Appendix C.

Fire Management Plan for the Albany Pine Bush Preserve

Fire Management Plan

for the

Albany Pine Bush Preserve

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I. Introduction

Wildland fire management (prescribed fire, wildfire, and wildland fire use) involves the appropriate use of prescribed firing techniques and the control of wildfire to assure a balance between ecological management and public health and safety. Wildland fire is used in the Preserve to restore and maintain viable pitch pine-scrub oak barrens, improve wildlife habitat, and manage fuel loads. This requires a high degree of staff training and logistical support as a well as a sophisticated understanding of ecological processes.

This fire management plan describes the goals and objectives of the Albany Pine Bush Preserve Commission (APBPC) for restoring altered fire regimes necessary to meet the ecological viability goals described in Bried and Gifford (2008). This plan details the wildland fire management objectives and the fire environment of Preserve lands. Additionally, it also provides a discussion on operations and logistics, required and guidance weather and fuel parameters for prescribed fire operations, and the potential impacts of smoke. Current procedures for minimizing potentially adverse effects of smoke and prescribed fire are also described. This plan is intended to meet the prescribed fire regulations and requirements of the New York State Department of Environmental Conservation (NYSDEC) (6NYCRR Chapter II, Part 194 and ECL Article 46) and the policies of the APBPC. Policies, procedures, and guidelines listed throughout this document update and supersede those found in the Fire Management Plan for the Albany Pine Bush Preserve (Hawver and Batcher, 2002) and the revised protocols developed in 1999 by the Albany Pine Bush Preserve Commission (APBPC, 1999).

II. Goals and Objectives

A. Albany Pine Bush Preserve Goals

The Albany Pine Bush Preserve Commission has adopted a series of goals and objectives to guide management and protection of the Preserve as part of the 2010 update to the Management Plan. These goals and objectives are directly based on Givnish et al. (1988) and the ecological viability assessment for the inland pitch pine-scrub oak barrens detailed in Bried and Gifford (2008).

The following Preserve goals and objectives are relevant to wildland fire management:

Goal:

Protect and manage an ecologically viable inland pitch pine-scrub oak barrens community capable of supporting a viable Karner blue butterfly (*Lycaeides melissa samuelis*) metapopulation.

Objectives:

1. Acquire the necessary acreage to obtain a minimum of 2,000 acres of pitch pine-scrub oak that can be managed by fire.

2. Restore and maintain the natural plant and animal species composition of the pitch pine-scrub oak community, by continuing and expanding the Preserve‟s ecological management programs.
3. Restore a viable metapopulation of Karner blue butterflies as defined in state and federal Karner blue butterfly recovery plans.

B. Fire Management Program Goals

Goal:

Restore and maintain the appropriate fire regime across fire-dependent/maintained ecological communities in the Preserve, based on Bried and Gifford (2008) fire regime recommendations.

Objectives:

1. Manage fuel loads to reduce the threat of catastrophic wildland fire through safe and effective fire management practices.
2. Maintain adequate refugia for rare/declining plants and animals by burning no more than 30 percent of any Preserve region in a given calendar year.
3. Ensure average fire size of 50 acres (multiple adjacent burns may be necessary).
4. Maintain appropriate fire return interval of three to 20 years for scrub oak dominated communities and 20-40 years for pitch pine dominate forest communities. (More frequent burning may be needed to reduce fuel loads and/or restore native species.)
5. Restore/maintain appropriate ratio of growing and dormant season prescribed fires.

III. Ecological Justification for Fire Management

A. Fire Maintained Ecological Communities in the Albany Pine Bush

Ecological communities represent assemblages of species that occur together in a definable area within a given period, have the potential to interact with one another, and depend on similar ecological processes and conditions to maintain them (Grossman et al., 1998). Ecological communities within the Albany Pine Bush Study Area were first mapped by the New York Natural Heritage Program, prior to preparation of the 1993 Preserve Management Plan (Schneider et al., 1991); during preparation of the 1996 Implementation Guidelines (APBPC Technical Committee, 1996); and most recently in 2004, for the entire Pine Bush Study Area.

The data for the 2004 analysis was derived from 2003 Land Cover imagery and analyzed using a Geographic Information System (GIS) based community analysis program. Of the 10 ecological community types described for the Albany Pine Bush Study Area, four are fire dependant (Table 1). Summary descriptions of each ecological community are described and mapped in the Management Plan and Final Environmental Impact Statement for the Albany Pine Bush Preserve (APBPC, 2002).

Table 1. Fire Dependent Community Types within the Albany Pine Bush Study Area.

Community Types	**Area (acres)**
Appalachian Oak Pine Forest	2,200
Pitch Pine-scrub Oak Forest	1,400
Pitch Pine-scrub Oak Barrens/Thicket	620
Open Field	300

B. Fire Maintained Rare Species

Schneider et al. (1991), identified six plants, 14 invertebrates, and four amphibians and reptiles in the Albany Pine Bush, listed as rare by the New York Natural Heritage Program. This list includes state and federally-listed endangered and threatened species. The Preserve supports 44 Species of Greatest Conservation Need (NYSDEC, 2006), most of which are dependent on fire maintained habitats within the Preserve. These include: birds, herpetofauna, butterflies, and moths. Pine barrens communities hold the greatest number of rarities, though there are several rare plant and animal species within the wetland communities as well.

When managing occupied Karner blue butterfly habitat, within the Albany Pine Bush, the prescribed fire activities must adhere to management guidelines established in its annual New York State Fish and Wildlife License (License Number 132). This license authorizes the Commission to manage occupied Karner blue butterfly and frosted elfin butterfly (*Callophrys irus*) habitat as needed to keep it from becoming unsuitable. Specifically, the license states that:

> "Prescribed burning may take place on no more than one third of a site in any one year and adjacent burn units shall not be burned in consecutive years. Burning shall only occur as necessary. The burn plan shall be coordinated with New York State Department of Environmental Conservation and U.S. Fish and Wildlife Service by March 1, annually."

C. Ecological Processes in Pine Barrens and Forests

1. Fire-dependent Communities

There is extensive literature on the ecological processes of pitch pine barrens (Bried and Gifford, 2008; Bernard and Seischab, 1996; Olsvig L., 1980; and Forman, 1979). Since the adoption of the APBPC"s initial 1993 Management Plan and the subsequent 1996 Protection and Project Review Implementation Guidelines, extensive work has been completed to better understand the ecology of pitch pine barrens (Bried and Gifford, 2008; Grossman et al., 1998; Gebauer et al. 1996; and Young, 1993). The results indicate that pitch pine barrens depend on low nutrient soil conditions and frequent disturbance, primarily by fire (Whelan, 1995). A comparative study of five pine barrens, including the Albany Pine Bush, involving analyses of historic land use and fire history information, indicated that historic land use (e.g., timbering and agriculture) was also a major factor in determining the composition of present-day pitch pine barrens communities (Finton, 1998). Pine barrens species are adapted to a combination of fire and coarse, droughty, nutrient poor, acidic soils.

Absent fire, the pitch pine-scrub oak communities in the Albany Pine Bush succeed to pitch pine-oak, pine-northern hardwood, and/or Appalachian oak-pine forest depending on seed source, soil conditions, and random events. In these communities, fire is less frequent, intense, or severe. Variations in species composition and abundance result from alterations in environmental conditions (e.g., light, temperature, and nutrient availability) that result from interactions between plant species. As soil organic content and nutrients increase and light reaching the forest floor decreases, shade tolerant species begin to dominate the understory (Tilman, 1988). These species utilize nutrients more efficiently than pitch pine and other disturbance adapted species (Streng and Harcombe, 1982 and Little, 1979). These species reach the canopy as the early oak and pine dominants are eliminated as a result of death or wind-throw.

2. Fire in the Albany Pine Bush

Historically, fire played a large part in creating and/or maintaining the dominance of pitch pine and scrub oak in the Albany Pine Bush (Lewis, 1976). The most comprehensive documentation of post-settlement wildfires in the Albany Pine Bush is found in Zaremba et al. (1991). These researchers suggest that fires before 1900 were probably larger than fires that occurred in more recent times. Fire suppression began in the Pine Bush around 1900 and became more successful, although not completely so, after 1940. In recent times, most fires have been caused by human action, either accidental or purposeful.

a. Fire Frequency

Historically, multiple fires occurred in the Albany Pine Bush during any given year. From 1854 through 1987, Zaremba et al. (1991) reported a range of two to 15 fires per year, with one major fire (10-100+ acres) and six smaller fires occurring in an average year (Table 2). They also stated that other researchers have posed a “natural” fire frequency of from five to 15 years, and proposed that pine barrens communities in the Pine Bush would burn, on average, every 10 years. Within the pitch pine-scrub oak barrens and pitch pine forest communities, fires were likely of high-intensity and severity. Fires within scrub oak dominated communities were likely crown fires, moving rapidly through thick areas of scrub oak. The litter layer may have been partially or completely consumed, depending on litter and soil moisture conditions.

Table 2. Average Number of Historic Fires, by Month, in the Albany Pine Bush, 1854-1987 (Zaremba et al., 1991).

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Small Fires	1	3	15	36	14	4	13	4	7	11	5	0
Large Fires	0	2	2	17	15	4	2	3	1	4	4	0
Total	1	5	17	53	29	8	15	7	8	15	9	0

Based on an extensive literature review of fire in the Pine Bush and other northeastern pine barrens, Bried and Gifford (2008) indicated that a three to 20 year and 20-40 year fire return interval should be appropriate to maintain pitch pine-scrub oak barrens/thickets and pitch pine-scrub oak forests, respectively. However, more frequent fire may be needed to maintain low fuel loading and/or restore these natural communities.

b. Fire Season

In the Albany Pine Bush Preserve the highest number of fires occurred during the spring, when most species are either dormant (April) or beginning to leaf out (May) (Zaremba et al., 1991). Winter and summer (growing season) fires were less numerous, with the number of fires increasing in the fall, probably due to the accumulation of dry leaves and litter following the growing season (Table 2). Both growing season and dormant season prescribed fires are considered essential to maintaining pine barrens communities (Bried and Gifford, 2008), since fires naturally occurred throughout the year and their beneficial effects vary with seasonal timing.

IV. The Effects of Fire

A. Definitions

Fire effects can be complex and depend on the overall fire regime, which include: fire intensity and severity, frequency, size, and season (Attachment A). Definitions of key terms used in following discussions include:

Fire intensity: refers to fire temperature (units of energy released/area).

Fire severity: refers to ecological effects, such as consumption of forest floor organic matter (duff reduction) and mortality of overstory trees.

Fire frequency: refers to the number of fires per unit time in a designated area.

Fire-return interval: refers to the average number of years between two successive fires in a designated area of specified size.

Ground fire: refers to a fire that consumes the litter, duff and organic soil layers, burning to mineral soil. Such fires usually occur during drought conditions and are the result of long, smoldering fires.

Surface fire: refers to a fire that consumes the surface litter layer and fine fuels, and is generally a rapidly moving fire with a short burn period or residence time.

Crown fire: refers to a fire in which the flames extend into, ignite, consume, and spread through tree crowns.

B. Effects on Component Plant Species

Pitch pine, scrub oak, heath shrubs, and various native grasses and wildflowers are adapted to a combination of fire and coarse, droughty, nutrient poor, acidic soils. Fire acts to determine plant species composition and abundance in several ways. First, many of the species have evolved several adaptations to allow them to survive periodic fire events. For example, mature pitch pines are moderately fire tolerant, due to thick bark and moderately long needles. Pitch pine is only one of four pine species of that can re-sprout from dormant epicormic buds. Pitch pine, top-killed by fire, can successfully re-sprout from the base until about 20-40 years of age (Jordan, 1999). Their seedlings also survive and grow best under the conditions of full sunlight and exposed mineral soil which usually follows severe fires or land-clearing activities.

Scrub oak is also fire adapted and recovers rapidly from even a hot crown fire. Scrub oak develops a significant root mass and grows as a shrub. Fires may kill the tops of plants, but individual plants readily re-sprout from their root stocks. Scrub oak also grows best under conditions of full sunlight. Scrub oak seedlings can become established only during the first few years following fire, due to decreased (acorn-consuming) mouse populations (Unnasch, 1990). Although most post-fire recovery of scrub oak results from root sprouts, occasional seedling regeneration is needed to maintain scrub oak long-term.

Pine barrens shrubs–which include blueberry, huckleberry, sweet fern, and wintergreen and herbs such as Pennsylvania sedge and bracken fern–also rapidly re-sprout from underground roots and rhizomes following fire. However, huckleberry is more sensitive to fire since its shallow roots are more readily killed than the deeper roots of blueberry (Jordan, 1999). Periodic fire is also required to open the canopy and provide the requisite light levels needed by many herbaceous species typical of grassy openings in the pine barrens.

Many barrens plants have characteristics that facilitate the spread of fire, such as a high content of flammable terpenes, oils, phenolics, and waxes. This adaptation is in defense against insects and other herbivores, and is based on carbon rather than nitrogen, as found in plants in areas with higher nutrient levels (Coley, et al., 1985). Barrens plants have a high-surface-to-volume and dead-to-live tissue ratios. In addition, they create highly flammable litter that has low water-absorbing and holding capacity and low-nutrient content (especially low phosphorus content, which in certain forms is a fire suppressant). However, these adaptations mean that while they can tolerate infertile soils and frequent fire, they do not have the ability to grow quickly and compete for sunlight (Chapin, 1980). The litter created by barrens plants is low in nutrients, again creating conditions inhospitable to fast-growing competitors found in more eutrophic conditions.

These barrens species effectively create conditions conducive to fire and in which fire-intolerant species cannot become established or survive. In the absence of fire, highly competitive, mesic forest vegetation encroaches upon the fire-dependent communities. This results in the replacement of pitch pine-dominated communities and their highly flammable, low-nutrient litter by mesic vegetation that produces litter resistant to igniting and carrying flame. Furthermore, this mesic litter also decays to form soil, rich in organic matter (Streng and Harcombe, 1982 and Little, 1979).

Absent of fire, the pitch pine-scrub oak community would succeed to pitch pine-oak, pine-northern hardwood, and/or Appalachian oak-pine forest, depending on seed source, soil conditions, and random events. In these communities, fire is less frequent, intense, or severe. Variations in species composition and abundance result from alterations in environmental conditions (e.g., light, temperature, and nutrient availability) that result from interactions between plant species. As soil nutrients increase and light reaching the forest floor decreases, shade tolerant species begin to dominate the understory. These species reach the canopy as the early oak and pine dominants are eliminated.

As described above, tree oaks are dominant in the Appalachian oak-pine and pine northern hardwoods communities, including black, white, scarlet, and chestnut oaks. Chestnut oak can produce acorns at 20 years of age (Carey, 1992), while white oak begins at 50 years (Tirmenstein, 1991). Tree oak seedlings and saplings do not grow well under the low-light conditions found in closed canopy forests. Slow moving, surface fires create suitable conditions for oak regeneration by opening the canopy, eliminating the mid and understory strata in mixed hardwood stands and preparing the seed bed (Van Lear et al., 2000). Open canopy woodlands, created by fire or cutting, favor growth of tree oaks. Lower light levels beneath the tree canopy (>60% cover) apparently limits the growth of shrub species, especially scrub oak.

Tree oaks vary in their tolerance to fire and fire frequency in oak dominated forests. A past study of an old growth chestnut oak forest showed a fire return interval of approximately 10 years (M. Abrams, Pennsylvania State University, pers. comm.). Harmon (1984) reported that a return interval of 14 years would yield a 50 percent survival rate of chestnut oak following low-intensity surface fires. Young pole-sized saplings may be top-killed by fire, but readily re-sprout. Tree oaks over 80 years of age can re-sprout following top-killing. Brown and Davis (1973) reported that chestnut oak is moderately resistant to fire and Spalt and Reifsnyder (1962) reported that chestnut oak was more fire resistant than scarlet, black, and white oak.

C. Effects on Wildlife Species

Wildland fire is generally recognized as beneficial to the rare and declining wildlife species referenced in Section III, B. As previously described, wildland fire can restore and/or maintain the composition, structure, and function which is essential to suitable wildlife habitat. However, an individual burn may have short-term detrimental effects on wildlife through direct mortality and the temporary loss of suitable habitat. Therefore, precautions are needed to avoid and/or minimize any short adverse impacts. The single most significant action the APBPC can take to alleviate negative effects of prescribed fire on rare and declining wildlife is to retain adequate refugia of unburned habitat adjacent to burned sites. Refugia, within and surrounding burn areas, should ensure that wildlife populations are capable of re-colonizing burned areas. Adequate refugia are especially important during the restoration phase of Preserve management.

Additionally, once restoration of habitats is complete, the maintenance fire regime should provide the time needed between fire operations, within a given management unit, to allow rare wildlife populations time to recover. The Karner blue butterfly is likely the single most restrictive of the rare wildlife species in the Preserve. Using this species as a guide, adequate refugia should remain at 2/3 of a given subpopulation area (or Preserve fragment) and adjacent 1/3 should not be treated in consecutive years without significantly compelling rationale. In the case of the Karner blue butterfly, the application of this management strategy would facilitate a five-year fire rotation in occupied habitat. It is important to note that restoring suitable habitat for this and other rare wildlife may require more frequent fire operations. However, it is currently believed that a five-year frequency is considered adequate to meet the habitat maintenance management strategy described above.

V. Fire Management in the Albany Pine Bush

A. Fire Management History

The APBPC"s fire management program was implemented in 1991 to restore and maintain fire-dependent communities and wildlife habitat and to reduce fuel loading throughout this wildland urban interface (WUI) (Table 3). This program was implemented with the assistance of The Nature Conservancy, NYSDEC, other Commission partners, and local fire departments. To date 1,156 acres of Preserve lands have been managed with prescribed fire, with several units being burned more than once (Figure 1). Mechanical treatment of fuels was initiated in 1995 and in 2003 the Commission began what is referred to as single-season Mow+Burn treatments (Table 4). These are single-season treatments, in which scrub oak and other smaller shrub fuels are mowed (typically in late spring/early summer) with a hydro-axe, allowed to dry and cure while allowing the live scrub oak and other shrubs to re-sprout from root stocks, and then burned within the same growing season.

The result is a slow-moving, severe fire that not only consumes surface fuels (i.e., mowing debris), but also ground fuels (i.e., organic soil comprised of decaying litter and duff). Additionally, this slow moving fire top-kills and consumes most of the scrub oak stems and opens up the habitat for other plants. The growth of the scrub oak the following two to three years is subsequently retarded for one to two growing seasons as the plant utilizes its stored carbohydrates. Dormant season prescribed fire, is desired as long as the overall fuel bed depth and fuel loads are considered to be within acceptable ranges. Generally, scrub oak should be between five and 10 feet tall. Density, or spacing of individual plants, should be low enough that suppression equipment and personnel can easily and safely access interior portions of a burn unit. Maintaining restored pine barrens communities will use both dormant and growing season fire, singly or in combination with additional chemical and/or mechanical treatments.

Table 3. Summary of Prescribed Fire Management in the Albany Pine Bush Preserve, 1991-2009.

Year	Days Burned	Number of Units	Acres
1991	10	14	44
1992	2	3	12
1993	6	11	75
1994	6	8	107
1995	10	15	92
1996	10	16	143
1997	7	7	50
1998	5	5	65
1999	3	3	74
2000	2	2	13
2001[a]	0	0	0
2002	1	1	8
2003	7	8	56
2004[b]	10	7	129
2005	8	10	133
2006	8	9	83
2007	3	3	52
2008	5	3	5
2009	5	2	14.5
Total	108	127[c]	1,156
Annual Mean	5.7	6.7	60.8

[a] two test fires were lit during 2001 season
[b] initiation of Mow+Burn management treatments of pine barren habitat
[c] individual burn units may have been burned more than once between 1991-2009

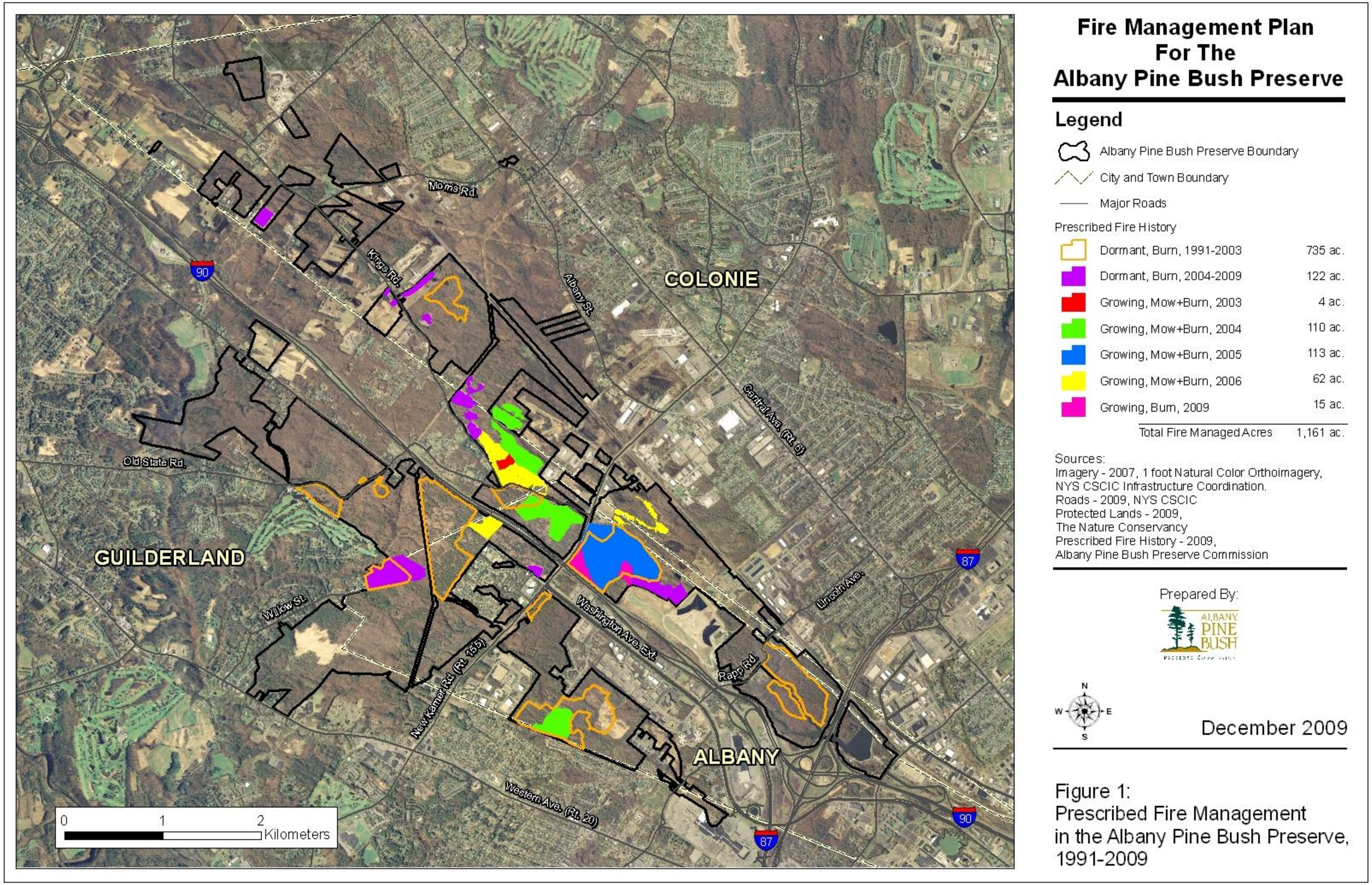


Figure 1:
Prescribed Fire Management
in the Albany Pine Bush Preserve,
1991-2009

Table 4. Summary of Mechanical and Fire Treatments in the Albany Pine Bush Preserve, 1995-2009.

Date	Acres Mowed	Acres Burned	Acres Mow+Burn[a]	Acres Managed[b]
1995	26	92	0	118
1996	30	143	0	173
1997	40	50	0	90
1998	35	65	0	100
1999	35	74	0	109
2000	70	13	0	83
2001	45	0	0	45
2002	25	8	0	33
2003[c]	31	52	4	65
2004	0	19	110	129
2005	0	20	113	133
2006	38	21	62	121
2007	0	52	0	52
2008	115	5	0	120
2009	0	14.5	0	14.5
Total	490	629	289	1386
Annual Mean	32.7	41.9	19.3	92.4

[a] single-season treatment on same parcel of ground conducted during growing season
[b] Acres Managed is a total of Acres Mowed, Acres Burned, and Acres Mow+Burn
[c] initiation of single-season Mow+Burn treatments

B. The Fire Environment

1. Fuel Types

The primary components of the “fire environment” are the fuel types, weather, and topography of an area. Mapping of natural communities has provided information needed to put communities into fuel types according to United States Forest Service methods.

The APBPC Fire Management Program previously utilized 13 fuel models developed by Anderson (1982) to predict potential fire behavior during prescribed fires. These models were created for periods of severe fire behavior and are, at times, deficient for predicting fire parameters for prescribed fires. While these were the best available models for predicting wildland fire behavior at the time, , they were developed for fully cured, very dry fuels and do not account for fuel conditions typical of more humid regions of the country (Anderson, 1982). To increase the efficacy of fire behavior predictions, based on computer modeling (Andrews et al., 2004 and Andrews, 2007), Scott and Burgan developed a new set of fuel models in 2005 that: 1) more accurately reflect fire behavior during prescribed fires and 2) more accurately reflect fuel response to humidity levels encountered in various regions of the country. Scott and Burgan (2005) also increased the number of models, offering practitioners more realistic choices of timber-dominated fuel beds including, forest litter fuels and litter fuels with grass or shrub understory .It is important to note that Scott and Burgan (2005) did not replicate the data for the original 13 fuel models.

Fire behavior calculations in existing prescribed fire plans were modeled on the original 13 fuel models (Table 5) and they are still available for use, where applicable. Additionally, they and can be used in conjunction with the more 40 fuel models developed by Scott and Burgan (2005) (Table 6). The APBPC Fire Management Program will incorporate, where applicable, the new 40 fuel models when new prescribed fire plans are created or when existing plans are revised. Additionally, plans may also be written utilizing custom fuel models for pitch pine-scrub oak barrens (PPSOB), which were developed for mowed and unmowed areas by Patterson et al. (2005) (Table 6).

Table 5. Fuel Types and Natural Communities in the Albany Pine Bush Preserve Utilizing the Original 13 Fuel Models (Anderson, 1982).

Fuel Model(s)	**Communities**
Grass	
1, 2, and 3: Fire spreads rapidly through herbaceous material such as cured graminoid and herbaceous species. Shrubs or trees may be widely scattered.	Open grassy areas of pitch pine-scrub oak barrens, brushy cleared land, and grassy openings (e.g., restored locust sites). Some croplands may also be included.
Shrub	
4: Fires are of high-intensity and rapid spread through both live and dead woody materials found in dense shrublands.	Scrub oak dominated pitch pine-scrub oak barrens or areas of extensive huckleberry Top killed scrub oak may exhibit behavior similar to Fuel Model 4
6: Fires are carried by primarily dead shrubs of lower density than in Fuel Model 4.	Pitch pine-scrub oak forest Pitch pine-scrub oak thicket Appalachian oak-pine Brushy cleared land
Timber	
8: Low-intensity, slow-moving fires spread through leaf litter from short-needle conifers (hemlock) or hardwoods (beech and maple).	Pine-northern hardwood Successional northern hardwood forest Successional southern hardwood forest Rich mesophytic forest Chestnut oak forest
9: Somewhat higher intensity fires moving through hardwood (oak) and long-needle (pitch pine) leaf litter.	Appalachian oak-pine forest Pitch pine-scrub oak barrens Pitch pine-scrub oak forest
10: Surface fire moving through three inch or larger wood from wind-thrown branches and trees.	All forest types

Table 6. Fuel Types and Natural Communities in the Albany Pine Bush Preserve Based on a New Set of Standard Fuel Models (Scott and Burgan, 2005) and Custom Fuel Models (Patterson et al., 2005).

Fuel Model(s)	**Communities**
Grass[a]	
GR1/GR3 Moderate spread rate and low to moderate flame length. *Fuel model is Dynamic*[b]	Cleared land and grassy openings with short fuel. Fuel may be sparse or discontinuous (e.g., restored locust and agricultural sites). Fuel loads range from low to moderate.
GR8 High spread rate and flame lengths. *Fuel model is Dynamic*[b]	Cleared land and grassy openings with tall, continuous fuel (e.g., restored locust and agricultural sites). Fuel loads are higher than GR1/GR3.
Grass-Shrub[a]	
GS3 High spread rate and moderate flame length, which are strongly regulated by the effect of live herbaceous moisture content. This is dependent on amount of grass and shrub load in the fuel model. *Fuel model is Dynamic*[b]	PPSOB with low to moderate, short scrub oak and herbaceous plants (e.g., National Grid high transmission powerline right-of-way).
Shrub[c]	
Custom 1 High spread rate and moderate to high flame length.	Unmowed PPSOB. Shrub litter and grasses, along with both live and dead woody materials (e.g., scrub oak, huckleberry, and blueberry).
Custom 2 Low to moderate spread rate and flame length. Depending on size, woody regrowth may moderate fire behavior.	Mowed PPSOB. Cured, mowed 1- and 10-hour woody fuels, as well as shrub litter and some grasses. Live woody regrowth also may become available.
Timber-Grass-Shrub[a]	
TL2/GS3 Moderate to high spread rate and low to moderate flame length. GS *fuel model is Dynamic*[b]	Forest litter with shrub-grass understory; some areas dominated by grass, others by shrubs. May be buildup of 1,000-hr fuels (e.g., girdled aspen).

Table 6. Continued.

Timber-Shrub[a]	
TU2/SH4	
Moderate to high spread rate and flame length.	PPSOF and pitch pine-scrub oak thickets with moderate shrub understory. Primary fire carrier is needle litter, woody shrubs, and shrub litter. Low to moderate overstory, shrub, and litter loads. Shrub depth about 3 feet.
TU2/SH8	
Comparable spread rate and higher flame length than TU2/SH4.	PPSOF with dense shrub understory. Primary fire carrier is needle litter, woody shrubs and shrub litter. Dense shrubs with some herbaceous fuel. Fine fuel load greater than TU2/SH4.
Timber[a]	
TL2	
Low spread rate and flame length.	Low load, invasive broadleaf forest litter.
TL6	
Moderate spread rate and low flame length.	Pitch pine oak forest. Primary fire carrier is moderate load broadleaf and long-needle pine litter, which may include small amounts of herbaceous load. White pines and invading hardwoods may be present in the canopy. Fuel is less compact than TL2.

[a] Scott and Burgan (2005)
[b] dynamic fuel models - live herbaceous fuel load shifts from live to dead as a function of live herbaceous moisture content
[c] Patterson et al. (2005)

Several community types exist within the Preserve boundary with either sparse or low intensity fuels (Table 7). Fires in such communities would be unlikely to spread far or fast. In fact, such communities could serve as natural fire breaks under certain conditions.

Table 7. Communities with Sparse or No Fuels in the Albany Pine Bush Preserve (Anderson, 1982).

Fuel Levels	**Natural Communities**
Sparse or patchy fuels with some high-intensity fuel types	Cultural uses Brushy cleared land
Low intensity fuels with limited capacity to carry fire	Pine-northern hardwood Rich mesophytic forest Successional northern hardwood forest Successional southern hardwood forest
Wetlands capable of carrying fire only in drought conditions	Sedge meadow Shallow emergent marsh Pine barrens vernal pond Red maple-hardwood swamp
No fuel	Roads Mowed lawns Lakes Streams

Fuel moisture is generally characterized for live and dead fuels. Dead fuels are described based on the amount of time it takes for the material to equilibrate, in terms of moisture, with the environment. One-hour fuels (0-1/4" diameter) (e.g., pine needles and leaf litter) can quickly absorb moisture from the air or lose that moisture if humidity decreases. For example, on a sunny spring day, these fine fuels can rapidly dry and increase in flammability from early morning to mid day as humidity decreases. As the terms suggest, 10-hour (1/4-1" diameter) and 100-hour fuels (1-3" diameter) equilibrate over longer periods of time, typically days or weeks. Long periods without rain can significantly affect the ability of such fuels to burn. Live vegetation is usually less vulnerable to ignition, but certain vegetation (e.g., pitch pine and some heath shrubs) can burn with high live fuel moisture. Live fuel moisture will increase as new growth occurs and decrease with senescence and/or dormancy in the fall. Fire intensity in such fuels is highest when live fuel moisture is low, typically during the dormant season.

2. Weather

Monthly temperatures from 1961 through July 2008 for Albany ranged from 2.9°F to 40.5°F in January and from 55.0°F to 86.1°F in July and total average annual precipitation was 38.2 inches (H. Johnson, National Weather Service, Albany, NY, pers. comm.). There can be a substantial amount of variation in precipitation from year to year and from month to month.

During the spring and early summer, lengthening days and the movement of frontal systems bring warmer conditions to the area with alternating periods of precipitation and drying as systems move across the continent. Relative humidity can range as low as 20-30 percent during days when high pressure systems dominate or as high as 100 percent during precipitation events or as temperatures drop at night. The potential for fire is highest during periods of low precipitation and low relative humidity.

During periods of low relative humidity, fine fuels can readily ignite. Wildfires occurring during these periods can create sparks or embers carried aloft in the rising hot air above the fire. As these embers or sparks fall, they may create spot fires downwind of the main fire, especially when humidities are below 35 percent. During periods of high winds, these embers may fall hundreds of feet from the main fire and cross barriers such as roads, wetlands, water bodies, and fire breaks.

In the Albany area, winds are generally from west (southwest to northwest), especially during periods when high pressure systems dominate local weather patterns. Easterly winds are generally associated with storm systems that bring in precipitation and higher humidity. Wind velocity increases with altitude due to less resistance from vegetation at the ground. Winds within forests are much lower than within open shrubland or grassland areas (Geiger, et al., 1995). Winds may also be channeled by fire breaks, roads, and powerline right-of-ways and be modified by nearby structures or topography (e.g. sand dunes).

Intensity and Severity of Fires

Intensity refers to flame length and rates of spread in surface fires. High-intensity fires have long flame lengths and high rates of spread, but may not burn down into the litter and duff layers.

Severity refers to burning into litter and duff layers in surface or ground fires. When temperatures are high and precipitation and relative humidity are low for long periods of time, these layers dry out and fire can reside for long periods of time resulting in reduction or loss of organic material down even to mineral layers.

Generally, the periods when high-intensity fires are most likely are in the spring (April to June) and again in the fall (October and November). These periods are correlated with large scale weather patterns that result in high pressure areas that create generally strong, westerly winds and low relative humidities (North Central Research Station, 1999). In the spring, leaf litter and standing dead stems are the primary fuels. As plants leaf out, live fuel moisture increases and the potential for high-intensity fires decreases. Both scrub oak and huckleberry can burn with high intensities after leafing out. Shrub fuel models (fuel model 6) have been shown to underestimate summer fire behavior in huckleberry in oak forests (Dell"Orfano, 1996). During the fall, senescing vegetation loses live fuel moisture, and fine fuels can dry in low humidities. However, in the fall, the days become shorter and the amount of time when the humidity is low is much less than in the spring and summer. In addition, leaves that fall are not fully cured and contain chemicals that reduce fire intensity. Droughty conditions in the summer months also cause reduction in soil and duff moistures, so that the potential for severe fires increases. As discussed in Section III, C, most of the historic fires in the Albany Pine Bush occurred in March, April, October, and November, but there were also a significant number of fires in July.

> **Types of Fire**
>
> **Ground fires** are low-intensity, high-severity fires where litter and duff are consumed. Fires may also burn in peat and last for weeks or months or even years.
>
> **Surface fires** are low to high-intensity fires burning in litter, herbaceous or shrub layers. Such fires can have high rates of spread and pass leaving duff relatively untouched if soil moisture is high.
>
> **Crown fires** burn through tree canopies. In surface fires, individual trees may be consumed in a fire, but in crown fires the fire actually spreads from tree to tree with high rates of spread and intensity.

Sandy soils can dry more quickly than organic soils. Therefore, there is a potential for fires that would burn into organic layers (duff) during dry spring conditions, as well as in the summer or fall. High-intensity fires may also burn away organic litter, revealing mineral soil.

Downed woody fuels, also known as slash, present special problems for fire management. It is generally thought that slash increases the hazard of wildfire. This is especially true in the western United States where low humidity can dry woody fuels. Slash consists of both fine fuels, that can equilibrate to changing humidity conditions quickly, and larger fuels which take days or weeks to equilibrate. In general, fine fuels affect the intensity and rate of spread of fire over large areas. Larger fuels, which may be discontinuous, create pockets or "jackpots" that can flare up and cause localized intense fire, but not fire that will spread rapidly. In the Albany Pine Bush Preserve, downed woody fuels resulting from wind and ice storm damage or from management and restoration activities, such as girdling, use of chemical or mechanical treatments may create localized fuel accumulations. They also create problems for mop up, as such areas will burn for long periods.

VI. Prescribed Fire Requirements

A. Fire Planning: The Prescribed Fire Plan

Each burn must be planned carefully. The intent of this planning is to meet the ecological goals and objectives for fire management while assuring safety and the protection of life and property. Prescribed fire plans or prescriptions are required by New York State law (6NYCRR Chapter II, Part 194 and ECL Article 46). Prescribed fire plans will be prepared by a fire planner and approved by the APBPC Executive Director. They are then used by the burn boss to implement the burn in a given unit. Approved prescribed fire plans are in effect until conditions stated within the plan have changed (e.g., fuels and/or burn unit boundaries).

Prescribed fire plans should provide details on the following:

- Legal and administrative review, permits and approvals
- Unit location and maps
- Emergency contacts, safety and medical information
- Public notification
- Description of the burn unit, including the surrounding area, hazards, fire and/or smoke sensitive areas, and other information
- Required weather and fuel parameters

- Goals and objectives of the burn
- Expected fire and smoke behavior
- Crew assignments and organization
- Required equipment
- Burn day operations (fire break preparation, ignition and holding plan, communications, mop-up procedures, and public relations)
- Contingencies
- Go/No Go checklist
- Post-burn evaluation

B. Weather and Fire Behavior Parameters

The three controlling factors of fire behavior are fuel, weather, and topography. In developing prescribed fire plans, the relationship between weather and fire behavior in different fuel types requires the most consideration. Weather conditions, particularly wind and relative humidity, can be used to predict fire behavior within different fuel types. The U.S. Forest Service has completed extensive research on this area (Rothermel, 1983).

Each prescribed fire plan must address required weather and fuel parameters (Table 8). These parameters are inflexible and cannot be modified. Fire behavior predictions will be calculated for the various fuels within each unit utilizing computer modeling, such as Behave 4.0 (Andrews et al., 2008). Actual fire behavior may temporarily fall outside those predicted, provided that ecological objectives can be met and the burn can be conducted safely.

Table 8. Weather and Fuel Parameters for Prescribed Fires in the Albany Pine Bush Preserve.

	MIN	MAX
Wind Direction	each unit varies	
Wind Gusts (mph)[a]	-	15
1-Hour Fuel Moisture (%)	5	18
100-Hour Fuel Moisture (%)	12	28
Atmospheric Mixing Height (ft)	1,500	-
Air Temperature (ºF)	33	95
Relative Humidity (%)	35	60
Keetch Byram Drought Index[b]	0	200
Days Since Rain	dependant on fuel type and time of year [c]	
Growing Season Specific		
Midflame Windspeed (mph)[a]	1[d]	8
10-Hour Fuel Moisture	8	28
Live Fuel Moisture	60	300
Dormant Season Specific		
Midflame Windspeed (mph)[a]	2	8
10-Hour Fuel Moisture	10	24
Live Fuel Moisture	30	90

[a] measured at eye level.
[b] a continuous reference scale for measuring the dryness of the soil and duff (decaying leaf litter) layers. The index increases for each day without rain (the amount of increase depends on the daily high temperature) and decreases when it rains. The scale ranges from 0 (no moisture deficit) to 800 (extreme drought) (Keetch and Byram, 1968).
[c] days since rain determination will be evaluated for each fuel type or combination of fuel types within the Preserve on a case-by-case basis. Fuel type, time of year, and soil moisture also may be considered when making this decision. This decision will be made by the Fire Management Specialist and/or the Burn Boss leading the fire operations.
[d] light and variable winds are acceptable during growing season burns.

C. Prescribed Fire Crew Qualifications, Organization, Responsibilities, and Equipment

Crew qualifications, experience, and equipment are critical to safely and effectively implementing a wildland fire program. During 2009 the APBPC adopted the training, experience, physical fitness level, and position currency standards outline in the National Interagency Incident Management System, Wildland Fire Qualifications System Guide, PMS 310-1 (National Wildfire Coordination Group [NWCG], 2009). These standards provide for clear lines of authority. The burn boss is the ultimate authority on a burn, with delegation of holding and ignition responsibilities to line bosses or the firing boss and holding boss. The following are required training, experience, and organizational parameters:

<u>Minimum training for all crew</u>: All crew and volunteers must be certified to the NWCG standard of Firefighter Type 2 (FFT2). NYSDEC Forest Rangers have their own policy, but generally follow NWCG standards. Smoke spotters are exempt from the above certification, due to this position"s location away from the fireline.

<u>Burn Boss</u>: Burns will be lead by a Prescribed Fire Burn Boss Type 2 (RXB2) or Type 1 (RXB1), certified to NWCG or NYSDEC standards.

<u>Firing Boss:</u> Certified to the NWCG standard of Single Resource, Firing Boss (FIRB).

Holding Boss: Certified to the NWCG standard of Firefighter Type 1 (FFT1).

Line/Squad Boss: Certified to the NWCG standard of Firefighter Type 1 (FFT1).

Experience: Crew must have participated in at least three prescribed fires as an apprentice. Crew with previous fire experience from another agency or organization may be exempt from this requirement.

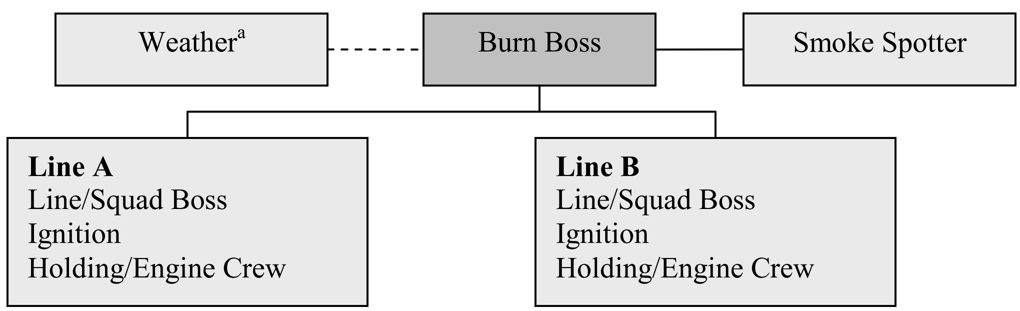
Physical fitness: All crew should meet the moderate or arduous levels, as described by the NWCG in PMS 310-1. This testing shall take place once every 12 months.

Annual Fireline Safety Refresher: All crew are required to attend an annual fireline safety refresher once every 12 months.

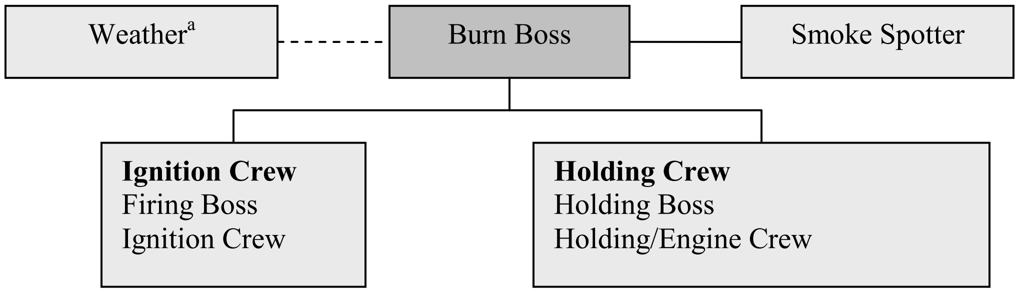
Crew Number: Ten (minimum number of 6 for research plots or other special circumstances approved by APBPC‟s Executive Director [e.g., small, low complexity portions of a unit]).

General organization and responsibilities of all crew are provided below. Two types of crew organization may be utilized on prescribed fires.

Option 1:



Option 2:



[a] weather observer does not need to exist as a dedicated position under either crew structure. If appropriate, given the complexity of the burn and number of personnel on-site, this function may be performed by holding crew members who have the ability to communicate directly with the burn boss.

General responsibilities of all crew are provided below:

Burn Boss

- Oversees entire burn and directs actions as appropriate
- Makes decision to start test fire and burn or shut down burn
- Decides when to begin mop-up and when it is complete
- Determines when to shift into suppression mode, if necessary
- Communicates with line/squad bosses, firing boss, holding boss, smoke spotters, weather observer, and fire behavior monitor
- Monitors fire behavior

Firing Boss

- Oversees the ignition of burn, under the guidance of burn boss
- Directs the ignition crew
- May be called upon to assist with suppression, in the event of a spot or slop-over

Holding Boss

- Oversees the holding of the burn, within the unit boundaries (fire breaks)
- Directs the holding crew as ignition proceeds
- In the event of a spot or slop-over, the holding boss will size up the situation and may lead initial attack procedures
- Oversees mop-up

Line/Squad Boss

- Oversees the holding of the burn, within the unit boundaries (fire breaks)
- Directs ignition of burn, under guidance of the burn boss or firing boss
- Directs holding crew as ignition proceeds
- In the event of a spot or slop-over, the line/squad boss will size up the situation and may lead initial attack procedures
- Oversees mop-up

Ignition Crew

- Must understand fire behavior and anticipate changes
- Use drip torch or other tool to ignite unit
- Always aware of position of holding crew
- Usually follows direction from line/squad boss or firing boss

Holding Crew

- Primary responsibility is to hold fire within the unit boundaries (fire breaks)
- Monitors the line (firebreak) and adjacent unburned fuels for spots or slop-overs
- Consists of two to six people who are proficient with a variety of hand tools (backpack pumps, council rakes, pulaskis, fire shovels, McLeods, etc.)
- Patrols line from current point of ignition, back to initial point of ignition (test-fire) throughout the duration of the burn.
- Often works in teams for safety and to rotate in and out of smoke
- Directed by line/squad boss or holding boss

Engine Operator

- Must be able to drive multiple vehicle types and maneuver off-road in narrow situations
- Drives truck or other vehicles along firebreaks and in unit interior, if requested for mop-up or suppression
- Works with hose/pump operator and directed by line/squad boss or holding boss
- Acts as part of holding crew, unless a situation develops elsewhere requiring relocation of the engine

Hose/Pump Operator

- Must understand the water delivery system and ensures pump is in operation prior to burn
- Uses hoses for wet-lining, foam application, mop-up and suppression
- Communicates with the driver and is directed by the line/squad boss or holding boss

Smoke Spotter

- Observe smoke dispersal
- In direct radio contact with burn boss
- Must communicate efficiently - using terminology (e.g., lift, column, settling, etc.)
- Reports any problems immediately to burn boss
- May serve as public liaison

Weather Observer or Fire Effects Monitor (FEMO)

- Collects information needed to assess current and potential fire behavior (information is also used to assess fire effects on vegetation)
- May serve as holding crew member

- Collects data on fire behavior: type of fire, rate of spread, flame lengths, fuel type, etc.
- Collects data on weather: relative humidity, temperature, wind speed, direction, etc.
- Communicates directly with the burn boss; updates on-site weather every hour
- Submits fire data observation sheet to burn boss for completion

All fire crew will have personal protective equipment, including: fire-resistant Nomex clothing, hard hat, goggles, fire shelter, leather gloves, and leather boots. Portable radios are distributed as appropriate to the crew for communications. In addition, there will be at least two cellular phones on site for emergency communications. All equipment will be checked to make sure it is in working order prior to any burn (Table 9).

Table 9. Required Equipment for Prescribed Fires in the Albany Pine Bush Preserve.

Item	**Number**
Engine	2
Backpack pump	6
Drip torch	6
Drip torch fuel	2 x 5 gal.
Council rake	4
Fire shovel	2
Pulaski	2
Spring tooth rake	2
Chainsaw w/accessories	1
Weather kit	1
First aid kit	1
Water cooler	2
Portable radio	≤10

D. Unit Preparation and Fire Management

Fire breaks will be either moved lines, four to eight feet in width; mowed road-side rights-of-ways (ROW); hiking trails; trails cleared with a leaf blower or rakes, one to two feet in width; and/or roads. Progressive hose lays also may be deployed to reinforce firebreaks depending on fuels and conditions. Overhanging vegetation will be limbed and removed. Firebreaks may be wetlined during the burn, if necessary. Mowed lines, roads, and ROW"s may be engine and/or ATV accessible.

A complete weather forecast will be obtained from the National Weather Service or NYSDEC meteorologists. Wind, relative humidity, and temperature will be taken at one-hour intervals preceding and during the prescribed fire and information from a weather radio may be recorded as well. One-hour fuel moisture data will be calculated from on-site weather data and 10-hour fuel moisture data will be collected from either a protimeter or fuel moisture sticks. If conditions fall from required parameters, ignitions may be stopped and the prescribed fire appropriately suppressed. However, it may be safer to continue the prescribed fire to completion. This decision will be made by the burn boss and recorded in the post-burn evaluation.

Parts of a Fire

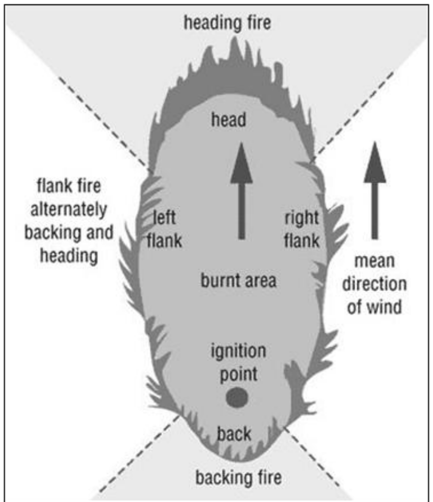


Diagram depicting parts of bushfire:
Copyright CSIRO. Reproduced with permission.

Crew should be briefed on how the burn will be implemented, contingencies, mop-up, hazards, and other operational procedures. Hazards may include: the fire itself, rough and uneven terrain, tripping hazards (e.g., shrubs, branches, and roots), vehicle traffic, powerlines, and insects (e.g., ticks, wasps, and bees). Fire behavior in shrub fuels can be intense and smoke can cause eye and skin irritations and respiratory problems. All crew members should be familiar with the area. A crew briefing and site walk around will be conducted. All crew members must wear personal protective equipment until the burn and mop-up operations are complete. Equipment should be checked prior to the burn to make sure it is in proper working order.

Following the crew briefing and all required notifications, and if on-site weather and fuels are within parameters, a test fire will be ignited at the downwind side of the burn unit. Test fires are used to evaluate on-site fire and smoke behavior and will vary in size and duration as conditions warrant. Backing and flanking fires will be used to gradually widen the downwind firebreaks. Drip torches will be the primary tool used for ignition and the pace of ignition will be controlled by the burn boss or firing boss. The decision on how the units will be burned is at the discretion of the burn boss, with consideration given to weather parameters, fire and smoke behavior characteristics, control factors, and firefighter safety. Existing trails, topography, and changes in the fuel complex will be considerations used for developing the ignition pattern.

Fire behavior will be manipulated using various ignition techniques. Primary ignition patterns used may include: backing, flanking, and strip-head fires. Dot, chevron, and ring head fires also may be used to achieve desired intensity and rate of spread. Firing patterns and directions may change depending on wind direction or other parameters. In general, ignition crew members involved with ignition on the perimeter of the burn unit should be accompanied by a holding crew member and/or an engine. Crews also may be utilized to reduce heat on the fireline or extinguish fires that could climb into high vegetation (e.g., snags or trees with associated ladder fuels).

Once the burn has been completed, mop-up will commence. Mop-up involves extinguishing all smoke and smoldering material. Mop-up may be timed to allow areas to smolder to extinction. Following mop-up, crew members will check the units thoroughly to make sure all smoldering materials are out, and must check the unit again the following day.

An After Action Review (AAR)/crew debriefing will be completed after the prescribed fire. Topics of discussion may include, but not be limited to: what was planned, what actually happened, why did the events happen, and what can be done next time (correct weaknesses/sustain strengths) (NWCG, 2006).

E. Contingencies

During the briefing, actions needed in the event of an escape need to be clearly discussed with the crew. All crew should know the locations of roads, trails, and firebreaks and the names of surrounding burn units or landmarks.

Contingencies that should be addressed include:

- Equipment breakdown or malfunction
- Injury to crew member(s)
- Unexpected fire behavior
- Weather or other conditions resulting in parameters out of prescription
- Shift in speed or direction of wind
- Unacceptable smoke behavior, with smoke impacting roads or neighboring properties

Addressing these contingencies is the responsibility of the burn boss and depends on the situation. For example, shifts in wind or equipment problems may be of short duration, or they may result in the decision by the burn boss to terminate the burn. The burn boss and the crew must be prepared for such events.

The most serious contingencies involve fire escaping the burn unit. There are many ways of suppressing escapes, and the common methods will be described below, focusing on methods utilizing the crew and equipment that would be involved in a prescribed fire. In all cases, should fire escape the unit boundary, ignition operations will cease.

Minor spot fires, where burning litter crosses a line and ignites an area outside of the burn unit, may occur. Any fire outside of the burn unit will be reported immediately, up the chain of command, to the burn boss. Ignition within the burn unit will cease, if safely practicable, until the spot fire or spotover is contained. Any fire that spots onto adjacent property, not managed by the APBPC, will be cause for the burn boss to call 911.

Spot fires will be handled by the holding crew or nearest engine, under the direction of the line/squad boss or holding boss (Table 10). Hand crews start from a secure “anchor” point. This is an area that would be barrier to fire such as a major fire break or areas already burned. Anchor points prevent a fire from outflanking the suppression crew. Crew members would stay within the “black,” (i.e., the area already burned in the escape) and work each of the flanks toward the head of the fire.

Table 10. Hauling chart: fire behavior and control strategies (Goodson and Adams, 1998).

Flame Length	Control Strategy
0-4 feet	Attack of heads or flank is possible with hand tools; hand lines should hold fire
4-8 feet	Too intense for direct attack; heavy equipment necessary for suppression
8-11 feet	Serious control problems; attack of head fire probably ineffective
>11 feet	Crowning, spotting, major runs probable; indirect attack may be best option

The burn boss has the authority to declare the escape fire a wildfire and summon assistance from local fire departments and the NYSDEC. If the need for backup suppression occurs, emergency assistance will be requested by calling 911 on the cellular phone. Once the suppression agency (or agencies) arrives on site, the Incident Commander (usually the fire department chief or designate) will take control of suppression operations and assume authority from the burn boss. However, a Unified Command may be established to include the burn boss or other qualified APBPC personnel. The APBPC crew will operate under the Incident Commander"s direction. During contingency operations all prescribed fire ignition operations will cease.

Crew Organization - Option 1

The nearest line/squad boss will size-up the fire, communicate the size-up and request resources as needed, secure an anchor point on the upwind side of the fire, and proceed suppressing the fire along the "hot" flank, towards the head, or downwind part of the fire. If this cannot be safely achieved the crew will work to suppress the "cool" flank or pull back for indirect attack. The line/squad boss may instruct their holding crews to serve as two suppression hand crews, one suppressing the "hot" flank, the second suppressing the "cool" flank, also starting at the anchor point and working toward the head.

The line/squad not involved with the spotover/escape may begin suppressing the prescribed fire in a similar fashion to the line/squad attending the escaped fire. The burn boss may decide to monitor the prescribed fire, versus extinguishing it. If the prescribed fire is suppressed, resources may be re-assigned to assist with the suppression of the escaped fire.

Crew Organization - Option 2

The holding boss will size-up the fire, communicate the size-up and request resources as needed, secure an anchor point on the upwind side of the fire, and proceed suppressing the fire along the "hot" flank, towards the head, or downwind part of the fire. If this cannot be safely achieved the crew will work to suppress the "cool" flank or pull back for indirect attack. The holding boss may instruct their holding crew to serve as two suppression hand crews, one suppressing the "hot" flank, and the second suppressing the "cool" flank, also starting at the anchor point and working toward the head.

The firing boss may begin suppressing the prescribed fire in a similar fashion to the crew attending the spot/escape fire. The burn boss may decide to monitor the prescribed fire, versus extinguishing it. If the prescribed fire is suppressed, ignition crew resources may be re-assigned to assist with the suppression of the spot/escape fire.

If direct attack is not safely feasible, the escape may be indirectly attacked in the adjacent units. Indirect attack can be carried out by preparing firebreaks in the adjacent units and holding the fire at these, or at pre-established fallback lines. If necessary and approved by the burn boss, backfiring may be conducted from these lines.

Crew safety is paramount. Escape routes and safety zones should be identified. Fallback control lines can be established using fire breaks, roads, or trails on the periphery of adjacent units, with secondary fallbacks surrounding the region where the prescribed fire is occurring.

In the event of an escaped prescribed fire, unplanned ignition, or other major incident on prescribed fires or unplanned ignitions (i.e., serious medical/trauma injuries or fatality) the burn boss will follow the procedures outlined in the Albany Pine Bush Fire Management Media Response Plan (Attachment B). Careful attention will be made to keep personnel names confidential, until so release by the Commission.

VII. Guidelines for Wildfire Management

Fire can be managed through: 1) prescribed fires, 2) suppression of wildfires, or 3) wildland fire use (management of wildfires, where such fires are permitted to burn under specified conditions). This latter case can be thought of as managing a wildfire as a prescribed fire.

Wildfire response is undertaken by the NYSDEC and local fire departments, and they would act to suppress all wildfires. Clearly the suppression of wildfires is critical where they threaten life and property. New York State law specifies that the setting of fires is a felony offense. It is imperative that wildfire management policies be developed that address the public health and safety issues of wildfire, crew capabilities and safety, and ecological management goals.

The following are guidelines for wildfire management that should be discussed with NYSDEC and local fire officials:

1) The APBPC Fire Management Specialist should meet with each of the relevant fire departments annually to review prescribed fire plans and wildfire response guidelines.
2) In the event of a wildfire in/adjacent to the Preserve, the responding agency/department should notify the Commission.
3) APBPC staff may be useful to support wildfire control strategies, due to their expertise, level of training, and knowledge of the Preserve.
4) Fires should not be permitted to leave Preserve property or threaten adjacent property.

5) Fires burning in the Preserve should be suppressed with as little damage to the area as practicable.
6) Suppression operations should minimize disturbance where possible by:
   - Burning out areas from existing fire breaks, where appropriate.
   - Suppression during periods of reduced fire activity, especially during periods of higher humidity during the evening.
   - Using areas with sparse or low intensity fuels for fire breaks.
   - Using topography to create fire lines on the back sides of ridges and knolls.
   - Utilizing existing, natural firebreaks.
7) Since prescription parameters have been developed for much of the Preserve, depending on weather conditions and available suppression techniques, wildfires occurring within "prescribed fire parameters" could be treated as prescribed fires and suppression would be part of burning one or more units (wildland fire use fires).
8) Wildfires that burn in conditions outside of prescription parameters, where suppression resources are limited, or life and property are threatened should be suppressed.
9) Pre-fire planning and preparation should be enhanced to ensure that agency/fire department crew and equipment are ready to suppress a wildfire as appropriate.
10) The potential for wildfire occurrence should be based on daily, on-site fuel and weather conditions, and clearly communicated to staff and visitors.
11) Firebreaks, created or enhanced to suppress or contain wildfires, should be restored to their pre-fire conditions using appropriate means.
12) Prescribed fires or mechanical treatment should be applied in specified areas to reduce fuel loads and break up areas of continuous fuels. This may make wildfire suppression and management easier.

VIII. Impacts of Smoke

A. Smoke and Human Health

The Commission has completed an extensive analysis of the impacts of smoke (Hawver, 1996). Smoke from prescribed fires consists of airborne particulates or particulate matter from burning vegetation. Particulates are pieces of soot, transported through the air, which can irritate the mucous membranes of the respiratory system. Particulate matter is the most important class of material generated from the burning of vegetation and is usually thought of as the main health hazard presented to humans. Other sources of particulate matter include: factories, power plants, vehicles, construction activity, fires, and natural windblown dust. Particulates also may form as particles in the atmosphere by condensation or transformation of emitted gases, such as sulfur dioxide and volatile organic compounds.

Most research, focused on particulate matter relevant to prescribed fires, comes from studies of wildland fires. Ninety percent of the total mass emitted from wildland fires is water and carbon dioxide, neither of which is classified as a pollutant. Other substances are released, but little is known about their characteristics, primarily due to the variability in fuels and conditions during wildfires (Hawver, 1996). The portion of carbon not converted to carbon dioxide is converted to carbon monoxide, particulate matter, or to volatile organic compounds.

The concentrations of these decreases dramatically within short distances from the area of combustion (Hawver, 1996).

Particulates are of major concern because of the high concentration of organic material with the particles. Additionally, a high percentage of the mass of this particulate matter consists of particles less than 10 microns in diameter (Hawver, 1996). These can aggravate respiratory conditions in susceptible individuals. Over 90 percent of the mass of particulate matter produced from prescribed fires is less than 10 microns in diameter. This size particulate is considered to pose particular health concerns because its small size enables it to enter the human respiratory system. Larger particles greater than 10 microns become deposited in the nasal passages and medium sized (5-10 microns) tend to deposit in large- and medium-sized airways (bronchioles) and are removed by ciliary action and coughing. Smaller (respirable) particles (0.5-5 microns) find their way into the alveolar region of the lung, while very small particles (0.2-0.5 microns) avoid deposition and are carried back through the airways during exhalation (Hawver, 1996).

Based on studies of human populations exposed to high concentrations of particles (often in the presence of sulfur dioxide from industrial or commercial processes) and laboratory studies of animals and humans, the major effects of concern for human health include: effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis, and premature mortality (U.S. EPA, 1992). The major subgroups of the population that appears likely to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary or cardiovascular disease, those with influenza, asthmatics, the elderly, and children.

B. Smoke and Visibility

Particulate matter emissions can limit visibility. In the case of vegetation combustion, smoke particles can scatter visible light, thus reducing visibility. In areas with major roadways, smoke from controlled burning must be managed so visibility is not limited. Prescribed fires that occur in the Albany Pine Bush, near major thoroughfares, are carried out so smoke does not interfere with the roadway.

At high relative humidities, a small concentration of smoke can trigger fog formation creating poor visibility (Hawver, 1996). High humidities are not conducive to most prescribed fire operations, in that specified objectives are unlikely to be met. The vegetation will not burn well and the fire will not spread. Because of poor combustion and little biomass consumption, objectives will not be accomplished and the prescribed fire is usually postponed.

C. Clean Air Act Requirements

As part of the Clean Air Act, the U.S. Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) for particulate matter (PM_{10} and $PM_{2.5}$) and five other primary air pollutants: sulfur dioxide, nitrogen dioxide, ozone, carbon monoxide, and lead (U.S. EPA, 2009a). A major air quality goal of the Clean Air Act includes attaining the NAAQS. "Attainment" areas are geographical regions with air pollutant levels below the NAAQS, while “nonattainment" areas have air pollutant levels which violate the NAAQS. Greater restrictions are placed on activities which emit pollutants and contribute to violations of the NAAQS in “nonattainment” areas. The New York State Capital District (Albany, Schenectady, Troy) is currently listed as “Former Subpart 1” for 8-hour ozone and is in attainment of the NAAQS for all other remaining categories (U.S. EPA, 2009b). “Former Subpart 1” is addressed by the EPA as follows:

> “One June 8, 2007, the United States Court of Appeals vacated the Subpart 1 portion of the Phase 1 Rule. The Subpart 1 areas in the Greenbook are listed as “Former Subpart 1” until reclassification of the areas is finalized. Proposed reclassifications were published on January 16, 2009”

Currently, the proposed 8-hour ozone Subpart 2 classification for the Capital District is listed as “marginal” (U.S. EPA, 2009c).

Annual and 24-hour NAAQS for particulate matter were set in 1971. Total suspended particulate (TSP) was the major indicator used to represent suspended particles in the ambient air. On July 1, 1987 the EPA promulgated new annual and 24-hour standards for particulate matter, using a new indicator. These standards are based on PM-10, including only those particles with an aerodynamic diameter smaller than 10 microns. The standards were revised because additional research showed that these smaller particles are likely responsible for most adverse health (Hawver, 1996).

Recognizing the importance of prescribed fires in ecological management, the EPA issued an interim policy on wildland and prescribed fires (U.S. EPA, 1998). Under this policy EPA will not designate an area as “nonattainment” (areas that do not meet EPA‟s national air quality standards) when prescribed or wildland fires managed for resource or environmental benefits cause or significantly contribute to violations of the particulate matter standards provided that the State has certified that they have implemented a basic smoke management program. Instead, EPA will require the State to review and upgrade their smoke management programs if fires lead to a first violation of the particulate matter standards (based on three calendar years of air quality monitoring data). A second violation would require implementation of stronger measures and a third violation would require mandatory smoke management programs to be adopted.

Where a state has not implemented a basic smoke management program the EPA will require it to revise their implementation plans to include a mandatory smoke management program if prescribed fires lead to violations of the particulate matter standards. In such cases, EPA will move forward to redesignate the area in violation as non-attainment.

The Clean Air Act authorizes states with approved Prevention of Significant Deterioration (PSD) programs to exclude particulate matter emissions caused by “temporary” activities from consuming increment. The EPA expects the states, on an individual basis, to decide the extent to which prescribed fires (and the resulting emissions increases) should be considered “temporary” sources of air pollution when determining increment consumption in specific areas. The goal of the PSD program is to prevent “clean” air quality (in areas that meet the national air quality standards) from deteriorating beyond certain amounts or increments.

IX. Smoke Management in the Albany Pine Bush

A. Planning to Address Potential Smoke Impacts

As discussed above, each burn is carried out according to a prescribed fire plan or prescription, developed well in advance. The burn plan addresses seasonality and timing, meteorological conditions, suppression means (mop-up), and ignition techniques. In addition to those required by law, other techniques APBPC uses to minimize smoke impacts from prescribed fires include: the number of days that burns occur annually and consecutively; computer modeling, to estimate particulate emissions; and an extensive public notification program.

A follow-up report must be submitted to the State of New York within 60 days of the final day of the period for which a prescribed fire has been authorized. The report must describe: whether the prescribed fire took place, including the actual days on which the action was conducted and, if the action took place, the weather conditions that existed at the time of the action; how actual fire and smoke behavior correlated with predicted behavior; whether the objectives set forth in the prescribed fire plan were achieved; an assessment of the impact of the action on the environment; and whether additional measures could be taken in the future to reduce this impact (6NYCRR, Section 194.10).

B. Season and Weather Conditions

The majority of prescribed fires in the Albany Pine Bush occurs in the spring and summer seasons. During the spring, there is the least amount of moisture present in the vegetation; a lower amount of moisture in the plant material reduces the amount of smoke produced as it burns. Although moisture is low in the vegetation at this time of year, the moisture held in the partially decomposed organic matter (duff) found above the soil is often high, which inhibits smoldering. Smoldering is a very inefficient and incomplete process of combustion, emitting pollutants at a much higher ratio to the quantity of fuel consumed than does the flaming combustion of similar materials. Additionally, because the time of day can influence smoke production, burns are normally conducted in the late morning through the afternoon, when atmospheric conditions are favorable for proper lift and dispersion of smoke, as opposed to the late afternoon or evening, when ventilation rates can deteriorate.

For prescribed fires that are held during the growing season, higher level fuel moistures will cause increased smoke. Burn unit size will be reduced to reduce smoke and allow for mop-up where substantial reduction of the litter and duff layers is an objective.

For most prescribed fire activities, a slightly unstable atmosphere tends to produce an optimum dispersion pattern, particularly when surface winds are moderate. The atmosphere should be unstable allowing smoke to rise and dissipate. This is opposed to conditions of a stable atmosphere, where a layer of stable air prevents smoke from adequately rising, such as during episodes of temperature inversions. High mixing heights are necessary when conducting prescribed fires. Mixing height is the height at which smoke will rise due to convection, before it drifts and disperses. A high mixing height allows smoke to rise high into the atmosphere and disperse.

Additionally, particular wind directions and velocities are specified for each particular burn unit. Wind directions are chosen so that smoke is carried away from any smoke-sensitive areas as it rises in the atmosphere. A steady wind from the pre-determined direction allows for the least amount of impact from smoke on these sensitive areas. Weather conditions favoring persisting winds usually prevent air stagnation. Wildfires on the other hand, can occur at any time, including during periods of air stagnation. Because they are uncontrolled fires, wildfires result in a large amount of particulate matter being introduced into the stagnant atmosphere, which can severely impact the surrounding community.

C. Managing Prescribed Fires to Reduce Smoke Impacts

Each day that a burn is planned, a forecast of local meteorological conditions is acquired and evaluated. The prescribed fire will only occur if conditions are favorable to burning and smoke management. Despite having acquired a thorough forecast, weather conditions can change. Therefore, weather conditions are monitored on-site prior to and throughout any prescribed fire. Any significant change will result in the fire being cancelled or, if in progress, immediately ceased, with all flames and smoke fully extinguished. This will only occur if fire crew safety is maintained. It may be safer to continue on and complete the burn. This decision will be made by the burn boss. Changes in weather conditions prior to and during prescribed fires have occurred during burn seasons. In one case, prior to ignition, the winds were not from a consistent direction on site (despite a positive forecast for the area) and the burn was cancelled. In another case, the local weather conditions changed after ignition began, presenting the potential for smoke to drift towards sensitive areas, and the burn was immediately shut down.

Methods used for the ignition of each burn unit also control the amount of smoke that is produced. Various ignition techniques allow for a more complete combustion of plant materials, with little smoldering, thus producing less smoke and particulate matter. For example, when appropriate, small sections of a unit may be burned utilizing a backing fire, which producing less smoke at one given time. In other situations, portions of a burn unit will be allowed to burn more rapidly (with a headfire), where the fire moves more quickly over the ground, not igniting the lower layers of fuel thus resulting in little smoldering. During prescribed fires in the Preserve, most of the fire is of low- or moderate-intensity, which also reduces the amount of particulate matter emitted.

Smoldering will continue to produce large amounts of particulate matter even though a fire is considered to be out. Because of the low heat release rate from smoldering fuels, smoke tends to stay near the ground, creating potential visibility problems in localized areas. Smoldering is minimized during prescribed fires in the Preserve to further decrease any impact on nearby roadways (Hawver, 1996).

Mop-up operations are designed to reduce the amount of smoke produced from the burns. Following the end of each prescribed fire, mop-up continues until all smoldering snags, logs, stumps, or organic soil is extinguished. A quick and efficient mop-up reduces impacts that may result from any residual smoke (particularly that of smoldering). Mop-up is specified in the detailed plan for each individual burn unit to be "100%", where every smoke is fully extinguished before the crew leaves the site. This procedure is absolutely essential. If smoldering continues, smoke generated could stay near the ground and impact the surrounding public. Even though all smoke is eliminated during mop-up, two crew members may remain at the site for up to four hours to monitor each burned unit for any possible residual smokes.

Within a given burn season, very few days actually present the specific environmental and meteorological conditions required to conduct a prescribed fire. For example, the fuels (i.e., 1-, 10-, 100-, and 1,000-hour fuels) within a unit may fall within the required parameters (Table 8). However, the required weather parameters (i.e., wind speed and direction, temperature, relative humidity, mixing height) may not be present (Table 8). The converse also may occur, with weather parameters falling within prescription, but environmental conditions, such as fuel moistures, being out of prescription. As a result fewer prescribed fires occur, both in consecutive days and in total for the year, thus reducing the amount of smoke produced and allowing for complete smoke dispersal between prescribed fires.

Prescribed fire has become a more ubiquitous tool utilized by land managers throughout the country, particularly by federal agencies. Recently, regulatory authorities have become more interested in the contribution of particulate matter to the atmosphere and possible visibility reduction from controlled burning by land management agencies. In particular, an application by the Bureau of Land Management (BLM) has developed a simple screening level (computer) model (Sestak and Riebau, 1988). The model, referred to as the Simple Approach Smoke Estimation Model (SASEM), was designed to be a screening tool for analyzing air impacts of prescribed fires on federal lands (Hawver, 1996). Although not required, it has been used on an experimental basis, and preliminary results show that the prescribed fires in the Preserve do not exceed federal air quality standards. However, the program is limited in its use for the northeast, having been developed for western fuels. Other modeling programs exist, such as VSmoke (Lavdas, 1996) and VSmoke-GIS (Harms and Lavdas, 1997) and may be used to assist with smoke management. As new modeling programs are developed, they will be assessed for applicability in evaluating impacts on air quality.

D. Public Notice

During each burn season extensive efforts go into providing neighbors with notification and information regarding the burns, so that if they are interested, they may take measures to protect themselves from potential smoke impacts (e.g., close windows, leave immediate vicinity, etc.).

Prior to each burn season, local businesses, officials, and police and fire departments receive written notification of the planned prescribed fires, with a time frame of when the burns potentially could occur and a map with areas that are planned to be managed. Before the start of the season a press-release is sent to local media sources providing notification of the prescribed fires, a time frame of when the burns are planned to occur and a map showing the location of proposed burns. Similar notification, in the form of a pre-burn postcard, is sent to all residents surrounding areas where burns are planned.

Each day, in which a prescribed fire is planned, all local officials, police and fire departments, and residents requesting daily notification receive personal phone calls notifying them of plans to conduct a burn, with approximate times of starting and ending, and the location of the activity.

On an annual basis, post-burn questionnaires are distributed to all local residents near areas managed with prescribed fires or who may have been impacted by the burns (i.e., smelled or observed smoke, etc.). People are encouraged to comment on the burns and whether they were impacted by the activity and return the questionnaire.

Typically at the end of the burn season local media sources receive a post-burn press release that announces the close of the burn season and what accomplishments were made during the season toward maintaining or restoring the natural ecology of the Albany Pine Bush Preserve.

X. Addressing Limitations on the Use of Prescribed Fire

Within a given burn window, very few days actually present the specific environmental and meteorological conditions required to conduct a burn (i.e., it may be too wet, dry, windy, etc.). The required conditions for fire management do not often continue consecutively for more than a few days in the northeastern United States during the spring season.

Another limitation is the resources needed, including trained crew, equipment, and qualified burn bosses, firing bosses, and line/squad bosses. The following actions are needed to increase the amount of acres burned each year:

- Continue to work with state and federal agencies and TNC to share resources throughout the Northeast for increased prescribed fire capacity
- Expand the number of trained crews, including burn bosses, from all members of the Commission and other public agencies, and have them available for prescribed fires during burn seasons
- Increase experience depth of all burn bosses, firing bosses, and line/squad bosses
- Investigate the need for acquiring additional equipment, including additional water sources such as fold-a-tanks; portable pumps, to boost water from hydrants; another engine; and air support (on call)
- Continue to utilize mechanical pre-treatment preparation, where ecologically feasible, prior to burning

XI. Monitoring and Research

A. Post-Burn Evaluation

Following each burn, the unit is evaluated to determine if ecological objectives were met. Information on the area burned, reduction in fuels, reduction in duff or litter layers, scorch height, and other information is collected and compiled. Monitoring plots have been established in areas being treated by fire, mechanical, and chemical management to determine the effectiveness of those practices.

B. Comprehensive Monitoring and Research

Research, inventory, and monitoring programs are essential to assessing the status of ecological communities and target species populations and progress in achieving management goals and objectives.

Monitoring of rare communities and species is intended to show changes in distribution and abundance over time and/or as a result of management activities. For instance, Karner blue butterfly numbers are being monitored, according to specified protocols, to determine changes in numbers from year to year and to identify changes in the locations of subpopulations.

Inventory efforts represent searches for species and natural communities and to provide documentation on their status. Most community inventory work in the Albany Pine Bush has been completed, though some rare species, historically identified in the Pine Bush, are still being sought.

Research involves specific studies to expand our understanding of the biology of organisms and ecological processes that maintain communities and habitat.

The APBPC research inventory and monitoring plan is attached to the 2010 Management Plan and FEIS for the Preserve.

Monitoring priorities include:

- Continued monitoring of Karner blue butterfly and inland barrens buckmoth populations
- Effectiveness of fire and other forms of management on maintaining and restoring pitch pine-scrub oak barrens
- Determining the status of invasive species
- Using birds, mammals, reptiles, and amphibians as indicators of community quality

Research needs include:

- Effects of different fire regimes, including growing season burns

Inventory needs have also been identified. If new species populations are located that require alteration of fire management activities, this information will be incorporated into management unit and prescribed fire plans. The results of these efforts would be compiled into a database that could be used in concert with the GIS information. Data would also be analyzed by creating, where appropriate, models of the community and species specific processes important for maintaining conservation targets and their components.

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Attachment A

Glossary of Wildland Fire Terms

A

Aerial Fuels: All live and dead vegetation in the forest canopy or above surface fuels, including tree branches, twigs and cones, snags, moss, and high brush.

Aerial Ignition: Ignition of fuels by dropping incendiary devices or materials from aircraft.

Anchor Point: An advantageous location, usually a barrier to fire spread, from which to start building a fire line. An anchor point is used to reduce the chance of firefighters being flanked by fire.

B

Backfire: A fire set along the inner edge of a fireline to consume the fuel in the path of a wildfire and/or change the direction of force of the fire's convection column.

Backing Fire: A fire burning into or against the wind. Generally produces more moderate flames that a head fire.

Backpack Pump: A portable sprayer with hand-pump, fed from a liquid-filled container fitted with straps, used mainly in fire and pest control. (See also Bladder Bag.)

Brush: A collective term that refers to stands of vegetation dominated by shrubby, woody plants, or low growing trees, usually of a type undesirable for livestock or timber management.

Bucket Drops: The dropping of fire retardants or suppressants from specially designed buckets slung below a helicopter.

Buffer Zones: An area of reduced vegetation that separates wildlands from vulnerable residential or business developments. This barrier is similar to a greenbelt in that it is usually used for another purpose such as agriculture, recreation areas, parks, or golf courses.

Burning Conditions: The state of the combined factors of the environment that affect fire behavior in a specified fuel type.

Burn Severity: A qualitative assessment of soil heating and the consumption of forest floor materials such as natural litter, duff, organic layer, and mortality of understand plant parts.

C

Canopy: The crowns of the tallest vegetation (living or dead), usually above 20 feet.

Chain: A unit of linear measurement equal to 66 feet.

Cold Front: The leading edge of a relatively cold air mass that displaces warmer air. The heavier cold air may cause some of the warm air to be lifted. If the lifted air contains enough moisture, the result may be cloudiness, precipitation, and thunderstorms. If both air masses are dry, no clouds may form. Following the passage of a cold front in the Northern Hemisphere, westerly or northwesterly winds of 15 to 30 or more miles per hour often continue for 12 to 24 hours.

Cold Trailing: A method of controlling a partly dead fire edge by carefully inspecting and feeling with the hand for heat to detect any fire, digging out every live spot, and trenching any live edge.

Control Line: All built or natural fire barriers and treated fire edge used to control a fire.

Creeping Fire: Fire burning with a low flame and spreading slowly.

Crew Boss: A person in supervisory charge of usually 16 to 21 firefighters and responsible for their performance, safety, and welfare.

Crown Fire (Crowning): The movement of fire through the crowns of trees or shrubs more or less independently of the surface fire.

Crown Scorch: Browning of needles or leaves in the crown of a tree caused by the heat of a fire.

D

Dead Fuels: Fuels with no living tissue in which moisture content is governed almost entirely by atmospheric moisture (relative humidity and precipitation), dry-bulb temperature, and solar radiation.

Defensible Space: An area either natural or manmade where material capable of causing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildland fire and the loss to life, property, or resources. In practice, "defensible space" is defined as an area a minimum of 30 feet around a structure that is cleared of flammable brush or vegetation.

Direct Attack: Any treatment of burning fuel, such as by wetting, smothering, or chemically quenching the fire or by physically separating burning from unburned fuel.

Drip Torch: Hand-held device for igniting fires by dripping flaming liquid fuel on the materials to be burned; consists of a fuel fount, burner arm, and igniter. Fuel used is generally a mixture of diesel and gasoline.

Duff: The layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles, and leaves and immediately above the mineral soil.

E

Engine: Any ground vehicle providing specified levels of pumping, water, and hose capacity.

Engine Crew: Firefighters assigned to an engine. The Fireline Handbook defines the minimum crew makeup by engine type.

Escape Route: A preplanned and understood route firefighters take to move to a safety zone or other low-risk area, such as an already burned area, previously constructed safety area, a meadow that won't burn, natural rocky area that is large enough to take refuge without being burned. When escape routes deviate from a defined physical path, they should be clearly marked (flagged).

Escaped Fire: A fire which has exceeded or is expected to exceed initial attack capabilities or prescription.

Extended Attack Incident: A wildland fire that has not been contained or controlled by initial attack forces and for which more firefighting resources are arriving, en route, or being ordered by the initial attack incident commander.

F

Faller: A person who fells trees. Also called a sawyer or cutter.

Fine (Light) Fuels: Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which are less than 1/4-inch in diameter and have a timelag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Fingers of a Fire: The long narrow extensions of a fire projecting from the main body.

Fire Behavior: The manner in which a fire reacts to the influences of fuel, weather and topography.

Fire Behavior Monitoring: Measurement of variables to describe and characterize fire behavior and allow for fire behavior predictions.

Fire Break: A natural or constructed barrier used to stop or check fires that may occur, or to provide a control line from which to work.

Fire Cache: A supply of fire tools and equipment assembled in planned quantities or standard units at a strategic point for exclusive use in fire suppression.

Fire Crew: An organized group of firefighters under the leadership of a crew leader or other designated official.

Fire Effects: The physical, biological, and ecological impacts of afire on the environment.

Fire Front: The part of a fire within which continuous flaming combustion is taking place. Unless otherwise specified the fire front is assumed to be the leading edge of the fire perimeter. In ground fires, the fire front may be mainly smoldering combustion.

Fire History: The chronological record of the occurrences and scope of fire in an ecosystem.

Fire Intensity: A general term relating to the heat energy released by a fire.

Fire Line: A linear fire barrier that is scraped or dug to mineral soil.

Fire Management Plan (FMP): A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational plans such as preparedness plans, preplanned dispatch plans, prescribed fire plans, and prevention plans.

Fire Perimeter: The entire outer edge or boundary of a fire.

Fire Regime: The pattern of fire in an area, as determined by its systematic interaction with the biotic and physical environment. It includes the timing, number, spatial distribution, size, duration, behavior, return interval, and effects of natural fires.

Fire Season: 1) Period(s) of the year during which wildland fires are likely to occur, spread, and affect resource values sufficient to warrant organized fire management activities. 2) A legally enacted time during which burning activities are regulated by state or local authority.

Fire Shelter: An aluminized tent offering protection by means of reflecting radiant heat and providing a volume of breathable air in a fire entrapment situation. Fire shelters should only be used in life-threatening situations, as a last resort.

Fire Shelter Deployment: The removing of a fire shelter from its case and using it as protection against fire.

Fire Triangle: Instructional aid in which the sides of a triangle are used to represent the three factors (oxygen, heat, fuel) necessary for combustion and flame production; removal of any of the three factors causes flame production to cease.

Fire Weather: Weather conditions that influence fire ignition, behavior and suppression.

Fire Whirl: Spinning vortex column of ascending hot air and gases rising from a fire and carrying aloft smoke, debris, and flame. Fire whirls range in size from less than one foot to more than 500 feet in diameter. Large fire whirls have the intensity of a small tornado.

Flame Height: The average maximum vertical extension of flames at the leading edge of the fire front. Occasional flashes that rise above the general level of flames are not considered. This distance is less than the flame length if flames are tilted due to wind or slope.

Flame Length: The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface); an indicator of fire intensity.

Flanks of a Fire: The parts of a fire's perimeter that are roughly parallel to the main direction of spread.

Flare-up: Any sudden acceleration in rate of spread (ROS) or intensification of a fire.

Fuel: Combustible material. Includes, vegetation, such as grass, leaves, ground litter, plants, shrubs and trees, that feed a fire.

Fuel Loading: The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area.

Fuel Model: Simulated fuel complex (or combination of vegetation types) for which all fuel descriptors required for the solution of a mathematical rate of spread model have been specified.

Fuel Moisture (Fuel Moisture Content): The quantity of moisture in fuel expressed as a percentage of the weight when thoroughly dried at 212 degrees Fahrenheit.

Fuel Reduction: Manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.

Fuel Type: An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

G

Green-up: The time period during which seed typically germinate and perennial species experience renewed growth. Typically in the spring for most species. In some regions, some species of grasses and forbes produce new growth in the fall, after an inactive summer.

Ground Fuel: All combustible materials below the surface litter, including duff, tree or shrub roots, punchy wood, peat, and sawdust, that normally support a glowing combustion without flame.

H

Hand Line: A fireline built with hand tools.

Hazardous Fuels: Fuels that, if ignited, could threaten human like and safety, natural resources, buildings or other values.

Head Fire: A fire spreading, or set to spread, with the wind or upslope. Tends to have the greatest flame lengths, rates of spread, and associated risk..

Heavy Fuels: Fuels of large diameter such as snags, logs, large limb wood, that ignite and are consumed more slowly than flash fuels.

Hose Lay: Arrangement of connected lengths of fire hose and accessories on the ground, beginning at the first pumping unit and ending at the point of water delivery.

I

Incident Command System (ICS): The combination of facilities, equipment, personnel, procedure and communications operating within a common organizational structure, with responsibility for the management of assigned resources to effectively accomplish stated objectives pertaining to an incident.

Incident Commander: Individual responsible for the management of all incident operations at the incident site.

Initial Attack: The actions taken by the first resources to arrive at a wildfire to protect lives and property, and prevent further extension of the fire.

K

Keech Byram Drought Index (KBDI): Commonly-used drought index adapted for fire management applications, with a numerical range from 0 (no moisture deficiency) to 800 (maximum drought).

Knock Down: To reduce the flame or heat on the more vigorously burning parts of a fire edge.

L

Ladder Fuels: Fuels which provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.

Light (Fine) Fuels: Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which are less than 1/4-inch in diameter and have a timelag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Litter: Top layer of the forest, scrubland, or grassland floor, directly above the fermentation layer, composed of loose debris of dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

Live Fuels: Living plants, such as trees, grasses, and shrubs, in which the seasonal moisture content cycle is controlled largely by internal physiological mechanisms, rather than by external weather influences.

Live Fuel Moisture: Water content of a living fuel, expressed as a percentage of the oven-dry weight of the fuel. Higher fuel moisture reduces the ability of the material to burn.

M

Mineral Soil: Soil layers below the predominantly organic horizons; soil with little combustible material.

Mixing Height: The maximum altitude at which ground and upper air mix; smoke rises to this height.

Mop-up: To make a fire safe or reduce residual smoke after the fire has been controlled by extinguishing or removing burning material along or near the control line, felling snags, or moving logs so they won't roll downhill.

N

National Fire Danger Rating System (NFDRS): A uniform fire danger rating system that focuses on the environmental factors that control the moisture content of fuels.

National Wildfire Coordinating Group: A group formed under the direction of the Secretaries of Agriculture and the Interior and comprised of representatives of the U.S. Forest Service, Bureau of Land Management, Bureau of Indian Affairs, National Park Service, U.S. Fish and Wildlife Service and Association of State Foresters. The group's purpose is to facilitate coordination and effectiveness of wildland fire activities and provide a forum to discuss, recommend action, or resolve issues and problems of substantive nature. NWCG is the certifying body for all courses in the National Fire Curriculum.

Nomex ®: Trade name for a fire resistant synthetic material used in the manufacturing of flight suits and pants and shirts used by firefighters (see Aramid).

Normal Fire Season: 1) A season when weather, fire danger, and number and distribution of fires are about average. 2) Period of the year that normally comprises the fire season.

O

Operational Period: The period of time scheduled for execution of a given set of tactical actions as specified in the Incident Action Plan. Operational periods can be of various lengths, although usually not more than 24 hours.

P

Pack Test: Used to determine the aerobic capacity of fire suppression and support personnel and assign physical fitness scores. The test consists of walking a specified distance, with or without a weighted pack, in a predetermined period of time, with altitude corrections.

Personnel Protective Equipment (PPE): All firefighting personnel must be equipped with proper equipment and clothing in order to mitigate the risk of injury from, or exposure to, hazardous conditions encountered while working. PPE includes, but is not limited to: 8-inch high-laced leather boots with lug soles, fire shelter, hard hat with chin strap, goggles, ear plugs, aramid shirts and trousers, leather gloves and individual first aid kits.

Preparedness: Condition or degree of being ready to cope with a potential fire situation.

Prescribed Fire: Any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement.

Prescribed Fire Plan (Burn Plan): A required document completed prior to the ignition of a prescribed fire, describing the site, goals and objectives, fuels and weather parameters, predicted behavior, equipment, personnel and other operational details.

Prescription: Measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of appropriate management responses, and indicate other required actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

Prevention: Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards.

R

Rate of Spread (ROS): The relative activity of a fire in extending its horizontal dimensions. It is expressed as a rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information. Usually it is expressed in chains or acres per hour for a specific period in the fire's history.

Reburn: The burning of an area that has been previously burned but that contains flammable fuel that ignites when burning conditions are more favorable; an area that has reburned.

Rehabilitation: The activities necessary to repair damage or disturbance caused by wildland fires or the fire suppression activity.

Relative Humidity (RH): The ratio of the amount of moisture in the air, to the maximum amount of moisture that air would contain if it were saturated. The ratio of the actual vapor pressure to the saturated vapor pressure.

Restoration Burn: A prescribed fire used to bring fuels and/or vegetation into a desired condition for improved habitat or to reduce wildfire potential.

Running Fire: A rapidly spreading surface fire with a well-defined head.

S

Safety Zone: An area cleared of flammable materials used for escape in the event the line is outflanked or in case a spot fire causes fuels outside the control line to render the line unsafe. In firing operations, crews progress so as to maintain a safety zone close at hand allowing the fuels inside the control line to be consumed before going ahead. Safety zones may also be constructed as integral parts of fuel breaks; they are greatly enlarged areas which can be used with relative safety by firefighters and their equipment in the event of a blowup in the vicinity.

Size-up: To evaluate a fire to determine a course of action for fire suppression.

Slash: Debris left after logging, pruning, thinning or brush cutting; includes logs, chips, bark, branches, stumps and broken understory trees or brush.

Smoke Management: Application of fire intensities and meteorological processes to minimize degradation of air quality during prescribed fires.

Smoldering Fire: A fire burning without flame and barely spreading.

Snag: A standing dead tree or part of a dead tree from which at least the smaller branches have fallen.

Spot Fire: A fire ignited outside the perimeter of the main fire by flying sparks or embers.

Spot Weather Forecast: A special forecast issued to fit the time, topography, and weather of each specific fire. These forecasts are issued upon request of the user agency and are more detailed, timely, and specific than zone forecasts.

Spotting: Behavior of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire.

Suppression: All the work of extinguishing or containing a fire, beginning with its discovery.

Surface Fuels: Loose surface litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity; also grasses, forbs, low and medium shrubs, tree seedlings, heavier branchwood, downed logs, and stumps interspersed with or partially replacing the litter.

T

Tactics: Deploying and directing resources on an incident to accomplish the objectives designated by strategy.

Temperature Inversion: An increase in temperature with height, or to the atmospheric layer within which such an increase occurs.

Test Fire: A small fire ignited within the planned burn unit to determine the characteristic of the prescribed fire, such as fire behavior, detection performance and control measures.

Torching: The ignition and flare-up of a tree or small group of trees, usually from bottom to top.

W

Wet Line: A line of water, or water and chemical retardant, sprayed along the ground, that serves as a temporary control line from which to ignite or stop a low-intensity fire.

Wildland Fire: Any nonstructure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Use: The management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in Fire Management Plans.

Wildland Urban Interface (WUI): The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. It is within these “interface” zones that people and structures are most at risk.

Attachment B

Albany Pine Bush Preserve Commission
Fire Management Media Response Plan

ALBANY PINE BUSH PRESERVE COMMISSION
FIRE MANAGEMENT MEDIA RESPONSE PLAN

This plan is to be utilized in the event of:
1) escaped prescribed fires,
2) unplanned ignitions, or
3) other major incidents on prescribed fires or unplanned ignitions
(e.g., serious medical/trauma injuries, shelter deployment, or fatality).

Goal of plan
An informed (and ideally sympathetic) media can be your partner in educating the general population with regard to Pine Bush management issues. Ultimately, informed citizens, with input in an ongoing planning process, will usually be understanding and supportive citizens.

Summary of plan
- Designate a "media savvy" spokesperson to work year-round with the media to help ensure accurate news reports on programs and incidents.
- In the event of an incident, the spokesperson runs a communication center from which information is provided to the media and the public, and from which news reports are monitored and corrected.
- In the event of an incident, be honest and concerned, talk in simple language, and adopt a sensitive, caring, apologetic tone. Stick to hard facts that are inherently educational with regards to why prescribed fire is used as a management tool. Avoid a defensive tone and assume something went wrong.

Preparatory work with media
- Develop and maintain (print, television & radio) media contacts on a year-round basis.
- Take the initiative to provide important media contacts with personal tours of the Preserve and/or fire management events (e.g., site preparation, wildland fire training, and prescribed fires).
- Designate a primary media contact person (year-round) for all Preserve issues. This person should cultivate personal relationships with media contacts, and become an "expert" source for the media.
- Additional staff and partners should also be exposed to and given the opportunity to work with the media, for recognition and for practice for the time they might be the primary spokesperson in a crisis.
- Supply up to date Pine Bush information, maps and phone numbers, in a format that is useful to different forms of media (newspapers, TV, and radio). Phone numbers should include primary, backup and home/emergency numbers for the designated primary media contact.
- Prior to each prescribed fire season, update media contact list, being sure to touch base with all contacts. Include phone/cell/pager and fax numbers for each individual.

Designated primary media contact person
- Designee(s) should have basic prescribed or wildland fire training and have participated on, or observed one or more burns. Experience with media relations and familiarity with the "Incident Command System" is helpful. Designees must be "media savvy."
- Possible courses to assist with this include: S-130, Basic Wildland Firefighter; S-190, Introduction to Fire Behavior; L-180, Human Factors on the Fireline; ICS-100, Introduction to the Incident Command System (ICS); ICS-200, ICS for Single Resource & Initial Action Incidents; and IS-700.a, National Incident Management System (NIMS), An Introduction.
- Media contact personnel must be familiar with burns scheduled for any given day and should have a copy of the prescription, and access to the fire management and contingency plans.

PROCEDURES FOR AN ESCAPED PRESCRIBED FIRE, UNPLANNED IGNITION, OR OTHER MAJOR INCIDENTS ON PRESCRIBED FIRES OR UNPLANNED IGNITIONS

In the event of an incident, be honest and concerned, speak in simple language (avoid jargon), and adopt a sensitive, caring, apologetic tone. Stick to hard facts that are inherently educational with regards to why prescribed fire is used as a management tool. Avoid a defensive tone and assume something went wrong.

1. **Pre-determined contingencies.** First and foremost, the crew on site of an escape must follow pre-established emergency protocol (i.e., calling for back-up suppression forces, falling back to contingency lines, etc.).

2. **Make contact with ALL of the following persons.**

Christopher Hawver	Albany Pine Bush Preserve Commission, Executive Director (or designated backup)
Larry Eckhaus	State of New York, Dept. of Environmental Conservation, General Counsel
Gene Kelly	State of New York, Dept. of Environmental Conservation, Region 4 Director
Loretta Simon	State of New York, Attorney General Office

Albany Pine Bush Preserve Commission			
	Christopher Hawver **Executive Director**	**Neil Gifford** **Conservation Director**	**Wendy Craney** **Communication Director**
Contact rank	*Primary*	*Backup #1*	*Backup #2*
Office phone	518-456-0655 x1218	518-456-0655 x1214	518-456-0655 x1211
Office fax	518-456-8198	518-456-8198	518-456-8198
Email	chawver@albanypinebush.org	ngifford@albanypinebush.org	wcraney@albanypinebush.org

State of New York			
	Larry Eckhaus **General Counsel**	**Gene Kelly** **Region 4 Director**	**Loretta Simon**
Agency	Department of Environmental Conservation	Department of Environmental Conservation	Attorney General Office
Office phone	518-402-9521	518-357-2068	518-402-2724[a]
Office fax	518-402-9019	518-357-2087	518-473-2534
Email	lseckhau@gw.dec.state.ny.us	ejkelly@gw.dec.state.ny.us	Loretta.simon@oag.state.ny.us

[a] Monday-Friday, leave message after hours and on weekends

3. **Activate a communications center.** The primary media contact needs this "war room" and should be equipped with multiple phone lines, a scanner, a fax, plus access to and/or an ability to monitor media reports (Radio and TV). A map of the Preserve must be available for reference and an electronic map to send to the media showing the location of the burn and direction of the escape; **prescribed fire plans should not be released to the media.** The Albany Pine Bush Preserve Commission"s administrative office can serve as this center. This has the benefit of removing the media from the site of the incident for the purpose of interviews with the spokesperson. At other times it may be appropriate to have the communication center at the site.

4. **Establish contact with personnel at the incident.** The spokesperson must receive facts from the field. This information must also be communicated immediately with lead DEC personnel. In coordination with DEC, establish communication (cell phone) with personnel on site or at the incident command post. While the primary responsibilities for field personnel are related to control and safety efforts, the spokesperson needs facts regarding the size of the fire, what may have caused the escape, and what is being done for control. A designated field person should be in contact with the media spokesperson as often as possible.

5. **Reach out to the media (See "Local Media Sources & Contacts" below).** Be proactive. Recognize reporter deadlines and return all calls as soon as possible (within 15 to 20 minutes). Call back even if you have nothing new to report. Prioritize TV and radio ahead of daily papers, and daily papers ahead of weekly papers. Agree to any and all interviews. Avoid the statement "The Commission wasn"t available for comment," or worse.

6. **If no facts are available.** Assume that something went wrong. A suggested statement with regards to a confirmed escape might incorporate some of the following:

- *Clearly something went wrong with a prescribed fire in the Pine Bush.*
- *The focus now is on safety and controlling and extinguishing the fire to minimize damage or inconvenience to people and property in the area.*
- *Fire is dangerous and can be very destructive. In the past, large 500-acre plus wildfires used to burn every ten or fifteen years as a natural part of the Pine Bush. While this was good for the rare Pine Bush ecosystem, such fires today would threaten people and property, and can no longer occur.*
- *Prescribed fire is critical in reducing fuel accumulations that pose wildfire threats to neighboring landowners. Prescribed fire is also a critical management tool used to restore and maintain the rare Pine Bush ecosystem.*
- *Smaller prescribed fires simulate the effects of larger wildfires. These fires are initiated only when weather conditions and forecasts are conducive to effective burning while also minimizing the risk of possible escape. Periodic prescribed fires decrease the build-up of organic materials and thus reduce the potential for wildfires.*
- *Consistent with pre-established emergency contingency plans, trained Pine Bush firefighting personnel are on site applying contingency actions and other suppression agencies are responding to assist with the containment and extinguishment of the fire.*
- *The Pine Bush fire management program has been active since 1991. Since then over 1,000 acres have been safely and effectively burned.*
- The Pine Bush fire management program will be immediately suspended. There will be a review of the incident to determine what may have gone wrong and what changes could be made to decrease the potential for an escape or a wildfire.

7. **Questions which may be posed by the media and suggested answers.**

Why did you do this burn?

The Albany Pine Bush Preserve Commission manages land for wildlife habitat and rare plants and animals. Prescribed fire can improve wildlife habitat, reduce hazardous fuel loads, reduce abundance of non-native species, and improve habitat for rare animals and plants, such as the Karner blue butterfly.

How do you control the burn?

The prescribed fire crew is highly trained and experienced in using fire. Fire suppression engines and ATV"s support the crew. Firelines are installed around the burn unit by removing fuel from the burn unit and adjacent areas. For a particular burn, the crew typically starts at the downwind side and ignites the burn unit side of the fireline. The fire will burn slowly into the wind with low flame lengths. Once the fire has burned in and created a blackline, the crew will light flanking and head fires.

How do you notify neighbors and officials?

Prior to the burn, Commission burn plans are reviewed and approved by the New York State Dept. of Environmental Conservation (NYS DEC), Division of Lands and Forests and Division of Forest Protection and Fire Management. Neighbors are mailed a flyer notifying them where and when a prescribed fire may take place in the future and information is posted on our web site. The morning of the burn, Commission staff make phone calls to notify officials and agencies, local businesses, and residents of the burn.

How long has the Albany Pine Bush Preserve been conducting burns?

The Albany Pine Bush Preserve Commission has been conducting prescribed fires since 1991. The Pine Bush has only had one other incident in fifteen years. In April 1999, a prescribed fire escaped our control for a short period of time burning 65 acres of Preserve land. There was no significant private property damage and thankfully, no injuries to personnel in that incident.

What are pre-established emergency contingency plans?

In the event of an escape or unplanned ignition, the crew will respond first by calling for back-up suppression forces. This generally includes NYS DEC Region 4 Forest Rangers and local fire departments. They will then assess and address all potential threats to life and property from the escape. Given that all threats to life and property have been abated, the crew will focus on falling back to secondary contingency firelines, which include surrounding trails, roads, and streams or newly cut lines, to "starve" the fire of fuel.

8. **Monitor media reports.** Disperse information and simultaneously correct mis-information. Do not allow false statements to go uncorrected or they will be repeated and "become fact." First impressions are powerful. While correcting facts to help the media reflect reality, be proactive and provide statements (sound bites) that accurately reflect the program. Try to speak in short sound bites and do not try to provide long detailed explanations, especially if a camera/recorder is running.

9. **Provide for positive external statements.** This can be one of the most powerful ways of gaining balanced coverage in the media. No matter what you say, you are still representing the Pine Bush Preserve Commission. A positive statement from an external party such as a fire department chief or suppression official will have significant impact.

10. **Identify the Commission.** With the media, identify and put the focus on the Albany Pine Bush Preserve Commission, not our partners/members such as the State, municipalities, the County, or The Nature Conservancy. Remember a simple rule - partners/donors get all the credit when something goes right. The Commission gets the blame if something goes wrong.

11. **Communication with partners (See "Additional Contacts" below).** Key individuals within associate or partner agencies/organizations should be informed directly and as soon as reasonably possible. Ideally this communication is in advance of their hearing news reports. Initiate contact after confirmation of an incident or when there is otherwise incomplete information. Suggest there be coordination with the Commission prior to their issuing comments to the media. Suggest that any media contact be forwarded to the established communication center.

12. **Follow-up**.
    - Arrange for an outside authority to critique the incident (See NYS DEC contacts above), interview involved individuals, and issue a report. Commission staff should not lead such an investigation.
    - No attempt should be made to keep anything from the public. Everything should be made available, good and bad. Honesty and credibility is critical.
    - All planning documents should be reviewed.
    - Write an editorial or "letters to the editor" to express gratitude for support from suppression forces/agencies/volunteers.
    - Issue a press release to correct any incorrect facts if necessary.
    - Invite the media to the next burn (or to escape site several weeks later to see re-growth) and provide news releases and information packets.
    - Learn from the experience.
    - Follow burns with field trip to show benefits of prescribed fire(s). Possibly visit multiple sites as a progression (i.e., an area burned this season, last season, two years ago, five years ago, etc.).

ADDITIONAL CONTACTS:

State of New York			
	Henry Hamilton **Assistant Commissioner** **Office of Public Protection**	**Rick Georgeson** **Region 4** **Public Affairs Officer**	**Alex Roth** **Executive Director**
Agency	Department of Environmental Conservation	Department of Environmental Conservation	Natural Heritage Trust
Office phone	518-402-9521	518-357-2075	518-474-2997
Office fax	518-402-9019	518-357-2087	518-473-1203
Email	lseckhau@gw.dec.state.ny.us	rngeorge@gw.dec.state.ny.us	alex.roth@oprhp.state.ny.us

State of New York			
	Yancy Roy **Director of Public Information**	**Maureen Wren** **Public Information Officer**	**Lori Severino** **Public Information Officer**
Agency	Department of Environmental Conservation	Department of Environmental Conservation	Department of Environmental Conservation
Office phone	518-402-8000	518-402-8000	518-402-8000
Office fax	518-402-9016	518-402-9016	518-402-9016
Email	yxroy@gw.dec.state.ny.us	mfwren@gw.dec.state.ny.us	-

CAPITAL DISTRICT AREA
LOCAL MEDIA SOURCES & CONTACTS

Newspaper

- **Albany Times Union** tucitydesk@timesunion.com (Fax 454-5628)
  Brian Nearing (454-5094)
- **Altamont Enterprise** altamontenterprise@csdsl.net (Fax 861-5105)
  Melissa Hale-Spencer &
  Saranac Hale-Spencer (861-5008)
- **Colonie Spotlight** spotnews@nycap.rr.com (Fax 439-0609)
  General (439-4949)
- **Metroland** mertoland@metroland.net (Fax 463-3712)
  General (463-2500)
- **Business Review** albany@bizjournals.com (Fax: 438-9212)
  General (640-6800)
  Neil Springer, Managing Editor (640-6817)
- **Saratogian** news@saratogian.com (Fax 587-7750)
  General (584-4242)
  Barbara Lombardi, Managing Editor (583-8711)
- **Schenectady Gazette** gazette@dailygazette.net (Fax 432-6388)
  Eli Fanning (432-4391)
- **Associated Press, Albany Bureau** (Fax 438-5891)
  General (458-7821)

Radio

- WRVE 99.5 (Fax 452-4855)
- WGY 810 (Fax 452-4859)
- WFLY 92.3 (Fax 786-6692)
- WGNA 107.7 (Fax 782-1486)
- WAMC 90.3 (Fax 432-0991)

Television

- **FOX23**
  General (862-2323)
  Fax (862-0930)
  Jeb Rowledge/Assignment Desk (862-0995)
- **WRGB Ch 6** (CBS)
  Fax (346-6249)
  Tips line (346-8477)
  General; ask for Assignment Desk (346-6666)
- **WTEN Ch 10** (ABC) and 19
  Fax (426-4792)
  Terry Cavanaugh (436-0771)
- **WNYT Ch 13** (NBC)
  Fax (434-0659)
  Assignment Desk (436-4791)

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