

<b>JOB HAZARD ANALYSIS</b>	<b>1. JOB TITLE:</b> Cyclic Maintenance of 38 Miles of Park Trails.	<b>2. DATE:</b>	<input checked="" type="checkbox"/> <b>NEW</b> <input type="checkbox"/> <b>REVISED</b>
<b>3. TITLE OF WORKER(S):</b> Maintenance Worker Leader, Maintenance Workers, Laborers.	<b>4. NAME OF ORGANIZATION:</b> Rocky Mountain National Park	<b>5. LOCATION:</b> RMNP Trails	<b>ANALYSIS BY:</b>
<b>6. DEPARTMENT:</b> Maintenance--Trails	<b>10. SUPERVISOR:</b>	<b>APPROVED BY:</b>	<b>REVIEWED BY:</b>

<b>11: REQUIRED AND/OR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT:</b>	Hard hat, ear protection, eye protection, respirator, gloves, long pants, chaps, good boots.
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<b>7. SEQUENCE OF BASIC JOB STEPS</b>	<b>8. POTENTIAL HAZARDS</b>	<b>9. RECOMMENDED ACTION OR PROCEDURE</b>
Preparing for Cyclic Maintenance work—establishing performance plans (evaluations), standard operating procedures, employee duties and responsibilities, safety plan, emergency response plan, references and resources available, etc.	General—all hazards.	Crew leaders and supervisors are responsible for ensuring each employee: - <b>Understands that our most important achievement is for every employee to conclude each and every day without personal injury or damage to property.</b> -Is provided adequate orientation, equipment and training as per their duties and responsibilities. -Participates in and supports an environment where all valid safety concerns can be raised and addressed, without fear of judgement or reprisal.
	Injuries resulting from lack of PPE or training.	-Crew leaders and supervisors are responsible for providing crewmembers with adequate PPE and related training. Refer to block 11.
	Injuries or property damage resulting from lack of knowledge or communication.	-Crew leaders and supervisors will conduct and document weekly safety meetings to discuss safety issues, projects, and other work related topics. -Crew leaders will also conduct, whenever appropriate, ‘tailgate’ safety and project orientation meetings with crews to avoid miscommunication.
	Injuries or property damage resulting from lack of knowledge or communication.	-Good communication between crewmembers should reinforce individual awareness of real and potential hazards. -Crewmembers should be aware of their surroundings, the location of other crewmembers and other trail users while performing trail work. -Each crewmember should receive training on basic radio procedures, emergency response plans, and SAR operations (see trails handbook). -Personnel should review the MSDS for any product they are unfamiliar with.
	Injuries or property damage resulting from lack of equipment or training.	-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.
	Injuries or property damage resulting from lack of preparation or hazard mitigation.	-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.
		- <b>JHA’s will be developed and made available for special or individual projects, such as this one for Cyclic Trail Maintenance.</b> - <i>These materials should be actively used by all employees as a training aid and reference for job safety and excellence.</i>

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Preparing for Cyclic Maintenance work—establishing performance plans (evaluations), standard operating procedures, employee duties and responsibilities, safety plans, references and resources available, etc.	Injuries resulting from being unprepared: deficient or insufficient personal equipment—brand new or aging boots, lack of adequate food, water, clothing, rain gear, first aid, sunscreen, maps, etc.	-Supervisors and crew leaders will provide information on what is required and recommended to carry, as well as what employees can expect, what is expected in return, and other important information about life on Rocky Mountain National Park’s trail crew.
Project/work site safety considerations.	Injuries or property damage resulting from work site hazards such as weather, loose/unstable ground, snags, brush, insects, poisonous/hazardous plants and animals, swift water, cliffs/heights, edges, etc.	-Crew Leaders and Supervisors are responsible for planning, project development, and initial work site hazard analysis and mitigation. - <b>Safety is everyone’s primary responsibility</b> , and all employees should take an active role in hazard identification, analysis, and mitigation. - <b>If at any point, a job is deemed unsafe, workers should feel entitled to stop until the appropriate PPE, engineering controls, equipment or conditions are available to make the job safe.</b>
Performing Cyclic Maintenance work: hiking, bending, shoveling, digging, grubbing, swinging, chopping, cutting, brushing, pushing, pulling, lifting, dragging, moving materials, etc.	Injuries from improper body mechanics, body positioning, etc.	-Each employee will 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 materials, tool use, securing good footing, the importance of good nutrition and hydration, etc., will be addressed.
	Muscle strains, pulls, and repetitive motion injuries.	-Each employee will be given time on the job to properly stretch and warm-up before, during and after 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.
Performing Cyclic Maintenance work: tool use and maintenance.	Injuries from tools or equipment.	-Each employee will be provided training on the safe and proper use and maintenance of tools and equipment used in trail work. -The right tool for the job should always be used to decrease the chances of injury to an employee, or damage to a tool through improper use. -Logic dictates that if proper body mechanics are employed while using any tool, proper tool use should follow.
		-Tools and equipment, when not in use, should be kept in an orderly manner a safe distance away from the work area or the public. -Tools should never be leaned against trees or rocks, always laid down flat, and in such a way to minimize exposure to sharp edges. -All protective covers, scabbards, and shields should be in place whenever such tools are not actively being used. -When carrying tools keep the working end close to your body to avoid accidental injury to others.
Performing Cyclic Maintenance work: tool use and maintenance.	Injuries from tools or equipment.	-Sharp edges should be positioned in such a way to minimize exposure to self and others. -Efforts should be made to avoid carrying tools above waist. Tools need to be carried securely, but also readily separable in case of a slip or fall. -Several lighter trips are better than struggling with one.
		-When loading tools on packs, all protective scabbards and covers should be in place. -Tools will be securely lashed to backpacks in such a way as to not pose an injury, tripping or safety hazard to the person carrying the tool(s) or anyone else on the trail.
		-Metal heads: burrs, mushrooms, etc. should be filled or ground down. -Edges should be sharp and covered when not in use.

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		<ul style="list-style-type: none"> <li>-Wood handles should be free of cracks or splinters, and fit tightly, with no wiggle or play, in respective heads.</li> <li>-Handles should be replaced when they are loose, cracked, or damaged beyond repair.</li> </ul>
Performing Cyclic Maintenance work: tool use and maintenance (rock bars).	Injuries from rock bars.	<ul style="list-style-type: none"> <li>-Workers should never sit, stand, or straddle rock bars.</li> <li>-Exercise caution when crisscrossing rock bars.</li> <li>-Be prepared for sudden or unexpected loss of bite or slippage—use chocks.</li> <li>-Experience shows that as the angle between the ground and the rock bar approach's 90 degrees, the “bite” becomes less secure.</li> </ul>
	Foot injuries.	<ul style="list-style-type: none"> <li>-Workers need to maintain constant awareness of their feet in relation to objects being moved and avoid placing them under materials.</li> </ul>
	Finger and/or hand injuries.	<ul style="list-style-type: none"> <li>-It is recommended that workers use <b>either</b> rock bars <b>or</b> hand lifting techniques to minimize the potential for injuries to hands.</li> <li>-If hands are absolutely necessary in the presence of rock bars, extreme caution and 100% communication with other workers should follow.</li> </ul>
Performing Cyclic Maintenance work: tool use and maintenance.	Injuries caused by shaping or splitting rock and swinging tools.	<ul style="list-style-type: none"> <li>-Chisels and wedges should be frequently ground or filed so that no “mushroom” or burrs develop.</li> <li>-All personnel in close proximity to shaping or splitting operations need to be in full PPE.</li> <li>-In case of a partial miss or deflection, workers need to give a 5 to 10 foot safety circle around anyone swinging a tool.</li> <li>-Consider use of the special driver bit in jackhammer mode to reduce potential hazards when driving wedges.</li> </ul>
Performing Cyclic Maintenance work: rock work.	Cuts or scrapes, from rock and freshly cut edges.	<ul style="list-style-type: none"> <li>-Freshly cut stone is extremely sharp, and workers need to exercise caution while handling or moving this material.</li> <li>-Clear work area often to reduce the chance of tripping or falling.</li> </ul>
Performing Cyclic Maintenance work: chainsaw use and maintenance	Injuries or property damage resulting from lack of skill, training, or supervision.	<ul style="list-style-type: none"> <li>-Only authorized personnel may operate power saws, under the approval and direction of supervisors, crew leaders or on-site (project) supervisors.</li> </ul>
	Cuts, scrapes, burns, crushing or pinching injuries.	<ul style="list-style-type: none"> <li>-Power saw operators will follow standard felling and bucking procedures and guidelines found in S-212 (Wildfire Power Saws), or Missoula Technology &amp; Development Center (MTDC) Chainsaw and Crosscut Saw Training Course.</li> </ul>
Performing Cyclic Maintenance work: moving materials.	Injuries from moving materials.	<ul style="list-style-type: none"> <li>-Fill holes, build temporary structures, and explore options to maximize safety and efficiency in moving materials, especially on steep or loose slopes.</li> <li>-Clear the route of hazards and debris before moving materials.</li> <li>-Communication methods or jargon should be discussed and agreed upon prior to moving materials.</li> <li>-Instructions should come from one person when working in teams of two or more.</li> </ul>
	Loss of control, or injuries from moving materials: logs.	<ul style="list-style-type: none"> <li>-Freshly peeled logs are extremely slippery and hard to control, especially on loose and steep slopes. Freshly peeled bark should be placed backside up to reduce risk of slipping.</li> <li>-Belay all large or questionable materials.</li> <li>-Clear a path, and post guards to minimize potential for injuries.</li> <li>-Use an adequate number of bodies when moving logs by hand (tongs).</li> <li>-Make sure all tongs have safely “bitten” into log and will not slip.</li> </ul>

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	Injuries from moving materials with griphoists and/or highlines.	<ul style="list-style-type: none"> <li>-All personnel will receive training on the safe use and maintenance of griphoists and highlines.</li> <li>-It is recommended that a load calculation is done before every new or major lift, to ensure loads are within safe working limits.</li> <li>-Workers should never straddle the cable, enter or occupy the ‘dead man zone’, and always belay loads down slopes.</li> <li>-Personnel should perform frequent inspection of equipment.</li> <li>-Refer also to the Griphoist &amp; Highline Use and Maintenance JHA.</li> </ul>
Footlog/ footbridge repair and reconstruction.	Overhead hazards, pinches, strains, swift water, etc.	-All appropriate PPE will be used during the repair or reconstruction of foot logs and footbridges, including waders and fall protection. See block 11.
	Injuries to visitors and/or trail users, due to bridge closures or repairs.	<ul style="list-style-type: none"> <li>-Provide temporary access/crossing, while work takes place.</li> <li>-Refer to page 2, for project considerations and mitigation options.</li> </ul>

**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:

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