

Sierra Nevada Network Lake Monitoring Protocol

SOP 2. Safety

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Revision History Log

Previous Version #	Revision Date	Author	Changes Made	Reason for Change	New Version #

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1. Introduction

The “Safety SOP” provides safety information, checklists and forms for the Sierra Nevada Network and contract personnel who are involved with field activities. This SOP is meant to be used in conjunction with more comprehensive manuals, and regulations and recommendations that apply to specific locales and field conditions. In an attempt to make this a readable document with practical field application, this document does not attempt to comprehensively cover every safety issue. This document is intended to engage all personnel and initiate a synergistic creative environment to address field safety.

The Sierra Nevada Network complies with the NPSafe program and with local park safety programs. NPSafe is a National Park Service employee safety and health implementation plan (NPS 2004). NPSafe outlines the following beliefs, goals and objectives:

1.1. Beliefs

- Healthy productive employees are our most important resource, and employee safety is our most important value.
- Injuries and occupational illnesses are unacceptable.
- At risk behaviors can be eliminated.
- Operating hazards and risks can be controlled.
- Safety is everyone’s responsibility.
- Managing for safety excellence can enhance employee productivity, save millions of dollars in workers compensation costs, and improve overall management effectiveness.

1.2. Goals

- The NPS becomes the safest place to work in the Department of the Interior.
- Safety is integrated into all NPS activities.
- The NPS organizational culture values employee safety as much as it values protecting resources and serving visitors.
- Employees, supervisors, and managers demonstrate unwavering commitment to continuous improvement in employee health and safety.

1.3. Objectives

- Managerial decisions and actions demonstrate a commitment and dedication to the health and safety of the employees of the Service.
- Employees, supervisors, and managers are knowledgeable of the NPS safety vision, are involved in the safety program, and demonstrate the competencies to get the job done safely.
- Every park and program unit has consistent and timely access to Safety and Industrial Hygiene resources/services.
- Every park and program unit implements a comprehensive and effective safety program per Director’s Order 50-B.

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- All non-NPS organizations performing work in parks must operate safety programs that meet all applicable standards and guidelines.
- NPS has no fatalities and its “lost time accident rate” and “total incident rate” are below all other DOI agencies.

2. Scope and Applicability

Safety of field personnel should always be the first concern in conducting a sampling program and in the selection of sampling sites. Numerous safety issues and concerns are associated with implementing a long-term, service-wide monitoring program that includes extensive fieldwork and sampling by network staff or other cooperators/contractors. Field work requires an awareness of potential hazards and knowledge of basic safety procedures. Field personnel routinely come in direct and indirect contact with waterborne pathogens, chemicals and potentially hazardous plants and animals. Advanced planning can reduce or eliminate many safety hazards.

Field sampling requires planning that anticipates the risks and dangers that field personnel may be exposed to so precautions may be taken to limit threats to human safety as much as possible.

3. Roles and Responsibilities

3.1. Division Chiefs or Network Coordinator

- Communicate vision clearly and continually.
- Monitor employee/unit performance, recognize successes, and take corrective actions when needed.
- Incorporate safety as a critical result in all supervisors’ and employees’ performance plans.
- Incorporate safety into all decision-making processes.
- Ensure requests are submitted for adequate funding of required safety programs and safety training.
- Integrate audit findings into existing performance management and training processes.
- Ensure all employees understand their roles and responsibilities in implementing a safety program.
- Ensure all employees are aware of their job hazards.

3.2. Line Supervisors

- Monitor employee/unit performance, recognize successes, and take corrective actions when needed.
- Incorporate safety into all decision-making processes.
- Incorporate safety as a critical result in all employees’ performance plans.

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- Develop and use employee safety and health orientation checklist identifying job specific hazards and safety concerns.
- Develop and continuously improve Job Hazard Analyses or Guidelines for all tasks and jobs.
- Integrate audit findings into existing performance management and training processes.
- Ensure all employees understand their roles and responsibilities in implementing a safety program.
- Ensure all employees are aware of and control their job hazards.
- Investigate all accidents and near misses, and implement corrective actions for identified hazards.

3.3. Employees

- Collaborate with supervisor on Job Hazard Analyses development and use employee safety and health orientation checklist.
- Integrate audit findings into existing performance management and training processes.
- Incorporate safety into all decision-making processes and job tasks.
- Ensure all employees understand their roles and responsibilities in implementing a safety program.
- Ensure all employees are aware of and control their job hazards.
- Identify and report hazards to immediate supervisor or park management.

4. Basic Safety Preparation

It is desirable to begin training well before the field season begins to allow adequate time for thorough understanding of field and laboratory procedures and to obtain required certifications. Field crews must be familiar with the general safety protocol in the following sections and complete any required training that is protocol specific.

4.1. Protocol SOP

A basic understanding of the system being studied is necessary for collecting good data. Recognition of bad or illogical data in the field can improve safety and efficiency by eliminating unnecessary sampling trips. Recognition of the problem at the time it occurs allows for immediate adjustment in the field. Individual protocol SOP's will establish the training necessary to understand the system of study.

Reading and understanding the entire protocol and all SOPs are crucial prior to initiating field work. The protocol lead will allow adequate time for all field crew members to complete this step to ensure success of the project. Field and laboratory related SOPs will also be covered as part of the hands-on training.

Hands-on training and practice prior to the first sampling period will help ensure high quality data collection. Familiarity with the use and maintenance of equipment, procedures for collecting

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and processing water samples, techniques for cleaning field and laboratory equipment, and lake and stream safety are essential to the success of the lake and stream monitoring project. Field crew leaders are required to complete all of the following training. Field crew members should also complete the training, if possible, although it is not required.

4.2. First Aid and CPR

Training in the basic first aid and CPR is required for all crew members and will be paid for by the Network. Certification is valid for two years. Training and certification should be acquired prior to the field season. Protocol lead is responsible for providing all crew members with the necessary training.

4.3. Basic Safety

This SOP is meant to be used in conjunction with other safety manuals such as Chapter A9 of the USGS National Field Manual (Lane and Fay 1997), and national, regional, and individual park safety standards. National standards from the Risk Management Division of WASO are at <http://inside.nps.gov/waso/waso.cfm?lv=2&prg=46>. The Pacific West Region Safety and Health Website at <http://inside.nps.gov/regions/region.cfm?rgn=70&lv=2> provides links to many safety tools including national, regional, and local safety protocol and online sites. The protocol and crew lead are responsible for updating SIEN safety protocol to keep it current with all standards. Park safety offices should be consulted to ensure SIEN crews are consistent with all park specific safety policies. The crew lead will contact individual park safety officers or resource managers for information on reporting injuries and safety concerns, park radio safety procedures, wilderness travel protocols, local problems and issues, such as dangerous or nuisance animals (e.g., black bears), insect-and tick-borne diseases (e.g., Lyme disease, encephalitis, West Nile disease), and other issues specific to each park. The crew lead is responsible for disseminating this information to the crew.

Sequoia and Kings Canyon safety information can be found on the intranet safety site at http://165.83.72.79/risk_management/rm.htm. This site provides links to SEKI Accident/Incident Reporting Requirements, Job Hazard Analysis (JHA), and general safety policies, guidelines, and management directives.

Yosemite safety information can be found in the Yosemite Safety Web page at <http://www.yose.nps.gov/yosenet/safety/default.htm>. This site provides links to the current Wilderness Travel Policy, a JHA Page, the YOSE Incident/Accident Reporting and Investigation policy, and many other safety links.

Safety of field personnel is always the first concern in selection of sampling sites, and in conducting a sampling program. No sample or sampling site is worth the risk of injury or death. Every sampling trip, at any time, if there is a perceived risk, the task should be stopped and the risk mitigated. This includes any travel to and from sites, and with any of the protocol steps. Numerous safety issues and concerns are associated with implementing a monitoring project that includes extensive field work and sampling. Field personnel routinely come into direct and indirect contact with waterborne pathogens, chemicals, and potentially hazardous plants and animals.

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Field work requires an awareness of potential hazards and knowledge of basic safety procedures. Advanced planning can reduce or eliminate many safety hazards. An integral part of informed awareness and successful mitigation of potential hazards is a process that helps to reveal hazards. SIEN is using the Job Hazard Analysis (JHA) to critically examine tasks, identify specific hazards, and reduce or eliminate these risks. A JHA is created for each protocol, or distinctly different process in the protocol, 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 the JHA.

Field work should be done in pairs. Always carry a park radio and if possible, a cellular telephone. Carry basic safety equipment, including first aid kit, flashlight, boots, rain gear, antibacterial soap or hand cleaner, matches or lighter, etc. Be aware of changing weather conditions and the potential for storms. Be aware of potential hazards at a monitoring site. Carry general safety items in each vehicle (see checklist).

At a minimum, a trip plan for each field trip must be completed and left it at a designated location in the office. The trip plan should include the following information:

- Field trip participants, including guests and observers, with emergency contact information
- Departure and expected return time(s) and date(s)
- Hotel and campground contact information (for overnight trips)
- Basic itinerary, including where and when sampling will occur
- Phone numbers for cellular phones or radio frequencies

4.4. Incidents/Accidents

In the event of an accident or incident, get immediate medical attention if required. To report an accident or incident, local park policy should be followed (see YOSE Incident/Accident Reporting and Investigation). At a minimum, the employee will report any injury to their immediate supervisor as soon as possible. The supervisor needs to report the incident/accident to appropriate personnel, and complete any park specific reporting forms (SEKI-134B the Sequoia and Kings Canyon NP Incident/Accident Report, or the Yosemite National Park Supervisor Incident/Accident or Close-Call Reporting Form (2-1a)). Supervisors and employees are required to complete a Department of Labor Form CA-1 (Federal Employee's Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation) or CA-2 (Notice of Occupational Disease and Claim for Compensation) when work related injuries or diseases require medical treatment. The Safety Management Information System (SMIS) is the automated system for reporting Form CA-1 or CA-2 for the Department of the Interior (<https://www.smis.doi.gov>). Employees complete a CA-1/2 electronically at <https://www.smis.doi.gov> before the end of the next work shift after an accident. After the employee completes the CA-1/2, the supervisor logs onto SMIS and completes the supervisor portion of the electronic CA-1/2. The supervisor takes any corrective action necessary to prevent similar incidents.

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4.5. Bears

Most of the information in this section is from the Sierra Interagency Black Bear Group website: <http://www.sierrawildbear.gov/>. This website should be checked for the most up to date information on approved food storage containers.

It is critical that I&M employees use proper food storage and maintain safe distances from bears. While black bears are wonderful to observe in the wild, it is important to keep a safe distance from bears and other wild animals. Bears will change their behavior if they become habituated to humans, which will happen if we crowd them or observe them too closely. Bears also change their behavior if they obtain human food—even just one time. They begin to break into cars, tents, and cabins and may become aggressive. If a bear becomes a safety hazard, it sometimes has to be destroyed. Other habituated and food-conditioned bears are killed by cars because they spend more time along roads and in campgrounds.

Encountering bears in natural areas can be a great experience. The following rules will help to ensure a safe encounter with Sierra Nevada bears:

- Stay together (especially if children are present).
- Give the bear(s) lots of room (300 feet or more).
- Don't get between a sow and her cubs.
- Don't linger too long.
- Use a telephoto lens or binoculars instead of approaching too closely.

Bears need to be “hazed” out of developed areas so they don't feel welcome and don't get habituated or get food. Please help keep bears wild by following the suggestions below—these are especially important if a bear enters your campsite or picnic area.

- Check to make sure all your food and food related items are stored properly.
- Get everyone together, look big, and make lots of noise (yelling, banging pots, clapping, etc.).
- Never surround a bear; they need an escape route.
- Never separate a sow from her cubs (sometimes cubs are up a nearby tree).
- If a bear huffs at you and shows its profile, it may be ready to bluff charge. Stand your ground or back away slowly. Do not run.
- Never try to take food back from a bear.

It is not uncommon for a black bear to show its dominance by bluff charging. If this happens, look big, raise your arms, and stand your ground. As soon as the bear backs away, you should back away as well. The bear may be guarding food or cubs and view you as a threat.

While it is extremely unusual for black bears to harm humans, injuries are reported every year in the Sierra Nevada. In the unlikely event that a bear does make contact with you, roll into a ball,

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face down with your hands over your neck. If the bear continues its aggression, bear experts advise that you fight back.

While some backcountry sites have metal food storage boxes available, many areas do not, and approved food storage containers are required when you are in these areas. The most up-to-date information on approved food storage containers can be found at:

<http://www.sierrawildbear.gov/foodstorage/index.htm>.

Conditional approval is given to any container that has passed visual inspection, an impact test, and a zoo test. Full approval is given to any container that has done the above and has been successful during three months of field-trials in the summer. Either type of approval may be revoked due to unexpected problems in the field that either lead to failures, injuries, or resource damage.

If a bear enters your camp, make noise and try to scare it away. However, if a bear does take possession of your food storage container, DO NOT try to take the container back from the bear, and advise Wildlife Managers in the park you are working in of the outcome.

4.6. Driver Safety

Driving in Sierra Nevada parks presents the typical hazards inherent to driving anywhere, in addition to hazards that are characteristic of driving in the mountains. Some hazards specific to driving in mountainous areas and popular national parks are:

- Wildlife in road
- Visitors not accustomed to driving mountainous roads
- Cars parked in road to view scenery or wildlife
- Winding, steep-gradient roads
- Fallen trees or rock slides in roads
- Ice and snow on roads
- Poor visibility from storms or smoke

When driving on park roads for work purposes, a park radio should be carried to report any accidents, broken down vehicles, inappropriate behavior around wildlife (such as feeding) or other road-related problems to Park Dispatch.

4.7. Forms and Checklists

The following pages contain medical forms, safety tailgate forms, and equipment checklists for field personnel (adapted from Lane and Fay 1997). Prior to the field season, complete the medical information as thoroughly as possible. Confirm all contact information annually. Medical information sheets should be completed for each individual venturing into the field.

Checklists are helpful for ensuring that personnel have the appropriate safety equipment available during field trips. Field crew members should consider their specific needs and should

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customize the checklists as necessary. The field crew and project manager will discuss the checklists and determine which items are necessary.

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Emergency Contact Form (Office) for:

(name) _____

Home phone: _____

Treatment preference: medical _____ other (specify) _____

Doctor: _____ Phone: _____

Allergies and other medical conditions	Medications being taken	Medications to avoid

Relevant medical history:

Special instructions:

Emergency contacts

#1 Name: _____ Relationship: _____

Phone: (home) (work) _____

#2 Name: _____ Relationship: _____

Phone: (home) (work) _____

Sierra Nevada Network Contacts

Network Office _____

Devils Postpile NM _____

Sequoia & Kings Canyon National Parks _____

Yosemite NP _____

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Local emergency contacts for field personnel (or call 911)

Hospital Phone: _____

Address: _____

Other medical facility (24-hour care) Phone: _____

Address: _____

Devils Postpile Dispatch _____

Sequoia & Kings Canyon Dispatch _____

Sequoia & Kings Canyon Fire _____

Sequoia & Kings Maintenance _____

Yosemite Dispatch _____

Yosemite Fire _____

Yosemite Maintenance _____

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General Safety Equipment Checklist

√	Basic Safety Equipment Checklist
	List of emergency phone numbers and office contacts
	List of radio call numbers
	First aid kit
	Fire extinguisher
	Park radio and cellular phone
	Flashlight and spare batteries
	Fluids (e.g., water, sports drinks)
	Tool box with basic tools
	Antibacterial soap or hand cleaner
	Spill kit
	Material safety data sheets (MSDS)
	Hand-held eye wash unit
	Protective goggles
	Accident reporting forms
	JHA(s)

Personal Protective Equipment Checklist

Personal Protective Equipment (PPE) must be selected based on the hazards likely to be encountered. The Sierra Nevada Network is required to supply appropriate PPE, and field personnel are required to use it.

√	PPE
	Aprons
	Eye/Face splash guards
	Gloves (vinyl and/or latex or nitrile)
	Protective suits
	Respirators (certification required for use)
	Boots
	Hat with a brim
	Insect repellent
	Rain gear
	Sunglasses
	Sunscreen
	Work gloves
	Flotation vests and jackets
	Traffic vests
	Cones and traffic signs
	Hard hat
	Hearing protection
	Waders, hip boots, rubber knee boots

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Checklists for Vehicles and Vehicular Laboratories

√	Chemical protection and storage
	Chemical spill kit
	Eye wash kit (replace old or expired wash solution)
	Material Safety Data Sheets (MSDS)
	Chemical reagents (stored in appropriate area)
	Flammable solvents (stored in appropriate dedicated area)
	Pressurized gases (stored in appropriate area)
√	Communications and instructions
	Field folder (including maps, emergency phone numbers for medical facilities, office contacts, family contacts)
	Cellular phone/park radio (check that the service is operational for the area to be
√	First aid and protective equipment
	Complete change of clothes (stored in dry area)
	Fire extinguisher (safely secured)
	First aid kit and manual (check for missing or old, expired items and replace if necessary)
	Orange reflective vest
√	Miscellaneous equipment
	Bungie cords (to secure loose articles)
	Flagging
	Flares
	Flashlight (including fresh batteries)
	Tool kit

To: Safety Officer

Through: Supervisor _____ Branch Manager _____ Division Chief _____

SAFETY/HEALTH TRAINING - TAILGATE MEETING RECORD

Person Conducting:

Date:

Length:

Division/Area:

What was the topic covered?

What significant questions or concerns were expressed? Follow-up required/taken.

Safety Rules Reviewed:

1. _____
2. _____
3. _____

SAFETY TRAINING RECORD

Please SIGN your name

NAME

WORK UNIT/LOCATION

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

CONTINUE ON BACK

5. Lake Monitoring Protocol Safety

An understanding of basic hydrologic concepts is needed for the Lake Monitoring Protocol. The crew lead, and if possible, other crew members, will study modules of the Water on the Web (2004) curricula (<http://waterontheweb.org/curricula>). The modules will be selected by the protocol lead and will include those on lake surveys (e.g., field profiles, sample collection, laboratory methods). Individual study will be followed with group discussion and/or individual discussion with the protocol lead or a hydrologist.

Prior to the field season, the field crew will be trained in the correct use and maintenance of all equipment to be used in the field (e.g. DO meter, current meter). The protocol lead will ensure all crew members understand, and can safely complete all aspects of the monitoring protocol safely and efficiently. The Safety SOP will be reviewed by all crew members. Protocol specific safety concerns will be addressed by the protocol lead.

5.1. Pre Trip

Before leaving for the field site, the field lead will ensure all required safety and work equipment (including vehicles) are available, maintained, and in good working condition. The field lead will notify all appropriate personnel about the location and time required for the sampling trip. All emergency contact information will be given to the protocol lead. The field lead will make sure all park specific wilderness protocol requirements are fulfilled.

5.2. Lake Monitoring JHA and Specific Safety Concerns

All the staff is required to participate in the production and evolution of a job hazard analysis (JHA) specific to the field implementation of the lake monitoring protocol. The field lead is responsible for documentation of improvements to the JHA during field implementation. The protocol lead incorporates changes into the protocol.

Principle steps in the implementation of the lake monitoring protocol include travel to and from the site, site monitoring from a boat, and site monitoring from the shore. Potential safety and health concerns include dehydration, heat stress, hypothermia, lightning, falls, sunburn, animal encounters, stream crossings, and drowning (see JHA adapted from Yosemite Wilderness Restoration). The JHA should be used as a catalyst for crew discussion and understanding of all safety concerns for the lake monitoring protocol. Discussions should address safety concerns including all aspects of safe wilderness travel to and from the site (such as traveling over rough terrain, high water crossings with and without a backpack, trip planning and notification, lightning and other weather events, heat and cold exposure, high elevation, snow travel, map and compass, GPS) with emphasis on the specific area being accessed and current local conditions.

Working at lakes carries the inherent risk of drowning. When sampling at the outlet and along the water edge, extra care should be used around rocks and logs which can be unstable and slippery. When wading a stream, watch for and be prepared for cold water, slippery footing, strong current, holes, and strainers. A stream should not be waded that has a value of the depth multiplied by the velocity greater than or equal to 10 ft²/s (Lane and Fey 1997). Waders should be worn for foot protection, and when needed for protection from cold water. Wear extra layers of clothing to keep warm such as long underwear with waders. Avoid waders with tight ankles,

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and chest waders that are tight fitting at the top (hard to remove in an emergency). Watch for floating debris such as logs.

When sampling from a boat a personal floatation device (PFD) is required. Do not wear waders or other items that could become a safety hazard if the boat flips or sinks. Special attention should be given to footing particularly when getting into and out of a boat. While working in the boat, be conscious of limitations in stability and awkward working conditions particularly when lifting heavy items such as the anchor. There should always be at least one crew member on shore, keeping an eye crew member(s) who are working on the lake.

Dress appropriately for weather conditions. Weather can change quickly in the Sierra Nevada. Be prepared for sunny and hot conditions by drinking plenty of water and protecting yourself from exposure to sun with the use of sunscreen, a hat, and sunglasses. Anticipate bad weather by bringing raingear, extra layers, and extra food. Be alert to changing weather by watching for developing clouds, wind shifts, and the sound of thunder. If the weather begins to change get to shore. Lightning can strike even when there are no clouds overhead. If there is lightning in the area, get inside a building or car. If this is not possible, go to lower areas such as valleys and canyons. Do not remain near large solitary trees or in the middle of open areas.

This safety protocol is not designed to attempt to comprehensively cover all safety issues that may be encountered. It is to be used as a starting point for field work where everyone is involved in creatively enhancing and bringing personal additions to the process. Safety is a responsibility of everyone. The JHA and all safety protocol should be constantly assessed to remove redundant and less useful items, and improved with the addition of new ideas and concepts. The field lead documents changes and new ideas gained from the crew and works with the protocol lead to keep the JHA and safety protocol current and pertinent

5.3. SIEN Lake Monitoring Job Hazard Analysis Form

Date Revised:

SEKI JOB HAZARD GUIDELINE			
Job Description: Water Sampling			Date of last update: July 8, 2010
Division with primary responsibility for this JHG: Resources Management and Science		Last updated by: Andi Heard	Reviewed by: Approved by: Bill Putre
Required standards & general notes:			
Required personal protective equipment:			
Typical tools & equipment:			
Activity	Potential Hazards	Safe Action or Procedure	
Collecting stream sample	Slipping, falling into river	Wear proper footwear. Avoid wet rocks. Avoid areas with deep or swift currents. Abort collection if water levels are too dangerous.	
Collecting a lake sample	Going into the lake – drowning or hypothermia	Inspect boat before entering the lake. Wear pfd. Always have someone on shore watching the sampler. The sampler should have strong swimming skills. If an individual goes into the lake, once on shore they should change into dry clothes and follow procedures for hypothermia.	

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SEKI JOB HAZARD GUIDELINE			
Job Description: Backcountry Travel			Date of last update: June 29, 2009
Division with primary responsibility for this JHG: SIEN		Last updated by: John Austin	Reviewed by: Approved by:
Required standards & general notes	Employees are traveling in groups of two or more, or they report daily by radio if traveling alone. Supervisor knows destination and route and return date.		
Required personal protective equipment	One radio per 2-3 persons (if splitting up at any point on the trip), first-aid kit, whistle, sturdy boots, solar protection (hat, bandana, and/or sun block), sunglasses, flashlight, minimal pack weight (1/3 of body weight), snow axe and crampons when on firm snow or ice.		
Typical tools & equipment	Backpack (or rucksack if traveling by stock), bear-proof food storage canister or pannier, cold and wet-weather gear, appropriate foot wear (including footwear for wading streams, etc.), tent, adequate sleeping bag, water purification equipment (usually a filter), food and food preparation equipment, mosquito repellent, compass and map, daypack/fanny pack, head net, hand tools (Kodiak shovel and/or hand tiller), satellite phone, Gatorade.		
Activity	Potential Hazards	Safe Action or Procedure	
Backpacking with heavy loads	Heavy loads	Carry no more than 1/3 of your body weight while traveling in the backcountry on trails (less weight when traveling off trail if possible). Assess equipment needs to ensure only required equipment is being carried. Utilize pack trains, helicopters for food/equipment drops whenever feasible.	
	Load instability	When carrying heavy loads, pack the gear so that heavy equipment is carried low on your back to increase stability [some differing opinions here—will confirm this.] Balance loads evenly (right/left). Consider using trekking poles.	
	Muscular pain and soreness, injury prevention	Start slowly to ensure muscle groups are given adequate time to warm up. Use stretching exercises before starting.	
	Fatigue	Take frequent breaks for food and water. Stop hiking for the day after reasonable distance is achieved.	
	Back strain	Lift loads with your legs to avoid back injuries. Sit on flat rocks or logs approximately 2' high for taking off or putting on packs.	

Hiking on steep or rough terrain off trail	Steep slopes and poor footing (falls)	Move slowly and deliberately across steep 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. Utilize trekking poles or Kodiak shovel for stabilization while stepping up, down, and side-hilling. Minimize pack weight. Areas of pine needle accumulation can be very slick.
	Footing	Plan to cross snow or ice fields late in the day for better footing; cross streams early before flow increases due to increased run-off and unbuckle waist belt on pack—use trekking poles and water shoes. Watch for slippery rocks and logs on land and around water, especially during/after rainfall. Use trekking poles or Kodiak shovel to move low vegetation aside to see next step (also to check for rattlesnakes in likely habitats).
	People above you or below you	Never be above or below someone on a loose or unstable slope. Be aware of the ground surface in front of you - watch for slick, sloped and unstable areas surfaced by loose rock, leaves, needles, or sticks. Members of a party should move up such slopes one at a time, together at the same elevation at all times, or parallel to each other and out of rock fall danger. Yell “ROCK!!” as loud as you can immediately upon seeing rolling rock(s)—even small rocks can gain dangerous velocities quickly on steep slopes.
Route finding	Hazardous obstacles	Plan routes to avoid or limit exposure to known hazards such as steep slopes, river crossings, poisonous vegetation, potentially slick materials (hard snow, ice, thick grass, moss, needles) etc.
	Disorientation	Ensure all personnel are knowledgeable with map and compass as well as GPS usage.
		Keep track of current position and location of prominent landmarks with frequent map updates. Whenever possible, stick to established trails.
Inclement weather	Unfamiliarity with current and forecasted weather	Obtain weather forecasts prior to beginning back country travel and monitor weather broadcasts via radio during trip.

	Inappropriate gear for the conditions	Assess anticipated routes, elevations, and weather conditions when planning what gear to carry. Always carry rain gear, a warm hat, gloves, adequate clothing layers, and a warm jacket when traveling in the backcountry.
	Thunderstorms	Avoid exposed ridge tops and open meadows if thunderstorms are approaching or developing nearby.
		Move to lower elevations away from tall trees as storms approach. Use Distance Rule to assess thunderstorm proximity. (The number of seconds between lightning flash and thunder divided by 5 = the distance in miles from that strike. If that time [or distance], is less than 10 seconds [or ~2 miles], OR if those values are decreasing, then seek the safest area available.)
		If hair begins to stand up, immediately minimize exposure by moving to lower elevations away from isolated trees and crouch down on the balls of your feet to reduce ground contact.
	White outs	In the event of white out conditions, immediately seek shelter and wait for conditions to improve. Do not attempt to "feel your way" over the pass. Foggy conditions are very similar.
	Hypothermia	Layer your clothing such that it will be easy to regulate your body temperature by adding or subtracting layers. DO NOT wear cotton as a layer.
	Heat stress	Drink plenty of liquids, keep hydrated, and take frequent breaks for snacks and water. Rest in shade. Wear hat and appropriate clothing/PPE. Drink Gatorade or similar.
Choosing a safe campsite	Tree hazards	Look for tree hazards (dead and leaning trees, large dead limbs) before selecting your campsite. Don't assume that established campsites are safe campsites.
Camp cleanliness, hygiene, and health	Contamination of shared food, water, and anything common (e.g., cook equipment and dishes)	Wash hands thoroughly with water or hand sanitizer before handling food dishes, utensils, water filters, or anything common to the crew. Always wash hands thoroughly after going to the bathroom. Utilize sand in water to scrub if necessary.
	Contamination of shared water	Wash hands before gathering and/or filtering water; avoid contaminating filtered water with unfiltered water at source.

	Bears and other wildlife	Properly store food, thoroughly wash dishes and keep a clean camp area. Fermenting seed heads become odoriferous and attractive to wildlife. STORE SEED HEADS IN BEAR BOX, BURN OR PACK OUT IMMEDIATELY. Properly store campware (pots, plates, mugs, utensils) to avoid contamination from mice.
Water filtering	Contamination of water	<p>Wash hands before handling filter. Avoid contaminating filtered water with unfiltered water from source or from in-hose assembly.</p> <p>Choose water sources wisely—look for well-flowing springs or non-stagnant, clear stream or lake water.</p> <p>Operate and maintain water filters properly at all times. Replace malfunctioning equipment as soon as possible. Boil water or use alternative methods (e.g., iodine tablets, etc.) until filter is replaced or functioning properly. NOTE: It is better to drink untreated water than to risk severe dehydration which is <u>immediately</u> life-threatening. Any disease that might be contracted in untreated water is not so immediate a threat and can be treated later if necessary.</p>

SEKI JOB HAZARD GUIDELINE		
Job Description: Driving Safely		Date of last update: July 22, 2009
Division with primary responsibility for this JHG: SIEN	Last updated by: John Austin	Reviewed by: Approved by: Bob Montgomery
Required standards & general notes:	Both general and winter driver safety training provided by the park Maintenance standards set by the auto shop This JHG does not cover the proper use of bicycles, motorcycles, ATVs, mules, or similar vehicles.	
Recommended personal protective equipment:	Two or more high-visibility safety road vests, two or more traffic cones, stop/slow paddle First-aid kit Radio	
Typical tools & equipment:	Emergency and unusual condition equipment such as ice scraper, fire extinguisher, snow chains, jack, and lug wrench	
Activity	Potential Hazards	Safe Action or Procedure
Vehicle Maintenance	Vehicle malfunctions leading to breakdown, injury, or accident.	Take the vehicle in for regular scheduled maintenance or when any problem arises with vehicle performance.

Pre-driving inspections	<p>Vehicle malfunctions leading to breakdown, injury, or accident.</p> <p>Lack of crucial equipment that might be needed.</p> <p>Accidents or injuries caused from unsecured loads.</p>	<p>During winter, check road conditions before leaving, carry additional clothing, and make sure that someone knows where you are going and when you should be back.</p> <p>Ensure that vehicle has appropriate equipment such as first-aid kit, snow chains, ice scraper, and cones.</p> <p>Do a walk around of vehicle, inspecting it for damage and potential hazards. Secure all items that might become projectiles in the event of a crash.</p> <p>Familiarize yourself with jack, spare tire, tools and other equipment.</p> <p>Familiarize yourself with the use of the lights, wipers, radio, climate control system, and cruise control. It is not safe to be trying to figure these out while you're driving.</p> <p>Adjust seat and mirrors to fit the driver.</p> <p>Do not ride in the back of a truck or anywhere else that is not equipped with a seatbelt. All vehicle occupants must have seat belts fastened before vehicle begins to move. Seatbelts should remain fastened whenever the vehicle is moving.</p> <p>Leave early enough so that you don't feel rushed and tempted to compromise your safety.</p>
Driving speed	Accidents caused from following a vehicle too closely or driving too fast for conditions.	<p>Obey speed limits. Drive at a reasonable speed. Getting to your destination a few minutes quicker is not worth exposing yourself or others to an accident.</p> <p>Allow at least two seconds between your vehicle and the one in front of you. This is the minimum for ideal conditions. Increase this cushion at night or during adverse driving conditions.</p>

Stopping quickly	Being hit from behind. Whiplash.	<p>Watch for traffic making unexpected turns or stops, especially near intersections.</p> <p>Watch for pedestrians unexpectedly stepping into the roadway, especially at intersections and near parked cars.</p> <p>Watch for potholes and for fallen rocks and trees. Use caution when driving in areas of known rock slide potential such as the section of 180 leading down into Kings Canyon. Pay particularly care during the spring when moisture combined with freezing increases the risk of rockfall and slides. If you find a new or active slide do not drive by it until you evaluate the safety of it. Stop well outside of the fall area and listen and look for sliding debris, if there is active movement do not drive through. Be extremely cautious when clearing debris from the roadway. Evaluate the safety of the area before you go into it, again spend some time listening and looking for movement. If there is any recent or active movement do not go into the area. If you decide you are going to clear debris make sure you have a spotter to warn you if rocks start moving again.</p> <p>Scan well ahead, drive defensively.</p> <p>Drive at speeds that are safe for the road conditions, thus allowing for reasonable stopping.</p> <p>Check rear-view mirror regularly.</p>
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Distractions	Accidents (collisions, driving off road, etc.)	<p>Do not talk on a cell phone or text while driving. Even when used hands free, a cell phone is still a significant distraction. NPS employees and volunteers are prohibited from using a cell phone while driving, even if used with a hands-free device. Texting is particularly distracting; don't do it. NPS employees are prohibited from reading, composing, or sending text messages or e-mails while driving. The prohibitions against using a cell phone or texting while driving applies whenever you're on official business, regardless of whether the vehicle you're operating is owned by the government, leased, rented, or is a private vehicle. NPS employees and volunteers are permitted to talk on the park radio while driving, but be aware that this is still a significant distraction.</p> <p>Don't take your eyes off the road to retrieve something on the seat, untangle a radio cord, read the display on your Blackberry, etc. If something demands your attention, stop the vehicle before dealing with it. Getting to your destination a few minutes quicker is not worth exposing yourself or others to an accident.</p> <p>Always keep at least one hand on the steering wheel. It's best to have two hands on the steering wheel whenever possible.</p> <p>Don't check your appearance in the mirror while driving.</p> <p>Be careful when drinking while driving. Exercise even greater care when eating while driving. In some cases, eating while you drive may increase your alertness and therefore your safety. Snacks are comparatively safe, but eating a double cheeseburger while driving is pushing your luck.</p> <p>Don't let yourself become distracted by events taking place outside of the vehicle (gawking at accident, arrival at destination, etc.).</p>
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Driving when visibility is impaired due to elements (rain, fog, smoke, snow, dust, etc.)	Accidents (collisions, driving off road, etc.)	<p>Reduce speed. Allow at least four seconds between you and the vehicle ahead of you to allow stopping time. Keep windshield clean and clear. Turn on headlights. Also turn on four-way flashers if conditions warrant. If conditions are too bad to drive safely, find a safe place to pull off the road and stop.</p>
Driving narrow and/or winding roads	Head-on collisions	<p>Where possible, avoid roads such as the Hogback that don't have at least a stripe to separate traffic lanes. When a choice of two roads is available; take the safer route. Getting to your destination a few minutes quicker is not worth exposing yourself or others to an accident. Be especially careful on curves. Stay within your lane. If you must drive a road without a lane divider, reduce speed and allow at least four seconds between you and the vehicle ahead of you. Scan ahead for oncoming traffic and slow down when approaching blind curves. When sight distance is limited, anticipate that oncoming traffic may be driving in your lane. If a vehicle wants to travel faster than you, find a safe place to pull off the road and let them by. Do this even if you think they are wrong to want to drive faster than you. Your ego will survive and the other driver won't be tempted to pass you in an unsafe area.</p>
Driving on unpaved or damaged roads	Accidents (collisions, driving off road, etc.)	<p>Reduce speed. Allow at least four seconds between you and the vehicle ahead of you to allow stopping time. When a choice of two roads is available; take the safer route. Getting to your destination a few minutes quicker is not worth exposing yourself or others to an accident. Be especially careful on curves. Stay within your lane. On very bad roads, scout ahead if in doubt. Report hazards such as fallen rocks or trees to park dispatch.</p>

Driving when road is slippery (rain, ice, snow, etc.)	Accidents (collisions, driving off road, etc.)	Reduce speed. Allow at least four seconds between you and the vehicle ahead of you to allow stopping time. When a choice of two roads is available; take the safer route. Getting to your destination a few minutes quicker is not worth exposing yourself or others to an accident. Use proper equipment as stated by road signs (chains, 4-wheel-drive, etc.)
Driving on closed roads	Accidents (collisions, driving off road, etc.)	Use caution when traveling the closed portion of any road. Notify Dispatch when entering the closed area, also notify Dispatch when you have cleared the closed area.
Night driving	Pedestrians, animals, obstacles not visible, glare from oncoming traffic.	Turn headlights on; keep windshield clean. Allow at least four seconds between you and the vehicle ahead of you to allow stopping time.
Following vehicles with different characteristics (i.e., motorcycles and trucks)	Collisions	Reduce speed. Allow at least four seconds between you and the vehicle ahead of you to allow stopping time.
Towing trailer	Collisions	Reduce speed. Allow at least four seconds between you and the vehicle ahead of you to allow stopping time. Extra weight of load requires greater stopping distance. Be aware of extra length added to your vehicle when making turns
	Back-up problems	Practice backing up with a trailer in a safe environment such as an empty parking lot.
Emergency/breakdown (your vehicle or when stopping to assist others)	Exposure due to being stranded. Being hit by passing vehicles.	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 the roadway (e.g., to direct traffic), wear a safety road vest. If possible, stand in a location with good sight distance. Report all accidents to park dispatch. Let them know what help is required such as medics, ambulances, people to direct traffic, etc.

Physical and mental fatigue	Falling asleep at wheel, accidents	<p>Get needed rest, avoid driving when tired, and take breaks as needed. Be particularly cautious when driving late at night.</p> <p>If a replacement driver is available, trade off driving when you start to feel tired. If you get tired and no replacement driver is available, pull off the road and take a break or a nap. If you're yawning, you probably shouldn't be driving; take a break.</p> <p>Plan the trip so that no person will be driving more than ten hours (behind the wheel) within any duty-day. If an unexpected situation develops and there is no good alternative, then it is okay to drive longer than ten hours. But such situations should rarely happen.</p> <p>Plan the trip so that no person will be driving unless they have had at least eight consecutive hours off duty before beginning a shift.</p> <p>Exception to the minimum off-duty hour requirement is allowed when essential to address immediate and critical employee or public safety issues (e.g., emergency bear management call-out in the middle of the night). Exception is also allowed when an unexpected situation develops and there is no good alternative.</p> <p>Mitigation measures must be taken to reduce fatigue for drivers who exceed 16 hour work shifts. This is required regardless of whether the driver is still compliant with the 10 hour individual (behind the wheel) driving time limitations.</p>
Ascending steep grades	Overheating leading to breakdown	<p>Watch temperature gauge.</p> <p>Turn-off air conditioning if vehicle starts to overheat.</p>
Descending steep grades	Brake failure Loss of control	<p>Reduce speed.</p> <p>Shift to a lower gear to conserve brakes.</p>
Passing traffic	Collision when changing lanes	<p>Look carefully before changing lanes. Visually check any blind spots left by mirrors.</p> <p>Signal before changing lanes.</p>
U-turns	Collision with on-coming traffic, road barriers or off-road features	<p>Ensure that point selected for turn has good view of oncoming traffic and space to negotiate turn. Position lookouts/flaggers when needed.</p>

<p>Parking</p>	<p>Collision with rock, pedestrian, or other hazard while backing into or out of a parking site.</p> <p>Exhaust system igniting a grass fire.</p> <p>Parked vehicle moving on its own.</p>	<p>Park off of the road or in a designated parking area. Find a safe location to park that will provide safe exiting.</p> <p>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, and be sure that you can see the backer and that you understand the hand signals being used. If no backer is available, then look behind the vehicle before backing.</p> <p>Put transmission in Park or in low gear. If parking on a slope, set parking brake.</p>
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SEKI JOB HAZARD GUIDELINE		
Job Description: Environmental Hazards		Date of last update: July 8, 2010
Division with primary responsibility for this JHG: SIEN	Last updated by: Andi Heard	Reviewed by: Approved by:
Required standards & general notes:	Employees should all be aware of potential hazards and know how to minimize risk. Also refer to the JHG for Wilderness/Backcountry Travel, especially if you will be camping.	
Required personal protective equipment:	For all workers: protective clothing and Technu where appropriate, snake leggings where appropriate. In addition, at least one person in each workgroup should carry a radio and first aid kit.	
Typical tools & equipment:		
Where Are You Likely to Encounter?	Potential Hazards, Why Worry	Safe Action or Procedure, Response If It Happens
Low to mid-elevations	Tick bites. Transmission of blood borne pathogens (bacteria, viruses, protozoa, and parasites) from tick bites (including Lyme disease, rocky mountain spotted fever, ehrlichiosis, tick relapsing fever, tularemia, Colorado tick fever, babesiosis, and tick paralysis) or flea bites (especially plague).	Prevention. Wear a long sleeve shirt, long pants, and a hat when working in high tick areas. Light colored clothing makes them more visible. Tuck pant legs into socks or tape pant legs to boots. Tuck long sleeves into gloves. Consider using physical tick barriers such as Rynoskin, or chemical repellents such as Permethrin. After returning from the field, check the body thoroughly. It takes hours for ticks to attach themselves.
		Initial response. Remove ticks using tweezers by gently pulling from head/mouth parts. Save the tick in a plastic bag or jar so it can be analyzed for pathogens if necessary.
		Follow-up. If a reaction occurs, such as swelling of lymph nodes, soreness, or a black (necrotic) center, visit a doctor as soon as possible.

Field or office	Puncture wounds.	<p>Prevention. Wear boots whenever possible. When sandals are required (e.g., wetland work), ensure that they are robust enough (such as Chacos or Tevas, or heavy duty Crocs) so that you can walk safely on uneven terrain. You never know when you may have to move rapidly to avoid some unexpected hazard such as a mother bear or a rattlesnake.</p> <p>Initial response</p>
Low to mid-elevations	<p>Contact with poison oak. This abundant foothill plant is found in a wide range of both xeric and mesic sites. Generally it is found below 5000 feet. It can take the form of an herb, tall shrub or vine. It has dark green leaves in spring and early summer, turning red in late summer and dropping in early fall to reveal the equally toxic light-colored stems. Note that all parts of the plant can cause an allergic reaction. Poison oak can have serious health repercussions and should be taken seriously as a health hazard.</p>	<p>Recognition. Learn what the plant looks like at all times of the year.</p> <p>Prevention. With care, exposure can be greatly lessened. Try to avoid contact with the plant, or anything that has come into contact with it (tools, clothing, car seats pets). Wear long sleeves and pants, gloves, even gaiters. Consider covering car seats with bags or sacks to prevent park vehicles from being contaminated. If you are sensitive or are not sure, use Ivy Block before exposure (this products is available in the Warehouse.) Wipe tools with alcohol to remove oils. Consider wearing two pairs of gloves. One being an inner thin latex or plastic disposable glove that is worn at all times while in the field. During work activities these gloves can be covered by a second pair of work or leather gloves. Some work crews have had success using Tyvek disposable suits to avoid exposing skin or personal clothing to the plant. Wash field clothing after exposure separately from other clothes in hot water and with Tecnu; following this run an additional wash cycle without clothes to flush the oils from the machine.</p>
		<p>Initial response. If you are sensitive or are not sure, use Tecnu after exposure (this product is available in the Warehouse.) If Tecnu isn't available, wash with soap and cold water as soon as possible. Some crews carry extra water with them and wash in the field immediately after exposure.</p>
		<p>Follow-up.</p>

	<p>Inhaling volatile oils from poison oak. This can cause significant damage to airways.</p>	<p>Prevention. Volatile oils can be transported in the air on hot days. Some people get poison oak by breathing; no direct contact required. If you're sensitive to this concentration of oils, avoid poison oak habitat on hot days. The far greater danger is inhaling smoke from burning poison oak plants. Everyone should avoid inhaling such smoke.</p> <p>Treatment</p>
Low to mid-elevations	<p>Bites from kissing bugs. Other common names: Blood sucking, cone nose beetles or assassin bugs. Kissing bugs are 3/4" long, dark brown to black, with a concave back and a reddish orange X pattern defining the wings. It has a long proboscis, which it carries tucked under its body until ready to bite. It is a poor flyer - often crawls. It likes dark, sheltered places. It is often associated with pack rat nests or other rodents. Kissing bug bites can cause extremely serious allergic reactions in sensitive individuals.</p>	<p>Recognition. Learn to recognize kissing bugs</p> <p>Prevention. Try to close unnecessary openings into your housing. Remove woodpiles near your dwelling to discourage rodents. Shake out clothing/shoes prior to putting them on. Check furniture before sitting down. Kissing bugs normally bite people at night while they are sleeping.</p> <p>Treatment.</p>
In the field	<p>Stings from bees, wasps, and yellow jackets. Solo bees generally do not sting when unprovoked. Beehives can be a problem if</p>	<p>Prevention. Watch for bees around food and drinks. Wearing protective clothing such as boots, long pants, long sleeved shirts and gloves may help to avoid stings. Watch your footing keeping an eye out for nests. If you spot a nest, let others know its location. Flag it.</p>

	they are disturbed. Hives can be found in the ground, as a paper hive above ground or in trees, or in the base of burned out trees. Honeybees leave their stinger in the wound, while some other bees and wasps sting repeatedly.	Treatment. Keep Benadryl, and if necessary, a bee sting kit, with you at all times.
In the field and office	Bites from spiders. Two spiders are of concern in the local area: Brown Recluse and Black Widow. Brown recluse spiders are often found in undisturbed dry locations. Black widows are most often encountered around buildings – storage sheds, garages, wood piles, etc. Both may produce serious bites.	Recognition. Learn to recognize poisonous spiders
		Prevention. Avoid putting your hands in places that you cannot see - especially areas that have been undisturbed for a long time. Be sure to shake out clothing and shoes before putting them on. Careful when moving things outside, such as rocks and wood. Be careful when using privies.
		Treatment.
Low to mid-elevations	Bites from rattlesnakes. Western Diamondback Rattlesnakes can be found at most elevations of the park. They can reach five feet in length. Their bite can be very dangerous. Little snakes are the most dangerous because they haven't learned how to control the injection of venom. Venom is a valuable resource that a mature snake won't use indiscriminately.	Recognition. Learn to recognize rattlesnakes.
		Prevention. Always scan the ground ahead when walking around your home, as well as the woods. Be cautious placing your hands in amongst rocks and other areas where a snake may be hiding. Be especially cautious around running water in the summer. The running water can obscure hearing a snake rattle, and the foothill snakes seem to be attracted to the cooler riparian environments. Wear snake leggings where there is risk with obscured visibility.
		Treatment. Minimize movement and strenuous activity. Seek advanced medical care as soon as possible.

All elevations, but most common at high elevations and exposed areas.	Lightning strike.	<p>Prevention (30-30 rule). 30 Seconds: Count the seconds between seeing the lightning and hearing the thunder. If this time is 30 seconds or less, then the lightning is close enough to be a threat. Seek shelter immediately. 30 Minutes: After seeing the last lightning flash, wait 30 minutes before leaving shelter. More than half of lightning deaths occur after the thunderstorm has passed. Stay in a safe area until you are sure the threat has passed.</p>
Hiking on steep or rough terrain off trail	Steep slopes and poor footing (falls)	<p>Prevention. Move slowly and deliberately across steep 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. Utilize trekking poles or Kodiak shovel for stabilization while stepping up, down, and side-hilling. Minimize pack weight and keep balanced. Areas of pine needle accumulation can be very slick.</p>
	Walking in dense vegetation	<p>Prevention. Use trekking poles or Kodiak shovel to move low vegetation aside to see next step (also to check for rattlesnakes in likely habitats).</p>
	Footing on snow	<p>Prevention. Plan to cross snow or ice fields late in the day for better footing.</p>
	Crossing creeks	<p>Prevention. Cross streams early before flow increases due to increased run-off and unbuckle waist belt on pack—use trekking poles and water shoes. Watch for slippery rocks and logs on land and around water, especially during/after rainfall.</p>

	People above you or below you	Prevention. Never be above or below someone on a loose or unstable slope. Be aware of the ground surface in front of you - watch for slick, sloped and unstable areas surfaced by loose rock, leaves, needles, or sticks. Members of a party should move up such slopes one at a time, together at the same elevation at all times, or parallel to each other and out of rock fall danger. Yell “ROCK!!” as loud as you can immediately upon seeing rolling rock(s)—even small rocks can gain dangerous velocities quickly on steep slopes.
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Working under trees	<p>Walking in a forest. Things fall in the forest.</p>	<p>Our work in a forest is not without some risks. When working in a forested area, beware of dangers not only on the ground, but also above you. During or after rain, snow, and wind, cones, branches, and limbs are more likely to fall. Be aware of your surroundings. When working in a developed area, report any tree failures, weaknesses, or large fallen limbs to the local law enforcement staff and the Forestry staff.</p>
	<p>Working near a known tree hazard. Some trees are known to pose a greater hazard than others.</p>	<p>In 2006, a large limb fell from the Robert E. Lee Tree, barely missing three park visitors. Subsequent analysis found that failure of the tree is likely. The potential for injury is greatest within a 120-foot hazard zone, measured from the outside of the tree. This safety zone includes all of the Fallen Monarch (a.k.a. Tunnel Tree) and most of the east leg of the trail from the trailhead to the Robert E. Lee Tree. Working around such a known tree hazard is significantly more dangerous than working in the forest in general.</p> <p>When working on the Grant Grove Trail, observe the unsigned 120-foot hazard zone around the Robert E. Lee Tree. Do not remain in this zone beyond the time required by your duties. All visible identifiers of the tree have been removed, so if you do not know the location of the tree, ask a co-worker or supervisor to identify the tree. Employees should also be careful to keep visitors moving through the 120-foot hazard zone so that they do not linger too close to the base of the tree.</p>
	<p>Observing wildlife in trees</p>	<p>Use caution when observing overhead wildlife in forests. The park once had an incident where a bear kicked off some tiny flakes of bark that got into the employee's eye causing damage. In addition, wildlife waste products sometimes drop out of trees.</p> <p>Employees should also be cautious of sap in conifer forests. Probably not a safety hazard unless it got into your eyes, but it is hard to get out of clothing. I seem to attract the stuff like a magnet.</p>

Choosing a safe campsite	Tree hazards	Look for tree hazards (dead and leaning trees, large dead limbs) before selecting your campsite. Don't assume that established campsites are safe campsites.
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SEKI JOB HAZARD GUIDELINE			
Job Description: Handling Hazardous Materials			Date of last update: December 2, 2003
Division with primary responsibility for this JHG: SIEN		Last updated by: Harold Werner	Reviewed by: Approved by: Bill Putre
Required standards & general notes:	Compliance with OSHA, NPS, and Park requirements.		
Required personal protective equipment:	Wear PPE appropriate for the hazardous material being handled.		
Typical tools & equipment:	PPE appropriate for the task.		
Activity	Potential Hazards	Safe Action or Procedure	
Carrying hazardous materials	Spill	Know what you carry	
		Read labels, MSDS, flammability levels before use, transport.	
		Ask questions about the materials	
Lifting hazardous materials	Spill	Do not handle if risk of spill	
	Injury to back, strain	Use proper lifting techniques	
Applying hazardous materials	Illegal substance	Obtain required permit	
	Contact with skin, eyes, lungs	Wear proper PPE	
		Notify people in the area	
Storage of hazardous materials	Storing materials together that should not be stored together	Know proper storage techniques	
		Use proper storage facilities and lockers	
Backpacking stove use	Tent fires	Do not use stove inside tents	

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	Burns	Be aware of spilled fuel and hot surfaces
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SEKI JOB HAZARD GUIDELINE		
Job Description: Physical Training		Date of last update: February, 2002
Division with primary responsibility for this JHG: SIEN	Last updated by: Tom Warner	Reviewed by: Approved by: Bill Putre
Required standards & general notes:		
Required personal protective equipment:		
Typical tools & equipment:		
Activity	Potential Hazards	Safe Action or Procedure
Increased physical activity	Unknown health concerns	It is recommended that all individuals consult their physician before beginning a higher intensity training program. It is especially important for those over the age of 45, or those having heart disease risk factors (high blood pressure, shortness of breath, high cholesterol) or any other health conditions. Have regular physicals, including blood pressure checks.
	Existing conditions	Consult physician if you have any condition which increased activity may be a problem.
Exercise program	Injuries	With proper training routines, injuries can be kept to a minimum. Start with a slow warm-up, between 5-10 minutes. Lightly stretch - with proper technique. Workout (whether aerobic or resistance training). Longer stretch at the end of training.
		Incorporate resistance training - free weights, machines, pushups, pull-ups, etc. Give muscles adequate recovery time.
		Seek professional instruction with resistance training & stretching. Poor technique can lead to injury, as well as be ineffective.

		Wear proper footwear & clothing for the activity that you are participating in.
Rest	Injuries and/or lack of increase in fitness level	Muscles need recovery time. Muscles are not getting stronger during training, but when they are repairing the micro-damage done during training. When working muscles to fatigue, such as during weight training, it is best to let those muscles recover for 48 hours. Aerobic activity can be done more often. It is advisable to take 2-3 days off per week from strenuous exercise. Overtraining can lead to less strength & fitness increases.
		Nighttime sleep is as important as taking days off. Try to obtain adequate sleep throughout the week

SEKI JOB HAZARD GUIDELINE		
Job Description: Wildlife Management		Date of last update: June 7, 2006
Division with primary responsibility for this JHG: SIEN	Last updated by: Rachel Mazur	Reviewed by: Approved by: Bill Putre
Required standards & general notes:	Compliance with NPS requirements (park and national policy)	
Required personal protective equipment:	Equipment appropriate to the task as specified below.	
Typical tools & equipment:	Field clothing and equipment appropriate to the task as specified below.	
Activity	Potential Hazards	Safe Action or Procedure
Electrofisher	Electric shock	Wear waterproof waders & rubber electrician gloves
		Do not place an unprotected hand in the water without both probes lifted entirely out of the water & the shock turned off
Float tube	Drowning or hypothermia	Never work in water alone
		Wear life vest
		Use belt or means to apply gentle constriction to top of waders
		Do not lunge forward or sideways while in float tube
		Make sure all gear is working properly & go to shore if you have any problems
		Do not go into lake if weather conditions compromise safety
		Do not stay in wet clothing if you are cold
Knife use (fish kills)	Cuts	Take your time & be very careful whenever using a knife to kill a fish or to open the swim bladder

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