OSI Instructor's Guide
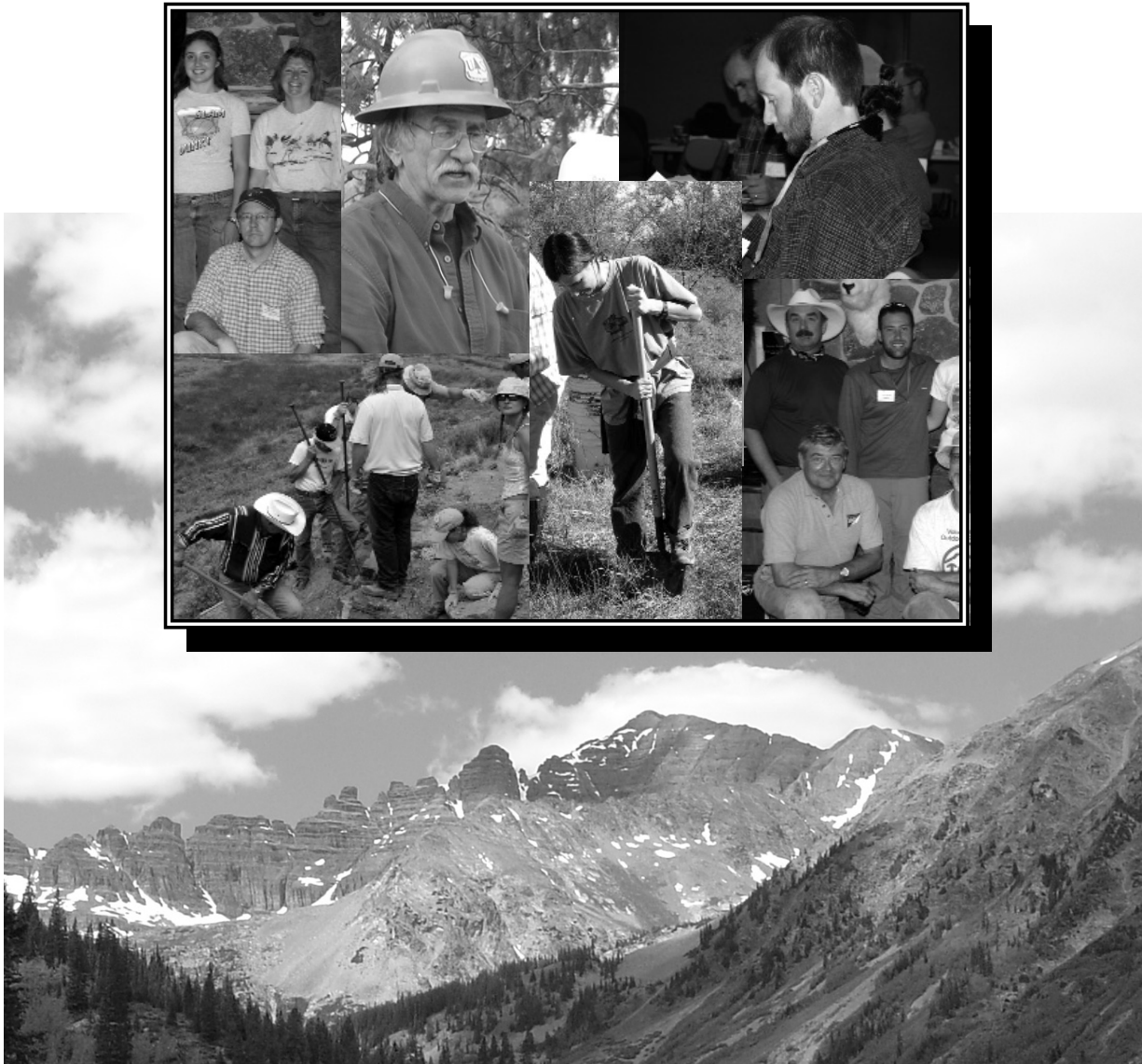## to Teaching Crew Leadership for Trails

Fourth Edition - 2008

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Colorado State Parks
TRAIL GRANTS
this project funded in part with

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About OSI Instructor's Guide
to Teaching Crew Leadership for Trails

PURPOSE

OSI Instructor's Guide to Teaching Crew Leadership for Trails was developed for any organization or land management agency that is interested in crew leadership training. This *Guide* has been designed to teach basic trail maintenance and construction, safety, tool use and crew leadership principles. The intent of OSI is to offer training resources that can be inserted into existing programming. Because this guide is designed to teach only basic technical and leadership skills, we recommend that crew leaders seek advanced training in order to broaden their skills and increase their knowledge.

HISTORY

The content of the *OSI Instructor's Guide to Teaching Crew Leadership for Trails* is a direct reflection on survey results and focus group feedback. Prior to the development of the materials, a comprehensive statewide survey titled: *The Blueprint for Outdoor Stewardship* confirmed the need for consistent, standardized crew leadership training. Training content was specified at statewide focus group meetings with organization and agency representatives. Multi-organizational committees collected curricula to match the focus group specifications. A statewide curricula content review period, followed by testing the materials at pilot workshops completed the development process. The *Guide* has since been refined every year using feedback from workshop participants and instructors who taught the materials.

BENEFITS

OSI Instructor's Guide to Teaching Crew Leadership for Trails and its companion pieces will offer a standardized training package to agencies and organizations. Local, state and federal land management agencies will benefit because all participants will gain basic skills that are uniform across Colorado. Land managers will know what to expect when groups trained with these materials work on projects.

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Local groups and organizations will benefit because they can insert the standardized training into their programming. The standardized materials may strengthen the base of their training program which may shape relationships with land managers.

Another benefit is that all groups that use the standardized training materials will have a common point of reference when discussing trail maintenance and construction, safety, tool use and crew leadership.

THE COURSE

2007 EDITION

The 2007 edition of the *OSI Instructor's Guide to Teaching Crew Leadership for Trails* underwent a few changes in an effort to help Crew Leader Instructors reduce preparation time, improve the flow of the training program, and standardize the presentation of course content.

• The suggested Course Outline (p. xii) and times were updated in an effort to help improve the flow of the training program.
• An Appendix was added in an effort to reduce preparation time and standardize presentation. The Appendix material is a tool for instructors and provides a suggested lecture format, main objectives, teacher's notes and a short outline for each section. Combining both the established course material and the information in the Appendix will result in more effective presentations and consistency in teaching the course statewide. The additional material assists new instructors and provides teaching tips for experienced Instructors.

NOTE: Experienced instructors may find that the Appendices do not cover the content in the same fashion, order and format as the Crew Leader Instructor Guide. As always, instructors need to ensure that all of the content is adequately covered when teaching the course

.

COURSE LENGTH

The course is scheduled to be completed in two eight-hour days.

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CUSTOMIZE

Each course is unique because the location, trail and sponsoring agency are different. Crew Leader Instructors have the flexibility to rearrange the presentation order to accommodate specific goals of a sponsoring organization, or restrictive weather conditions. Course content CANNOT be changed. The material in the manual must be covered to ensure that participants will qualify for course completion documents and certification.

SETTING

This course is designed to use both classroom and on-site, outdoor locations.

COURSE MATERIALS & EQUIPMENT

Each section contains a list of materials and preparation needed for that section. There is a list of handouts and worksheets that can be prepared before the course begins. This list can be found on page xiii. The Crew Leader Instructor will coordinate with the hosting agency to ensure needed equipment will be available.

HOW TO USE THIS MANUAL

The lesson plans follow a recommended agenda for the training. Each section contains **BACKGROUND INFORMATION** pertinent to the topic. While Crew Leader Instructors have license to present the materials in their own style, it is expected that the **OBJECTIVES** of each section be achieved.

Sections

In the table of contents, you will find a list of sections. Each section is a modular lesson to teach. The ordering of sections has several intentions. Leadership, tool, safety, and trail topics are interlaced, with emphasis on safety and leadership topics early on and more trail work later. This interlacing breaks up the flow of the day with alternating indoor sit-down learning and outdoor field learning. In addition, this interlacing reflects the fact that leadership, tools and safety topics only have real meaning in the context of the trail work to be done.

This course outline presents the sections in a recommended order. However, the circumstances and goals of a particular training may necessitate a change in the order.

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Lesson Sub-Headings

Each lesson is organized in a similar fashion, with the following typical sub-headings:

DESCRIPTION: Brief summary of the purpose of the lesson.

OBJECTIVES: Brief summary of what the Crew Leader Trainees will be able to do when they are finished with the lesson.

TIME ALLOWANCE: The estimated time this lesson should take.

MATERIALS & PREPARATION: Materials and preparation needed for the lesson.

BACKGROUND INFORMATION: This section provides back-ground information for the lesson. The Background Information is not intended to be taught in its entirety. In several sections there is more Background Information than can be effectively presented within the time allowed for the training. Instructors should summarize the main points of the Background Information section and combine with the Description and Objectives in order to present a brief introduction to the Presentation (lecture and activity). Pages containing Background Information are highlighted with a grey bar.

PROCEDURE BEFORE PRESENTATION: This section lists what you need to do to get ready for the presentation, for example copy and prepare handouts or prepare the site for trail activities.

PRESENTATION / LECTURE: The lesson to be taught.

ACTIVITY or ON-SITE ACTIVITY: Step by step instructions for a hands-on field activity associated with the lesson.

BRINGING IT TOGETHER: Questions to help trainees synthesize what they have learned and apply to their crew leading circumstances.

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RESOURCES: Reference sources to consult for further information.

HANDOUTS, REFERENCE PAGES, INSTRUCTOR WORKSHEETS: These materials are included at the end of a lesson. Handouts and worksheets are highlighted with a black bar. Background information and reference pages are highlighted with a grey bar. They are cross referenced to the Crew Leader manual by the CL page number printed in the grey bar.

MANUAL: The *OSI Instructors Guide for Trails* is intended for Crew Leader Instructors. The *OSI Guide to Crew Leadership for Trails* is a companion document given to crew leader trainees. The trainee's guide is an assemblage of the background information sections as well as reference and activity sheets from the instructor's guide.

All pages from the instructor's guide that are repeated in the trainee's guide are clearly marked with a grey bar across the top. The number printed in the grey bar, preceded by the designation "CL", is the corresponding page number in the trainees guide. In addition, some materials are provided separately to Crew Leader Instructors. The materials provided separately include evaluation forms, course completion documents , trail terminology document and a set of quick reference cards.

COURSE OUTCOME

Participants will receive Crew Leader course completion documents recognizing their successful participation in a OSI Crew Leadership for Trails training program.

SPONSORSHIP

Crew Leadership for Trails is sponsored by Outdoor Stewardship Institute and funded in part by Great Outdoors Colorado (GOCO) through the Colorado State Parks Trails Program.

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Suggested Course Outline

SUGGESTED TIME	SECTIONS	PAGE	APPENDIX
Day 1			
1 hour	Introduction	1	Appendix A
30 minutes	Keys to Effective Listening	99	Appendix B
30 minutes	Teaching to Different Styles	95	Appendix C
15 minutes	Know Agency Protocols	145	Appendix D
2 hours	Trails Overview	9	Appendix E
30 minutes	Basic Risk Assessment	125	Appendix F
30 minutes	Understanding Motivational Types	25	Appendix G
30 minutes	How to Say Thank You / Meaningful Praise	35	Appendix H
45 minutes	Tools	45	Appendix I
30 minutes	Tool & Safety Talk	67	Appendix I
Day 2			
10 minutes	Day 2 Introduction		Appendix J
20 minutes	Safety Warm Up	71	Appendix K
2 hours, 25 minutes	Trail Construction	77	Appendix L
35 minutes	Assessing Your Crew	139	Appendix M
35 minutes	Conflict and Dispute Management	131	Appendix N
2 hours, 25 minutes	Trail Maintenance	105	Appendix O
15 minutes	Putting it All Together	151	Appendix P
15 minutes	Conclusion	155	Appendix P

Take a 10-15 minute break each morning and each afternoon.
Take a 30 minute lunch break each day.

Approximate Course Length: 16 hours

Note: If travel time needs to be incorporated into the schedule, plan for this in advance and shorten times for topics appropriate for skill and experience level of Crew Leader Trainees.

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Worksheets / Handouts / Reference Pages

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Introduction

DESCRIPTION

Crew Leader Instructors will outline the course activities and material that will be covered over the next two days. Participants will be introduced to the instructors and each other. Instructors will provide information about OSI and introduce an activity that can be utilized by a Crew Leader when leading a crew.

OBJECTIVES

By the end of this module, Crew Leader Trainees will:
• Have an opportunity to meet one another and be introduced to the Crew Leader Instructor(s).
• Have the course content and structure explained with the goal that Crew Leader Trainees will be comfortable with the expectations and requirements for receiving Crew Leader course completion documents.
• Learn an introduction activity that can be utilized as a crew leader.
• Be introduced to teaching/presentation techniques.

By the end of this module, Crew Leader Instructors will:
• Gain insight about the personalities of the Crew Leader Trainees.
• Be able to determine the best way to set the tone for the course.
• Model effective teaching techniques.

TIME ALLOWANCE

60 minutes

SETTING

Classroom and/or outdoors

MATERIALS & PREPARATION

Name tags
Marking pens
Appropriate number of copies of Course Agenda
Flip chart or writing board

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Introduction

BACKGROUND INFORMATION

This training course was developed to teach trail crew leadership consistently throughout the state. Local, state and federal land management agencies will benefit because all participants will gain basic skills that are uniform across Colorado. Land managers will know what to expect when groups trained with these materials work on projects.

Local groups and organizations will benefit because they can insert the standardized training into their programming. The standardized materials may strengthen the base of their training program which may shape relationships with land managers.

Another benefit is that all groups that use the standardized training materials will have a common point of reference when discussing trail maintenance and construction, safety, tool use and crew leadership.

As a result of the training, Crew Leader Trainees will learn trail terminology, methodology and fundamentals of the functionality of a trail. Instructors will teach Trainees about trail maintenance and construction, tools and tool safety – including tool identification, carrying, use and storage. Crew Leader Trainees will learn how to assess risks to avoid injury.

Crew Leader Trainees will learn individual learning styles, listening skills as well as conflict and dispute management. A successful Crew Leader will be able to assess the individuals that make up the crew, understand motivational types and be able to effectively acknowledge efforts of individuals and the team.

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Introduction

By the time the course concludes, Crew Leader Trainees will know how to motivate individuals to produce the desired end result in a safe manner while utilizing the varied skills offered by Trail Crew Members.

Crew Leadership for Trails is a basic course for crew leadership. Time limitations and the amount of material covered in the course do not allow Crew Leader Trainees the opportunity to practice being a Crew Leader. OSI recommends that in addition to this course, Crew Leaders work under an experienced Crew Leader or arrange for mentoring to gain confidence prior to leading a crew. In addition, many organizations and agencies have established protocols and programs for their Crew Leaders. Trainees need to check with these entities to get any additional training that is specific to that group.

PROCEDURE

BEFORE PRESENTATION

1. Use the Description, Objectives and Background Information as well as the notes and outline in Appendix A, page A-1, to develop your own outline for the introduction to this section and activity.

PRESENTATION

LECTURE

Introductions.
1. Introduce yourself as well as other instructors. Do a brief welcome speech. Remember to thank the sponsoring agency or organization, if applicable, and introduce agency/organization members present who were instrumental in helping to organize the training.

2. Instructor will present a summary of the OSI organization (reference p. 5; CL vi) and background information utilizing the prepared outline.

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3. Ask Crew Leader Trainees what their expectations/objectives are for the course.

4. Review the objectives of the two-day training and provide the course agenda.

5. Determine how many students (and course instructors) are present. Divide by two. Start at the front and have students say numbers consecutively. (Numbering consecutively ensures that friends and acquaintances, who tend to sit next to one another, will end up interviewing someone they don't know).

6. Pair up the Crew Leader Trainees who have number 1, number 2, etc. Include the course instructors in this pairing process if you do not have individual introductions prepared.

7. Give each pair six minutes (3 minutes each) to ask questions and prepare a short introduction. At the conclusion of the interviews each person will be presented by their interviewer. Keep the introduction segment informal, allow questions and interactions between instructors and trainees.

8. Review effective leadership and teaching techniques from Apprendix A.

Summary of OSI Training Program

PURPOSE

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The content of the *OSI Instructor's Guide to Teaching Crew Leadership for Trails* is a direct reflection on survey results and focus group feedback. Prior to the development of the materials, a comprehensive statewide survey titled: *The Blueprint for Outdoor Stewardship* confirmed the need for consistent, standardized crew leadership training. Training content was specified at statewide focus group meetings with organization and agency representatives. Multi-organizational committees collected curricula to match the focus group specifications. A statewide curricula content review period, followed by testing the materials at pilot workshops completed the development process. The *Guide* has since been refined every year using feedback from workshop participants and instructors who taught the materials.

BENEFITS

OSI Instructor's Guide to Teaching Crew Leadership for Trails and its companion pieces will offer a standardized training package to agencies and organizations. Local, state and federal land management agencies will benefit because all participants will gain basic skills that are uniform across Colorado. Land managers will know what to expect when groups trained with these materials work on projects.

Local groups and organizations will benefit because they can insert the standardized training into their programming. The standardized materials may strengthen the base of their training program which may shape relationships with land managers.

Another benefit is that all groups that use the standardized training materials will have a common point of reference when discussing trail maintenance and construction, safety, tool use and crew leadership.

SPONSORSHIP

Crew Leadership for Trails is sponsored by Outdoor Stewardship Institute and funded in part by Great Outdoors Colorado (GOCO) through the Colorado State Parks Trails Program. Information about OSI's other leadership and stewardship training opportunities can be found at www.cotionline.org.

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OSI Crew Leadership for Trails Agenda

DAY 1

1. Introduction to Trails Crew Leader Training
2. Keys to Effective Listening
3. Teaching to Different Styles
4. Know Agency Protocols
5. Trails Overview
6. Risk Assessment
7. Understanding Motivational Types
8. How to Say Thank You / Meaningful Praise
9. Tools
10. Tool & Safety Talk

DAY 2

11. Day 2 Introduction
12. Safety Warm Up
13. Trail Construction
14. Assessing Your Crew
15. Conflict and Dispute Management
16. Trail Maintenance
17. Putting It all Together
18. Conclusion

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Course Objectives

By the time the course concludes, Crew Leader Trainees will:

▶ Know how to motivate individuals to produce the desired end result in a safe manner.

▶ Understand practical trail construction and maintenance techniques.

▶ Know about tools and tool safety – including tool identification, carrying, use and storage.

▶ Know how to assess risks to avoid injury.

▶ Understand individual learning styles and the importance of listening and conflict management skills.

▶ Experience a mix of in- and out-of-the-classroom discussions and activities that facilitate learning.

▶ Learn effective teaching and leadership techniques.

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Trails Overview

DESCRIPTION

Crew Leader Instructors will introduce Crew Leader Trainees to basic trail development and planning. Crew Leader Trainees will learn the fundamentals of trail development, including concepts for sustainable trail planning, trail construction and maintenance standards, and trail anatomy and terminology.

OBJECTIVES

By the end of this module, Crew Leader Trainees will be able to:
• Identify the basic concepts of trail development and planning.
• Identify common trail design problems in the field.

TIME ALLOWANCE

30 minutes classroom
1-1/2 hours in the field

SETTING

Classroom & outdoors

MATERIALS & PREPARATION

Marking pens
Flip chart or writing board
Pre-marked trail for walk and talk
Research trail standards for walk and talk. Talk to
    agency representative where training is held.
Wooden stakes, hammer, or flags
Appropriate number of copies of handout:
    Trail Terminology (provided separately)

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Trails Overview

**BACKGROUND
INFORMATION**

The Importance of Planning

It is essential that Crew Leaders have a basic understanding of trail development and planning. Knowing how trails are planned for sustainability, understanding the objectives of the trail, and understanding the impacts of a trail will enhance a Crew Leader's ability to effectively communicate trail concepts to the crew. It is important for a Crew Leader to involve their crew in identifying existing problems and brainstorming solutions as a team.

Planning is an important first step in the development of a trail for a land management agency or organization. During the planning process, agencies will consider various environmental factors as well as establish goals and objectives for trail development. Trails vary considerably by area management objectives, intended user groups, environmental conditions, location, and past use patterns.

Developing sustainable trails is a planning objective for most agencies. Characteristics of a sustainable trail include:
• Supports current and future intended use with minimal impact to the area's natural systems.
• Produces negligible soil loss or movement with minimal impact to vegetation and fauna that inhabit the area.
• Pruning or removal of certain plants may be necessary over time.
• Accommodates existing use while allowing for appropriate future use.
• Requires little rerouting and minimal long-term maintenance.

Good planning begins by establishing objectives. It is important to understand the objectives for a trail system or work section before beginning any trail work. Why are we doing what we are proposing to do? What are we trying to accomplish with this particular trail? Is it to provide access for visitors to a special

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Trails Overview

attraction, provide an escape and rescue route, create an interpretive opportunity, reduce impacts to other trails by providing alternatives, or rebuild an existing trail that has deteriorated? All steps in the trail design, construction, and maintenance process are grounded in the objectives set out during the planning process.

Objectives can be compromised or changed unintentionally through new construction, reroutes, or maintenance activities. For example, if a trail is designed as a universally accessible trail to an overlook but, during maintenance work a step or drainage dip is installed, the trail objectives have been compromised. Similarly, if a trail is intended for mountain bike and equestrian use and steps are installed, trail objectives will be compromised.

Examples of trail objectives:
• Provide high quality recreation experiences for families
• Provide access for physically challenged individuals or groups
• Provide high quality recreation experiences for mountain bikers
• Provide high quality recreation experiences for motorized recreation
• Provide opportunities for interpretation and environmental education
• Provide access to an area for camping or hunting
• Provide for multiple-use opportunities
• Provide access to scenic or cultural opportunities
• Reduce resource impacts from unplanned trails and establish manageable use patterns
• Manage conflict among existing users
• Localize use to minimize impact on other areas

Some examples of different trail users and user groups:
• Experienced trekkers, hikers and backpackers
• Bird watchers and other wildlife viewers

Horse and rider on a trail in the Rawah Wilderness area.

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- Casual weekend users
- Families
- School children
- Foreign tourists of varying abilities
- Scientists and researchers
- Physically challenged or other special needs populations
- Local communities
- Park management and ranger patrols
- Mountain bikers
- Horseback riders
- Motorized vehicle users
- Fisherman and hunters
- Winter recreationists (snowmobile, ski, snowshoe)

Both motorized users and non-motorized users have legitimate rights and responsibilities regarding ethical trail use. As is the case with all user groups, they also have different needs and motivations. Understanding and tolerance of all trail users can promote a positive share-the-trail ethic and may help with conflict resolution.

Trail Impacts
Trails can have impacts, both desirable and undesirable. Undesirable impacts can be environmental such as erosion, stream sedimentation and contamination, and habitat fragmentation or social such as conflict among trail users, attracting undesired users, etc. Desirable impacts include new and expanded recreation opportunities, increased understanding of conservation issues, and increased tourism revenues.

Examples of trail impacts include:
- New recreation opportunities
- Education/interpretive opportunities
- Social benefits
- Economic boost to community

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• Health benefits
• Reduction in resource impacts by directing and channeling visitor use
• Stress on human sensitive wildlife species
• Loss or degradation of vegetation
• Visual degradation
• Increased use
• Increased demands upon maintenance and patrol resources

Trail Anatomy and Terminology
Understanding trail terminology will assist Crew Leaders in understanding trail issues while also increasing confidence in communicating trail concepts to crew members.

Figure 1.
Trail structure anatomy
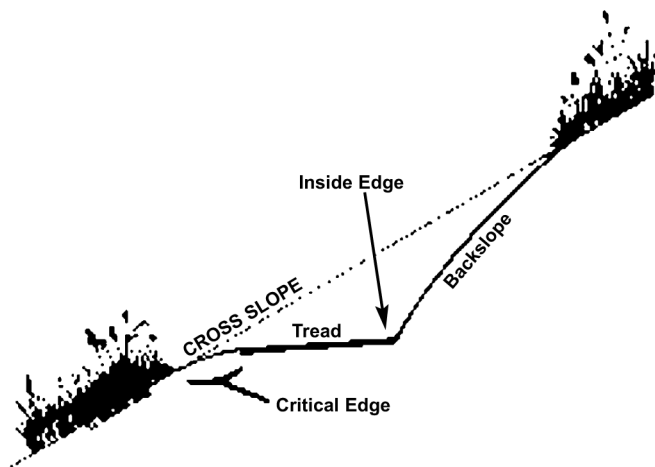
Tread: The tread is the surface of the trail on which users walk or ride. The tread may be either built as a "partial" or "full bench" trail. Partial bench trail is essentially cut-and-fill, where all or part of the trail is composed of excavated (loose) soil, which can be prone to erosion. Full bench construction means the trail is built entirely on native mineral soil, and is less likely

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to erode. Full bench trails are cut into the hillside, and are generally more sustainable than partial bench trails. OSI training will emphasize full bench construction as the most sustainable trail construction technique.

The width of the tread will vary from agency to agency and from trail to trail. Hiking and biking trails will be narrower than trails built to accommodate horses or all terrain vehicles (ATV's). The land management agency will establish the width of the tread in their construction or maintenance standards for trails under their jurisdiction.

Figure 2.
Full bench trail

Backslope
(Gently Blended)

Critical Edge
(Rounded)

Trail Tread
(Outsloped)
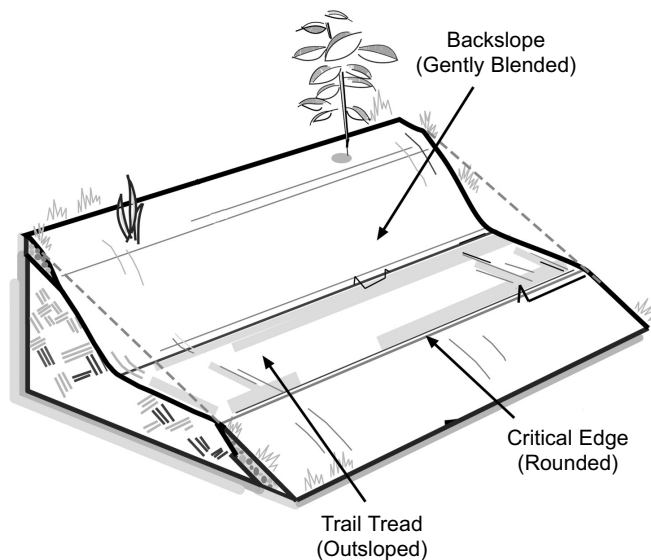
Outslope: Notice in the illustration that the tread is not level perpendicular to the direction of travel. Like the hillside, the tread slopes downward. Outsloping a trail is one technique to get water to flow across the tread rather than follow it or stay on the trail causing puddles. Water flowing down the hillside simply crosses the trail and continues down the hill. Trails that are insloped or have no outslope will tend to allow water to flow down the trail, causing erosion or a puddle on the trail which

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Trails Overview

causes users to walk around the puddle, widening the trail. The trail tread is usually outsloped by 1" to 2" for every 12" in width of the trail tread. Hence, a 24" wide trail would have an outside edge 2" to 4" lower than the inside edge. In general, when dealing with basic trail: outslope is good, inslope is bad, with some exceptions.

Figure 3.
Outslope

Outslope

Outslope
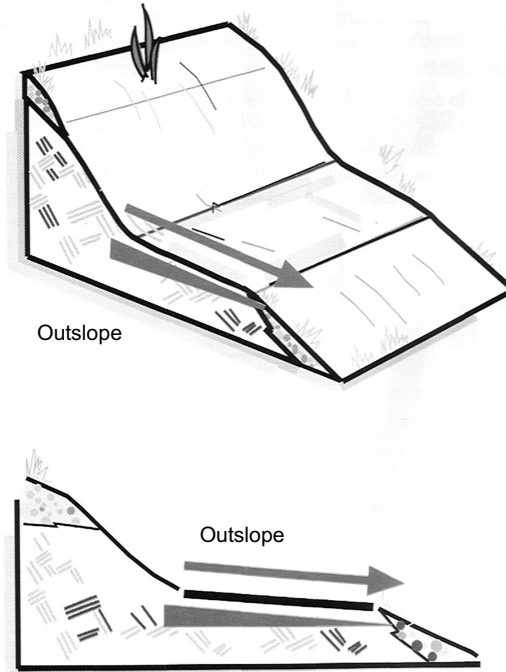
Backslope work on a trail.

Cross Slope: The slope or gradient of the undisturbed hillside is called cross slope. It is generally referred to in percent, not degrees. A good analogy is to alpine skiing terminology – fall line, or the line or path water follows down hill.

Backslope: The excavated slope rising above the inside edge of the tread is called the backslope. The slope is cut back to mimic the original hillside. The backslope is a merger or transition of the natural hillside cross slope with that of the tread. It is "laid back" or reclining into the native hillside. When vegetation returns, the backslope will blend into the hillside and the trail will seem like it has always been there.

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Critical Edge: The rounded outside edge of the trail is called the "critical edge" because this is where critical trail mainte-nance problems usually begin. Rounding the outside edge helps water to flow off of the trail.

Centerline: The middle of the trail is called the centerline. Trails are sometimes marked for construction by placing a row of pin flags along this centerline.

Trail Corridor: The area of passage of the trail, including all cleared and managed parts above, below and adjacent to the tread. This trail corridor is wider than the tread surface itself and is as high as necessary for the trail users. Trail corridors that blend in with the landscape and accommodate traffic will encourage appropriate trail use. When the trail corridor is not maintained, trail users may leave the trail tread and cause unnecessary trailside impacts.

Figure 4.
Trail corridor

Trail Corridor

Trail Tread

Trail Corridor

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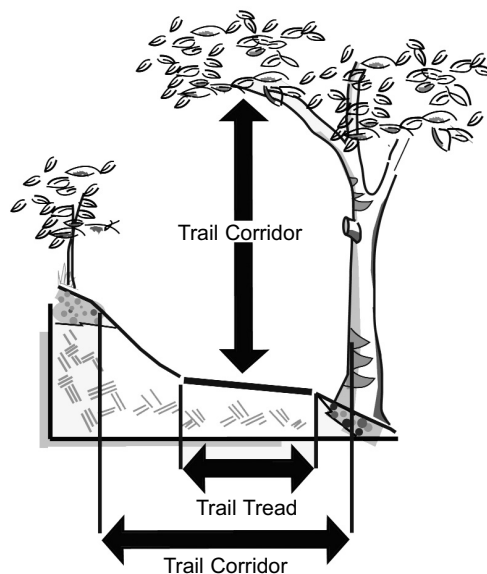
Trails Overview

Grade: The trail grade is the amount of change in elevation of the trail from one point to another. The USFS defines grade as "the vertical distance of ascent or descent of the trail expressed as percentage of the horizontal distance, commonly measured as a ratio of rise to length or as a percent." Grade may be measured for the entire trail but more commonly is measured by trail segment. In simplest terms, grade is the distance the trail rises (rise) over the horizontal distance of the segment (run) and is usually expressed in percent.

Figure 5.
Grade of Cross Slope

Rise 10 feet

Grade
10%

Run 100 feet

$10 \div 100 \times 100 = 10\%$
Grade = 10%
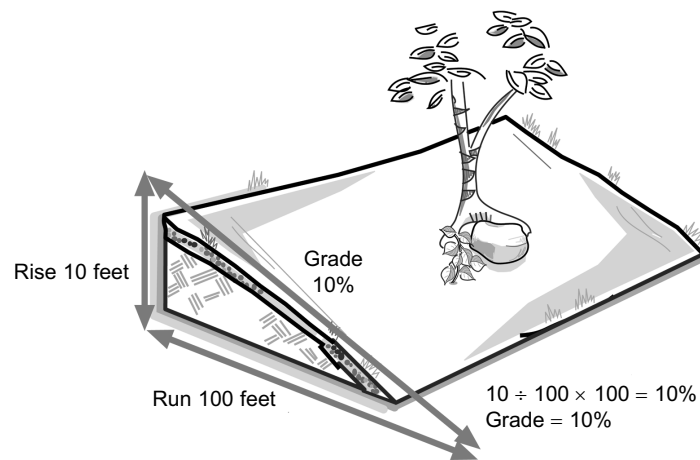
Trail Construction or Maintenance Standards
Land management agencies have trail standards that relate to physical characteristics, users, location, and environmental factors. The trail corridor height, tread width, grades, and surface will vary, depending upon the intended user groups, location, the projected usage level, and environmental factors such as soil type and drainage patterns. Agency standards promote trail objectives, sustainability, uniformity, minimal maintenance, and cost effective trails.

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Trail surfaces can be concrete, asphalt, natural, crusher fines, or other materials (boardwalk, gravel, paved cobblestone, wood chips, etc.). The potential user groups as well as environmental factors will help to determine surface standards.

Agency standards vary by recreation zone and management objectives creating a range from basic primitive trails in wilderness settings to 10-foot wide paved trails in urban or front country areas. The US Forest Service, the National Park Service, Bureau of Land Management and Colorado State Parks may have very different construction or maintenance standards that are dependent upon zoning and conservation objectives as well as user and social preferences. Usually, an agency representative or trail designer will communicate agency standards to the Crew Leader before initiation of the project. The Crew Leader is encouraged to find out the agency standards before beginning work.

Equally important, agency standards vary by the type of experience and the motivations of the visitor. Examples of user motivations:
• Solitude
• Be with others / family
• Challenge
• Education
• Excitement / thrill
• Skill improvement
• Fitness / health
• Enjoy outdoor environment

Environmental factors are also taken into consideration when establishing agency standards for trails. Topography, water features, drainage patterns, soils, wildlife, and vegetation can have an influence on land management agency guidelines.

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Trails Overview

Trail Design
Crew Leaders are not usually called upon or expected to design new trails. Designing, staking and layout of trails requires special training, knowledge, experience, and skill and is usually accomplished by a land management agency representative or qualified trail designer.

The role of topography is well recognized in trail design and construction literature. Drainage patterns and the erosive force of water are directly related to topographic forms. Steeper topographic areas are more susceptible to erosion than more gently sloped areas due to the higher velocity of water flow. Topography also has a social aspect. When topography dictates steeper trail grades (for example, trails on Colorado's 14,000-foot peaks) certain user groups may be excluded, including the physically challenged, the aged, or some family groups and impacts may be greater. It is necessary to balance both environmental impacts and the visitor experience when determining trail standards and final trail grades.

Topography is the trail designer's best friend. The construction and maintenance of trails in flat areas is generally more difficult and requires more maintenance than trails in areas with some topographic relief or cross slope. This is because areas with cross slope allow natural water flow that doesn't usually impact trail corridors. However, cross slope conditions can also present a difficult challenge to the designer when grades are exceedingly steep, rainfall amounts are significant and/or intense, and soils are erosive. A trail designer must have a thorough understanding of how to use topography efficiently and effectively in order to minimize resource damage.

Trail Designers study the area to find natural features that add to user enjoyment while avoiding sensitive areas. They must strive to balance both anticipated environmental impacts and the intended visitor experience when designing trails, while also meeting agency objectives. A significant amount of time goes into the planning, design, staking, and layout of a trail. A trail is not built in one day.

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Trails Overview

Grade

The maximum sustainable profile grade is the steepest acceptable grade for a trail segment that meets agency standards with minimal impacts to natural or cultural resources. It is established based upon a variety of conditions such as:
• Soil types (susceptibility to erosion)
• Rainfall amounts (seasonality and rainfall event intensity)
• Vegetation
• User group characteristics

Soil type, in combination with flow patterns, grade, and user group characteristics are often the determining factor in establishing the maximum sustainable profile grade for the trail, but there is no magic formula for establishing maximum sustainable grade. It requires experience and an understanding of the local conditions as well as intended present and future user groups.

Curvilinear Design Principles

Curvilinear design is an approach to trail design that utilizes the natural land contours as the desired location for a trail corridor. Using this approach, the trail corridor is located to rise or descend gradually along natural contours crossing the contours at an angle so that natural drainage patterns

Figure 6.
Curvilinear trail

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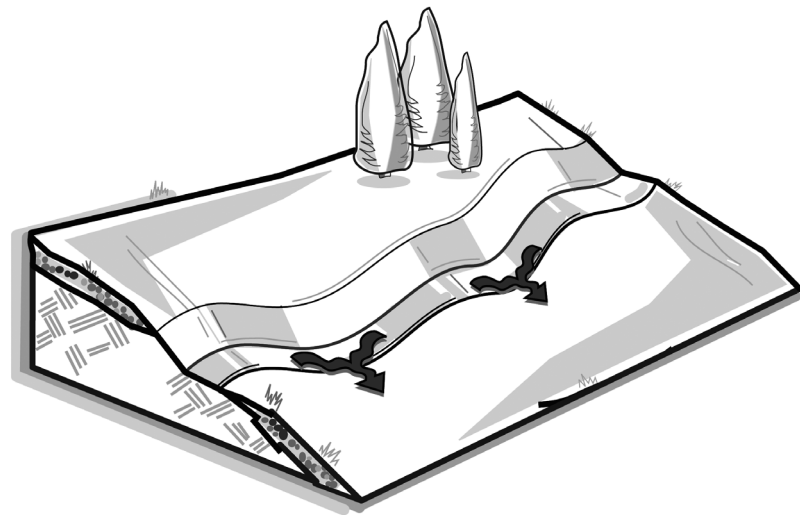
Trails Overview

can be reestablished during the trail construction process. Maintaining trail profile grades that gradually rise or fall across contours will most appropriately ensure sustainable trail construction. It is recommended that trails never climb directly up an existing hillside or fall line. Where necessary, special structures such as dips, switchbacks, steps, and bridges may be needed when a sustainable grade cannot be achieved.

PROCEDURE

BEFORE PRESENTATION

1. Use the Description, Objectives and Background Information as well as the notes and outline in Appendix E, page E-1, to develop your own outline for the introduction to this section and activity.

2. Crew Leader Instructors will walk a trail and mark important sites (stations) that demonstrate good and poor trail conditions. These sites will illustrate the information that is covered in the presentation.

3. Contact a representative of the agency with oversight for the trail. Confirm the agency standards. This is also an opportunity for Crew Leader Instructors to request the help of an agency representative or trail designer to assist in marking the stations.

4. Stations along the trail need to include the following:
   • Trail terminology. Choose a good section of trail to discuss trail parts, their names, and function. (Corridor, tread, outslope, backslope, cross slope, critical edge and grade.)

   • Standards for the trail. What are the agency standards for this trail? Is there maintenance needed? What is intended use and what is actual use of trail?

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• Good and bad examples of trail conditions and design. Have examples of poor design (sections going through wet areas, flat areas, straight up a hill, etc.) as well as good examples of trail design.

• User impacts. Have examples of trail braiding, shortcutting, berms along critical edge developed from bicycle, OHV or other use, trail compaction (cupping), horse hoof holes in mud creating puddles, bicycle tire tracks causing ruts in tread, etc.

• Water impacts. Have examples of erosion, water flowing down a trail, ruts or channels in the tread, stream or drainage crossings, inadequate backslope causing undercutting and sloughing, berms along the critical edge preventing water from sheeting off the trail, inadequate outslope of tread, etc.

• Structures. Examples of structures include water bars and dips, swales, rock walls, switchbacks and climbing turns, turnpikes, steps, etc. Are the structures working and in the right place?

PRESENTATION

LECTURE

1. Crew Leader Instructors will present the basic trail overview to the Crew Leader Trainees utilizing the prepared outline.

2. Provide the Crew Leader Trainees the Trail Terminology handout and refer them to the Accessibility reference page in their manual (CL 13).

3. Crew Leader Instructors and Crew Leader Trainees will head for the trail.

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Trails Overview

OUTDOORS

1. Review all concepts in the field while walking a trail pre-marked with stakes or flags; save some sites for participant's identification and discussion.

2. Encourage participants to discuss and point out factors that illustrate good and/or poor trail conditions at each of the stations.

3. How to mitigate, maintain or repair any trail issues will be discussed in Section VII: Trail Maintenance.

RESOURCES

Edited by Steve Austin, Ed Benson, Curt Chitwood, Kristy Dudley, David Hamilton, Becky Hubbarth, Stuart Miner, Eric Schwab, Dave Simonson, Glenn Ward, Steve West, Claudia Wiley, Tom Wiley, and Wayne Zahm. June 2002. *Volunteers for Outdoor Colorado Crew Leader Manual,* Fifth Edition. Published by VOC. Denver, Colorado.

Larry Lechner, *Trails Training Manual,* 2003. "Trail Planning, Construction and Maintenance in Parks and Protected Areas." Fort Collins, CO. Available from author.

Woody Hesselbarth & Brian Vachowski. 2000. *Trail Construction and Maintenance Notebook: 2000 Edition.* Published by USDA Forest Service.

Prepared by Michael Lee Stills, Jeff Bartlett, and Kim Frederick. August, 2001. *Youth Work Program, Crew Leader Manual,* Administrative. Published by Jefferson County Open Space Trails Program. Golden, Colorado.

Hugh Duffy with assistance from Kim Frederick and Lois Bachensky. January 1991. *Developing Sustainable Mountain Trail Corridors, An Overview.* Colorado State Trails Newsletter. Published by Colorado State Parks.

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ACCESSIBLE TRAIL

Accessibility is a regulatory requirement (set forth in the Americans with Disabilities Act or other legislation). In the trails world, accessibility usually takes into account five characteristics: grade, cross slope, width, surface and trail length. Constructing a trail that is advertised as "accessible" is usually done as a preference on the part of the agency. That being said, it is rare that volunteers or trail crews would be used to build a trail to meet government accessibility requirements. In some cases, trails advertised as "accessible" may not meet all the government standards or guidelines for accessibility. Trail professionals and contractors usually construct these hard-surface (concrete or asphalt) trails.

Other terms used to describe the concept of accessible services and facilities are "universal design" and "universal access."

When constructing partially accessible trail, consider the following points:

• The firmness and stability of the trail surface. Firmness is the resistance to vertical movement; stability refers to resistance to lateral movement.

• Trail sections that have relatively excessive grade and cross slope.

• Any item or material that causes an obstruction. An acceptable obstruction could range from ¼-inch in height above the trail surface to 4 inches in height or more, depending upon the trail standards.

• The minimum clearance width of the trail corridor. Are there any large features (boulders, drop-offs, large trees, and buildings) that restrict or limit the width of the trail corridor?

• Ruts, roots, grooves, or other similar objects in or near the tread that run parallel to the trail tread. These types of objects can force a wheelchair to go where the user does not wish to go.

• Watch for places where two or more critical elements are found together. These critical elements include lack of firmness; lack of stability; steep grade; excessive cross slope; obstructions or rough surface; and overhead hazards. Areas with numerous critical elements can be especially difficult for people with mobility limitations. If a combination of any of these factors exist on a section of trail, try to get rid of at least one of them.

For more information about accessible trail:
www.americantrails.org/resources/accessible/index.HTML
www.fs.fed.us/recreation/programs/accessibility

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Understanding Motivational Types

DESCRIPTION

Crew Leader Instructors will introduce Crew Leader Trainees to an activity that will evaluate their own motivational type and show why motivation is important when working with a crew.

OBJECTIVES

By the end of this module, Crew Leader Trainees will be able to identify their personal motivation characteristics and how an individual's motivational characteristics can influence leadership styles.

TIME ALLOWANCE

30 minutes

SETTING

Classroom or outdoors

MATERIALS & PREPARATION

Scissors
Three (3) hats or bags
Colored paper or 3 different items in sufficient quantities
        (typically 10 x number of participants, for each
        type of item).

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Understanding Motivational Types

BACKGROUND INFORMATION
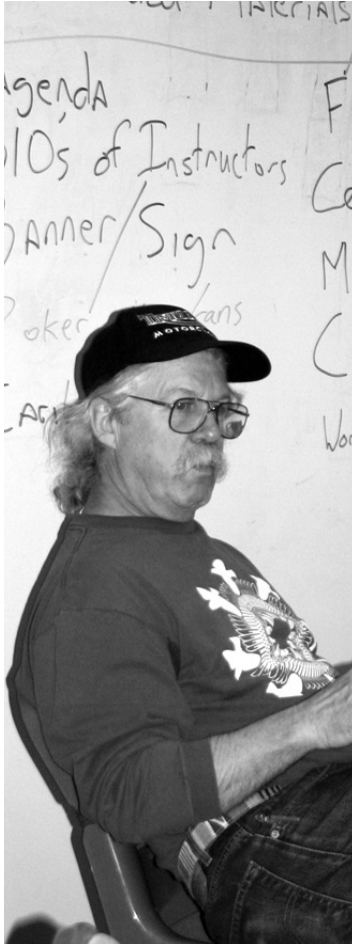
Researchers David McClelland and John Atkinson suggest that there are three different motivating characteristics in human behavior. Although they acknowledge that most individuals have a mix of all three types, one tends to dominate.

The three characteristic types identified are:

The Achiever:
This person is committed to accomplishing goals, welcomes a new challenge and looks for opportunities to test out new skills and improve performance.

The Affiliator:
This person values relationships, enjoys working with others and seeks out opportunities to be helpful and supportive.

The Power Person:
This person seeks to influence people and events so that change is realized.

No one style is better than the other. In fact, most successful projects require a mix of styles to blend the work of a group. Teams that include a variety of styles benefit from the different perspectives people bring to the task. However, people with different styles prefer different kinds of supervision, recognition and job placement. It is helpful to determine the preferred style of a crew member in order to provide an effective match. The reference sheet describes characteristics of each motivational type and the kind of supervision that is the most effective.

PROCEDURE

BEFORE PRESENTATION

1. Use the Description, Objectives and Background Information as well as the notes and outline in Appendix G, page G-1, to develop your own outline for the introduction to this section and activity.

2. Cut small pieces of paper in three different colors; or use three different, distinct objects such as candy. Have plenty of paper or candy!

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3. Place like colored paper or items in three bags or hats with one type of item per bag or hat. Put enough items in each bag or hat for the entire group (20 Crew Leader Trainees = 200 items per bag/hat).

4. Label each bag or hat with A, B or C respectively. Each letter corresponds with the 3 different motivational styles.

5. Place a bag or hat in three different locations in in the room or activity area.

1. Initially, instruct the Crew Leader Trainees to stand in one group. Tell the Crew Leader Trainees that you are going to read a description statement with an associated letter. <u>Do NOT tell the group what characteristic each letter represents!</u>

2. Read a description statement from the Motivational Analysis Exercise (p. 33). (Crew Leader Trainees do not have this page).

3. Instruct the Crew Leader Trainees to go to the bag with the letter that matches their preferred statement.

4. Tell the Crew Leader Trainees to take an item from the bag and wait until you read the next set of description statements before they move again.

5. Repeat steps 3 to 5 until all of the characteristics have been read. Each person should have 10 items.

6. Crew Leader Instructors will present Understanding Motivational Types to the Crew Leader Trainees utilizing the prepared outline.

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What the items signify:

7. Ask each Crew Leader Trainee to note the number of each item. Most likely, each person will have a mixture of items, but usually one item will dominate.

   • Crew Leader Trainees with more items from the A bag are most like: Achiever

   • Crew Leader Trainees with more items from the B bag are most like: Power Person

   • Crew Leader Trainees with more items from the C bag are most like: Affiliator

8. Ask the Crew Leader Trainees to refer to all the Motivational Characteristics (CL 46-48).

9. Review the activity by asking the following questions in Bringing It Together.

BRINGING IT TOGETHER

• What was your dominant motivational type?

• How does your type affect your preference for supervision, recognition and volunteer job choice?

• What happens when your supervisor or boss is of a different motivational type?

• Why is motivational type an important concept for leaders to know?

• What suggestions do you have for using this information about motivational types in working with work crews?

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RESOURCES

The Volunteer Development Toolbox; Adapted from a description by Marlene Wilson in *The Effective Management of Volunteer Programs,* Volunteer Management Associates, Boulder, 1976.

Kufeldt, Pat. Don't Forget To "Pay" Your Volunteers. *LEAVEN*, Vol. 37 No. 5, October-November 2001, pp. 113.

McClelland D.C., Atkinson J.W., Clark R.A. & Lowell E.L. (1976). *The achievement motive.* New York: Irvington.

MacKenzie, Marilyn and Gail Moore. (1993). *The Volunteer Development Toolbox.* Downers Grove, IL: Heritage Arts Publishing

MacLeod, Flora. (1993). *Motivating and Managing Today's Volunteers.* Bellingham, WA: Self-Counsel Press, 148.

McCurley, Steve and Rick Lynch. (1996). *Volunteer Management: Mobilizing All the Resources of the Community.* Downers Grove, IL: Heritage Arts Publishing, 63-125.

Vineyard, Sue. (1996). *New Competencies for Volunteer Administrators.* Downers Grove, IL: Heritage Arts Publishing, 43-50.

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Motivational Characteristics: ACHIEVER

MOTIVATIONAL CHARACTERISTICS	DESCRIPTION	CONDITIONS OF SUPERVISION
Achiever **Goal:** Success in a situation which requires excellent or improved performance	**Positive Attributes:** Concern with excellence, personal best Sets moderate goals, takes risks Enjoys a level of moderate stress Restless/innovative Likes challenging work Likes to work alone Likes to overcome barriers **Negative Attributes:** Will sacrifice people to achieve goals May be insensitive Can be autocratic Gets bored quickly	Wants concrete feedback to improve performance Likes results-focused management Wants a boss who leaves him/her alone Likes to be challenged Enjoys time management and responds to goals, objectives and conceptual thinking Needs a well-delegated task Enjoys being consulted about decisions, planning

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Motivational Characteristics: POWER

MOTIVATIONAL CHARACTERISTICS	DESCRIPTION	CONDITIONS OF SUPERVISION
Power **Goal:** To have an impact or influence on others; to bring about change.	**Positive Attributes:** Concern for reputation, position, respect Tries to shape opinion Wants to change things (e.g. Provide opportunities for the physically challenged) Combative, fighting spirit Verbally forceful Uses social power: • Exercises power to benefit others • I win – you win – (we win!) • Charismatic • Creates confidence in group to realize achievable goals **Negative Attributes:** Uses personal power • I'm in charge • I win – you lose – (we lose) • Group is dependent, submissive • Treats people indifferently • Autocratic	Likes clear cut policies and procedures Likes to know limits of authority Likes strong leadership Needs lots of personal freedom and respect Works well alone Tends to operate outside standard rules and regulations Likes to associate with other "power brokers" Needs to be included in decision making and planning

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Motivational Characteristics: AFFILIATOR

MOTIVATIONAL CHARACTERISTICS	DESCRIPTION	CONDITIONS OF SUPERVISION
## Affiliator **Goal:** To be with others, to enjoy mutual friendships	**Positive Attributes:** Seeks out relationships Likes to work with many people Likes social activity for its own sake Sensitive to feelings, needs and wants of others Supports others in the achievement of their goals Talks about feelings **Negative Attributes:** Will sacrifice project goals to keep people happy Concerned about personal popularity Hates to discipline Is crushed by criticism	Wants a concerned, caring supervisor Enjoys long chats Welcomes advice Likes to be part of a team, pair, group Needs help if situation is tense or unpleasant Avoids conflict May not report problems back to supervisor or may "dump" them back to supervisor

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Motivational Analysis Exercise

CHARACTERISTIC		DESCRIPTION STATEMENT
Achievement	A.	When doing a job, I seek feedback.
Power	B.	I prefer to work alone and am eager to be my own boss.
Affiliator	C.	I seem to be uncomfortable when forced to work alone.
Achievement	A.	After starting a task, I am not comfortable until it is complete.
Power	B.	I enjoy a good argument.
Affiliator	C.	I go out of my way to make friends with new people.
Achievement	A.	I work better when there is a deadline.
Power	B.	Status symbols are important to me.
Affiliator	C.	I am always getting involved in group projects.
Achievement	A.	I work best when there is some challenge involved.
Power	B.	I would rather give orders than take them.
Affiliator	C.	I am sensitive to others – especially when they are mad.
Achievement	A.	When given responsibility, I set measurable standards of high performance.
Power	B.	I prefer being my own boss, even when others feel a joint effort is required.
Affiliator	C.	I am uncomfortable when forced to work alone.
Achievement	A.	I have a desire to out-perform others.
Power	B.	I am very concerned about my reputation or position.
Affiliator	C.	I am concerned with being liked and accepted.
Achievement	A.	I attempt complete involvement in a project.
Power	B.	I want my ideas to predominate.
Affiliator	C.	I enjoy and seek warm, friendly relationships.
Achievement	A.	I desire unique accomplishments.
Power	B.	I have a need and desire to influence others.
Affiliator	C.	It concerns me when I am being separated from others.
Achievement	A.	I am restless and innovative.
Power	B.	I am verbally fluent.
Affiliator	C.	I think about consoling and helping others.
Achievement	A.	I set goals and think about how to obtain them.
Power	B.	I think about ways to change people.
Affiliator	C.	I think a lot about my feelings and the feelings of others.

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How to Say Thank You

DESCRIPTION

Crew Leader Instructors will teach Crew Leader Trainees how to tailor recognition based on individual motivational styles. Crew Leader Trainees will refer to the *Understanding Motivational Types* activity.

OBJECTIVES

By the end of this module, Crew Leader Trainees will be able to provide meaningful praise to Crew Members based on varying motivational styles.

TIME ALLOWANCE

30 minutes

SETTING

Classroom or outdoors

MATERIALS & PREPARATION

Pens and/or pencils

Note: Instructors can consider making several laminated copies of each of the Scenario Recognition Cards for field use (pp. 41, 42, 43).

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How to Say Thank You

BACKGROUND INFORMATION

Crew Leaders represent the front line of any organization/ agency and they are key for the retention of individual Crew Members. A Crew Leader's interaction with each Crew Member will play a large role in the quality of a project experience. Effective crew recognition requires an understanding of why people participate. By determining a Crew Member's motivational type and reason for participation, you can provide an environment that meets the motivational needs of individual Crew Members.

The previous exercise emphasized three motivational types. This activity will focus on effective recognition tailored for each motivational type. This activity will provide the opportunity to practice developing and delivering verbal recognition to a crew based on a Crew Member's motivational type.

PROCEDURE

BEFORE PRESENTATION

1. Use the Description, Objectives and Background Information as well as the notes and outline in Appendix H, page H-1, to develop your own outline for the introduction to this section and activity.

2. Make copies of the Scenario Recognition Cards to use as handouts, if you do not already have laminated copies.

3. Make sure to refer participants to the pages in their manuals for the Motivational Characteristics pages (CL 46, CL 47 and CL 48) from the previous activity, and also the Recognition Tips page (CL 50).

PRESENTATION

LECTURE

1. Crew Leader Instructors will present the activity to the Crew Leader Trainees utilizing the prepared outline.

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2. Present and briefly discuss the Recognition Tips page with the Crew Leader Trainees.

3. Divide the Crew Leader Trainees into equal groups.

4. Give each group one of the Scenario Cards (laminated or paper copies).

5. Instruct the Crew Leader Trainees to work on their assigned scenario. If the group is large, instruct the Crew Leader Trainees to break into smaller groups and work on different Scenario Cards simultaneously.

6. Referring to the *Recognition and Motivational Type* reference sheets (pages CL46-CL48), instruct participants to develop/ write a recognition for each motivational type based on their assigned scenario either individually or together as a group. Encourage use of the Recognition Tips page as a helpful reference tool.

7. Instruct participants to take turns discussing their recognition for each motivational type within their group, as they write their recognitions onto their copies of the Crew Member Recognition Strategy page (CL 51).

8. Make time at the end of the activity to have each team briefly present and discuss their scenario recognitions.

BRINGING IT TOGETHER

How can you apply this exercise to your work situation or in the field?

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How to Say Thank You

RESOURCES

The Volunteer Development Toolbox; Adapted from a description by Marilyn Wilson in *The Effective Management of Volunteer Programs,* Volunteer Management Associates, Boulder, 1976

Kufeldt, Pat. Don't Forget To "Pay" Your Volunteers. *LEAVEN*, Vol. 37 No. 5, October-November 2001, pp. 113.

McClelland D.C., Atkinson J.W., Clark R.A. & Lowell E.L. (1976). *The achievement motive.* New York: Irvington.

MacKenzie, Marilyn and Gail Moore. (1993). *The Volunteer Development Toolbox.* Downers Grove, Il.: Heritage Arts Publishing

MacLeod, Flora. (1993). *Motivating and Managing Today's Volunteers.* Bellingham, WA: Self-Counsel Press, 148.

McCurley, Steve and Rick Lynch. (1996). *Volunteer Management: Mobilizing All the Resources of the Community.* Downers Grove, IL: Heritage Arts Publishing, 63-125.

Vineyard, Sue. (1996). *New Competencies for Volunteer Administrators.* Downers Grove, IL: Heritage Arts Publishing, 43-50.

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Recognition Tips

Recognition:

- Give it frequently
- Give it using different methods
- Give it honestly
- Give it to the person, not to the work
- Give it to the achievement
- Give it consistently
- Give it on a timely basis
- Be as specific as possible

> **Honesty is key.**

> **FOLLOW THROUGH ON THE EXPECTATION THAT YOU SET.**

Day-to-Day Recognition:

- Say "thank you"
- Tell them that they did a good job
- Ask for their opinions
- Greet them by name
- Show interest in their personal interests
- Smile when you see them
- Brag about them to others in their presence
- Say something positive about their personal qualities
- Provide food, snacks to acknowledge
- Demonstrate that you care about them and their well being
- Provide social opportunities on a project for a reward
- Provide educational opportunities
- Involve Crew Members in decisions
- Ask about the Crew Member's outside life (family, other work, interests, etc.)
- Make sure that Crew Members receive treatment equal to that given to staff
- Send a note of appreciation to the Crew Member or the Crew Member's family
- Recommend the Crew Member for promotion or a more responsible job
- Celebrate goals achieved, small triumphs

> **GREETING CREW MEMBERS BY NAME IS A VERY EFFECTIVE RECOGNITION TOOL.**

> **ASK FOR OPINIONS – BUT ONLY IF YOU WILL USE THEM.**

> **BE CAREFUL NOT TO EMBARASS OR SHOW FAVORITISM...**

> **INVOLVE CREW MEMBERS IN DECISIONS *ONLY* IF THEY TRULY CAN BE A PART OF A PROBLEM SOLVING SOLUTION.**

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Crew Member Recognition Strategy

Write a verbal recognition for the Crew Member for each motivational type indicated in the chart below based on the scenario.

MOTIVATIONAL TYPE	RECOGNITION
ACHIEVER	
AFFILIATOR	
POWER	

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Recognition Scenario Card 1

- Peter, one of your crew members, demonstrated signs of being timid and apprehensive at the beginning of the day.

- Toward the end of the project Peter bonded well with his other Crew Members and is interested in learning more about trail projects.

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Recognition Scenario Card 2

PHOTOGRAPH PROVIDED BY CONTINENTAL DIVIDE TRAIL ALLIANCE

- Serena successfully completed 55 lineal feet of tread maintenance on a section of badly eroded trail with 2 other Crew Members.

- This is Serena's first opportunity to work on a trail project.

- Serena is eager to learn and has quickly developed some basic trail work skills.

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Recognition Scenario Card 3

PHOTOGRAPH PROVIDED BY CONTINENTAL DIVIDE TRAIL ALLIANCE

- Bob, one of your experienced Crew Members, assists a more inexperienced Crew Member throughout the day.

- Bob has attended over 10 projects this year, has great technical knowledge and works well with other Crew Members.

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Tools

DESCRIPTION

Crew Leader Instructors will teach Crew Leader Trainees proper tool identification, carrying, use, and storage in order to safely and confidently manage a crew. Crew Leader Instructors will show Crew Leader Trainees what to demonstrate when leading a crew. Crew Leader Trainees will present this information to a Crew as part of an introduction to a safely managed project.

OBJECTIVES

By the end of this module, Crew Leader Trainees will be able to:
• Identify and describe various tools and their uses.

• Teach a crew about "CUSS": the Carrying, Using, Storing, and Safety of hand tools.

• Be aware of the most efficient and appropriate tools for a project.

• Select the right tool for a project.

TIME ALLOWANCE

45 minutes

SETTING

Classroom & outdoors

MATERIALS & PREPARATION

Arrange for required number of tools for all participants:
• Bow Saw
• Lopping and/or Pruning Shears
• McLeod
• Pick Mattock
• Pulaski
• Rock Bar
• Shovel

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Tools

BACKGROUND INFORMATION

Tools can make a crew leading experience either enjoyable or miserable, depending on whether the right tool is available at the right time and whether crew members know how to use tools safely. The information provided gives the basics for hand tools in a project setting. Only basic hand tools used on a project will be covered in this training.

There are many specialized tools available for work projects including rockwork tools, power tools, and motorized equipment. All of these specialized tools require training before using in the field and will not be covered in this section. It is essential to know what tools your agency or organization will allow on a work project.

TOOL TALK

The tools to be used during the day should be introduced in a logical order to allow an effective discussion of their use and safety with the crew. The order of tool presentation is up to the Crew Leader. However, certain subjects regarding tools must be covered. These subjects will be referred to as "CUSS":

· **C**arrying tools
· **U**sing tools
· **S**toring tools
· **S**afety with tools

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Tools

"C" – Carrying Tools

There are basic safety requirements for carrying tools to and from the work site. Be alert and make sure the safety guidelines are enforced throughout the day:

- Always wear gloves while carrying tools.

- Safety sheaths should be properly in place on the tool.

- Pick up a tool and feel for the balance point. The balance point is the place where there is equal weight in front of and behind your hand. Carrying a tool at the balance point results in less strain on wrist and arms. Carrying a tool vertically requires tensing the wrist and provides minimal control over movement of the tool. The best possible control over motion of the tool is obtained when it is gripped at the balance point.

- Always carry tools in hands with arms at sides. The blade or most dangerous part of the tool should point downward.

- <u>Never carry tools propped on your shoulder.</u>

- Tools should be carried on the downhill side of the trail. This is so that the tool can be thrown clear in case of a stumble or fall.

- When it is necessary to carry tools in both hands, carry the heaviest or most dangerous tool on the downhill side.

- Maintain a safe distance between people when walking to the work site. Everyone should be an arm and a tool-length from the next person on the trail while walking.

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Tools

Crew Members need to be responsible for maintaining the correct distance from the person immediately preceding them down the trail.

• Watch where tools are pointed at all times.

• Let the slowest Crew Member set the pace for the group.

• Announce "Coming through" or "Bumping by" when approaching other crews working. Stop and wait for the Crew Members to cease work. The person who is working has the right of way and will cease work and yield when comfortable for them to do so. "Coming through" or "bumping by" is always a <u>request</u> for passage and <u>never a demand.</u>

"U" – Using Tools

Each tool has its proper and improper methods for use. Here are some of the general considerations when using tools:

• Before using any tool, make sure you know what it is used for and how to use it safely.

• Before using any tool, check to make sure the handle is not loose or split. Tag all damaged tools for repair. Any tool with flagging on the handle is not safe to use.

• Adopt the proper stance for using the tool. This will save strain on your back and make the tool more effective to use.

• Establish secure footing before using tools. Be especially careful when working in wet, slippery conditions.

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Tools

• Maintain a safe working distance between Crew Members <u>at all times.</u> Be sure someone else's space is not compromised while using a tool. Do not bunch up or crowd one another. Some organizations will maintain at least a 10-foot distance between workers as a safe operating distance when using tools.

• Full "roundhouse" swings with tools are not generally acceptable unless a Crew Member has extensive experience with this technique. Using a tool this way can be dangerous and may cause the user to quickly tire.

• In the rare occasion a roundhouse swing is necessary, check to make sure the work site is safe and advise those people nearby that you will be swinging. Before starting to work, clear away any brush or limbs that might unexpectedly catch a swinging tool. Yell "Swinging!" before lifting the tool to work.

• Use all tools in a motion parallel to the body rather than towards the body.

• Demonstrate to the crew how to lift with the legs instead of the back. "Head up, butt down" is the order of the day.

"S" – Storing Tools at the Worksite
Tools are dangerous when not stored properly at the worksite; any tool is a potential risk. Here are some things to remember about tool storage:

• Concentrate all tools not currently in use in one area if possible.

• Tool sheaths, due to their small size, are easily lost and should be gathered by the Crew Leader.

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Tools

- Store all tools on the uphill side of the work section or trail so they are not a hazard, but can be reached easily. Store them with the handles pointed down towards the trail or work section, and the sharp or business end furthest uphill.

- Store shovels with the sharp edge towards the ground.

- Never sink axes, Pulaskis, picks, or similar edged tools into the ground or in stumps where they become dangerous obstacles, i.e., impalement and tripping hazards.

- The storage of rock bars requires special attention. Rock bars are heavy and have pointed tips that can severely injure someone if they slide or roll down a hillside. To store rock bars, place the tool on the ground, parallel with the contour, and preferably centered behind a tree or rock for security. They should never be stored in such a way that they can escape downslope and create a javelin-like hazard.

"S" – Safety With Tools
Carrying, using, and storing tools present different safety issues. It is important for Crew Leaders to emphasize tool safety at all times. Remember these tool safety tips:

- Dis-CUSS tools in the morning and re-emphasize "CUSS" all day long.

- Be careful how you carry, use, and store tools at all times. Set a good example for your crew by always being "tool safe".

- Always use proper personal protective equipment like hardhats, gloves, and safety glasses when using tools.

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Tools

- Use the right tool, the right way, for the job at hand.

- Avoid "roundhouse" swings. You could injure someone else and you increase the likelihood of a miss-stroke and hitting yourself. Roundhouse swings are very tiring and unsustainable over extended time periods.

- Tools come in a variety of sizes, shapes, and intended uses. They are all dangerous if not treated with respect.

- Misused tools can break and are a danger to future users. They also cost time and money to repair.

- Remove all broken tools from use immediately, and tag for repair before you forget and the tool is used again.

- Stay alert when others are using tools nearby.

- Do not set a tool down "just for a minute" in the wrong place. It will become a hazard.

- Safety with rock bars is very important; they are a hazard especially when stored improperly.

- Trade off on tools occasionally for relief from repetitive stresses. Repetitive stress may cause more injuries particularly towards the end of the day.

- Always "CUSS" your tools, even if you have a crew of veteran members. The refresher is helpful for everyone.

- Be thinking about the consequences of every move. When working with a rock or log, think ahead so as not to be standing in the wrong place when it moves. Be ready to toss the tool aside and jump free. Avoid cutting

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Tools

toward any part of your body, and watch out for your coworkers. Use skill, not brute force.

• Everyone has different levels of coordination. Some members of your crew may need to use a given tool several times before they are able to overcome their awkwardness. For others, new tools may come as second nature. Spend an appropriate amount of time training each individual to ensure safe and efficient work habits.

PROCEDURE

BEFORE PRESENTATION

Use the Description, Objectives and Background Information as well as the notes and outline in Appendix I, page I-1, to develop your own outline for the introduction to this section and activity.

PRESENTATION

LECTURE

1. Crew Leader Instructors will present the CUSS procedure to the Crew Leader Trainees utilizing the prepared outline. This presentation is referred to as a Tool Talk.

2. Crew Leader Instructors will demonstrate the CUSS procedure and Tool Talk for the following tools:
   • Bow Saw
   • Lopping and/or Pruning Shears
   • McLeod
   • Pick Mattock
   • Pulaski
   • Rock Bar
   • Shovel

3. Crew Leader Trainees will practice the Tool Talk in the Tool and Safety Talk section.

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4. Direct the Crew Leader Trainees to the Tool Description and Uses Glossary in their manual (pp. CL 69-CL 79).

5. Direct Crew Leader Trainees to the Suggested Tools Per Crew reference in their manual, CL 80.

RESOURCES

Edited by Steve Austin, Ed Benson, Curt Chitwood, Kristy Dudley, David Hamilton, Becky Hubbarth, Stuart Miner, Eric Schwab, Dave Simonson, Glenn Ward, Steve West, Claudia Wiley, Tom Wiley, and Wayne Zahm. June, 2002. *Volunteers for Outdoor Colorado Crew Leader Manual,* Fifth Edition. Published by VOC. Denver, Colorado.

Woody Hesselbarth & Brian Vachowski. 2000. *Trail Construction and Maintenance Notebook: 2000 Edition.* Published by USDA Forest Service.

Jim Schmid. 2004. *Tools for Trails.* American Trails website, www.americantrails.org.

Prepared by Michael Lee Stills, Jeff Bartlett, and Kim Frederick. August, 2001. *Youth Work Program, Crew Leader Manual, Administrative.* Published by Jefferson County Open Space Trails Program. Golden, Colorado.

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Tool Descriptions and Uses Glossary

Knowing what a tool is designed for is important. The following tool descriptions contain usage and safety concerns for each tool.
Safe and proper tool usage cannot be overemphasized.

Always be on the lookout for Crew Members using tools improperly. If a Crew Member is using the wrong tool for the job, it can lead to overexertion and increase the potential for an accident or broken or damaged tools. You need to be sure that the right tool is being used for the job.

Common examples of tool misuse are:
• Using a shovel to pry rocks or to dig in hard, rocky soil instead of a rock bar or pick mattock
• Using the axe blade of a Pulaski to break up soil
• Using the grubbing end of a Pulaski to pry up big roots and rocks
• Using an Adze hoe to cut larger vegetation, such as tree roots
• Chipping or prying rocks with a McLeod
• Cutting into dirt or rock with a bow saw
• Chipping rock without safety glasses
• Throwing a tool

When you see these things happening, politely instruct the Crew Member how to use the tool safely. Always keep in mind – safety first!

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Tools for Measuring

Altimeter: An instrument for measuring altitude.

Clinometers: A clinometer is a simple instrument for measuring grades. Most clinometers have two scales, one indicating percent of slope, the other showing degrees. Percent slope, the relationship between the amount of elevational rise or drop over a horizontal distance, is the most commonly used measure. Don't confuse percent and degree readings. It is easy to do! Expressed as an equation:

$$\text{Percent of Grade} = \frac{\text{Rise}}{\text{Run}} \times 100 \text{ percent}$$

A section of trail 30 m (100 ft) long with 3 m (10 ft) of elevation difference would be a 10 percent grade.

Levels: A device for establishing a true horizontal line or plane by means of a bubble in liquid that shows adjustment to the horizontal by movement to the center of a slightly bowed glass tube. Carpentry and construction levels, line levels, and laser levels are different types of levels that can be used for construction of fencing, stone walls, boardwalks, and bridges. Levels also help to determine the slope of trail tread.

Abney Level: Hand-held instrument that is adjusted like a sextant and can be set to a fixed gradient. The user sights through the Abney to a fixed reference (usually a second person) until the crosshair bisects the bubble; this indicates the preset grade.

Global Positioning System (GPS) Receiver: A hand-held, battery powered device used to determine the location (latitude and longitude and/or meridian) and altitude using a network of global positioning satellites.

Measuring Wheel: A device that records the revolutions of a wheel and hence the distance traveled by rolling the wheel over a trail or land surface. (Cyclometer)

Other Measuring Devices: The tilt of the handle on an upright McLeod can be used to measure outslope of tread. A partially filled, clear water bottle can be used as a level. Pulaski's are useful as measuring gauges since the handles are exactly 3 feet long and most heads are 1 foot from end to end. Get a tape measure that has metric units. Another good idea is to mark off commonly used measurements on your tools. Know the length of your feet, arms, fingers, and other handy rulers as a ready reference on the trail. Get to know the length of your pace over a known course so you can easily estimate longer distances.

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Institute

Tools for Cutting, Sawing and Brushing

Bow Saws: Bow saws come in many sizes and consist of a tubular steel frame designed to hold a sharp and deeply toothed steel blade. Blade lengths can vary from 16 to 36 inches.

Bark Spud: A tool with a 1- to 4-foot long wood handle and a dished blade used to remove bark from logs by sliding between the bark and the wood.

Bush Hook: A long handle and either double- or single- edged curved blade gives the bush hook a powerful cut.

Chain Saw: A portable gas-operated saw with an endless chain carrying cutting teeth.

Cross Cut Saws: A crosscut saw is a large saw intended for cutting through downed timber. This type of saw should be used with wedges to hold the kerf (cut) open to prevent the log being cut from sagging and pinching the saw. The crosscut saw has two handles connected by a long steel saw blade. This saw requires two people to use it. Correctly pushing the saw in sync and at the same speed, while your partner pulls allows the saw to work to it's full potential. After a few pulls, a smooth rhythm may be obtained. Crosscut saws are another tool that takes practice and experience to use safely and effectively and may require certification.

Draw Knife: A tool with a sharp blade and handles at both ends used to strip bark from small diameter logs. (Raw Knife)

Froe: An old hand tool used originally for splitting shingles and shakes. It consists of a heavy, 12-inch-long, straight steel blade with a wooden handle. The cutting edge of the blade is placed against the wood to be cut and a club or mallet is used to hit the face.

Lopping and Pruning Shears: Lopping and pruning shears are similar in design and use. However, lopping shears have longer handles to improve reach and increase leverage for cutting thicker stems. Handles on lopping shears range from 26 to 36 inches long, and should be used on live limbs approximately 1 inch diameter or smaller. Pruning shears have shorter handles and should be used on small branches with diameter of approximately 3/8 of an inch. A good rule of thumb is not to cut anything bigger than your thumb. Use a bow saw for limbs larger than 1 inch in diameter.

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Machete: A large knife used to clear succulent vegetation.

Pole Saw: A pruning saw with a telescoping handle to trim branches that would otherwise be out of arm's reach. Some models have built-in loppers that can be operated from the ground with a rope. (Tree Pruner)

Pruning Saws: Single handled, straight bladed pruning saws are useful for limbing, some brushing, and removing small downfall; especially where space is limited and cutting is difficult. Folding pruning saws are handy.

Scissors: Heavy duty scissors or utility shears are used to cut erosion mat, straw wattles and twine used in erosion control.

Swedish Safety Brush Axe: A machete-like tool with a protected short, replaceable blade and a 28-inch handle used to cut through springy hardwood stems. (Sandvik)

Timber Carrier: A tool, with a long handle and hooks, which allows two people on each side of the carrier to transport logs or timber.

Weed Cutters: Weed cutters are used for cutting light growth like grasses and annual plants that grow along trails. They are lightweight and durable and usually swing like a golf club. Tool with a serrated blade at the end of a wooden handle. (Grass Whips, Weed Whip, Swizzle Stick, Swing Blade)

Wire Cutters: Various pliers-like tools, some with cutting blades only, some with cutting and gripping blades – such as needle-nose pliers or fencing pliers – are used for cutting wire and wire mesh in the construction of protective tree cages, barrier fences, etc.

Tools for Pounding and Hammering

Hammers: A variety of hammers may be used on projects. Sledgehammers or "double jacks" should be used carefully. They are used to drive spikes or to break rocks or concrete. Carry sledges by your side, by gripping the handle near the head. Nail or claw hammers have heads with heat-treated steel faces for driving nails, and claws on the other end for pulling nails. Three and four pound sledges ("single jacks") are used with a rock chisel for shaping stone. Carry the hammer by gripping it near the head, holding the tool away from your body as you walk. Protective glasses must be worn when using

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hammers, especially a sledge with a chisel. Claw hammers are for driving nails only and should never be used with a rock chisel.

Rubber Mallet: A short handled hammer with a large diameter, hard rubber head used for driving the wire staples that hold erosion matting in place. Fist-sized rocks are a good substitute if they are available.

Single-Jack Hammer: A short handled hammer with a 3 to 4 pound head. Can be used alone to drive timber spikes, or with a star drill to punch holes in rock.

Sledgehammer: A long handled heavy hammer with a 6- to 8-pound head, usually held with both hands.

Star Drill: A foot-long tool, weighing about a pound, used with a single-jack hammer to punch holes in rock or open a seam/crack. Chisel end is star shaped.

Tools for Lifting and Hauling

Austin Rock Sling: An Austin rock sling is a carrying device made of steel chain configured in a web pattern with rope or steel ring handles. It is generally used to transport large rock for use in walls or other structures. Several Austins used together can be utilized to move large logs and beams for bridges or turnpikes.

Brewery Blanket: A brewery blanket is a heavy nylon blanket generally 6 to 8 feet square and originally used in the filtering process at a brewery. It is useful for transporting duff, soil, and rocks. For heavy loads, a brewery blanket can be knotted at the corners or a golf ball sized rock wrapped in each corner of the blanket to provide the volunteers with a better handhold.

Buckets: Usually a five-gallon plastic container with a heavy wire handle (bail) useful for transporting soil, duff, and small hand tools.

Cable, Wire: A thick, heavy rope, made of wire strands.

Cable Gripper: A device that clamps onto a cable when tension is applied to the attachment point.

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Cable Rigging: Cable works and hoists used to lift and move large, heavy rock or logs.

Cable Strap: A pre-cut length of wire rope (that may have eyes on both ends), that is used in rigging applications.

Cant Hooks and Peaveys: Cant hooks and peaveys afford leverage for moving or rotating logs. To roll a heavy log, use a series of short bites with the hook and maintain your progress by quickly resetting it. Catch the log with the hook hanging on top of the log. Rotate the log using the leverage of the handle, working the tool like a ratchet. Moving large logs may require several hooks working together. Avoid taking large bites; a heavy log will roll back and pin the handle before the hook can be reset.

Canvas Bags: The canvas bag or coal sack is a large heavy canvas tote bag with two handles that can be used to carry large volumes of light material such as duff, needles, or leaves. It has the same capacity as about two full buckets.

Clevis: A U-shaped metal piece with holes in each end through which a pin or bolt is run. Used to attach two objects together. (Shackle)

Griphoist: A brand name for a manually operated hoist that pulls in a cable at one end and expels it from the other end; used to move rock or timber needed for trail structures.

Hay Hooks: Also called "bale hooks," are sturdy steel hooks equipped with D-handles that are designed to be slammed into bales of hay or straw, providing a grip for dragging or lifting them. Hay hooks are also used to grip the mesh or handles of wire baskets enclosing the burlapped root balls of B&B trees to aid in moving and positioning them.

J-Straps: Nylon loop straps attached to a shoulder pad are used to carry rock bars comfortably by transferring the weight to a shoulder.

Log Carriers: Log carriers enable teams of workers to move logs. The tool hooks the log, allowing persons on either side of the handle to drag it. Several carriers could allow four or more persons to carry a large log.

Ratchet Winches or Come-Alongs: Hand operated winch. Ratchet winches (also called come-alongs) are useful for pulling stumps and for moving large rocks and logs. These winches offer mechanical advantage – the Grip Hoist is a specialized winching system that provides a mechanical advantage of 30:1 or more.

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Rope: A large stout cord of strands of fibers or wire twisted or braided together.
- Working End: The end of the rope being used at the time to tie a knot.
- Standing Part: The part of the rope not being used at the moment.
- Bight: A curve or bend in the rope. This is usually a loop through which the working end is passed.

Skyline: Rigging system with a highline by which a load is moved via a pulley, pulled by a separate rope.

Slackline: Rigging system with a highline, which is lowered to pick up a load, then tightened to move the load.

Snatch Block: Pulley with hinged side plate allowing attachment anywhere along a fixed rope.

Sod Stretcher: A carrying device similar to a medical stretcher, consisting of a large rectangle of fabric (usually a brewery blanket) with sleeves sewn into its long sides to receive two rock bars or aluminum pipes which serve as stiffeners and carrying handles. The pipes are usually held apart by plywood spacers slipped over the pipes at the ends of the blanket. Sod stretchers are used to carry chunks of sod, plant plugs and small tree plugs that are being harvested or transplanted.

Tumpline: A strap slung over the forehead, to anchor a backpack.

Wheelbarrows: Wheeled tub used to transport loose materials.

Winch: Applicable to a broad array of devices that use a drum, driven by a handle and gears, around which a cable is wound, to provide mechanical advantage for moving heavy objects.

Wire Cable: A thick, heavy rope made of wire strands.

Zipline: Rigging system with a taut, stationary wire rope highline for moving loads on a movable pulley.

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Institute

Tools for Chopping and Grubbing

Adze Hoe: The modern adze hoe has a forged steel head with a large, almost flat blade set at a 90-angle to a three foot wooden or fiberglass handle. The head is "friction fitted" to a bent "adze style" handle. You use an adze hoe to chip or break up clumps of soil when constructing new trail or outsloping an existing tread.

Axes: Axes are of two basic types – single or double bit. Single-bit axes have a cutting edge opposite a flat face. Double-bit axes have two symmetrically opposed cutting edges. One edge is maintained at razor sharpness and the other is usually somewhat duller as result of chopping around rocks or dirt.

Cutter Mattock: A cutter mattock has a broad mattock blade, but also a short stout axe or cutter blade in place of the pick point.

Fire Rake: A tool with triangular tines used to cut duff and debris from firebreaks or trail corridors.

McLeods: The McLeod combines a heavy-duty rake with a large, sturdy hoe. The hoe edge of the McLeod is about 9 ¾ inches wide and the head is 11 inches at its widest point. The head can be used for tamping soil or crusher fines. The McLeod is also useful as a slope gauge. When planted standing upright on a trail tread, the tilt of the handle will indicate the slope of the tread. You can clearly see whether the trail is insloped or outsloped.

Pick Mattock: A pick mattock has a broad adze or mattock blade instead of the clay point. The mattock blade is good for working in most soils and may be used to cut roots or chop clumps of grass.

Railroad Pick: The modern railroad pick is a heavy digging tool with a stout forged steel-head. The head has an "eye" or socket for a handle and two points. The "chisel" or "clay" point is flat and used to work hard packed clay soil. The point is tapered and is a good tool to use for general digging in rocky soil.

Pulaskis: The Pulaski combines an axe and an adze hoe in one multi-purpose tool. The tool is named for Edward Pulaski, circa 1910, a Forest Service Ranger and part-time black-smith. He developed the tool especially for firefighting purposes.

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Rakes: Lightweight rakes are usually used for smoothing and leveling surfaces, for spreading and seeding.

Tools for Digging, Scooping and Planting

Auger, Soil Auger: T-shaped tool with a spiral tip for turning into soil to probe its content.

Auger, Power Auger: Consists of a vertical shaft with a spiral tip for digging into the soil, and a small motor mounted on the top of the shaft for turning it. These are used by some agencies to dig planting and fence post holes in non-wilderness settings. Various models may be operated by one or by two or more people.

Dibble: Essentially a tapering, pointed stick used to open a hole for small plants (e.g. grass plugs) by thrusting the point into the soil and moving the handle with a circular motion to enlarge the diameter of the hole. Dibbles may be long or short, thin or thick, wood or metal, and may be equipped with a cross-piece to grip on the handle. They are frequently used in wetland restoration for planting plugs of grasses or sedges.

Digging-Tamping Bar: A long bar with a small blade at one end for loosening compacted or rocky soil and a flattened end for tamping.

Planting Bar: A heavy steel tool consisting of a three foot rod-steel handle tipped with a steel wedge that has a foot plate projecting from one side, near the ground. The wedge is stepped into the ground with foot pressure applied to the foot plate and the handle is pushed away from the user to open a hole to receive a small plant, such as a tree seedling or grass plug. Perhaps best used with one person opening holes and a partner installing the plants.

Posthole Digger: Consists of a hinged pair of clam-like blades attached to long handles. Spreading the handles apart causes the blades to close, making it possible to grip and remove pre-loosened soil from a narrow hole. Occasionally used to dig signpost, fencepost and small planting holes.

Rockbars: Mild steel bars, 6 feet long and designed with a chisel tip for loosening dirt or prying rocks and a pointed end for prying or a tamping end for compacting soil.

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Sharpshooter: A short handled spade with a D-grip and a long, narrow, round-tipped blade which is useful for digging and lifting transplants and for cleaning soil out of trenches.

Shovels: Shovel blades are either square-edged for scooping (good for piles of loose material) or pointed for digging in soft or pre-loosened soil, with either a wooden or fiberglass handle that can vary from three feet to five feet long.

Trowel: A small planting tool, usually a foot or less in length, with a straight handle and shovel-like blade.

Tools for Personal Protection

Clothing: Long sleeved shirts and long pants are suggested clothing when working and may actually be required by some agencies. Shorts are not recommended.

Dust Masks: Dust masks can be used for some types of rockwork and in extremely dusty conditions.

Ear Protection: Ear protection is needed when working near most motorized equipment and working in any environment with loud, repetitive noises such as chipping rock with a manual jackhammer.

Footwear: Sturdy shoes or boots are preferred due to the rugged terrain associated with trail or outdoor work. They are necessary to protect the feet from glancing tools, loose rock, dense vegetation, and cactus and provide good footing when working.

Gaiters: Coverings that zip or snap around the ankles and lower legs to keep debris and water out of your boots. (Leggings, Puttees)

Gloves: Work gloves are necessary to protect the hands from blisters, thorny brush, poison ivy, or any other minor scratches associated with outdoor work. Gloves also help with gripping tools.

Hardhat: A hard shell worn on the head as protection during trail work. Hardhats are an agency requirement for many types of work, especially when working in timber or when there is a chance of being hit on the head and risk of head injury.

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Safety Goggles or Glasses: Eye protection is important for any type of work whether digging, cutting, sharpening, sawing, chipping rock or for when there is a chance of something getting into your eyes.

Safety Harness: A body belt or strap usually made of nylon, for use while working near steep drop-offs. Must be of approved construction and design, and in good repair, and attached to a secure anchor point with carabiners and approved climbing rope.

Sheath: Protective covering made of leather or plastic used to cover sharp blades of tools while in storage or when the tools are transported.

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Suggested Tools Per Crew

The following table outlines the suggested range of tools needed for equipping crews for various types of work. The table includes columns for generalized trail and restoration work as well as columns that emphasize more specialized tasks. Evaluate the tool needs for each crew as it relates to the work project and adjust the list accordingly. This table is based on a crew size of seven workers.

SOME BASIC TIPS:
- Two tools can be carried per worker (one in each hand)
- Smaller tools can be carried in packs or buckets
- Carry tools with protective sheaths on (keep sheaths together in one place)
- Tools can be carried in a wheelbarrow to some work sites

Tool	New Trail Construction	Easy Trail Construction	Trail Maintenance	Trail Closure	Crusher Fines	Tree Planting	Habitat Restor
Adze Hoe		1	1		1		
Bow Saw	1	1	2				1
Br. Blanket	1	1		2		3	2
Buckets	4	4	4	6		6	2
Canvas Bag				1			
Lopper	1	1	2				
McLeod	3	3	3	4	5	2	3
Pick Mattock	2	1	2			1	2
Pulaski	2	2	2	1	1	2	1
Rake					2		1
Rock Bar	2	1	1	1	1	2	1*
Shovel	3	3	3	4	5	4	2
Wheelbarrow		2		2	4		1

New Trail Construction – rocky, forested slopes
Easy Trail Construction – grassy meadows
Trail Maintenance – corridor clearing, tread maintenance, drainage structure maintenance
Trail Closure – other tools may be needed such as small trowels
Crusher Fines – assumes trenching has been completed by machinery. Crew does finishing work on trench and transports and spreads fines material
Tree Planting – other tools will be needed such as wire cutters & hammers
Habitat Restoration – closing old trail or road; prepping the soil, seeding, and transplanting some native plants. Installing erosion matting if needed on slopes would require additional tools such as 1 scissors, landscape staples, and 2 small sledgehammers per crew.
*1 rock bar every other crew to be shared if possible

Outdoor Stewardship Institute

Tool & Safety Talk

DESCRIPTION

Crew Leader Trainees will practice and learn how to deliver the Tool and Safety Talk.

OBJECTIVES

By the end of this module, Crew Leader Trainees will be able to effectively present the Tool and Safety Talk to a crew.

TIME ALLOWANCE

30 minutes

SETTING

Classroom and/or outdoors

MATERIALS & PREPARATION

BACKGROUND INFORMATION

Crew Leaders are responsible for the safety of their assigned crew and for anyone who passes through their work section. Project safety begins as soon as the Crew Leader meets their crew.

The Safety and Tool Talk will establish safety guidelines for the crew at the start of the day. The Safety presentation informs volunteers of safety issues such as dehydration, sunburn, over exertion, poison ivy, and other site-specific hazards. The Tool Talk establishes safe ways to carry, use, and store tools during the project. Wearing appropriate clothing at all times (boots, gloves, etc) sets a good example for the crew.

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Institute

Tool & Safety Talk

PROCEDURE

1. Give the Crew Leader Trainees time to review the Tool Descriptions and Uses, CL 69-79, and Safety Talk, CL 83.

2. The Crew Leader Instructor will present a Safety Talk to Crew Leader Trainees.

3. If this activity is being done with a small group, go on to step four. If this activity is being conducted with a large group, divide the group into teams. If possible, assign one person with the following skill levels to each group:
   • Experience giving safety and tool talks.

   • Somewhat comfortable, but would need some practice.

   • Never done or heard this before.

4. Instruct each Crew Leader Trainee to deliver the "Safety Talk" and "Tool Talk" to the other members of the group.

5. Discuss other safety and tool issues that need to be assessed on a project.

6. Discuss what items are essential for a Crew Leader to have with them on all projects. What are some items you might want to carry extras of to the project?

BRINGING IT TOGETHER

• Are there other important safety points you think should be added to this training?

• How will knowing what to look out for during the day make you a better Crew Leader?

RESOURCES

OSI Focus Group Data, August – October, 2003
Volunteers for Outdoor Colorado Crew Leader Manual, pages 2-1 through 2-10, 5-3 through 5-6

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If An Accident Occurs...

▶ The Crew Leader stays with the accident victim.

▶ Only the Crew Leader (or his/her designee) should be in verbal communication with the next level in the chain of communication.

▶ Make sure you can give clear directions about your location to staff or medical personnel. Be prepared to send Crew Members to strategic locations such as a flag, or to notify the appropriate staff or medical personnel as per the established chain of communication appropriate to the Project Safety Net.

▶ Do not talk to the media. Refer them to agency personnel.

▶ Do not attempt anything medically that you or your crew has not been trained to do.

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Crew Leader Safety Talk Checklist

___ Have Crew Members completed a liability waiver if required?

___ Make sure your crew has appropriate footwear, clothing, eye protection, and gloves.

___ Do Crew Members have lunch and enough water?

___ Do Crew Members have sun protection (hat, sunscreen, sunglasses, and lip balm?)

___ Discuss the project goals, specifications, and context (Refer to Know Agency Protocols, pp. CLI 145-149).

___ Specify the length of hike and type of work.

___ Explain any site- or project-specific hazards.

___ Ask that persons with specific health concerns notify you about them in private. Some items you should know about include: back problems, allergies (insect, plant, and medication), diabetes, heart and lung problems, epilepsy, and other serious physical conditions.

___ Ask if any of your crew are certified Emergency Medical Services personnel (EMS) or other health care professionals. Ask if anyone is certified in CPR or Wilderness First Aid. Establish primary and secondary medical chain of command within crew.

___ Explain to your crew the Project Safety Net and the chain of communication for the project. (Refer to Know Your Agency and Organization Protocols, pp. CLI 145-149). Select someone on your crew to act as an alternate leader to start the safety net process should you become incapacitated.

___ Explain "Coming Through!" or "Bumping By" and practice it at all times.

___ Demonstrate why safe working distances are important. Be sure that people working near a hazard (chipping stone, lumber cutting, etc) stay at a safe distance and are wearing eye and/or ear protection.

___ Hardhats should always be worn if there is any risk of head injury (on steep slopes or areas where rock or other materials may come down from above) or if required by the agency.

___ Demonstrate how to lift with the legs and not with the back. Get help and/or tools to move heavy objects.

___ Reiterate through the day the crew's need to drink water, even when they may not be thirsty (drink water at least every 15 minutes). Remind them that by the time they feel thirsty, they are already dehydrated. Enforce water breaks by taking them as a crew throughout the day.

___ Stress the need to wear sunscreen. Watch for sunburn throughout the day.

___ In areas where West Nile Virus may be a concern, stress the need to wear insect repellent.

___ Lead the Safety Warm Up and stretching exercises at some point before starting the work. Use the opportunity to provide further information on additional safety issues.

Safety Warm-Up

DESCRIPTION

Crew Leader Instructors will teach Crew Leader Trainees how to lead a Safety Warm-up – simple stretching exercises – combined with reviewing safety issues common to a project. Crew Leader Trainees will use this exercise when working with a crew.

OBJECTIVES

By the end of this module, Crew Leader Trainees will be able to:

• Teach the stretching exercises as a way to introduce and focus on safety issues.

• List safety issues that are of concern on a project.

• Touch their toes.

• Know the benefit of stretching prior to starting work.

TIME ALLOWANCE

20 minutes

SETTING

Classroom & outdoors

MATERIALS & PREPARATION

Safety Guidelines (p. 75)
Large open area for stretching
Refer to Resources for additional safe and appropriate stretching exercises

Outdoor Stewardship Institute

Safety Warm-up

BACKGROUND INFORMATION

This unit is designed to teach Crew Leader Trainees how to lead a simple warm-up stretching exercise in the field with a crew, while emphasizing safety concerns simultaneously.

The Safety Warm-up Exercise is an easy way to prepare a crew for project work, and a great way for a Crew Leader to facilitate leadership of a group in a fun, interactive way at the beginning of a day. Because stretching is more effective after 15 minutes of exercise, this exercise may be more productive after hiking to the work site.

This exercise can also be utilized as an "ice breaker" to introduce Crew Members to each other.

Safety is the most important component of a trail project, therefore Crew Leaders must stress that <u>Safety is the Number One Priority.</u> A successful project is a safe project – getting the work done is secondary!

PROCEDURE

1. Use the Description, Objectives and Background Information as well as the notes and outline in Appendix K, page K-1, to develop your own outline for the introduction to this section and activity.

Note: Let Crew Leader Trainees know that this activity can be used in other ways. For instance, Crew Members can also introduce themselves, tell where they are from, and provide other information as an ice breaker. A good Crew Leader might want to know which Crew Members have medical training.

PRESENTATION

1. Crew Leader Instructors will present details about the activity to the Crew Leader Trainees utilizing the prepared outline.

2. Instruct the Crew Leader Trainees to form a circle.

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3. Give one person the copy of the page titled "Safety Guidelines"

4. Tell the person with the handout to read one of the Individual Safety Items listed, along with the associated Hazard, and then assume a stretching position. To do a "stretch wave" requires that the stretch exercise be done around the circle, one person after another...so the exercise appears to flow around the circle.

5. The person immediately to the right of the stretch leader gets into the same stretching position and repeats the safety item.

6. The next person to the right creates the same stretching position. This pattern continues around the circle to the right until everyone completes the stretching position and says the safety item.

7. After everyone completes the stretch, hand the Safety Handout copy to another person. Repeat with a different stretch and different item from the list. Continue until every-one has had the opportunity to lead a stretch.

Note: If it is necessary to use less time for this activity, <u>change the format</u> to a group stretch:

- Have the entire group perform the stretch at the same time.

- Pass the Safety Guidelines copy to a second person and repeat the above step with a different stretch and different item from the list.

Examples of appropriate stretches:
- Arms over head and bend side to side
- Low back arch (numerous times)

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• Bend forward to stretch back-touch toes (numerous times)
• Forward lunge-keep back leg straight and foot flat on ground
• Arch back and pull shoulder blades together

BRINGING IT TOGETHER

• How can you apply this exercise to your work situation or use it in the field?

• How will doing this icebreaker with your crew make you a better Crew Leader?

• Are there other variations to the Safety Warmup that might help energize a crew?

RESOURCES

Cain, J. & Joliff, B. (1998). *Teamwork & Teamplay.* Dubuque, Iowa. Kendall/Hunt Publishing Company, pp. 34.
OSI Focus Group Data, August – October 2003
Activity idea adapted from Crew Leader Training, Mile High Youth Corps, Denver, CO
Additional sources of information:
    www.womensheartfoundation.org/content/exercise/stretching_exercise.asp
    www.howtostretch.com
    walkingabout.com/cs/stretching/a/howstretch.htm
    Alter, Judith B. *Stretch & Strengthen.*
    Walker, Brad (1998). *The Stretching Handbook.* Queensland, Australia. Walker Bout Health PTY Ltd.

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Safety Guidelines

INDIVIDUAL SAFETY ITEM	HAZARD
• Drink water every 15 minutes	• Dehydration
• Wear sun screen	• Serious sunburn
• Use bug spray	• West Nile Virus
• Wear gloves	• Finger cuts and bruises
• Wear a hat	• Protect head from sun exposure
• Use eye protection	• Protect eyes from possible injury
• Watch the weather	• Watch for lightning and other weather related hazards
• Keep all belongings in a pack near the trail	• Quick evacuation from a site means that you are able to pick up and leave at any time without packing up personal belongings
• Be aware of your surroundings	• Poisonous plants, stinging insects or snakes may be in the area
• Lift properly	• Prevent muscle strains
• Let others know you are behind them on the trail, i.e., "Coming through, please" or "Bumping by"	• Prevent accidents with other crew members

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Trail Construction

DESCRIPTION

Crew Leader Instructors will teach Crew Leader Trainees how to construct basic trail. Crew Leader Trainees will learn how to differentiate between different trail design layout techniques. Crew Leader Instructors will prepare Crew Leader Trainees to lead basic trail construction projects.

OBJECTIVES

By the end of this module, Crew Leader Trainees will be able to:

• Construct a trail utilizing four different methods of trail design layout.

• Demonstrate the steps to construct a new trail.

• Learn how to lead basic trail construction projects.

TIME ALLOWANCE

15 minutes classroom
2 hours 10 minutes field

SETTING

Classroom & outdoors

MATERIALS & PREPARATION

1. Use the Description, Objectives and Background Information as well as the notes and outline in Appendix L, page L-1, to develop your own outline for the introduction to this section and activity.

2. Gather flags, stakes and hammer to mark new trail.

3. Arrange for required number of tools for all participants:
   • Lopper   • Bow Saw
   • McLeod   • Pulaski

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Trail Construction

• Rock Bar   • Shovel
• Pick Mattock   • Bucket

4. Research trail standards for trail construction. Talk to agency representative where training is held. Obtain a copy of the project construction notes for the new trail.

5. Arrange for approximately 5 to 10 feet of new trail construction for each Crew Leader Trainee.

6. Appropriate number of copies of handouts:
      Trail Terminology (provided separately)
      Project Construction Notes (provided separately -
          obtained from land management agency prior to
          training or provide your own example)

**BACKGROUND
INFORMATION**

Introduction
The Trail Construction section will cover the basics of new trail construction. Crew Leaders construct trails using the specifications and standards provided by the land management agency representative. Changing the agency specifications, design or layout of a new trail can have negative repercussions unless the Crew Leader is given permission to do so by an agency representative or the trail designer. If a Crew Leader has questions regarding the trail standards, location or construction of a proposed trail, talk to the agency representative or trail designer.

Trail Staking and Layout
More often than not, trail construction is associated with a trail re-route. An agency representative or trail designer will mark a new trail route with flagging, stakes, or pin flags or a combination of them. The flagging, stakes, and pin flags serve as a

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Trail Construction
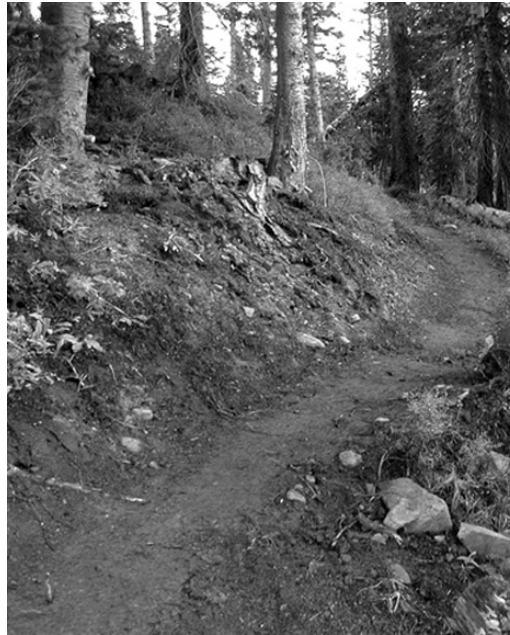
Example of a good basic trail. American Lakes Trail, State Forest State Park.

guide for the Crew Leader as to where to construct a trail or a related improvement such as a rock wall or drainage dip. Flagging will also mark special features for a Crew Leader to be aware of such as large rocks to remove. Not all designers or agencies use the same methodology in the layout of a trail. A Crew Leader needs to know what methodology the trail designer or agency representative used before starting construction of a new trail. Find out what the markings mean.

Types of trail staking and layout marking:
- Starting point of trail construction will be marked at either the centerline, inside edge or critical edge of a trail, or marked with plastic flagging in trees.

- A new trail may be broken down into sections marked with stakes or flags.

- A trail may be measured and different points will be marked denoting distance from a starting point. (For example, 1+00 would be 100 feet from the starting point according to standard civil engineering notation).

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Trail Construction

Construction Notes

A land management agency representative or trail designer may provide detailed construction notes to explain their markings and how they would like the trail built. These notes usually give information based upon linear footage or station from a starting point of the trail. Crew Leaders must then read these notes to know what to do. In other cases, Crew Leaders may pre-walk the trail section with the trail designer or agency representative to discuss the work to be done. Construction notes will sometimes give details on safety issues for a project site, objectives for the project, and standards for trail construction. The Crew Leader needs to be aware of the safety issues, objectives and standards so the finished product matches the anticipated vision described in the construction notes. In circumstances where trail construction notes are minimal or not provided, it is important for the Crew Leader to either request notes from the agency or schedule a time to walk the new trail route with an agency representative to be clear on construction expectations.

The trail designer will communicate the construction standards and expectations for the trail. Trail construction standards will include trail corridor height and width, tread width, grades, and type of surface materials. In some cases, specifications will also be provided for unique improvements such as boardwalks. Trail standards may vary by agency. Know the agency standards before beginning work.

Water Control Structures: Drainage & Erosion

Erosion is the single biggest threat to trails and is a primary concern when constructing a new trail. Erosion occurs when water is allowed to flow at forces greater than the ability of the land to resist erosion. Concentrated flows of water strip soils and move them down hill.

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Trail Construction

Figure 7.
Sheet flow
An outsloped trail tread allows water to drain in a gentle, non-erosive manner called "sheet flow."

Tread Outslope
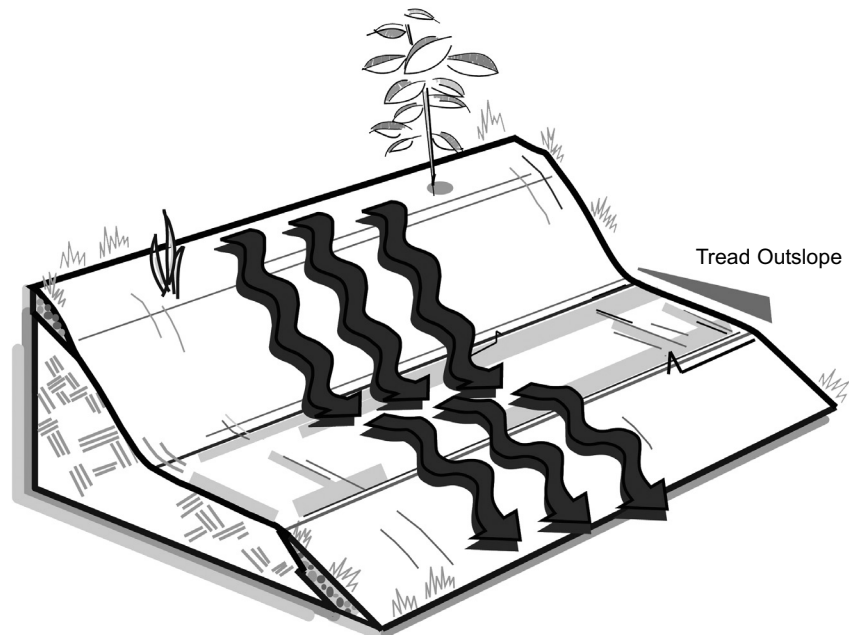
Trail grade and outsloping are designed to let water move across the trail following natural flow patterns. "Sheeting" describes a very thin layer of water gradually moving across the trail. Encourage water to sheet across the trail. Do not let it collect and run down the tread.

Water control structures are used to supplement natural drainage in difficult portions of a trail. They are also used in maintenance projects to correct drainage problems. Further training is required to learn the skill of constructing drainage structures.

• Outslope of a trail is the primary drainage control method.

• Grade reversal dips are used as an erosion prevention measure. They make sure water cannot continue down a trail by providing a short section of uphill trail. Water doesn't flow up hill. These also add interest to the trail by providing undulation.

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Trail Construction

- In-sloping the trail is occasionally used in special circumstances like switchbacks or banked turns. Water sheets back, toward the hill, and is then diverted away from the trail. A grade reversal dip is nearly always installed above a section of in-sloped trail.

- Basic drainage dips and swales encourage surplus water to move off the trail. Swales are short sections of trail where extra outslope is used to move any surplus water off the trail. Drainage dips refer to larger structures where the lower portion of trail is gently and smoothly built up to create an "earthen dam."

- Reinforced drainage dips and waterbars, rarely specified in new trail construction, are occasionally used to fix erosion problems on existing trails. New trail construction usually relies on integrated natural drainage, not drainage structures.

TRAIL CONSTRUCTION: STEP-BY-STEP

Only full bench construction techniques are described below. Prior to starting trail construction, a Crew Leader will walk their section with their crew and discuss the work needed using the construction notes.

STEP 1: Clear the Corridor

Every trail needs an opening or corridor through the complex "enviroscape" of trees, shrubs, grassland, rocks, and water. This corridor needs to be wider than the tread itself, but should look as natural as possible. The height and width of the corridor vary according to the users, the site, and the dominant vegetation. Trail standards of height and width are established by the land management agency.

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Trail Construction

Width:
Usually
between 4
and 8 feet

Height:
Up to
12 feet
on an
equestrian
trail
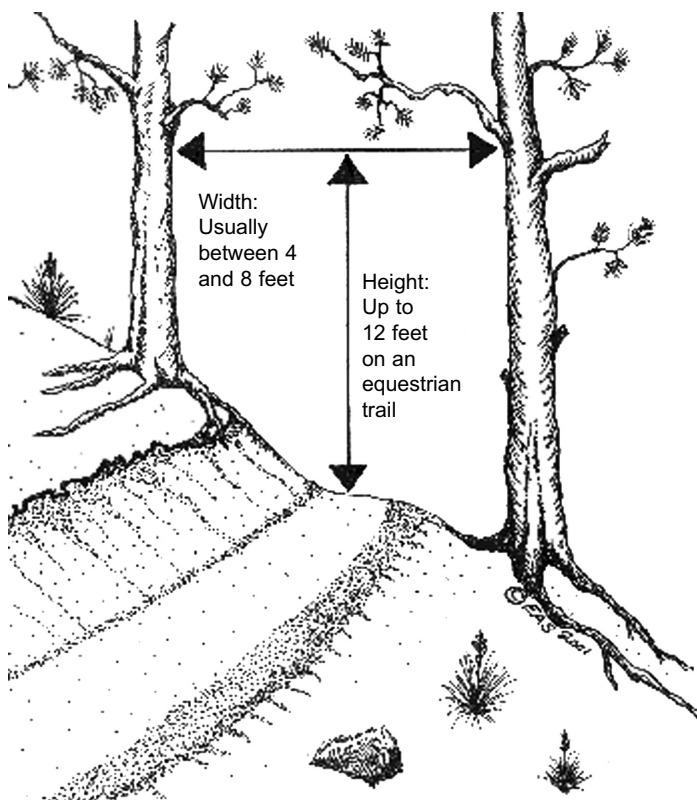
Figure 8.
Trail corridor
*The trail corridor varies
depending upon the
intended user.*

• Remove rocks and vegetation to create an opening and establish the corridor.

• While pruning and removing plants, emulate the vegetation patterns as best you can.

• If over half of a plant needs to be pruned, it is better to remove it.

• Cut trees and other vegetation at ground level. Use duff or dirt to hide the ground level stump of a tree.

• Prune branches of trees to within no more than ½ inch of the bark collar. When using loppers, always place the sharp blade rather than the wedge to the living side of a branch.

• Use the three-cut method when removing large limbs of 2 inches or more in diameter. (Please see a more thorough explanation on page 110 in Trail Maintenance or in the *VOC Crew Leader Manual,* Fifth Edition, page 8-10 through 8-12).

• Never rub soil or duff into a cut on a live tree or shrub.

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Institute**

Trail Construction

• Discard and scatter cuttings out of sight, off the trail with cut ends facing away from the trail.

• Try to blend all cuttings into the natural surroundings.

STEP 2: Establish Starting Point of Construction
There are several methods that trail designers will use to mark or flag a new trail so that Crew Leaders will know where to begin construction. This training will discuss four different methods used by trail designers. Tread width is established by the land management agency.

Figure 9.
Establish the starting point of trail construction. Center Line method is illustrated.
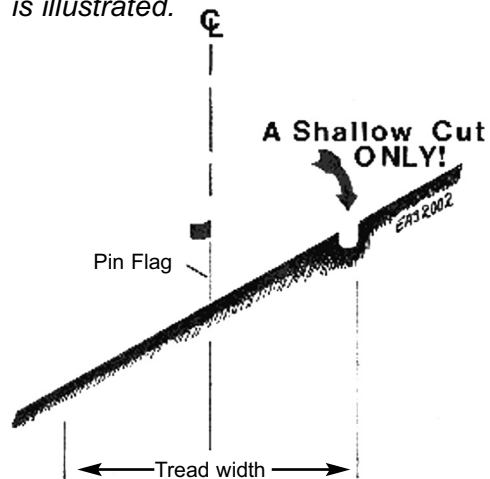
Pin flags are used to mark the center line of the planned trail tread.

1. Center Line Method.
   In this method, the center line of the trail tread is usually marked with a line of pin flags or stakes placed at intervals of 5 to 10 feet along the length of the trail route.

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Trail Construction

   • Cut a shallow line along the uphill edge of the tread at half of the tread width measuring from the centerline flag for the entire section of work.

   • Check location of flag line frequently as you cut this line so as to stay on course.

   • You can mark this upper line with more flags to make it easier for your crew.

2. Inside Edge Method.
The inside edge (where the tread meets the backslope) is marked with a line of pin flags or stakes.

   • Cut a shallow line along the lower edge of the tread for the full tread width measured from the inside edge flag for the entire section of work.

   • Check location of flag line frequently as you cut this line so as to stay on course.

   • You can mark this lower line with more flags to make it easier for your crew.

3. Critical Edge Method.
   • The critical edge is marked with a line of pin flags or stakes.

   • Cut a shallow line along the uphill edge of the tread for the full tread width measured from the critical edge flag for the entire section of work.

   • Check location of flag line frequently as you cut this line so as to stay on course.

Outdoor Stewardship Institute

Trail Construction

• You can mark this upper line with more flags to make it easier for your crew.

4. Flagging Method.
This method is not recommended for inexperienced Crew Leaders. Flagging is placed at intervals in trees and shrubs above the ground. The Crew Leader must decide where to start construction of the trail on the ground based on where the flags are placed in the vegetation.

STEP 3: Establish the Initial Tread Surface
After cutting a shallow line, start digging and grubbing to establish a rough trail bench and tread. While working on the tread, it is important that the crew not walk on the critical edge or below it in order to protect the integrity of the trail surface and prevent unnecessary resource damage.

Figure 10.
Establish the initial tread surface.
Center Line method is illustrated.

Tread width

Cut in

Inside edge

Cut in

Outside edge

Working edge
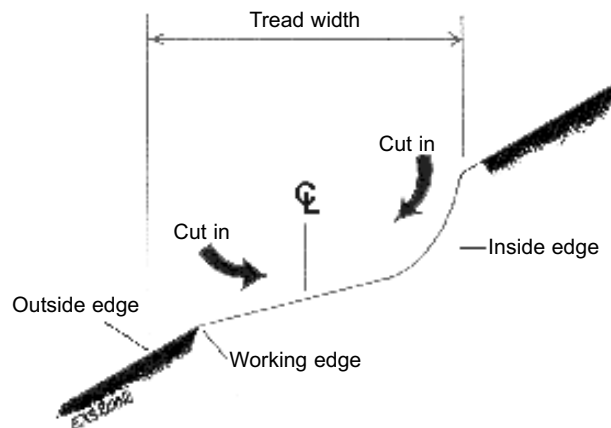
• Clear organic matter (duff) from the surface.

• Save duff for later restoration work if needed, otherwise disperse and scatter according to agency specifications.

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Trail Construction

• Cut flat or slightly outsloped tread with nearly vertical backslope

1. Excavate less than you think you need to in terms of both width and depth of the tread. It is better to excavate more later than try to re-pack soil in holes left because of too much excavation.

2. Save mineral soil for sections of trail that need fill or else broadcast material as per agency guidelines.

3. Rocks are often designed to be left as part of the trail. Make sure a rock should be removed before doing so. It is easier to leave it in than take it out and put it back.

4. Remove stumps, roots, rocks as appropriate. Details below.

5. Keep all duff and dirt within the tread area. Rake into piles on the tread, shovel into buckets and disperse or scatter according to agency specifications. (It is recommended to disperse well off the trail and not in big piles, unless filling up a depression out-of-sight from the trail.)

Tread surface assessment – what to remove or leave (usually specified by trail designer)

• Based on user: For more challenging trails leave natural obstacles such as roots and rocks that do not pose a safety hazard, cause damage to vegetation, or contribute to erosion. Obstacles on the inside of a trail will force users to the outside of the tread which will cause the edge to break down, resulting in tread creep. Conversely, obstacles left on the outside edge will guide users back onto the designated route. Remove any object that will act as a dam or gutter to collect and hold water on the trail.

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Trail Construction

• Rocks: Large round or rectangular rocks tend to make a good, durable trail surface and should generally be left in place. Jagged, pointy, sharp rocks force users off the trail and should be removed if reasonable. Keep in mind, when these rocks occur near, but not in, the tread, they will keep the user on the trail. Remove any rocks that will work loose and leave holes. If a rock is too large to remove, consider chipping with a hammer and chisel to remove jagged portion.

• Roots: The same principles regarding "traffic control" apply to roots as well as rocks. Leave most roots that are not in the tread itself. Deciding which roots to remove requires discussion and should consider roots holding soil, trail users and safety, health of vegetation, and alternatives to removal such as ramping up and over a root. Remove most roots that lay parallel to the tread. Parallel roots channel water and are a hazard to users. Removing, or even cutting, large feeder roots on the downhill side of a tree may damage the tree (that is why trails are often routed above large trees).

DO NOT REMOVE IF:
• There is any uncertainty it should be removed (ask land management agency personnel for instruction).

• It poses a hazard to your crew.

• You don't know how.

• Proper tools/resources/fill materials are lacking.

• It would make the trail worse than leaving it.

Dealing with tread obstacles – rocks, roots, stumps
• Techniques for removal will be demonstrated by instructor.

Figure 11.
Digging out roots.

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Trail Construction

• Fill and compact all holes left after removing objects. Techniques for filling will be demonstrated or discussed by instructor.

• Getting creative: often an object is in the way but removing it is not practical or desirable. Rocks may be placed in gaps between roots/other rocks. Mineral soil and/or aggregate is then used to fill any remaining voids and then vigorously compacted. On some occasions, a small rock wall may hold fill soil to cover important roots that are in the way but should not be removed.

STEP 4: Establish Backslope

The backslope is important as an interface between the trail and the slope above the tread. The backslope controls how water enters the tread area from above. It is also a distinct and recognizable boundary between the tread and the inside edge. The backslope should be a merger or transition of the slope of hillside with that of the tread.

Blend backslope into hill:
1. Taper back from vertical.

2. Develop to prevent water from undercutting and causing sloughing into the trail.

Figure 12.

Cut the backslope by shaving down and in towards the tread center line. Notice that the inside edge now merges the outsloped tread with the backslope. The top of the backslope also serves as a transition point with the native slope.

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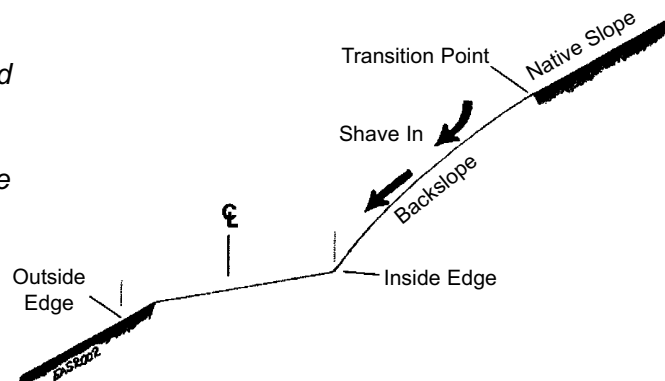
Trail Construction

STEP 5: Establish Outslope
Now that the trail tread has been cut and the backslope created, it is time to establish the critical edge and refine the outslope of the tread.

Figure 13.
Shave-in to establish the critical edge of the trail. The edge should be rounded over to blend in with the native hill slope below the trail. This improves drainage across the tread, and ultimately the sustainability of the trail.

12"

Rounded
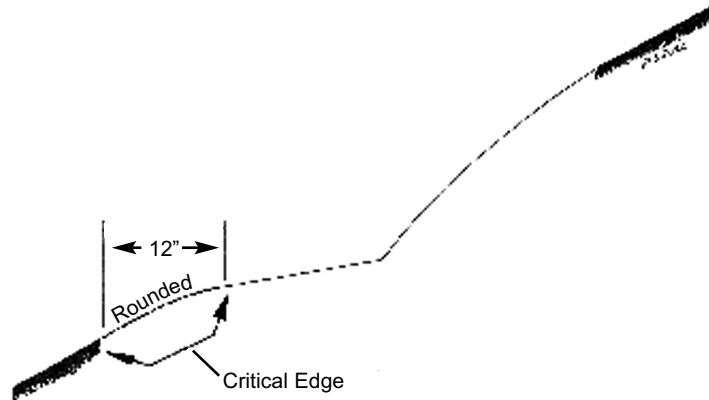
Critical Edge

• The trail should be well compacted and fairly smooth with no place for water to puddle.

• Critical edge (outside edge) should have no loose fill, duff, or debris.

• Avoid creating berms.

• Methods to check for appropriate outslope:
  Techniques will be demonstrated by Crew Leader Instructor.
  1. Tool lean

  2. Water-bottle used as a level

  3. Roll a ball

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Trail Construction

STEP 6: Evaluation, Reclamation & Finish Work

Take the time to evaluate your work. Step back and view the whole picture. Have you met the standards for the project – appropriate trail corridor height and width, tread width, backslope, outslope and obstacle removal?

When finished with a section of new trail it should appear as if it's always been there.

• Repair any scars to area surrounding trail.

• Do not leave rocks that are clearly "out of place".

• Scatter saved organic material over disturbed soil and rocks off trail being careful not to impede drainage or block the outslope.

• Make sure no tools or trash are left behind.

• Flags should be left in place unless instructed otherwise. The trail will usually be inspected after the project and the flags serve as markers.

PROCEDURE

BEFORE PRESENTATION

1. Use the Description, Objectives and Background Information as well as the notes and outline in Appendix L, page L-1, to develop your own outline for the introduction to this section and activity.

2. Crew Leader Instructor will need to work with a management agency representative to mark a trail that is scheduled for re-route or construction. Set up the 4 different marking methods for a comparison: 1) Center Line Method; 2) Inside Edge Method; 3) Critical Edge Method; 4) Flagging Method. Crew Leader Instructor may need assistance from an agency representative or trail designer to mark the trail.

Outdoor Stewardship Institute

Trail Construction

PRESENTATION

LECTURE

1. Crew Leader Instructor will present details to the Crew Leader Trainees utilizing the prepared outline.
2. After the presentation, refer Crew Leader Trainees to the Trail Terminology handout provided earlier.

3. Crew Leader Instructor and Crew Leader Trainees will head for the trail.

ON THE TRAIL

1. Review all marking methods and construction steps at the work site. Utilize and demonstrate how project Construction Notes can explain objectives of trail work, any special safety concerns and standards for trail construction.

2. Demonstrate construction techniques for the Crew Leader Trainees on a small section of the trail utilizing the six steps.

3. Crew Leader Instructor will lead the Crew Leader Trainees in constructing basic trail utilizing appropriate leadership techniques. Remember to demonstrate root and rock removal, how to fill and compact holes left after removing an object and outslope measurement techniques (p.90).

4. Assign 5 to 10 feet of trail to each Crew Leader.

5. Introduce two different approaches: assembly line versus ownership of small section. Crew Leader Trainees will use ownership approach to effectively learn skill. If time, have Crew Leader Trainees do assembly line approach later.

6. Have each Crew Leader Trainee decide what tool to use. Monitor selection and usage and correct as necessary.

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7. Instruct the Crew Leader Trainees to construct their assigned section of trail.

8. Instruct each Crew Leader Trainee to evaluate work by reviewing and comparing the trail construction steps to the finished trail.

RESOURCES

Edited by Steve Austin, Ed Benson, Curt Chitwood, Kristy Dudley, David Hamilton, Becky Hubbarth, Stuart Miner, Eric Schwab, Dave Simonson, Glenn Ward, Steve West, Claudia Wiley, Tom Wiley, and Wayne Zahm. June 2002. *Volunteers for Outdoor Colorado Crew Leader Manual,* Fifth Edition. Published by VOC. Denver, Colorado.

International Mountain Bicycling Association with contributions from Mike Riter, Jan Riter, Joey Klein, Rich Edwards and Jen Edwards. 2001. *Building Better Trails.* Published by International Mountain Bicycle Association. Boulder, Colorado.

Woody Hesselbarth & Brian Vachowski. 2000. *Trail Construction and Maintenance Notebook: 2000 Edition.* Published by USDA Forest Service. Missoula, Montana.

Outdoor Stewardship Institute

Teaching to Different Learning Styles

DESCRIPTION

Crew Leader Instructors will teach Crew Leader Trainees how to teach to different learning styles. Crew Leader Trainees will learn how to present the same information in different ways so that each Crew Member understands the instruction.

OBJECTIVES

By the end of this module, Crew Leader Trainees will be able to teach how to do one of the trail construction steps using four different teaching styles.

SETTING

Classroom & outdoors

TIME ALLOWANCE

30 minutes

MATERIALS & PREPARATION

BACKGROUND INFORMATION

Leading a crew to accomplish a goal is one of the most challenging aspects of being a Crew Leader. Crew Leaders are challenged with creating a safe, positive work environment while addressing a wide variety of learning needs. Each Crew Member will interpret directions in a different way. Misunderstandings can lead to poor outcomes, an unsafe work environment, and frustration for all involved. The key to effective teaching lies in understanding different learning style preferences. Effective instructors can teach different ways to do one task. The Learning Styles reference page (CL 54) defines examples of different learning styles and how to teach to each style. These learning styles are a simplification and are meant to be used to illustrate a point.

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Institute

Teaching to Different Learning Styles

PROCEDURE

BEFORE PRESENTATION

1. Use the Description, Objectives and Background Information as well as the notes and outline in Apppendix C, page C-1, to develop your own outline for the introduction to this section and activity.

PRESENTATION

1. Crew Leader instructors will present details to the Crew Leader Trainees utilizing the prepared outline.

2. Ask the Crew Leader Trainees to reference the Learning Styles page CL 54.

3. Describe each learner type and what they want from a learning experience.

4. Ask the group to select one of the trail construction steps described in the trail construction section, pages CLI 82-91.

5. Ask for volunteers to demonstrate how to teach the task using the 4 different learning styles.

BRINGING IT TOGETHER

How can you apply this exercise to your work situation or in the field?

RESOURCES

Birkey, Richard C., and Joseph J. Rodman. 1995. *Adult Learning Styles and Preference for Technology Programs.* National University Research Institute, 1995 Lifelong Learning Conference Proceedings.

Blackmore, Jessica (1996). *Pedagogy: Learning Styles, in Telecommunications for Remote Work and Learning,* a web-based document. http://granite.cyg.net/~jblackmo/diglib/styl-a.html

Dewar, Tammy. 1996. Adult Learning Online. http://www.cybercorp.net/~tammy/lo/oned2.html

Hartman, Virginia F. 1995. *Teaching and learning style preferences: Transitions through technology.* VCCA Journal 9, no. 2 Summer: 18-20.

Kearsley, Greg. 1996. *Cognitive/Learning Styles.* Washington DC: George Washington University.

Litzinger, Mary Ellen, and Bonnie Osif. 1993. Accommodating diverse learning styles: Designing instruction for electronic information sources. In What is Good Instruction Now? *Library Instruction for the 90s.* ed. Linda Shirato. Ann Arbor, MI: Pierian Press.

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Learning Styles

PROACTIVE LEARNERS   **(LET'S GET GOING AND DO IT!)**

What they want:
- Examples of what others have done
- Minimal instruction and details
- Learn through trial and error

Successful Technique:
   Lecture
✗ Demonstration
   Mentor
✗ Learning-by-doing
   Hand-outs

REFLECTIVE LEARNERS   **(CLASSIC TEACHING AND REASSURANCE.)**

What they want:
- Verbal step-by-step directions followed by a demonstration on how to follow the directions
- Mentoring during the project
- Questions answered during the project

Successful Technique:
✗ Lecture
✗ Demonstration
✗ Mentor
   Learning-by-doing
✗ Hand-outs

ACTIVE LEARNERS   **(TELL ME THE WHOLE THING, THEN LET ME DO IT.)**

What they want:
- Simple directions/overview of what needs to be done
- Questions answered BEFORE work begins on the project
- Demonstration and mentoring at the beginning of a project with less oversight as time passes

Successful Technique:
✗ Lecture
✗ Demonstration
   Mentor
   Learning-by-doing
   Hand-outs

CONCRETE LEARNERS   **(I WANT TO KNOW THE ONE WAY IT IS TO BE DONE.)**

What they want:
- Detailed and systematic directions
- Demonstration of detailed and systematic directions
- Instructional guides or hand-outs

Successful Technique:
✗ Lecture
✗ Demonstration
   Mentor
   Learning-by-doing
✗ Hand-outs

Outdoor Stewardship Institute

Keys to Effective Listening

DESCRIPTION

Crew Leader Instructors will teach Crew Leader Trainees how distractions and multi-tasking can deter good listening skills. In some cases, miscommunication due to poor listening skills can cause accidents or an unsatisfying experience.

OBJECTIVES

By the end of this module, Crew Leader Trainees will be able to understand that active listening is essential for good communication with a crew.

TIME ALLOWANCE

30 minutes

SETTING

Classroom or outdoors

MATERIALS & PREPARATION

One 8-1/2 x 11 piece of paper per person

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Keys to Effective Listening

BACKGROUND INFORMATION

Active listening facilitates many positive relationships.

Crew Leaders work with a large range of personalities and levels of acquaintance that makes active listening paramount. Active listening includes <u>empathy, paraphrasing, probing, reflecting, summarizing, verbal prompts and silence.</u> We listen at 125-250 words per minute, but think at 1000-3000 words per minute so our brains are usually way ahead of our ears. We usually recall only 50% of what we heard immediately after we listen to someone talk. The most helpful thing to remember when listening is to *stop talking.*

All too often, as listeners, we allow distractions (multi-tasking), attitude, or personal biases to interfere with our abilities to engage in a beneficial listening experience. Crew Leaders can be distracted by any number of activities that are happening around a discussion. It is vital that a Crew Leader focus, because how the other person feels could determine how that individual behaves during the project, or whether that person returns for future projects. This activity will demonstrate how multi-tasking and distractions can deter from active listening.

PROCEDURE

BEFORE PRESENTATION

1. Use the Description, Objectives and Background Information as well as the notes and outline in Appendix B, page B-1, to develop your own outline for the introduction to this section and activity.

PRESENTATION

LECTURE

1. Hand out an 8-1/2 x 11 sheet of paper to all participants.

2. Tell the Crew Leader Trainees that you are going to read a story, and you will give directions on what to do with the paper later on.

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3. Read the following scenario:
The weather on this trail project has been brutal – HOT! Most days have hit the high 90s and because of that your crew has been starting the day at 6 am instead of 7 am. This means finishing work at 4 pm in order to get back to camp by 4:30 pm.

STOP. Instruct the group to fold the paper in half.

• Continue reading:
Each day, each person has brought 3 quarts of water. This is working pretty well, however, everyone is usually out of water by the end of the day. The creek at the trail project is far enough away that folks aren't going down to pump water during the day. Each Crew Member drinks at least a quart when back at camp. The afternoons are fairly long because of the heat, but Tom and Wendy have broken them up with two afternoon breaks, so people don't wear themselves out. Also, everyone has been encouraged to take a break if needed.

STOP. Instruct the group to tear off the upper, left-hand corner of the paper.

• Continue reading:
It is day 5 and not as hot as usual. The crew is making good progress and it looks like they may be able to finish this project if all goes well. The sponsor didn't expect this trail project to get done until day 7. When lunch arrives, everyone is excited and agrees that it would be great to finish the project today. In order to do that, everyone will have to work really hard to get it done. At about 3 pm, Tom notices that people are beginning to tire and it looks like the trail project won't get done until tomorrow. He pulls Wendy aside to figure out where to go from here.

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STOP. Instruct the group to fold the paper in half.

• Continue reading:

After discussing the situation, Tom and Wendy decide that it would be best to just "plug away" and get it done. Tom has some concerns about this, but Wendy thinks the boost in morale by finishing today will far outweigh the "bummer" of heading back to camp with the job almost finished. They agree to bring the group together and try to rally them to finish. Wendy agrees that if Tom thinks the crew is not physically up to the task, they will allow the group to vote against finishing the project today.

STOP. Instruct the group to tear off the lower, right-hand corner of the paper.

• Continue reading:

When they gather the crew, all are tired. Tony and Alex are "psyched" to get the project finished and Beth is okay with that. Rebecca thinks they should head back to camp and finish tomorrow, but is also willing to let the majority of the group decide. Molly is completely indifferent. The group has little water left, but everyone says that they are fine because it isn't as hot as it has been the past few days. They decide to finish up today even though that may mean working a bit late. They decide that if they follow this course of action then they will take some time off tomorrow, either at the start or the end of the day.

STOP. Instruct the group to fold the paper in half.

• Continue reading:

It is now 5:30 pm and the crew is almost finished. Tom has noticed everyone dragging for the past 45 minutes but still decides to push on. He is working at the front of the project and Wendy is working at the end. Tom is cruising along and can see that the end is near. It looks like they will finish the project. Just then a Crew Member runs up to Tom and says that Tony has fallen over with a Pulaski in his hand.

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STOP. Instruct the group to tear off the upper and lower, left-hand corners of the paper.

• Have the Crew Leader Trainees unfold their sheets of paper and compare the results.

**BRINGING IT
TOGETHER**

1. Ask the following questions:
   • How does this activity apply to interpersonal communication?

   • How does this activity apply to assuring a safe work environment?

   • What was the gist of the story?

   • How could this exercise help you in the field or in a work situation?

   • How does this activity relate to crew retention or staff job satisfaction?

2. Instruct the Crew Leader Trainees to refer to the Active Listening Tips reference in their manual, page CL 56.

RESOURCES

Bohlken, Robert. 1999. Listening from Common Perspectives. A web-based document.
http://old.weber.edu/comm/IlaListening%20Exercises/listenin.htm

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Active Listening Tips

POSITIVE LISTENING TECHNIQUES
• *STOP TALKING. YOU CAN'T LISTEN AND TALK AT THE SAME TIME.*
• Lean forward and make eye contact.
• Be patient, allow the speaker time and ignore distractions.
• Empathize with the Crew Member.
• Hold your temper – anger displays more than words.
• Focus on the problem, not on the personality.
• Be open – consider the speaker's feelings and opinions.
• Demonstrate equality, not superiority.
• Maintain a problem-solving attitude.
• Show tolerance for ambiguity.
• Be aware of others in the group.

> **Try not to invade personal space.**

> **Particularly in 1-on-1 conversations.**

> **Try to see their point of view.**

> **Better yet, get rid of your anger first.**

> **If you have already made up your mind, it is hard to listen well.**

> **But do not give up your authority.**

> **A group is dynamic. Each part affects the others.**

NEGATIVE LISTENING TECHNIQUES
• Criticize or argue.
• Interrupt or be obstructive.
• Distract, by drumming fingers, jingling keys or coins which signifies your impatience.
• Be confrontational.
• Be a "yes man".
• Act exasperated or walk away.

QUESTIONS AND PHRASES THAT PROMPT COMMUNICATION
• Can you expand on that?
• What are your major concerns?
• What solutions/choices do you see?
• How can I help?
• What needs to be done?
• What is the best way to work it out?
• How do you feel about that?
• What do you think?
• How important is that to you?
• How did you come to your decision?
• How do you plan to do it?
• That is important. What solutions do you see?
• I'm glad you brought that to my attention.

> **Feelings are different from thinking.**

> **Using more of intellect and thoughts as versus feelings.**

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Trail Maintenance

DESCRIPTION

Crew Leader Instructors will teach Crew Leader Trainees about basic trail maintenance. Crew Leader Trainees will learn how to repair tread, clean drainage structures and prune the trail corridor. Crew Leader Instructors will teach Crew Leader Trainees what to demonstrate when leading a crew.

OBJECTIVES

By the end of this module, Crew Leader Trainees will be able to:
• Recognize trail maintenance issues

• Properly prune trail corridor

• Repair or maintain tread

• Properly clean water bars/dips/swales

• Select the right tool for a project

• Learn how to lead basic trail maintenance projects

TIME ALLOWANCE

15 minutes classroom
2 hours 10 minutes field

SETTING

Classroom & outdoors

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MATERIALS & PREPARATION

1. Appropriate number of tools for a group of five Crew Leader Trainees to include the following:

   - Lopper
   - McLeod
   - Rockbar
   - Pick mattock

   - Bow saw
   - Pulaski
   - Shovel
   - Bucket

2. Approx. 50 to 200 feet of unmaintained trail available for each Crew Leader Trainee depending on how much work is available. Research and know trail standards and work objectives of land management agency.

3. Appropriate number of copies of handout:
       Trail Terminology (provided separately)

BACKGROUND INFORMATION

Land management agencies usually have maintenance plans with established maintenance standards and priorities for each trail. Agency personnel and/or trail adopters will regularly inspect trails to locate and identify problems such as safety concerns, areas of excessive erosion, vandalism and potential segments of trail for re-routing. The maintenance trail crew's task is to correct those problems according to the established maintenance standards and priorities.

Purpose of Trail Maintenance

• To repair trails damaged by flood, avalanche, fire, user abuse, or heavy use.

• To restore tread to a safe, usable condition.

• It is cost effective to keep trails in good shape. Failing to care for trails can lead to extensive and costly maintenance, closure, or complete loss of trails.

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Trail Maintenance

Maintenance tasks take a variety of shapes and pose their own individual challenges. Too much water and sediment washed out this waterbar.

• To increase visitor safety and reduce liability risk.

• To protect the resource by reducing unwanted impacts.

Trail maintenance is a critical activity to ensure the success of a trail program. Finding solutions for erosion problems, boggy areas, loose soils, and widening or braiding of trails requires experience and skill. If a trail re-route is needed, knowledge of trail design, staking and layout is required. Trail designers may be consulted for assistance in determining reroute potential. Trails built without conformance to sustainability concepts will require more maintenance and cause more resource damage.

Priorities in Trail Maintenance
Lacking a specific land management agency maintenance plan, the following three priorities can be used to determine which tasks to complete and in which order:

1. Correct unsafe situations. This could mean repairing impassable washouts along a cliff or removing blowdown from a steep section of an equestrian trail.

2. Correct natural resource damage – erosion, sedimentation and off-site trampling, for instance.

3. Restore the trail to the planned design standard. This means that the ease of finding and traveling the trail matches the construction standard for the recreational setting and antici-pated user group. Actions may range from simply adding signs to reconstruction of eroded tread or failed structures.

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Trail Maintenance

At the work site, determine what projects can be accomplished as basic maintenance, what projects can be deferred, and what projects will need major work. Always inform the land management agency of any work not completed.

Basic Trail Maintenance
Only basic trail maintenance will be included in this training module. Techniques such as construction of drainage structures, drainage crossings, turnpikes, rock walls, rock steps, and culverts will be covered in future OSI training modules. Only hand tools will be used in performing maintenance techniques.

The topics covered in detail are:
1. Trail Corridor Maintenance
   • Plant removal
   • Pruning

2. Tread Maintenance
   • Re-establish tread alignment
   • Remove roots and stumps
   • Remove rocks
   • Remove slough and berm
   • Improve backslope

3. Drainage Structure Maintenance
   • Surface water control
   • Types of drainage control structures
   • Maintaining a swale, dip or waterbar

1. TRAIL CORRIDOR MAINTENANCE
Plant removal
Plants growing into a trail corridor or trees falling across a tread surface are a threat to user safety and trail integrity.

Encroaching plants such as thistles or dense willows may make travel unpleasant or even completely hide the trail. If people have trouble traveling through the trail corridor, they will likely impact surrounding areas by traveling off of the established

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Trail Maintenance

tread. It doesn't take a full obstruction of the tread to push users to one side or the other. Anything that impinges on the user's visual perception of how clear the trail is will push them to one side or the other. For example, a low branch that comes to within a foot of the tread, when it is about at eye level, will subconsciously push the user to the other side of the trail.

KNOW THE AGENCY STANDARDS BEFORE BEGINNING MAINTENANCE WORK ON ANY TRAIL

Most trail corridors are cleared an equal distance on either side of the tread centerline. Construction or maintenance standards established for that trail determine the height and width of a trail corridor. A Crew Leader needs to know the trail standards. Within the trail corridor, plant material and debris are cleared all the way to the ground. Large trees and boulders within this corridor are obvious exceptions and shall remain. The critical corridor dimension is the safe, unhindered passage of the user (hikers, stock, OHV, etc., fully packed and with a rider, if applicable.)

A trail corridor with persistent straight edges is not pleasing to the eye. Work with natural vegetation patterns to "feather" or meander the edges of your clearing work so they don't have a severe appearance.

Some trail corridors may need to be cleared several times a year while other trail corridors may only need corridor maintenance once every few years depending on the type of vegetation near the trail. For example, a trail in a scrub oak area requires more frequent corridor clearing than a trail in a lodgepole pine forest. Trail corridor maintenance can also be accomplished at the same time a volunteer or staff person is performing a monitor and evaluation of trail conditions.

Only remove trees or shrubs that are 6-inches in diameter or less and can be cut with loppers or a bow saw.

• Walk away from trees that are larger than 6-inches in diameter. Felling standing trees (including snags) or large branches are statistically one of the most dangerous activities in which a trail worker can engage. Do not consider felling trees unless you have been trained and certified.

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Trail Maintenance

If you are uncomfortable with your ability to safely cut a tree due to the hazards or your lack of experience, walk away from it!
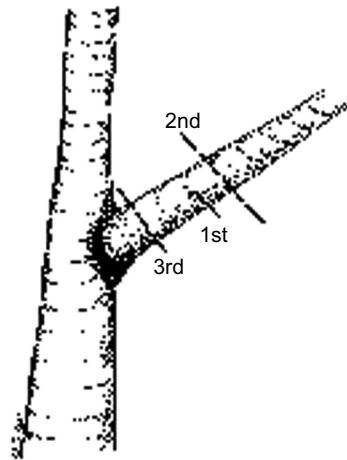
Figure 14.
The "three-cut" method of trimming large branches prevents bark from "banana peeling" off the main trunk of the tree.

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• Mark any hazardous trees that you are unable to safely remove and inform the land management agency representative.

• If you find a fallen tree lying parallel with the trail and the trunk of the tree is not within the clearing limits, you can leave it in place and prune the limbs flush with the trunk.

Pruning of the trail corridor provides an unimpeded passage for trail users.

• For a clean pruning cut, use the three-cut method where the first step is to make a shallow undercut with a bow saw, then follow with the top cut. This allows for a clean cut and prevents the limb from peeling bark off the tree as it falls. Use the three-cut method to remove large limbs (2 inches or more in diameter). Make the first cut about 8 to 12 inches up the branch from the collar on the underside of the branch. Make the second cut on the top side opposite the first cut, and the third cut to remove the stub flush with the limb collar. Do not use an ax for pruning. Loppers and bow saws are best for pruning as using an ax above knee height can be very hazardous.

• Trim back all limbs to the trunk (or ground for brush) leaving nothing that could impale or grab trail users, their stock or their equipment.

• If over half of a tree or any other large plant needs pruning; it is usually better to cut it down instead. Otherwise, prune trail facing branches to within ½ inch of the collar on the main trunk of the tree.

• If a limb is too high or too large to cut at its base, try to cut it at a "fork" of the branch as close as possible to the trunk.

Trail Maintenance

Figure 15.
These trees could have been removed rather than pruned.

• Never rub dirt or duff into the cut on a live tree or shrub. Microorganisms (pathogens) in the soil can be introduced through the exposed cut.

• Dispose of cuttings and vegetation in an acceptable manner. Whenever possible, branches, limbs, and especially small trees should be moved out of sight of the hiker or rider on the trail. Often a small clearing behind a tree or shrub will suffice to deposit cut limbs.

• Young trees that have been cut should be dragged into the surrounding forest and/or hidden behind rock outcroppings, out of sight. Take special care that the cut, butt-end of a tree is not visible from the trail.

• Cut intruding brush back at the base of the plant rather than in midair at the clearing limit boundary. Cut all plant stems close to the ground.

• Some land management agencies may want cuttings piled up for wildlife habitat. In addition, some agencies may have concerns relating to wildfire that direct how the slash is to be disposed. Other agencies may require that vegetation be spread below the trail to impede runoff.

2. TREAD MAINTENANCE
Tread maintenance ensures a solid, obstacle-free tread is established and enough protection is provided to keep it in place. Multiple use trails, primarily those that include bicycle traffic, will sometimes leave obstacles to provide additional challenge to bicycle riders or limit bicycle speeds, as long as these clearly do not present a hazard to foot traffic.

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Trail Maintenance

Tread work requires maintaining tread to its desired width. This means removing slough and berm and filling ruts, holes, and low spots. It includes removing obstacles such as protruding roots and rocks. Do not leave any exposed roots or root stubs, as exposed roots usually die. It also means repairing any sections that have been damaged by landslides, uprooted trees, washouts, or boggy conditions.

Tread maintenance aims for a solid, outsloped surface. Remove all the debris that has fallen on the tread including the sticks, stones and candy wrappers. Some land management agencies advocate pulling the lower edge berm back onto the tread surface and using it to restore the outslope as well as using any slough material in the same fashion. Only do so if the material can be firmly packed, not creating another berm. Remove and widely scatter organic debris well beyond the clearing limits, preferably out of sight.

Reestablish the tread alignment

Most livestock, bicycle and ATV use, and some people have a natural tendency to follow the outside edges of trails. Additionally, sloughing will make the trail edge the flattest place to walk. As the tread moves downhill, it also narrows, causing trail users to travel closer to the outer edge. The result is tread creep, in which the trail actually moves from its intended location within the established corridor. Other causes of tread creep are constructing a trail that is too narrow or with backslopes that are too steep. The trail crew's job is to bring the trail back uphill to its original location.

Slough spreads across tread

Rounded inside edge

Critical edge breaks down
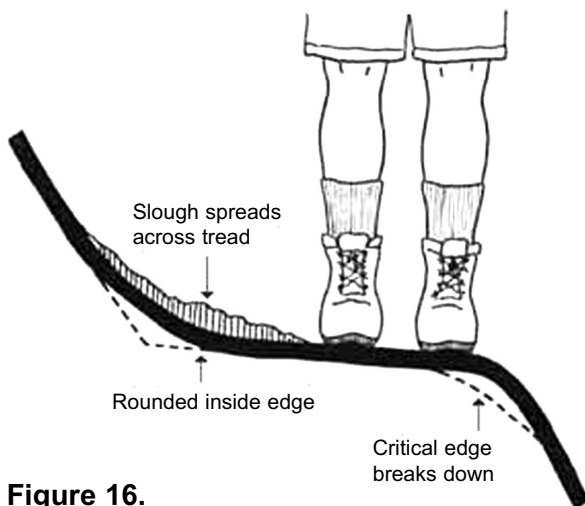
Figure 16.
Tread creep at work.

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Trail Maintenance

• Trees, log ends, rocks, and stumps left close to the downhill edge of the trail will keep animals and people to the middle of the tread. Good places for off-trail objects like this are at the crest of a hill, adjacent to a dip, steps or other structures, or along the inside edge of a turn in a trail. These "guide structures" should not impede the natural drainage pattern across the tread surface.

Remove roots and stumps within the tread surface

• A sharpened pick mattock or Pulaski is most often used to chop away at roots.

• Not all roots and stumps are problems. A stump may have been left during trail construction to help keep the trail from creeping downhill.

• Leave roots that are perpendicular and flush to the tread and that are not a tripping hazard. Remove roots that are parallel to the tread. They cause erosion and create slipping hazards. Look for the reason the roots were exposed and fix that problem. (For example, a drainage dip may be needed above root exposure.)

• Some large, exposed roots may require ramping the trail over them using rocks and fill dirt.

Figure 17.
A "daylighted" tree root.

Remove rocks within the tread surface

• Rock removal ranges from shoveling cobble to moving large rock off the tread.

• When moving large rock, think first. Plan where the rock should go, and anticipate how it might roll. Communicate with the entire crew about how the task is progressing and what move should occur next.

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Trail Maintenance

• The two most common injuries in rockwork are pinched (or smashed) fingers and tweaked (or blown out) backs. Work safely when removing large rock!

• Do not throw or kick rock off the trail. Always place or roll a rock to a safe location. An out-of-control rock might hit someone below.

• Always keep your back straight and lift rock with the strong muscles of your legs.

• Rockbars work great for moving medium and large size rocks. Use small rocks or logs as a fulcrum for better leverage.

• Not all rock within a tread surface needs to be removed. If it is not a tripping hazard, you can leave them.

• Some large, exposed rock can be crushed or chipped with rock bars and sledgehammers to create a flatter surface. Use eye protection when chipping rock.

Remove slough and berm that has formed on the tread. On hillside trails, slough is soil, rock, and debris that have moved downhill to the inside of the tread, narrowing it. Slough needs to be removed. Leaving slough will cause the trail to "creep" downhill.

• Loosen compacted slough with a pick mattock or Pulaski, then remove the soil with a shovel or McLeod. Use excess soil to fill holes in the tread or on the downhill side of waterbars and drainage dips.

• Blend the slope of the tread into the backslope area.

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Trail Maintenance

Figure 18.
Remove the slough and berm, leaving the trail outsloped so water will run off.

Berm formation is the single largest contributor to erosion of the tread surface and its removal is the most important task for trail maintenance. Berms may form a false edge. Berm is soil that has built up on the critical edge of the tread, forming a barrier that prevents water from running off the trail. Berms are a natural consequence of tread surface erosion and redeposition or inadequate compaction during construction.

A false edge is unconsolidated, unstable material, often including significant amounts of organic material that has almost no ability to bear weight. This is probably the least stable trail feature and a major contributor to accidents.

• The outside berm along the trail tread must be periodically removed. Some management agencies recommend shoveling the berm material back into the center of the trail to avoid trenching which can cause more erosion issues. Removing berms also promotes natural drainage and runoff patterns. Remove any organic material and pack the soil firmly.

Improve the backslope of the trail
The backslope is an important interface between the trail and the slope above the tread. The backslope controls how water enters the tread area and it is a distinct and recognizable boundary of the tread on the inside edge.

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• The backslope, where at all possible, should not be steeper than the native hillside slope, also known as the angle of repose or cross slope. It may not be practical to bring the backslope to the angle of repose on a steep hillside where a full bench trail is cut into the hill. This can be acceptable as long as hillside materials are solid enough to stand on their own. A vertical backslope eventually causes slumping of the soil onto the trail causing the trail to again "creep" downhill.

• The backslope imitates the cross slope above the tread.

• Cut the backslope by shaving down and in towards the tread center line. The inside edge now merges the outsloped tread with the backslope.

3. DRAINAGE STRUCTURE MAINTENANCE

The erosive force of water is usually the most destructive element acting upon a trail. A properly outsloped trail will allow water to flow across the tread rather than straight down the trail. However, a poorly laid out trail, maintenance problems, or local site conditions (such as steep trail profile grade) may allow water to be captured and the result will be water flowing down the tread. Proper maintenance of trails includes correcting drainage problems.

Trail Crew Leaders must be able to analyze various trail drainage problems and develop appropriate solutions. The more fluent a Crew Leader is in understanding the causes of a trail drainage problem, the better they can communicate to the crew members the corrective work required for the situation. Always try to identify the source of the trail drainage problem. Often just looking uphill will help locate the source of a problem. Frequently, the solution to a drainage problem may be in a less obvious location away from where the problem is manifesting itself.

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Trail Maintenance

To effectively analyze a drainage problem, a Crew Leader must understand the physics of water. Water erodes soil surfaces by picking up soil particles and carrying them. Water builds soil surfaces by slowing down and dropping soil particles. Water in the erosion mode will strip tread surface, undercut support structures, and blast apart fill on its way downhill. How much damage is done depends on the amount of water involved and how fast it is flowing.

Water has "deposit" ability. If you slow water down, it loses its ability to carry soil. If you abruptly turn or block water, it slows. This has some advantages if you are restoring eroded tread and use check dams to capture waterborne soil.

Water can also affect soil strength. Generally, drier soils are stronger (more cohesive) than saturated soils, but it is also true that fine, dry soils blow away. More experienced trail workers can identify basic soils in their areas and know their wet, dry, and wear properties.

Surface water control

Running water erodes tread and support structures and can even lead to loss of the trail itself. Diverting surface water off the trail is part of an effective maintenance program.

The most effective drainage structures are those designed and installed during the original trail construction. A properly out-sloped trail will allow water to flow across the tread rather than straight down the trail. A good drainage structure is self maintaining, requiring minimal care, but there will be times when more work is needed to promote effective drainage.

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Trail Maintenance

Types of drainage control structures

• Grade reversal dip or rolling grade dip. These drainage control structures use a reversal in grade to force water off the trail without the need for any other structures. This type of dip works best when designed and built during the original trail layout and construction. Water collected from the hillside is not intercepted and carried by the tread. Grade reversal dips are the most unobtrusive of all drainage structures if constructed with smooth grade transitions. Grade dip channels can be armored.
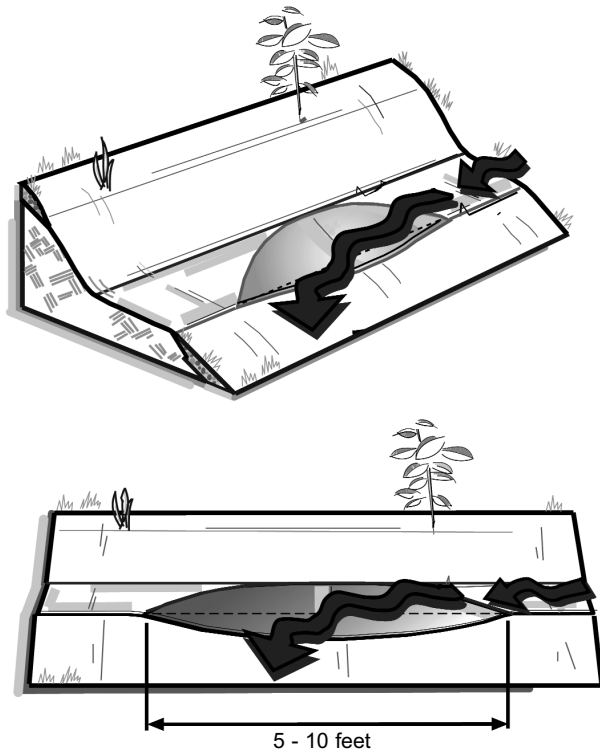
• Swales. Shaved-down sections of trail with an exaggerated outslope. Used to shed water off a trail and is a useful remedy for wet spots on relatively flat trails.

• Drainage dip. A depression constructed in the trail to catch water running down the trail and to divert the water off the trail. Usually constructed in a trail after the original trail layout and construction has been completed.

• Reinforced drainage dip. A reinforced drainage dip is a drainage structure which has a water bar buried under a layer of compacted soil.

• Water bar. A drainage dip combined with an exposed stone or timber barrier set diagonally into the trail. The drainage dip diverts water from the trail and the hardened barrier deflects water in case of major water flow. This type of drainage structure is no longer recommended for construction or use on trails, but previously constructed water bars need to be maintained or replaced.

5 - 10 feet

Figure 19.
Swale.

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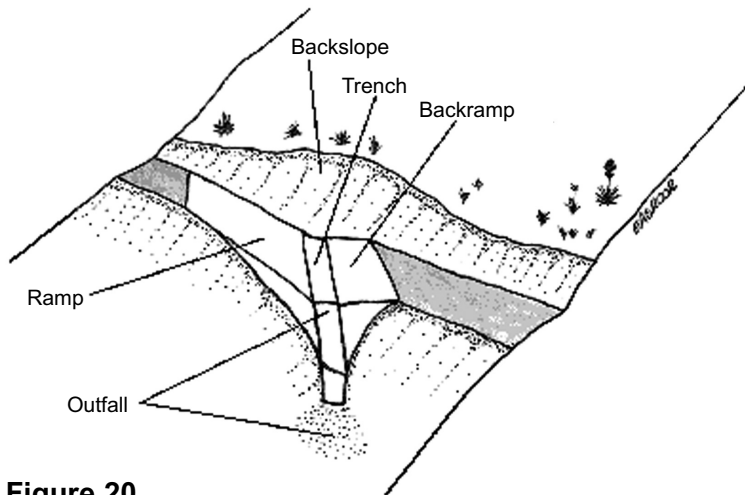
Trail Maintenance

Figure 20.
Anatomy of a drainage dip.

Maintaining a swale, dip, or waterbar

The biggest maintenance issue for drainage structures is sediment build up. If a drainage structure clogs, water will find its way down the tread, creating erosion channels or puddling. The best drainage structures are self-cleaning, but realistically, most drains collect debris and sediment that must be removed.

Most problem drainage structures are water bars. If water is slowed by hitting the stone or timber barrier, sediment builds up. Inadequate outsloping or an outfall that is too narrow can compound this. An effective water bar allows for the "natural" flow of water on and off of the trail.

• When maintaining a water bar or dip, anticipate where the runoff goes and remove excess sediment where needed.

• Reestablish or locate the outfall or drain outlet to naturally turn the water off the trail before it reaches the water bar or the dirt barrier of a drainage dip.

• Dig the outfall wide (up to two shovel widths) and graded so water does not slow before it exits the trail. Outfalls that allow water to return to the tread below the drainage structure need to be reconstructed.

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Figure 21.
Anatomy of a water bar.
The waterbar itself is a raised row
of fitted and buried stones, which
reinforce the dip.

Trench   Water bar

Ramp

Outfall

EPS R002
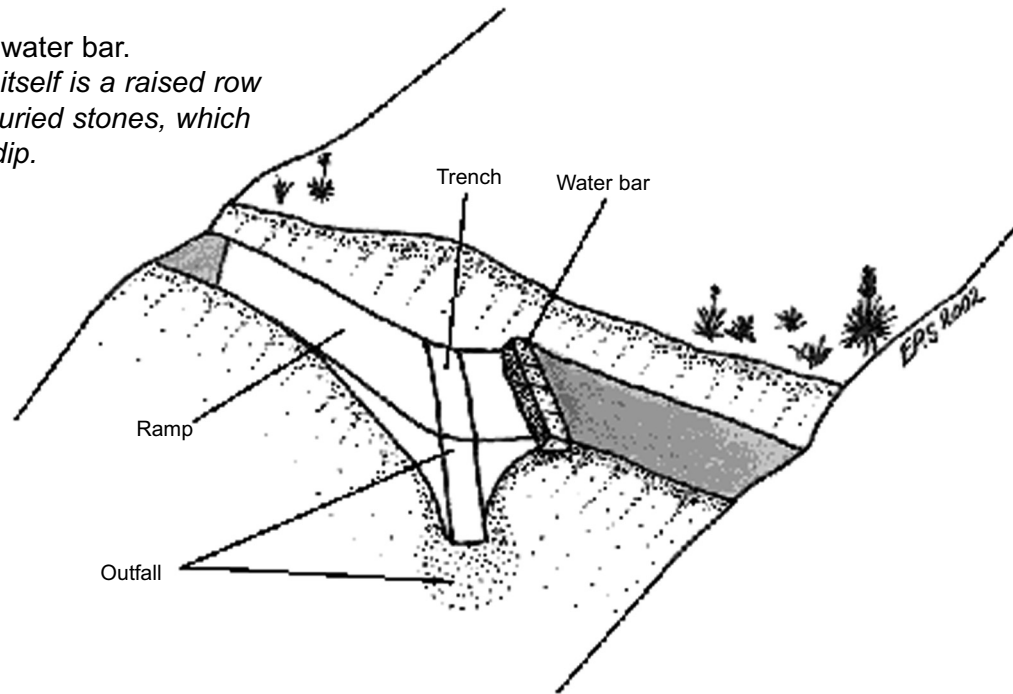
• Clear the outfall of all logs, rocks, and other debris, and even consider cutting logs and roots if needed to preserve the natural flow of water off the trail. The exception is that some rocks, logs or other debris can be left to dissipate the energy of flowing water.

• Mineral soil removed from an outfall can be placed on the downhill side of the dip or waterbar on the trail and compacted. This will promote a smooth ramp up and over the dip or waterbar.

• The outlet can dip down to 12 inches below trail level across the entire width of the trail.

• Dips and water bars are constructed at an angle to the trail, not perpendicular.

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• The ramp or downhill approach to the drainage structure will usually begin at a minimum of five to six feet above (up to 10 to 20 feet for steeper trails) and will be a steady grade several degrees steeper than the trail and outsloped as much as possible..

• Below the drainage structure, the approach will extend about five feet below the drainage structure and will be a steady and consistent grade across the entire width of the trail.

PROCEDURE

BEFORE PRESENTATION

1. Use the Description, Objectives and Background Information as well as the notes and outline in Appendix O, page O-1, to develop your own outline for the introduction to this section and activity.

2. Crew Leader Instructors will walk a trail and mark important sites that demonstrate good and poor trail conditions. These sites will illustrate the information that is covered in the trail maintenance presentation.

3. Stations along trail need to include the following:
   • Standards for trail. What are agency standards for this trail? Is there maintenance needed? What is intended use and what is actual use of trail?

   • User impacts. Have examples of trail braiding, shortcutting, berms along the critical edge developed from bicycle or other use, trail compaction, horse hoof holes in mud, bicycle tire tracks causing ruts in tread, etc. What maintenance techniques would improve these sites?

   • Water impacts. Have examples of erosion, water flowing down a trail, ruts or channels in tread, inadequate backslope causing undercutting and sloughing, berms along the critical edge preventing water from sheeting

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off the trail, inadequate outslope of tread, etc. What maintenance techniques would improve these sites?

• Structures. Examples of structures include water bars and dips, swales, rock walls, switchbacks and climbing turns, turnpikes, steps, etc. Are the structures working? What would be needed to repair or maintain structures?

PRESENTATION

LECTURE

1. Crew Leader Instructors will present basic trail maintenance to the Crew Leader Trainees utilizing the prepared outline.

2. After the presentation, refer the Crew Leader Trainees to the Trail Terminology handout.

3. Crew Leader Instructors and Crew Leader Trainees will head for the trail.

ON THE TRAIL

1. Review all corridor maintenance, tread maintenance and drainage structure maintenance items while walking pre-marked trail.

2. Crew Leader Instructor will demonstrate maintenance techniques:
   • Dip or water bar maintenance
   • Tread maintenance
   • Corridor clearing

3. Crew Leader Instructor will lead Crew Leader Trainees in maintenance of trail utilizing appropriate leadership techniques..

4. Assign appropriate amount of trail to each Crew Leader Trainee.

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5. Instruct the Crew Leader Trainees to maintain their assigned section of trail.

6. Have each person decide which tool to use; monitor selection and usage and correct if necessary.

7. Instruct each Crew Leader Trainee to evaluate the work by reviewing and comparing the maintenance guidelines and instructions to the finished trail.

RESOURCES

Stephen Griswold. 1996. *A Handbook on Trail Building and Maintenance: For National, State, and Local Natural Resource Managing Agencies.* Published by Sequoia Natural History Association. Three Rivers, California.

Woody Hesselbarth and Brian Vachowski. 2000. *Trail Construction and Maintenance Notebook: 2000 Edition.* Published by USDA Forest Service.

Larry Lechner. 2004. *Trail Planning, Construction and Maintenance in Parks and Protected Areas.* Available by author. Fort Collins, Colorado.

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Basic Risk Assessment

DESCRIPTION

Crew Leader Instructors will teach Crew Leader Trainees what risks are and how to assess risks. Crew Leader Instructors can use the site conditions found in the trail maintenance or trail construction sections to demonstrate what risks to look for when leading a crew or provide copies of scenarios.

OBJECTIVES

By the end of this module, Crew Leader Trainees will be able to:

• Identify potential risks for a project.

• Consider possible hazards associated with risk.

• Prevent injuries by recognizing and communicating about risks and hazards to a crew.

TIME ALLOWANCE

30 minutes

SETTING

Classroom & outdoors

MATERIALS & PREPARATION

Pencils and/or pens
Laminated Scenario Photos (instructor provides separately, if needed)

Note: Instructors may wish to provide their own photos, acquire photos from the sponsoring organization or simply direct the Trainees to visualize conditions in the field.

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Basic Risk Assessment

BACKGROUND INFORMATION

The Crew Leader is responsible for the safety of a crew and therefore needs to understand the basics of risk assessment. Crew Leaders will perform risk assessments constantly throughout the workday. Crew Leaders need to assess potential hazards while hiking to the work site, while working at the work site, and even during lunch!

The term "risk" includes three concepts: the hazard, the possible outcomes, and the likelihood. A hazard is a situation that can cause harm to a person. An outcome is the resulting injury due to a hazard. The likelihood describes the level of probability of the outcome.

For example, one of the possible risks of standing in front of the group to teach this course is that the instructor could step on a loose rock (hazard) and sprain his or her ankle. The instructor may experience pain, need to go to the doctor, and could even miss a paid work day (outcomes). However, the likelihood is low.

Once we understand the risks of any particular activity, we can think about how to mitigate, or lessen the likelihood of each. If the severity of the outcome and the likelihood are both low, we may choose to do nothing to mitigate the risk. But if the severity is high (even if the likelihood is low), we will probably choose to take some mitigation action. For example, when operating a vehicle on icy winter roads, an accident could cause death for the driver. Although the likelihood is relatively low, the severity is high: we will both adhere to safety standards already in place (following the rules of the road, wearing our seatbelts) and implement some new ones ourselves (driving slowly and cautiously.)

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Basic Risk Assessment

PROCEDURE

BEFORE PRESENTATION

1. Use the Description, Objectives and Background Information as well as the notes and outline in Appendix F, page F-1, to develop your own outline for the introduction to this section activity.

2. If needed, copy photos (laminated, instructor provides separately) showing people working on a project.

PRESENTATION

1. Stop work and gather the group together if in the field.

2. Crew Leader Instructors will present basic risk assessment to the Crew Leader Trainees utilizing the prepared outline.

3. Have the Crew Leader Trainees use their copy of the Hazard-a-Guess Scenario Activity Sheet (CL 88), give them a pen or pencil (and a copy of the photographs chosen for this activity if needed).

4. Tell the Crew Leader Trainees to assess the current conditions of the work site or utilize the photos. Identify hazards, outcomes and the likelihood of each occurring. Write answers on the Hazard-a-Guess Scenario sheet.

5. Ask the group to list hazards that have not been mentioned during the activity. Below is a reference list:
   - Dehydration
   - Hypothermia
   - Sun Exposure
   - Altitude Sickness
   - Lightning
   - Rock Slides
   - Snowfields
   - Hantavirus
   - Giardia
   - Wildlife Encounters
   - Weather
   - Falling Rocks
   - Flash Floods
   - Snakes
   - Tool Gashes
   - Barbed Wire

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- Barbed Wire
- Smashed Fingers/Limbs
- Snags, Falling Trees
- Insect Bites and Stings
- Noxious or Poisonous Plants
- Transporting Materials (carrying heavy or awkward objects)
- Use of Specialized Equipment/Tools (tram systems, chain saws, snowmobiles, etc)
- Identification of other environmental hazards (power lines, buried cable, etc)

BRINGING IT TOGETHER

- How can you apply this exercise to your work situation or in the field?

- Do we always need to mitigate the risk?

- How will doing risk assessments make you a better Crew Leader?

- Was this lesson helpful to you for thinking about risk assessment and mitigation?

- Are there other ways you can think of to teach new crew leaders to understand risk assessment?

RESOURCES

OSI Focus Group Data, August – October 2003.
Activity idea adapted from an activity description by Wil Rickards, Colorado Mountain College part-time faculty .
Work site hazards compiled from: *Colorado Fourteeners Initiative Health & Safety Manual.*
Volunteers for Outdoor Colorado Crew Leader Manual, pages 2-11 through 2-20.

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Hazard-a-Guess Scenario

Potential Hazard	Potential Injury / Outcome	Likelihood (high/ med/low)	Need to mitigate? Y/N	What measures are already in place?	What should be done?

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Conflict and Dispute Management

DESCRIPTION	Crew Leader Instructors will teach Crew Leader Trainees how to manage conflict between Crew Members. Crew Leader Trainees will learn more about their personal style of managing conflict, and learn about other styles of conflict management.
OBJECTIVES	By the end of this module, participants will be able to identify their own conflict management style.
TIME ALLOWANCE	35 minutes
SETTING	Classroom or outdoors

MATERIALS & PREPARATION	2 hats or bags
	Scissors
	Appropriate number of copies of instructor worksheet:
	    Conflict Scenario page (p. 136)
	    Conflict Personality page (pp. 137)

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Conflict and Dispute Management

**BACKGROUND
INFORMATION**

Conflict is inevitable in any group that is together for any length of time. People are unique and therefore will have differing viewpoints, ideas and opinions. Conflict occurs when there is no internal harmony within a person or whenever there is disagreement or a dispute between, or among, individuals. In other words, conflict may be intra-personal, interpersonal or intra-group.

There are many sources of conflict:
• Different values and beliefs
• Role pressure or clarification
• Perception differences
• Diverse goals or objectives
• Race, ethnicity, or gender differences
• Personality clash or conflict
• Competition for limited resources
• Disagreement on how things should be done
• Personal, self or group interest
• Tension and stress
• Power and influence

People generally may think of conflict in negative terms because conflicting issues that are avoided or handled poorly may divert attention from important issues, damage morale, cause polarization and reinforce differences in values. Outcomes may also include irresponsible and regrettable behaviors.

Conflict handled well can result in positive outcomes. It may promote change, increase cohesiveness, become a forum for problems to be heard, and provide a means for people to work together. Knowing how you handle conflict will help you to better interact with others who approach conflict in a different way.

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Conflict and Dispute Management

Remember, when managing conflicts:
• Real issues driving many conflicts are rarely obvious.

• Separate the people involved in the conflict from the rest of the group for privacy unless it is a group issue.

• Clarify issues and find common ground.

• You are in charge of how you respond.

• Avoid pre-formed judgments.

• Solutions lie in building trust and open dialogue.

• A vision of success is required.

PROCEDURE

BEFORE PRESENTATION

1. Make enough copies of the Conflict Personality page so that each participant will get one of the 4 personalities.

2. Cut the conflict personality styles into slips.

3. Fill one hat with all of the personality slips.

4. Make enough copies of the Conflict Scenarios page so that each participant will get one of the five scenarios.

5. Cut the scenarios into slips.

6. Fill one hat with all of the scenario slips.

7. Use the Description, Objectives and Background Information as well as the notes and outline in Appendix N, page N-1, to develop your own outline for the introduction to this section and activity.

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Conflict and Dispute Management

1. Use the outline to introduce the activity. Be sure to discuss the four different conflict personalities prior to beginning your scenarios.

2. Ask for two volunteers from the group to assume the roles of a "Crew Leader" and a "Crew Member."

3. The Crew MEMBER will pick one scenario AND one conflict personality style slip from each hat.

4. Tell the Crew MEMBER to share the scenario card with the Crew LEADER.

5. Explain that the goal of this activity is for the Crew LEADER to successfully resolve the conflict by effectively responding to the personality type and the scenario.

6. Instruct the Crew MEMBER to assume the conflict personality as indicated on the slip.

7. Instruct the Crew LEADER to resolve the conflict using their own management style.

8. Give the teams 30 seconds to get into character according to the scenario and conflict management styles.

9. Instruct the Crew LEADER to approach the Crew MEMBER under the pretense that the Crew MEMBER is behaving differently than the rest of the crew.

10. Allow two minutes to resolve the conflict.

11. Repeat until each Crew Leader Trainee has had the opportunity to be a Crew Leader in the scenario.

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Conflict and Dispute Management

• How can you apply this exercise to your work situation or in the field?

• How do learning styles and active listening apply here?

• How can you avoid conflict situations from developing in the first place?

• How can you use a knowledge of the personality styles to help you manage a conflict?

• Can all conflicts be resolved?

RESOURCES

Greve, Shirley. *Participants Handbook: Conflict Resolution. Handout.* Range Riders Youth Corps.
The Great Scenario Book. Handout. Rocky Mountain Youth Corps.
Getting to Yes. Roger Fisher.

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Conflict Scenarios

✂ -

A Crew Member is unsafe or won't wear personal protection equipment.
You have already talked to him/her once about this.

- -

The Crew is working well together. Another Crew Member approaches
and is critical of the work.

- -

You don't like a Crew Member and his/her boy scout troop
are rough-housing with each other.

- -

A Crew Member is rude and
disrespectful to others.

- -

A Crew Member is telling other Crew Members how
to incorrectly construct the trail.

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Conflict Personality

✂ --

ACCOMMODATE: **YOUR WAY – I GIVE IN TO YOU.**
The relationship is more important than what we are arguing over. I may come across as not listening or "blowing off" another person's comments.

COMPETE: **MY WAY – I GET WHAT I WANT.**
This is the "I win/you lose" scenario and what I want is more important than our relationship. This style is also utilized in competition, sports, politics, etc.

COMPROMISE: **HALF WAY – A LITTLE BIT ME, A LITTLE BIT YOU.**
We both have to give up something in order to get something.
I'm willing to argue for "my side" of the story or issue until I think that you understand my viewpoint.

COLLABORATE: **OUR WAY – THE WIN/WIN.**
I value the relationship – my needs and your needs equally.
We work together to make sure each of our needs is met without giving up anything.

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Assessing Your Crew

DESCRIPTION

Crew Leader Instructors will teach Crew Leader Trainees how to make sure that the crew has a great experience on a project. Crew Leaders will learn the basics of constantly "reading" people's reactions to, and behaviors during, the project.

OBJECTIVES

By the end of this module, Crew Leader Trainees will be able to ask the right questions to assess their crew's reactions to, and behaviors during, the project and make adjustments if necessary.

TIME ALLOWANCE

35 minutes

SETTING

Classroom and/or outdoors

MATERIALS & PREPARATION

Scissors
Appropriate number of copies of Instructor Worksheet Four Scenarios (pp. 144)
Hat or bag in which to put scenarios

Note: Instructors may need several copies of each scenario and can consider laminating them for field use.

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Assessing Your Crew

Crew Leaders are expected to manage projects, people and safety. It is a Crew Leader's job to ensure a positive experience for all parties. Crew assessment is a tool that can be very helpful. Every Crew Leader needs to know about the people working on the project and be one step ahead. It is much more important for a Crew Leader to be proactive than reactive. A skilled Crew Leader is able to anticipate, to see things before they happen and institute a preventative measure.

There are five elements for a Crew Leader to be mindful of while leading a crew. The five elements are <u>expectation, skill, personality, performance and safety</u>.

The first element is **expectation**. Every member on the crew has a different reason for being there. The more expectations a Crew Leader can fulfill the better the experience each member will have. It is important to find out the member's reason or motivation for being there. If the member feels satisfied in their experience they tend to be more productive. Meeting member's expectations will also help increase retention levels. Clear expectations in the beginning will lead to fewer problems down the road.

Next, it is important to measure the team's **skill level**. By knowing the individual skill sets of members on the crew, the team can tackle projects more efficiently. Some members may have medical expertise, equipment certification or project experience, which can make the work go a lot smoother and safer. This information helps when pairing people together, deciding who will do which tasks, determining which member will need more assistance and/or training and ensures better quality of work.

Personalities play a big role in project management. Not everyone will be a leader, an analytical thinker, a supporter, and a cheerleader or show exceptional determination. But the combination of these personalities is what makes a team successful. Identifying the roles people play and strategically

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Assessing Your Crew

placing them will help the team be more efficient and productive.

Performance assessments need to be done on a continuous basis. It is easy to get off track when supervising multiple people. It is easier to correct mistakes as they happen than to correct them when a task has been finished. Trying to motivate a crew to redo a task because their leader was negligent is not easy.

Lastly and probably most important is assessing your crew's **safety**. Safety is a Crew Leader's first priority. A person's well-being can be measured in three different ways:

• **Personal safety** is the first consideration for a crew. Crew Leaders need to be sure their crew is healthy in order to take on the physical demands specific to their projects. Crew Members need to drink plenty of water, eat nourishing food, take enough breaks, stay warm (or cool as the case may be) and dry, and stretch their muscles throughout the day. It is the Crew Leader's job to provide a method that maintains each of these physical needs.

• **Mental well-being** must also be evaluated. Members need to be attentive and focused to help maintain their own safety. Members need to continue to learn and be challenged in order to grow and remain attentive and focused. When boredom and monotony set in, members lose their motivation and determination. This will cause a loss in productivity and may create an unsafe environment.

• **People want to fit in, accomplish goals and feel good about themselves.** Stress, feeling overwhelmed, and lack of support will keep a person from achieving their fullest potential. A Crew Leader needs to watch for external signals and be ready to offer additional support when needed.

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Assessing Your Crew

PROCEDURE

LECTURE

1. Use the Description, Objectives and Background Information as well as the notes and outline in Appendix M, page M-1, to develop your own outline for the introduction to this section and activity.

2. Make copies of the Scenarios page beforehand (if you do not already have laminated copies) and cut the scenarios into individual slips.

PRESENTATION

1. Crew Leader Instructors will present the background information for assessing your crew utilizing the prepared outline.

2. Briefly outline the activity to the entire group.

3. Put scenario slips or laminated cards into a bag or hat. Have a Crew Leader Trainee pick a scenario slip. Tell card holder he/she will take on the role described on the card.

4. Explain to the entire group that the card holder will behave like a "Crew Member" according to the setting and circumstances provided by the scenario card.

5. Assign one Crew Leader Trainee to act as the "Crew Leader."

6. The "Crew Leader's" responsibility is to 1) determine the situation through interaction with the "Crew Member"; 2) figure out a way to handle and/or prevent the situation from escalating.

7. Read the setting aloud to the entire group.

Setting: It is mid-July. You and your crew of 15 are working on a trail project. The elevation is around 11,000 feet. The sun has been shining all day and the temperature is in the low 80s. Your team's goal for the day is to complete 200 feet of new trail. You've pushed your crew all

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morning, but they are still short of the half-way mark at 12:30 pm. You begin to head down the trail to check on your crew members.

8. Instruct the card holder to act out the role on the card, and the Crew Leader Trainee posing as the "Crew Leader" should react.

9. Repeat the activity until each person in the group has had the opportunity to play the role of "Crew Leader" and the role of "Crew Member."

BRINGING IT TOGETHER

• How would you apply the information from this session to daily activity in the field?

• What sort of difficulties do you see in making assessments?

• What sort of methods might a Crew Leader use to ensure they were correctly assessing the crew?

RESOURCES

MacKenzie, Marilyn and Gail Moore. (1993). *The Volunteer Development Toolbox.* Downers Grove, IL: Heritage Arts Publishing.
MacLeod, Flora. (1993). *Motivating and Managing Today's Volunteers.* Bellingham, WA: Self-Counsel Press, 148.
McCurley, Steve and Rick Lynch. (1996). *Volunteer Management: Mobilizing All the Resources of the Community.* Downers Grove, IL: Heritage Arts Publishing, 63-125.
Vineyard, Sue. (1996). *New Competencies for Volunteer Administrators.* Downers Grove, IL: Heritage Arts Publishing, 43-50.

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Four Scenarios

Card #1

Scenario 1:

You are TOTALLY bored with your task. As a result, you lack enthusiasm, work slowly, and stop every 15 seconds to take a rest while leaning on your tool.

Card #2

Scenario 2:

You are working on a rock wall and you really don't know what you're doing. After an hour, you are sitting on the ground tossing small rocks down the hill. You seem bored and periodically walk away from your duties.

Card #3

Scenario 3:

Yesterday, before you left, you heard that your supervisor at work is unhappy with your performance. You don't know why. The Crew Leader placed you on a small sub task. You are not getting along with your group, and another Crew Member is being bossy and a know-it-all. You're stressed, frustrated and don't want to be there.

Card #4

Scenario 4:

In a rush to get to the project on time, you missed breakfast. You have been digging a back slope all morning with a pick mattock. You have a headache, and you're feeling a little dizzy. You don't really feel like working.

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Know Agency and Organization Protocols

DESCRIPTION

Crew Leader Instructors will teach Crew Leader Trainees what questions to ask a Project Coordinator or Land Management Agency Representative prior to beginning a project.

OBJECTIVES

By the end of this module, Crew Leaders will be able to collect information about a project by using a project and safety checklist.

TIME ALLOWANCE

15 minutes

SETTING

Classroom or outdoors

MATERIALS & PREPARATION

BACKGROUND INFORMATION

OSI-trained Crew Leaders may work with many different agencies and organizations. "Agency" refers to local, state, and federal land management organizations. "Organization" typically refers to non-governmental or non-profit groups.

Because every agency and organization has different communication protocols and a different safety net, this unit reviews what questions need to be asked before and during a project.

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Know Agency and Organization Protocols

PROCEDURE

1. Discuss how to use the checklist to complete the Project and Safety Information Form.

2. Explain to the group that each organization or agency will have a different communication and safety net.

3. Provide the necessary information for today's training (land management agency, project goals, safety and communications network, who has EMS training, where first aid kit is located, etc.)

BRINGING IT TOGETHER

• How can you apply this training to your work situation or in the field?

• How will knowing agency and organization protocols make you a better Crew Leader?

• Are there other important safety protocols you think should be added to the OSI Safety Protocols?

RESOURCES

OSI Focus Group Data, August – October 2003
Activity idea adapted from Nancy Scalise, Colorado State Parks
Project & Safety Information Form adapted from Mile High Youth Corps
Volunteers for Outdoor Colorado Crew Leader Manual, page 2-21
Crew Leader Check List

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Project & Safety Checklist

Use the checklist to complete the Project & Safety Information Form. It is ESSENTIAL that you know this information and do everything you can to collect details. Contact the organization or land management agency representative on their protocols. They may have already gathered the information for the Crew Leader.

Before you arrive on the project:

1. ❑ Contact the sponsoring agency.
    a. ❑ Find out the Agency Staff Liaison's name, title, and contact information.
    b. ❑ Give the Agency Liaison YOUR contact information.

2. ❑ Contact the Agency Staff Liaison to make sure you have all the basic information:
    a. ❑ What are the dates of the project?
    b. ❑ Where is the project located?
    c. ❑ What type of project is it?
    d. ❑ What are the goals of the project?
        How much does the agency expect you to accomplish?
    e. ❑ What is the background or context for the project? Why are you doing it?
    f. ❑ Where do you get the tools for the project?
        Is any special equipment needed for the project?
    g. ❑ What are the specifications they want you to follow (for example,
        trail standards for a trail construction project)?
    h. ❑ Are there any special regulations for the area? What should the
        Crew Leader do if someone is violating a regulation?
    i. ❑ Will an agency person be at the project?

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Project & Safety Checklist *continued*

3. ❏ Ask the Agency Staff Liaison some questions about the safety and communications network for the project:

    a. ❏ Find out what the safety and communications net will be for the project, and if there is a project safety plan specific to the agency. In case of an emergency, what is the chain of communication?

    b. ❏ Get the agency's safety and communication protocols in writing! If a serious accident occurs, (i.e., medical transport, airlift) you may not remember what to do.

    c. ❏ Find out if there are any special safety concerns for the project.

    d. ❏ Will there be an EMS personnel on site at the project?

    e. ❏ Where is the nearest medical facility?

    f. ❏ Find out what forms they will require you to use. These could include liability waiver forms, accident forms, incident forms, etc.

When you arrive at the project:

❏ 1. Park your vehicle facing toward the exit – make sure it won't be blocked in!

❏ 2. Check in with agency person when you arrive on site (if there is one on the project).

❏ 3. Learn about the specific evacuation plans.

❏ 4. Find out if the agency wants to be informed of all medical incidents, no matter how small.

❏ 5. Find out which Crew Member(s) have the highest level of medical training, and appoint a stand-in Crew Leader, in case you get hurt.

❏ 6. Obtain any agency communication devices, such as a radio. Learn to use it! Is the radio set on the proper channel?

❏ 7. Obtain maintenance, restoration or trail notes.

❏ 8. Ask that safety and communications protocols be provided in writing.

❏ 9. Review the project-specific safety protocols, and Job Hazard Analysis, if applicable, with your crew.

❏ 10. Do not let Crew Members avoid safety protocols.

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Project & Safety Information Form

	PROJECT NAME
	SPONSORING AGENCY
1a	AGENCY STAFF LIAISON'S NAME AND TITLE
	OFFICE PHONE CELL PHONE EMAIL
2a	PROJECT DATES
2b	PROJECT LOCATION
2c	TYPE OF PROJECT
2d	PROJECT DESCRIPTION, GOALS
2e	PROJECT BACKGROUND
2f	EQUIPMENT/TOOLS NEEDED & LOCATION
2g	PROJECT SPECIFICATIONS AND STANDARDS
2h	SPECIAL AREA REGULATIONS
2i	AGENCY PERSON ON SITE OR AVAILABLE DURING PROJECT
3a	COMMUNICATIONS / SAFETY NET
3b	SAFETY / COMMUNICATIONS PROTOCOLS
3c	SPECIFIC PROJECT SAFETY CONCERNS
3d	WHAT TYPE OF EMS PERSONNEL WILL BE ON SITE AT PROJECT?
3e	NEAREST MEDICAL FACILITY
3f	NECESSARY FORMS REQUIRED (LIABILITY WAIVER, ACCIDENT, INCIDENT, ETC.)
	IMPORTANT PHONE #'S / RADIO CHANNELS / SECONDARY EMERGENCY CONTACT AND NUMBERS

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Putting It All Together

DESCRIPTION

The Daily Reminder summarizes all of the basic components from the training workshop and presents the information in a simple format that can be utilized in the field. Following the basic reminders will promote a better crew leading experience.

OBJECTIVES

By the end of this module, Crew Leaders will be able to put together everything they have learned throughout the course to be utilized in the field.

TIME ALLOWANCE

15 minutes

SETTING

Classroom and/or outdoors

MATERIALS & PREPARATION

PROCEDURE

1. Do a quick review of all components in the course. (Identify basic topics).

2. Ask questions of group:
   a. How do all of the different topics of the course fit together while actually crew leading in the field?
   b. In what order?

3. Refer Crew Leader Trainees to "A Crew Leader's Daily Reminder" on page 152 (CL 93).

4. Have a discussion on how trainees will be utilizing everything they learned while crew leading on a project.

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A Crew Leader's Daily Reminder

Start of Project

GREET crew members as they arrive
   • Supply name tags for everyone (if you decide to use them)
   • Ensure waivers are signed (if required)

INTRODUCE yourself and crew members

DISCUSS project expectations, work objectives and work site specifics
   • How far/difficult is hike/travel to site
   • What type of work will be done

DEMONSTRATE/PROVIDE Safety/Tool Talk
   • Discuss safety and first aid
      - Find out crew members health needs
      - Make sure everyone has water, food, clothing, boots, and gloves for the day
      - Ask if anyone has medical/first aid training
      - Explain your level of first aid training and where a first aid kit is located
      - Explain the safety net for the project
      - Explain the environmental and safety hazards for the project
   • (CUSS) Carry, use, storage and safety of tools being used that day

LEAD Safety Stretch Exercise (may be done upon arrival at the worksite)

HIKE/TRAVEL to the work site at a pace everyone can handle
   • Put your slowest hikers/travelers in front
   • Check tool carry and safety on the way to the site

Upon Arrival at the Worksite

EXPLORE work area and discuss with crew members
   • Find out what talents, experience or expertise crew members have
   • Utilize project notes (if provided) to explain tasks and standards for project

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DEMONSTRATE 6-step method of trail construction or maintenance techniques
- Provide a short talk on trail terminology, trail overview, 6-step method, and/or maintenance techniques.

DELEGATE tasks to crew members accounting for individual preference, ability and skill

Ongoing/Throughout Project

PROMOTE a safe work environment
- Take breaks as needed
- CUSS for tools
- Encourage crew members to work at a comfortable pace.
- Continually assess for risks

PROVIDE a positive work environment through:
- Demonstration of appropriate leadership styles
- Praise and recognition of crew members
- Utilizing active listening techniques, giving appropriate feedback, and demonstrating tact and diplomacy in negotiations and confrontations with others
- Understanding motivational styles
- Understanding learning styles and using effective teaching techniques
- On-going assessment of crew members (expectations, skill level, personality, performance, and safety)
- Identifying problems in the field, creating a plan of action to resolve problems, communicating the plan to crew members, and motivating them to implement solution
- Using a group approach to solve problems
- Modeling appropriate behavior
- Having fun!

End of Project

WALK work site at end of project with crew members to assess work accomplished
- Gather tools, packs, clothing, trash, etc. so that nothing is left behind
- Give thanks to crew members for a job well done and encourage them to volunteer/work again
- Check tool carry and safety on the way out

ENCOURAGE crew members to provide feedback on project
- Fill out evaluation form if provided

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Conclusion

Appropriate number of forms and documents:
- Course evaluation forms (provided separately)
- Course completion documents (provided separately)

CONGRATULATIONS!

Your Crew Leader Trainees have completed *Crew Leadership Training for Trails*. Time limitations and the amount of material covered in the course do not allow Crew Leader Trainees the opportunity to practice being a Crew Leader. **OSI recommends that in addition to this course, Crew Leaders work under an experienced Crew Leader or arrange for mentoring to gain confidence prior to leading a crew.** In addition many organizations and agencies have established protocols and programs for their Crew Leaders. **Trainees need to check with these entities to get any additional training that is specific to that group.**

Encourage Crew Leader Trainees to visit OSI's website at www.cotionline.org to find out about additional training and volunteer opportunities.

TIME ALLOWANCE

15 minutes

COURSE OUTCOME

Participants will receive course completion documents recognizing their successful participation in a OSI Trails Crew Leader training program.

PROCEDURE

1. Ask questions of group:
   a. Were your objectives met?
   b. Does anyone have any questions?
2. Distribute course evaluation forms.
3. While the trainees are completing the forms, prepare the course completion documents.
4. Collect the evaluation forms.
5. Prepare a simple, fun recognition process to hand out the course completion documents.
6. Thank all participants for attending course.
7. Mail all evaluation forms to OSI upon completion of the course.

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Colorado State Parks
TRAIL GRANTS
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Appendices Contents

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ABOUT APPENDICES TO OSI INSTRUCTOR'S GUIDE TO TEACHING CREW LEADERSHIP FOR TRAILS

INTRODUCTION

The Appendices have been added to the *Instructor's Guide* in an effort to reduce preparation time and standardize presentation. The Appendix material is a tool for Instructors and provides a suggested lecture format, main objectives, teacher's notes and a short outline for each section. Combining both the established course material and the information in the Appendix will result in more effective presentations for all Instructors and consistency in teaching the course statewide.

NOTE: Experienced instructors may find that the Appendices do not cover the content in the same fashion, order and format as the *Instructor's Guide.* Using the Appendices in conjunction with the *Instructor's Guide* will ensure that all of the content is covered.

HOW TO USE THE APPENDICES

The Appendices are listed in a recommended order for instructing the course. (See Course Outline page xii.) However, the circumstances and goals of a particular training may necessitate a change in order.

Each Appendix topic is organized in a similar fashion with the following sub-headings and boxes:

LECTURE: A suggested lecture format for each lesson module (although this tool gives an instructor a word for word presentation, reading it is not an effective way to teach.)

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ACTIVITY: Step by step instruction and presentation for a hands-on activity associated with the lesson module.

MAIN IDEA: The "Main Ideas" boxes are objectives for the Instructor to achieve during the lecture.

TEACHER NOTE: The "Teacher Note" boxes are tips for instructors to incorporate into their lecture that will promote consistency and improve presentation.

MORE INFORMATION: The "More Information" boxes provide answers to questions for instructors to look for during discussions with Crew Leader Trainees and other tips useful to the presentation.

RECALL TIP: This box will contain ways to tie the lecture points to a previous lesson module.

As mentioned previously, the tools in the appendices will bene-fit instructors by reducing their preparation time. Effective teaching is, in no small part, a function of preparation. Several of the modules in the current curriculum ask each instructor to develop a lecture from the background information. This can be a very time consuming process especially if an instructor is going to be delivering the entire course. The model lecture (and to some extent the outline) does a large part of the preparation for the instructor. Neither tool completely eliminates prep time however. Even if an instructor chooses to work from the model lecture, he will likely need to highlight or underline key words, make his own notes, or rewrite the lecture in his own words. The purpose is not to have instructors say the exact same words, but to have instructors deliver the same set of concepts.

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About Appendices

NOTES

APPENDIX A, INTRODUCTION: The Introduction is expanded from the original in the *OSI Instructor's Guide to Teaching Crew Leadership for Trails.* The introduction now includes teaching and presentation techniques for Crew Leader Trainees.

A suggestion for instructors is to talk about leadership characteristics in general first (ex. "What qualities/characteristics define a good crew leader?"). One of those characteristics could be "able to teach trail skills and concepts". At this point, an instructor can then talk about teaching and presentation techniques and how a Crew Leader can be both.

Whatever list the Crew Leader Trainees generate for good qualities/characteristics for a Crew Leader can then be tied to the other lesson modules presented throughout the two-day course. For example, a Crew Leader needs to be a good listener. This characteristic/skill will be taught in the "Keys to Effective Listening" module.

A Few Crew Leader Characteristics:

Able to teach trail skills
Maintains a safe environment
Good listener
Able to demonstrate trail skills
Can handle emergency situations
Gives appropriate feedback
Personable
Knowledge of trails
Sense of humor
Have technical skills and knowledge
Relate to Crew Members
Able to handle conflict between people
Able to communicate effectively
Motivates people
Enjoys being a crew leader
Promotes teamwork

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Questions to ask:
• Which of the characteristics of a good Crew Leader lean more toward leadership or more toward teaching?

APPENDIX E, TRAILS OVERVIEW: The Trails Overview Appendix provides more information about erosion and the effects of water on trails than the original lesson module. Erosion, physics of water and effects of water on trail is covered in the Trail Construction and Maintenance modules starting on pages 77 and 105 in the *Instructor's Guide.* Instructors may choose which lesson module to present information on water and erosion in detail, but need to ensure that the basic content of the Trails Overview background information is covered (Importance of Planning & Objectives of Trails, Trail Impacts, Trail Anatomy & Terminology, Grade, Trail Construction & Maintenance Standards, Trail Design and Curvilinear Design Principles).

APPENDIX I, TOOLS & TOOL SAFETY TALK: The Tools and Tool & Safety Talk lesson modules from the Instructor's Guide have been combined in this Appendix. Only "CUSS" and the Tool Talk are covered in the presentation. Instructors will need to add to the presentation the information regarding the Safety Talk as well as review the reference material in the *Instructor's Guide* on pages 69 and 70. Crew Leader Trainees will need to practice delivering both the "Tool Talk" and the "Safety Talk".

APPENDIX P, PUTTING IT ALL TOGETHER/CONCLUSION: The "Putting It All Together" and "Conclusion" modules from the *Instructor's Guide* have been combined in this Appendix.

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Appendix A
Introduction

MAIN IDEA	

MAIN IDEA

Establish why participants should be listening to you.

Introduce OSI and its training.

Find out about your participants.

LECTURE:

Welcome to OSI Crew Leader Training. My name is _____. I'll be part of your instructor team for the next two days. Before we begin our first exercise, the bathrooms are located _____. The food is located _____. My expectation is that you take care of yourself as needed.

(PRESENT ANY OTHER LOGISTICAL INFORMATION THAT NEEDS TO BE STATED.)

TEACHER NOTE

It is helpful for the participants to have the teachers' names and the schedule written on the white board. Also, name tags for *everyone* are a good idea.

As I mentioned, my name is _____.
I am a OSI Crew Leader Instructor (or Master Instructor) and have been with OSI for ___ years.
My OSI constituent organization is _____.
My trails experience _____.
My teaching experience _____.
Teaching with me is _____.

(HAVE FELLOW INSTRUCTORS INTRODUCE THEMSELVES IN A SIMILAR MANNER.)

Let's start with a little bit about OSI. OSI is a non-profit stewardship training and leadership organization made up of constituent organizations that include federal agencies (forest service, park service, BLM), state and local government agencies, and non-profits. It developed its Trail Crew Leader training program in 2004, and now has a variety of other leadership and stewardship

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training programs (Crew Leadership for Ecological Restoration, Trail Skills, Weed Management) that we encourage you to attend. In the trails world, OSI's mission is to take the latent volunteer resources in Colorado and put them to work by providing leadership and skills training to volunteers and staff. Land managers have trail work that needs to be done. Volunteers want to do the work. OSI training provides volunteers the skills they need to have a land manager trust them to perform work on the land that they manage. In addition to leadership, this training promotes up-to-date trail practices and seeks to establish a common trails vocabulary in the state. Over the next two days, we are going to explore trails and leadership ideas that will prepare you to become a better trail Crew Leader. Are there any questions about OSI?

(ANSWER AS BEST YOU CAN AND REFER THEM TO THE WEBSITE WWW.COTIONLINE.ORG OR TO THE OSI OFFICE IF YOU NEED TO.)

As we move through the series of exercises, I (we) will be modeling effective teaching and training techniques, and I invite you to pay attention to the techniques I employ in this training. Please feel free to adopt anything that will be useful to you, and **I'd like you to be thinking about the presentation style that you use and will use with your crews.**

Our schedule for the training is:

(POINT OUT SCHEDULE. MAKE PARTICIPANTS AWARE OF TRANSPORTATION, OTHER LOCATIONS, CLOTHING/GEAR NEEDS.)

You should all have in front of you a OSI Crew Leader manual. We will be referring to this through-out the training. It is yours to keep and it has back-

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ground information on almost everything that we are going to talk about. I encourage you to take notes in the book as you go. Also, you should have a set of quick reference cards. These cards are used as a field reference guide. So if you forget some of the steps to a process, you have a handy way to remind yourself. Does everyone have all the materials? Does anyone have questions or concerns at this point?

ACTIVITY:

Our first activity is about introductions. I'm going to pair everyone in the group up with a partner, preferably someone you don't know or don't know well. Then, I'm going to give you some questions that I would like you to ask your partner. After everyone has had a chance to interview their partner, you will each introduce your partner to the group.

(DIVIDE YOUR GROUP INTO PAIRS. HAVE THEM PHYSICALLY REARRANGE THEMSELVES SO THAT THEY CAN TALK TO THEIR PARTNER. IF YOU HAVE AN ODD NUMBER OF PEOPLE, YOU MAY NEED TO BE SOMEONE'S PARTNER.)

Okay, here are the things that I want you to learn about the other person.
- Name
- OSI constituent organization
- Something that you have taught or lead
- Why you want to be a OSI Crew Leader
- Favorite pet you've ever had
Either partner can begin. I'll give you a couple minutes to talk then I'll say "switch" and the other partner can get their chance. Go.

(AFTER A COUPLE OF MINUTES, CALL 'SWITCH".)

TEACHER NOTE

Welcoming each person out loud establishes them as part of the group. It also can help you to remember names. And using someone's name shows up again in our How to Say Thank You/Meaningful Praise module.

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(WHEN YOU HAVE GIVEN EACH PAIR ENOUGH TIME TO COMPLETE THEIR ASSIGNMENT, ASK EVERYONE TO REFORM THE CIRCLE. ONCE THE GROUP IS BACK TOGETHER, CHOOSE SOMEONE TO START THE INTRODUCTIONS. AS EACH PERSON IS INTRODUCED, SAY "WELCOME _(NAME)_".)

This introduction exercise is one that you, as a Crew Leader can use. It is a good way to start a work day because it gets people talking to each other. If you have a multi-day project, it's a good idea to start each day with this exercise. It is important for safety and efficiency for a trail crew to communicate during their work. You will no doubt have crew members with varying social comfort, and this introduction exercise gets people more familiar with each other. Also, for a lot of people, it is fun. Keep in mind that when you are leading volunteers, you want folks to have a positive, satisfying experience. Hopefully, that will lead to them coming back to work again.

On a brief technical note, some other questions that you might use in the introduction exercise are: favorite movie, favorite park, favorite trail, favorite tool, book, historic person, ….

Are there any questions about who I am, what OSI is, what we are going to be doing, or about the introduction exercise? (ANSWER ANY QUESTIONS.) Okay, let's move on.

Let's talk about leadership. It is a topic that we will be dealing with directly and indirectly throughout the training.

(ASK FOR A VOLUNTEER TO RECORD ANSWERS ON THE WHITE BOARD)

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MORE INFO

Partial list of responses and things to say about them:

Honesty – students need to trust the instructor

Knowledge of subject – student won't listen to someone who doesn't exhibit mastery of the subject

Enthusiasm/energy – if the teacher isn't engaged in the subject why should the student be engaged

Patience – not everyone is going to "get it" right away

Preparation – a polished presentation keeps the students attention

Integrity/do what you say – students will do what the teacher does

Adaptability – it is rare that all things go as planned

Good listener – students often let you know what they need

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What personal characteristics make a good leader or teacher?

(MAKE SURE ALL ANSWERS GET RECORDED. THERE ARE NO WRONG ANSWERS HERE. GIVE POSITIVE FEEDBACK AS THE RESPONSES ARE GIVEN. FOR EXAMPLE, SOMEONE SAYS "KNOWLEDGE OF THE SUBJECT", YOU COULD RESPOND "ABSOLUTELY. A TEACHER NEEDS TO KNOW WHAT HE'S TALKING ABOUT. OTHERWISE, STUDENTS WILL TUNE OUT RIGHT AWAY.)

Good. Anyone else?"

*(*AFTER YOU HAVE A LIST [15-25 RESPONSES], ASK)

Do any of these characteristics lean more toward leadership or more toward teaching?

(ALLOW FOR SOME RESPONSES/DISCUSSION TO THIS QUESTION.)

I'd like to suggest that a distinction between teaching and leading may be found in command decisions. Good teaching is about guiding students to discover concepts and own that knowledge. Leading is sometimes making a call and giving a direction. If you think there is immanent danger due to lightning, are you going to ask probing questions until your crew starts to see that lightning can be dangerous? No. You're going to say, "Drop your tools, let's head for a safe place."

When you take on the role of Crew Leader, you need to be both a teacher and a leader. For some of you, it may be unusual for you to not do the work yourself but to teach the work to others. For some of you, it may be uncomfortable to exercise

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authority. When you take on the role of Crew Leader, you are accepting the fact that you are going to need to function in multiple capacities.

The six leadership modules in the OSI program are designed to engage leader and teacher traits in you and give you leadership ideas: some ways to conceptualize the human landscape of your crew and some ideas on actions for you to take.

Are there any questions?

(IF THERE ARE QUESTIONS THAT ARE ADDRESSED IN LATER MODULES, DEFER THEM UNTIL THAT MODULE.)

I mentioned at the beginning that I want you to be thinking about your presentation style. Let's talk about teaching and presentation.

(ASK FOR A VOLUNTEER TO RECORD ANSWERS ON THE WHITE BOARD/BIG PAPER.)

As you already know, crew leadership involves the process of imparting a lot of information. Take a second and think about student experiences you've had: in school, at work, on the trail.

(PAUSE FOR 30 TO 60 SECONDS.)

TEACHER NOTE

1.
As you go through this topic, call attention to the presentation techniques that you have already employed. (room setup, writing on board, setting expectations.)

2.
This topic has some overlap with some of the other leadership modules particularly Learning Styles. Feel free to call attention to that now or later when you notice a repetition.

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MORE INFO

Partial list of answers and why they are important:

Basic needs – tough to concentrate when you are cold, hungry, have to pee…
Handouts – can refer to later
Modeling – allows students to see and example
Check for understanding – make sure you have delivered the message
Mentor – Allows for a continuing resource
Pause for answers to questions – conveys value to the question and answer
Demonstration – allows students to see process
Let them try it – participation
Diagrams – some learn better this way
Write on board – engages sight
Feedback – find out if you need to adjust
Room arrangement – allow for good communication
Speak clearly – need to hear or no chance for success
Don't read – easy way to lose connection with students
Encouragement – create a "safe" environment for ideas

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Now let's generate a list of presentation/teaching techniques. What makes for an effective presentation?

(YOU MAY NEED TO START THEM OFF. YOU COULD SAY, HOW ABOUT REPETITION? IT IS RARE THAT A PERSON WILL ABSORB EVERYTHING I SAY THE FIRST TIME THEY HEAR IT. SO I REVISIT IMPORTANT TOPICS THROUGHOUT THE COURSE OF A TRAINING TO MAKE SURE IT HAS A CHANCE TO SINK IN. WHO HAS ANOTHER ONE?" REMEMBER TO GIVE POSITIVE FEEDBACK TO EACH RESPONSE. FOR EXAMPLE, A PARTICIPANT SAYS "SPEAK CLEARLY/LOUDLY". SAY, "YES, ABSOLUTELY, IF PEOPLE CAN'T HEAR YOU THEY WILL HAVE A HARD TIME ABSORBING THE CONTENT." AND SO ON.)

(AFTER YOU HAVE GENERATED THE LIST:)

Okay. This is a good list. It is probably not comprehensive, and that is okay. The purpose of having this discussion is to turn some of your attention on this topic. So when we start talking about leading a crew on a construction or maintenance project, I encourage you to think about and ask about techniques to improve your effectiveness. Questions or concerns?

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Introduction Outline

- Welcome

- Review logistics/bathrooms/etc.

- Introduce self and other instructors

- Discuss OSI background info

- Review training schedule and course objectives

- Introduce course materials

- Lead introduction activity

- Lead discussion on leadership and teaching characteristics

- Introduce idea that a Crew Leader may be both a teacher and a leader

- Lead discussion on presentation/teaching techniques

- Answer questions

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Appendix B
Keys to Effective Listening

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MAIN IDEA

**Get participants thinking
about elements of good listening.**

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ACTIVITY:

(Hand out a piece of paper to each participant.

Say:)

I'm going to tell a story, and I'll ask some questions about it afterward.

(Read the story and give the instructions on what to do with the paper as described on CLI Manual page 101-103. When finished, ask:)

What is going on with the trail project?

(Allow some answers)

Who are Tom and Wendy?

(Allow some answers)

What is the water situation?

(Allow some answers)

Okay, everyone unfold and hold up your paper so that everyone can see it. Everybody look around at the papers. What do you see?

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(ALLOW SOMEONE TO SAY THAT THEY ARE ALL DIFFERENT.)

LECTURE: So what does that activity tell us?

(ALLOW FOR SOME DISCUSSION ABOUT THIS. SOMEONE WILL PROBABLY COME CLOSE TO GETTING THE IDEA. YOU ARE LOOKING FOR A THOUGHT ABOUT DISTRACTIONS AND ONE ABOUT INTERPRETATION.)

There are two main themes to this exercise: one, there are often different stimuli competing for someone's attention; and, two, the same communication issued by a speaker can be interpreted in different ways, witness the papers. Furthermore, all this stuff is happening simultaneously. You've all been on trail projects before, is it common for there to be multiple things going on at a given time?

(ALLOW ANSWERS)

Sure, folks are looking at the sky, the mountains, fishing around for their gloves, all kinds of stuff. Human beings listen at about 125 to 250 words per minute but it is estimated that we think at 1000 to 3000 words per minute. That leaves a lot of brain power to be somewhere else.

Remember that listening is occurring in two directions when interacting with a crew. They are listening to you, and you are listening to them. Our exercise with the story and the paper illustrates the need for us as Crew Leaders to be clear and engaging. We need to capture our audience's full attention as best we can. In our discussion of presentation and teaching techniques and in the learning styles module, we talked about effective

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ways to engage our audience. And we will continue that discussion throughout the training. For now, let's talk about the other direction, us listening to our crew. Please turn to page 56 in your manual to the Active Listening Tips heading. This sheet offers some suggestions on how to make our listening more effective.

(POINT OUT SOME IMPORTANT TIPS.)

TEACHERS NOTE

Your comments on the Active Listening Tips might sound like these:

Lean forward and make eye contact, but, of course, you don't want to invade.

Demonstrate equality, not superiority but don't give up your authority either.

What do you feel about that? And what do you think? One is about emotional content and the other is about intellect or thoughts. It is important not to get these confused. And we will talk later about how the answers to these two questions can be useful in dealing with crew members.

The better listeners we are as Crew Leaders, often the better our chance of success. Through listening we can find out what our crew's expectations are, what their interests and limitations are, and what they are thinking about thus giving us a chance to adapt. Does that idea resonate with everyone?

(GET AFFIRMATION THAT IT DOES.)

Questions or comments before we move on?

(ANSWER QUESTIONS IF ANY AND GO TO THE NEXT MODULE.)

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Keys to Effective Listening Outline

- Conduct activity

- Lead discussion about meaning of activity
    - people get distracted
    - humans listen and think at different speeds
    - all communication between people involves some inter-pretation

- Go over the Active Listening tips sheet on CLI Manual p. 104

- Conclude by reiterating important points

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Appendix C
Teaching to Different Styles

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MAIN IDEA

Individuals respond differently to specific teaching techniques. A good teacher employs a variety of techniques to reach the most students.

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LECTURE:

Our next topic is learning styles. In its most basic form this module is about the fact that there are multiple ways that people learn. For instance, one basic division of learning styles could be passive vs. active. Let's take the idea of learning to make an omelet. The passive learner might want to read how to make an omelet whereas the active learner wants the teacher to put the eggs in his hand and see what happens.

(CHECK TO SEE IF PARTICIPANTS "GET" THE DISTINCTION)

Everyone please turn to page 54 of your manual. This page shows one way to categorize learners into four types. This breakdown of types is by no means the last word in learning styles. It is simply one method of illuminating differences.

(HAVE STUDENTS READ THE "WHAT THEY WANT" COLUMN FOR EACH LEARNING STYLE. AS EACH STYLE IS READ, REINFORCE THE MAIN IDEA. FOR EXAMPLE, A STUDENT READS THE COLUMN FOR PROACTIVE LEARNERS AND YOU SAY SOMETHING LIKE,)

"Right! Proactive learners want a quick demo and let them at it."

(READ THE NEXT TYPE.)

MORE INFO

The more senses of a student that you can engage, the more likely they are to retain the information.

SIGHT – words on a board or a demonstration.
SOUND – hearing a discussion or lecture.
ACTIVITY – get them to "do" something.
EMOTION – relate the learning to the students own lives.

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"Reflective learners want the most. They want to be lead through and tended to during the process."

(READ THE NEXT TYPE.)

"Active learners want information up front. They want a coherent presentation and then the space to do it."

(READ THE NEXT TYPE.)

"Concrete learners want even more up front information and then let them go. They tend to want the one, right way to do it."

ACTIVITY:

TEACHER NOTE

Point out during this activity that if you are in the field and can't use handouts, a Crew Leader can draw a diagram (in the dirt, on a tool).

(GET A VOLUNTEER TO TEACH SOMETHING (CAN BE ONE OF THE SIX TRAIL CONSTRUCTION STEPS, TYING A SHOELACE, PUTTING ON A SHIRT, HOW TO USE A STAPLER IF THERE'S ONE AROUND, ETC.) TO THE CLASS AS IF IT WERE A CLASS OF PROACTIVE LEARNERS. THEN GET THE NEXT VOLUNTEER TO TEACH SOMETHING AS IF THE CLASS IS REFLECTIVE LEARNERS. AND SO ON THROUGH ALL FOUR TYPES. AFTER A VOLUNTEER COMPLETES THEIR PRESENTATION, MAKE SURE TO LEAD THE CLASS IN CLAPPING FOR THE EFFORT. THEN ASK THE CLASS IF THE PRESENTATION INCLUDED EACH OF THE "SUCCESSFUL TECHNIQUES" FOR THAT LEARNING STYLE. IF YES, GREAT. IF NOT, ASK WHAT THE TECHNIQUE MIGHT LOOK LIKE IN THE PRESENTATION.)

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LECTURE:

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RECALL TIP

This is a good place to point back
to the list of teaching techniques
that you generated earlier.
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A good teacher will be aware of and utilize as many teaching techniques as they can in order to reach all of their students. In this exercise, we focussed on five techniques. In the presentations that we just witnessed, one can see how several techniques can be used together in a seamless presentation.

Something to keep in mind is that as a teacher, it is not unusual for me to rely on the techniques to which I respond the best. So if I like demonstration a lot, I may have a tendency to use that technique to the exclusion of other techniques. I need to be aware of that tendency and not forget to teach using multiple techniques.

So, does it make sense to everyone that being aware of different learning styles and the techniques that address those styles will make us more effective for a greater number of our students?

(LOOK FOR NODS OF AFFIRMATION.)

Questions?

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Teaching to Different Styles Outline

- Introduce idea of learning in different ways with an example (like passive vs. active)

- Go over sheet on p. 54 (CL Manual) that describes the four types of learners

- Lead activity

- Talk about idea of using more than one technique at a time to try to reach as many types of learners as possible

- Introduce the idea of teachers having tendencies to teach one way and that teachers should be aware of their own tendencies

- Conclude with a final thought and ask for questions

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Appendix D
Know Agency Protocols

LECTURE:

Trail work, both what needs to be done and how to do it are matters of opinion. This can be kind of an uncomfortable idea, particularly for folks who are new at it. They want to learn the "right" way (like concrete learners). In this course, OSI has tried to distill some basic concepts and practices that are generally accepted around the state. But it is imperative that you all understand that the authority for any given project is the Land Manager or sponsor. If it helps you to conceptualize this you can think of yourself as a contractor and the Land Manager as the client. It is your job to produce the work that the client wants.

Therefore, communication is an essential element for a successful project. Everyone turn to page 90 in your manual.

(TAKE 10 MINUTES OR SO TO GO OVER THE PROJECT AND SAFETY CHECKLIST. THE IDEA IS FOR THE PARTICIPANTS TO BE MADE AWARE OF THIS LIST AND HAVE A GENERAL IDEA OF WHAT IS ON IT. ALSO, MAKE THEM AWARE OF THE PROJECT AND SAFETY INFORMATION FORM WHICH SERVES AS A CENTRALIZED PLACE TO ASSEMBLE INFORMATION FOR THE PROJECT.)

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The underlying idea for a Crew Leader here is that your responsibility starts BEFORE the first tool hits the ground. That may mean gathering information well in advance or it may mean simply showing up early, but, either way, your role as a Crew Leader involves preparation. Does anyone have questions about the process of gathering project information?

(IT IS NOT UNCOMMON FOR PEOPLE TO NEED CLARIFICATION ON WHOM THEY NEED TO CONTACT. FOR INSTANCE, SOME PROJECTS ARE RUN BY NON PROFITS THAT HAVE THE SANCTIONED ABILITY TO DO WORK ON PUBLIC LAND FROM THE LAND MANAGER. A CREW LEADER NEEDS TO FIND OUT WHAT THE CHAIN OF AUTHORITY IS.)

TEACHER NOTE

This is your chance to show your group the kind of information that needs to be at the leader's finger-tips. You need to have gathered this information ahead of time, just like we are asking them to do. This is an opportunity to show that you know what you're talking about and that you practice what you preach.

For the work that we will be doing today as part of this training, the Land Manager is _____. The safety procedures are _____. If someone gets hurt _____. The communication devices and methods that will be used are _____. Specifications for the construction and maintenance exercises will be explained in the field as we get to them. Does anyone in this group have any training or skills in first aid?

(AFTER YOU HAVE ESTABLISHED YOUR PROJECT INFORMATION, ASK)

Any questions before we move on?

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Know Agency Protocols Outline

- Introduce idea that it is the Land Manager's opinion about trail work that matters on any given project

- Go over information on p. 90 and talk about the Crew Leader's responsibility to gather that information

- Go over the pertinent safety and communication information for the field exercises that will be occurring during the training

- Ask for questions

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Appendix E
Trails Overview

MAIN IDEA

To introduce participants to trail design, construction, and management concepts.

Now we are going to turn our attention to trails themselves. Let's start to think about what we are looking at when we see or walk on a trail. First, let's think big picture or concept.

Why do we put trails on the land?

MORE INFO

Likely Responses:

Recreation
Travel/transit
Enjoy the land
Manage use

(GET A PARTICIPANT TO WRITE DOWN THE IDEAS ON THE WHITE BOARD/PAPER. ALLOW THIS BRAINSTORM TO GO ON FOR A FEW MINUTES. WHEN YOU FEEL LIKE YOUR GROUP IS WINDING DOWN GO TO THE NEXT QUESTION.)

MORE INFO

Likely Responses:

Destinations
Topography
User groups
Distance
Budget
Flora
Fauna
Erosion

What are some possible design considerations for a trail?

(IF YOUR GROUP NEEDS A PROMPT, YOU CAN ALSO ASK "WHAT MAKES A TRAIL A GOOD ONE?")

Good. These are good lists, and I want you to be thinking about these ideas when we go out on the trail in a little while.

Now, let's talk about erosion. I think it is fair to say that erosion is a major force in trail design, construction, maintenance. Since it is such a central factor, let's be clear about what it is. What is erosion and what causes it?

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TEACHER NOTE

It may serve your discussion to touch on why erosion is undesirable.
Some examples are:
• It compromises the tread surface
• It can destroy vegetation
• May clog rivers and streams with soil

(LISTEN TO AND RECORD ANSWERS.

MAKE SURE THAT YOU TOUCH ON THE FOLLOWING:

- SOIL DISPLACEMENT IS THE MAIN IDEA

- MAIN CAUSES ARE WIND, WATER, AND USERS)

To simplify our discussion lets discuss water erosion. It is the biggest troublemaker anyway. What are some factors that affect water erosion?

(MAKE SURE THE LIST INCLUDES GRADE AND SOIL TYPE.)

So, steeper trails are subject to more erosion, and soils that have less cohesion are subject to more erosion. What I mean by soil cohesion is that the particles that make up soil/dirt/etc. have certain shapes and properties that change the amount of cling that they have to each other. Some soil has jagged particles that hook onto each other. Some soil has smooth particles that tend to not interconnect with other particles. In most soils, moisture content affects the amount of erosion potential. You might see the same soil on a south facing slope be more erosive than the same soil type just over the ridge on the north facing slope simply because the north slope holds more moisture.

Obviously, soil that has vegetation growing on it is less susceptible to erosion because the roots of the plant spread out underneath the ground and act as a binding force on the soil.

Lets go back to grade for a minute. We said that steeper trails are more susceptible to erosion. What is going on there?

(ALLOW FOR SOME DISCUSSION.)

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So, gravity causes water to move faster on steeper slopes. The more water the more carrying capacity that it has. Specifically, as water flows over the ground, it has the power to displace soil particles, pick them up and carry them away. So, the faster the water is going, the more water there is going over a certain spot in a given time, thus there is more carrying capacity. This creates a higher susceptibility for erosion. Also, with more speed can come more turmoil in the water. With more turmoil, the water can displace more surface soil. Also, once the water has some soil in it, it becomes a more effective displacer of surface soil because the particles that are already being carried in the water collide with the surface soil particles.

So what does this all mean on a trail? Lets assume that we have water running down the trail due to a berm on the critical edge of the trail. Given that scenario, when the trail grade changes from flatter to steeper, what would you expect to see on the surface of the trail?

(SCOURING IS WHAT YOU ARE LOOKING FOR.)

Right, scouring. As the water velocity increases its erosive force increases and so the soil displacement increases. What happens when the grade changes from steeper to flatter?

(DEPOSITION IS WHAT YOU ARE LOOKING FOR.)

Right, deposition. The water is slowing down (due to less gravitational force) and therefore it's carrying capacity is less, so it dumps some of its soil load. If you haven't noticed this phenomena, you'll

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see it out on the trail today. What happens at a water bar, where the water's direction gets changed?

(Deposition is again what you are looking for.)

Right, deposition. The water direction is changed in the horizontal plane and that causes slowing, which causes deposition.

Are there questions about erosion as we have discussed it in relation to trails?

(Address questions as needed.)

TEACHER NOTE

Follow up with this discussion in the field by pointing at physical examples of these terms in the field exercise and asking your students to name them

When we go out on the trail in a few minutes, I'd like you to remember what we talked about regarding erosion and look for places where these dynamics have occurred. If you can make yourself a good detective when it comes to erosion, all trail design, construction and maintenance will make more sense to you.

Let's talk about another concept that gets a lot of conversation. Has anyone heard the term sustainability used in relation to trails? What does it mean?

(Allow for some answers/discussion.)

While there may be some variation regarding what sustainability is and what level of sustainability is desired, certainly it is a concept that revolves around a trail lasting in a usable form through some amount of time. Limited maintenance costs and a low incidence of failure are hallmarks of sustainability. It is a word that gets stated often. Does every-

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one feel like they have a reasonable grasp of what is being referenced when they hear sustainability?

(IF YES, MOVE ON. IF NO, EXTEND THE DISCUSSION BRIEFLY TO TRY TO GET THEM COMFORTABLE WITH THE CONCEPT.)

One more topic before we head outside, and that is trail terminology. One of OSI's primary goals is to promote general trail knowledge, and that can get fouled up by people not using a common vocabulary. A single thing or concept may be called by different names by trail folks in different parts of the state, in different organizations, or in different parts of the country. We have provided you with a Recommended Standardized Trail Terminology book. We provide this not to say necessarily that one term is better than another but to facilitate communication by advocating a common vocabulary. Everyone open your manuals to page 4. Let's look at some graphics that describe some basic terms.

(REVIEW THE FOLLOWING GRAPHICS AND TERMS:

P.4	CROSS SLOPE
	CRITICAL EDGE
	BACKSLOPE
	TREAD
P.6	OUTSLOPE
P.7	TRAIL CORRIDOR
P.8	GRADE
P.11	CURVILINEAR

MAKE SURE EVERYONE IS CLEAR ABOUT THE CONCEPTS BEING DESCRIBED.)

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We talked about trail motivations and design, erosion, sustainability, and vocabulary. Now we're going to hit the trail and talk about what these things mean in the field. Any questions before we go?

ACTIVITY:

(WALK AND TALK. IF YOU CAN SEE THE SITE BEFOREHAND, THAT IS GREAT. IF YOU CAN MARK THINGS THAT YOU ARE GOING TO TALK ABOUT, EVEN BETTER.)

(REGARDLESS OF LEVEL OR PREPARATION, THE IMPORTANT THINGS ARE TO REINFORCE TERMINOLOGY, SHOW EROSION DYNAMICS, AND POINT OUT DESIGN CONSIDERATIONS [LIKE CROSS SLOPE, NATURAL FEATURES,…]. REMEMBER THAT YOU WILL BE DISCUSSING CON-STRUCTION AND MAINTENANCE LATER, SO TRY TO KEEP THIS DISCUS-SION FOCUSED ON TRAILS OVERVIEW TOPICS.)

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Trails Overview Outline

• Lead discussion about why we put trails on the land

• Lead discussion about design considerations for trails

• Talk about erosion

    – define erosion

    – causes of erosion

    – how does erosion behave regarding trails

    – Ask for questions

• Talk about sustainability / what is it / why is it important

• Introduce idea that using common trail terminology is important

• Use diagrams in manuals (starting on p.4) to define

    – Cross slope
    – Critical edge
    – Backslope
    – Tread
    – Outslope
    – Trail Corridor
    – Grade
    – Curvilinear design

• Recap concepts in the lecture and ask for questions

• Activity (Walk and Talk)

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Appendix F
Risk Assessment

MAIN IDEA

Introduce participants to a risk assessment process and how that can be managed in a crew environment.

LECTURE:

TEACHER NOTE

Mention that Risk Assessment, like other safety issues, is best addressed in a crew by involving everyone in it.

It will likely not be a surprise to any of you that trail work can be dangerous. There are risks involved in working outside, working a significant distance from "civilization", using sharp heavy tools, and so on. Do you think that means we shouldn't do the work?

(ALLOW A QUICK GROUP "NO".)

Right, risk is everywhere, just because it exists doesn't necessarily mean that we don't do something. The important thing then becomes keeping an eye out for what the risks are and what we want to do about them.

Let me briefly describe the three concepts embedded in "risk".

• Hazard – set of factors that could cause harm

• Possible outcomes – speaks to the resulting level of harm

• Likelihood – level of probability that the harm will occur

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Once we have identified these three factors, we make a decision about mitigating the risk. Mitigation includes a broad spectrum of choices ranging from doing nothing to completely suspending work. In between those two extremes are innumerable mitigation strategies. Three basic categories that would probably need to be considered are:

- **Education/ Awareness** – a Crew Leader defines known risks for his crew

- **Proper equipment/technique** - a Crew Leader secures proper equipment for a job and teaches how to use it

- **Emergency plan** – a Crew Leader makes an action plan and conveys it to the crew in the event that something goes wrong

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Appendix F: Risk Assessment

ACTIVITY:

+-------------------------------------+
| **MORE INFO** |
| Sample Risk List: |
| |
| Dehydration |
| Hypothermia |
| Sun Exposure |
| Altitude Sickness |
| Lightning |
| Rock Slides |
| Snowfields |
| Hantavirus |
| Giardia |
| Wildlife Encounters |
| Weather |
| Falling Rocks |
| Flash Floods |
| Tool Gashes |
| Barbed Wire |
| Smashed Fingers/Limbs |
| Snags/Falling Trees |
| Insect Bites and Stings |
| Noxious or poisonous Plants |
| Moving materials |
| Other environmental hazards |
| (power lines, buried cable,…) |
+-------------------------------------+

AFTER EVERYONE HAS HAD 10 MINUTES OR SO, GET PARTICIPANTS IN A CIRCLE AND HAVE THEM VOLUNTEER SOME OF THEIR PERCEIVED RISKS AND LEAD A DISCUSSION ABOUT THEM.

LAST, GET EVERYONE TO BRAINSTORM A LIST OF RISKS THAT OCCUR ON TRAIL PROJECTS BUT THAT MAY NOT EXIST IN YOUR CURRENT SITUATION.)

LECTURE:

So, how might you, as the Crew Leader, get your crew involved with risk assessment?

(GET SOME ANSWERS TO THIS QUESTION FROM YOUR GROUP. THE IDEA THAT YOU WANT TO MAKE SURE GETS VOICED IS THE IDEA THAT ALL CREW MEMBERS NEED TO BE ENGAGED IN IDENTIFYING RISKS AND BEING AWARE OF RISKS AS THEY WORK.)

Questions before we move on?

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Risk Assessment Outline

- Lead discussion on risk assessment process

- Lead activity and go through Hazard-a-Guess Scenarios

- Talk about importance of involving crew in risk assessment

- Questions

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Appendix G
Understanding Motivational Types

MAIN IDEA

Members of your crew are driven by various needs and wants. In order to provide a satisfying experience, it is helpful to know these motivations.

ACTIVITY:

TEACHER NOTE

When you read each grouping, read "Red, (statement). Green, (statement)."

If you tell participants that a is red, and b is green, and c is yellow, and then read "A, (statement). B, (statement). C, (statement)", then your participants have to continually spend their concentration translating letters to colors.

(GET EVERYONE OUT OF THEIR CHAIRS AND ORIENT THEM TO WHERE THE THREE COLORS OF PAPER (OR THREE GROUPS OF WHATEVER) ARE. EXPLAIN THAT:
• YOU WILL BE READING GROUPINGS OF THREE STATEMENTS
• EACH STATEMENT IN A GROUPING WILL BE ASSOCIATED WITH A COLORED PIECE OF PAPER
• AFTER HEARING EACH GROUPING OF THREE STATEMENTS, THEY ARE TO CHOOSE THE ONE WITH WHICH THEY IDENTIFY MOST, AND COLLECT THE APPROPRIATE COLORED PIECE OF PAPER.

ENCOURAGE THEM NOT TO THINK TOO MUCH AND NOT TO BE INFLUENCED BY OTHERS. THERE IS NO RIGHT AND WRONG. WHEN YOU HAVE READ ALL TEN GROUPINGS, HAVE PARTICIPANTS TAKE THEIR PAPERS AND GET BACK INTO THE CIRCLE.)

LECTURE:

Okay, everyone turn to page 46 in your manual.

(REVEAL WHICH COLORS OR OBJECTS CORRESPOND TO WHICH MOTIVATIONAL TYPES.)

I reveal these motivational types with the disclaimer that goes with a couple of these exercises. This is not the be all and end all of motivational characteristics. It is one way make distinctions. That being said, what type were you?

(GO AROUND THE CIRCLE AND ALLOW EACH PERSON TO SAY WHAT TYPE THEY WERE.)

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Did anyone have all of one color?

(MOST PEOPLE WILL SAY NO.)

It is unusual for anyone to be all one color. Most of us have parts of all three motivational types. Even if you have only one color, it doesn't necessarily mean that you don't have some affinity for the other types either.

Okay, lets talk briefly about the characteristics of each motivational type.

(HAVE A PARTICIPANT READ THE GOAL, A POSITIVE ATTRIBUTE, A NEGATIVE ATTRIBUTE, AND CONDITION OF SUPERVISION. AFTER EACH OF THE THREE, SUMMARIZE THAT MOTIVATIONAL TYPE.)

Why might this be an important concept for you as a Crew Leader?

(ALLOW SOME ANSWERS/DISCUSSION. LOOK TO EMPHASIZE THAT A CREW LEADER NEEDS TO RECOGNIZE DIFFERENCES AND USE THEM TO THE GROUPS ADVANTAGE.)

What might it look like to use a certain motivational type in a trail crew situation?

(ALLOW SOME DISCUSSION. IF YOUR GROUP NEEDS PROMPTING, AN EXAMPLE WOULD BE TO "INCLUDE AN ACHIEVER IN A SUB-CREW SENT OUT TO ACCOMPLISH A TASK". WATCH THE TIME AND CUT IT OFF AT 30 MINUTES.)

Great. Questions before we move on? We'll come back to these motivational types in the Meaningful Praise (How to Say Thank You) module.

TEACHER NOTE

Possible **Achiever** summation: Achievers like to feel a sense of quantifiable accomplishment. They will strive toward a goal. This may make them a little tunnel-visioned. And they tend to want a defined goal and then be left alone to do it.

Possible **Power** summation: Power folks like the feeling of effecting change. They will employ social power techniques to shape opinion, and they sometimes can be autocratic. They respect strong leaders though may challenge them anyway.

Possible **Affiliator** summation: Affiliators want to be in a relationship with others. They seek out people for this purpose, and sometimes that becomes their only purpose. They want a boss who makes them feel cared for and part of a team.

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Understanding Motivational Types Outline

- Lead activity

- Reveal motivational types (Page 46 of the manual)

- Most of us have some of all the types in us

- Discuss how this might be an important concept when managing a collection of people

- Questions

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Appendix H
Meaningful Praise
(How to Say Thank You)

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MAIN IDEA

Create awareness around giving feedback,
specifically praise, to different types of people.

</div>

LECTURE:

In this module we are going to explore how to effectively say thanks to your crew members. Remember that, particularly when you are working with volunteers, it is critical to express appreciation for the effort they are putting forth. In fact, feedback of all kinds is important. What does it express to you when your supervisor talks to you about your work?

(LOOK FOR COMMENTS THAT THE WORK THE PERSON IS DOING IS VALUED/WORTHWHILE.)

Now feedback can be a boost for someone or it can be a downer. So it is important that as a Crew Leader you are skillful at delivering feedback. One way to help yourself in this regard is to set the expectation that you are going to give feedback right from the beginning. And deliver on that expectation. Give appropriate feedback for the situation. The simple fact of a person expecting you to come around and make comments takes some of the edge off your feedback. People don't feel singled out.

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So to engage the idea of thinking about how to give effective feedback, let's do an exercise using the motivational types that we discussed earlier.

ACTIVITY:

(DIVIDE YOUR STUDENTS INTO GROUPS OF 2 TO 4 AND DIRECT THEM TO OPEN THEIR MANUALS TO PAGE 51. REMIND THEM THAT THEY WILL BE USING PAGES 46 TO 48 AS WELL. HAND OUT THE 3 SCENARIO CARDS TO EACH GROUP. ASSIGN A SCENARIO, PETER, BOB, OR SERENA TO EACH GROUP. INSTRUCT THEM TO FILL OUT A PAGE 51 SHEET AS IF PETER OR BOB OR SERENA WERE FIRST AN ACHIEVER THEN AN AFFILIATOR THEN A POWER PERSON. THE IDEA IS TO GET THEM TO ADJUST THEIR RECOGNITION TECHNIQUE ACCORDING TO THE MOTIVATIONAL TYPES. GIVE THE GROUPS A COUPLE OF MINUTES TO FILL OUT THE SHEET. OBSERVE THE GROUPS TO SEE IF THEY NEED YOUR DIRECTION. WHEN THEY ARE FINISHED, HAVE SOMEONE FROM EACH GROUP READ ABOUT THEIR SCENARIO PERSON AND THEN PRESENT THE RECOGNITION THAT WAS CHOSEN GIVEN THE MOTIVATIONAL TYPE. IF TIME PERMITS, YOU CAN HAVE THE GROUPS CHANGE SCENARIOS AND GO THROUGH THE EXERCISE AGAIN.)

TEACHER NOTE

Pick out a couple of the Recognition Tips to mention. It might sound like this.

"I'll just call your attention to a couple of these. 'Greet them by name', about a third of the way down the page, is a really effective one. It demonstrates to the person that they matter to you. And that ties into another tip a little further down 'Demonstrate that you care about them and their well-being.'"

"Be a little careful about the 'Brag about them' tip because you don't want to embarrass them. As we just talked about, tailor your praise to the personality type if you can."

LECTURE:

Everyone open to page 50 in your manuals. What you see there is a list of recognition tips to give you ideas if you need to remind yourself of what we talked about in this module.

(TALK ABOUT A COUPLE OF ITEMS THAT YOU FEEL WORK WELL.)

Are there any questions before we go on to the next module?

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Meaningful Praise Outline
(How to Say Thank You)

- Introduce idea of feedback in general and the power of praise

- Introduce idea that people want praise in different manners

- Lead activity

- Highlight p.50 in manual, Recognition Tips

- Questions

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Appendix I
Tools and Tool Safety Talk

MAIN IDEA

**To introduce CUSS as an organizational
strategy for Crew Leaders in their effort
to deliver tool safety talk.**

LECTURE:

We aspire to much more than this, but there is a certain level where a work day, particularly with inexperienced volunteers, is a success if we, one, do no harm to the environment, and, two, everyone comes back to the trailhead safely. The most important and one of the toughest assignments for a Crew Leader is to keep his/her crew safe. It's not something that is entirely in your control, but it is definitely something that you can influence with what you say and do.

TEACHER NOTE

This may be a good place to refer your group to the Tool Description and Uses Glossary on page 69 of their manuals.

In this module, we are going to discuss tool safety. Most trail work is accomplished with hand tools and elbow grease. As simple as hand tools appear, they can be very dangerous. Most people feel like they know everything they need to know about hand tools. Some do and some don't, and under any circumstances it is good practice to have tool safety discussions before each project if not before each work day.

RECALL TIP

We talked about this concept of getting everyone involved when we talked about Risk Assessment

One of your most powerful allies in preventing accidents and injuries is awareness. The more you can get your crew to help keep an eye out for possible risks, the better off everyone is. As Crew Leader it is imperative that you set the example. You need to wear your Personal Protective Equipment (PPE). You need to use and carry tools properly. You

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TEACHER NOTE

Optional Activity:
Let's do a quick visualization here, so everyone close your eyes for just a minute and I want you to imagine yourself as a Crew Leader working on a trail construction project 2 or 3 miles into the back-country. You're leading a crew of volunteers and I want you to imagine how you would feel if a member of your crew got knocked unconscious by someone else swinging a tool in an unsafe man-ner, or a member of your crew gets seriously cut or breaks a bone while using a tool inappropriately.
(PAUSE TO ALLOW THIS TO SINK IN A LITTLE.)

Okay, eyes open.
How did that feel?
(ALLOW FOR SOME RANDOM ANSWERS.)

It's not a good feeling right?
(TELL BRIEFLY HOW YOU WOULD FEEL OR HAVE FELT IN THAT SITUATION.)

need to remind crew members to use their tools properly and safely. If you set the example and make explicit your desire for all your crew members to watch out for their own and others' safety, you have gone a long way toward a successful project from a safety standpoint.As a way to organize your tool talk, we are going to use the acronym, C.U.S.S.

(WRITE THE LETTERS UP ON THE BOARD (IF YOU HAVE ONE). INTRODUCE THE LETTERS AND GIVE A BRIEF DESCRIPTION OF EACH.)

C – Carry (use bullet points on CL p. 61, CLI p. 47)
U – Use (CL p. 63, CLI p. 48)
S – Store (at the work site) (CL p. 65, CLI p.49)
S – Safety (CLI p.50)

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Appendix I: Tools and Tool Safety Talk

ACTIVITY:

First, check to see if your participants are familiar with all the tools that you have. If there is a tool(s) that no one is familiar with, you need to CUSS that tool(s). If everyone is familiar with all the tools, pick one and model a good tool talk.

TEACHER NOTE

Call attention to the balance between being thorough and being mindful of time

---

Next, have each participant attempt a tool talk on a tool. (Try to get all the tools covered.) After each talk, have the participant get feedback from you and the group. The feedback should include presentation comments as well as any tool-specific information that got missed in the talk.

So let's review. First, having everyone finish a work day safely is our primary goal. Second, it is important to engage your crew in safety awareness. Third, tool safety is established by having tool talks before work days. And, finally, we use C.U.S.S. to organize tool talks. Questions about any of that?

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Tools and Tool Safety Talk Outline

- Introduce tool safety as an expectation for a Crew Leader

- Awareness is a key component of tool safety

- Introduce C.U.S.S.

- Lead activity

- Review main concepts

- Questions

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Appendix J
Day 2 Introduction

Outline

- Welcome
  Review first day, reiterate objectives of course and what has been accomplished up to this time.

- Introduction activity
  Use the same activity from the first day or use a different icebreaker to promote teamwork and positive communications for the second day of training.

- Logistics and Schedule for the day

- Questions

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Appendix K
Safety Warm-Up

LECTURE:

Why do we stretch?

(ALLOW FOR SOME ANSWERS/DISCUSSION, AND YOU ARE LOOKING FOR THE IDEA THAT IT PREVENTS INJURIES.)

When should we stretch?

(ALLOW FOR SOME ANSWERS/DISCUSSION. BEFORE EXERCISE OR AFTER A FEW MINUTES OF LIGHT/EASY MOVEMENT ARE BOTH GOOD ANSWERS.)

So a good way to get your crew to stretch is to make it a group activity we call a stretch circle. So let's get up and form a circle. Remember that when we stretch, it is important not to "bounce". A stretch should be a slow controlled motion. If it hurts, stop. Do not overdo. That being said let's do a basic stretch circle.

TEACHER NOTE

Communicate to Crew Leaders that in addition to the physical benefit of stretching, the stretch circle has some other benefits.

• Stresses safety

• Promotes interaction/ communication among Crew Members

• Chance to set a fun tone

ACTIVITY:

DO A BASIC CIRCLE IN WHICH EACH PERSON INTRODUCES AND PERFORMS A STRETCH WHICH EVERYONE IN THE CIRCLE THEN PERFORMS. AND AS THE GROUP PARTCIPATES IN THE STRETCH, THE LEADER OF THAT STRETCH CAN READ AN ITEM FROM THE SAFETY GUIDELINES HANDOUT, P.75 IN CLI MANUAL. (OR YOU CAN SIMPLY HAVE PEOPLE COME UP WITH A GENERAL SAFETY TIP.) GO AROUND THE CIRCLE UNTIL EACH PERSON HAS LED A STRETCH.

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NOW THAT YOU HAVE DONE A BASIC CIRCLE, INTRODUCE SOME OF THE VARIATIONS THAT A CREW LEADER COULD USE. FOR EXAMPLE, THE CIRCLE CAN BE USED AS AN ICE-BREAKER ACTIVITY ("THIS IS MY STRETCH AND I WAS BORN IN _____."), THE STRETCHES CAN BE DONE AS "THE WAVE", OR ONE PERSON CAN LEAD ALL THE STRETCHES.

THIS IS MEANT TO BE FLUID AND FUN AS WELL AS A SAFETY MEASURE.

Questions?

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Safety Warm-Up Outline

- Lead discussion about why we should stretch and when we should stretch

- Discuss and demonstrate proper stretching technique

- Lead activity

- Questions

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Appendix L
Trail Construction

MAIN IDEA

Prepare participants to lead basic trail construction
projects using the 6-step method.

LECTURE:

> **TEACHER NOTE**
>
> This course does not address
> structures (walls, switchbacks,
> steps,). Though they are integral to
> most trails, this course is focusing
> on crew leading. OSI does offer
> technical skills workshops.

We will now turn our attention to trail construction.
As an organizational tool for you, it can be said that
there are three main functions for Crew Leaders on
a construction project:

1. Coordinate with the Land Manager.

2. Serve as a source of technical information on
   site. In other words, be able to specify work to
   be done and, when necessary, teach construc-
   tion work to crew members.

3. Manage crew members for safety and efficiency.

We will learn some things about each of these
functions in this module.

One thing that I often hear when I talk to people
about their trail experience is that they learned from
a particular person. It is not uncommon to hear
something like "I learned how to do trail work from
Danny Basch at Rocky Mountain National Park." Or
something to that effect. A lot of trail building gets
transmitted via oral tradition. Despite more and bet-
ter publications and an interest in training courses
like this one, trail work is commonly an appren-
tice/mentor type education. This is really a cool
thing about the trail world, but loyalty to a particular
method can sometimes obscure the reality that trail

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work is by and large a matter of opinion. How wide is the trail? What type of surface? What is the maximum percent grade? These specifications, among many others, are decisions made by a land manager for a particular project. We have talked about design considerations before so I am not going to go back to that, but it bears repeating that the opinion that matters on a given project is that of the Land Manager in charge. Therefore, it is critical that Crew Leaders get in concert with the Land Manager before work begins. This most likely will occur using construction notes, flagging, and/or a walk through of the site. If you are not familiar with construction notes, we have a sample for you. Flagging we will address in a minute, and a walk through is what it sounds like. You would simply walk the trail route and get specific information regarding the Land Manager's expectations.

To help with organizing the technical details of trail construction, OSI has enunciated a six step method of basic construction. The steps, which are explained in detail in your manual starting on page 18, are:

1. **Clear Corridor** – Basically this is removing the vegetation and sometimes rocks and roots that exist in the trail corridor. Remember we talked before about corridor being the space around the trail that allows easy and safe passage on the trail tread. Corridor generally has its own specifi-cations like height and width which don't neces-sarily correspond to tread specifications. So a land manager could specify an 18-inch tread width and a 10-foot trail corridor width.

TEACHER NOTE

1. Remember to point out that these steps are on the quick reference cards.

2. Point out that the manual assumes a full bench construction method. Explain that full bench is tread that does not utilize any fill to achieve the desired width. It is thought to have a high degree of "sustainability". You may want to briefly describe half bench construction for contrast.

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2. **Establish starting point (flagging method)** – Crew Leaders need to know in what manner the trail is delineated. There are four flagging methods that we will touch on today. Center Line, Inside Edge, and Critical Edge methods are very similar. Each of these three methods places flags in a line to show where a part of the trail is to go. Center Line shows where the center of the trail is, Inside Edge then shows where the inside edge is, and the Critical Edge method, obviously, points out where the trail's critical edge will be. A fourth method is placing tape flags in trees or shrubs to show the route. This one tends to give more flexibility to the builders, but again with all three methods, you should check with the Land Manager to find out how strictly the line needs to be adhered to.

3. **Establish initial tread surface** – This step includes clearing duff and grass and beginning to cut the ground in the general shape of the tread. It is important to communicate to your crew to cut less rather than more at the beginning. Disturbed soil is not as durable as non-disturbed, and you can't "undisturb" it.

4. **Establish backslope** – The backslope involves two transition points for water flowing down the native hillside: from the cross slope onto the backslope and from the backslope onto the tread. This step is therefore an important one because the treatment of water is one of the most important parts of trail construction.

5. **Establish outslope** – This step is about refining the tread surface. One of the most important things to do with your crew is make sure that

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they understand what a certain grade of outslope is. Saying five percent to an inexperienced trail builder is not likely to achieve the desired result. It might be more informative to say, "The outslope needs to be 5% and the tread width is two feet, so we need to make the critical edge about an inch and three-quarters lower than the inside edge."

6. **Reclamation and finish work** – This is a bit of a catch-all step that means to encompass everything that we need to do to make the trail complete. Meaning disposing of spoils, mitigating construction damage around the site, and generally cleaning up.

I would not be surprised if you all had heard of other organizational methods, different numbers of steps, perhaps a different order, and so on. I will say that this six step method was developed after reviewing numerous other methods used in Colorado and around the country. It is intended to help you organize your thoughts when dealing with your crew, not necessarily to establish a definitive "right" way.

One thing that crew leading often involves is taking knowledge that has become second nature to us and learning to enunciate it for our crew. In other words, I may be able to build trail well, but my job as a Crew Leader is to be able to communicate to someone else how to do it. When we get to the field exercise in just a few minutes, that is what we are going to practice. Everyone will get a chance to present some part of trail building and you will get some feedback from the rest of us about your technique. Questions about what we are going to be doing?

Appendix L: Trail Construction

ACTIVITY:

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TEACHER NOTE

Things to look for in the participants' presentation:

Voice – Did he/she speak clearly so that everyone could hear?

Content – Did he/she cover the step completely? Would you be able to begin work on that job?

Command – Did he/she get and maintain everyone's attention?

Clarity – Was there any part of the presentation that was hard to understand?

Technique – Did he/she use multiple presentation techniques (lecture, demonstration, diagrams, etc.)?

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TEACHER NOTE

This is a good place to discuss the difference between assigning each person their own section of trail vs. the assembly line method.

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(Have one of the participants take step one of the six step method and present it to the other participants who are to act as a novice crew. Those who are acting as the crew should ask questions that a novice might ask. At the end of each step presentation, stop and offer feedback to the presenter. Also, have the rest of the group offer feedback. Each participant will take one of the six steps and present it. If you have less than six participants, make sure to check in with your group that everyone is comfortable with the step(s) that will not be presented. If you have more than six participants, double up on however many steps is necessary. It is important that every participant gets a chance to present.)

Activity Alternative

<table>
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If your participants have limited or no trail experience, the activity should be changed. You should model presenting the six-step method. Then you have a few options.

First, you could proceed to the participants presenting the six steps. If you do this, you need to mindful of time and perhaps you want to be the only one who gives feedback. Second, you could have them each build a small section of tread. If they have no experience with actually building trail then the practice of handling tools will be valuable not only for trail work but also for the tool talk. And third, you could have the group build tread. As this is occurring, have each participant assume the Crew Leader role for a time. You can shadow the leader and give constructive criticism.

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Questions?

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Trail Construction Outline

- Briefly introduce main functions of a Crew Leader on a trail project

- Discuss flagging methods

- Introduce 6-Step method of trail construction
  – Clear Corridor
  – Establish Starting Point
  – Establish Initial Tread Surface
  – Establish Backslope
  – Establish Outslope
  – Reclamation and Finish Work

- Acknowledge that this method is an organizational rubric and that its intention is to enunciate the elements of creating competent trail tread

- Lead activity (first determine if you will need to use an Alternate Activity)

- Questions

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Appendix M
Assessing Your Crew

LECTURE:

During this module we are going to be talking about assessing your crew. Before we talk about some specific criteria which you might be able to use, let's talk about assessment itself. If you are going to gather information about your crew, what does that look like out in the field on a work day? What are you, yourself, actually doing while out in the field?

(ALLOW FOR SOME ANSWERS AND BRIEF DISCUSSION. YOU ARE LOOKING TO GET TO THE FACT THAT CREW LEADERS ARE NOT ALWAYS WORKING. IN FACT, PARTCULARLY AT THE BEGINNING OF WORKING WITH A NEW CREW OR ON A NEW PROJECT, THE CREW LEADER OFTEN DOES LITTLE OR NONE OF THE ACTUAL WORK.)

TEACHER NOTE

Evaluation Criteria

- Expectation
- Skill
- Personality
- Performance
- Safety

Okay, so there are a lot of ways to think about a crew. I'm going to propose five criteria along which it can be valuable to evaluate your crew members. I give you these as a way to help you figure out what might be a valuable place for your attention and as a possible aid in assigning tasks.

Expectation. This is a leadership and teaching topic. Give your expectations and get their expectations. A crew member's satisfaction on a job will be closely related to what they thought was going to happen or wanted to happen. Particularly with volunteers, there is a lot of talk about keeping them happy. Happiness, however, is not an easy thing to produce and may well be beyond the scope of trail

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work. I suggest that we focus on crew members having a satisfying experience. A large part of someone's satisfaction comes from expectations being met. That is why it is so important that you find out what your crew's expectations are and that you let them know what yours are. If they are widely divergent, you may want to address that right away. For example, if you are running a one day volunteer project, and a guy shows up in flip flops and no shirt and when asked what he wanted to have happen on the day, he says "I want to catch some rays." This may be someone that you redirect to the nearest beach.

Next criteria is **skill.** You have probably encountered this before. Some folks come to a project with no trail experience at all, and some have worked on a park service trail crew and have worked on every aspect of trails. It is pretty obvious that you want to know who can do what particularly in assigning tasks. If you have a really experienced person, you may be able to use them as a kind of sub-group leader. If you have a rank novice or two, this should trigger the idea that you will be doing a lot of teaching and supervision. It is a good idea to ask people about their experience, but you also need to be aware that people intentionally or unintentionally may not be giving you the straight story. It is very hard to gauge an exact level of expertise just from what a person says, so ask yes, but also watch. Look to see how a person handles tools or how they start an assigned task. Your observations will refine your knowledge of their skill.

Personality. This is a pretty broad heading. We've already talked about what might motivate a person, how they might learn, and how they might want to be acknowledged. All these have to do with someone's personality. It is often helpful to look for who is a self starter, who is a natural leader, who motivates others, and other team type characteristics. I don't want you to think you need to be a psychologist to be a Crew Leader but I do want to advocate that being observant about crew members' personality traits might contribute to how you manage your personnel.

Performance. This criteria is a bit of a combination of skill and personality. You want to pay attention to who is producing the work that you want and who isn't. That will dictate some of your future management. Also, with regard to performance, I will mention that this is a good category to set an expectation about. If you can make your expected goal in a concrete way, you go a long way to achieving it. For example, a concrete goal could be to produce 200 linear feet of finished tread. Also, as we mentioned before, it will be of service to you to set the expectation that you will be giving feedback regarding performance. Not only will it convey your attention, but from a performance standpoint, it is almost always more efficient to correct mistakes as they begin rather than correct them after something comes out wrong. Having to make a crew or a crew member do something over is demoralizing. So the beginning of a project is often a time to go slow so that you can go fast later.

Last criteria, **Safety.** Look for your crew's physical safety, of course, and we talk about that throughout this course. But also look for your crew's "psycho-

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logical" safety. In other words, you want to make it safe for them to approach you about anything that is going on for them. Also, you want to make sure there aren't any inappropriate interpersonal dynamics going on. No bullying, no harrassment, and so on. And we'll talk more about conflict in another module.

So there are five ideas for you as Crew Leader to use when considering your crew and what is going on with them. Some of what we have been talking about is pretty intuitive, but part of what this whole course is attempting to accomplish is to call out these things to engage your leadership brain and to give you ideas for when you get stuck or your normal mode of operation isn't working as well as you'd like.

Let's do some role-playing to reinforce what we have just been talking about.

TEACHER NOTE

Organize what you are looking for in the role-play. Here are some elements to observe/discuss:

Recognition – what got the Crew Leader's attention, what was the initial perception of the situation?

Intervention – how did the Crew Leader insert himself/herself into the situation – what style was used

Investigation – how did the Crew Leader find out what was going on – how did he/she manage the rest of the crew

Resolution – did the Crew Leader solve the problem – what technique was used – was it a lasting solution or a temporary one

---

ACTIVITY:

ASK FOR A VOLUNTEER TO BE THE CREW LEADER AND THREE TO FIVE VOLUNTEERS TO ACT AS THE CREW. (IT IS OK TO INVOLVE YOUR WHOLE GROUP IF YOU ONLY HAVE A HANDFUL OF PEOPLE. IT IS ALSO OK TO HAVE PEOPLE SIMPLY OBSERVE IF YOU HAVE A LARGER GROUP.) BE CLEAR THAT AFTER THE ROLE-PLAYING, THERE WILL BE A DISCUSSION ABOUT THE SCENARIO. SEND THE CREW LEADER ACTOR OUT OF HEARING AND ASSIGN THE CREW MEMBER ACTORS THEIR ROLES FROM SCENARIO ONE. HAVE THE CREW MEMBER ACTORS BEGIN. INSTRUCT THE CREW LEADER ACTOR TO OBSERVE THE CREW AND STEP IN WHEN APPROPRIATE. YOU CAN STEP IN IF NECESSARY, BUT GENERALLY LET THE SCENARIO PLAY OUT UNTIL A RESOLUTION IS ATTEMPTED. ONCE THIS OCCURS, STOP THE PROCESS AND THANK THE ACTORS.

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Appendix M: Assessing Your Crew

LECTURE:

What was going on?
How did that get addressed?
What worked about the interaction? What didn't?
How did the intervention feel?
What was _____ attitude when intervening?

(MAKE SURE THAT PARTICIPANTS' COMMENTS ARE PRESENTED IN A RESPECTFUL MANNER. MAKE SURE TO POINT OUT THINGS THAT THE CREW LEADER ACTOR DID WELL. IF THE CREW LEADER ACTOR GOT TO THE BACK-STORY, CALL THAT OUT. IF NOT, POINT OUT HOW THAT COULD HAVE HAPPENED.)

(SUM UP THE OUTCOME OF THE SCENARIO.)

Well done.

(IF TIME PERMITS, DO SCENARIO TWO. IF NOT, PROCEED TO CLOSING BELOW.)

On a certain level, the particulars of this exercise are less important than the bones of the process. In other words, as a Crew Leader it is imperative that you feel empowered to step in and take action. Step in. Gather information. Make a call on what to do. Our discussion has touched on some techniques that may be effective for you, but there is no hard and fast rule about what to do in a given situation. If I knew one and could tell you, I would. The more experience you have, hopefully, the better your results will be. For today though, I hope you have become more comfortable with the idea that thinking about your crew and stepping in when something is not quite right is part of the role of a Crew Leader.

Questions?

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Assessing Your Crew Outline

- Introduce purpose of this module which is to give Crew Leaders some criteria with which to understand the members of their crew

- Introduce the 5 criteria
    - Expectation
    - Skill
    - Personality
    - Performance
    - Safety

- Lead activity

- Reinforce with participants the importance of accepting the leadership role and taking action as you see what is going on with a crew

- Questions

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Appendix N
Conflict Management
(Conflict & Dispute Resolution Management)

> **MAIN IDEA**
>
> Generate ideas that participants can employ when they encounter conflict in their crew.

LECTURE:

In any of your trail crew experience, how many of you have experienced or witnessed conflict?

(ALLOW FOR A SHOW OF HANDS.)

MORE INFORMATION

Possible sources of conflict:

• Different values and beliefs
• Role pressure or clarification
• Perception differences
• Diverse goals or objectives
• Personality clash or conflict

It is not uncommon for conflict to arise in any group that spends any significant amount of time together. What are some possible causes of conflict?

(REFER TO P.132 IN YOUR CREW LEADER INSTRUCTOR MANUAL FOR A PARTIAL LIST.)

As Crew Leaders, what is our job when there is conflict within the group?

(ALLOW FOR BRIEF DISCUSSION. MAKE SURE THAT THE DISCUSSION INCLUDES SOMETHING TO THE EFFECT THAT CREW LEADERS ARE INTERESTED IN CULTIVATING WORKING RELATIONSHIPS AND MAINTAINING A SAFE, COMFORTABLE WORK ENVIRONMENT. IT IS NOT A CREW LEADER'S JOB TO GET EVERYONE TO LIKE EACH OTHER.)

If we take it as given that conflict will occur at some point, not necessarily on every project of course, but at some point, then the important thing becomes how we, as Crew Leaders react. We need to recognize that something is going on. Then diffuse any inflammatory energy and move to a resolution. We're going to do some role playing

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here in a minute to practice that, but I want to ask a question first. As the authority figure in a group, is our reaction going to impact the course of the conflict?

(ALLOW FOR FOLKS TO SAY YES AND DISCUSS VERY BRIEFLY.)

Right, so rule number one becomes, don't get drawn into the emotion of the conflict. That will likely make whatever is happening worse by escalating the tension. Regardless of whether the conflict is between crew members or between you and a crew member, you need to stay collected and work on the problem. If you start adding to the friction, you have given up some of your authority and thus you're ability to mediate the conflict.

Turn to page 58 in your manuals (p. 133 in CLI manual). Let's touch on these concepts before we begin the exercise. The first item there is about the fact that sometimes the real source of tension is not immediately apparent. Remember when we talked about active listening and we talked about the difference between how a person feels and what they think. Sometimes the surface of a conflict is about what the person thinks but the energy driving it is emotion. So remember to employ active listening when addressing a conflict. By listening you may be able to get to the root of the driving energy and diffuse the situation considerably. The fourth and fifth bullet points there are about what we just touched on. A Crew Leader needs to stay in control. Clarifying issues, finding common ground, and building trust all flow from opening up dialogue from the partcipants in a "safe" environment created by you. The second point on the list offers the technique of moving the conflict away from the group

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and that may be a good thing to do. It is certainly something to keep in mind. And the last bullet point talks about having a vision of success. This encompasses a few things. One, you need to have confidence that you can create a workable situation out of what is happening. Two, you need to keep an eye on your goals of keeping work going and maintaining a safe work environmnent. Third, and not actually stated in the bullet point is that while it is important to keep your eye on your goals, you also need to be flexible and ready to adapt to what is going on. So, given those general techniques for response to conflict lets practice some.

ACTIVITY:

TEACHER NOTE

Organize what you are looking for in the role-play. Here are some elements to observe/discuss:

Recognition of conflict – what got the Crew Leader's attention, what was the initial perception of the situation?

Intervention – how did the Crew Leader insert him/herself into the situation – what style was used?

Investigation – how did the Crew Leader find out what was going on – how did he/she manage the rest of the crew?

Resolution – did the Crew Leader solve the problem – what technique was used – was it a lasting solution or a temporary one?

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ASK FOR A VOLUNTEER TO BE THE CREW LEADER AND THREE TO FIVE VOLUNTEERS TO ACT AS THE CREW. (IT IS OK TO INVOLVE YOUR WHOLE GROUP IF YOU ONLY HAVE A HANDFUL OF PEOPLE. IT IS ALSO OK TO HAVE PEOPLE SIMPLY OBSERVE IF YOU HAVE A LARGER GROUP.) BE CLEAR THAT AFTER THE ROLE-PLAYING, THERE WILL BE A DISCUSSION ABOUT THE CONFLICT AND ITS RESOLUTION. SEND THE CREW LEADER ACTOR OUT OF HEARING AND ASSIGN THE CREW MEMBER ACTORS THEIR ROLES FROM SCENARIO ONE. HAVE THE CREW MEMBER ACTORS BEGIN. INSTRUCT THE CREW LEADER ACTOR TO OBSERVE THE CREW AND STEP IN WHEN APPROPRIATE. YOU CAN STEP IN IF NECESSARY, BUT GENERALLY LET THE SCENARIO PLAY OUT UNTIL A RESOLUTION IS ATTEMPTED. ONCE THIS OCCURS, STOP THE PROCESS AND THANK THE ACTORS.

LECTURE:

What did you perceive as the conflict?
What was the proposed resolution?
How did you feel as the crew?
Did it feel like a reasonable solution?
How did the intervention feel?
Was the situation diffused? How?
What did _____ do well? What might he/she have done differently?
What was _____ attitude when intervening?
Who was affected by the conflict?

(MAKE SURE THAT PARTICIPANTS' COMMENTS ARE PRESENTED IN A RESPECTFUL MANNER. MAKE SURE TO POINT OUT THINGS THAT THE CREW LEADER ACTOR DID WELL. IF THE CREW LEADER ACTOR GOT TO THE BACK STORY, CALL THAT OUT. IF NOT, POINT OUT HOW THAT COULD HAVE HAPPENED.)

(SUM UP THE OUTCOME OF THE SCENARIO.)

Well done.

(IF TIME PERMITS, DO SCENARIO TWO.)

Okay, remember the point of this exercise is to alert you to the need for your action in a conflict situation and to give you some ideas on how to organize your response. Did everyone get something like that going in their heads?

(WAIT FOR AFFIRMATION BEFORE MOVING ON.)

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Conflict Management Outline

(Conflict and Dispute Resolution Management)

- Introduce idea of what a Crew Leader's role is when conflict occurs in a crew
  - Use p. 58 in manual to establish basic actions and goals

- Lead activity

- Summarize main ideas and ask for questions

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Appendix O
Trail Maintenance

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MAIN IDEA

Familiarize participants with common activities
involved in trail maintenance.

</div>

LECTURE:

What Trail Maintenance have each of you done?

(WHAT YOU ARE LOOKING FOR IS WHAT YOUR PARTICIPANTS THINK
MAINTENANCE IS AND THEIR LEVEL OF EXPERTISE.)

TEACHER NOTE

Likely Answers:

Protect investment
Make trail safe
Stop erosion

Why would a land manager want to do trail
maintenance?

(THIS QUESTION INTRODUCES THE PURPOSE OF DOING TRAIL
MAINTENANCE.)

Again, it is important to note that the purpose of
trail maintenance, notwithstanding the generally
accepted answers that we just generated, is to
correct trail problems as the Land Manager sees
them. As a Crew Leader, you may get a list of
priorities such as this:
1. Safety concerns
2. Resource damage
3. Restore design standard

Or you may get a list like this:
1. Water diversion structures
2. Corridor
3. Berm correction

It is also likely that you would get from the Land
Manager an amount of time to address a certain
amount of trail. So, you, as the Crew Leader, need

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to be aware of budgeting your crew's time. Let's talk about some common tasks on a trail maintenance assignment.

Water diversion structures. Everyone turn to figure 19 on page 41. A swale is an intentional low spot on the outside of a trail tread in order to allow water to drain out.

Next, let's look on page 42 at a drainage dip. A drainage dip is similar to a water bar which we will look at next. A dip is a little more elaborate than a swale in that it has an intentional drain on the downhill side of the trail.

And then on page 43, there is a diagram of a water bar. A water bar is also more elaborate than a dip in that it has a bar or mini-wall included in its construction. The wall is intended to be a failsafe effort to stop surface flow from continuing down the trail. In all three of these types of structures, the goal of maintenance is to return them to their optimum functioning condition. And we will talk more about that in the field.

When we talk about corridor maintenance, we are talking about returning the trail corridor to its original specifications. In other words, plants grow and encroach on the trail corridor and a maintenance crew will prune or remove that vegetation. The underlying thought here is to make the trail clear for travel.

TEACHER NOTE

It is helpful to the participants to note that there is not a really clean-cut line between these types of diversion structures. They will most likely encounter a lot of hybrid looking structures.

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Another common trail condition that is sometimes included in a maintenance sweep is removing the berm from a trail. Take a look at page 38 in your manual. This is a good graphic of a berm that has formed on a trail. Of course, that berm will keep water from traveling down hill across the trail. Instead, the water will get trapped and travel down the trail. Mitigating the berm will then extend the life of the trail.

Those are some basic tasks involved in typical trail maintenance. Before we go out in the field, let's touch on some vocabulary.

(GO OVER THE FOLLOWING VOCABULARY USING THE GRAPHICS IN THE MANUAL BEFORE YOU HEAD OUT TO THE FIELD EXERCISE. PP.38-43 OF PARTICIPANT MANUAL.

    TRENCH
    RAMP
    OUTFALL
    BERM
    SLOUGH
    SURFACE WATER
    BACKRAMP
    BAR)

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Appendix O: Trail Maintenance

ACTIVITY:

(EACH OF YOUR PARTICIPANTS WILL PRESENT AN ELEMENT OF BASIC TRAIL MAINTENANCE. THE WORK THAT NEEDS TO BE DONE AT YOUR SITE WILL DETERMINE WHICH ELEMENTS GET PRESENTED.

HERE IS A LIST OF ELEMENTS FROM WHICH TO CHOOSE:
- WATER BAR
- PRUNE VEGETATION (PROPER CUTTING TECHNIQUE)
- REMOVE BERM FROM A SECTION OF TRAIL
- DRAINAGE DIP
- CUTTING A ROOT
- REMOVING A ROCK

EACH PARTICIPANT SHOULD GET FEEDBACK ON HIS/HER PRESENTATION.

NEXT YOU SHOULD GIVE AN EXAMPLE OF HOW YOU SEE A SECTION OF TRAIL. TELL THEM WHAT YOU SEE THAT NEEDS TO BE DONE. THEN AS YOU MOVE TO ANOTHER SECTION OF TRAIL, ASK YOUR GROUP WHAT ISSUES THEY SEE. IDENTIFICATION OF PROBLEMS AND A GENERAL IDEA OF THEIR SEVERITY IS SOMETHING THAT YOU WANT TO CONVEY.)

Questions?

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Trail Maintenance Outline

- Establish what kind of maintenance the participants have done

- Lead a brief discussion on why a Land Manager would want to do maintenance

- Give a brief idea of what types of tasks a Land Manager might ask for

- Use manual to review maintenance tasks
    - Swale
    - Drainage dip
    - Water bar
    - Corridor
    - Berm

- Go over maintenance vocabulary
    - Trench
    - Ramp
    - Outfall
    - Berm
    - Slough
    - Surface water
    - Backramp
    - Bar

- Lead activity

- Questions

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Appendix P
Putting It All Together / Conclusion

> ### MAIN IDEA
>
> Recap the main components of leading a crew
> on a given work day. Get evaluations from participants.
> Give out course completion documents and
> celebrate the end of the training.

LECTURE:

We have arrived at the last module in our training. We have covered a lot of ground over the last two days. Let's take a minute to think about how a work day might go when you are leading a crew.

Before work on the project even begins, what are you responsible for?

(You are looking for making contact with the land manager/project sponsor and any other logistics. It is not important that this be an exhaustive discussion, but it is always a good idea to write responses on the board.)

TEACHER NOTE

At some point, make sure to direct your participants' attention to p. 93-94 in their manuals. A Crew Leader's Daily Reminder is located there and can serve as a reference for them.

At the trailhead, on the morning of a workday, what things are you going to do as the Crew Leader?

(You are looking for basic elements like greeting, Tool & Safety Talk, stretching, etc.)

When you get to the work site, what are your responsibilities?

(You are looking for risk assessment, delivering the 6-step method, directing maintenance, directing work, but not necessarily doing the work.)

(At this point, depending on time, you can go on to the conclusion or you can ask additional questions like "What actions are you going to take to increase safety?" or "What are you going to do at the end of the day?")

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> **TEACHER NOTE**
>
> Make time to tell your participants about how they can contact you if they have questions later.

Great, are there questions about anything? Anything we have covered in the entire training?

CONGRATULATIONS! You have completed the OSI Trail Crew Leadership Training. I have some course completion documents for everyone.

(HAND OUT COURSE COMPLETION DOCUMENTS. MAKE SURE TO MENTION THE OSI CERTIFICATION PROCESS AND THE SKILLS TRAININGS AND WHERE TO FIND THAT INFORMATION ON THE WEB.)

Thanks for your energy and attention over the last two days. You are helping to improve trails and trail work in Colorado, and that is cool.

I'm going to hand out evaluation forms for this training now. Please be candid. We at OSI are always trying to improve our training, and we need your input to do that.

(HAND OUT EVALUATIONS AND COLLECT THEM WHEN FINISHED.)

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Putting It All Together / Conclusion Outline

- Lead a discussion about the phases of a work day (manual p. 93 is a good resource)
    - What are a Crew Leader responsibilities before the work day
    - What are the actions of a Crew Leader at the start of the work day
    - During work, what is a Crew Leader doing/thinking about
    - End of the work day

- Questions

- Congratulations!

- Mention OSI websiste at www.cotionline.org, Crew Leader certification and OSI skills workshops

- Complete and collect evaluations.

- Hand out course completion certificates.

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