

U.S. Department of Agriculture Forest Service	WORK PROJECT/CTIVITY: Wilderness Field Work, Desert	LOCATION: Lake Wenatchee/Leavenworth Ranger Districts	UNIT: Wenatchee N.F.
JOB HAZARD ANALYSIS (JHA) References-FSH 6709.11 and -12	NAME OF ANALYST: McMillin, Therrell	JOB TITLE: Resource Assistant and Wilderness Manager	DATE PREPARED: 6/22/02

TASKS/PROCEDURES	HAZARDS	ABATEMENT ACTIONS
		Engineering Controls * Substitution * Administrative Controls * PPE
Attitude about work and physical limits	Pride/Ego over-ruling good judgment	Taking pride in our work is important and one of the pleasures of work. Likewise, our ego is a tool to help us deal effectively with life. However, sometimes the voice of "pride/ego" talks us into taking a "calculated risk" or pushing harder than we should or becoming competitive. Always listen to the "sage voice" inside that is telling you to slow down, rest, lift less weight, drive slower, etc.
Drive to trailhead Refer to Driver's Handbook and Health and Safety Code Chapter 10 for Defensive Driving techniques	Traffic; narrow mountain roads; mud/rocks.	Obey all traffic laws. Basic speed rule (conditions determine max. speed). Always use seat belts and lights. Drive defensively. Inspect vehicle frequently. Refer to driving JHA.
Backcountry travel (general)	Heat illness	Drink abundant water/fluids. Supplement with electrolytes. Dip baseball cap in water for cooling. Take frequent breaks in shade if laboring heavily. Mid-day siesta if appropriate if spending night and can work early evening instead. For heat regulation, it is OK to hike in shorts and short sleeves if on a trail (or in open subalpine/alpine environment) that is not brushy or rattlesnake. Schedule most physical work for coolest parts of day. If simply too hot, stop working and cool off with shade, cool water, drinking fluids, etc.
	Sunburn/skin cancer Macular degeneration of eyes	Wear SPF 30-50 sunscreen including lip salve every day. SPF 50 is necessary in the alpine zone. Wear wide-brim hat, long sleeves, and long pants as needed. Sunglasses with dark lenses and UV protection. Use aloe Vera for burns.
	Hypothermia	Carry ten essentials always. Layer clothing (wicking layer, insulating layer, rain gear). Return to camp and warm up before getting too chilled; get out of cold wet clothing and into warm sleeping bag. Sip warm fluids. Do work that is physical enough to stay warm. Monitor crew members for chilling, slurred speech, clumsiness, etc and get them to camp to warm up, using first aid if needed. Anticipate cooler conditions and layer appropriately before body cools. Be prepared to bivouac on any backcountry trip (emergency supplies).
	Wind	If wind is blowing so hard that trees could come down, either move work activities (and camp) to a location away from large trees OR hike out. Wear hard hat if it is windy and you are in trees.
	Irregular gait causing repetitive motion injury	Use proper walking technique. Watch and secure footing at all times. Know proper body alignment, muscular stabilization, knee position, and striking technique. Stretch every day. See footwear below.
	Foot problems	Approved footwear is medium to heavy all leather hiking boots with the following features; lug sole, firm ankle support, half shank or 3/4 shank footbed, and a good insole with adequate arch support and metatarsal support. Refer to handouts on shoe

		and boot fit. Most 8" boots provide questionable support and comfort for wilderness travel with a heavy pack. If using 8" boots for wilderness travel, they must meet the above criteria. All boots must be inspected and approved by supervisor. Socks should be a soft thick wool. Liner socks can be used if desired under the wool sock.
	Hotspots/blisters	Break in new boots with shorter walks and hikes first. Immediately doctor feet as hot spots or rubbed areas make themselves known. If boots are causing blisters, pretreat feet at start of workday. Leave blister intact if possible. Change socks daily.
	Crossing talus slopes	For large steps, use hands to stabilize or pick easier route. Test for unstable rock/walk elsewhere. Use 3-point stance. Be prepared to move quickly to next rock if unstable rock throws off your balance. Stay out of fall line of other hikers crossing rock. Yell "rock" if you accidentally dislodge a rock.
	Fording	Refer to pages 85-86 in Mountaineering Freedom of the Hills 5th ed. Trips will be planned to avoid fords during high water. If a creek is too high options are to 1. look up and downstream for a wider and thus shallower crossing, 2. cross in the morning when water is not as high, or 3. turn around and change trip itinerary with CWICC. If there is more than one person, it may be possible to ford thigh deep by holding onto a pole or tool and having only one person move at a time. If a creek seems safe to ford (water is not more than knee deep if fast moving or thigh deep if slow moving) use the following procedure; unfasten hip belt and sternum strap, wear shoes or boots, consider removing pants to reduce drag, use shovel or stick for support on upstream side. Face upstream, and angle upstream as you ford. Move 1 foot at a time, finding secure placement, then move prop. If water is deep and slow, you can angle downstream at same rate as current. If you feel you could be swept off your feet, find a different crossing, backtrack, or wait for lower water the next morning.
	Rock hopping across streams	Rock hopping across a stream is a big temptation that could result in a serious fall. Rock hopping should only be undertaken when rocks are adequately spaced, and either very flat or dry to secure footing. Larger gaps can be jumped with a daypack or no pack than with a heavy overnight pack. Unfasten hip and waist belts.
	Crossing on logs	Logs should not be used when the risk of falling is high unless the log is straddled. Factors that increase risk of falling include small diameter logs, slippery conditions, unanchored logs that bounce, or lots of branches.
	Slips. falls	Use proper hiking footwear. Adjust hiking pace to terrain/personal comfort zone. Watch footing with every step, and secure footing before taking next step. Move slowly if hiking through heavy brush where feet cannot be seen. Don't hurry.
	Encountering stock on trails and in camps	Step off trail; preferably below. Turn around if necessary, to find a safe spot. Do not stand in front of a tree or rock where you could be crushed. Talk to handler/animals as they approach and as passing. No hasty/quick movements or noises.
	Working alone in remote areas	Know radio care and procedures. Carry functional radio/extra batteries. Exercise caution/self-awareness of isolation from aid. Check map with known radio reception areas before leaving station. Remember sign in/sign out procedure plus daily check-in. Keep radio on except when sleeping. Follow all safety procedures.

	fatigue	Do PT prior to backpacking season to maintain aerobic fitness and stamina. Good nutrition with balance of high-quality proteins, carbs, fats. Take vitamins. Pace work. Take rest breaks as needed. Drink LOTS of water, even when weather is cool or wet. Use electrolyte replacement. Change work plan if needed to manage fatigue, such as making camp early. Avoid working more than 9-hour day. Get adequate rest on days off.
	Cumulative fatigue	Same as above. Take annual leave if needed to get more rest. Let supervisor know if you are getting worn out so we can adjust work plan to less arduous work.
	Back strain from pack	Fit and adjust pack carefully. If pack is not comfortable, tell supervisor and we can get you a better fitting pack. Pack heavier items low and close to body. Do not overload pack! In general, a pack should not exceed 50 pounds unless you are packing in extra signs or tools. Never load pack to the point of feeling too weighed down. We can get the job done some other way. Take pack off during rest breaks and stretch back, especially gentle backbends, shoulder and chest openers, and gentle twists. Lift pack to knee first with legs in wide stance, knees slightly bent, then swing around to back.
Litter Removal	Excess weight	If you find too much litter to pack out, bag it up and leave alongside trail with a note asking for help in packing out. Do not give sharp items to public unless you personally make contact and explain contents to them. If you find a huge cache of litter (like an abandoned camp), do your best to clean it up/bag it up and note EXACT location so we can come back with stock or more people
	Cuts	Use extra care with broken glass and rusty cans. Get tetanus shot if cut. Use gloves if possible. Wrap sharp items carefully within trash bags and double bag.
	Bloodborne pathogens	FS will provide Hepatitis B shots. Use latex gloves, sticks, shovel, or litter bag itself to work with toilet paper, diapers, bloody items, or used condoms. If you expose a cut to a potential source of blood borne pathogens (body fluids), wash and disinfect area immediately, radio supervisor, and hike out for medical attention. Hypodermic needles need to be secured so they won't poke you.
	Dangerous Chemicals	This is most likely at trailheads or along Forest Roads. If you see anything that looks like a chemical dump, immediately leave and secure area, call CWICC to report. Do not approach or investigate either chemicals or people possibly associated with it. Know how to recognize meth lab garbage. Get immediate medical attention if any exposure to fumes. Examples of Meth Lab garage: coolers, stoves, tubing, glassware/beakers, rock salt, propane tanks, allergy/cold medicine with pseudoephedrine, acetone, lithium batteries, isopropyl alcohol, coffee filters, starting fluid, drain cleaner, muriatic acid, denatured alcohol, anhydrous ammonia, toluene, ether, lye. See "lifting" below. Roll or scoot heavy rocks. Leave if too heavy.
Fire Ring Removal	Strain	See "lifting" below. Roll or scoot heavy rocks. Leave if too heavy.
	Burns	Make sure a fire is dead out before dismantling fire ring.
	Cuts/Contaminants	See "litter" section above.
	Strain	See "lifting" below.
Cairn Construction/repair	Rolling rock	Make sure cairn has a stable base and is stable as your work your way up. Exercise extreme care to NOT roll rock. Do not work directly above other people. If rock

		rolls accidentally, yell "rock" repeatedly until rock comes to rest, unless you can see that no one is there.
	Strain	See "lifting" below.
	Pinching/crushing fingers	Wear gloves. Keep fingers away from contact points at base of rock when setting down.
Blocking cut switchbacks and removing windfall	Rolling debris	Make sure debris is stable.
	Cuts or blows	If debris is large or sharp, wear long clothing, gloves, hardhat, eye protection.
Clearing logs Watch video; Hand tools for Trail Work (recommended)	Injury from moving log	Unless working under the direct supervision of a certified sawyer, cut trees only up to 8" in diameter. If the fallen tree is pinned between other trees, and especially if the trunk is bowed the log is "under bind". A bound tree will spring back to a straight position once cut. To make your cut, stand on the opposite side of the direction the log will move. Wear hardhat.
	Injury to eyes	Wear safety glasses. Clear a safe workspace, including limbing and brushing.
	Cuts from saw or staubs	Wear long pants, long sleeves, and gloves. Clear safe work area. Securely anchor feet. Keep body parts away from saw. Return saw to sheath when not in use.
Brushing Watch video; Hand tools for Trail Work (recommended)	Back strain	Keep back straight and knees bent. Counter forward bending work with gentle backbends and twists. Stretch frequently.
	Injury to eyes	Wear safety glasses and hardhat. Cut limbs and staubs out of way as needed to brush back to base. Flush cut all limbs and trunks.
	Puncture wounds from staubs	See above item. Wear long sleeved shirt and long pants.
	Insect sting or rattlesnake bite	Look before you leap. Bald face hornets have nests suspended in brush at about head height. Rattlesnakes may be tucked up underneath brush. If in snake habitat, look under brush before working on it.
Constructing or maintaining drains. Removing berm. Cleaning culverts Watch video; Hand tools for Trail Work (recommended)	Back Strain	Keep back straight and knees bent. Switch off working from one side of body and then the other. When shoveling, brace arms against legs to use legs as lever. Stretch frequently.
	Dirt in eyes	Wear eye protection.
	Cuts or blows	Wear full PPE including all leather boots and hardhat. Use proper stance with feet spread for chopping. Use good chopping technique. Carry tool properly and to downhill side. Use guard on Pulaski and axe during transport.
Tool use – general	Repetitive motion injury	Switch sides/hands if possible. Switch off on tasks. Adjust work method as soon as problem (pain/stiffness) occurs. Rest as needed. Inform supervisor if problem does not resolve quickly.
Painting	Exposure to fumes	Ensure ventilation, wear eye protection, follow warning labels/directions. Know location of MSDS.
Snow Travel Refer to pages 276-292 and 300-314 on snow travel in Mountaineering Freedom of the Hills 5 th ed.	Sliding out of control	Recognize and do not enter avalanche-prone areas. Avoid crossing steep snow slopes altogether, unless traveling with ice axe and skill to use it or digging steps with shovel. Know how to "shovel arrest." Use judgement; is situation too risky? If so, don't do it. No travel on Aasgard Pass until snow is 90% gone due to probability of slides and rock fall during freeze/thaw.

	Ice axe use/possibility of goring	Avoid steep snow slopes as first course of action. Only use ice axe if authorized by supervisor. Employee must already be skilled or receive training and practice in an area without dangerous exposure. PPE for ice axe use includes full raingear with hood up, gloves, and leather medium to heavy weight hiking boots. Use proper technique for carrying/transporting axe.
	Falling through snow bridges and pits	Listen for water. Give "edges" a wide berth. Avoid traveling close to exposed rocks/trees. Probe snow; if in doubt, go around or turn back.
	Glissading into hazards	Inspect slope carefully for rocks, holes, debris, and runout area. Look above and below. Use tool as "brake". Learn proper technique.
Wildfires, lightening	Burns, risk of death	Use fire behavior knowledge. Observe/record weather. Get below ridge tops/saddles; keep fire above you if possible. Seek safety zone or leave area if fire behavior is active. Radio dispatch with location, etc.
	Burns and electrocution	Observe weather at all times; anticipate storms. During lightning storms, seek lower ground away from rocks, trees, and water. Do not take shelter in overhangs.
Animals of Concern	Insect/Animal bites	Inform supervisor and co-workers of allergies. Stay to center or inside edge of trail; yellow jackets nest in soft outer edge of trail. In areas with known nests, wear long pants, long sleeves, and gloves. If nest is stirred up, yell "bees" to alert crew and run a short distance away. Get off trail to go around nest. Watch for hornet nests in trees and brush. Carry antihistamine for allergic reactions and an EpiPen or bee sting kit if you know you have an allergy. Use caution when around dogs and wildlife. Get medical attention for mammal bites. For mosquitos and flies use long sleeved clothing, a head net, and/or bug dope as appropriate.
	Tick attacks	Wear long sleeves/pants when working/travelling in heavy brush. Tuck bottom of pant legs into socks or boot. Keep shirt tucked in, and cuffs tight. Use insect repellent on skin and clothing. Inspect body periodically and then thoroughly at end of day. Shower or submerge in water if you can. Know Lyme disease symptoms. Remove ticks by pulling straight out with forceps. Save dead tick for analysis. Put clothing in wash or inspect very carefully before wearing again.
	Rattlesnake bite	Be observant during hand/foot placement. Wear long pants if brushy in snake habitat. If bitten; don't panic, immobilize bite. Radio for help. If alone and a helicopter evacuation is not a possibility, walk slowly, keeping heart rate low, rest periodically, use a makeshift crutch if bite is on leg. Get immediate medical attention. Do not suck venom or use a tourniquet.
	Cougar attack	If encountered, do not run, scream, crouch, or hide (or act like prey). Leave an escape route open to cougar. Maintain eye contact and talk calmly and firmly. Slowly back away. Make self-look big by holding jacket up and open. Don't be so aggressive you provoke an attack. If cougar approaches throw sticks or stones that you can grasp without crouching. If attacked, fight back and yell loudly. Try to remain standing. If knocked over, try to get back up. Protect head and neck with arms.
	Bears	Hang food, toiletries, and trash properly (refer to "Bear Safe Washington" brochure). Don't cook in campsite. Be observant for bear sign when traveling. If bear is encountered, do not approach or make eye contact. If bear charges, make yourself

		appear as large as possible and yell at the bear. Play dead for grizzly bear and protect back of neck. Know how to differentiate between grizzly and black bear.
Plants of concern	Poisonous	The only topically poisonous plant here is poison ivy. It is recognized by having shiny "leaves of three". The only known trail location is the bottom of Castle Rock Trail. DO NOT TOUCH! If you touch inadvertently, wash skin with Technu and wash clothing. Many local plants and mushrooms are poisonous if ingested. Do not eat plants unless you are an expert at identification.
	Thorns	A number of plants are thorny including Devil's Club and Wild Rose. Do not grab at these plants! Wear long clothing. If traveling x-country wear gloves to avoid thorns.
	Rash	Learn to recognize and avoid stinging nettles with their heart-shaped serrate leaves, erect hairs. Wear long clothing. The "sting" will go away overnight and is only a discomfort, not a health concern. Some people get a rash from pulling knapweed. Avoid by wearing long sleeves and gloves.
Off-trail travel	Route finding/getting lost	Do not overextend your skill level. Don't travel cross-country in white-out conditions. Pre-trip map analysis. Practice compass/map use. Carry ten essentials. Don't hurry. NO technical climbing on the job. If lost, stay calm. Can you backtrack to a known spot without endangering yourself? If not, stay put and call on radio for help. Devise signaling devices; a bright colored item in an opening, a signal fire, signaling with mirror on compass, using whistle (3 sets of 3 blasts.)
	Heavy Brush Making footing difficult, and increasing risk of cuts and pokes	Move slowly/purposefully. Watch for trippers and stubs. Learn to plan travel to avoid brush fields whenever possible. Wear long pants and long sleeves. Wear eye protection if brush is at head level or above. Grab brush for added support unless thorny
Backcountry camping Bring all items from wilderness gear list	Burns/asphyxiation	Know how to operate the stove before trip. Never cook/light stove in/near tents or equipment. Never refill fuel cannister indoors. Know location of MSDS.
	Giardia/waterborne parasite	Always boil/filter/or treat drinking water. Boiling method is rolling boil for 5 minutes plus 1 additional minute for each 1,000 feet of elevation.
	Snags, falling branches	Inspect camping area. Look above, all around for potential falling snags, widow-makers, etc. Don't camp within striking range.
	Cuts, abrasions, puncture wounds	Proper training, technique, and PPE. If using a cutting tool or working overhead wear long pants, long sleeves, gloves, hardhat, eye protection. Use pocketknife properly-- maintain control of blade, cut against something else if needed, don't push against back of blade, keep fingers clear when closing blade, close blade to pass knife to another person.
Public contact	Angry People	Disengage if in a situation as described below. If person is angry, but you do not perceive a physical threat, you may need to leave and come back later to give them a chance to calm down. Use "firm but friendly" technique, and "authority of the resource technique" to avoid pissing them off in the first place. Empathize with their situation while persuading them to comply with regulations. Give them options. If no compliance, take I.D. if no physical threat.
	Violent Encounters	Leave confrontational people if there is a physical threat, or the presence of guns, alcohol, drugs, or it is dark. Use radio to call for assistance. Assess all situations; plan ahead for contingencies. Don't get boxed into a corner.

	Creepy People	Get away, even if you have to hike out or change camp location. Once you intuitively do not feel comfortable with a person's or group's behavior, break away. You do not have to make contact or check permit.
	Search and rescue putting you at risk	Know radio protocol. Know USFS role in rescue/aid situations. Never put yourself or additional persons in danger. Establish and maintain communication with CWICC. Don't let reporting party leave.
	First Aid situation putting you at risk	Follow all training procedures. Ensure your own safety first. Follow all protocols for blood borne pathogens as described above in "litter".
Lifting heavy objects	Back strain/injury, scrapes	Use bent legs to lift; keep back straight and stable. Pivot with knees/hips, not back. Keep weight close to body. Get help. Use mechanical advantage/innovation. Lighten load if possible. Leave item if too heavy
Weed pulling	Back strain/injury	Refer to lifting above. Use digging tool or cut weed at base if too firmly rooted.
	Rashes from Vegetation	Wear gloves and long sleeves. Wash skin as soon as possible after weed pulling.
Emergency Plan Read pages 407-412 in Mountaineering Freedom of the Hills 5 th ed. On search and rescue	You are injured or lost and need assistance.	Stop and calmly review your situation. Call CWICC and explain situation, your location, and the closest area you think a helicopter could land. Have CWICC contact your supervisor by phone or radio. See "lost" above.
	You are overdue at the end of your trip.	Make every effort to get out on time without endangering yourself. If you have an unavoidable delay use the radio to notify your supervisor, the person picking you up and notify CWICC. If you are overdue and unable to communicate, we will initiate a search starting at the trailhead you were to come out at and tracing back toward the last place you radioed in from. If you come in late, BE SURE to sign in with CWICC and on our scheduling calendar. Call your supervisor at home and leave a message.
	A crew member you are out with is missing.	Notify supervisor and CWICC by radio. Leave a message at camp of your search plans in case the person returns; check back periodically. Begin a search if you can do so safely. Ask all other users if they have seen the missing individual. Don't search in the dark or in exposed places like cliffy terrain.

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