

Investigating Fire Ecology

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INTRODUCTION TO INVESTIGATING FIRE ECOLOGY



Investigating Fire Ecology: An Overview

Investigating Fire Ecology is a curriculum designed to provide students with interactive opportunities to construct a basic understanding of the sciences associated with wildfire ecology. The disciplines of forestry, biology, and geology are introduced to students using an interactive, hands-on, field-based investigation process. The guide is primarily written for 6th grade but is easily adaptable to accommodate grades 5 through 8.

Activities are divided into three sections: preparatory classroom lessons, an educational and work focused field trip, and post-trip analysis, review and instruction. All activities have been field tested and reflect facts and approaches utilized by professionals in each of the respective fields.

The lessons center on ecological recovery from fire and related topics that encourage students to collect and analyze their own data. Throughout the guide students are offered opportunities to examine multiple perspectives of post-fire ecology and to gain an understanding of the complexity of the issues, as appropriate for their developmental level.

The lessons present topics to students in a manner that integrates critical thinking processes such as problem definition, forming hypothesis, collecting and organizing data and information, synthesizing, performing analysis, formulating alternative solutions, identifying optimal courses of action, and drawing conclusions.

Students are encouraged throughout to practice interpersonal and communication skills, including oral and written communication, group cooperation, leadership, and citizenship skills. The activities are designed to sharpen basic classroom and field skills such as observation, data collection, and data analysis. Lessons incorporate the use of technology in the form of computers, software, and mapping using Global Positioning Systems (GPS).

Delivery is accomplished via a combination of lecture, discussion, field trips, cooperative learning, and independent work in an environment that encourages creative expression. Each lesson begins with an essential question that challenges students to broaden their thinking and sharpen their research skills. All topics are relevant to the students daily lives and reflect real-world experiences.

The program is interdisciplinary and combines math, science, social studies, art, geography, language arts, and computers. All lessons are carefully aligned with the National Science Standards and New Mexico Science Standards.

A variety of performance assessment techniques are included, such as pre- and post-activity sheets that emphasize open ended questions, data analysis, and journal entries. Student outcomes are tied to goals and objectives. Expectations are clearly expressed at the onset of each lesson to provide for a more direct and objective ability to perform assessment.





Lessons can be implemented sequentially or individually depending on teacher preference and the attributes, interests, and characteristics of your community and school.

The study of fire ecology will challenge students, facilitate developmental skills, and impart specific scientific knowledge that prepares students for more advanced course work. It encourages active learning and is an exciting way to investigate these issues that exist within every community.

SUGGESTED LESSON SEQUENCE

Pre-Visit: Time needed: 4 hrs

- ★ Activity #1: FIRE HISTORY OF PONDEROSA PINE ECOSYSTEMS
Students read a fire history newspaper and complete worksheets to understand the fire regime in ponderosa pine forests
- ★ Activity #2: WHY DO FORESTS BURN? EXPLORING THE FIRE TRIANGLE
Students learn how forest density, slope and weather conditions affect the nature of wildland fire.
- ★ Activity #3: WILDFIRE & NATIVE PLANTS: IDENTIFICATION OF TREES, SHRUBS AND UNDERSTORY PLANTS
Students identify common trees, shrubs and understory plants in a ponderosa pine forest using dichotomous keys and drawings.
- ★ Activity #4: MEASURING THE EARTH FROM THE GROUND UP
Students use GPS units to map specific locations in preparation for the field trip.
- ★ Activity #5: PREPARING FOR THE FIELD TRIP: FIELD JOURNALS AND PHOTO COLLAGES
Students prepare a field journal and learn about photography in preparation for the field trip.

On-Site: Time needed: 6 hours

- ★ FIELD JOURNAL: Students complete their field journal by recording data from their plot study, identifying plant species, and recording observations in burned and unburned areas.
- ★ OPTIONAL FIELD TRIP EXTENSION: Teachers may select a site stewardship project in an area affected by a wildfire.

Post-Visit: Time needed: 6 hours

- ★ Activity #1: WHAT DOES IT ALL MEAN? ANALYSIS OF PLOT DATA
Students analyze the data collected during their field trip.
- ★ Activity #2: WILDFIRE AND NATIVE PLANTS: CREATING A FIELD GUIDE
- ★ Activity #3: USING OBSERVATIONS TO EXPRESS FEELINGS: WRITING AND PHOTO COLLAGE
Students reflect on the effects of wildfire and on their field trip observations.
- ★ Activity #4: SHOULD WE THIN ALL THE PONDEROSA PINE FORESTS?
A FOREST MANAGEMENT PLAN
Students develop a forest management plan for maintaining healthy ponderosa pine forests
- ★ Activity #5: Be Prepared: DEFENSIBLE SPACE
Students create a defensible space plan for their home.



This curriculum is designed to replace one of your ecology units. To make it relevant, it is important for you to link it with the national science standards, national art standards, New Mexico content standards & benchmarks, and/or New Mexico visual art standards & benchmarks.

The skills listed below identify those skills that students will gain while participating in the activities found in this guide:

Mathematics

- Understand meaning and use of random samples
- Use estimation with measurement
- Solve problems by collecting, organizing, and analyzing data
- Look for a pattern in data
- Classify and measure angles
- Understand the processes of basic mathematical operations
- Solve problems with ratios and proportions
- Generate and solve word problems using real data
- Use and evaluate problem-solving strategies
- Collect, organize and analyze data
- Compare quantities in table, graph, and pictorial form
- Use calculators to solve and check problems

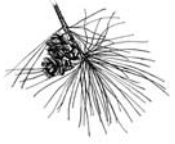
Science

- Use tools to collect data, to measure, and to manipulate objects
- Investigate and solve problems about the movement of living things
- Make predictions, and observations, and draw conclusions
- Use a variety of strategies to solve problems
- Develop predictions based on prior knowledge
- Explore personal risks and costs to society in dealing with environmental hazards
- Understand that some events in nature have a repetitive pattern
- Determine the requirements for living things to survive
- Identify the appearance of diversification of life forms
- Present results of investigations in several ways (individual and group presentation, logbooks) and using various forms (graphs, charts, reports)
- Use sensory observations to describe the physical properties of objects
- Observe changes in animals, plants, and the environment

Communication

- Respond to reading through writing, speaking, and art
- Prepare, organize and make oral presentations
- Stay on topic when speaking
- Use appropriate grammar when speaking
- Use voice, body language, notes and visual aids to correctly engage the audience when speaking





- Use basic three-part format in organizing presentation
- Maintain listening skills
- Use peer review to revise and edit
- Work cooperatively in groups, state opinions, and discuss reactions

Social Studies

- Explain obligations and responsibilities of citizenship
- Explain roles of citizens in political decision-making.

National Science Standards Grades 5-8	National Art Standards Grades 5-8
Content Standard A: Science as Inquiry Abilities to do scientific inquiry Understandings about scientific inquiry	Content Standard 1: Understanding and applying media, techniques, and processes a.b.
Content Standard C: Life Science Regulation and behavior Populations and ecosystems Diversity and adaptations of organisms	Content Standard 2: Using knowledge of structures and functions a.b.c.
Content Standard E: Science and Technology Abilities of technological design Understandings about science and technology	Content Standard 3: Choosing and evaluating a range of subject matter, symbols, and ideas a.b.
Content Standard F: Science in Personal and Social Perspectives Populations, resources, and environments Natural hazards Risks and benefits Science and technology in society	
Content Standard G: History and Nature of Science Science as a human endeavor Nature of science History of science	

New Mexico Visual Art Standards and Benchmarks Grades 5-8			
Content Standard 1: Learn and develop the essential skills and techni- cal demands unique to dance, music, theater/drama, and visual art. Benchmarks A1, B1	Content Standard 2: Use dance, music, theatre/drama, and visual arts to express ideas Benchmarks A1, A2, B1, B2	Content Standard 3: Integrate understand- ing of visual and per- forming arts by seek- ing connections and parallels among art disciplines as well as other content areas. Benchmarks A1, B1	Content Standard 4: Demonstrate an understanding of the dynamics of the creative process. Benchmarks A1, B3, B4

New Mexico Science Content Standards, Benchmarks,
and Performance Standards, 6th Grade



STRAND I Scientific Thinking and Practice

STANDARD I Understand the processes of scientific investigations and use inquiry and scientific ways of observing, experimenting, predicting, and validating to think critically.

BENCHMARK I Use scientific methods to develop questions, design and conduct experiments using appropriate technologies, analyze and evaluate results, make predictions, and communicate findings.

PERFORMANCE STANDARDS:

1. Construct appropriate graphs from data and develop qualitative and quantitative statements about the relationships between variables being investigated.
2. Examine the reasonableness of data supporting a proposed scientific explanation.
3. Justify predictions and conclusions based on data.

BENCHMARK II Understand the processes of scientific investigation and how scientific inquiry results in scientific knowledge.

PERFORMANCE STANDARDS:

1. Understand that scientific knowledge is continually reviewed, critiqued, and revised as new data become available.
2. Understand that scientific investigations use common processes that include the collection of relevant data and observations, accurate measurements, the identification and control of variables, and logical reasoning to formulate hypotheses and explanations.
3. Understand that not all investigations result in defensible scientific explanations.

BENCHMARK III Use mathematical ideas, tools, and techniques to understand scientific knowledge.

PERFORMANCE STANDARDS:

1. Evaluate the usefulness and relevance of data to an investigation.
2. Use probabilities, patterns, and relationships to explain data and observations.

STRAND II Content of Science

STANDARD II (LIFE SCIENCE) Understand the properties, structures, and processes of living things and the interdependence of living things and their environments

BENCHMARK I Explain the diverse structures and functions of living things and the complex relationships between living things and their environments

Performance Standards:

1. Understand how organisms interact with their physical environments to meet their needs (i.e., food, water, air) and how the water cycle is essential to most living systems.
2. Describe how weather and geologic events (e.g., volcanoes, earthquakes) affect the function of living systems.
3. Describe how organisms have adapted to various environmental conditions.

BENCHMARK II Understand how traits are passed from one generation to the next and how species evolve.

PERFORMANCE STANDARDS:

1. Describe how species have responded to changing environmental conditions over time (e.g., extinction, adaptation).

STRAND III Science and Society

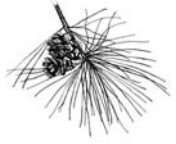
STANDARD I Understand how scientific discoveries, inventions, practices, and knowledge influence, and are influenced by, individuals and societies.

BENCHMARK I Explain how scientific discoveries and inventions have changed individuals and societies.

PERFORMANCE STANDARDS:

1. Examine the role of scientific knowledge in decisions (e.g., space exploration, what to eat, preventive medicine and medical treatment).
2. Describe the technologies responsible for revolutionizing information processing and communications (e.g., computers, cellular phones, Internet).





FIELD TRIP LOGISTICS

for

Investigating Fire Ecology

TEACHER PREPARATION

Planning a Time and Selecting a Location

When: The field trip outlined in this guide may be taken year-round, but fall and late spring are the best times for avoiding snow. Rain is most prevalent during the summer monsoon season, usually in July and August.

Where: Teachers need to select a location for the field trip. Any ponderosa pine forest will work if you can identify the burned vs. unburned areas or treated vs. untreated areas. We recommend one of the following locations:

Ponderosa Campground, Bandelier National Monument

This campground may be used for day use or overnight field trips. Located on State Route 4, this group campground has two group sites that can accommodate up to 50 people each. Reservations are required for overnight use and may be made by calling (505) 672-3861 ext. 534 between 9 am and 4 pm (Monday-Friday).

Rendija Canyon, Los Alamos

This day-use area is located on the Santa Fe National Forest at the trailhead for the Pajarito Trail. No bathroom facilities, water, or camping are available. The trailhead has a parking area suitable for buses. If more than 70 students will participate in the field day at this site, contact the USDA Forest Service Española Ranger District office at (505) 753-7331 for a permit to use the site.

East Fork of Jemez River Trailhead, Santa Fe National Forest

This day-use area has primitive bathroom facilities and parking for buses. No water is available at the site. If more than 70 students will participate in the field day at this site, contact the USDA Forest Service Jemez Ranger District office at (505) 829-3535 for a permit to use the site.

Weather: The chart on the next page lists average climate expectations. Weather is subject to change quickly and can vary dramatically for different locations throughout the Jemez Mountains, especially at the higher elevations.





CLIMATE AVERAGES FOR LOS ALAMOS, NEW MEXICO			
	Maximum Temperature	Minimum Temperature	Mean Precipitation
January	39.6	18.5	0.89
February	43.4	21.8	0.73
March	49.7	26.8	1.06
April	58.8	33.9	0.98
May	67.9	42.7	1.23
June	78.1	51.9	1.38
July	80.6	55.6	3.01
August	77.8	53.9	3.72
September	72.4	48	1.79
October	61.7	37.7	1.52
November	48.8	26.8	0.94
December	40.8	19.8	0.95

Seasonal events: Consult the chart below to assess which months may be best for a class to visit the Jemez Mountains.

April	Turkey vultures and birds of prey migrate through the Jemez. Early-season wildflower displays of Rocky Mountain clematis, Easter daisy, and pasqueflower.
May	Elk calves are born in the Valles Caldera.
June	Wildflowers in the mountains reach their peak with mountain parsley, Indian paintbrush, Calypso orchids, New Mexico penstemon and dozens of other species in bloom.
July	Summer thunderstorms bring green to the mountains.
August	Dances at Jemez Pueblo
September	Bull elk bugle in the Valles Caldera. Chenopods in the burned areas turn brilliant red.
October	Aspens turn golden as the days grow shorter

Guided or self-guided trips: This guide may be used by teachers as a self-contained lesson sequence. A Fire Box containing the necessary equipment to complete the lesson sequence is available (see next page).





Reservations: Teachers who would like more assistance in presenting the field components of this guide can contact the Volunteer Task Force in Los Alamos to make reservations for a field day. Please allow at least 6 hours at the site for the field day. VTF instructors can accommodate up to 70 students per day. Reservations should be made at least one month in advance. There is no charge for the field day. Make reservations by contacting the VTF at info@volunteertaskforce.org.

Fire Box Contents

Fire boxes are available for check out at the Bandelier visitor center or through the Volunteer Task Force (VTF). Make a reservation by calling the Bandelier Visitor Center (505-672-3861 #517) or by emailing the VTF at info@volunteertaskforce.org. The fire boxes contain the following items:

- 4 GPS receivers
- 4 100-meter measuring tapes
- 6 50-meter measuring tapes
- 4 rolls of surveyor stape
- Wooden stakes
- Pin flags
- 15 blue Nerf balls
- Yellow surveyor tape for arm bands for fire tag
- Samples of ponderosa pine, limber pine, juniper, piñon pine, Douglas fir
- 4 three-foot ropes or plastic circles
- First-aid kit
- Field guides for plants and animals

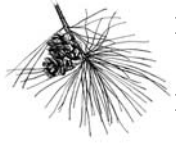
Field Trip Logistics

The success of any field trip requires careful attention and detailed planning. The following tips will help ensure that your field trip will be a rewarding experience for all.



1. Pre-visit the field site. Check for any potential problems (see safety hazards).
2. Arrange for bus transportation and funding well in advance.
3. Inform your school secretary and principal of your trip well in advance.
4. Involve all staff in the planning of trips. Give plenty of notice to the classrooms that students will miss the day of the trip. (i.e., computers, band and orchestra, music, art, library).
5. Handicapped students may require special arrangements, for both transportation and field activities. Make necessary contacts to ensure these students will benefit from the experience.
6. Prepare a short handout for parents and volunteers that describes the details and objectives of the field trip.
7. If some students remain in school on trip day, make sure there is a plan for where they are to be and who will be responsible.
8. Create a master permission slip form indicating the destination, purpose of the field trip, type of transportation, and approximate time of return. Use the bottom of the page as a detachable permission slip so that parents can give their consent and still keep the information. Leave a space for parents to indicate whether their child is likely to suffer from allergies on this trip. Leave another spot for parents to declare whether they'll be joining you. Attach the What Students Need form or the letter explaining the trip to the permission slip. Distribute the permission slips about a week before the trip. You should never take a student on a field trip without a parent's signed consent.
9. Discuss Guidelines for Field Trips and What Students Need with students one week in advance. Have both students and parents sign this form along with the permission slip.
10. Set up a datatable or spreadsheet with information about your students and their parents/guardians with contact information. Information should include student and parent name, address, emergency contact information and any important medical information. This student information should accompany you on all field trips.
11. Have students wear name tags. Color-code them for group identification.
12. Have precise directions to the field site available for the bus driver and all other participants.
13. Check the weather forecast a day or two ahead of time. Do not hesitate to cancel on the day of the trip if the weather is questionable.
14. Leave your cell phone number with the school secretary on the day of the trip.





TEACHER PREPARATION

15. Each teacher should be in charge of their own students.
16. Assign specific responsibilities for parents and volunteers. Remind participants that field trips are very task-intensive and not a time for them to be talking to each other. Tactfully let them know that they are role models, and enforce that.
17. Extend an invitation to other interested community members (school board members, journalists, former students).
18. When students are walking, there should always be one adult in front, one in the middle, and one at the end of the line.
19. Teachers should be accountable for all their students at all times.
20. Each teacher should carry a complete, transportable first aid kit. One teacher should have an Epi Pen (epinephrine) and be trained in how to use it.
21. Pack extra water, clothes, and sunscreen.
22. During the trip, students should get the teacher's permission to go to the bathroom and never go alone.
23. Write thank you notes to the parents and volunteers who helped you. You may want to acknowledge their help in a school newsletter.
24. For later use, maintain a file with information on your field trip's highlights, observations and evaluations, and things for which you could have better prepared.





Grouping Students

There are many ways to group students. If left up to the students, they will naturally want to team up with their friends. In some cases this works but be aware of potential behavior problems. Consider the following when grouping students

- Academic needs
 - Reading levels
 - Learning styles
 - Math skills
 - Problem solving skills
 - Work habits
 - Organizational skills
 - Behavioral skills
 - Content or subject matter

Create groups that have students skilled in different areas. Include in each group one student who is good at math, a good reader, and one who has good interpersonal skills.

The field activities in this guide are best done in groups of four. Divide students into groups before the field trip. Assign each group a color. Make name tags for each student that include the color code. Name tags can be strips of masking tape.

What Each Student Needs

- | | |
|--------------------------|--|
| Rain gear | Clipboard with field journal and 2 pencils |
| Warm layered clothing | Colored pencils |
| Gloves and hat | Permission slip |
| Sunscreen and sunglasses | Inhalers (if needed) |
| Hearty snack or lunch | Sturdy hiking shoes |
| Water | |

What Each Teacher Needs

- | | |
|--------------------------|-------------------------------------|
| Rain gear | Pencil sharpeners and extra pencils |
| Warm, layered clothing | Cell phone |
| Gloves and hat | Garbage sack |
| Sunscreen and sunglasses | Sturdy hiking shoes |
| Hearty snack or lunch | First-aid kit |
| Water | Class list |
| Permission slips | |

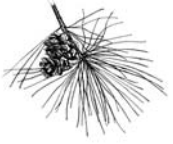
What Each Parent Helper Needs

- | | |
|--------------------------|-----------------------|
| Rain gear | Sturdy hiking shoes |
| Warm, layered clothing | Hearty snack or lunch |
| Gloves and hat | Copy of lesson plan |
| Sunscreen and sunglasses | Water |
| Class list | |

Optional

- | | |
|----------------|--------|
| Small backpack | Camera |
| Binoculars | |





Before You Head Out to the Field

Recruit parent volunteers: one adult for each group of four students is ideal. Make certain adults understand that they will be expected to help supervise students on the field trip. They should lend a hand, but permit the students to do the work.

Have students make legible name tags and color code the name tags for each group.

At the Field Site

The three activities of the field day are best done as a rotation through three stations. Allow at least 1.5 hours per station. In your schedule for the day, include time to walk to the site, for rotation between activities, for a snack, and for lunch. A comfortable schedule is:

Arrive at site

Unload buses and safety briefing: 15 minutes

Walk to first station: 10 minutes

First activity: 1.5 hours

Snack break and rotation to next activity: 15 minutes

Second activity: 1.5 hours

Lunch and rotation to next activity: 30 minutes

Third activity: 1.5 hours

Return to trailhead and load buses: 15 minutes

If necessary, the length of time at each activity can be reduced to 1 hour 15 minutes.

Ideas for Stewardship Projects for Students

A visit to a burned area offers students the opportunity to participate in service learning projects that teach about the importance of environmental stewardship and provide a valuable service to communities affected by wildfire. Teachers should contact local land managers or the Volunteer Task Force for assistance in planning stewardship projects

Some ideas are:

Plant seedlings in burned areas

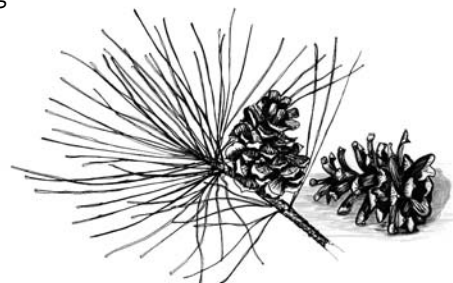
Make seed balls and scatter them in burned areas

Do trail repair

Monitor post-fire recovery of burned areas

Slash removal in fuel reduction projects

Make a video on burned area safety





Student participation in field trips can significantly compliment the existing educational program. While field trips have a very positive educational value when properly organized, care must also be taken to ensure that the trips are planned and conducted in a manner that ensures the protection and safety of students. All field trips introduce some risk. The objective is to manage that foreseeable risk by reducing or eliminating it. The most effective way to manage risk is to plan preventative steps that will minimize the possibility of an accident, and reduce both individual and district liability. Essentially, such steps include effective planning, prudent selection of activities, and careful supervision of those activities.

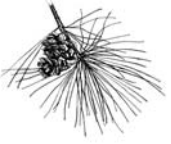
Although typically protected, a teacher, like everyone else, is vulnerable to damaging lawsuits. Often teachers pose legal questions that center around the topic of liability. The obligation or responsibility of teachers is determined through a combination of legislation, regulation, common law and school board policy or by-laws. Should it be found that a teacher did not properly fulfill their obligations, and that failure contributed specifically to the injury of a student, common sense dictates an increase in possible liability will arise. Most school districts have an insurance policy to protect teachers against the financial implication of such liability suites, and they will act on behalf and represent the teacher if they believe the teacher was acting within the bounds of his / her employment, and took prudent steps. The courts typically rule based upon a determination of whether the responsible individuals exercised the proper degree of caution and judgment. While this may appear daunting, it is not that difficult.

To avoid lawsuits, a teacher should assess all the possible risks associated with the activity and complete a risk management plan (sample attached) ¹ This is a simple, documented approach to identifying the risks, and developing an approach to mitigate or eliminate them. Is the educational benefit of the trip worth the risks? Usually, but highly hazardous areas or exposure to undue risk should be avoided when picking locations and activities. A review of the specific district policies and associated requirements and safety guidelines may also help to answer that question.

The teacher responsible for planning, coordinating and implementing a field trip should complete a risk management plan, which includes an educational and safety assessment, for the principal's approval. You should have assistance personnel, and all of them, including parents should be trained in procedures and safety prior to the outing. Once the principal has approved a field trip the teacher should ensure that parents provide an informed written consent for their child to attend. The information to be provided should include a written, detailed itinerary including your educational assessment, the safety assessment, your expectations of students and parents, and supervision. Teachers should have student lists, phone contacts for school and parents, student medical information, first aid kits, and cell phones on each field trip. (See Planning Successful Field Trips for detailed planning tips).

¹ Note: This article is intended to be a helpful guide to planning field trips. Any inference that this constitutes specific legal advice is inappropriate; educators and administration are encouraged to secure specific, professional legal advice relative to issues / concerns / or the policies of their particular district and state.





TEACHER PREPARATION

If an accident occurs on the field trip, the teacher in charge must assess the situation, and if injuries have occurred, attend to the immediate medical concerns. Parents should be informed as soon as possible and a written accident report should be filled out within forty-eight (48) hours of the incident or as soon as possible upon return to the school. The principal should be notified at the earliest opportunity. Ensure that at least one supervisor is qualified in emergency first aid and CPR (cardiopulmonary resuscitation). Be aware of the location of the nearest accessible medical facility.

All participating students should use the transportation that has been arranged for the field trip unless other arrangements have been made between the parent and the teacher organizing the field trip. The principal should be informed in writing of any alternate arrangement for transporting students.

Students should never be left unattended. It is one of the surest ways for teachers to be found liable for student injuries.

It is the duty of the teacher to select field trip activities that can reasonably be conducted in a safe manner. All known hazardous conditions must be recognized.

Teachers and administrators cannot guarantee that injuries or accidents will not result from activities on field trips. They can only assume the responsibility of using good judgment and react sensibly in situations of potential danger. It is important that all teachers and principals become thoroughly familiar with the policies and procedures necessary in taking field trips to help protect themselves and their students. Preparation for a field trip is very important and should be a cooperative undertaking between teacher and students. Careful preparation prior to the trip will help ensure a safe and enjoyable educational experience.



Risk Management Planning

(This description explains how to complete the risk management form on page 42.)



Describe the proposed activity: (In order to determine risk, you must have a detailed idea of all the components of your program and the demands on students)

List the goals and anticipated outcomes: (Ultimately, you need to determine that the benefits and outcomes of the activity outweigh the potential risks the activity presents)

Who is responsible for instructing the students about the activity, safety, risks involved and risk management plans? (Risk management is an active process and must be communicated and shared with all participants. This plan only has value to the extent that it is brought to life through communication and diligence.)

What risk does this activity present?

Physical (i.e. physical injury to participants, staff and partners)

Emotional/psychological (i.e. stress, emotional trauma, fear)

Environmental (i.e. risks caused by environmental conditions such as falling trees, lightning, toxic chemicals, asbestos not risks to the environment)

Institutional (risks to the institution such as the school or agency. i.e. negative press, litigation)

What steps must be taken to reduce or eliminate the risk(s) and who is the responsible person to see that the risks have been minimized: (This active process must be clear to all)

Steps

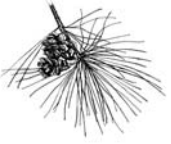
Person Responsible:

What risks exist that cannot be eliminated? (and do these risks outweigh the benefits of the activity? If so, then the activity should not be held)

What steps specific to this activity are planned to be implemented in the event a risk becomes an emergency? (Don't forget to assign these specific steps to specific people)

(Source: The Service-Learning Initiative of Southwest Colorado)





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Dunmire, William & Tiemey, Gail. Wild Plants of the Pueblo Province . 1995.

Gilmer, Maureen. The Wildfire Survival Guide: Defensive Landscaping to Protect Your Family and Home Before, During and After a Wildfire .1995.



National Interagency Fire Center

<http://www.nifc.gov>

Bureau of Land Management

<http://www.blm.gov>

Discovery Channel School

<http://discoveryschool.com>

Fire Information Now Database United States Fire Administration/FEMA

<http://www.usfa.fema.gov/find>

Fire Management Today

<http://www.fs.fed.us/fire/planning/firenote.htm>

FireNet (International Fire Information Network)

<http://online.anu.edu.au/Forestry/fire/firenet.htm>

FireSafe

<http://firesafe.org>

FireWise

<http://www.firewise.org>

Index to Wildland Fire WWW catalog

<http://www.blm.gov/narsc/wildfire/wwwindex.html>

NASA Earth Observatory Global Fire Monitoring

<http://earthobservatory.nasa.gov/Library/GlobalFire/fire.html>

National Park Service

<http://www.nps.gov>

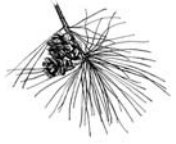
National Wildfire Coordinating Group (NWCG)

<http://www.nwcg.gov>

Smokey Bear s Official Homepage

<http://www.smokeybear.com>





Southwest Area Wildland Fire Operations

<http://www.fs.fed.us/r3/fire/>

The Nature Conservancy National Fire Management Program

<http://www.tncfire.org>

U.S. Fish and Wildlife Service

<http://ww.fws.gov>

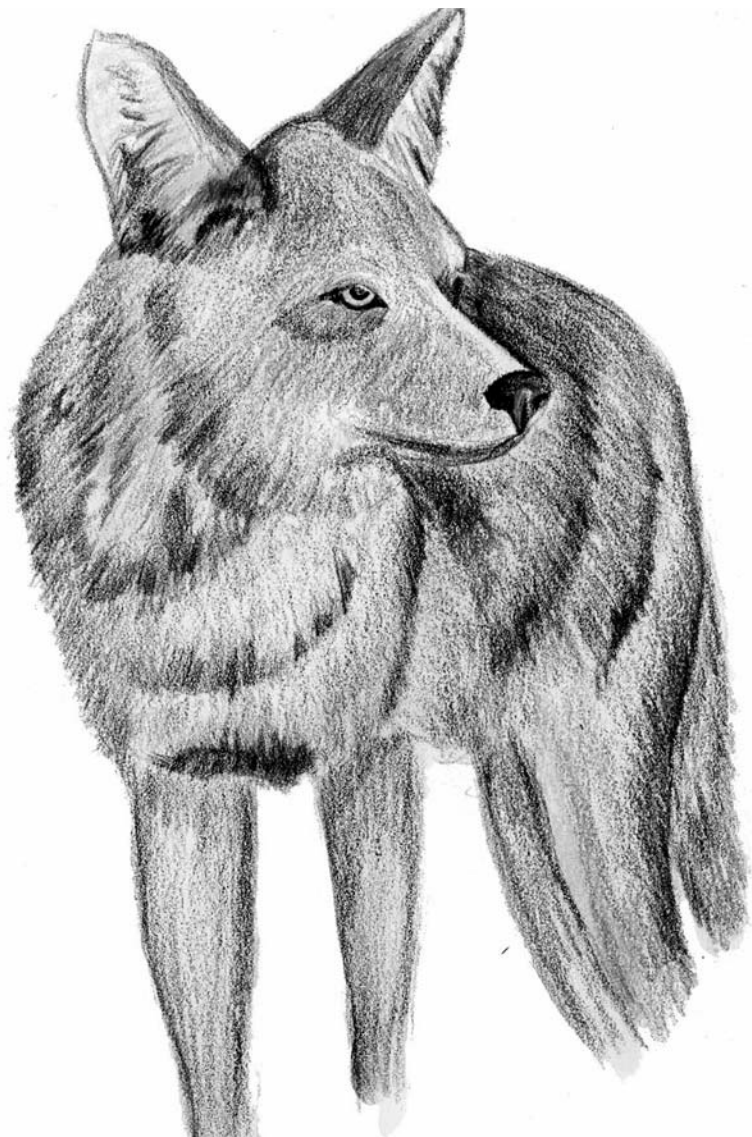
USDA Forest Service Fire Effects Information System

<http://www.fs.fed.us/database/feis>

USGS Wildland Fire Research

<http://www.usgs.gov/themes/Wildfire/fire.html>

TEACHER PREPARATION



ACKNOWLEDGEMENTS



This guide was written and field-tested by area teachers, naturalists, scientists, and members of the Volunteer Task Force.

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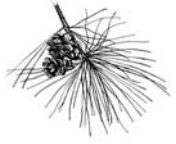
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ATTACHMENT





ATTACHMENT

Volunteer Task Force
3100 Arizona Avenue
Los Alamos, NM 87544
(505) 662-1612
E-mail: info@volunteertaskforce.org

Dear Parents

Your child will be participating in a field trip with the Volunteer Task Force. Students will be participating in three activities that may include planting seedlings in the area burned by the Cerro Grande Fire, studying forest density and forest health, examining a stream profile, or distributing seed balls.

Students will be instructed on safe handling and use of tools, proper planting techniques, and the importance of community service. We will also discuss issues of forest health, fire ecology, and making better forests in the future.

In addition to signed permission slips, each student should bring the following required items:

- Long-sleeve shirts
- Long pants
- Sturdy shoes
- Work gloves
- Hat
- Sunscreen
- Rain gear
- Inhalers and other medicines, as appropriate
- Water (at least a quart)
- Snack

If you have any questions, please do not hesitate to contact your child's teacher or the Volunteer Task Force.

Sincerely,

A handwritten signature in black ink that reads "Craig Martin". The signature is fluid and cursive.

Craig Martin
Project Manager





Field Trip Guidelines For Students

1. Be aware of the situation around you and your classmates; develop the habit of identifying hazards and then avoiding them. Examples: low branches, leaning trees, loose branches, loose stones, ledges and stump holes.
2. Pay attention to adults; follow instructions
3. Be prepared
 - a. Have required materials
 - b. Carry adequate water
 - c. Bring lunch/snacks
 - d. Wear appropriate footwear and clothing
4. Be responsible
 - a. Carry trash back to school; dispose of properly
 - b. Act appropriately
 - c. Handle equipment with care
 - d. Return all equipment and unused materials supplied to you in good condition

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Agreement:

I fully understand and accept all rules and requirements governing conduct during the field trip. I understand that a violation or failure to meet these behavior standards will result in my removal from the trip. Any removal from a field trip for violation of safety rules will result in my not participating in future field trips.

Student Signature

Date

Parent Signature



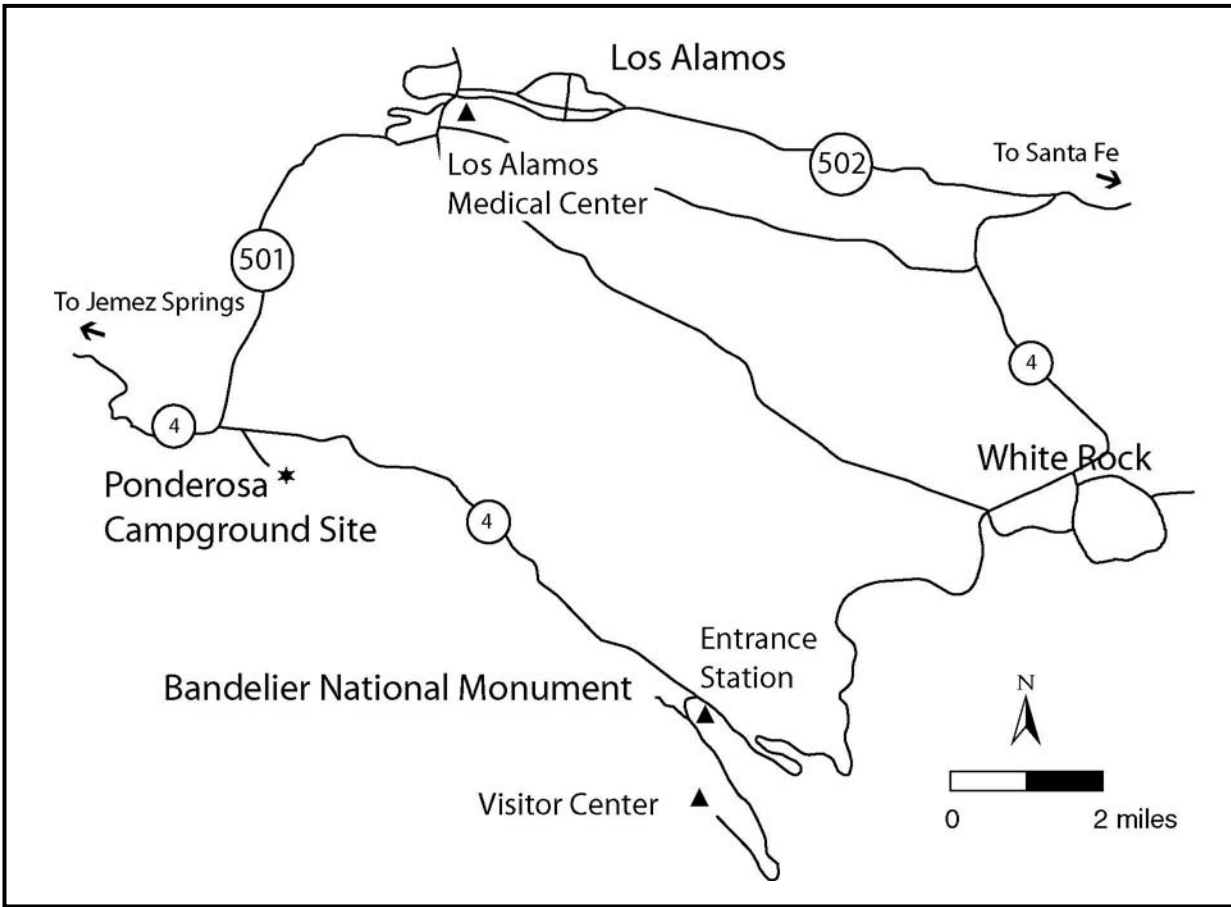
DRIVING AND SITE MAPS FOR THE FIELD LOCATIONS

Ponderosa Campground at Bandelier National Monument

From Santa Fe, drive north on US Highway 84/285 about 15 miles to Pojoaque. Follow the exit signs for New Mexico Highway 502 and Los Alamos. Once on NM 502, continue 15 miles west to the interchange with New Mexico Highway 4. Bear right to get onto NM 4, following the arrows pointing toward White Rock and Bandelier National Monument. Continue on NM 4 through White Rock about 10 miles to the entrance to Bandelier National Monument. Continue straight on NM 4 past the entrance. In about 7 miles, Ponderosa Campground is on the left Turn left into the parking area.

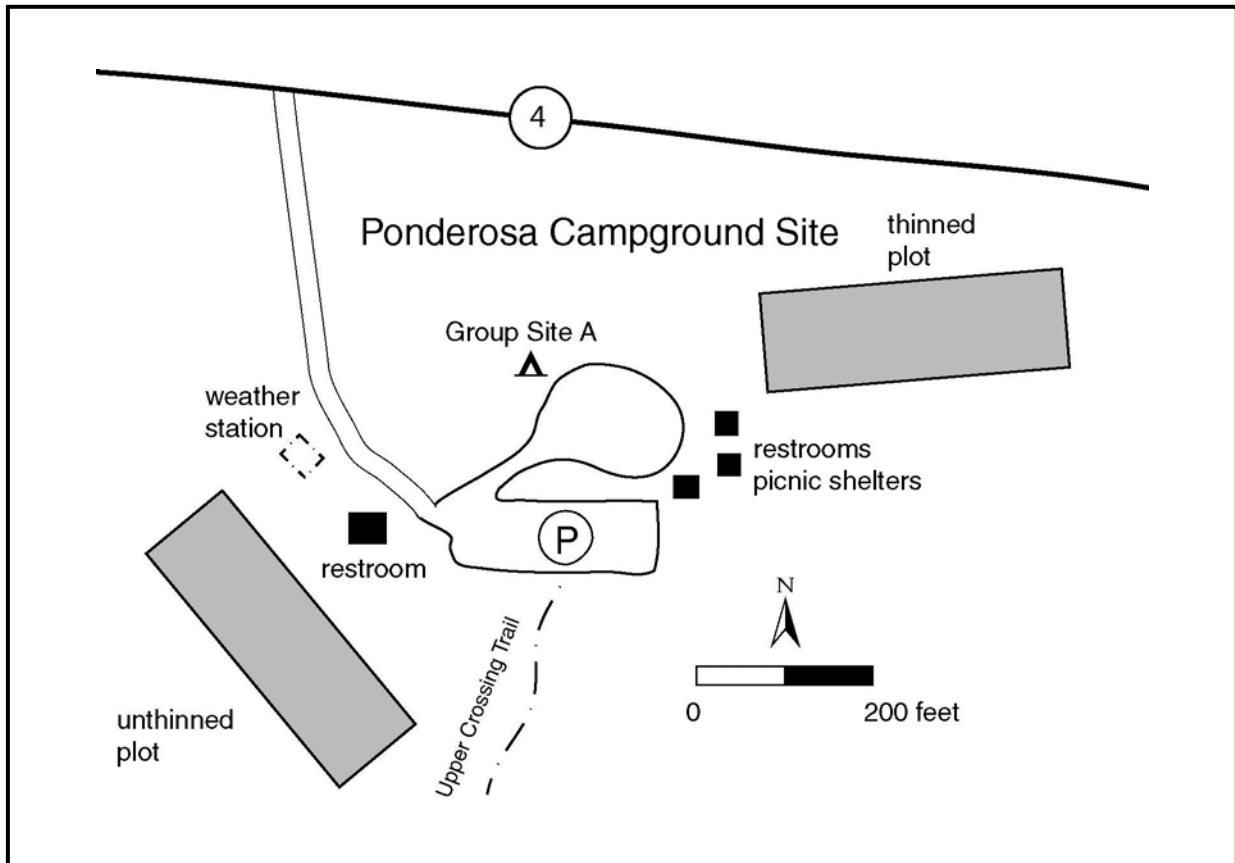
From downtown Los Alamos, drive west on Trinity Drive to the Los Alamos Medical Center. Turn left onto Diamond Drive, crossing the high bridge over Los Alamos Canyon. Just past the bridge, bear right onto New Mexico Highway 501. At a t-intersection in 4 miles, turn left onto New Mexico Highway 4. In 0.2 miles, turn right into Ponderosa Campground.

ATTACHMENT



Ponderosa Campground Site Description

Sample plots are shown on the map below. Plots may be established in the general areas identified on the map but you must make sure that one of each is located in the thinned and unthinned areas. The thinned area (which has fewer trees) is located near the picnic shelters at Group Campsite A. Park either in the trailhead parking or in the parking circle for the group site. The unthinned area is across the gravel entrance road near the weather station. Look for the corner near the southwest corner of the fence surrounding the weather station.

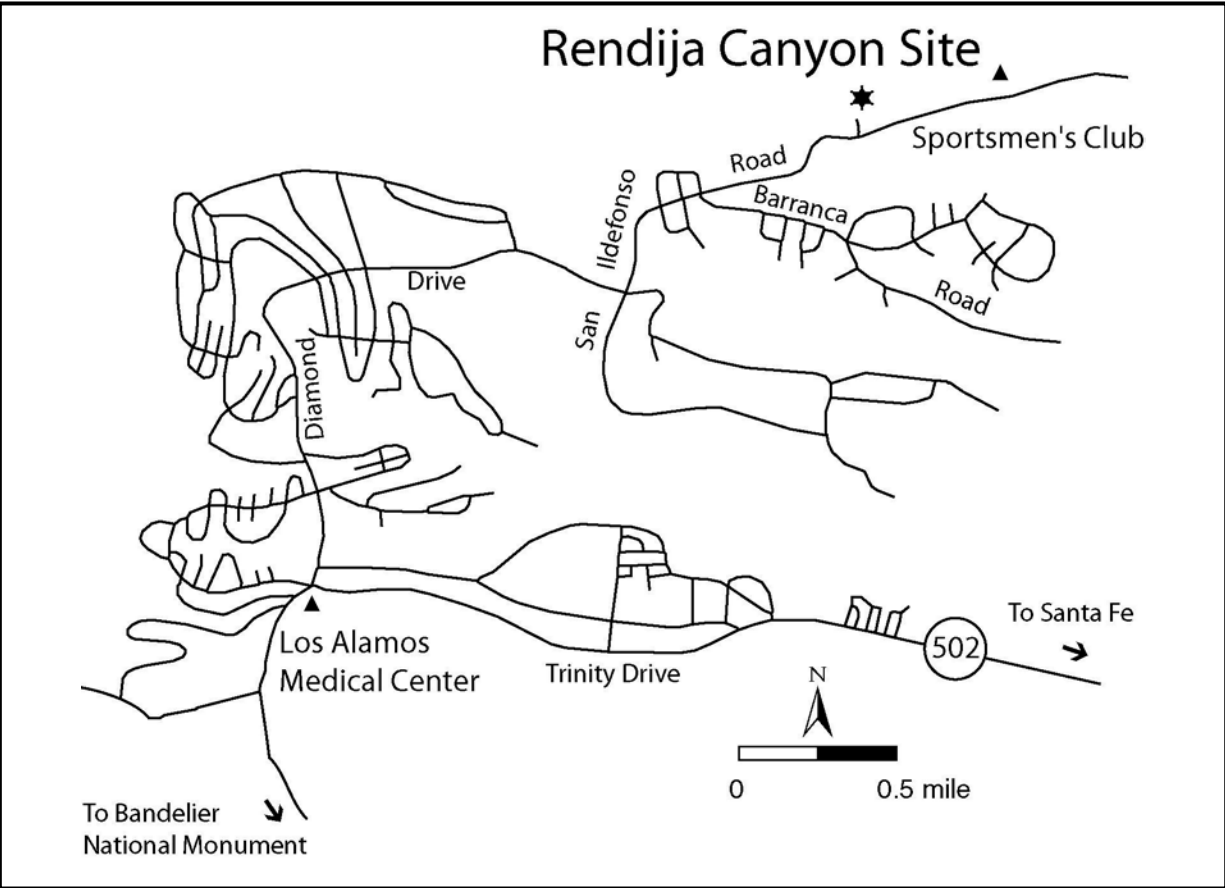




Rendija Canyon, Santa Fe National Forest

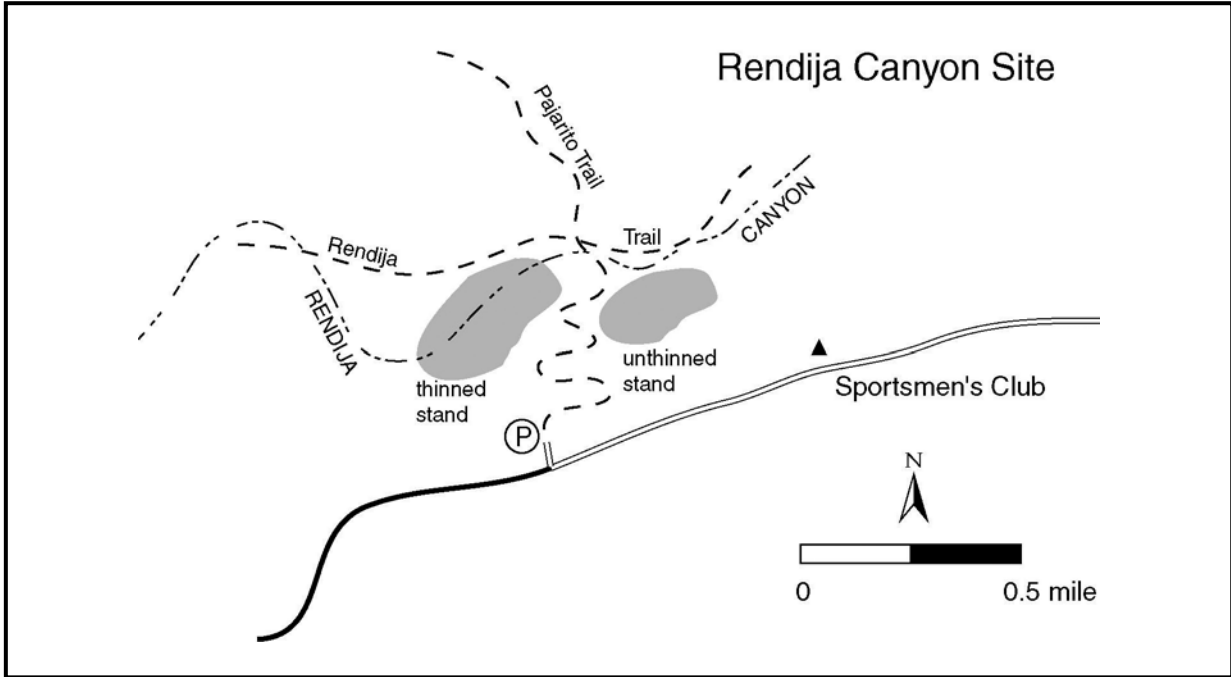
From Santa Fe, drive north on US Highway 84/285 about 15 miles to Pojoaque. Follow the exit signs for New Mexico Highway 502 and Los Alamos. Once on NM 502, continue 15 miles west to the interchange with New Mexico Highway 4. Continue straight on NM 502 toward Los Alamos. Stay on NM 502 as it becomes Trinity Drive in downtown Los Alamos. After about one mile on Trinity, turn right onto Diamond Drive at the Los Alamos Medical Center. Continue on Diamond Drive past the Los Alamos High School, around a bend, and past the golf course. Just past the golf course, swing around a traffic circle in the left hand lane. Scribe three-quarters of the circle to head uphill on San Ildefonso Road. In 0.4 miles, make a sharp left turn to stay on San Ildefonso Road. The road now drops steeply downhill. As the road begins to climb again, the pavement ends. Turn left at the end of the pavement and park in the dirt lot at the Pajarito Trailhead.

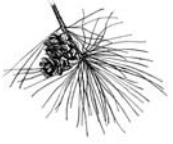
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Site Description

From the trailhead for the Pajarito Trail, walk on the trail as it descends toward the bottom of Rendija Canyon on several switchbacks. Immediately before the trail crosses the arroyo in the canyon bottom, an unthinned stand of trees on flat ground lies to the right. Across the arroyo (west of the trail) is a large area that has been thinned and treated with prescribed fire.

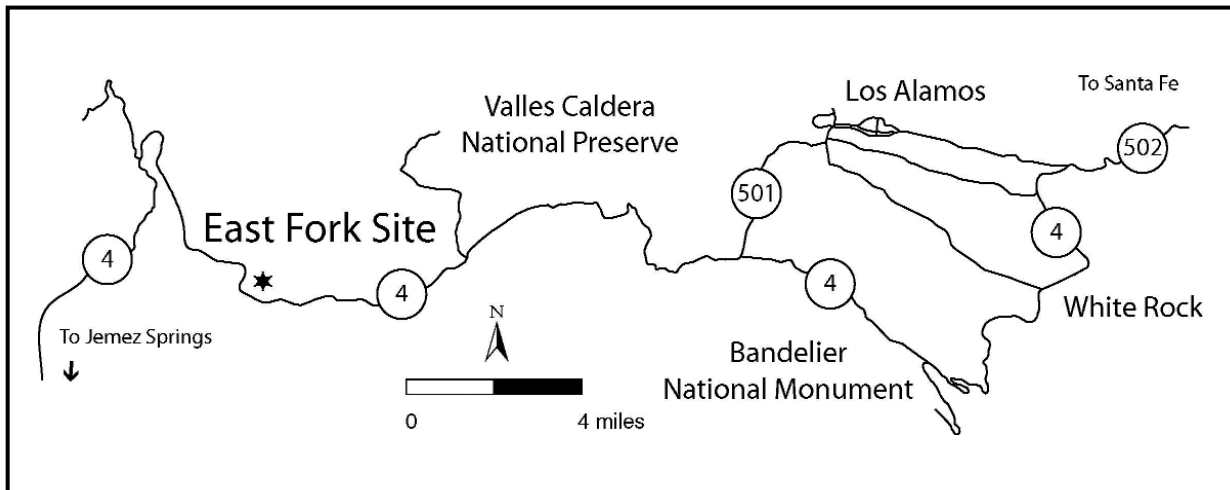




East Fork Site, Santa Fe National Forest

From Santa Fe, drive north on US Highway 84/285 about 15 miles to Pojoaque. Follow the exit signs for New Mexico Highway 502 and Los Alamos. Once on NM 502, continue 15 miles west to the interchange with New Mexico Highway 4. Continue straight on NM 502 toward Los Alamos. Stay on NM 502 as it becomes Trinity Drive in downtown Los Alamos. After about one mile on Trinity, turn left onto Diamond Drive, crossing the high bridge over Los Alamos Canyon. Just past the bridge, bear right onto New Mexico Highway 501. At a t-intersection in 4 miles, turn right onto New Mexico Highway 4. Climb a steep hill. Continue 25 miles from the intersection with NM 501 to the East Fork Trailhead on the right.

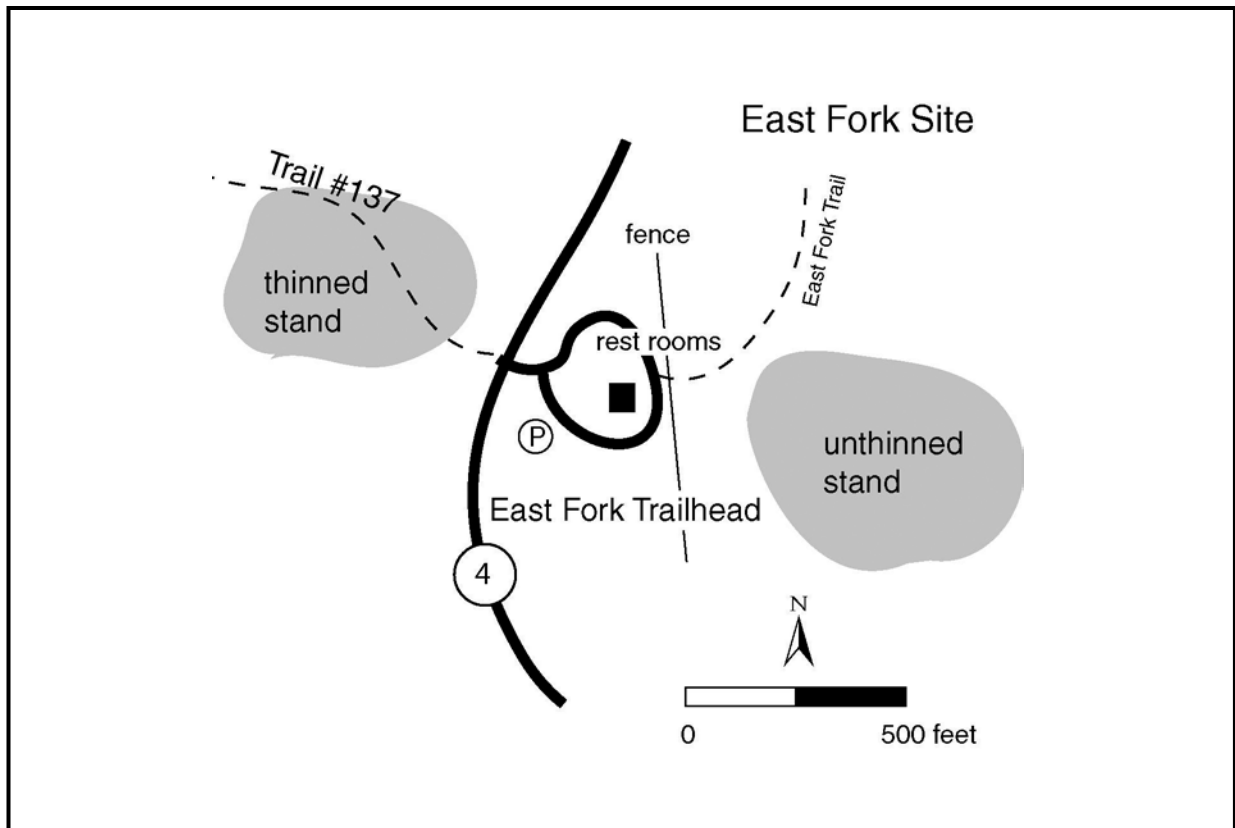
From downtown Los Alamos, drive west on Trinity Drive to the Los Alamos Medical Center. Turn left onto Diamond Drive, crossing the high bridge over Los Alamos Canyon. Just past the bridge, bear right onto New Mexico Highway 501. At a t-intersection in 4 miles, turn right onto New Mexico Highway 4. Climb a steep hill. Continue 25 miles from the intersection with NM 501 to the East Fork Trailhead on the right.

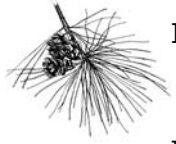


Site Description

From the parking area, the unthinned site is through the fence at the start of the East Fork Trail at the east side of the parking loop. Walk through the hiker's gate and continue uphill on the trail for a few yards. Unthinned forest on flat ground is to the right.

To reach the thinned site, use caution crossing the highway to reach the East Fork Trail #137 on the west side of the highway. Pass through a hiker's gate and enter a thinned stand of ponderosa pine. The stand to the right of the trail makes a good area for a plot.





Risk Management Planning

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Describe the proposed activity:

List the goals and anticipated outcomes:

Who is responsible for instructing the students about the activity, safety, risks involved and risk management plans?

What risk does this activity present?

Physical

Emotional/psychological

Environmental

Institutional

What steps must be taken to reduce or eliminate the risk(s) and who is the responsible person to see that the risks have been minimized:

Steps:

Person Responsible:

What risks exist that cannot be eliminated?

What steps specific to this activity are planned to be implemented in the event a risk becomes an emergency?

(Source: The Service-Learning Initiative of Southwest Colorado)



Proposal for Field Trip Approval



School: _____ Proposal Date: _____

Principal: _____

Teacher Organizer(s): _____

Destination: _____

Field trip date(s): _____

Departure and return times: _____

Field trip description: (brief)

Grade Level: _____

Number of students _____

Number of teachers: _____

Number of chaperones: _____

Mode of transportation: _____

Financial costs and arrangements _____

Alternate educational plans for students not attending the field trip:

Principal's Signature for Approval _____

Notes:

ATTACHMENT





CONSENT AND RELEASE FORM FOR INTERVIEW, PHOTOGRAPHING,
VIDEOTAPING AND/OR WEBSITE USE

ATTACHMENT

I consent to interview(s), photography, videotaping and its/their release, publication, exhibition, or reproduction to be used for public relations, news articles or telecasts, education, research, inclusion on the Volunteer Task Force Website, fund raising, or any other purpose by the VTF and/or its affiliates. I release the VTF, their board members, and each and all persons involved from any liability connected with the taking, recording, or publication of said interviews, photographs, slides, computer images, videotapes, or sound recordings.

I waive all rights I may have to any claims for payment or royalties in connection with any exhibition, televising, or other publication of these materials, regardless of the purpose or sponsoring of such exhibiting, broadcasting, or other publication irrespective of whether a fee for admission or film rental is charged. I also waive any right to inspect or approve any photo, video, or film taken by the VTF or the person or entity designated by it. I release and discharge the VTF from any liability by virtue of any blurring, distortion, alteration, optical illusion, or use in composite form whether intentional or otherwise, that may occur or be produced in the taking of the pictures, or in any processing toward the completion of the finished product. All negatives and positives, whether prints, video, film, or sound recording are the property of the VTF or the person or entity designated by it, solely and completely.

I declare that if I am under the age of eighteen (18) years old I have acquired the written consent of my parent or guardian. I understand that the terms herein are contractual and not a mere recital, that this instrument is legally binding, and that I have voluntarily signed this document.

I have fully informed myself of this consent, waiver of liability, and release before signing it.

Student's Name (please print) _____ Date _____

Student's Address _____ Phone _____

Signature of Student _____

If student is under 18, the parent or legal guardian, if any, must sign.

Parent/Guardian Name (please print) _____ Phone _____

Signature of Parent/Guardian _____ Date _____

Witness Signature _____

Witness Name (please print) _____

List anticipated uses, i.e. brochure, display board, website, etc.

Return signed form to: The Volunteer Task Force, 465 Grand Canyon Dr. Los Alamos, NM 87544



PROGRAM EVALUATION FORM



The Volunteer Task Force and National Park Service wish to provide you and your students with the best program possible. The few minutes it will take to complete this evaluation will provide invaluable information for the education staff. Thank you for your time and thoughtful response.

Please fill out the following information:

Teacher Name _____

E-mail Address _____

School Name _____

School Address _____

School Phone (include area code) _____

Home Phone _____

Grade Level _____

Number of Students _____

Location where activity took place _____

Date of Visit _____

1. How would you rate the overall quality of the educational program your students participated in today?

- Excellent
- Good
- Fair
- Poor

Comments _____

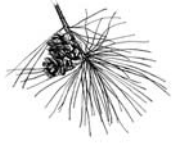
2. How would you rate the educational content presented in the program?

- Excellent
- Good
- Fair
- Poor

Comments _____

ATTACHMENT





3. How would you rate the presenter's instructional skills?

- Excellent
- Good
- Fair
- Poor

Comments _____

4. Did you receive the proper pre- and post-visit materials (if applicable)?

- Yes
- No
- Not applicable

Comments _____

5. Which lessons were the most effective?

6. Was the program appropriate for the maturity level of your students?

- Excellent
- Good
- Fair
- Poor
- Unable to judge

Comments _____

7. Would you recommend this program to other teachers?

- Yes
- No
- Undecided

Comments _____

8. What could the VIF or NPS do to improve your education program? _____

