

Wildfire at Park Boundaries: The Wildland/Urban Interface

By Ted Morlock

As the trend towards rural development continues across the U.S. into the 1990s, parks that share their boundaries with privately owned lands need to look more closely at their wildland/urban interface. The idea of having a National Park "in your backyard" is so popular that realtors and other developers often use it as a primary selling point. With each new home constructed along a park's boundary two management problems escalate. The first is the potential for a structural or powerline fire igniting nearby vegetation within the park. The second is the potential for a wildfire exiting the park and destroying a structure. These seem like opposite scenarios but in fact they share one factor – the park boundary. Thus they require a multi-faceted solution, which may involve many individuals and agencies. During the winter of 1989-90, Cape Hatteras National Seashore undertook an experimental program of boundary fuels management and public education to reduce hazard situations at the wildland/urban interface in the Buxton Woods area of Hatteras Island.

Prior to initiation of the management program, fuel and vegetation maps were prepared for Buxton Woods, the largest remaining maritime forest in North Carolina. A fire history study by Kent Turner indicated ignitions at Cape Hatteras were primarily anthropogenic. Field survey data

Effects of Severe Fire in Coastal Scrub

Although National Seashores are not usually considered to be "fire prone" parks, several east coast barrier islands have areas of high fuels. During 1987 and 1988, the University of Georgia Cooperative Studies Unit investigated the historic impact of severe fire in coastal scrub (or pocosin) and fresh water marsh communities on adjoining live oak (*Quercus virginiana*) forest on Cumberland Island National Seashore. Seven series of aerial photographs, taken between 1953 and 1988, were analyzed to determine the location of boundaries between plant community types before and after fires. A sampling team established permanent transects between scrub and forest communities, and evaluated the basal area of woody vegetation along gradients between scrub and better developed oak forest. A green house bioassay of soil fertility also was conducted.

The project found, that despite the highly flammable nature of the scrub and the history of repeated fires in the dense thickets, disturbance was not correlated to the areal extent of scrub or marsh communities. The scrub and marsh boundaries expanded, rather, in response to periods of high precipitation; thus boundary changes were related to the coastal drought cycle.

Scrub forest boundaries were relatively dynamic compared to marsh/forest boundaries. In recent years, extensive browsing by white-tailed deer has limited survival of live oak sprouts after fires. If scrub communities expand into oak forest, it will ultimately be a result of herbivore impacts, and not of high intensity fires. The data suggest wildfire plays a minor role in boundary dynamics among these communities, and that fire suppression should not be necessary to prevent loss of oak forest along the scrub boundary. Further reduction of the deer herd would, however, be very desirable.

Guy McPherson/Susan Bratton
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taken by Katherine Davidson and Susan Bratton indicated that Buxton Woods had burned several times within this century and that successional loblolly pine (*Pinus taeda*) stands had greater loadings of fine fuels and were more likely to burn than laurel oak (*Quercus laurifolia*) and mixed hardwood stands. In some cases, new homes had been constructed in pine stands adjoining the extensive, and moderately flammable, pine and wetland areas within the park. The simplest, and often only strategy, in such a situation is to provide a fuel break along the boundary. This may be accomplished either through mechanical manipulation and removal of fuels using chain saws and other tools, or through the use of prescribed fire.

In Buxton Woods, the volume of pine litter and the proximity of homes to the park boundary discouraged the use of fire. Further, historic vegetation analysis indicated the Woods had been dominated by live oak (*Quercus virginiana*) prior to the colonial era. Prescribed burning might inhibit desirable hardwood succession and might actually maintain more flammable pine forest types. The use of prescribed burning also was limited by authorization difficulties, public aversion to burning near their properties, and shortages of fire protection personnel (both in the planning and execution phases) and equipment. Although more time consuming and less effective than prescribed burning, mechanical manipulation was thus effected along the six-mile park boundary through the Woods.

The actual treatment consisted of removal of all underbrush (laddering fuels), trees less than 3" dbh and any dead and down fuel concentrations for a 10' width along the relatively level terrain of the boundary. Resulting slash was scattered in the park or hauled to a safe burning location, to prevent hazardous fuel buildups along the treated area. This initial treatment required 10 person days (1 pay period) and 50 hours chain saw useage per mile (using an experienced sawyer). Long-term management will require 4 person-days and 20 hours motorized brush cutter useage per mile if done annually. The resulting fuel break provides minimal protection against anything more intense than slow-moving ground fire, but greatly increases access

along the boundary for firefighting personnel and equipment. Providing high boundary discernment is a benefit with some disadvantages. It may increase use by poachers and ATVs. It may inhibit movement of some small animals. If not done carefully and with forethought it may be aesthetically repulsive and cause homeowners and park visitors to object.

In conjunction with fuels management, a complex, though potentially more effective program, was undertaken to educate and involve the neighboring community, including homeowners, local fire departments, and developers. In the eastern U.S., many homeowners are unaware of the dangers of fuels build-up and do not perceive wildfire as a threat to a second home "at the beach". Further, those that do recognize the danger do not consider it their responsibility to take preventive measures. They assume the fire departments and government agencies will suppress fires and conduct any necessary fuels reduction. The education program therefore attempted to make the public recognize that the responsibility of fire protection is not the Park Service's exclusively, and that in the event of a major wildfire, available fire protection personnel and equipment might be insufficient to save their homes. Through meetings with officials (fire chiefs, county planning board members, county fire marshalls, etc.), discussions with school authorities (to develop programs for students), and instructional handouts for homeowners, the concept of fuels management as a community responsibility began to spread in the Buxton Woods area. A fire technician personally met with homeowners to explain how they could help protect their residences, and presented training videos to the local fire department.

The fuel management program for Buxton Woods encountered a perception of forestry that clashed with contemporary fire management concepts, especially at the county planning level. Since maritime forest is a threatened habitat in North Carolina, the trend has been to push for open space areas, with limited vegetation removal. Although this type of land use planning

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Burning slash after fuels removal along the boundary between Cape Hatteras National Seashore and nearby developments.

is derived from an interest in protecting the uniqueness of the maritime forest, it is self-defeating from a fire prevention standpoint. The resources it strives to protect will be destroyed in the event of a wildfire. At Cape Hatteras a 170 unit subdivision, which is located immediately adjacent to the park boundary, is being developed under a county ordinance which prohibits removal of any vegetation beyond 30 percent of the lot area (roughly the amount necessary to build the structure, no more). The justification for this code is protection of the freshwater aquifer from excessive runoff. This same subdivision is being built under building codes which require "low visual impact", highly flammable, natural building materials. Hazard fuels were not considered when the ordinances were developed, so the design of the subdivisions considers only the impact of the new housing on the natural ecosystems and does not consider potential impact of adjoining wildlands on the housing. Future plans should consider both elements, thereby avoiding conflicts between human communities and park resource management programs.

Evaluation of the wildland/urban interface at Buxton Woods suggests that further research and managerial experimentation on maintaining fuel breaks is desirable. Use of fire resistant vegetation or vegetation conversion to low fuel plant communities, for example, are options which have rarely been employed in national parks. This approach can encourage natural succession of native fire resistant vegetation, such as live oak, or their use in landscaping applications. This may be a very valuable option around residences and park historic structures where removal of vegetation using

either mechanical means or prescribed burning may be undesirable. This treatment may also be viewed, by county planning boards and other officials, as a suitable compromise in situations where runoff and watershed protection are primary considerations. Vegetation conversion or establishment of fuel breaks of adequate width to protect structures and developments exterior to the parks may, however, effect wildlife movements or habitat use. More information is needed on optimal strategies for boundary management.

Parks interested in obtaining information or training materials on the wildland/urban interface should contact: NPFA (National Fire Protection Association), Batterymarch Park, Quincy, MA 02269.

Available publications are: *Protecting Your Home From Wildfire*, a handout booklet for distribution to homeowners; *Wildland Fire Management Briefings*; *Wildfire Strikes Home*, Newsletter; *Wildfire Strikes Home*, Annual Report; and *People and Fire at the wildland/urban interface* (a sourcebook).

Contact: Bill Baden (wildland/urban interface specialist) 617-770-3000, ext. 7484.

Available videos are: *Wildland Fire Strikes Home*, discusses the 1985 fire season, the worst in history for the wildland/urban interface; *Wildland Fires Satellite Broadcast*, looks at the 1987 wildfire season, details ways to protect your home and methods for building interagency cooperation.

Contact: Manuscriptions, 28 South Main St., Suite 256, Randolph, MA 02368 — also available through BIFC by spring, 1990.

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