



NORTH CAROLINA PRESCRIBED FIRE COUNCIL NEWSLETTER

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Spring 2009

WORKHORSE

Let your mind wander back in time. Now imagine a proud farmer standing by a dusty road showing off his spread. He beams and puffs his chest, “Look at what I have done”. As he directs your view to row after row of his healthy crop nearing harvest you let your gaze wander out beyond the crop field to the pasture. Quietly going about his business is the workhorse. Is the proud farmer really responsible for the crop? Who pulled the plow to break the land, laid out the straight rows, pulled the sweep to cultivate the crop, and will soon haul the crop out of the field?

In the background, behind every successful burning program a workhorse is quietly going about his or her business. Maybe they don’t shun publicity, but maybe they do, because in their position publicity often means that something has gone wrong. I can’t name them all, would leave some out if I tried to do so, but I will give a couple of examples of workhorses that I know well.

Bill Parsons and Tim McDonald are prescribed burners in the sandhills. Day after day, year after year, they come in, check the weather and mentally go through the list of possibilities. They weigh a hundred factors: predicted wind direction and speed, humidity, fuel moisture, who is available to help today, what equipment is serviceable, who are the neighbors downwind, what is the weather predicted for tomorrow..... They generally don’t like surprises. Attention means distractions and often a missed opportunity... “Can’t stop to attend a meeting when we have a dry northeast wind. May not see that again this season.”

What do these workhorses have in common?

First they learned under good teachers. For Bill it was Norman Lantz, the wildlife forester who spent much of his career burning on the Sandhills Game Land while Grady McCrimmon taught Tim the delicate dance of burning around the upscale neighborhoods in southern Moore County.

They are teachers themselves, but in subtle ways. Under their leadership neophytes learn when to bring the line ahead, spread those spots out, or back it off a branch. They frequently start the burning season with a green crew, but through trial by fire, end it with a team. These guys may not stand in front of a classroom, but at the end of each burning season they send out a group of young missionaries, many of them ending up as burn bosses on other areas.

They are quiet by nature but when things don't go as planned they take the lead while remaining calm, a trait that sends confidence to their burn crews. They look out for their crew, especially members with less experience and when things stay quiet too long can make sure they are ok, but in a way that they don't convey that they are concerned. They are focused and consistent, coming back to burn day after day, even after a bad one, to reshuffle the deck and lead the crew to the next job.

They head to the woods each morning with a well thought out burn plan. But should conditions change they have the capacity to adapt while maintaining control of the situation. They have earned respect from their cohorts who are responsible for fire control and follow procedures and laws to keep people safe and to keep the image of prescribed burning positive.

Bill and Tim happen to be the two that I know best. But I know that behind every successful burn program, whether the Department of Defense, The Nature Conservancy, or a private contracting business, there is a workhorse. There is no more fitting way to end my term as the proud leader of the North Carolina Prescribed Fire Council than by recognizing the workhorses. We owe each of them a nod of thanks for working in the trenches, for keeping the tradition alive, and for training the next generation of burners.

Submitted by Terry Sharpe, Past Chair - NCPFC (sharpetl@etinternet.net)

**NEW NORTH CAROLINA PRESCRIBED FIRE COUNCIL OFFICERS
AND
STEERING COMMITTEE MEMBERS FOR 2009**

Shortly after the first of the year, the North Carolina Prescribed Fire Council held elections for Vice-Chair, Secretary-Treasurer, and 5 At-Large Steering Committee positions who would assume office on March 1st, 2009. The New Vice-Chair, Secretary-Treasurer, and 5 At-Large Steering Committee members are as follows:

New Vice-Chair: Doug Sprouse

New Secretary-Treasurer: Faren Wolter

New At-Large Steering Committee Members: Jim Gray, Kevin Harvell, Bart Kicklighter, Chris Moorman, and Brent Wilson.

Congratulations to all the new Officers and Steering Committee Members and thanks for your willingness to serve on the Council. Also, many thanks to the outgoing steering committee members Scott Pohlman, Secretary and at-large steering committee members Jeff Bouchelle, Jim Prevette, Brandon Price, and John Ann Shearer. We welcome Erica Taecker who is completing Lea Wofford's term on the steering committee.

PRESCRIBED FIRE COUNCIL LEADERS FOR 2009

Dean Simon	Chair	simondm@earthlink.net
Doug Sprouse	Chair-elect (Vice-Chair)	doug.sprouse@ncmail.net
Terry Sharpe	Past Chair	sharpetl@etinternet.net
Faren Wolter	Secretary-Treasurer	fwolter@uncfsu.edu
Jim Gray	At-large steering committee	jmgray1@earthlink.net
Kevin Harvell	At-large steering committee	Kevin.Harvell@ncmail.net
Bart Kicklighter	At-large steering committee	bkicklighter@fs.fed.us
Chris Moorman	At-large steering committee	chris_moorman@ncsu.edu
Brent Wilson	At-large steering committee	brent.wilson@embarqmail.com
John Isenhour	At-large steering committee	john.isenhour@nc.usda.gov
Scott Hartley	At-large steering committee	scott.hartley@ncmail.net
Erica Taecker	At-large steering committee	etaecker@fs.fed.us
Kelley VanDruten	Chair, Education and Outreach committee	kelley_vandruten@fws.gov
- VACANT -	Chair, Data Collection committee	-
Bob Mickler	Co-Chair, Policy committee	rmickler@alionscience.com
Cynthia Van der Wiele	Co-Chair, Policy committee	cvanderwiele@kci.com
Margit Bucher	Chair, Implementation committee	mbucher@tnc.org
Mark Megalos	Chair, Membership committee	mark.megalos@ncsu.edu

AMERICA'S LONGLEAF INITIATIVE

The Regional Working Group for America's Longleaf is busy preparing for the national release of its first-ever Range-wide Conservation Plan for Longleaf Pine at the upcoming North American Conference for Wildlife and Natural Resources to be held in the DC area in mid-March. This release follows almost a year and a half of work drafting the Plan and otherwise envisioning the America's Longleaf Initiative to implement it. The Regional Working Group is comprised of multiple federal and state agencies as well as numerous conservation organizations with an interest in longleaf. According to Coordinator Lark Hayes, both the Plan and America's Longleaf build directly on the many successful efforts of longleaf proponents over the past two decades, including local restoration projects in North Carolina. By setting forth a comprehensive Plan and launching America's Longleaf, the group hopes to generate more support for these locally led efforts while regional strategies to conserve longleaf are also pursued.

The Plan includes an admittedly ambitious goal of maintaining, improving and restoring 8 million acres of longleaf over the next 15 years, up from 3.4 million acres today. Among the six key strategies identified in the Plan is the Fire Management Strategy which overlaps significantly with interests of the NC Fire Council. Indeed, a "key action" recommended in the Plan is the building of a strong partnership with state fire councils. Information on the other strategies in the Plan as well as the Significant Geographic Areas identified as targets for longleaf activity can be found at www.americaslongleaf.org.

Submitted by Lark Hayes, Southern Environmental Law Center

NEW FIRE MANAGEMENT PROGRAM FOR NORTH CAROLINA STATE PARKS

North Carolina State Parks is proud to announce it's first ever Prescribed Burn Crew, dedicated primarily to reintroducing much needed fire into the appropriate ecosystems. This fully mobile five person crew consists of four Firefighter Type 2 Fire Technicians: Chris Wilson, Nathan Messer, Tyrone Hicks, and Damian Smith, and one Firefighter Type 1 Lead Fire Technician: Matt Drury. The Crew will be traveling from Elk Knob State Park up in the mountains all the way down to Carolina Beach State Park, performing hazard reductions and ecological burns in many of the State Parks and State Natural Areas state wide. This new State Parks Wildland Fire Management Program is supervised by the State Fire Program Manager Doug Sprouse, who has been on the project for nearly two years and has previous fire experience working with multiple agencies across the US. Funding for this program was attained by a grant from the Natural Resource Conservation Service Wildlife Habitat Improvement Program (WHIP) and will sustain the program for the next five years.

In addition to burning on State Lands, the North Carolina State Parks Wildland Fire Management Program plans on participating in as many Interagency Burns as possible, including The Nature Conservancy, Wildlife Resources Commission, Department of Forest Resources, and others. The Fire Management Program will also be a fully equipped AD crew with Type 6 and Type 7 engines available to respond to incidents in North Carolina.

State Parks has a history of prescribed burning that dates back to the early 1970's, however there has been a 200% decline in the number of prescribed burns in State Parks over the last nine years and a 500% increase in wildfires on State Park lands. Many State Parks Rangers have a good grasp of the important role fire plays in the forest and have been eager to implement prescribed burns, but not enough trained personnel or proper equipment have always been available. With this new Prescribed Burn Crew dedicating the next five months almost exclusively to prescribed burning in State Parks, many of these rangers will have these much needed resources available to help them safely put fire back on the ground.

Submitted by Matt Drury, NC Sate Parks



Aerial view of “potato patch,” a plowed area adjacent to Evans Road that was used to strengthen the road as a firebreak during the Evans Road fire in summer 2008. (USFWS)

THE “WHAT IF’S” OF THE EVANS ROAD FIRE

Now that the Evans Road Fire has been over for a few months, fire managers have had time to think about the “what if’s.” What if we had put this resource here instead of there? What if the fire would have jumped Evans Road and made a run to the Lake Phelps community? What if all or parts of the 40,000 acres that burned had been prescribed burned within the last few years? This fire, because of the brushy fuels and organic soils, made it more challenging than a fire under the same weather conditions but with normal upland fuels. Without the organic soils, this fire might have lasted for 30 instead of 200 days. Without the 20 years of fuel build-up we might have been able to stop it at 20 acres.

There is a good chance - nothing in firefighting is concrete - that if the land around the origin of the fire had been prescribed burned within the last 2-3 years the Evans Road Fire could have been caught/held before it made its terrific runs. The thick fuels slowed the line production rates of the dozers and limited the visibility of the operators. Without the fuel loading, the dozers may have put initial fire lines in quicker and had more time to secure and improve the lines before the adverse weather came in and caused the spot fire that turned into an 8,000 acre run.

There is a good chance that if the lands south of Harvester Road had been prescribed burned within the last 2-3 years, the backfire operation could have been successful at stopping the fire at about ¼ of its final size. Over dry organic soils the size of the fire is proportional to the amount of smoke produced and the duration of the incident. This holds true for prescribed burns as well as wildfires. Prescribed burning over organic soils has all the challenges of burning over mineral soil, but because of the long duration of the burns, smoke management and long term containment amps up the degree of these challenges.

Water management is a prerequisite to burning over organic soils. US Fish and Wildlife Service fire managers have not found the right conditions that will meet the burn objectives and not ignite the peat. And, if those conditions were found it might only happen once every 3 years. Ignitions points for ground fire tend to be elevated areas, places where soil disturbance leaves “sharp edges,” partially buried woody material and fire ant mounds. Because we know we are going to have some degree of ground fire, it is important to have the water table as high as possible and still meet the burn objectives. With a high enough water table, you will have less ground fire ignitions and the option of letting the ground fire burn itself out if smoke and containment are not major issues.

Pocosin Lakes National Wildlife Refuge is currently working on projects that will allow the refuge to manage its water in a way that mimics the natural hydrology of the area. Having control of the water over the landscape should allow the prescribed fire program to grow on Pocosin Lakes; however, even on areas of the refuge that currently have good water management, burn windows are still limited. The brushy fuels emit a lot of smoke which presents challenges with smoke management. Another factor is that there is a fine line between good prescribed burn days versus good wildfire days. Pocosin fuels tend to burn hot or not at all. When they are burning hot, managers must weigh the need to have their resources at the ready to suppress a wildfire with the ability to safely committed those resources to a prescribed burn.

The benefits of water control projects to fire management efforts on Pocosin Lakes NWR will be enhanced by continued research partnerships into ground fire and smoke emissions. Better science coupled with on the ground efforts will improve the refuge’s ability to conduct prescribed burning safely while achieving management objectives. Burning in pocosin fuels and organic soils will always be a mix of science and art as experienced fire managers weigh objectives and risks before lighting the match on a prescribed burn.

Submitted by Vince Carver, Fire Management Officer at Pocosin Lakes National Wildlife Refuge



Firefighters use a terra torch mounted on the back of a fire tractor to ignite a prescribed burn at Pocosin Lakes NWR in 2004 (USFWS)

TRAINING OPPORTUNITIES

S-290 Intermediate Wildland Behavior (6/1/2009-6/4/2009)

Pre-requisites: S-190

Location: Crossnore

Nominations accepted 4/1/2009 through 4/24/2009

This is a classroom-based skills course designed to prepare the prospective fireline supervisor to undertake safe and effective fire management operations. It is the second course in a series that collectively serves to develop fire behavior prediction knowledge and skills.

Coordinator: [Paul Gellerstedt](#) - 919-857-4827

S-390 Introduction to Wildland Fire Behavior Calculations (6/1/2009-6/5/2009)

Pre-requisites: S-290 and qualified as single resource boss

Location: Crossnore

Nominations accepted 4/1/2009 through 4/24/2009

This course is designed to introduce fire behavior calculations by manual methods, using nomograms and the Fire Behavior Handbook Appendix B. The student gains an understanding of the determinants of fire behavior through studying inputs (weather, slope, fuels, and fuel moisture). The student also learns how to interpret fire behavior outputs, documentation processes, and fire behavior briefing components.

Coordinator: [Jim Prevette](#) - 919-857-4848

S-211 Portable Pumps & Water Use (7/13/2009-7/17/2009)

Pre-requisites: None

Location: Crossnore

Nominations accepted 5/11/2009 through 5/31/2009

Portable Pumps and Water Use, S-211, is an instructor-led course intended to be presented at the local level. The course consists of three skill areas: supply, delivery, and application of water. Students will be required to demonstrate their knowledge of correct water use, basic hydraulics, and equipment care. The field exercise requires set up, operation, and maintenance of pump equipment. To receive credit for this course, students must have field work observed and approved, and take a closed book written final examination.

Coordinator: [Paul Gellerstedt](#) - 919-857-4827



WOODLAND STEWARD SERIES
Woodscaping Your Woodlands and Firewise Management
Day 1: May 1, 2009

- 8:30 Registration, meet at Jordan Lake Educational State Forest
- 9:00 Welcome – Amy Garascia, Program Coordinator, Woodland Steward Series
- 9:15 Value-Added Forest Products – Amy-Lynn Albertson, Ext. Agent, Horticulture, NCSU Cooperative Extension Service
- 10:15 Break
- 10:30 Topography, Trees, & Soil: How the Land Affects the Forest Type – Mark Bost
- 11:30 Lunch
- 12:30 Silvicultural Treatments Tour & Horse Logging Demonstration– Diane Steltz; Mark Bost
- 2:45 Break
- 3:00 Forest Invaders – Rob Trickel
- 4:00 Establishing Habitat Areas – John Isenhour, Piedmont Technical Assistance Biologist, NC Wildlife Resources Commission
- 4:30 Forest Management Incentive Programs – John Isenhour
- 4:45 Wrap-up and evaluations

Day 2: May 2, 2009

- 9:00 Welcome, meet at Jordan Lake Educational State Forest
- 9:15 Firewise – Gary Wood
- 10:45 Break
- 11:00 Prescribed Burning in Your Forest – Scott Maynor, Montgomery County Ranger
- 11:30 Services and Materials Available from the North Carolina Forest Service – Scott Maynor
- 11:45 Wrap-up and evaluations

For more information on The Woodland Steward Series, visit: www.cradleofforestry.org

FIRE-ADAPTED PLANT HIGHLIGHT
PLANTS ON FIRE - Michaux's Sumac (*Rhus michauxii*)

Michaux's sumac or dwarf sumac – *Rhus michauxii* – is a federally endangered species that needs some fire kindled in both its sex-life and in its dry open woodland habitat. Because it is dioecious (where each individual is either male or female) and has had a severe population size decline in the last two centuries due to fire suppression, many of its 60-some populations contain only single sex individuals.

Habitat disruption from fire suppression has left us with only 17 viable populations in the Piedmont and Sandhills – all but three in North Carolina – and nine of which have less than 100 plants each. And Michaux's sumac's clonal growth ability has historically misled us to think that "populations" contain large numbers of individuals, when in fact there might be only one or a few AND that all of these might be the same sex. The largest known population is a recent discovery of over 20,000 plants at Fort Pickett Military Reservation in Virginia's southern Piedmont where ordnance-facilitated fires maintained suitable habitat. (The bombing range-rare plant irony always makes for interesting stories....)

Familiarize yourself with the life history and looks of Michaux's sumac, and you might help find additional populations. And if you only refer to one article on this species, read the fascinating story by Larry Barden and Jim Matthews on the plants discovery in Union County, NC, in 1794, and ultimate re-naming to honor the remarkable botanist, Andre' Michaux: **Andre' Michaux's Sumac—*Rhus michauxii* Sargent: Why Did Sargent Rename It and Where Did Michaux Find It?** (*Castanea* 69(2): 109–115. June 2004). Also refer to the US Fish and Wildlife Recovery Plan for detailed biological information and recovery objectives at <http://ecos.fws.gov/speciesProfile/SpeciesReport.do?spcode=Q2HH>.

This extremely rare species is also part of the Center for Plant Conservation **National Collection of Endangered Plants** (www.centerforplantconservation.org) and curated at the North Carolina Botanical Garden (www.ncbg.unc.edu). At NCBG we hold *ex situ* conservation seed collections that are kept for long-term seed banking and for legitimate research and recovery work. We also have living specimens for demonstration if anyone wants to come by and create a search image!

Submitted by Johnny Randall, Ph.D., Assistant Director, North Carolina Botanical Garden, The University of North Carolina at Chapel Hill.



Michaux's Sumac (*Rhus michauxii*)

From: The Forest History Society (<http://fhsarchives.wordpress.com/2009/02/10/historian-stephen-j-pyne-on-the-australian-fires/>) Note the highlighted areas of particular interest to Prescribed Fire Councils

HISTORIAN STEPHEN J. PYNE ON THE AUSTRALIAN FIRES

February 10, 2009 by [Guest Contributor](#)



We've asked Stephen Pyne, an environmental historian who has written about fire around the world, to offer his thoughts on the bushfires in Australia. As of this publication date, an area roughly the size of Rhode Island had burned and the death toll neared 200.

Black Saturday: The Sequel

The fires are a horror, even by Australian standards, which is saying much. But for those of us who have long admired Australia's gritty resolve in the face of conflagrations and have regarded it as a firepower for the caliber of its fire sciences and its bushfire brigades, the recent spectacle arouses dismay and sadness as well.

This is not the first such eruption. Australia has filled up the weekly calendar with Red Tuesdays, Ash Wednesdays, Black Thursdays, and so on. The chronicle is having to appeal to holidays like Black Christmas and renumber its sequels. Black Saturday II is a monster: the bad bushfire on steroids. But it is not an alien visitation. It is a recurring nightmare, at times worse, at times less savage, and Australians seem unable to do anything but fight and flee, and curse and console.

The reason for the fires is simple. Australia is a fire continent: it is built to burn. To this general combustibility its southeast adds a pattern of seasonal winds, associated with cold fronts that draft scorching, unstable air from the interior across whatever flame lies on the land. At such times the region becomes a colossal fire flume that fans flames which for scale and savagery have no equal elsewhere on Earth.

But even heat waves do not kindle fires of themselves, and cyclonic winds do not drive fire in the same way they do storm surges. Fire is not a physical substance: it is a reaction. It feeds on the vegetation, and whatever climatic forces exist must be integrated into that combustible biomass. Fire, that is, synthesizes its surroundings. Understand its setting, and you understand fire. Control that setting, and you control fire.

What saddens many of us is that Australia knows better. It developed many key concepts of fire ecology and models of bushfire behavior. It pioneered landscape-scale prescribed burning as a method of bushfire management. It devised the protocol for structure protection in the bush, especially, the ingenious stratagem of leaving early or staying, preparing, and defending. In recent decades, it has beefed up active suppression capabilities and emergency response services. Almost uniquely, Australia seemed to have gotten the basics right, certainly better than the muscle-bound, paramilitary response of North America. That approach only set up an ecological insurgency which summer surges of hardware and firefighters could never quell. Americans looked to Australia especially as a cognate country that knew how to replace feral fire with tame fire.

Yet Australia keeps enduring the same Sisyphean cycle of calamitous conflagrations in the same places. It isn't getting what it knows into its practices. It seems to be abandoning its historic solutions for precisely the kind of telegenic suppression operations and political theater that have failed elsewhere. Even when controlled burning is accepted "in principle," there always seems a reason not to burn in this place or at this time. The burning gets outsourced to lightning, accident, and arson.

It's too early to identify the particulars behind this most recent catastrophe. But it's likely that investigation will point to the same culprits, perhaps aggravated by climate change and arson. Both are reasons, and both are also potential misdirections. Global warming might magnify outbreaks, but it means a change in degree, not in kind; and its effects must still be absorbed by the combustible cover. Arson can put fire in the worst place at the worst time, but its power depends on ignition's capacity to spread and on flame to destroy susceptible buildings.

Neither is basic. With or without global warming or arson, damaging fires will come, they will spread as the landscape allows, and they will inflict damage as structures permit. And it is there – with how Australians live on the land – that reform must go.

Australia will have fire, and it will recycle the conditions that can leverage small flames into holocausts. The choice is whether to kindle those fires with some degree of deliberation, or whether to leave that task to lightning, clumsies, and crazies.

After the 1939 Black Friday conflagration, a royal commission set into motion the modern era of bushfire management. At the time the official ambition of state-sponsored conservation was to eliminate fire as far as possible, and through fire exclusion, ultimately to alter the very character of the landscape so that it would become less fire prone. Judge Stretton asked the nation's forester why he continued to hold this view when it had never succeeded, when bushfires had inevitably wiped out his every repeated effort. Wryly, Stretton mocked the absurdity of those who sought to make sunburnt Australia into green England.

It seems likely that Black Saturday II will yield another royal commission. Much has changed over 70 years; Australians are more urban, more sensitive to environmental issues, keener to protect unique ecological assets. Yet perhaps they are substituting another, more modern delusion, striving to remake the burning bush into an unburnt Oz, only to find this vision also repeatedly obliterated by remorseless fire.

I hope not. We don't need a Black Saturday III.



Stephen J. Pyne is a professor at Arizona State University. He is the author of *Burning Bush: A Fire History of Australia* (1991) and *The Still-Burning Bush* (2006). You can read two of Steve's essays on fire in the wildland-urban interface in the most recent issue of *Forest History Today*. His FHS Issues Series book, *America's Fires: Management of Wildlands and Forests*, is currently being revised and updated.

Developing A Prescribed Fire Insurance Liability Product: *Actuarial Analysis of Survey Data*

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Prepared by Paul D. Mitchell
With assistance from Tom Buman

The following are excerpts from the report that summarize responses concerning the “Typical Burner” and the “Typical Escape” of a prescribed burn. Contact Terry Sharpe (sharpetl@etinternet.net) to obtain a pdf with the complete report.

The “Typical” Prescribed Burner

Below are several general statements that describe the “typical” prescribed burner based on the responses to the mail survey and summarized in the indicated tables.

Technical Practices: (Tables 1 and 7)

- Most (68%) use written burn plans Always or Often, but 17% Never or Rarely do.
- Almost all (90%) predict smoke behavior Always or Often.
- Most (67%) wear protective equipment Always or Often, but 20% Never or Rarely do.
- Most (73%) Never or Rarely begin a burn after sunset.
- Most (72%) Never or Rarely burn with open flames for more than 24 hours.
- One third Sometimes extinguish a burn after sunset, 23% Often or Always do.

General Practices: (Tables 2-4 and 18-20)

- Most burn for private land owners (88%) and farmers and ranchers (52%).
- Most (78%) burn 2000 or fewer total acres per year.
- Most (87%) conduct 30 or fewer prescribed burns per year.
- Half report conducting burns with others not employed by their company, most commonly not government agencies or other private consultants.
- Half report burning in the South, a third in the Midwest, most commonly in Florida, Texas, and Wisconsin.
- Almost half (48%) burn in 1 state and almost a third (31%) burn in 3 or more states.

Prescribed Fire Characteristics: (Tables 5, 6, and 8)

- Almost all (87%) conduct some burns in the wildland/urban interface, but most (55%) conduct less than 25% of their burns in the wildland/urban interface.
- Most (69%) conduct less than 25% of their burns next to public lands.
- Most (53%) conduct more than half of their burns in sparsely populated areas.
- Grass is the most common fuel type (43% of burns) and then Timber (32%).
- Some burn exclusively in one fuel type (Grass, Timber, Slash or Brush).
- The median low size range for a typical burn is 15 acres.
- The median high size range for a typical burn is 150 acres.
- Most (66%) fires have a high size range less than 200 acres, but some are quite large—11% report a high range of at least 1,000 acres; 2% of at least 10,000 acres.

Experience and Certification: (Table 14)

- The average years of experience with prescribed fire is 18.5 years, with a range from 1 to 50 years.
- One third report having no fire suppression experience.
- For those with fire suppression experience, the average years of experience is 16.2 years, with a range from 1 to 50 years.
- Almost half (46%) did not know if their burn boss had the Burn Boss II designation
- A third (34%) had the Burn Boss II designation or higher.

Escape Experience: (Tables 9-11)

- Annually, most (74%-80%) have no escapes. Those who have escapes usually have only 1 escape (1 is the median and mode). A few have 10-20 escapes.
- Claims for smoke damage from prescribed burns are rare. Only 1 reported a smoke claim from an escape and only 3 reported a total of 6 smoke claims from non-escaped fires.

Insurance Experience: (Tables 12 and 13)

- Most (86%) report having some form of general business liability insurance in the years they conducted burns, with a median premium of \$3,000.
- About half (55%) report having a policy providing some form of liability coverage for prescribed burns; 18% have no coverage and 20% left the question blank.

Business Characteristics: (Tables 15-17 and 19)

- Almost a third (30%) report less than \$100,000 in gross income, 51% report less than \$250,000 in gross income, and 24% report more than \$1 million in gross income.
- Prescribed burning on average is 11% of their business income, with most income (62% on average) from other activities not related to controlling woody vegetation or fire.
- On average have been in business for 21 years and conduct burns 4 months a year.
- Most (69%) planned on conducting prescribed burns in the coming year.

These statements are generalizations intended to indicate typical responses to the survey and should be fairly representative of the population of prescribed burners in the states surveyed. No cross tabulation between characteristics (e.g., how do the gross income responses correlate with experience with escapes) has been conducted or reported here. Readers can develop any desired summaries or cross tabulations using the data in the accompanying spreadsheet.

The “Typical” Prescribed Fire Escape

Below are several general statements that describe the “typical” prescribed fire escape based on the responses to the telephone interview and summarized in the indicated tables. Remember that these bullets described prescribed burns that escaped and were reported in our telephone survey.

Location (Table 21)

Most occurred in the South (49%) and the Midwest (47%), largely following the location of the survey population.

Fuels and Sizes (Tables 22 and 23)

- Most commonly prescribed burns that escape were burns in Grass (42%) or Slash (31%).
- Most commonly escaped fires burned additional Grass (46%) or Timber (27%).
- Most (89%) escaped prescribed burns are less than 200 acres; 60 acres is the median size.
- Most (70%) burned less than 10 additional acres, 2 additional acres was the median.

Extinguishing the Escape (Tables 24 and 26)

- Most (72%) took less than 3 hours to extinguish, almost all (97%) took 10 or fewer hours.
- Additional costs to extinguish the escape ranged \$35 to \$2,500, with a median of \$500.
- Additional resources to extinguish the escape typically included plows, trenchers, and bulldozers (30% of the escapes) and other fire fighters (28%).

Training and Experience (Table 25)

- Most (69%) burn crews had 2-5 members besides the burn boss.
- Over half (56%) had crews with Excellent or Very Good experience.
- Most (69%) had burn bosses with Excellent or Very Good experience.

Monetary Value of Damages (Tables 27 and 28)

- Almost all (97%) reported no property damage.
- None reported any payments for bodily injury.
- Most (84%) reported paying no out of pocket costs to settle damage claims.
- For the 15% of escapes paying claims, the total payment from all sources ranged \$15 to \$22,000, with an average of \$5,674 and a median of \$1,500.

Smoke Claims without Escapes (Table 29)

- Smoke can be costly even without an escape—the survey found one case of spending \$2,000 for traffic control help to deal with unexpected smoke behavior.

These statements are generalizations intended to indicate typical responses to the telephone survey and should be fairly representative of the escapes that occurred in the states surveyed. No cross tabulation between variables has been conducted or reported here. Furthermore, no summaries that link information from the mail and telephone surveys has been conducted or reported here. Readers can develop any desired summaries or cross tabulations using the data in the accompanying spreadsheet, including for the combined mail and telephone survey data.

PRACTICAL SMOKE MANAGEMENT

There are many challenges associated with implementing a prescribed fire. Often, one of the biggest hurdles to clear is the issue of smoke management. Many tracts of land that would benefit from a prescribed fire go unburned due to smoke related issues. These issues could include adjacent or nearby roads and highways, homes, schools, or communities that are in areas that are near to a planned prescribed fire. Other issues can include smoke management regulations, air quality considerations and non-attainment areas. There are likely other issues to be considered as well.

Sometimes, a fire manager might have to be a bit creative, or to think “outside the box” in order to implement a burn that is deemed a high priority to get burned, but does contain some of the aforementioned smoke management issues. On the Uwharrie National Forest, most of the burns that the district implements contain at least some type of smoke related issue and many of them contain multiple issues. The Uwharrie has a very broken land ownership pattern, meaning the Forest Service lands are not very contiguous. They are scattered over a 3 county area, with large amounts of private land and communities intermixed with the Forest Service property. Interestingly, a major objective of Forest Service prescribed burning is hazardous fuels reduction in and around these lands that have private development along or very near National Forest boundaries. In order to accomplish these burns, there are many issues that have to be addressed and many issues that have to be mitigated. This article will attempt to illustrate some of the methods that the Uwharrie uses to help alleviate smoke issues on prescribed fires. Hopefully, these ideas will be of some value to other fire managers as they attempt to implement prescribed fire in areas where smoke issues exist.

To start with, any prescribed fire should begin with a well thought out burn plan. Obviously, things such as objectives, weather parameters, fuel conditions, etc. should be considered. Another important item that must be given careful thought is smoke management. You should consider things like “Does this area contain smoke sensitive areas?” and “Which direction would I prefer the smoke to go?” You may ask the question “What exactly is a Smoke Sensitive Area?” According the National Wildfire Coordination Group, a smoke sensitive area is any area that can be adversely affected by smoke. Under the new North Carolina Smoke Management Plan*, a smoke sensitive area (SSA) is defined as:

“This CAN include but is not limited to Class I areas (there are five in NC) and other locations of scenic and/or important vistas, especially during periods of significant public use. There are also urban and rural population centers, schools, hospitals, nursing homes, day care centers, transportation facilities such as roads and airports, recreational areas, and other locations that may be sensitive to smoke impacts for health, safety, and/or aesthetic reasons.”

**The North Carolina Smoke Management Plan is in the final stages of development and should be a legal binding document in the very near future. At the writing of this article, it is not known the exact date of completion of the plan.*

However, a single house or two does not necessarily have to constitute a “Smoke Sensitive Area.” Targets such as these can be mitigated. According to the new SMP,

“If an SSA is mitigated under any circumstance, then in essence there is no SSA and the prescribed burn can proceed and be accomplished. “

Now the question arises “What constitutes mitigation?” Mitigation could be many things. On the Uwharrie, we start with notifying adjacent landowners that we are planning to conduct a prescribed fire. This is usually done early in the planning process – it could be a few months prior to actual implementation. Basically, feedback from those landowners is solicited and their comments are considered. Then, usually within a week or two of the expected ignition, Uwharrie fire staff will go door to door, and either speak directly with a neighbor, or leave a door hanger on the front door of the home. This door hanger notifies the homeowner that we intend to burn nearby, gives that homeowner some brief objectives of the burn, and has contact numbers to call if they have concerns about the burn. We also include a range of dates that we expect the burn to be conducted within. By doing these steps, we do our best to identify any persons that would have a problem with or object to smoke from a prescribed fire. Otherwise, if we determined that any and every home was a smoke sensitive area, we would get very little burning accomplished, and we would not be able to meet federal objectives such as reducing hazardous fuels in wildland urban interface areas (areas where homes exist very near woodlands). Rather, we choose to mitigate by informing the public of planned activities, and then reacting to those comments. When we receive negative feedback that has to do with smoke related issues, some options are to make sure that forecasted winds carry smoke away from those targets. In some cases we have smoke targets on more than 1 side of a burn. In instances like this, the Forest Service in the past has chosen to actually pay for a hotel room for the day and night of the planned activity. This is not a regular occurrence, but has been done on occasion if the burn is determined to be a very high priority for accomplishment.

Roads and highways are almost always smoke sensitive areas as well. It is usually easier to conduct a burn with the wind direction blowing smoke away from a road, but on the Uwharrie, that is not always possible. On those occasions when smoke is likely to impact a road, the first thing that must be done is to post the road with some type of signage indicating that there may be smoke in the roadway. Second, some type of traffic control or patrol will be necessary. In some cases we use a flag person to slow down or stop oncoming traffic until the smoke clears. A “pilot car” that leads the traffic thru smoke can be used as well. Usually, the smoky conditions are brief, and normal traffic flow can resume pretty quickly. The best idea is to be prepared and have adequate personnel to help with smoke patrol activities should they become necessary.

Once the smoke sensitive areas have been identified (on a map) and mitigated, then you will of course need the proper burning permit from the NC Division of Forest Resources before you decide to proceed with a burn. You will also need a fire weather forecast from the National Weather Service. This forecast will include smoke management information for that day. Two items that are very important to note are the forecasted “mixing heights” and “transport winds”. These two items multiplied together determine the ventilation rate for the day (how well the smoke will disperse). Each day is classified as a particular “category day”, and with each category there are regulations and limits to how much smoke can be emitted. These limits are also associated with the tonnage that is planned to be consumed, and very importantly, the distance to any unmitigated smoke sensitive area. While this is a lot of information to consider,

it can be accessed at North Carolina Forest Service website (<http://www.dfr.state.nc.us/index.htm>). Look under the “Fire Control and Prevention” section, and then navigate down to the “Prescribed Fire and Debris Burning” section. A great deal of very helpful information can be found at this location. The burn category tables are listed here, as well as other smoke management information such as tonnage limits based on distances to an SSA, and there is also a table with good estimates to help calculate fuel loadings. One key note to remember, no burning is allowed at all unless the ventilation rate is at least a Category 2 day. This webpage is an excellent resource that can be used to help stay in compliance with state guidelines concerning smoke management. It should also be noted that some counties within North Carolina are classified as “non-attainment” areas for either ozone or particulate matter. If you are planning to burn in one of these counties designated as such, there are more restrictions that have to be considered. These regulations are governed by the NC Division of Air Quality. Please consult their website at <http://daq.state.nc.us/> for more information.

Now, once the steps have been taken to assure compliance with laws and regulations, it is time to go burn. The first thing we try to do on the Uwharrie is to notify interested parties that would need to know that we are burning on that day. Specifically, law enforcement agencies such as the sheriff’s department and any volunteer fire departments in the area where we are burning get notified. This will save many false alarm phone calls. We also notify the NC Forest Service as well and any other homeowners that may live adjacent to the burn. We then try to post affected roads with smoke signs on each end of the burn project, and we attempt to have adequate resources to use for traffic and smoke patrol.

Once these bases are covered, a test fire is ignited. This test fire will give us an idea of how the fire is going to behave that day, and it will give a good indication of how the smoke from the fire is going to disperse. We use the information that we see during this test fire to decide on a GO or NO/GO for proceeding with the burn. Sometimes it can be difficult to make that decision at the outset due to the fact that you have the least amount of information at the very beginning of the burn. Many times, when the burn is initially beginning, the smoke cooperates the least. The air is typically cooler, and the fire is not really generating much heat. Smoke will tend to stay nearer to the surface and linger around more than what is preferred. Typically though, as the day progresses, the air warms up and the fire begins to produce enough heat to lift the smoke and carry it away. Another point to consider, typically openings such as roads and power lines (where many burns are initiated), tend to draw smoke out into the openings rather than disperse smoke upward. Traffic passing along a roadway will have the same affect as well.

Another idea to consider - if more than one smoke target exists, sometimes it is possible to avoid the most critical and choose the less significant one to mitigate. For instance, in an area on the Uwharrie where a major road as well as a school exists very near to a burn that is considered a high priority, we usually attempt send smoke away from the school, and then use traffic control to mitigate the impact on the roadway. Usually there will be some smoke in the roadway, but with effective signing and traffic control, we are able to mitigate the hazard to an acceptable level. This particular area has been burned several times successfully using this approach. Another tactic that has worked successfully on the Uwharrie is to pay close attention to the speed of the predicted surface winds. If the surface wind speeds are light, and the overall ventilation rate for the day is adequate, it is possible to conduct a burn very near a smoke target due to the

fact that the smoke will usually rise straight up. When smoke movement is vertical with little lateral movement, smoke targets can be effectively avoided. Remember- this is usually only an option when surface winds are light.

Sometimes, even with the best of planning and preparation, smoke does not cooperate or changes during the day and does not disperse as anticipated. At this point, there is not a great deal that can be done to stop the smoke immediately, but there are a few things that can be done to help minimize the impact. The first thing that should be considered is damage control. If you are smoking in a road, make sure to have traffic patrol. Inquire as to the availability of local law enforcement to help close a road or stop traffic if necessary. You might consider a rapid burnout (if conditions allow) which would hopefully get smoke going vertical again. This tactic will complete the burn quicker and therefore get smoke production over with quicker. There are risks associated with this tactic, however. There have been cases where this method was used, and in the immediate area of the burn, worked well, but downwind several miles away, communities got smoked in from the huge amount of smoke that was put up in such a short amount of time.

Computer based smoke models are also a helpful tool that can be used to help a prescribed burner to predict smoke dispersal or smoke concentrations. Some computer knowledge or some training is usually necessary to use these models. Be aware that these models are models and are not perfect, but can provide additional information to aid in making a decision to burn or not to burn.

Some final thoughts on the subject of smoke management. It is almost always best to get the burn completed earlier in the day rather than later. Smoke issues increase around sunset and during the night. If a burn can be completed 2 hours or more before sunset, smoke issues are reduced considerably. As for nighttime burning, no burning is allowed in North Carolina unless the nighttime smoke dispersion is at least in the “fair” category. It would be preferable to have the dispersion in the “good” category. Time of the year is a consideration as well. Summertime growing season burns almost always produce more residual smoke than dormant season or winter burns. This is especially true in the days immediately following the original burn day. Generally these burns will produce smoke for several days –usually until adequate rainfall is received. One last note about smoke management. It would be wise to visit the NC Division of Air Quality website and become familiar with the locations of any EPA or state air quality monitoring stations. If there is a station in a location that is near a planned prescribed burn, mitigation (burn with the wind blowing away from the station) would help to prevent impacting the station with smoke, and then causing that station to have a reading that exceeds allowable standards.

In conclusion, prescribed fire has proven to be one of the most effective and efficient tools to use in managing forest resources in the southeast. Smoke is a by –product of this process, and smoke related issues are likely the biggest threat to a prescribed fire program. Managing smoke from prescribed fire is not an exact science. There are many variables which contribute to whether or not a prescribed fire and the resulting smoke management are successful, and several of those factors are out of the prescribed burner’s control. However, in past experiences on the Uwharrie, outcomes were usually favorable when we made sure to be in compliance with all applicable smoke management regulations for that day, had our mitigation in place, and (big

and) we received the forecasted weather that was predicted. Take these steps and your odds for success will be much greater. Prescribed fire is just too valuable to not have as an option, and if we choose to employ prescribed fire, we should do our very best to get it right.

Information gathered from the National Wildfire Coordination Group, the North Carolina Division of Forest Resources and the North Carolina Division of Air Quality websites was used in the article.

Submitted by: Kelly Cagle, District Fire Management Officer, Uwharrie National Forest, Troy, NC

COMMITTEE UPDATES

The Education and Outreach Subcommittee pulled together a brochure entitled "Prescribed Fire: What North Carolina Citizens Need to Know," and are now in the process of getting the brochure to the printer. It will soon be available to Council members for distribution and we will also post a .pdf file of the brochure on the website. As we work out the details on how to distribute the printed copies, we'll post that information on the website. Thanks to all the subcommittee and Council members that helped with pulling that brochure together. The E&O subcommittee will be having a conference call in March that will focus on updates to the website and charting out projects for the summer.

Kelley Van Druten, Chair

NATIONAL COALITION OF PRESCRIBED FIRE COUNCILS HOLDS INAUGURAL MEETING IN FLORIDA

The National Coalition of Prescribed Fire Councils held its inaugural meeting at the 24th Tall Timbers Fire Ecology Conference in Florida during mid-January 2009. The Coalition was established in 2006 and its mission is to "promote the use of prescribed fire for public safety, resource management, and sustaining the environment". The Coalition's first governing board was established in 2008 and consists of 9 members, including a representative from North Carolina, Norman Christensen of Duke University.

There are currently 25 states with established Prescribed Fire Councils in the country and 5 that are in the process of developing. Sixteen Prescribed Fire Councils, including North Carolina, were represented and presented updates during the meeting. Common issues included needs for public awareness, liability insurance, legislative action, and funding.

ANNOUNCEMENTS

FIRE AS A GLOBAL PROCESS

The Association for Fire Ecology (AFE) is pleased to announce the call for Workshops and Special Sessions for the Fourth International Fire Ecology and Management Congress: Fire as a Global Process to be held in **Savannah, GA, USA** from Nov. 30-Dec. 4, 2009. The Congress will feature plenary sessions highlighting the relationship between indigenous and modern fire cultures around the globe; Special Sessions addressing these and other global fire issues are especially solicited. Submissions should represent original work pertaining, but not limited, to the following primary themes:

- Fire Effects
- Human Dimensions
- Integrating Science and Management
- Fire Behavior
- Landscape Level Issues
- Fire History
- Role of Technology

Authors are invited to submit abstracts until April 3, 2009 via the on-line submission page ([Click Here](#)). Please limit your abstract length to 300 words. For more specific themes please visit our web site Scientific Program page ([Click Here](#)). Submissions will be reviewed by the Program Committee, and authors will be notified, via the e-mail provided on the proposal form, by May 15, 2009. For additional information on the Congress, please visit the web site at <http://www.fireecology.net/Congress09/Home.html> .

We look forward to seeing you in Savannah!

Submitted by The 4th International Fire Ecology and Management Congress Committee

GUIDE TO INVASIVE EXOTIC PLANTS AVAILABLE

N.C. DOT has just released this comprehensive guide to invasive exotic plants. It includes color photos, information on the historical introduction of the plant and detailed prevention and management recommendations. A great resource for educational programs as well as a valuable aid in management. Contains references to fire impacts on several invasives. Below is the message from DOT with complete details. It is available in .pdf at:

http://www.ncdot.org/doh/preconstruct/pe/neu/NEUProcedures/NCDOT_Invasive_Exotic_Plants.pdf

WEBSITE REMINDER

The NC Prescribed Fire Council Website contains information and links that can be helpful in planning your burns.

Here are a couple of examples of the info available on the Council's web site.

A list of insurers that offer insurance to prescribed burners is available in the Spring 2008 Issue of our newsletter. <http://ncprescribedfirecouncil.org/id12.cfm>

Click on: Spring Newsletter 2008

For fire weather links and training opportunities go to:

<http://ncprescribedfirecouncil.org/id2.cfm>

RESEARCH UPDATES

Congratulations are due several Council members for their recent article in the Natural Areas Journal.

Prescribed Burning in State Park Properties of North Carolina and Nearby Coastal States. 2009. John B. Taggart, J. Marshall Ellis, James D. Sprouse. Natural Areas Journal. Volume 29 (1), 2009. Pages 64-70.

ABSTRACT: Prescribed burning has been used by the North Carolina Division of Parks and Recreation (DPR) since 1974 to reduce hazardous fuel loads, to restore/maintain specific habitats, and to preserve rare species populations within state parks, recreation areas, and natural areas. System-wide staff training, development of burn prescriptions, and burning procedures were mandated according to agency guidelines. During 2002-2007, prescribed burns within state park properties were conducted mostly in the coastal plain, but system-wide coverage was far less than adequate to maintain fire-dependent communities. The number of hectares treated per year as a percentage of the number needing treatment decreased yearly. In addition to weather conditions, common obstacles to achieving burning goals included conflicts with other responsibilities, lack of trained staff/dedicated funding, and increasing wildland-urban interfaces. Prescribed burning data and associated information from state parks and natural areas in Virginia, South Carolina, Georgia, and Florida indicated that interagency burning agreements, full-time burning staff, and use of contractors have improved burning results significantly in recent years. Prescribed fire councils have served as advocates for prescribed burning at state-wide levels, while prescribed burning legislation has helped to limit smoke and, in some states, fire damage liability. Suggested enhancements for the DPR prescribed burn program include: use of both internal and external burning organizations, development of cooperative agreements with analogous programs, pursuit of earmarked state funds and outside grants, expansion of staff burn training, active participation in prescribed fire advocacy groups, and site-specific public information/education to address local concerns and to promote benefits of prescribed burning.

WHERE THERE IS WILDFIRE SMOKE THERE IS TOXICITY

Constantinos Sioutas, Vishal Verma, Andrea Polidori, James Schauer, Martin Schafer, Dr. Flemming Cassee

ScienceDaily (Dec. 1, 2008) — The health threat to city dwellers posed by Southern California wildfires like those of November 2008 may have been underestimated by officials.

Detailed particulate analysis of the smoke produced by previous California wild fires indicates that the composition posed more serious potential threats to health than is generally realized, according to a new paper analyzing particulate matter (PM) from wildfires in Southern California.

The new article confirms earlier studies by air pollution specialist Constantinos Sioutas of the USC Viterbi School of Engineering, who is also co-director of the Southern California Particle Center.

For the study Sioutas and colleagues from USC, the University of Wisconsin-Madison and RIVM (the National Institute of Health and the Environment of the Netherlands) analyzed the particular matter gathered during the fall 2007 blazes.

"Fire emissions produce a significantly larger aerosol in size than typically seen in urban environments during periods affected by traffic sources, which emit mostly ultrafine particles," Sioutas said.

"Staying indoors may not provide protection from smoke particles in the absence of air conditioning or the ability to recirculate filtered indoor air. This is because the fire particles can penetrate indoor structures more readily than particles from vehicular emissions."

According to Sioutas, the fires produce a dangerous mix. "The chemical composition of particles during the fire episodes is different than that during 'normal' days impacted by traffic sources.

"Tracers of biomass burning (e.g. potassium and levoglucosan) were elevated by two-fold during the fire period" he said. "Water-soluble organic carbon (WSOC) was also higher during the fire event. This makes these particles from wood smoke more bioavailable, thus more readily absorbable by our system than particulate matter from traffic sources."

The ability of the particulates to penetrate structures, even if windows are closed, and their potential ability to be absorbed by human tissues are a matter of concern. "More aggressive measures to avoid smoke seem to deserve study, including distribution of masks and evacuation to air conditioned environments, and closure of non-smoke secured schools," said Sioutas, who holds the school's Fred Champion Professorship of Civil and Environmental Engineering.

The results of the latest study confirm an earlier analysis of particles from October 2003 California wildfires, conducted by Sioutas and colleagues from USC and UCLA.

The research was supported by the Environmental Protection Agency.

Journal reference:

Physicochemical and Toxicological Profile of Particulate Matter (PM) in Los Angeles during the October 2007 Southern California Wildfires. *Environmental Science and Technology*, (in press)

Adapted from materials provided by [University of Southern California](#), via [EurekAlert!](#), a service of AAAS.

The geography of private forests that support at-risk species in the conterminous United States

Marcos D Robles^{1*}, Curtis H Flather², Susan M Stein³, Mark D Nelson⁴, and Andrew Cutko¹
Front Ecol Environ 2008; 6, doi:10.1890/070106

In this study, we present a coarse-scale, first approximation of the geographic areas where privately owned forests support at-risk species in the conterminous United States. At-risk species are defined as those species listed under the US Endangered Species Act or with a global conservation status rank of critically imperiled, imperiled, or vulnerable. Our results indicate that two-thirds of the watersheds in the conterminous US contain at-risk species associated with private forests, with counts ranging from one to 101 species. Those watersheds with the greatest number and density of such species are found in the **Southeast**, Midwest, and west coast states. Many private forests are threatened by land-use conversion. Those forests projected to experience the greatest increase in housing density within the next 25 years, and with relatively high densities of at-risk species, are found in over 100 watersheds, most of them in the **Southeastern states**.

To join the **North Carolina Prescribed Fire Council**, complete this form and mail it to the address below. You can also fax the form or contact Mark by email.

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NAME: _____

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PHONE: _____ Email: _____

Are you interested in participating on a Council subcommittee? YES ____ NO ____

If YES, which one? Education and Outreach _____

Policy and Regulatory _____

Membership _____

Implementation _____

Annual Meeting _____