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# Raleigh Fire Department

## Memorandum

**To:** Chief John McGrath

**CC:**

**From:** Assistant Chief W.R. Styons

**Date:** 3/31/2010

**Re: Recommendation for the Adoption of an Ordinance Restricting the  
use of Pine Straw in Proximity to Combustible Structures  
Exempting One and Two Family Dwellings**

### **Executive Summary**

On February 22, 2007, a fire caused by a carelessly discarded cigarette, at the Pine Knoll subdivision, ignited dormant grass and quickly spread into pine straw beds used as a decorative ground cover around the 56 unit townhome complex. The resulting conflagration destroyed 32 of the existing 56 townhome units. High winds and low humidity were mitigating factors in the blaze.

On March 23, 2010, a very similar incident occurred in a subdivision consisting of single family dwellings off Armadale Lane. Once again dormant grass was ignited during windy, low humidity conditions. Fire rapidly spread into pine straw beds surrounding several homes. Three homes were completely destroyed and three more significantly damaged.

Our experience here in Raleigh has been played out in other similar incidences across the region where pine straw is both abundant and in common use as ground cover.

It is the determination of the Fire Marshal's office that recurrence of similar conflagrations are likely if not inevitable if no remedial action is taken. Of the many contributing factors associated with these blazes, two stand out as areas where mitigation efforts are most likely to be effective and practical.

1. Adaptation of construction methods/codes to provide noncombustible foundation walls of sufficient height to prevent structural ignition associated with flammable ground cover.
2. Limiting and or restricting flammable ground cover's proximity to structures that have readily combustible exterior surfaces.

The Fire Marshal's office is consistently engaged in efforts to strengthen and improve the fire safety measures designed into North Carolina's fire and building codes; however, the code development and evolution process is driven by a broad range of considerations, perspectives, and parties of interest. For these reasons, our city's capacity to directly and autonomously impact the code process is limited. In addition, preexisting structures would continue to present a substantial risk regardless of future changes in construction methods.

Therefore, the Office of the Fire Marshal is of the opinion that the most effective and feasible option for addressing this risk is the consideration of adopting an ordinance restricting the use of pine straw in close proximity to structures that have readily combustible exterior surfaces. As will be demonstrated in supporting documentation, pine straw exhibits a number of flammability characteristics that make it particularly unsuitable for use in close proximity to combustible structures. The rate of flame spread and flame

height associated with pine straw are several times greater than other readily available organic materials such as mulch or pine bark nuggets. Due to these factors the Office of the Fire Marshal is recommending the consideration of both an educational campaign and the adoption of an ordinance prohibiting the use of pine straw within 10 feet of any combustible structure with the exception of one and two family dwellings. Conceptually this program would be beneficial if applied to one and two family dwellings, but it is the opinion of this office that we lack jurisdictional authority to mandate action in one and two family dwellings. Our educational effort will be our primary mechanism to influence compliance in one and two family dwellings/subdivisions.

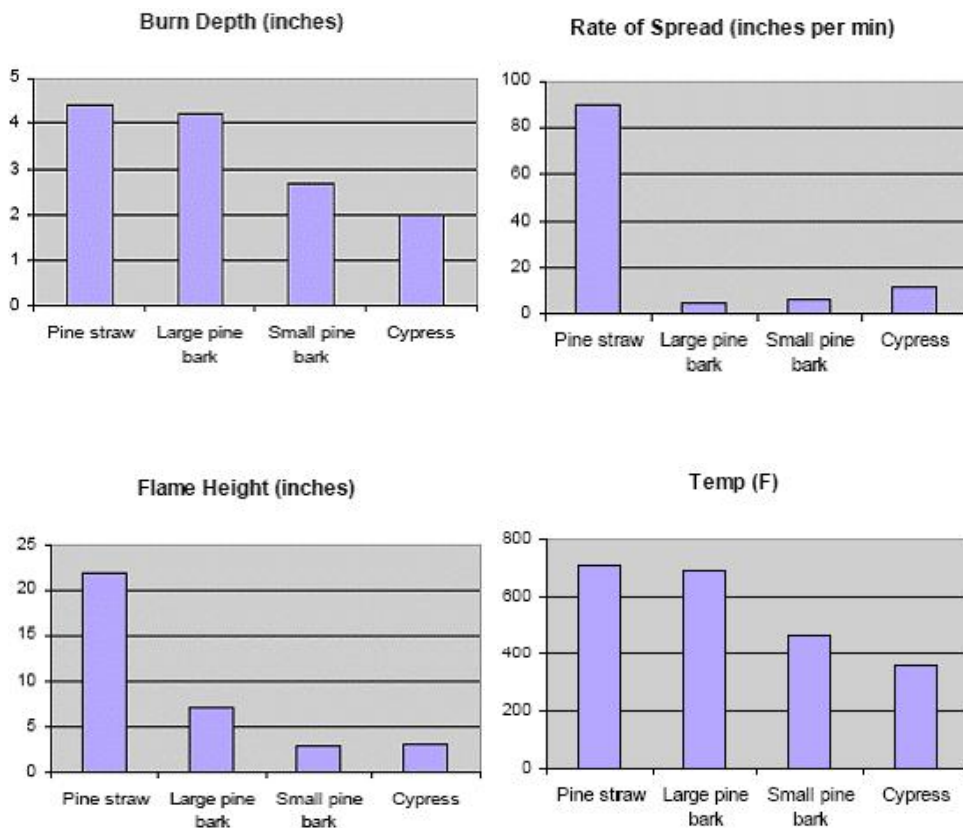
Three municipalities across the State have enacted ordinances similar to that proposed here. These ordinances are included here and could serve as a guide for the development of an ordinance appropriate for our jurisdiction. Many other municipalities have policy statements and or recommendations for limiting the use of pine straw near structures. Most were enacted as a direct result of the 2007 Pine Knoll fire. It is this office's recommendation that we partner with our city's Planning, Zoning, and Legal departments to craft a local ordinance appropriate to our jurisdiction that incorporates the basic themes in these existing ordinances, essentially a prohibition on the use of pine straw within 10 feet of any combustible structure.

### **Justifications**

Pine straw's flammability characteristics clearly set it apart from other organic ground cover. In particular flame height and rate of flame spread are several orders of magnitude higher than other commonly used materials (See following charts/graphs).

*Flammability data associated with common organic ground cover materials*

Mulch type	Rate of spread (inches per min)	Temp (F)	Flame Height (in)	Burn Depth (in)
<b>Pine straw</b>	<b>90</b>	<b>706</b>	<b>21.9</b>	<b>4.4</b>
Large pine bark	4.8	690	7.1	4.2
Small pine bark	6.3	463	2.8	2.7
Cypress	11.5	359	3.0	2.0



In the course of our research we reviewed the policies of the ten largest cities in the State as well as the municipalities within Wake County. The following spread sheets give an overview of where ordinances have actually

been adopted. Note the three municipalities having ordinances, Apex, Chapel Hill and Morrisville are all in our immediate area and were undoubtedly influenced by the 2007, Pine Knoll fire.

**Major NC Cities**

CITY	POPULATION	SQUARE MILES	ORDINANCE	COUNTY
Asheville, NC	74,543	40.9	NO	Buncombe
Chapel Hill, NC	52,542	19.8	YES	Orange
Charlotte, NC	687,456	242.3	NO	Mecklenburg
Greensboro, NC	250,642	104.7	NO	Guildford
Greenville, NC	79,629	25.6	NO	Pitt
Fayetteville, NC	123,382	58.8	NO	Cumberland
High point, NC	101,835	49	NO	Piedmont-Triad (4)
Jacksonville, NC	81,863	45.2	NO	Onslow
Wilmington, NC	89,648	41	NO	New Hanover
Winston Salem, NC	217,600	108.9	NO	Forsyth

**Wake County**

CITY	POPULATION	SQUARE MILES	ORDINANCE
Angier, NC	4,344	2.29	NO
Apex, NC	33,075	10.5	YES
Cary, NC	129,545	42.1	NO
Clayton, NC	8,872	5.4	NO
Durham, NC	223,284	94.6	NO
Fuquay Varina, NC	17,002	6.83	NO
Garner, NC	27,138	12.8	NO
Holly Springs, NC	20,870	7.49	NO
Knightdale, NC	8,174	2.68	NO
Morrisville, NC	13,699	6.77	YES
Rolesville, NC	2,844	1.63	NO
Wake Forest, NC	27,068	7.8	NO
Wendell, NC	5,300	1.96	NO
Zebulon, NC	4,732	3.23	NO

The three municipalities who have adopted ordinances each cite recent fires in which dormant grasses and pine straw were direct contributing factors to significant fire losses. Each ordinance is straight forward, simply limiting the use of pine straw within 10 feet of the applicable structures. This excerpt from The Town of Chapel Hill's ordinance is representative of the entire group.

AN ORDINANCE AMENDING CHAPTER 7 OF THE CODE OF ORDINANCES TO ESTABLISH A STANDARD FOR THE USE OF COMBUSTIBLE LANDSCAPING MATERIALS (2007-10-22/O-3)

BE IT ORDAINED by the Council of the Town of Chapel Hill as follows:

Section 1. Article I., Chapter 7 of the Town Code is hereby amended by adding a new Section 7-6.1, 7-6.1A and 7-10 to read as follows:

**Sec. 7-6.1 Combustible Landscaping Materials Prohibited**

That no pine straw or any other material with a fire rate of spread more than 24 inches per minute shall be placed, kept, or stored within ten feet of buildings with combustible exterior construction.

**Sec. 7-6.1A Exemptions to Section 7-6.1**

- Single Family Residential homes

**Sec. 7-10 Penalties.**

- a. Criminal Penalties. Violation of any provision of Article 1 and 1A shall be a misdemeanor and shall be subject to a fine not to exceed five hundred (\$500.00) dollars or imprisonment not to exceed thirty (30) days.

Section 2. This ordinance shall become effective upon adoption.

This the 22<sup>nd</sup> day of October, 2007.

**Counterpoint/Conclusion**

Our jurisdiction can continue to rely solely on educational efforts to address the hazards associated with pine straw used in proximity to combustible structures. Undoubtedly a ramped up educational effort will have a tangible

impact. However, as demonstrated by our educational efforts after the Pine Knoll event and the recurrence of a similar incident last week, education alone is likely to leave our city and its citizenry exposed to this recurrent threat. The adoption of an ordinance and its enforcement by Planning, Zoning, Inspections, and Fire assets is the most likely course of action to meaningfully reduce the risk associated with these incidents.