

Instructor Presentation Plan

Course: Florida's Certified Pile Burn Manager Program

Unit Number: 3

Presentation Title: Pile Burning Planning and Implementation

Presentation Time: 1.5 Hours

Presentation Objectives:

Upon completion of this presentation, the participants will:

1. Gain working knowledge of the techniques necessary to plan and conduct pile burning operations while keeping problems to a minimum
2. Learn how to write a Pile Burning Plan

Handouts:

03-01-CPBM-HO - CPBM_04_Legal_HO1_Sample Burn Plan

03-02-CPBM-HO - CPBM_04_Legal_HO2_ACI Use Handout

03-03-CPBM-HO - CPBM_04_Legal_HO3_Burning Laws that Apply to Pile Burners

Presentation Outline	Aids and Cues
Title Slide	03-01-CPBM-PPT
Presentation Objectives	03-02-CPBM-PPT
Lesson Objectives 1. Gain working knowledge of the techniques necessary to plan and conduct pile burning operations while keeping problems to a minimum 2. Learn how to write a Burn Plan “Responsible burners build public confidence and acceptance of the use of fire. However, a momentary lapse in judgment can change someone’s life forever.”	
Lesson Overview 1) Fire Science 2) Fuel Characteristics and Variations 3) Pile Location, Construction, and Maintenance 4) Air Curtain Incinerators 5) Extinguishing Techniques 6) Creating a Written Burn Plan	03-03-CPBM-PPT
Combustion Science	03-04-CPBM-PPT

Presentation Outline	Aids and Cues
1) Fire Triangle 2) Changing any one of these elements will either increase or decrease the intensity of the fire. An increase in Oxygen increases intensity and lessens smoke. An increase in fuel moisture decreases intensity and creates more smoke An increase in Heat increases intensity and creates more convection	
Fuel Characteristics 1) Pine It is best to let all fuels dry as long as possible Pine tops and saplings can create a good base for a hot fire. Large Pines should be “bucked up” to burn up faster Due to their high moisture content and density, pine stumps can take a long time to burn. Add them to your pile early and keep them hot.	03-05-CPBM-PPT
2) Citrus Extremely clean burning fuel type. Dries quickly Small root diameters that can be shaken free of soil easily (usually dry, sandy sites. Burns best if “cured”, but can be burned “green” with a hot fire.	03-06-CPBM-PPT
3) Palmetto	03-07-CPBM-PPT

Presentation Outline	Aids and Cues
Due to high moisture content, Palmetto can be difficult to burn. Burns best if cured, but a minimum of one day drying time may suffice depending on how clean they are. Requires a great deal of “shaking” to remove high soil content. This may mean spreading out in the sun and re-raking several times. If not well cured, use other fuel types to create a hotter base. Usually created a ‘compact’ pile so periodic ‘fluffing’ will be required to increase oxygen. If done right, palmetto will burn down to clean ash.	
4) Oak – Smaller oaks burn hot and make a good starter fuel for a fire base Larger oaks may need extensive curing time. Due to the time required to consume larger oaks, consider bucking up.	03-08-CPBM-PPT
FUEL CHARACTERISTICS – SUMMARY All fuels are greatly affected by: - Soil Moisture (affects residual root and live plant moisture) - Weather (humidity, dispersion, temp, wind) - Size (diameter) - Arrangement (amount of surface area exposed to oxygen) - Amount of sand/soil in Pile (absorbs heat – reduces oxygen)	03-09-CPBM-PPT
“This is a good time to discuss “starter fuels.” Make sure you use only approved fuels such as Diesel, Kerosene, a fuel mix, or Dry paper/Straw/Hay.”	03-10-CPBM-PPT

Presentation Outline	Aids and Cues
“The following fuels are prohibited (either as starter fuels or as a component of a land clearing pile): tires, any rubber, tar, treated wood, cross ties, plastics, Styrofoam, used motor oil, or garbage.” How do you decide where to place your pile? 1) Time? Convenience? Cost? The “EASIEST” or “FASTEST” is not always the best spot. “First of all of course, you need to meet legal setbacks. You <u>should</u> also consider practical issues like travel distance and your ability to visually monitor your piles. All this <u>is</u> critically important; but in some cases these considerations may not be enough” a) “You should always consider how your pile location could affect people. For instance, how close are you to homes, commercial areas, or busy roads? Will your fire, smoke, or ash alarm, bother, scare, irritate, or otherwise interfere with anyone’s daily life?” b) “Think about ways to locate your piles in such a way to at least minimize these impacts. This might mean moving your pile to a more inconvenient, time consuming location where it won’t draw as much attention”	03-11-CPBM-PPT
Pile Construction 1) Small Piles Get more oxygen and generally burn cleaner and more quickly. Easier to work, control, and put out if it becomes necessary Hard to get hot enough to consume larger diameter or high moisture content fuels. 2) Large Piles Produces the heat needed to consume larger diameter, higher moisture content fuels.	03-12-CPBM-PPT

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Helps to maintain a hot coal bed for morning startups on multi-day jobs. Can be difficult to work (fluff) with heavy equipment. Can be hard to meet legal requirement of having fire out 1 hour before sunset. Requires a higher skill level for equipment operator	
3) Composition/arrangement “Although each job is unique, you should build your pile with the most volatile (hottest burning) fuels on the bottom. This will help you build a hot fire center and coal bed you can build on later.” “Keep stumps in the hottest part of the fire. They will take the longest to burn. This will save you time and money in the long run.”	03-13-CPBM-PPT
4) Configuration Round Piles – generally easier and safer to manage than Windrows. Round piles also allow for a concentration of heat, helping with complete combustion. If windrows <u>are</u> used; Make sure you have adequate fire breaks between rows; Make sure rows run perpendicular to the prevailing winds; Make sure you break windrows up into manageable lengths.	03-14-CPBM-PPT
5) Soil Content Affects of sand and soil content? SAND WON'T BURN! Soil absorbs heat, stores moisture, reduces oxygen, and generally slows the combustion process.	03-15-CPBM-PPT

Presentation Outline	Aids and Cues
Take time to shake your fuels well before you put them in the pile. You may need to shake roots several times letting them dry in the sun. Air Curtain Incinerators 1) Greatly reduces smoke 2) Lower Setbacks – allows for set back limit to 300’ 3) Lessens impact in populated areas 4) How they work? They are used with a Pit or Box; A high-pressure air manifold creates an “air curtain” trapping smoke and embers; while at the same time oxygenating the fire The result is more complete combustion. If constructed and used properly, emissions can be reduced to near zero; If a pit is used, it must not be any longer than the manifold for the air curtain to work properly. Ideal dimensions are about 8-12’ wide and about 10-12’ deep. Sandy soils may require a shallower “egg shaped” pit that will allow loading equipment to approach pit without caving in sides of getting stuck or disabled. You can have the FFS inspect your setup to see if the operations meet the legal requirements. If your system doesn’t create a true “air curtain” then what you really have is simply a “forced air” system. Advantages of an ACI: Nearly 100% combustion with minimal escaped particulate and smoke. Volume reduction rate of about 98%. (100 tons of wood becomes 2 tons of ash) Very low environmental impact (ash can be back filled in pit or mixed safely with soils) Can be used relatively close to structures Saves time (larger ACIs can dispose of up to 15 tons per hour depending on fuel types). Very affordable if compared to options like chipping, grinding, mulching, or hauling to land fills. (Prices range from \$30,000	03-16-CPBM-PPT 03-17-CPBM-PPT 03-18-CPBM-PPT 03-19-CPBM-PPT

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for a portable tow behind model to \$118,000 for the largest self contained units) Disadvantages: Costly when conventional pile burning is still an option. Portable units may not be suitable for all soil types (Sandy soils will require a shallower pit that may need to be cleaned out every several days) If soil is unsuitable for a sturdy pit, an air curtain incinerator can be used as a “forced air” machine forcing oxygenated air into the pile. Demo video This demonstration video is of a land clearing operation in Florida Watch for the puff of smoke when the material “breaks” the air curtain Then watch how long it takes for the smoke to clear. The next thing you’ll see is the same air curtain incinerator in full operation looking down from above. The high velocity air is running across the top of the box from left to right. The curtain of air works just like a “lid” keeping smoke and particulates inside. This same forced air results in an extremely high temp, clean, fast burn.	03-20-CPBM-PPT
Public Safety and Security When you use fire as a tool every day, it’s easy to become complacent and careless. Professional Burners purposely avoid becoming complacent. You are ultimately responsible for all damages to life and property.	03-21-CPBM-PPT
Extinguishing Techniques 1) With the notable exceptions during post hurricane cleanup and emergency exceptions, the FFS does not issue night time authorizations. 2) Preferred Extinguishing Technique – let it burn itself out 3) “Legally out within 1 hour of sunset – Legally out means “your pile can still be hot, but cannot be emitting visible flame or	03-22-CPBM-PPT

Presentation Outline	Aids and Cues
excessive smoke”. 4) Adding fuel – When to quit? Avoid adding fuel to the pile in the afternoon. Allow time for the pile to burn down. 5) Smoke sensitive areas: If you are within a “Smoke Sensitive Area”, as defined by the FFS, you may need to completely extinguish your burn pile each day. This can be accomplished by burying with dirt, or cooling with water.	
Written Burn Plan 1) “Burn Prescription” defined: A “Burn Prescription” is a written statement defining the range of conditions under which a fire will be allowed to burn to meet stated objectives. 2) Benefits of a written burn plan a) presents a professional image b) Shows intent to comply with regulations c) May give some protection against liability d) Provides an undisputable record 3) Elements of a Good Prescription: a) Objectives of Burn b) Fuel Description c) Smoke Management requirements d) Publicity/Contacts needed e) Legal Requirements f) Map of Burn Area g) Weather Factors including Season and time of day h) Control/Extinguishment Plan i) Evaluation 4) Sample Plan (Handout #2) this is a sample burn plan form. Yours can be different, but needs to be in writing. a) Why a written plan? The main point of a written burn plan is to serve as a tool helping hyou show “due diligence” in planning your burn. If you follow your plan, it can help protect you from liability. b) If you don’t follow your plan it can also be used as evidence against you.	03-23-CPBM-PPT 03-24-CPBM-PPT 03-25-CPBM-PPT 03-26-CPBM-PPT
Practical Exercises: <i>(At this point the ppt presentation contains two scenarios for the class to work through. Below are the notes for each scenario, along with the solution to Scenario # 1. The instructor should work through the first scenario quickly with the class emphasizing the thought processes necessary to come up with reasonable weather factors. A solution is not provided for Scenario # 2. After presenting the scenario, the instructor should allow 10—15 minutes for the class to fill in their weather factors</i>	

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<i>on a sample burn plan form and be prepared to explain their decisions. After the class is finished, select a participant to review their plan with reasons for their decisions. While the instructor can offer constructive criticism, class participation can be encouraged by polling the class for differing opinions on specific weather parameters that may be questionable. After both scenarios are completed, emphasis should be given to practicing this process on all future burns, certified or not, until the participant gains a high level of proficiency and confidence.)</i> Fish Hawk Burn Pile Overview: This is a 400 acre plus Land Clearing Job to expand the Fish Hawk Ridge Subdivision in Hillsborough County. Within 5 miles there are at least 15 public and private schools and daycare facilities. Several shopping centers and commercial retail outlets. Lithia Springs Park is located about ¼ mile to your northwest. Fish Hawk Blvd is directly to the south and County Road 640 is to the Northeast There are at least 9 schools that are between 1 and 2 miles away. And there are about 80 occupied luxury homes directly to your south (phase I of your subdivision) You’ve applied for and received a open burning permit from Hillsborough County Environmental Protection Commission (EPC); which will be good for 30 days from today, and allows you a maximum of 3 piles 30’ x 10’. This permit also requires your pile/piles to be completely extinguished each day, one hour before sunset. You’re burning oak of various sizes (mostly large) that you’ve cleared over the past 7 weeks. All the trees are well cured and have been shaken clean of almost all dirt.	03-27-CPBM-PPT
QUESTIONS This is a closer shot. Note that the aerial does not show phase 1 of the subdivision located about 1200 feet south of the burn pile location. Fish Hawk Project – Weather (day 1) This is the Fire Weather Forecast for the first day of the project. Note the wind directions for the next 4 days. What does the clockwise rotation tell you? <i>(cold front passage coming)</i>	03-28-CPBM-PPT 03-29-CPBM-PPT

Presentation Outline	Aids and Cues
Fish Hawk Scenario Solution: Answer to the Scenario: The burner was limited to three piles, but chose to limit himself to only one pile to minimize smoke. Wind Direction: The condition of the fuel allowed for good combustion and very little smoke production so almost any wind direction was acceptable. He decided to monitor the pile closely for smoke impacts, especially to the school to the SW and the homes a little over 1000' to the south. He decided to increase to two piles on days when winds were either due east or SSW pushing smoke into unpopulated areas. Wind speed wasn't critical other than he didn't want surface winds greater than 12 mph which might cause your smoke to lay on the ground and impact smoke sensitive targets downwind. He decided to stop adding to the pile at 4:00 which would allow the pile to burn down to zero emissions by the "1 hour before sunset time. Mixing height, Drought Index, and dispersion were not considered critical factors since escape wasn't a worry, but high numbers were preferred for all three.	03-30-CPBM-PPT
Scenario # 2: This land clearing job is for the removal of 60 acres of citrus making way for a permitted mobile home retirement community. The nearest occupied building is a single family residence about 1300' to the north. Good Shepherd retirement community is located to the southwest with the closest building about 1450' away from your proposed burn pile site. Lake Arbuckle Road is about 900' to the Southwest and is lightly traveled. Lake Reedy Blvd is about 1900' to the West Northwest with	03-31-CPBM-PPT

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homes lining both sides of the roadway. This road is also lightly traveled. The land to the east is a private game preserve with overgrown natural fuels (300'). The land to the Southeast is a State Forest that has been burned within the last few years. The grove has not been irrigated for several months now. Your last rainfall as of today was 8 days ago. The local drought index is 125. The tighter shot shows the number of homes in the nearest community. Note that the fuels between the homes and the road are overgrown drained swamp with large pine over-story.	03-32-CPBM-PPT

