



**NORTH CAROLINA PRESCRIBED FIRE COUNCIL NEWSLETTER**  
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Fall 2008

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**NC PFC: WHO ARE WE? HOW CAN WE BE MORE EFFECTIVE?**

Our Council experiences a significant pulse of growth each year as a result of our annual meetings. Moving the meeting location to different areas of the state has encouraged local participation and introduced the Council to newcomers. However, new members only trickle in at other times of the year. We are currently composed of 187 members (make that 188, as we did gain one today) who represent over 35 entities that support the use of prescribed fire in North Carolina (See Table 1). Not bad for a young organization, but I feel that we have a lot to offer members and a larger organization would be more effective in maintaining our ability to use prescribed fire.

I encourage each of you to take a quick look at the attached membership roster to identify friends, clients, or coworkers who are not currently members but may benefit from membership (Table 2). One simple way to introduce your peers to the Council is to forward this newsletter to potential members and ask them to learn more about the organization and to consider joining. They will benefit from a better understanding of the issues impacting our ability to use fire, staying abreast of training opportunities, and learn from networking with other members. The Council will benefit from having a more diverse and larger membership.

One group that is currently under represented is the private landowner. Though most don't personally burn, they benefit from having their property prescribed burned and can be a valuable part of the Council. Forestry consultants should be in a particularly good position to recruit landowners who depend upon fire to accomplish management objectives.

Members who work for agencies are in a great position to introduce co-workers. Agency personnel will benefit from technical information, training opportunities, and updates available in Council newsletters and annual meetings.

Enough rambling, I think each of you can easily identify a couple of potential members. I encourage each of you to forward the newsletter along with a personal invitation to someone who could benefit from being a member. Also encourage them to learn more about the Council by visiting our recently updated web site at <http://ncprescribedfirecouncil.org/index.cfm>.

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

**Table 1. NC PFC Membership Summary by organization.**

ENTITY	MEMBERS
NC FOREST SERVICE	17
NC STATE PARKS	19
NC WILDLIFE COMMISSION	34
NC DIVISION OF AIR QUALITY	3
NC BOTANICAL GARDEN	2
NC DOT	2
NC DEPARTMENT OF AGRICULTURE	2
NC ZOO	8
<b>STATE GOVERNMENT</b>	<b>87</b>
US FOREST SERVICE	9
NRCS	4
USFWS	8
DEPARTMENT OF DEFENSE	11
NATIONAL PARK SERVICE	2
<b>US GOVERNMENT</b>	<b>34</b>
FOREST INDUSTRY	2
FORESTRY CONSULTANT	17
NON UNIVERSITY RESEARCHERS	3
LANDOWNER	5
LAND TRUST	2
LAND MANAGER	2
UTILITY	1
TNC	5
NGO (NWTF, QU, QDMA)	5
NC FORESTRY ASSOCIATION	2
<b>PRIVATE</b>	<b>44</b>
<b>COLLEGE/UNIVERSITY</b>	<b>12</b>
<b>COUNTY GOVT</b>	<b>4</b>
<b>UNKNOWN</b>	<b>6</b>
<b>TOTAL</b>	<b>187</b>

**Table 2. NC PFC Membership Roster**

Aimee Rockhill	NCSU	Bryan Henderson	Seymour Johnson AFB
Adrienne Paoletta	WRC	Bud Taylor	
Alex McLennan		Carmen Lombardo	NR Mangr. EADS, MCAS Cherry Pt
Alice Ricks		Charlene E. Spells	U.S. EPA OAQPS/SPPD
Alice Zawadski	NC Native Plant Society	Charles Williams	Woods Work, Inc.
Allen Plaster	Comprehensive Forestry Service	Chris Ayers	NCSU
Allen Rogers	South Mountain State Park	Chris Baranski	WRC
Andy Fairbanks	City of Wilmington	Chris Brown	NCFA
Angie Carl	TNC	Chris Dawes	WRC
Anita Goetz	USFWS	Chris DePerno	NCSU - CNR - Wildlife
Bennet Rose	Bennett Rose and Assoc	Chris Helms	DPR-Lake Waccamaw S.P.
Bill DeMay	NC DFR	Chris Jordan	WRC
Billy Hartness	NC Div. Of Parks & Recs	Chris Ketchie	graduate student NCSU
Bill Parsons	NCWRC	Chris Moorman	NCSU
Bob Slocum	NC Forestry Association	Chris Moss	NC Forest Service
Boon Chesson	Landowner	Chris Szell	The Nature Conservancy
Brandee Boggs		Christa Rogers	Mecklenburg County Parks and rec
Brandon Price	NC Certified Burner Representative(s)	Colter Chitwood	NCSU
Brent Wilson	WRC	Conner P. Coleman	Duke University
Brian Bockhahn	NC Parks and Recreation	Corey Shake	NCSU
Brian Hahn	NC Museum of Natural Sciences Prairie Ridge	Cynthia Van Der Wiele	KCI Assoc. of NC, PA
Brian Strong	NC State Parks	Dale Suiter	US Fish & Wildlife Service
Britt Paige	Landowner	Daniel Becker	USMC Base Camp Lejeune

Daniel C Bunce	NCDAECS, Plant Conservation Program	Kerry Lathrop	NC Division of Forest Resources
Daniel Ray	NC Wildlife Resource Commission	Kevin Harvell	NC Division of Forest Resources
Dave Andres	NC Forest Service	Kimberly Hyre	Weymouth Woods - SNP
David Auman		Kip Hollifield	WRC
David Halley	True North Forest Management Service	LeAnne Bonner	WRC
David Knowles	ECU	Larry Such	NC Division of Forest Resources
David Lee	Tortoise Reserve	Laura Fogo	US Fish & Wildlife Service
David McAdoo	Native Orchid Conference	Lea Wofford	U.S. Forest Service
Dean Simon	NCWRC	Lucy Bruce	Hanging Rock State Park
Deanna Noble	NCWRC	Manada Pearson	
Dennis Desmond	Land Trust for the Little Tennessee	Marchall Ellis	NC Div. of Parks & Recreation
Doug Sprouse	NC Div. Of Parks and Recreation	Marek Smith	Mecklenberg County Park & Rec
Dowd Bruton	National Wild Turkey Foundation	Margit Bucher	The Nature Conservancy – NC Chapter
Drag Sharp	US Forest Service	Mark E. Johns	NC Wildlife Commission PIF CORD.
Dr. David Cobb	NC Wildlife Resources Commission	Mark Jones	NCWRC
Dr. Karsten Bauman	Research Triangle Institute	Mark Megalos	NC SU - College of Natural Resources
E. Mark Williams	WRC	Mark Rose	Native Orchid Conference
Ed Christopher	NC Forest Service	Mark Sanfoss	NCSU
Eddie Johnson		Mark Taylor	USDI National Park Service
Elizabeth Barnhardt	Registered Forester	Marshall Hartsfield	Woodland Management, Inc.
Emily Moberg	Nat. Resources- Mecklenburg County	Mary Clark	NCWRC
Emily Parisher	NC Div. Of Parks & Recs	Matt Christian	WRC
Eric Dousharm	NC Div. Of Parks & Recs	Matt Flint	USDA Natural Resources Conservation Service
Erica Newman	NCWRC	Michael Cheek	NC Division of Forest Resources
Erica Taecker	US Forest Service	Maynard Johnson	
Forrest Sutton	US Forest Service	Michael Good	NC DFR
Franky Hancock	NC Zoological Park	Michael Greene	NC WRC
Gary McCurry	Burke Co. Landowner	Michael Juhan, Jr	NC WRC
Greg Suszek	USFWS/Alligator River	Michael Kunz	NC Botanical Garden
Greg Yates	NC Forest Service	Michael Schafale	Natural Heritage Program
Harry Jarrett	NC Forest Service	Mike Hendricks	NC Forest Service
Heather Hawkins	NC DENR-Division of Air Quality	Mike Norris	The Nature Conservancy
Helen Mohr	US Forest Service	Mike Sanderson	NC DOT
Jack Sherman	NC Zoological Park	Mike Thompson	Montgomery CC
James Epps	NC Zoological Park	Neal Mills	Abitibi Bowater
James Keefer	NCWRC	Nell Allen	North Carolina Zoological Park
Janet Pearson	NC Div. Of Parks & Rec	Owen Anderson	NC Dept of Transportation
James N. Slye	Wayne Community College	Patrick Farrell	WRC
Jason B. Kiker	Kiker Forestry and Realty	Paul Carlton	Land Trust for the Little Tennessee
Jeff Bouchelle	NC DENR-Division of Air Quality	Paul Hinkle	Fort Bragg
Jeff Dimorier	NC Zoological Park	Perry Wilkerson	USDA Natural Resources Conservation Service
Jeff Prestemon	Forestry Sciences Laboratory, SRS	Pete Liles	
Jim Gray	JMG Forestry, Inc.	Peter Bates	Western Carolina University
Jim Keepfer	WRC	Riddick Ricks	Ricks Tree Farm
Jim Prevette	NC Div. Forest Resources	Rob Evans	NCDAECS, Plant Conservation Program
Jim Sain		Robert H. Westmorland	Westmoreland Forestry consultants
Jimmy Dodson	NC SU - College of Natural Resources	Robert Horton	USDA Natural Resources Conservation Service
Jody Stancil	NC Zoological Park	Robert McCrory	NC Zoological Park
Joe Cox	NC SU - College of Natural Resources	Robert Miekler	Alion Science
Joe Stancar	DOD Forestry Branch	Rudy Evenson	National Park Service
Joffrey Brooks	WRC	Russell A. Hardee	Progress Energy
John Alsup	NC Tree Farm	Russell J. Strong	Montgomery CC
John Isenhour	NC Wildlife Resources Commission	Ryan Jacobs	NCWRC
John Mangus	US Department of Defense- Cherry Point	Ryan Myers	NCWRC
John Monroe	Monroe Timberland	Scott Hartley	Weymouth Woods - Park Superintendent
John R. Green , Jr.		Scott Pohlman	NC DENR-NC Natural Heritage Program
John Townson	US Department of Defense- Camp Lejeune	Sean Brogan	NC DENR-Division of Forest Resources
John Ward	DOD Forestry Branch	Sheree Bowyer	Woods Work, Inc.
John Ann Shearer	US Fish & Wildlife Service	Sheryl Bryan	US Forest Service
Johnny Randall	NC Botanical Garden	Stephen Whitfield	NC Woodlands
Joseph Tomcho	WRC	Steve Thornburg	NC Zoological Park
Joy Malone	US Forest Service	Steve Woodruff	NRCS
Kelly Hughes	WRC	Steven Daniels	NC DENR DAQ
Kelley Van Druten	US Fish & Wildlife Service	Susan Carl	NC State Trails Coord. Piedmont
Ken Shughart	NC Wildlife Res. Comm.	Terry Sharpe	Consultant
Kendall Smith	US Fish & Wildlife Service	Tiffany Cervi	NCSU

Tim Keller  
Tim Johnson  
Toddi Steelman  
Tom Crews  
Tom Harville  
Tommy McColl  
Tom Steves  
Tony Wait  
Tracy Minton

WRC  
South Mountain State Park  
NCSU  
US Fish and Wildlife Service  
NC Native Plant Society  
Fort Bragg  
NC Forest Service  
WRC  
NC Div. Of Parks & Rec

Wade Teague  
Wes Duncan  
Wib Owen  
Will Ricks  
William E. Pearce  
William H. Rogers  
Willie F. Bartholomew  
Yancy King

Quail Unlimited  
NCWRC  
NC Forest Service  
UGA/QMDA  
Micro-analytical Svcs.  
Marine Corps Base Camp Lejeune  
Fifield Forest Subdivision  
NC Parks and Recreation



Rose Rodriguez

*The following article was written by Gary Curcio with NC Division of Forest Resources at the request of the NC Prescribed Fire Council. Several members requested a discussion of night burning and a clarification of what constitutes a Smoke Sensitive Area. Thanks to Gary for taking time to thoroughly address these issues.*

Use of prescribed fire in North Carolina's forests and natural ecosystems is often constrained, not only by weather conditions, fuel and soil moisture, and distance to smoke sensitive areas, but other demands that may be locally unique. Neighbors or persons impacted from smoke that is the direct result from the use of prescribed fire, can be asked and may be willing to tolerate smoke for a day, but after 2-3 days, anyone's patience can wear thin. This article will speak to two aspects of the NC Smoke Management Program (SMP): prescribed burning at night and smoke sensitive areas.

## **NIGHTTIME PRESCRIBED FIRE**

Prescribed burning, if properly applied, is the most economical means of eliminating the wildfire hazard of increased fuel loading that is created and left after each year of growth. If prescribed burns can be conducted at night, the number of hours available for burning is increased. To accomplish this practice, natural resource practitioners are requested that they voluntarily comply with the NC SMP. Favorable wind conditions, direction, and speed are essential in order to generate an acceptable rate of spread to the fire, dissipate its convective heat and disperse its smoke.

Under the present NC SMP, 20 ft wind speeds need to be equal to or better than 9 mph in order to conduct prescribed fire operations during night or early morning hours. Nighttime dispersion for smoke management is currently determined by wind speed as outlined in the table below.

**Nighttime Smoke Dispersion.**

<b>Nighttime Dispersion</b>	<b>Forecast Surface Wind</b>	<b>Interpretation</b>
Stagnant	Near Calm	Day burning needs to conclude 3 hrs. prior to sunset
Very Poor	2 – 4 MPH	Day burning needs to conclude 2 hrs. prior to sunset
Poor	5 -8 MPH	Day burning needs to conclude prior to sunset
Fair	9-12 MPH	Nighttime burning permissible
Good	>12 MPH	Nighttime burning permissible
Excellent	>14 MPH	Nighttime burning permissible but dangerous

Atmospheric conditions tend to become stable at night with wind speeds very smooth and light. It is important for any nighttime prescribed burning to have steady persistent winds with “acceptable speeds to disseminate smoke.” Stable conditions tend to keep smoke near the ground. Usually down slope or down drainage winds generally prevail at night and smoke will therefore flow down drainages and concentrate in low areas. When relative humidity rises above 80 percent and smoke is present, the formation of fog becomes increasingly likely as moisture condenses on the smoke particles. There are no satisfactory solutions to these problems, so they should be avoided entirely whenever possible. Wind speeds at 9 mph or better indicate at least “fair conditions” to disperse smoke. They also indicate that inversions and smoke induced fog are very unlikely events which are important to conduct successful nighttime prescribed burns.

The Low Visibility Occurrence Risk Index (LVORI) is another tool which can estimate the atmosphere’s potential to contribute to low visibility. LVORI has a scale from 1 to 10. When smoke is present in the atmosphere and the LVORI has a value of  $\geq 7$ , visibility issues can be magnified as weather conditions can act synergistically to impair visibility. Other factors that need to be considered include:

The fire is more than three miles from a road or smoke sensitive areas. Most nighttime visibility problems occur within three miles, but in exceptional cases problems may extend out to 30 miles from the fire.

The vegetation is continuous and heavy between the burn and a road. Heavy vegetation acts as both as a filter or a barrier, and slows the movement of smoke.

Logging roads, power lines, streams, or similar features can provide an unobstructed pathway, a conduit between the burn and state roads.

State roads are at a higher elevation than the burn.

The National Weather Service (NWS) will be including the LVORI in the Fire Weather Forecasts as the NCDNR Fire Environmental Work Group works in partnership with the NWS. The LVORI is currently projected 3 days out by the Southern High Resolution Modeling Consortium (SHRMC) at their website: [http://shrmc.ggy.uga.edu/state\\_maps.php](http://shrmc.ggy.uga.edu/state_maps.php) (Select the Field Low Visibility Risk Index / Select North Carolina / Select Time Loop All). Also within the Fire Weather Forecast the Surface Winds are forecasted WND20FT2MIN/EARLY and WND20FT2MIN/LATE. This is done to give a forecast of wind speeds between 6PM and midnight. Wind speeds are usually higher during this time period and therefore can provide opportunities for nighttime burning. Surface wind speed and direction represent a two-minute average at 20 feet above the ground or 20 ft above the vegetative cover. Wind direction is the direction the wind blows from, to eight points of the compass. The "EARLY" designation refers to morning hours (before noon) during daytime periods, and also the evening hours (before midnight) during nighttime periods. "LATE" refers to the afternoon hours during the daytime periods, and also the pre-dawn hours (after midnight) during the nighttime periods. Wind gusts, which are rapid fluctuations in wind speed of usually less than 30 seconds in duration, are indicated in the forecast if gustiness is expected. Forecasts for highest probable gust will be preceded by "G".

Prescribed burning at night is a management tool for natural resource managers. It certainly can increase the opportunities available for burning and provide an additional means of regulating the prescribed fire's intensity when stand fuel conditions can generate intense burns due to fuel loadings and fuel moistures.

### **SMOKE SENSITIVE AREAS**

In the wildland-urban interface, prescribed burns are constrained by impacts of smoke. As defined by the National Wildfire Coordinating Group (NWCG), Smoke Sensitive Areas (SSA's) are areas that may be adversely affected by smoke from a prescribed burn or wildfire. Smoke from outside sources is intolerable, for reasons such as heavy population, existing air pollution, or intensive recreational or tourist use. Under the NC SMP what can be considered an SSA? 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.

When working under the NC Ventilation Index System, the closest SSA needs to be determined as this assists in setting the limits for the amount of permissible tonnage that can be released to the atmosphere within the 25 sq. mi. area. The SSA is determined by the acceptable wind direction for the burn and then generating a Dispersion Impact Zone (DIZ). This zone is shaped by a 60 degree arc extending 30 miles downwind from the project to be prescribed burned. Burners need to assess potential smoke impacts of their prescribed burn project within the DIZ. The total permissible tons to be released are considered for their downwind impacts to public health and visibility. All SSA's within a ½ mile of the project and in the DIZ result in a no burn situation. This can be overcome if the SSA can be mitigated. If a SSA is mitigated under any

circumstance, then in essence there is no SSA and the prescribed burn can proceed and be accomplished.

- **Class I Areas:** Class I areas must be identified and be considered by burn bosses. Impacts to visibility from smoke need to be evaluated when burning. Prescribed Burn Projects located near Class I areas need to document the timing, duration, and severity of their smoke impacts from the burn on visibility in the Class I area. These areas include Forest Service wildernesses and national memorial parks over 5,000 acres, National Parks exceeding 6,000 acres, international parks, as well as other designated lands.
- **Recreational Areas:** Recreational areas need to be identified and be considered by burn bosses as to their smoke visibility impacts.
- **Urban and Rural Population Centers:** Urban and rural population centers need to be identified and be considered by burn bosses as to their smoke visibility impacts. All population centers within a 30 mile radius of the burn that appear as cities, towns or urban areas on the current NC Department of Transportation's maps are to be considered Smoke Sensitive Areas. If there are several SSA's in the DIZ, it will be necessary to determine the closest SSA so the permissible tonnage that can be released can be determined. Residences that are in groups too small to appear on the above mentioned map must also be considered as a SSA.

Even if it is a single residence, burners are expected to limit their smoke exposure. In some cases homeowners have been more than willing to accept limited smoke so burns can be accomplished. If this is so, then such SSA is said to have been mitigated. It is also the law that adjoining landowners be informed that the practice of prescribed fire will be used. Therefore, Prescribed Fire Practitioners when using this natural resource management tool need to provide adjoining neighbors, residents, sufficient information about prescribed fire plans so that they can be informed. This good neighbor courtesy allows adjoining landowners to know what is happening in their surroundings and to make any necessary adjustments.

- **Other Sensitive Populations:** Schools, hospitals, day care centers, and nursing homes in the DIZ need to be identified and evaluated for impact.
- **Transportation Facilities:** Transportation facilities such as roads and airports need to be identified as Smoke Sensitive Areas. The likelihood of prolonged exposure to particulate matter (PM) levels on potentially impacted roads or airports needs to be evaluated as reduced visibility is a threat to one's safety. In 2008 two first responders lost their lives in the line of duty while responding to vehicle accidents that were caused by wildfire smoke that reduced visibility well beyond the road's posted speed limit. It is possible that this could have been a Super fog Event. Super fog is a dense fog that reduces visibility to a few meters. This would make driving unsafe. It can occur when residual smoke from prescribed burns combines with just the right ambient temperature and relative humidity.

Prescribed Fire Prescriptions need to consider and protect the public on the road or at an airport. It is a goal and objective of the NC SMP and the responsibility of natural resource prescribed fire practitioners to minimize and protect the public safety from potential smoke intrusions onto

roads, airports, or other transportation related facilities. This is necessary as driving and flying safety problems may occur with poor visibility on roads or runways at levels far below the PM standard for human health.

As the NC SMP migrates to include the use of Atmospheric Dispersion Models such as VSMOKE (for daytime burns) and PB-PIEDMONT (for nighttime residual smoke or burns), SSA's will be reviewed differently and more finely. They will be examined for modeled particulate matter (PM), plume concentrations, and visibility plume concentrations. These modeled plumes will be interpreted as to their individual potential impact and thereby, provide assistance in reaching a "Go or No Go" decision to proceed with prescribed fire.

SSA's for PM 2.5 is an unmitigated area that can have a population of individuals who are sensitive to breathing air with high concentrations of smoke particulate matter. Examples are hospitals, nursing homes, schools, day care centers, and some communities. It is important to note that the elderly, very young, and persons with chronic illness have a higher sensitivity to smoke concentrations than normal healthy adult populations. This definition may also include businesses or farms where smoke could cause an adverse affect on crops, poultry, cause contamination issues, or interrupt operations. Mitigation of an area may include assessment, notification, and confining peak smoke emissions during certain times or other means to avoid impacting the SSA-PM at an "unacceptable" level.

SSA for Visibility Hazard is an unmitigated area where reduced visibility from smoke or smoke induced fog poses a hazard to human safety on roads, airports, and other locations. Mitigation may include posting warning signs and other notifications, traffic control, road closures, or other positive steps to reduce the hazard to acceptable conditions.

Using dispersion models necessitates a closer examination of meteorological conditions and interpretation of modeled smoke impacts. This extra effort was exercised under the Operation Research Evaluation Burn Project. Over a 4 year period burning days were increased by 32 days. A total 91 management units were successfully burned covering some 43,000 acres.

The key to effective smoke management when using prescribed fire is to utilize favorable weather conditions, best science, prescribed fire techniques, and keep smoke emissions to a minimum as far as impacting SSA's.

*Submitted by Gary Curcio, NC Division of Forest Resources (gary.curcio@ncmail.net)*



## 2008 ANNUAL MEETING - MORGANTON, NC

Eighty four members attended the NC Prescribed Fire Council Annual meeting in Morganton. In opening remarks the progress made by the NC Division of Forest Resources (DFR) in addressing burn bans was pointed out as one thing that can be attributed in part to input from the Council and its members. Recent regional- or local-specific short-term burn bans based on objective criteria are appropriate and much preferred over statewide bans. DFR is currently formalizing the burn ban process, and the Prescribed Fire Council has helped, in part by contacting decision-makers, as well as providing information.

The following points were made as part of a vision of what the Council should seek to accomplish in the future:

- Increase awareness about role of prescribed fire in promoting healthy ecosystems and public safety
- Increase participation in PFC of DFR
- Work on projects with lawmakers
  - One example was to look at building codes, and make sure that burners do not carry more than fair share of the burden in liability.
- Work with Governor's office
  - For example, a Prescribed Fire week
- Work toward the use of fire on a scale in North Carolina that can make a difference at the landscape level
- Coordinate, promote, conduct training
- Support local and regional efforts
  - E.g. Fire Learning networks in Onslow Bight and Southern Blue Ridge; Sandhills Fire Council
- Be the "go-to" organization for prescribed burners
- Develop stable funding.

Larry Such of the NC Division of DFR (filling in for State Forester Wib Owen) gave an update on the Evans Road fire. Dr. David Loftis, research forester at Bent Creek, spoke on fire and oak regeneration. Dr. Patrick Keyser, University of Tennessee Center for Native Grasslands Management, spoke on the oak ecosystem restoration project and made a strong case for restoring grasslands where there are remnants, as opposed to working to convert agricultural lands. Helen Mohr, US Forest Service, gave an update on the fire and fire surrogate study that is going on at multiple sites across the U.S including the Green River Game Lands. Gary McMurry, a Burke County private landowner, provided an entertaining perspective on burning in the mountains that included some "lessons learned" from experience. Terry Sharpe updated on National Coalition of Prescribed Fire Councils which continues to add new states with Fire Councils.



*Two of the featured speakers at the Moganton meeting were Dr. Patrick Keyser (shown on left) from the University of Tennessee Center for Native Grasslands Management who spoke about the restoration of oak ecosystems and Burke County landowner Gary McMurry (on right) who gave his entertaining perspective on the importance of prescribed burning and his personal experiences with it.*

After lunch, Margit Bucher of The Nature Conservancy updated the group on Onslow Bight and the Southern Blue Ridge Fire Learning Networks. Jim Gray updated efforts of the Sandhills Prescribed Fire Council which included several training sessions. Larry Such updated meeting attendees on the Smoke Management Plan (SMP) and Burn Ban criteria and revision to G.S. 113-60.21.

At this point, attendees divided among the committee breakout sessions. Major points follow.

Education and Outreach Committee – The committee reports that the website has improved, that they are taking on development of a brochure targeted at those persons most affected by prescribed fire (i.e. adjacent property owners).

Policy and Government Relations – The committee is working on two initiatives they are working on: 1) Educating Governor’s staff; and, 2) Working with DFR on the burn ban legislation.

Data Collection and Information – The committee reported that the website provides a great venue for efforts of the data collection committee and noted that there is a need for standardized data collection for fire and fire effects, and that the committee will continue to encourage DFR to collect information before and after burns.

Implementation – The committee noted that training remains a critical need and one positive development is that Montgomery Community College may become a prescribed fire training center. They also discussed the value of Fire Learning Networks, the need to reach out to private landowners, and the importance of good information on cost-share programs on the website.

Council Chair Terry Sharpe presented the Council's *Prescribed Burner of the Year* award to Brandon Price for "service to the Council and outstanding support for the continued use of prescribed fire as a land management tool in North Carolina." There was also a "passing of the torch" to Dean Simon as the incoming chair. Lastly, Terry thanked Dean Simon, John Ann Shearer and others for work in arranging the meeting, attendees for their participation and the NC Division of Forest Resources, NC Association of Consulting Foresters, and NC Council of Quail Unlimited for providing funding.



*The "Prescribed Burner of the Year" award was presented to Brandon Price for his outstanding service to the Fire Council and his support of prescribed burning. The torch as was ceremoniously passed from Terry Sharpe to Dean Simon who will begin his term as Chair of the NC PFC in 2009.*

**\*\*\*\*\*LESSONS LEARNED\*\*\*\*\***

**TNC BURN INCIDENTS**

*The following message was sent to TNC Fire Crews from Paula Seamon, Director of Fire Management & Training with The Nature Conservancy in Tallahassee, FL*

Fire crews,

During spring fire season, we had two burn injuries to the leg in different chapter programs that occurred in exactly the same way, so please read below and spread the word to your fellow crew members. In both cases, the person's Nomex pants caught fire and they tried to smother it with their hand, pressing the heated material against their skin. The Nomex were relatively new and in good condition.

Excerpts from one of the incident reports:

At approximately 1500 I was igniting within oak litter. This area of the unit had never burned well during previous burns. I had ignited through this type of fuel for about 15 minutes and was proceeding southeast toward the black to begin mop-up with two other crew members.

To build some heat in the hardwood litter, I was walking through the site, with the torch in my right hand and was flipping fuel out to my right while lighting a solid line. As I flipped the torch out to my right, the torch caught on some vegetation. I continued forward and gave a tug to the torch to free it. The torch came free easily and swung back toward me with more momentum than I anticipated. This caused the tip of the torch to swing behind my right leg and put flaming fuel on my left leg. I noticed this immediately and promptly used my left hand (gloved) to attempt to put the flame out. This failed, so I dropped the torch and sat down in the sand and used both hands to scoop dirt onto the pant leg and extinguish the fire.

As soon as the fire was out I pulled my pant leg up, which was stiff and had immediately turned brown. The leg had already blistered and popped over the majority of the burn. It already felt painful and there were a few smaller blisters above and below the large area that had blistered and popped.

How the burn could have been prevented:

In retrospect the burn could have been prevented during at least two different points. The first is by stopping and facing the torch when it first was caught in the vegetation. By doing this I would have had more control over the momentum produced when I tugged it free. By continuing to walk forward while tugging the torch it produced momentum to the torch when it came free that my arm was not in a position to control.

The second point is once I caught the pant leg on fire I should have dropped the torch immediately and used my right hand to hold the bottom of my pant leg away from my leg as I sat down and used my left hand to smother the fire on the pant leg, keeping the pant material from contacting my leg. I believe the attempt to put the pant leg fire out with my left hand caused the severity of the burn by forcing the heat against my leg.

Do NOT try to smother flaming Nomex by pressing it against your skin. If at all possible, pull the material away from your body and smother it.

Remember, Nomex is fire resistant, not fire-proof. Don't fall into the assumption that Nomex will give more protection than it is designed to. Discard Nomex clothing that has burned or turned brown as it loses its fire resistance.

Paula

**“SPRAY-DRAG-BLOW”**  
**A LOW COST ALTERNATIVE FOR MAINTAINING FIRE LINES**

I prescribe burn tracts of Piedmont loblolly pine totaling one to three hundred acres each year. My experiences in installing fire lines may be of interest to others who burn in similar situations and with budget and equipment constraints typical of small private landowners.

I started as most burners by getting the NC DFR to plow fire lines, but after experiencing problems with soil erosion on fire plow lines plowed in rolling topography with clay soils I began experimenting with low cost alternative ways to maintain fire lines. As a starting point, each of the tracts I burn has a flat bladed fire line about 10 feet wide along the boundary of the burn block. The bladed lines were installed by a contractor from 5 to 20 years ago. No additional dozer work has occurred on the lines since they were installed.

When I started burning, lines were prepped each year by friends and kids with broom rakes and fire rakes. That was a lot of work and the work force soon found reasons to be in other places when it came time to install lines. I am also no longer comfortable burning off lines that were often only a couple of feet wide.

Phase two came when my youngest son purchased a 4-wheeler. We began by experimenting with a number of types of drags to create a bare line to contain the fire. We finally settled on using a large brushy topped American holly to freshen lines before each burn. The typical routine now consists of dragging the holly brush up and down the line several times to loosen as much of the litter and organic matter as possible. Hardwood leaves and pine needles are easy to loosen, but grasses forbs and vines cause problems. After dragging the lines one can move along quickly with a backpack leaf blower to get the lines down to bare dirt. The dirt in the lines remains tightly packed and after using some lines for up to 15 years I have had no problems with soil erosion.

Phase three came along after having problems with grasses and weeds growing on lines, particularly when adjacent tracts were clearcut and in areas with damp soils. These grassy areas were requiring a lot of time and work to clear with a fire rake. My solution has been to make one or two trips around each tract during the summer with a backpack sprayer with glyphosate herbicide or a mixture of glyphosate and Imazapyr. Each year the job gets a little easier as the hard packed clay soils do not support the rank growth that disked lines promote.

Now I have added a small tractor with a disk to my list of tools, but I find that the spray/drag/blow technique works well for the scale that I burn. So I am not using the tractor for fire lines. Even though I know that each of us has access to different resources and each tract has its peculiarities I hope my experiences will lead to ideas that will help you with your burning.

Terry Sharpe

## TRAINING OPPORTUNITIES

### **BARK BEETLES & PINES**

#### **A LOOK AT THEIR ECOLOGY, IDENTIFICATION AND TREATMENT OPTIONS**

Sponsored by the Land Manager's Working Group of the NC Sandhills Conservation Partnership.

Location: Weymouth Woods Sandhills Nature Preserve, 1024 Ft. Bragg Rd, Southern Pines, NC  
PLEASE CALL OR E-MAIL TO REGISTER: 910.692.2167 OR [scott.hartley@ncmail.net](mailto:scott.hartley@ncmail.net)

Time/Date: October 14th - 9:00 to 15:00

#### Agenda

9:00 – 10:30 Rob Trickel, NC Forest Service Forest Pest Control Branch Head, will give an overview of the life cycle of three of the most common bark beetles Ips, Black Turpentine and Southern Pine; how to recognize trees that are affected by beetles; how to identify the species, and treatment options. Rob will also discuss and answer question about other pest and disease that affect our southern pines. He will also share a short video on a serious exotic/invasive plant that land manager need to be aware of; Cogon Grass – The Next Kudzu?

10:30 – 10:45 Break

10:45 – Noon Discuss urban forest/homeowner issues with beetles and disease. The Group will share lessons learned.

Noon – 13:00 Lunch

13:15 – 15:00 Field trip to look at sites with beetle damaged trees. We will look at factors that may have contributed to the mortality and potential ways to avoid stressing trees with our management activities.

### **TRAINING FOR PRACTITIONERS:**

An opportunity to stay current on smoke management practices, fire weather resources available through the national weather service, insurance for prescribed burners through the Forestry Issues Series

November 12, 2008.

The session will be broadcast 9am-12 noon

Location: NCSU and 13 campuses across NC.

Participants will have an opportunity to ask questions of the speakers.

Cost \$35 with pre-registration

CFE credits will be available.

Look for more details at: <http://www.ces.ncsu.edu/nreos/forest/feop/programs.html>

## PRESCRIBED BURNING CERTIFICATION

A Certified Burner Class is scheduled to be held October 28-29, 2008 at the Gaston County Citizens Resource Center in Dallas, NC. NC DFR will continue accepting registrants until approximately 1 week prior to the class.

Credits TBA

October 28-29, 2008

Dallas, NC

For more info visit: [http://www.dfr.state.nc.us/education/edu\\_cfetraining.htm](http://www.dfr.state.nc.us/education/edu_cfetraining.htm)

## FIRE-ADAPTED PLANT HIGHLIGHT

I delight at the splendid adaptations plants have to their environments, and one particular favorite is the pond pine (*Pinus serotina*). Also known as pocosin pine, marsh pine, and bay pine, *P. serotina* is a true denizen of the peaty coastal plain soils along pond borders and within pocosins. Pond pine ranges from southern NJ south to north FL and southeast to AL. It is closely related to pitch pine (*P. rigida*) with which it hybridizes in the northern portion of its reach.

The descriptive portion of pond pine's scientific name (the *specific epithet*) comes from the Latin *sero*, meaning "late," in reference to the delayed opening of the cones that are bound by resins and that don't ordinarily open unless heat breaks the seal – generally in response to fire. The top-shaped cones establish an aerial seed bank that awaits a fire to create the conditions suitable for seed germination and subsequent seedling establishment. So here's a wetland plant that holds its seeds high and dry (sometimes for years), awaiting a periodic dry spell and a coincidental fire, and whose seeds would certainly perish if shed otherwise...

Other adaptations to fire are pond pine's thick armored bark and its ability to initiate new branches or to root-sprout after top-kill. These *epicormic* branches, those that occur along the trunk and originate from wounding of the cambium, make field identification particularly easy. And after branching in such fashion, particularly in response to frequent fire, they take on variously odd forms like gnarly old men or dense needled columns.

Pond pine's exquisite adaptations to fire are overwhelmed, however, when pocosins are drained and the natural hydrology is altered. Such was the case in the months-long Evans Road fire that has burned approximately 41,000 acres mostly in the Pocosin Lakes National Wildlife Refuge. Because of altered hydrology, the unnaturally dry organic soils allowed a ground fire to burn, in some places 10-feet deep, destroying the tree root zone.

Let's keep our pond pine ecosystems intact and rehabilitate the ones that have been altered so that these wondrous trees can respond as Nature intended...

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



**Pond Pine - *Pinus serotina***

## ANNOUNCEMENTS

### **Tall Timbers 24th Annual Fire Ecology Conference**

*Future of Prescribed Fire: Public Awareness, Health, and Safety*

Ramada Inn Conference Center

Tallahassee, Florida, USA

January 11-15, 2009

For more information about the conference, visit the conference web site:

[www.talltimbers.org/FEconference](http://www.talltimbers.org/FEconference).

The Virginia Department of Forestry web site below has links to helpful prescribed fire literature and info sources.

Check it out at: <http://www.dof.virginia.gov/fire/prescribed-smoke-mgmt.shtml>

### **The Longleaf Alliance Regional Conference and Workshop**

*Forestry in a Changing World: new challenges and opportunities*

October 28-31, 2008 Sandestin, Florida

[http://www.auburn.edu/academic/forestry\\_wildlife/longleafalliance/RegionalConference2008/RegCon08.html](http://www.auburn.edu/academic/forestry_wildlife/longleafalliance/RegionalConference2008/RegCon08.html)



## RESEARCH UPDATES

### WILDLAND FIRE IN ECOSYSTEMS: FIRE AND NONNATIVE INVASIVE PLANTS

Kristin Zouhar, Jane Kapler Smith, Steve Sutherland, Matthew L. Brooks

#### ABSTRACT

This state-of-knowledge review of information on relationships between wildland fire and nonnative invasive plants can assist fire managers and other land managers concerned with prevention, detection, and eradication or control of nonnative invasive plants. The 16 chapters in this volume synthesize ecological and botanical principles regarding relationships between wildland fire and nonnative invasive plants, identify the nonnative invasive species currently of greatest concern in major bioregions of the United States, and describe emerging fire-invasive issues in each bioregion and throughout the nation. This volume can help increase understanding of plant invasions and fire and can be used in fire management and ecosystem-based management planning. The volume's first part summarizes fundamental concepts regarding fire effects on invasions by nonnative plants, effects of plant invasions on fuels and fire regimes, and use of fire to control plant invasions. The second part identifies the nonnative invasive species of greatest concern and synthesizes information on the three topics covered in part one for nonnative invasives in seven major bioregions of the United States: Northeast, Southeast, Central, Interior West, Southwest Coastal, Northwest Coastal (including Alaska), and Hawaiian Islands. The third part analyzes knowledge gaps regarding fire and nonnative invasive plants, synthesizes information on management questions (nonfire fuel treatments, postfire rehabilitation, and postfire monitoring), summarizes key concepts described throughout the volume, and discusses urgent management issues and research questions.

From *Wildland fire in ecosystems: fire and nonnative invasive plants*. 2008, Gen. Tech. Rep. RMRS-GTR-42-vol. 6. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 355 p.

View entire publication at: [http://www.fs.fed.us/rm/pubs/rmrs\\_gtr042\\_6.pdf](http://www.fs.fed.us/rm/pubs/rmrs_gtr042_6.pdf)

### TIMING OF PRESCRIBED BURNS AFFECTS ABUNDANCE AND COMPOSITION OF ARTHROPODS IN THE TEXAS HILL COUNTRY

Sally D. Johnson, Katherine C. Horne, Amy M. Savage, Steve Windhager, Mark T. Simmons, and Jennifer A. Rudgers

#### ABSTRACT

Prior research has demonstrated that fire can be an important structuring force for plant communities in prairies and grasslands. However, investigations of land-management techniques, such as prescribed fire, often overlook responses of local fauna, particularly the arthropods. In this study, we examined a previously unappreciated, although potentially important, component of fire ecology by asking, does the timing of prescribed burns alter community structure of arthropods? At a site in the Texas Hill Country, we used sweep-net sampling to collect arthropods from experimental plots that had been treated with a summer-burn or winter-burn regime. Summer-burn plots supported .170% more individual arthropods than winter burns. Although overall diversity of arthropods did not significantly differ between treatments, there were significantly more carnivorous arthropods and marginally more

herbivorous arthropods after fire in summer relative to fire in winter. Effects of timing were particularly strong for Cicadellidae (leaf hoppers) and Tetragnathidae (long-jawed spiders). Our results demonstrate that timing of prescribed fire can substantially alter composition of resident communities of arthropods. Furthermore, these data highlight the importance of examining composition of the community, in addition to diversity indices, when assessing response of arthropods to land-management techniques.

*From The Southwestern Naturalist 53 (2): 137-145, June 2008*



Ron Masters

#### LIGHTNING-SEASON BURNING: FRIEND OR FOE OF BREEDING BIRDS?

Jim Cox and Brent Widener, Tall Timbers Research Station and Land Conservancy

#### SUMMARY

For decades, the prescribed fires needed to maintain suitable habitat conditions for pineland birds were applied early in the calendar year (i.e., before April) when cooler temperatures and steady winds prevailed. More recently, some land managers have shifted to burning areas dominated by native forbs and grasses later in the year (e.g., after April) both to increase the acreage treated with fire each year and also in consideration of ecological observations. The shift to burning later in the year has led to concerns about the effects such burns may have on nesting birds. We reviewed recent research on the effects of “lightning-season” burning on the breeding birds associated with southern pine forests. The threat posed to nesting birds generally is not as severe as perceived, though additional research is needed for several species. Many ground-nesting birds that might be affected by burns prefer to nest in areas that have been burned recently (i.e., within the past 18-24 months), so the number of nests located in areas typically scheduled for

lighting-season burns will be small relative to the total number of nests constructed each year. Birds also frequently re-nest following the loss of a nest, and improved habitat conditions created through the application of prescribed fire may improve adult and juvenile survival and effectively offset the loss of a nest. Burns set in May also provide time for nests of some species to fledge but also are early enough to avoid peak nesting activity for Northern Bobwhite. Late-season burning does not pose a threat to nesting birds when it is included as part of a comprehensive burn program and is used to achieve the fire frequencies required to maintain suitable habitat conditions for many pineland birds on large managed areas. For several pineland species that are experiencing steep population declines, the preferred fire frequency is burning every two-to-three years.

#### SUSCEPTIBILITY OF EXOTIC ANNUAL GRASS SEEDS TO FIRE

Sara B. Sweet, Guy B. Kyser, and Joseph M. DiTomaso

##### ABSTRACT

Prescribed burning can control invasive annual grasses that threaten the biological and economic value of California grasslands. Susceptibility of grass seed to burning can depend on burn timing, exposure time, and type of exposure (direct flame heat or convective heat); thus, these factors can influence the success of a prescribed burning program. To further investigate these factors, laboratory simulations were conducted on barb goatgrass, medusahead, and ripgut brome at several stages of seed maturity, as determined by percent moisture of the inflorescences. Seeds were exposed either to direct flame using a Bunsen burner or to heated air in a muffle furnace. Flame treatments were conducted at one temperature (400 C) and several exposure times (0 to 14 s), depending on the species. Furnace treatments included four temperatures (150, 200, 250, and 300 C) and seven exposure times (0, 10, 20, 30, 40, 60, or 80 s). Seed germination was analyzed for each temperature series to determine the LD50 and LD90 in seconds of exposure time. Susceptibility to furnace treatments, which simulated heat exposure of seeds on the soil surface, was not statistically different within a range of seed moisture levels for all three species. The LD50 values at 250 C (typical soil temperature with grassland fire) ranged from 28 to 49 s, which far exceeds the time of exposure during a typical grassland fire. Susceptibility to flame showed a similar lack of change over maturation of medusahead and barb goatgrass seeds, with LD90 values ranging between 4.8 and 7.4 s for all seed moisture levels. In contrast, ripgut brome seeds exposed to flame showed increasing susceptibility with reduced seed moisture content. The LD90 values for exposure were less than one second for seed moisture levels at or below 10%, compared to 3.7 s for seeds at 55 to 60%. Although flame susceptibility increased for ripgut brome, seeds at all maturation stages were more sensitive than medusahead and barb goatgrass. Additionally, the LD90 values for all three species are attainable under field conditions. Thus, burn prescriptions for these three species are not constrained by maturation stage, but should occur prior to seed drop and when fuel loading is high. This will maximize exposure time of seeds to direct flame.

From *Invasive Plant Management Science* 2008, 1:158-167

## PERCEPTIONS OF TEXAS LANDOWNERS REGARDING FIRE AND ITS USE

Urs P. Kreuter, J. Brad Woodard, Charles A. Taylor, and W. Richard Teague

### ABSTRACT

Growing recognition that periodic fire is critical for maintaining the health of many rangeland ecosystems and concerns over more frequent catastrophic wildfires have focused attention on prescribed fire as an ecosystem restoration and fuel management tool. In states such as Texas, where most land is privately owned, the level of success of outreach activities aimed at expanding the adoption of specific management practices is influenced by the extent to which landowners' perceptions, interests, and concerns regarding such practices are addressed. This is particularly important for prescribed fire, which has been perceived by many landowners to be a dangerous or wasteful practice. Here we report the results of a mail survey of 185 members of the Edwards Plateau Prescribed Burn Association (EPPBA) and a random sample of 600 nonmember rural landowners in four counties in the Edwards Plateau and two counties in the Rolling Plains ecoregions of Texas. The overall response rate was 46.6%. Primary reasons respondents did not apply fire on their land were insufficient resources, legal concerns, and lack of assistance with burn plan development. EPPBA members had more positive attitudes than nonmembers about the ecological role of fire and the use of prescribed fire. Our study suggests that adoption of prescribed burning as an integral part of land management plans by private landowners could be expanded by forming new prescribed burning associations. The EPPBA model for such associations provides learning opportunities that are consistent with adult learning and innovation adoption principles. It facilitates fire safety training, reduces concerns over legal liability associated with fire ignition, and enhances access to shared fire management equipment and labor on burn days. The two-tiered structure of the EPPBA with some form of statelevel representation appears to be an efficient organizational structure for these associations. *From Rangeland Ecology and Management 61:456-464, July 2008*

## THE WILDLAND-URBAN INTERFACE IN THE UNITED STATES

Susan I. Stewart, Volker C. Radeloff, Roger B. Hammer

### INTRODUCTION

The purpose of this project is to provide information on "the area where houses and wildland vegetation coincide." Although there are other ways of defining the wildland-urban interface (WUI), this is the definition referenced in the National Fire Plan. Details about the rationale, development, testing, and sensitivity analysis of this definition, as well as the data sources and analytical methods we used, can be found at the end of the article in the methods section.

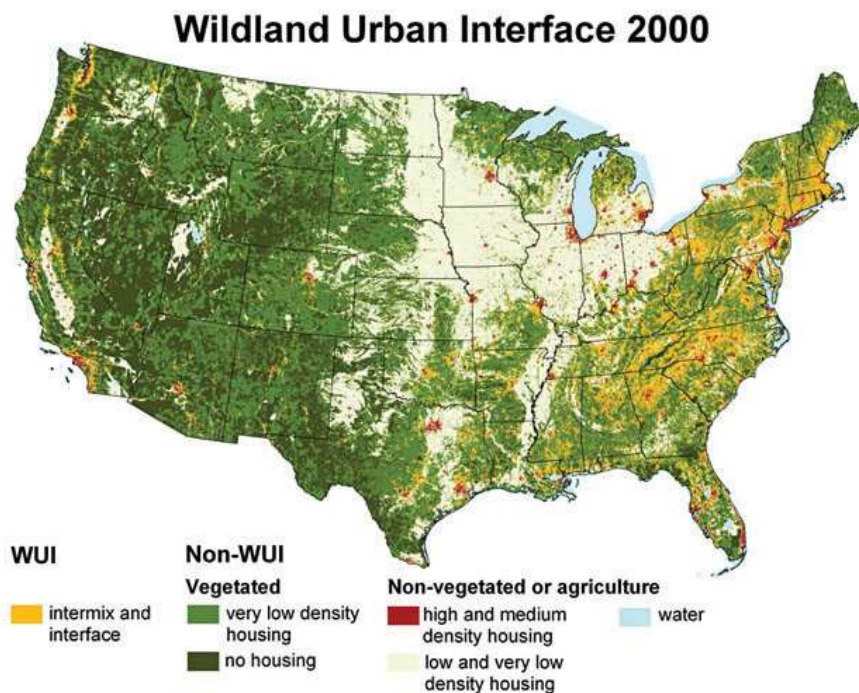
The WUI maps and data were created with the hope they would be useful to planners and managers at the local, state, and national levels. Tools and information regarding the WUI are available on our Web site for public use. Users should note that the resulting WUI map does not indicate the risk of fire; it shows only where houses and wildland vegetation coincide. Some of the areas identified as WUI are prone to fire, and some are not.

## KEY FINDINGS

The 2000 U.S. WUI map offers insights about the extent and distribution of the interface across the United States (fig. 1).

- All States have at least a small amount of land classified as WUI, and some have almost threequarters of their land area in the WUI.
- Across the United States, 9.4 percent of all land is classified as WUI.
- WUI is concentrated along the eastern seaboard.
- WUI is also commonly found in amenity areas with extensive recreation and tourism including the northern Great Lakes and the Missouri Ozarks.
- In the Rocky Mountains and the Southwest, virtually every urban area has a large ring of WUI, reflecting the sprawling patterns of recent growth, with extensive medium- and low-density housing near or in low-elevation forested areas.
- Although the WUI is not extensive along the west coast, it encompasses a high percentage of homes, particularly in the fire-prone areas of southern California.

**Figure 1.—The 2000 wildland-urban interface**



Source: Radloff et al. 2005b

*From The Public and Wildland Fire Management, 197-202*

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

If YES, which one? Education and Outreach \_\_\_\_\_

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Annual Meeting \_\_\_\_\_