	OSU-HERS Lab staff
Natalie W. 206- XXX-XXXX	OSU-HERS Lab staff

ITINERARY DETAILS

DATE/TIMES	LOCATION	ACCOMMODATION	CONTACT DETAILS
Tuesday August 14	Drive to cell 127360 and Deploy	Field Camping	Trent's Cell Natalie's Cell
Wednesday August 15	Pick up 127360 and Drive to 130595	Field Camping	“”
Thursday August 16	Deploy cell 130595	Field Camping	“”
Friday August 17	Pick up 130595 and drive to 127353	Field Camping	“”
Saturday August 18	Deploy 127353	Field Camping	“”
Sunday August 19	Pick up 127353 and return to Mount Rainier	Mt. Rainier Housing	“”
Monday August 20	Deploy 121807	Mt. Rainier Housing	“”
Tuesday August 21	Pick up 121807 and Deploy 119494	Mt. Rainier Housing	“”
Wednesday August 22	Pick up 119494	Mt. Rainier Housing	“”
Thursday August 23	Data Management at Mt. Rainier	Mt. Rainier Housing	“”

RISK ASSESSMENT

FIELD WORK ACTIVITY	POTENTIAL HAZARD What might harm you?	RISK RATING (Extreme, High, Medium, Low)	CONTROLS What are you going to do to make this activity as safe as possible?	PERSON WHO WILL ENSURE THIS HAPPENS
Bat acoustic detector deployment	See Bat Acoustic Monitoring job hazards analysis	Medium	Communication with local and OSU staff contacts, proper preparation of safety gear and equipment prior to fieldwork. Changes to field itinerary will be communicated with HERS Lab and local contacts.	Erin B. and Trent H.

See attached JHA for additional activities and hazards

ITEMS THAT WILL BE COMPLETED PRIOR TO THE FIELD WORK

Item Description	Mark as appropriate
Participants briefed on details of proposed field work; relevant safety policies, procedures and expected conduct while in the field	X
Job Hazard Analysis signed by all participants	X
All equipment, vehicles and tools will be checked for safety compliance prior to field work commencing	X
I have made the necessary provisions for emergency situations such as the appropriate level of first aid, emergency contact telephone numbers; e.g., helicopter rescue, police, fire, etc.	X
I have checked with participants whether they have any medical conditions that should be disclosed	X
I have checked that appropriate licenses, permits and agreements with have been obtained and are up to date for the use of specialized equipment such as boats.	X

PEOPLE RESPONSIBLE FOR SUBMISSION AND APPROVAL

NAME	SIGNATURE	DATE
Field Work Supervisor/Leader Bat Hub Coordinator	Roger R.	
Field Crew Leads	Trent H.	08/14/2018
Where necessary (e.g., NPS units), program manager or superintendent, based upon the information in the above field Itinerary: ☐ Approve ☐ Do not approve ☐ Grant conditional approval		
Conditions if relevant		

Appendix SOP 2-B. Job Hazard Analysis (General)

2019 Job Hazards Analysis – North American Bat Monitoring Program (NABat) Job Hazard Analysis			
Oregon State University-Cascades Human and Ecosystem Resiliency and Sustainability Lab	WORK PROJECT/ACTIVITY North American Bat Monitoring Program (NABat)	LOCATION: Various locations	
JOB HAZARD ANALYSIS (JHA)	DEVELOPED BY	JOB TITLE	DATE PREPARED
APPROVED BY: DATE:			
REVISED BY: Trent Hawkins DATE: 11/06/2018			
Required and/or Recommended Personal Protective Equipment: Sturdy hiking boots Long pants Warm clothing / hat Rain gear Sun hat Sunscreen Sunglasses Personal water bottles Food and water First Aid Kit Garmin InReach Compass / GPS Unit Maps (both digital and paper for reference) Emergency contact information			
Tasks/Procedures	Hazards	Abatement Actions	
		All people (permanent, seasonal, VIPs) involved in any project should receive a general orientation and tailgate safety session specific to the task prior to beginning of work.	

1. Communication	1a. Loss of contact with field partner(s)/team member(s)	1a. Contact will be made by field crews with the project coordinator at least once, daily, using the supplied Garmin InReach device. Make sure Garmin InReach devices are charged and within reach at all times when operating in the field (in the field vehicle or otherwise). Personal cell phones may also be used in the case of a failure of the supplied device. The project coordinator and crew leads are responsible for ensuring that everyone under his or her supervision is informed on how to operate the Garmin InReach device and avoid false alarms with the "SOS" button on the device. Two missed check-ins from field crews will require that the project coordinator enact an emergency search and rescue plan. When operating within National Parks, HERS field crews will follow the prescribed protocol of the given park they are operating in.
	1b. Emergency contact	1c. In the case of an emergency in the field, crew leads, or crew members will attempt to contact either the project coordinator and/or 911 depending on the severity of the emergency. If the field crew cannot make contact with a cellphone, the "SOS" feature of the InReach will be utilized and a search and rescue protocol will be enacted.
2. Hiking	2a. Steep, rugged, and slippery terrain	2a. Move slowly and deliberately across steep or rough areas. Use trees and solid rocks for handholds when they are available. Check footholds before using them. Fall into the slope if you slip or slide. Have a companion spot you from a more secure location. Never be above or below someone on a loose or unstable slope.
	2b. Disorientation	2b(a). Ensure all personnel are knowledgeable with map and compass as well as GPS usage. Be aware that compass accuracy can be affected by as much as 20 degrees due to local geology. 2b(b). Keep track of current position and location of prominent landmarks with frequent map updates. All members of the party should be capable of describing their location and the route to their starting and/or planned ending point at all times. When available, stick to established trails.

	2c. Rocks/climbing	2c. At various locations throughout Oregon and Washington, it is possible that crews will encounter rocky and unstable talus slopes. Refer to section 2a for how to move under those conditions. It is also possible that crews will be operating around large cliffs. Be aware of where those cliffs are and avoid the edge when possible (if on top). If traveling along the bottom of a cliff band, be aware of potential rock fall.
	2d. Crossing fences	2d. Crossing fences will be a common occurrence in some parts of Oregon and Washington. When crossing fences, field crews must be absolutely certain that they are still traveling on public lands or lands where they have permissions to otherwise operate. When crossing fences, cross UNDER them when possible.
3. Encountering noxious plants, animals, disease, and people	3a. Bees/Wasps/Hornets	3a. Determine if any field crew are allergic to bee stings. Notify other crew members/leads and the project coordinator if you know you are allergic to bee stings; ensure that individual carries prescribed medication to prevent anaphylactic shock; carry a bee sting kit, Benadryl or other antihistamine; be aware of the ground where you step- some hornets build nests in the ground at the base of trees or shrubs, or in rotten logs- watch for bees buzzing in and out of holes or around ground level; if possible, flag a nest so future surveyors won't run into it.
	3b. Ticks	3b. Prevent tick bites by using repellent, wearing long pants tucked into socks (if conditions allow), and checking thoroughly for ticks daily and after returning from the field. If bitten by a tick, remove it (grasp tick with tweezers at head and pull straight out); wash the site with antibacterial soap; save the tick to best tested for disease and fill out an accident report in the event that symptoms of Lyme disease appear (red bull's eye rash).
	3c. Scorpions	3c. Be aware of scorpions when operating in dry climates. Inspect items left lying on the ground, e.g., clothing, for scorpions prior to putting them on, especially after camping
	3d. Mosquitoes	3d. Use bug repellent and wear long sleeve shirt (possibly hat with netting and gloves) to prevent bites; be aware of West Nile Virus symptoms.

	3e. Rattlesnakes	3e. Avoid rattlesnakes by inspecting the ground near logs and overhanging rocks before stepping over them; avoid placing hands on rock ledges or other natural hoists without visually inspecting them first; in the unlikely event you're bitten by a rattlesnake, stay calm, sit still, and call and wait for help.
	3f. Mountain lions	3f. Avoid solo travel near dusk in densely vegetated terrain; if you encounter a lion that doesn't run from you- leave the area; if attacked- fight back!
	3g. Bears	3g. Properly store food, using bear canisters and bear boxes when available or required. Thoroughly wash dishes and keep a clean camp area. Stay at safe distance. If bluff-charged, look big, raise arms, stand your ground. If attacked, roll into ball with face toward ground and hands over neck. If attack continues, fight back.
	3h. Disease	3h(a). Stay away from dead rodents and rodent feces, especially in closed buildings. Be aware of rodent contamination in food, particularly if storing food in an exposed environment (e.g. a field vehicle). Prevent contamination by storing all food in sealed containers. 3h(b). Always keep clean bathroom habits when operating in the backcountry and follow Leave-no-trace principles. Before touching anything common, WASH! 3h(c). Notify appropriate land management agency if you observed a sick or dead animal while in the field.
	3i. Encounters with strangers	3i. Be alert to potential for or developing situations that could lead to unsafe conflicts with other people. This includes encounters when communicating about access to lands to deploy detectors. When confrontations are developing, back away, maintain physical distance, attempt to de-escalate the situation, and leave the area for safety. Send communications to contacts immediately, even for "near misses."
4. Exposure to environmental variables	4a. Treatment of general injuries	4a. All NABat field staff should have current first aid and CPR/AED certification.

	4b. Hypothermia	4b. Always anticipate bad weather and dress accordingly, or carry warm clothes with you; keep clothing as dry as possible; use synthetic fleece and non-cotton outdoor clothing in inclement weather; eat high energy nutritional supplements between meals; cover the head and neck to prevent heat loss; keep active to maintain the body's metabolism; drink plenty of liquids to prevent dehydration, although an individual does not "feel" thirsty; drink warm liquids not cold; understand the effects of cold and wind; most hypothermia cases develop between 30°F and 50°F.
	4c. Hyperthermia	4c. Hyperthermia may occur during high temperatures, monitor for dehydration, heat exhaustion, heat cramps, and heat stroke; symptoms include nausea, headache, and flushed, red skin; drink plenty of water (even when you are not thirsty); as heat increases, take frequent breaks in cool locations; wear a light shirt.
	4d. Waterborne illnesses	4d. Giardiasis and cryptosporidiosis are illnesses caused by drinking contaminated water. Carry plenty of clean drinking water on outings; also carry water treatment methods; consider all surface water sources contaminated.
	4e. Sunburn	4e. Field work takes place in full sunlight so use 30+ or greater SPF sunscreen and lip balm; and wear a hat, sunglasses, and shirt.
	4f. Whiteouts	4f. In the event of a snowstorm and white out conditions, immediately seek shelter & wait for conditions to improve. Do not attempt to "feel your way" out of an emergency situation.
	4g. Thunderstorms	4g. Avoid exposed ridge tops and being on or near lakes, meadows or other exposed areas if thunderstorms are approaching or developing nearby. Move to lower elevations away from tall trees as storms approach. If hair begins to stand up, immediately minimize exposure by moving to lower elevations away from isolated trees & crouch down on the balls of your feet or sit on a pack to reduce ground contact.

JHA Instructions The JHA shall identify the location of the work project or activity, the name of employee(s) involved in the process, the date(s) of acknowledgment, and the name of the appropriate supervisor approving the JHA. The supervisor acknowledges that employees have read and understand the contents, have received the required training, and are qualified to perform the work project or activity. Identify all tasks and procedures associated with the work project or activity that have potential to cause injury or illness to personnel and damage to property or material. Include emergency evacuation procedures (EEP). Identify all known or suspect hazards associated with each respective task/procedure listed. For example: - Research past accidents/incidents. - Research the Health and Safety Code, or other appropriate literature. - Discuss the work project/activity with participants. - Observe the work project/activity. - A combination of the above.	Emergency Evacuation Instructions Work supervisors and crewmembers are responsible for developing and discussing field emergency evacuation procedures (EEP) and alternatives in the event a person(s) becomes seriously ill or injured at the worksite. Be prepared to provide the following information: - Nature of the accident or injury (avoid using victim's name). - Type of assistance needed, if any (ground, air, or water evacuation). - Location of accident or injury, best access route into the worksite (road name/number), identifiable ground/air landmarks. - Radio frequencies. - Contact person. - Local hazards to ground vehicles or aviation. - Weather conditions (wind speed & direction, visibility, temperature). - Topography. - Number of individuals to be transported. - Estimated weight of individuals for air/water evacuation. The items listed above serve only as guidelines for the development of emergency evacuation procedures.																								
Identify appropriate actions to reduce or eliminate the hazards identified. Abatement measures listed below are in the order of the preferred abatement method: - Engineering Controls (the most desirable method of abatement). For example, ergonomically designed tools, equipment, and Furniture. - Substitution. For example, switching to high flash point, non-toxic solvents. - Administrative Controls. For example, limiting exposure by reducing the work schedule; establishing appropriate procedures and practices. - PPE (least desirable method of abatement). For example, using hearing protection when working with or close to portable machines (chain saws, rock drills, and portable water pumps). - A combination of the above. Copy of the JHA as justification for purchase orders when procuring PPE.	JHA and Emergency Evacuation Procedures Acknowledgment We, the undersigned work leader and crewmembers, acknowledge participation in the development of this JHA (as applicable) and accompanying emergency evacuation procedures. We have thoroughly discussed and understand the provisions of each of these documents: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">DATE</th> <th style="width: 40%;">PRINT NAME</th> <th style="width: 45%;">SIGNATURE</th> </tr> </thead> <tbody> <tr><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td><td>_____</td></tr> </tbody> </table>	DATE	PRINT NAME	SIGNATURE	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
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Appendix SOP 2-C. Job Hazard Analysis (Driving)

JOB HAZARD ANALYSIS (Driving)	JOB TITLE (and number if applicable): Driving Safety	DATE: 11/6/2018	NEW REVISED X	NEW
	Title of Person Who Does the Job: All HERS employees	Revised By: Trent H		
Original Author: Melissa N	Supervisor: Roger R	Approved by:		
GENERAL DESCRIPTION: Driving comprises roughly %70 of the time spent working this position and is the most dangerous task. It is essential that all crew members are educated on and comfortable with how to respond in the case of a driving-related emergency. This Job Hazard Analysis lays out exactly how crew members should act and respond to various situations that they may encounter on the road.				
REQUIRED AND/OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT: - Two or more high-visibility safety road vests - Functioning seatbelts for all passengers - General first aid kit that includes a thermal blanket in case of stranding				
REQUIRED AND/OR RECOMMENDED VEHICLE EMERGENCY EQUIPMENT: - Spare tire, tire jack, and tire wrench - Fire extinguishing equipment (fire extinguisher & shovel) - Battery recharging equipment (jumper cables or otherwise)				
SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS	RECOMMENDED ACTION OR PROCEDURE		
Vehicle Maintenance including pre-driving inspections	- Vehicle malfunctions leading to breakdown, injury or accident - In the event of a breakdown, lack of crucial equipment that might be needed - Accidents or injuries caused from unsecured items	- Take the vehicle in for regular scheduled maintenance or when any problem arises with vehicle performance - Familiarize yourself with the tire jack, spare tire, tools and other vehicle equipment. - Check that the vehicle has appropriate equipment such a first-aid kit, safety vests and cone, snow or fire shovel and an ice scraper. - Do a walk around of vehicle. Inspecting for damage and potential hazards. - Secure all items that might become projectiles in the event of a crash.		

Driving on paved roads	- Accidents from following a vehicle too closely or driving too fast for conditions - Collisions with other vehicles or animals and/or driving off road surface due to inattention - Head-on collisions due to driving when visibility is impaired due to elements (rain, fog, smoke, snow, etc.).	- Obey speed limits and slow down if road conditions become slick or congested, - Pay attention at all times. Do not talk on a cell phone or text while driving. - Choose the safest route such as a road with a divider stripe and passing lanes. - Be especially careful on curves and stay within your lane. - If you must drive a road without a lane divider, reduce speed and allow at least 4 seconds between you and the vehicle ahead of you.
Driving on slippery roads (rain, ice, snow)	- Accidents (collisions, driving off-road) - Getting stuck in snow	- Reduce speed - Engage proper equipment such as snow tires, 4-wheel drive, or tire chains BEFORE you actually need them - Keep informed on the current weather- check www.weather.com or www.wrh.noaa.gov - Check with park staff for road conditions - Avoid wet clay roads as much as possible, these roads can fail after storms, especially in spring - If water bars are damaged, make sure you repair them immediately
Driving in areas that are busy and sharing the road with drivers who are unfamiliar with the terrain	- Potential for accidents - Potential for striking pedestrians - Potential for encounters with park visitors	- Be aware that tourists driving on park or national forest roads are often distracted - Do not assume you are the only one on the road behind locked gates (day or night); people from other agencies use these roads - Be alert to the idea that others may be coming in from the field in the early a.m.; drive slowly and keep right - If you encounter an unusual situation, contact your partner to inform and notify the supervisor or local law enforcement- avoid confrontational situations with visitors- let the proper authorities handle it!
Driving in areas with large animal crossings	Collision with wildlife	- Slow down where animals might be present to allow for reaction time - Do not swerve abruptly to avoid hitting an animal, if necessary it's better to ride out the impact.
Driving in arid conditions on unmaintained roads	Wildfire ignition from vehicle undercarriage/catalytic converter	- Track fire hazard warnings from the respective agencies - Obey road closures, such as those that occur in late summer when fire hazards are extreme - Avoid driving over vegetated two-track roads whenever possible (often this will not be possible). - Constantly monitor accumulated vegetation underneath vehicle and watch behind for smolder ALL VEHICLES MUST HAVE BASIC FIRE PREVENTION AND EXTINGUISHING EQUIPMENT AT ALL TIMES!
Towing trailer	- Collisions due to extra weight of load, extra length and greater stopping distances - Back-up problems	- Reduce speed - Allow 4 or more seconds between you and the vehicle ahead of you to allow stopping time. - Practice backing up with a trailer in a safe environment such as an empty parking lot.
Driving in the night or with limited vision	- Potential for collisions with pedestrians, animals and other obstacles that are not visible - Accidents due to fatigue - Accidents due to being blinded by dust or sun	- Turn headlights on - Schedule trip to ensure driver is well rested - Pull over and rest if sleepy - Maintain windshield cleaner fluid level and clean both sides of windows regularly (remember back window); and keep windshield clean - Reduce speed

Emergency / breakdown / flat tire	- Exposure due to being stranded - Being hit by passing vehicles - A dead battery	- If possible, pull off road - If there is risk of being hit by passing traffic, turn on four-way flashers. Use cones or flares to provide a buffer around your vehicle. - If you need to stand on or near roadway, wear a safety road vest. - Put hazard lights on and pull vehicle to a safe location off road and onto shoulder. - Make sure drivers are educated in jack use and properly changing a tire. - Inform drivers of policy on purchasing new tires. - Be sure that the field vehicle is equipped with jumper cables or some other form of battery recharging equipment.
Parking	- Collision with rocks, pedestrian or other hazard while backing into or out of a parking site - Exhaust system igniting a grass fire - Parked vehicle moving on its own. - Parking on uneven or loose grounds	- Park off of the road or in a designated parking area. Find a safe location to park that will provide safe exiting. - Put transmission in Park or in low gear. If parking on a slope, set parking break. - Ensure that fuels are clear beneath vehicle so as not to start a fire. - Use a backer to guide you into a safe place that will be easy to pull forward out of later. Use mirrors or look over your shoulder. If no backer is available, look behind the vehicle before backing. - Do NOT park on a loose gravel shoulder in a National Park or otherwise. Although it seems easy in large 4X4 vehicles, a truck can easily get trapped in the loose soil.
Driving – physical and mental fatigue	Accidents results from falling asleep at the wheel	- Get needed rest. Avoid driving when tired and take breaks as needed. Be particularly cautious when driving late at night. - If a replacement driver is available, trade off driving when you start to feel tired. - If no replacement driver is available, pull off the road and take a break or a nap. - Plan the trip so that no person will be driving more than 10 hours straight - Plan the trip so that no person will be driving after working extensive hours in the field.
Driving in the night or with limited vision	- Potential for collisions with pedestrians, animals and other obstacles that are not visible - Accidents due to fatigue - Accidents due to being blinded by dust or sun	- Turn headlights on - Schedule trip to ensure driver is well rested - Pull over and rest if sleepy - Maintain windshield cleaner fluid level and clean both sides of windows regularly (remember back window); and keep windshield clean - Reduce speed

Acknowledgment

We, the undersigned work leader and crewmembers, acknowledge participation in the development of this JHA (as applicable). We have thoroughly discussed and understand the provisions of each of these documents:

**PRINT NAME
DATE**

SIGNATURE

