

BURNING ISSUES: PARTNERS IN FIRE EDUCATION-- IMPLEMENTATION IN TWO LAND MANAGEMENT UNITS

Jennifer A. Chapman, National Park Service, Point Reyes Station, CA
Kay Antunez, Project Learning Tree and California Department of Forestry and Fire Protection, Sacramento, CA
David E. LaHart, Florida State University, Tallahassee, FL
John Owens, Bureau of Land Management, Boise, ID

1. INTRODUCTION

With a growing number of property losses caused by wildfire and ecological problems caused by altered fire regimes, fire education has become a critical fire management strategy. Burning Issues, an interactive multi-media program developed by the Bureau of Land Management and Florida State University, and delivered through Project Learning Tree, provides a social treatment which complements fuel treatments in the wildland-urban interface.

Land management agencies involved in educating their surrounding communities about fire management are significant stakeholders in the implementation of the Burning Issues program. Some of these communities are recovering from wildfire. Furthermore, community support is needed for successful prescribed fire and fuels management programs. Undeveloped lands where wildland fire has occurred or been prescribed offer a vital field trip component to the classroom activities presented in the Burning Issues program. Local fire ecology and fire management examples allow students to connect new knowledge to the environment they live in.

This paper describes a case study of how the Burning Issues program is being implemented at two national park sites in Marin County, California.

2. LOCATION AND AUDIENCE

Point Reyes National Seashore and Golden Gate National Recreation Area (GGNRA) are contiguous national parks comprising approximately 100,000 acres, roughly one third of the land in Marin County California. Most of the county's approximately 250,000 residents live in a wildland-urban interface near national parks, state parks, water district lands or other open space. The national parks alone have over 60 miles of wildland-urban interface and an opportunity to reach the broader audience of the San Francisco Bay Area. This audience accounts for the majority of park users in Marin County as well as significant users of wildlands throughout California and other western states where wildland fire is an integral part of the environment. Fire education gives this audience a framework for understanding a variety of interrelated fire management projects, issues and events, that are occurring around them on the local, state and national levels.

3. ENVIRONMENT AS AN INTEGRATING CONTEXT FOR LEARNING

Recent educational research has demonstrated the effectiveness of using the environment as an integrating context for learning. Once students have been exposed to concepts of fire ecology and fire management, relating these concepts to actual landscapes and fire events enhances their understanding. Landscapes where fire has occurred offer an opportunity for firsthand observation of the effects of fire and the environmental factors that must be considered in fire management.

All four Burning Issues themes are well illustrated at Point Reyes and Golden Gate: prescribed fire, wildland fire suppression, the relationship between fire and invasive, non-native species, and firewise community planning.

Point Reyes National Seashore experienced a major wildfire in 1995, which resulted in the loss of 45 homes and numerous other changes in a highly diverse ecosystem. A sequence of historic fires are recorded in the tree rings of the redwood forest at Muir Woods in Golden Gate National Recreation Area, many of which can be correlated to fire events reported in newspaper articles during the 1800's and 1900's. GGNRA is also contiguous with Mount Tamalpais, where some of the areas highest wildfire

potential occurs. The "Great Tamalpais Fire of 1929" burned only 2,500 acres, but destroyed 117 homes.

Prescribed fire has been used at both sites to reduce hazardous fuels, enhance biodiversity, and control non-native species. Several non-native eucalyptus removal projects are also underway for the purpose of fuel reduction and fire safety. Visits to these parks allows an opportunity to see the effects of fire on many vegetation types including bishop pine, Douglas fir, redwood, and oak woodland forests, coastal scrub, and grassland. Current fire research at Point Reyes and Golden Gate is also investigating the effects of fire on invasive, non-native species. This research demonstrates that fire can help eliminate some species, but may cause others to invade faster. Firewise community planning is actively in progress on private lands near these parks through over 40 community-based fuels management projects in partnership with the local fire safe council. These projects include fuel breaks, brush drop-off and chipping programs to dispose of vegetation debris, and home defensible space assessments.

4. BURNING ISSUES WORKSHOPS IN PARTNERSHIP WITH PROJECT LEARNING TREE

Project Learning Tree, a national non-profit environmental organization, was selected by the Bureau of Land Management as a partner to train educators in the Burning Issues program. Since 1973, Project Learning Tree has been using natural areas as a "window" to develop the ability to make informed decisions on environmental issues; and instill commitment to take responsible action on behalf of the environment.

Project Learning Tree has an extensive network of educators and school district contacts, which supports the Burning Issues program. Through grants they receive, PLT provides Burning Issues CD-ROMs and other forest ecology curricula to facilitators of Project Learning Tree / Burning Issues workshops. Additionally, they provide reimbursement to school districts for the costs of substitute teachers which makes it more possible for teachers to attend a workshop.

Point Reyes National Seashore and Golden Gate National Recreation Area have used a 2-day (Friday-Saturday) workshop model. The first day is devoted to classroom activities which includes a thorough exploration of the Burning Issues CD-ROM, a series of hands-on fire-related lab activities, and an introduction to fire ecology and current fire management projects at the park sites. The second day focuses on field trip activities.

5. LOGISTICAL CONSIDERATIONS

Computer equipment is required for the Burning Issues CD-ROM portion of the workshop. Ideally, the workshop can use a computer lab at a school or district office where participants can each work with the CD-ROM independently, guided by the course instructor.

The second day takes place in the park site and focuses on field trip activities. Design considerations for the field trip activities include: 1) the timeframe expected for a school group's visit; 2) the size of the school group; 3) bus parking; and 4) safety. The basic timeframe assumed for developing the park programs was four hours (3 hours of field trip activity and an hour for lunch and restrooms), however additional project sites were also presented which could extend the field trip. The size of the group was based on the typical class size of 30. The trail segments chosen had parking, which could easily accommodate a school bus.

6. USING A SITE AS A CASE STUDY FOR FIRE EDUCATION

Fire ecology and fire management varies from place to place. This theme is conveyed through the different ecosystems presented in the Burning Issues program, and can be further developed by challenging students to consider how fire relates to the immediate landscape surrounding them.

Fire education materials developed for Point Reyes National Seashore are centered on the Vision Fire. An educational trail guide for the Vision Fire burn area provides an experience along 3 quarter-mile segments of trail each which has 6 stops. Along these stops, students will observe examples of serotinous cones, how fire shapes even aged stands of bishop pine and mixed aged stands of Douglas fir, basal

sprouting, upper crown sprouting, evidence of vegetative succession, and the mosaic effects of burning.

The Vision Fire is a case study, which emphasizes the following points:

1) Fire suppression can have significant environmental impacts. The Vision Fire involved a rehabilitation of 23 miles of dozer line, 6 miles of handline, 10 safety zones, and 13 drop points and helispots.

2) Defensible space and firewise building materials are important strategies to prevent loss in the wildland-urban interface. The property losses during the Vision Fire amounted to approximately \$50 million dollars. This included 45 homes, several outbuildings, roads, fences, and other infrastructure.

3) Individuals must take personal responsibility for fire safe recreation. The Vision Fire was caused by an illegal campfire. Though it seemed to be extinguished from above, subsurface radiation allowed the fire to smolder underground and resurface as a wildfire after igniting a tree through its root system.

4) There is great potential for non-native species invasion after a fire. Weeds are notorious colonizers of disturbed areas, including recently burned areas. Vegetation monitoring crews hand pulled millions of non-native plants that invaded and proliferated after the Vision Fire.

5) Wildland fire can have ecological benefits. New generations of bishop pine, ceanothus, and rare Marin manzanita were facilitated by the fire. Insect population booms favored bird reproduction.

6) Weather is a critical factor in determining a fire's outcome. A rare foehn wind event coinciding with the fire caused extreme fire behavior with a maximum rate of spread at 3,500 acres/hour and a minimum relative humidity of 5%.

Fire education materials are currently being developed for Muir Woods National Monument. These materials will allow students to use tree rings and written historic records to learn about fire history and how different cultures have managed fire. They will also be able to compare and contrast the fire ecology of a redwood forest with a eucalyptus forest.

Muir Woods is a case study, which emphasizes:

1) Fire history can be recorded in tree rings. Fire scars in the tree rings of the redwood forest in and around Muir Woods are evidence of a series of fires during the 1800's and 1900's.

2) Some plants such as redwood trees are very fire resistant. Thick bark on some trees can protect trees from fire. Redwood trees are a notable example.

3) Fire changes the structure of vegetation, which creates new kinds of habitat. Bats are using the fire scars in redwood trees at Muir Woods for roosting. This is the topic of a current research project.

4) Replacing native plants with non-native plants can change the amount of fuel in an ecosystem and make it more fire prone. Blue gum eucalyptus sheds both bark and leaves, leading to very thick duff beneath the trees. Its leaves are also high in oil content. These characteristics make eucalyptus very fire prone. Eucalyptus populations planted in the park for historic landscaping purposes such as windbreaks or boundary markers have expanded far beyond their historic extent. In some places these eucalyptus groves pose a serious fire hazard.

5) Studying newspapers and other records from the past can teach a lot about how fires started and were managed over long periods of human history. The long human history of the San Francisco Bay Area has left a series of written records from explorers, to Spanish governors, to

American settlers. These records reflect changing views of fire over time.

Additional learning opportunities at both Point Reyes National Seashore and Golden Gate NRA will be created by:

- 1) Providing opportunities to visit a prescribed burn unit, learn how it was conducted, what its objectives were, and how to determine if the objectives are being met.
- 2) Providing a defensible space assessment tool so students can apply fire management principles by identifying ways to reduce fuels and hazards around their home.
- 3) Providing an opportunity to compare burned and unburned areas to view the effects of fire on vegetation and ecological succession.

7. CONCLUSION

The personal and social choices that wildland fire confronts us with are complex, spanning from ecology to economics. Burning Issues classroom and field trip activities can create a more fire literate and fire-wise citizenry, which offers long range benefits for ecosystems and communities. Energy, adaptation, responsibility, protection, safety, cycles, weather, teamwork, loss, regeneration, preparedness, home and community are some of the many universal concepts that are embedded in the interdisciplinary subjects addressed through fire education.

The Burning Issues CD-ROM offers an effective and engaging way to introduce students to fire ecology and fire management. For parks and other land management agencies that hope to build community understanding of their fire management programs, Burning Issues can provide a solid foundation before students are introduced to the fire ecology and fire management of a particular site.

Developing additional fire education materials to help students understand the fire management of a place they can visit enhances the relevance of the subject, and provides students an opportunity for further inquiry into the world around them. For land management agencies, these opportunities build an important bridge with the public.

Fire is not inherently good or bad. Fire education should provoke critical thinking, feelings of respect for fire as an ecological process, and responsibility for the social dimensions of wildfire. The scientific inquiry in fire education involves both natural and social science.