

JOB HAZARD ANALYSIS	1. JOB TITLE: Chainsaw Use & Maintenance	2. DATE:	<input checked="" type="checkbox"/> NEW <input type="checkbox"/> REVISED
3. TITLE OF WORKER(S): Maintenance Worker Leader, Maintenance Workers, Laborers	4. NAME OF ORGANIZATION: Rocky Mountain National Park	5. LOCATION:	6. DEPARTMENT: Maintenance--Trails
10. SUPERVISOR:	ANALYSIS BY:	REVIEWED BY:	APPROVED BY:

11. REQUIRED AND/OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT:	Hard hat (face shield), eye and ear protection, long sleeves, gloves, long pants, chaps, (note: chaps should cover from waist to top of boots), good boots, wedges, felling axe, respirator (optional).
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7. SEQUENCE OF BASIC JOB STEPS	8. POTENTIAL HAZARDS	9. RECOMMENDED ACTION OR PROCEDURE
Preparing for work.	Injuries or property damage from lack of PPE.	-Crew Leaders and supervisors will be responsible for providing crewmembers with appropriate PPE and related training (see block 11). -Anyone working around chainsaws needs to be in appropriate PPE.
Selecting saw, "pre-trip inspection" of equipment, assembling equipment, mixing fuel, etc.	Injuries or property damage from lack of preparation, proper tools, or poorly maintained equipment.	-All tools should be inspected regularly to ensure their safe condition. -Thoroughly inspect chainsaws and field kits <i>before</i> leaving the Trail Shop. -Any unsafe, defective, or poorly maintained tools should be fixed, red-flagged, tagged, rotated out of service, and/or brought to the attention of the cache manager. -Employees will be trained on the proper maintenance and safe use of chainsaws and related equipment, including the chain grinder.
	Injuries or property damage from improper chainsaw use.	-Only authorized personnel may operate power saws , under the approval and direction of supervisors, crew leaders or on-site (project) supervisors. -When felling trees or in other situations involving anything other than simple bucking of downed trees, chainsaws can be operated only when two or more workers are present.
		-Power saw operators will follow standard operating procedures and guidelines found in S-212 (Wildfire Power Saws), or Missoula Technology & Development Center (MTDC) Chainsaw and Crosscut Saw Training Course.
Managing chainsaws in the field.	Injuries or property damage from lack of tool or project management.	-Tools and equipment, when not in use, should be kept in an orderly manner a safe distance away from the area of work and the public. -All protective covers, and scabbards should be in place whenever such tools are not actively being used. Use the 'chap-wrap' technique. -The right tool for the job should always be used to decrease the chances of injury, incidents, or damage to a tool through improper use.

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Transporting chainsaws.	Injuries or property damage from transporting tools.	<ul style="list-style-type: none"> -Be extremely careful when carrying saws, keep the power head close to your body, and maintain control of the saw at all times. -Be aware of areas (e.g. mufflers) that can become extremely hot during use. -Sharp edges should be positioned in such a way to minimize exposure to self and others, use scabbards/sheaths, and the ‘chap-wrap’. -Tools need to be carried securely, but also readily separable in case of a slip or fall.
Chainsaw use: general.	Injuries or property damage from lack of or poor communication.	<ul style="list-style-type: none"> -Good communication between crewmembers should reinforce individual awareness of potential hazards. -Trail workers need to stay aware of their surroundings, the location of other crewmembers and other trail users while operating chainsaws.
	Injuries or property damage from lack of project management and control.	<ul style="list-style-type: none"> -Good project management should include consideration and implementation of any of the following: scheduling, logistics, season, trail closures, signage, reroutes, temporary trails/detours, flaggers, guards, lookouts, communications, relays, visibility, signals/hand signs, fatigue, location, elevation, visitor traffic patterns/volume, and other factors.
Project/work site safety considerations.	Injuries or property damage resulting from work site hazards such as weather, loose/unstable ground, snags, brush, insects, swift water etc.	<ul style="list-style-type: none"> -Trail workers should be continually aware of, and prepared for, dynamic and extreme weather. The trail’s handbook addresses these topics, and should be readily available to all employees. -Safety is everyone’s primary responsibility, and all employees should take an active role in hazard identification, analysis, and mitigation. -If at any point, a job is deemed unsafe, workers should feel entitled to stop until the appropriate PPE, engineering control’s, equipment or conditions are available to make the job safe.
		<ul style="list-style-type: none"> -Each crewmember should receive training on basic radio procedures, emergency response plans, and SAR operations (see trails handbook). -Each crew will be provided at least one first-aid kit and water-filter. -Crewmembers should be familiar with its location and contents at all times. -Basic first aid/CPR training will be available for all crewmembers.
Chainsaw use: general.	Injuries from improper body mechanics, body positioning, etc.	<ul style="list-style-type: none"> -Each employee should be provided training on the safe and proper use of the most important, primary tool—their bodies (Strong, Alert, Focused, Energetic, or SAFE training). Proper techniques of stretching, lifting, bending, moving, rolling rocks, tool use, securing good footing, the importance of good nutrition and hydration, etc., should be address.
	Muscle strains, pulls, and repetitive motion injuries.	<ul style="list-style-type: none"> -Each employee will be given time on the job to properly stretch and warm-up before and during physical activity for a period of time deemed appropriate by the crew leader, or on-site supervisor. -Employees will be encouraged to switch hands often, and vary the types of activities performed to limit exposure to repetitive motion injuries. However, when operating a chain saw, the correct and only hand positions are left hand on the brake and right hand on the rear handle. -Logic dictates that if proper body mechanics are employed while using any tool, proper tool use should follow.

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	Injuries or property damage from poorly maintained equipment.	<ul style="list-style-type: none"> -At full throttle, the chain can reach speeds of 45 mph! Be careful! -The chain brake should be functional, and tested prior to each use. -Chains should be sharp, and spares should be readily available.
		<ul style="list-style-type: none"> -An O26 displaces 8,316 cu. in. at idle, while a resting person only breathes 104 cu. in.! Keep air filters clean! -At full throttle, an O26 requires 35,640 cu. in. of air every minute! -Air filters should be thoroughly cleaned at least once per use or once a day, and have a spare along.
	Injuries or property damage from improper chainsaw use—general.	<ul style="list-style-type: none"> -Always thoroughly size-up each and every tree, before any cuts are made. -Constantly assess and reassess as you go—things can change! -Never attempt to cut any tree that is unsafe, that you are uncomfortable with, or that is beyond your skill level.
Chainsaw use: general do's and don'ts.	Injuries or property damage from improper chainsaw use—general.	<ul style="list-style-type: none"> -Never attempt to cut any tree when conditions aren't right or too hazardous—e.g., high winds, deep snow, etc. -Always have at least one escape route and safety zone planned prior to making any cuts. -Always post guards or lookouts when clearing trails, preferably in the line of sight of the chainsaw operator. -Always yell-out, “front-cut! Back-cut!” and, “falling!” when falling trees. -Try to accomplish work with as few cuts as possible to reduce visual impacts, but keep it safe and within reason!
Chainsaw use: general do's and don'ts.	Injuries or property damage from improper felling, bucking, or limbing.	<ul style="list-style-type: none"> -As a general rule, always release the stump shot from stump first, then limb your way out to the top and buck your way back to the stump. -Anticipate where the tree is being pinched, where it's under tension (pulled apart) and where it's under compression (pushed together/compressed). -Watch the kerf—it is a good indicator of tension and compression—if the cut opens, it's under tension: if it closes, it's under compression. -But don't forget to look up, down and all around—don't focus in on one thing and neglect to watch for other hazards. -Anticipate ‘spring-back’ from ‘spring poles’, saplings or pinched trees. -Always work from the uphill side unless the situation dictates otherwise. -Always try to cut limbs on the opposite side of the tree in relation to where the operator is standing, as terrain, tension, and the situation allows. -Flush cut stumps, and scarify/checkerboard to encourage decomposition. -Use wedges, especially on larger diameter material. -Be extremely careful when setting and taping wedges! If possible, stop the chain and engage the chain brake while setting and driving wedges. -Analyze stumps to assess the operation.
	Injuries from materials: logs.	<ul style="list-style-type: none"> -Rotten or wind-blown trees should be considered unsafe until thoroughly sized up and inspected. -Be especially careful rolling logs and rounds on loose or steep slopes. -Clear a path, and post guards to minimize potential for injuries. -Use an adequate number of bodies when moving logs by hand (tongs).

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Bridge construction-saddle notches, feathering, etc.	Injuries or property damage from improper technique, lack of control, kickback.	<ul style="list-style-type: none"> -Saddle notches and other joinery will be instructed and performed under the direction of supervisors, crew leaders or on-site (project) supervisors. -Saddle notches, plunge cuts, and mortise work are technical and difficult procedures. Extreme caution should be exercised when performing these cuts. -Operators need to be familiar with the principles of kick-back, and how to avoid it. -Suggest using “safety chain” whenever performing joint work. -Smaller sized power heads are better suited for fine notch-work.
	Injuries, property or resource damage from, lack of control, or flying debris.	-When ‘feathering’ bridge stringers, make sure spotter is not in line with the bar in case of a thrown chain, or flying debris.
Cutting/working with pressure treated wood.	Hazardous materials.	<ul style="list-style-type: none"> - Employees cutting or working with pressure treated wood should minimize their exposure to direct skin contact and wash hands before eating, and consider wearing a dust mask or respirator. -Saw dust and scraps from ACQ treated wood are considered non-native material and must be packed out and properly disposed of. -Consider placing temporary booms over water, and/or perform as much cutting as possible away from water sources.

JSA Instructions

The JSA shall identify the location of the work project or activity, the name of employee(s) writing the JSA, the date(s) of development, and the name of the appropriate line officer approving it. 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.

Blocks 1, 2, 3, 4, 5, and 6: Self-explanatory

Block 7: 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).

Block 8: Identify all known or suspect hazards associated with each respective task/procedure listed in block 7. For example:

- a. Research past accidents/incidents.
- b. Research the Health and Safety Code or other appropriate literature.
- c. Discuss the work project/activity with participants
- d. Observe the work project/activity
- e. A combination of the above

Block 9: Identify appropriate actions to reduce or eliminate the hazards identified in block 8. Abatement measures listed below are in the order of the preferred abatement method:

- a. Engineering Controls (the most desirable method of abatement). For example, ergonomically designed tools, equipment and furniture.
- b. Substitution. For example, switching to high flash point, non-toxic solvents.
- c. Administrative Controls. For example, limiting exposure by reducing the work schedule.
- d. PPE (least desirable method of abatement). For example, using hearing protection when working with or close to portable machines (chain saws, rock drills, portable water pumps)
- e. A combination of the above.

Block 10: The JSA must be reviewed and approved by a supervisor.

Block 11: List all recommended and required PPE relevant for job/activity.

Emergency Evacuation Instructions

Work supervisors and crew members 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 work site.

Be prepared to provide the following information:

- a. Nature of the accident or injury (avoid using victim's name).
- b. Type of assistance needed, if any (ground, air or water evacuation).
- c. Location of accident or injury, best access route into the work site (road name/number), identifiable ground/air landmarks.
- d. Radio frequency(s).
- e. Contact person.
- f. Local hazards to ground vehicles or aviation.
- g. Weather conditions (wind speed & direction, visibility, temp).
- h. Topography.
- i. Number of person(s) to be transported
- j. Estimated weight of passengers for air/water evacuation.

The items listed above serve only as guidelines for the development of emergency evacuation procedures.

JSA and Emergency Evacuation Procedures Acknowledgement

As supervisor I acknowledge that the following employees have participated in the development of this JSA, accompanying evacuation procedures and have also been briefed on the provisions thereof:

Supervisor's Signature:
